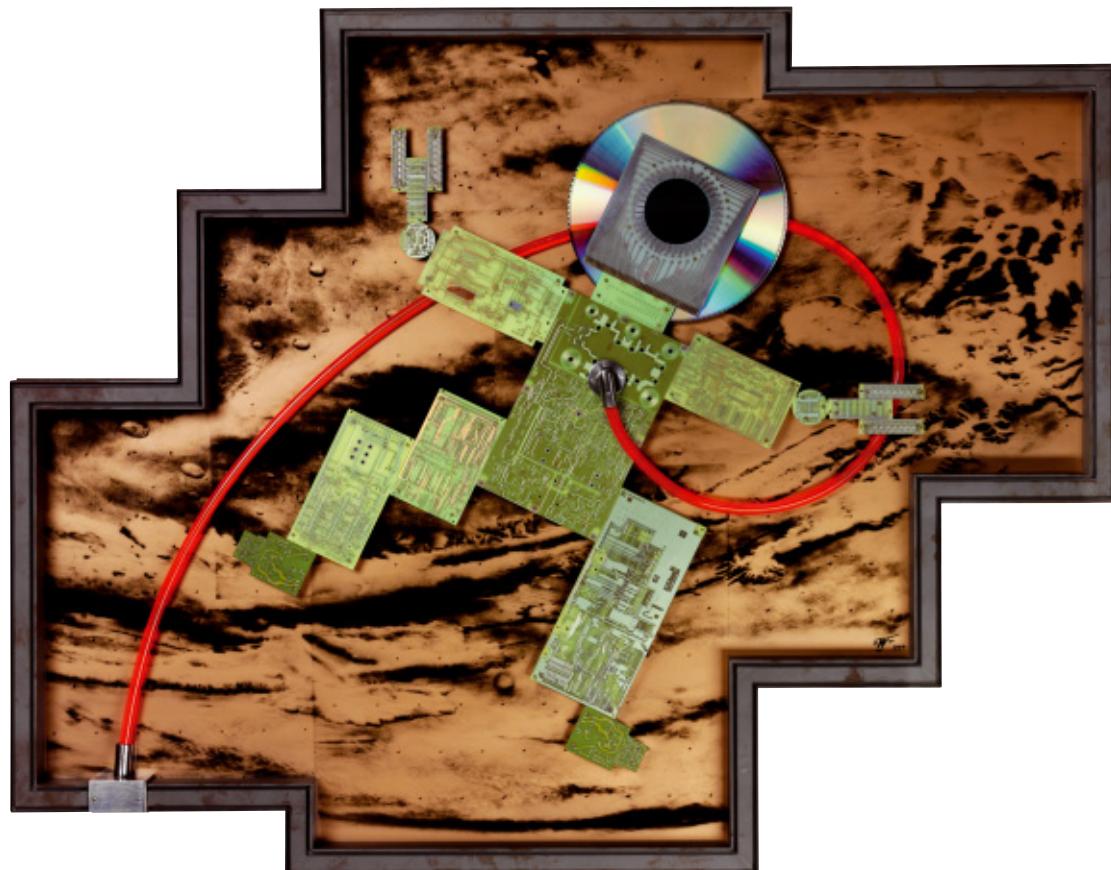


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ORBITER 4

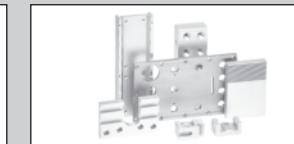
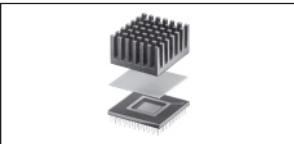
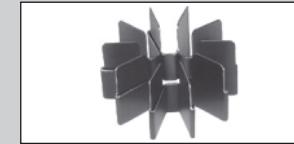
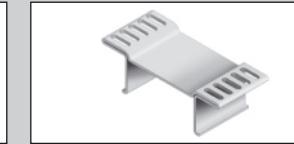
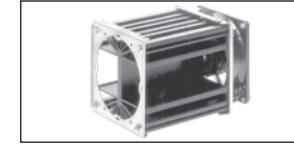
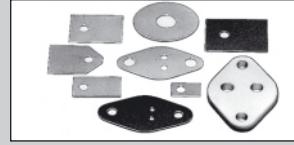
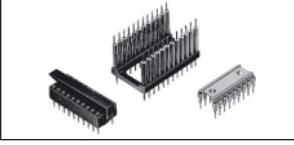
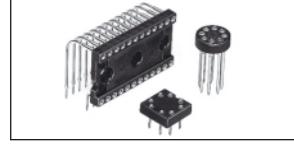
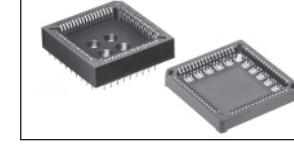
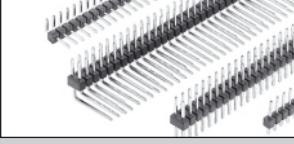
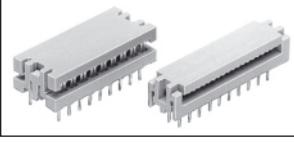
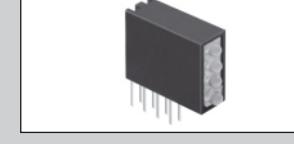
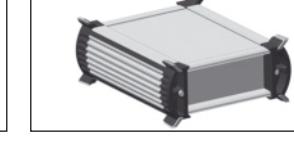
Mixed-Media auf Holz, 117,5 x 150 x 8 cm



von:

Petrus Wandrey

www.digitalism-art.de

A A 1 - A 138				
B B 1 - B 54				
C C 1 - C 22				
D D 1 - D 36				
E E 1 - E 50				
F F 1 - F 26				
G G 1 - G 78				
H H 1 - H 14				
I I 1 - I 28				
K K 1 - K 32				
L L 1 - L 10				
M M 1 - M 48				
N N 1 - N 82				

Extruded profiles: extruded heatsinks, extruded heatsinks with solder pins, fin coolers, fluid coolers, high-performance heatsinks	A 1 – A 138	A
Heatsinks for processors and LED: heatsinks and fan coolers for universal PGA/BGA, DIL, PLCC, Intel Pentium Xeon, Intel Pentium IV, heatsinks for LED	B 1 – B 54	B
Finger-shaped heatsinks, small heatsinks: finger-shaped heatsinks, heatsinks for transistors in plastic case, attachable heatsinks, small heatsinks, copper heatsinks for D PAK and others	C 1 – C 22	C
Cooling aggregates: miniature cooling aggregates, heatsink cooling aggregates, high capacity cooling aggregates, multi module cooling aggregates, hollow-fin aggregates	D 1 – D 36	D
Accessories for electronic components: mounting parts for heatsinks, thermal transfer compound, thermally conductive material, aluminium oxide and mica wafers, silicone washers, guide rails, solder stop plug, Clip fastening for mounting rail	E 1 – E 50	E
Sockets: IC-sockets for DIL, PLCC, sockets for transistors, LED displays, crystal oscillators and connector-sleeves	F 1 – F 26	F
PCB connectors and accessories: male and female headers, grid spacing 2.54, 2.00 and 1.27 mm, high precision contact strips, jumpers	G 1 – G 78	G
IDC connectors: design DIL, single and double row female headers, lockable connectors, flat band cable	H 1 – H 14	H
D-Sub connectors: male and female headers, connectors with mounting brackets, connectors for flat band cable, SMD and mixed layout, D-Sub shells, cut-out covers	I 1 – I 28	I
Brackets: brackets for PC and PCI with or without fixing tab, retainer for ISA versions	K 1 – K 32	K
Optoelectronics: LED-holders for front panel assembly, LED-holder without mounted LED, LED-holder with mounted LED, light pipes for SMDs	L 1 – L 10	L
Cases: desk consoles, shell cases, extruded assembled cases, combination cases, tube cases, miniature aluminium cases, design cases, cooling cases, ventilation frames, feet and bushings, special front panels, sheet constructions	M 1 – M 48	M
19" Extension systems: plug-in chassis, subracks, bench cases, system cases, insert modules, part front panels, rack handles, PC-board holder, extender cards	N 1 – N 82	N

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ABM 3050	E 36	DR 145 V0	E 38	FK 234 SA L 1	C 4	FS 6 120	E 25
ABM 4070	E 36	DR 150 V0	E 38	FK 234 SA L 2	C 4	FS 6 130	E 25
ABM TE 04	E 37	DR 710 V0	E 38	FK 234 SA L 3	C 4	FS 85	E 26
ABM TE 04 DIN	E 37	DR 711 V0	E 38	FK 234 SA L 4	C 4	FS 85 50	E 26
ABM TE 06	E 37	DR 712 V0	E 38	FK 235 MI L 1	C 4	FS 85 60	E 26
ABM TE 06 DIN	E 37	DR 713 V0	E 38	FK 235 MI L 2	C 4	FS 85 70	E 26
ABM TE 08	E 37	DR 714 V0	E 38	FK 235 SA L 1	C 4	FS 100	E 25
ABM TE 08 DIN	E 37	DR 715 V0	E 38	FK 235 SA L 2	C 4	FS 109	E 25
ABP 2550	E 36	DR 720 V0	E 38	FK 236 220	C 9	FS 151 P	E 24
ABP 3060	E 36	DR 725 V0	E 38	FK 236 CB	C 9	FS BF 06	E 27
ABP 4080	E 36	DR 730 V0	E 38	FK 237 SA 220 H	C 14	FS BF 07	E 27
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AHG K 28	E 29	DR 740 V0	E 38	FK 237 SA 220 V	C 14	FS BF 11	E 27
AHG L 7	E 29	DR 745 V0	E 38	FK 237 SA 220 VL	C 14	FS BF 13	E 27
AHG V 14	E 29	DR 750 V0	E 38	FK 238 SA L 1	C 8	FS BF 15	E 27
AHG V 17	E 29	DR 760 V0	E 38	FK 239 SA 32	C 6	FS BF 19	E 27
AHM 3260	E 37	DR 810 V0	E 38	FK 240 SA 220 H	C 14	FS BF 20	E 27
AHM 4380	E 37	DR 811 V0	E 38	FK 240 SA 220 O	C 13	FS BT 06	E 27
AKK 127	A 123	DR 812 V0	E 38	FK 240 SA 220 V	C 14	FS BT 08	E 27
AKK 191	A 123	DR 813 V0	E 38	FK 240 SA 220 VL	C 14	FS BT 10	E 27
AOS 3	E 15	DR 814 V0	E 38	FK 241 SA 218 V	C 11	FS BT 11	E 27
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AOS 3 P 2	E 15	DR 820 V0	E 38	FK 242 SA 220 O	C 13	FS BT 15	E 27
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AOS 5	E 15	DR 830 V0	E 38	FK 242 SA 220 VL	C 14	FS BT 19	E 27
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AOS 220 4	E 15	FK 201 SA CB	C 2	FK 245 MI 247 H	C 12	FS LP 16	E 28
AOS 220 SL	E 15	FK 202 SA	C 2	FK 245 MI 247 O	C 12	FS LP 17	E 28
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AOS P 2	E 16	FK 206 SA L	C 2	FK 249 SA 220	C 5	FS S 07 2	E 27
AOS P 3	E 16	FK 207 SA L	C 2	FK 250 06 LF PAK	C 22	FS S 08 2	E 27
AOS P 4	E 16	FK 208 SA L	C 2	FK 250 08 LF PAK	C 22	FS S 10 2	E 27
AOS P 5	E 16	FK 209 SA 32	C 6	FK 250 10 LF PAK	C 22	FS S 11 2	E 27
AOS P 6	E 16	FK 210 SA CB	C 6	FK 251 06 LF PAK	C 22	FS S 12 2	E 27
AOS P 7	E 16	FK 211 32	C 7	FK 251 08 LF PAK	C 22	FS S 13 2	E 27
AOS P 8	E 16	FK 212 CB	C 7	FK 251 10 LF PAK	C 22	FS S 15 2	E 27
AOS P 9	E 16	FK 213 SA 32	C 6	FK 252 SA 220 H	C 15	FS S 16 2	E 27
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DR 072 V0	E 38	FK 217 SA CB 2	C 3	FK 253	C 16	FS S 21 3	E 27
DR 073 V0	E 38	FK 218 32	C 8	FK 254 SA 3	C 2	FS U 06	E 28
DR 074 V0	E 38	FK 219 CB 1	C 9	FK 255	C 16	FS U 11	E 28
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DR 077 V0	E 38	FK 220 SA 220	C 10	FK 258 SA 220	C 10	GBM 3050	E 35
DR 078 V0	E 38	FK 222	C 7	FK 318 SA	C 2	GBM 4070	E 35
DR 079 V0	E 38	FK 222 THF	C 7	FK 318 SA 3	C 2	GBM 5080	E 35
DR 081 V0	E 38	FK 223 SA	C 3	FL 0,55	A 126	GBP 3060	E 35
DR 082 V0	E 38	FK 223 SA 3	C 3	FL 1,1	A 126	GBP 4080	E 35
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DR 084 V0	E 38	FK 224 ... 218 1	C 11	FLKI 80 G 200	A 130	GEL G ...	
DR 085 V0	E 38	FK 224 ... 218 2	C 11	FLKI 80 G 300	A 130	GEL 27 S ...	E 13
DR 086 V0	E 38	FK 224 ... 220 1	C 11	FLKI 80 G 500	A 130	GEL 28 ...	E 12
DR 087 V0	E 38	FK 224 ... 220 2	C 11	FLKR 1	A 131	GEL 28 G ...	
DR 088 V0	E 38	FK 224 ... P SIP	C 10	FLKU 140	A 129	GEL 60 ...	E 13
DR 089 V0	E 38	FK 225 SA L 1	C 5	FLKU 140 G 200	A 130	GEL 60 G ...	
DR 105 V0	E 38	FK 225 SA L 2	C 5	FLKU 140 G 300	A 130	GS 3	E 17
DR 110 V0	E 38	FK 227 SA L 1	C 8	FLKU 140 G 500	A 130	GS 3 P	E 17
DR 115 V0	E 38	FK 228 SA L 1	C 5	FS 6 065	E 25	GS 3 P SL	E 17
DR 120 V0	E 38	FK 229 SA L 1	C 5	FS 6 070	E 25	GS 32 P	E 17
DR 125 V0	E 38	FK 230 SA L 1	C 5	FS 6 080	E 25	GS 66 P	E 17
DR 130 V0	E 38	FK 231 SA 220	C 6	FS 6 090	E 25	GS 218	E 17
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GS 220 P	E 17	ICK LED R 29 x 11,5 G	B 33	ICK S 25 x 25 x 6,5	B 22	ICK S 32,5 x 20	B 28
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IB 2	E 50	ICK LED R 32 x 14 G	B 33	ICK S 25 x 25 x 18,5	B 23	ICK S 40 x 10	B 29
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IB 5	E 50	ICK LED R 33 x 16,5	B 34	ICK S 32 x 32 x 10	B 23	ICK S 45 x 30	B 29
IB 6	E 50	ICK LED R 33 x 16,5 G	B 34	ICK S 32 x 32 x 20	B 23	ICK S 45 x 45	B 29
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IB 9	E 50	ICK LED R 36 x 12	B 34	ICK S 36 x 36 x 20	B 24	ICK S 50 x 30	B 30
IB 10	E 50	ICK LED R 36 x 12 G	B 34	ICK S 40 x 40 x 10	B 24	ICK S 50 x 45	B 30
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IB 13	E 50	ICK LED R 40 x 27	B 35	ICK S 45 x 45 x 10	B 25	ICK S 54 x 45	B 31
IB 14	E 50	ICK LED R 40 x 27 G	B 35	ICK S 45 x 45 x 20	B 25	ICK S R A 40 x 20	B 29
IB 15	E 50	ICK LED R 45,7 x 16,5	B 35	ICK S 50 x 50 x 20	B 25	IK 3	E 49
IB 16	E 50	ICK LED R 45,7 x 16,5 G	B 35	ICK S 50 x 50 x 25	B 25	IK 341 3	E 49
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IB 18	E 50	ICK LED R 50,8 x 16,5 G	B 36	ICK S 50 x 50 x 50	B 25	IS 2	E 47
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IBT 7	E 50	ICK LED R 75 x 10	B 37	ICK SMD A 5	B 45	IS 8	E 48
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ICK 1000 H	B 44	ICK PGA 16 x 16 x 8	B 13	ICK SMD F 21	B 46	ISAS 25 A	E 33
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ICK BGA 14 x 14 x 10	B 17	ICK PGA 17 x 17 x 8	B 13	ICK SMD G 13 SA	B 46	ISAS 30 B	E 34
ICK BGA 21 x 21	B 18	ICK PGA 17 x 17 x 12	B 13	ICK SMD G 17 SA	B 46	ISAS 30 C	E 34
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ICK BGA 31 x 31 x 10	B 19	ICK PGA 20 x 20 x 12	B 15	ICK SMD K 8	B 46	ISAS 60 B	E 34
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ICK LED R 27 x 10 G	B 32	ICK S 17 x 17 x 15	B 22	ICK S R 28,5 x 10	B 28	K 15	A 125
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KAP 220 K	E 14	LA ICK 17 x 17 F 12 A	B 50	MS 54 25	E 44	SK 31	A 72
KAP 220 O	E 14	LA ICK 17 x 17 W 05	B 50	MS 56 15	E 44	SK 32	A 76
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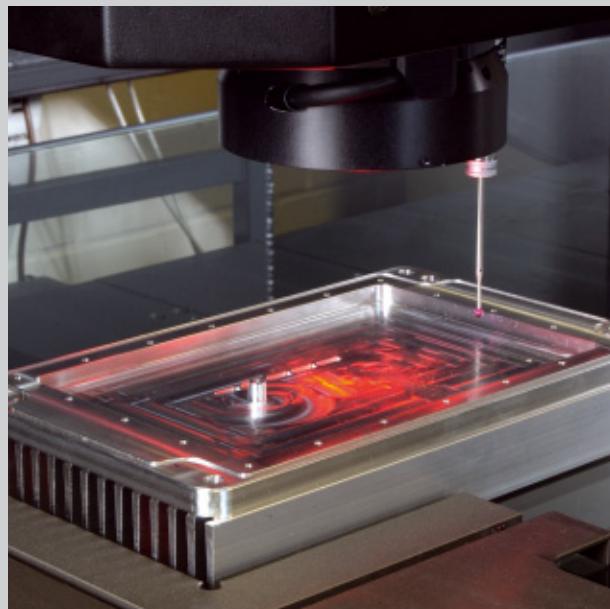
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certified quality management



own tool-making department



foresighted storekeeping



efficient special machines



precise punching department



up-to-date milling technology



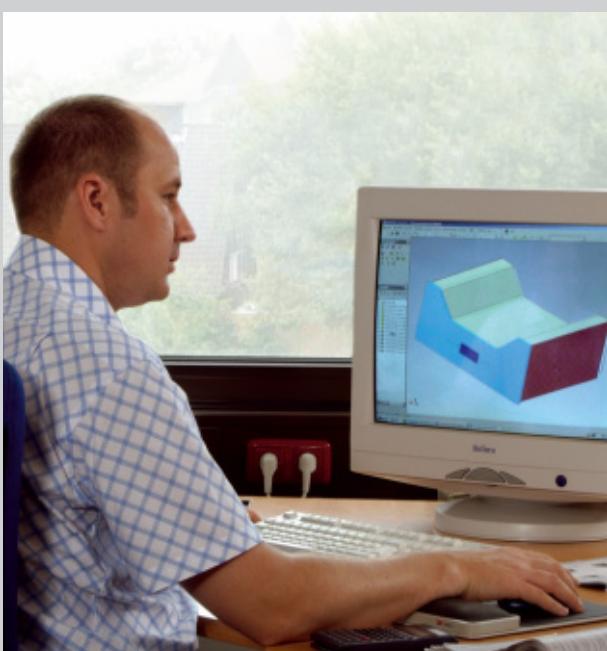
oyer of the company



motivated employees



committed field service



innovative product development



Quality-Management System DIN EN ISO 9001

We are certified to DIN EN ISO 9001.

This process-directed quality management system implies a constant focus on satisfying the demands of customers, and this is the major objective of our company.

The implementation and further development of our quality management system demonstrably ensures

- guaranteed customer satisfaction and thus the success of our company,
- compliance with customers' requirements at all times through defined processes,
- early detection and prevention of errors, and
- checking of both process effectiveness and efficiency on a regular basis together with steady improvement.

It is through constant vigilance and the provision of evidence that we deliver flawless products, which fully comply with quality requirements, that we maintain our quality certification.

In order to secure lasting company success and to meet our customers' expectations now and in the future, we define measurable objectives within the framework of our quality system, which are regularly checked and developed.

We are committed to constant measurement and improvement of our performance.

Our quality management system applies to all processes carried out by our company.

Certificate

Standard

ISO 14001:2004

Certificate Registr. No. 01 104 8209

TÜV Rheinland Cert GmbH certifies:

Certificate Holder:



Fischer Elektronik GmbH & Co. KG
Nottebohmstraße 28
D - 58511 Lüdenscheid

Scope:

Design/construction, manufacture, assembly and technical advice for heatsinks, sockets, connectors, mounting parts, cases, 19" assembly systems, computer accessories

An audit was performed, Report No. 8209. Proof has been furnished that the requirements according to ISO 14001:2004 are fulfilled.
The due date for all future audits is 31-12 (dd.mm).

Validity:

The certificate is valid from 2011-01-01 until 2013-12-31.
First certification 1998

2010-12-13

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln



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Certificate

Standard

ISO 9001:2008

Certificate Registr. No. 09 100 4274

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Certificate Holder:



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Nottebohmstraße 28
D - 58511 Lüdenscheid

Scope:

Design/construction, manufacture, assembly and technical advice for heatsinks, sockets, connectors, mounting parts, cases, 19" assembly systems, computer accessories

An audit was performed, Report No. 4274. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 31-10 (dd.mm).

Validity:

The certificate is valid from 2012-11-01 until 2015-10-31.
First certification 1994

2012-10-23

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln



DGA-ZM-58-95-00

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Environmental Management System DIN EN ISO 14001

Fischer Elektronik consider protection of the environment and saving of natural resources entrepreneurial tasks of high priority.

Aware of this, Fischer Elektronik were the first German heat-sink manufacturer to implement, in 1998, the environmental management system in accordance with DIN EN ISO 14001.

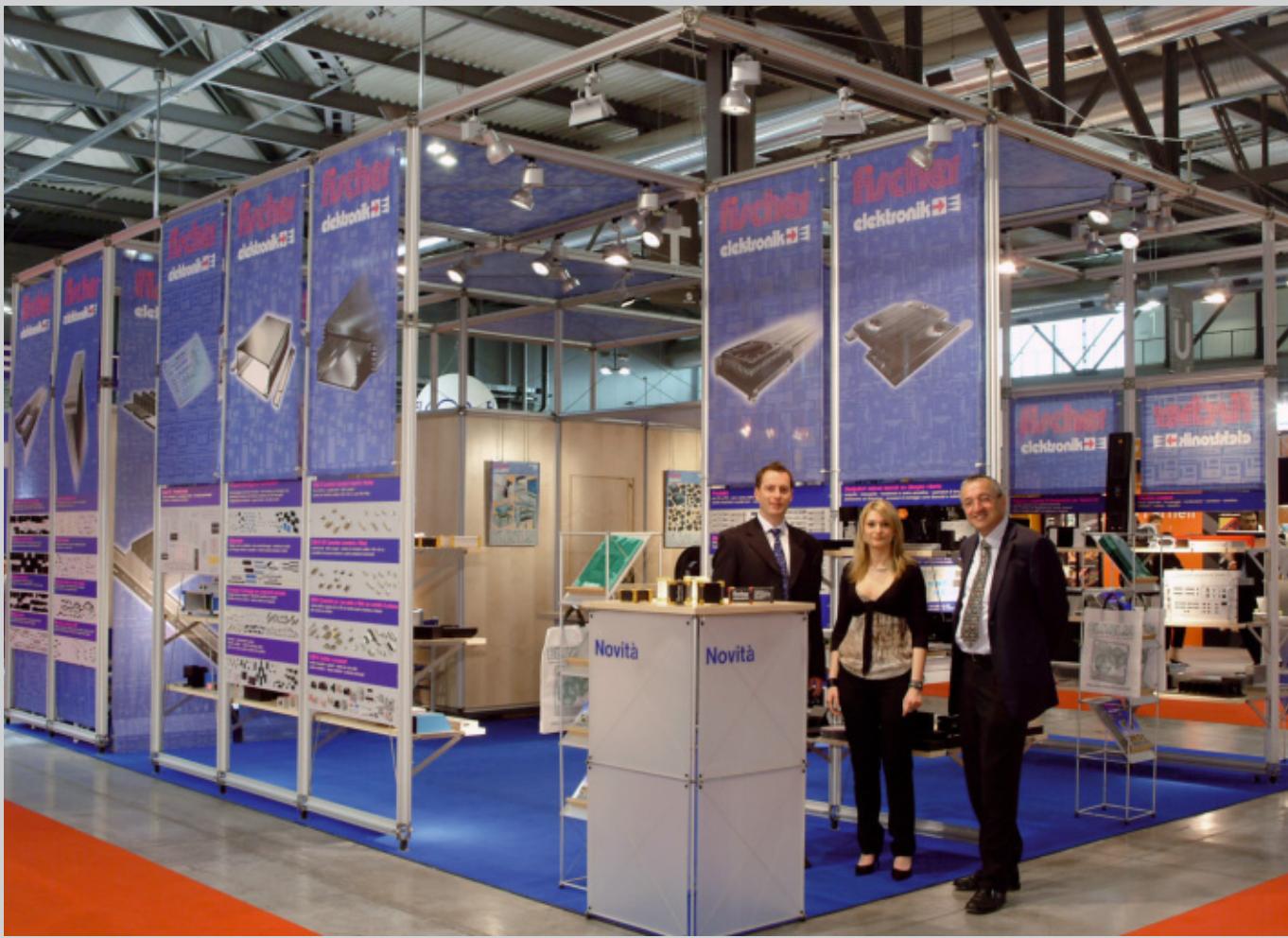
Our entrepreneurial responsibility comprises preventing accidents, safeguarding against occupational diseases, designing workplaces to suit human requirements, developing products which are safe to use, saving resources and avoiding environmental impact to the maximum extent possible.

We already consider environmental compatibility at the product and process development stage. The environmental impact of our activities is documented, assessed and in a continuous improvement process reduced to a minimum.

Implementation and consistent working on and with the environmental management system is a vital process and a constant challenge but finally it will always lead to better results.

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19. 3. - 22. 3. 2013
www.amper.cz

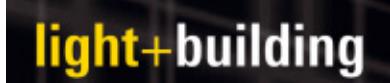


Munich D
9. 5. - 12. 5. 2013
www.highendsociety.de



Nuremberg D
14. 5. - 16. 5. 2013
www.pcim.de
Hall 9, stand 9-215

LpS 2013
LED SYMPOSIUM + EXPO
professional
LED Lighting Technologies
International Winning Approaches



Bregenz F
24. 9. - 26. 9. 2013
www.led-professional.com
Hall A 16

Frankfurt D
30. 3. - 4. 4. 2013
www.light-building.de



electronica

Munich D
2014
www.electronica.de



WindEnergy
Hamburg

Hamburg D
23. 9. - 26. 9. 2014
www.windenergyhamburg.com



Vienna A
2014
www.vienna-tec.at

fischer elektronik ➤

Explanations – references – printings

... index area:
shows topics/categories
“current”

... index area:
shows topics/categories
“further”

Standard aluminium profiles	→ A 129 - 130
Technical explanations	→ A 2 - 7
Extruded heatsinks	→ A 20 - 81
Assignment table	→ A 9 - 11

SA = black anodised
MI = solderable surface
ME = clear anodised
TP = chrom-free transparent passivated




... page number

... footnotes, give references to pages with combinable or similar products

... option for surface finishing

... link to page

... length on stock in mm

... hole pattern

... symbol of heatsink geometry

... thermal resistance in K/W

... thickness of sheet/plate

... air/speed in m/s

Imprinting of heatsinks - Your and our time is expensive

An order for imprinting must state the font, the font size and the exact position of the imprint with dimensions, taking due account of countersunk holes etc.. When placing the first order, the company logo must be supplied as a vector file. If these conditions are not complied with, the order for imprinting may have to be turned down, or additional costs will have to be charged.

Compliance with the following criteria ensures smooth handling:

Adobe Illustrator (.ai)

without half-tone images, fonts transformed into paths or supplied

CorelDraw (.cdr)

Macromedia FreeHand (.fh)

all fonts enclosed; half-tone images colour-separated (full-tone or scale colours) and with correct resolution (300 dpi colour, black / white 600 dpi), no RGB

QuarkXPress (.qxd)

All this takes additional time and consequently incurs extra costs. The usability must be checked by our printing shop:
In most cases, Adobe Acrobat (.pdf); screen formats (.jpg, .gif, .png) and paper copies, stickers and the like are not suitable for preparing printer's copies!

Copies that definitely cannot be used:

Imperfect copies such as fax copies / Microsoft Office files (.doc, .xls, .ppt) can only be used for information or for transmitting texts.

Please always add dimensional drawings (.dxf) to the parts to be imprinted! Please note as a general rule:

Retouching work extending beyond the standard time will be invoiced additionally at cost price.

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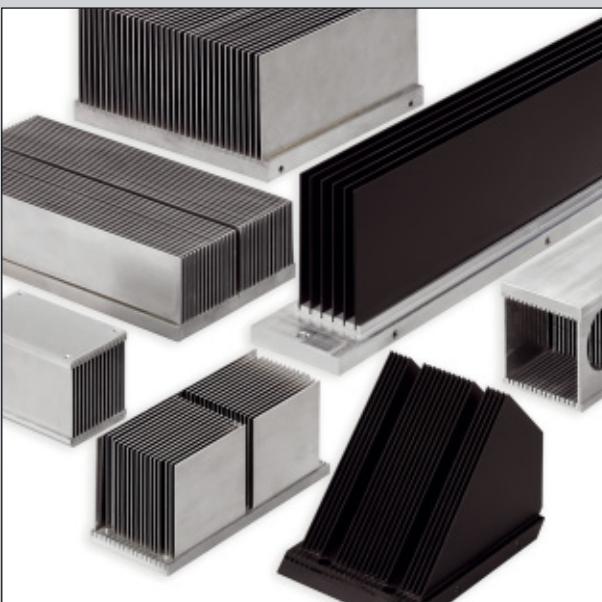
Machined heatsinks

- several hundreds of extrusion profiles available
- future orientated stockkeeping of heatsink profiles in a fully automatic honeycomb warehouse
- precise milling treatments in highest quality
- effective heat spreading by means of heatsinks with grouted copper areas
- designs and modifications according to your demand



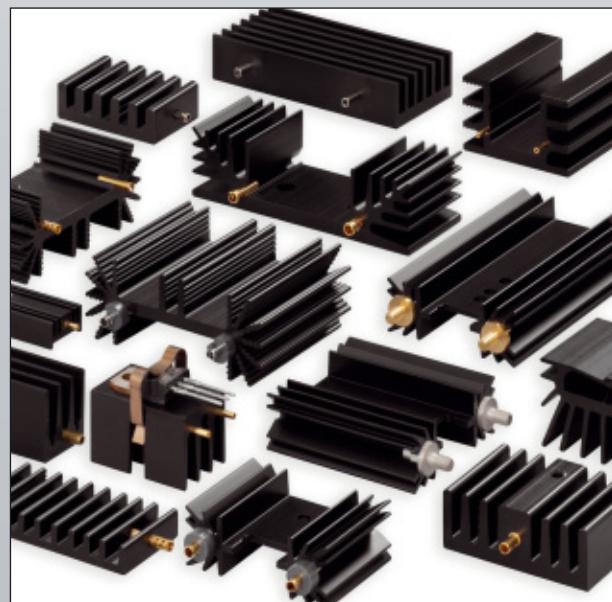
Fluid heatsinks

- fluid heatsinks for dissipation of big heat flow volumes
- compact design with internal lamella structure
- thick bottom plates for optimal heat dissipation
- I- and U-streamed versions
- Water connection or mounting flange for your special application
- Customized treatments and solutions



Lamella heatsinks

- compact lamella heatsinks with a big surface
- special design for forced convection
- thermotechnical optimal fitted lamellas
- precise milled flat semiconductor mounting surface
- single and double sided bottom plate made of aluminium or copper
- production according to customer specified demands



Extruded heatsinks with solder pins

- solid pressed in soldering pins and threaded bolts for a direct pcb-mounting
- for horizontal and vertical mounting position
- standard drilling patterns and transistor retaining springs for various semi-conductive elements
- soldering pins with insulation for spacing help
- variations and modifications according to drawing

Technical introduction

1. General points

In order to provide optimum performance of semi-conducting devices it is essential not to exceed the maximum junction temperature indicated by the manufacturer.

Generally this maximum junction temperature can only be maintained without exceeding it by running the device concerned at lower power outputs.

At outputs approaching the maximum ratings semi-conductor devices have to be cooled by so called heatsinks, sometimes called dissipators.

The thermal performance of these heatsinks primarily depends on the thermal conductivity of the material from which they are made, size of surface area and mass.

In addition, surface colour, mounting position, temperature, ambient air velocity and mounting place all have varying influence on the final performance of the heatsink from one application to another..

However, a figure for thermal resistance can be experimentally determined in a reliable manner and used in the equations that follow in part 2.

There are no agreed international standard methods for testing electronic cooling systems or for the determination of the thermal resistance.

Therefore the diagrams and values given in our catalogue have been determined under practical operating conditions and therefore allow the most suitable heatsink from the range to be selected.

We expressly point out that all information and data is given to the best of our knowledge and belief. The user is solely responsible for the proper use of our products and he should check their suitability for the intended application.

Fischer Elektronik do not assume any warranty, whether expressed or implied, for the suitability, function or merchantability of their products in specific or general applications, and they cannot be held liable for accidental or consequential damage due to non-observance of the above.

Furthermore Fischer Elektronik reserve the right to carry out technical modifications to their products at any time.
All orders are subject to the General Sales Conditions of Fischer Elektronik.

2. The determination of thermal resistance

The thermal resistance is the parameter that is the most important in cooler selection, apart from mechanical considerations.

For determination of the thermal resistance the following equation applies:

$$\text{Equation 1: } R_{thK} = \frac{\vartheta_i - \vartheta_u}{P} - (R_{thG} + R_{thM}) = \frac{\Delta\vartheta}{P} - R_{thGM}$$

In case of an application where the maximum junction temperature is not exceeded the temperature has to be verified.
When the case temperature has been measured the use of the following equation will enable the maximum junction temperature to be calculated:

$$\text{Equation 2: } \vartheta_i = \vartheta_G + P \times R_{thG}$$

The meaning of the determinants:

ϑ_i = maximum junction temperature in °C of the device as indicated by manufacturer.
As a »safety factor« this should be reduced by 20-30 °C.

ϑ_u = ambient temperature in °C.
The rise in temperature caused by radiant heat of the heatsink should be increased by a margin of 10-30 °C.

$\Delta\vartheta$ = difference between maximum junction temperature and ambient temperature.

ϑ_G = measured temperature of device case (equation 2).

P = maximum power rating of device in watts

R_{th} = thermal resistance in K/W

R_{thG} = internal thermal resistance of semiconductor device (as indicated by manufacturer)

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→ A 21

Technical introduction

R_{thM} = thermal resistance of mounting surface. For TO 3 cases the following approximate values apply:

- | | |
|---|------------------|
| 1. dry, without insulator | 0.05 - 0.20 K/W |
| 2. with thermal compound/without insulator | 0.005 - 0.10 K/W |
| 3. Aluminium oxide wafer with thermal compound | 0.20 - 0.60 K/W |
| 4. Mica wafer (0.05 mm thick) with thermal compound | 0.40 - 0.90 K/W |

R_{thK} = thermal resistance of heatsink, which can be directly taken from the diagrams

R_{thGM} = sum of R_{thG} and R_{thM} . For parallel connections of several transistors the value R_{thGM} can be determined by the following equation:

$$\text{Equation 3: } \frac{1}{R_{thGM \text{ ges.}}} = \frac{1}{R_{thG1} + R_{thM1}} + \frac{1}{R_{thG2} + R_{thM2}} + \dots + \frac{1}{R_{thGn} + R_{thMn}}$$

The result can be substituted into equation 1.

K = Kelvin, which is now the standard measure of temperature differences, measured in °C, therefore $1^\circ\text{C} = 1 \text{ K}$.

K/W = Kelvin per watt, the unit of thermal resistance.

Calculation examples:

1.A TO 3 power transistor with 60 watt rating has a maximum junction temperature of 180°C and an internal resistance of 0.6 K/W at an ambient of 40°C with aluminium oxide wafers.

What thermal resistance is required for the heatsink?

given:

- $P = 60 \text{ W}$
 $\theta_j = 180^\circ\text{C} - 20^\circ\text{C} = 160^\circ\text{C}$ (for safety margin)
 $\theta_u = 40^\circ\text{C}$
 $R_{thG} = 0.6 \text{ K/W}$
 $R_{thM} = 0.4 \text{ K/W}$ (average value)

find: R_{thK} using equation 1 $R_{thK} = \frac{\theta_j - \theta_u}{P} - (R_{thG} + R_{thM}) = \frac{160^\circ\text{C} - 40^\circ\text{C}}{60 \text{ W}} - (0.6 \text{ K/W} + 0.4 \text{ K/W}) = 1.0 \text{ K/W}$

2.Same conditions as above but for three devices with equally distributed power ratings.

solution use equation 1 and equation 3 $\frac{1}{R_{thGM \text{ ges.}}} = \frac{1}{0.6 + 0.4 \text{ K/W}} + \frac{1}{0.6 + 0.4 \text{ K/W}} + \frac{1}{0.6 + 0.4 \text{ K/W}} = \frac{3}{1} \text{ W/K}$

$$R_{thGM \text{ ges.}} = \frac{1}{3} \text{ K/W} = 0.33 \text{ K/W}$$

substitute into Equation 1 gives: $R_{thK} = \frac{160^\circ\text{C} - 40^\circ\text{C}}{60 \text{ W}} - 0.33 \text{ K/W} = 1.67 \text{ K/W}$

With these values determined, the tabulation on page A 13 - 17 can be used to give a choice of possible heatsink profiles. Then by examination of the drawings and curves the final choice can be made.

3.A transistor with power rating of 50 W and internal thermal resistance of 0.5 K/W has a case temperature of 40°C . What is the actual value of junction temperature?

données:

- $P = 50 \text{ W}$
 $R_{thG} = 0.5 \text{ K/W}$
 $\theta_G = 40^\circ\text{C}$

find: θ_j using equation 2

$$\theta_j = \theta_G + (P \cdot R_{thG}) = 40^\circ\text{C} + (50 \text{ W} \cdot 0.5 \text{ K/W}) = 65^\circ\text{C}$$

Technical introduction

Thermal resistances of any profiles with forced convection

$R_{thKf} \approx a \cdot R_{thK}$
 R_{thKf} = thermal resistance with forced convection
 R_{thK} = thermal resistance with natural convection
 a = factor of proportion



Remarks:

1. The values indicated in the diagrams apply only for heatsinks with black anodised surface, mounted vertically and natural convection.

Correction factors: natural surface: +10 to 15 % for horizontal mounting: + 15 to 20 %

2. Heatsink profiles are extruded to European standard DIN EN 12020 (former DIN 17615). For profiles exceeding a circumscribed circle of 300 mm, the tolerances to DIN EN 755 (former DIN 1748) apply.

Important note:

Manufacturers of certain electronic components, especially modules with a large surface area, IGBT etc., specify installation surfaces for heatsinks etc. with an flatness, which is beyond standard tolerances. Such perfect flatness can only be achieved by milling the installation surface. Furthermore, it should be noted that threaded wire inserts may be required in order to reach higher tightening torques in aluminium (e.g. Heli-Coil or similar.). Please observe the semiconductor manufacturers' information.

3. The mentioned heatsink profiles in our catalogue contain so called extrusion marks between the fins for a profile identification.

To avoid misuse the operator has to check the size and position for the mechanical treatment or placement of the components.

4. Profile extruded threaded channels are no threads conforming to standards, as they have no thread pitch. The thread pitch is imitated by staggered webs (ribs). The customer is responsible for appropriate use.

5. Machining of our extruded and non extruded profiles conforms to requirements of DIN ISO 2768 m - unless otherwise stated. For all ICK S types DIN ISO 2768c is valid.

6. The lengths of extruded profiles [↔] and the pin layouts [⊕] indicate only the standard range. We offer every profile cut to customer's exact length and machining requirement made to drawing or sample. We bore, countersink, mill, saw, grind and cut threads into your heat sink to meet your specific requirements. With our modern machine tools including CNC machining centres, multispeduled drills (up to 26 drillings/threads at the same time) and digital milling and stamping tools plus our own "in house" tool room we are able to manufacture competitively priced prototypes as well as batch and mass produced parts with short lead times.

7. The standard material of our heatsinks is warm age-hardened aluminium alloy according to EN AW 6060 – T66 (former AlMgSi05 – F22 acc. to DIN 1748). Our standard surface treatments are raw degreased aluminium (Al) and black anodised (SA). On request, we anodise clear natural (ME) or decorative in any colour that is technically possible.

8. If you cannot find a suitable profile within our range of approx. 400 profiles, 13 small heatsinks and 50 finger shaped heatsinks, we can design and produce to your requirements. Please contact us at the start of your next project so that we can work together, either directly or through our representatives. Remember that we have the ability to find the solution for "your" cooling problem.

9. Note on tolerances

All dimensions given in this catalogue for products, items and machined parts are acc. to DIN ISO 2768 m if not otherwise stated. Not included are items like extruded profiles, diecasts, handles, vibration dumper etc. for which different standards apply.

Update - January 2013

The information given in this catalogue were established and examined carefully.

Nevertheless, mistakes or printing errors, and especially technical modifications and updating and improvement of our products, cannot be excluded.

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Order example

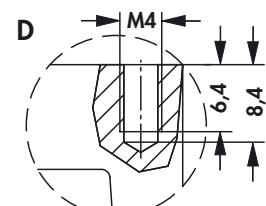
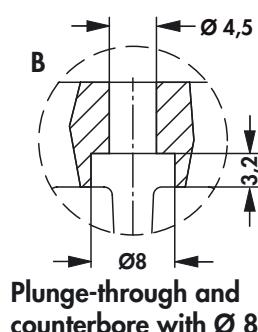
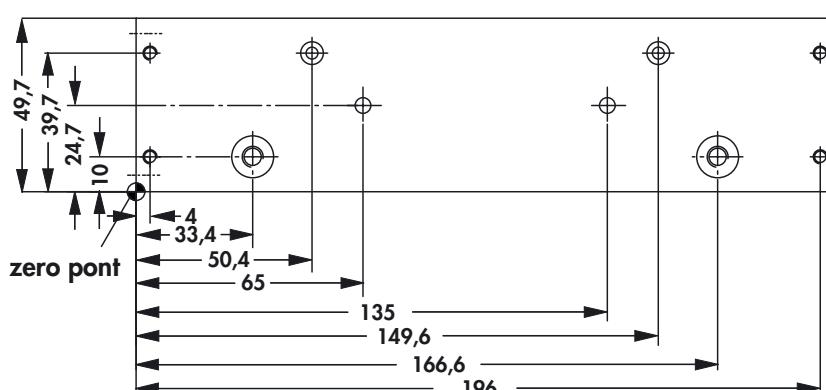
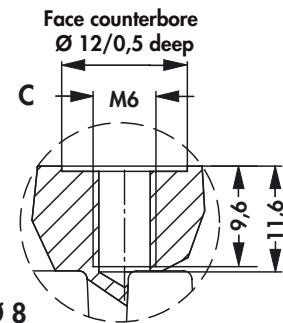
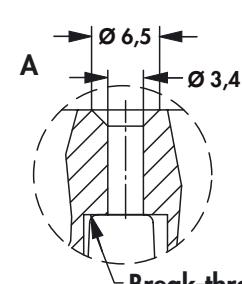
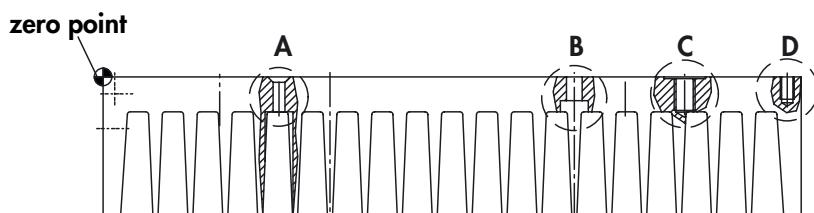
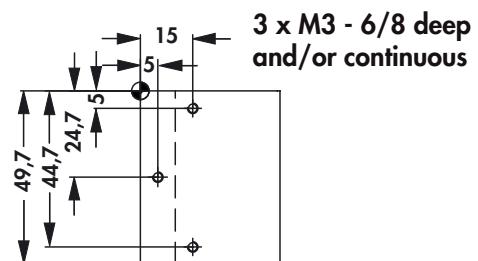
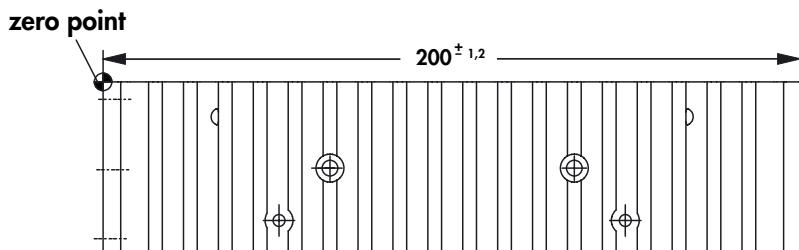
→ A 21

Technical introduction

General information

Blind holes are produced after anodising. Through holes are produced before anodising. With completely visual parts, additional painting is recommended. The sections are extruded according to DIN EN 12020. For sections that exceed a circumscribed circle of 300 mm, DIN EN 755 apply. The machining tolerances are specified according to DIN ISO 2768 m.

Visual parts: Please indicate at which place **clamp points** are allowed! We recommend e.g. supplementary laquering.



Technical introduction

Information for dimensioning, shown on SK 47 general:

The deflection can be up to 0.8 mm concave, 0.2 mm convex. If a certain flatness of the bottom surface is required the bottom thickness can be decreased by a maximum of approx. 0.8 mm by means of face-milling. This situation must be taken into consideration with the bore hole depths for blind holes.

Counterbores and bore hole diameters are to be produced according to DIN 74, if not explicitly stated otherwise.

The depth of thread should be calculated as follows.

Example M 5:

thread: $<M> 5 \times 1.6 \text{ mm} = 8 \text{ mm}$

core bore: $8 \text{ mm} + 2 \text{ mm} = 10 \text{ mm}$

Examples:

cutout A: Through-hole according to DIN 74 A m 3, counterbore bottom side, undercut of the fins.

cutout B: Through hole with break-through of the fins according to DIN 74 H m 4, counterbore on fin side.

cutout C: Thread M 6. Depth of thread $1.6 \times 6 \text{ mm} = 9.6 \text{ mm}$, bore depth $9.6 \text{ mm} + 2 \text{ mm} = 11.6 \text{ mm}$.

Bore hole on fin base is plunged through. Face counterbore dia. 12×0.5 on bottom side.

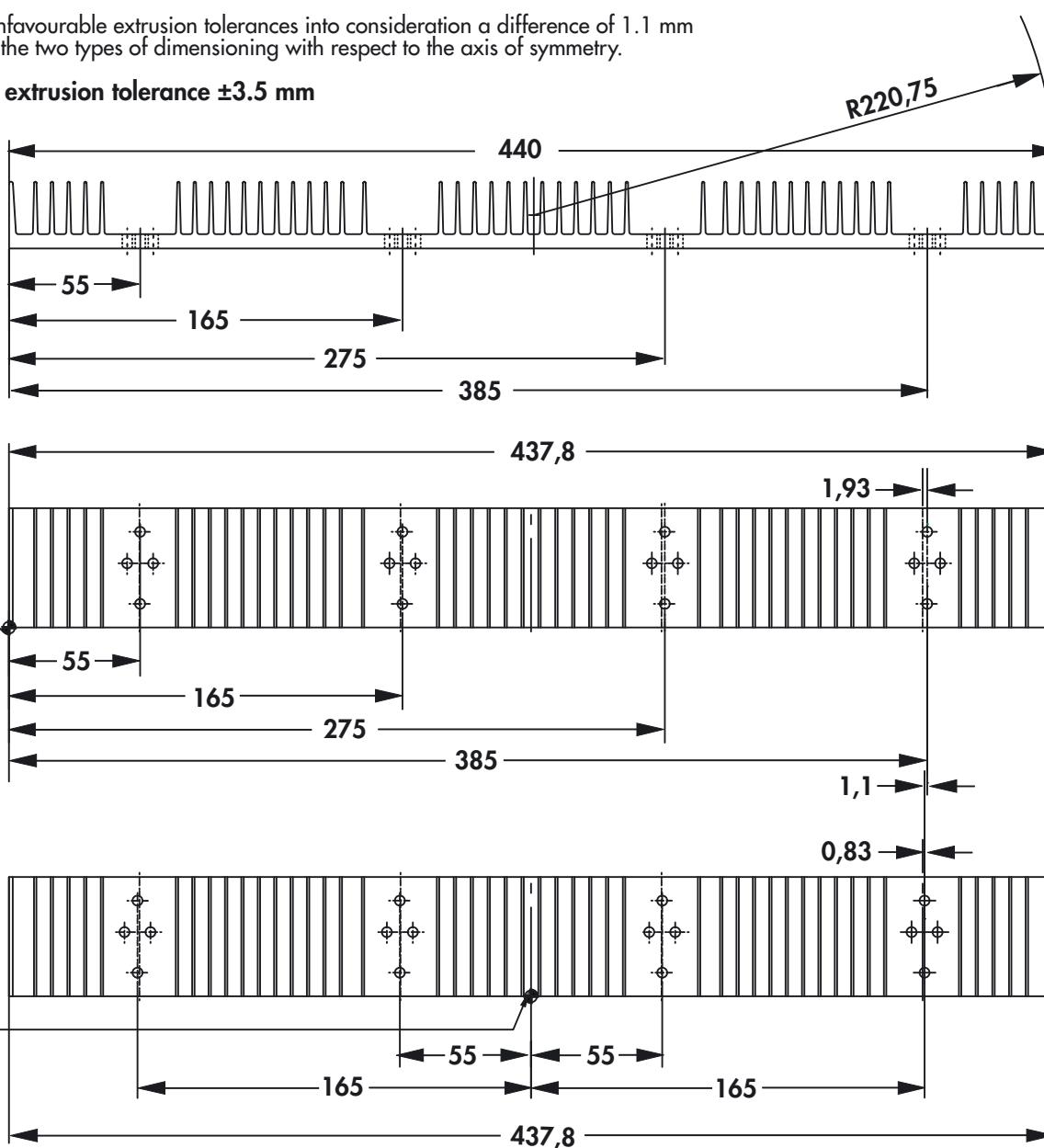
cutout D: Blind thread M 4. Depth of thread $1.6 \times 4 \text{ mm} = 6.4 \text{ mm}$, bore depth $6.4 \text{ mm} + 2 \text{ mm} = 8.4 \text{ mm}$.

Extrusion tolerances – production tolerances

There is often the problem, that the production tolerances cannot be adhered to, due to the extrusion tolerances. The two examples show how the production tolerances can be cut in half by means of suitable dimensioning (here: extension of the zero point from the outer edge to the center of the section).

When taking unfavourable extrusion tolerances into consideration a difference of 1.1 mm arises between the two types of dimensioning with respect to the axis of symmetry.

SK 82



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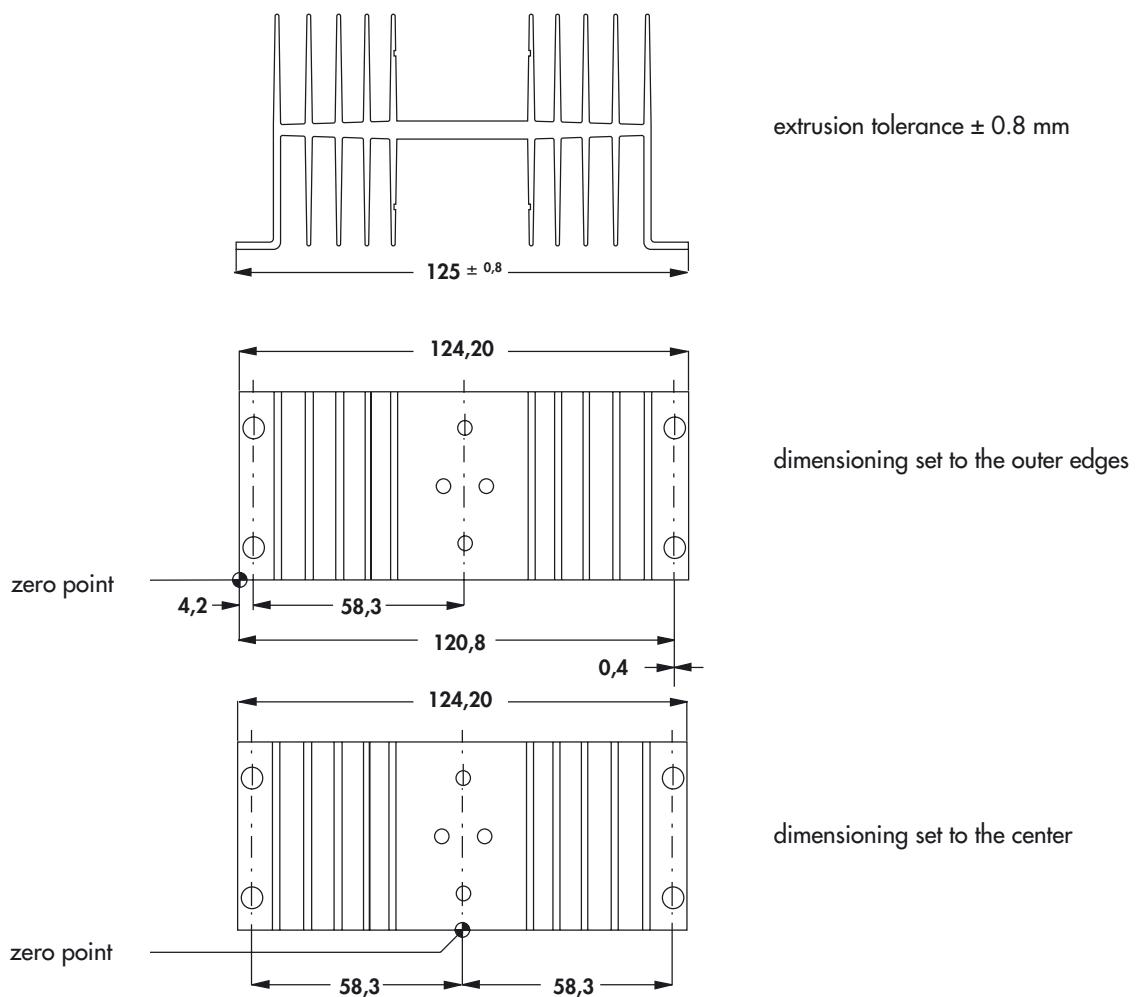
Assignment table

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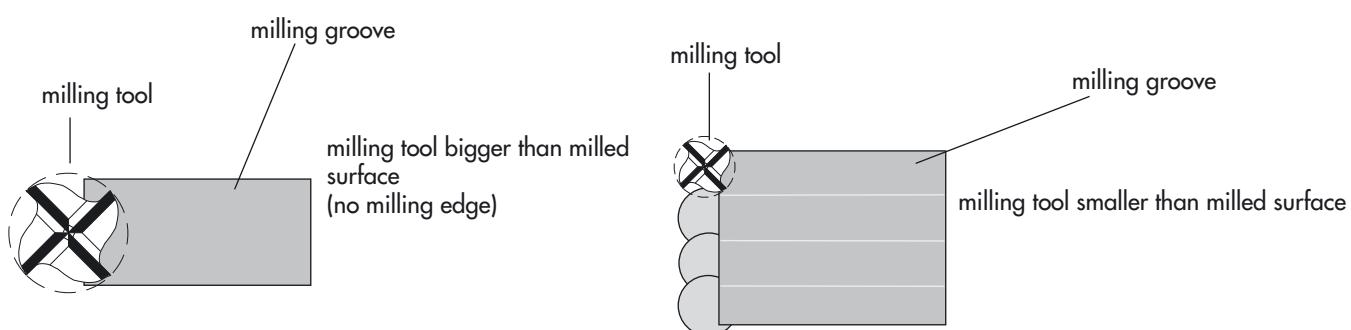
SK 34

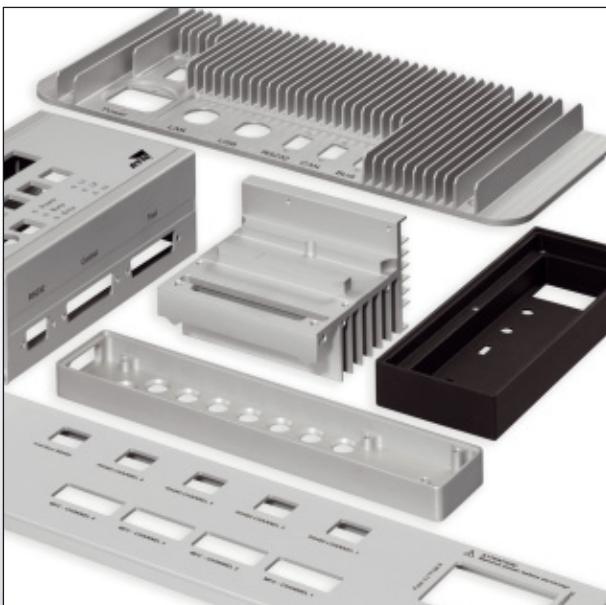


When taking unfavourable extrusion tolerances into consideration, a difference of 0.4 mm arises between the two types of dimensioning with respect to the axis of symmetry.

Milling

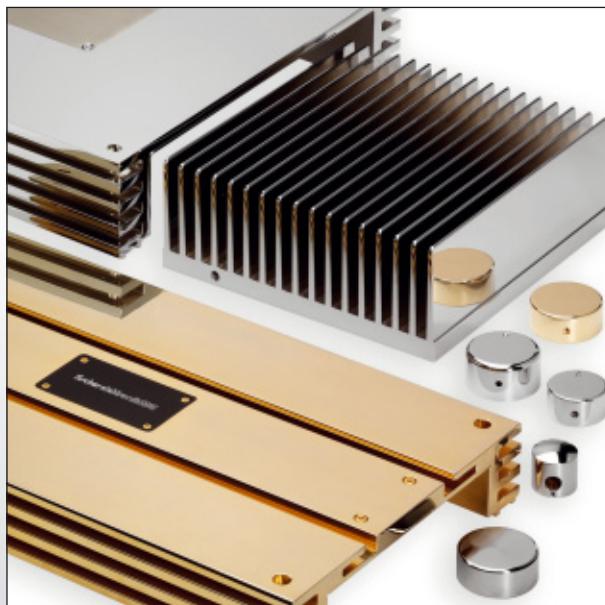
If, when milling heatsinks, cooling aggregates, etc., the milling tool diameter is smaller than the area being milled for production reasons, so called „milling grooves“ with steps or edges are produced (see sketch). Even if the roughness depth value for the surface is observed, it is a good idea to specify the area of the component in which no milling edges are allowed.





Decorative aluminium milled parts

- high quality, very precise milled, decorative aluminium parts
- exact radii and sharp-edged cutouts
- precision ground surfaces
- natural colour and black anodized



Chromium plating and gold plating

- chromium plating and gold plating of front panels, extruded profiles and construction parts
- qualitative constant and reproducible, high quality surfaces
- Various gloss levels by means of different polishing processes
- processing of brass, aluminium and steel



Surface refinements

- corrosion resistant and decorative anodize layers
- lacquerings and durable powder coatings in all current RAL colours
- anti-glare surfaces, Nextel®-Suide Coating
- electrically conductive surfaces, chromate VI free
- Prevention of clamp marks by means of special contacting systems

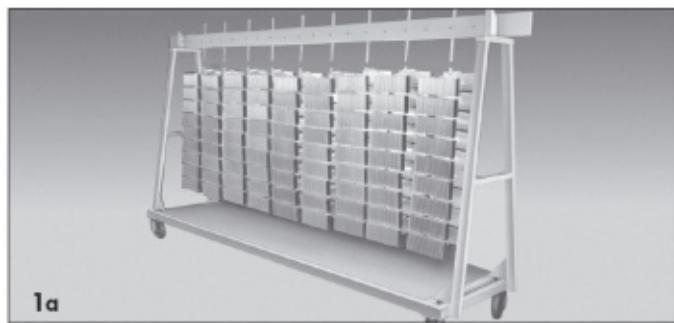


Development and construction

- competent partner with experience of more than 40 year
- Innovative product development, product-specific support by means of application engineers
- design assistance, feasibility analyses and product optimizations
- construction support and preparation of drawings

Heatsinks for decorative purposes and as visual parts

A



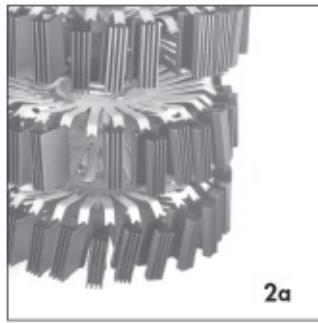
1a



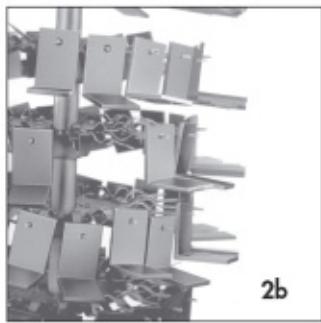
1b



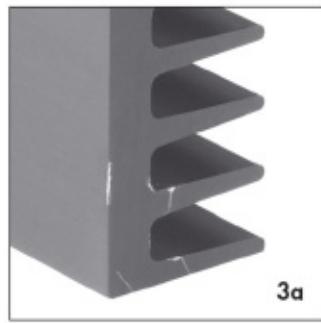
1c



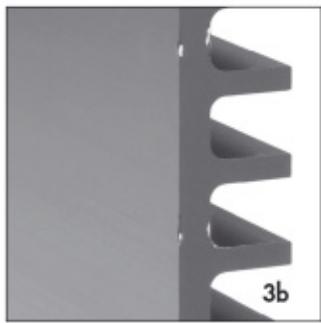
2a



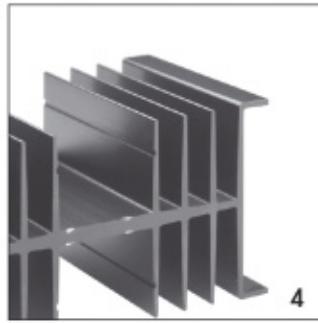
2b



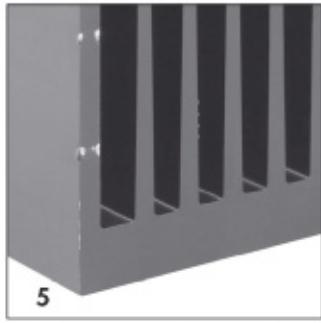
3a



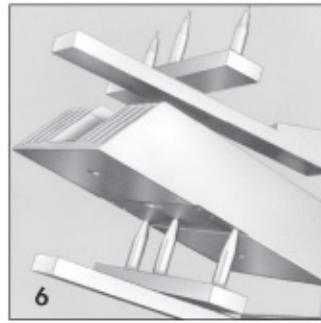
3b



4



5



6



7

Anodising (also known as ELOXAL: **E**lectrically **O**Xidised **A**luminium) is used in many cases for decorative surface protection of aluminium. In this process, the aluminium parts to be treated are connected to the positive pole of a direct-current source (anode) in a suitable electrolyte where aluminium, in so doing, forms the negative pole (cathode). The flowing direct current now causes a migration of oxygen-containing ions, with electrically negative charge, to the anode in order to deposit the oxygen. At this point, the aluminium reacts with this oxygen, forming aluminium oxide. A non-porous, electrically insulating, abrasion free, oxide barrier, or „eloxallayer”, then develops. The development and therefore thickness of this layer can be controlled by the amount of current flow.

For process handling, secure transportation and electrical connection, the parts to be anodised must be placed on „racks” (figure 1). As excellent electrical contact is necessary and the parts being processed must be mounted on the carrying racks in a totally secure manner a high clamping force is required especially for those large and heavy heatsinks (figure 2). This will mean that „clamp marks” are visible. These are mere bare points in the case of small and light weight heatsinks with black anodising (figure 3) but for heavy parts the clamping pressures and current can cause deformation of the surface (figure 4). Any such deformations on large heatsinks is unavoidable and varies with each part (figure 5).

If heat sinks are used as visual parts, in other words parts whose surface must be blemish-free in appearance, it is suggested that the customer will define specific areas which should have no clamp marks. If, for technical production reasons, it is not possible to place clamps on the remaining points then consideration should be either given to the construction of separate specialpurpose frames which will allow processing (figure 6). Existing or additional threaded holes may possibly also be used for screwing on fixing angles, upon which the clamps may then be placed (figure 7). Furthermore, there is always the possibility to remove the clamp marks by hand finishing, although some slight indentation may still be visible. Alternatively, instead of using the anodising process there are various paint finishes available.

With visual parts and mouldings, both discussion of all technical details and determination of the desired design in cooperation with the manufacturer - even at the initial enquiry stage - are imperative for the smooth completion of orders to the satisfaction of the customer.

Our experts are at your disposal for all technical advice.

B

C

D

E

F

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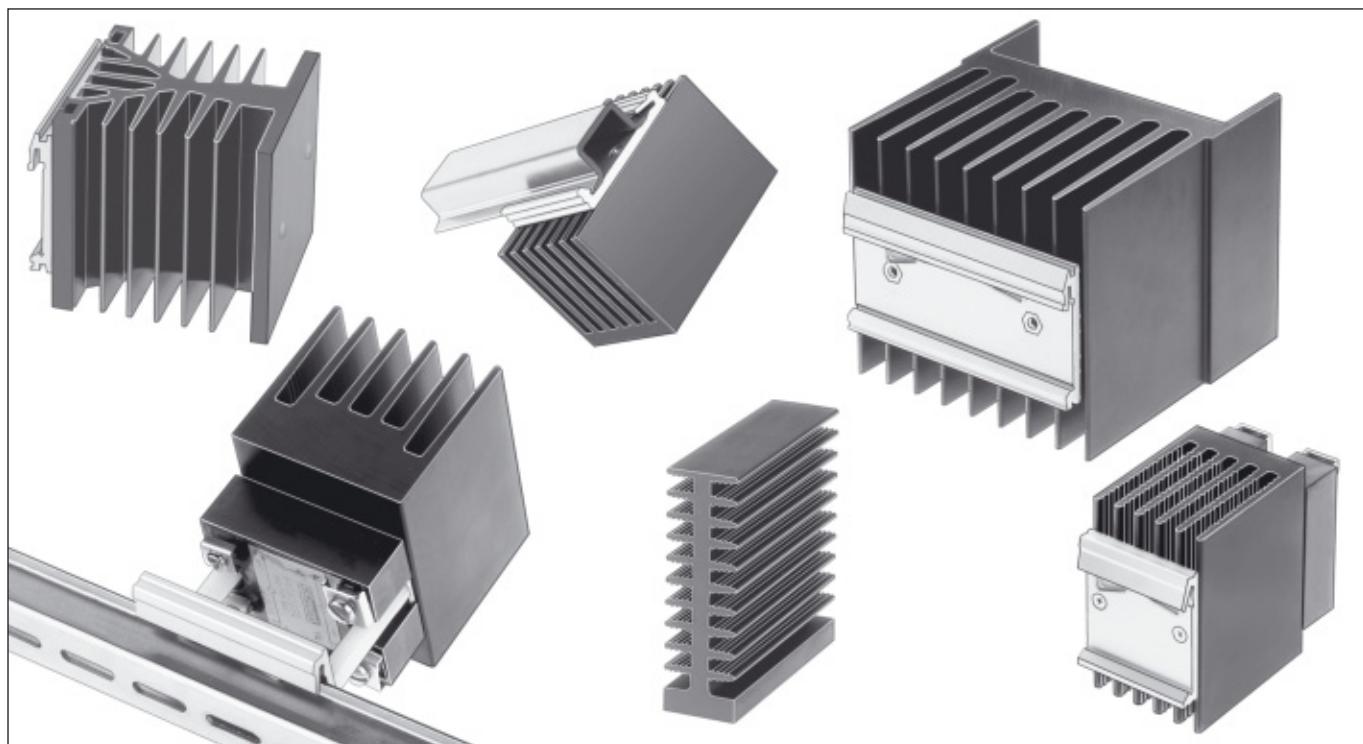
I

K

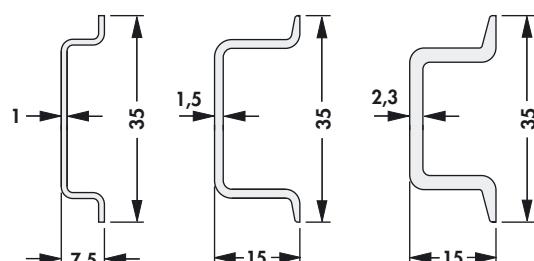
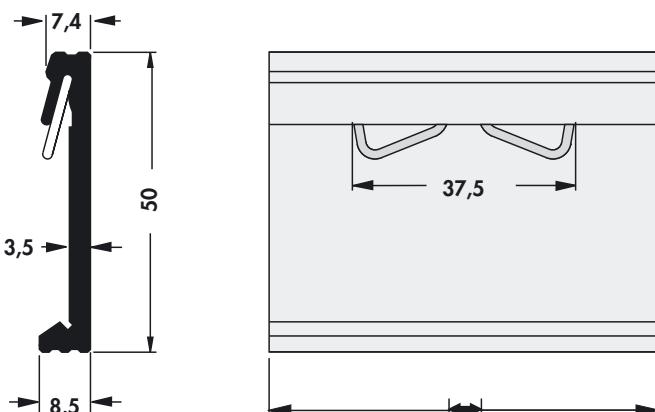
L

M

N



- universal clip fastening, suitable for all 35 mm mounting rails according to DIN EN 50 022, rail thickness from 1 to 2.3 mm → E 23
- fast and simple assembly of heatsinks by means of snapping them onto the mounting rail
- secure hold due to a stable extruded profile with integral stainless steel spring
- special lengths ($\geq 40\text{mm}$) and drillings on request



Examples of mounting rail versions suitable for KL 35

surface:	finish clear anodised
----------	-----------------------

Heatsinks for solid state relays

perforations	s KL 35	bez KL 35	
<ul style="list-style-type: none"> - drilling pattern rotated by 90° as well as further drilling patterns upon request 	<ul style="list-style-type: none"> - fixing of the SSR by means of screws with the help of insert nuts in the heatsink 	<ul style="list-style-type: none"> - fixing of the SSR by means of screws with the help of tapped holes in the heatsink 	
	Art. Nr.	Art. Nr.	Art. Nr.
SSR 1 	SK 172 - 75 KL SSR 1	SK 89 - 75 KL SSR 1 SK 89 - 100 KL SSR 1 SK 111 - 75 KL SSR 1 SK 434 - 75 KL SRR 1 SK 453 - 75 KL SRR 1 SK 467 - 75 KL SRR 1 SK 507 - 75 KL SSR 1	SK 04 - 75 KL SSR 1 SK 33 - 75 KL SSR 1 SK 455 - 75 KL SSR 1 SK 467 - 75 KL SRR 1 SK 507 - 75 KL SRR 1
SSR 2 		SK 89 - 100 KL SSR 2 SK 89 - 150 KL SSR 2 SK 176 - 100 KL SSR 2 SK 176 - 150 KL SSR 2 SK 194 - 75 KL SSR 2 SK 507 - 100 KL SSR 2	SK 04 - 150 KL SSR 2 SK 507 - 100 KL SSR 2 SK 507 - 150 KL SSR 2
SSR 3 	SK 187 - 75 KL SSR 3	SK 111 - 75 KL SSR 3	SK 48 - 50 KL SSR 3
SSR 4 	SK 172 - 150 KL SSR 4	SK 455 - 100 KL SSR 4 SK 467 - 100 KL SSR 4	

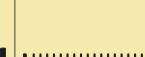
Distance sleeves
Fastening for mounting rail
Guide rails for PCBs
Mounting material for semiconduct

→ E 30 - 37
→ E 23
→ E 24 - 28
→ E 42 - 46

Spacers
Mica wafers
Aluminium oxide wafers
Mounting parts for heatsinks

→ E 38
→ E 17
→ E 15 - 16
→ A 2 - 7

Heatsink-chart

SK 440	D 30	SK 441	D 30	SK 458	D 30	SK 461	D 30	SK 497	D 30	SK 498	D 30
											
SK 47	A 49	SK 49	A 51	SK 56	A 53	SK 66	A 54	SK 90	A 47	SK 91	A 51
											
SK 93	A 55	SK 101	A 54	SK 102	A 50	SK 130		A 55	SK 139	A 52	
											
SK 149	A 52	SK 154	A 45	SK 155	A 45	SK 157	A 54	SK 158	A 58	SK 159	A 58
											
SK 160	A 58	SK 161	A 58	SK 162			A 58	SK 168			A 50
											
SK 190	A 52	SK 191	A 55	SK 193		A 49	SK 198				A 53
											
SK 199	A 51	SK 416	A 46	SK 418	A 58	SK 438	A 52	SK 439			A 55
											
SK 446	A 53	SK 466	A 43	SK 479	A 55	SK 501	A 53	SK 502	A 49	SK 507	A 40
											
SK 510	A 46	SK 520	A 49	SK 523	A 54	SK 524	A 51	SK 530	A 57	SK 531	A 57
											
SK 533	A 57	SK 535	A 57	SK 536	A 57	SK 537	A 57				
											
SK 538	A 57	SK 539	A 57	SK 540							A 57
											

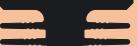
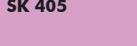
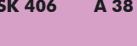
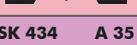
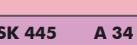
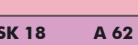
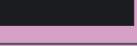
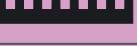
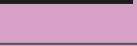
Heatsink-chart classified in categories of thermal resistance at 75 mm length

Heatsink-chart

SK 553 A 43	SK 555 A 51	SK 557 A 50	SK 568 A 53	SK 579		A 54	SK 580 A 50	SK 588 A 45
SK 591 A 49	SK 601 A 43	SK 57 A 64	SK 30 A 67	SK 53 A 74	SK 82			A 75
SK 86		A 75	SK 15 A 77	SK 163 A 78	SK 556 A 77	SK 83 A 79	SK 108 A 80	SK 109 A 80
SK 110 A 80	SK 435 A 81	SK 144 A 82	SK 584 B 41	SK 590 B 42	SK 592 B 41	SK 33 A 42	SK 42	A 48
SK 58 A 44	SK 85 A 46	SK 92 A 41	SK 94		A 48	SK 113		A 48
SK 118 A 50	SK 119 A 46	SK 120 A 45	SK 121 A 41	SK 132 A 44	SK 133 A 44	SK 135 A 39		
SK 136 A 48	SK 411 A 42	SK 412 A 47	SK 413 A 43	SK 429 A 37	SK 463			A 43
SK 467 A 33	SK 503 A 46	SK 504 A 44	SK 519 A 47	SK 583	A 52	SK 595 A 42	SK 71 A 64	SK 98 A 65
SK 197 A 65	SK 404 A 65	SK 02 A 66	SK 34 A 67	SK 67 A 69	SK 148 A 68	SK 88 A 73	SK 80	A 74
SK 147 A 74	SK 89 A 77	SK 140 A 77	SK 06 A 79	SK 23 A 79	SK 194 A 81	SK 40 A 82	SK 61 A 82	SK 415 A 90
SK 569 B 40	SK 570 B 40	SK 571 B 40	SK 572 B 40	SK 577 B 39	SK 578 B 39	SK 599 B 41	SK 602 B 39	SK 50 A 37



Heatsink-chart

SK 100 A 38	SK 166	A 48	SK 408 A 40	SK 410	A 44	SK 417	A 45	
								
SK 421	A 47	SK 433 A 41	SK 442	A 42	SK 453 A 32	SK 455 A 33	SK 464 A 39	SK 527 A 35
								
SK 04 A 64	SK 72 A 63	SK 401 A 63	SK 403 A 64	SK 14 A 67	SK 39 A 67	SK 20 A 68	SK 84 A 68	SK 184 A 68
								
SK 74 A 71	SK 124 A 71	SK 195	A 71	SK 500 A 72	SK 08 A 73	SK 60	A 74	SK 176 A 78
								
SK 172 A 81	SK 432 A 82	SK 46 B 39	SK 598 B 39	SK 407 A 39	SK 436 A 37	SK 450 A 34	SK 505 A 41	SK 508 A 41
								
SK 73	A 64	SK 97 A 62	SK 03 A 66	SK 419 A 70	SK 16	A 72	SK 79 A 73	SK 187 A 76
								
SK 11 A 79	SK 111 A 81	SK 44	A 90	SK 81 A 40	SK 189 A 31	SK 405	A 47	SK 406 A 38
								
SK 434 A 35	SK 445 A 34	SK 05 A 62	SK 18 A 62	SK 25 A 61	SK 28	A 63	SK 63 A 62	SK 402 A 62
								
SK 01 A 66	SK 64 A 70	SK 48 A 73	SK 52 A 74	SK 32 A 76	SK 544 A 76	SK 596 A 76	SK 175 A 83	SK 105 A 90
								
SK 484	A 109	SK 487 A 87	SK 499 A 87	SK 514 A 86	SK 593 A 87	SK 99 A 36	SK 106 A 31	SK 134 A 28
								
SK 182 A 39	SK 424 A 33	SK 425 A 33	SK 426 A 36	SK 475 A 35	SK 545	A 38	SK 546	A 40
								

Heatsink-chart classified in categories of thermal resistance at 75 mm length

Heatsink-chart

SK 567 A 34	SK 594 A 38	SK 19 A 63	SK 45 A 63	SK 51 A 61	SK 165 A 61	SK 181 A 60	SK 36 A 66	SK 21 A 70
SK 65 A 70	SK 69 A 71	SK 07 A 72	SK 55 A 83	SK 68 A 89	SK 112 A 89	SK 128 A 91	SK 414 A 90	
SK 481 A 85	SK 482 A 86	SK 483 A 87	SK 489 A 85	SK 495 A 87	SK 517 A 92	SK 518 A 92	SK 585 B 39	SK 589 A 86
SK 156 A 36	SK 174 A 30	SK 179 A 30	SK 180 A 36	SK 422 A 32	SK 444 A 38	SK 468 A 36	SK 472 A 31	SK 485 A 37
SK 566 A 26	SK 78 A 61	SK 107 A 60	SK 122 A 60	SK 150 A 61	SK 173 A 59	SK 185 A 73	SK 96 A 91	SK 138 A 91
SK 451 A 91	SK 490 A 84	SK 573 A 85	SK 574 A 86	SK 576 A 85	SK LED 2 B 43	SK LED 3 B 43	SK 177 A 27	SK 178 A 28
SK 400 A 28	SK 420 A 30	SK 423 A 32	SK 427 A 35	SK 437 A 24	SK 447 A 26	SK 448 A 26	SK 452 A 27	SK 454 A 24
SK 456 A 30	SK 469 A 23	SK 470 A 22	SK 471 A 28	SK 473 A 25	SK 476 A 24	SK 477 A 24	SK 478 A 23	SK 486 A 25
SK 493 A 27	SK 496 A 22	SK 509 A 29	SK 511 A 32	SK 513 A 31	SK 521 A 23	SK 522 A 22	SK 547 A 31	SK 548 A 34
SK 549 A 29	SK 550 A 27	SK 551 A 25	SK 552 A 23	SK 554 A 25	SK 558 A 23	SK 559 A 25	SK 560 A 26	SK 561 A 26
SK 562 A 29	SK 563 A 29	SK 564 A 30	SK 565 A 22	SK 581 A 28	SK 582 A 24	SK 586 A 22	SK 587 A 29	SK 597 A 27

A

B

C

D

E

F

G

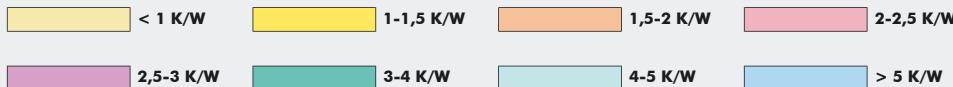
H

I

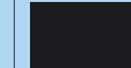
K

L

M



Heatsink-chart

SK 09 A 59	SK 59 A 60	SK 145 A 59	SK 443 A 59	SK 31 A 72	SK 153 A 83	SK 494 A 83	ICK ... B B 44	ICK ... H B 44
								
ICK ... L B 44	SFP A 133	SK 12 A 121	SK 13 A 121	SK 75 A 104	SK 76 A 104	SK 95 A 107	SK 115 A 121	SK 125 A 91
								
SK 126 A 106	SK 431 A 122	SK 480 A 84	SK 492 A 84	SK 512 A 84	SK 515 A 93	SK 515 05 A 93	SK 516 A 93	SK 575 A 84
								
SK LED 1 B 43	STP A 134	SU A 133	SVP A 134	SWP A 133	UK 14 SA A 121			
								

Heatsink-chart classified in categories of thermal resistance at 75 mm length

Assignment table of transistor heatsinks

	TO 3	TO 66	SOT 9	TO 220	SOT 32
extruded profiles	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 67 SK 69 SK 71 SK 72 SK 72 SK 73 SK 73 SK 74 SK 74 SK 78 SK 78 SK 79 SK 79 SK 80 SK 80 SK 84 SK 88 SK 97 SK 122 SK 124 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 122 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 122 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404	SK 09 SK 145 SK 59	SK 01 SK 02 SK 03 SK 04 SK 05 SK 07 SK 08 SK 14 SK 16 SK 18 SK 19 SK 20 SK 21 SK 28 SK 30 SK 31 SK 34 SK 36 SK 39 SK 45 SK 48 SK 52 SK 53 SK 55 SK 60 SK 63 SK 69 SK 71 SK 72 SK 73 SK 74 SK 78 SK 79 SK 80 SK 122 SK 147 SK 148 SK 150 SK 165 SK 185 SK 195 SK 197 SK 401 SK 402 SK 404

Extruded heatsinks

 Heatsinks for printed circuit boards → A 89 - 111
 Thermal conductive material → E 2 - 22
 Mount. material for semiconductors → E 42 - 46

→ A 22 - 83

 → A 84 - 88
 → A 2 - 7

Die-cast heatsinks

 Reating springs for transistors
 Lock-in transistor fixing spring
 Technical introduction

→ A 123 - 126

 → A 114 - 120
 → A 84 - 88
 → A 2 - 7

Assignment table of transistor heatsinks

	TO 3	TO 66	SOT 9	TO 5	TO 18	TO 247	TO 3 P
extruded heatsink with solder pins						SK 459 SK 484 SK 145 SK 126 SK 437	SK 129 SK 409 SK 104 SK 484 SK 448 SK 400 SK 456
extruded heatsinks	WP 4030					SK 126 SK 452	SK 452
set-up/clip-on heatsinks	AKK 127 AKK 191					FK 243 FK 245	
finger-shaped heatsinks	FK 201 FK 202 FK 236 FK 205 FK 206 FK 223 FK 217 FK 225 FK 234 FK 236	FK 201 FK 202 FK 205 FK 206 FK 207 FK 208 FK 217 FK 234 FK 236	FK 201 FK 202 FK 205 FK 206 FK 207 FK 208 FK 217 FK 234 FK 236				
small heatsinks				KF KK 55 KK 562 SKK			

Assignment table transistor heatsinks

	TO 218	TO 220	SOT 32	DIL	PLCC	P-SIP	PGA/BGA
U - Heatsinks		ICK 35 SK 13 SK 431 UK 14	SK 12				assignment table → B 2 - 9
extruded heatsink with solder pin	SK 145 SK 460 SK 437 SK 459	SK 104 SK 129 SK 145 SK 185 SK 409 SK 459 SK 460 SK 75	SK 129 SK 459 SK 104 SK 409 SK 469 SK 470			SK 460 SK 459	
extruded heatsinks	SK 126 SK 452	SK 95 SK 126 SK 454 SK 452 SK 517 SK 518	SK 95 SK 454	ICK...B ICK..H ICK...L	ICK PLCC ICK R		
set-up/clip-on heatsinks	FK 224 FK 241 SK 516	FK 220 FK 224 FK 237 SK 515				FK 224 FK 241	
finger-shaped heatsinks	FK 224 FK 243 FK 245	FK 205 FK 206 FK 207 FK 208 FK 210 FK 212 FK 214 FK 216 FK 217 FK 218 FK 219 FK 220 FK 222 FK 225 FK 227 FK 228 FK 229 FK 230 FK 231 FK 232 FK 233 FK 234 FK 235 FK 247	FK 201 FK 217 FK 205 FK 206 FK 207 FK 208 FK 209 FK 210 FK 211 FK 212 FK 213 FK 214 FK 215 FK 216 FK 218 FK 223 FK 234 FK 235 FK 236 FK 239 FK 219			FK 224	
small heatsinks			KK 32 KK 92				

Extruded heatsinks

Heatsinks for printed circuit boards

Thermal conductive material

Mount. material for semiconductors

→ A 22 - 83

→ A 89 - 111

→ E 2 - 22

→ E 42 - 46

Die-cast heatsinks

Reating springs for transistors

Lock-in transistor fixing spring

Technical introduction

→ A 123 - 126

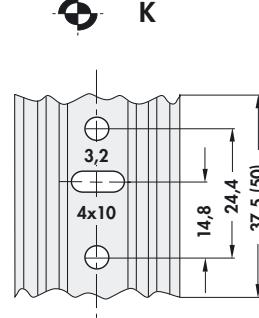
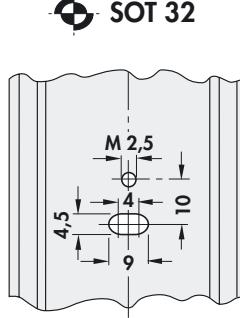
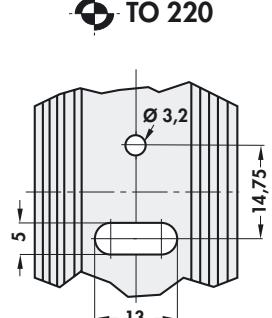
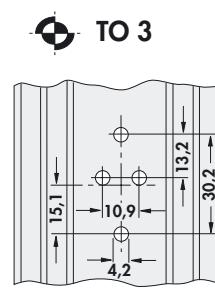
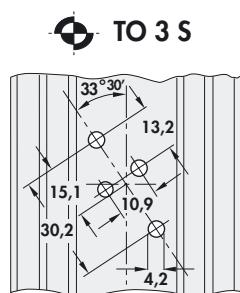
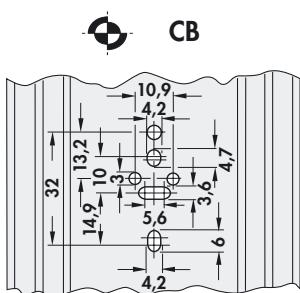
→ A 114 - 120

→ A 84 - 88

→ A 2 - 7

Heatsinks

Hole pattern

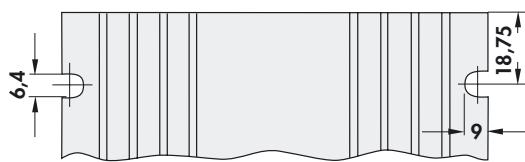


SOT 32 / TO 220 exceeding \leftrightarrow 37.5 mm

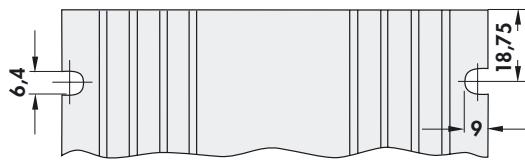
Standard hole pattern are processed as complete pin layouts, centered on the length of the heatsink.
Other positions of the pin layout on the heatsink, multiple drillings or changes of the drillings are processed according to customer's requirements.

For heatsinks exceeding \leftrightarrow 75 mm standard hole pattern can be supplied in multiple design.

Fixing slots



\leftrightarrow [mm]	number of fixing slots
37,5	2
75	4



\leftrightarrow [mm]	number of fixing slots
50	2
100	4

Heatsinks with the following shape and a standard hole pattern have these fixing slots as part of the serial production

Order example

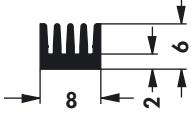
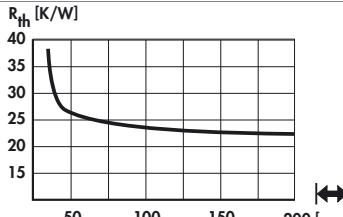
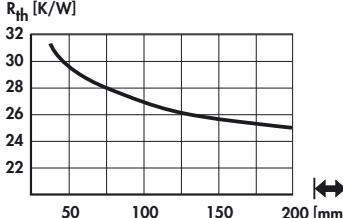
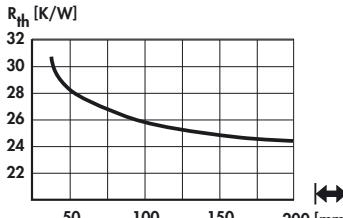
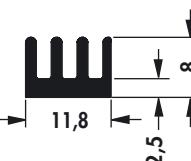
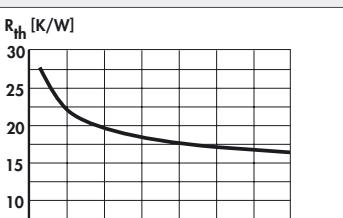
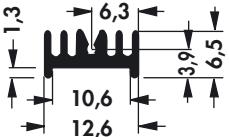
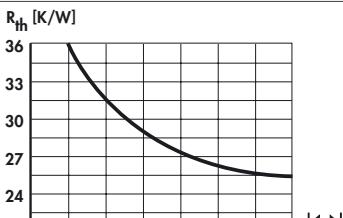
SK 01	50	SA	TO3
profile	length	surface	pin layout

Surface treatment for heatsinks with standard drilling: black anodised (SA).

Raw degreased aluminium (AL) and clear natural anodise (ME) on request.



Standard extruded heatsinks

art. no. SK 586 ...		
please indicate: ...  37.5 50 75 100 1000 mm		
art. no. SK 496 ...		
please indicate: ...  37.5 50 75 100 1000 mm		
art. no. SK 565 ...		
please indicate: ...  37.5 50 75 100 1000 mm		
art. no. SK 470 ...		
	extruded heatsinks for PCB mounting → A 109	
please indicate: ...  25 37.5 50 75 100 1000 mm	... ⌀ (optional) SOT 32; TO 220	
art. no. SK 522 ...		
please indicate: ...  15 25 37.5 50 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais

→ A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

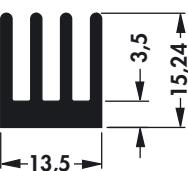
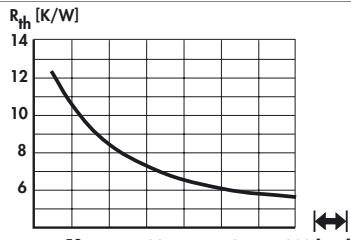
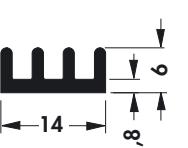
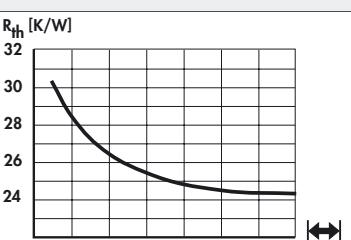
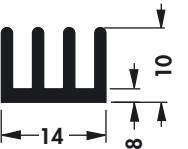
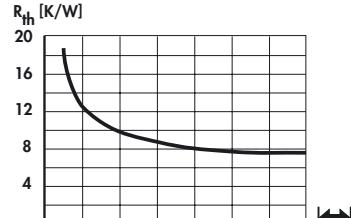
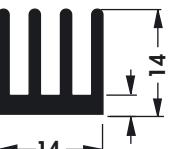
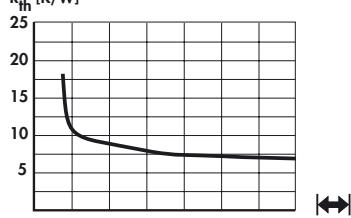
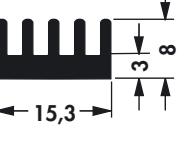
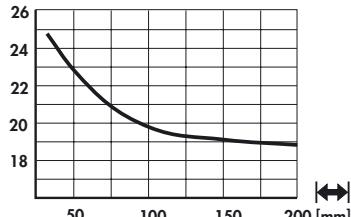
→ A 138

Technical introduction

→ A 2 - 7

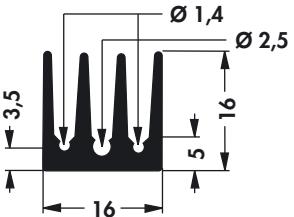
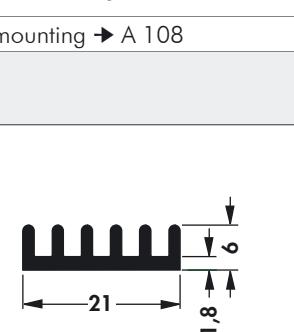
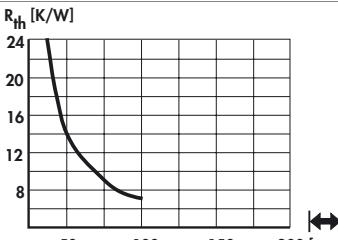
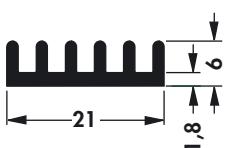
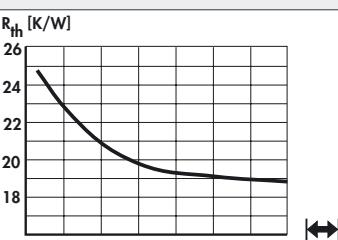
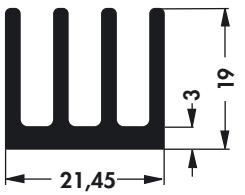
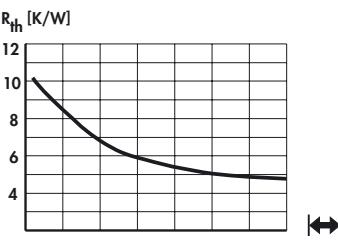
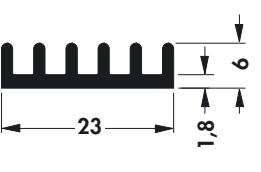
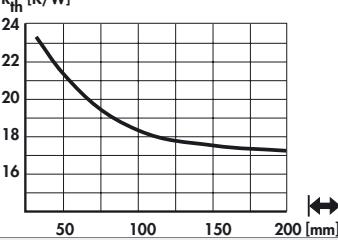
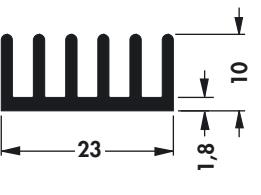
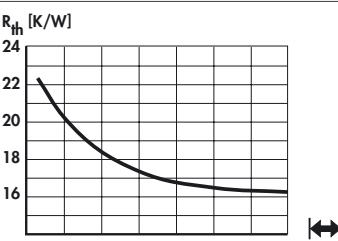


Standard extruded heatsinks

art. no.				
SK 469 ...	extruded heatsinks for PCB mounting → A 109			
please indicate:	... ↗	25 37,5 75 100 1000 mm	... ↗ (optional)	SOT 32; TO 220
art. no.				
SK 478 ...	please indicate: ... ↗		25 37,5 50 75 100 1000 mm	
please indicate:	... ↗	25 37,5 50 75 100 1000 mm		
art. no.				
SK 552 ...	please indicate: ... ↗		25 37,5 50 75 100 1000 mm	
please indicate:	... ↗	25 37,5 50 75 100 1000 mm		
art. no.				
SK 558 ...	please indicate: ... ↗		25 37,5 50 75 100 1000 mm	
please indicate:	... ↗	25 37,5 50 75 100 1000 mm		
art. no.				
SK 521 ...	please indicate: ... ↗		25 37,5 50 75 100 1000 mm	
please indicate:	... ↗	25 37,5 50 75 100 1000 mm		



Standard extruded heatsinks

art. no.	 		R _{th} [K/W]
SK 437 ...	extruded heatsinks for PCB mounting → A 108	... ↗ (optional) TO 218; TO 220; TO 247; TO 248	
please indicate: ... ↗ 100 1000 mm			
art. no.			R _{th} [K/W]
SK 476 ↗ (optional) TO 218; TO 220; TO 247; TO 248	
please indicate: ... ↗ 37,5 50 75 100 1000 mm			
art. no.			R _{th} [K/W]
SK 454 ...	extruded heatsinks for PCB mounting → A 95	... ↗ (optional) SOT 32; TO 220	
please indicate: ... ↗ 37,5 50 75 100 150 1000 mm			
art. no.			R _{th} [K/W]
SK 477 ↗ (optional) SOT 32; TO 220	
please indicate: ... ↗ 37,5 50 100 1000 mm			
art. no.			R _{th} [K/W]
SK 582 ↗ (optional) SOT 32; TO 220	
please indicate: ... ↗ 37,5 50 75 100 1000 mm			

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

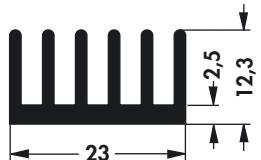
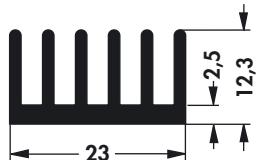
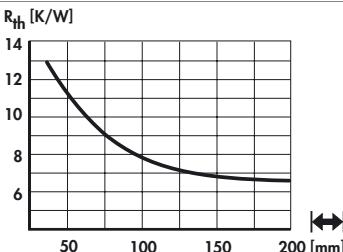
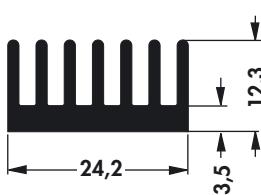
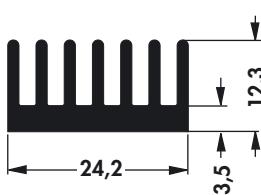
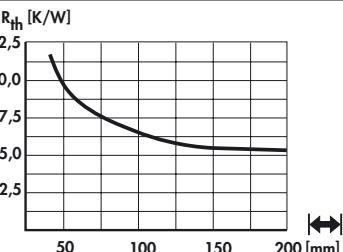
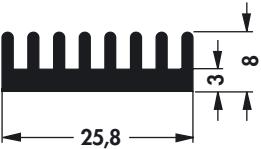
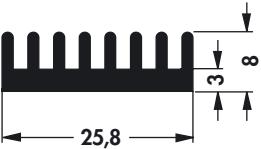
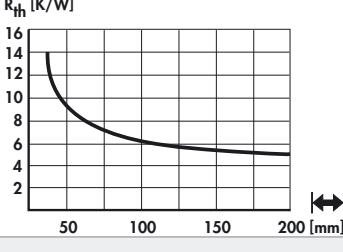
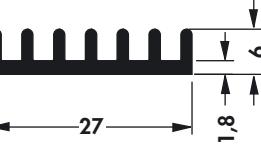
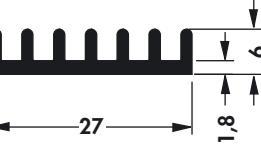
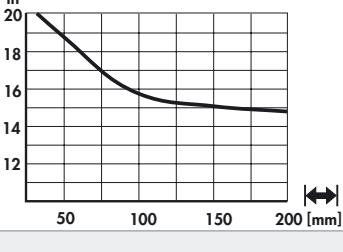
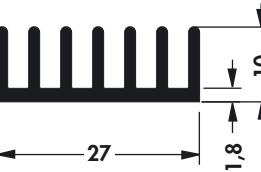
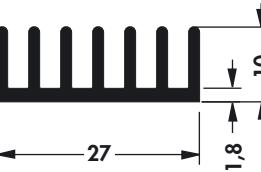
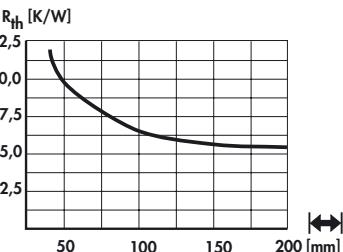
→ A 138

Technical introduction

→ A 2 - 7



Standard extruded heatsinks

art. no.		R_{th} [K/W]
SK 559 ...		
please indicate: ...  37,5 75 100 1000 mm		
art. no.		R_{th} [K/W]
SK 551 ...		
please indicate: ...  37,5 50 75 100 1000 mm		
art. no.		R_{th} [K/W]
SK 486 ...		
please indicate: ...  37,5 50 75 100 1000 mm		
art. no.		R_{th} [K/W]
SK 473 ...		
please indicate: ...  37,5 50 75 100 1000 mm		
art. no.		R_{th} [K/W]
SK 554 ...		
please indicate: ...  37,5 50 75 100 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

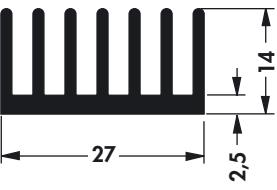
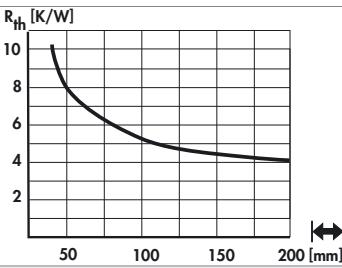
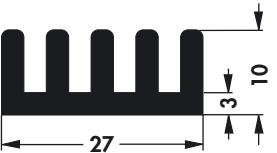
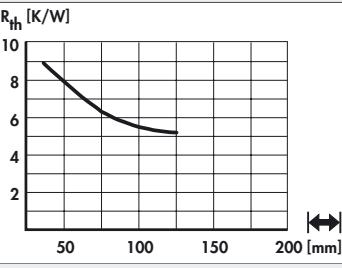
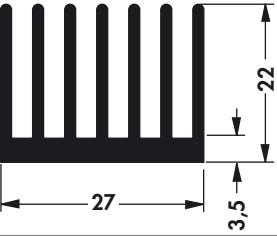
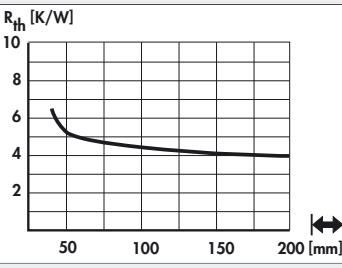
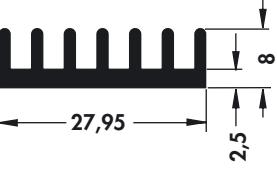
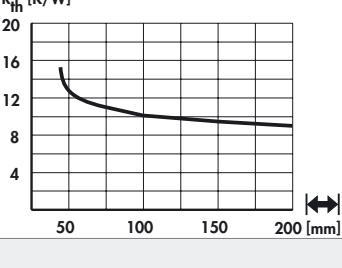
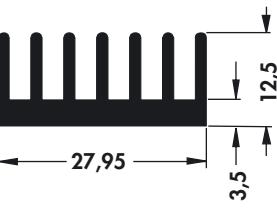
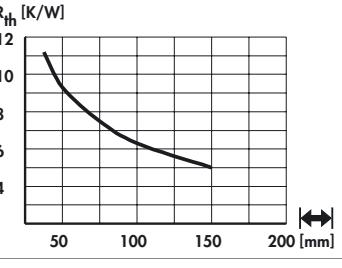
→ A 138

Technical introduction

→ A 2 – 7



Standard extruded heatsinks

art. no.			
SK 560 ...	please indicate:	...  37.5 50 75 100 1000 mm	
art. no.			
SK 447 ...	please indicate:	...  37.5 1000 mm	
art. no.			
SK 566 ...	please indicate:	...  37.5 50 75 100 1000 mm	
art. no.			
SK 561 ...	please indicate:	...  37.5 50 75 100 1000 mm	
art. no.			
SK 448 ...	extruded heatsinks for PCB mounting → A 110		
please indicate:	...  37.5 50 75 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

→ A 138

→ A 2 - 7

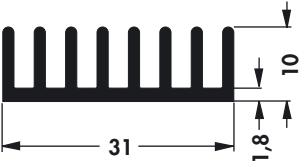
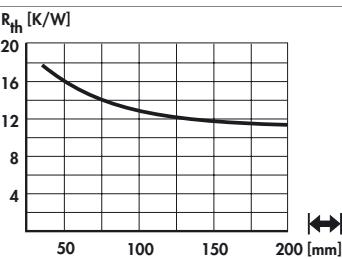
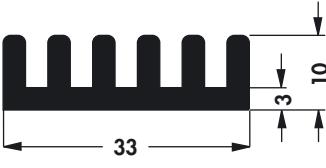
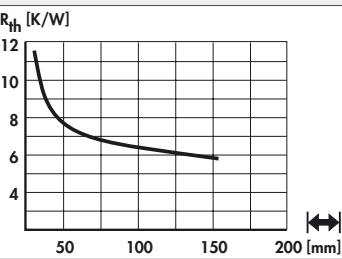
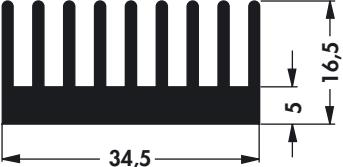
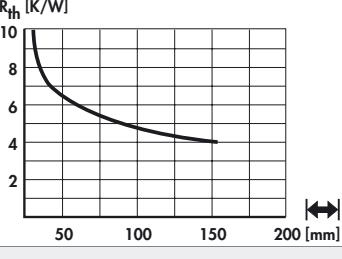
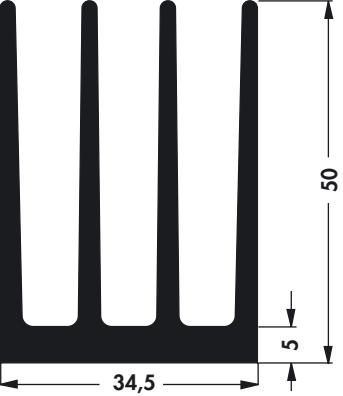
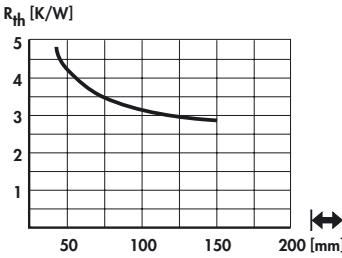
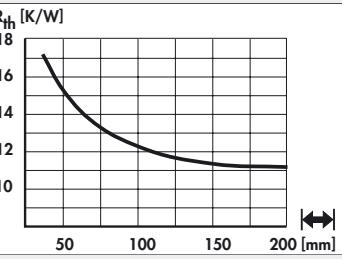


Standard extruded heatsinks

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art. no.				
SK 177 ...				
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art. no.				
SK 550 ...				
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art. no.				
SK 452 ...				
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art. no.				
SK 597 ...				
<table border="1"> <thead> <tr> <th>art. no.</th></tr> </thead> <tbody> <tr> <td>SK 493 ...</td></tr> </tbody> </table> <p>please indicate: ... ↗ 37,5 50 75 100 1000 mm</p>	art. no.	SK 493 ...		
art. no.				
SK 493 ...				



Standard extruded heatsinks

art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 581 ...		 Approximate data points: Width [mm]: 50, 100, 150, 200 R_th [K/W]: 17, 13, 11, 11
please indicate: ...  37.5 50 75 100 1000 mm		
art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 400 ...		 Approximate data points: Width [mm]: 50, 100, 150, 200 R_th [K/W]: 12, 7, 5.5, 5.5
please indicate: ...  37.5 50 75 100 1000 mm		
art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 178 ...		 Approximate data points: Width [mm]: 50, 100, 150, 200 R_th [K/W]: 10, 5.5, 4, 4
please indicate: ...  37.5 75 100 1000 mm		
art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 134 ...		 Approximate data points: Width [mm]: 50, 100, 150, 200 R_th [K/W]: 5, 3, 2.5, 2.5
please indicate: ...  37.5 50 100 1000 mm		
art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 471 ...		 Approximate data points: Width [mm]: 50, 100, 150, 200 R_th [K/W]: 17, 13, 11, 11
please indicate: ...  37.5 50 75 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

→ A 138

→ A 2 - 7

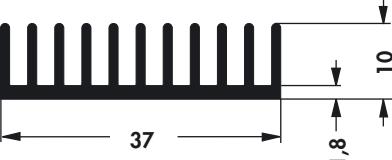
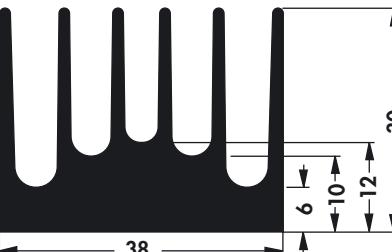
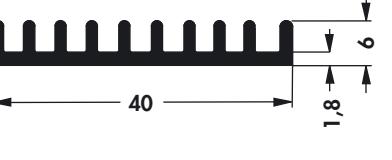
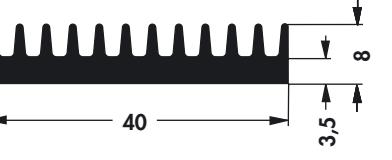


Standard extruded heatsinks

art. no.	Diagram	Graph
SK 587 ...		
SK 549 ...		
SK 562 ...		
SK 509 ...		
SK 563 ...		



Standard extruded heatsinks

art. no. SK 564 ... please indicate: ... ↪ 37.5 50 75 100 1000 mm		R_{th} [K/W] <table border="1"> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>13</td></tr> <tr><td>75</td><td>8</td></tr> <tr><td>100</td><td>7</td></tr> <tr><td>150</td><td>6.5</td></tr> <tr><td>200</td><td>6.5</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	13	75	8	100	7	150	6.5	200	6.5
Length [mm]	R_{th} [K/W]													
50	13													
75	8													
100	7													
150	6.5													
200	6.5													
art. no. SK 174 ... please indicate: ... ↪ 75 1000 mm		R_{th} [K/W] <table border="1"> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>5.5</td></tr> <tr><td>75</td><td>4.5</td></tr> <tr><td>100</td><td>4.2</td></tr> <tr><td>150</td><td>3.8</td></tr> <tr><td>200</td><td>3.8</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	5.5	75	4.5	100	4.2	150	3.8	200	3.8
Length [mm]	R_{th} [K/W]													
50	5.5													
75	4.5													
100	4.2													
150	3.8													
200	3.8													
art. no. SK 179 ... please indicate: ... ↪ 37.5 50 100 1000 mm		R_{th} [K/W] <table border="1"> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>6.5</td></tr> <tr><td>75</td><td>5.5</td></tr> <tr><td>100</td><td>5.2</td></tr> <tr><td>150</td><td>4.8</td></tr> <tr><td>200</td><td>4.8</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	6.5	75	5.5	100	5.2	150	4.8	200	4.8
Length [mm]	R_{th} [K/W]													
50	6.5													
75	5.5													
100	5.2													
150	4.8													
200	4.8													
art. no. SK 456 ... please indicate: ... ↪ 37.5 50 75 100 1000 mm		R_{th} [K/W] <table border="1"> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>15</td></tr> <tr><td>75</td><td>11</td></tr> <tr><td>100</td><td>10.5</td></tr> <tr><td>150</td><td>9.5</td></tr> <tr><td>200</td><td>9.5</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	15	75	11	100	10.5	150	9.5	200	9.5
Length [mm]	R_{th} [K/W]													
50	15													
75	11													
100	10.5													
150	9.5													
200	9.5													
art. no. SK 420 ... please indicate: ... ↪ 37.5 75 1000 mm		R_{th} [K/W] <table border="1"> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>14</td></tr> <tr><td>75</td><td>9.5</td></tr> <tr><td>100</td><td>8.5</td></tr> <tr><td>150</td><td>7.5</td></tr> <tr><td>200</td><td>7.5</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	14	75	9.5	100	8.5	150	7.5	200	7.5
Length [mm]	R_{th} [K/W]													
50	14													
75	9.5													
100	8.5													
150	7.5													
200	7.5													

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

→ A 138

Technical introduction

→ A 2 - 7

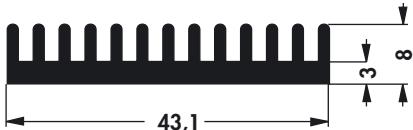
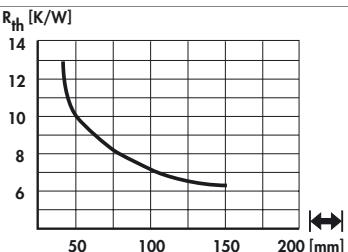
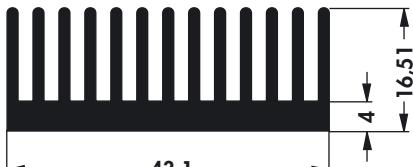
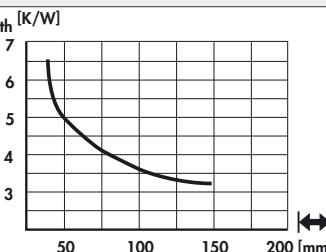
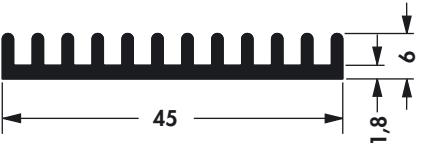
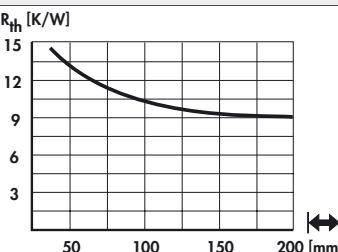
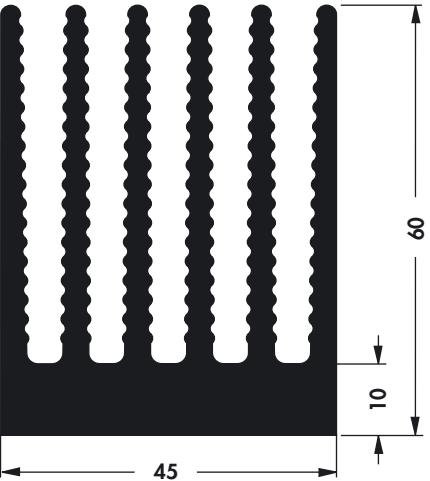
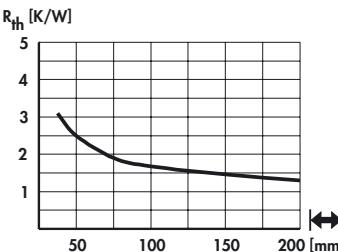


Standard extruded heatsinks

art. no.		R_{th} [K/W]
SK 513 ...		
please indicate:	... ↵ 37.5 50 75 100 1000 mm	
art. no.		R_{th} [K/W]
SK 547 ...		
please indicate:	... ↵ 37.5 50 75 100 1000 mm	
art. no.		R_{th} [K/W]
SK 106 ...		
please indicate:	... ↵ 50 75 1000 mm	
art. no.		R_{th} [K/W]
SK 472 ...		
please indicate:	... ↵ 37.5 50 75 100 1000 mm	
art. no.		R_{th} [K/W]
SK 189 ...		
please indicate:	... ↵ 37.5 50 75 100 1000 mm	



Standard extruded heatsinks

art. no.	 SK 423 ...	
please indicate:	...  100 1000 mm	
art. no.	 SK 422 ...	
please indicate:	...  50 1000 mm	
art. no.	 SK 511 ...	
please indicate:	...  50 75 100 1000 mm	
art. no.	 SK 453 ...	
please indicate:	...  37.5 75 mm	...  (optional) SSR 1

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 – 12

→ A 135 – 136

→ A 138

→ A 2 – 7

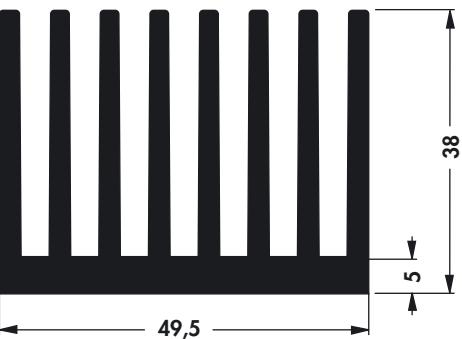
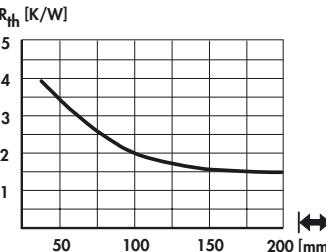
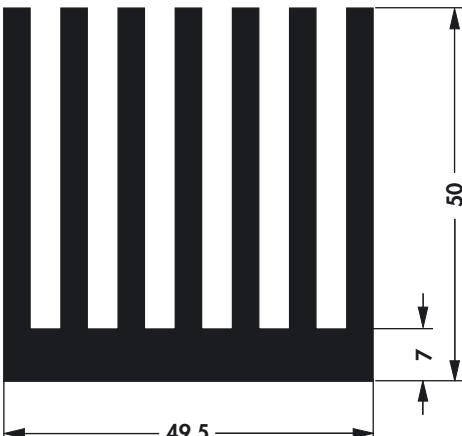
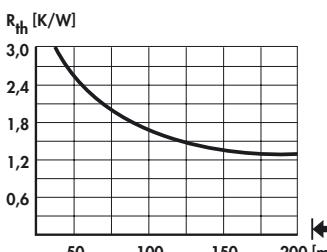
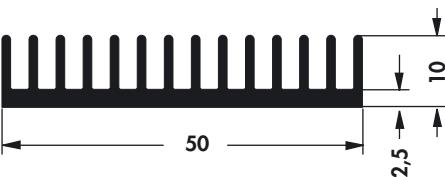
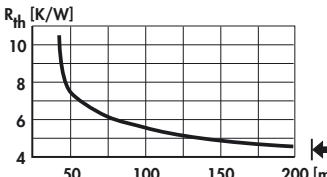
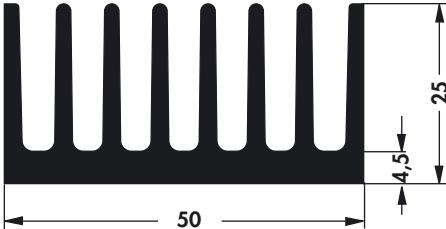
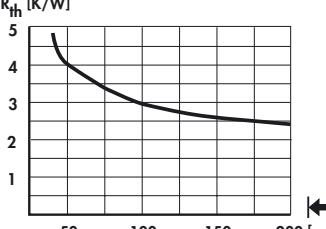


Standard extruded heatsinks

art. no. SK 455 ...		
	please indicate: ... ↗ 75 mm	... ⚡ (optional) SSR 4
art. no. SK 467 ...		
	please indicate: ... ↗ 37,5 50 75 100 1000 mm	... ⚡ (optional) SSR 1; SSR 4
art. no. SK 424 ...		
	please indicate: ... ↗ 75 1000 mm	
art. no. SK 425 ...		
	please indicate: ... ↗ 75 mm	



Standard extruded heatsinks

art. no. SK 445 ...		
please indicate: ...  100 1000 mm		
art. no. SK 450 ...		
please indicate: ...  75 1000 mm ...  SSR 1		
art. no. SK 548 ...		
please indicate: ...  37,5 50 75 100 1000 mm		
art. no. SK 567 ...		
please indicate: ...  37,5 50 75 100 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

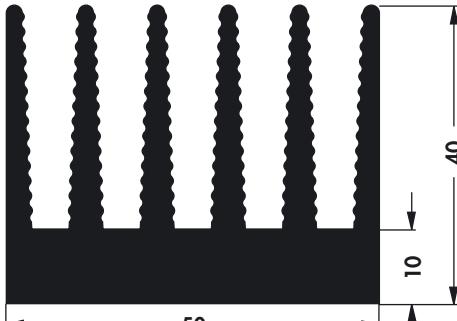
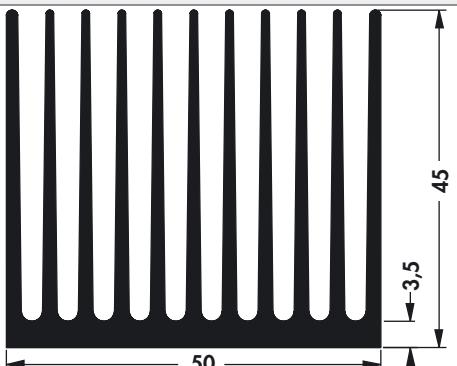
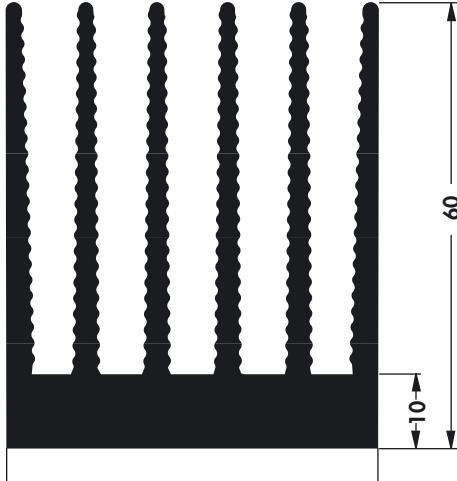
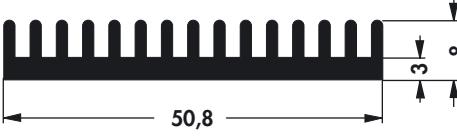
→ A 138

Technical introduction

→ A 2 – 7



Standard extruded heatsinks

art. no. SK 434 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>100</td><td>150</td><td>200</td></tr> <tr><td>3,5</td><td>2,2</td><td>1,8</td><td>1,6</td></tr> </table>	50	100	150	200	3,5	2,2	1,8	1,6
50	100	150	200							
3,5	2,2	1,8	1,6							
please indicate: ... ↗ 50 75 100 1000 mm		... ⚡ (optional) SSR 1; SSR 4								
art. no. SK 475 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>100</td><td>150</td><td>200</td></tr> <tr><td>4,0</td><td>2,8</td><td>2,0</td><td>1,8</td></tr> </table>	50	100	150	200	4,0	2,8	2,0	1,8
50	100	150	200							
4,0	2,8	2,0	1,8							
please indicate: ... ↗ 37,5 50 100 1000 mm										
art. no. SK 527 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>100</td><td>150</td><td>200</td></tr> <tr><td>3,0</td><td>1,8</td><td>1,4</td><td>1,2</td></tr> </table>	50	100	150	200	3,0	1,8	1,4	1,2
50	100	150	200							
3,0	1,8	1,4	1,2							
please indicate: ... ↗ 50 75 100 1000 mm										
art. no. SK 427 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>100</td><td>150</td><td>200</td></tr> <tr><td>11,0</td><td>6,5</td><td>5,5</td><td>5,0</td></tr> </table>	50	100	150	200	11,0	6,5	5,5	5,0
50	100	150	200							
11,0	6,5	5,5	5,0							
please indicate: ... ↗ 50 75 1000 mm										



Standard extruded heatsinks

art. no.		
SK 426 ...	please indicate: ... ↪ 37.5 50 75 100 1000 mm	
art. no.		
SK 156 ...	please indicate: ... ↪ 37.5 50 75 100 1000 mm	
art. no.		
SK 468 ...	please indicate: ... ↪ 37.5 75 1000 mm	
art. no.		
SK 180 ...	please indicate: ... ↪ 37.5 50 75 100 1000 mm	
art. no.		
SK 99 ...	please indicate: ... ↪ 37.5 50 75 100 150 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

→ A 138

→ A 2 - 7

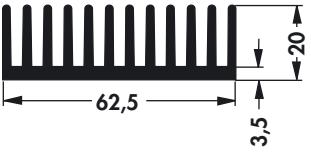
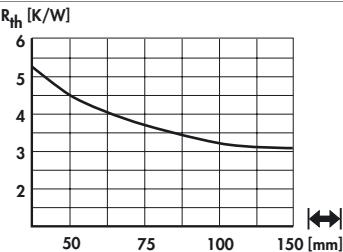
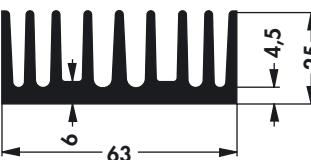
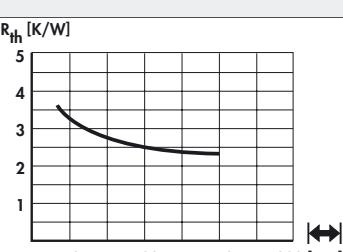
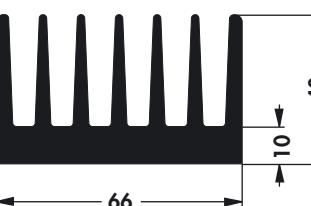
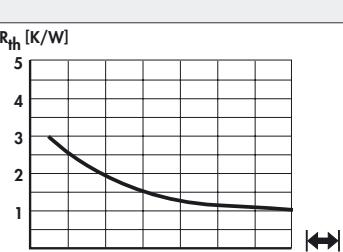
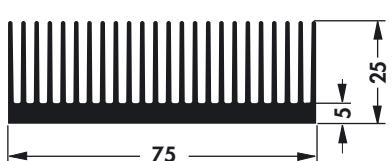
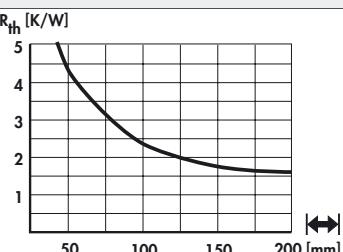
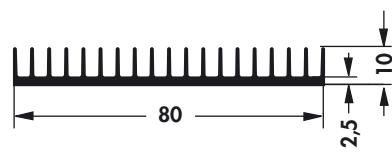
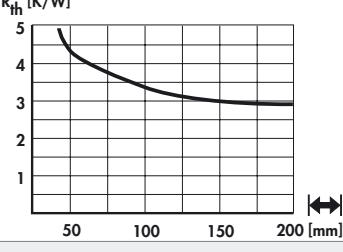


Standard extruded heatsinks

art. no.	Technical drawing	Graph R_{th} [K/W]
SK 429 ...		
please indicate:	... ↗ 37.5 50 75 100 1000 mm	
art. no.	Technical drawing	Graph R_{th} [K/W]
SK 436 ...		
please indicate:	... ↗ 75 1000 mm	
art. no.	Technical drawing	Graph R_{th} [K/W]
SK 50 ...		
please indicate:	... ↗ 75 1000 mm	
art. no.	Technical drawing	Graph R_{th} [K/W]
SK 485 ...		
please indicate:	... ↗ 50 75 100 1000 mm	



Standard extruded heatsinks

art. no.			
SK 444 ...	please indicate:	...  37.5 50 75 1000 mm	
art. no.			
SK 406 ...	please indicate:	...  37.5 50 75 100 1000 mm	
art. no.			
SK 100 ...	please indicate:	...  37.5 50 75 100 150 1000 mm	
art. no.			
SK 594 ...	please indicate:	...  37.5 50 75 100 1000 mm	
art. no.			
SK 545 ...	please indicate:	...  50 75 100 150 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

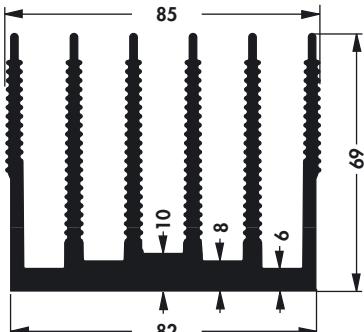
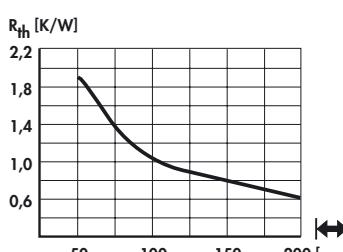
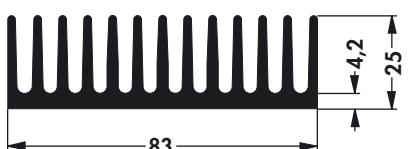
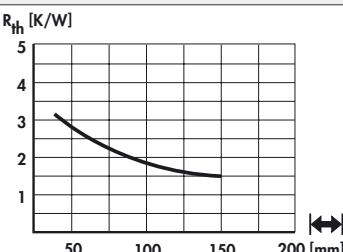
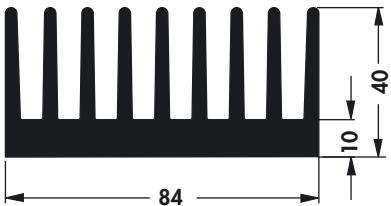
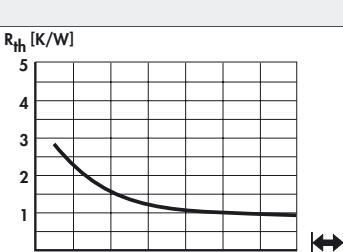
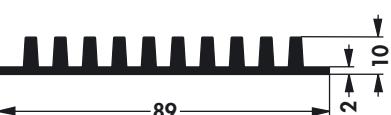
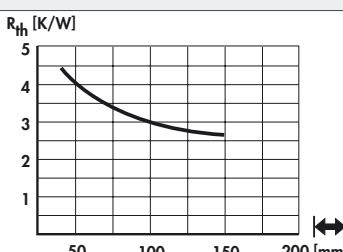
→ A 138

Technical introduction

→ A 2 - 7



Standard extruded heatsinks

art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width [mm]
SK 135 ...		
please indicate:	... ↗ 50 100 1000 mm	
art. no.		
SK 407 ...		
please indicate:	... ↗ 37.5 50 75 100 1000 mm	
art. no.		
SK 464 ...		
please indicate:	... ↗ 50 75 100 150 1000 mm	
art. no.		
SK 182 ...		
please indicate:	... ↗ 37.5 50 75 100 150 200 1000 mm	



Standard extruded heatsinks

<table border="1"> <thead> <tr> <th>art. no.</th></tr> </thead> <tbody> <tr> <td>SK 507 ...</td></tr> </tbody> </table> <p>please indicate: ... ↗ 37,5 75 100 1000 mm</p>	art. no.	SK 507 ...		
art. no.				
SK 507 ...				
<table border="1"> <thead> <tr> <th>art. no.</th></tr> </thead> <tbody> <tr> <td>SK 408 ...</td></tr> </tbody> </table> <p>please indicate: ... ↗ 50 75 100 150 1000 mm</p>	art. no.	SK 408 ...		
art. no.				
SK 408 ...				
<table border="1"> <thead> <tr> <th>art. no.</th></tr> </thead> <tbody> <tr> <td>SK 546 ...</td></tr> </tbody> </table> <p>please indicate: ... ↗ 37,5 50 75 100 150 1000 mm</p>	art. no.	SK 546 ...		
art. no.				
SK 546 ...				
<table border="1"> <thead> <tr> <th>art. no.</th></tr> </thead> <tbody> <tr> <td>SK 81 ...</td></tr> </tbody> </table> <p>please indicate: ... ↗ 37,5 50 75 100 1000 mm</p>	art. no.	SK 81 ...		
art. no.				
SK 81 ...				

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

→ A 138

Technical introduction

→ A 2 – 7



Standard extruded heatsinks

art. no.	Diagram	Graph
SK 505 ... weight reduced like SK 81		
please indicate: ... ↪ 37,5 50 75 100 150 1000 mm		
SK 508 ...		
please indicate: ... ↪ 37,5 50 75 100 1000 mm		
SK 92 ...		
please indicate: ... ↪ 50 75 100 150 1000 mm		
SK 433 ...		
please indicate: ... ↪ 37,5 50 75 1000 mm		
SK 121 ...		
please indicate: ... ↪ 75 100 150 1000 mm		



Standard extruded heatsinks

art. no.		
SK 33 ...	please indicate: ... ↗ 50 75 100 1000 mm ... ⚡ (optional) SSR 1; SSR 2	
art. no.		
SK 411 ...	please indicate: ... ↗ 50 75 100 150 1000 mm	
art. no.		
SK 442 ...	please indicate: ... ↗ 50 75 100 150 1000 mm	
art. no.		
SK 595 ...	please indicate: ... ↗ 50 75 100 150 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

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Technical introduction

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Standard extruded heatsinks

art. no.	Diagram	R_{th} [K/W]
SK 463 ...		
please indicate: ... ↗	50 75 100 150 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 466 ...		
please indicate: ... ↗	50 75 100 150 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 413 ...		
please indicate: ... ↗	100 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 601 ...		
please indicate: ... ↗	50 75 100 150 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 553 ...		
please indicate: ... ↗	37.5 50 75 100 150 1000 mm	



Standard extruded heatsinks

art. no.		
SK 132 ...		
please indicate:	... ↪ 37,5 50 75 100 150 1000 mm	
art. no.		
SK 410 ...		
please indicate:	... ↪ 37,5 50 75 100 150 1000 mm	
art. no.		
SK 133 ...		
please indicate:	... ↪ 50 75 100 1000 mm	
art. no.		
SK 58 ...		
please indicate:	... ↪ 50 75 100 150 1000 mm	
art. no.		
SK 504 ...	weight reduced like SK 58	
please indicate:	... ↪ 37,5 50 75 100 150 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais

→ A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

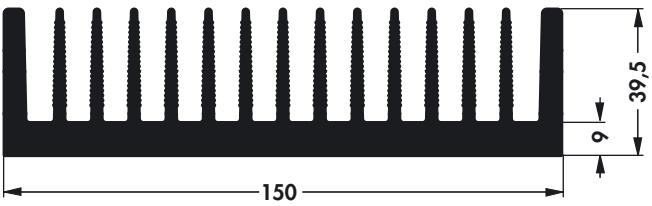
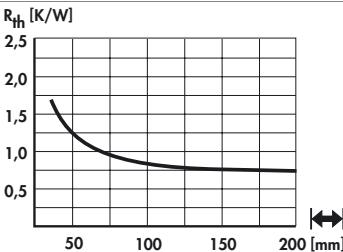
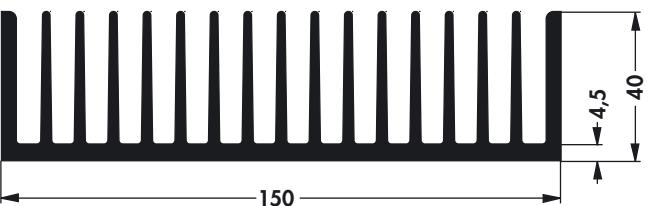
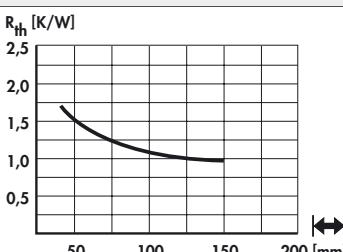
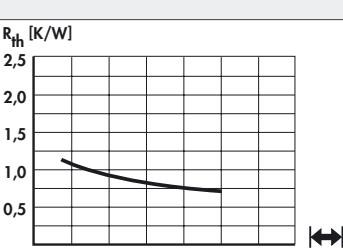
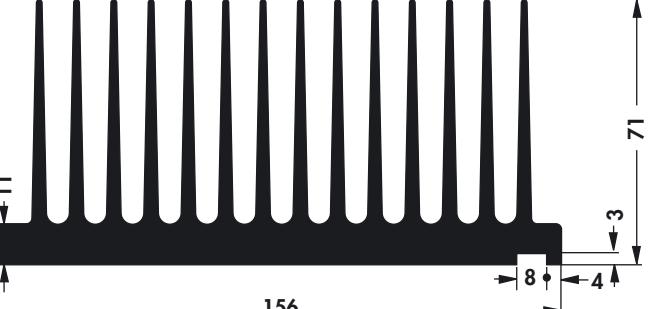
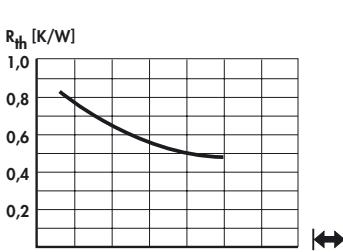
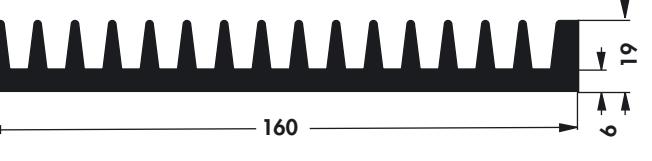
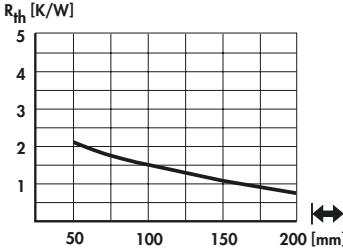
→ A 138

Technical introduction

→ A 2 - 7



Standard extruded heatsinks

art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width W [mm]
SK 588 ...	 150 → 39,5 ↑ 9 ↑	 <p>Graph showing Thermal resistance R_{th} [K/W] versus width W [mm] for SK 588. The curve starts at approximately 1.6 K/W for 50 mm and decreases to about 0.8 K/W at 200 mm.</p>
please indicate:	... ↗ 50 75 100 150 1000 mm	
art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width W [mm]
SK 120 ...	 150 → 40 ↑ 4,5 ↑	 <p>Graph showing Thermal resistance R_{th} [K/W] versus width W [mm] for SK 120. The curve starts at approximately 1.8 K/W for 50 mm and decreases to about 1.0 K/W at 200 mm.</p>
please indicate:	... ↗ 50 75 100 150 1000 mm	
art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width W [mm]
SK 155 ...	 150 → 50 ↑ 15 ↑	 <p>Graph showing Thermal resistance R_{th} [K/W] versus width W [mm] for SK 155. The curve starts at approximately 1.1 K/W for 50 mm and decreases to about 0.7 K/W at 200 mm.</p>
please indicate:	... ↗ 75 100 150 1000 mm	
art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width W [mm]
SK 154 ...	 156 → 71 ↑ 11 ↑ 8 ↑ 4 ↑ 3 ↑	 <p>Graph showing Thermal resistance R_{th} [K/W] versus width W [mm] for SK 154. The curve starts at approximately 0.8 K/W for 50 mm and decreases to about 0.4 K/W at 200 mm.</p>
please indicate:	... ↗ 50 75 100 150 mm	
art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width W [mm]
SK 417 ...	 160 → 6 ↑ 19 ↑	 <p>Graph showing Thermal resistance R_{th} [K/W] versus width W [mm] for SK 417. The curve starts at approximately 2.2 K/W for 50 mm and decreases to about 1.0 K/W at 200 mm.</p>
please indicate:	... ↗ 75 100 150 1000 mm	

A 45

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 Order example → A 21
 Heatsink as visual & decor-parts → A 10
 Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay → A 11 – 12
 Heatsink special design → A 135 – 136
 Special profiles → A 138
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Standard extruded heatsinks

art. no.		
SK 85 ...	please indicate: ... ↪ 37.5 50 75 100 150 1000 mm	
art. no.		
SK 503 ...	weight reduced like SK 85	
please indicate: ... ↪ 75 100 1000 mm		
art. no.		
SK 510 ...	please indicate: ... ↪ 50 75 100 150 1000 mm	
please indicate: ... ↪ 50 75 100 150 1000 mm		
art. no.		
SK 416 ...	please indicate: ... ↪ 50 75 100 150 1000 mm	
please indicate: ... ↪ 50 75 100 150 1000 mm		
art. no.		
SK 119 ...	please indicate: ... ↪ 50 75 100 150 1000 mm	
please indicate: ... ↪ 50 75 100 150 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

→ A 138

Technical introduction

→ A 2 – 7

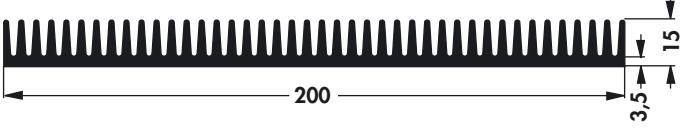
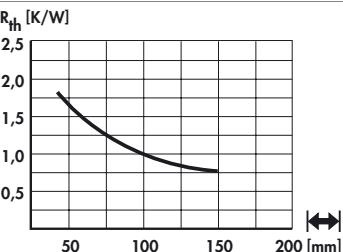
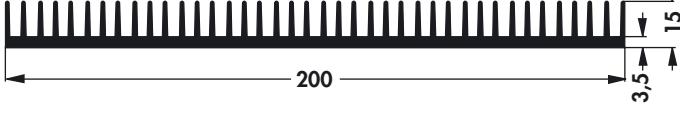
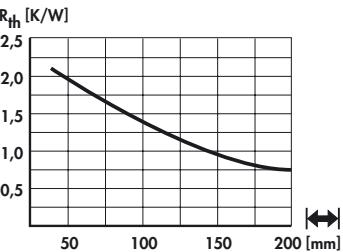
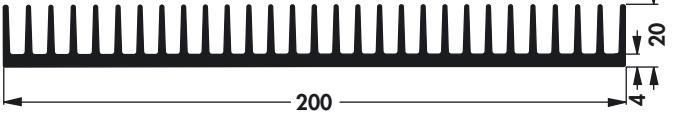
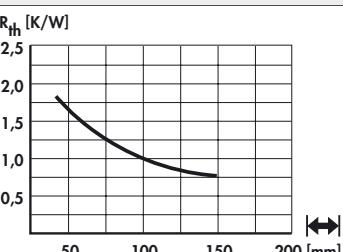
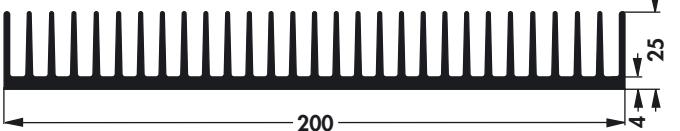
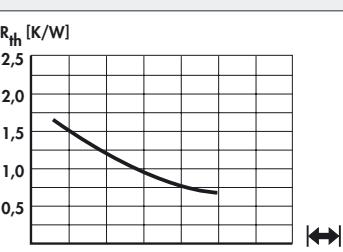
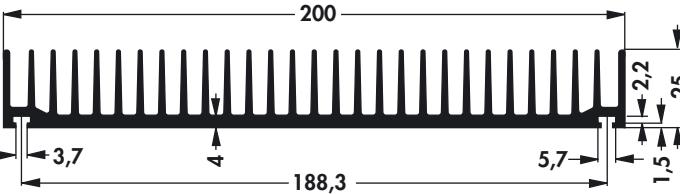
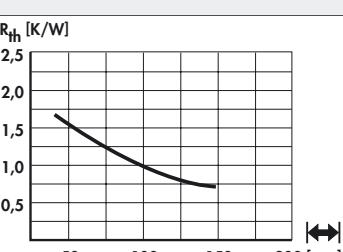


Standard extruded heatsinks

art. no.	Diagram	Graph
SK 412 ...		
please indicate:	... ↗ 50 75 100 150 1000 mm	
art. no.		
SK 421 ...		
please indicate:	... ↗ 50 75 100 150 200 1000 mm	
art. no.		
SK 405 ...		
please indicate:	... ↗ 100 1000 mm	
art. no.		
SK 519 ...		
please indicate:	... ↗ 50 100 1000 mm	
art. no.		
SK 90 ...		
please indicate:	... ↗ 50 75 100 1000 mm	



Standard extruded heatsinks

art. no. SK 136 ...	 <p>200</p> <p>3,5 ↕ 15 ↕</p>	 <p>R_{th} [K/W]</p> <table border="1"> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1,8</td></tr> <tr><td>100</td><td>1,0</td></tr> <tr><td>150</td><td>0,8</td></tr> <tr><td>200</td><td>0,7</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	1,8	100	1,0	150	0,8	200	0,7
Width [mm]	R_{th} [K/W]											
50	1,8											
100	1,0											
150	0,8											
200	0,7											
please indicate: ... ↕ 75 100 150 1000 mm												
art. no. SK 166 ...	 <p>200</p> <p>3,5 ↕ 15 ↕</p>	 <p>R_{th} [K/W]</p> <table border="1"> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2,0</td></tr> <tr><td>100</td><td>1,2</td></tr> <tr><td>150</td><td>0,9</td></tr> <tr><td>200</td><td>0,8</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	2,0	100	1,2	150	0,9	200	0,8
Width [mm]	R_{th} [K/W]											
50	2,0											
100	1,2											
150	0,9											
200	0,8											
please indicate: ... ↕ 1000 mm												
art. no. SK 113 ...	 <p>200</p> <p>4 ↕ 20 ↕</p>	 <p>R_{th} [K/W]</p> <table border="1"> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1,8</td></tr> <tr><td>100</td><td>1,0</td></tr> <tr><td>150</td><td>0,8</td></tr> <tr><td>200</td><td>0,7</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	1,8	100	1,0	150	0,8	200	0,7
Width [mm]	R_{th} [K/W]											
50	1,8											
100	1,0											
150	0,8											
200	0,7											
please indicate: ... ↕ 50 75 100 150 1000 mm												
art. no. SK 42 ...	 <p>200</p> <p>4 ↕ 25 ↕</p>	 <p>R_{th} [K/W]</p> <table border="1"> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1,6</td></tr> <tr><td>100</td><td>0,9</td></tr> <tr><td>150</td><td>0,7</td></tr> <tr><td>200</td><td>0,6</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	1,6	100	0,9	150	0,7	200	0,6
Width [mm]	R_{th} [K/W]											
50	1,6											
100	0,9											
150	0,7											
200	0,6											
please indicate: ... ↕ 50 75 100 150 200 1000 mm												
art. no. SK 94 ...	 <p>200</p> <p>3,7 ↕ 4 ↕ 188,3 ↕ 5,7 ↕ 1,5 ↕ 2,2 ↕ 25 ↕</p>	 <p>R_{th} [K/W]</p> <table border="1"> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1,6</td></tr> <tr><td>100</td><td>0,9</td></tr> <tr><td>150</td><td>0,7</td></tr> <tr><td>200</td><td>0,6</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	1,6	100	0,9	150	0,7	200	0,6
Width [mm]	R_{th} [K/W]											
50	1,6											
100	0,9											
150	0,7											
200	0,6											
please indicate: ... ↕ 1000 mm												

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

→ A 138

Technical introduction

→ A 2 - 7

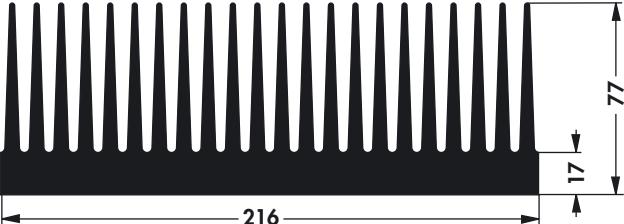
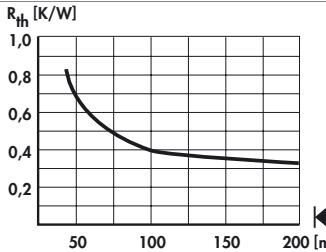
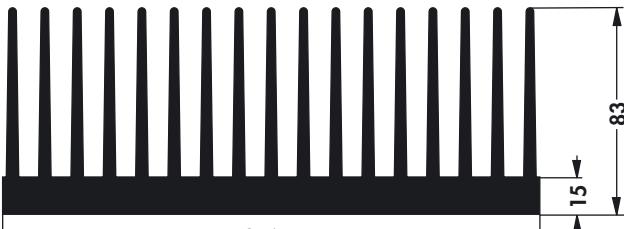
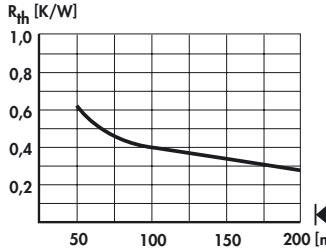
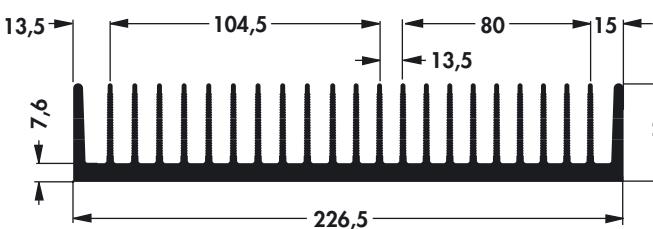
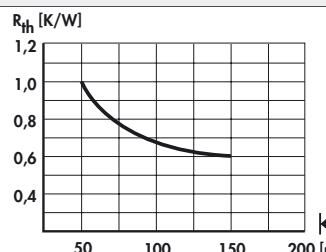
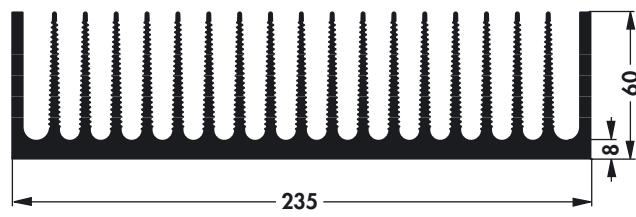
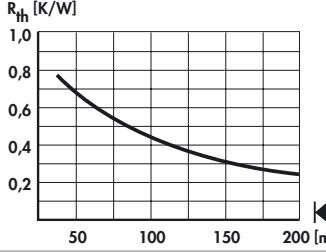
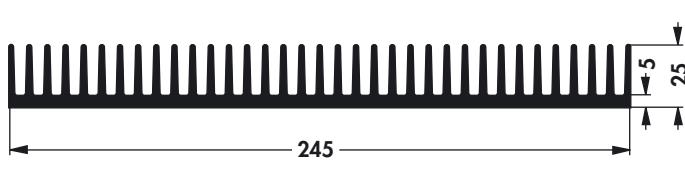
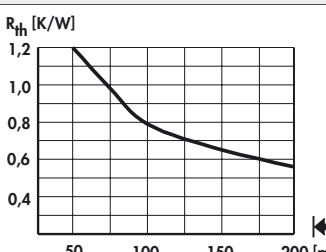
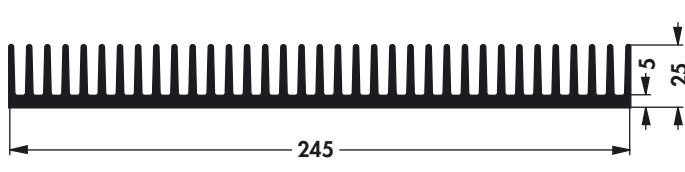
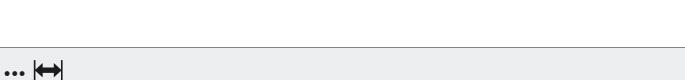
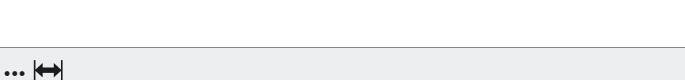


Standard extruded heatsinks

art. no.		
SK 502 ...	weight reduced like SK 47	
please indicate:	... 37.5 50 75 100 150 1000 mm	
art. no.		
SK 47 ...		
please indicate:	... 75 100 150 1000 mm	
art. no.		
SK 591 ...		
please indicate:	... 75 100 150 1000 mm	
art. no.		
SK 520 ...		
please indicate:	... 75 100 150 1000 mm	
art. no.		
SK 193 ...		
please indicate:	... 100 150 1000 mm	



Standard extruded heatsinks

art. no.			
SK 557 ...			
please indicate:	... ↪ 75 100 150 1000 mm		
art. no.			
SK 168 ...			
please indicate:	... ↪ 1000 mm		
art. no.			
SK 580 ...			
please indicate:	... ↪ 75 100 150 200 1000 mm		
art. no.			
SK 118 ...			
please indicate:	... ↪ 75 100 150 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

→ A 138

Technical introduction

→ A 2 - 7



Standard extruded heatsinks

art. no.	Diagram	R_{th} [K/W]
SK 49 ...		
please indicate:	... ↗ 50 75 150 200 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 555 ...		
please indicate:	... ↗ 75 100 150 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 199 ...		
please indicate:	... ↗ 75 100 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 524 ...		
please indicate:	... ↗ 75 100 150 1000 mm	
art. no.	Diagram	R_{th} [K/W]
SK 91 ...		
please indicate:	... ↗ 75 100 150 1000 mm	



Standard extruded heatsinks

art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]										
SK 438 ...	 please indicate: ... ↪ 75 100 150 1000 mm	<table border="1"> <caption>Approximate data points from SK 438 graph</caption> <thead> <tr> <th>P [W]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>0.50</td></tr> <tr><td>100</td><td>0.45</td></tr> <tr><td>150</td><td>0.38</td></tr> <tr><td>200</td><td>0.32</td></tr> </tbody> </table>	P [W]	R_{th} [K/W]	50	0.50	100	0.45	150	0.38	200	0.32
P [W]	R_{th} [K/W]											
50	0.50											
100	0.45											
150	0.38											
200	0.32											
SK 190 ...	 please indicate: ... ↪ 150 1000 mm	<table border="1"> <caption>Approximate data points from SK 190 graph</caption> <thead> <tr> <th>P [W]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>0.90</td></tr> <tr><td>100</td><td>0.60</td></tr> <tr><td>150</td><td>0.45</td></tr> <tr><td>200</td><td>0.38</td></tr> </tbody> </table>	P [W]	R_{th} [K/W]	50	0.90	100	0.60	150	0.45	200	0.38
P [W]	R_{th} [K/W]											
50	0.90											
100	0.60											
150	0.45											
200	0.38											
SK 149 ...	 please indicate: ... ↪ 200 1000 mm	<table border="1"> <caption>Approximate data points from SK 149 graph</caption> <thead> <tr> <th>P [W]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1.00</td></tr> <tr><td>100</td><td>0.80</td></tr> <tr><td>150</td><td>0.70</td></tr> <tr><td>200</td><td>0.65</td></tr> </tbody> </table>	P [W]	R_{th} [K/W]	50	1.00	100	0.80	150	0.70	200	0.65
P [W]	R_{th} [K/W]											
50	1.00											
100	0.80											
150	0.70											
200	0.65											
SK 139 ...	 please indicate: ... ↪ 100 150 200 1000 mm	<table border="1"> <caption>Approximate data points from SK 139 graph</caption> <thead> <tr> <th>P [W]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>0.70</td></tr> <tr><td>100</td><td>0.45</td></tr> <tr><td>150</td><td>0.35</td></tr> <tr><td>200</td><td>0.30</td></tr> </tbody> </table>	P [W]	R_{th} [K/W]	50	0.70	100	0.45	150	0.35	200	0.30
P [W]	R_{th} [K/W]											
50	0.70											
100	0.45											
150	0.35											
200	0.30											
SK 583 ...	 please indicate: ... ↪ 100 150 200 1000 mm	<table border="1"> <caption>Approximate data points from SK 583 graph</caption> <thead> <tr> <th>P [W]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1.20</td></tr> <tr><td>100</td><td>0.85</td></tr> <tr><td>150</td><td>0.70</td></tr> <tr><td>200</td><td>0.65</td></tr> </tbody> </table>	P [W]	R_{th} [K/W]	50	1.20	100	0.85	150	0.70	200	0.65
P [W]	R_{th} [K/W]											
50	1.20											
100	0.85											
150	0.70											
200	0.65											

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

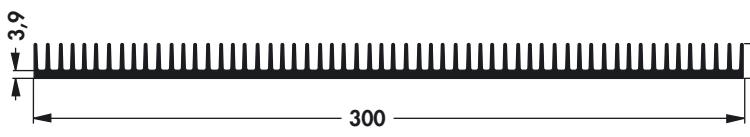
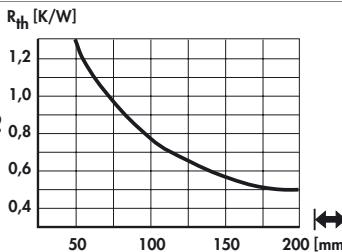
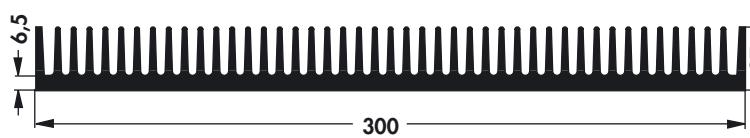
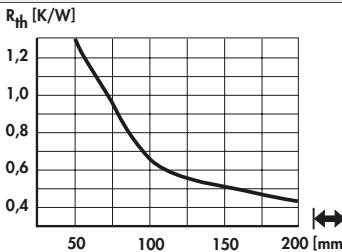
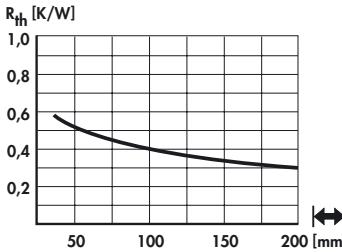
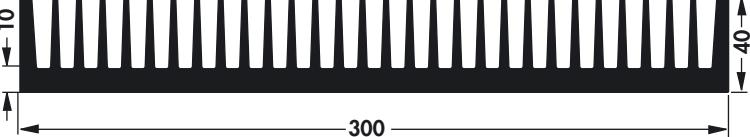
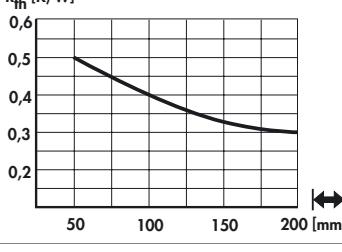
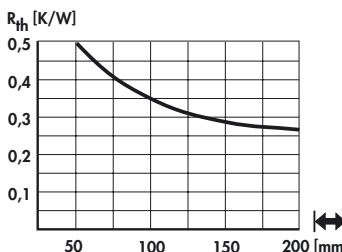
→ A 138

Technical introduction

→ A 2 - 7

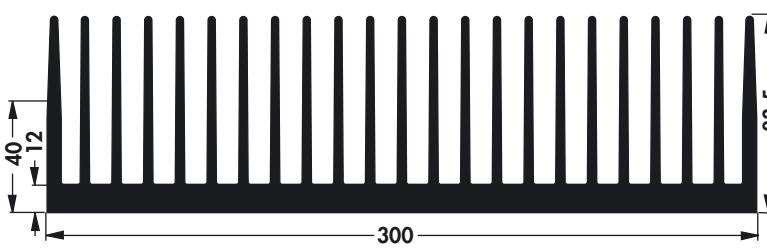
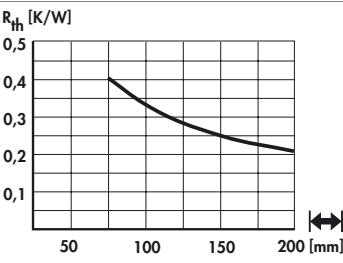
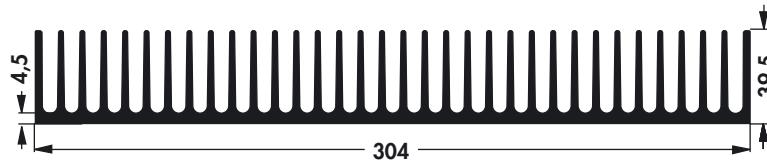
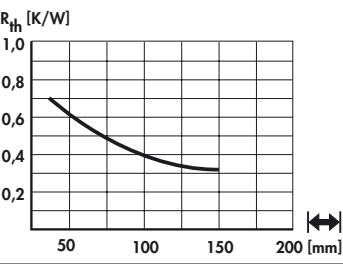
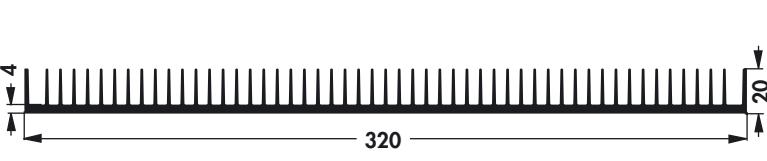
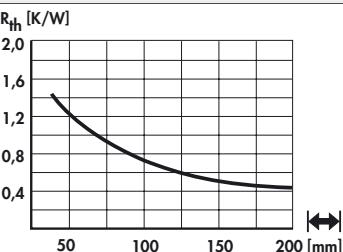
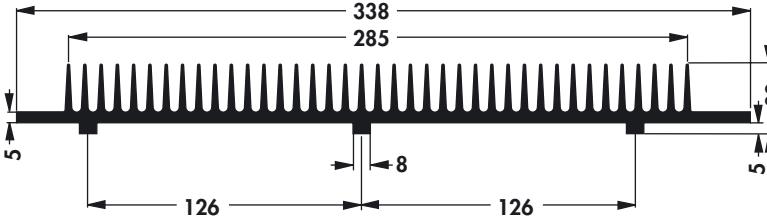
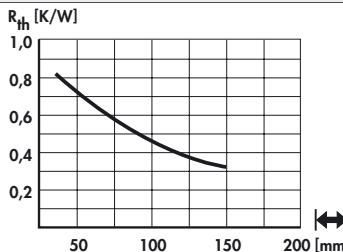
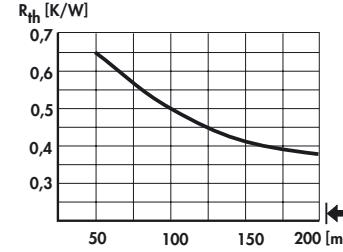


Standard extruded heatsinks

art. no.	Dimensions	Graph: R_{th} [K/W] vs. Length [mm]
SK 198 ...		
please indicate:	... ↗ 100 150 1000 mm	
art. no.	Dimensions	Graph: R_{th} [K/W] vs. Length [mm]
SK 446 ...		
please indicate:	... ↗ 75 100 150 1000 mm	
art. no.	Dimensions	Graph: R_{th} [K/W] vs. Length [mm]
SK 56 ...		
please indicate:	... ↗ 75 100 150 200 1000 mm	
art. no.	Dimensions	Graph: R_{th} [K/W] vs. Length [mm]
SK 501 ...		
weight reduced like SK 56		
please indicate:	... ↗ 37,5 50 75 100 150 200 1000 mm	
art. no.	Dimensions	Graph: R_{th} [K/W] vs. Length [mm]
SK 568 ...		
please indicate:	... ↗ 75 100 150 200 1000 mm	



Standard extruded heatsinks

art. no.			
SK 157 ...	please indicate: ...  100 150 200 1000 mm		
art. no.			
SK 101 ...	please indicate: ...  75 100 1000 mm		
art. no.			
SK 579 ...	please indicate: ...  75 100 150 200 1000 mm		
art. no.			
SK 66 ...	please indicate: ...  75 100 1000 mm		
art. no.			
SK 523 ...	please indicate: ...  100 150 200 1000 mm		

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

→ A 138

Technical introduction

→ A 2 - 7



Standard extruded heatsinks

art. no.		
SK 439 ...	please indicate: ... 100 150 1000 mm	
art. no.		
SK 479 ...	please indicate: ... 75 100 150 1000 mm	
art. no.		
SK 93 ...	please indicate: ... 75 100 150 1000 mm	
art. no.		
SK 130 ...	please indicate: ... 200 1000 mm	
art. no.		
SK 191 ...	suitable heatsink for rear panel in 19" cases please indicate: ... 75 100 150 200 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12**Heatsinks for Solid State Relay**

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

→ A 138

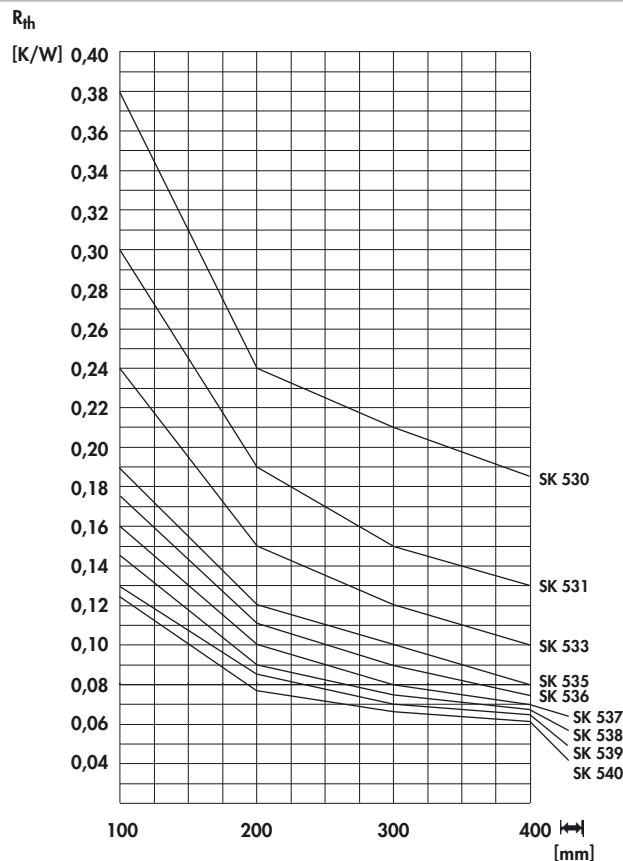
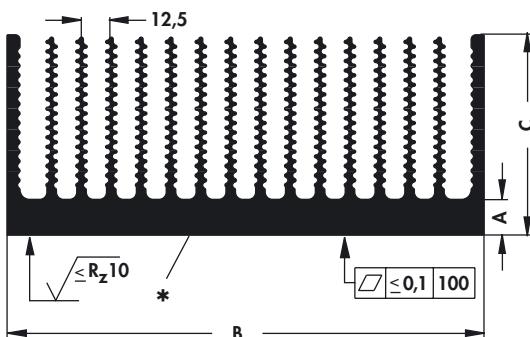
Technical introduction

→ A 2 – 7



Welded high performance heatsinks

- optimum fin geometry and fin quantity for free convection
- well suited for forced convection
- flat milled base (not SK 530, SK 531)
- * = welded joint (not SK 530, SK 531)
- length according customer's details
- customer specific versions and machining on request



art. no.	number of fins	dim. [mm]		
		A	B	C
SK 530	14	15 ± 0.7	200 ± 0.7	84 ± 0.7
SK 531	22	15 ± 0.7	300 ± 1	84 ± 0.7
SK 533	30	16 +0/-1.5	400 +0.6/-1.6	84 +0/-1.5
SK 535	38	16 +0/-1.5	500 +0.6/-1.6	84 +0/-1.5
SK 536	42	16 +0/-1.5	550 +0.6/-1.6	84 +0/-1.5
SK 537	46	16 +0/-1.5	600 +0.6/-1.6	84 +0/-1.5
SK 538	50	16 +0/-1.5	650 +0.6/-1.6	84 +0/-1.5
SK 539	54	16 +0/-1.5	700 +0.6/-1.6	84 +0/-1.5
SK 540	58	16 +0/-1.5	750 +0.6/-1.6	84 +0/-1.5



High performance heatsinks with press-in fins

- length according to customer's details
- customer specific versions and machining upon request

art. no.	Technical drawing		Graph R _{th} [K/W]
SK 418 ...			
please indicate: ... 100 150 200 1000 mm			
			SK 158 SK 159 SK 160 SK 161 SK 162
			SK 158 SK 159 SK 160 SK 161 SK 162
			SK 158 SK 159 SK 160 SK 161 SK 162
art. no.	number of fins	dim. [mm]	
SK 158	22	A	B
SK 159	30	20	300 +/- 2
SK 160	38	20	400 +/- 2
SK 161	46	20	500 +/- 2,5
SK 162	58	20	600 +/- 3
			750 +/- 4

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

→ A 138

Technical introduction

→ A 2 - 7

Standard extruded heatsinks

art. no.	SK 09 37,5 TO 220	SK 09 37,5 TO 220 1 SK 09 50,0 TO 220 1	SK 09 50 TO 220	SK 09 20 TO 220
SK 09 ...				
please indicate: ... 20 25 37,5 50 1000 mm				... K; TO 220
art. no.	SK 145 20 TO 220	SK 145 37,5 TO 220	SK 145 50 TO 220	SK 145 25 TO 220
SK 145 ...				
please indicate: ... 20 25 37,5 50 1000 mm				... K; TO 220
art. no.				
SK 443 ...				
please indicate: ... 37,5 75 100 1000 mm				
art. no.				
SK 173 ...				
please indicate: ... 1000 mm				

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

→ A 138

Technical introduction

→ A 2 – 7



Standard extruded heatsinks

art. no.			
SK 59 ...			
please indicate:	... ↪ 37,5 50 75 100 1000 mm	... ⚡ (optional) TO 220	
art. no.			
SK 122 ...			
please indicate:	... ↪ 37,5 50 mm	... ⚡ (optional) TO 3; CB	
art. no.			
SK 107 ...			
please indicate:	... ↪ 50 75 100 1000 mm		
art. no.			
SK 181 ...			
please indicate:	... ↪ 50 75 100 1000 mm		
art. no.			
SK 181 94 C 3 x TO 220			

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

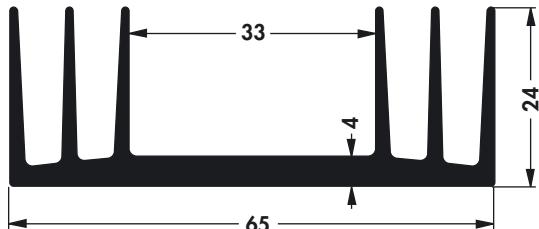
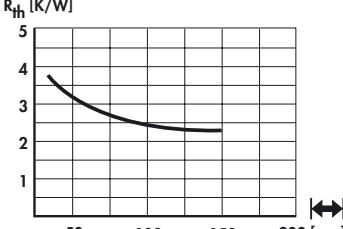
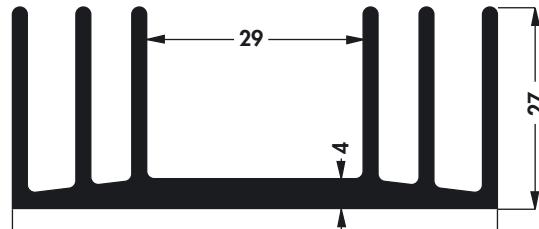
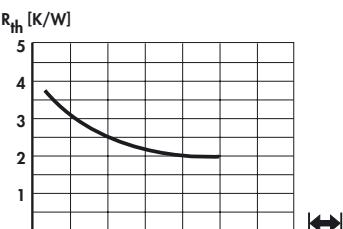
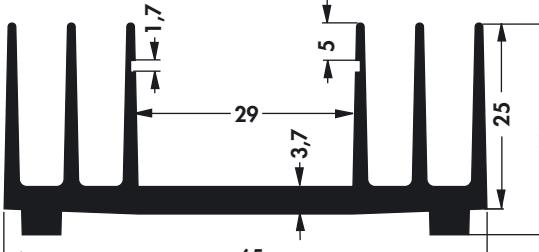
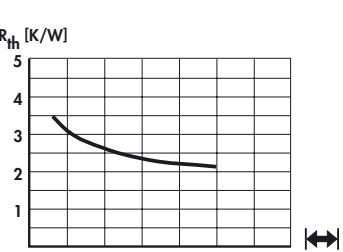
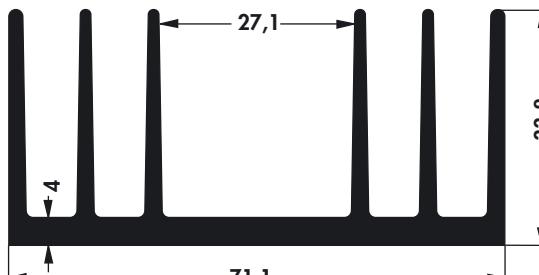
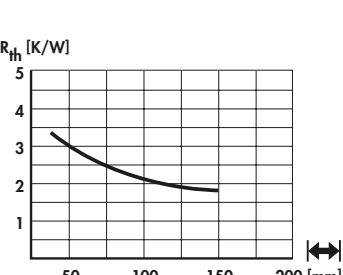
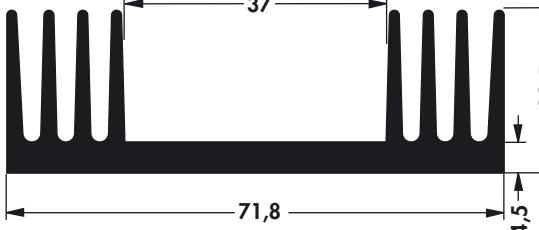
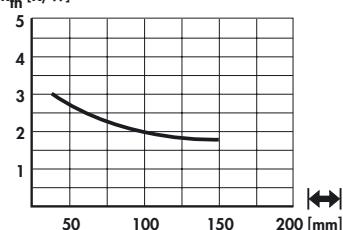
→ A 138

→ A 2 - 7

Standard extruded heatsinks

art. no. SK 78 ...		
please indicate: ... ↗ 37,5 50 75 100 1000 mm		... ⚡ (optional) TO 3; CB
art. no. SK 51 ...		
please indicate: ... ↗ 37,5 50 75 100 1000 mm		... ⚡ (optional) TO 3; CB
art. no. SK 165 ...		
please indicate: ... ↗ 37,5 50 75 1000 mm		... ⚡ (optional) TO 3; CB
art. no. SK 25 ...	<p>with slots for cover plates or PCBs</p>	
please indicate: ... ↗ 37,5 50 1000 mm		
art. no. SK 150 ...		
please indicate: ... ↗ 1000 mm		... ⚡ (optional) TO 3; CB

Standard extruded heatsinks

art. no.		
SK 18 ...	33 4 24 65	$R_{th} [K/W]$ 5 4 3 2 1 50 100 150 200 [mm]
please indicate:	... ↗ 37.5 50 75 1000 mm	... ⚡ (optional) TO 3; CB
art. no.		
SK 63 ...	29 4 27 65	$R_{th} [K/W]$ 5 4 3 2 1 50 100 150 200 [mm]
please indicate:	... ↗ 37.5 50 75 100 1000 mm	... ⚡ (optional) TO 3; CB
art. no.		
SK 05 ...	11,7 29 3,7 5 25 28,5 65	$R_{th} [K/W]$ 5 4 3 2 1 50 100 150 200 [mm]
with slots for cover plates or PCBs		
please indicate:	... ↗ 50 75 1000 mm	... ⚡ (optional) TO 3; CB
art. no.		
SK 402 ...	27,1 4 33,8 71,1	$R_{th} [K/W]$ 5 4 3 2 1 50 100 150 200 [mm]
please indicate:	... ↗ 100 mm	... ⚡ (optional) TO 3; CB
art. no.		
SK 97 ...	37 71,8 4,5 23,5	$R_{th} [K/W]$ 5 4 3 2 1 50 100 150 200 [mm]
please indicate:	... ↗ 37.5 50 75 100 1000 mm	... ⚡ (optional) TO 3

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

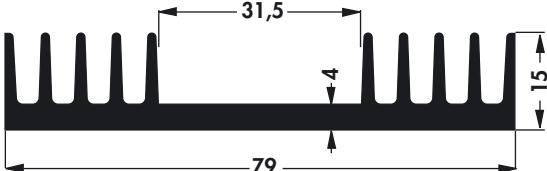
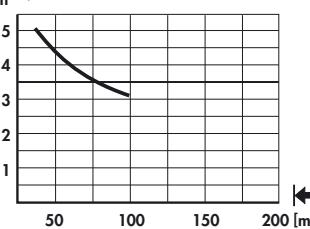
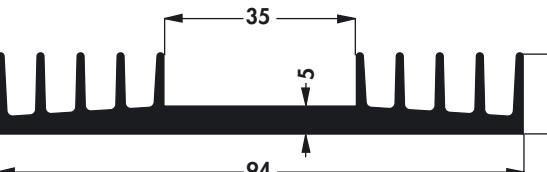
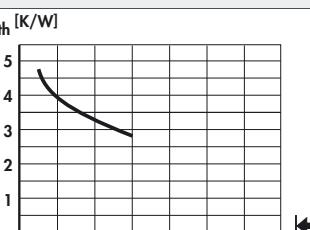
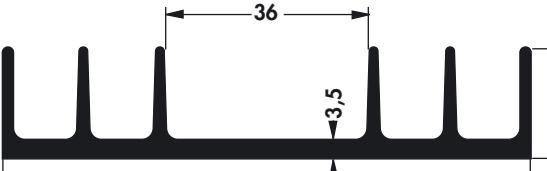
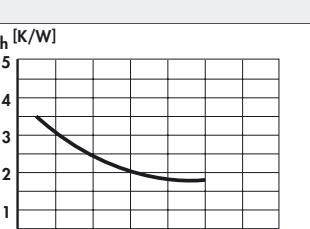
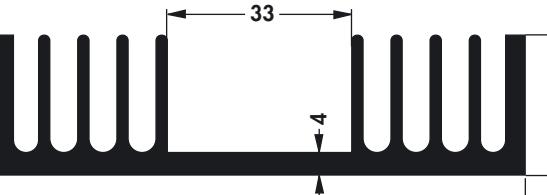
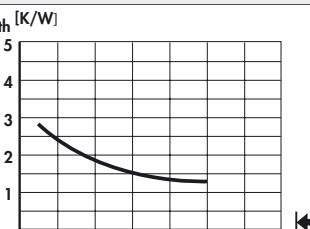
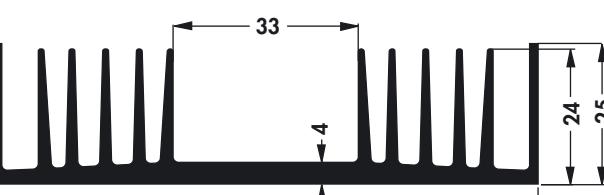
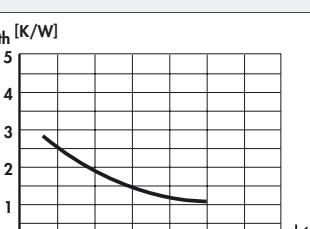
→ A 11 - 12

→ A 135 - 136

→ A 138

→ A 2 - 7

Standard extruded heatsinks

art. no.	 31,5 4 15 79		R_{th} [K/W]
SK 45 ...			 R_{th} [K/W] vs. length [mm]
please indicate:	... ↗	37,5 50 75 100 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	 35 5 14,5 94		R_{th} [K/W]
SK 19 ...			 R_{th} [K/W] vs. length [mm]
please indicate:	... ↗	37,5 50 75 100 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	 36 3,5 20 94,5		R_{th} [K/W]
SK 28 ...			 R_{th} [K/W] vs. length [mm]
please indicate:	... ↗	37,5 50 75 100 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	 33 4 25 95		R_{th} [K/W]
SK 401 ...			 R_{th} [K/W] vs. length [mm]
please indicate:	... ↗	100 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	 33 4 24 25 97		R_{th} [K/W]
SK 72 ...			 R_{th} [K/W] vs. length [mm]
please indicate:	... ↗	37,5 50 75 100 1000 mm	... ⚡ (optional) TO 3; CB



Standard extruded heatsinks

art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]										
SK 04 ...	<p>with slots for cover plates or PCBs</p>	<table border="1"> <caption>Approximate data points from SK 04 graph</caption> <thead> <tr> <th>Width L [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2.8</td></tr> <tr><td>100</td><td>1.8</td></tr> <tr><td>150</td><td>1.5</td></tr> <tr><td>200</td><td>1.4</td></tr> </tbody> </table>	Width L [mm]	R_{th} [K/W]	50	2.8	100	1.8	150	1.5	200	1.4
Width L [mm]	R_{th} [K/W]											
50	2.8											
100	1.8											
150	1.5											
200	1.4											
please indicate: ... ↗ 37.5 50 75 100 1000 mm	... ⚡ (optional) SSR 1; SSR 2; TO 3; CB											
SK 403 ...	<p>with slots for cover plates or PCBs</p>	<table border="1"> <caption>Approximate data points from SK 403 graph</caption> <thead> <tr> <th>Width L [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2.8</td></tr> <tr><td>100</td><td>1.8</td></tr> <tr><td>150</td><td>1.5</td></tr> <tr><td>200</td><td>1.4</td></tr> </tbody> </table>	Width L [mm]	R_{th} [K/W]	50	2.8	100	1.8	150	1.5	200	1.4
Width L [mm]	R_{th} [K/W]											
50	2.8											
100	1.8											
150	1.5											
200	1.4											
please indicate: ... ↗ 1000 mm	... ⚡ (optional) TO 3; CB											
SK 73 ...	<p>with slots for cover plates or PCBs</p>	<table border="1"> <caption>Approximate data points from SK 73 graph</caption> <thead> <tr> <th>Width L [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2.8</td></tr> <tr><td>100</td><td>1.8</td></tr> <tr><td>150</td><td>1.5</td></tr> <tr><td>200</td><td>1.4</td></tr> </tbody> </table>	Width L [mm]	R_{th} [K/W]	50	2.8	100	1.8	150	1.5	200	1.4
Width L [mm]	R_{th} [K/W]											
50	2.8											
100	1.8											
150	1.5											
200	1.4											
please indicate: ... ↗ 50 75 1000 mm	... ⚡ (optional) TO 3; CB											
SK 71 ...	<p>with slots for cover plates or PCBs</p>	<table border="1"> <caption>Approximate data points from SK 71 graph</caption> <thead> <tr> <th>Width L [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1.8</td></tr> <tr><td>100</td><td>1.0</td></tr> <tr><td>150</td><td>0.9</td></tr> <tr><td>200</td><td>0.9</td></tr> </tbody> </table>	Width L [mm]	R_{th} [K/W]	50	1.8	100	1.0	150	0.9	200	0.9
Width L [mm]	R_{th} [K/W]											
50	1.8											
100	1.0											
150	0.9											
200	0.9											
please indicate: ... ↗ 37.5 50 75 100 1000 mm	... ⚡ (optional) TO 3											
SK 57 ...	<p>with slots for cover plates or PCBs</p>	<table border="1"> <caption>Approximate data points from SK 57 graph</caption> <thead> <tr> <th>Width L [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1.5</td></tr> <tr><td>100</td><td>0.8</td></tr> <tr><td>150</td><td>0.6</td></tr> <tr><td>200</td><td>0.6</td></tr> </tbody> </table>	Width L [mm]	R_{th} [K/W]	50	1.5	100	0.8	150	0.6	200	0.6
Width L [mm]	R_{th} [K/W]											
50	1.5											
100	0.8											
150	0.6											
200	0.6											
please indicate: ... ↗ 37.5 75 100 1000 mm	... ⚡ (optional) TO 3											

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais

→ A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

→ A 138

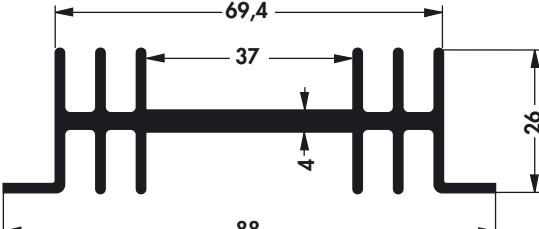
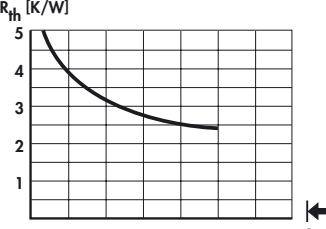
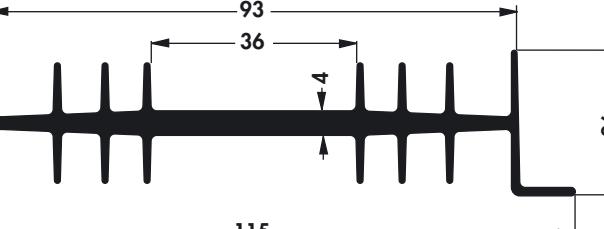
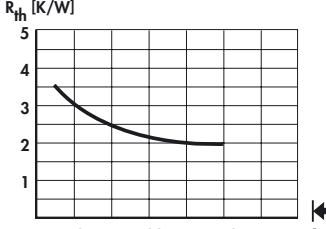
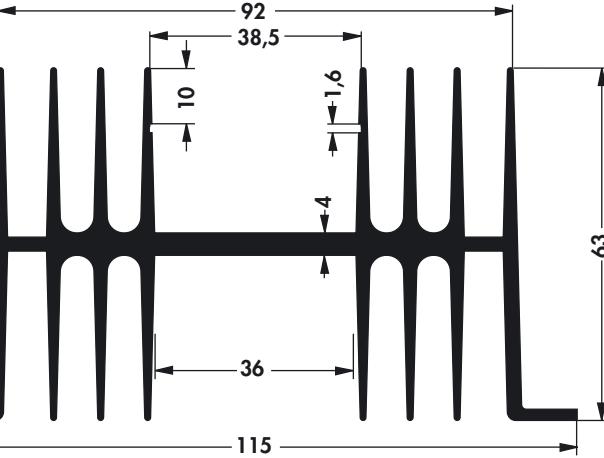
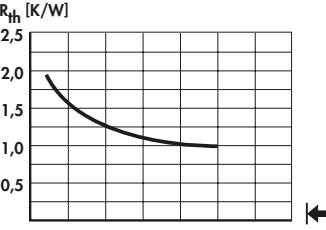
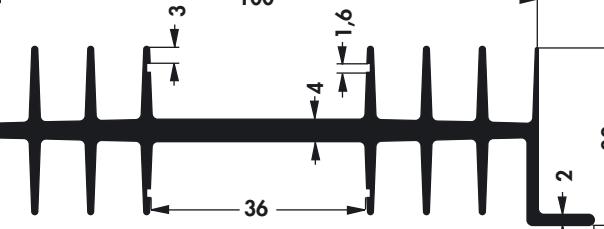
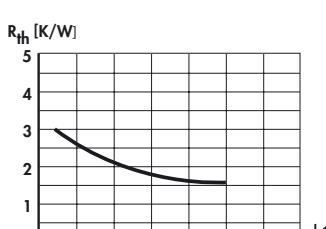
→ A 2 - 7

Standard extruded heatsinks

art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 197 ...		
please indicate:	... ↗ 37,5 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 98 ...		
please indicate:	... ↗ 100 150 mm	with slots for cover plates or PCBs
art. no.	Diagram	Thermal resistance R_{th} [K/W]
SK 404 ...		
please indicate:	... ↗ 50 75 1000 mm	... ⚡ (optional) TO 3; CB



Standard extruded heatsinks

art. no. SK 36 ... <small>mounting parts IS 1, IS 2, IS 3 → E 47</small>	 please indicate: ...  50 75 1000 mm	 $R_{th} [\text{K/W}]$ 50 100 150 200 [mm]
art. no. SK 01 ... <small>mounting parts IS 1, IS 2, IS 3 → E 47</small>	 please indicate: ...  37,5 50 75 100 1000 mm	 $R_{th} [\text{K/W}]$ 50 100 150 200 [mm]
art. no. SK 02 ... <small>with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 47</small>	 please indicate: ...  37,5 50 75 100 1000 mm	 $R_{th} [\text{K/W}]$ 50 100 150 200 [mm]
art. no. SK 03 ... <small>with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 47</small>	 please indicate: ...  50 75 100 1000 mm	 $R_{th} [\text{K/W}]$ 50 100 150 200 [mm]

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

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→ A 138

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→ A 2 – 7

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I

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M

N



Standard extruded heatsinks

art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]
SK 39 ...		
	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 47	
please indicate:	... ↗ 75 100 1000 mm	... ⚡ (optional) TO 3; CB
SK 30 ...		
	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 47	
please indicate:	... ↗ 75 100 1000 mm	... ⚡ (optional) TO 3; CB
SK 34 ...		
	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 47	
please indicate:	... ↗ 50 75 100 1000 mm	... ⚡ (optional) TO 3; CB
SK 14 ...		
	with slots for cover plates or PCBs; mounting parts IS 1, IS 2, IS 3 → E 47	
please indicate:	... ↗ 50 75 100 mm	... ⚡ (optional) TO 3; CB



Standard extruded heatsinks

art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]										
SK 20 ...		<table border="1"> <caption>Approximate data points from SK 20 graph</caption> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2.5</td></tr> <tr><td>100</td><td>1.5</td></tr> <tr><td>150</td><td>1.2</td></tr> <tr><td>200</td><td>1.1</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	2.5	100	1.5	150	1.2	200	1.1
Width [mm]	R_{th} [K/W]											
50	2.5											
100	1.5											
150	1.2											
200	1.1											
please indicate:	... ↗ 37.5 75 100 1000 mm	... ⚡ (optional) TO 3; CB										
art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]										
SK 184 ...		<table border="1"> <caption>Approximate data points from SK 184 graph</caption> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2.8</td></tr> <tr><td>100</td><td>1.8</td></tr> <tr><td>150</td><td>1.5</td></tr> <tr><td>200</td><td>1.4</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	2.8	100	1.8	150	1.5	200	1.4
Width [mm]	R_{th} [K/W]											
50	2.8											
100	1.8											
150	1.5											
200	1.4											
please indicate:	... ↗ 100 1000 mm											
art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]										
SK 148 ...		<table border="1"> <caption>Approximate data points from SK 148 graph</caption> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1.8</td></tr> <tr><td>100</td><td>1.2</td></tr> <tr><td>150</td><td>1.0</td></tr> <tr><td>200</td><td>0.9</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	1.8	100	1.2	150	1.0	200	0.9
Width [mm]	R_{th} [K/W]											
50	1.8											
100	1.2											
150	1.0											
200	0.9											
please indicate:	... ↗ 37.5 100 1000 mm	... ⚡ (optional) TO 3; CB										
art. no.	Diagram & Dimensions	Thermal Resistance R_{th} [K/W]										
SK 84 ...		<table border="1"> <caption>Approximate data points from SK 84 graph</caption> <thead> <tr> <th>Width [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>2.3</td></tr> <tr><td>100</td><td>1.6</td></tr> <tr><td>150</td><td>1.2</td></tr> <tr><td>200</td><td>1.1</td></tr> </tbody> </table>	Width [mm]	R_{th} [K/W]	50	2.3	100	1.6	150	1.2	200	1.1
Width [mm]	R_{th} [K/W]											
50	2.3											
100	1.6											
150	1.2											
200	1.1											
please indicate:	... ↗ 50 150 1000 mm	... ⚡ (optional) TO 3										

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

→ A 138

Technical introduction

→ A 2 – 7



Standard extruded heatsinks

art. no.	Dimensions [mm]		Thermal resistance R_{th} [K/W]
SK 67 ...	34	40	
	145	6,5	
	164		
mounting part IS 6 → E 47			
please indicate:	... ↗	... ⚡ (optional)	
	37,5 50 100 1000 mm	TO 3	

A

B

C

D

E

F

G

H

I

K

L

M

N

A 69

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 – 12

Heatsink special design

→ A 135 – 136

Special profiles

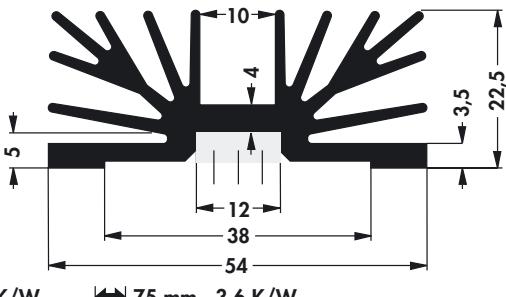
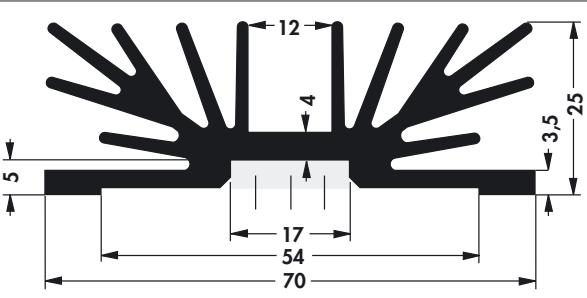
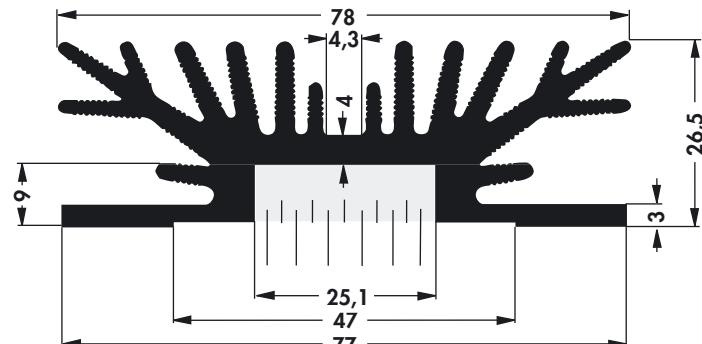
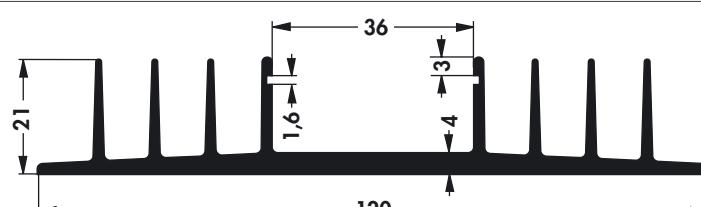
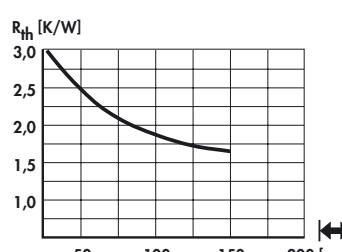
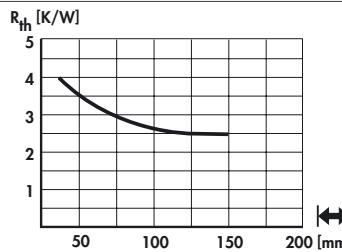
→ A 138

Technical introduction

→ A 2 – 7

Standard extruded heatsinks



art. no. SK 65 ... please indicate:	 37,5 75 mm SK 64 ... please indicate:	 37,5 75 mm SK 419 ... please indicate:	 1000 mm SK 21 ... please indicate:	 37,5 1000 mm														
				... ⚡ (optional) 1 x M3; 2 x M3														
				 <table border="1"> <caption>Approximate data points from SK 65 graph</caption> <thead> <tr> <th>Fin Height [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>37,5</td><td>3,0</td></tr> <tr><td>50</td><td>2,5</td></tr> <tr><td>75</td><td>2,0</td></tr> <tr><td>100</td><td>1,8</td></tr> <tr><td>150</td><td>1,6</td></tr> <tr><td>200</td><td>1,5</td></tr> </tbody> </table>	Fin Height [mm]	R _{th} [K/W]	37,5	3,0	50	2,5	75	2,0	100	1,8	150	1,6	200	1,5
Fin Height [mm]	R _{th} [K/W]																	
37,5	3,0																	
50	2,5																	
75	2,0																	
100	1,8																	
150	1,6																	
200	1,5																	
				 <table border="1"> <caption>Approximate data points from SK 21 graph</caption> <thead> <tr> <th>Fin Height [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>36</td><td>4,0</td></tr> <tr><td>50</td><td>3,5</td></tr> <tr><td>75</td><td>2,8</td></tr> <tr><td>100</td><td>2,5</td></tr> <tr><td>150</td><td>2,3</td></tr> <tr><td>200</td><td>2,2</td></tr> </tbody> </table>	Fin Height [mm]	R _{th} [K/W]	36	4,0	50	3,5	75	2,8	100	2,5	150	2,3	200	2,2
Fin Height [mm]	R _{th} [K/W]																	
36	4,0																	
50	3,5																	
75	2,8																	
100	2,5																	
150	2,3																	
200	2,2																	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

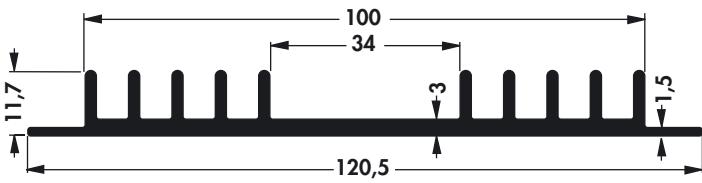
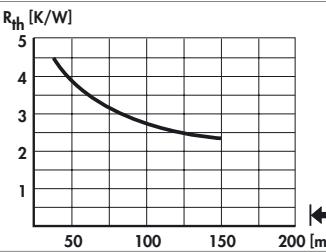
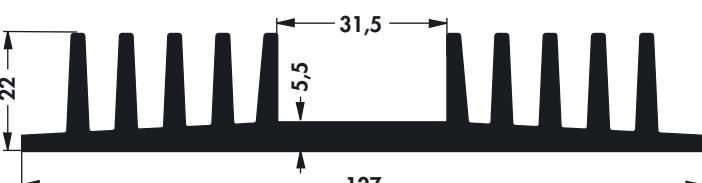
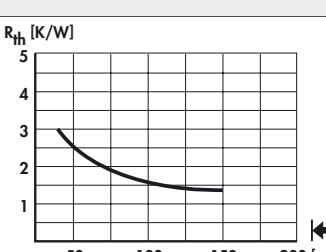
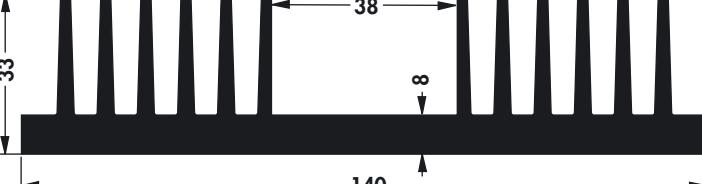
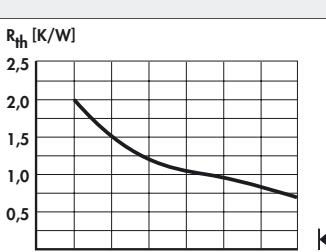
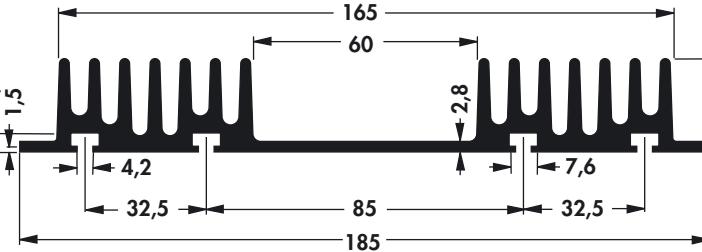
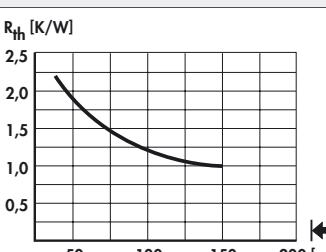
→ A 138

Technical introduction

→ A 2 - 7



Standard extruded heatsinks

art. no.	Dimensions [mm]	Graph: Thermal Resistance R_{th} [K/W] vs. Width [mm]
SK 69 ...	 mounting parts IS 1, IS 2, IS 3 → E 47	
	please indicate: ... ↗ 50 75 100 1000 mm ... ⚡ (optional) TO 3; CB	
SK 74 ...		
	please indicate: ... ↗ 37,5 100 1000 mm ... ⚡ (optional) TO 3; CB	
SK 124 ...		
	please indicate: ... ↗ 50 100 150 1000 mm ... ⚡ (optional) TO 3	
SK 195 ...		
	please indicate: ... ↗ 75 100 mm ... ⚡ (optional) TO 3; CB	



Standard extruded heatsinks

art. no.	Diagram	Graph R_{th} [K/W]
SK 31 ...		
please indicate:	... ↗ 37.5 50 75 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	Diagram	Graph R_{th} [K/W]
SK 07 ...		
please indicate:	... ↗ 37.5 50 75 1000 mm	... ⚡ (optional) TO 3; CB
art. no.	Diagram	Graph R_{th} [K/W]
SK 16 ...		
please indicate:	... ↗ 75 1000 mm	... ⚡ (optional) TO 3; CB
mountingpart IS 3 → E 47		
art. no.	Diagram	Graph R_{th} [K/W]
SK 500 ...		
please indicate:	... ↗ 37.5 50 75 100 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 – 12

→ A 135 – 136

→ A 138

→ A 2 – 7

Standard extruded heatsinks

art. no.		
SK 185 ...	extruded heatsink for PCB mounting → A 103	... ↗ (optional) TO 3; CB
please indicate:	... ↗ 37,5 50 1000 mm	
art. no.		
SK 48 ↗ (optional) SSR 1; SSR 3; TO 3; CB
please indicate:	... ↗ 37,5 50 75 100 1000 mm	
art. no.		
SK 79 ...	with slots for cover plates or PCBs	... ↗ (optional) TO 3; CB
please indicate:	... ↗ 37,5 50 75 100 1000 mm	
art. no.		
SK 08 ...	with slots for cover plates or PCBs	... ↗ (optional) TO 3; CB
please indicate:	... ↗ 37,5 50 75 100 1000 mm	
art. no.		
SK 88 ...	with slots for cover plates or PCBs	... ↗ (optional) TO 3
please indicate:	... ↗ 37,5 50 75 100 1000 mm	

Standard extruded heatsinks

art. no.		R_{th} [K/W]
SK 52 ...		
please indicate:	... \leftrightarrow 37.5 50 75 100 1000 mm	... \diamond (optional) 2 x TO 3; 2 x CB
art. no.		R_{th} [K/W]
SK 60 ...		
please indicate:	... \leftrightarrow 50 75 100 1000 mm	... \diamond (optional) 2 x TO 3; 2 x CB
art. no.		R_{th} [K/W]
SK 147 ...		
please indicate:	... \leftrightarrow 50 150 1000 mm	... \diamond (optional) 2 x TO 3; 2 x CB
art. no.		R_{th} [K/W]
SK 80 ...		
please indicate:	... \leftrightarrow 75 100 1000 mm	... \diamond (optional) 2 x TO 3; 2 x CB
art. no.		R_{th} [K/W]
SK 53 ...		
please indicate:	... \leftrightarrow 50 75 100 150 1000 mm	... \diamond (optional) 2 x TO 3; 2 x CB

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

→ A 138

→ A 2 - 7

Standard extruded heatsinks

art. no.	Diagram	R_{th} [K/W]										
SK 86 ...	<p>29 28 29 28 29 28 29 232 38</p>	<p>R_{th} [K/W] vs. Length [mm]</p> <table border="1"> <caption>Data points estimated from graph</caption> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>1,5</td></tr> <tr><td>100</td><td>0,8</td></tr> <tr><td>150</td><td>0,5</td></tr> <tr><td>200</td><td>0,4</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	1,5	100	0,8	150	0,5	200	0,4
Length [mm]	R_{th} [K/W]											
50	1,5											
100	0,8											
150	0,5											
200	0,4											
please indicate: ... ↗ 100 150 1000 mm												
SK 82 ...	<p>30 28 110 110 110 440 6</p>	<p>R_{th} [K/W] vs. Length [mm]</p> <table border="1"> <caption>Data points estimated from graph</caption> <thead> <tr> <th>Length [mm]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>50</td><td>0,7</td></tr> <tr><td>100</td><td>0,4</td></tr> <tr><td>150</td><td>0,28</td></tr> <tr><td>200</td><td>0,25</td></tr> </tbody> </table>	Length [mm]	R_{th} [K/W]	50	0,7	100	0,4	150	0,28	200	0,25
Length [mm]	R_{th} [K/W]											
50	0,7											
100	0,4											
150	0,28											
200	0,25											
please indicate: ... ↗ 100 1000 mm												

A

B

C

D

E

F

G

H

I

K

L

M

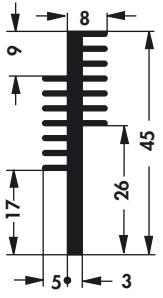
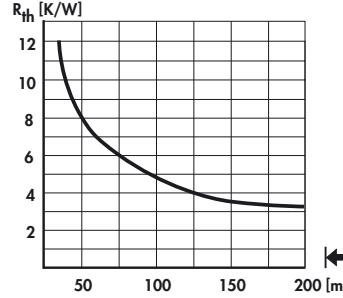
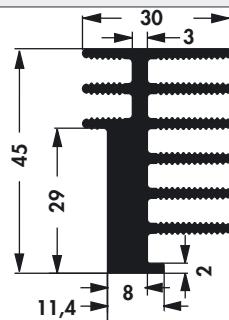
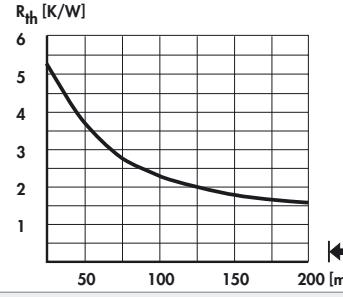
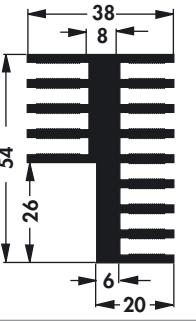
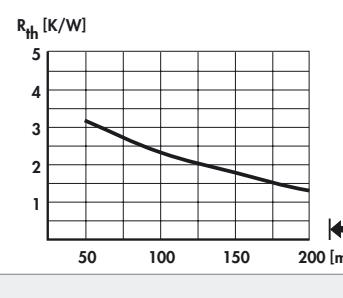
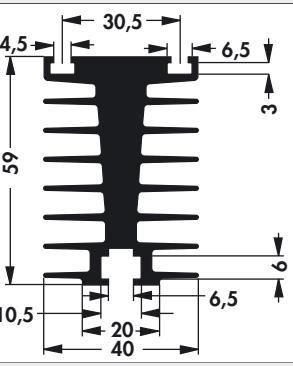
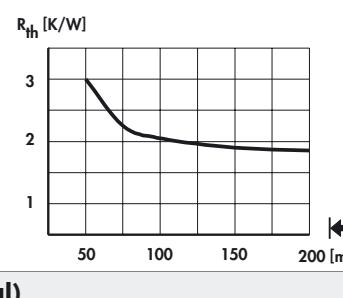
N

A 75

High decorative surfaces → A 9
 Order example → A 21
 Heatsink as visual & decor-parts → A 10
 Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay → A 11 – 12
 Heatsink special design → A 135 – 136
 Special profiles → A 138
 Technical introduction → A 2 – 7

Standard extruded heatsinks

art. no.		
SK 596 ...	please indicate: ...  37.5 50 75 100 1000 mm	
art. no.		
SK 544 ...	please indicate: ...  50 75 100 1000 mm	
art. no.		
SK 32 ...	please indicate: ...  37.5 50 75 100 1000 mm	
art. no.		
SK 187 ...	please indicate: ...  75 1000 mm	...  (optional) SSR 3

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

→ A 11 - 12

Heatsink special design

→ A 135 - 136

Special profiles

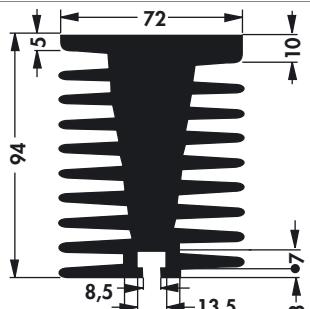
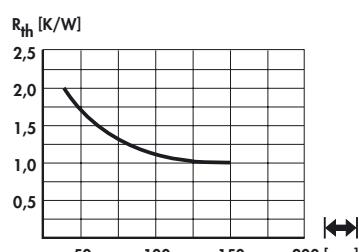
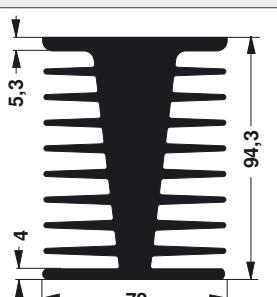
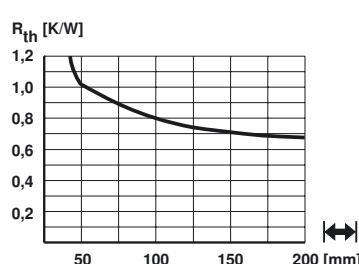
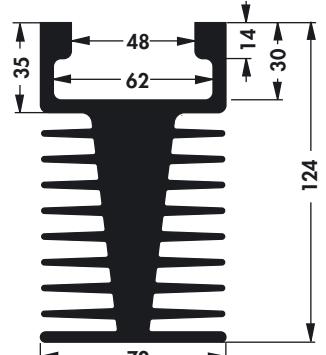
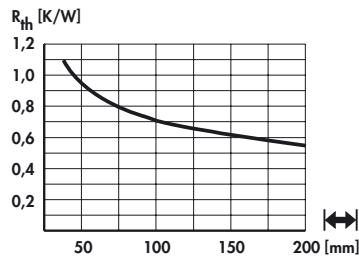
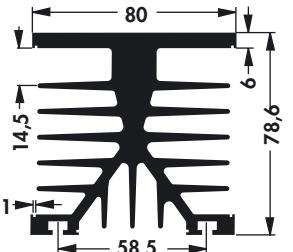
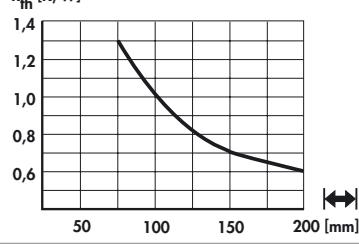
→ A 138

Technical introduction

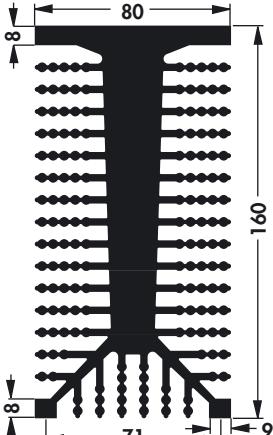
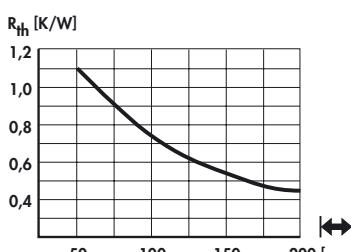
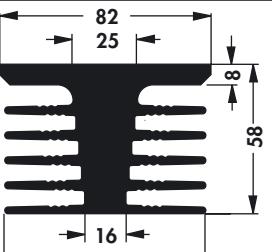
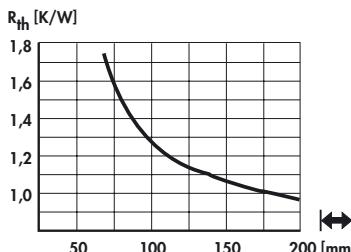
→ A 2 - 7



Standard extruded heatsinks

art. no.	Dimensions [mm]	R_{th} [K/W]
SK 140 ...		
please indicate:	...  1000 mm	
art. no.	Dimensions [mm]	R_{th} [K/W]
SK 556 ...		
please indicate:	...  75 100 150 1000 mm	
art. no.	Dimensions [mm]	R_{th} [K/W]
SK 15 ...		
please indicate:	...  75 1000 mm	
art. no.	Dimensions [mm]	R_{th} [K/W]
SK 89 ...		
please indicate:	...  100 150 1000 mm	...  (optional) SSR 1; SSR 2; SSR 4
with slots for cover plates or PCBs		

Standard extruded heatsinks

art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width b [mm]
SK 163 ...	 please indicate: ...  100 150 1000 mm	
SK 176 ...	 please indicate: ...  75 100 150 1000 mm	 ...  SSR 2

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 – 12

→ A 135 – 136

→ A 138

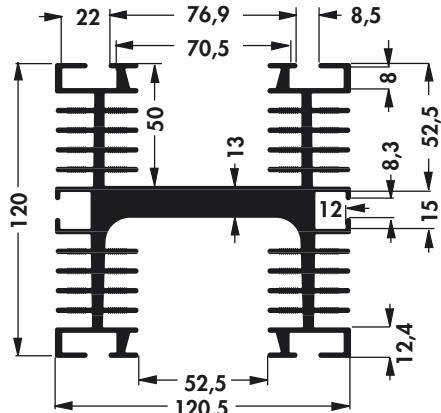
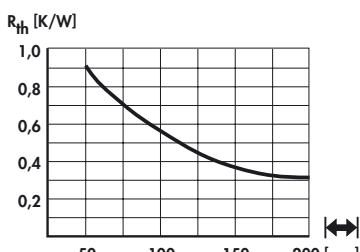
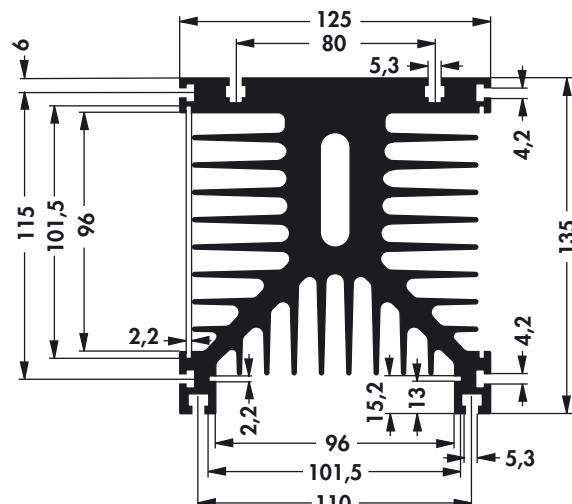
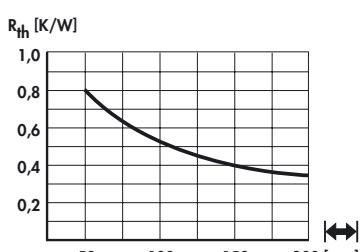
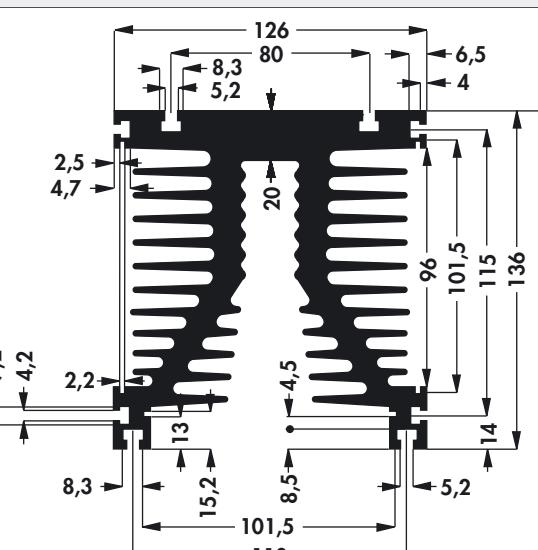
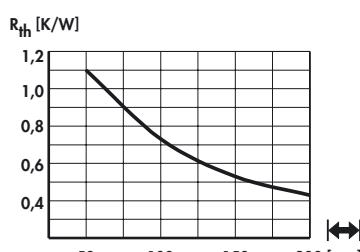
→ A 2 – 7



Standard extruded heatsinks

art. no.	Diagram	Technical Data								
SK 11 ...	 	R_{th} [K/W] <table border="1"> <tr><td>50</td><td>2,5</td></tr> <tr><td>100</td><td>1,5</td></tr> <tr><td>150</td><td>1,2</td></tr> <tr><td>200</td><td>1,1</td></tr> </table>	50	2,5	100	1,5	150	1,2	200	1,1
50	2,5									
100	1,5									
150	1,2									
200	1,1									
please indicate:	... ↗ 1000 mm	threads, through holes and fixing according to your demand; mounting parts IS 1, IS 2, IS 3 → E 47								
art. no.	Diagram	Technical Data								
SK 83 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>1,5</td></tr> <tr><td>100</td><td>0,8</td></tr> <tr><td>150</td><td>0,5</td></tr> <tr><td>200</td><td>0,4</td></tr> </table>	50	1,5	100	0,8	150	0,5	200	0,4
50	1,5									
100	0,8									
150	0,5									
200	0,4									
please indicate:	... ↗ 100 1000 mm									
art. no.	Diagram	Technical Data								
SK 06 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>1,5</td></tr> <tr><td>100</td><td>0,8</td></tr> <tr><td>150</td><td>0,5</td></tr> <tr><td>200</td><td>0,4</td></tr> </table>	50	1,5	100	0,8	150	0,5	200	0,4
50	1,5									
100	0,8									
150	0,5									
200	0,4									
mounting part IS 4 → E 47										
please indicate:	... ↗ 75 1000 mm	... ⚡ (optional) TO 3								
art. no.	Diagram	Technical Data								
SK 23 ...		R_{th} [K/W] <table border="1"> <tr><td>50</td><td>1,5</td></tr> <tr><td>100</td><td>0,8</td></tr> <tr><td>150</td><td>0,5</td></tr> <tr><td>200</td><td>0,4</td></tr> </table>	50	1,5	100	0,8	150	0,5	200	0,4
50	1,5									
100	0,8									
150	0,5									
200	0,4									
with slots for cover plates or PCBs; equipped with fan and endplates = LA 4 → D 14										
please indicate:	... ↗ 75 mm									

Standard extruded heatsinks

art. no.	Dimensions [mm]	Graph: Thermal resistance R_{th} [K/W] vs. width b [mm]
SK 110 ...	 please indicate: ...  150 200 1000 mm	
SK 109 ...	 with slots for cover plates or PCBs please indicate: ...  100 150 200 1000 mm	
SK 108 ...	 with slots for cover plates or PCBs please indicate: ...  100 1000 mm	

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

→ A 135 - 136

→ A 138

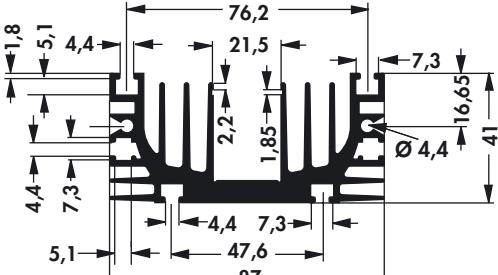
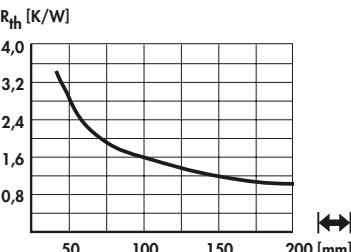
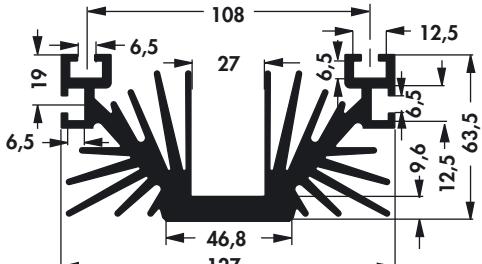
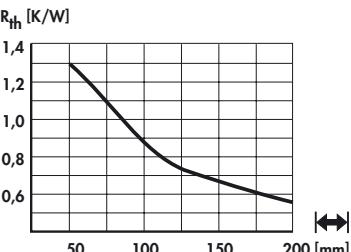
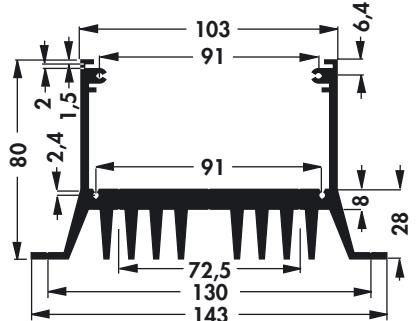
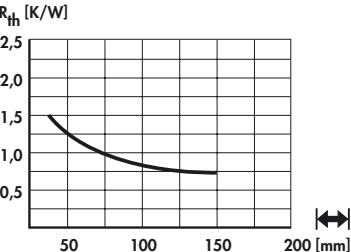
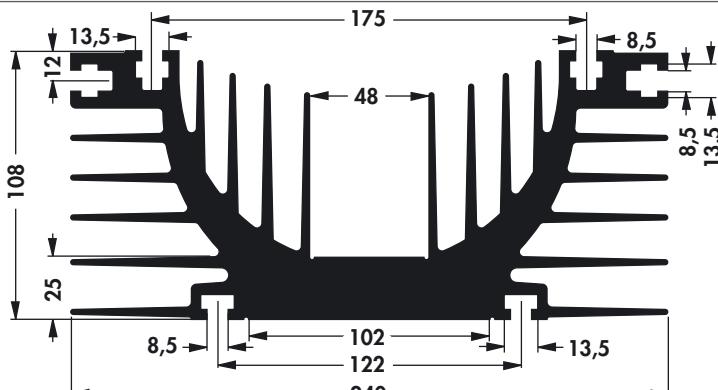
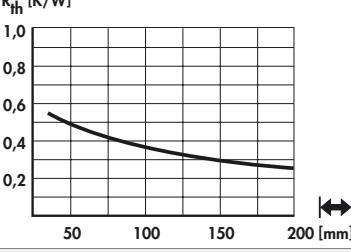
→ A 2 - 7



Standard extruded heatsinks

art. no.		R_{th} [K/W]
SK 111 ...		
please indicate:	... 75 100 1000 mm	... SSR 1; SSR 3
art. no.		R_{th} [K/W]
SK 172 ...		
please indicate:	... 50 75 100 150 1000 mm	... SSR 1; SSR 2; SSR 4
art. no.		R_{th} [K/W]
SK 194 ...		
please indicate:	... 75 1000 mm	... SSR 2
art. no.		R_{th} [K/W]
SK 435 ...		
please indicate:	... 150 200 1000 mm	

Standard extruded heatsinks

art. no.	Technical drawing	Thermal resistance R_{th} [K/W]
SK 432 ...		 The graph shows a curve starting at approximately 3.2 K/W for a width of 50 mm and decreasing to about 0.8 K/W at a width of 200 mm.
SK 40 ...		 The graph shows a curve starting at approximately 1.3 K/W for a width of 50 mm and decreasing to about 0.6 K/W at a width of 200 mm.
SK 61 ...		 The graph shows a curve starting at approximately 1.5 K/W for a width of 50 mm and decreasing to about 0.5 K/W at a width of 200 mm.
SK 144 ...		 The graph shows a curve starting at approximately 0.55 K/W for a width of 50 mm and decreasing to about 0.2 K/W at a width of 200 mm.

High decorative surfaces

→ A 9

Order example

→ A 21

Heatsink as visual & decor-parts

→ A 10

Drilling pattern for Solid State Relais → A 12

Heatsinks for Solid State Relay

Heatsink special design

Special profiles

Technical introduction

→ A 11 - 12

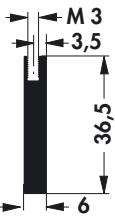
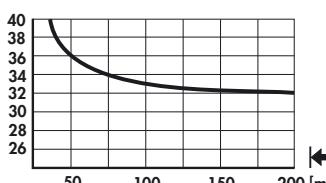
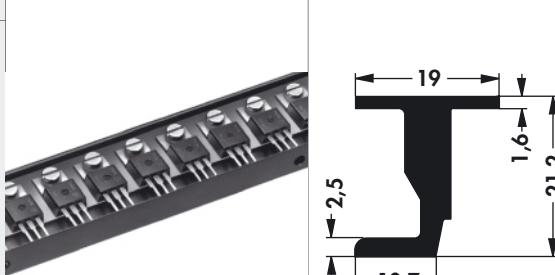
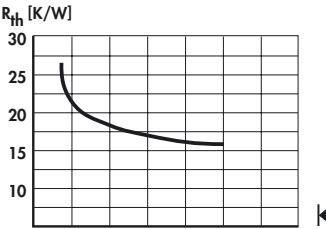
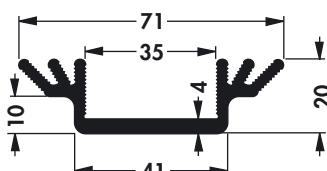
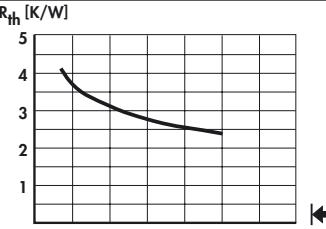
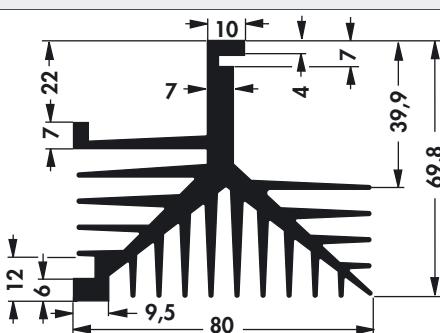
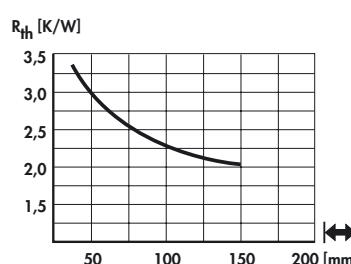
→ A 135 - 136

→ A 138

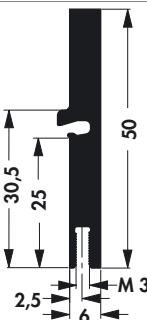
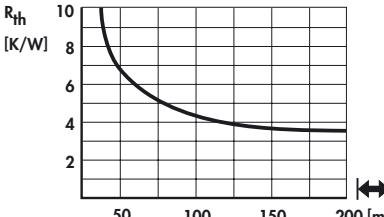
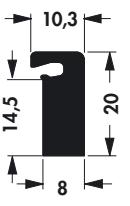
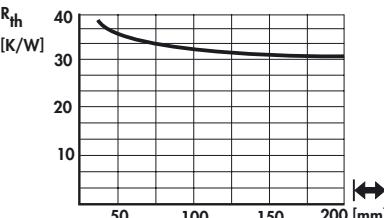
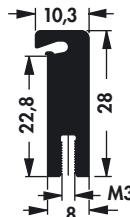
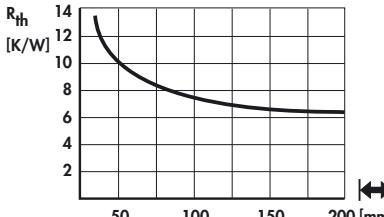
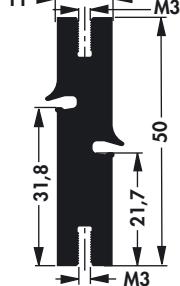
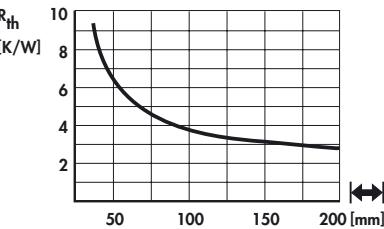
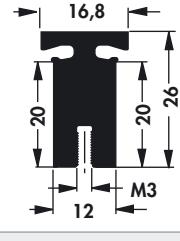
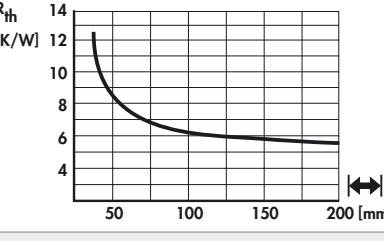
→ A 2 - 7



Standard extruded heatsinks

art. no. SK 494 ...		R_{th} [K/W] 
please indicate: ...  25 37,5 50 75 100 1000 mm		
art. no. SK 153 ...		R_{th} [K/W] 
please indicate: ...  50 mm		
art. no. SK 55 ...		R_{th} [K/W] 
please indicate: ...  37,5 1000 mm ...  (optional) TO 3; CB		
art. no. SK 175 ...		R_{th} [K/W] 
please indicate: ...  50 1000 mm		

Extruded heatsinks for lock-in retaining spring

art. no.			
SK 575 ...			
please indicate:	... ↪ 25 37.5 50 75 84 100 1000 mm		
art. no.			
SK 512 ...			
please indicate:	... ↪ 25 50 100 1000 mm		
art. no.			
SK 480 ...			
please indicate:	... ↪ 25 37.5 50 75 84 100 1000 mm		
art. no.			
SK 490 ...			
please indicate:	... ↪ 37.5 50 75 84 100 1000 mm		
art. no.			
SK 492 ...			
please indicate:	... ↪ 25 37.5 50 75 84 100 1000 mm		

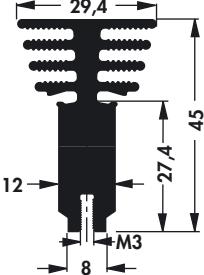
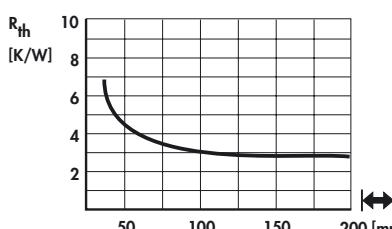
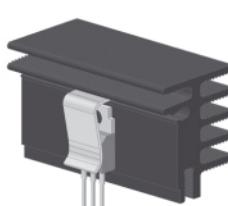
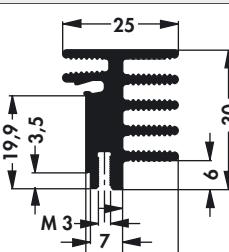
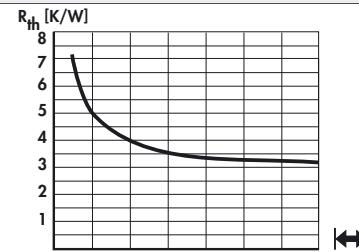
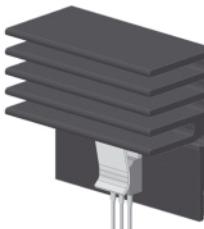
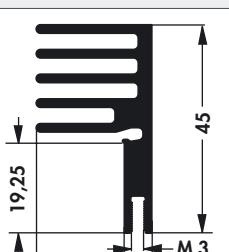
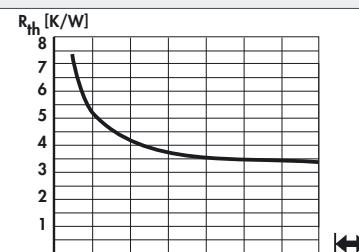
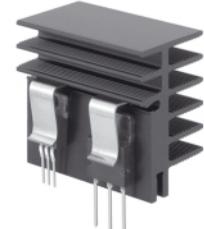
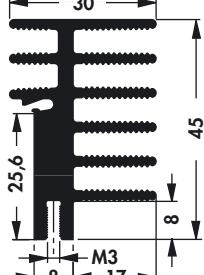
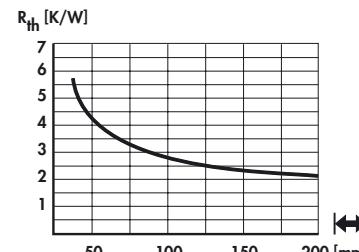
please note: profile threads → A 4

Mounting parts for heatsinks
 Insulating caps
 Mounting pads
 Lock-in transistor fixing spring

→ E 47 – 48 Heatsinks for PCB
 → E 49 Profiles for PCB components
 → E 44 Heatsinks with threaded rail
 → A 117 – 119 Technical introduction

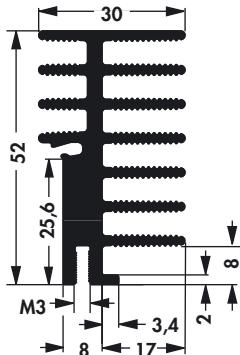
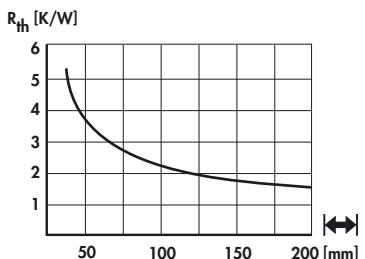
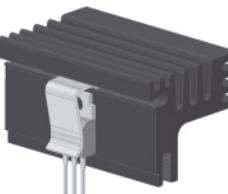
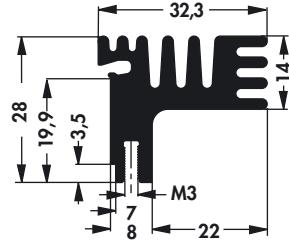
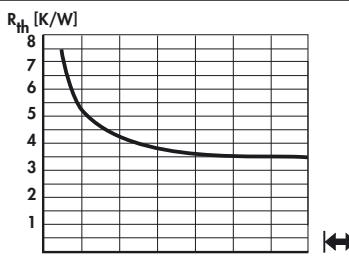
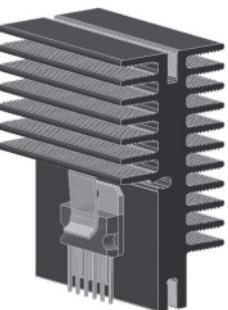
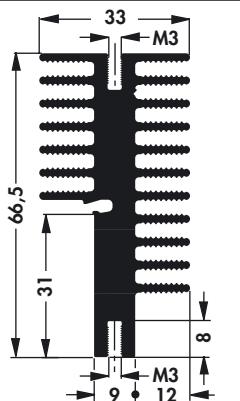
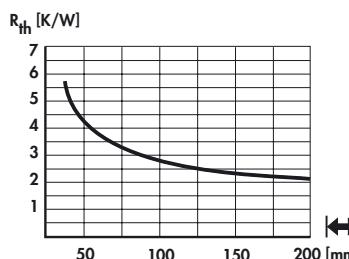
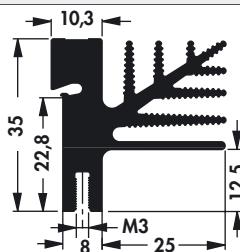
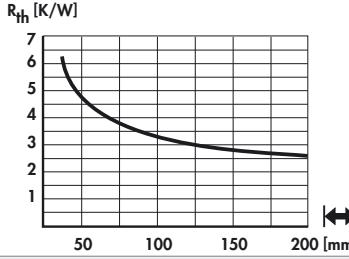
→ A 89
 → A 91
 → A 92
 → A 2 – 7

Extruded heatsinks for lock-in retaining spring

art. no.  SK 489 ...		
please indicate: ... ↗ 25 37.5 50 75 84 100 1000 mm		
art. no.  SK 573 ...		
please indicate: ... ↗ 25 37.5 50 75 84 100 1000 mm		
art. no.  SK 576 ...		
please indicate: ... ↗ 25 37.5 50 75 84 100 1000 mm		
art. no.  SK 481 ...		
please indicate: ... ↗ 25 37.5 50 75 84 100 1000 mm		

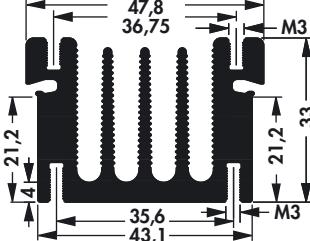
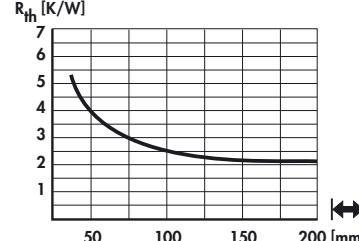
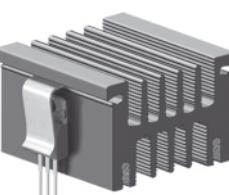
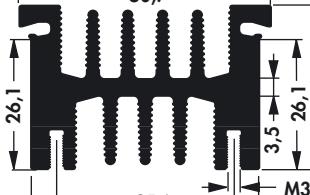
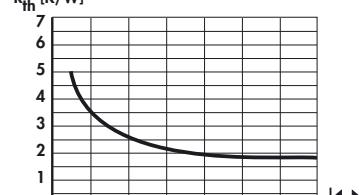
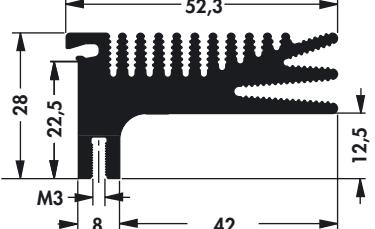
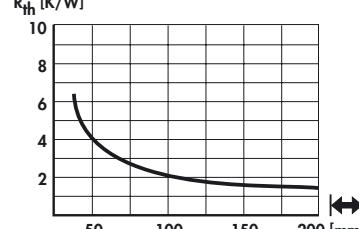
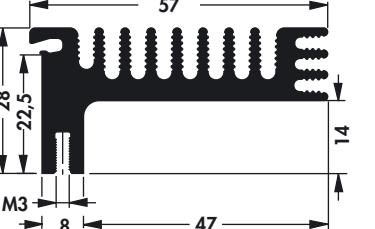
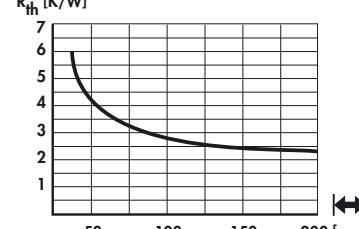
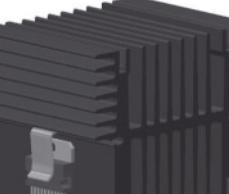
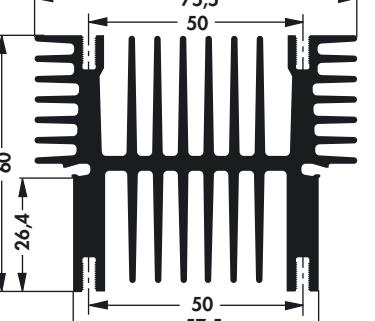
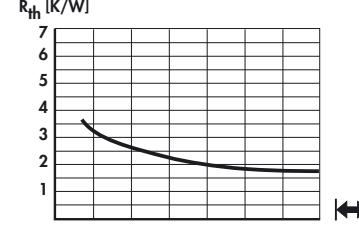
please note: profile threads → A 4

Extruded heatsinks for lock-in retaining spring

art. no.			
SK 514 ...			
please indicate:	...  25 37.5 50 75 100 1000 mm		
art. no.			
SK 574 ...			
please indicate:	...  25 37.5 50 75 84 100 1000 mm		
art. no.			
SK 589 ...			
please indicate:	...  25 37.5 50 75 84 100 1000 mm		
art. no.			
SK 482 ...			
please indicate:	...  25 37.5 50 75 84 100 1000 mm		

please note: profile threads → A 4

Extruded heatsinks for lock-in retaining spring

art. no.  SK 495 ...		
please indicate: ...  25 37,5 50 75 100 1000 mm		
art. no.  SK 499 ...		
please indicate: ...  25 37,5 50 75 100 1000 mm		
art. no.  SK 487 ...		
please indicate: ...  25 37,5 50 75 84 100 1000 mm		
art. no.  SK 483 ...		
please indicate: ...  25 37,5 50 75 84 100 1000 mm		
art. no.  SK 593 ...		
please indicate: ...  25 37,5 50 75 84 100 1000 mm		

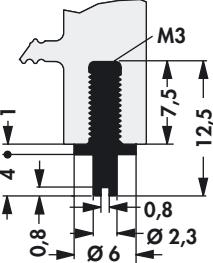
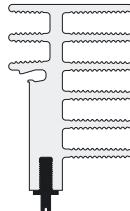
please note: profile threads → A 4

Extruded heatsinks for lock-in retaining spring

A

Screw-in solder pin ELS 3

- screw in solder pin made of brass
- easy mounting
- secure hold
- surface coating suitable for soldering
- suitable for all heatsinks with M3 profile thread
- position in the threaded channel as required
- specific designs upon customer's request

art. no.	
ELS 3	  

B

C

D

E

F

G

H

I

K

L

M

N

Mounting parts for heatsinks

Insulating caps

Mounting pads

Lock-in transistor fixing spring

→ E 47 – 48

→ E 49

→ E 44

→ A 117 – 119

Heatsinks for PCB

Profiles for PCB components

Heatsinks with threaded rail

Technical introduction

→ A 89

→ A 91

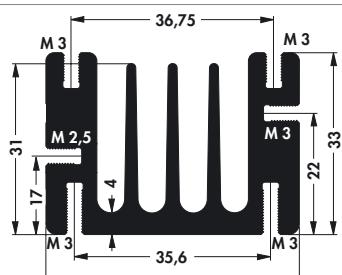
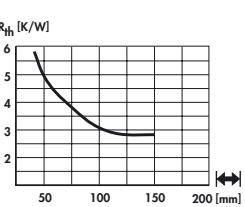
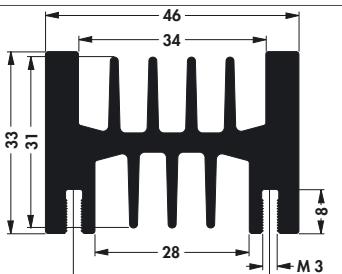
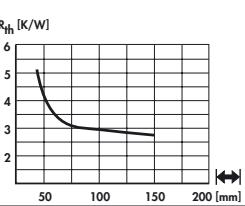
→ A 92

→ A 2 – 7

Extruded heatsinks for PCB mounting

Heatsinks for printed circuit boards

- matching cylindrical screws according to DIN 84 with zinc coated surface
- M 3 thread diameter: 2.90 ... 2.94 mm (**art. no.: SZ M 3 x 8**)
- screw-in solder pin M 3 (**art. no.: ELS 3**)

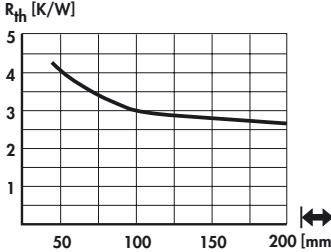
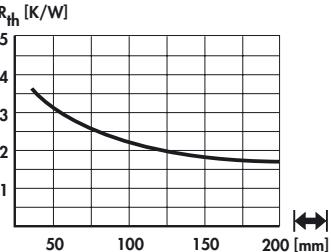
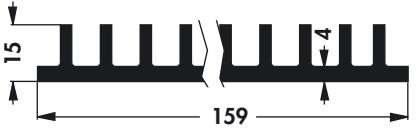
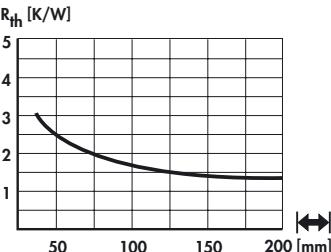
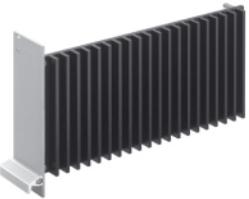
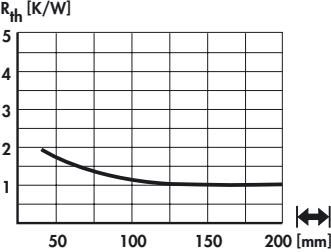
art. no.			
SK 68 ...			
art. no.			
SK 112 ...			
please indicate:  37.5 50 75 94 100 1000 mm			

please note: profile threads → A 4

Extruded heatsinks for PCB mounting

Heatsinks for printed circuit boards

– the heatsinks SK 414, SK 105, SK 44 and SK 415 are especially suitable for printed circuit board heatsinks for 19" plug in units

art. no.			
SK 414 ...			
please indicate:	...  100 233.4 1000 mm		
art. no.			
SK 105 ...			
please indicate:	...  37.5 50 75 100 150 200 233.4 1000 mm		
art. no.			
SK 44 ...			
please indicate:	...  50 75 100 150 200 233.4 1000 mm		
art. no.			
SK 415 ...			
please indicate:	...  37.5 100 150 1000 mm		

Extruded heatsinks for PCB mounting

Heatsinks for printed circuit boards

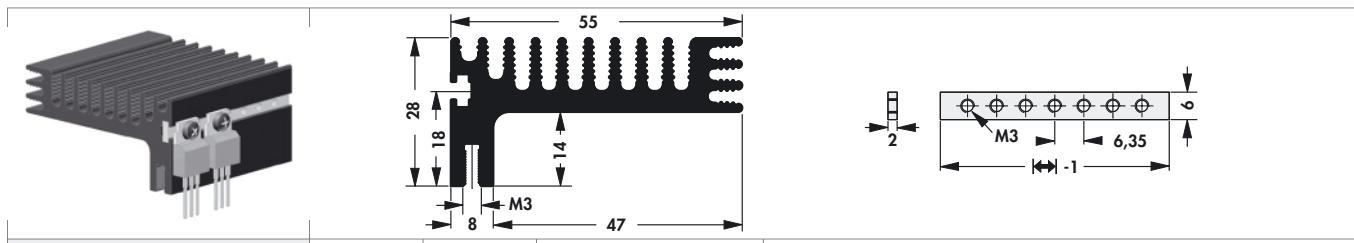
– for use on eurocards

art. no.	Diagram	Technical drawing	Graph
SK 96 ...			
SK 125 ...			
please indicate: ... 50 84 94 1000 mm			
SK 138 ...			
SK 451 ...			
SK 128 ...			
please indicate: ... 84 94 1000 mm			

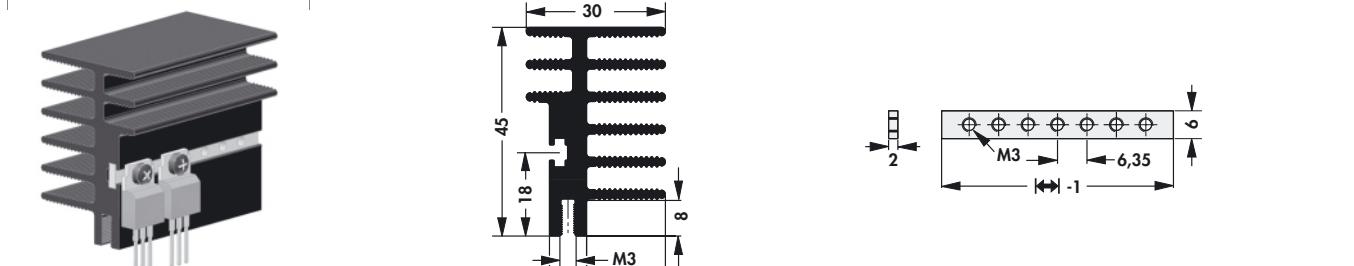
Extruded heatsinks for PCB mounting

Heatsink for PCB with threaded rail

- transistor mounting onto the heatsink using a slide-in rail with M 3 thread
- easy positioning using a grid 6.35mm
- other rail grids upon request
- suitable for TO 220, TO 218, TO 247 and similar
- suitable screws M 3 (**art. no.: SZ M 3 x 8**)
- screw-in solder pin M 3 (**art. no.: ELS 3**)
- specific versions upon customer's request



art. no.	↔ [mm]	R _{th} [K/W]	✿	version
SK 517 50 GS	50	5.0	TO 220	with threaded rail
SK 517 75 GS	75	3.9	TO 220	with threaded rail
SK 517 84 GS	84	3.6	TO 220	with threaded rail
SK 517 50	50	5.0	—	without threaded rail
SK 517 75	75	3.9	—	without threaded rail
SK 517 84	84	3.6	—	without threaded rail



art. no.	↔ [mm]	R _{th} [K/W]	✿	version
SK 518 50 GS	50	4.3	TO 220	with threaded rail
SK 518 75 GS	75	3.3	TO 220	with threaded rail
SK 518 84 GS	84	3.0	TO 220	with threaded rail
SK 518 50	50	4.3	—	without threaded rail
SK 518 75	75	3.3	—	without threaded rail
SK 518 84	84	3.0	—	without threaded rail

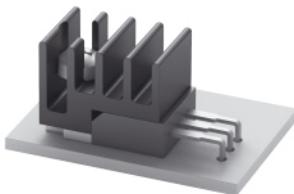
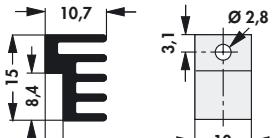
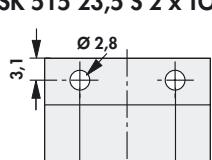
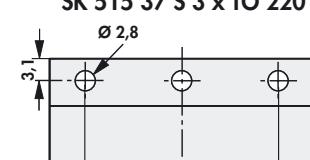
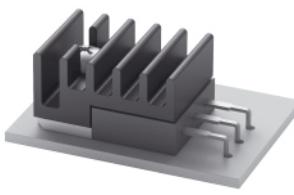
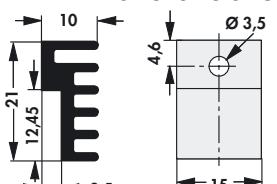
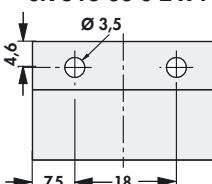
please note: profile threads → A 4

surface:	black anodised
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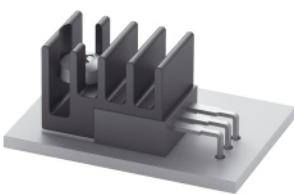
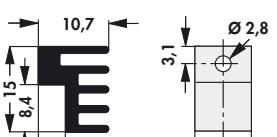
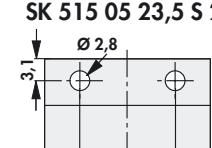
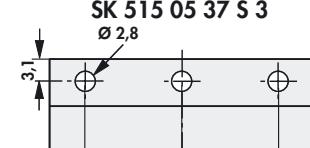
Extruded heatsinks for PCB mounting

Attachable heatsinks for transistors

- compact heatsink in transistor dimensions
- for horizontal and vertical transistors
- can be screwed or glued
- specific versions upon customer's request

	 SK 515 10 S TO 220	 SK 515 23,5 S 2 x TO 220	 SK 515 37 S 3 x TO 220
art. no.	↔ [mm]	R _{th} [K/W]	version
SK 515 10 S TO 220	10.0	30.0	TO 220 for screw fastening M2.5
SK 515 23,5 S 2 x TO 220	23.5	27.5	2 x TO 220 for screw fastening M2.5
SK 515 37 S 3 x TO 220	37.0	26.1	3 x TO 220 for screw fastening M2.5
SK 515 10 TO 220	10.0	30.0	— without screw fastening
SK 515 23,5 TO 220	23.5	27.5	— without screw fastening
SK 515 37 TO 220	37.0	26.1	— without screw fastening
	 SK 516 15 S TO 218	 SK 516 33 S 2 x TO 218	
art. no.	↔ [mm]	R _{th} [K/W]	version
SK 516 15 S TO 218	15	28.4	TO 218 for screw fastening M3
SK 516 33 S 2 x TO 218	33	26.9	2 x TO 218 for screw fastening M3
SK 516 15 TO 218	15	28.4	— without screw fastening
surface:	black anodised		

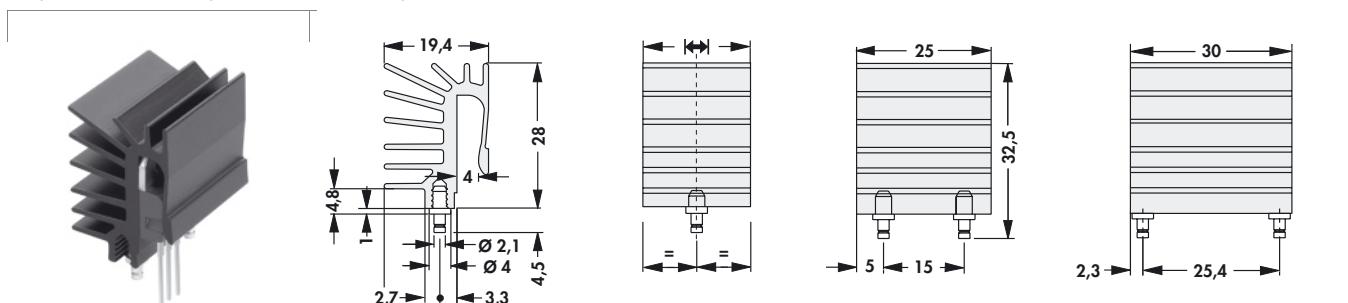
Attachable heatsinks for transistors

	 SK 515 05 10 S	 SK 515 05 23,5 S 2	 SK 515 05 37 S 3
art. no.	↔ [mm]	R _{th} [K/W]	version
SK 515 05 10 S	10.0	30.0	TO 220 for screw fastening M2.5
SK 515 05 23,5 S 2	23.5	27.5	2 x TO 220 for screw fastening M2.5
SK 515 05 37 S 3	37.0	26.1	3 x TO 220 for screw fastening M2.5
SK 515 05 10	10.0	30.0	— without screw fastening
SK 515 05 23,5	23.5	27.5	— without screw fastening
SK 515 05 37	37.0	26.1	— without screw fastening
surface:	black anodised		

Extruded heatsinks for PCB mounting

Attachable heatsinks for transistors

- extruded heatsink with integrated spring locking function
- simple assembly by pushing the heatsink onto the transistor
- optimum heat transfer between component and heatsink
- solderable pin for PCB mounting
- specific versions upon customer's request



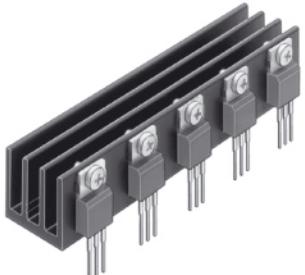
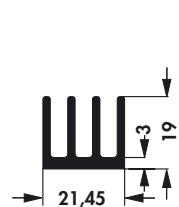
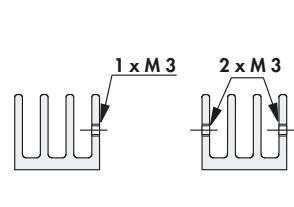
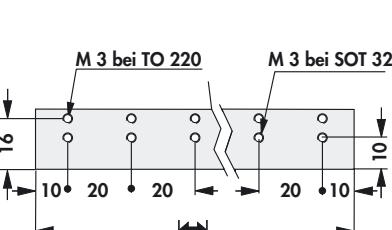
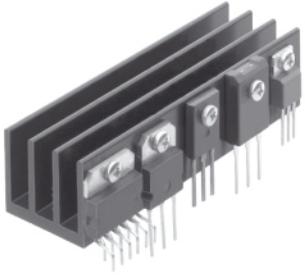
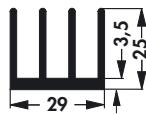
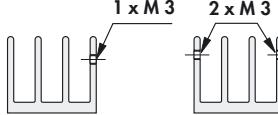
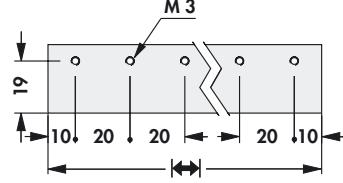
art. no.	for transistor	\leftrightarrow [mm]	R_{th} [K/W]	spring force [N]	version
SK 525 15	TO 220	15	13.3	54	without solder pins
SK 525 30	TO 220	30	7.8	100	without solder pins
SK 525 15 ST	TO 220	15	13.3	54	with 1 solder pin
SK 525 20 ST	TO 220	20	10.7	70	with 1 solder pin
SK 525 25 ST	TO 220	25	9.0	85	with 2 solder pins
SK 525 30 ST	TO 220	30	7.8	100	with 2 solder pins

art. no.	for transistor	\leftrightarrow [mm]	R_{th} [K/W]	spring force [N]	version
SK 526 30 ST	TO 247	30	6.3	100	with 2 solder pins
surface:		black anodised			

Extruded heatsinks for PCB mounting

Extruded heatsinks for transistors

- compact PCB heatsink
- effective heat dissipation for single and double row transistor mounting
- profile **SK 454** → A 24
- profile **SK 452** → A 27
- specific versions upon customer's request

			
art. no.	↔ [mm]	R _{th} [K/W]	
SK 454 20 1 x M3 ...	20	10.8	SOT 32/ TO 220
SK 454 60 3 x M3 ...	60	7.7	SOT 32/ TO 220
SK 454 20 2 x M3 ...	20	10.8	SOT 32/ TO 220
SK 454 40 4 x M3 ...	40	9.4	SOT 32/ TO 220
SK 454 60 6 x M3 ...	60	7.7	SOT 32/ TO 220
SK 454 40 2 x M3 TO 220	40	9.4	TO 220
SK 454 80 4 x M3 TO 220	80	6.5	TO 220
SK 454 100 5 x M3 TO 220	100	5.9	TO 220
SK 454 80 8 x M3 TO 220	80	6.5	TO 220
SK 454 100 10xM3 TO 220	100	5.9	TO 220
please indicate: ... ♦ SOT 32; TO 220			
			
art. no.	↔ [mm]	R _{th} [K/W]	
SK 452 20 1 x M3	20	11.1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 40 2 x M3	40	7.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 60 3 x M3	60	5.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 80 4 x M3	80	4.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 100 5 x M3	100	4.3	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 20 2 x M3	20	11.1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 40 4 x M3	40	7.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 60 6 x M3	60	5.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 80 8 x M3	80	4.9	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 452 100 10 x M3	100	4.3	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
surface:	black anodised		

A 95

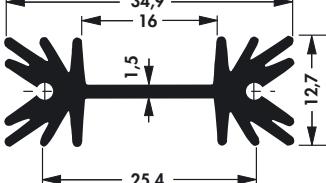
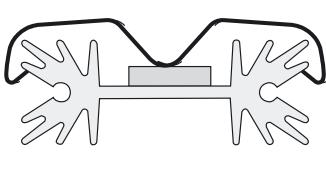
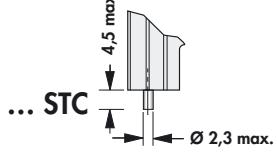
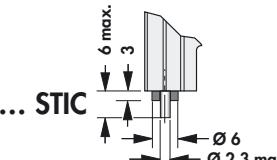
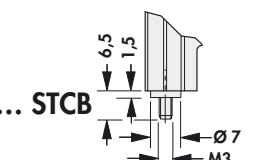
Lock-in transistor fixing spring
 Profiles for PCB components
 Vibration dampers
 Heatsinks with threaded rail

→ **A 117 – 119** Miniature distance sleeves
 → **A 91** Thermal conductive glue
 → **E 39** Thermal conductive paste
 → **A 92** Technical introduction

→ **E 32**
 → **E 21 – 22**
 → **E 19 – 20**
 → **A 2 – 7**

Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- special lengths and transistor drillings upon request
- **P** = raised retaining stud, **E** = mounting method

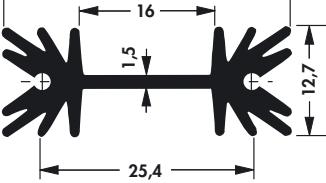
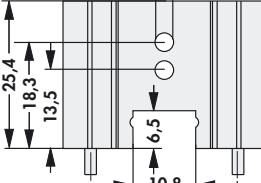
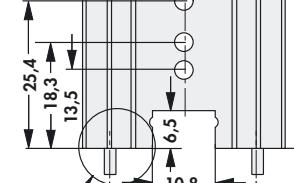
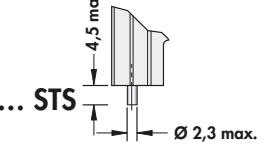
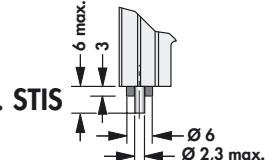
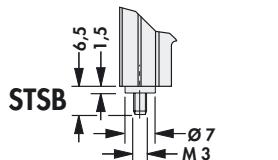







art. no.	↔ [mm]	R _{th} [K/W]	
SK 104 25,4 ...	25.4	14	TO 220
SK 104 38,1 ...	38.1	11	TO 220
SK 104 50,8 ...	50.8	9	TO 220
SK 104 63,5 ...	63.5	8	TO 220

please indicate: ... mounting method
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M3, brass

surface: black anodised

- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method

art. no.	↔ [mm]	R _{th} [K/W]	
SK 104 25,4 ...	25.4	14	SOT 32/ TO 220/ TO 3 P
SK 104 38,1 ...	38.1	11	SOT 32/ TO 220/ TO 3 P
SK 104 50,8 ...	50.8	9	SOT 32/ TO 220/ TO 3 P
SK 104 63,5 ...	63.5	8	SOT 32/ TO 220/ TO 3 P

please indicate: ... mounting method
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M3, brass

surface: black anodised

Extruded heatsinks for PCB mounting

- horizontal for semiconductor screw-mounting
- special lengths and transistor drillings on request

art. no.	\leftrightarrow [mm]	R_{th} [K/W]	
SK 104 25,4 LS	25.4	14	SOT 32/ TO 220/ TO 3 P
SK 104 38,1 LS	38.1	11	SOT 32/ TO 220/ TO 3 P
SK 104 50,8 LS	50.8	9	SOT 32/ TO 220/ TO 3 P
surface:	black anodised		

A

B

C

D

E

F

G

H

I

K

L

M

N

A 97

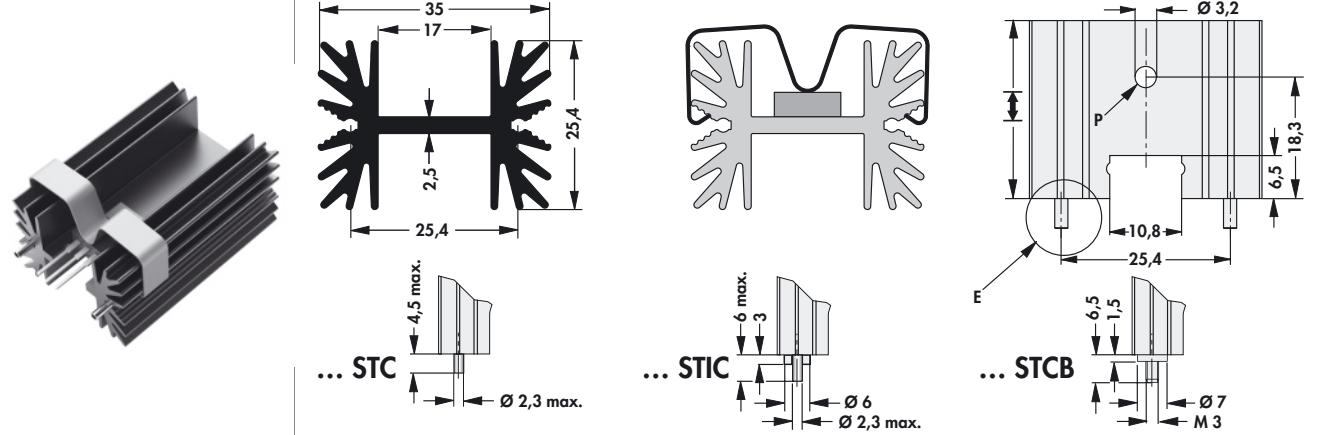
Lock-in transistor fixing spring
Profiles for PCB components
Vibration dampers
Heatsinks with threaded rail

→ A 117 – 119 **Miniature distance sleeves**
 → A 91 **Thermal conductive glue**
 → E 39 **Thermal conductive paste**
 → A 92 **Technical introduction**

→ E 32
 → E 21 – 22
 → E 19 – 20
 → A 2 – 7

Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- special lengths and transistor drillings on request
- **P** = raised retaining stud, **E** = mounting method

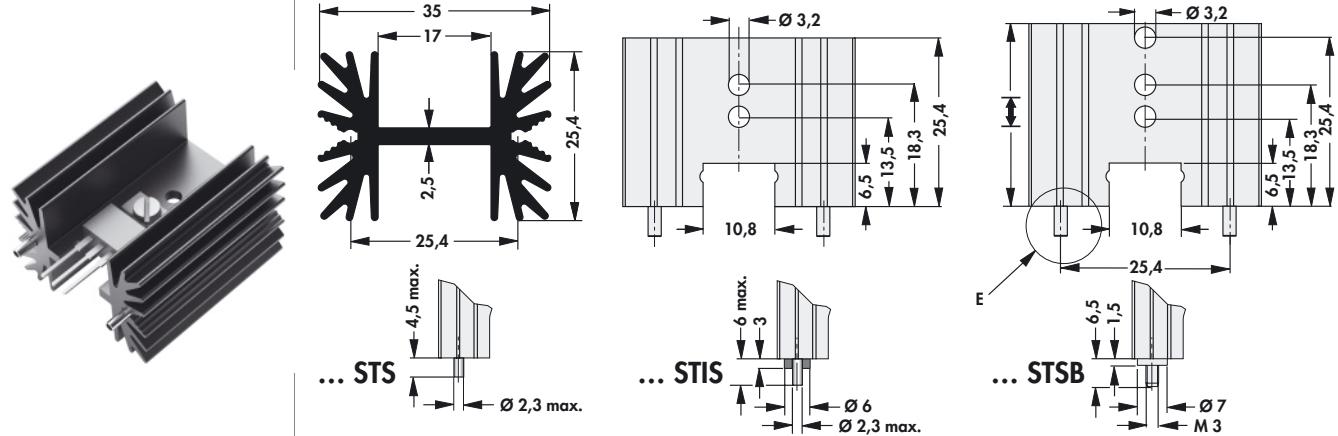


art. no.	↔ [mm]	R _{th} [K/W]	
SK 600 25,4 ...	25.4	11.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 38,1 ...	38.1	9.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 50,8 ...	50.8	7.3	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 63,5 ...	63.5	6.5	TO 218/ TO 220/ TO 247/ TO 3 P

please indicate: ... mounting method
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M3, brass

surface: black anodised

- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method



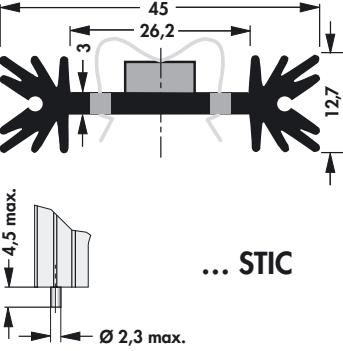
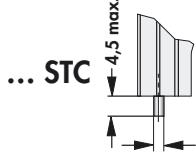
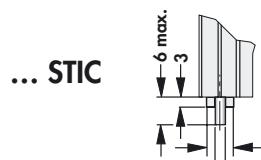
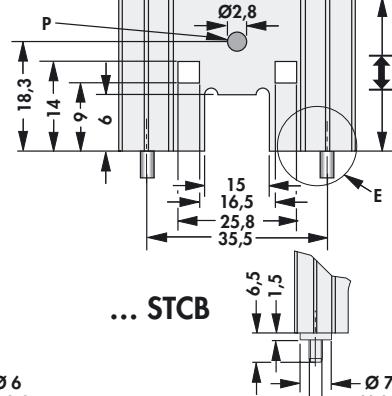
art. no.	↔ [mm]	R _{th} [K/W]	
SK 600 25,4 ...	25.4	11.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 38,1 ...	38.1	9.0	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 50,8 ...	50.8	7.3	TO 218/ TO 220/ TO 247/ TO 3 P
SK 600 63,5 ...	63.5	6.5	TO 218/ TO 220/ TO 247/ TO 3 P

please indicate: ... mounting method
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M3, brass

surface: black anodised

Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- special lengths and transistor drillings on request
- **P** = raised retaining stud, **E** = mounting method

				
art. no.	↔ [mm]	R _{th} [K/W]		
SK 409 25,4 ...	25.4	8.2		TO 220/ TO 3 P
SK 409 38,1 ...	38.1	7.0		TO 220/ TO 3 P
SK 409 50,8 ...	50.8	6.2		TO 220/ TO 3 P
SK 409 63,5 ...	63.5	5.6		TO 220/ TO 3 P

please indicate:

... mouting method

STC = with solder pin

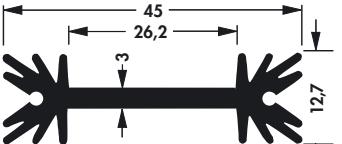
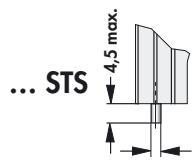
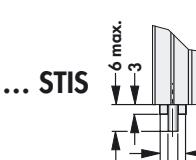
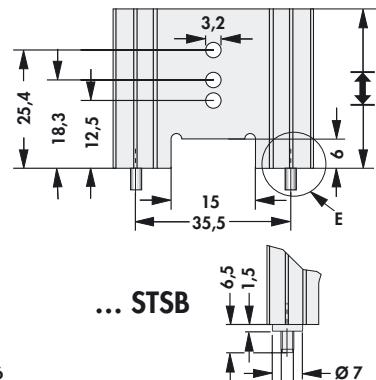
STIC = with solder pin and insulating washer

STCB = with threaded bolt M3, brass

surface:

black anodised

- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method

				
art. no.	↔ [mm]	R _{th} [K/W]		
SK 409 25,4 ...	25.4	8.2		TO 220/ TO 3 P
SK 409 38,1 ...	38.1	7.0		TO 220/ TO 3 P
SK 409 50,8 ...	50.8	6.2		TO 220/ TO 3 P
SK 409 63,5 ...	63.5	5.6		TO 220/ TO 3 P

please indicate:

... mouting method

STS = with solder pin

STIS = with solder pins and insulating washer

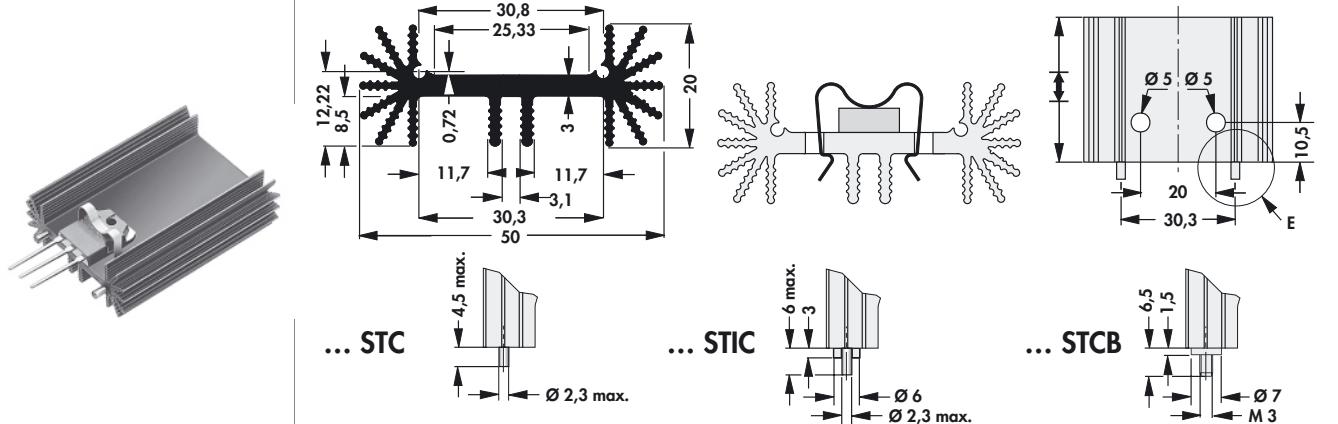
STSB = with threaded bolt M3, brass

surface:

black anodised

Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- special lengths and transistor drillings on request
- **E** = mounting method

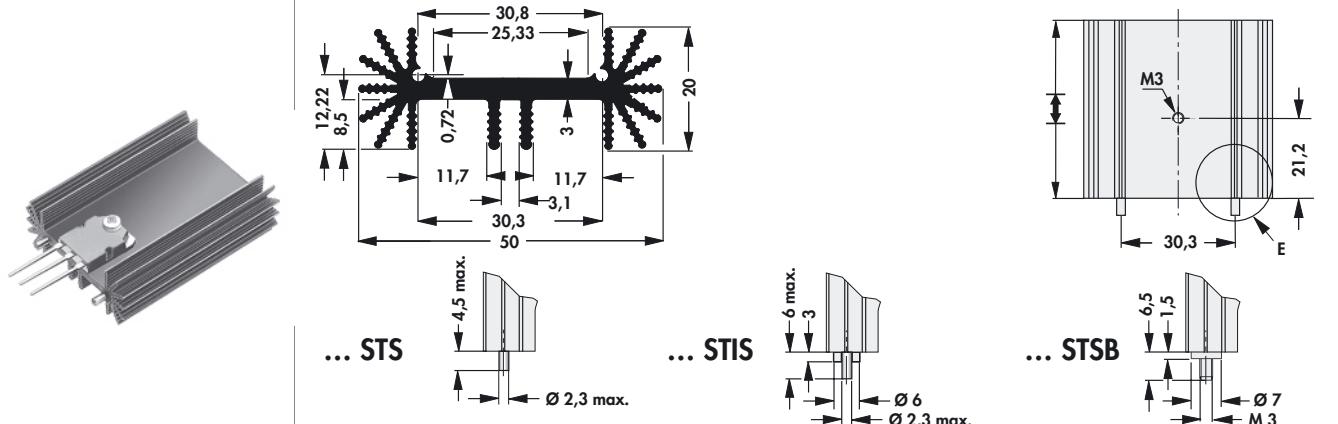


art. no.	↔ [mm]	R _{th} [K/W]	
SK 459 25 ...	25.0	7.9	TO 218/ TO 220/ TO 247/ TO 248
SK 459 37,5 ...	37.5	6.3	TO 218/ TO 220/ TO 247/ TO 248
SK 459 50 ...	50.0	5.6	TO 218/ TO 220/ TO 247/ TO 248

please indicate: ... mounting method
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M3, brass

surface: black anodised

- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method



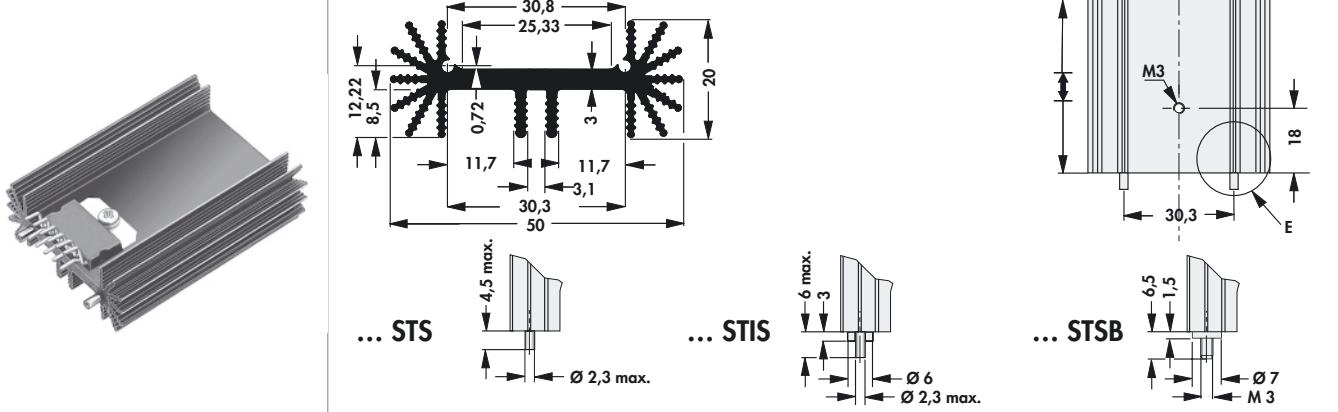
art. no.	↔ [mm]	R _{th} [K/W]	
SK 459 25 ...	25.0	7.9	TO 218/ TO 220/ TO 247/ TO 248
SK 459 37,5 ...	37.5	6.3	TO 218/ TO 220/ TO 247/ TO 248
SK 459 50 ...	50.0	5.6	TO 218/ TO 220/ TO 247/ TO 248

please indicate: ... mounting method
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M3, brass

surface: black anodised

Extruded heatsinks for PCB mounting

- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method

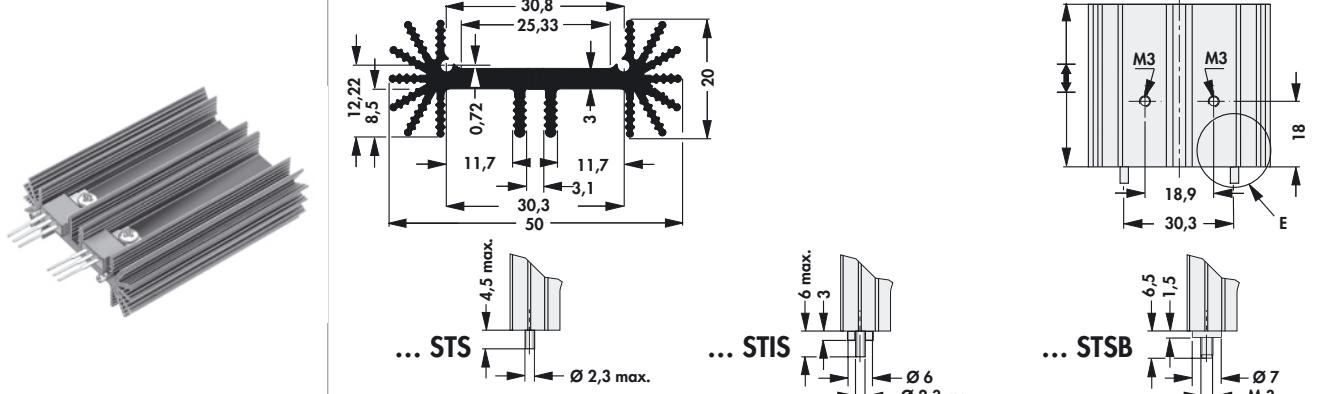


art. no.	↔ [mm]	R _{th} [K/W]	
SK 459 25 M ...	25.0	7.9	SIP Multiwatt
SK 459 37,5 M ...	37.5	6.3	SIP Multiwatt
SK 459 50 M ...	50.0	5.6	SIP Multiwatt

please indicate: ... mouting method
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M3, brass

surface: black anodised

- for semiconductor screw-mounting
- with **combination-hole pattern** for mounting of 2 x TO 220 or 2 x SOT 32
- special lengths and transistor drillings on request
- **E** = mounting method



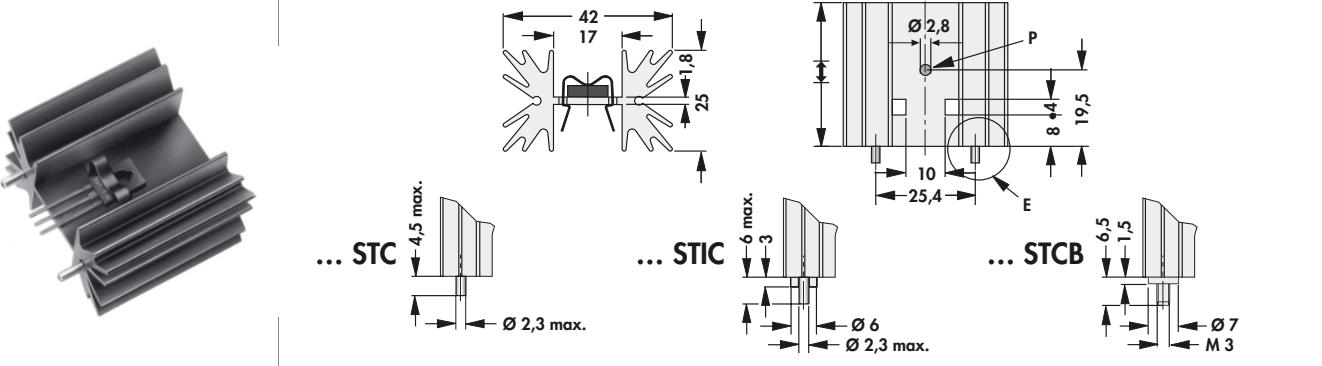
art. no.	↔ [mm]	R _{th} [K/W]	
SK 459 25 2 x TO 220 ...	25.0	7.9	2 x SOT 32/ 2 x TO 220
SK 459 37,5 2 x TO 220...	37.5	6.3	2 x SOT 32/ 2 x TO 220
SK 459 50 2 x TO 220 ...	50.0	5.6	2 x SOT 32/ 2 x TO 220

please indicate: ... mouting method
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M3, brass

surface: black anodised

Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- special lengths and transistor drillings on request
- **P** = raised retaining stud, **E** = mounting method

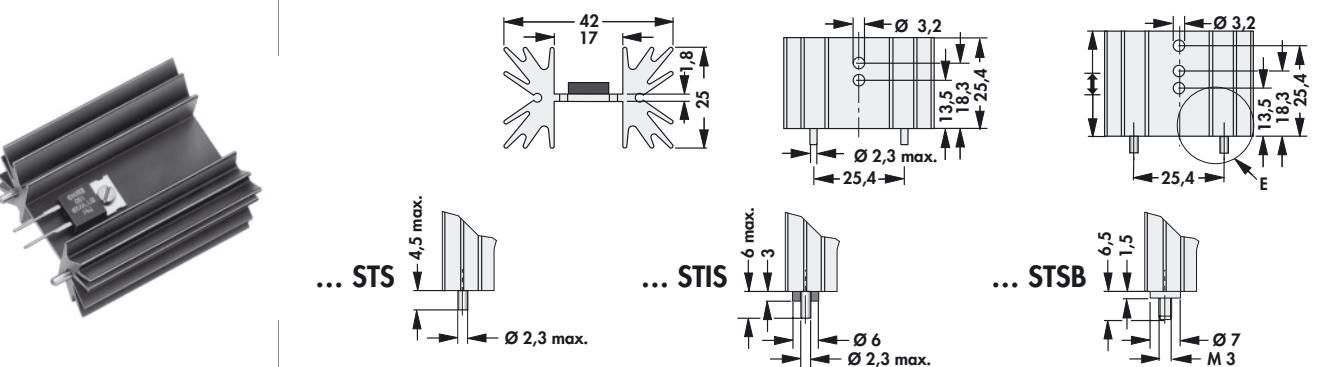


art. no.	↔ [mm]	R _{th} [K/W]	
SK 129 25,4 ...	25.4	7.8	TO 220
SK 129 38,1 ...	38.1	6.5	TO 220
SK 129 50,8 ...	50.8	5.3	TO 220
SK 129 63,5 ...	63.5	4.5	TO 220

please indicate: ... mounting method
STC = with solder pin
STIC = with solder pin and insulating washer
STCB = with threaded bolt M3, brass

surface:	black anodised
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- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method



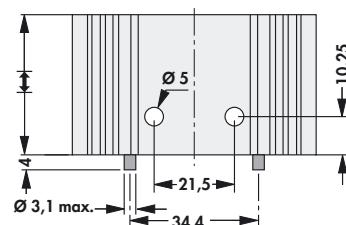
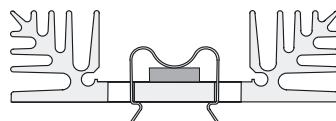
art. no.	↔ [mm]	R _{th} [K/W]	
SK 129 25,4 ...	25.4	7.8	SOT 32/ TO 220/ TO 3 P
SK 129 38,1 ...	38.1	6.5	SOT 32/ TO 220/ TO 3 P
SK 129 50,8 ...	50.8	5.3	SOT 32/ TO 220/ TO 3 P
SK 129 63,5 ...	63.5	4.5	SOT 32/ TO 220/ TO 3 P

please indicate: ... mounting method
STS = with solder pin
STIS = with solder pins and insulating washer
STSB = with threaded bolt M3, brass

surface:	black anodised
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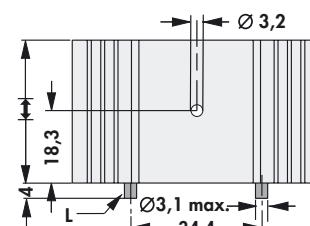
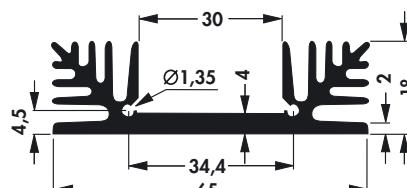
Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- profile **SK 185** ➔ A 73
- special lengths and drillings on request
- **L** = solderable pins



art. no.	↔ [mm]	R _{th} [K/W]	❖	version
SK 185 25 STC TO 220	25.0	7.9	TO 220	with solder pins
SK 185 37,5 STC TO 220	37.5	6.4	TO 220	with solder pins
SK 185 50 STC TO 220	50.0	4.9	TO 220	with solder pins
SK 185 37,5 C TO 220	37.5	6.4	TO 220	without solder pins
SK 185 50 C TO 220	50.0	4.9	TO 220	without solder pins
surface:	black anodised			

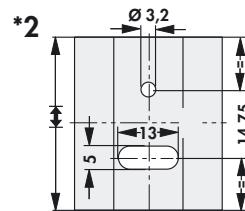
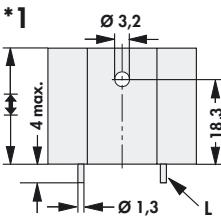
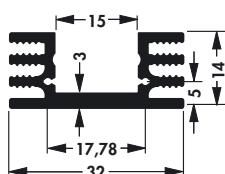
- for semiconductor screw-mounting
- profile **SK 185** ➔ A 73
- special lengths and drillings on request
- **L** = solderable pins



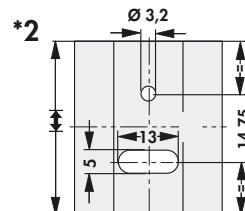
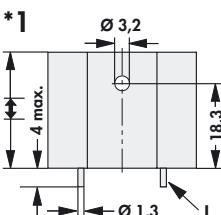
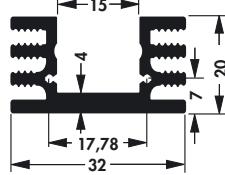
art. no.	↔ [mm]	R _{th} [K/W]	❖	version
SK 185 25 STS TO 220	25.0	7.9	TO 220	with solder pins
SK 185 37,5 STS TO 220	37.5	6.4	TO 220	with solder pins
SK 185 50 STS TO 220	50.0	4.9	TO 220	with solder pins
SK 185 25 TO 220	25.0	7.9	TO 220	without solder pins
SK 185 37,5 TO 220	37.5	6.4	TO 220	without solder pins
SK 185 50 TO 220	50.0	4.9	TO 220	without solder pins
surface:	black anodised			

Extruded heatsinks for PCB mounting

- for semiconductor screw-mounting
- hole pattern is centered to the total length of the heatsink
- special lengths and drillings on request
- *1 = versions with solder pins; *2 = versions without solder pins
- L = solderable pins



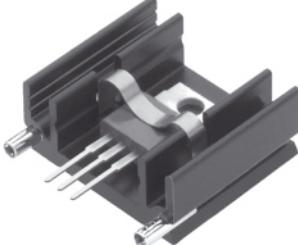
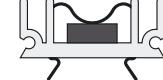
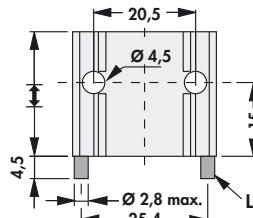
art. no.	\leftrightarrow [mm]	R_{th} [K/W]	\diamond	version
SK 75 25 STS TO 220	25.0	12.5	TO 220 / *1	with solder pins
SK 75 37,5 STS TO 220	37.5	10.0	TO 220 / *1	with solder pins
SK 75 50 STS TO 220	50.0	8.5	TO 220 / *1	with solder pins
SK 75 25	25.0	12.5	—	without solder pins
SK 75 25 TO 220	25.0	12.5	TO 220 / *2	without solder pins
SK 75 37,5	37.5	10.0	—	without solder pins
SK 75 37,5 TO 220	37.5	10.0	TO 220 / *2	without solder pins
SK 75 50	50.0	8.5	—	without solder pins
SK 75 50 TO 220	50.0	8.5	TO 220 / *2	without solder pins
SK 75 75	75.0	7.0	—	without solder pins
SK 75 1000	1000.0	—	—	without solder pins



art. no.	\leftrightarrow [mm]	R_{th} [K/W]	\diamond	version
SK 76 25 STS TO 220	25.0	10.0	TO 220 / *1	with solder pins
SK 76 37,5 STS TO 220	37.5	8.0	TO 220 / *1	with solder pins
SK 76 50 STS TO 220	50.0	7.0	TO 220 / *1	with solder pins
SK 76 25	25.0	10.0	—	without solder pins
SK 76 25 TO 220	25.0	10.0	TO 220 / *2	without solder pins
SK 76 37,5	37.5	8.0	—	without solder pins
SK 76 37,5 TO 220	37.5	8.0	TO 220 / *2	without solder pins
SK 76 50	50.0	7.0	—	without solder pins
SK 76 50 TO 220	50.0	7.0	TO 220 / *2	without solder pins
SK 76 75	75.0	5.9	—	without solder pins
SK 76 1000	1000.0	—	—	without solder pins
surface:	black anodised			

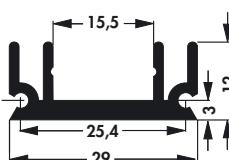
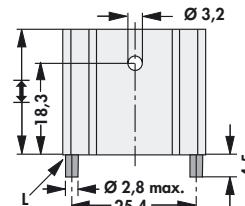
Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- profile **SK 145** → A 73
- special lengths and drillings on request
- **L** = solderable pins

art. no.	↔ [mm]	R _{th} [K/W]	◆	version
SK 145 25 STC	25	13.5	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 30 STC	30	12.4	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 50 STC	50	10.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
surface:				black anodised

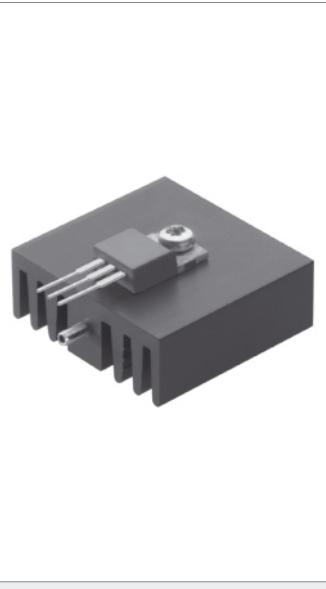
- for semiconductor screw-mounting
- profile **SK 145** → A 73
- special lengths and drillings on request
- **L** = solderable pins

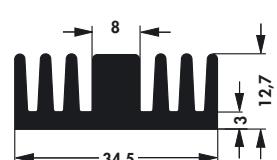
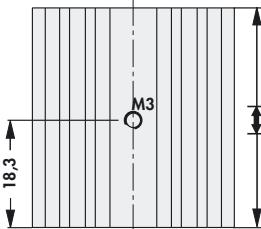
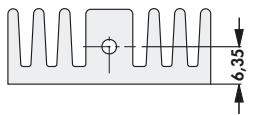
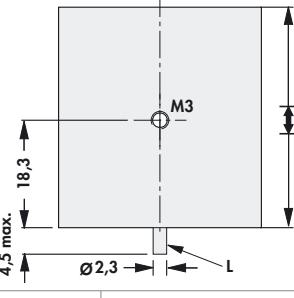
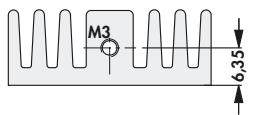
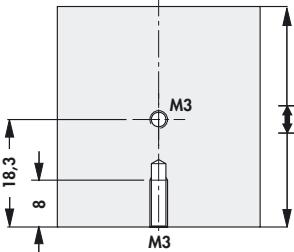




art. no.	↔ [mm]	R _{th} [K/W]	◆	version
SK 145 25 STS TO 220	25.0	13.5	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 37,5 STS TO 220	37.5	12.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
SK 145 50 STS TO 220	50.0	10.0	TO 218/ TO 220/ TO 247/ TO 248	with solder pins
surface:				black anodised

Extruded heatsinks for PCB mounting

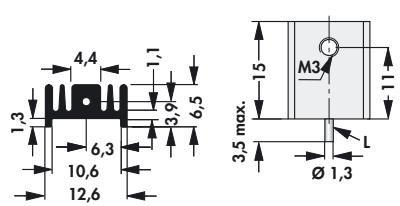
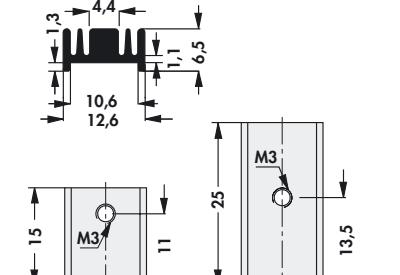
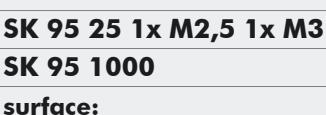
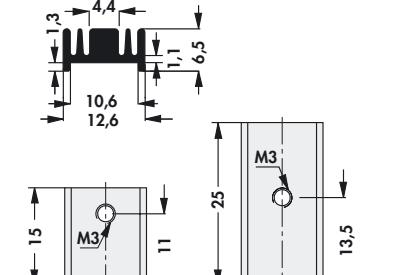
- special lengths and drillings on request
- **L** = solderable pins



	SK 126 25 TO 220 SK 126 37,5 TO 220	SK 126 25 STS TO 220 SK 126 37,5 STS TO 220	SK 126 25 2 x M 3 SK 126 37,5 2 x M 3
	 	 	 
art. no.	↔ [mm]	R_{th} [K/W]	version
SK 126 25 STS TO 220	25.0	8.0	TO 218/ TO 220/ TO 247/ TO 248 with solder pin and thread M3
SK 126 37,5 STS TO 220	37.5	6.5	TO 218/ TO 220/ TO 247/ TO 248 with solder pin and thread M3
SK 126 25 TO 220	25.0	8.0	TO 218/ TO 220/ TO 247/ TO 248 without solder pin with thread M3
SK 126 25 2 x M3	25.0	8.0	TO 218/ TO 220/ TO 247/ TO 248 without solder pin with thread M3
SK 126 37,5 TO 220	37.5	6.5	TO 218/ TO 220/ TO 247/ TO 248 without solder pin with thread M3
SK 126 37,5 2 x M3	37.5	6.5	TO 218/ TO 220/ TO 247/ TO 248 without solder pin with thread M3
SK 126 25	25.0	8.0	—
SK 126 37,5	37.5	6.5	—
SK 126 1000	1000.0	—	—
surface:	black anodised		

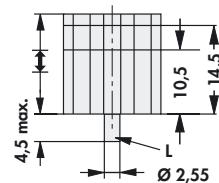
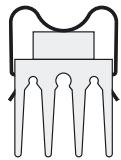
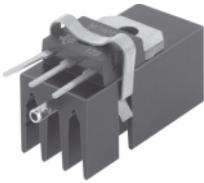
Extruded heatsinks for PCB mounting

- special lengths and drillings on request
- L = solderable pins

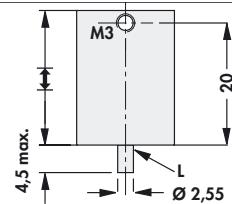
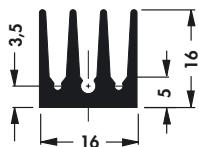
		SK 95 15 STS SOT 32 S	SK 95 25 STS TO 220	SK 95 25 STS SOT 32	
		15	38.5	SOT 32	
		25	36.0	SOT 32	
		SK 95 15 SOT 32 S	SK 95 25 SOT 32	SK 95 25 1 x M2,5 1 x M3	
		15	38.5	SOT 32	
		25	36.0	TO 220	
		SK 95 25 TO 220	SK 95 25 2 x M3	SK 95 25 2 x M3	
		15	38.5	—	
		25	36.0	TO 220	
		25	36.0	SOT 32	
		25	36.0	—	
		25	36.0	2 x M3 (TO 220)	
		25	36.0	1 x M2,5/ 1 x M3 (TO 220)	
		1000	—	—	
surface:		black anodised			
type of thread:		not anodised			

Extruded heatsinks for PCB mounting

- single solder pin
- profile **SK 437** → A 24
- special lengths and drillings on request
- **L** = solderable pin



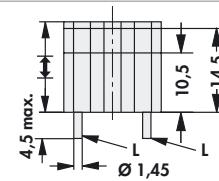
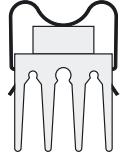
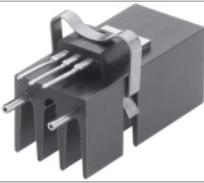
art. no.	↔ [mm]	R _{th} [K/W]	
SK 437 25 STC	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STC	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STC	35	18	TO 218/ TO 220/ TO 247/ TO 248
SK 437 50 STC	50	14	TO 218/ TO 220/ TO 247/ TO 248



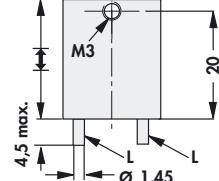
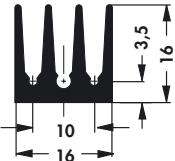
art. no.	↔ [mm]	R _{th} [K/W]	
SK 437 25 STS	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STS	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STS	35	18	TO 218/ TO 220/ TO 247/ TO 248
SK 437 50 STS	50	14	TO 218/ TO 220/ TO 247/ TO 248

surface: black anodised

- double solder pin
- profile **SK 437** → A 24
- special lengths and drillings on request
- **L** = solderable pin



art. no.	↔ [mm]	R _{th} [K/W]	
SK 437 25 STC 2	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STC 2	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STC 2	35	18	TO 218/ TO 220/ TO 247/ TO 248



art. no.	↔ [mm]	R _{th} [K/W]	
SK 437 25 STS 2	25	24	TO 218/ TO 220/ TO 247/ TO 248
SK 437 30 STS 2	30	22	TO 218/ TO 220/ TO 247/ TO 248
SK 437 35 STS 2	35	18	TO 218/ TO 220/ TO 247/ TO 248

surface: black anodised

Lock-in transistor fixing spring

Profiles for PCB components

Vibration dampers

Heatsinks with threaded rail

→ **A 117 – 119** Miniature distance sleeves

→ **A 91** Thermal conductive glue

→ **E 39** Thermal conductive paste

→ **A 92** Technical introduction

→ **E 32**

→ **E 21 – 22**

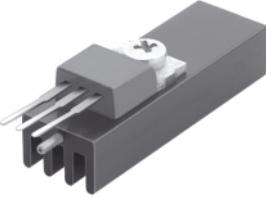
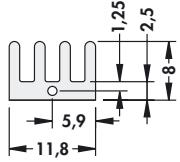
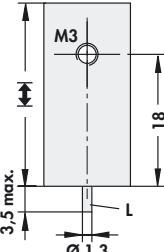
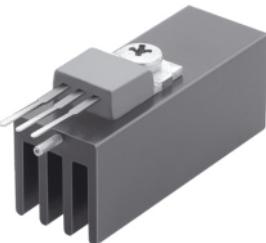
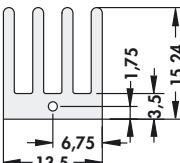
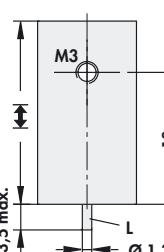
→ **E 19 – 20**

→ **A 2 – 7**

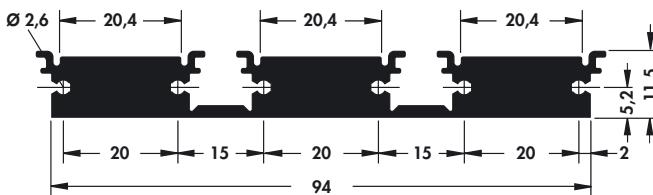
Extruded heatsinks for PCB mounting

– special versions on customer's request

– L = solderable pin

		
art. no.	↔ [mm]	R _{th} [K/W]
SK 470 25 STS	25	29.0
SK 470 30 STS	30	27.2
SK 470 35 STS	35	25.6
SK 470 50 STS	50	23.2
		
art. no.	↔ [mm]	R _{th} [K/W]
SK 469 25 STS	25	15.3
SK 469 30 STS	30	14.3
SK 469 35 STS	35	13.0
SK 469 50 STS	50	10.6
surface:	black anodised	

- as mounting- and connecting piece
- for clamp mounting of the transistors
- triple unit can be separated
- solder pin mounting possible
- special versions on customer's request

		
art. no.	↔ [mm]	R _{th} [K/W]
SK 484 25	25.0	6.0
SK 484 37,5	37.5	4.5
SK 484 50	50.0	3.7
SK 484 75	75.0	2.8

A 109

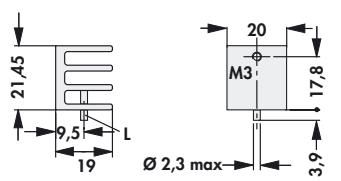
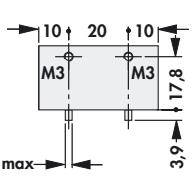
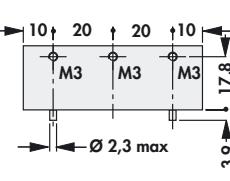
Lock-in transistor fixing spring
 Profiles for PCB components
 Vibration dampers
 Heatsinks with threaded rail

→ A 117 – 119 Miniature distance sleeves
 → A 91 Thermal conductive glue
 → E 39 Thermal conductive paste
 → A 92 Technical introduction

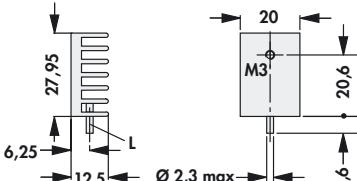
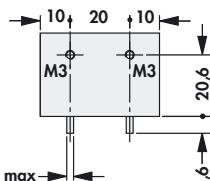
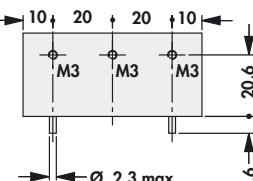
→ E 32
 → E 21 – 22
 → E 19 – 20
 → A 2 – 7

Extruded heatsinks for PCB mounting

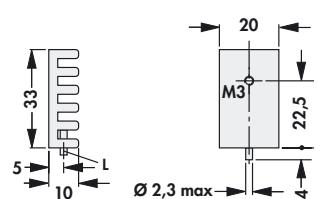
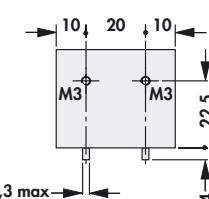
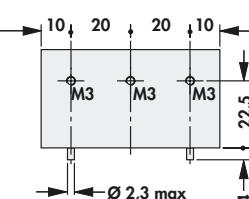
- compact PCB heatsinks
- especially suitable for vertical PCB mounting in housings, racks etc.
- easy solder fixing
- special versions on customer's request
- L = solderable pin


SK 454 20 1 x M3 L

SK 454 40 2 x M3 L

SK 454 60 3 x M3 L


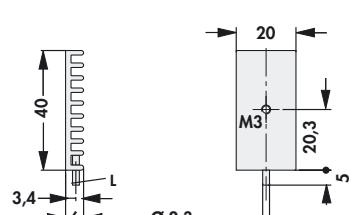
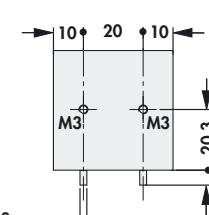
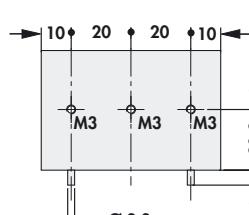
art. no.	$\text{L} \text{ [mm]}$	$R_{\text{th}} \text{ [K/W]}$	
SK 454 20 1 x M3 L	20	10.1	SOT 32/ TO 220
SK 454 40 2 x M3 L	40	8.8	SOT 32/ TO 220
SK 454 60 3 x M3 L	60	7.5	SOT 32/ TO 220


SK 448 20 1 x M3 L

SK 448 40 2 x M3 L

SK 448 60 3 x M3 L


art. no.	$\text{L} \text{ [mm]}$	$R_{\text{th}} \text{ [K/W]}$	
SK 448 20 1 x M3 L	20	11.8	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 448 40 2 x M3 L	40	9.8	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 448 60 3 x M3 L	60	7.1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P


SK 400 20 1 x M3 L

SK 400 40 2 x M3 L

SK 400 60 3 x M3 L


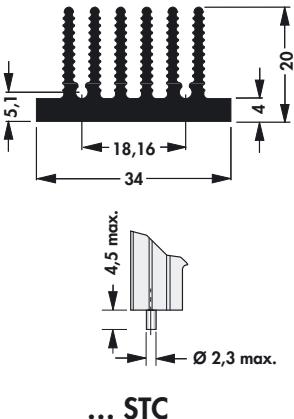
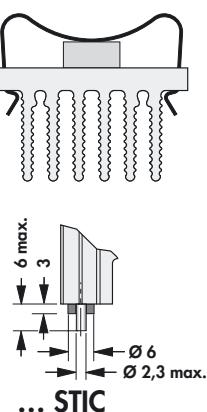
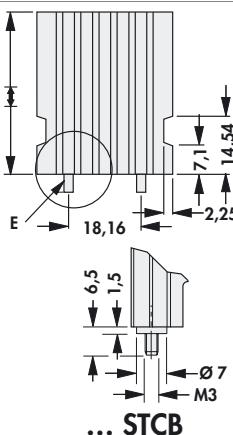
art. no.	$\text{L} \text{ [mm]}$	$R_{\text{th}} \text{ [K/W]}$	
SK 400 20 1 x M3 L	20	11.6	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 400 40 2 x M3 L	40	8.2	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 400 60 3 x M3 L	60	7.2	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P


SK 456 20 1 x M3 L

SK 456 40 2 x M3 L

SK 456 60 3 x M3 L


art. no.	$\text{L} \text{ [mm]}$	$R_{\text{th}} \text{ [K/W]}$	
SK 456 20 1 x M3 L	20	13.0	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 456 40 2 x M3 L	40	10.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P
SK 456 60 3 x M3 L	60	8.5	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P

Extruded heatsinks for PCB mounting

- for semiconductor clip-mounting
- special lengths and transistor drillings on request
- **E** = mounting method

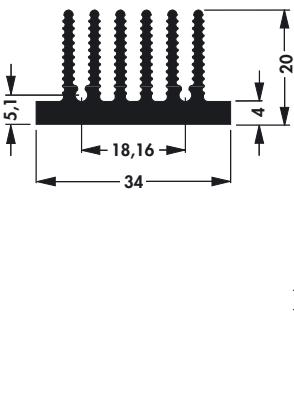
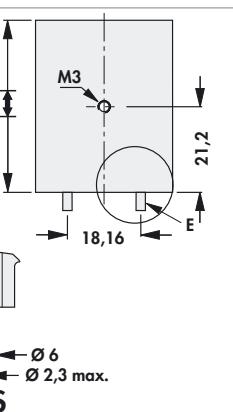
			
art. no.	↔ [mm]	R _{th} [K/W]	
SK 460 25 ...	25.0	9.0	SIP Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248

please indicate: ... mounting method

STC = with solder pin
 STIC = with solder pin and insulating washer
 STCB = with threaded bolt M3, brass

surface:	black anodised
----------	----------------

- for semiconductor screw-mounting
- special lengths and transistor drillings on request
- **E** = mounting method

			
art. no.	↔ [mm]	R _{th} [K/W]	
SK 460 25 STS	25.0	9.0	SIP Multiwatt/ TO 218/ TO 220/ TO 247/ TO 248

please indicate: ... mounting method

STS = with threaded bolt M3
 STIS = with insulating washer

surface:	black anodised
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A 111

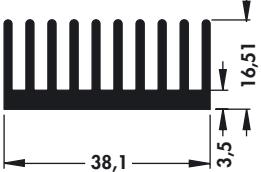
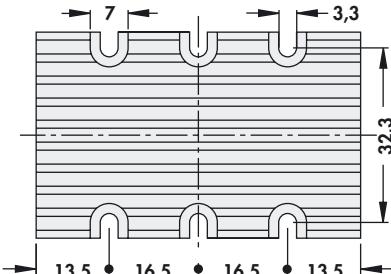
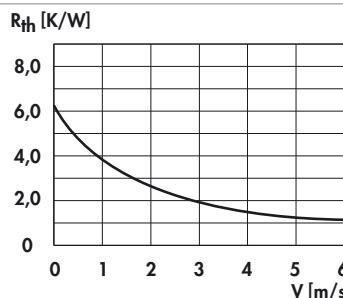
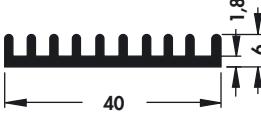
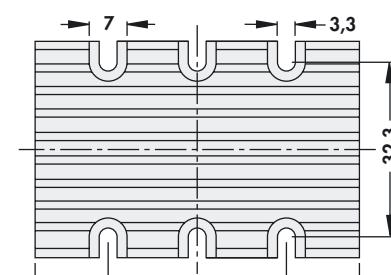
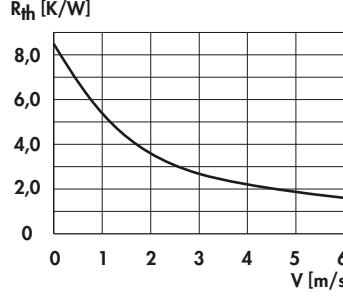
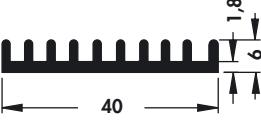
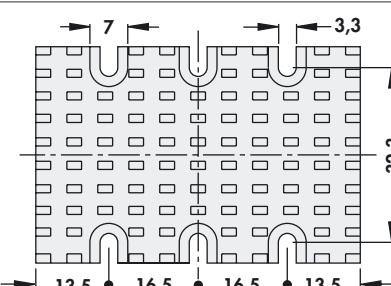
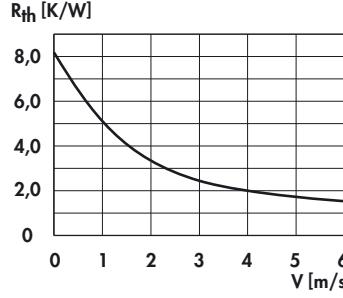
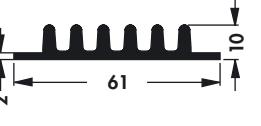
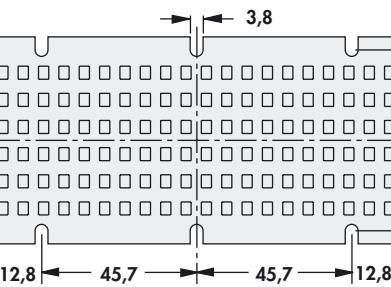
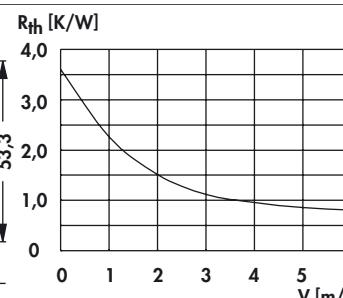
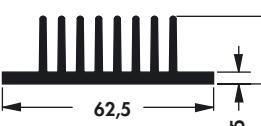
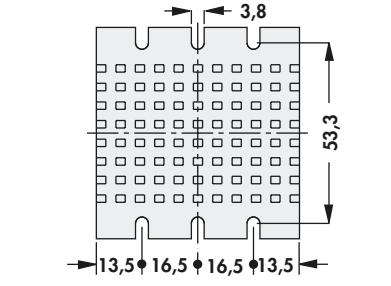
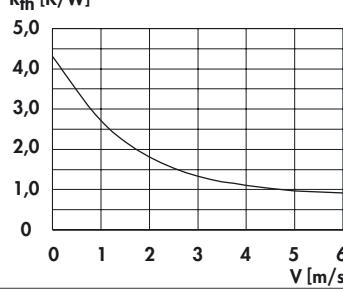
Lock-in transistor fixing spring
 Profiles for PCB components
 Vibration dampers
 Heatsinks with threaded rail

→ A 117 – 119 Miniature distance sleeves
 → A 91 Thermal conductive glue
 → E 39 Thermal conductive paste
 → A 92 Technical introduction

→ E 32
 → E 21 – 22
 → E 19 – 20
 → A 2 – 7

Extruded heatsinks for DC/DC converter

– special versions on customer's request

art. no.			
SK DC 10 60 SA			
art. no.			
SK DC 8 60 SA			
art. no.			
SK DC 8 1 60 SA			
art. no.			
SK DC 4 1 117 SA			
art. no.			
SK DC 6 1 60 SA			
surface:	black anodised		

Heatsink profile-overview

Drilling pattern for Solid State Relais → A 12
 Heatsinks for Solid State Relais → A 11 – 12
 Special profiles → A 138

→ A 13 – 17

Standard aluminium profiles
 Extruded heatsinks
 Profiles for PCB mounting
 Technical introduction

→ A 133 – 134
 → A 22 – 83
 → A 89 – 111
 → A 2 – 7

A 112

A

B

C

D

E

F

G

H

K

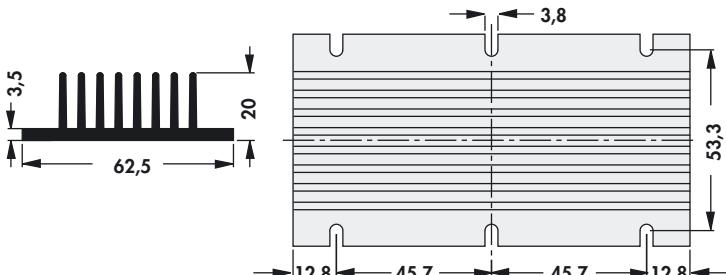
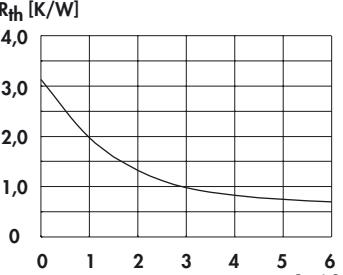
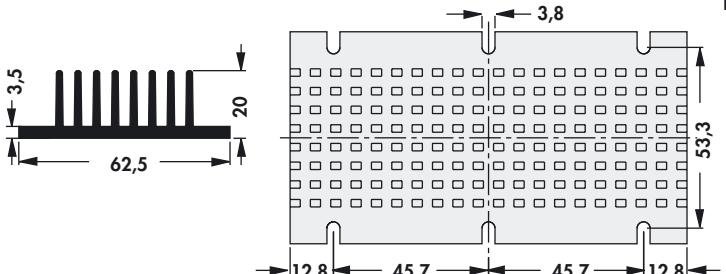
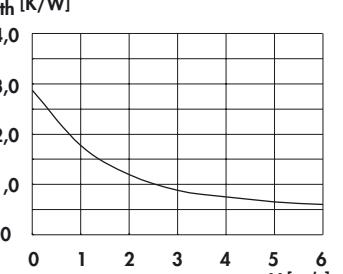
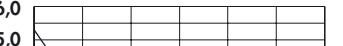
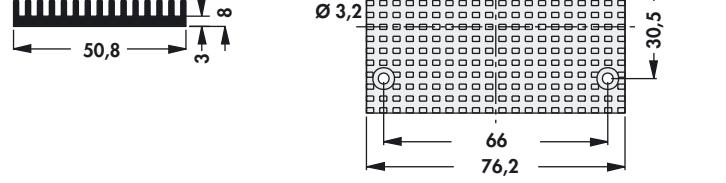
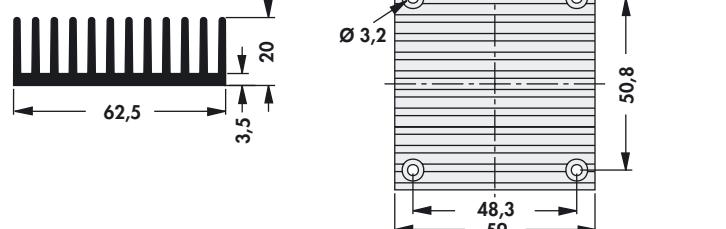
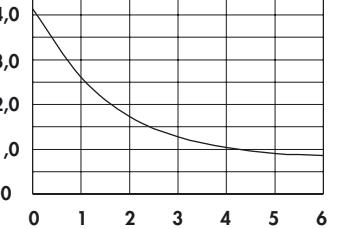
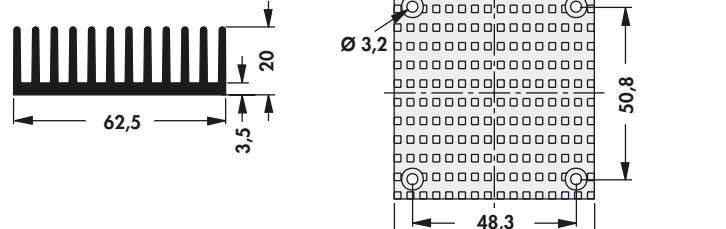
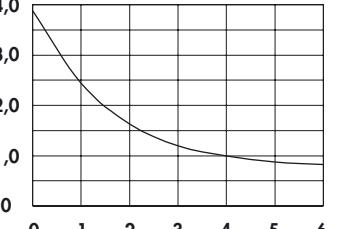
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M

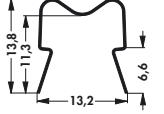
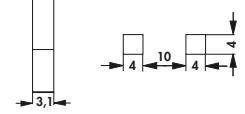
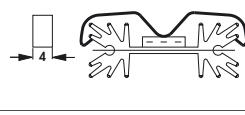
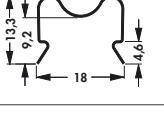
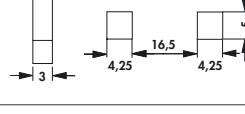
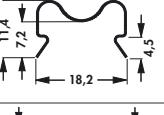
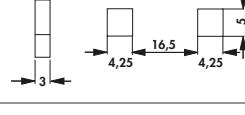
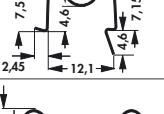
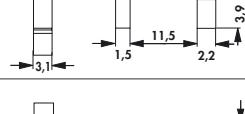
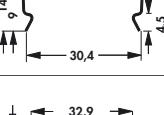
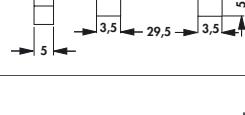
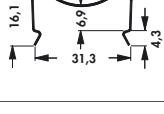
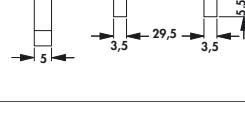
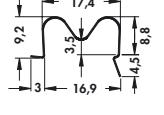
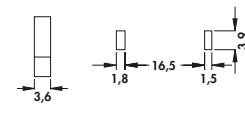
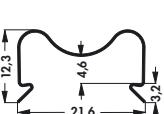
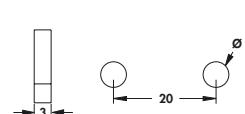
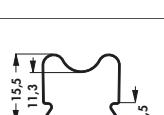
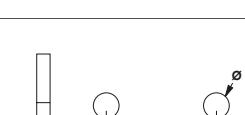
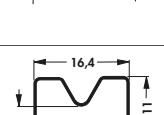
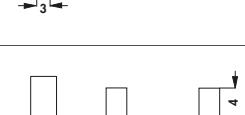
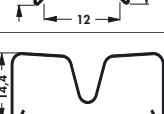
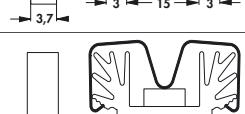
N

Extruded heatsinks for DC/DC converter

– special versions on customer's request

art. no.		
SK DC 7 117 SA		
SK DC 7 1 117 SA		
SK DC 2 1 76 SA		
SK DC 5 59 SA		
SK DC 5 1 59 SA		
surface:	black anodised	

Retaining springs for transistors

art. no.	for transistor-housing	suitable for heatsinks	plate thickness [mm]	material	
THF 129 TO 220	TO 220	FK 219/ FK 222/ SK 129	1-2	spring steel, corrosion protected	 
THF 104	TO 220/ TO 247/ TO 248/ TO 3 P	SK 104	1-2	stainless steel	 
THF 409 TO 220	TO 220/ TO 247/ TO 248/ TO 3 P	SK 409	1.5-3.0	stainless steel	 
THF 409 SOT 32	TO 126/ SOT 32/ SOT 82	SK 409	2-3	stainless steel	 
THF 220	TO 220	FK 219/ FK 222	1-2	spring steel, corrosion protected	 
THF 247	TO 220/ TO 247/ TO 248/ TO 3 P	SK 484	2	stainless steel	 
THF 247 4	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	SK 460	4	stainless steel	 
THF 220 17	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	UK 35	1.0-1.5	stainless steel	 
THF 409 220 1	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	SK 409/ SK 459	2-3	stainless steel	 
THF 409 220 2	TO 218/ TO 220/ TO 247/ TO 248/ TO 3 P	SK 145/ SK 185/ SK 437	4	stainless steel	 
THF 249	TO 220	FK 249	1.0-1.5	spring steel, corrosion protected	 
THF 600	TO 218/ TO 220/ TO 247/ TO 3 P	SK 600	2.5	spring steel, corrosion protected	 

Mica wafers

Kapton insulator washers

Mounting parts for heatsinks

Mounting material for semiconduct.

→ E 17

→ E 14

→ E 47 - 48

→ E 42 - 46

Thermal conductive material

Insulating caps

Thermal conductive paste

Technical introduction

→ E 2 - 5

→ E 49

→ E 19

→ A 2 - 7

Retaining springs for transistors

- universal **retaining spring** for transistor housings types TO 218, TO 220, TO 247, TO 264, SOT 32 and various SIP Multiwatt etc.
- utility patent 200 14 739.0
- fast and easy mounting of the transistors
- number of retaining spring elements can be chosen (**n = max. 10**)
- **THFMG** with thread M 4
- specific versions and modifications on customer's request

art. no.	for transistor-housing	spring force [N]	material	
THFM ...	TO 218/ TO 220/ TO 247/ TO 264/ SOT 32/ SIP Multiwatt	60 ±5	stainless steel	
THF MG ...	TO 218/ TO 220/ TO 247/ TO 264/ SOT 32/ SIP Multiwatt	60 ±5	stainless steel	

please indicate: ... number of retaining-spring elements
1 - 10

art. no.	for transistor-housing	spring force [N]	material	
THFK 220	TO 220	79	stainless steel	
THFK 247	TO 218/ TO 247	119	stainless steel	

Mica wafers

→ E 17

Kapton insulator washers

→ E 14

Thermal conductive material

→ E 2 - 5

Mounting parts for heatsinks

→ E 47 - 48

Insulating caps

→ E 49

Mounting material for semiconduct.

→ E 42 - 46

Thermal conductive paste

→ E 19

Technical introduction

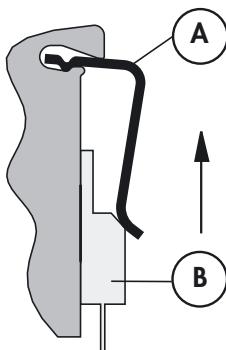
→ A 2 - 7

Lock-in retaining spring for transistors

- universal lock-in retaining spring for types TO 218, TO 220, TO 247, TO 264 and various SIP-Multiwatt etc. transistor housings
- clip fastening also for power transistors without holes, MAX types etc.
- easy assembly and secure hold when using a special groove geometry in heatsinks, housing parts etc.
- optimal heat transfer between component and cooling element
- various spring clip shapes available for fastening the components (see sketch)
- the range of suitable heat sinks is continuously extended
- versions specifically designed to meet customers requirements on request

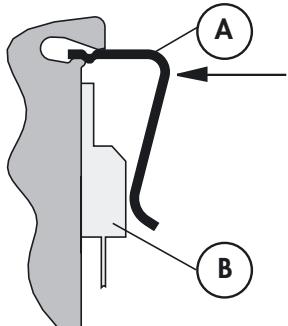
Installation

THFU 1

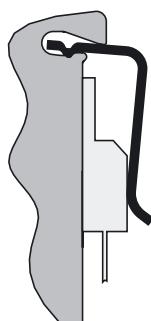


- insert the lock-in retaining spring for transistors THFU 1 (A) into the groove of the profile
- push transistor (B) below the spring

THFU 2, THFU 3, THFU 4, THFU 5, THFU 6



- place transistor (B) onto the mounting area
- press the lock-in retaining spring for transistors THFU 2 - 6 (A) into the groove of the profile (a suitable installation aid will facilitate pressing in)



- Once in place, the spring will keep its position and fix the transistor with a high contact pressure on the installation surface (the spring remains in its position and it can neither be moved in a lengthwise direction nor fall it can out of the groove in a cross direction).

material:	stainless steel
material thickness:	0.8 mm

Mica wafers

→ E 17

Thermal conductive material

→ E 2 – 5

Kapton insulator washers

→ E 14

Insulating caps

→ E 49

Mounting parts for heatsinks

→ E 47 – 48

Thermal conductive paste

→ E 19

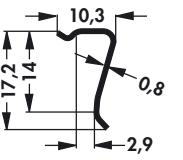
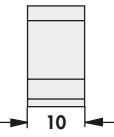
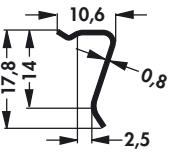
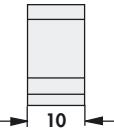
Mounting material for semiconduct.

→ E 42 – 46

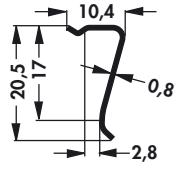
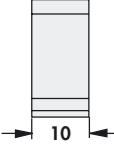
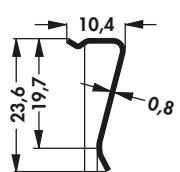
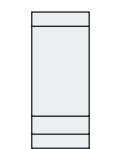
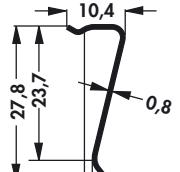
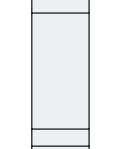
Technical introduction

→ A 2 – 7

Lock-in retaining spring for transistors

art. no.	for transistor-housing	suitable for heatsinks	spring force [N]	materi-al	
THFU 1	TO 218/ TO 220/ TO 247/ TO 262/ SOT 199/ SOT 429/ TO 3 P	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 512/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ LAM 3 K/ LAM 4 K/ LAM 5 K	60 \pm 5	stain-less steel	  
THFU 2	TO 218/ TO 220/ TO 247/ TO 262/ SOT 199/ SOT 429/ TO 3 P	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 512/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ LAM 3 K/ LAM 4 K/ LAM 5 K	60 \pm 5	stain-less steel	  

Lock-in retaining spring for transistors

art. no.	for transistor-housing	suitable for heatsinks	spring force [N]	material		
THFU 3	TO 218/ TO 220/ TO 247/ TO 262/ SOT 199/ SOT 429/ TO 3 P	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ LAM 3 K/ LAM 4 K/ LAM 5 K	50 ± 5	stain-less steel		 
THFU 4	TO 218/ TO 202/ TO 220/ TO 248/ TO 262/ TO 264/ SOT 199/ TO 3 P	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 495/ SK 499/ SK 514/ SK 575/ SK 589/ SK 593/ LAM 5 K	32 ± 5	stain-less steel		 
THFU 5	TO 218/ TO 202/ TO 220/ TO 247/ TO 248/ TO 262/ TO 264/ SOT 199/ SOT 429/ TO 3 P	SK 490/ SK 589/ LAM 5 K	25 ± 5	stain-less steel		 

Mica wafers

Kapton insulator washers

Mounting parts for heatsinks

Mounting material for semiconduct.

→ E 17

→ E 14

→ E 47 – 48

→ E 42 – 46

Thermal conductive material

Insulating caps

Thermal conductive paste

Technical introduction

→ E 2 – 5

→ E 49

→ E 19

→ A 2 – 7

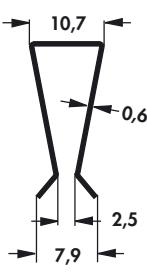
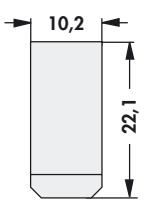
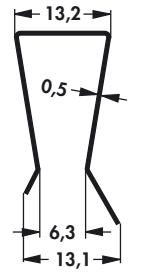
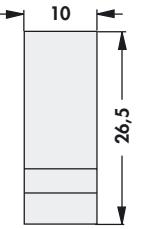
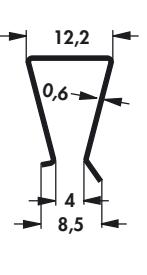
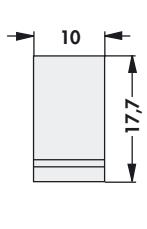
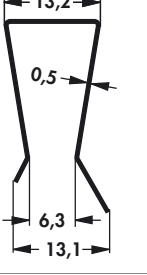
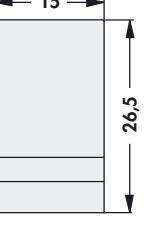
Lock-in retaining spring for transistors

– THFU 6 for transistors with low component height

art. no.	for transistor-housing	suitable for heatsinks	spring force [N]	material	
THFU 6	TO 126/ TO 218/ TO 220/ TO 225/ TO 247/ TO 248/ TO 251/ SOT 32/ TO 3 P	SK 480/ SK 481/ SK 482/ SK 483/ SK 487/ SK 489/ SK 490/ SK 492/ SK 495/ SK 499/ SK 512/ SK 514/ SK 573/ SK 574/ SK 575/ SK 576/ SK 589/ SK 593/ LAM 3 K/ LAM 4 K/ LAM 5 K	65 ±5	stain-less steel	

Transistor clamps

- able to slide on the transistor and mounting plate
- easy mounting
- high pressure force and firm grip
- specific versions upon customer's request

art. no.	for transistor-housing	plate thickness [mm]	holding force [N]	material		
THFA 1	TO 220	2	20	stainless steel		 
THFA 2	TO 220	6.5	20	spring steel, corrosion protected		 
THFA 3	TO 220	5.5	33	spring steel, corrosion protected		 
THFA 4	TO 218/ TO 247	6.5	59	spring steel, corrosion protected		 

Mica wafers

Kapton insulator washers

Mounting parts for heatsinks

Mounting material for semiconduct.

→ E 17

→ E 14

→ E 47 - 48

→ E 42 - 46

Thermal conductive material

Insulating caps

Thermal conductive paste

Technical introduction

→ E 2 - 5

→ E 49

→ E 19

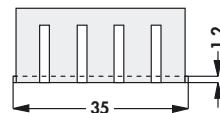
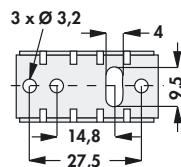
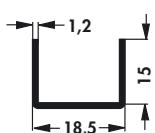
→ A 2 - 7

U-Extruded heatsinks

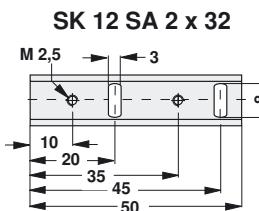
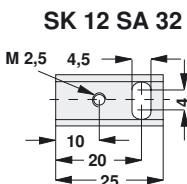
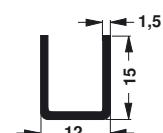
art. no.		R_{th} [K/W]
SK 12 ...		
please indicate:	... 1000 mm	
art. no.		R_{th} [K/W]
SK 13 ...		
please indicate:	... 25 35 mm	
art. no.		R_{th} [K/W]
SK 115 ...		
please indicate:	... 37.5 50 1000 mm	

	UK 14 SA 220 M 2,5 Ø 1,8 4 5 12,5 20 25	UK 14 SA 220 3,2 Ø 3,2 Ø 1,8 4 5 12,5 20 25	UK 14 SA M3 M3 Ø 1,8 4 5 12,5 20 25
art. no.	R_{th} [K/W]		
UK 14 SA 220	20		
UK 14 SA 220 3,2	20		
UK 14 SA M3	20		
surface:	black anodised		

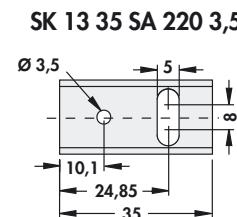
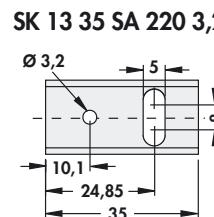
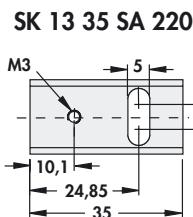
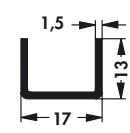
U-Extruded heatsinks



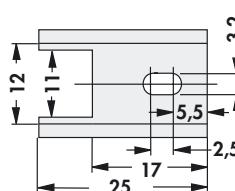
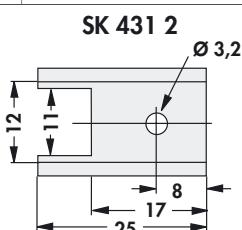
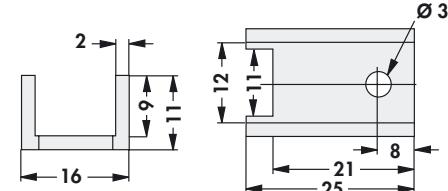
art. no.	R _{th} [K/W]	
ICK 35 SA	15	TO 220



art. no.	R _{th} [K/W]	
SK 12 SA 32	30	1 x SOT 32
SK 12 SA 2 x 32	15	2 x SOT 32



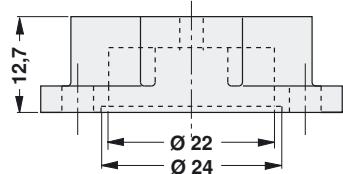
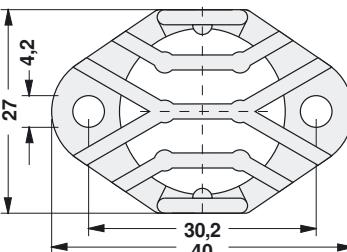
art. no.	R _{th} [K/W]	
SK 13 35 SA 220	17	TO 220
SK 13 35 SA 220 3,2	17	TO 220
SK 13 35 SA 220 3,5	17	TO 220

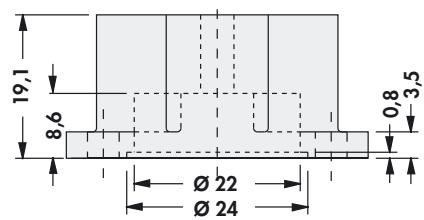
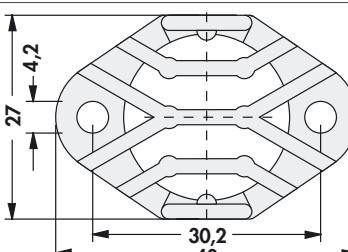


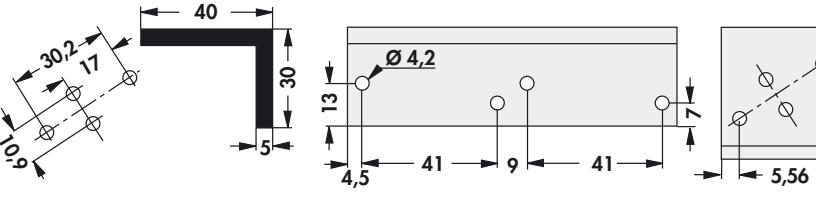
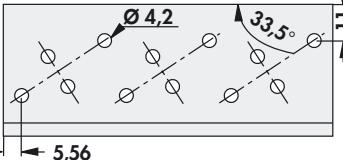
art. no.	R _{th} [K/W]	
SK 431 1	18	TO 220
SK 431 2	18	TO 220
SK 431 3	18	TO 220
surface:	black anodised	

Die-cast heatsinks

Setup heatsinks and angle for TO 3

		
art. no. AKK 127	\leftrightarrow [mm] 27	R_{th} [K/W] 14

		
art. no. AKK 191	\leftrightarrow [mm] 27	R_{th} [K/W] 12
surface:	black lacquered	
material:	die-casting aluminium	

		
art. no. WP 4030 100 ...	\leftrightarrow [mm] 100	R_{th} [K/W] 3.7
art. no. WP 4030 100 3 ...	\leftrightarrow [mm] 100	R_{th} [K/W] 3.7
please indicate:	... surface SA = black anodised AL = raw degreased aluminium	

socket: TF 3 2 → E 48

A 123

Mounting for TO 3 angle

Order example

Standard aluminium profiles

Heatsinks for PCB

→ A 123

→ A 21

→ A 133 – 134

→ A 89 – 111

Heatsinks for DC/DC converter

Profiles for lock-in fixing spring

Heatsink profile-overview

Technical introduction

→ A 112 – 113

→ A 84 – 88

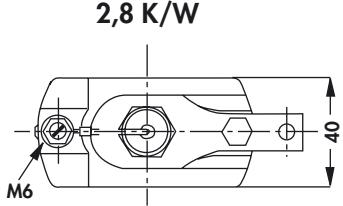
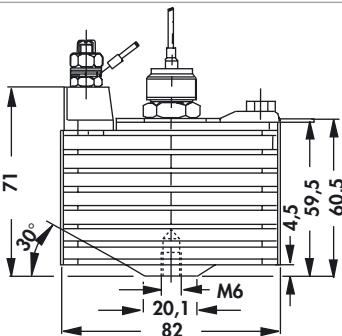
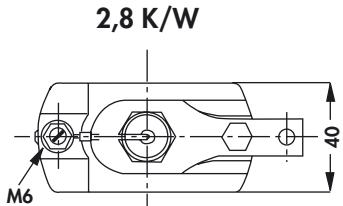
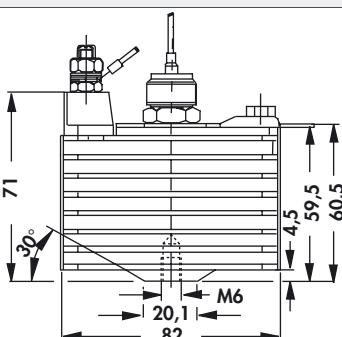
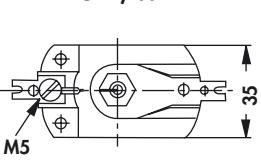
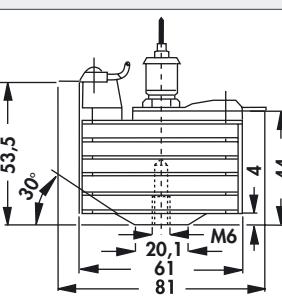
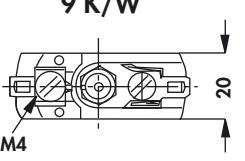
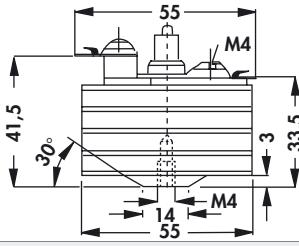
→ A 13 – 17

→ A 2 – 7

Die-cast heatsinks

Die-cast acc. to german standard DIN 41882

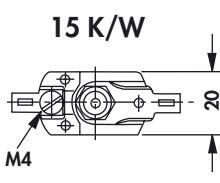
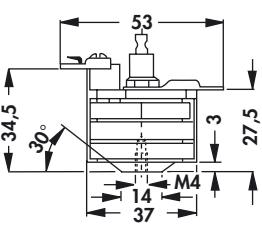
– other lengths and drillings on request

art. no.		2,8 K/W		
K 3 ...		for mounting use insulator: art. no.: IS 53		
please indicate:	... semiconductor retaining thread M 6, M 8, M 10, M 12, 1/4"-28 UNF			
art. no.		2,8 K/W		
K 3 T ...		Cathode lug insulator with an additional insulated connection (M 3). for mounting use insulator: art. no.: IS 53		
please indicate:	... semiconductor retaining thread M 6, M 8			
art. no.		5 K/W		
K 5 ...		for mounting use insulator: art. no.: IS 53		
please indicate:	... semiconductor retaining thread M 5, M 6, M 8, 1/4"-28 UNF			
art. no.		9 K/W		
K 9 ...		please indicate: ... semiconductor retaining thread M 4, M 5		
surface:		black lacquered		

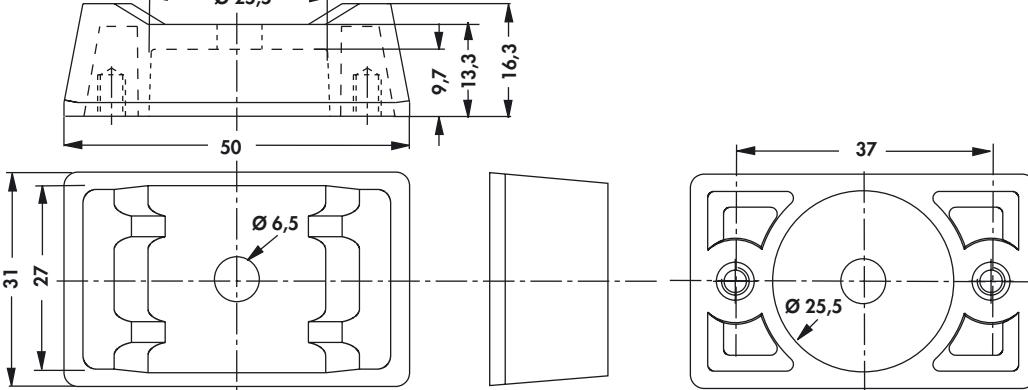
Die-cast heatsinks

Die-cast acc. to german standard DIN 41882

– other lengths and drillings on request

art. no. K 15 ...		15 K/W 	
please indicate: ... semiconductor retaining thread M 4, M 5			
surface:	black lacquered		

Mounting parts for heatsinks

art. no. IS 53	
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A 125

Mounting for TO 3 angle
 Order example
 Standard aluminium profiles
 Heatsinks for PCB

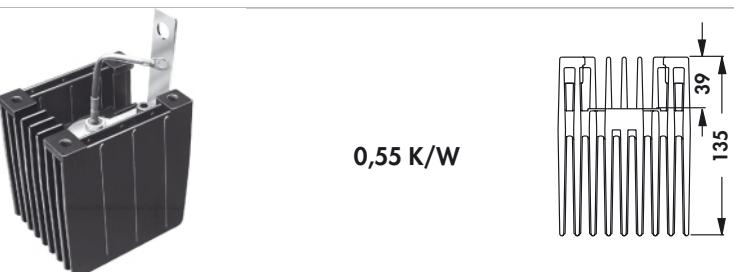
→ A 123
 → A 21
 → A 133 – 134
 → A 89 – 111

Heatsinks for DC/DC converter
 Profiles for lock-in fixing spring
 Heatsink profile-overview
 Technical introduction

→ A 112 – 113
 → A 84 – 88
 → A 13 – 17
 → A 2 – 7

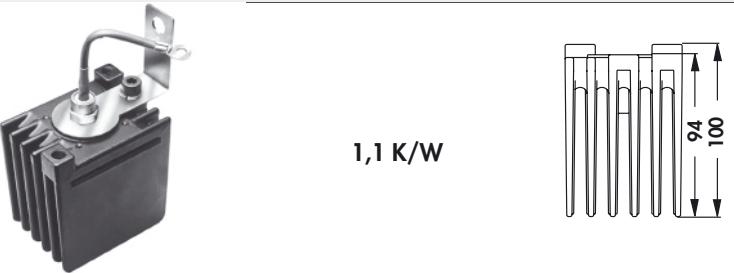
Die-cast heatsinks

- completely milled mounting surface for semiconductors with square bottom plates
- the mounting surface can be equipped with threads for fastening semiconductors with screwed glands (semiconductor thread tapping)
- threads from M 4 to M 32 x 1.5 or 4 x threads for semiconductors with clamping plate mounting are available
- strap fastening thread M 8
- delivery without anode strap
- other lengths and drillings on request



0,55 K/W

art. no.	↔ [mm]	R _{th} [K/W]
K 0,55 ...	120	0.55
please indicate: ... semiconductor retaining thread M 8, M 12, M 16 x 1,5, M 24 x 1,5		

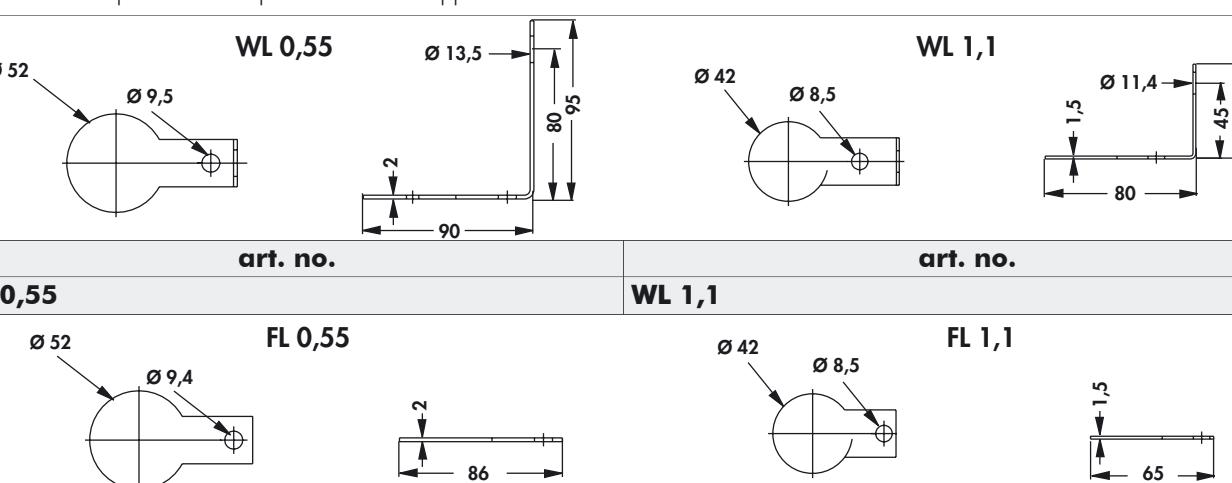


1,1 K/W

art. no.	↔ [mm]	R _{th} [K/W]
K 1,1 ...	90	1.1
please indicate: ... semiconductor retaining thread M 8, M 12, M 16 x 1,5, M 24 x 1,5		
surface:	black lacquered	

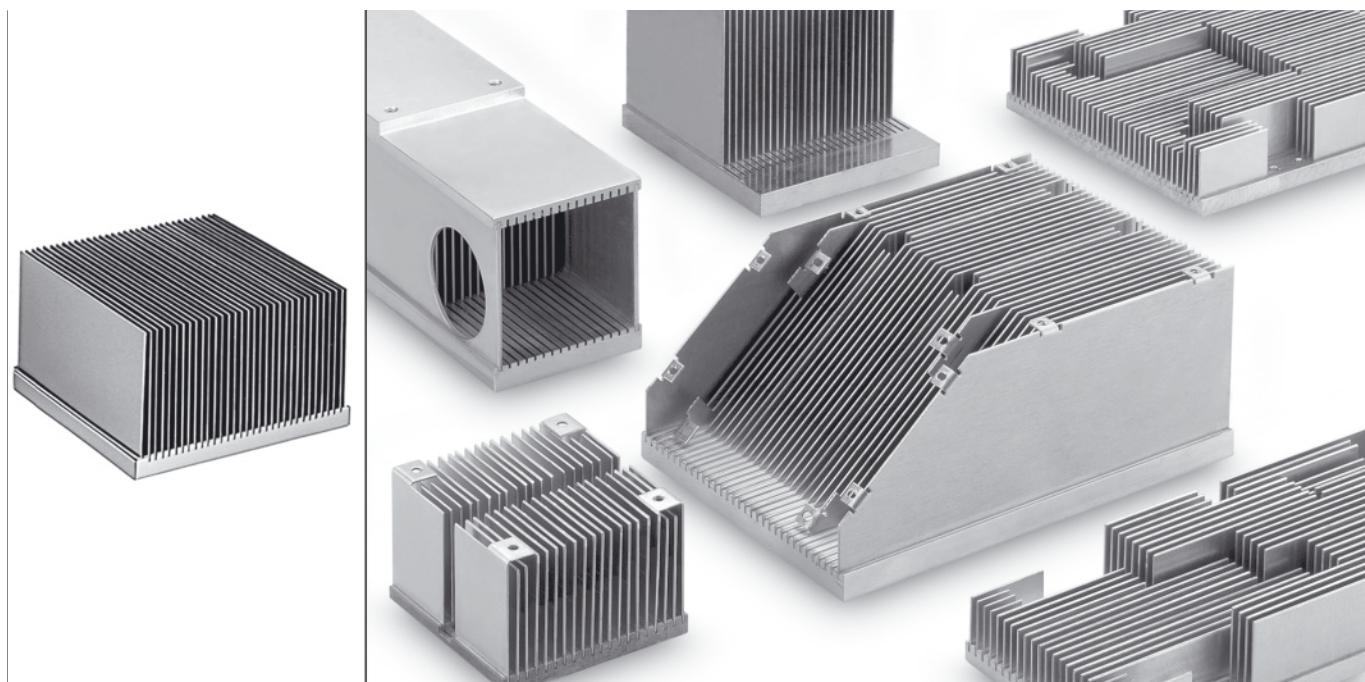
Accessories

- anode end strap made of tin-plated cathode copper



WL 0,55	WL 1,1
art. no.	art. no.
WL 0,55	WL 1,1
FL 0,55	FL 1,1
art. no.	art. no.
FL 0,55	FL 1,1

Standard fin coolers for thermoelectrical elements



- fin coolers in special design
- especially suitable for thermoelectric elements (Peltier-elements) and similar power modules
- compact design with reduced volume
- large surface, therefore more efficient than extruded profiles
- particularly low heat resistance with forced air cooling
- ideally fitted fins from a heat engineer's point of view
- accurately flat milled surfaces
- very low roughness
- machining for module mounting according to drawing
- heat bridges (spacing bridges) on request
- lapped surface on request
- customer specific special design

		KTE 1	KTE 2
art. no.	\downarrow [mm]	art. no.	\downarrow [mm]
KTE 1	58	KTE 2	46
material: aluminium, construction with copper on request			

A 127

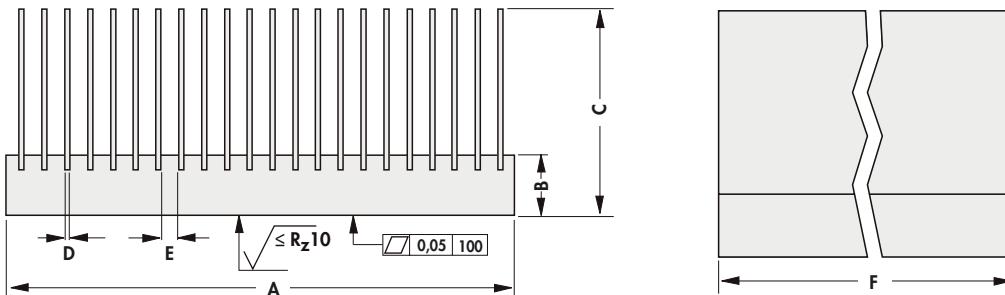
Fluid coolers
Standard aluminium profiles
High capacity cooling aggregat.
Heatsink profile-overview

→ A 129 – 131 Drilling pattern for Solid State
→ A 133 – 134 Heatsink special design
→ D 26 – 29 Special profiles
→ A 13 – 17 Technical introduction

→ A 12
→ A 135 – 136
→ A 138
→ A 2 – 7

Fin coolers KTE/KTED custom design

KTE



possible dimensions:

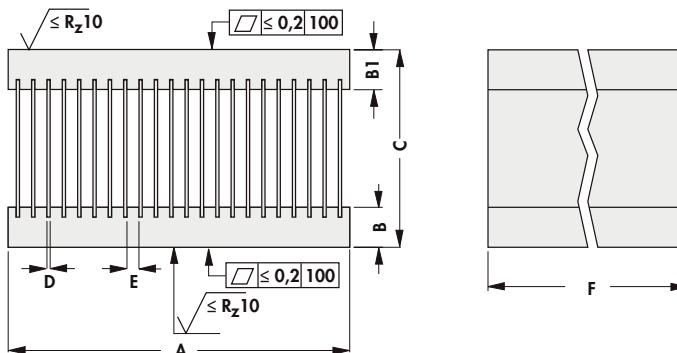
dimensions [mm]					
A	B	C	D	E	F
max. 400	max. 30	max. 150	0,8 / 1 / 1,5 / 2	min. 2	max. 400

please indicate with your order:

dimensions [mm]					
A	B	C	D	E	F
material:					aluminium, construction with copper upon request



- fin coolers in special design
- for forced convection, thus particularly low thermal resistance
- two opposite bottom plates as mounting surfaces for power modules and similar
- mounting surfaces precisely flat milled
- compact design with reduced volume
- ideally fitted fins from a heat engineering point of view
- lapped finish on request
- additional machining according to customer's requirements
- fan versions on request
- special constructions to customer's indications



possible dimensions:

dimensions [mm]						
A	B	B 1	C	D	E	F
max. 400	max. 30	max. 30	max. 150	0,8 / 1 / 1,5 / 2	min. 2	max. 400

please indicate with your order:

dimensions [mm]						
A	B	B 1	C	D	E	F
max. 400	max. 30	max. 30	max. 150	0,8 / 1 / 1,5 / 2	min. 2	max. 400

Fluid coolers

Standard aluminium profiles

High capacity cooling aggregat.

Heatsink profile-overview

→ A 129 – 131 Drilling pattern for Solid State

→ A 133 – 134 Heatsink special design

→ D 26 – 29 Special profiles

→ A 13 – 17 Technical introduction

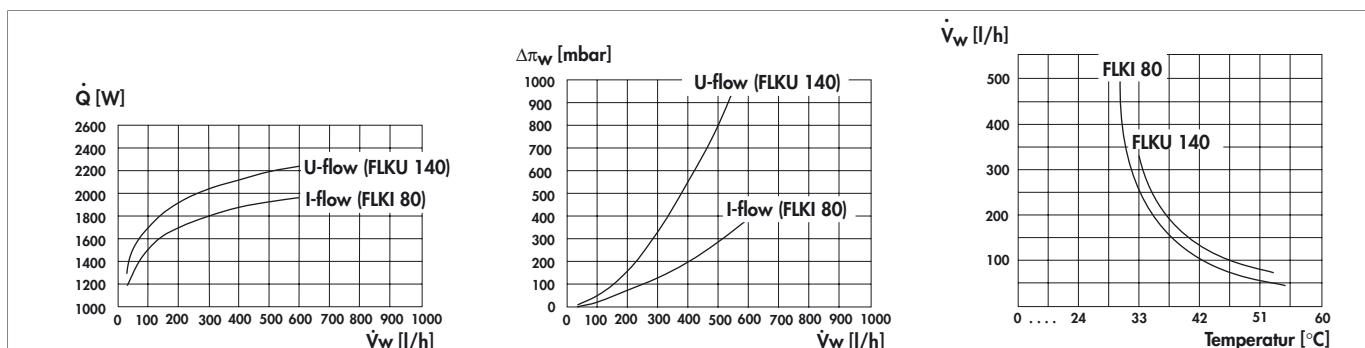
→ A 12

→ A 135 – 136

→ A 138

→ A 2 – 7

Fluid coolers for power modules



– water-glycol mixture (60/40); inlet temperature approx. 26 °C

Fluid cooler for dissipating large quantities of heat with low space requirement; **effective system to cool power modules**; suitable for water pH 6,5-8,5 with anticorrosives, as well as other fluids (eg. oil, alcohols, etc.); **compact design with internal fin structure for particularly good heat transfer to the fluid**; minimised flow pressure losses (see diagram); **operating pressure up to 2 bar possible**; thick base plate for optimum heat distribution and to secure the heat-emmitting elements; **mounting flange for the cooler according to customer's instructions**; precisely face milled surface of component mounting area with very good flatness and low roughness depth; **dimensionally accurate adjustment to given mounting conditions**; connections using hole ports 12 mm in diameter with reinforcing seam to DIN 71550 or installation flange to customers instructions; **I- or U-throughflow or multiple throughflow versions**; max. drilling depth in the base plate: 7 mm

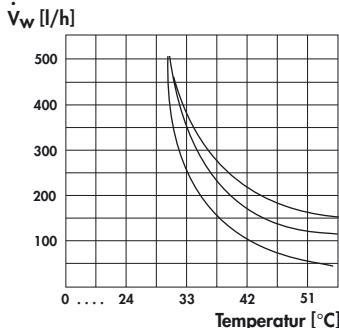
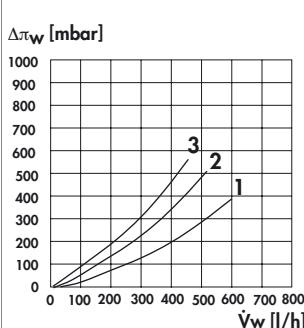
To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60% (preferred is 50%) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

– dimensions and designs using customer's instructions

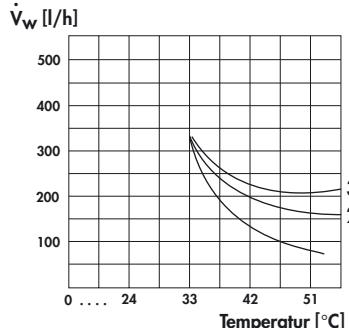
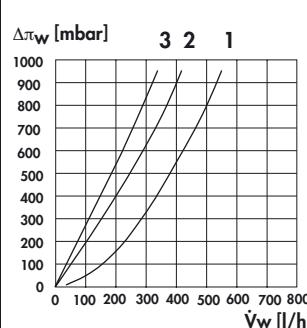
art. no. FLKI 80 art. no. FLKU 140 material:	
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Fluid coolers for power modules

1 = FLKI 80 G 500 2 = FLKI 80 G 300 3 = FLKI 80 G 200



1 = FLKU 140 G 500 2 = FLKU 140 G 300 3 = FLKU 140 G 200



– water-glycol mixture (60/40); inlet temperature approx. 26 °C

Fluid cooler for dissipating large quantities of heat with low space requirement; **effective system to cool power modules**; suitable for water pH 6,5-8,5 with anticorrosive, as well as other fluids (eg. oil, alcohols, etc.); **compact design with internal fin structure for particularly good heat transfer to the fluid**; minimised flow pressure losses; **operating pressure up to 2 bar possible**; thick base plate for optimum heat distribution and to secure the heat-emitting elements; **mounting flange for the cooler according to customer's instructions**; precisely face milled surface of component mounting area with very good evenness and low roughness depth; **for power modules like IGBT-module, Thyristor-module, SCR diode module, bridge amplifiers and others; dimensionally accurate adjustment to given mounting conditions**; connections with thread muffle 1/8" or mounting flange according to customer's instructions; **I- or U-throughflow or multiple throughflow versions**; max. drilling depth in the base plate: 17 mm

To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60% (preferred is 50%) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

– dimensions and designs using customer's instructions

art. no.	\leftrightarrow [mm]	art. no.	\leftrightarrow [mm]
FLKI 80 G 200	200	FLKI 80 G 500	500
FLKI 80 G 300	300		
art. no.	\leftrightarrow [mm]	art. no.	\leftrightarrow [mm]
FLKU 140 G 200	200	FLKU 140 G 500	500
FLKU 140 G 300	300		
material:	EN AW 6060 (Al Mg Si 0,5)		

lamella heatsinks

Fluid coolers

High capacity cooling aggregat.

Heatsink profile-overview

→ A 127

→ A 129 - 131

→ D 26 - 29

→ A 13 - 17

Heatsink special design

Special profiles

Drilling pattern for Solid State Relais

Technical introduction

→ A 135 - 136

→ A 138

→ A 21

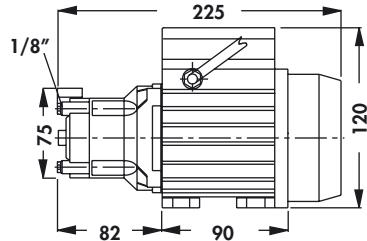
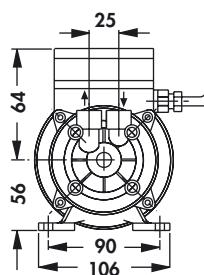
→ A 2 - 7

A 130

Recooling systems for liquid coolers

- recooling system for all types of liquid coolers
- cools up to 2.600 watts thermal power loss
- consists of pump and recoler
- pump as normally aspirating, single-stage centrifugal pump with spiral housing in block construction
- recoler with liquid-conducting tube system with air lamella and electrically driven fan motor
- further information free of charge under: **FLK R1-Info**
- notes: anticorrosive agents are required when water is used as coolant (eg. water/glykol - 60/40)
- the hose systems used (NOT in scope of delivery) must be resistant to anticorrosive agents (eg. material EPDM according to DIN 73411, ISO 4081)

To avoid corrosion in the water cooler the cooling fluid has to flow in a closed circuit and it has to contain 40-60% (preferred is 50%) anti-corrosive fluids for aluminium, if necessary with anti-freeze. For the choice and approval of the cooling fluid as well as for the possible consequences in the cooling circuit the user is the only liable person. Therefore we exclude any liability for damages caused by the choice or approval of the cooling fluids.

art. no.			
FLKR 1			
thermal cooling capacity:	max. 2,600 W		
pump:	single-phase 230 V AC, 120 W		
recooler:	single-phase 230 V AC, 120 W/ three-phase 400 V AC, 90 W		
type of delivery:	pump and recoler		

Iamella heatsinks**Fluid coolers****High capacity cooling aggregat.****Heatsink profile-overview**

→ A 127

→ A 129 – 131

→ D 26 – 29

→ A 13 – 17

Heatsink special design**Special profiles****Drilling pattern for Solid State Relais****Technical introduction**

→ A 135 – 136

→ A 138

→ A 21

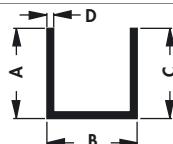
→ A 2 – 7

A 132

Standard aluminium profiles

- length, drilling and surface finishes to customer's instructions
- other standard profiles on request

U-profiles



art. no.	A [mm]	B [mm]	C [mm]	D [mm]	art. no.	A [mm]	B [mm]	C [mm]	D [mm]
SU 02	20	40	20	2.5	SU 16	30	30	30	2.0
SU 03	20	40	20	2.0	SU 27	40	40	40	2.5
SU 05	30	20	30	2.0	SU 29	40	40	40	4.0
SU 09	20	20	20	1.5	SU 32	30	30	30	3.0

tolerances: EN 755

material: EN AW 6060 (Al Mg Si 0.5)

flat profiles

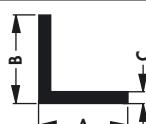


art. no.	A [mm]	B [mm]	art. no.	A [mm]	B [mm]
SFP 005	40	15	SFP 058	40	8
SFP 006	30	8	SFP 060	80	8
SFP 007	40	5	SFP 067	30	15
SFP 016	70	15	SFP 074	70	10
SFP 028	40	10	SFP 076	60	30
SFP 029	30	10	SFP 079	90	100
SFP 037	55	10	SFP 090	120	15
SFP 046	25	5	SFP 100	100	15
SFP 054	50	10	SFP 106	40	20
SFP 057	115	100	SFP 112	100	25

tolerances: EN 755

material: EN AW 6060 (Al Mg Si 0.5)

angled profile



art. no.	A [mm]	B [mm]	C [mm]	art. no.	A [mm]	B [mm]	C [mm]
SWP 02	80	80	8	SWP 29	15	10	2
SWP 06	80	40	6	SWP 36	75	50	5
SWP 10	30	20	2	SWP 40	40	30	5
SWP 15	40	20	4	SWP 55	40	40	5
SWP 23	20	15	2	SWP 57	60	30	5
SWP 25	50	30	5				

tolerances: EN 755

material: EN AW 6060 (Al Mg Si 0.5)

A 133

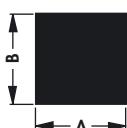
Hole pattern
Extruded heatsinks
Mounting for TO 3 angle
High capacity heatsinks

→ **A 21** Construction parts made of aluminium → **A 137**
 → **A 22 – 83** Heatsink as visual & decor-parts → **A 10**
 → **A 123 – 124** Special profiles → **A 138**
 → **A 57 – 58** Technical introduction → **A 2 – 7**

Standard aluminium profiles

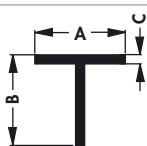
- length, drilling and surface finishes to customer's instructions
- other standard profiles on request

quadrangular profile



art. no.	A [mm]	B [mm]	art. no.	A [mm]	B [mm]
SVP 01	8	8	SVP 12	50	50
SVP 04	25	25	SVP 13	55	55
SVP 10	10	10			
tolerances:		EN 755			
material:		EN AW 6060 (Al Mg Si 0.5)			

T-profile



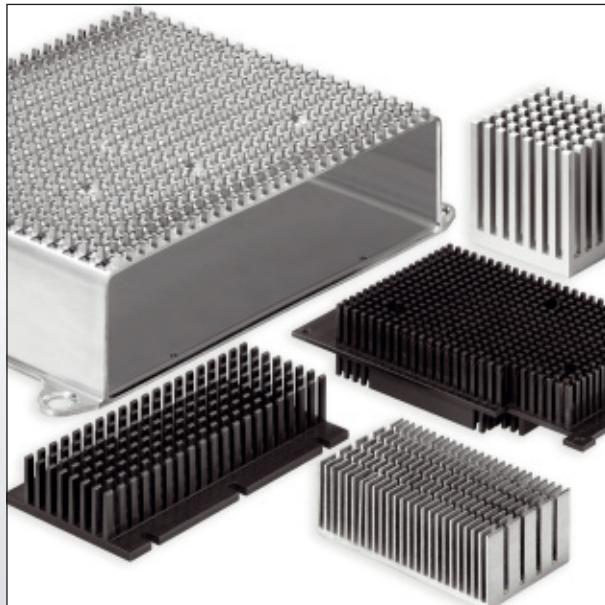
art. no.	A [mm]	B [mm]	C [mm]	art. no.	A [mm]	B [mm]	C [mm]
STP 4	60	60	6	STP 5	20	20	2
tolerances:		EN 755					
material:		EN AW 6060 (Al Mg Si 0.5)					

**CNC treatments of cooling profiles
Streamlined omnidirectional fin geometrie
Heatsinks with pressed-in fins
Precise milled flat surfaces**



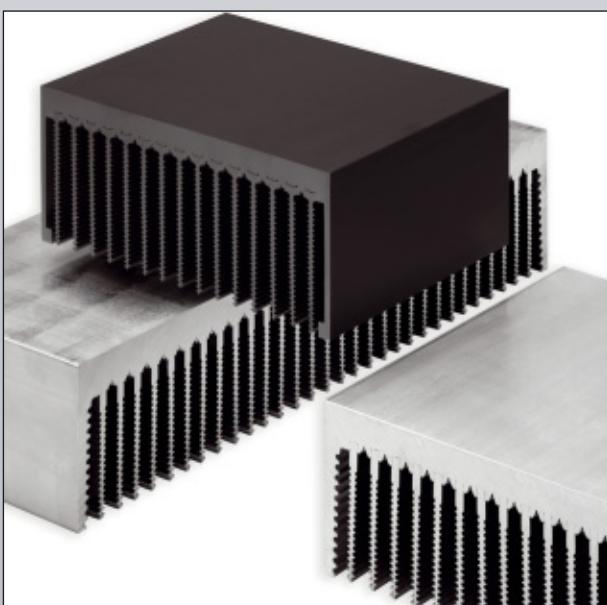
Customer specified CNC treatments of cooling profiles

- latest CNC machining centres for highest quality demands
- profile treatments for sizes up to 1600 mm
- future orientated stockkeeping of the aluminium profiles in fully automated honeycomb warehouses
- batch size optimized production flow
- special profiles, modifications and surfaces according to your special demand



Streamlined omnidirectional fin geometrie

- free-standing cooling fingers for forced cooling
- incident flow of the heatsinks by means of fans from all sides (omnidirectional)
- no direction-oriented installation position
- fin spacings according to your demand
- special designs, treatments and versions according to customer's request



Extruded heatsinks with pressed-in fins

- for highest thermal dissipation losses
- channelled fin geometrie for increasing the surface
- thermotechnical optimized connection between fin and bottom plate
- deliverable in widths of 200 up to 750 mm
- customer specific versions and treatments



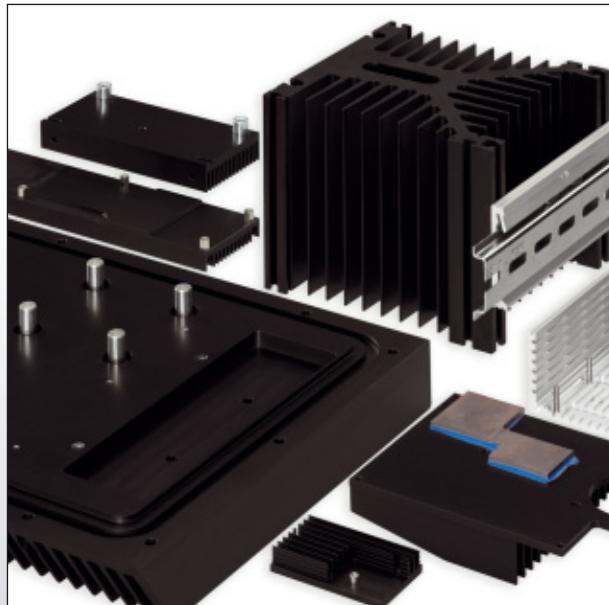
Precise milled flat surfaces

- very small depth of roughness and unevenness
- individually milled flat semi-conductor mounting surfaces for minimizing the heat-transmission resistances
- millings on the already anodized heatsinks
- protective foil avoid scratching of the high-quality mounting surface
- special designs according to customer's drawing



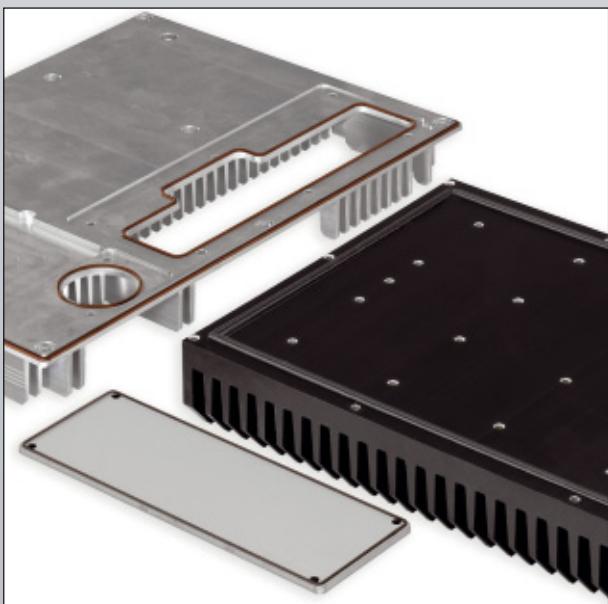
Surface labelling

- durable and high quality labeling by means of YAG-laser, silk screen-, pad- and digital printing
- print layout preparation by means of in-house repro department
- precise in contrast, precise engraved fonts and contours by means of CNC-controlled treatment systems
- labeling of aluminium, Plexiglas and plastics



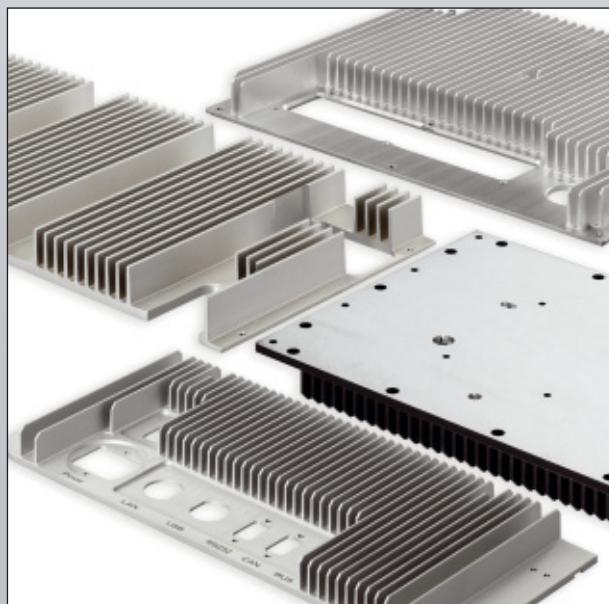
Additional equipments

- fractional semi-conductor mounting surfaces made of copper for heat dissipation
- pressed-in or screwed distance sleeves made of metal and plastics
- threaded bolts with internal and external thread
- support rail mountings made of metal or plastics according to DIN EN 50022



Heatsinks with integrated sealing

- foamed sealing applied on the profile as a permanent element of the heatsink
- also usable for front plates or milled parts
- groove filled or stacked
- permanently elastic and CFC-free
- adaption of the sealing properties to the specific application



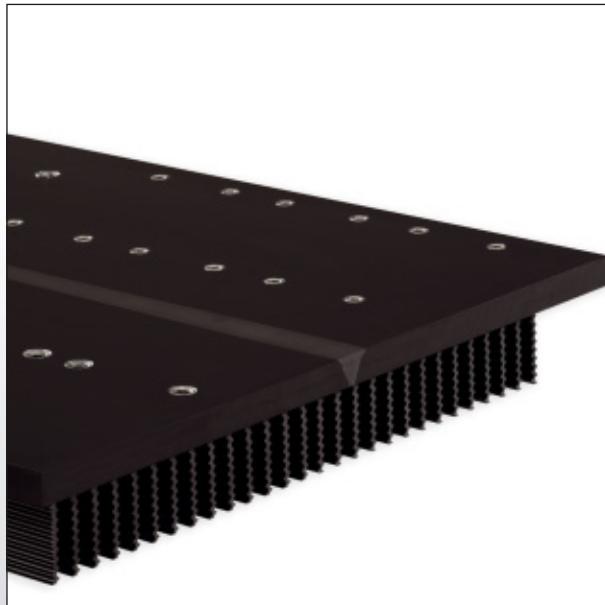
19" compliant CNC-treatment

- milled heatsink side or back panels for 19" cases, 19" plug in boxes, subracks and insert modules
- pressing in or welding of threaded bolts
- customer specified modifications, designs
- surfaces and printing upon request



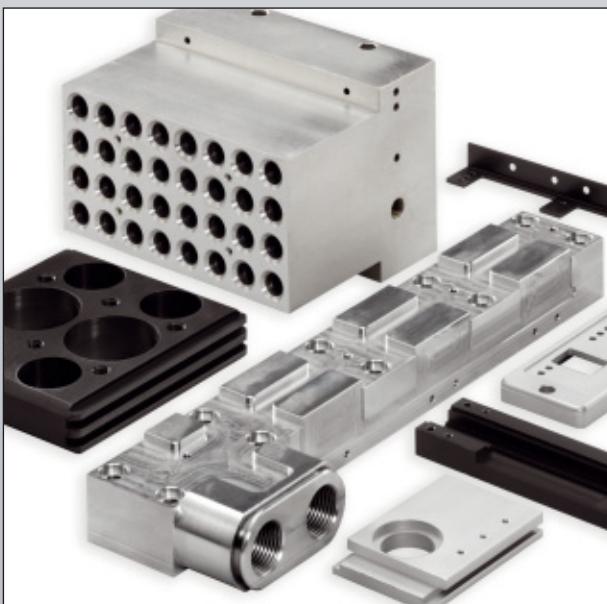
Welded high capacity heatsinks

- optimal fin geometry with channelled structure for free convection
- production of heatsink widths outside of the press-technical production possibilities
- removing of the welding line by means of precise milled flat surfaces
- individual surface design



Welded heatsinks

- homogeneous connection of the materials by means of special welding methods
- welding on additional mounting levels which are situated diagonally to the pressing direction of the profiles
- production of prototypes
- application-based special designs and treatments according to your demand



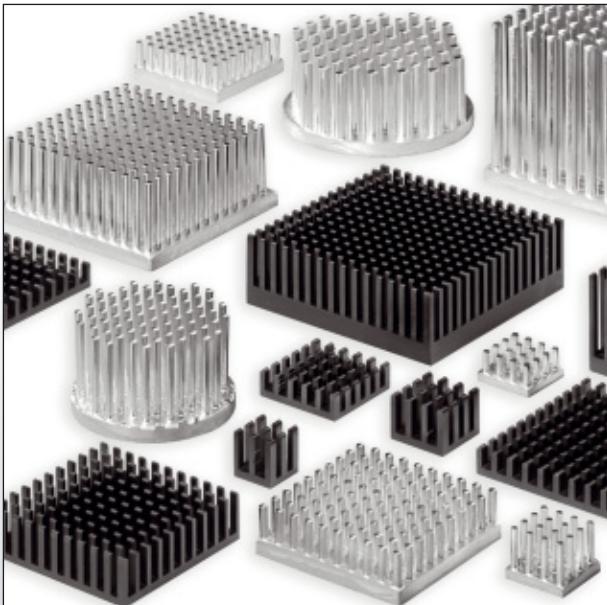
Construction- and milled parts made of aluminium according to customer specifications

- precise milled contours and surfaces
- inserting of holes and cut-outs, cutting or milling of threads
- turning in of wire thread inserts for high- and wear-resistant threads
- simple data exchange by means of up to date CAD- / CAM-systems



Cases and contour milled parts made of aluminium

- customer specific cases and construction parts
- precise mechanical treatments for highest quality demands
- all requested surface designs
- modifications and versions, special requirements, treatments and designs according to your drawing specification



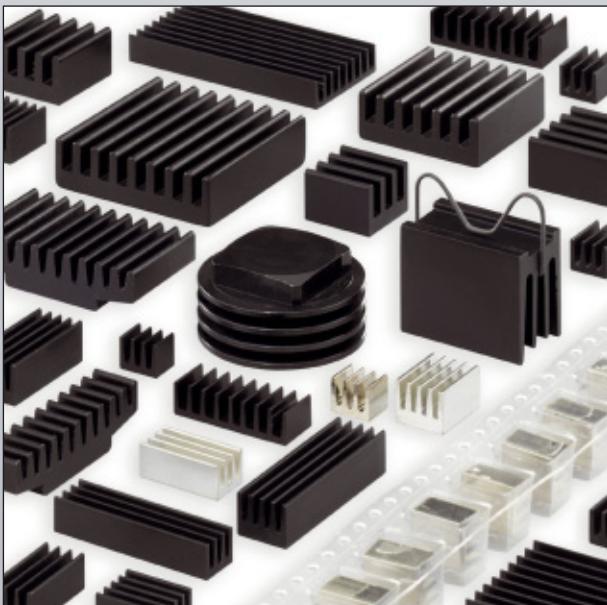
Round and pin heatsinks

- streamlined omnidirectional fin geometrie
- excellent thermal conductivity due to special aluminium alloys
- suitable for free and forced convection
- no direction bounded installation position
- flat semiconductor mounting surfaces
- contour also as milled parts according to your demands



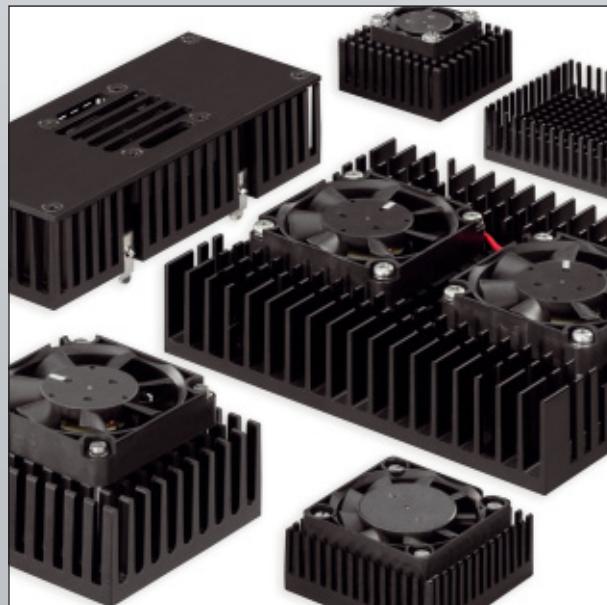
Heatsinks for LEDs

- various heatsink geometries adjusted to all current LED-types and light-engines
- star shaped heatsinks for the use as a LED-lamp housing
- LED mounting by means of screws, thermal conductive adhesive foil or thermal conductive glue
- customer specified versions with application based „thermal management“



Heatsinks for all current PL CC, DIL-IC and SMD transistor types

- effective heat dissipation at a low profile and low weight
- direct mounting of the component by means of a double-sided adhesive thermal foil or glue
- solderable versions of the surface
- special packaging such as tape & reel, magazine or tray upon request



Heatsinks and coolers for processors

- passive and active product solutions
- effective heat dissipation due to optimal conception of fan and heatsink
- long lifetime and high operating safety due to high quality fans
- versions for screw, glue and clip mounting
- customer specific solutions and fans

Heatsinks for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK PGA 6 x 6 x 14	B 11	20	6.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 8 x 8 x 12	B 11	14.8	8.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 9 x 9	B 11	14	3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 11 x 11 x 8	B 11	16	7.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 11 x 11	B 11	10.9	4.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 11 x 11 x 12	B 12	12.3	3.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14	B 12	10	4.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14 x 10	B 12	10.5	11.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14 x 14	B 12	9.6	12.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 14 x 14 x 12	B 12	9.8	5.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 15 x 15	B 12	9.4	5.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 16 x 16 x 8	B 13	14	4.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 16 x 16 x 10	B 13	10.5	12.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 16 x 16 x 12	B 13	9.3	6.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 17 x 17	B 13	8.6	6.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 17 x 17 x 8	B 13	13.2	5.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 17 x 17 x 12	B 13	9	6.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 18 x 18	B 14	8.4	7.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 19 x 19	B 14	8.6	7.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 19 x 19 x 12	B 14	9	6.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20 x 10	B 14	8.5	15.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20	B 14	7.6	8.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20 K	B 15	7.6	8.3	fixing clamp	socket 7/ socket 370	IDT W2A/ AMD® K6-III/ AMD® K6-2/ MMX/ IDT C6/ Intel® Pentium®
ICK PGA 20 x 20 x 8	B 15	12	6.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 20 x 20 x 12	B 15	8	8.1	therm. conductive foil/ therm. cond. adhesive	universal	universal

- very good thermal efficiency
- aerodynamic omnidirectional fin geometry
- simple mounting by means of fixing clamp, thermal conductive adhesive film or thermal conductive glue
- customer specified designs, surfaces and modifications upon request

Heatsinks for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK PGA 21 x 21	B 15	7	8.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 22 x 22	B 15	6.2	8.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PGA 25 x 25	B 16	5	11.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 10 x 10	B 17	30	1.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 10 x 10 x 10	B 17	28.5	1.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 14 x 14	B 17	30	2.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 14 x 14 x 10	B 17	27.4	2.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 21 x 21	B 18	24.3	2.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 23 x 23	B 18	22.5	2.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 23 x 23 x 10	B 18	21.5	2.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27	B 18	20	3.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27 x 10	B 18	18.5	3.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27 x 14	B 18	13.5	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 27 x 27 x 22	B 19	10.5	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 31 x 31	B 19	18.6	3.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 31 x 31 x 10	B 19	17	3.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 35 x 35	B 19	16.5	3.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 35 x 35 x 10	B 19	15.7	3.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 37 x 37 x 6	B 19	15.7	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 37 x 37 x 10	B 20	14	10.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 40 x 40	B 20	14.6	4.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 40 x 40 x 10	B 20	13.8	4.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK BGA 42,5 x 45	B 20	13.6	4.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 10 x 10 x 6,5	B 21	29.9	2.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 10 x 10 x 12,5	B 21	26.3	2.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 14 x 14 x 6,5	B 21	10	5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 14 x 14 x 10	B 22	9.8	5.1	therm. conductive foil/ therm. cond. adhesive	universal	universal

- B 3**
- very good thermal efficiency
 - aerodynamic omnidirectional fin geometry
 - simple mounting by means to fixing clamp, thermal conductive adhesive film or thermal conductive glue
 - customer specified designs, surfaces and modifications upon request

Heatsinks for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK S 17 x 17 x 15	B 22	8.36	5.95	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 17 x 17 x 20	B 22	7.89	6.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 18 x 18 x 6,5	B 22	7	7.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 18 x 18 x 10	B 22	6.8	7.35	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 25 x 25 x 6,5	B 22	5.8	12.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 25 x 25 x 12,5	B 23	5.3	14.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 25 x 25 x 18,5	B 23	5.2	14.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 29 x 29 x 10	B 23	5.7	13.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 29 x 29 x 20	B 23	3.7	20.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 32 x 32 x 10	B 23	5.4	13.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 32 x 32 x 20	B 23	3.7	20.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 10	B 24	4.7	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 15	B 24	3.9	19.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 36 x 36 x 20	B 24	3.2	23.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 40 x 40 x 10	B 24	4.6	16.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 40 x 40 x 20	B 24	3.5	21.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 40 x 40 x 25	B 24	3.1	23.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 45 x 45 x 10	B 25	4.7	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 45 x 45 x 20	B 25	4.4	17	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 20	B 25	2.7	27.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 25	B 25	2.4	31.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 40	B 25	6.05	13.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 50 x 50 x 50	B 25	4.05	14.32	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S 98 x 98 x 45	B 26	3.5	42	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 12 x 12 x 7,5	B 27	10.85	4.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 18 x 12 x 7,5	B 27	9	5.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S D 24 x 18 x 7,5	B 27	8.5	5.85	therm. conductive foil/ therm. cond. adhesive	universal	universal

- very good thermal efficiency
- aerodynamic omnidirectional fin geometry
- simple mounting by means of fixing clamp, thermal conductive adhesive film or thermal conductive glue
- customer specified designs, surfaces and modifications upon request

Heatsinks for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK S D 98 x 98 x 10	B 27	4.88	10.25	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 6,5	B 28	5.82	15.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 10	B 28	5.65	16	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 12,5	B 28	5.53	16.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 28,5 x 18,5	B 28	4.25	20.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 10	B 28	5.54	9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 32,5 x 20	B 28	5.6	8.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 36,5 x 20	B 29	6.41	18	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 10	B 29	11.04	8.4	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 20	B 29	10.32	8.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R A 40 x 20	B 29	11.62	8.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 40 x 30	B 29	9.77	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 45 x 30	B 29	8	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 45 x 45	B 29	6	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 10	B 30	5.28	9.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 20	B 30	8.55	9.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 30	B 30	8.26	10	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 50 x 45	B 30	6.32	12.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 54 x 20	B 30	8.11	10.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 54 x 30	B 30	6.95	11.57	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK S R 54 x 45	B 31	5.37	15.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 23,5 x 14	B 32	18.58	6.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 23,5 x 14 G	B 32	19.16	6.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 27 x 10	B 32	17.69	6.7	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 27 x 10 G	B 32	18.24	6.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 28 x 15	B 32	15.24	7.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 28 x 15 G	B 33	15.72	7.6	therm. conductive foil/ therm. cond. adhesive	universal	universal

- B 5**
- very good thermal efficiency
 - aerodynamic omnidirectional fin geometry
 - simple mounting by means to fixing clamp, thermal conductive adhesive film or thermal conductive glue
 - customer specified designs, surfaces and modifications upon request

Heatsinks for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK LED R 29 x 11,5	B 33	17.26	8.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 29 x 11,5 G	B 33	17.8	8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 32 x 14	B 33	15.23	7.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 32 x 14 G	B 33	15.23	7.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 10	B 33	17.6	6.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 10 G	B 33	18.15	6.6	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 16,5	B 34	13.87	8.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 33 x 16,5 G	B 34	14.3	8.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 35 x 10	B 34	16.9	9.35	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 35 x 10 G	B 34	17.5	9.2	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 36 x 12	B 34	12.88	10	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 36 x 12 G	B 34	13.28	8.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 10	B 34	12.28	9.45	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 10 G	B 35	12.66	9.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 27	B 35	9.41	12.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 40 x 27 G	B 35	9.71	11.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 45,7 x 16,5	B 35	10.46	11.05	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 45,7 x 16,5 G	B 35	10.49	10.8	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50 x 10	B 35	10.57	10.5	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50 x 10 G	B 36	10.9	10.3	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50,8 x 16,5	B 36	10.17	11.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 50,8 x 16,5 G	B 36	10.49	10.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 54 x 20	B 36	9.48	12.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 54 x 20 G	B 36	9.78	11.9	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 66 x 40	B 36	3.2	21	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 75 x 10	B 37	5.2	12.1	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 84 x 40	B 37	2.5	14.5	therm. conductive foil/ therm. cond. adhesive	universal	universal

- very good thermal efficiency
- aerodynamic omnidirectional fin geometry
- simple mounting by means of fixing clamp, thermal conductive adhesive film or thermal conductive glue
- customer specified designs, surfaces and modifications upon request

Heatsinks for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
ICK LED R 100 x 40	B 37	2	27	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 160 x 40	B 37	1.4	42	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK LED R 200 x 40	B 38	1	51	therm. conductive foil/ therm. cond. adhesive	universal	universal
ICK PPC 51	B 48	8.1	14	screw fastening		Power PC
ICK PEN 3 XE	B 48	2	31.3	screw fastening	Slot 2	Intel® Pentium® III-Xeon™ Slot II Format
ICK PEN 3 XE 1	B 48	1.8	33.6	screw fastening	Slot 2	Intel® Pentium® III-Xeon™ Slot II Format
ICK EM 25	B 48	3.9	20.4	screw fastening		Q7 Board
ICK PEN 38 F	B 49	4	15.1	therm. conductive foil	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
ICK PEN 38 W	B 49	4	15.1	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
ICK PEN 45 W	B 49	3.5	21	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
ICK PRO 40 W	B 49	2.7	22	therm. cond. adhesive	socket 8	Intel® Pentium® PRO
ICK PEN 3 FC	B 49	3.5	22	fixing clamp	socket 7/ socket 370	Intel® Pentium® III FC PGA (Mendocino, Coppermine)

- very good thermal efficiency
- aerodynamic omnidirectional fin geometry
- simple mounting by means to fixing clamp, thermal conductive adhesive film or thermal conductive glue
- customer specified designs, surfaces and modifications upon request

Fan coolers for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
LA ICK 15 x 15 F 05	B 50	2.3	22.2	therm. conductive foil	universal	universal
LA ICK 15 x 15 F 12	B 50	2.3	22.2	therm. conductive foil	universal	universal
LA ICK 17 x 17 F 12	B 50	1.6	35.8	therm. conductive foil	universal	universal
LA ICK 17 x 17 F 12 A	B 50	1.6	35.8	therm. conductive foil	universal	universal
LA ICK 17 x 17 W 05	B 50	1.6	35.8	therm. cond. adhesive	universal	universal
LA ICK 17 x 17 W 12	B 50	1.6	35.8	therm. cond. adhesive	universal	universal
LA ICK 18 x 18 F 12	B 50	1.5	41.7	therm. conductive foil	universal	universal
LA ICK 18 x 18 W 12	B 50	1.5	41.7	therm. cond. adhesive	universal	universal
LA ICK 21 x 21 F 05	B 50	1.4	46.3	therm. conductive foil	universal	universal
LA ICK 21 x 21 F 12	B 50	1.4	46.3	therm. conductive foil	universal	universal
LA ICK 21 x 21 W 05	B 50	1.4	46.3	therm. cond. adhesive	universal	universal
LA ICK 21 x 21 W 12	B 50	1.4	46.3	therm. cond. adhesive	universal	universal
LA ICK PEN 8 F 05	B 51	2.5	23.4	therm. conductive foil	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 8 F 12	B 51	2.5	23.4	therm. conductive foil	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 8 W 05	B 51	2.5	23.4	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 8 W 12	B 51	2.5	23.4	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 16 K 12	B 51	1.2	51.1	fixing clamp	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 16 W 12	B 51	1.2	51.1	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2

- high-quality industrial design
- compact design with high mechanical stability
- fan with doubled ball bearing axis
- optimal thermotechnical design of fan and heatsink

Fan coolers for IC processor

art. no.	page	R _{th} [K/W]	dissipation loss [W]	way of fixation	socket	suitable for processor type
LA ICK PEN 16 W 12 A	B 51	1.2	51.1	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 18 W 12	B 51	1.6	38.6	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PEN 38 W 12	B 51	1.1	53.6	therm. cond. adhesive	socket 7/ socket 370	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2
LA ICK PRO 25 F 12	B 51	0.97	60	therm. conductive foil	socket 8	Intel® Pentium® PRO
LA ICK PEN 2 K 12	B 52	1.2	58	fixing clamp	Slot A/ Slot 1	Intel® Pentium® II/ AMD® Athlon®
LA ICK PEN 3 XE	B 52	0.8	61.8	screw fastening	Slot 2	Intel® Pentium® III-Xeon™
LA ICK PEN 4 1 K	B 52	0.6	85	fixing clamp	socket 463/ socket 423	Intel® Pentium® IV

- B 9**
- high-quality industrial design
 - compact design with high mechanical stability
 - fan with doubled ball bearing axis
 - optimal thermotechnical design of fan and heatsink

Fan coolers for IC processor

Heatsinks

- excellent thermal efficiency achieved by flow-favourable omnidirectional fin geometry and black anodised surface
- easy mounting using fixing clamp, thermally conductive adhesive foil or thermally conductive glue

Fan coolers

- special high-grade industrial type
- compact design with high mechanical stability
- fan motor axle with double ball bearings ensures high reliability and long product life
- low current consumption and thus low self-heating
- effective heat dissipation achieved by optimum design of fan motor and heatsink
- fan motors with other operating voltages on request
- fan motors also available with pulse output and alarm device circuit

Technical introduction

- the thermal resistances and the power dissipation were determined with an ambient temperature of 25 °C and an IC case-temperature of 85 °C
- with higher IC case-temperature, the power to be dissipated increases proportionally

Fixing methods

K = fixing clamp

F = double sided thermally conductive adhesive foil

W = thermally conductive glue

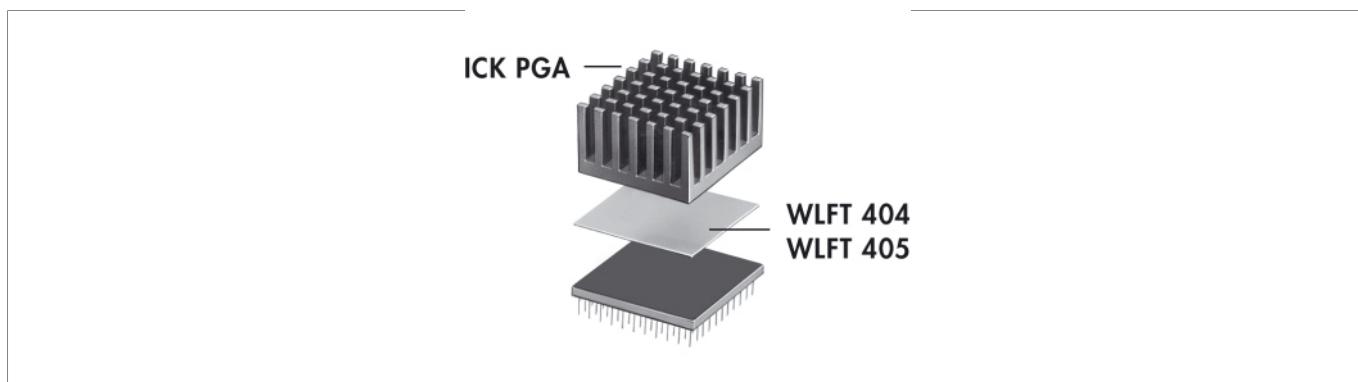
SB = screw fixing

Technical data for fans with pulse output → B 54

- pulse output for control of the alarm device circuit
- pulse form is like rectangle with the triple frequency of rotation speed
- with blocked rotor the output signal can be L (0.8 V) or H (Vcc-1V)
- the pulse output must not be connected with GND or Vcc without a multiplier (>10K)
- to prevent short circuits, do not isolate the used pulse output

- high-quality industrial design
- compact design with high mechanical stability
- fan with doubled ball bearing axis
- optimal thermotechnical design of fan and heatsink

Heatsinks for PGA



- double-sided adhesive thermal conductive foil **WLF ...** → E 7

- **surface:** black anodised

art. no.			
ICK PGA 6 x 6 x 14 WLF ... 14 x 14			
art. no.			
ICK PGA 8 x 8 x 12 WLF ... 23 x 23			
art. no.			
ICK PGA 9 x 9 WLF ... 24 x 24			
art. no.			
ICK PGA 11 x 11 x 8 WLF ... 24 x 27			
art. no.			
ICK PGA 11 x 11 WLF ... 24 x 27			

Heatsinks for PGA

A

B

C

D

E

F

G

H

I

K

L

M

art. no.	Diagram	Graph
ICK PGA 11 x 11 x 12 WLF ... 24 x 27		
ICK PGA 14 x 14 WLF ... 31 x 34		
ICK PGA 14 x 14 x 10 WLF ... 35 x 35		
ICK PGA 14 x 14 x 14 WLF ... 35 x 35		
ICK PGA 14 x 14 x 12 WLF ... 36 x 36		
ICK PGA 15 x 15 WLF ... 37 x 37		

Mounts

Heatsinks for PLCC

Thermal conductive paste

Thermal conductive glue

→ E 42 - 46

→ B 44

→ E 19 - 22

→ E 21 - 22

Pin heatsinks for IC

SMD-heatsinks

Heatsinks for PGA

Technical introduction

→ B 21 - 25

→ B 45 - 46

→ B 11 - 16

→ A 2 - 7

Heatsinks for PGA

art. no.	Dimensions	Graph R_{th} [K/W] vs. v [m/s]
ICK PGA 16 x 16 x 8 WLF ... 40 x 40		
ICK PGA 16 x 16 x 10 WLF ... 40 x 40		
ICK PGA 16 x 16 x 12 WLF ... 40 x 40		
ICK PGA 17 x 17 WLF ... 43 x 43		
ICK PGA 17 x 17 x 8 WLF ... 43 x 43		
ICK PGA 17 x 17 x 12 WLF ... 43 x 43		

Mounts

Heatsinks for PLCC
Thermal conductive paste
Thermal conductive glue

→ E 42 - 46

→ B 44
→ E 19 - 22
→ E 21 - 22

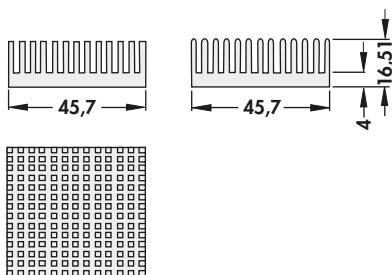
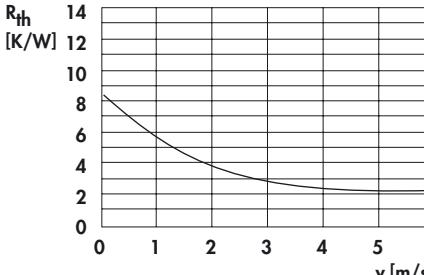
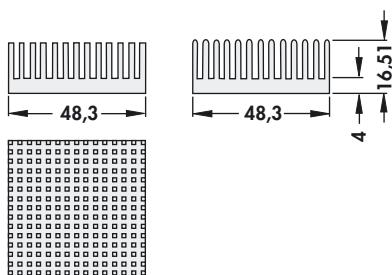
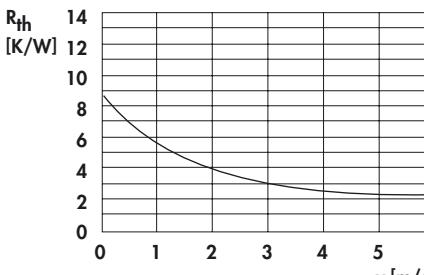
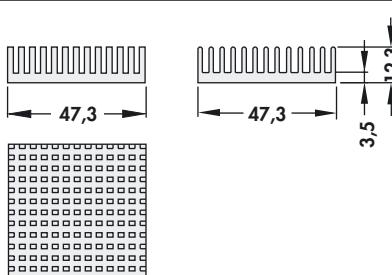
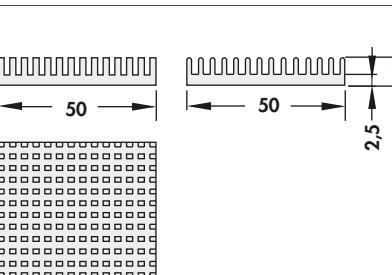
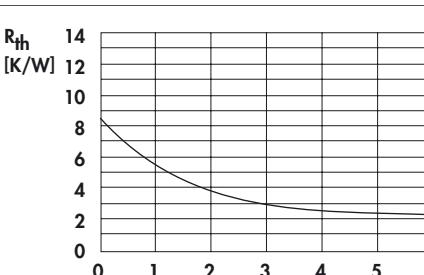
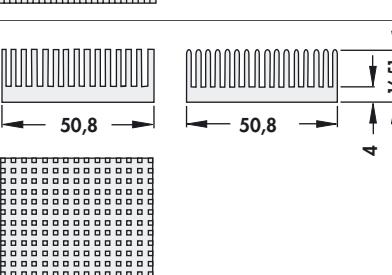
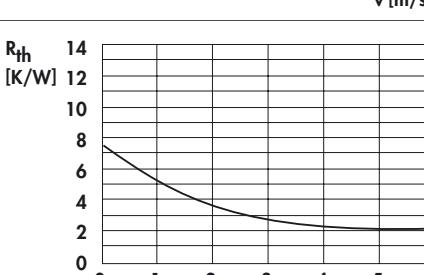
Pin heatsinks for IC

SMD-heatsinks
Heatsinks for PGA
Technical introduction

→ B 21 - 25

→ B 45 - 46
→ B 11 - 16
→ A 2 - 7

Heatsinks for PGA

art. no.	Diagram	Graph
ICK PGA 18 x 18 WLF ... 45 x 45		
ICK PGA 19 x 19 WLF ... 48 x 48		
ICK PGA 19 x 19 x 12 WLF ... 47 x 47		
ICK PGA 20 x 20 x 10 WLF ... 48 x 48		
ICK PGA 20 x 20 WLF ... 50 x 50		

Mounts

Heatsinks for PLCC
Thermal conductive paste
Thermal conductive glue

→ E 42 - 46

→ B 44
→ E 19 - 22
→ E 21 - 22

Pin heatsinks for IC

SMD-heatsinks
Heatsinks for PGA
Technical introduction

→ B 21 - 25

→ B 45 - 46
→ B 11 - 16
→ A 2 - 7

Heatsinks for PGA

art. no.	Diagram	Graph
ICK PGA 20 x 20 K WLF ... 50 x 50		
ICK PGA 20 x 20 x 8 WLF ... 50 x 50		
ICK PGA 20 x 20 x 12 WLF ... 50 x 50		
ICK PGA 21 x 21 WLF ... 53 x 53		
ICK PGA 22 x 22 WLF ... 54 x 54		

Mounts

Heatsinks for PLCC
Thermal conductive paste
Thermal conductive glue

→ E 42 - 46

→ B 44
→ E 19 - 22
→ E 21 - 22

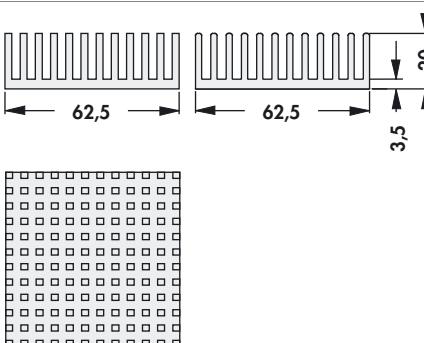
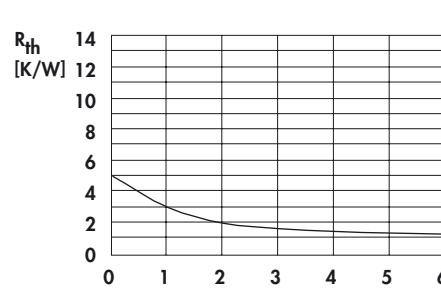
Pin heatsinks for IC

SMD-heatsinks
Heatsinks for PGA
Technical introduction

→ B 21 - 25

→ B 45 - 46
→ B 11 - 16
→ A 2 - 7

Heatsinks for PGA

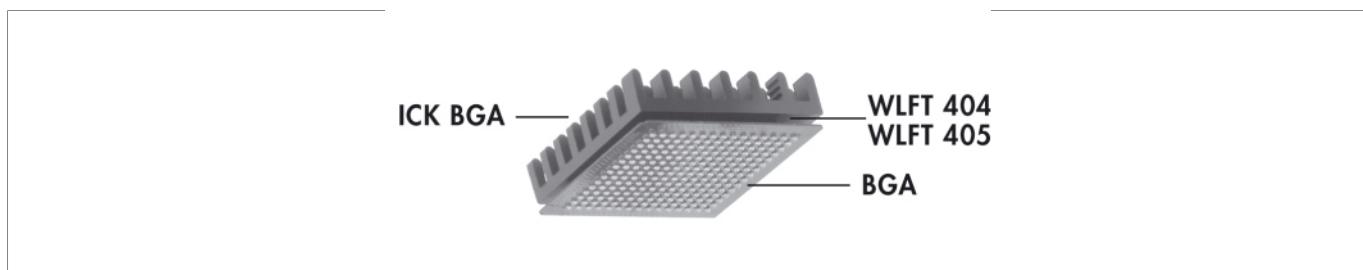
art. no.		
ICK PGA 25 x 25 WLF ... 62 x 62		

Mounts
Heatsinks for PLCC
Thermal conductive paste
Thermal conductive glue

→ E 42 – 46 Pin heatsinks for IC
 → B 44 SMD-heatsinks
 → E 19 – 22 Heatsinks for PGA
 → E 21 – 22 Technical introduction

→ B 21 – 25
 → B 45 – 46
 → B 11 – 16
 → A 2 – 7

Heatsinks for BGAs



- particularly suited for **Ball Grid Arrays**
- heatsink dimensions match the respective BGA-type
- can be glued directly on the BGA component
- double-sided adhesive thermal conductive foil **WLF ... → E 7**
- **surface:** black anodised

art. no.	Dimensions (mm)	Graph: Thermal resistance R_{th} [K/W] vs. air velocity v [m/s]
ICK BGA 10 x 10 WLF ... 10 x 10	 Dimensions: 10 mm width, 1.8 mm height, 6 mm fin thickness	<p>Graph showing Thermal resistance R_{th} [K/W] versus air velocity v [m/s]. The curve starts at approximately 30 K/W at 0 m/s and decreases to about 10 K/W at 6 m/s.</p>
ICK BGA 10 x 10 x 10 WLF ... 10 x 10	 Dimensions: 10 mm width, 1.8 mm height, 10 mm fin thickness	<p>Graph showing Thermal resistance R_{th} [K/W] versus air velocity v [m/s]. The curve starts at approximately 28 K/W at 0 m/s and decreases to about 10 K/W at 6 m/s.</p>
ICK BGA 14 x 14 WLF ... 14 x 14	 Dimensions: 14 mm width, 1.8 mm height, 6 mm fin thickness	<p>Graph showing Thermal resistance R_{th} [K/W] versus air velocity v [m/s]. The curve starts at approximately 30 K/W at 0 m/s and decreases to about 10 K/W at 6 m/s.</p>
ICK BGA 14 x 14 x 10 WLF ... 14 x 14	 Dimensions: 14 mm width, 1.8 mm height, 10 mm fin thickness	<p>Graph showing Thermal resistance R_{th} [K/W] versus air velocity v [m/s]. The curve starts at approximately 28 K/W at 0 m/s and decreases to about 8 K/W at 6 m/s.</p>

Heatsinks for BGAs

A

B

C

D

E

F

G

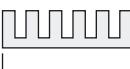
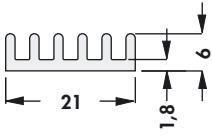
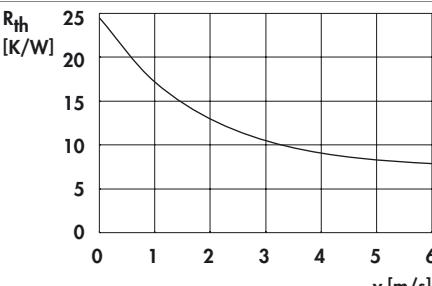
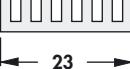
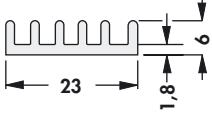
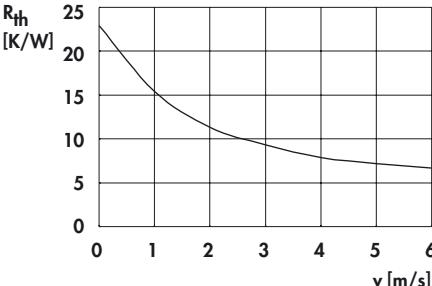
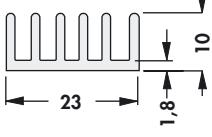
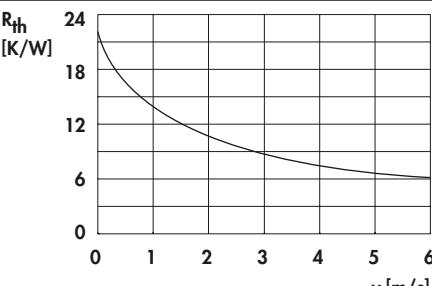
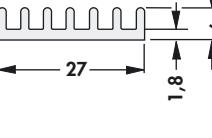
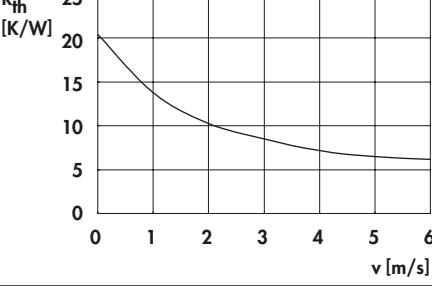
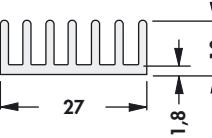
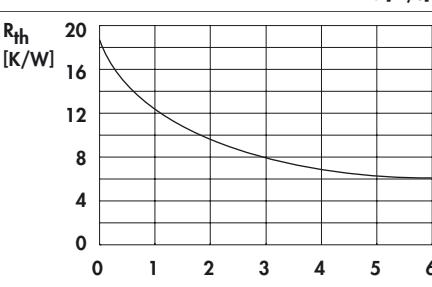
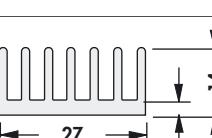
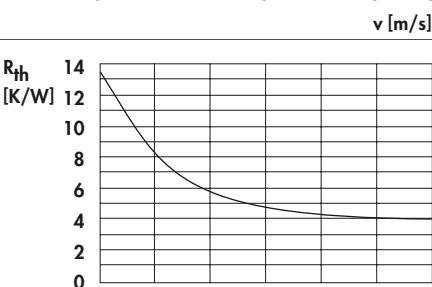
H

I

K

L

M

art. no.			
ICK BGA 21 x 21 WLF ... 21 x 21			
ICK BGA 23 x 23 WLF ... 23 x 23			
ICK BGA 23 x 23 x 10 WLF ... 23 x 23			
ICK BGA 27 x 27 WLF ... 27 x 27			
ICK BGA 27 x 27 x 10 WLF ... 27 x 27			
ICK BGA 27 x 27 x 14 WLF ... 27 x 27			

Mounts

SMD-heatsinks

Thermally conductive foil

Thermal conductive paste

→ E 42 - 46

→ B 45 - 47

→ E 5 - 13

→ E 19 - 20

Thermal conductive glue

Drilling pattern for Solid State Relais

Processor overview

Technical introduction

→ E 21 - 22

→ A 21

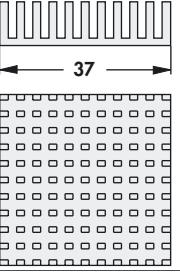
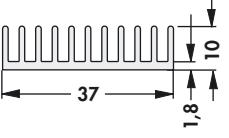
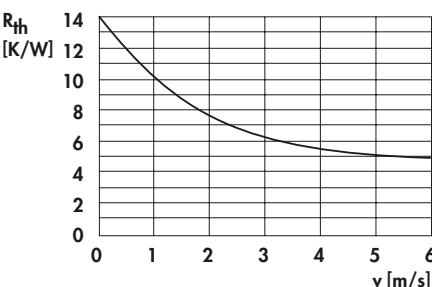
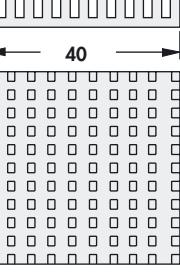
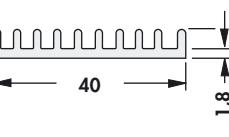
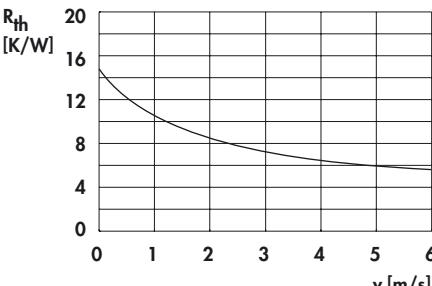
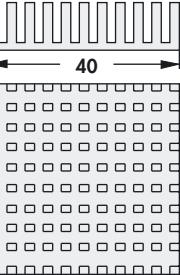
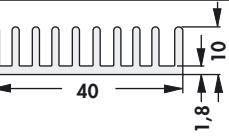
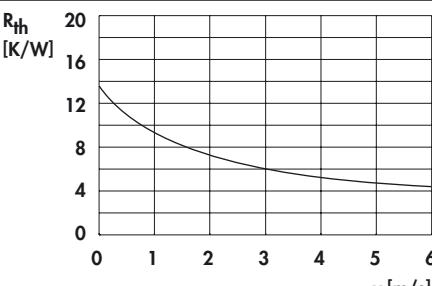
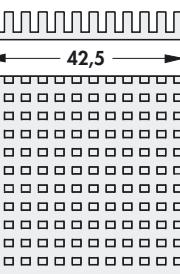
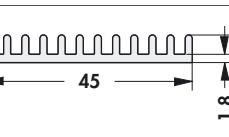
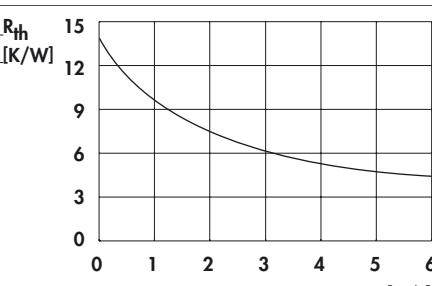
→ B 2 - 10

→ A 2 - 7

Heatsinks for BGAs

art. no.			
ICK BGA 27 x 27 x 22 WLF ... 27 x 27			
ICK BGA 31 x 31 WLF ... 31 x 31			
ICK BGA 31 x 31 x 10 WLF ... 31 x 31			
ICK BGA 35 x 35 WLF ... 35 x 35			
ICK BGA 35 x 35 x 10 WLF ... 35 x 35			
ICK BGA 37 x 37 x 6 WLF ... 37 x 37			

Heatsinks for BGAs

art. no.			
ICK BGA 37 x 37 x 10 WLF ... 37 x 37			
ICK BGA 40 x 40 WLF ... 40 x 40			
ICK BGA 40 x 40 x 10 WLF ... 40 x 40			
ICK BGA 42,5 x 45 WLF ... 42,5 x 45			

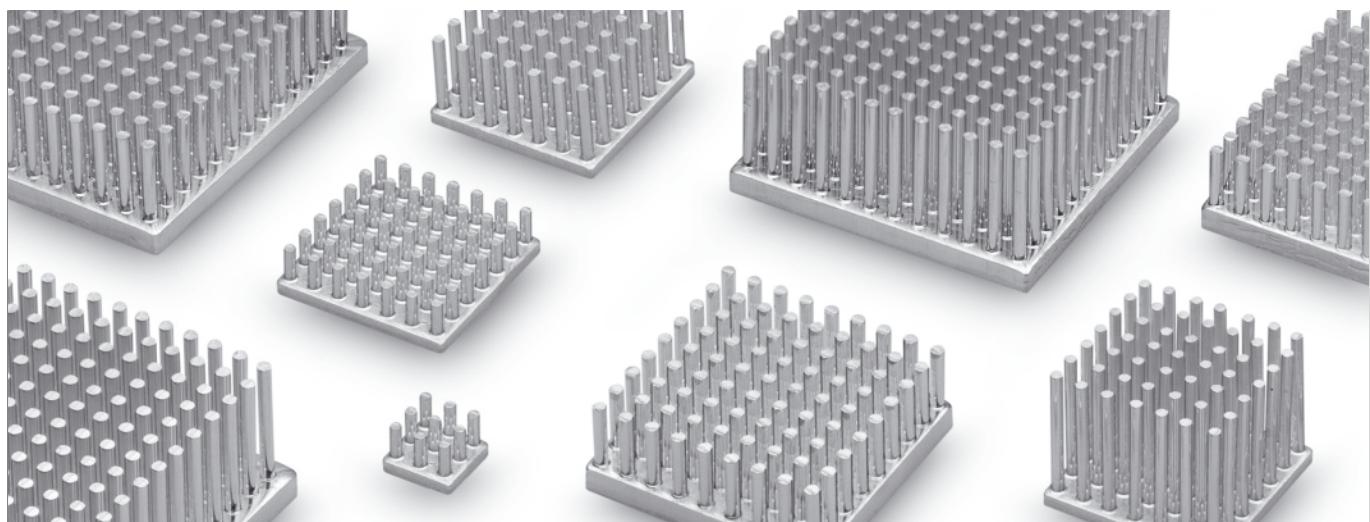
Mounts
SMD-heatsinks
Thermally conductive foil
Thermal conductive paste

→ E 42 - 46
→ B 45 - 47
→ E 5 - 13
→ E 19 - 20

Thermal conductive glue
Drilling pattern for Solid State Relais
Processor overview
Technical introduction

→ E 21 - 22
→ A 21
→ B 2 - 10
→ A 2 - 7

Pin heatsinks



- arrangement and number of pins for optimum air flow
- suitable for forced and free convection
- excellent thermal conductivity by the alloy material (Al99,5; 220 W/mK) and homogeneous arrangement of materials
- constant heat dissipation in the base and the pins in the direction of heat flow
- low weight achieved by optimised geometry
- components fastened using glue, adhesive foil or clamps
- customer-specific modifications and special designs
- other pin-lengths and surfaces on request
- **surface:** Al-natural

art. no.			R_{th} [K/W]
ICK S 10 x 10 x 6,5 WLF ... 10 x 10 weight: 1g	<p>Technical drawings showing cross-section and pin layout for the ICK S 10x10x6.5 model. The cross-section indicates a height of 6.5 mm, a base width of 10 mm, and a gap of 2 mm between the base and the pins. The pin layout shows a 10x10 grid of pins.</p>	<p>Graph showing Thermal Resistance (R_{th}) in K/W versus Air Velocity (v) in m/s for the ICK S 10x10x6.5 model. The resistance decreases from approximately 25 K/W at 0.5 m/s to about 10 K/W at 5 m/s.</p>	
ICK S 10 x 10 x 12,5 WLF ... 10 x 10 weight: 1.3g	<p>Technical drawings showing cross-section and pin layout for the ICK S 10x10x12.5 model. The cross-section indicates a height of 12.5 mm, a base width of 10 mm, and a gap of 2 mm between the base and the pins. The pin layout shows a 10x10 grid of pins.</p>	<p>Graph showing Thermal Resistance (R_{th}) in K/W versus Air Velocity (v) in m/s for the ICK S 10x10x12.5 model. The resistance decreases from approximately 22 K/W at 0.5 m/s to about 12 K/W at 5 m/s.</p>	
ICK S 14 x 14 x 6,5 WLF ... 14 x 14 weight: 1.5g	<p>Technical drawings showing cross-section and pin layout for the ICK S 14x14x6.5 model. The cross-section indicates a height of 6.5 mm, a base width of 14 mm, and a gap of 2 mm between the base and the pins. The pin layout shows a 14x14 grid of pins.</p>	<p>Graph showing Thermal Resistance (R_{th}) in K/W versus Air Velocity (v) in m/s for the ICK S 14x14x6.5 model. The resistance decreases from approximately 10 K/W at 0.5 m/s to about 5 K/W at 5 m/s.</p>	

Pin heatsinks

A

B

C

D

E

F

G

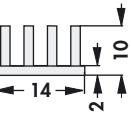
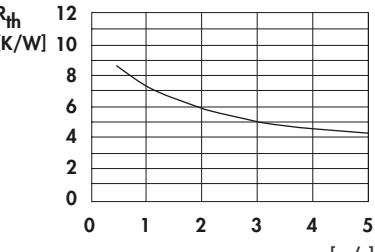
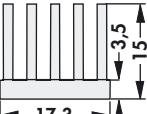
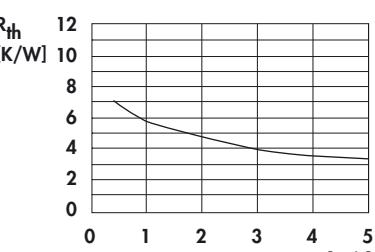
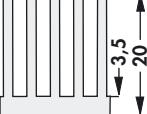
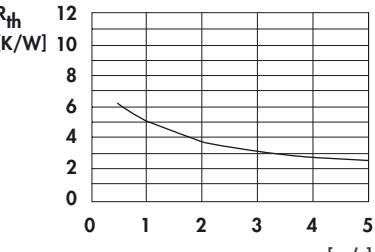
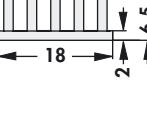
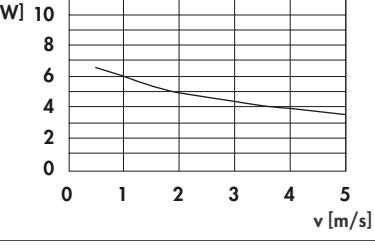
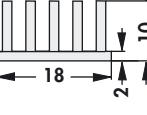
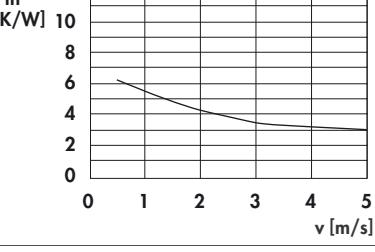
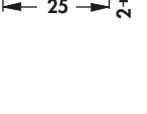
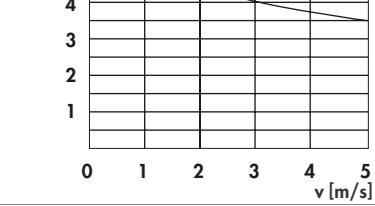
H

I

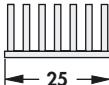
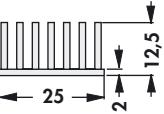
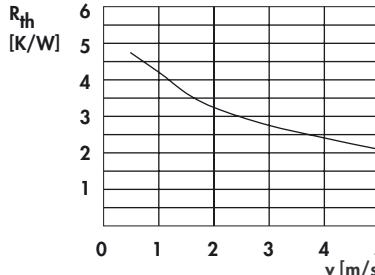
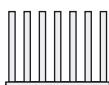
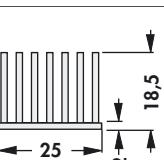
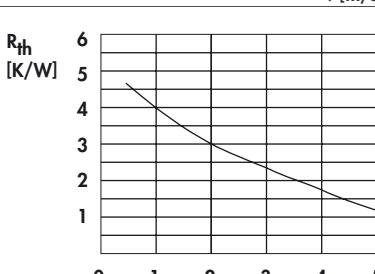
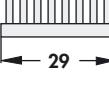
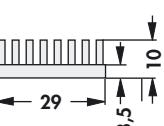
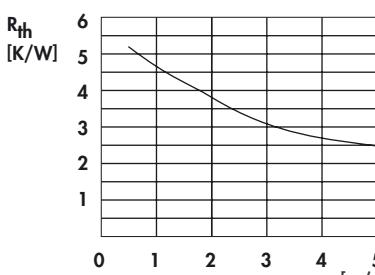
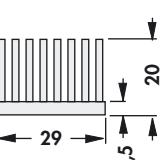
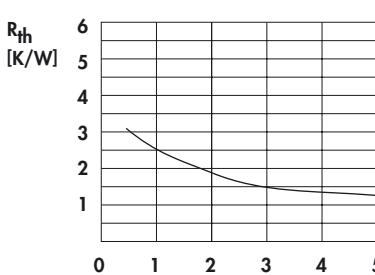
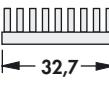
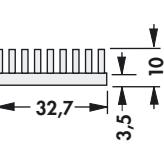
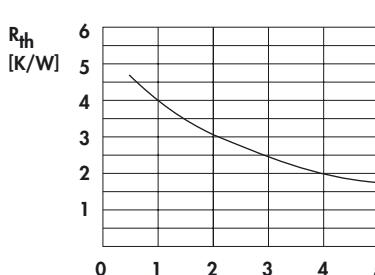
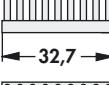
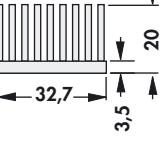
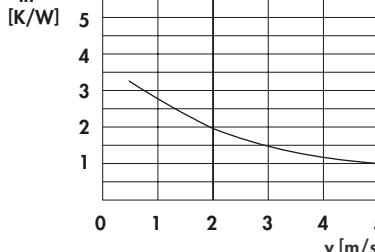
K

L

M

art. no.			R_{th} [K/W]
ICK S 14 x 14 x 10 WLF ... 14 x 14 weight: 1.9g	 		
ICK S 17 x 17 x 15 WLF ... 17 x 17 weight: 4.7g	 		
ICK S 17 x 17 x 20 WLF ... 17 x 17 weight: 5.6g	 		
ICK S 18 x 18 x 6,5 WLF ... 18 x 18 weight: 2.5g	 		
ICK S 18 x 18 x 10 WLF ... 18 x 18 weight: 3.1g	 		
ICK S 25 x 25 x 6,5 WLF ... 25 x 25 weight: 4g	 		

Pin heatsinks

art. no.			
ICK S 25 x 25 x 12,5 WLF ... 25 x 25 weight: 6g			
ICK S 25 x 25 x 18,5 WLF ... 25 x 25 weight: 7g			
ICK S 29 x 29 x 10 WLF ... 29 x 29 weight: 11g			
ICK S 29 x 29 x 20 WLF ... 29 x 29 weight: 15g			
ICK S 32 x 32 x 10 WLF ... 32 x 32 weight: 14g			
ICK S 32 x 32 x 20 WLF ... 32 x 32 weight: 19g			

Pin heatsinks

A

B

C

D

E

F

G

H

I

K

L

M

art. no.			R_{th} [K/W]
ICK S 36 x 36 x 10 WLF ... 36 x 36 weight: 17g			
ICK S 36 x 36 x 15 WLF ... 36 x 36 weight: 20g			
ICK S 36 x 36 x 20 WLF ... 36 x 36 weight: 24g			
ICK S 40 x 40 x 10 WLF ... 40 x 40 weight: 21g			
ICK S 40 x 40 x 20 WLF ... 40 x 40 weight: 29g			
ICK S 40 x 40 x 25 WLF ... 40 x 40 weight: 37g			

Processor overview

Mounts

SMD-heatsinks

Thermally conductive foil

→ B 2 - 10

→ E 42 - 46

→ B 45 - 47

→ E 5 - 13

Thermal conductive paste

Thermal conductive glue

Heatsinks for LEDs

Technical introduction

→ E 19 - 20

→ E 21 - 22

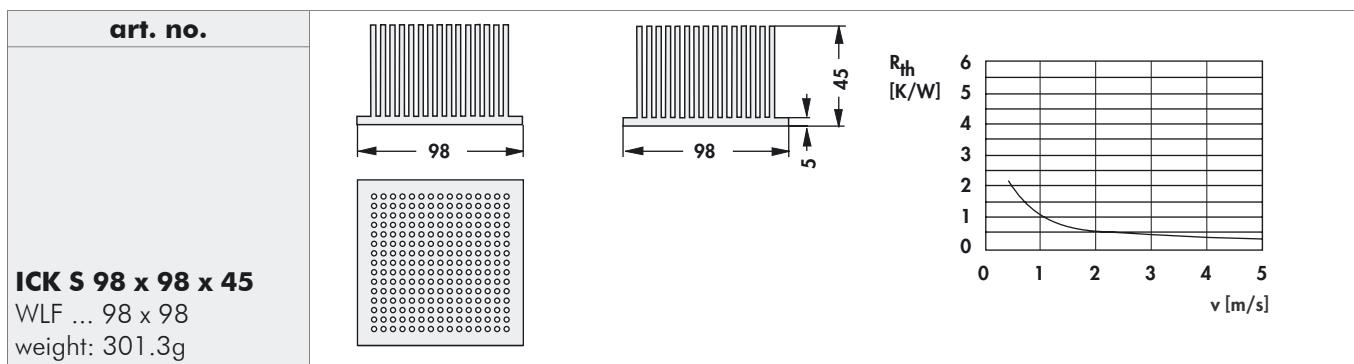
→ B 32 - 43

→ A 2 - 7

Pin heatsinks

art. no.			
ICK S 45 x 45 x 10 WLF ... 45 x 45 weight: 26g			
ICK S 45 x 45 x 20 WLF ... 45 x 45 weight: 36g			
ICK S 50 x 50 x 20 WLF ... 50 x 50 weight: 43g			
ICK S 50 x 50 x 25 WLF ... 50 x 50 weight: 49g			
ICK S 50 x 50 x 40 WLF ... 50 x 50 weight: 80.05g			
ICK S 50 x 50 x 50 WLF ... 50 x 50 weight: 95.51g			

Pin heatsinks



Pin heatsinks

Dome

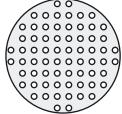
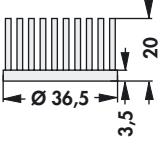
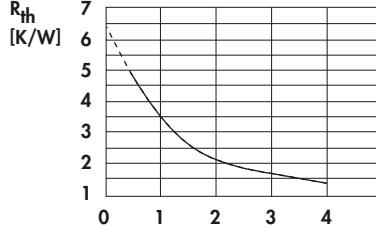
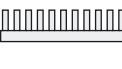
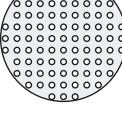
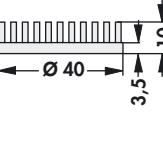
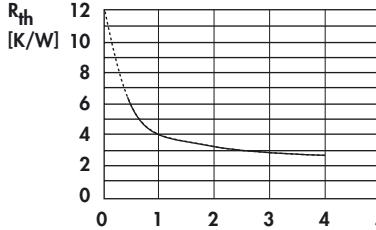
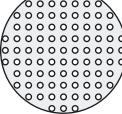
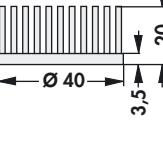
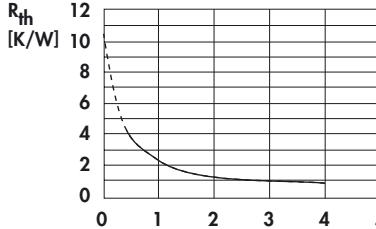
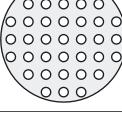
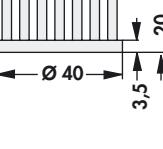
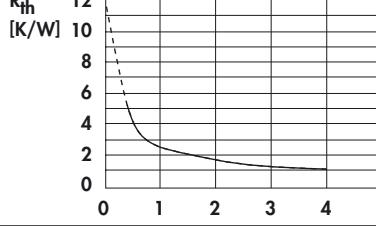
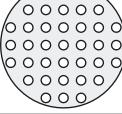
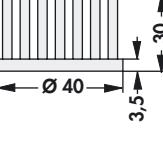
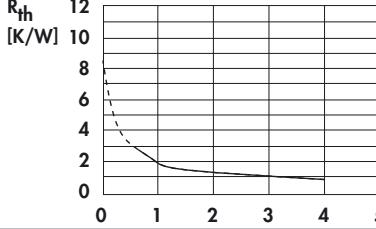
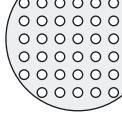
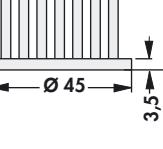
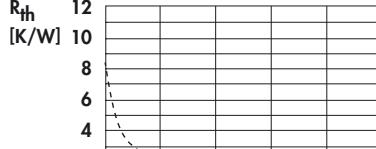
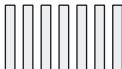
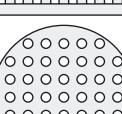
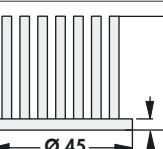
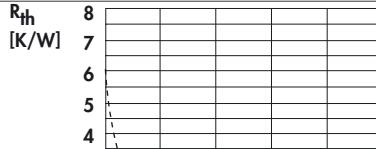
art. no.	Dimensions	Graph														
ICK S D 12 x 12 x 7,5 WLF ... 12 x 12 weight: 1.8g		<table border="1"> <caption>Data points estimated from graph for ICK S D 12x12x7,5</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>10.0</td></tr> <tr><td>1.0</td><td>7.0</td></tr> <tr><td>2.0</td><td>4.5</td></tr> <tr><td>3.0</td><td>3.5</td></tr> <tr><td>4.0</td><td>3.0</td></tr> <tr><td>5.0</td><td>2.8</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0.5	10.0	1.0	7.0	2.0	4.5	3.0	3.5	4.0	3.0	5.0	2.8
v [m/s]	R _{th} [K/W]															
0.5	10.0															
1.0	7.0															
2.0	4.5															
3.0	3.5															
4.0	3.0															
5.0	2.8															
ICK S D 18 x 12 x 7,5 WLF ... 12 x 18 weight: 2.7g		<table border="1"> <caption>Data points estimated from graph for ICK S D 18x12x7,5</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>10.0</td></tr> <tr><td>1.0</td><td>7.0</td></tr> <tr><td>2.0</td><td>5.0</td></tr> <tr><td>3.0</td><td>4.0</td></tr> <tr><td>4.0</td><td>3.5</td></tr> <tr><td>5.0</td><td>3.3</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0.5	10.0	1.0	7.0	2.0	5.0	3.0	4.0	4.0	3.5	5.0	3.3
v [m/s]	R _{th} [K/W]															
0.5	10.0															
1.0	7.0															
2.0	5.0															
3.0	4.0															
4.0	3.5															
5.0	3.3															
ICK S D 24 x 18 x 7,5 WLF ... 18 x 24 weight: 4.4g		<table border="1"> <caption>Data points estimated from graph for ICK S D 24x18x7,5</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>10.0</td></tr> <tr><td>1.0</td><td>7.0</td></tr> <tr><td>2.0</td><td>4.5</td></tr> <tr><td>3.0</td><td>3.5</td></tr> <tr><td>4.0</td><td>3.0</td></tr> <tr><td>5.0</td><td>2.8</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0.5	10.0	1.0	7.0	2.0	4.5	3.0	3.5	4.0	3.0	5.0	2.8
v [m/s]	R _{th} [K/W]															
0.5	10.0															
1.0	7.0															
2.0	4.5															
3.0	3.5															
4.0	3.0															
5.0	2.8															
ICK S D 98 x 98 x 10 WLF ... 98 x 98 weight: 154g		<table border="1"> <caption>Data points estimated from graph for ICK S D 98x98x10</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>10.0</td></tr> <tr><td>1.0</td><td>4.0</td></tr> <tr><td>2.0</td><td>2.5</td></tr> <tr><td>3.0</td><td>2.0</td></tr> <tr><td>4.0</td><td>1.8</td></tr> <tr><td>5.0</td><td>1.7</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0.5	10.0	1.0	4.0	2.0	2.5	3.0	2.0	4.0	1.8	5.0	1.7
v [m/s]	R _{th} [K/W]															
0.5	10.0															
1.0	4.0															
2.0	2.5															
3.0	2.0															
4.0	1.8															
5.0	1.7															

Pin heatsinks

Round

art. no.	Diagram	Diagram	Graph
ICK S R 28,5 x 6,5 WLF ... D 28,5 weight: 4.41g			
ICK S R 28,5 x 10 WLF ... D 28,5 weight: 5.16g			
ICK S R 28,5 x 12,5 WLF ... D 28,5 weight: 5.7g			
ICK S R 28,5 x 18,5 WLF ... D 28,5 weight: 6.98g			
ICK S R 32,5 x 10 WLF ... D 32 weight: 9.7g			
ICK S R 32,5 x 20 WLF ... D 32 weight: 13.8g			

Pin heatsinks

art. no.	 		
ICK S R 36,5 x 20 WLF ... D 36,5 weight: 17.59g			
art. no.	 		
ICK S R 40 x 10 WLF ... D 40 weight: 15.85g			
art. no.	 		
ICK S R 40 x 20 WLF ... D 40 weight: 21.96g			
art. no.	 		
ICK S R A 40 x 20 WLF ... D 40 weight: 22.18g			
art. no.	 		
ICK S R 40 x 30 WLF ... D 40 weight: 29.24g			
art. no.	 		
ICK S R 45 x 30 WLF ... D 45 weight: 37.78g			
art. no.	 		
ICK S R 45 x 45 WLF ... D 45 weight: 50.67g			

Pin heatsinks

A

B

C

D

E

F

G

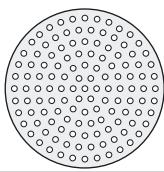
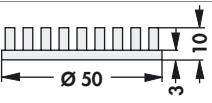
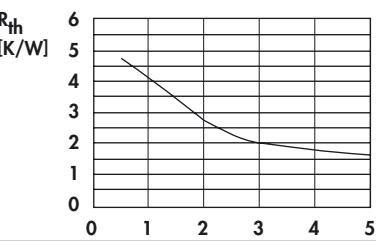
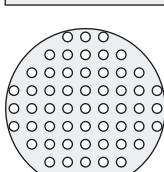
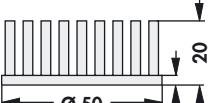
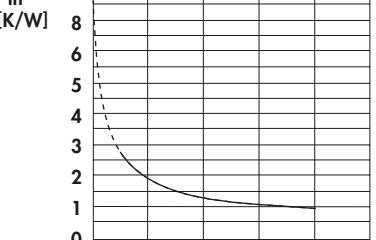
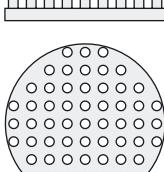
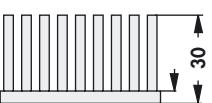
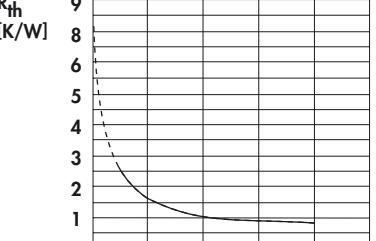
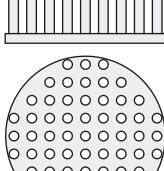
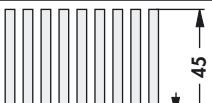
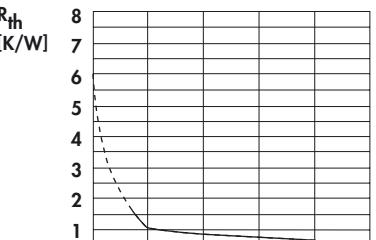
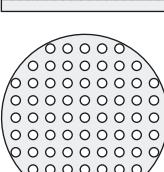
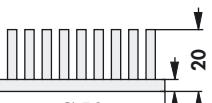
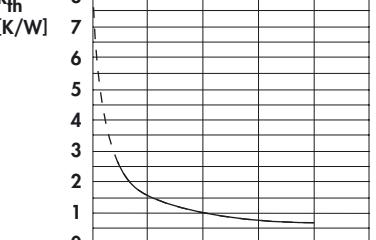
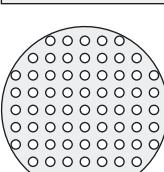
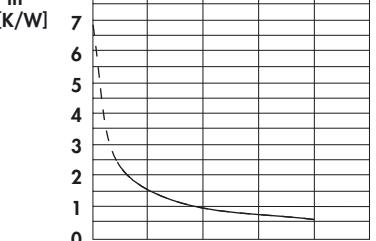
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I

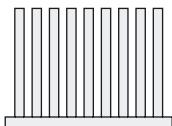
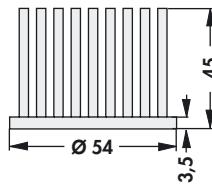
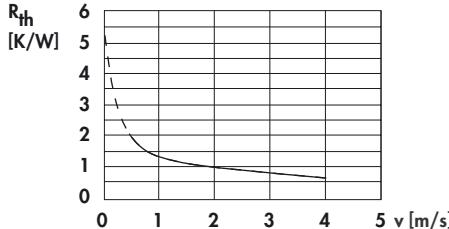
L

M

N

art. no.			R_{th} [K/W]	
ICK S R 50 x 10 WLF ... D 50 weight: 22g	 			v [m/s]
ICK S R 50 x 20 WLF ... D 50 weight: 34.39g	 			v [m/s]
ICK S R 50 x 30 WLF ... D 50 weight: 45.28g	 			v [m/s]
ICK S R 50 x 45 WLF ... D 50 weight: 61.59g	 			v [m/s]
ICK S R 54 x 20 WLF ... D 54 weight: 40.94g	 			v [m/s]
ICK S R 54 x 30 WLF ... D 54 weight: 54.11g	 			v [m/s]

Pin heatsinks

art. no.			
ICK S R 54 x 45 WLF ... D 54 weight: 73.86g			

D

E

F

G

H

I

K

L

M

N

B 31**Processor overview****Mounts****SMD-heatsinks****Thermally conductive foil**→ **B 2 – 10**→ **E 42 – 46**→ **B 45 – 47**→ **E 5 – 13****Thermal conductive paste****Thermal conductive glue****Heatsinks for LEDs****Technical introduction**→ **E 19 – 20**→ **E 21 – 22**→ **B 32 – 43**→ **A 2 – 7**

Heatsinks for LEDs



- suitable for free or forced convection
- heat sink dimensions are fitted to the respective LED typ
- simple mounting by using thermally conductive adhesive foil, glue or screw mounting
- specific versions on customer's request
- double-sided adhesive thermal conductive foil **WLF ... → E 7**
- special design, surfaces and modification to customer specification on request
- surface:** black anodised

art. no.	Diagram	Dimensions	$R_{th} = 18,58 \text{ K/W}$
ICK LED R 23,5 x 14 WLF ... D 23			
ICK LED R 23,5 x 14 G WLF ... D 23			
ICK LED R 27 x 10 WLF ... D 27			$R_{th} = 17,69 \text{ K/W}$
ICK LED R 27 x 10 G WLF ... D 27			
ICK LED R 28 x 15 WLF ... D 28			$R_{th} = 15,24 \text{ K/W}$

Pin heatsinks Ø

Mounts

Thermally conductive foil

Thermal conductive paste

→ **B 28 – 31**

→ **E 42 – 46**

→ **E 5 – 13**

→ **E 19 – 20**

Thermal conductive glue

Drilling pattern for Solid State Relais

Heatsink profile-overview

Technical introduction

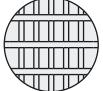
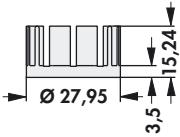
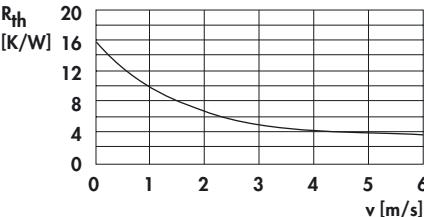
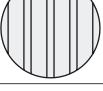
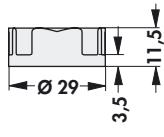
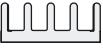
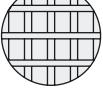
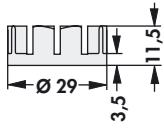
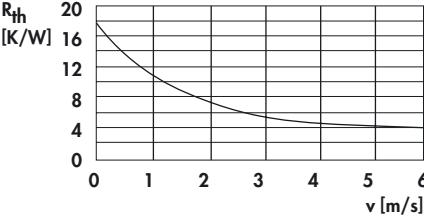
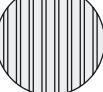
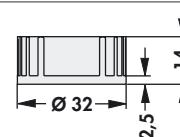
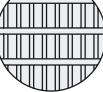
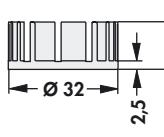
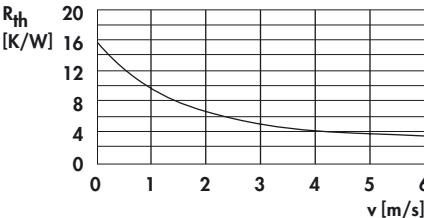
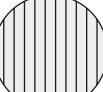
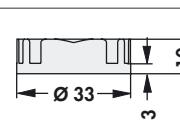
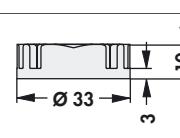
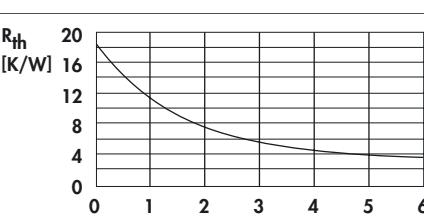
→ **E 21 – 22**

→ **A 21**

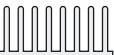
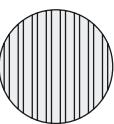
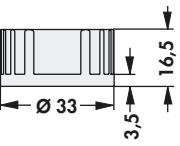
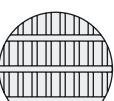
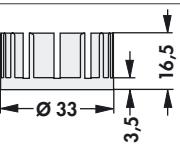
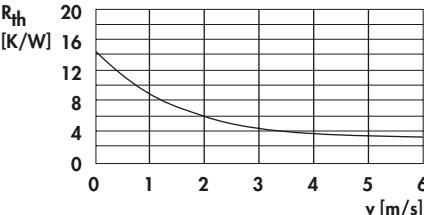
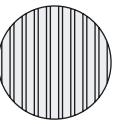
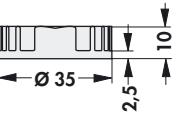
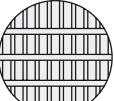
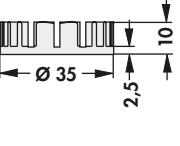
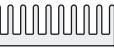
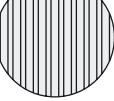
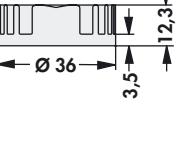
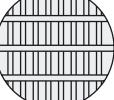
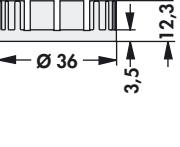
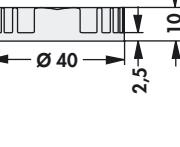
→ **A 13 – 17**

→ **A 2 – 7**

Heatsinks for LEDs

art. no. ICK LED R 28 x 15 G WLF ... D 28	 		
art. no. ICK LED R 29 x 11,5 WLF ... D 29	 		$R_{th} = 17,26 \text{ K/W}$
art. no. ICK LED R 29 x 11,5 G WLF ... D 29	 		
art. no. ICK LED R 32 x 14 WLF ... D 32	 		$R_{th} = 15,23 \text{ K/W}$
art. no. ICK LED R 32 x 14 G WLF ... D 32	 		
art. no. ICK LED R 33 x 10 WLF ... D 33	 		$R_{th} = 17,6 \text{ K/W}$
art. no. ICK LED R 33 x 10 G WLF ... D 33	 		

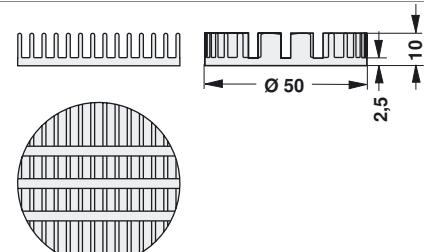
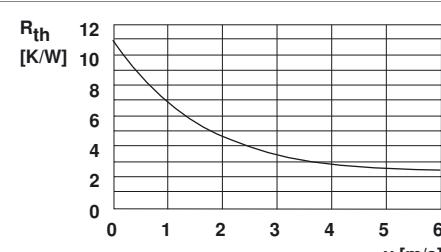
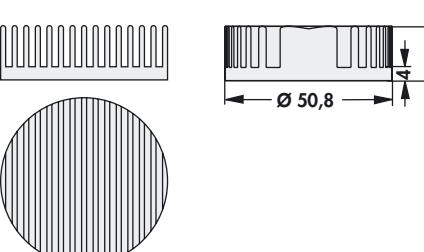
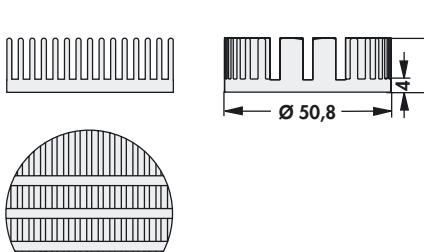
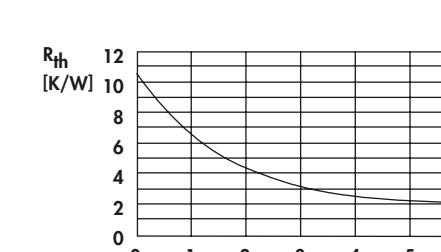
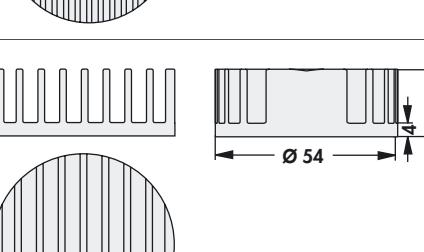
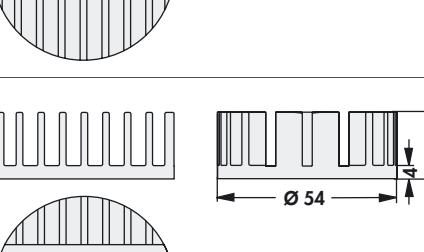
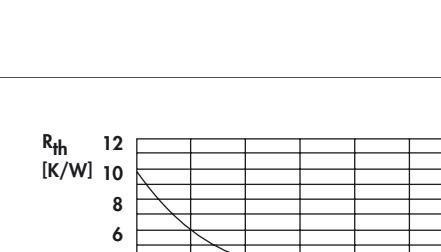
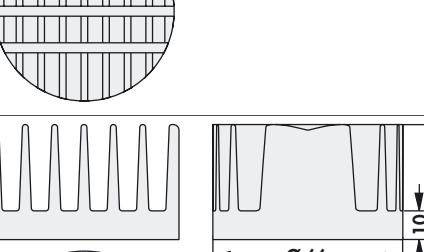
Heatsinks for LEDs

art. no.  ICK LED R 33 x 16,5 WLF ... D 33	  $R_{th} = 13,87 \text{ K/W}$
art. no.  ICK LED R 33 x 16,5 G WLF ... D 33	  
art. no.  ICK LED R 35 x 10 WLF ... D 35	  $R_{th} = 16,9 \text{ K/W}$
art. no.  ICK LED R 35 x 10 G WLF ... D 35	  
art. no.  ICK LED R 36 x 12 WLF ... D 36	  $R_{th} = 12,88 \text{ K/W}$
art. no.  ICK LED R 36 x 12 G WLF ... D 36	  
art. no.  ICK LED R 40 x 10 WLF ... D 40	  $R_{th} = 12,28 \text{ K/W}$

Heatsinks for LEDs

art. no.	Diagram	Diagram	R_{th} [K/W]
ICK LED R 40 x 10 G WLF ... D 40			
ICK LED R 40 x 27 WLF ... D 40			$R_{th} = 9,41 \text{ K/W}$
ICK LED R 40 x 27 G WLF ... D 40			
ICK LED R 45,7 x 16,5 WLF ... D 45			$R_{th} = 10,46 \text{ K/W}$
ICK LED R 45,7 x 16,5 G WLF ... D 45			
ICK LED R 50 x 10 WLF ... D 50			$R_{th} = 10,57 \text{ K/W}$

Heatsinks for LEDs

art. no. ICK LED R 50 x 10 G WLF ... D 50	 <p>Ø 50 2,5 10</p>	 <table border="1"> <caption>Data points estimated from graph</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0</td><td>10.5</td></tr> <tr><td>1</td><td>7.5</td></tr> <tr><td>2</td><td>5.5</td></tr> <tr><td>3</td><td>4.5</td></tr> <tr><td>4</td><td>3.8</td></tr> <tr><td>5</td><td>3.2</td></tr> <tr><td>6</td><td>2.8</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0	10.5	1	7.5	2	5.5	3	4.5	4	3.8	5	3.2	6	2.8
v [m/s]	R _{th} [K/W]																	
0	10.5																	
1	7.5																	
2	5.5																	
3	4.5																	
4	3.8																	
5	3.2																	
6	2.8																	
art. no. ICK LED R 50,8 x 16,5 WLF ... D 50	 <p>Ø 50,8 4 16,51</p>	$R_{th} = 10,17 \text{ K/W}$																
art. no. ICK LED R 50,8 x 16,5 G WLF ... D 50	 <p>Ø 50,8 4 16,51</p>	 <table border="1"> <caption>Data points estimated from graph</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0</td><td>10.5</td></tr> <tr><td>1</td><td>7.5</td></tr> <tr><td>2</td><td>5.5</td></tr> <tr><td>3</td><td>4.5</td></tr> <tr><td>4</td><td>3.8</td></tr> <tr><td>5</td><td>3.2</td></tr> <tr><td>6</td><td>2.8</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0	10.5	1	7.5	2	5.5	3	4.5	4	3.8	5	3.2	6	2.8
v [m/s]	R _{th} [K/W]																	
0	10.5																	
1	7.5																	
2	5.5																	
3	4.5																	
4	3.8																	
5	3.2																	
6	2.8																	
art. no. ICK LED R 54 x 20 WLF ... D 54	 <p>Ø 54 4 20</p>	$R_{th} = 9,48 \text{ K/W}$																
art. no. ICK LED R 54 x 20 G WLF ... D 54	 <p>Ø 54 4 20</p>	 <table border="1"> <caption>Data points estimated from graph</caption> <thead> <tr> <th>v [m/s]</th> <th>R_{th} [K/W]</th> </tr> </thead> <tbody> <tr><td>0</td><td>10.5</td></tr> <tr><td>1</td><td>7.5</td></tr> <tr><td>2</td><td>5.5</td></tr> <tr><td>3</td><td>4.5</td></tr> <tr><td>4</td><td>3.8</td></tr> <tr><td>5</td><td>3.2</td></tr> <tr><td>6</td><td>2.8</td></tr> </tbody> </table>	v [m/s]	R _{th} [K/W]	0	10.5	1	7.5	2	5.5	3	4.5	4	3.8	5	3.2	6	2.8
v [m/s]	R _{th} [K/W]																	
0	10.5																	
1	7.5																	
2	5.5																	
3	4.5																	
4	3.8																	
5	3.2																	
6	2.8																	
art. no. ICK LED R 66 x 40 WLF ... D 66	 <p>Ø 66 10 40</p>	$R_{th} = 3,2 \text{ K/W}$																

Pin heatsinks Ø

Mounts

Thermally conductive foil

Thermal conductive paste

→ B 28 – 31

→ E 42 – 46

→ E 5 – 13

→ E 19 – 20

Thermal conductive glue

Drilling pattern for Solid State Relais

Heatsink profile-overview

Technical introduction

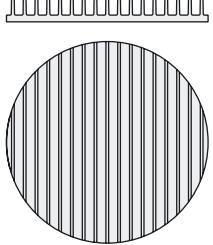
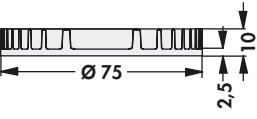
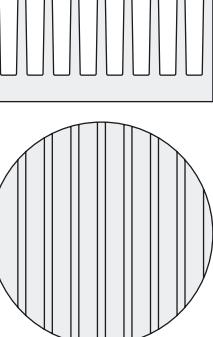
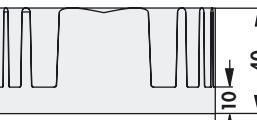
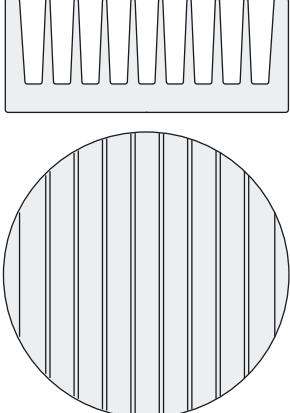
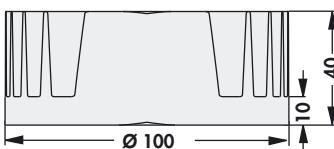
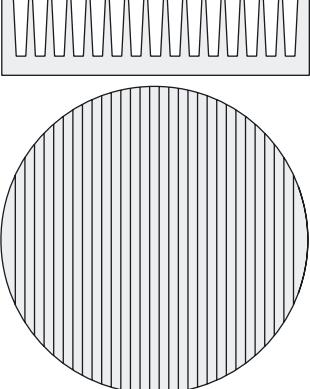
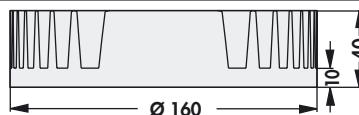
→ E 21 – 22

→ A 21

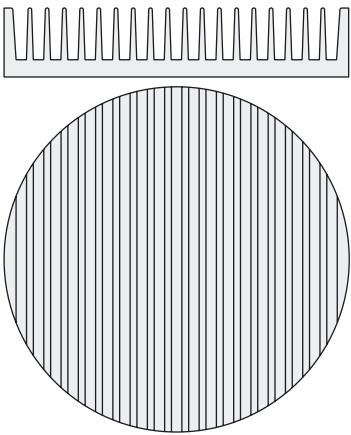
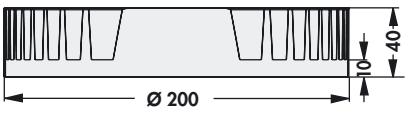
→ A 13 – 17

→ A 2 – 7

Heatsinks for LEDs

art. no. ICK LED R 75 x 10 WLF ... D 75	 	$R_{th} = 5,2 \text{ K/W}$
art. no. ICK LED R 84 x 40 WLF ... D 84	 	$R_{th} = 2,5 \text{ K/W}$
art. no. ICK LED R 100 x 40 WLF ... D 100	 	$R_{th} = 2 \text{ K/W}$
art. no. ICK LED R 160 x 40 WLF ... D 160	 	$R_{th} = 1,4 \text{ K/W}$

Heatsinks for LEDs

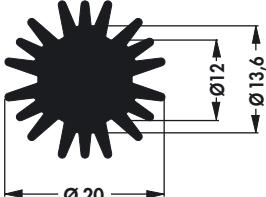
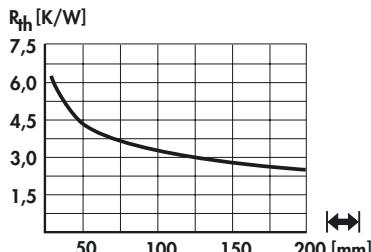
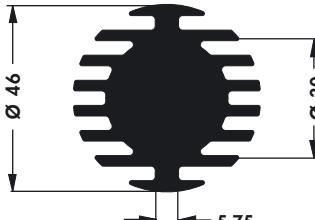
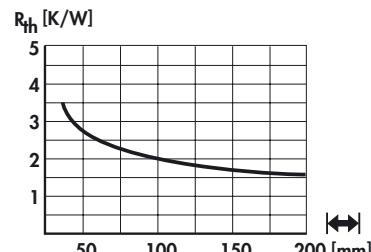
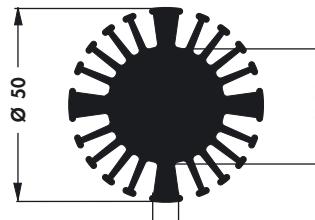
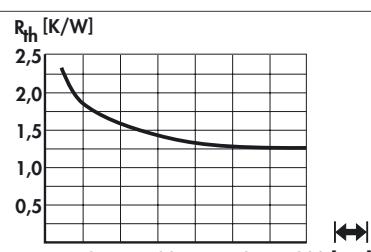
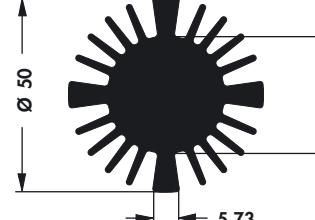
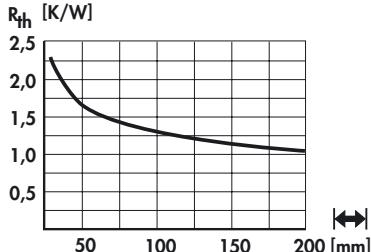
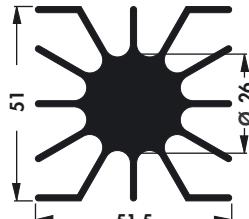
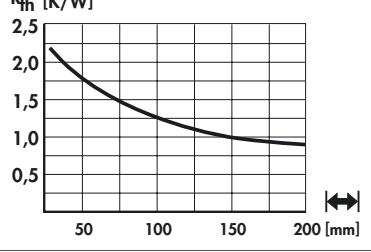
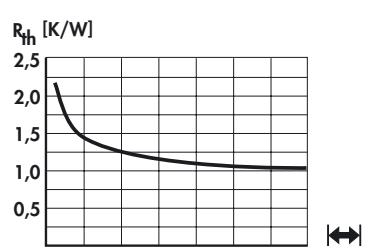
art. no.			$R_{th} = 1 \text{ K/W}$
ICK LED R 200 x 40 WLF ... D 200			

Pin heatsinks Ø
Mounts
Thermally conductive foil
Thermal conductive paste

→ B 28 – 31 Thermal conductive glue → E 21 – 22
→ E 42 – 46 Drilling pattern for Solid State Relais → A 21
→ E 5 – 13 Heatsink profile-overview → A 13 – 17
→ E 19 – 20 Technical introduction → A 2 – 7

Heatsinks for LEDs

– special design, surfaces and modification to customer specification on request

art. no.	Dimensions [mm]	R_{th} [K/W]
SK 585 ...		
SK 598 ...		
SK 602 ...		
SK 577 ...		
SK 46 ...		
SK 578 ...		
please indicate:	... 	10 15 20 25 37.5 50 1000 mm
surface:		black anodised

B 39

Pin heatsinks Ø

Mounts

Thermally conductive foil

Thermal conductive paste

→ B 28 – 31

→ E 42 – 46

→ E 5 – 13

→ E 19 – 20

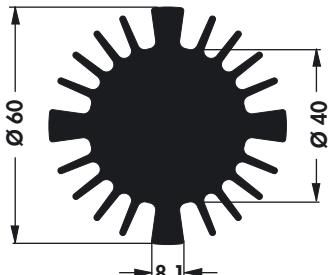
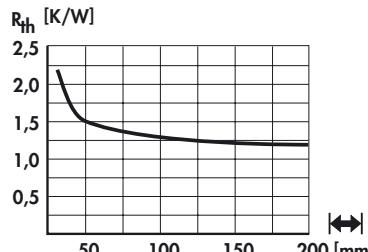
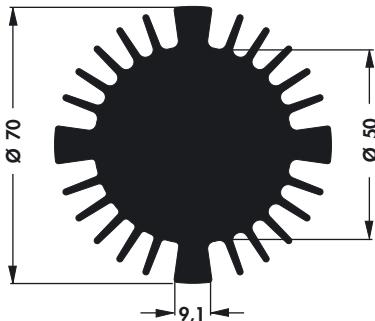
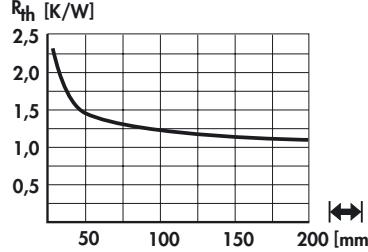
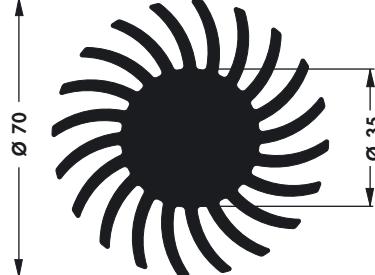
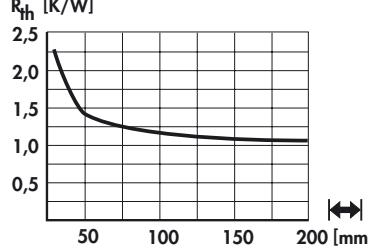
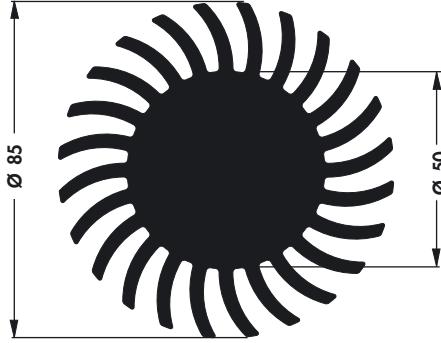
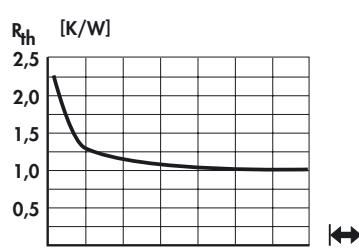
Thermal conductive glue

Drilling pattern for Solid State Relais → A 21

Heatsink profile-overview → A 13 – 17

Technical introduction → A 2 – 7

Heatsinks for LEDs

art. no. SK 569 ...		
art. no. SK 570 ...		
art. no. SK 571 ...		
art. no. SK 572 ...		
please indicate: ...  10 15 20 25 37,5 50 1000 mm		
surface: black anodised		

Pin heatsinks Ø

Mounts

Thermally conductive foil

Thermal conductive paste

→ B 28 – 31

→ E 42 – 46

→ E 5 – 13

→ E 19 – 20

Thermal conductive glue

Drilling pattern for Solid State Relais

Heatsink profile-overview

Technical introduction

→ E 21 – 22

→ A 21

→ A 13 – 17

→ A 2 – 7

Heatsinks for LEDs

B

C

D

E

F

G

H

I

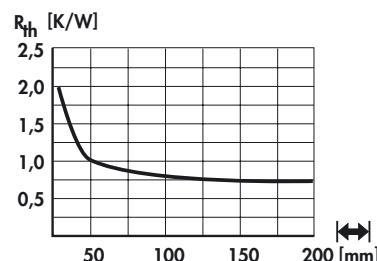
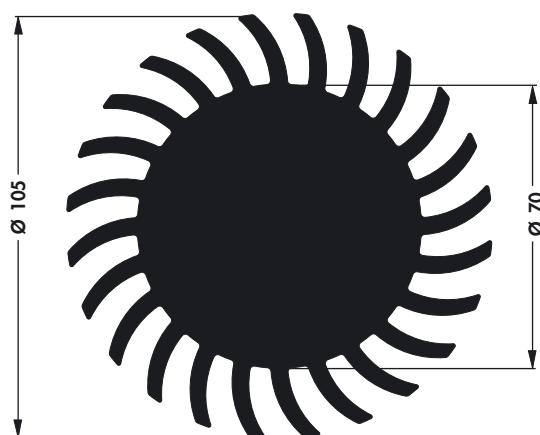
K

L

M

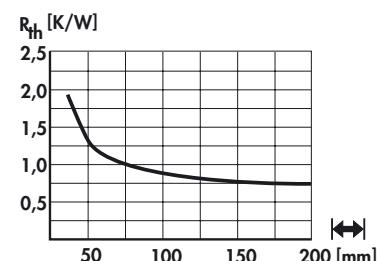
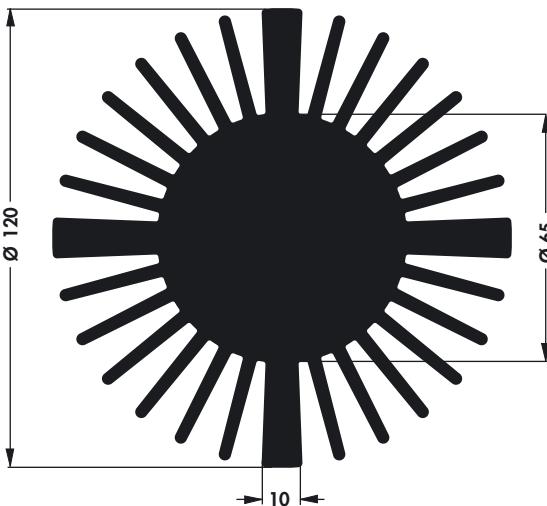
N

art. no.
SK 584 ...



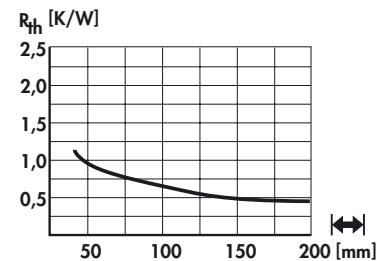
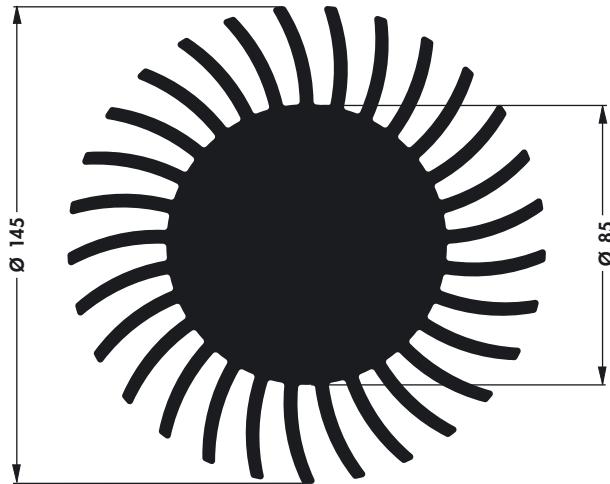
please indicate: ... ↗
10 15 20 25 37,5 50 1000 mm

art. no.
SK 599 ...



SK 599 ...

art. no.
SK 592 ...



please indicate: ... ↗
10 15 20 25 37,5 50 75 100 150 1000 mm

surface: black anodised

B 41

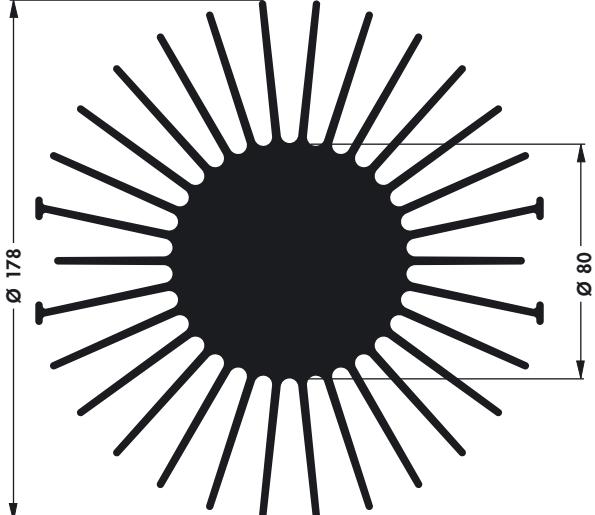
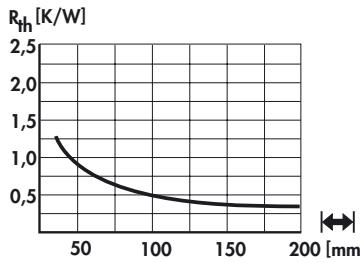
Pin heatsinks Ø
Mounts
Thermally conductive foil
Thermal conductive paste

→ B 28 – 31
→ E 42 – 46
→ E 5 – 13
→ E 19 – 20

Thermal conductive glue
Drilling pattern for Solid State Relais
Heatsink profile-overview
Technical introduction

→ E 21 – 22
→ A 21
→ A 13 – 17
→ A 2 – 7

Heatsinks for LEDs

art. no. SK 590 ...		
please indicate: ... 	10 15 20 25 37.5 50 75 100 150 1000 mm	
surface:	black anodised	

Pin heatsinks Ø
Mounts
Thermally conductive foil
Thermal conductive paste

→ **B 28 – 31**
 → **E 42 – 46**
 → **E 5 – 13**
 → **E 19 – 20**

Thermal conductive glue
Drilling pattern for Solid State Relais
Heatsink profile-overview
Technical introduction

→ **E 21 – 22**
 → **A 21**
 → **A 13 – 17**
 → **A 2 – 7**

Heatsinks for LEDs

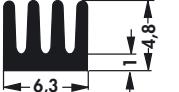
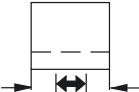
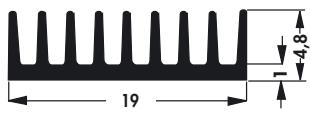
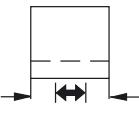
- heatsink specially made for flexible and fixed LED Line Modules
- insertion possibility of metal sheets and sheets of Plexiglas
- customer specified designs, lengths and treatments upon request

art. no.	SK LED 1	R _{th} [K/W]
art. no.	SK LED 2	R _{th} [K/W]
art. no.	SK LED 3	R _{th} [K/W]
please indicate:	... 50 75 100 150 1000 mm	... surface SA = black anodised ME = natural colour anodised

Heatsinks for DIL-IC and PLCC

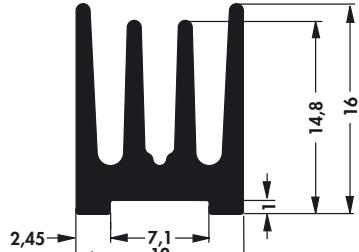
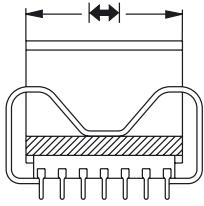
Heatsinks for DIL-IC

- other length on request

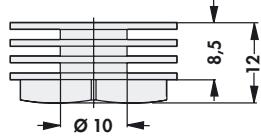
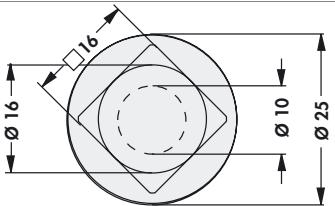
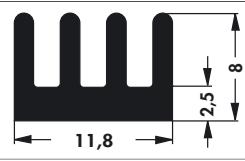
						
art. no.	cases	↔ [mm]	R _{th} [K/W]	art. no.	cases	↔ [mm]
ICK 6 8 L	6/8 contacts	8.5	83	ICK 20 L	20 contacts	25.0
ICK 14 16 L	14/16 contacts	19.0	46			
						
art. no.	cases	↔ [mm]	R _{th} [K/W]	art. no.	cases	↔ [mm]
ICK 14 16 B	14/16 contacts	6.3	54.0	ICK 36 B	36 contacts	47.0
ICK 24 B	24 contacts	33.0	19.4	ICK 40 B	40 contacts	51.0
ICK 28 B	28 contacts	37.0	18.5	ICK 1000 B	—	1000.0
surface:	black anodised					

- with clip

- other length on request

						
art. no.	cases	↔ [mm]	R _{th} [K/W]	art. no.	cases	↔ [mm]
ICK 14 H	14 contacts	18.0	20	ICK 18 H	18 contacts	23.0
ICK 16 H	16 contacts	20.5	18	ICK 1000 H	—	1000.0
surface:	black anodised					

Heatsinks for PLCC

		
art. no.	↔ [mm]	R _{th} [K/W]
ICK R	25	19
		
art. no.	↔ [mm]	R _{th} [K/W]
ICK PLCC 28	11.8	25
surface:	black anodised	

Extruded heatsinks

Pin heatsinks for IC

Insulating clamping parts

Thermal conductive glue

→ A 22 - 83

→ B 21 - 27

→ E 43

→ E 21 - 22

Thermally conductive foil

Thermal conductive paste

Hole pattern

Technical introduction

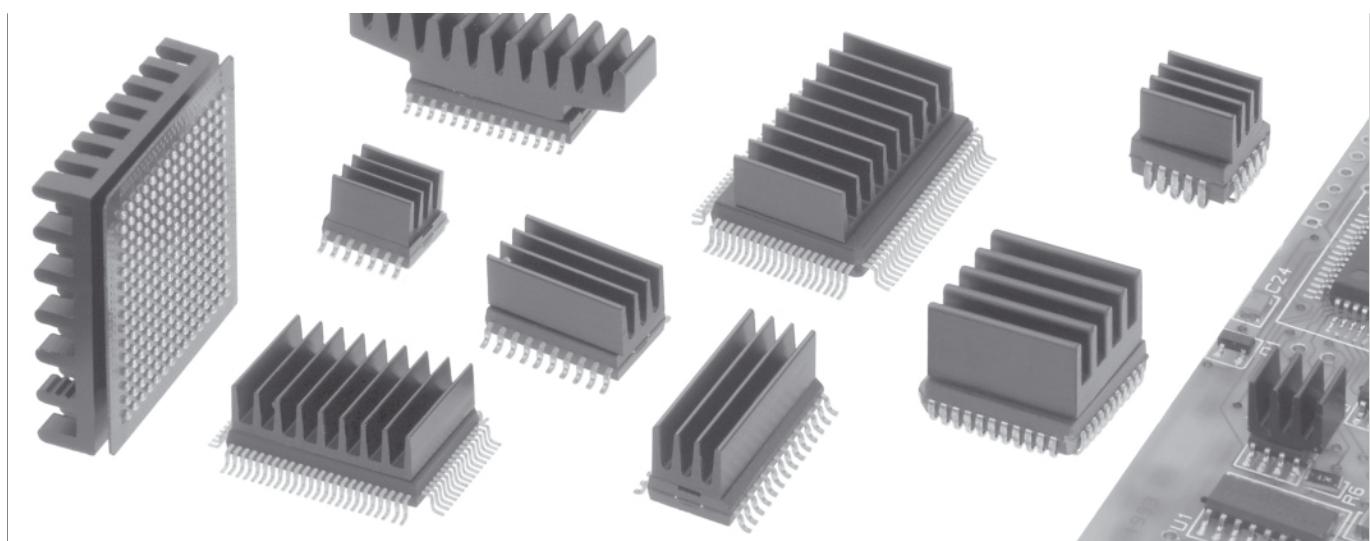
→ E 5 - 13

→ E 19 - 20

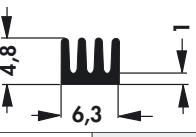
→ A 21

→ A 2 - 7

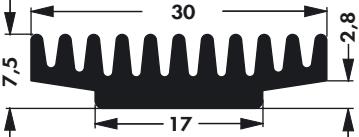
Heatsinks for SMD



- particularly suitable for SMD components
- low profile
- reduced weight
- effective heat dissipation
- can be glued directly onto the component
- solderable versions
- customer specific versions on request
- special packaging like tape and reel, bar magazin, tray etc. on request

					
art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD A 5 ...	5	123	ICK SMD A 13 ...	13	63
ICK SMD A 8 ...	8	87	ICK SMD A 17 ...	17	51
ICK SMD A 10 ...	10	75	ICK SMD A 22 ...	22	34

					
art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD B 5 ...	5	56	ICK SMD B 13 SA	13	29
ICK SMD B 7 SA	7	47	ICK SMD B 19 ...	19	22
ICK SMD B 10 SA	10	35			

					
art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD C 7 SA	7	33	ICK SMD C 17 ...	17	17
ICK SMD C 10 SA	10	26			

please indicate: ... surface
 SA = black anodised
 MI = solderable surface

Heatsinks for SMD

A

B

C

D

E

F

G

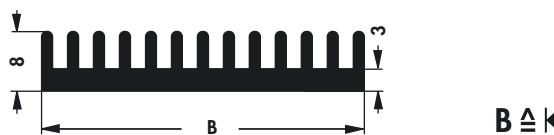
H

I

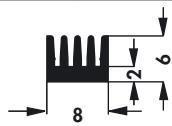
K

L

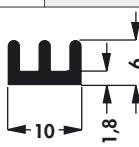
M



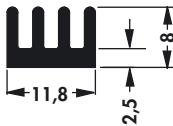
art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD E 15 SA	15.3	27	ICK SMD E 29 SA	29.0	18
ICK SMD E 22 SA	22.3	21			



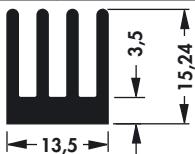
art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD F 8 ...	8	74	ICK SMD F 19 ...	19	37
ICK SMD F 10 ...	10	71	ICK SMD F 21 ...	21	33
ICK SMD F 17 SA	17	42	ICK SMD F 26 ...	26	26



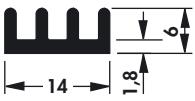
art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD G 8 MI	8	73	ICK SMD G 17 SA	17	41
ICK SMD G 10 ...	10	70	ICK SMD G 19 SA	19	36
ICK SMD G 13 SA	13	61	ICK SMD G 21 ...	21	32



art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD H 8 ...	8	33.0	ICK SMD H 19 SA	19	23.0
ICK SMD H 10 ...	10	29.0	ICK SMD H 25 ...	25	20.0
ICK SMD H 17 ...	17	24.5			



art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD K 8 ...	8	25.6	ICK SMD K 17 ...	17	19.4
ICK SMD K 10 SA	10	23.4	ICK SMD K 19 ...	19	18.0
ICK SMD K 13 ...	13	21.5	ICK SMD K 21 ...	21	16.5



art. no.	↔ [mm]	R _{th} [K/W]	art. no.	↔ [mm]	R _{th} [K/W]
ICK SMD M 8 SA	8	72	ICK SMD M 19 SA	19	35
ICK SMD M 10 SA	10	66	ICK SMD M 21 SA	21	31
ICK SMD M 17 MI	17	40			

please indicate: ... surface
SA = black anodised
MI = solderable surface

Sample box SMD heatsinks

- contains an assortment of SMD heatsinks with anodised and solderable surface as well as thermally conductive glue (**WLK**) and double-sided adhesive thermal foil (**WLF**)



**art. no.
ICK SMD BOX 1**

B 47

**Extruded heatsinks
Pin heatsinks for IC
Insulating clamping parts
Thermal conductive glue**

→ **A 22 – 83
B 21 – 27
E 43
E 21 – 22**

**Thermally conductive foil
Thermal conductive paste
Hole pattern
Technical introduction**

→ **E 5 – 13
E 19 – 20
A 21
A 2 – 7**

Passive heatsinks for processors

A

B

C

D

E

F

G

H

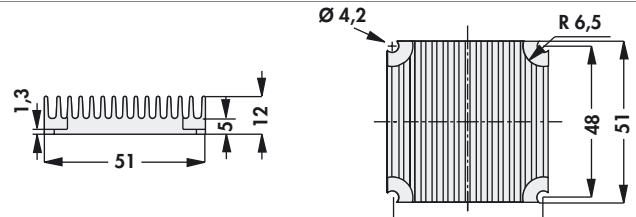
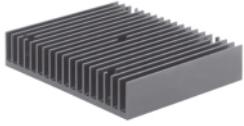
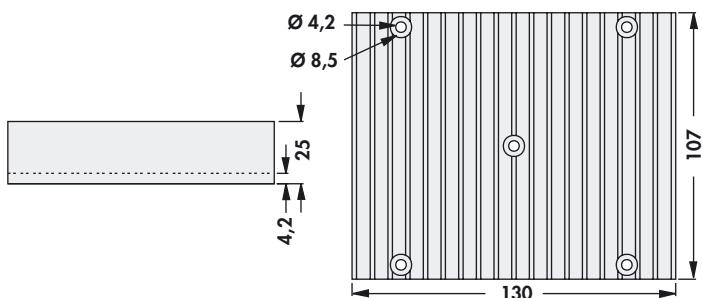
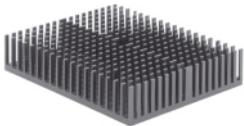
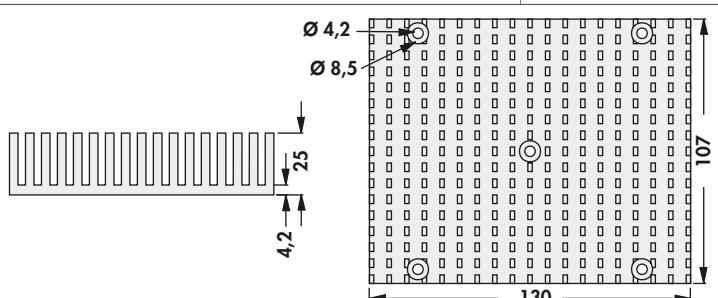
I

K

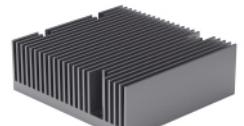
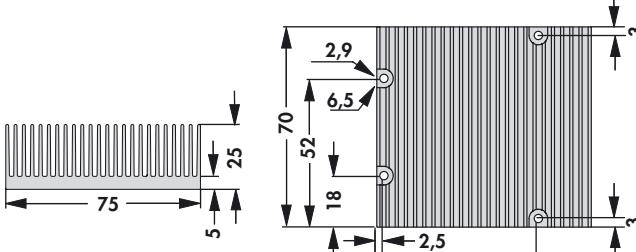
L

M

N

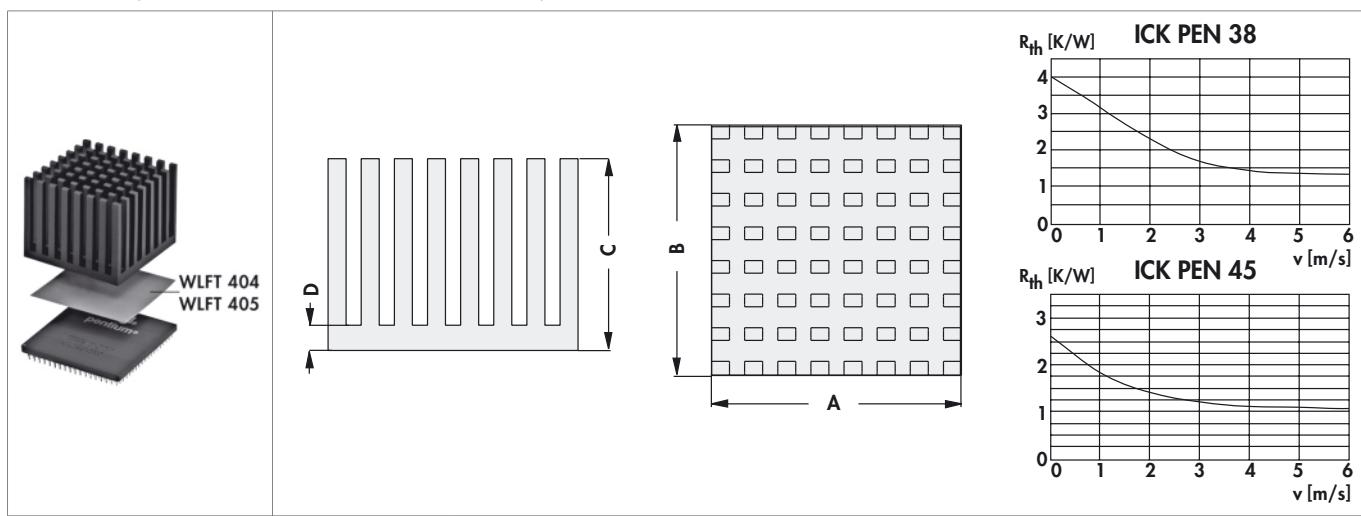
		art. no.	R_{th} [K/W]	suitable for processor type
ICK PPC 51	8.1			Power PC
		art. no.	R_{th} [K/W]	suitable for processor type
ICK PEN 3 XE	2			Intel® Pentium® III-Xeon™ Slot II Format
		art. no.	R_{th} [K/W]	suitable for processor type
ICK PEN 3 XE 1	1.8			Intel® Pentium® III-Xeon™ Slot II Format

Heatsinks specially for Q7 "Embedded-Boards"

		art. no.	R_{th} [K/W]	suitable for processor type
ICK EM 25	3.9			Q7 Board

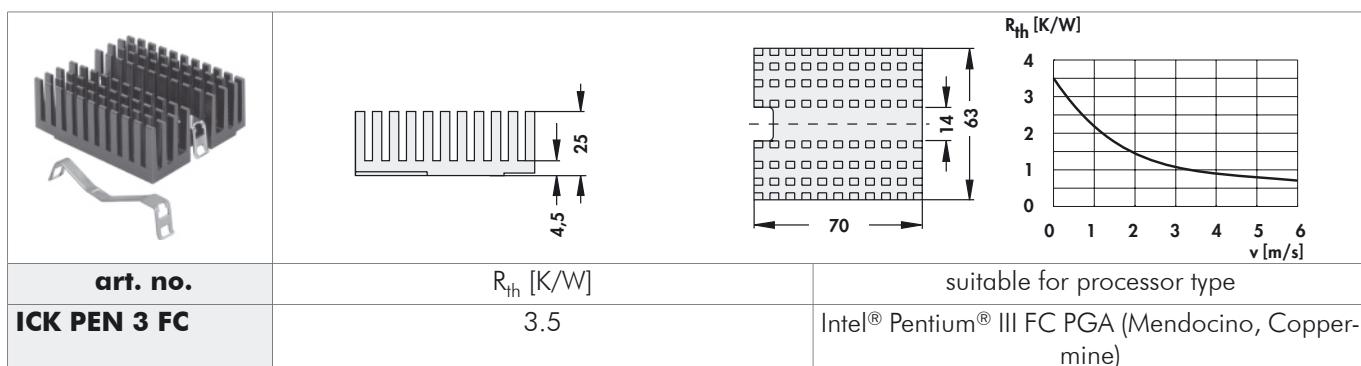
Passive heatsinks for processors

– customer specific versions and modifications on request



art. no.	R_{th} [K/W]	suitable for processor type	A [mm]	B [mm]	C [mm]	D [mm]
ICK PRO 40 W	2.7	Intel® Pentium® PRO	65	67.5	40	4.5

F = with double-sided thermally conductive adhesive foil; **W** = for thermally conductive adhesive (please order separately)
WLK ... → E 21



fixing method: **K** = with fixing clamp (incl. one-sided adherent thermal foil)

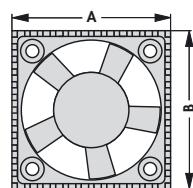
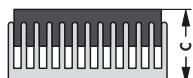
B 49

Fan cooler for Intel PentiumIII/Xeon
 Fan cooler, universal
 Attachable heatsinks
 Thermal conductive material

→ **B 52**
 → **B 50**
 → **C 10 – 16**
 → **E 2 – 22**

Heatsinks for Q7 "Embedded-Boards" → **B 48**
 Heatsinks for BGA → **B 17 – 20**
 Heatsinks for PGA → **B 11 – 16**
 Technical introduction → **A 2 – 7**

Active heatsinks for processors



art. no.	R_{th} [K/W]	suitable for processor type	dim. [mm]		
			A	B	C
LA ICK 15 x 15 F 05	2.3	universal	37.92	38.10	20
LA ICK 15 x 15 F 12	2.3	universal	37.92	38.10	20
LA ICK 17 x 17 F 12	1.6	universal	43.10	43.10	20
LA ICK 17 x 17 F 12 A	1.6	universal	43.10	43.10	20
LA ICK 17 x 17 W 05	1.6	universal	43.10	43.10	20
LA ICK 17 x 17 W 12	1.6	universal	43.10	43.10	20
LA ICK 18 x 18 F 12	1.5	universal	45.70	45.70	20
LA ICK 18 x 18 W 12	1.5	universal	45.70	45.70	20
LA ICK 21 x 21 F 05	1.4	universal	53.34	53.34	20
LA ICK 21 x 21 F 12	1.4	universal	53.34	53.34	20
LA ICK 21 x 21 W 05	1.4	universal	53.34	53.34	20
LA ICK 21 x 21 W 12	1.4	universal	53.34	53.34	20

used fans:

5 Volt = **Sepa MFB 25 A 05 H / MFB 40 H 05 / MFB 40 H 05 A**;

12 Volt = **Sepa MFB 25 F 12 / MFB 40 H 12 / MFB 40 H 12 A**

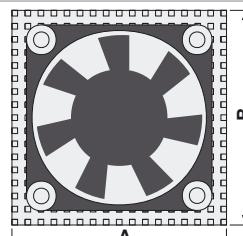
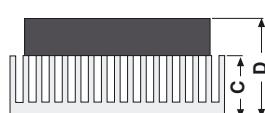
F = with double-sided thermally conductive adhesive foil; **A** = alarm exit;

W = for thermally conductive adhesive (please order separately) **WLK ... ➔ E 21**

Active heatsinks for processors


LA ICK PEN 8
LA ICK PEN 16
LA ICK PEN 18
LA ICK PEN 38
LA ICK PRO 25

– easy assembly on ZIF socket by fixing clamp



art. no.	R_{th} [K/W]	suitable for processor type	dim. [mm]			
			A	B	C	D
LA ICK PEN 8 F 05	2.50	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 8 F 12	2.50	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 8 W 05	2.50	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 8 W 12	2.50	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	9.00
LA ICK PEN 16 K 12	1.20	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	16.51	26.51
LA ICK PEN 16 W 12	1.20	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	16.51	26.51
LA ICK PEN 16 W 12 A	1.20	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	16.51	26.51
LA ICK PEN 18 W 12	1.60	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	50.8	50.8	8.00	18.00
LA ICK PEN 38 W 12	1.10	AMD® K6-III/ IDT W2A/ Cyrix M II and similar/ MMX/ IDT C6/ Intel® Pentium®/ AMD® K6-2	49.5	49.5	38.00	48.00
LA ICK PRO 25 F 12	0.97	Intel® Pentium® PRO	63.5	67.5	25.00	35.00

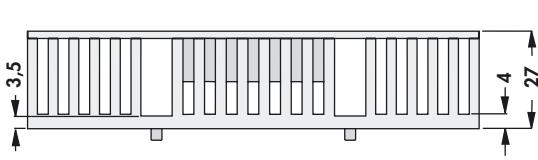
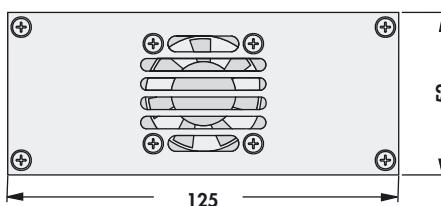
used fans: 5 Volt = **Sepa MFB 50 E 05**; 12 Volt = **Sepa MFB 50 E 12/ Sepa MFB 50 E 12 A**;

LA ICK PEN 8: 5 Volt = **Sepa HFB 44 X 05 A**; 12 Volt = **Sepa HFB 44 B 12 A**

K = with fixing clamp (incl. one-sided adherent conductive foil); **F** = with double-sided thermally conductive adhesive foil

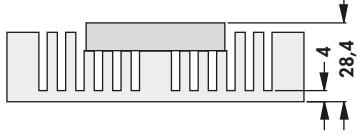
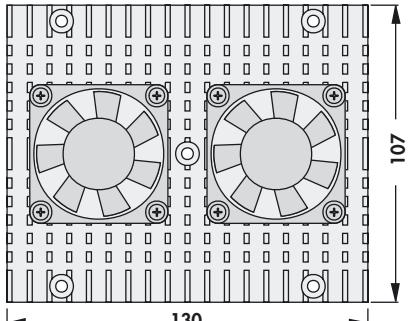
W = for thermally conductive adhesive (please order separately); **A** = alarm exit; **WLK ... → E 21**

Active heatsinks for processors

		
art. no.	R_{th} [K/W]	suitable for processor type
LA ICK PEN 2 K 12 ...	1.2	Intel® Pentium® II/ AMD® Athlon®
please indicate: ... accessory (optional) SM = molex connection plug		

fixing method: K = with fixing clamp (incl. one-sided adherent thermal foil)

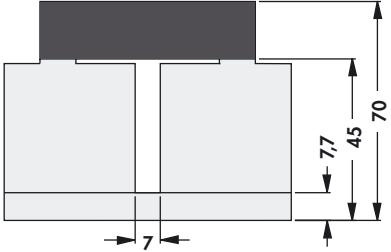
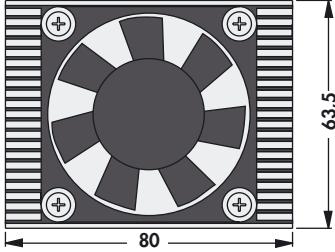
utilized fans: 12 Volt = **Sepa MFB 40 H 12**

		
art. no.	R_{th} [K/W]	suitable for processor type
LA ICK PEN 3 XE	0.8	Intel® Pentium® III-Xeon™
please indicate: ... accessory (optional) A = alarm exit SM = molex connection plug		

fixing method: SB = screw fixing

utilized fans: 12 Volt = **Sepa MFB 50 E 12**

- with copper base plate
- customer specific designs and modifications on request

		
art. no.	R_{th} [K/W]	suitable for processor type
LA ICK PEN 4 1 K	0.6	Intel® Pentium® IV
please indicate: ... accessory (optional) SM = molex connection plug		

fixing method: K = with fixing clamp

operating voltage of the fan motor: 12 Volt (Papst 612 NHH)

A

B

C

D

E

F

G

H

I

K

L

M

N

Technical data of the fans



molex crimp case series: 6471; molex crimp terminals: 2759; - Sepa-fan 24 h BURN-IN tested

5 volt fan

	Sepa MFB 25 A 05 H	Sepa MFB 40 H 05	Sepa MFB 40 H 05 A	Sepa MFB 50 E 05	Sepa HFB 44 X 05 A	ebmpapst 405 F
circuit voltage	4.5 - 5.5 V DC	4.5 - 5.5 V DC	4.5 - 5.5 V DC			
bearing type	double ball bearing	double ball bearing	double ball bearing	double ball bearing	ball bearing	double slide bearing
fan dimensions	25 x 25 x 10 mm	40 x 40 x 10 mm	40 x 40 x 10 mm	50 x 50 x 10 mm	44 x 44 x 6.2 mm	40 x 40 x 10 mm
cur. consumpt.	85 mA	120 mA	90 mA	50 mA	110 mA	140 mA
max. initial current	220 mA	250 mA	250 mA	120 mA	160 mA	
max. volume flow	32 l/min 1.92 m ³ /h	110 l/min 6.6 m ³ /h	184 l/min 11 m ³ /h	169 l/min 10.1 m ³ /h	50 l/min 3.0 m ³ /h	132 l/min 8 m ³ /h
max. static pressure	2.3 mm H ₂ O 22.6 Pa	3.0 mm H ₂ O 29.4 Pa	3.1 mm H ₂ O 30.5 Pa	1.6 mm H ₂ O 15.6 Pa	2.6 mm H ₂ O 25.5 Pa	3.06 mm H ₂ O 30 Pa
noise level	17 dB(A), 1 m lateral	21 dB(A), 1 m lateral	24 dB(A), 1 m lateral	16 dB(A), 1 m lateral	28 dB(A), 1 m lateral	22.1 dB(A), 1 m lateral
temperature range	-40 °C ... +80 °C	-40 °C ... +80 °C	-20 °C ... +70 °C			
failure rate (L₁₀)	95,000 h	95,000 h	95,000 h	95,000 h	75,000 h	45,000 h (20 °C)
MTBF	280,000 h (20°C) 80,000 h (70°C)	280,000 h (20°C) 80,000 h (70°C)	280,000 h (20°C) 80,000 h (70°C)	280,000 h (20°C)	210,000 h (60°C)	
weight	8 g	13 g	13 g	19 g	7 g	17 g
cases	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E38324)

12 volt fan

	Sepa MFB 25 F 12	Sepa MFB 50 H 12 A	Sepa MFB 40 H 12 A	Sepa MFB 50 E 12	Sepa HFB 44 B 12 A	ebmpapst 412 F
circuit voltage	10.2 - 13.8 V DC	10.2 - 13.8 V DC	10 - 14 V DC			
bearing type	double ball bearing	double ball bearing	double ball bearing	ball bearing	ball bearing	double slide bearing
fan dimensions	25 x 25 x 10 mm	40 x 40 x 10 mm	40 x 40 x 10 mm	50 x 50 x 10 mm	44 x 44 x 6.2 mm	40 x 40 x 10 mm
cur. consumpt.	70 mA	40 mA	40 mA	40 mA	40 mA	60 mA
max. initial current	150 mA	90 mA	90 mA	100 mA	70 mA	
max. volume flow	68 l/min 4 m ³ /h	185 l/min 11 m ³ /h	185 l/min 11 m ³ /h	238 l/min 14.3 m ³ /h	50 l/min 3.0 m ³ /h	132 l/min 8 m ³ /h
max. static pressure	2.24 mm H ₂ O 41.5 Pa	2.9 mm H ₂ O 28 Pa	2.9 mm H ₂ O 28 Pa	2.7 mm H ₂ O 26.9 Pa	2.6 mm H ₂ O 25.5 Pa	3.06 mm H ₂ O 30 Pa
noise level	23 dB(A), 1 m lateral	24 dB(A), 1 m lateral	24 dB(A), 1 m lateral	25 dB(A), 1 m lateral	28 dB(A), 1 m lateral	22.1 dB(A), 1 m lateral
temperature range	-40 °C ... +70 °C	-40 °C ... +80 °C	-20 °C ... +70 °C			
failure rate (L₁₀)	95,000 h (20 °C)	75,000 h	45,000 h (20 °C)			
MTBF	280,000 h (20°C) 55,000 h (70°C)	280,000 h (20°C) 80,000 h (70°C)	280,000 h (20°C) 80,000 h (70°C)	280,000 h (20°C) 80,000 h (70°C)	210,000 h (60°C)	
weight	8 g	13 g	13 g	19 g	7 g	17 g
cases	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E54695)	plastic PBT (UL E38324)

Fans with pulse output - Technical data of fans with pulse output:

- pulse output for activation of the alarm control
- pulse similar to a square pulse with three times the frequency of the rotor speed
- when the rotor is blocked, the output signal may be L (≤ 0.8 V) or H (V_{cc}-1 V)
- the pulse output must not be connected to GND or V_{cc} without protective resistor (>10 K)
- in order to avoid short circuits, the pulse output not being used must be insulated

Finger shaped heatsinks for power semiconductors

Attachable heatsinks

Finger shaped heatsinks for transistors

Miniature heatsinks



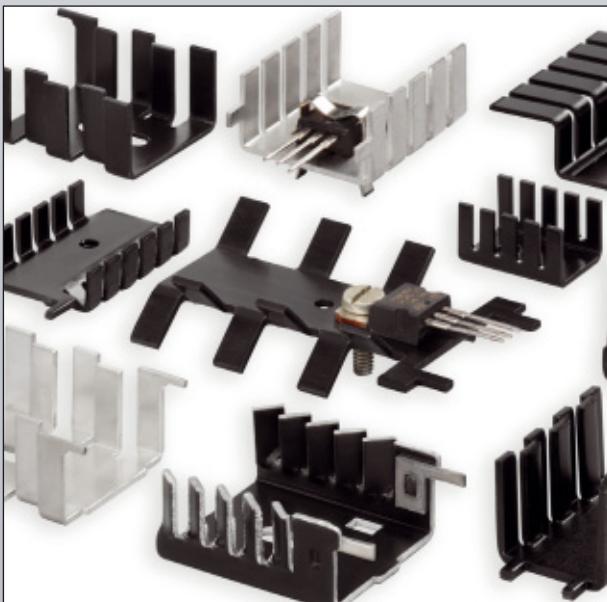
Finger shaped heatsinks for power semiconductors

- specially compatible for power semiconductors in a TO-case
- made as a bent sheet metal part or die cast heatsink made of aluminium
- aligned heatsink contours for the best heat dissipation
- direct screwing of the component to the heatsink on the PCB



Attachable heatsinks

- made of aluminium or copper material
- solderable surface coating
- integrated spring clip for easy and fast mounting of the transistor
- secure hold of the component due to optimized spring force and geometry
- customer specific version upon request



Finger shaped heatsinks for transistors

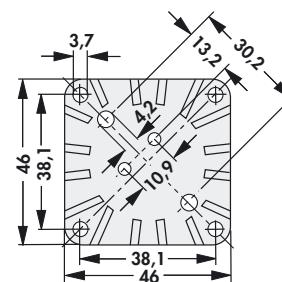
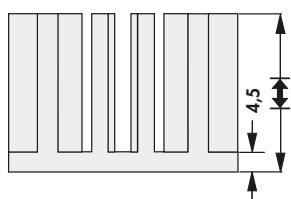
- effective heat dissipation of transistors
- efficient radiation of heat at a horizontal or vertical mounting position
- component fastening by means of screws or special transistor retaining springs
- solder mounting by means of integrated solder pins and solderable surfaces



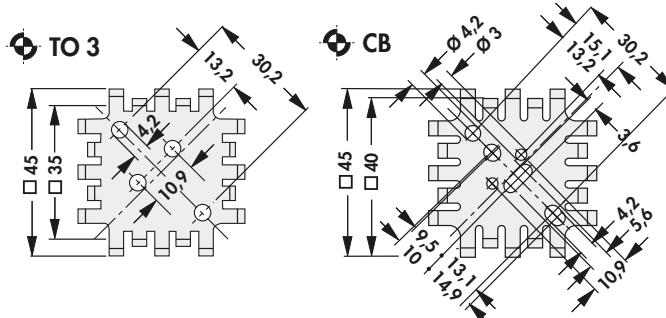
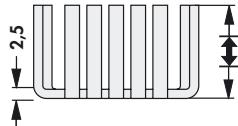
Miniature heatsinks

- for TO 5, SOT 82, D PAK and similar semiconductors
- made of aluminium, phosphorus bronze or copper
- simple mounting by direct plugging or soldering of the heatsink
- special types of packaging such as tape & reel, magazine or tray upon request
- versions and designs for your application

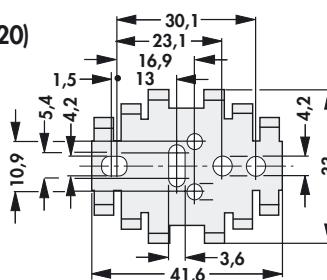
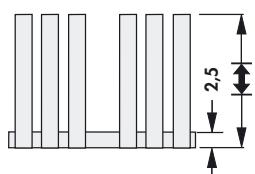
Finger shaped heatsinks for power semiconductors



art. no.	\downarrow [mm]	R_{th} [K/W]	
FK 254 SA 3	25.4	5.8	TO 3
FK 318 SA	31.8	4.8	without
FK 318 SA 3	31.8	4.8	TO 3
material:	die-casting aluminium		
surface:	black lacquered		

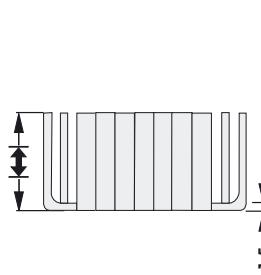
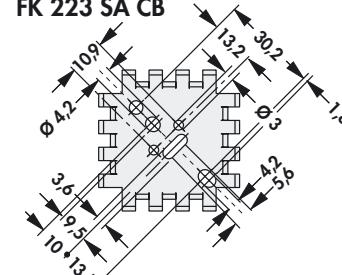
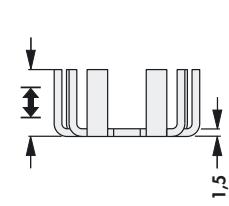
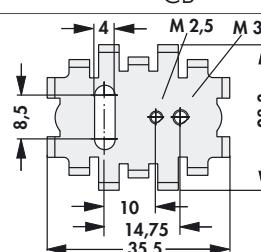


art. no.	\downarrow [mm]	R_{th} [K/W]	
FK 201 SA	25.4	6	without
FK 201 SA 3	25.4	6	TO 3
FK 201 SA CB	25.4	6	CB
FK 202 SA	12.7	8	without
FK 202 SA 3	12.7	8	TO 3
FK 202 SA CB	12.7	8	CB



art. no.	\downarrow [mm]	R_{th} [K/W]	
FK 205 SA L	31.8	9.0	L
FK 206 SA L	25.4	10.5	L
FK 207 SA L	19.1	12.0	L
FK 208 SA L	12.7	14.0	L
material:	aluminium		
surface:	black anodised		

Finger shaped heatsinks for power semiconductors

	FK 223 SA 3 	FK 223 SA CB 
art. no.	↓ [mm]	R_{th} [K/W]
FK 223 SA	17	6.8
FK 223 SA 3	17	6.8
FK 223 SA CB	17	6.8
		
art. no.	↓ [mm]	R_{th} [K/W]
FK 217 SA CB 2	13	16
material:	aluminium	
surface:	black anodised	

C 3

Attachable heatsinks
Heatsinks for TO 5 and TO 18
Heatsinks for D PAK
Aluminium oxide wafers

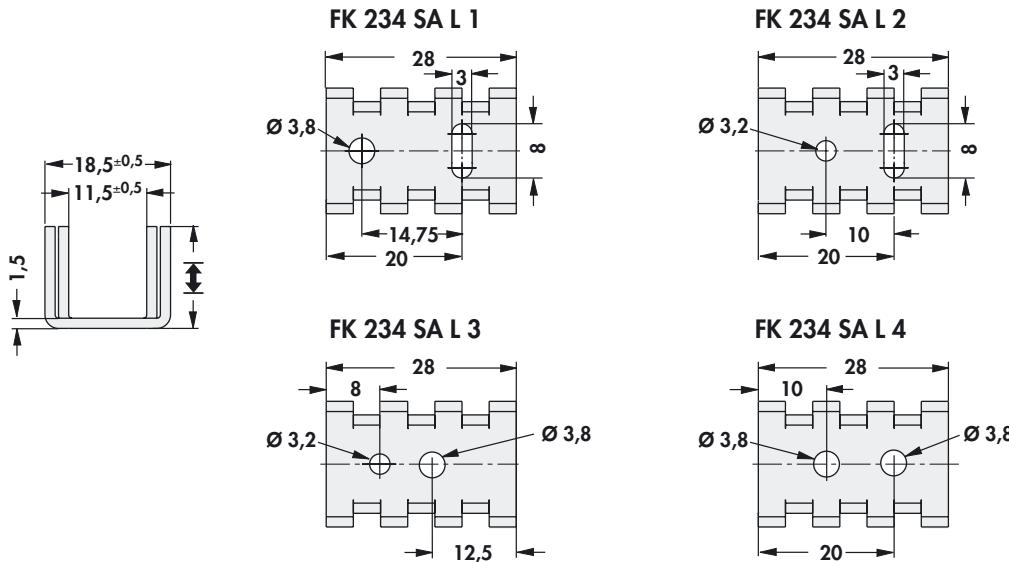
→ C 10 – 14
→ C 17 – 19
→ C 21 – 120
→ E 15 – 16

Mounts
Insulating caps
Thermal conductive material
Technical introduction

→ E 42 – 46
→ E 49
→ E 2 – 22
→ A 2 – 7

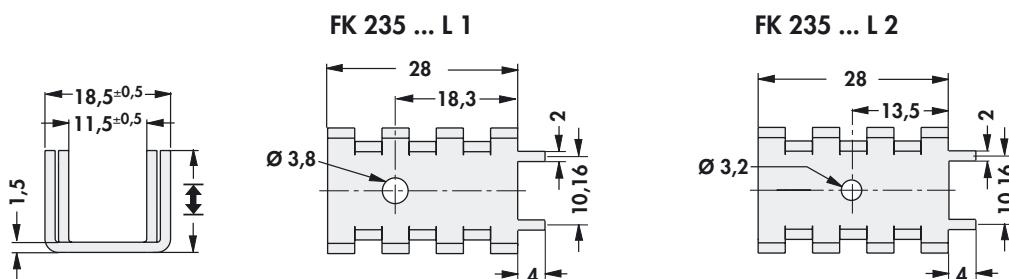
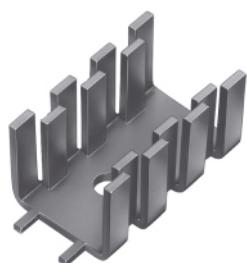
Heatsinks for transistors in plastic case

– for semiconductor screw-assembly, horizontal



art. no.	↔ [mm]	R _{th} [K/W]	♦
FK 234 SA L 1	15	17	TO 220
FK 234 SA L 2	15	17	SOT 32
FK 234 SA L 3	15	17	CB
FK 234 SA L 4	15	17	CB
material:	aluminium		
surface:	black anodised		

– for semiconductor screw-assembly, vertical



art. no.	↔ [mm]	R _{th} [K/W]	♦
FK 235 MI L 1	15	16	TO 220
FK 235 MI L 2	15	16	SOT 32
FK 235 SA L 1	15	16	TO 220
FK 235 SA L 2	15	16	SOT 32
material:	aluminium		
surface:	solderable surface/ black anodised		

Heatsinks for transistors in plastic case

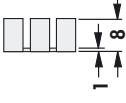
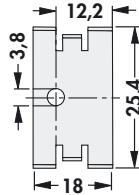
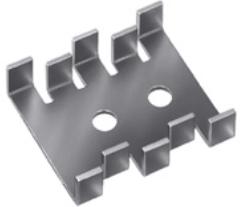
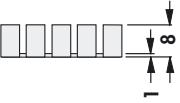
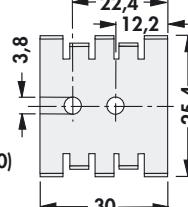
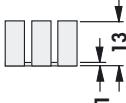
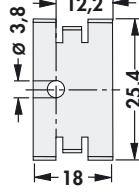
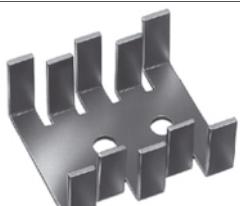
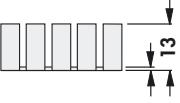
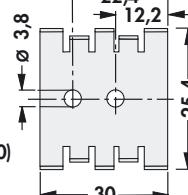
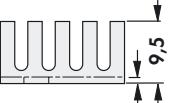
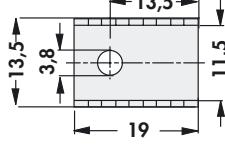
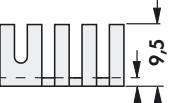
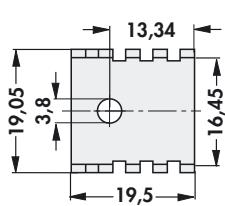
A			
B			
C			
D			
E			
F			
G			
H			
I			
K			
L			
M			
N			
C 5	Attachable heatsinks Heatsinks for TO 5 and TO 18 Heatsinks for D PAK Aluminium oxide wafers	→ C 10 – 14 Mounts → C 17 – 19 Insulating caps → C 21 – 120 Thermal conductive material → E 15 – 16 Technical introduction	→ E 42 – 46 → E 49 → E 2 – 22 → A 2 – 7
		<p>38 4 13 19 26 18 1,5 22 9,9 K/W TO 220</p>	<p>26 18 1,5 22 24,5 9,9 K/W TO 220</p>
		<p>38 3,6 10 6,9 16,5 2,5 31,2 26 18 22 9,9 K/W TO 220</p>	<p>26 18 22 24,5 9,9 K/W TO 220</p>
		<p>19 4 6,5 21 13 18,5 1,5 11,5 30 K/W TO 220</p>	<p>21 13 18,5 1,5 11,5 30 K/W TO 220</p>
		<p>19 4 6,5 21 13 18,5 1,5 13,5 27 K/W TO 220</p>	<p>21 13 18,5 1,5 13,5 27 K/W TO 220</p>
		<p>19 4 6,5 21 13 18,5 1,5 19,5 21 K/W TO 220</p>	<p>21 13 18,5 1,5 19,5 21 K/W TO 220</p>
		<p>30,4 5,1 3,8 15,2 5 3 15 7 4 24,2 0,8 17 K/W TO 220</p>	<p>12,5 31,2 1,2 11,1 1,9 17 K/W TO 220</p>
	material: aluminium		
	surface: black anodised		

Attachable heatsinks
Heatsinks for TO 5 and TO 18
Heatsinks for D PAK
Aluminium oxide wafers

→ C 10 – 14 Mounts
→ C 17 – 19 Insulating caps
→ C 21 – 120 Thermal conductive material
→ E 15 – 16 Technical introduction

→ E 42 – 46
→ E 49
→ E 2 – 22
→ A 2 – 7

Heatsinks for transistors in plastic case

art. no.			25 K/W SOT 32	
FK 209 SA 32	available without hole pattern as well			
art. no.			18 K/W CB (SOT 32 + TO 220)	
FK 210 SA CB	available without hole pattern as well			
art. no.			21 K/W SOT 32	
FK 213 SA 32	available without hole pattern as well			
art. no.			15 K/W CB (SOT 32 + TO 220)	
FK 214 SA CB	available without hole pattern as well			
art. no.			24 K/W TO 220	
FK 231 SA 220				
art. no.			24 K/W SOT 32	
FK 239 SA 32				
material:	aluminium			
surface:	black anodised			

Attachable heatsinks
 Heatsinks for TO 5 and TO 18
 Heatsinks for D PAK
 Aluminium oxide wafers

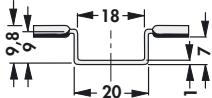
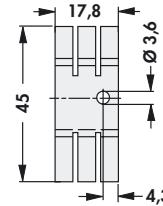
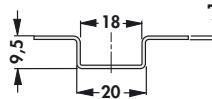
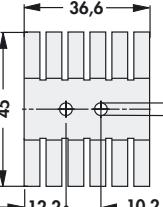
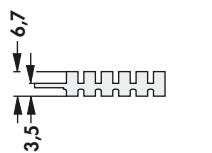
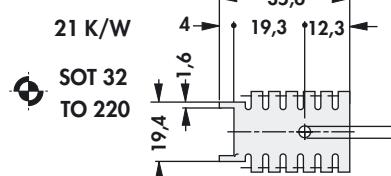
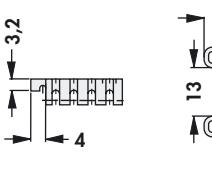
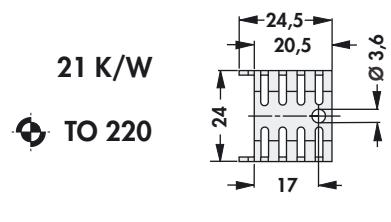
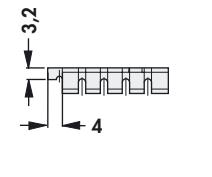
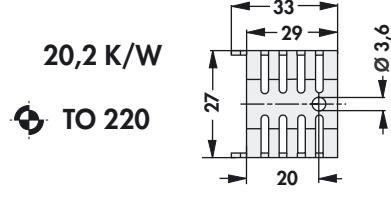
→ C 10 – 14 Mounts
 → C 17 – 19 Insulating caps
 → C 21 – 120 Thermal conductive material
 → E 15 – 16 Technical introduction

→ E 42 – 46
 → E 49
 → E 2 – 22
 → A 2 – 7

Heatsinks for transistors in plastic case

art. no.	available without hole pattern as well	25 K/W SOT 32	12,2 3,8 25,4 18 3
FK 211 32 ...			
art. no.	available without hole pattern as well	18 K/W CB (SOT 32 + TO 220)	22,4 12,2 3,8 18,2 30 1 25,4
FK 212 CB ...			
art. no.	available without hole pattern as well	21 K/W SOT 32	12,2 3,8 25,4 18 3
FK 215 32 ...			
art. no.	available without hole pattern as well	15 K/W CB (SOT 32 + TO 220)	22,4 12,2 3,8 18,2 30 1 25,4
FK 216 CB	available without hole pattern as well		
art. no.	available without hole pattern as well	20 K/W TO 220	12,7 3,8 5,5 30 2,5 1 14,4 25,4
FK 222 ...			
art. no.	available without hole pattern as well	20 K/W TO 220	12,7 3,8 5,2 30 2,5 1 14,4 8 1,6 12 2,2 1 25,4
FK 222 THF ...			
art. no.	available without hole pattern as well	22 K/W TO 220	19,1 3,8 7,9 23,5 1,95 1,5 1 16,8 4,5
FK 247 220 ...			
please indicate:	... surface SA = black anodised MI = solderable surface		
material:	aluminium		

Heatsinks for transistors in plastic case

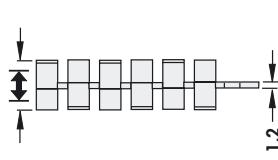
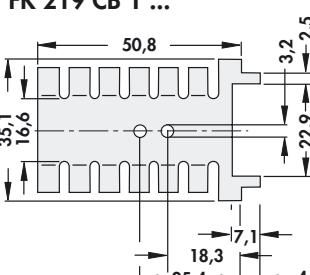
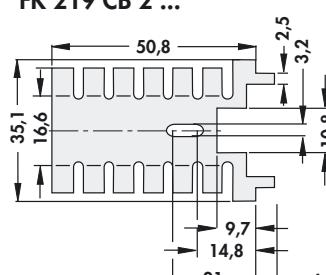
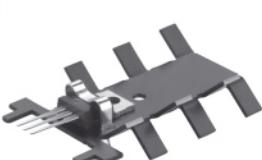
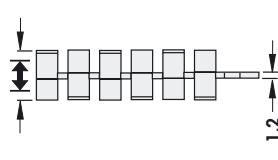
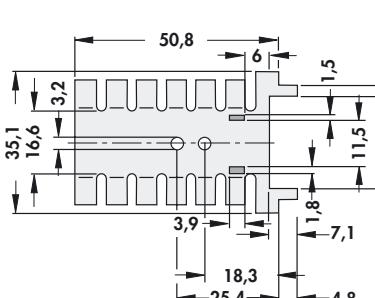
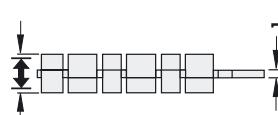
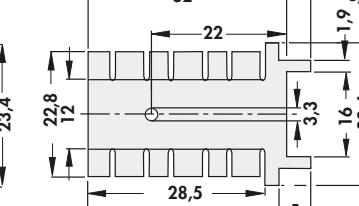
art. no.		 22 K/W TO 220	 17,8 45 Ø 3,6 4,3
FK 227 SA L 1			
art. no.		 12 K/W TO 220	 36,6 45 Ø 3,7 12,2 10,2
FK 238 SA L 1			
material:	aluminium		
surface:	black anodised		
art. no.		 3,5 6,7 1,2 22	 21 K/W SOT 32 TO 220 19,4 1,6 19,3 12,3 Ø 3,2
FK 218 32 ...			
art. no.		 3,2 7 13 1,2 4	 21 K/W TO 220 24,5 20,5 24 17 Ø 3,6
FK 232 220 ...			
art. no.		 3,2 7 16 1,2 4	 20,2 K/W TO 220 33 29 27 20 Ø 3,6
FK 233 220 ...			
please indicate:	... surface SA = black anodised MI = solderable surface		
material:	aluminium		

Attachable heatsinks
Heatsinks for TO 5 and TO 18
Heatsinks for D PAK
Aluminium oxide wafers

→ C 10 – 14 Mounts
→ C 17 – 19 Insulating caps
→ C 21 – 120 Thermal conductive material
→ E 15 – 16 Technical introduction

→ E 42 – 46
→ E 49
→ E 2 – 22
→ A 2 – 7

Heatsinks for transistors in plastic case

	FK 219 CB 1 ...		FK 219 CB 2 ...
			
art. no.	↓ [mm]	R_{th} [K/W]	
FK 219 CB 1 ...	12.6	14	CB 1 (TO 220)
FK 219 CB 2 ...	12.6	14	CB 2 (TO 220)
			
	art. no.	↓ [mm]	R_{th} [K/W]
FK 219 CB 3 ...	12.6	14	CB 3 (TO 220)
			
	art. no.	↓ [mm]	R_{th} [K/W]
FK 236 220 ...	5	18	TO 220
FK 236 CB ...	5	18	CB
please indicate:	... surface SA = black anodised MI = solderable surface		
material:	aluminium		

C 9

Attachable heatsinks
 Heatsinks for TO 5 and TO 18
 Heatsinks for D PAK
 Aluminium oxide wafers

→ C 10 - 14
 → C 17 - 19
 → C 21 - 120
 → E 15 - 16

Mounts
 Insulating caps
 Thermal conductive material
 Technical introduction

→ E 42 - 46
 → E 49
 → E 2 - 22
 → A 2 - 7

Attachable heatsinks

A

B

C

D

E

F

G

H

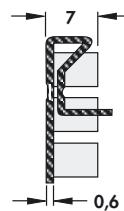
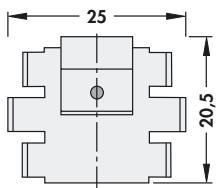
I

K

L

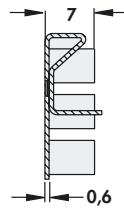
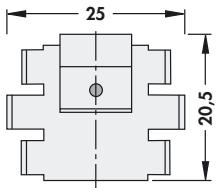
M

N

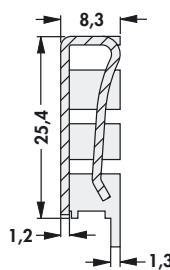
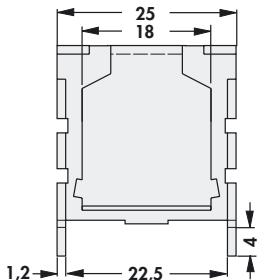


art. no.	R_{th} [K/W]	
FK 220 SA 220	25	TO 220
material:	aluminium	
surface:	black anodised	

– for transistors with thin bottom thickness (0.5 mm)

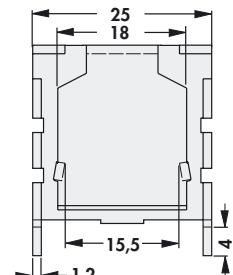
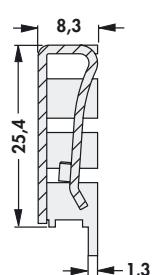
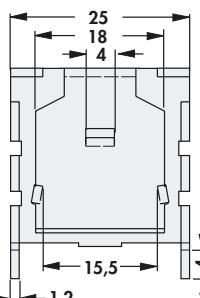
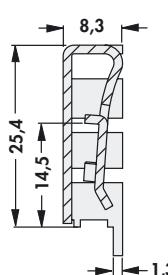
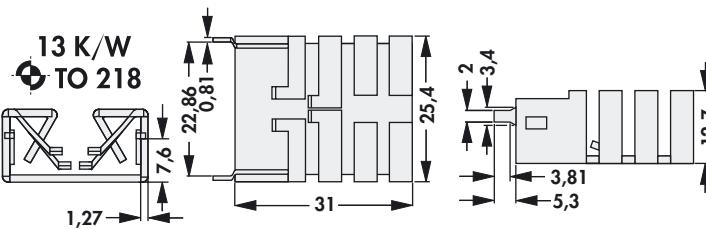
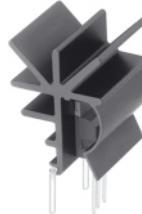
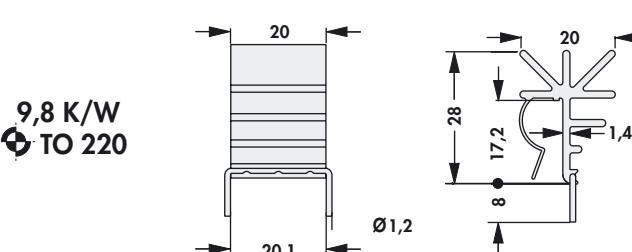


art. no.	R_{th} [K/W]	
FK 258 SA 220	25	TO 220
material:	aluminium	
surface:	black anodised	



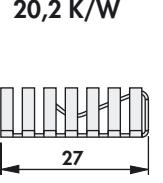
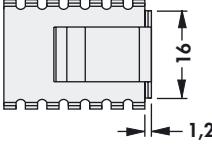
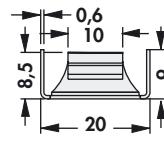
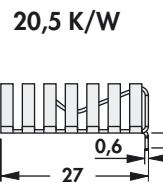
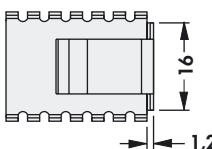
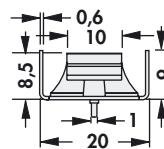
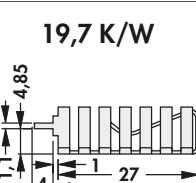
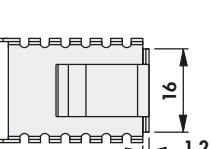
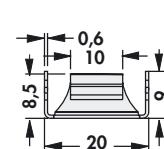
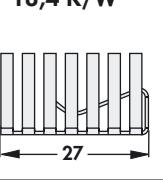
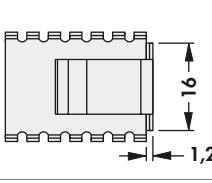
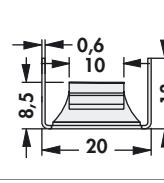
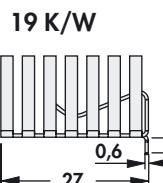
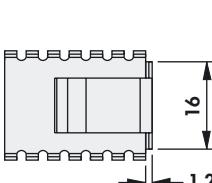
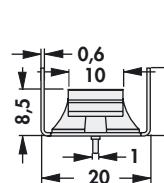
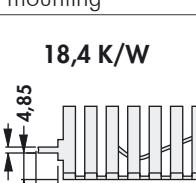
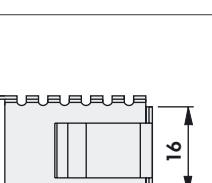
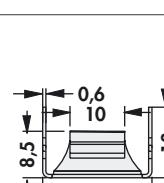
art. no.	R_{th} [K/W]	
FK 224 ... P SIP	18	P SIP
please indicate:	... surface SA = black anodised MI = solderable surface	
material:	aluminium	

Attachable heatsinks

	FK 224 ... 218 1		FK 224 ... 218 2		
					
art. no. FK 224 ... 218 1 FK 224 ... 218 2	R_{th} [K/W]		art. no. FK 224 ... 220 1 FK 224 ... 220 2	R_{th} [K/W]	
	18	TO 218		18	TO 220
please indicate:	... surface SA = black anodised MI = solderable surface				
material:	aluminium				
art. no. FK 241 SA 218 V	 				
with tin-plated soldering lug for direct soldering onto circuit board, for vertical installation					
art. no. FK 248 SA 220	 				
material:	aluminium				
surface:	black anodised, solder pins tin plated				

Attachable heatsinks

- universal clip on heatsinks for type TO 218, TO 229, TO 247, TO 248, SIP-Muliwatt and similar
- easy assembly by pushing the heatsink onto the component
- for vertical and horizontal fastening by soldering
- fin height variations on request
- special design accord. to customized specification

art. no.		20,2 K/W			
FK 245 MI 247 O	without soldering lug				
art. no.		20,5 K/W			
FK 245 MI 247 H	with soldering lug for horizontal mounting				
art. no.		19,7 K/W			
FK 245 MI 247 V	with soldering lug for vertical mounting				
art. no.		18,4 K/W			
FK 243 MI 247 O	without soldering lug				
art. no.		19 K/W			
FK 243 MI 247 H	with soldering lug for horizontal mounting				
art. no.		18,4 K/W			
FK 243 MI 247 V	with soldering lug for vertical mounting				
material:	copper (Cu)				
surface:	solderable surface				
material thickness:	0.6 mm				

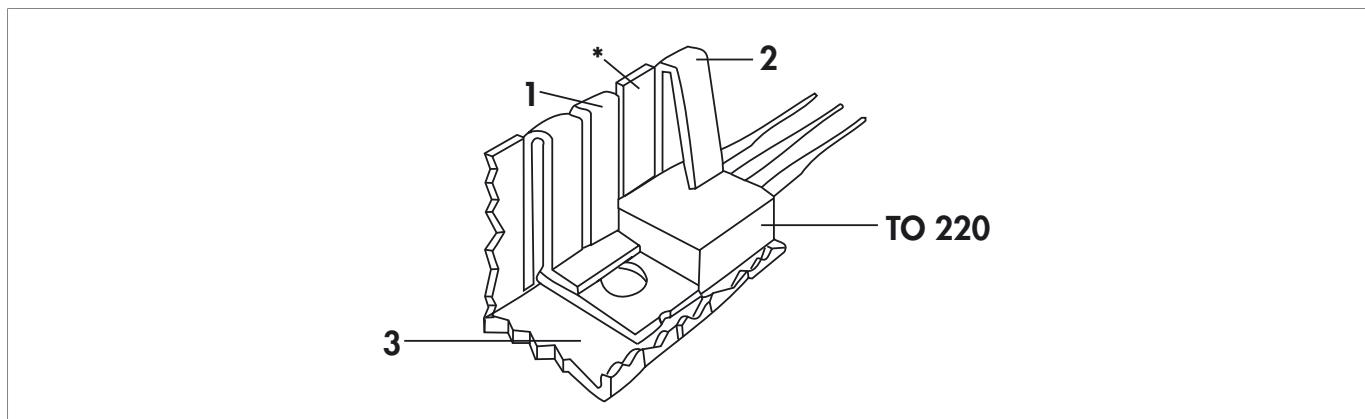
Heatsinks for D PAK
Heatsinks for transistors
Kapton insulator washers
Vibration dampers

→ C 21
→ C 4 - 9
→ E 14
→ E 39

Vibration dampers
U-shaped heatsink
Aluminium oxide wafers
Technical introduction

→ E 39
→ A 121 - 122
→ E 15 - 16
→ A 2 - 7

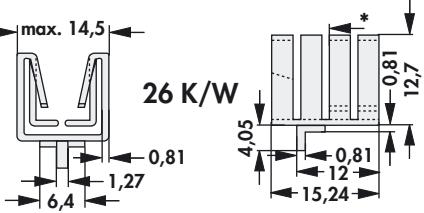
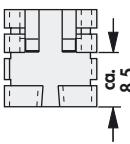
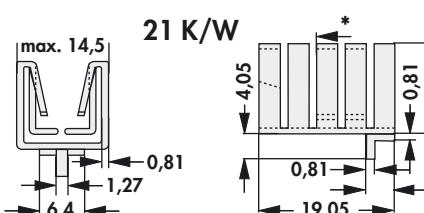
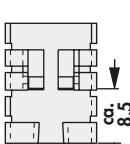
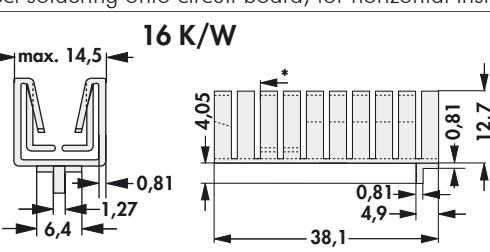
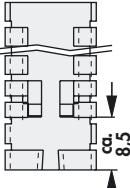
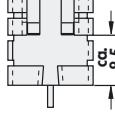
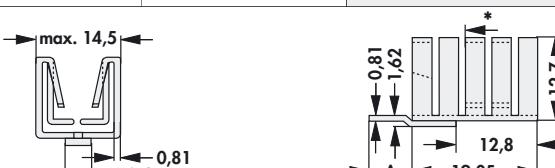
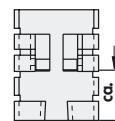
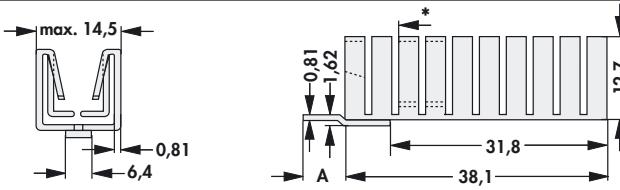
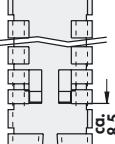
Attachable heatsinks



- narrow version with better thermal resistance
- max. 14.5 mm wide
- 3 different lengths for varied dissipation power
- takes less space than any other attachable heatsink
- simple assembly by pushing the heatsink onto the TO 220 housing
- the cooling fingers form spring clamps (**1+2**), which pushes the TO 220 and its mounting flange onto the heatsink (**3**)
- optimum heat transfer due to the constant pressure on the entire contact surface of the TO 220 cases
- effective heat emission with horizontal and vertical mounting
- * = touch in edge of transistor

art. no.	without soldering lug
FK 242 SA 220 O	<p>max. 14,5 0,81 26 K/W 15,24 12,7 ca. 8,5</p>
FK 237 SA 220 O	<p>max. 14,5 0,81 21 K/W 19,05 12,7 ca. 8,5</p>
FK 240 SA 220 O	<p>max. 14,5 0,81 16 K/W 38,1 12,7 ca. 8,5</p>
material:	aluminium
surface:	black anodised, solder pins tin plated

Attachable heatsinks

art. no.					
FK 242 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation				
art. no.					
FK 237 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation				
art. no.					
FK 240 SA 220 H	with tinned soldering lug for direct soldering onto circuit board, for horizontal installation				
material:	aluminium				
surface:	black anodised, solder pins tin plated				
– with tinned soldering lug for direct soldering onto circuit board, for vertical installation					
					
art. no.	A [mm]	R _{th} [K/W]	art. no.	A [mm]	R _{th} [K/W]
FK 242 SA 220 V	6.35	26	FK 242 SA 220 VL	9.53	26
					
art. no.	A [mm]	R _{th} [K/W]	art. no.	A [mm]	R _{th} [K/W]
FK 237 SA 220 V	6.35	21	FK 237 SA 220 VL	9.53	21
					
art. no.	A [mm]	R _{th} [K/W]	art. no.	A [mm]	R _{th} [K/W]
FK 240 SA 220 V	6.35	16	FK 240 SA 220 VL	9.53	16
material:	aluminium				
surface:	black anodised, solder pins tin plated				

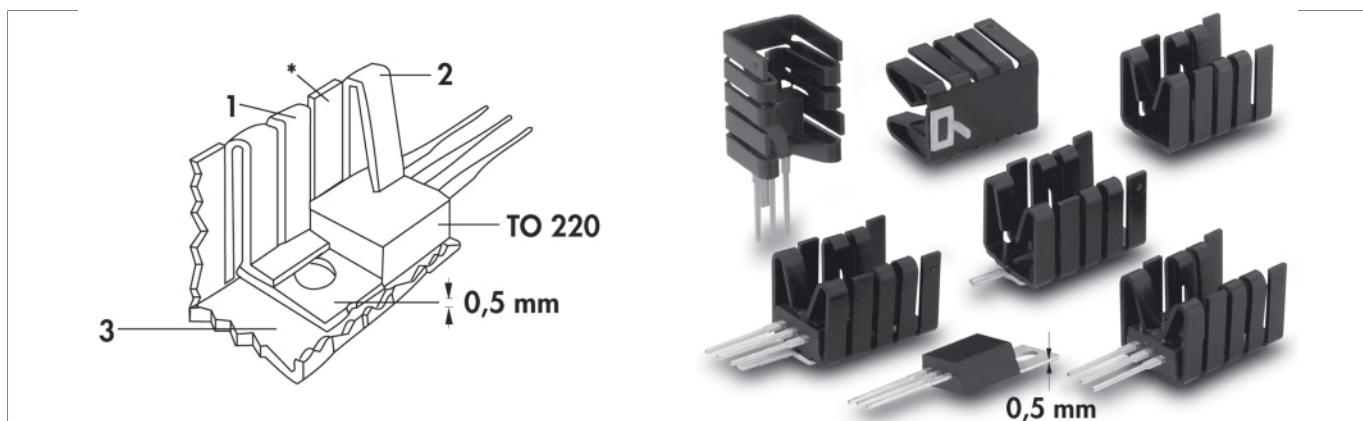
Heatsinks for D PAK
 Heatsinks for transistors
 Kapton insulator washers
 Vibration dampers

→ C 21
 → C 4 – 9
 → E 14
 → E 39

Vibration dampers
 U-shaped heatsink
 Aluminium oxide wafers
 Technical introduction

→ E 39
 → A 121 – 122
 → E 15 – 16
 → A 2 – 7

Attachable heatsinks for TO 220 with a bottom plate thickness of 0.5 mm



- narrow version with better thermal resistance
- max. 14.5 mm wide
- takes less space than any other attachable heatsink
- simple assembly by pushing the heatsink onto the TO 220 housing
- the cooling fingers form spring clamps (**1+2**), which pushes the TO 220 and its mounting flange onto the heatsink (**3**)
- optimum heat transfer due the constant pressure on the entire contact surface of the TO 220 cases
- effective heat emmision with horizontal and vertical mounting
- * = touch in edge of transistor

art. no.	without soldering lug		
FK 252 SA 220 O	FK 252 SA 220 H with tinned soldering lug for direct soldering onto circuit board, for horizontal installation		
material:	aluminium		
surface:	black anodised		

- with tinned soldering lug for direct soldering onto circuit board, for vertical installation

with tinned soldering lug for direct soldering onto circuit board, for vertical installation					
art. no.	A [mm]	R _{th} [K/W]	art. no.	A [mm]	R _{th} [K/W]
FK 252 SA 220 V	6.35	21	FK 252 SA 220 VL	9.53	21
material:	aluminium				
surface:	black anodised				

Attachable heatsinks

A

B

C

D

E

F

G

H

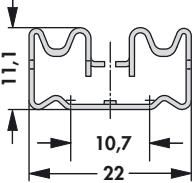
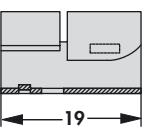
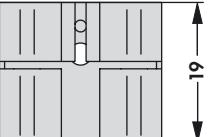
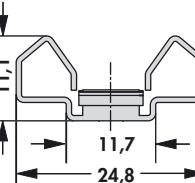
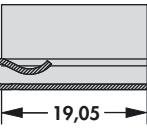
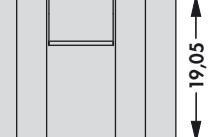
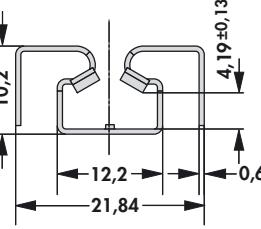
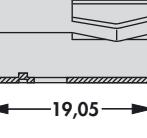
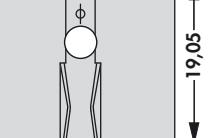
I

K

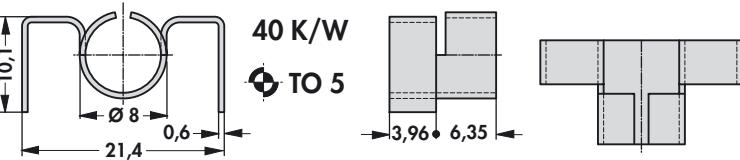
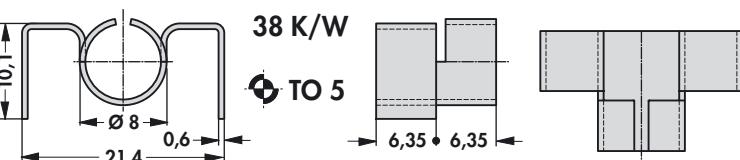
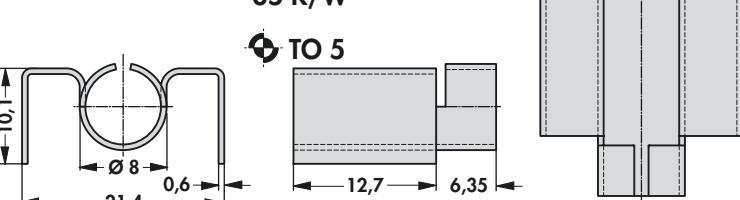
L

M

N

	  	
	art. no. FK 253	R_{th} [K/W] 23.7
	  	
	art. no. FK 255	R_{th} [K/W] 16.8
	  	
	art. no. FK 257	R_{th} [K/W] 21.2
material: aluminium surface: black anodised		

Small heatsinks

A		
B		
C		
D		
E		
F		
G		
H		
I		
K		
L		
M		
N		
art. no.		 KK 1 3,96 art. no.
art. no.		 KK 1 6,35 art. no.
art. no.		 KK 1 12,7 art. no.
art. no.		 KK 1 19,05 material: aluminium surface: black anodised

Small heatsinks

A

B

C

D

E

F

G

H

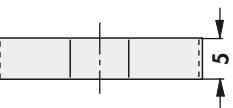
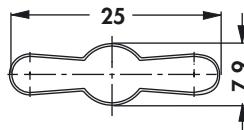
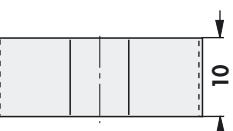
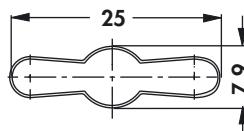
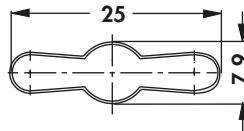
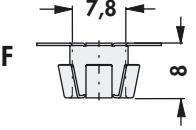
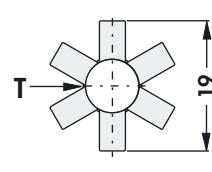
I

K

L

M

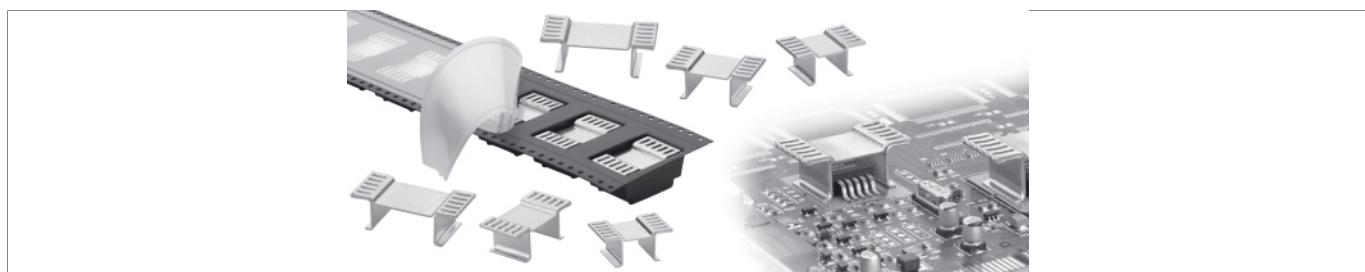
N

art. no.			57 K/W	
KF 5/5				
art. no.			46 K/W	
KF 5/10				
art. no.			40 K/W	
KF 5/15				
material:	brass			
surface:	blackened			
art. no.			60 K/W	
KK 562 GS	T = gap; F = spring loaded			
material:	special bronze Cu Zn 15			
material thickness:	0.3 mm			
surface:	blackened			

Small heatsinks

A		
B		
C		
D		
E		
F		
G		
H		
I		
K		
L		
M		
N		
SKK 56	 art. no.	<p>63 K/W</p> <p>TO 5</p>
SKK 58	 art. no.	<p>55 K/W</p> <p>TO 5</p>
SKK 510	 art. no.	<p>44 K/W</p> <p>TO 5</p>
material:	aluminium	
surface:	etched (other surfaces on request)	
KK 92	 art. no.	<p>80 K/W</p> <p>TO 126</p> <p>SOT 32</p> <p>SOT 82</p>
KK 32	 art. no.	<p>60 K/W</p> <p>TO 126</p> <p>SOT 32</p> <p>SOT 82</p>
material:	special bronze Cu Zn 6	
surface:	blackened	

Heatsinks for D PAK and others

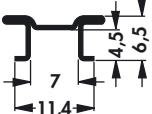
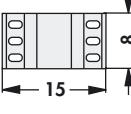
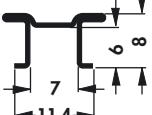
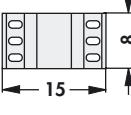
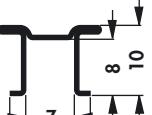
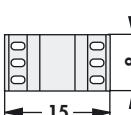
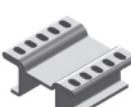
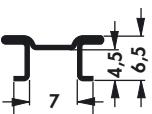
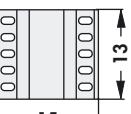
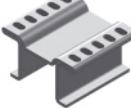
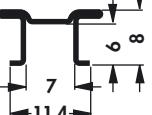
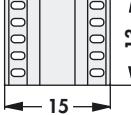
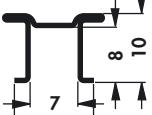
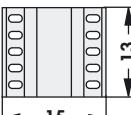


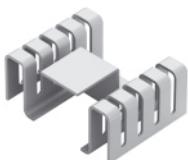
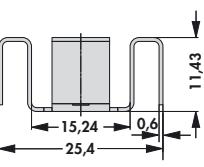
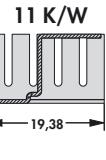
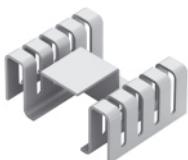
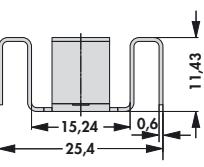
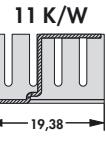
- copper heatsinks with excellent heat conductivity
- direct mounting on printed circuit through solderable surface
- especially suitable for SMD components of type D PAK (TO 252), D² PAK (TO 263), D³ PAK (TO 268), SOT 669 LF PAK, SO IC-8 FL MP, Power SO-8, Power SO-10, Power SO-20, Power SO-36, SO-14, SO-16, SOT 223 etc
- available standard packing: bulk parts or reel
- special packing like magazine, tray etc. on request; - special versions according to customers specifications
- **tape width:** 44 mm, **reel diameter:** 330 mm, **quantity:** FK 244 08 = 450, FK 244 13 = 200

art. no.			
FK 244 08 D PAK ... weight: 2g			
FK 244 13 D PAK ... weight: 3.3g			
FK 244 08 D2 PAK ... weight: 2.2g			
FK 244 13 D2 PAK ... weight: 3.6g			
FK 244 08 D3 PAK ... weight: 2.5g			
please indicate: ... packing (optional) TR = tape and reel			
surface:	solderable surface		
material:	copper (Cu)		
material thickness:	0.6 mm		

Heatsinks for D PAK and others

– **tape width:** 24 mm, **reel diameter:** 330 mm, **quantity:** FK 250 06 = 450, FK 250 08 = 450, FK 250 10 = 350
 – **tape width:** 24 mm, **reel diameter:** 330 mm, **quantity:** FK 251 06 = 450, FK 251 08 = 350, FK 251 10 = 250

art. no.			37 K/W	
FK 250 06 LF PAK ... weight: 1g			34,8 K/W	
FK 250 10 LF PAK ... weight: 1.2g			28,8 K/W	
FK 251 06 LF PAK ... weight: 1.3g			32 K/W	
FK 251 08 LF PAK ... weight: 1.4g			29,8 K/W	
FK 251 10 LF PAK ... weight: 1.5g			24 K/W	
please indicate:	... packing (optional) TR = tape and reel			
surface:	solderable surface			
material:	copper (Cu)			
material thickness:	0.6 mm			

art. no.			11 K/W	
FK 256			11 K/W	
surface:	solderable surface			
material:	aluminium			
material thickness:	0.6 mm			

Segment cooling aggregates
Miniature cooling aggregates
Hollow fin cooling aggregates
High performance heatsinks



Segment cooling aggregates

- modular assembly consisting of different circle- and length segments
- electrical and thermal insulation of the single cooling segment sections
- standard drilling patterns TO 3 and pressfit
- segment profile also sold by the meter
- other fan types and fan voltages upon request



Miniature cooling aggregates

- compact construction for dissipating high power losses on smallest installation space
- heatsink geometries and fixed length optimal adjusted to the fan being used
- homogeneous heat dissipation
- mounting of the semi-conductor by means of sliding nut channels or specific snap-to-retaining springs for transistors



Hollow fin cooling aggregates

- flow-optimized hollow fin geometry
- precise milled flat semi-conductor mounting surface, single- and double-sided
- laminar airflow and noise reduction by means of harmonized chamber systems
- additional treatments, modifications and designs according to customers specifications

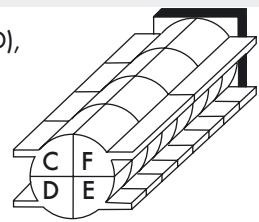


High performance heatsinks

- exclusive for forced convection
- for radial- and tangential fans
- flow-optimized design, best heat dissipation by means of especially thick bottom plates
- precise milled flat semi-conductor mounting surfaces
- mechanical treatments, special designs and surface coating for your application

Order example (see drawing on the right)

Semiconductor cooling package, consisting of 4 heatsinks LA 1 -2 A (segment C), 1 heatsink LA 1 - 8 A (segment D), 8 heatsinks LA 1 - 1 A (segment E) and 2 heatsinks LA 1- 4 A (segment F).
Total dissipation 1280 W..



How to tick off?

1. Tick on the left hand side the circles corresponding to an eight element long package, and also at the end of each row of the segments C, D, E and F to define the length.
2. For segment C: 4 marks for four double length elements, insulated from each other. This indicates 4 units LA 1 - 2.
3. For segment D: 1 mark for one single length of heatsink, 290,5 mm long. This indicates 1 unit LA 1 - 8.
4. For segment E: 8 marks for 8 elements of the standard length (35 mm) each insulated from the other. This indicates 8 units LA 1 - 1.
5. For segment F: 2 marks for each two heatsinks of 144,5 mm length, each insulated from the other. This indicates 2 units LA 1 - 4.
6. For each segment the profile types, either A or B, must be indicated for aggregate LA 1.
7. In the rectangle corresponding to the heatsink elements, the pin layouts for the transistor should also be indicated.
8. In the order form please indicate whether the cooling-aggregate is to be supplied with a fan and whether this is equipped with a protection-grid, or if it is to be supplied without a fan.

Upon request, it is possible to supply fans for special voltages and higher temperatures.

		LA 1 ☒	LA 2 ○		
date:					
pieces p. order:					
company:					
name/dept.:					
town:					
street:					
signature:					
<input type="checkbox"/> with fan <input type="checkbox"/> protection grid <input type="checkbox"/> without fan					
<input type="checkbox"/> 230 Volt voltage: <input type="checkbox"/> ~ ○ =					
cable connection					
Length Units: mm	segment:	segment:	segment:	segment:	
35,0 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
71,5 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
108,0 3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
144,5 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
181,0 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
217,5 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
254,0 7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
290,5 8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
327,0 9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
363,5 10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	C	D	E	F	
Please check off here total length of the cooling aggregate.					

Order example

The segment-line C-D-E-F is shown against air-escape orifice, thus on the other side of the axial fan.
From this view also tick off cable terminal with axial fan.

LA 1

LA 2

date:

pieces p. order:

company:

name/dept.:

town:

street:

signature:

- with fan
- protection grid
- without fan

- 230 Volt
voltage:
 ~ = Volt

Length Units:
mm

35,0

	segment:	segment:	segment:	segment:
35,0	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
71,5	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 Fassung TO 3 Lochung Prefit-Bohrg.	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
108,0	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
144,5	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
181,0	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
217,5	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
254,0	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
290,5	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
327,0	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole
363,5	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole	<input type="radio"/> Typ. A <input type="radio"/> B TO 3 holder TO 3 hole pressfit hole

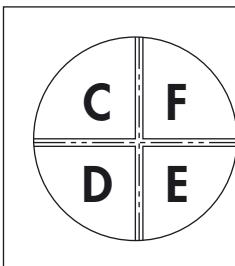
C

D

E

F

Please check off here total length of the cooling aggregate.



cable connection

The segment-line C-D-E-F is shown against air-escape orifice, thus on the other side of the axial fan.
From this view also tick off cable terminal with axial fan.

D 3

POB 1590
Nottebohmstraße 28
Tel.: +49 (0) 23 51 / 4 35-0

D - 58465 Lüdenscheid
D - 58511 Lüdenscheid
Fax: +49 (0) 23 51 / 4 57 54

info@fischerelektronik.de
www.fischerelektronik.de
www.facebook/fischerelektronik

LA 1

LA 2

date:

pieces p. order:

company:

name/dept.:

town:

street:

signature:

- with fan
- protection grid
- without fan

- 230 Volt
- Volt
- voltage:
 ~

Length Units:
mm

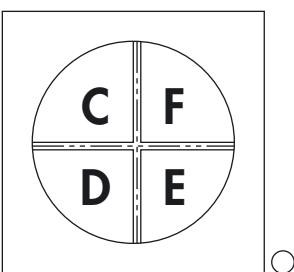
35,0 1
71,5 2
108,0 3
144,5 4
181,0 5
217,5 6
254,0 7
290,5 8
327,0 9
363,5 10

segment:	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

segment:	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 Fassung TO 3 Lochung Preßfit Bohrg.	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

segment:	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

segment:	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole	Typ. A Ø B TO 3 holder TO 3 hole pressfit hole
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



cable connection

The segment-line C-D-E-F is shown against air-escape orifice, thus on the other side of the axial fan.
From this view also tick off cable terminal with axial fan.

C

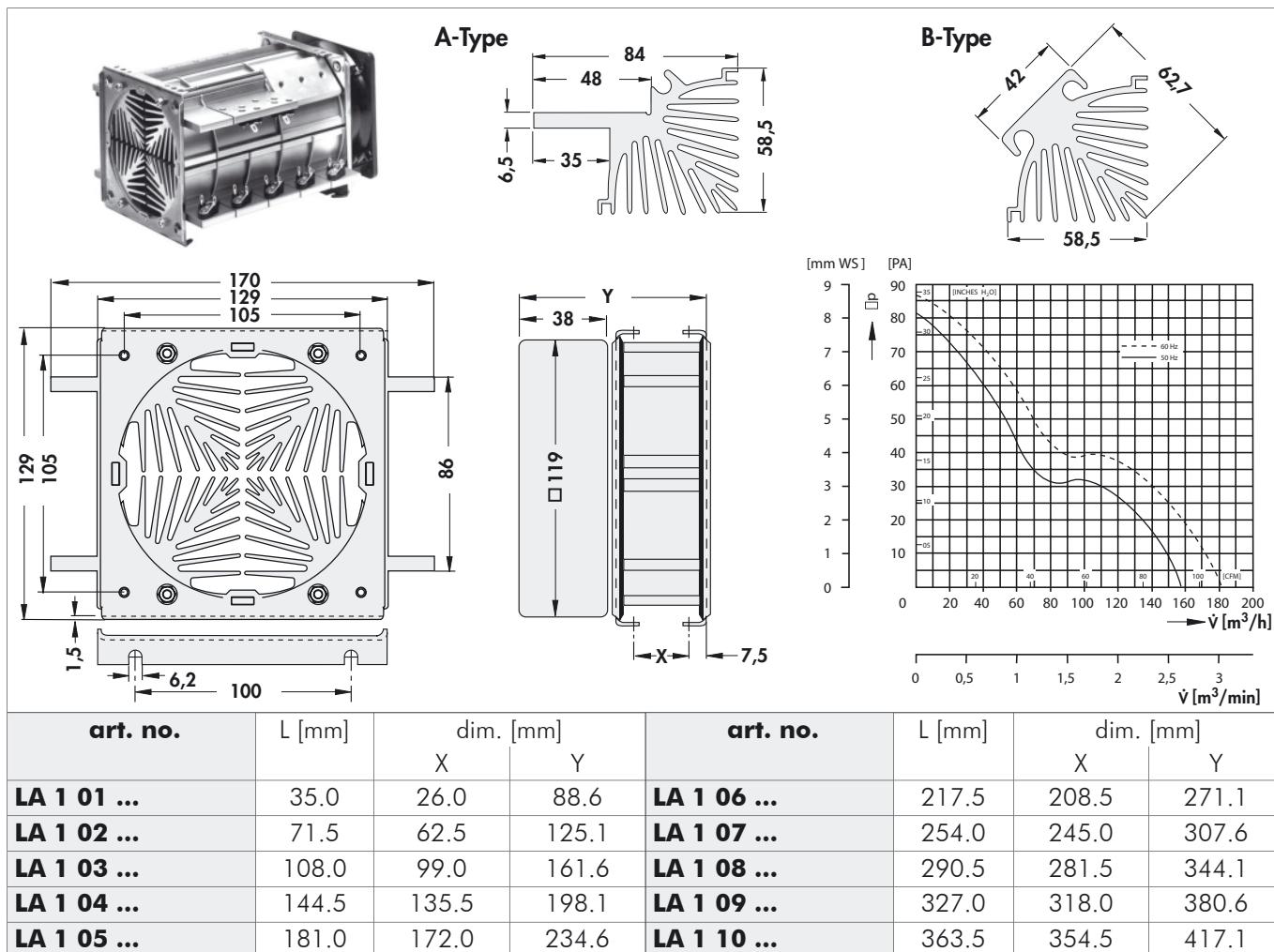
D

E

F

Please check off here total length of the cooling aggregate.

Segment cooling aggregates



... for A-types: please add an "A", for B-types: please add a "B".

L: unit lengths of the segments incl. insulation; **X:** mounting distance; **Y:** length of the cooling aggregate incl. fan

24 V DC fan on request

In case of order please use order form.

segments also available in meter length:

art. no. for A-type: LA 1 1000 A; art. no. for B-type: LA 1 1000 B

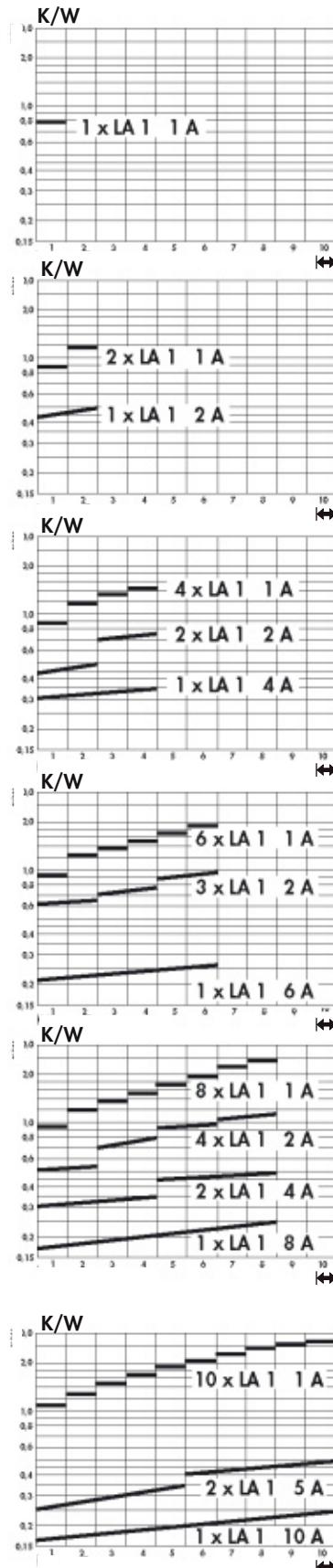
Other fan types and fan voltages on request.

Technical data of the fans

	... 230
type	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm
tension	230 V AC
power inout	19 W
max. air volume	160 m³/h
temperature range	-40 °C ... +85 °C
speed	2,650 min⁻¹
noise level	47 dB(A)
weight	550 g
failure rate (L₁₀)	L ₁₀ > 37,500 h (40 °C)

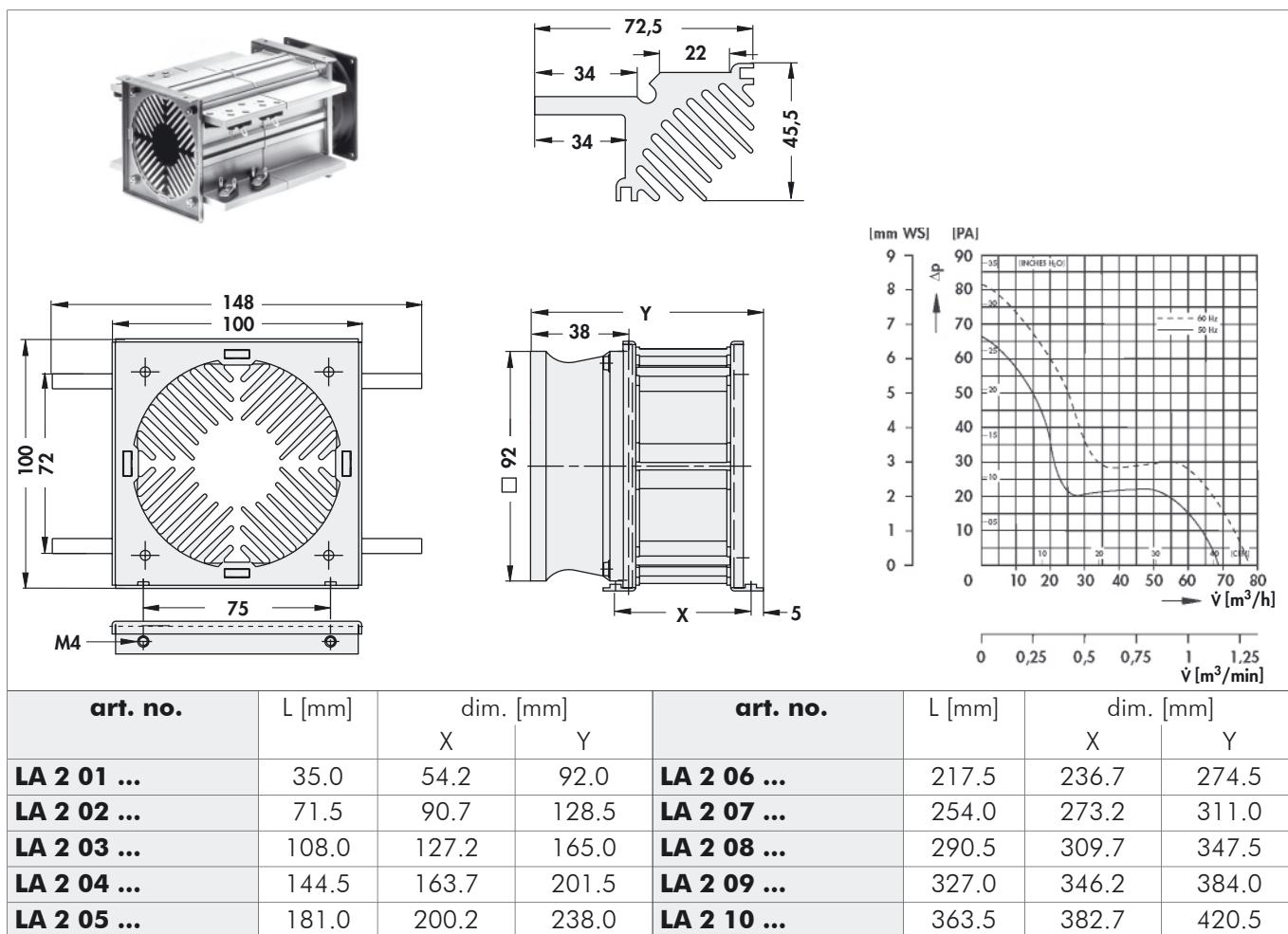
Thermal resistance LA 1

The thermal resistance in the following diagrams is given on the base of a total dissipation of 40 Watt per heatsink of the „A“-type. When using „B“-types this value increases by 3 %.



1. Cooling aggregate consisting of 4 heatsinks LA 1 - 1 A. Total dissipation 160 W.
2. Cooling aggregate consisting of 4 heatsinks LA 1 - 1 A and 2 x 1 heatsink LA 1 - 2 A. Total dissipation 320 W.
3. Cooling aggregate consisting of 4 heatsinks LA 1 - 1 A, 2 heatsinks LA 1 - 2 A and 2 x 1 heatsink LA 1 - 4 A. Total dissipation 640 W.
4. Cooling aggregate consisting of 6 heatsinks LA 1 - 1 A, 3 heatsinks LA 1 - 2 A and 2 x 1 heatsink LA 1 - 6 A. Total dissipation 960 W.
5. Cooling aggregate consisting of 8 heatsinks LA 1 - 1 A, 4 heatsinks LA 1 - 2 A, 2 heatsinks LA 1 - 4 A and 1 heatsink LA 1 - 8 A. Total dissipation 1280 W.
6. Cooling aggregate consisting of 10 heatsinks LA 1 - 1 A, 2 heatsinks LA 1 - 5 A and 2 x 1 heatsink LA 1 - 10 A. Total dissipation 1600 W.

Segment cooling aggregates



L: unit lengths of the segments incl. insulation; **X:** mounting distance; **Y:** length of the cooling aggregate incl. fan

24 V DC fan on request

In case of order please use order form.

segments also available in meter length: **art. no. for A-type: LA 1 1000 A; art. no. for B-type: LA 2 1000 B**

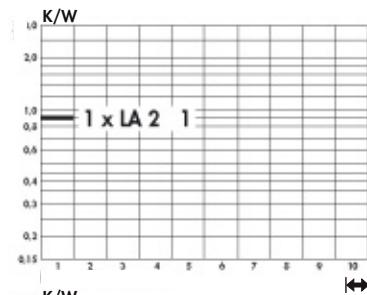
Other fan types and fan voltages on request.

Technical data of the fans

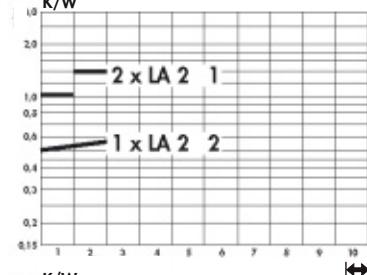
	... 230
type	ebmpapst, ball bearing
dimensions	92 x 92 x 38 mm
tension	230 V AC
power inout	12 W
max. air volume	75 m³/h
temperature range	-40 °C ... +75 °C
speed	2,700 min ⁻¹
noise level	37 dB(A)
weight	420 g
failure rate (L₁₀)	L ₁₀ > 52,500 h (40 °C)

Thermal resistance LA 2

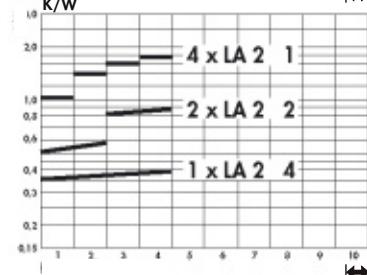
The thermal resistance in the following diagrams is given on the base of a total dissipation of 40 Watt per heatsink of the „A“-type.



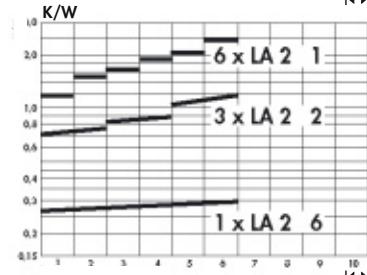
1. Cooling aggregate consisting of 4 heatsinks LA 2 - 1. Total dissipation 160 W maximal.



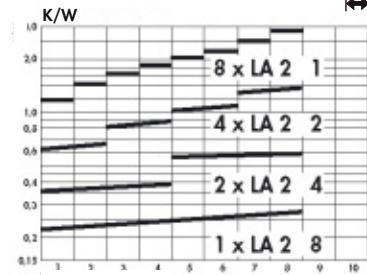
2. Cooling aggregate consisting of 4 heatsinks LA 2 - 1 and 2 x 1 heatsink LA 2 - 2. Total dissipation 320 W.



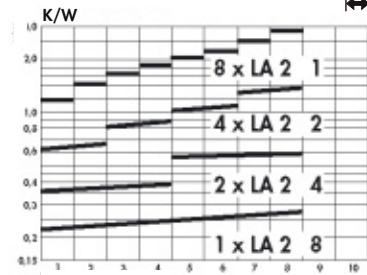
3. Cooling aggregate consisting of 4 heatsinks LA 2 - 1, 2 heatsinks LA 2 - 2 and 2 x 1 heatsink LA 2 - 4. Total dissipation 640 W.



4. Cooling aggregate consisting of 6 heatsinks LA 2 - 1, 3 heatsinks LA 2 - 2 and 2 x 1 heatsink LA 2 - 6. Total dissipation 960 W.



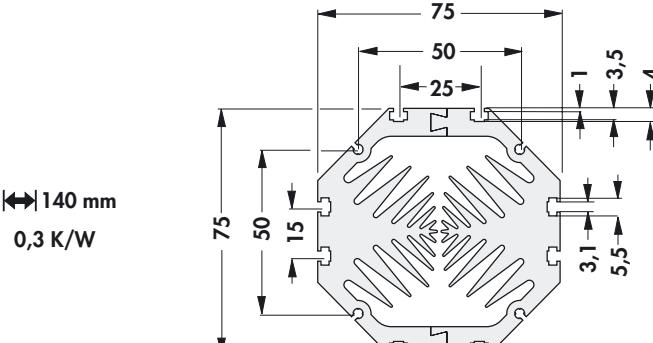
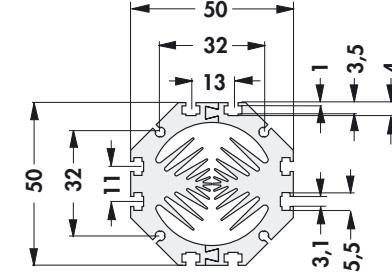
5. Cooling aggregate consisting of 8 heatsinks LA 2 - 1, 4 heatsinks LA 2 - 2, 2 heatsinks LA 2 - 4 and 1 heatsink LA 2 - 8. Total dissipation 1280 W.



6. Cooling aggregate consisting of 10 heatsinks LA 2 - 1, 2 heatsinks LA 2 - 5, and 2 x 1 heatsink LA 2 - 10. Total dissipation 1600 W.

Miniature cooling aggregates

- made for dissipation of high power within a very small space
- approximate length is optimised to the fan motor
- slide-nut channels for M3 nuts for mounting the transistors and circuit boards
- other fan types and fan voltages on request

art. no.		 140 mm 0,3 K/W	 100 mm 0,73 K/W
LAM 1			
surface:	natural colour anodised		

Technical data of the fans

	LAM 1	LAM 2
type	ebmpapst 612 NHH-118	ebmpapst 412 F
dimensions	60 x 60 x 25 mm	40 x 40 x 10 mm
tension	12 V DC	12 V DC
power inout	2.9 W	0.7 W
max. air volume	56 m ³ /h	8 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C
speed	6,800 min ⁻¹	5,400 min ⁻¹
noise level	41 dB(A)	22.1 dB(A)
weight	66 g	17 g
failure rate (L₁₀)	L ₁₀ > 60,000 h (40 °C)	L ₁₀ > 45,000 h (20 °C)

D 9

Retaining springs for transistors
 Special heatsink design
 Hollow-fin cooling aggregates
 High capacity cooling aggregat.

→ A 114 – 120 Fluid coolers
 → A 135 – 136 Protection grid for axial fans
 → D 15 – 25 Thermally conductive foil
 → D 26 – 35 Technical introduction

→ A 129 – 131
 → D 36
 → E 5 – 13
 → A 2 – 7

Miniature cooling aggregates

- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and processing according to customer's requirements
- other surfaces treatment, fan types and fan voltages on request

art. no.			
LAM 3 ...			
please indicate:	... ↗ 50 75 100 125 150 mm	... fan type 5 = 5 V DC 12 = 12 V DC	
surface:	natural colour anodised		

- with grooves for transistor retaining springs THFU ➔ A 117
- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and processing according to customers requirements
- other surfaces treatment, fan types and fan voltages on request

art. no.			
LAM 3 K ...			
please indicate:	... ↗ 50 75 100 125 150 mm	... fan type 5 = 5 V DC 12 = 12 V DC	
surface:	natural colour anodised		

Technical data of the fans

	... 5	... 12
type	Sepa, ball bearing	Sepa, ball bearing
dimensions	30 x 30 x 10 mm	30 x 30 x 10 mm
tension	5 V DC	12 V DC
max. air volume	6.8 m ³ /h	7.7 m ³ /h
cur. consumpt.	130 mA	70 mA
temperature range	-10 °C ... +70 °C	-10 °C ... +70 °C
noise level	21 dB(A)	23 dB(A)
speed	8,500 min ⁻¹	9,100 min ⁻¹
weight	8 g	8 g
failure rate (L₁₀)	L ₁₀ > 95,000 h (20 °C) MTBF > 280,000 h (20 °C)	L ₁₀ > 95,000 h (20 °C) MTBF > 280,000 h (20 °C)

Retaining springs for transistors
 Special heatsink design
 Hollow-fin cooling aggregates
 High capacity cooling aggregat.

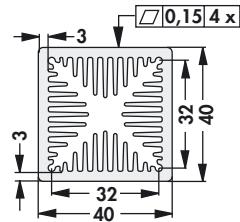
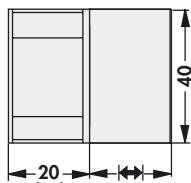
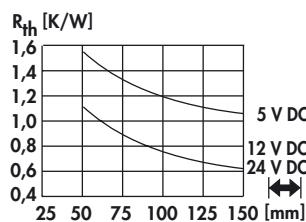
→ A 114 - 120 Fluid coolers
 → A 135 - 136 Protection grid for axial fans
 → D 15 - 25 Thermally conductive foil
 → D 26 - 35 Technical introduction

→ A 129 - 131
 → D 36
 → E 5 - 13
 → A 2 - 7

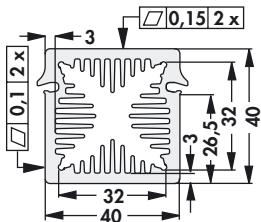
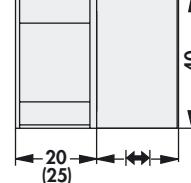
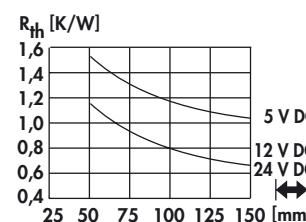
D 10

Miniature cooling aggregates

- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and processing according to customer's requirements
- other surfaces treatment, fan types and fan voltages on request

art. no.				R _{th} [K/W]
LAM 4 ...				
please indicate:	... ↗ 50 75 100 125 150 mm		... fan type 5 = 5 V DC 12 = 12 V DC 24 = 24 V DC	
surface:		natural colour anodised		

- with grooves for transistor retaining springs THFU → A 117
- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and processing according to customer's requirements
- other surfaces treatment, fan types and fan voltages on request

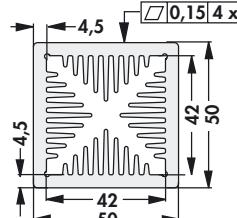
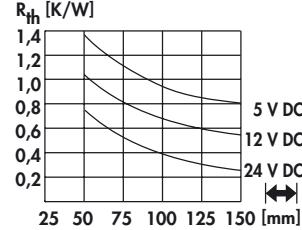
art. no.				R _{th} [K/W]
LAM 4 K ...				
please indicate:	... ↗ 50 75 100 125 150 mm		... fan type 5 = 5 V DC 12 = 12 V DC 24 = 24 V DC	
surface:		natural colour anodised		

Technical data of the fans

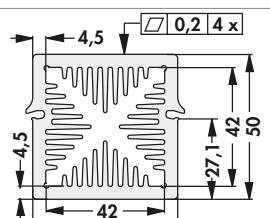
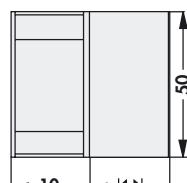
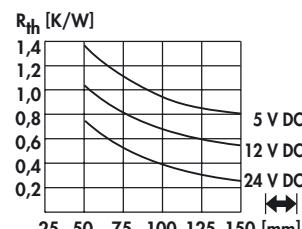
	... 5	... 12	... 24
type	ebmpapst 405	ebmpapst 412 JHH	ebmpapst 414 JHH
dimensions	40 x 40 x 20 mm	40 x 40 x 25 mm	40 x 40 x 25 mm
tension	5 V DC	12 V DC	24 V DC
power inout	0.9 W	3.3 W	3.6 W
max. air volume	10 m ³ /h	24 m ³ /h	24 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +60 °C	-20 °C ... +60 °C
speed	6,000 min ⁻¹	13,000 min ⁻¹	13,000 min ⁻¹
noise level	18 dB(A)	46 dB(A)	46 dB(A)
weight	27 g	50 g	50 g
failure rate (L₁₀)	L ₁₀ > 50,000 h (40 °C) L ₁₀ > 20,000 h (tmax)	L ₁₀ > 57,500 h (40 °C) L ₁₀ > 35,000 h (tmax)	L ₁₀ > 57,500 h (40 °C) L ₁₀ > 35,000 h (tmax)

Miniature cooling aggregates

- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and processing according to customer's requirements
- other surfaces treatment, fan types and fan voltages on request

art. no.				
LAM 5 ...				
please indicate:	... ↗ 50 75 100 125 150 mm	... fan type 5 = 5 V DC 12 = 12 V DC 24 = 24 V DC		
surface:	natural colour anodised			

- with grooves for transistor retaining springs THFU → A 117
- compact design
- homogeneous heat dissipation
- mounting possible on any side
- powerful axial-fan motor
- other lengths, special designs and processing according to customer's requirements
- other surfaces treatment, fan types and fan voltages on request

art. no.				
LAM 5 K ...				
please indicate:	... ↗ 50 75 100 125 150 mm	... fan type 5 = 5 V DC 12 = 12 V DC 24 = 24 V DC		
surface:	natural colour anodised			

Technical data of the fans

	... 5	... 12	... 24
type	Sepa, ball bearing	Sepa, ball bearing	ebmpapst
dimensions	50 x 50 x 10 mm	50 x 50 x 10 mm	50 x 50 x 15 mm
tension	5 V DC	12 V DC	24 V DC
max. air volume	10.1 m ³ /h	14.3 m ³ /h	20 m ³ /h
cur. consumpt.	50 mA	40 mA	42 mA
temperature range	-40 °C ... +80 °C	-40 °C ... +80 °C	-20 °C ... +70 °C
speed	3,500 min ⁻¹	4,800 min ⁻¹	5,000 min ⁻¹
noise level	16 dB(A)	25 dB(A)	30 dB(A)
weight	19 g	19 g	25 g
failure rate (L₁₀)	L ₁₀ > 95,000 h (20 °C) MTBF > 280,000 h (20 °C)	L ₁₀ > 95,000 h (20 °C) MTBF > 280,000 h (20 °C)	L ₁₀ 50,000 h (20 °C)
alarm output	with	with	

Retaining springs for transistors
Special heatsink design
Hollow-fin cooling aggregates
High capacity cooling aggregat.

→ A 114 – 120 Fluid coolers
→ A 135 – 136 Protection grid for axial fans
→ D 15 – 25 Thermally conductive foil
→ D 26 – 35 Technical introduction

→ A 129 – 131
→ D 36
→ E 5 – 13
→ A 2 – 7

D 12

A

B

C

D

E

F

G

H

I

K

L

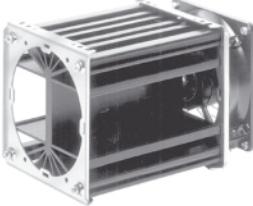
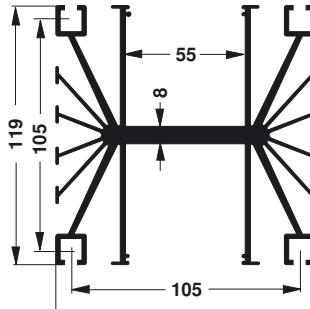
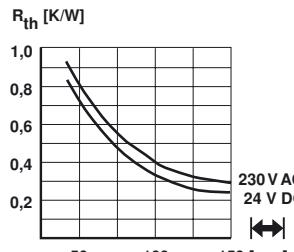
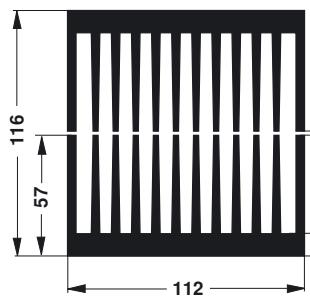
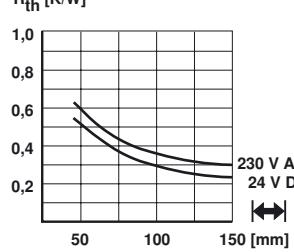
M

N

Cooling aggregates with axial fan

Heatsink-cooling aggregates

- especially suitable for IGBT, SSR, semiconductor modules, high performance transistors etc.
- effective construction with axial fans
- good thermal performance
- additional machining according to customer's instructions
- cooling aggregates also available without fans
- other fan types and fan voltages on request

art. no.  LA 4 ...		
art. no.  LA 5 ...		
* for one segment		
please indicate: ... ↗ 75 100 150 mm	... fan type 24 = 24 V DC 230 = 230 V AC	

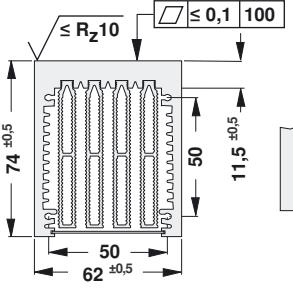
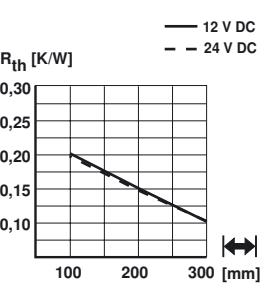
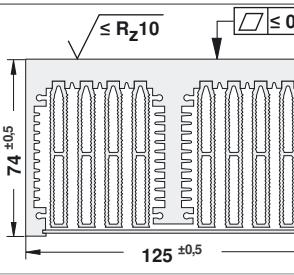
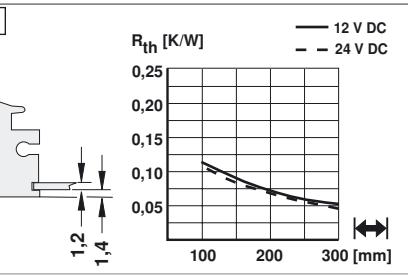
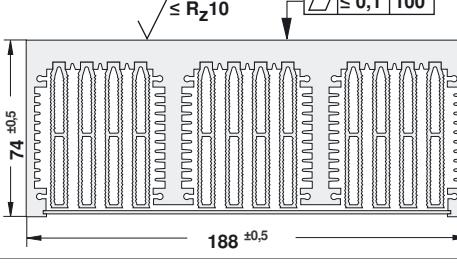
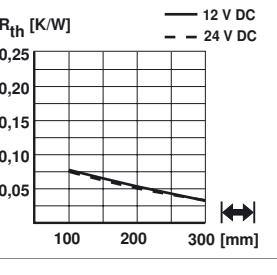
Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
speed	4,400 min ⁻¹	2,650 min ⁻¹
noise level	59 dB(A)	47 dB(A)
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70,000 h (40 °C)	L ₁₀ > 37,500 h (40 °C)

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- milled flat semiconductor mounting surface
- other fan types and fan voltages on request

art. no.			
LA 6 ...	without air flow chamber		
art. no.			
LA 7 ...	without air flow chamber		
art. no.			
LA 8 ...	without air flow chamber		
please indicate:	... ↵ 100 150 200 250 300 mm	... fan type 12 = 12 V DC 24 = 24 V DC	

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60 x 60 x 25 mm	60 x 60 x 25 mm
tension	12 V DC	24 V DC
power inout	2.9 W	3 W
max. air volume	56 m³/h	56 m³/h
temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C
speed	6,800 min⁻¹	6,850 min⁻¹
noise level	41 dB(A)	41 dB(A)
weight	66 g	66 g
failure rate (L₁₀)	L ₁₀ > 60,000 h (40 °C)	L ₁₀ > 60,000 h (40 °C)

D 15

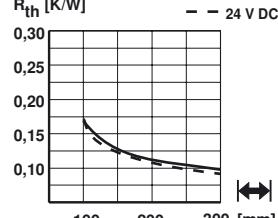
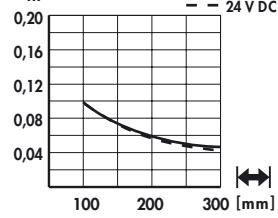
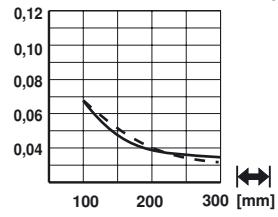
Cooling aggreg. in segment mount. → D 5 – 7
 Miniature cooling aggregates → D 9 – 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 – 29

Extruded heatsinks → A 22 – 83
 Cooling aggregates with radial fan → D 33 – 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 – 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- milled flat semiconductor mounting surface
- other fan types and fan voltages on request

art. no.			
LA V 6 ...	with air flow chamber		
art. no.			
LA V 7 ...	with air flow chamber		
art. no.			
LA V 8 ...	with air flow chamber		
please indicate:	...  100 150 200 250 300 mm	... fan type	12 = 12 V DC 24 = 24 V DC

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	60 x 60 x 25 mm	60 x 60 x 25 mm
tension	12 V DC	24 V DC
power inout	2.9 W	3 W
max. air volume	56 m ³ /h	56 m ³ /h
temperature range	-20 °C ... +70 °C	-20 °C ... +70 °C
speed	6,800 min ⁻¹	6,850 min ⁻¹
noise level	41 dB(A)	41 dB(A)
weight	66 g	66 g
failure rate (L₁₀)	L ₁₀ > 60,000 h (40 °C)	L ₁₀ > 60,000 h (40 °C)

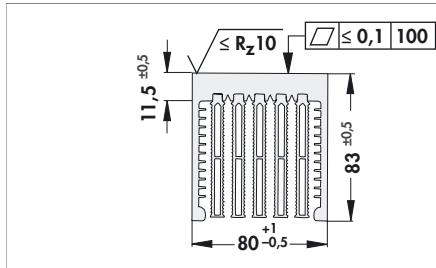
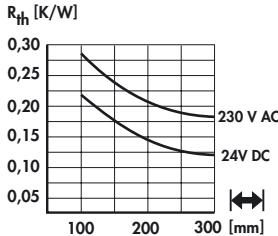
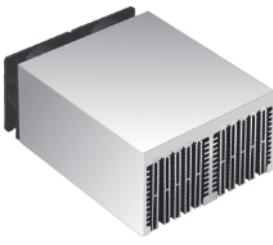
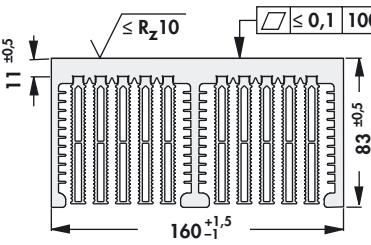
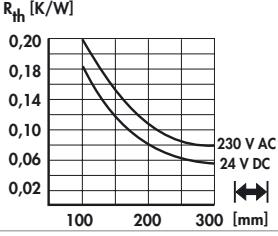
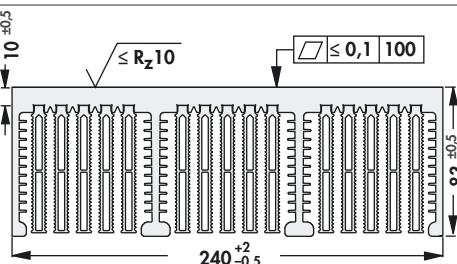
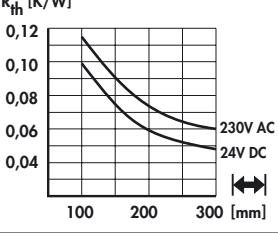
Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- milled flat semiconductor mounting surface
- other fan types and fan voltages on request

art. no.			R _{th} [K/W]
LA 9 ...	without air flow chamber		
art. no.			
LA 10 ...	without air flow chamber		
art. no.			
LA 11 ...	without air flow chamber		
please indicate:	... ↗ 100 150 200 250 300 mm	... fan type 24 = 24 V DC 230 = 230 V AC	

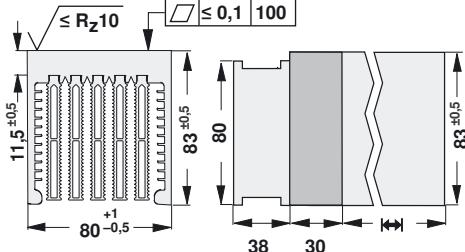
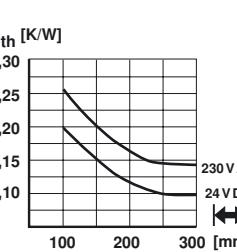
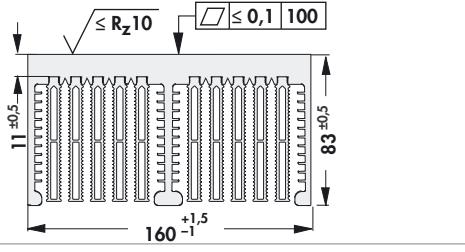
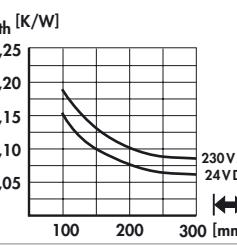
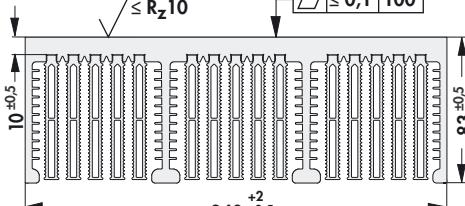
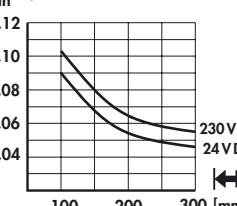
Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	80 x 80 x 32 mm	80 x 80 x 38 mm
tension	24 V DC	230 V AC
power inout	6 W	12 W
max. air volume	80 m ³ /h	50 m ³ /h
temperature range	-20 °C ... +75 °C	-40 °C ... +90 °C
speed	5,000 min ⁻¹	2,800 min ⁻¹
noise level	48 dB(A)	31 dB(A)
weight	170 g	480 g
failure rate (L₁₀)	L ₁₀ > 55,000 h (40 °C)	L ₁₀ > 52,500 h (40 °C)

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- geometry of hollow fin optimising the air flow
- particularly effective heat dissipation
- compact construction
- milled flat semiconductor mounting surface
- other fan types and fan voltages on request

art. no.			
LA V 9 ...	with air flow chamber		
art. no.			
LA V 10 ...	with air flow chamber		
art. no.			
LA V 11 ...	with air flow chamber		
please indicate:	... ↗	... fan type	
	100 150 200 250 300 mm	24 = 24 V DC	
		230 = 230 V AC	

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	80 x 80 x 32 mm	80 x 80 x 38 mm
tension	24 V DC	230 V AC
power inout	6 W	12 W
max. air volume	80 m³/h	50 m³/h
temperature range	-20 °C ... +75 °C	-40 °C ... +90 °C
speed	5,000 min⁻¹	2,800 min⁻¹
noise level	48 dB(A)	31 dB(A)
weight	170 g	480 g
failure rate (L₁₀)	L ₁₀ > 55,000 h (40 °C)	L ₁₀ > 52,500 h (40 °C)

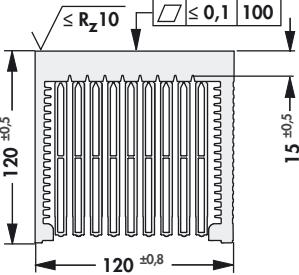
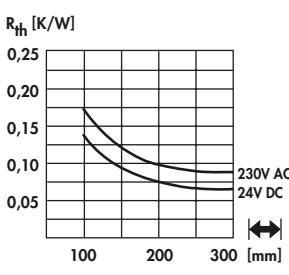
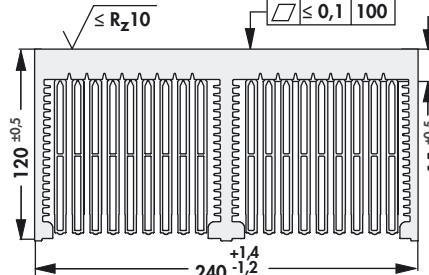
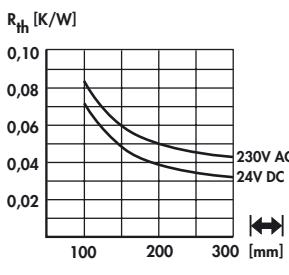
Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- particularly effective heat dissipation
- compact design with axial fan
- milled flat semiconductor mounting surface
- additional design to customer's instructions
- other fan types and fan voltages on request

art. no.			
LA 14 ...	without air flow chamber		
art. no.			
LA 15 ...	without air flow chamber		
please indicate:	... ↗ 100 150 200 250 300 400 mm	... fan type 24 = 24 V DC 230 = 230 V AC	

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
speed	4,400 min ⁻¹	2,650 min ⁻¹
noise level	59 dB(A)	47 dB(A)
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70,000 h (40 °C)	L ₁₀ > 37,500 h (40 °C)

D 19

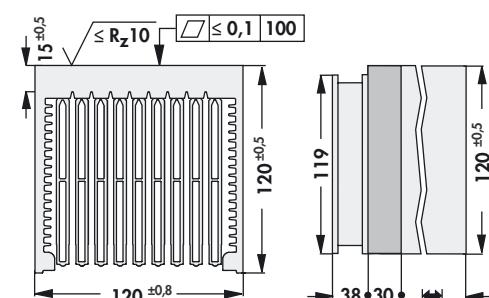
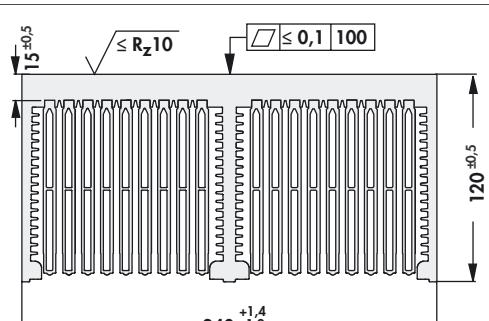
Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks → A 22 - 83
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- particularly effective heat dissipation
- compact design with axial fan
- milled flat semiconductor mounting surface
- additional design to customer's instructions on request
- other fan types and fan voltages on request

art. no. 	 R_{th} [K/W] vs. dimension [mm] graph: <table border="1"> <thead> <tr> <th>Dimension [mm]</th> <th>230 VAC</th> <th>24 VDC</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>0,15</td> <td>0,12</td> </tr> <tr> <td>200</td> <td>0,08</td> <td>0,06</td> </tr> <tr> <td>300</td> <td>0,05</td> <td>0,04</td> </tr> </tbody> </table>	Dimension [mm]	230 VAC	24 VDC	100	0,15	0,12	200	0,08	0,06	300	0,05	0,04
Dimension [mm]	230 VAC	24 VDC											
100	0,15	0,12											
200	0,08	0,06											
300	0,05	0,04											
LA V 14 ... with air flow chamber													
art. no. 	 R_{th} [K/W] vs. dimension [mm] graph: <table border="1"> <thead> <tr> <th>Dimension [mm]</th> <th>230 VAC</th> <th>24 VDC</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>0,10</td> <td>0,08</td> </tr> <tr> <td>200</td> <td>0,05</td> <td>0,04</td> </tr> <tr> <td>300</td> <td>0,03</td> <td>0,02</td> </tr> </tbody> </table>	Dimension [mm]	230 VAC	24 VDC	100	0,10	0,08	200	0,05	0,04	300	0,03	0,02
Dimension [mm]	230 VAC	24 VDC											
100	0,10	0,08											
200	0,05	0,04											
300	0,03	0,02											
LA V 15 ... with air flow chamber													
please indicate: ... ↵ 100 150 200 250 300 400 mm	... fan type 24 = 24 V DC 230 = 230 V AC												

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m³/h	160 m³/h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
speed	4,400 min⁻¹	2,650 min⁻¹
noise level	59 dB(A)	47 dB(A)
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70,000 h (40 °C)	L ₁₀ > 37,500 h (40 °C)

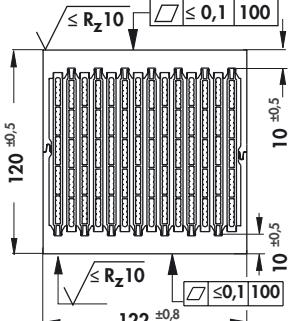
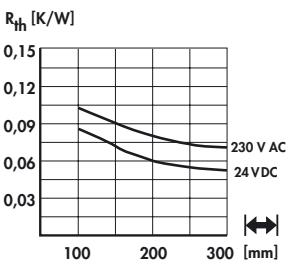
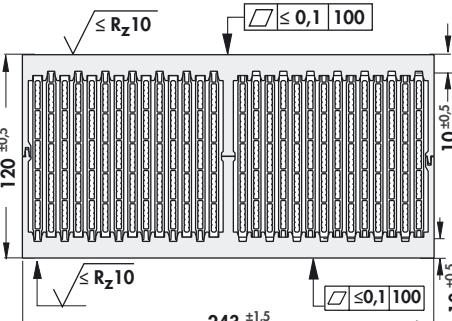
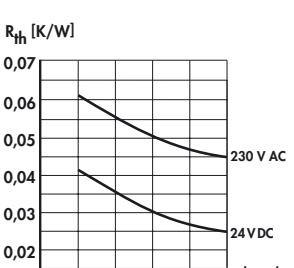
Cooling aggreg. in segment mount. → D 5 - 7
Miniature cooling aggregates → D 9 - 11
Protection grid for axial fans → D 36
Thermal conductive material → E 2 - 29

Extruded heatsinks
Cooling aggregates with radial fan → D 33 - 35
Heatsinks with hollow fin profile → D 30
Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.			
LA 17 ...	without air flow chamber		
art. no.			
LA 18 ...	without air flow chamber		
please indicate:	... ↪ 100 150 200 250 300 400 mm	... fan type 24 = 24 V DC 230 = 230 V AC	

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m ³ /h	160 m ³ /h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
speed	4,400 min ⁻¹	2,650 min ⁻¹
noise level	59 dB(A)	47 dB(A)
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70,000 h (40 °C)	L ₁₀ > 37,500 h (40 °C)

D 21

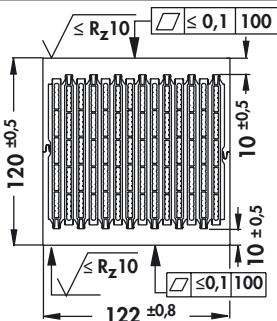
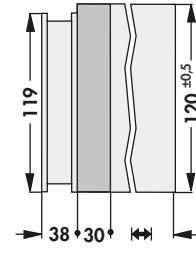
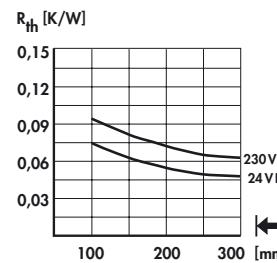
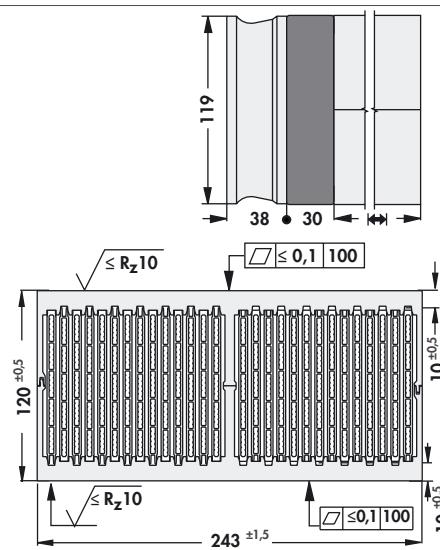
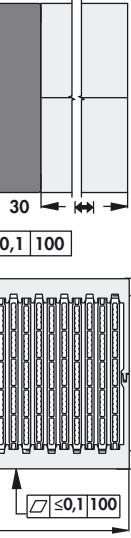
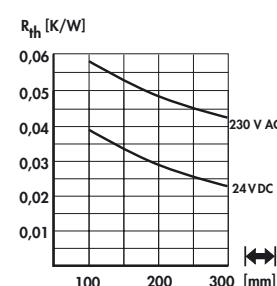
Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks → A 22 - 83
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no. 	 	
LA V 17 ...	with air flow chamber	
art. no. 	 	
LA V 18 ...	with air flow chamber	
please indicate:	... ↪ 100 150 200 250 300 400 mm	... fan type 24 = 24 V DC 230 = 230 V AC

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
tension	24 V DC	230 V AC
power inout	11 W	19 W
max. air volume	237 m³/h	160 m³/h
temperature range	-30 °C ... +55 °C	-40 °C ... +85 °C
speed	4,400 min⁻¹	2,650 min⁻¹
noise level	59 dB(A)	47 dB(A)
weight	390 g	550 g
failure rate (L₁₀)	L ₁₀ > 70,000 h (40 °C)	L ₁₀ > 37,500 h (40 °C)

Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.			 R _{th} [K/W]
LA 21 ...	without air flow chamber		 R _{th} [K/W]
LA 22 ...	without air flow chamber		 R _{th} [K/W]
please indicate:	... ↗ 100 150 200 250 300 400 mm	... fan type 24 = 24 V DC 230 = 230 V AC	

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	92 x 92 x 32 mm	92 x 92 x 38 mm
tension	24 V DC	230 V AC
power inout	5.3 W	12 W
max. air volume	107 m ³ /h	75 m ³ /h
temperature range	-20 °C ... +75 °C	-40 °C ... +75 °C
speed	4,000 min ⁻¹	2,700 min ⁻¹
noise level	47 dB(A)	37 dB(A)
weight	190 g	420 g
failure rate (L₁₀)	L ₁₀ > 57,500 h (40 °C)	L ₁₀ > 52,500 h (40 °C)

D 23

Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks → A 22 - 83
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due to optimised hollow fin geometry
- effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.			
LA V 21 ...	with air flow chamber		
art. no.			
LA V 22 ...	with air flow chamber		
please indicate:	... ↗ 100 150 200 250 300 400 mm		... fan type 24 = 24 V DC 230 = 230 V AC

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing	ebmpapst, ball bearing
dimensions	92 x 92 x 32 mm	92 x 92 x 38 mm
tension	24 V DC	230 V AC
power inout	5.3 W	12 W
max. air volume	107 m ³ /h	75 m ³ /h
temperature range	-20 °C ... +75 °C	-40 °C ... +75 °C
speed	4,000 min ⁻¹	2,700 min ⁻¹
noise level	47 dB(A)	37 dB(A)
weight	190 g	420 g
failure rate (L₁₀)	L ₁₀ > 57,500 h (40 °C)	L ₁₀ > 52,500 h (40 °C)

Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

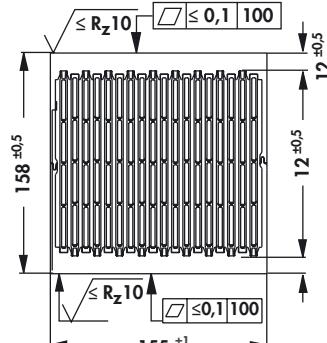
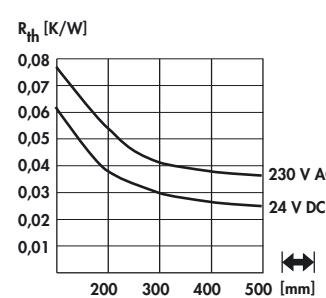
Extruded heatsinks
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

D 24

Cooling aggregates with axial fan

Hollow-fin cooling aggregates

- extremely low losses due optimised hollow fin geometry
- especially effective heat dissipation
- compact construction with axial fans
- two opposite mounting surfaces are milled flat
- additional treatment upon customer's request
- other fan types and fan voltages on request

art. no.			
LA V 24 ...	with air flow chamber		
please indicate:	... ↗ 200 300 400 mm		... fan type 24 = 24 V DC 230 = 230 V AC

Technical data of the fans

	... 24	... 230
type	ebmpapst, ball bearing, with grid	ebmpapst, ball bearing, with grid
dimensions	ø 150 x 38 mm	ø 150 x 55 mm
tension	24 V DC	230 V AC
power inout	19 W	47 W
max. air volume	420 m ³ /h	380 m ³ /h
temperature range	-25 °C ... +72 °C	-30 °C ... +60 °C
speed	3,350 min ⁻¹	2,700 min ⁻¹
noise level	59 dB(A)	60 dB(A)
weight	620 g	1,100 g
failure rate (L₁₀)	L ₁₀ > 75,000 h (40 °C)	L ₁₀ > 40,000 h (40 °C)

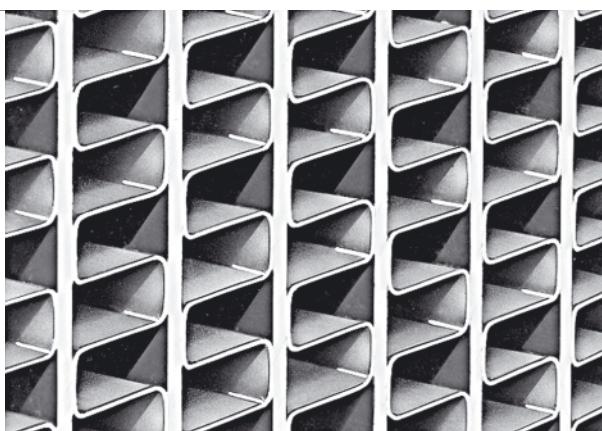
D 25

Cooling aggreg. in segment mount. → D 5 – 7
Miniature cooling aggregates → D 9 – 11
Protection grid for axial fans → D 36
Thermal conductive material → E 2 – 29

Extruded heatsinks → A 22 – 83
Cooling aggregates with radial fan → D 33 – 35
Heatsinks with hollow fin profile → D 30
Technical introduction → A 2 – 7

Cooling aggregates with axial fan

High performance cooling aggregate



- extremely low losses of air flow as compared to cooling aggregates with extruded aluminium
- compact dimensions, that means high performance density due to large heat-conducting surfaces
- maximum heat flow due to brazing or thermal adhesion
- high performance cooling aggregates are only effective with forced ventilation by means of the fan, but not with free convection
- other fan types and fan voltages on request

material: solder-plated aluminium sheet, thus minimal weight due to the thickness of the material

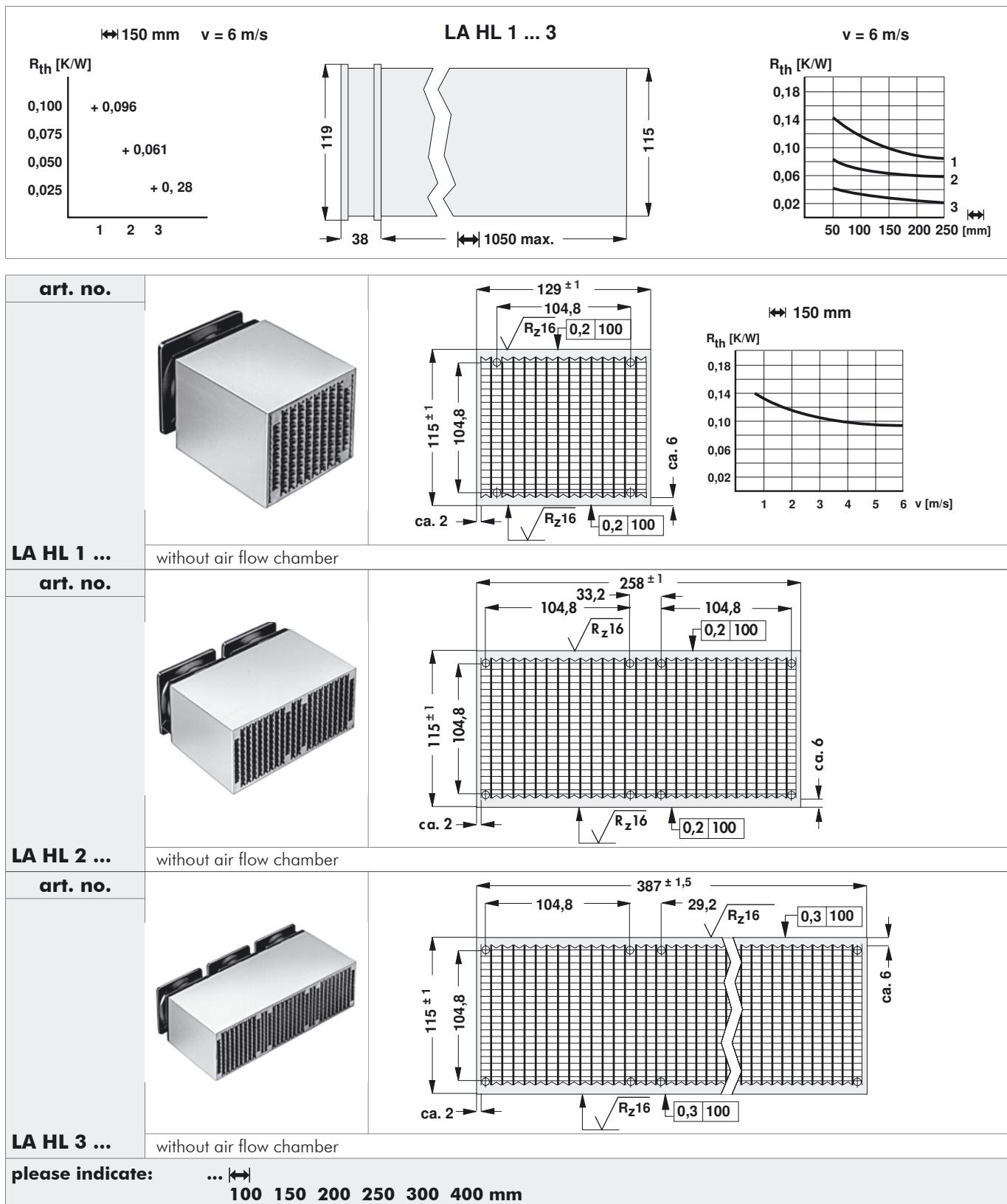
An optimised unit for any application can be produced from the wide range of existing components upon request. The specific capacity will be determined by a test run upon customer's request.

Technical data of the fans

	... 230
type	ebmpapst, ball bearing
dimensions	119 x 119 x 38 mm
tension	230 V AC
power inout	19 W
max. air volume	160 m ³ /h
temperature range	-40 °C ... +85 °C
speed	2,650 min ⁻¹
noise level	47 dB(A)
weight	550 g
failure rate (L₁₀)	L ₁₀ > 37,500 h (40 °C)

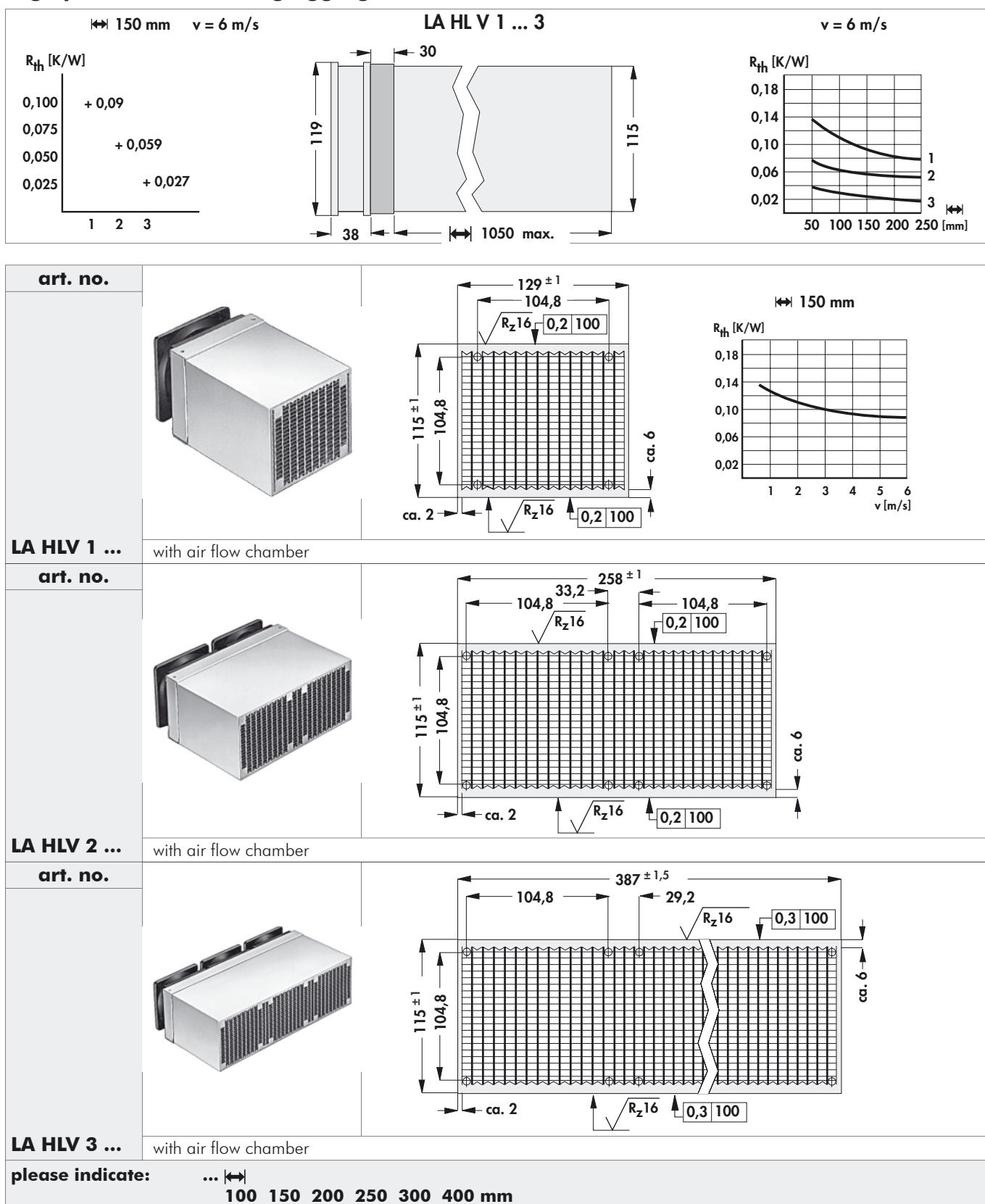
Cooling aggregates with axial fan

High performance cooling aggregate



Cooling aggregates with axial fan

High performance cooling aggregate



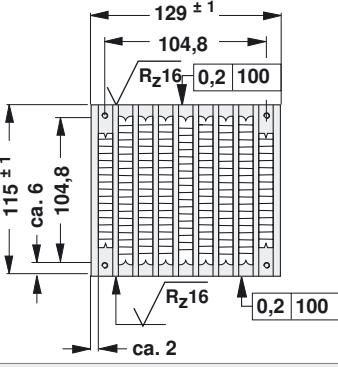
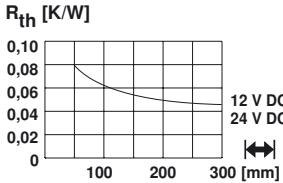
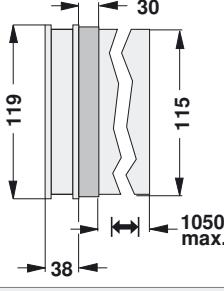
Cooling aggreg. in segment mount. → D 5 - 7
 Miniature cooling aggregates → D 9 - 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 - 29

Extruded heatsinks
 Cooling aggregates with radial fan → D 33 - 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 - 7

Cooling aggregates with axial fan

High performance cooling aggregate

- innovative, efficient heatsink design
- thick multiwall sheets for maximum heat dissipation
- specially formed laminated structures ensure optimum heat exchange with the air flow
- powerful mixed axial fan for highly efficient heat dissipation
- reduced noise output achieved by an optimised adaption of fan and heatsink
- additional treatment and modifications upon customer's request
- double and triple versions upon request

art. no.			
LAHL D 1 ...			
please indicate:	... ↗ 100 150 200 250 300 400 mm	... fan type 12 = 12 V DC 24 = 24 V DC	

Technical data of the fans

	... 12	... 24
type	ebmpapst, ball bearing, with grid	ebmpapst, ball bearing, with grid
dimensions	119 x 119 x 38 mm	119 x 119 x 38 mm
tension	12 V DC	24 V DC
power inout	21 W	21 W
max. air volume	275 m ³ /h	275 m ³ /h
temperature range	-20 °C ... +65 °C	-20 °C ... +65 °C
speed	6,000 min ⁻¹	6,000 min ⁻¹
noise level	60 dB(A)	60 dB(A)
weight	455 g	455 g
failure rate (L₁₀)	L ₁₀ > 70,000 h (20 °C) L ₁₀ > 40,000 h (60 °C)	L ₁₀ > 70,000 h (20 °C) L ₁₀ > 40,000 h (60 °C)

D 29

Cooling aggreg. in segment mount. → D 5 – 7
 Miniature cooling aggregates → D 9 – 11
 Protection grid for axial fans → D 36
 Thermal conductive material → E 2 – 29

Extruded heatsinks → A 22 – 83
 Cooling aggregates with radial fan → D 33 – 35
 Heatsinks with hollow fin profile → D 30
 Technical introduction → A 2 – 7

High-performance heatsinks

High performance heatsinks with hollow-fin profile

- high performance heatsinks for fan operation
- exclusively for forced convection
- preferably for radial or tangential fans
- hollow fin geometry optimises the air flow
- particularly effective heat dissipation
- milled flat base (except length 1000 mm)

art. no.	Diagram and dimensions	Graph: R_{th} [K/W] vs. $v = 5 \text{ m/s}$
SK 497 ...		
SK 498 ...		
please indicate:		... \leftrightarrow 150 200 250 300 1000 mm
		... surface SA = black anodised AL = raw degreased aluminium

art. no.	number of fins	A	B	C
SK 440 ...	15	84 ± 1	200 ± 1.2	16
SK 458 ...	19	84 ± 1	250 ± 1.4	16
SK 441 ...	23	84 ± 1	300 ± 1.6	16
SK 461 ...	31	88 ± 1	400 ± 2	20
please indicate:		... \leftrightarrow 150 200 300 1000 mm	... surface SA = black anodised AL = raw degreased aluminium	

High capacity cooling aggregat.

Cooling aggregates with radial fan

Heatsinks with hollow fin profile

Hollow-fin cooling aggregates

→ D 26 – 29

→ D 33 – 35

→ D 30 – 31

→ D 15 – 25

Extruded heatsink-cooling aggregat. → D 14

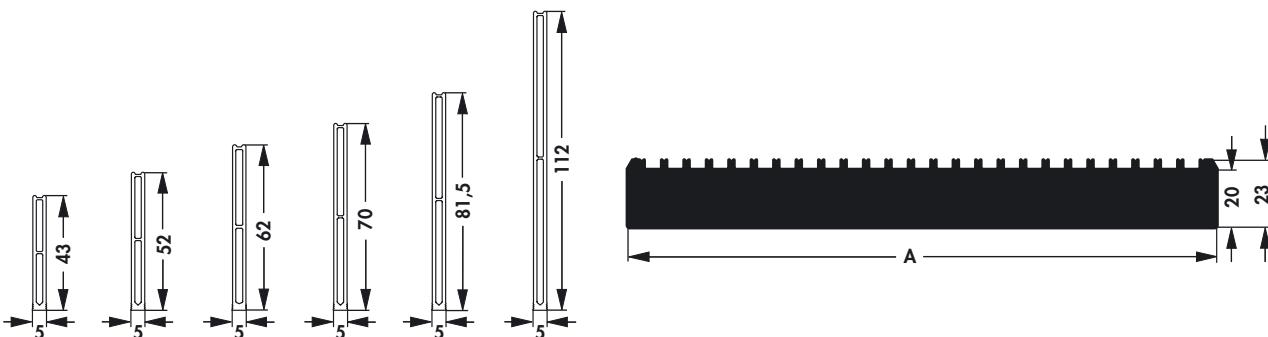
Cooling aggreg. in segment mount. → D 5

Miniature cooling aggregates → D 9 – 11

Technical introduction → A 2 – 7

High performance heatsinks with hollow-fin profile

- high capacity heatsinks for fan operation preferably for radial- or tangential fan motors
- universal modular design
- exclusively for forced convection
- flow-optimized hollow fin geometry

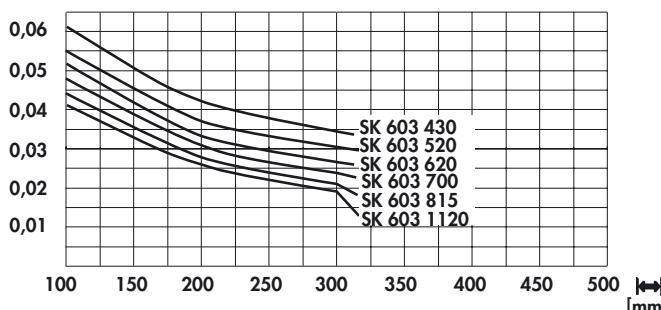


art. no.	number of fins	dim. [mm]
SK 603 ...	25	A 200
SK 604 ...	32	250
SK 605 ...	39	300
SK 606 ...	45	350
SK 607 ...	52	400
SK 608 ...	65	500

please indicate: ↪	... ↪	... surface
	430	= 430 mm	200 300 400 500 mm	SA = black anodised
	520	= 520 mm		ME = natural colour anodised
	620	= 620 mm		
	700	= 700 mm		
	815	= 815 mm		
	1120	= 1120 mm		

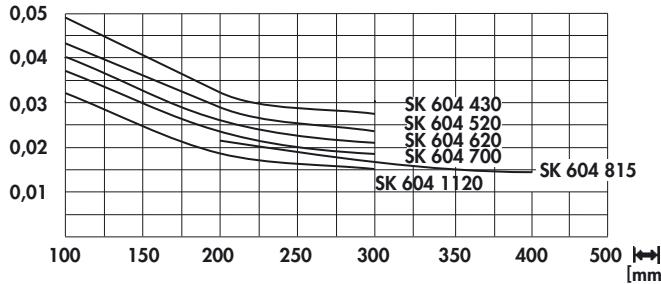
SK 603

R_{th} [K/W] $v = 11 \text{ m/s}$



SK 604

R_{th} [K/W] $v = 11 \text{ m/s}$



High capacity cooling aggregat.
Cooling aggregates with radial fan
Heatsinks with hollow fin profile
Hollow-fin cooling aggregates

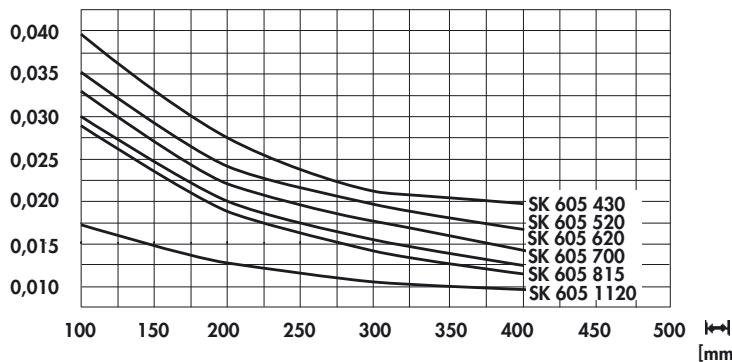
→ D 26 – 29
→ D 33 – 35
→ D 30 – 31
→ D 15 – 25

Extruded heatsink-cooling aggregat. → D 14
Cooling aggreg. in segment mount. → D 5
Miniature cooling aggregates → D 9 – 11
Technical introduction → A 2 – 7

High performance heatsinks with hollow-fin profile

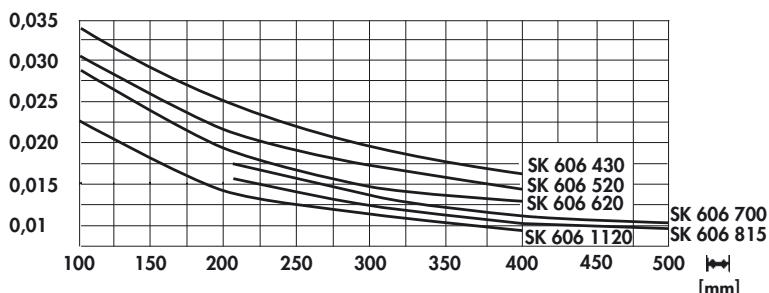
SK 605

R_{th} [K/W] $v = 11 \text{ m/s}$



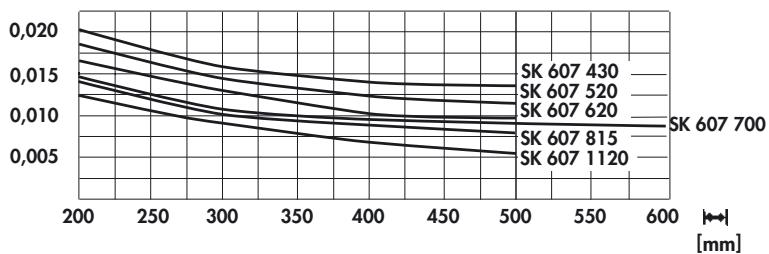
SK 606

R_{th} [K/W] $v = 11 \text{ m/s}$



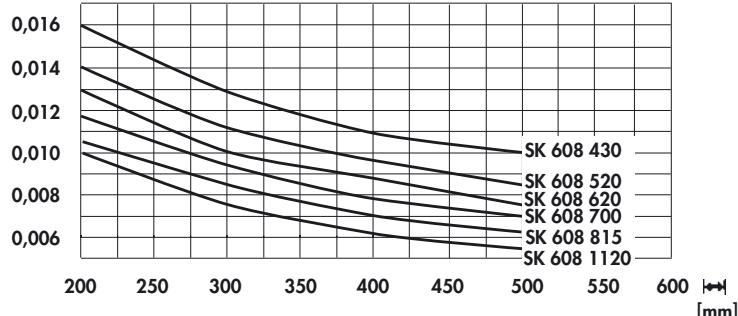
SK 607

R_{th} [K/W] $v = 11 \text{ m/s}$



SK 608

R_{th} [K/W] $v = 11 \text{ m/s}$



High capacity cooling aggregat.

Cooling aggregates with radial fan

Heatsinks with hollow fin profile

Hollow-fin cooling aggregates

→ D 26 – 29

→ D 33 – 35

→ D 30 – 31

→ D 15 – 25

Extruded heatsink-cooling aggregat. → D 14

Cooling aggreg. in segment mount. → D 5

Miniature cooling aggregates

→ D 9 – 11

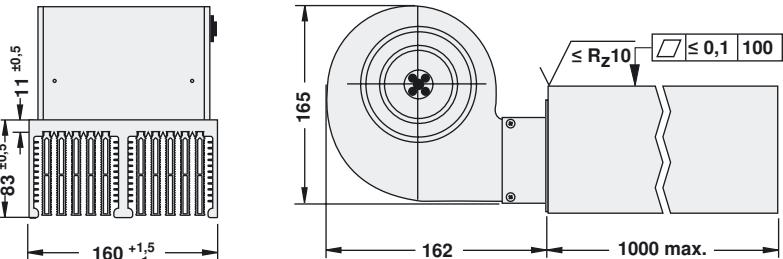
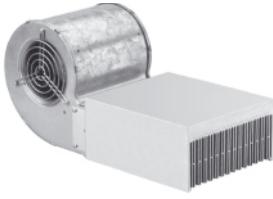
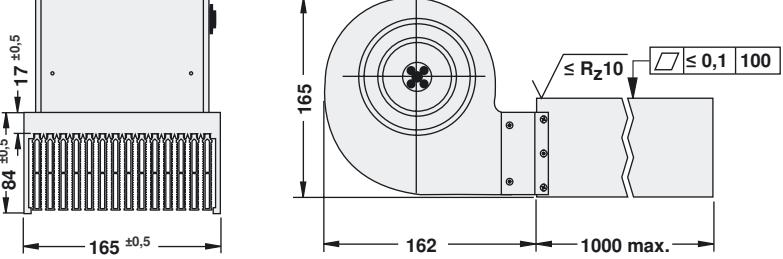
Technical introduction

→ A 2 – 7

Cooling aggregates with radial fan

High performance cooling aggregate

- optimised air flow due to hollow fin geometrie
- very good thermal performance
- optimized high performance construction with radial fan
- milled flat mounting surface for semiconductor
- cover plate for fin side upon request
- additional customized treatment upon request
- fan condenser: art. no. **LAHLR K 2**

art. no.		
art. no.		
please indicate:  200 300 400 500 600 mm		

Technical data of the fans

	... 230
type	ebmpapst, radial blower with grid, double sided absorption
bearing type	ball bearing
discharge air flow	435 m ³ /h
rotation speed	1,950 min ⁻¹
power inout	87 W
current consumption	0.39 A
temperature range	-25 °C ... +40 °C
circuit voltage	230 V AC
motor condenser	2 µF / 400 V
noise level	58 dB(A)
weight	1,500 g

D 33

Heatsinks for Solid State Relay

Mounting for TO 3 angle

High capacity heatsinks

Cooling aggreg. in segment mount.

→ A 12
→ A 123 - 126
→ A 57 - 58
→ D 5 - 7

Miniature cooling aggregates

Special heatsink design

Hole pattern

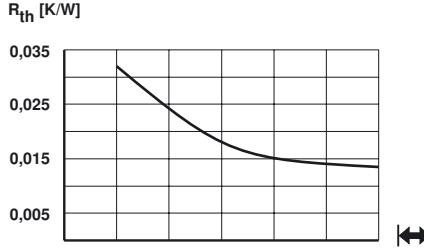
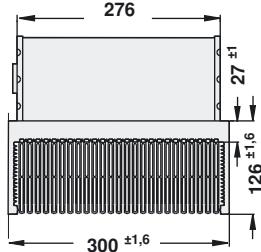
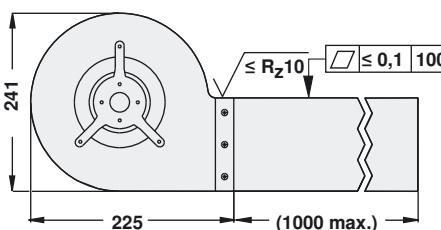
Technical introduction

→ D 9 - 12
→ 135 - 136
→ A 21
→ A 2 - 7

Cooling aggregates with radial fan

High performance cooling aggregate

- optimised air flow due to hollow fin geometrie
- very good thermal performance
- optimized high performance construction with radial fan
- milled flat mounting surface for semiconductor
- cover plate for fin side upon request
- additional customized treatment upon request
- fan condenser: **art. no. LA 20 K 6**

art. no.		
LA 20 ...		
please indicate:	... ↗ 200 300 400 500 600 mm	

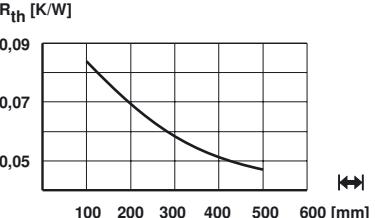
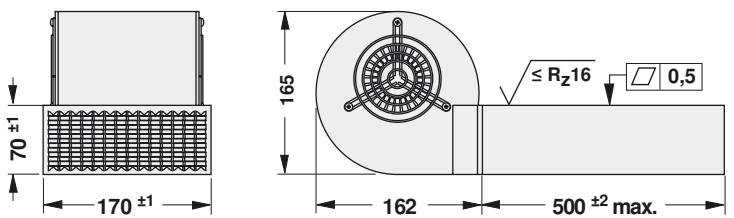
Technical data of the fans

	... 230
type	ebmpapst, radial blower with grid, double sided absorption
bearing type	ball bearing
discharge air flow	1,310 m³/h
rotation speed	1,350 min⁻¹
power inout	185 W
current consumption	0.81 A
temperature range	-25 °C ... +70 °C
circuit voltage	230 V AC
motor condenser	6 µF
noise level	64 dB(A)
weight	5,900 g

Cooling aggregates with radial fan

High performance cooling aggregate

- other lengths upon request
- fan condenser: art. no. LAHLR K 2

art. no.		
LAHLR 1 500		
construction:	solid frame construction with inner animation and carrier plates, thermally connected by soldering	
weight:	6,300 g	
material:	aluminium alloy	
surface:	blanc, milled flat	

Technical data of the fans

	... 230
type	ebmpapst, radial blower with grid, double sided absorption
bearing type	ball bearing
discharge air flow	435 m ³ /h
rotation speed	1,950 min ⁻¹
power inout	87 W
current consumption	0.39 A
temperature range	-25 °C ... +40 °C
circuit voltage	230 V AC
motor condenser	2 µF / 400 V
noise level	58 dB(A)
weight	1,500 g

D 35

Heatsinks for Solid State Relay

Mounting for TO 3 angle

High capacity heatsinks

Cooling aggreg. in segment mount.

→ A 12

→ A 123 - 126

→ A 57 - 58

→ D 5 - 7

Miniature cooling aggregates

Special heatsink design

Hole pattern

Technical introduction

→ D 9 - 12

→ 135 - 136

→ A 21

→ A 2 - 7

Protection grid for fans

- protection against contact as per EN 294
- aerodynamic contruction
- minimized noise modification
- only low modification of the air flow

art. no.	suitable for cooling aggregate		
		LAGI 40	LAM 2 / LAM 4 / LAM 4 K
art. no.	suitable for cooling aggregate		
		LAGI 60	LAM 1 / LA (V) 6 / LA (V) 7 / LA (V) 8
art. no.	suitable for cooling aggregate		
		LAGI 80	LA (V) 9 / LA (V) 10 / LA (V) 11
art. no.	suitable for cooling aggregate		
		LAGI 92	LA 2 / LA (V) 21 / LA (V) 22
art. no.	suitable for cooling aggregate		
		LAGI 119	LA 1 / LA 4 / LA 5 / LA (V) 14 / LA (V) 15 / LA (V) 17 / LA (V) 18 / LA HL (V) 1 / LA HL (V) 2 / LA HL (V) 3 / LA HL D1
material:	steel wire, nickel-plated		

High capacity cooling aggregat.

Cooling aggregates with radial fan

Heatsinks with hollow fin profile

Hollow-fin cooling aggregates

→ D 26 – 29

→ D 33 – 35

→ D 30

→ D 15 – 25

Extruded heatsink-cooling aggregat. → D 14

Cooling aggreg. in segment mount. → D 5

Miniature cooling aggregates → D 9 – 11

Technical introduction → A 2 – 7



Thermal conductive material

- large standard programme for thermal conductive pastes and glues, silicone-, GEL-, and foam foils (Gap Filler), cuts, tapes, tubes and caps
- thermal conductive electrically insulating foils
- customer specific productions made in our in-house punching shop



Guide rails for PCBs

- for horizontal and vertical assembly
- suitable for sheet thicknesses of 0.5 - 1.85 mm
- with and without lock mechanism
- slim an wide designs
- screwable and snapable versions, extractors with locking pin fixing
- special designs upon request



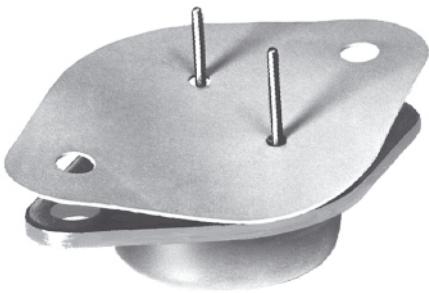
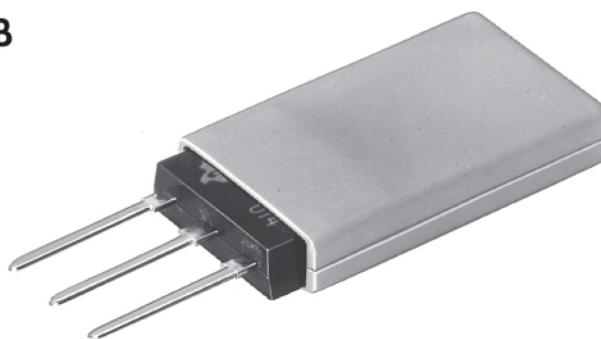
Mounting material for semiconductors

- mounting disc for discrete devices such as transistors, capacitors and LEDs
- electrically insulating mounting of the transistors
- simple and fast assembly
- insulating clamping pins for various semiconductors for increasing the dielectric strength
- cover and insulating cap for transistors



Mounting material for mechanical components

- distance bolts made of metal and plastics with inner or outer thread
- clamp mounting made of aluminium and plastics for mounting the heatsinks and cases on the mounting rail acc. to DIN EN 50022
- anti-vibration device for minimizing the noise and resonance

Silicon-rubber insulating material for semiconductors**A****B****C****D****A:** washer**B:** insulating cap**C:** insulating tube**D:** cuts**Our thermal conduction wafers effect following advantages:**

- good surface contact as material is flexible
- reduced production costs as a matter of mounting without thermal conducting paste (clean and fast)
- spring-back of the elastic material protects the transistor against damage
- free of any toxic substances

Customer specific versions:

- punching and cuts of our thermal conductive foil according to drawing
- sold per sheet or by the meter
- other foils, plastics, papers, etc. upon request

The thermal details refer to an area of 1 inch² (6.45 cm²).

A

B

C

D

E

F

G

H

I

K

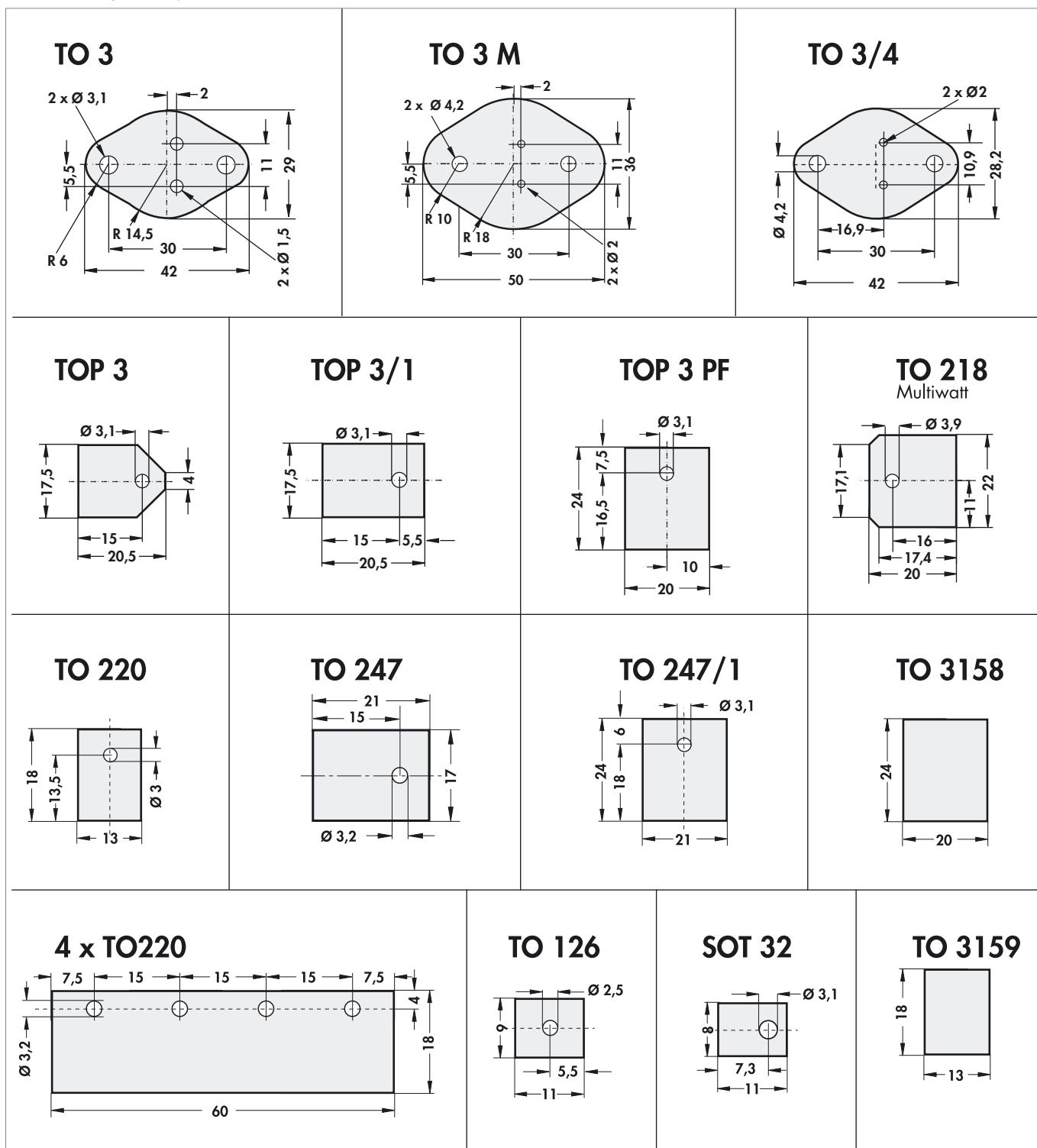
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M

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Silicone rubber insulating material for semiconductors

– other cuttings on request



E 3

Thermal conductive foil
GEL thermal conductive foils
Thermal conductive paste
Thermal conductive glue

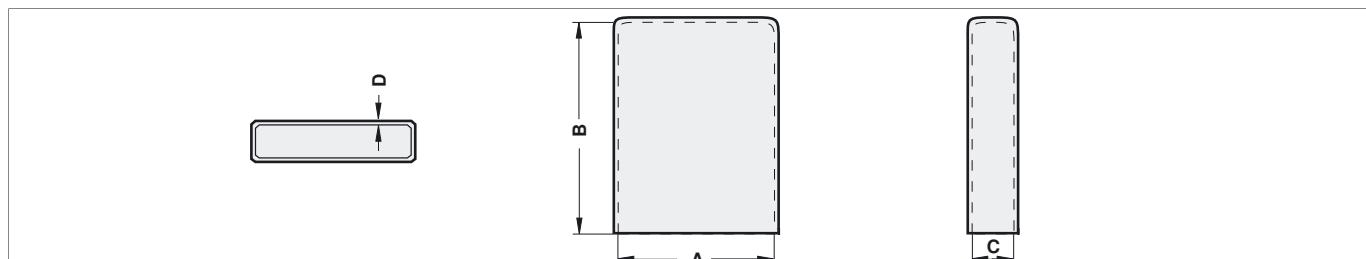
→ E 7 – 10
→ E 11 – 13
→ E 19 – 20
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Heatsinks for PCB
Heatsinks for BGA
Extruded heatsinks
Technical introduction

→ A 89 – 111
→ B 17 – 20
→ A 22 – 83
→ A 2 – 7

Thermally conductive foil made of siliconelastomer

foil type	foil WS	foil WG	foil WK	foil WB
material	silicone foil, standard	silicone foil, GF reinforced	silicone foil, GF reinforced, one-sided self-adhesive	silicone foil, GF reinforced
Washer				
TO-3	WS 3	WG 3	WK 3	WB 3
TO-3 M	WS 3 M			
TO-3/4	WS 3/4		WK 3/4	
TO-3 PF	WS 3 P	WG 3 P	WK 3 P	WB 3 P
3158	WS 3158		WK 3158	WB 3158
TOP 3	WS TOP 3			
TOP 3/1	WS TOP 3/1		WK TOP 3/1	
TO 218 (Multiwatt)		WG 218		
TO 247	WS 247		WK 247	
TO 220	WS 220	WG 220	WK 220	WB 220
4 X TO 220	WS 4 220			
3159	WS 3159		WK 3159	WB 3159
TO 126			WK 126	
SOT 32			WK 32	
TO 247/1	WS 247/1			
Insulating tube				
TO-220 Ø 11 mm, length 25 mm	WSC-220			
TO-3 PF Ø 13.5 mm, length 25 mm	WSC-3 P			
TO-247 Ø 14.5 mm, length 30 mm	WSC-247			
Insulating tube as meterpiece				
TO-220 Ø 11 mm	WSM-220			
TO-3 PF Ø 13.5 mm	WSM-3 P			
Tape material (width)				
24 mm			WKT 24	
30 mm	WST 30			WBT 30
36 mm	WST 36			
85 mm	WST 85			
300 mm		WGT 300	WKT 300	WBT 300
		Foil WS	Foil WG	Foil WK
material thickness		0.3 mm	0.2 mm	0.15 mm
material hardness		75 Shore A	87 Shore A	90 Shore A
dielectric strength		10 kV	6.5 kV	3 kV
thermal resistance		0.4 K/W	0.42 K/W	0.45 K/W
thermal conductivity		1.22 W/m·K	1.13 W/m·K	0.92 W/m·K
insulation resistance		2.9·10 ¹⁵ Ω cm	5.7·10 ¹⁵ Ω cm	1.6·10 ¹⁵ Ω cm
extensibility		100 %	2 %	4 %
temperature range		-60 °C ... +180 °C		
class of flammability		UL 94 V-0		

Insulating cap


art. no.	type	dim. [mm]			
		A	B	C	D
WSI 220 210	TO 220	11	21.0	5.0	0.9
WSI 220 225	TO 220	11	22.5	5.0	0.3
WSI TOP 3 235	TOP 3	18	23.5	5.0	0.9
WSI TOP 3 280	TO 3 PL/ TO 247	16	28.0	5.0	0.3
WSI TO 3 PL	TO 3 PL / TO 247	22	34.0	5.5	0.9

	Foil WSI
material thickness	0.9 mm
material hardness	75 Shore A
dielectric strength	15 kV
thermal resistance	0.96 K/W
thermal conductivity	1.22 W/m·K
insulation resistance	2.9·10 ¹⁵ Ω cm
extensibility	100 %
temperature range	-60 °C ... +180 °C
class of flammability	UL 94 V-0

Thermally conductive foil both sides adhesive



- good thermal characteristics
- double-sided adhesive layers
- replaces mechanical fastenings
- cuttings and cut-outs upon request

art. no.	width [mm]	type of delivery	art. no.	width [mm]	type of delivery
WLFT 404 R25	25	sold by the meter	WLFT 414 R100	100	sold by the meter
WLFT 404 R50	50	sold by the meter	WLFT 414 R200	200	sold by the meter
WLFT 404 R100	100	sold by the meter	WLFT 405 R25	25	sold by the meter
WLFT 404 R200	200	sold by the meter	WLFT 405 R50	50	sold by the meter
WLFT 414 R25	25	sold by the meter	WLFT 405 R100	100	sold by the meter
WLFT 414 R50	50	sold by the meter	WLFT 405 R200	200	sold by the meter

art. no.	dimensions [mm]	type of delivery	art. no.	dimensions [mm]	type of delivery
WLFT 404 100x100	100 x 100	plate	WLFT 414 200x200	200 x 200	plate
WLFT 404 100x200	100 x 200	plate	WLFT 405 100x100	100 x 100	plate
WLFT 404 200x200	200 x 200	plate	WLFT 405 100x200	100 x 200	plate
WLFT 414 100x100	100 x 100	plate	WLFT 405 200x200	200 x 200	plate
WLFT 414 100x200	100 x 200	plate			

	WLFT 404	WLFT 414	WLFT 405
description	insulating, double sided adhesive		non insulating, double-sided adhesive
overall thickness	0.127 mm ± 0.03		0.15 mm ± 0.03
truss material	polyimide (Kapton MT) 0.025 mm		aluminium foil 0.05 mm
glue layer	acrylate (pressure sensitive) double-sided		
thermal conductivity	0.37 W/m·K		0.5 W/m·K
specific thermal resistance	3.7°C cm ² /W		3.4°C cm ² /W
temperature range	-30 °C ... +125 °C		
holding force (overlapping)	0.86 MPa		0.93 MPa
holding force (shear rate)	Al₂O₃ 150 °C 0.34 [MPa]/ Al 150 °C 0.345 [MPa]/ Cu 25 °C 0.828 [MPa]/ Al₂O₃ 25 °C 1.17 [MPa]/ Al 25 °C 0.897 [MPa]/ Cu 150 °C 0.31 [MPa]	Al 150 °C 0.345 [MPa]/ Al 25 °C 0.897 [MPa]	Al 150 °C 0.38 [MPa]/ Al₂O₃ 150 °C 0.41 [MPa]/ Cu 25 °C 1.1 [MPa]/ Al₂O₃ 25 °C 1.0 [MPa]/ Al 25 °C 0.86 [MPa]/ Cu 150 °C 0.48 [MPa]
dielectric strength	5 kV (AC)		
class of flammability	UL 94 V-0		

E 7

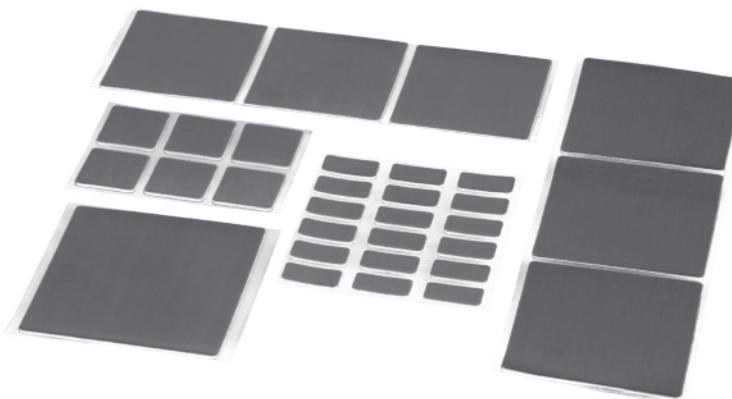
Thermal conductive material
Heatsinks for PCB
Profiles for PCB mounting
Heatsinks for transistors

→ E 2 – 5
→ A 89 – 92
→ A 89 – 111
→ C 4 – 9

GEL thermal conductive foils
Spacers
Insulating distance sleeves
Technical introduction

→ E 11 – 13
→ E 38
→ E 30 – 31
→ A 2 – 7

Thermally conductive foil both sides adhesive

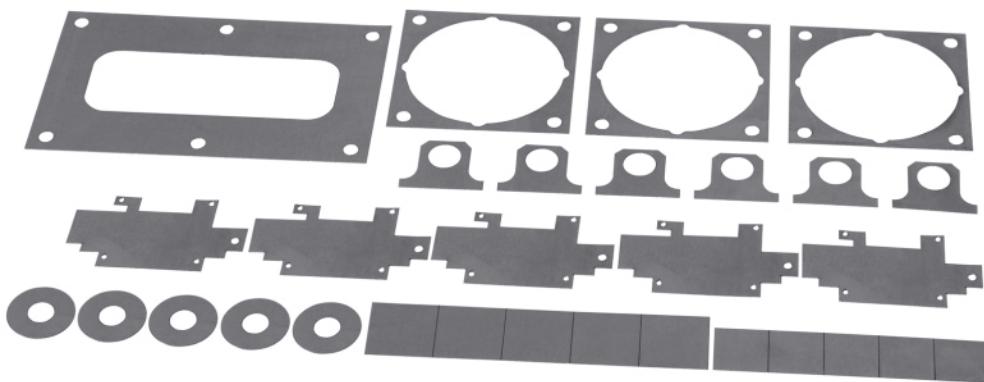


- double sided adhesive layer
- optimal adhesion of different substrates
- very good thermal conductivity, electrical insulating
- easy handling due to double sided protection foil
- optimized surface moistening and excellent impact strength
- cutouts and different punchings according to customer drawing

art. no.	type of delivery
WLFT 8805	plates, usable area 300 x 200 mm
WLFT 8810	plates, usable area 300 x 200 mm
WLFT 8815	plates, usable area 300 x 200 mm
WLFT 8820	plates, usable area 300 x 200 mm
WLFT 8940	plates, usable area 300 x 200 mm

	WLFT 8805	WLFT 8810	WLFT 8815	WLFT 8820	WLFT 8940
description	double sided adhesive, filled acrylic polymer				
overall thickness	0.13 mm	0.25 mm	0.38 mm	0.5 mm	0.19 mm
filling material	ceramic				
protection cover	silicone treated polyester, 37.5 - 50 µm				
thermal impedance	3.1 °C cm ² /W	5.7 °C cm ² /W	7.6 °C cm ² /W	9.7 °C cm ² /W	
thermal conductivity	0.6 W/m·K				0.9 W/m·K
temperature range	permanent up to 100 °C				permanent up to 150 °C
volume resistivity	5.2 x 10 ¹¹ Ωcm	3.9 x 10 ¹¹ Ωcm	3.8 x 10 ¹¹ Ωcm	2.5 x 10 ¹³ Ωcm	
dielectric strength	37 kV/mm				55 kV/mm
peel strength at ambient temperature and 72h	5.8 N/cm	8.3 N/cm	9.8 N/cm	11.9 N/cm	6 N/cm
class of flammability	UL 746 C				UL 94 V-0

High thermoconducting graphite foils



- high-compressed anisotropic natural graphite
- very good thermal characteristics
- optimal for heat spreading
- high operating temperature range
- different material thicknesses and coatings upon request
- customer specified cuttings and stampings acc. to drawing

art. no.	width [mm]	type of delivery	art. no.	width [mm]	type of delivery
WLFG 9010 R 25	25	sold by the meter	WLFG 9020 R 25	25	sold by the meter
WLFG 9010 R 50	50	sold by the meter	WLFG 9020 R 50	50	sold by the meter
WLFG 9010 R 100	100	sold by the meter	WLFG 9020 R 100	100	sold by the meter
WLFG 9015 R 25	25	sold by the meter	WLFG S 900 K R 25	25	sold by the meter
WLFG 9015 R 50	50	sold by the meter	WLFG S 900 K R 50	50	sold by the meter
WLFG 9015 R 100	100	sold by the meter	WLFG S 900 K R 100	100	sold by the meter

	WLFG 9010	WLFG 9015	WLFG 9020	WLFG S 900 K
description	base film made of graphite, electrically conductive		graphite foil, electrically conductive	
version			single sided adhesive coating	
overall thickness	0.15 mm	0.2 mm	0.25 mm	0.175 mm
thermal resistance	0.09 K/W	0.07 K/W	0.23 K/W	0.08 K/W
thermal impedance	36 °C mm ² /W	28.8 °C mm ² /W	72 °C mm ² /W	34 °C mm ² /W
thermal conductivity z (x/y)	5,5 (55) W/m·K	6 (55) W/m·K	4 (55) W/m·K	7,5 (>450) W/m·K
temperature range		-40 °C ... +500 °C		
hardness range		30 Shore D		
tensile strength	5.5 N/mm ²	6 N/mm ²	5.5 N/mm ²	10 N/mm ²
elongation at break		10 %		5 %
tightness		1 g/cm ³		>1.6 g/cm ³
class of flammability		UL 94 V-0		

Heat conductive silicon foam foil



- elastomer foam with closed cell structure
- good heat conductor e.g. between components, heatsinks and casing parts
- electrical insulating
- can be compressed even with a low contact pressure
- absorbs shocks and vibrations

art. no.	material thickness [mm]
WSF 16	1.60 ±0.4
WSF 32	3.20 ±0.8
WSF 635	6.35 ±1.2
WSFS 635	6.35 ±1.2

Thermal resistance at 3.2 mm material thickness:

compression %	contact	10	25	50
contact pressure PSI	>1	5	12	34
R _{th} K/W (1 in ² x 3.2 mm)	6	4.5	2.5	1
heat conductivity W/mK	0.3	0.4	0.45	0.65

- **WSFS 635** double sided adhesive and **WSF** adhesive upon request
- according to NASA gas emission requirements

	WSF	WSFS 635
version	no adhesive	one-sided self-adhesive
thermal conductivity	0.108 W/m·K (substrate)	
hardness range	13 Shore A	
compression, 25%	18 PSI	
temperature range	-62 °C ... +205 °C	
extensibility	150 %	
tensile strength	120 PSI	
dielectric strength	4 kV/mm	
tightness	1.118 g/cm ³	
class of flammability	UL 94 V-1 (at thickness ≥3.2 mm)	
type of delivery	plates 914 x 914 mm/ cuttings on customer's requirements	

Gel thermal conducting foil

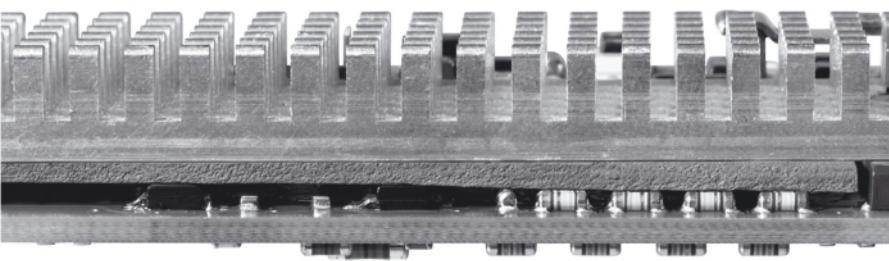
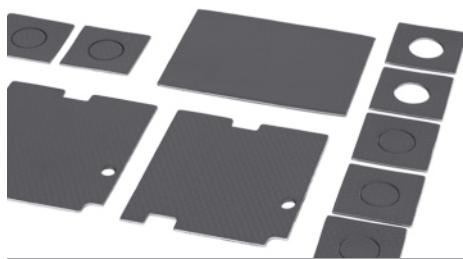


- highly heat-conductive silicon foil
- smooth, elastic and compressible
- equals uneven surfaces very well (Gap-Filler)

art. no.	material thickness [mm]	R_{th} [$^{\circ}\text{C in}^2/\text{W}$]	art. no.	material thickness [mm]	R_{th} [$^{\circ}\text{C in}^2/\text{W}$]
GEL 05	0.5 ±0.1	0.57	GEL G 05	0.5 ±0.1	0.67
GEL 10	1.0 ±0.2	1.02	GEL G 1	1.0 ±0.2	1.11
GEL 15	1.5 ±0.2	1.45	GEL G 15	1.5 ±0.2	1.66
GEL 20	2.0 ±0.3	1.71	GEL G 2	2.0 ±0.3	1.92
GEL 25	2.5 ±0.3	2.11	GEL G 25	2.5 ±0.3	2.40
GEL 30	3.0 ±0.3	2.34	GEL G 3	3.0 ±0.3	2.68
GEL 35	3.5 ±0.3	2.59	GEL G 35	3.5 ±0.3	2.75
GEL 40	4.0 ±0.4	2.79	GEL G 4	4.0 ±0.4	2.92
GEL 45	4.5 ±0.4	3.03	GEL G 45	4.5 ±0.4	3.19
GEL 50	5.0 ±0.5	3.30	GEL G 5	5.0 ±0.5	3.37

	GEL	GEL G 05 - 25	GEL G 3 - 5
version	standard	polyamide film mesh reinforced, single sided adhesive coating	
thermal conductivity		1.5 W/m·K	
volume resistivity		>1·10 ⁶ MΩ/m	
hardness range		< 49 Shore 00	
temperature range		-60 °C ... +200 °C	
extensibility	100 %	60 %	
dielectric constant		5.8 [50 Hz]/ 5.6 [1 KHz]/ 5.5 [1 MHz]	
dielectric loss factor		0.048 [50 Hz]/ 0.015 [1 KHz]/ 0.003 [1 MHz]	
dielectric strength	14 kV/mm (AC)	8 kV/mm (AC)	
tightness		2.6 g/cm ³	
class of flammability	UL 94 V-0	UL 94 V-1	UL 94 V-0
type of delivery	on both sides covered with protective foil/ plates, usable area 300 x 200 mm/ cuttings on customer's requirements		

Gel thermal conducting foil



- GEL thermal conductive foils with very good thermal characteristics
- for balancing non-planarities and differences in components (GAP Filler)
- soft, elastic and compressible
- customer specific cuts and punchings according to drawing

art. no.	material thickness [mm]	R _{th} [°C in ² /W]	R _{th} [°C cm ² /W]	art. no.	material thickness [mm]	R _{th} [°C in ² /W]	R _{th} [°C cm ² /W]
GEL 28 05	0.5 ±0.1	0.27	1.77	GEL 28 G 05	0.5 ±0.1	0.32	2.05
GEL 28 10	1.0 ±0.2	0.44	2.87	GEL 28 G 10	1.0 ±0.2	0.55	3.56
GEL 28 15	1.5 ±0.2	0.68	4.40	GEL 28 G 15	1.5 ±0.2	0.76	4.89
GEL 28 20	2.0 ±0.3	0.86	5.57	GEL 28 G 20	2.0 ±0.3	1.02	6.56
GEL 28 25	2.5 ±0.3	1.12	7.24	GEL 28 G 25	2.5 ±0.3	1.21	7.83
GEL 28 30	3.0 ±0.3	1.26	8.10	GEL 28 G 30	3.0 ±0.3	1.35	8.74
GEL 28 35	3.5 ±0.3	1.41	9.12	GEL 28 G 35	3.5 ±0.3	1.48	9.56
GEL 28 40	4.0 ±0.3	1.56	10.06	GEL 28 G 40	4.0 ±0.3	1.79	11.57
GEL 28 50	5.0 ±0.3	1.80	11.61	GEL 28 G 50	5.0 ±0.3	1.99	12.85

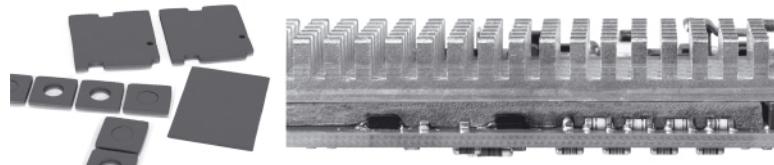
	GEL 28	GEL 28 G
version	standard	polyamide film mesh reinforced
thermal conductivity		2.8 W/m·K
volume resistivity	3·10 ⁴ MΩ/m	2·10 ⁴ MΩ/m
hardness range	45 Shore 00	52 Shore 00
temperature range		-60 °C ... +200 °C
extensibility	64 %	32 %
dielectric constant		6.2 [50 Hz] / 6 [1 kHz] / 6 [1 MHz]
dielectric loss factor		0.038 [50 Hz]/ 0.007 [1 kHz]/ 0.001 [1 MHz]
dielectric strength	7 kV/mm	10 kV/mm
tightness		2.7 g/cm ³
class of flammability		UL 94 V-0
type of delivery	on both sides covered with protective foil/ plates, usable area 300 x 200 mm/ other dimensions upon request	

Gel thermal conducting foil

- GEL silicone foils with especially high thermal conductivity
- balances non-planarities and differences in components (GAP Filler)
- soft, elastic and compressible
- cuts, punchings and special designs according to customer specifications

art. no.	material thickness [mm]	R _{th} [°C in ² /W]	R _{th} [°C cm ² /W]	art. no.	material thickness [mm]	R _{th} [°C in ² /W]	R _{th} [°C cm ² /W]
GEL 60 05	0.5 ±0.1	0.20	1.30	GEL 60 G 05	0.5 ±0.1	0.21	1.37
GEL 60 10	1.0 ±0.2	0.33	2.11	GEL 60 G 10	1.0 ±0.2	0.31	1.99
GEL 60 15	1.5 ±0.2	0.53	3.45	GEL 60 G 15	1.5 ±0.2	0.48	3.08
GEL 60 20	2.0 ±0.3	0.61	3.91	GEL 60 G 20	2.0 ±0.3	0.62	4.00
GEL 60 25	2.5 ±0.3	0.72	4.67	GEL 60 G 25	2.5 ±0.3	0.77	4.96
GEL 60 30	3.0 ±0.3	0.81	5.24	GEL 60 G 30	3.0 ±0.3	0.87	5.61

	GEL 60	GEL 60 G
version	standard	polyamide film mesh reinforced
thermal conductivity	6 W/m·K	
volume resistivity	1 · 10 ⁶ MΩ/m	
hardness range	52 Shore 00	
temperature range	-60 °C ... +200 °C	
extensibility	80 %	
dielectric constant	6.4 [50 Hz] / 6.4 [1 kHz] / 6.4 [1 MHz]	
dielectric loss factor	0.035 [50 Hz] / 0.005 [1 kHz] / 0.001 [1 MHz]	
dielectric strength	13 kV/mm	
tightness	3.2 g/cm ³	
class of flammability	UL 94 V-0	
type of delivery	on both sides covered with protective foil/ plates, usable area 300 x 200 mm/ other dimensions upon request	



- especially soft design
- levels smallest air gaps and unevennesses
- cuts and contours with cutouts according to customer specification

art. no.	material thickness [mm]	R _{th} [°C in ² /W]	R _{th} [°C cm ² /W]	art. no.	material thickness [mm]	R _{th} [°C in ² /W]	R _{th} [°C cm ² /W]
GEL 27 S 25	2.5	0.94	6.05	GEL 27 S 50	5.0	1.69	10.91
version:	standard						
thermal conductivity:	2.7 W/m·K						
volume resistivity:	2 · 10 ⁷ MΩ/m						
hardness range:	45 Shore 00						
temperature range:	-60 °C ... +200 °C						
extensibility:	45 %						
dielectric strength:	15 kV/mm						
tightness:	g/cm ³						
class of flammability:	UL 94 V-0						
type of delivery:	on both sides covered with protective foil/ plates, usable area 300 x 200 mm/ other dimensions upon request						

E 13

Thermal conductive material
GEL thermal conductive foils
Thermal conductive paste
Thermal conductive glue

→ **E 2 – 5**
→ **E 11 – 13**
→ **E 19 – 20**
→ **E 21 – 22**

Kapton insulator washers
Heatsinks for PGA
Heatsinks for BGA
Technical introduction

→ **E 14**
→ **B 11 – 16**
→ **B 17 – 20**
→ **A 2 – 7**

Kapton insulator washers

- very low thermal resistance
- optimised heat conductivity
- best mechanical characteristics
- polyimide-carrier foil with silicone-free phase changing thermal conductive layer completely coated on both sides
- clean processing, no abrasion of the coating
- stacked foils do not stick together
- good resistance against cleaning agents
- no cold flow
- low pressure force necessary, thus particularly applicable for spring-fixing of semiconductors
- cuttings and special versions according to customer's requirements
- the thermal details refer to an area of 1 inch² (6.45 cm²)

art. no. KAP 1 P suitable for pre-cut parts (plate)	art. no. KAP 247 O TO 248/ TO 218/ TO 247	art. no. KAP 218 O TO 218	art. no. KAP 220 O TO 220	art. no. KAP 218 TO 248/ TO 218/ TO 247
art. no. KAP 220 G TO 220	art. no. KAP 220 K TO 220	art. no. KAP 3 G TO 3	art. no. KAP 3 K TO 3	

KAP	
material	polyimide-carrier foil with silicone-free phase changing thermal conductive layer completely coated on both sides
material thickness	0.077 mm (substrate 0.05 mm)
thermal conductivity	0.45 W/m·K (substrate)
insulation resistance	$10^{14} \Omega$
thermal resistance	0.15 K/W [at 1 inch ² ; = 6.45 cm ² ; = TO 3 (KAP 3)]
temperature range	-40 °C ... +150 °C
phase change temperature	52 °C
extensibility	30 %
dielectric strength	7.8 kV
class of flammability	UL 94 V-0

Aluminium oxide wafers

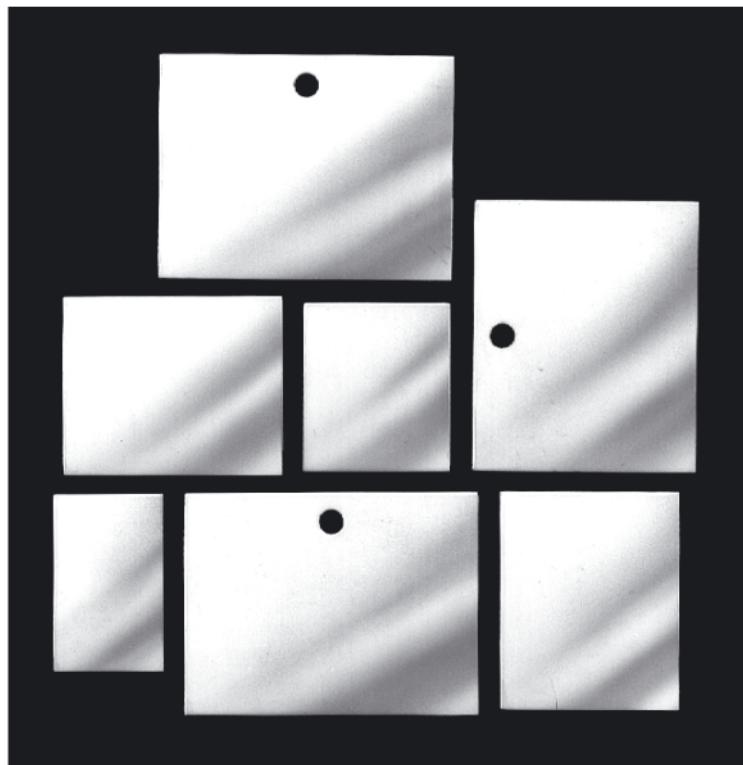
– other thicknesses and versions on request; \pm = thickness; \square = flatness

art. no. AOS 247 ± 1 mm / ± 0.02 mm	art. no. AOS 218 247 ± 3 mm / ± 0.15 mm	art. no. AOS 218 247 1 ± 1.5 mm / ± 0.02 mm	art. no. AOS 3 P 2 ± 1 mm / ± 0.15 mm	art. no. AOS 3 P SL ± 1.5 mm / ± 0.15 mm
art. no. AOS 220 3 ± 1.6 mm / ± 0.11 mm	art. no. AOS 220 SL ± 4.5 mm / ± 0.054 mm	art. no. AOS 220 4 ± 1.5 mm / ± 0.054 mm	art. no. AOS 220 ± 1.5 mm / ± 0.054 mm	art. no. AOS 32 ± 1.5 mm / ± 0.033 mm
art. no. AOS 127 ± 3 mm / ± 0.076 mm	art. no. AOS 3 P ± 1.5 mm / ± 0.061 mm	art. no. AOS 5 ± 1.5 mm / ± 0.032 mm	art. no. AOS 93 ± 2.3 mm / ± 0.03 mm	art. no. AOS 18 ± 1.5 mm / ± 0.023 mm
art. no. AOS 3 ± 2.9 mm / ± 0.123 mm	art. no. AOS 66 ± 2.5 mm / ± 0.10 mm			

AOS	
material	Al ₂ O ₃ - ceramics
thermal resistance	0.3 K/W [at 1 inch ² ; = 6.45 cm ² ; = TO 3 (AOS 3 G)]
specific electrical resistance	>10 ¹⁴ Ω/cm
thermal conductivity	25 W/m·K
dielectric constant	9
linear expansion coefficient	~8·10 ⁻⁶ /K
snap through stability	10 kV/mm

Aluminium oxide wafers according to customer's instructions

- laser-cut versions with outer dimensions and cutouts according to customer's requirements
- other plate dimensions on request



material thickness [mm]	outer dimensions [mm]
2.000	114 x 114
2.540	114 x 114
1.500	114 x 114
1.270	114 x 114
1.000	114 x 114/ 165 x 115/ 160 x 113
0.800	114 x 114/ 165 x 115/ 160 x 113
0.635	106.5 x 106.5/ 114 x 114/ 165 x 115/ 160 x 113
0.500	106.5 x 106.5/ 114 x 114
0.400	106.5 x 106.5/ 114 x 114
0.300	106.5 x 106.5/ 114 x 114
0.250	106.5 x 106.5/ 114 x 114

Thermal conductive material
GEL thermal conductive foils
Thermal conductive paste
Thermal conductive glue

→ **E 2 – 5**
→ **E 11 – 13**
→ **E 19 – 20**
→ **E 21 – 22**

Thermal conductive foil
Kapton insulator washers
Mica wafers
Technical introduction

→ **E 7 – 10**
→ **E 14**
→ **E 17**
→ **A 2 – 7**

Mica wafers

art. no. GS 220 C TO 220	art. no. GS 218 TO 218	art. no. GS 3 P SL TOP 3	art. no. GS 66 P TO 66	art. no. GS 220 4 TO 220
art. no. GS 220 P TO 220	art. no. GS 32 P SOT 32	art. no. GS 3 P TOP 3	art. no. GS 3 TO-3	

GS	
material	muskovit
material thickness	0.05 mm
insulation resistance	$3 \cdot 10^{17} \Omega/\text{cm}$
thermal resistance (GS 3)	0.4 K/W
snap through stability	5 kV

E 17

Thermal conductive material
 Thermal conductive foil
 GEL thermal conductive foils
 Thermal conductive paste

→ E 2 – 5
 → E 7 – 10
 → E 11 – 13
 → E 19 – 20

Thermal conductive glue
 Kapton insulator washers
 Aluminium oxide wafers
 Technical introduction

→ E 21 – 22
 → E 14
 → E 15 – 16
 → A 2 – 7

Free standing film



- self-supporting differential phase changing thermal interface material, contains no substrate (Free Standing Film)
- materials with phase change temperature at 52 °C;
- best thermal conductivity, exceeding phase change temperature point, material flows into all gaps between components and heatsink
- thixotropic, does not migrate from the interface area
- no lowering of thermal conductivity though thermal cycling
- application with very low contact pressure, due to non elastomeric material, particularly suitable for clamp mounting of components
- electrically non-conductive, but not an insulator
- self adhering characteristics, also suitable for large areas
- no toxic ingredients
- custom required shapes on request
- all with protection foil on both sides

art. no.	basin	dimensions [mm]
FSF 52 P	plate, protection foil on both sides	330 x 343 x 0.127 ±0.025

	FSF 52 P
phase change temperature	52 °C
colour	white
tightness	2 g/cm ³
thermal resistance (1 in², TO 3) at contact pressure of	0.03 K/W 0.031 N/mm ²
thermal conductivity	0.9 W/m·K
temperature range	max. +200 °C
adhesive holding force	0.35 N/mm ²
class of flammability	UL 94 V-0
dielectric constant	3.8 [1 kHz] 3.4 [1 MHz]

Thermal transfer compounds

Silicon thermal transfer compound

– thermal transfer compound used to reduce the thermal transmission resistance between semiconductor and heatsink



art. no.	basin	delivery quantity [g]
WLP 004	box	4
WLP 035	box	35
WLP 500	box	500
WLP 300 S	cartridge (310 ml)	300
WLP 500 S	cartridge (310 ml)	500

Silicone-free thermal transfer compound

– thermal transfer compound used to reduce the thermal transmission resistance between semiconductor and heatsink



art. no.	basin	delivery quantity [ml]	delivery quantity [g]
WLPS 05	syringe	2	—
WLPS 10	syringe	5	—
WLPS 20	syringe	10	—
WLPS 50	syringe	20	—
WLPS 300 S	cartridge (310 ml)	—	300

	WLP	WLPS
composition	silicone oil, inorganic filling material	silicone free synthetic liquid. Metal oxide filling.
consistancy	pastey	
colour	white	white-grey
tightness	1.1 g/cm ³	ca. 2 g/cm ³
thermal conductivity	0.61 W/m·K	>0.7 W/m·K
specific electrical resistance		>10 ¹² Ω/cm
flashpoint	none (DIN 53213)	of the basic oil >280 °C (ISO 2592)
drop point	>260 °C	
thermal resistance	no bleeding at (4 h / 200°C)	<1 % (96 h / 200 °C)
temperature range	-70 °C ... +250 °C	-40 °C ... +150 °C
acid number	< 0.01 mg KOH/g	
solubility in water		insoluble

Mica wafers
Thermal conductive foil
Thermal conductive paste
Thermal conductive glue

→ E 17
→ E 7 – 10
→ E 19 – 20
→ E 21 – 22

Thermal conductive material
Insulating caps
Aluminium oxide wafers
Technical introduction

→ E 2 – 5
→ E 49
→ E 15 – 16
→ A 2 – 7

E 19

Thermal transfer compounds

Ceramic filled, silicone-free thermal conductive paste with high thermal conductivity

- suitable especially for silicone-sensitive applications
- no drying out, hardening or melting of the thermal conductive paste
- high long-term stability
- further package sizes, container types such as cans, cartridge, etc. upon request



art. no.	basin	delivery quantity [ml]
WLPK 3	syringe	3
WLPK 5	syringe	5
WLPK 10	syringe	10

	WLPK
composition	silicone-free, synthetic fluid ceramic filled
consistance	pastey
colour	silver
tightness	1.4 g/cm ³
thermal conductivity	10 W/m·K
dielectric strength	not applicable, because conducting
temperature range	-60 °C ... +150 °C
solubility in water	insoluble

Thermally conductive adhesive

- thermally conductive, electrically non-conductive adhesive
- two part epoxy resin adhesive, metaloxide filled
- fully replaces mechanical fastenings
- excellent function and application characteristics
- to be stored at a cool and dark place

WLK 5



WLK 10



art. no.	composition	art. no.	composition
WLK 5	5 g resin / 0.5 g hardener	WLK 10	10 g resin / 1 g hardener

WLK 30



WLK 120



art. no.	composition	art. no.	composition
WLK 30	30 g resin / 3 g hardener	WLK 120	120 g resin / 12 g hardener

WLK

thermal conductivity	0.836 W/m·K
pass resistance	10^{16} Ω/cm
specific thermal resistance	1.2 m·K/W
temperature range	-56 °C ... +149 °C
hardening time	20 °C approx. 16 - 24 h / 190 °C approx. 20 min / 38 °C approx. 6 h
glue layer	Epoxid
mixture proportion	10:1

E 21

Thermal conductive material
Thermal conductive foil
GEL thermal conductive foils
Thermal conductive paste

→ E 2 - 5
→ E 7 - 10
→ E 11 - 13
→ E 19 - 20

Thermal conductive glue
fan cooler for Pentium and MMX
heatsinks for Pentium III FC PGA
Technical introduction

→ E 21 - 22
→ B 51
→ B 49
→ A 2 - 7

Thermally conductive adhesive

- solvent-free and thermal conductive two part adhesive
- epoxy based filled with aluminium oxide
- composition of hardener and resin (1:1) with statical mixing tube
- lockability of the container via Luer-Lock System
- good usage and working properties

WLK DK 4



WLK DK 10



WLK DK 50



art. no.	basin	contents of delivery
WLK DK 4	syringe	1x 4 ml syringe / 3x mixer WLK M 4
WLK DK 10	syringe	1x 10 ml syringe / 3x mixer WLK M 4
WLK DK 50	cartridge	1x 50 ml cartridge / 3x mixer WLK M 50

WLK DK

thermal conductivity	1.0 W/m·K
pass resistance	$8 \times 10^{11} \Omega/\text{cm}$
specific thermal resistance	118°C cm/W
temperature range	-50 °C ... +145 °C
working life at room temperature	approx. 30 min
hardening time	25 °C ca. 4 h / 50 °C ca. 1 h / 85 °C ca. 10 min / 125 °C ca. 2 min
glue layer	Epoxid
mixture proportion	1:1

Accessories

- more package sizes and container types upon request
- store cool and dry

art. no.	contents of delivery
WLK M 4	10x mixer für 4 & 10 ml syringe (packing unit 10 pieces)
WLK M 50	10x mixer für 50 ml cartridge (packing unit 10 pieces)
WLK P	1x applicator gun for 50 ml cartridge

Thermal conductive material
 Thermal conductive foil
 GEL thermal conductive foils
 Thermal conductive paste

→ E 2 - 5
 → E 7 - 10
 → E 11 - 13
 → E 19 - 20

Thermal conductive glue
 fan cooler for Pentium and MMX
 heatsinks for Pentium III FC PGA
 Technical introduction

→ E 21 - 22
 → B 51
 → B 49
 → A 2 - 7

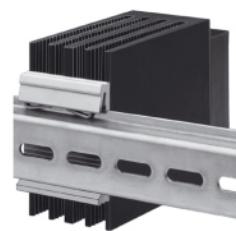
Fastening for mounting rail



KL 35 K ...

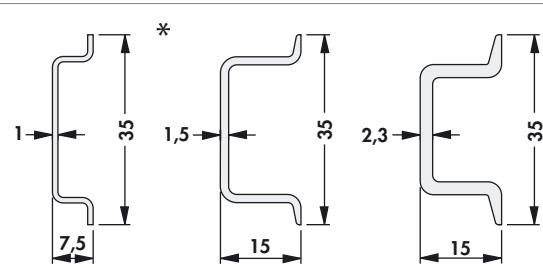
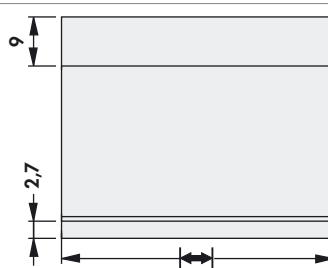
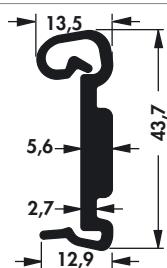


KL 35 ...



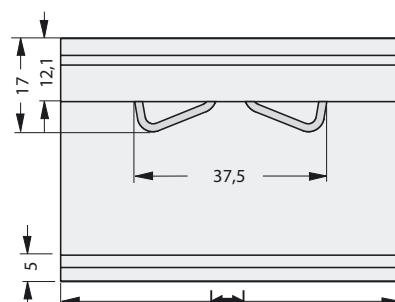
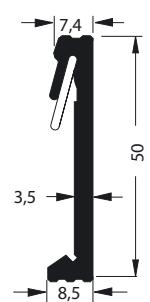
- universal, solid plastic clip fastening for all 35 mm mounting rails
- suitable for rail material thicknesses from 1 to 2.3 mm according to DIN EN 50 022
- registered design DE 200 07 435.0
- fast and easy mounting of heatsinks, casings etc. due to direct snap up on the mounting rail

- safe hold due to a stable extruded plastic profile with integrated spring back
- electroconductive material or surface on request
- special lengths and treatments on customer's request
- * = examples of mounting rail versions suitable for **KL 35 K**



art. no.	dim. [mm]	art. no.	dim. [mm]
KL 35 K 40	40	KL 35 K 75	75
KL 35 K 50	50	KL 35 K 100	100
material:		rigid PVC	
heat distortion:		-30 °C ... +80 °C	
colour:		anthracite grey	
class of flammability:		UL 94 V-0	

- safe hold due to a stable extruded profile with integrated stainless steel spring
- special lengths ($\geq 40\text{mm}$), treatments and surfaces on request
- * = examples of mounting rail versions suitable for KL 35

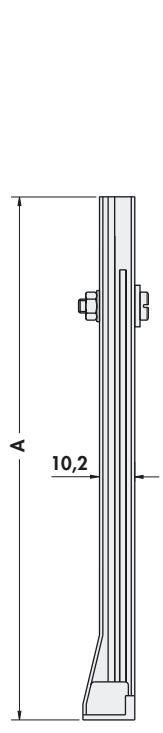
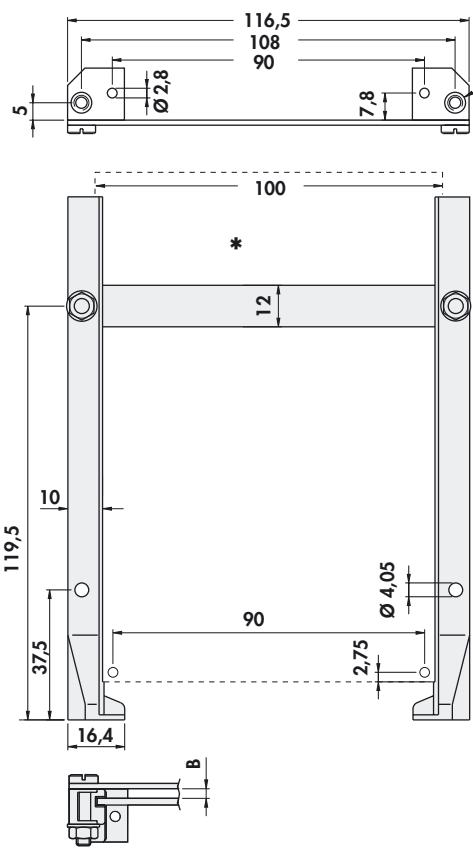
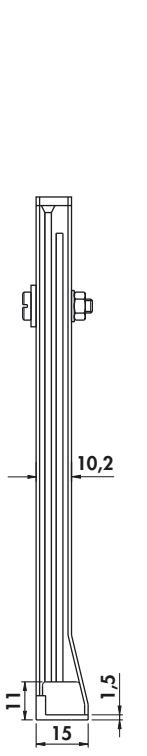


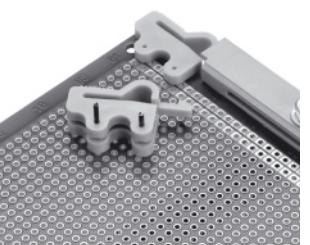
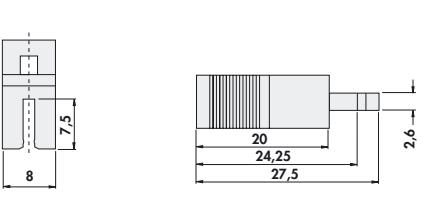
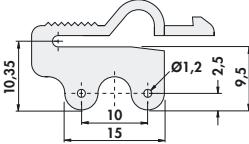
art. no.	dim. [mm]	art. no.	dim. [mm]	art. no.	dim. [mm]
KL 35 50	50	KL 35 75	75	KL 35 100	100
material:					aluminium
surface:					natural colour anodised

Guide rails

Screw-on type

- for eurocards
- connectors according to DIN 41612 or VG 95324 mountable
- high stability through inner reinforcements
- stable foot mounting trough inserted brass- thread inserts
- groove depth: 2.2 mm, groove width 1.9 mm
- suitable for PCB thicknesses from 0.5 to 1.85 mm
- * = printed circuit board

				art. no.	dim. [mm]	
					A	B
FS 151 P	151					2,5

art. no.				CLIP 151 only for FS 151 P	dim. [mm]	
					D	E
material:		polycarbonate, GF reinforced				
temperature range:		-40 °C ... +125 °C				
class of flammability:		UL 94 V-0				

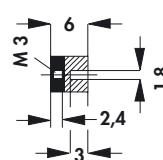
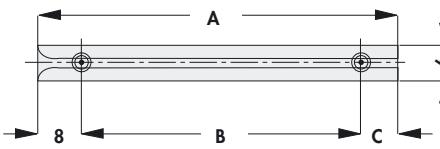
Solder pins
Snap-in guide rails
Extractors for guide rails
Insulating clamping parts

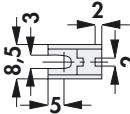
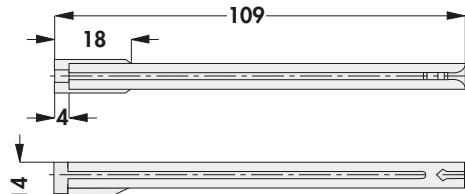
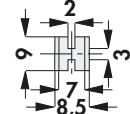
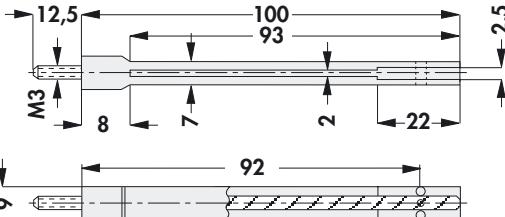
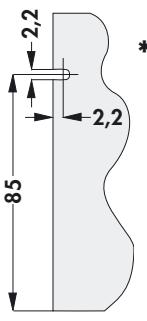
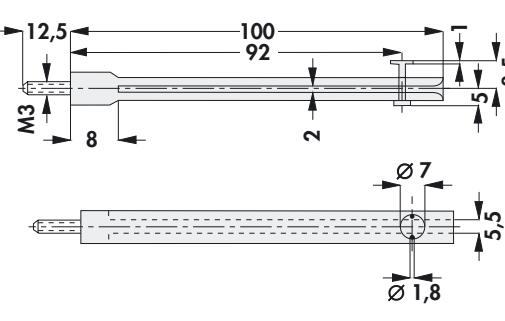
→ **E 41**
 → **E 27 - 28**
 → **E 28**
 → **E 43**

Distance sleeves for PCB's in HP grid → **E 37**
Mounting pads for transistors → **E 45**
Vibration dampers → **E 39**
Technical introduction → **A 2 - 7**

Guide rails

Screw-on type

			
art. no.	A	dim. [mm]	
FS 6 065	65	B	C
FS 6 070	70	50	7
FS 6 080	80	67	5
FS 6 090	90	67	15
FS 6 100	100	84	8
FS 6 110	110	84	18
FS 6 120	120	84	28
FS 6 130	130	84	38
material:	polycarbonate, GF reinforced		
temperature range:	-20 °C ... +130 °C		
thread nut:	brass nickel-plated		
class of flammability:	UL 94 V-0		

art. no.			
FS 109			
art. no.			
FS 100			
art. no.			
MSVL 100	* = position of snap-in slot		
material:	polyamide, GF reinforced		
temperature range:	-40 °C ... +205 °C		
class of flammability:	UL 94 V-0		

Solder pins
Snap-in guide rails
Extractors for guide rails
Insulating clamping parts

→ E 41
 → E 27 – 28
 → E 28
 → E 43

Distance sleeves for PCB's in HP grid → E 37
Mounting pads for transistors → E 45
Vibration dampers → E 39
Technical introduction → A 2 – 7

Guide rails

Lockable mounting rails

- lockable by pushing the plastic pin or the metal button
- no conductive connection to the PCB
- the PCB requires a snap-in slot in accordance to the drawing
- other position with locking device on request
- * = position of snap-in slot

art. no.	version	dim. [mm] L A	art. no.	version
FS 85 50	without bolting device	50 42	FS 85 70	without bolting device
FS 85 60	without bolting device	60 52	FS 85	without bolting device
art. no.	version	dim. [mm] L A	art. no.	version
MSVL 50	with bolting device	50 42	MSVL 70	with bolting device
MSVL 60	with bolting device	60 52	MSVL 85	with bolting device
material:	polyamide, GF reinforced			
temperature range:	-40 °C ... +205 °C			
class of flammability:	UL 94 V-0			

- the guide bars have got mounting holes for vertical and horizontal assembly of printed circuits
- they can also be stacked together horizontally or vertically using pins and treatments

art. no.		MSHV 90
material:		polyamide, GF reinforced
class of flammability:		UL 94 V-0

Solder pins

Snap-in guide rails

Extractors for guide rails

Insulating clamping parts

→ E 41

→ E 27 - 28

→ E 28

→ E 43

Distance sleeves for PCB's in HP grid → E 37

Mounting pads for transistors → E 45

Vibration dampers → E 39

Technical introduction → A 2 - 7

Guide rails

Snap-in

– narrow version

art. no.	dim. [mm]		art. no.	dim. [mm]	
	L	A		L	A
FS S 06 2	63,5	50,8	FS S 15 2	152,4	139,7
FS S 07 2	76,2	63,5	FS S 16 2	165,1	152,4
FS S 08 2	88,9	76,2	FS S 19 3	190,5	177,8
FS S 10 2	101,6	88,9	FS S 20 3	203,2	190,5
FS S 11 2	114,3	101,6	FS S 21 2	215,9	203,2
FS S 12 2	127,0	114,3	FS S 21 3	215,9	203,2
FS S 13 2	139,7	127,0			101,6
material:	nylon, natural coloured				
temperature range:	-40 °C ... +120 °C				
class of flammability:	UL 94 V-2				

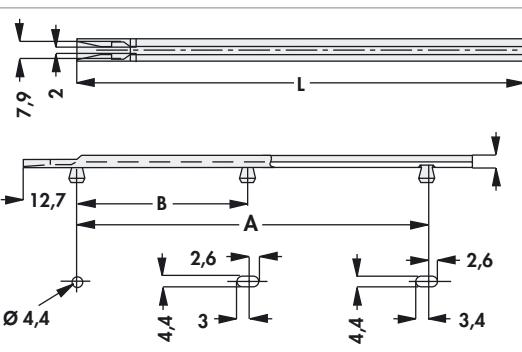
– wide version

art. no.	version	dim. [mm]		art. no.	version
		L	A		
FS BT 06	deep groove	63,5	38,1	FS BF 06	shallow groove
FS BT 08	deep groove	88,9	63,5	FS BF 07	shallow groove
FS BT 10	deep groove	101,6	76,2	FS BF 10	shallow groove
FS BT 11	deep groove	114,3	88,9	FS BF 11	shallow groove
FS BT 13	deep groove	139,7	114,3	FS BF 13	shallow groove
FS BT 15	deep groove	152,4	127,0	FS BF 15	shallow groove
FS BT 16	deep groove	165,1	139,7	FS BF 19	shallow groove
FS BT 19	deep groove	190,5	165,1	FS BF 20	shallow groove
FS BT 20	deep groove	203,2	177,8		
material:	nylon, natural coloured				
temperature range:	-40 °C ... +120 °C				
class of flammability:	UL 94 V-2				

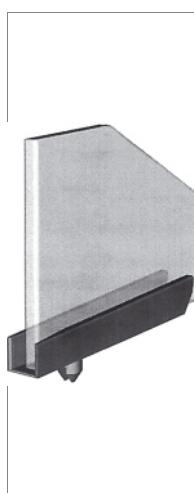
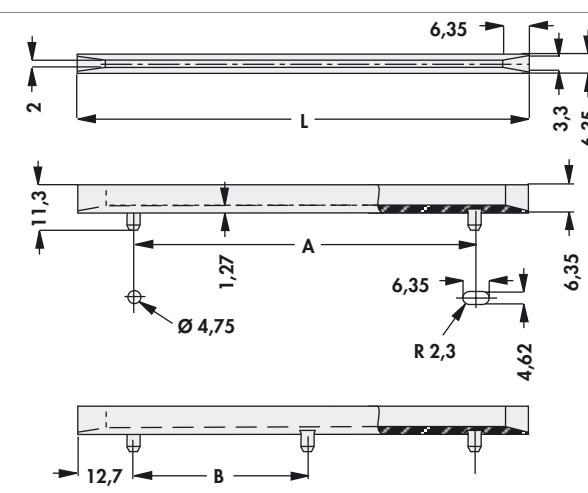
Guide rails

Ejectors

- low profile
- suitable for ejectors art. no. **AHG V 14** und **AHG V 17**

										
art. no.	dim. [mm]			art. no.	dim. [mm]					
	L	A	C	D		L	A	B	C	D
FS LP 05	50.8	25.8	2.0	3.2	FS LP 15	152.4	127.4	—	2.0	3.2
FS LP 07	76.2	38.5	2.0	3.2	FS LP 16	165.1	127.4	—	2.0	3.2
FS LP 08	88.9	38.5	2.0	3.2	FS LP 17	177.8	153.2	—	2.0	3.2
FS LP 10	101.6	76.6	2.0	3.2	FS LP 22	228.6	191.3	95.7	2.0	3.6
FS LP 11	114.3	76.6	2.0	3.2	FS LP 30	304.8	267.9	134.0	2.4	4.0
FS LP 13	139.7	76.6	2.0	3.2						
material:	polyamide, GF reinforced									
temperature range:	-40 °C ... +120 °C									
class of flammability:	UL 94 V-0									

- deep guideway
- bevelled entrance zone

				
art. no.	dim. [mm]			
	L	A	B	
FS U 06	63.5	38.1	—	
FS U 11	114.3	88.9	—	
FS U 20	203.2	177.8	88.9	
material:	polyamide, GF reinforced			
temperature range:	-40 °C ... +120 °C			
class of flammability:	UL 94 V-0			

Solder pins

Snap-in guide rails

Extractors for guide rails

Insulating clamping parts

→ **E 41**

→ **E 27 - 28**

→ **E 28**

→ **E 43**

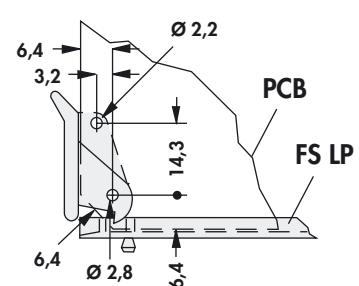
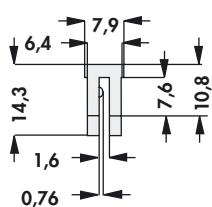
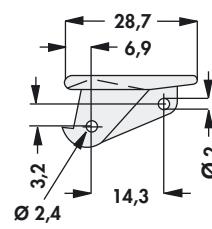
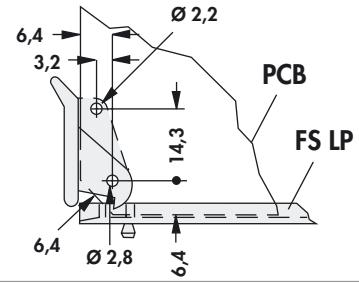
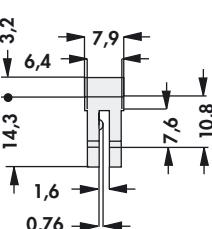
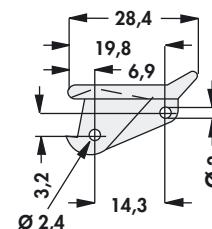
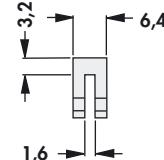
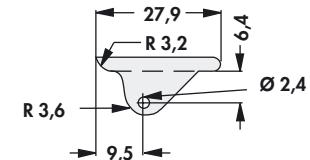
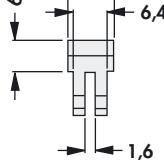
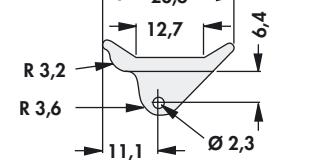
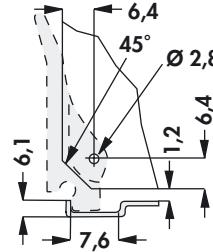
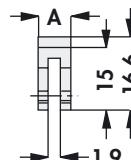
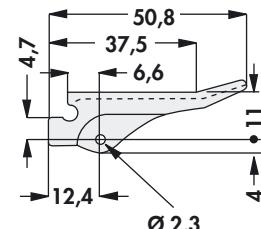
Distance sleeves for PCB's in HP grid → **E 37**

Mounting pads for transistors → **E 45**

Vibration dampers → **E 39**

Technical introduction → **A 2 - 7**

Ejectors

art. no.			
AHG V 14	* = mounting dimensions; locking in FS LP		
art. no.			
AHG V 17	* = mounting dimensions; locking in FS LP		
art. no.			
AHG K 27			
art. no.			
AHG K 28			
art. no.			
AHG L 7	dim. [mm] A 7.4		
material:	nylon		
temperature range:	-40 °C ... +120 °C		
class of flammability:	UL 94 V-2		
type of delivery:	all ejectors with matching spring pin		

E 29

Solder pins
Snap-in guide rails
Extractors for guide rails
Insulating clamping parts

→ E 41
→ E 27 – 28
→ E 28
→ E 43

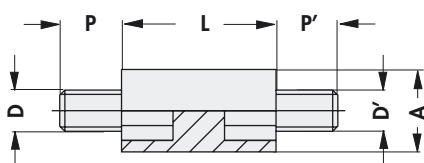
Distance sleeves for PCB's in HP grid → E 37
Mounting pads for transistors → E 45
Vibration dampers → E 39
Technical introduction → A 2 – 7

Insulating spacers with internal and external thread

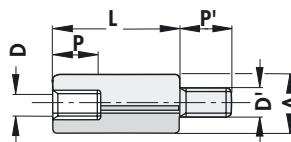


field of applications:

- insulated assembly of stacked PCB
- insulated assembly of stacked heatsinks with varying capacities
- insulated assembly of chassis plates in cases
- insulated supports in the wiring
- mechanically very stable as threads are made of brass
- other lengths on request
- dimensions = nominal size: deviation ± 0.5 mm
- ... please indicate length "L"

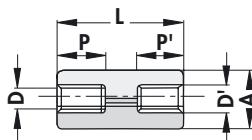


art. no.	A	D/D'	dim. [mm]	P/P'
ISAB 25 A ...	6.5	M2.5/M2.5	10/ 15/ 20/ 25	6.0
ISAB 3 A ...	8.0	M3/M3	10/ 20	6.0
ISAB 4 A ...	8.0	M4/M4	15/ 20	6.0
ISAB 6 A ...	12.7	M6/M6	25	12.7
dielectric strength:	approx. 40 kV/mm			
creeping current resistance:	3c, level KA			
thread inserts:	brass			
temperature range:	-30 °C ... +85 °C (short term +200 °C)			
surface:	raw			
plastic body:	polyamide 66			
colour:	natural (opaque)			

Insulating spacers with internal and external thread


art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAB 25 B ...	6.5	M2.5/M2.5	10/ 13/ 15/ 18/ 20/ 25/ 30	6.0
ISAB 3 B ...	8.0	M3/M3	10/ 13/ 15/ 18/ 20/ 25/ 30/ 35/ 40	6.0
ISAB 4 B ...	8.0	M4/M4	15/ 20/ 25/ 30/ 40	6.0
ISAB 5 B ...	9.5	M5/M5	20/ 30/ 40	10.0
ISAB 6 B ...	12.7	M6/M6	25/ 30/ 35/ 40/ 50	12.7

– dimensions = nominal size; deviation ± 0.5 mm; at **ISAB 3 C ...** $L=10 \Rightarrow P/P'=3.5$



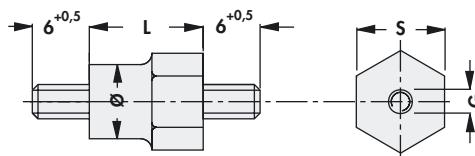
art. no.	dim. [mm]			
	A	D/D'	L	P/P'
ISAB 25 C ...	6.5	M2.5/M2.5	10/ 13/ 15/ 18/ 20/ 25/ 30	6.0
ISAB 3 C ...	8.0	M3/M3	10/ 13/ 15/ 18/ 20	6.0
ISAB 4 C ...	8.0	M4/M4	15/ 35	6.0
ISAB 5 C ...	9.5	M5/M5	20	10.0
ISAB 6 C ...	12.7	M6/M6	25	12.0
ISAB 6 C ...	12.7	M6/M6	30	12.7

dielectric strength:	approx. 40 kV/mm
creeping current resistance:	3c, level KA
thread inserts:	brass
temperature range:	-30 °C ... +85 °C (short term +200 °C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

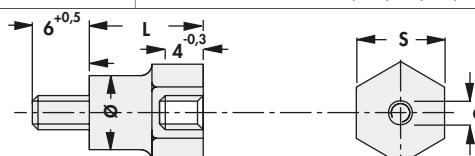
Miniature spacers with threads



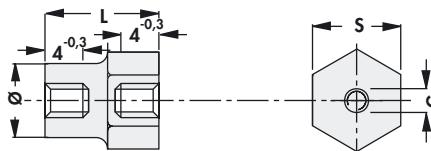
- allows compact, insulated constructions
- reduced volume in case of stack assembly
- insulated mounting of heatsinks, PCB, housingparts etc.
- very good mechanical stability due to brass inserts
- dimensions = nominal size: deviation ±0.5 mm
- ... please indicate length "L"



art. no.	S	type of thread	dim. [mm]	L	max. diameter of the bushing
ISAM 2 A ...	6	M 2.5		4/ 5/ 7/ 9/ 11/ 12	6
ISAM 3 A ...	7	M 3		4/ 5/ 7/ 8/ 9/ 10	7



art. no.	S	type of thread	dim. [mm]	L	max. diameter of the bushing
ISAM 2 B ...	6	M 2.5		8/ 9/ 10/ 11	6
ISAM 3 B ...	7	M 3		7/ 8/ 9/ 10/ 11/ 12	7



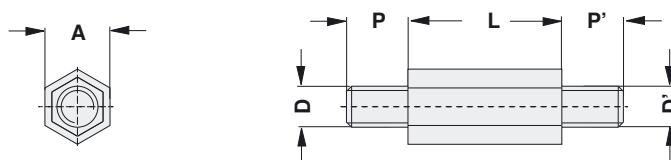
art. no.	S	type of thread	dim. [mm]	L	max. diameter of the bushing
ISAM 2 C ...	6	M 2.5		9	6
ISAM 3 C ...	7	M 3		9/ 10/ 12	7

dielectric strength:	30 kV/mm
creeping current resistance:	3c, level KA
thread inserts:	brass
temperature range:	-30 °C ... +85 °C (short term +200 °C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

Distance hexagonal bolts insulating


field of applications:

- insulated assembly of stacked PCBs
- insulated assembly of stacked heatsinks with varying capacities
- insulated assembly of chassis plates in cases
- insulated supports in the wiring
- mechanically very stable, as threads are made of brass
- other lengths on request
- dimensions = nominal size: deviation ± 0.5 mm
- ... please indicate length "L"



art. no.	A	D/D'	dim. [mm]		P/P'
			L		
ISAS 25 A ...	6.35	M2.5/M2.5	15/ 20/ 25/ 30/ 35/ 40		6.0
ISAS 30 A ...	6.35	M3/M3	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50		6.0
ISAS 40 A ...	8.00	M4/M4	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50		6.0
ISAS 50 A ...	9.50	M5/M5	20/ 25/ 30/ 35/ 40/ 45/ 50		10.0
ISAS 60 A ...	12.70	M6/M6	25/ 30/ 35/ 40/ 45/ 50/ 60		12.7

dielectric strength:	approx. 40 kV/mm
creeping current resistance:	3c, level KA
thread inserts:	brass
temperature range:	-30 °C ... +85 °C (short term +200 °C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

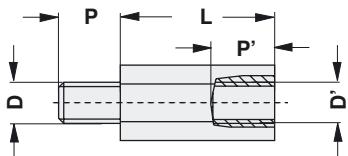
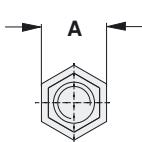
E 33

Spacers
Screw mounted guide rails
Ejectors
Vibration dampers

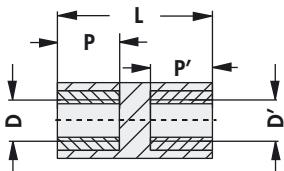
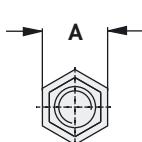
→ **E 38**
 → **E 24 – 28**
 → **E 29**
 → **E 39**

Mounting material for semiconduct. → **E 42 – 46**
Mounting parts for heatsinks → **E 47 – 48**
Thermal conductive material → **E 2 – 22**
Technical introduction → **A 2 – 7**

Distance hexagonal bolts insulating



art. no.	A	D/D'	dim. [mm] L	P/P'
ISAS 25 B ...	6.35	M2.5/M2.5	15/ 20/ 25/ 30/ 35/ 40	6.0
ISAS 30 B ...	6.35	M3/M3	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 40 B ...	8.00	M4/M4	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 50 B ...	9.50	M5/M5	20/ 25/ 30/ 35/ 40/ 45/ 50	10.0
ISAS 60 B ...	12.70	M6/M6	25/ 30/ 35/ 40/ 45/ 50/ 60	12.7

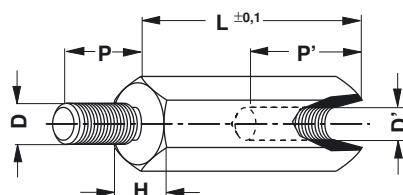


art. no.	A	D/D'	dim. [mm] L	P/P'
ISAS 25 C ...	6.35	M2.5/M2.5	15/ 20/ 25/ 30/ 35/ 40	6.0
ISAS 30 C ...	6.35	M3/M3	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 40 C ...	8.00	M4/M4	15/ 20/ 25/ 30/ 35/ 40/ 45/ 50	6.0
ISAS 50 C ...	9.50	M5/M5	20/ 25/ 30/ 35/ 40/ 45/ 50	10.0
ISAS 60 C ...	12.70	M6/M6	25/ 30/ 35/ 40/ 45/ 50/ 60	12.7

dielectric strength:	approx. 40 kV/mm
creeping current resistance:	3c, level KA
thread inserts:	brass
temperature range:	-30 °C ... +85 °C (short term +200 °C)
surface:	raw
plastic body:	polyamide 66
colour:	natural (opaque)

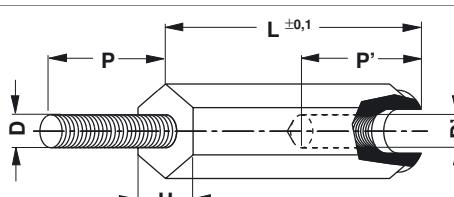
Spacers with internal and external thread

- other lengths and threads on request
- ... please indicate length "L"



art. no.	dim. [mm]				
	H	D/D'	L	P	P'
GBM 2550 ...	5	M2.5	5	6	2.5
GBM 2550 ...	5	M2.5	10	6	5.0
GBM 2550 ...	5	M2.5	15/ 20	6	8.0
GBM 2550 ...	5	M2.5	25/ 30/ 35	8	10.0
GBM 3050 ...	5	M3	5	8	2.5
GBM 3050 ...	5	M3	10/ 12/ 14	8	5.0
GBM 3050 ...	5	M3	15/ 18/ 20	8	10.0
GBM 3050 ...	5	M3	25/ 30/ 35/ 40/ 45/ 50	10	10.0
GBM 4070 ...	7	M 4	5	8	2.5
GBM 4070 ...	7	M 4	10	8	5.0
GBM 4070 ...	7	M 4	15	8	8.0
GBM 4070 ...	7	M 4	20	8	10.0
GBM 4070 ...	7	M 4	25/ 30/ 35/ 40/ 45/ 50	10	10.0
GBM 5080 ...	8	M 5	10	8	5.0
GBM 5080 ...	8	M 5	15/ 20	8	6.0
GBM 5080 ...	8	M 5	25/ 30/ 35/ 40/ 45/ 50	10	10.0
material:	brass				
surface:	6 µm nickel-plated, solderable				

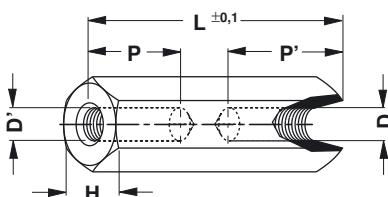
- other lengths and threads on request
- ... please indicate length "L"



art. no.	dim. [mm]				
	H	D/D'	L	P	P'
GBP 3060 ...	6	M3	10	8	7
GBP 3060 ...	6	M3	12	8	8
GBP 3060 ...	6	M3	15/ 18/ 20/ 25/ 30	8	10
GBP 4080 ...	8	M 4	10	8	7
GBP 4080 ...	8	M 4	12	8	9
GBP 4080 ...	8	M 4	15/ 18/ 20/ 25/ 30/ 35/ 40/ 45	8	10
material:	polyamide, GF reinforced				
temperature range:	-30 °C ... +110 °C				
colour:	black				

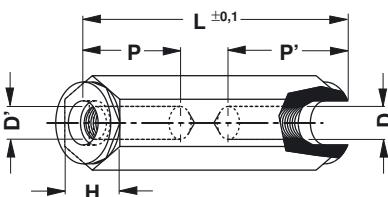
Distance sleeves with internal thread

- other lengths and threads on request
- ... please indicate length "L"



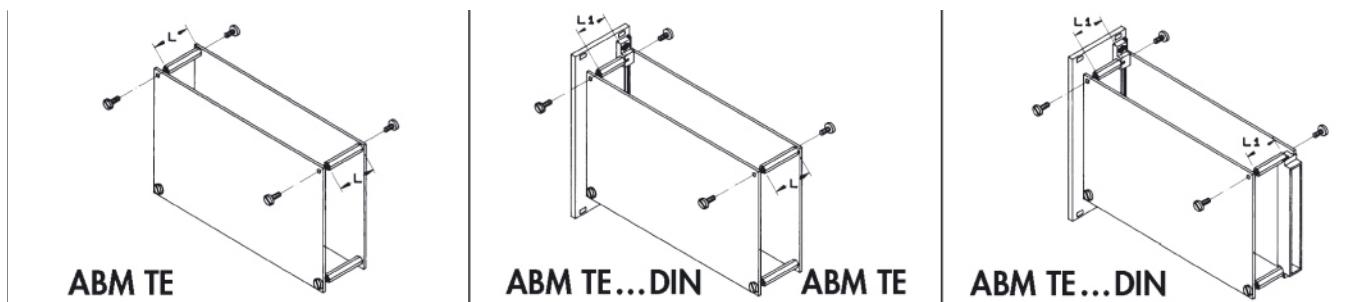
art. no.	dim. [mm]				
	H	D/D'	L	P	P'
ABM 2550 ...	5	M2.5	5/ 8/ 10/ 12/ 15	=L	—
ABM 2550 ...	5	M2.5	18	8	8
ABM 2550 ...	5	M2.5	20/ 25/ 30/ 35/ 40/ 45/ 50	10	10
ABM 3050 ...	5	M3	5/ 8/ 9/ 10/ 12/ 13/ 15	=L	—
ABM 3050 ...	5	M3	16/ 18/ 19	8	8
ABM 3050 ...	5	M3	20/ 25/ 29/ 30/ 35/ 40/ 45/ 50	10	10
ABM 4070 ...	7	M 4	5/ 8/ 10/ 12/ 15	=L	—
ABM 4070 ...	7	M 4	18	9	9
ABM 4070 ...	7	M 4	20/ 25/ 30/ 35/ 40/ 45/ 50	10	10
material:	brass				
surface:	6 µm nickel-plated, solderable				

- other lengths and threads on request
- ... please indicate length "L"



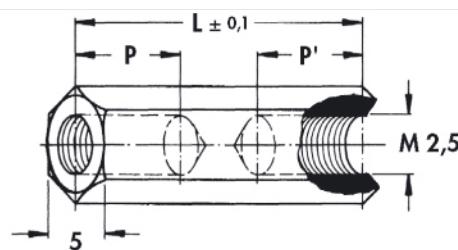
art. no.	dim. [mm]				
	H	D/D'	L	P	P'
ABP 2550 ...	5	M2.5	10	=L	—
ABP 2550 ...	5	M2.5	15/ 20/ 25/ 30	6	6
ABP 3060 ...	6	M3	10/ 12/ 15	=L	—
ABP 3060 ...	6	M3	20	8	8
ABP 3060 ...	6	M3	25/ 30	10	10
ABP 4080 ...	8	M 4	10/ 15/ 20	=L	—
ABP 4080 ...	8	M 4	30/ 40	10	10
material:	polyamide, GF reinforced				
temperature range:	-30 °C ... +110 °C				
colour:	black				

Distance sleeves for PCB in HP grid

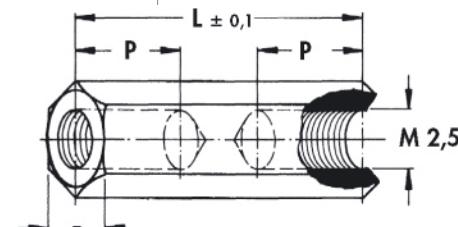


– these internally threaded distance sleeves mount PCBs to the correct pitch for insertion into subracks

- **ABM TE**: spacer between two PC boards
- **ABM TE ... DIN**: spacer between two PC boards, one of them equipped with DIN-connector resp. A front panel/PCB Interconnection device VS 1
- spacers with internal and external thread to HP grid on request



art. no.	suitable for TE	dim. [mm]	P/P'
ABM TE 04	4	18.72	8
ABM TE 06	6	28.88	8
ABM TE 08	8	39.04	8

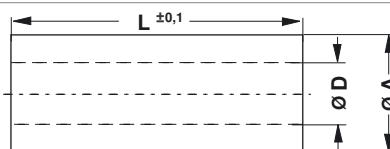


art. no.	suitable for TE	dim. [mm]	P
ABM TE 04 DIN	4	12.72	=L
ABM TE 06 DIN	6	22.88	8
ABM TE 08 DIN	8	33.04	8

material: brass

surface: 8 µm nickel-plated, solderable

– ... please indicate length "L"



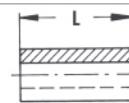
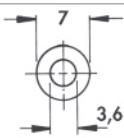
art. no.	A	D	dim. [mm]	L
AHM 3260...	6	3.2	1/ 2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 12/ 15/ 18/ 25/ 30	
AHM 4380...	8	4.3	2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 12/ 15/ 18/ 20	

material: brass

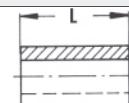
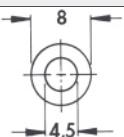
surface: 8 µm nickel-plated, solderable

Distance spacers

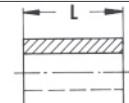
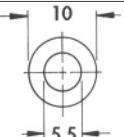
– special lengths on request



art. no.	length [mm]	art. no.	length [mm]	art. no.	length [mm]
DR 071 V0	1	DR 079 V0	9	DR 725 V0	25
DR 072 V0	2	DR 710 V0	10	DR 730 V0	30
DR 073 V0	3	DR 711 V0	11	DR 735 V0	35
DR 074 V0	4	DR 712 V0	12	DR 740 V0	40
DR 075 V0	5	DR 713 V0	13	DR 745 V0	45
DR 076 V0	6	DR 714 V0	14	DR 750 V0	50
DR 077 V0	7	DR 715 V0	15	DR 760 V0	60
DR 078 V0	8	DR 720 V0	20		



art. no.	length [mm]	art. no.	length [mm]	art. no.	length [mm]
DR 081 V0	1	DR 089 V0	9	DR 825 V0	25
DR 082 V0	2	DR 810 V0	10	DR 830 V0	30
DR 083 V0	3	DR 811 V0	11	DR 835 V0	35
DR 084 V0	4	DR 812 V0	12	DR 840 V0	40
DR 085 V0	5	DR 813 V0	13	DR 845 V0	45
DR 086 V0	6	DR 814 V0	14	DR 850 V0	50
DR 087 V0	7	DR 815 V0	15	DR 860 V0	60
DR 088 V0	8	DR 820 V0	20		



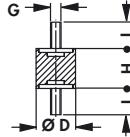
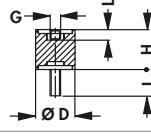
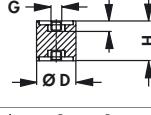
art. no.	length [mm]	art. no.	length [mm]	art. no.	length [mm]
DR 105 V0	5	DR 125 V0	25	DR 140 V0	40
DR 110 V0	10	DR 130 V0	30	DR 145 V0	45
DR 115 V0	15	DR 135 V0	35	DR 150 V0	50
DR 120 V0	20				
material:	polyamide				
heat distortion:	180 °C				
temperature range:	+180 °C				
colour:	black				
class of flammability:	UL 94 V-0				

Contractual elements to vibration damping and insulation

- universal applicable round metal, antivibration buffers for solving vibration problems
- other lengths and hardness range on request
- ... please indicate height "H"

Field of applications:

- reduction of dynamic component stress
- vibration insulation for disc drives and motors
- impact reducing on sensitive instruments
- reduction of the noise level
- prevention of vibration resonance phenomena (amplified effect)
- compensation of mechanical imbalances

					
art. no.	dim. [mm]				
	H	type of thread	Ø D	L	
SMP 410 A ...	10	4	10	10	
SMP 415 A ...	15	4	15	10	
SMP 515 A ...	15	M 5	15	12	
					
art. no.	dim. [mm]				
	H	type of thread	Ø D	L'	L
SMP 410 B ...	10	4	10	4	10
SMP 415 B ...	15	4	15	4	10
SMP 515 B ...	15	M 5	15	5	12
					
art. no.	dim. [mm]				
	H	type of thread	Ø D	L'	
SMP 410 C ...	15/ 20	4	10	4	
SMP 415 C ...	15/ 20	4	15	4	
SMP 515 C ...	20	M 5	15	5	
material:	rubber-metal connection				
rubber:	natural rubber (NR according to ISO)				
hardness range:	approx. 50 Shore A				
extensibility and tensile strength:	very good				
colour:	black				
metall parts:	steel tin-plated				
temperature range:	-40 °C ... +80 °C (short term +90 °C)				

E 39

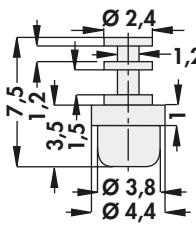
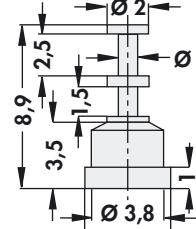
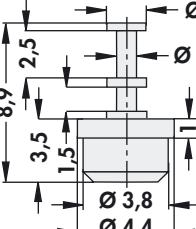
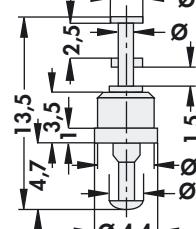
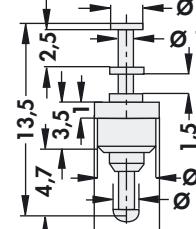
Screw mounted guide rails
Ejectors
Insulating distance sleeves
Spacers

→ E 24 – 26
→ E 29
→ E 30 – 37
→ E 38

Insulating clamping parts
Mounting parts for heatsinks
Mounting material for semiconduct.
Technical introduction

→ E 43
→ E 47 – 48
→ E 42
→ A 2 – 7

Solder terminals

art. no.		
LSD 07520		
LSD 08910		
LSD 08920		
LSD 13510		
LSD 13520		
material:	insulating body: PTFE (teflon)	
contact pin:	brass, 2 µm Ni, 4 µm Ag	
temperature range:	-200 °C ... +260 °C	

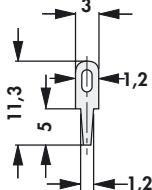
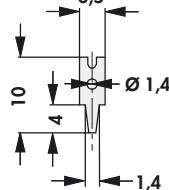
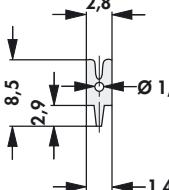
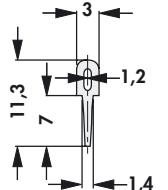
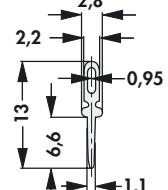
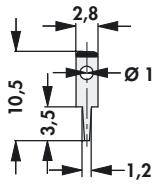
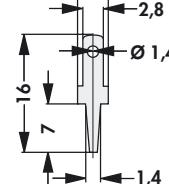
Screw mounted guide rails
Ejectors
Insulating distance sleeves
Spacers

→ E 24 - 26
→ E 29
→ E 30 - 37
→ E 38

Insulating clamping parts
Mounting parts for heatsinks
Mounting material for semiconduct.
Technical introduction

→ E 43
→ E 47 - 48
→ E 42
→ A 2 - 7

Solder pins

				
art. no.	art. no.	art. no.	art. no.	art. no.
LS 101 0.6 mm	LS 102 0.6 mm	LS 103 0.6 mm	LS 104 0.6 mm	LS 105 0.5 mm
				
art. no.	art. no.			
LS 106 0.8 mm	LS 107 0.5 mm			

 = thickness

	LS
material	brass, 6 µm Sn

E 41

Screw mounted guide rails
Ejectors
Insulating distance sleeves
Spacers

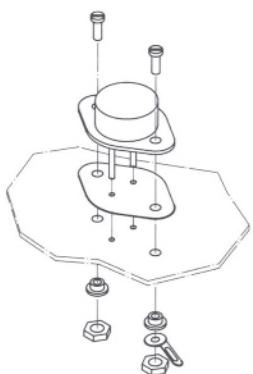
→ E 24 – 26
→ E 29
→ E 30 – 37
→ E 38

Insulating clamping parts
Mounting parts for heatsinks
Mounting material for semiconduct.
Technical introduction

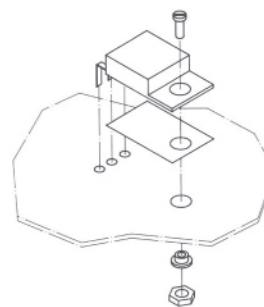
→ E 43
→ E 47 – 48
→ E 42
→ A 2 – 7

Mounting kits for insulation of power transistors

**MST 3
MSTS 3**



**MST 220
MSTS 220**



art. no.	for transistor	version	contents of delivery
MST 3	TO 3	with mica wafer GS 3	1 mica wafer, 2 insulator sleeves, 1 tin-plated solder lug, 2 cheese head screws, nickel-plated, 2 screw nuts M3 nickel-plated
MSTS 3	TO 3	with silicone wafer WS 3	1 silicone wafer, 2 insulator sleeves, 1 tin-plated solder lug, 2 cheese head screws, nickel-plated, 2 screw nuts M3 nickel-plated
MST 220	TO 220	with mica wafer GS 220	1 mica wafer, 1 tin-plated solder lug, 1 cheese head screw, nickel-plated, 1 screw nut M3 nickel-plated
MSTS 220	TO 220	with silicone wafer WS 220	1 silicone wafer, 1 insulator sleeve, 1 tin-plated solder lug, 1 cheese head screw, nickel-plated, 1 screw nut M3 nickel-plated

Snap rivet for quick fastening of TO 220

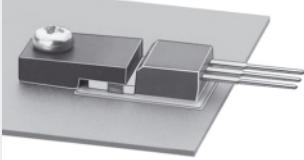
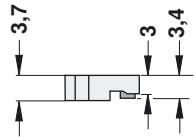
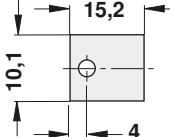
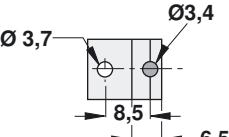
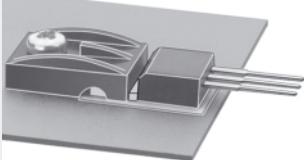
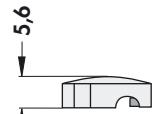
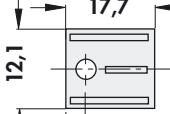
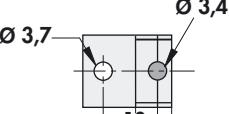
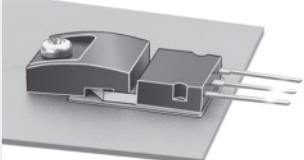
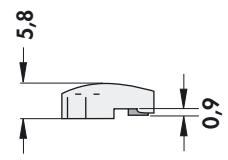
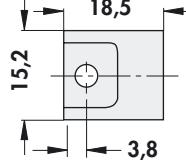
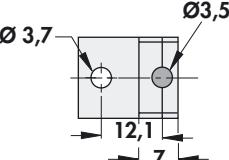
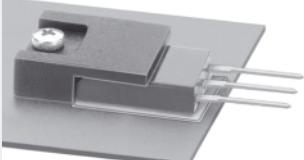
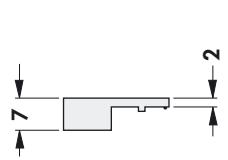
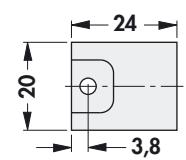
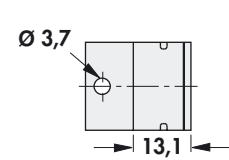
- detachable plastic snap rivet for quick fastening of transistors onto heatsinks and cooling plates (e.g. FK 212-CB, FK 216-CB, FK 222-220, FK 232, FK 233, FK 235-L 1)
- suitable for material thickness: 1 – 1.5 mm
- suitable for hole diameter: 3.5 – 4 mm
- * = bottom view, pin not inserted

art. no.	for transistor	
EPN 1	TO 220	
material:	polysulphone, GF reinforced	
temperature range:	-70 °C ... +180 ° (5 sec. +260 °C)	
class of flammability:	UL 94 V-0	

Insulating clamping parts for power transistors

Plastic insulating clamping parts for mounting transistors in cases TO 220, TO 218 and TO 247 for enhanced dielectric strengths

- electrically insulating assembly of the transistor by means of a plastic clamping part
- pin reaching into the hole of the transistor plate
- fastening of clamping part onto the mounting plate by screws, no electroinsulating connection to the transistor
- dielectric strength only determined by the insulating washer between transistor and mounting surface
- no insulating bush necessary, thus no dielectric breakdown

art. no.				
ISP 220				
art. no.				
ISP 220 V				
art. no.				
ISP 218				
art. no.				
ISP 247				
material:	polyamide 6, GF reinforced			
dielectric strength:	>27 kV/mm			
heat distortion:	205(1,8 MPa)135(8 MPa)			
dielectric constant:	8 [100 Hz] / 4.5 [1 MHz]			
dielectric loss factor:	1300 [100 Hz] 450 [1 MHz]			
specific volume resistance:	>10 ¹³ Ω/cm			
colour:	black			
class of flammability:	UL 94 V-0			

Mounts

A

B

C

D

E

F

G

H

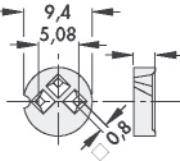
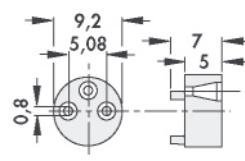
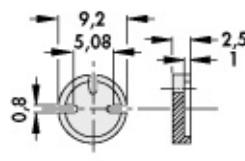
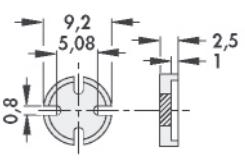
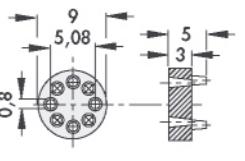
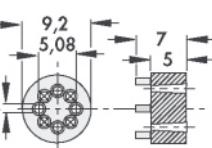
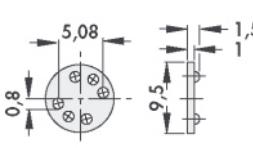
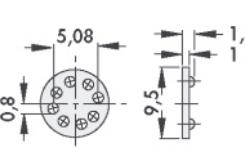
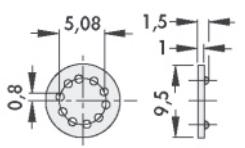
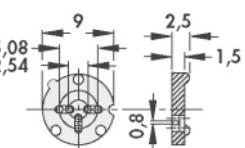
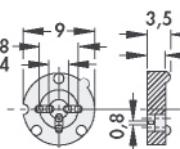
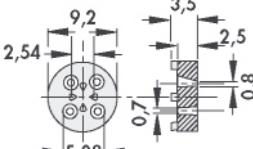
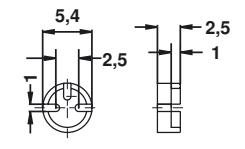
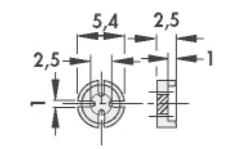
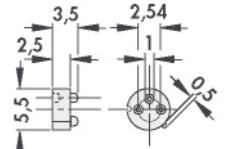
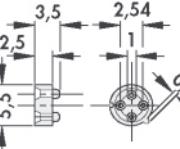
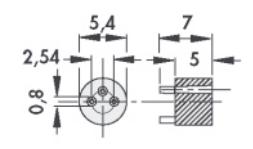
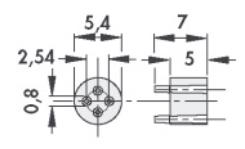
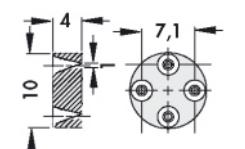
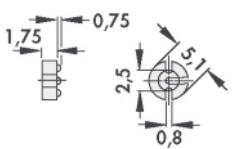
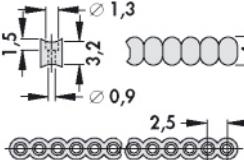
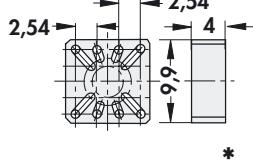
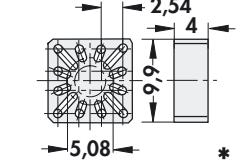
I

K

L

M

N

				
art. no. MS 53 3 TO 5	art. no. MS 53 7 TO 5	art. no. MS 53 25 TO 5	art. no. MS 54 25 TO 5	art. no. MS 58 5 TO 5-8 p.
				
art. no. MS 58 7 TO 5-8 p.	art. no. MS 56 15 TO 5-6 p.	art. no. MS 58 15 TO 5-8 p.	art. no. MS 510 15 TO 5-10 p.	art. no. MS 3518 25 TO 5/ TO 18
				
art. no. MS 3518 35 TO 5/ TO 18	art. no. MS 34 518 TO 5 / TO 18	art. no. MS 183 25 TO 18	art. no. MS 184 25 TO 18	art. no. MS 183 35 TO 18
				
art. no. MS 184 35 TO 18	art. no. MS 183 7 TO 18	art. no. MS 184 7 TO 18	art. no. MS 84 4 TO 8	art. no. MS 923 25 TO 92
				
art. no. MS 4016 max. 16 contacts	art. no. US 58 4 TO 5	art. no. US 512 4 TO 5		

* = **mounting pads:** the US-pads convert the TO 5 pin circle to a pitch of .1".

material:	polyamide 6, GF reinforced
temperature range:	-40 °C ... +205 °C
class of flammability:	UL 94 V-0 (at thickness ≥ 3 mm), UL 94 V-1

Mounting parts for heatsinks
Heatsinks for PCB
Profiles for PCB mounting
Thermal conductive material

→ E 47 - 48
 → A 89 - 92
 → A 89 - 111
 → E 2 - 22

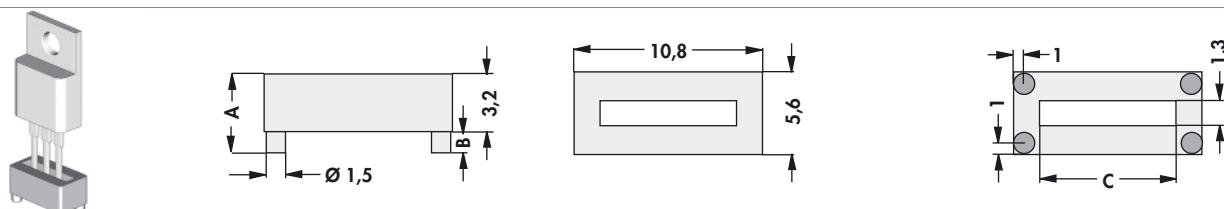
Insulating distance sleeves
Finger-shaped heatsinks
Retaining springs for transistors
Technical introduction

→ E 30 - 32
 → C 2 - 3
 → A 114 - 120
 → A 2 - 7

Mounts

Mounts for power transistors

- for TO 220, TO 219, TO 202 and similar
- for vertical and horizontal mounting
- also suitable as mounting bracket for angled connections



art. no.	colour	A	B	C
MLW 32	white	3.2	—	7.1
MLW 44	white	4.4	1.3	7.1
MLW 51	white	5.1	1.9	7.1

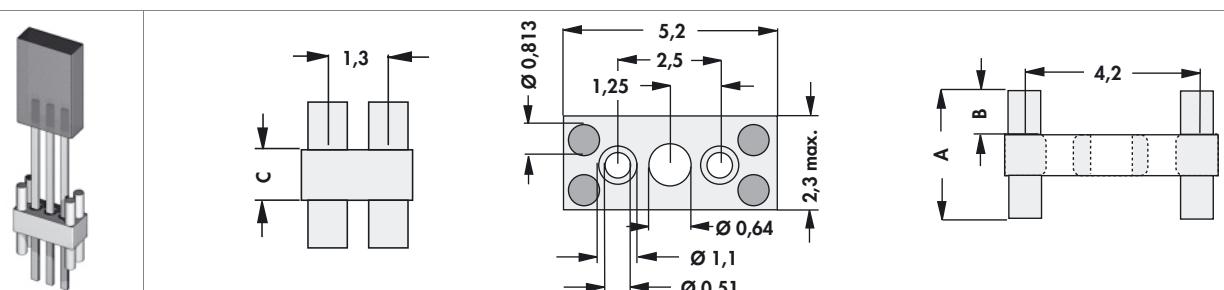
material: polyamide 6 (nylon)

temperature range: -40 °C ... +120 °C

class of flammability: UL 94 V-2

Mounts for rectangular LEDs

- for LED 2x4 mm oder 2x5 mm
- symmetric version for easy assembly
- self-adhesive



art. no.	colour	A	B	C
MRL 20	white	2	0.5	1

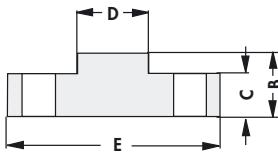
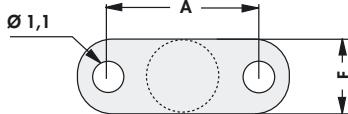
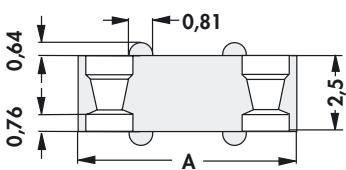
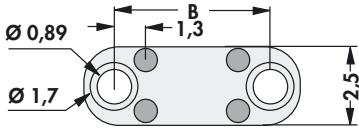
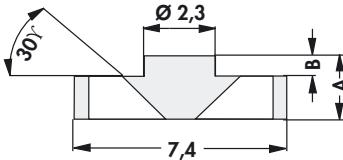
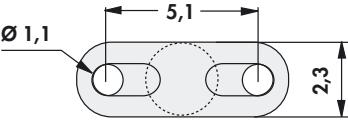
material: polyamide 6 (nylon)

temperature range: -40 °C ... +120 °C

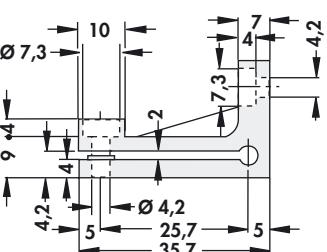
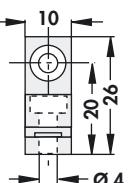
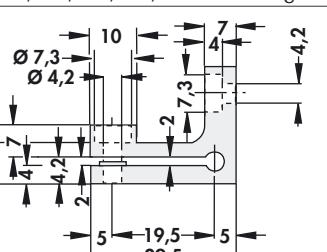
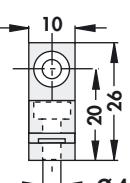
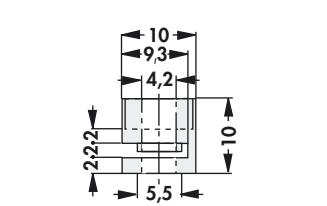
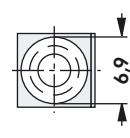
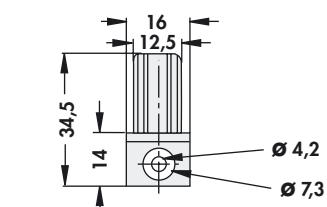
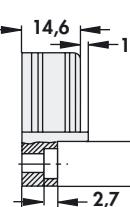
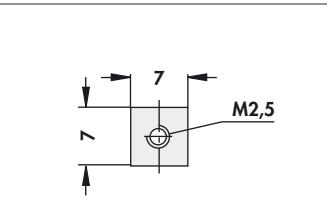
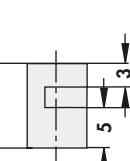
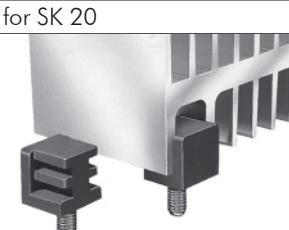
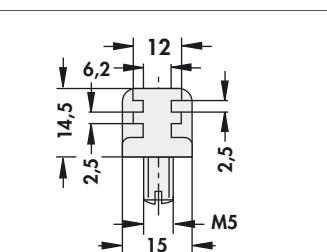
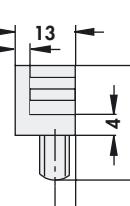
class of flammability: UL 94 V-2

Mounts for discrete components

– suitable for various components e.g. resistors, capacitors etc.

			
art. no.	dim. [mm]	art. no.	dim. [mm]
	A B C D E F		A B C D E F
MD A 04	2.5 1.1 0.55 1.3 4.6 2.3	MD A 09	7.6 1.1 0.66 3.6 9.9 2.3
MD A 06	3.8 1.1 0.55 2.3 6.9 3.2	MD A 12	10.2 1.1 0.76 4.8 12.4 2.3
MD A 07	5.1 1.1 0.55 2.3 7.4 2.3		
			
art. no.	dim. [mm]	art. no.	dim. [mm]
	A B		A B
MD B 07	7.6 5.1	MD B 12	12.7 10.2
MD B 10	10.2 7.6	MD B 15	15.2 12.7
MD B 11	11.4 8.9		
			
art. no.	dim. [mm]	art. no.	dim. [mm]
	A		A B
MD C 13	1.3	MD C 22	2.2 0.89
material:	polyamide 6 (nylon)		
temperature range:	-30 °C ... +110 °C		
class of flammability:	UL 94 V-2		

Mounting parts for heatsinks

art. no.  IS 1	 for SK 01, 02, 03, 11, 14, 21, 30, 34, 36, 39, 46, 69; heatsink length: 50 mm	
art. no.  IS 2	 for SK 01, 02, 03, 11, 14, 21, 30, 34, 36, 39, 46, 69; heatsink length: 37,5 75 100 mm	
art. no.  IS 3	 for SK 01, 02, 03, 11, 14, 21, 30, 34, 36, 39, 46, 69	
art. no.  IS 4	 for SK 06	
art. no.  IS 5	 for SK 20	
art. no.  IS 6	 for SK 67	
material:	polyamide 6, GF reinforced	
class of flammability:	UL 94 V-0	

E 47

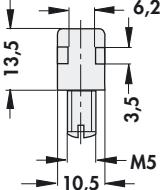
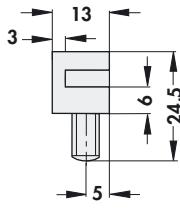
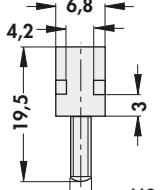
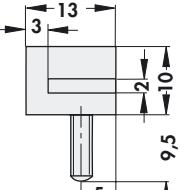
Heatsink profile-overview
Profiles for PCB mounting
Heatsinks for PCB
Insulating distance sleeves

→ **A 13 – 17**
→ **A 89 – 111**
→ **A 89 – 92**
→ **E 30 – 32**

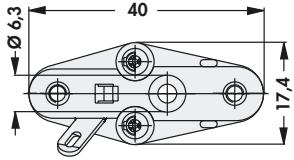
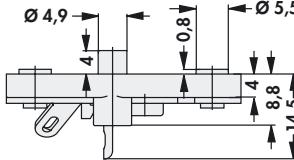
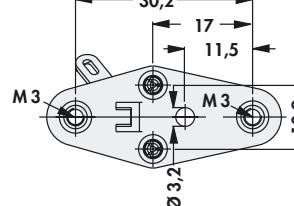
Insulating clamping parts
Mounting pads for transistors
Mounting pads for single components
Technical introduction

→ **E 43**
→ **E 45**
→ **E 46**
→ **A 2 – 7**

Mounting parts for heatsinks

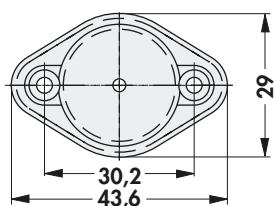
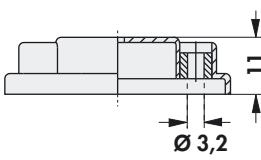
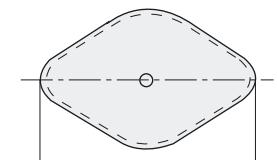
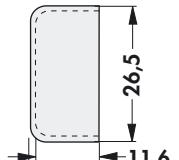
art. no.					
IS 7	for SK 70				
art. no.					
IS 8	for SK 20				
material:	polyamide 6, GF reinforced				
class of flammability:	UL 94 V-0				

Sockets for power transistors TO 3

			
art. no.	no. of contacts		
TF 3 2	3		
insulator:	PCT, glassfibre filled		
contact:	beryllium copper; 4 ... 6 μm Sn		
current rating:	15 A max.		
contact resistance:	<10 m Ω		
temperature range:	-65 °C ... +290 °C		
insulation resistance:	>10 ¹⁰ Ω/cm		
capacity:	1 pF		
test voltage:	1650 V		
class of flammability:	UL 94 V-0		

Insulating caps

– different transistor flange levels will be by the sleeves

art. no.			
IK 341 3			
art. no.			
IK 3			
material:	polyamide, GF reinforced		
pressed-in sleeves:	brass, nickel-plated		
class of flammability:	UL 94 V-0		

A

B

C

D

E

F

G

H

I

K

L

M

N

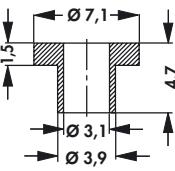
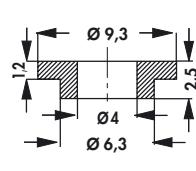
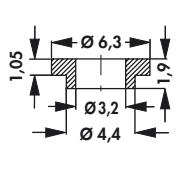
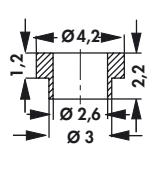
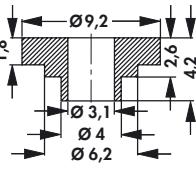
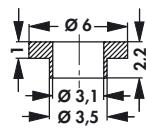
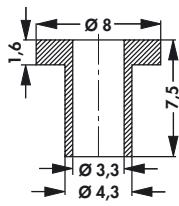
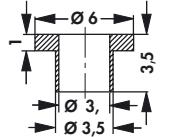
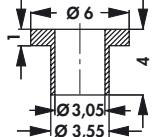
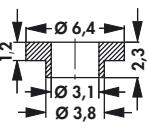
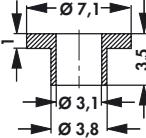
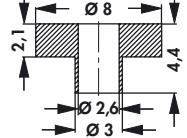
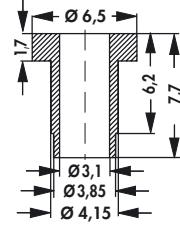
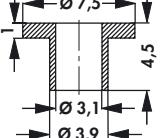
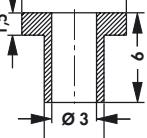
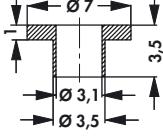
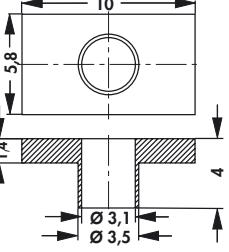
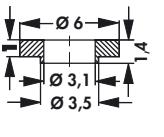
E 49

Mica wafers
 Thermal conductive material
 Mounting for TO 3 angle
 Die-cast heatsinks

→ E 17 Aluminium oxide wafers
 → E 2 – 5 Thermal conductive paste
 → A 123 Thermal conductive glue
 → A 123 – 126 Technical introduction

→ E 15 – 16
 → E 19 – 20
 → E 21 – 22
 → A 2 – 7

Insulating bush

				
art. no. IB 1 / IBT 1	art. no. IB 2 / IBT 2	art. no. IB 3 / IBT 3	art. no. IB 4 / IBT 4	art. no. IB 5
				
art. no. IB 6 / IBT 6	art. no. IB 7 / IBT 7	art. no. IB 8 / IBT 8	art. no. IB 9 / IBT 9	art. no. IB 10 / IBT 10
				
art. no. IB 11 / IBT 11	art. no. IB 12 / IBT 12	art. no. IB 13	art. no. IB 14 / IBT 14	art. no. IB 15 / IBT 15
				
art. no. IB 16	art. no. IB 17	art. no. IB 18 / IBT 18		

	IB 1 - IB 7 / 18	IBT 1 - IBT 15 / 18	IB 8 - IB 17
material	polyamide 4.6, GF reinforced	PTFE (teflon)	thermoplastic resin
form stability	-40 °C ... +250°C (1,8 MPa)	-260 °C ... +250 °C	-40 °C ... +200 °C
dielectric strength	>30 kV/mm	>40 kV/mm	>38 kV/mm
class of flammability		UL 94 V-0	

Mica wafers

Thermal conductive material

Mounting for TO 3 angle

Die-cast heatsinks

→ E 17

→ E 2 - 5

→ A 123

→ A 123 - 126

Aluminium oxide wafers

Thermal conductive paste

Thermal conductive glue

Technical introduction

→ E 15 - 16

→ E 19 - 20

→ E 21 - 22

→ A 2 - 7



OBERFLÄCHEN-
VEREDELUNG
GMBH

High quality surface treatment
for electronic components

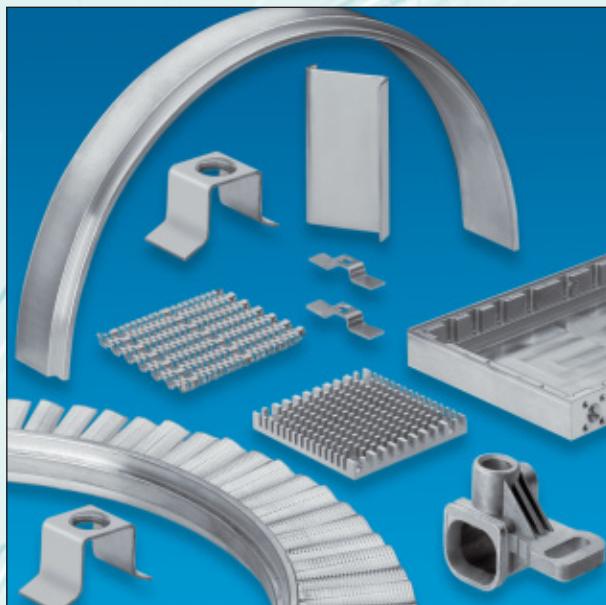
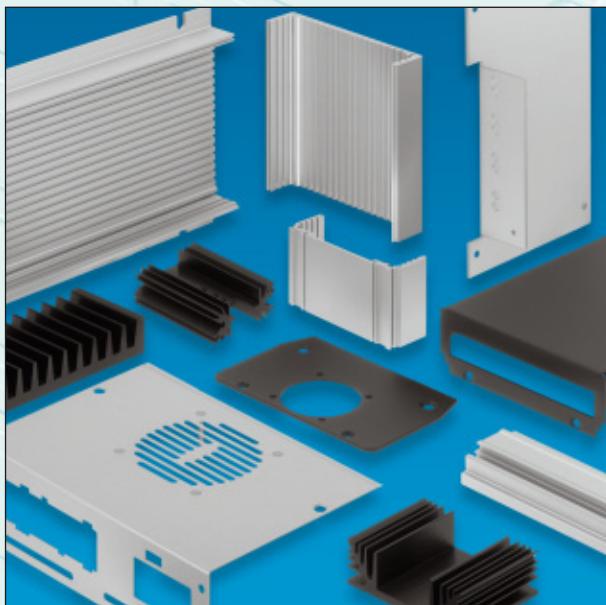


Gold-plating

properties: high resistance to wear, good corrosion resistance, temperature stability and solderability
process: drum technology
materials: non-ferrous metals
coating system: copper/nickel/gold

Tin-plating

properties: solderable layers with improved tarnishing and corrosion resistance
process: drum technology
materials: non-ferrous metals
coating system: copper/nickel/tin



Anodising

performance: fabrication of corrosion resistant, decorative oxide films
process: anodic oxidation in fully automated equipment
materials: aluminium and aluminium alloys
max. component size: 1500 x 2000 x 450 mm
colour: natural aluminium or black

Degreasing

performance: degreasing of oily or greasy metallic surfaces
process: steam degreasing using chlorinated hydrocarbons in hermetically sealed equipment
material: aluminium and aluminium alloys
min. component size: 30 x 30 x 30 mm
max. component size: 600 x 400 x 380 mm
max. component weight: 80 kg



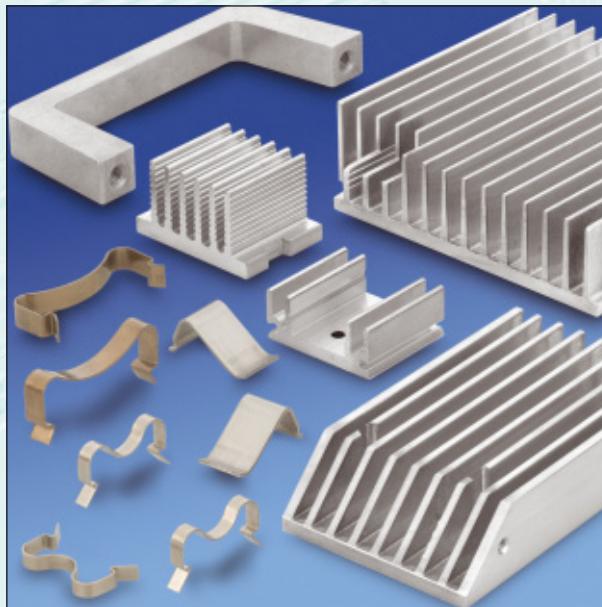
OBERFLÄCHEN-
VEREDELUNG
GMBH

High quality surface treatment
for electronic components



Transparent passivating (surface free from chromium VI)

characteristics: environmental compatibility due to chrome free passivation of the aluminium surfaces
process: fabrication of conversion coatings by immersion process
materials: aluminium und aluminium alloys
max. component size: 1500 x 2000 x 450 mm
colour: natural aluminium or black



Vibratory grinding (tumbling in a barrel)

characteristics: deburring, removing of sharp edges, rough and fine grinding
process: treatment using vibration technique and grinding tools (trowalization)
materials: metallic, aluminium favoured
max. component size: 230 x 200 mm



Anodisation facility

- economization of water by using spray-rinsing, automated ion exchange installation, cascade water guided system and recirculation of splash water
- reduction of electrical energy by means of current density regulation
- reduction of chemicals by recirculation of the dragged-off chemicals using a compensation of the evaporation losses
- recycling of the sulphuric acid out of the anodizing bathes

Certificate

Standard ISO 9001:2008

Certificate Registr. No. 01 100 052055

TÜV Rheinland Cert GmbH certifies:

Certificate Holder:



Fischer Oberflächenveredelung GmbH
Nottebohmstraße 25
D - 58511 Lüdenscheid

Scope:

surfaces for electronics: goldplating, tinplating, nickelplating, anodizing, passivating, deburring.

An audit was performed. Report No. 052055. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 06-12 (dd.mm).

Validity:

The certificate is valid from 2011-12-15 until 2014-12-14.
First certification 2005

2011-11-09

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51108 Köln



www.tuv.com

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Precisely Right.

How to find us



Fischer Elektronik GmbH und Co. KG

Nottebohmstraße 28

D - 58511 Lüdenscheid

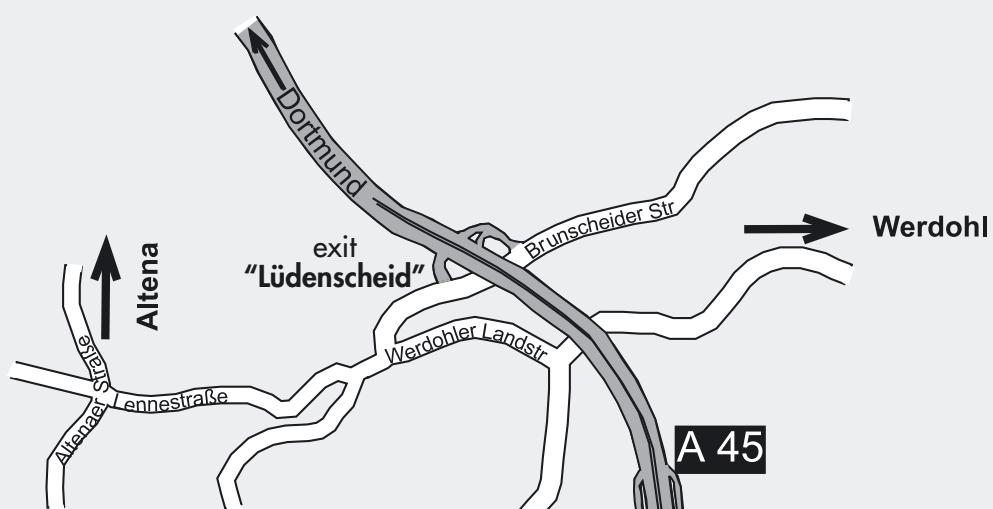
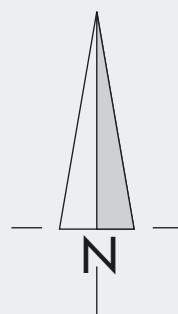
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