Standard Rectifier

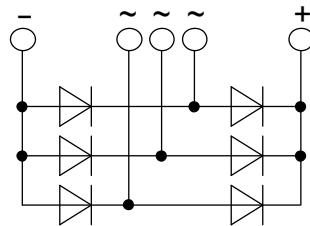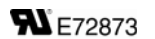| 3~ Rectifier		
V_{RRM} =	1200 V	
I_{DAV} =	40 A	
I_{FSM} =	370 A	

3~ Rectifier Bridge

Part number

GUO40-12NO1
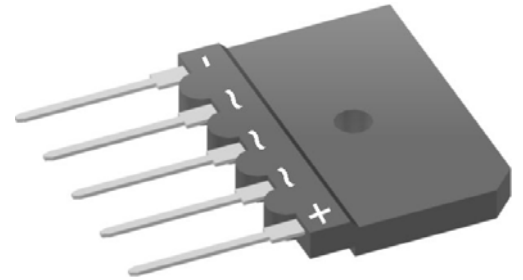
Backside: isolated

E72873

Features / Advantages:
● Low forward voltage drop
● Planar passivated chips
● Easy to mount with one screw
● Space and weight savings

Applications:
● Supplies for DC power equipment
● Input rectifiers for PWM inverter
● Battery DC power supplies
● Field supply for DC motors

Package: GUFP
● Isolation Voltage: 2500 V~
● Industry standard outline
● RoHS compliant
● Epoxy meets UL 94V-0
● Soldering pins for PCB mounting
● Base plate: Plastic overmolded tab
● Reduced weight

Data according to IEC 60747and per semiconductor unless otherwise specified   20131108c

Rectifier

Ratings

Symbol	Definition	Conditions			min.	typ.	max.	Unit
V_{RSM}	max. non-repetitive reverse blocking voltage		$T_{VJ} = 25°C$				1300	V
V_{RRM}	max. repetitive reverse blocking voltage		$T_{VJ} = 25°C$				1200	V
I_R	reverse current	$V_R = 1200$ V	$T_{VJ} = 25°C$				40	μA
		$V_R = 1200$ V	$T_{VJ} = 150°C$				1.5	mA
V_F	forward voltage drop	$I_F = 10$ A	$T_{VJ} = 25°C$				1.06	V
		$I_F = 30$ A					1.28	V
		$I_F = 10$ A	$T_{VJ} = 150 °C$				0.92	V
		$I_F = 30$ A					1.23	V
I_{DAV}	bridge output current	$T_C = 90°C$	$T_{VJ} = 175°C$				40	A
		rectangular d = ⅓						
V_{F0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 175°C$				0.74	V
r_F	slope resistance						16.3	mΩ
R_{thJC}	thermal resistance junction to case						4.3	K/W
R_{thCH}	thermal resistance case to heatsink					0.50		K/W
P_{tot}	total power dissipation	$T_C = 25°C$					35	W
I_{FSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45°C$				370	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V				400	A
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150°C$				315	A
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V				340	A
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45°C$				685	A²s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V				665	A²s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150°C$				495	A²s
		t = 8,3 ms; (60 Hz), sine	$V_R = 0$ V				480	A²s
C_J	junction capacitance	$V_R = 400$ V; f = 1 MHz	$T_{VJ} = 25°C$			10		pF

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Package GUFP | Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal				70	A
T_{VJ}	virtual junction temperature			-40		175	°C
T_{op}	operation temperature			-40		150	°C
T_{stg}	storage temperature			-40		150	°C
Weight					8.5		g
M_D	mounting torque				0.8	1.2	Nm
F_C	mounting force with clip				20	120	N
$d_{Spp/App}$	creepage distance on surface | striking distance through air	terminal to terminal	6.7	5.4			mm
$d_{Spb/Apb}$		terminal to backside	10.0	8.0			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq$ 1 mA	2500			V
		t = 1 minute		2080			V
R_{thJA}	thermal resistance junction to ambient				50		K/W
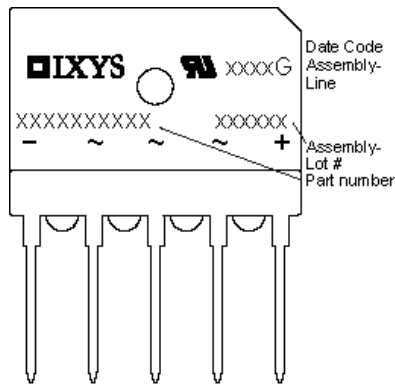
Ordering	Part Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	GUO40-12NO1	GUO40-12NO1	Tube	14	514892

Similar Part	Package	Voltage class
DNA40U2200GU	GUFP	2200
DMA40U1800GU	GUFP	1800
GUO40-16NO1	GUFP	1600
GUO40-08NO1	GUFP	800

Equivalent Circuits for Simulation   *on die level* T_{VJ} = 175 °C
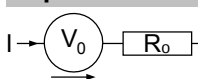
Rectifier

$V_{0\ max}$	threshold voltage	0.74	V
$R_{0\ max}$	slope resistance *	13.7	mΩ

Outlines   GUFP
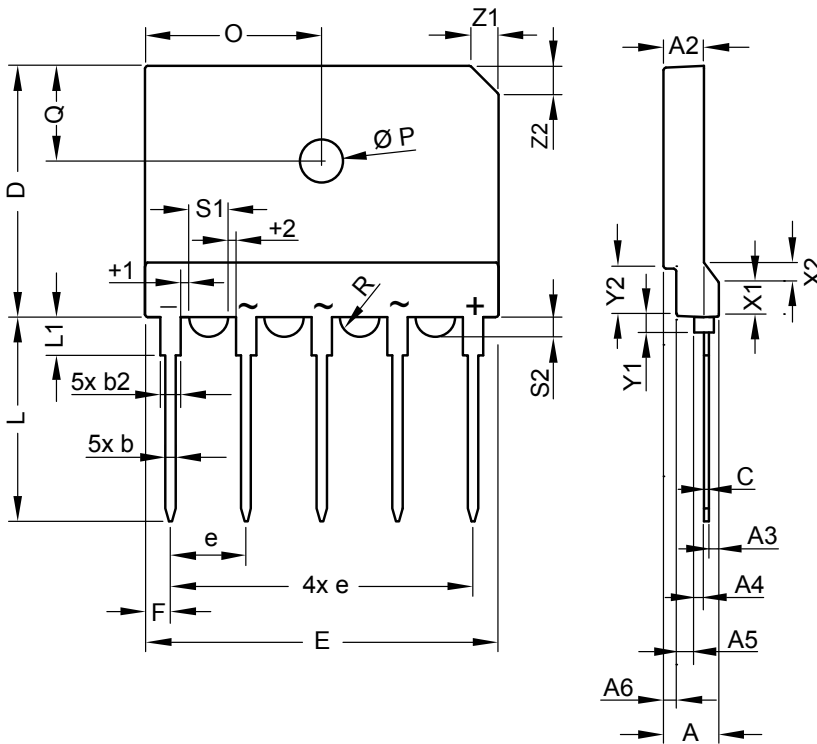
Dim.	Millimeter			Inches		
	min	typ.	max	min	typ.	max
A	5.40	5.50	5.60	0.213	0.217	0.221
A2	3.90	4.00	4.10	0.154	0.158	0.162
A3	0.95	1.00	1.10	0.037	0.039	0.043
A4	0.95	1.00	1.05	0.037	0.039	0.041
A5	1.60	1.70	1.80	0.063	0.067	0.071
A6	1.25	1.30	1.35	0.049	0.051	0.053
b	0.95	1.00	1.05	0.037	0.039	0.041
b2	1.95	2.00	2.05	0.077	0.079	0.081
C	0.45	0.50	0.55	0.018	0.020	0.022
D	24.80	25.00	25.20	0.977	0.985	0.993
E	34.70	35.00	35.30	1.367	1.379	1.391
e	BSC 7.50			BSC 0.296		
F	2.40	2.50	2.60	0.095	0.099	0.102
L	20.30	20.40	20.50	0.800	0.804	0.808
L1	3.70	3.75	3.80	0.146	0.148	0.150
O	17.40	17.50	17.60	0.686	0.690	0.693
Ø P	4.10	4.20	4.30	0.162	0.165	0.169
Q	9.20	9.30	9.40	0.362	0.366	0.370
Ø/₂R		1.77			0.070	
s1	3.45	3.50	3.55	0.136	0.138	0.140
s2	1.45	1.50	1.55	0.057	0.059	0.061
t1	0.95	1.00	1.05	0.037	0.039	0.041
t2	0.95	1.00	1.05	0.037	0.039	0.041
x1	3.20	3.30	3.40	0.126	0.130	0.134
x2	1.90	2.00	2.10	0.075	0.079	0.083
y1	1.60	1.65	1.70	0.063	0.065	0.067
y2	4.65	4.70	4.75	0.183	0.185	0.187
z1	2.80	2.90	3.00	0.110	0.114	0.118

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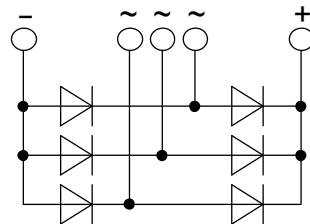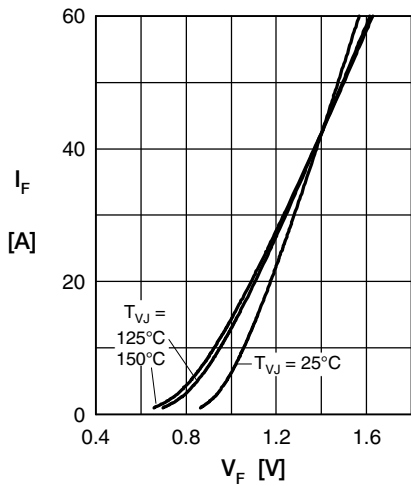
Rectifier

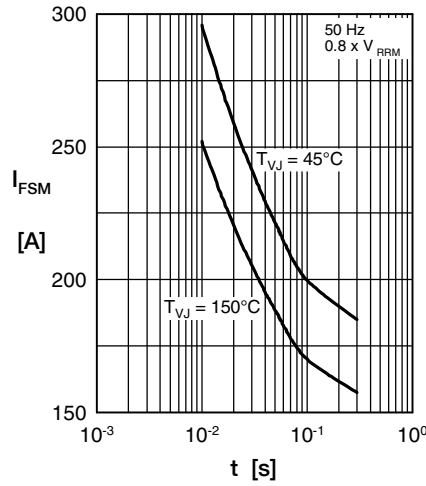Fig. 1 Forward current vs. voltage drop per diode

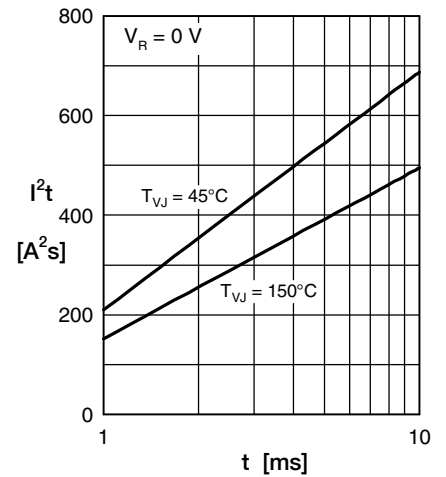Fig. 2 Surge overload current vs. time per diode
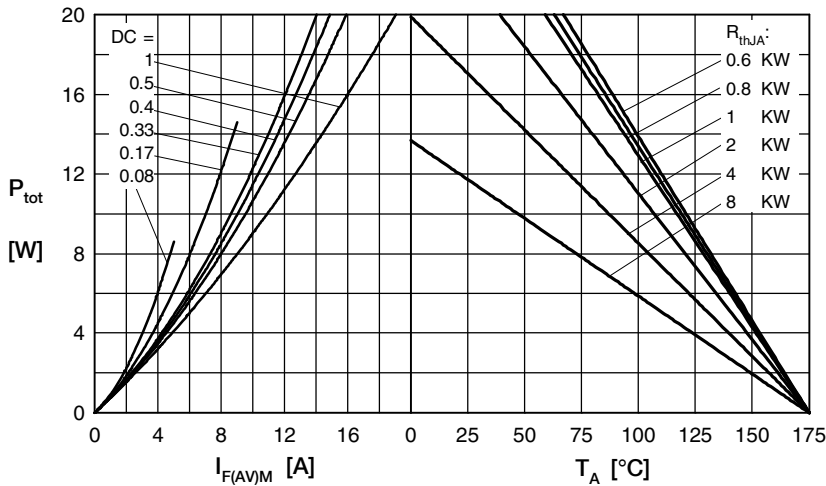

Fig. 3 I^2t vs. time per diode

Fig. 4 Power dissipation vs. forward current and ambient temperature per diode
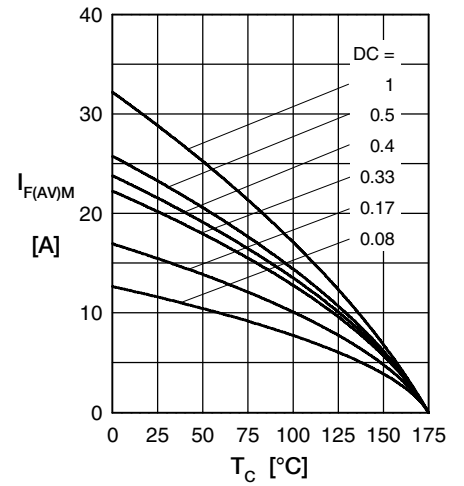

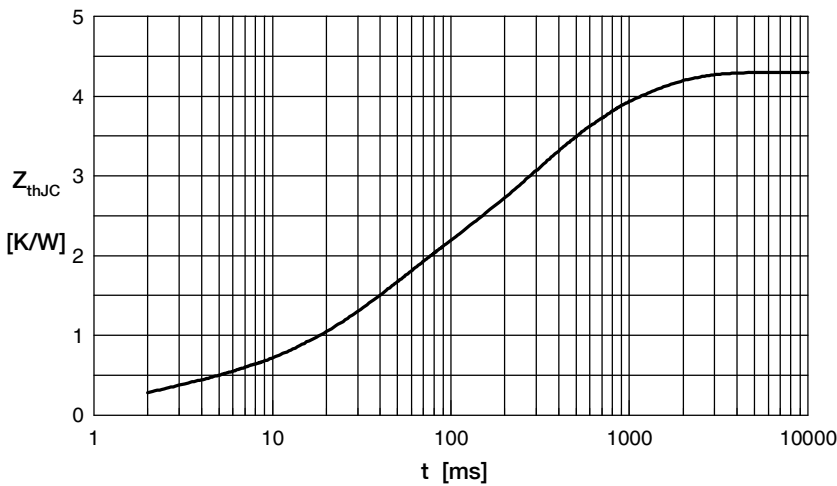Fig. 5 Max. forward current vs. case temperature per diode

Fig. 6 Transient thermal impedance junction to case vs. time per diode

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t_i (s)
1	0.302	0.002
2	1.252	0.032
3	1.582	0.227
4	1.164	0.820

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