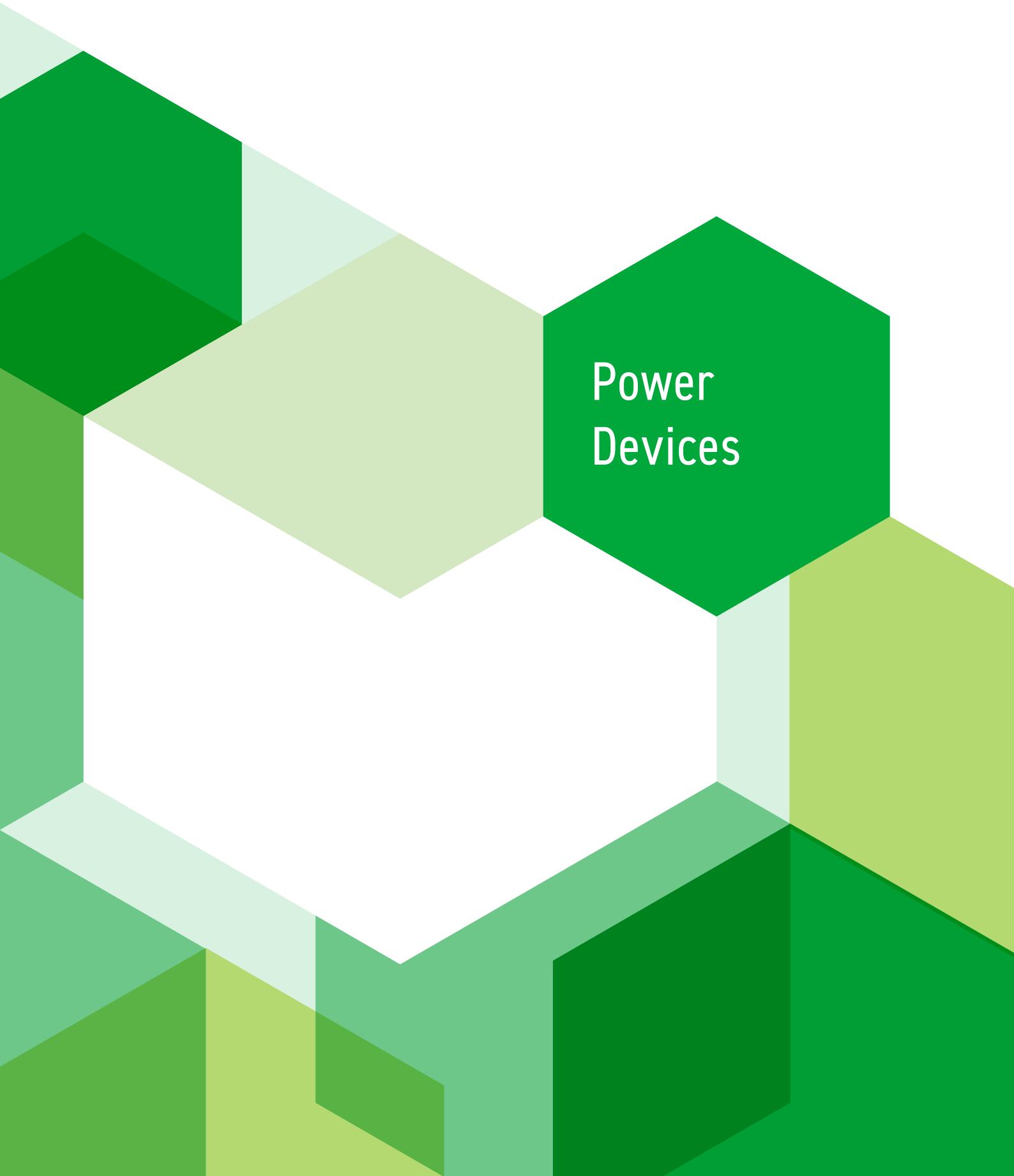




Changes for the Better

for a greener tomorrow The ECO Changes logo consists of the word "ECO" in a green circle above the word "Changes" in a smaller green circle, with a small green leaf icon integrated into the design.

POWER DEVICES

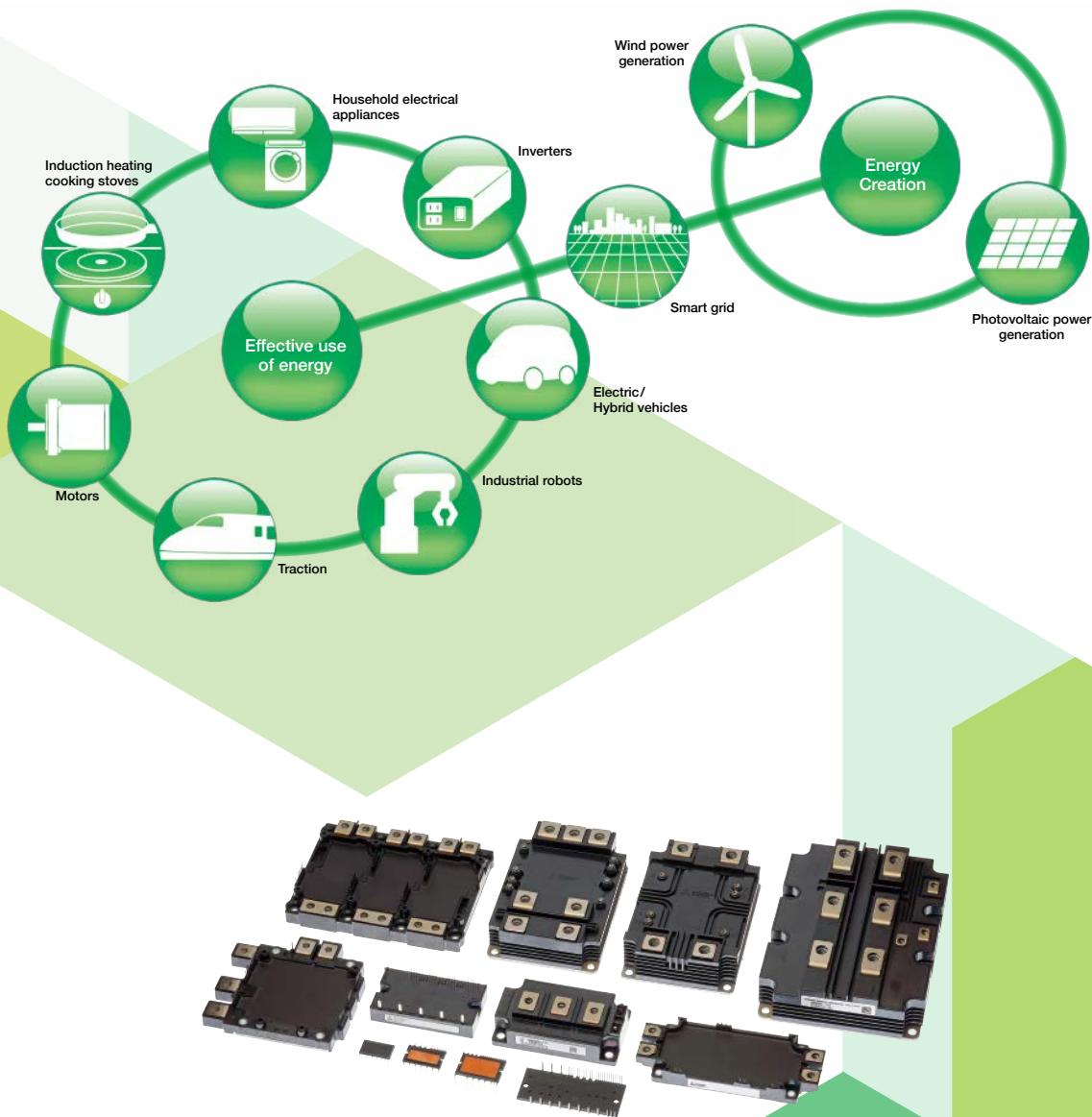


The background features a large, abstract geometric shape composed of several overlapping and nested hexagons in various shades of green (dark green, medium green, light green, and pale green). This shape is centered and partially overlaps the text area. It has a three-dimensional effect with visible edges and shadows.

Power
Devices

Innovative Power Devices for a Sustainable Future

Mitsubishi Electric power modules are at the forefront of the latest energy innovations that seek to solve global environmental issues while creating a more affluent and comfortable society for all. Some of these innovations are photovoltaic (PV) and wind power generation from renewable energy sources, smart grids realizing efficient supply of power, hybrid/electric vehicles (HVs/EVs) that take the next step in reducing carbon emissions and fuel consumption, and home appliances that achieve ground-breaking energy savings. Whether in appliances, railcars, EVs or industrial systems, our power modules are key elements in changing the way energy is used.



Index

Product	Page	Connection					Rated voltage	Rated current	Main Application
		IGBT Module	Intelligent Power Module	MOSFET Module	Diode Module	Discrete Diode			
SiC Power Modules	5-11	✓ (Hybrid)	✓	✓			600V	15A-30A	 Home Appliance Industrial equipment Traction
							1200V	75A-1200A	
							1700V	300A,1200A	
							3300V	375A,750A	
SiC-SBD	12					✓	600V	20A	 Home Appliance Industrial equipment xEV
							1200V	10A,20A	
SOPIPM	13		✓				600V	2A	 Home Appliance
DIPIPIM	13-18		✓				600V	5A-75A	 Home Appliance
							1200V	5A-100A	
IPM	19-23		✓				600V	50A-800A	 Industrial equipment
							650V	50A-450A	
							1200V	25A-450A	
IGBT Modules	24-34	✓					600V	75A-600A	 Industrial equipment
							650V	50A-600A	
							1200V	35A-1400A	
							1700V	75A-1200A	
MOSFET Modules	35			✓			75V	100A-300A	 Industrial equipment
							100V		
							150V		
HVIGBT Modules	36-40	✓					1700V	600A-3600A	 Traction High Power
							2500V	400A-1200A	
							3300V	400A-1800A	
							4500V	350A-1500A	
							6500V	200A-1000A	
HVDIODE Modules	41-42				✓		1700V	800A-1800A	 Traction High Power
							3300V	400A-1500A	
							4500V	350A-1500A	
							6500V	200A-1000A	
Power Modules for xEV*1	43-44	✓					650V	300A-1000A	 xEV
							1200V	300A,600A	

*1 EV: Electric Vehicle

*2 SOPIPM,DIPIPIM,SLIMDIP,DIPIPIM+,DIPPFC,CSTBT are trademarks of Mitsubishi Electric

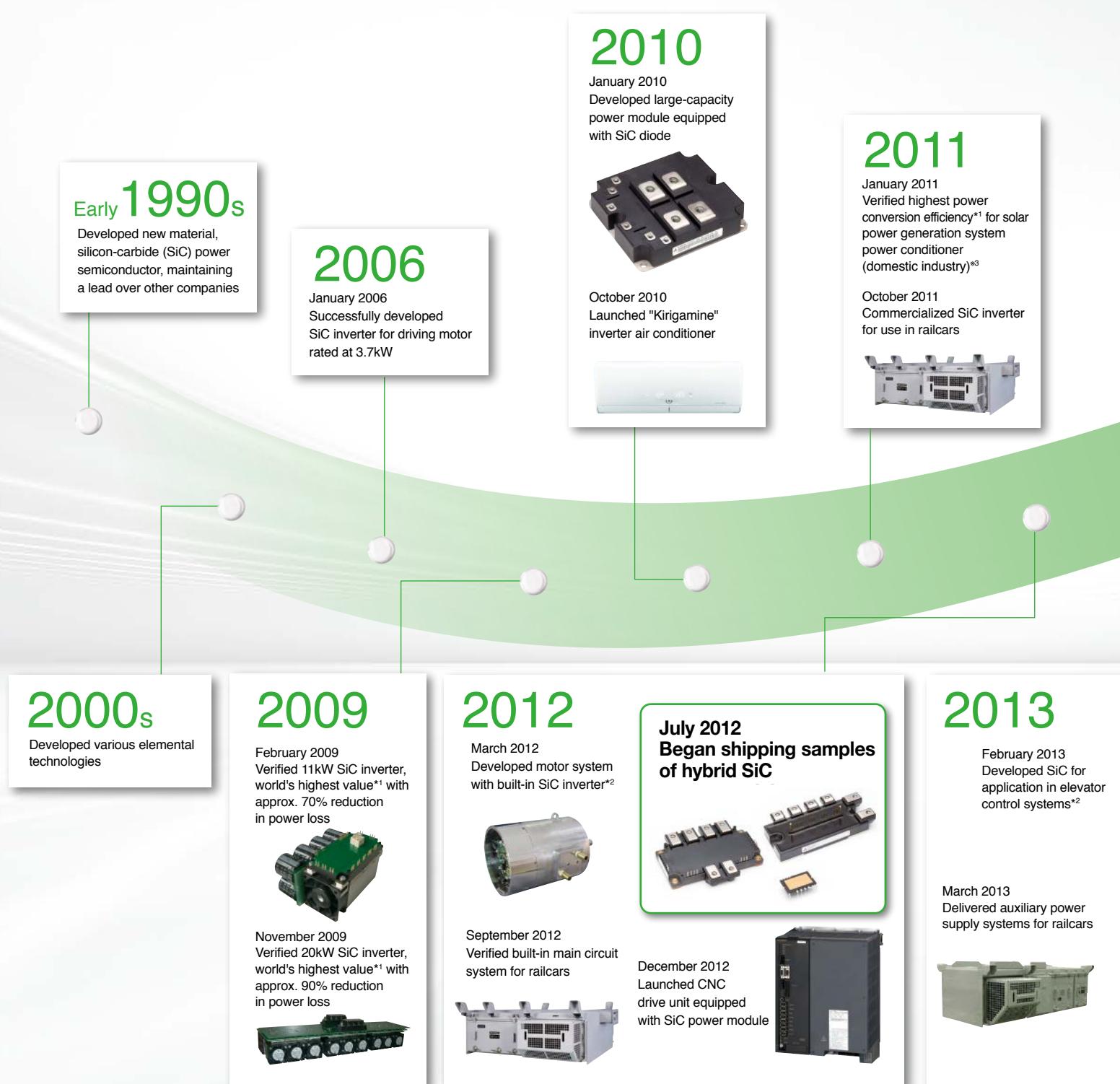
Development of Mitsubishi Electric SiC Power Devices and Power Electronics Equipment Incorporating Them

Mitsubishi Electric began developing SiC as a new material in the early 1990s. Pursuing special characteristics, we succeeded in developing various elemental technologies.

In 2010, we commercialized the first air conditioner in the world equipped with a SiC power device.

Furthermore, substantial energy-saving effects have been achieved for traction and FA machinery.

We will continue to provide competitive SiC power modules with advanced development and achievements from now on.



Development of these modules and applications has been partially supported by Japan's Ministry of Economy, Trade and Industry (METI) and New Energy and Industrial Technology Development Organization (NEDO).

* The year and month listed are based on press releases or information released during the product launch month in Japan.

Contributing to the realization of a low-carbon society and more affluent lifestyles

2014

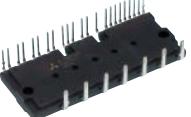
February 2014
Developed EV motor
drive system with
built-in SiC inverter^{*2}



May 2014
Began shipping
samples of hybrid
SiC power modules
for high-frequency
switching applications



November 2014
Launched
Large Hybrid SiC
DIPIPM™ for
PV Applications



2018

January 2018
New 6.5kV Full-SiC Power
Semiconductor Module
Achieves World's Highest
Power Density

December 2018
Mitsubishi Electric and
the University of Tokyo
Reveal New Mechanism
for Enhancing Reliability
of SiC Power
Semiconductor Devices

January 2018



2019

June 2019
Began shipping
samples of
1200V
SiC-SBD



February 2019
Develops Super Compact Power
Unit for Hybrid Electric Vehicle

September 2019
Trench-type SiC-MOSFET with
unique electric-field-limiting
structure developed

2017

March 2017
Launched SiC-SBD



March 2017
Develops World's
smallest SiC Inverter
for HEVs.



September 2017
Develops SiC Power Device with
Record Power Efficiency

December 2017
Mitsubishi Electric and the University of
Tokyo Quantify Factors for Reducing
SiC Power Semiconductor Resistance
by Two-Thirds

2015

January 2015
Launched power conditioner
for PV equipped
with full SiC-IPM^{*3}

June 2015
Railcar traction system with
full SiC power modules installed
in Shinkansen bullet trains



2016

April 2016
Launched Super mini
Full SiC DIPIPM™



October 2016
Launched package
air conditioners with
full SiC DIPIPM™ in Japan



May 2016
Launched room
air conditioners with
full SiC DIPIPM™ in Japan



May 2013
Launched SiC power
modules



December 2013
Launched railcar traction inverter
with full SiC power module



*1 Researched in press releases by Mitsubishi Electric.

*2 Currently under development, as of April 2019.

*3 Mitsubishi Electric solar-power generation system discontinued on March 31, 2020.

SiC Power Modules

Data sheet
here



Lineup of SiC Power Modules

Application	Product name	Model	Rating		Connection	States	Page
			Voltages[V]	Current[A]			
Industrial equipment	SiC-MOSFET Built-in Hybrid SiC Power Modules	FMH600STX-24B	1200	600	3Level T-type	Under development	5
		FMH600FX-24B			Vienna rectifier		
	Full SiC Power Modules	FMF300BXZ-24B		300	4in1		6
		FMF400BX-24B		400	4in1		
		FMF400BXZ-24B		400	4in1		
		FMF600DXZ-24B		600	2in1		
		FMF800DX-24B		800	2in1		
		FMF800DXZ-24B		800	2in1		
		FMF1200DXZ-24B		1200	2in1		
		FMF300DXZ-34B		300	2in1		
		FMF300E3XZ-34B		300	2in1(Chopper)		
	Full SiC-IPM	PMF75CGA120		1200	75	6in1	
		PMF75CGAL120					
Hybrid SiC Power Modules for High-frequency Switching Applications	Hybrid SiC Power Modules for High-frequency Switching Applications	CMH100DY-24NHF	1200	100	2in1	Commercially available	7
		CMH150DY-24NHF		150			
		CMH200DU-24NHF		200			
		CMH300DU-24NHF		300			
		CMH300DX-24NHF		300			
		CMH400DU-24NHF		400			
		CMH600DU-24NHF		600			
		CMH400HC6-24NFM		400	1in1		
		FMF375DC-66A		375	2in1	Under development	8
		FMF750DC-66A		750			
Traction	Hybrid SiC Power Modules	CMH1200DC-34S	1700	1200	2in1	Under development	8
		PSF15S92F6	600	15			
Home appliances	Super mini Full SiC DIPPIPM	PSF25S92F6		25	6in1	Commercially available	9
		PSH30L92C6-W	600	30Arms	Three-phase interleaved		
	Super mini Hybrid SiC DIPPFC	PSH20L91A6-A		20Arms	Two-phase interleaved		
		PSF20L91A6-A					



1200V/600A SiC-MOSFET Built-in Hybrid SiC Power Modules for Industrial Equipment Under development

Contributes to improvement of power loss and downsizing of equipment by optimized to IGBT and Diode configuration

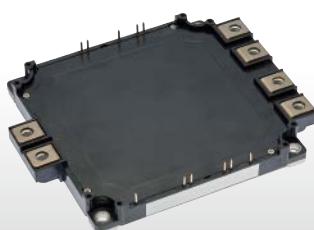
Features

- SiC-MOSFET built-in hybrid power module
- Contributes to improvement of power loss and downsizing of equipment by optimized to IGBT and Diode for 3Level T type and Vienna rectifier
- Reduction surge voltage by Low-inductance package

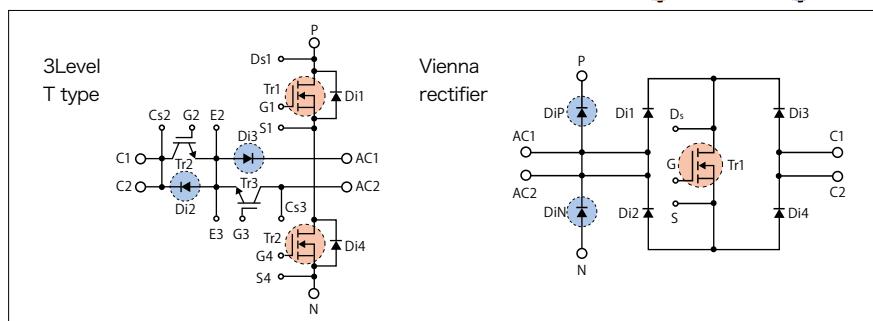
Product lineup

Model	Rated voltage	Rated current	Circuit configuration	Package size (D x W)
FMH600STX-24B**	1200V	600A	3Level T-type	152mmx121.7mm
FMH600FX-24B**			Vienna rectifier	

★★Under Development



Internal circuit diagram





Full-SiC Power Modules for Industrial Equipment

Under development

Contributes to reducing size/weight of industrial-use inverters

■ Features

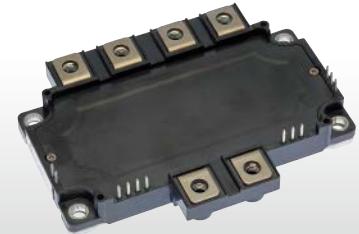
- Power loss reduced approx. 70% compared to the conventional product*
- Low-inductance package adopted to deliver full SiC performance
- Contributes to increasing the output current and downsizing peripheral components by low power loss characteristics of SiC

*Comparison with the same rated value of the conventional 7th Gen. IGBT modules

■ Product lineup

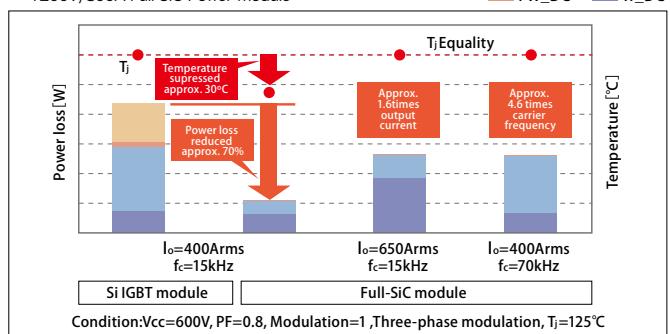
Model	Rated voltage	Rated current	Circuit configuration	Package size (D x W)
FMF400BX-24B**	1200V	400A	4 in 1	92.3mm x121.7mm
FMF800DX-24B**		800A	2 in 1	

★★:Under development



■ Power loss comparison

1200V/800A Full SiC Power module



Full-SiC Power Modules for Industrial Equipment (built-in short-circuit protection function)

Under development

Contributes to enhancing the performance of industrial-use inverters thanks to built-in protection function for short circuit

■ Features

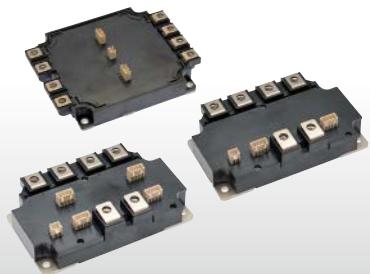
- By using short circuit monitoring circuit in the module it is possible to transfer a short circuit detection signal to the system side
- Power loss reduced approx. 70% compared to the conventional product*
- Low- inductance package adopted to deliver full SiC performance

*Comparison with the same rated value of the conventional 7th Gen. IGBT modules

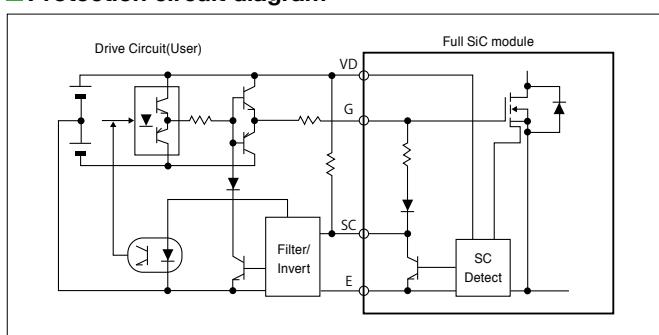
■ Product lineup

Model	Rated voltage	Rated current	Circuit configuration	Package size (D x W)
FMF300BXZ-24B**	1200V	300A	4 in 1	79.6mmx122mm
FMF400BXZ-24B**		400A	4 in 1	
FMF600DXZ-24B**		600A	2 in 1	
FMF800DXZ-24B**		800A	2 in 1	
FMF1200DXZ-24B**		1200A	2 in 1	
FMF300DXZ-34B**	1700V	300A	2 in 1	79.6mmx122mm
FMF300E3XZ-34B**		300A	2 in 1(Chopper)	

★★:Under development

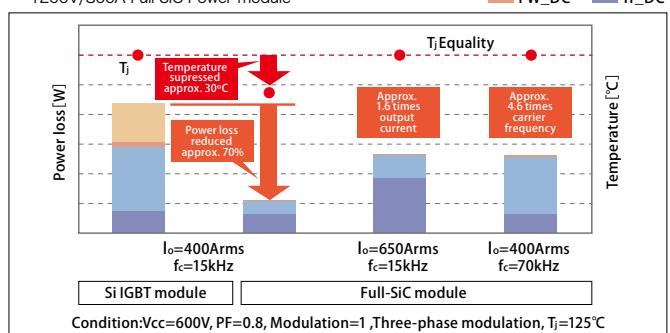


■ Protection circuit diagram



■ Power loss comparison

1200V/800A Full SiC Power module



SiC Power Modules



1200V/75A Full SiC-IPM for Industrial Equipment PMF75CGA120/PMF75CGAL120 Under development

SiC chips(MOSFET and Schottky Barrier Diode) incorporated in an IPM with a built-in drive circuit and protection functions Power loss reduction of approx.70% contributes to improving the performance of industrial equipment

Features

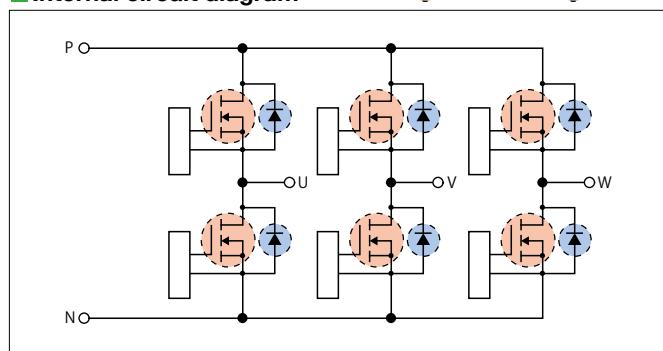
- Realized high performance and low power loss by 2nd. generation SiC-MOSFET and SiC-SBD with current sense and temperature sense
- External size is reduced approx.30% with the conventional Silicon IPM products* of the same rating.
- Available to drive it by the equivalent I/F and power supply circuit with the Silicon IPM products.



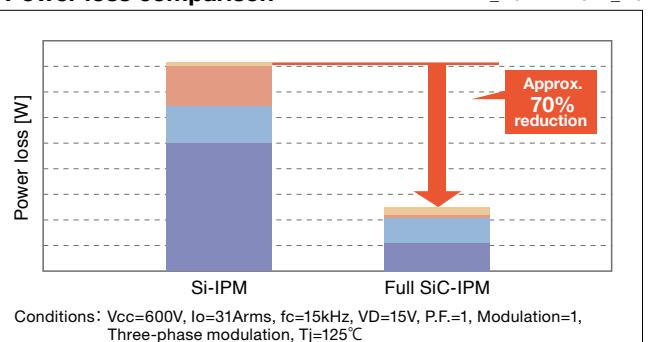
* Conventional product: Mitsubishi Electric G1 Series PM75CG1B120

Internal circuit diagram

:SiC-MOSFET :SiC-SBD



Power loss comparison



Hybrid SiC Power Modules for High-frequency Switching Applications Commercially available

For optimal operation of power electronics devices that conduct high-frequency switching

Features

- Power loss reduction of approx. 40% contributes to higher efficiency, smaller size and weight reduction of total system
- Suppresses surge voltage by reducing internal inductance
- Package compatible with the conventional product*

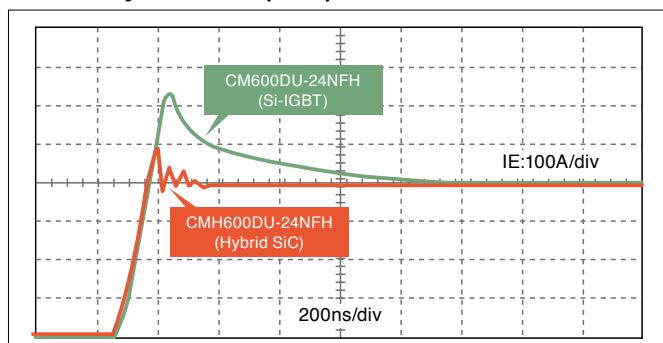
* Conventional product: Mitsubishi Electric NFH Series IGBT Modules

Product lineup

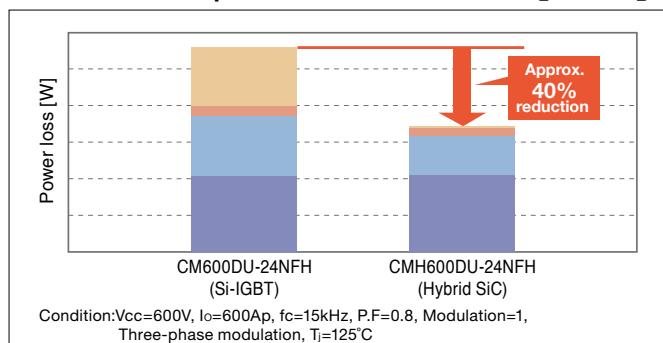
Applications	Model	Rated voltage	Rated current	Circuit configuration	External size (D x W)
Industrial equipment	CMH100DY-24NFH	1200V	100A	2 in 1	48×94mm
	CMH150DY-24NFH		150A		48×94mm
	CMH200DU-24NFH		200A		62×108mm
	CMH300DU-24NFH		300A		62×108mm
	CMH300DX-24NFH		300A		62.5×152mm
	CMH400DU-24NFH		400A		80×110mm
	CMH600DU-24NFH		600A		80×110mm
	CMH400HC-24NFM		400A	1 in 1	62×108mm



Recovery waveform (FWD)



Power loss comparison





3300V Full SiC Power Modules for Traction Inverters and HVDC system FMF375DC-66A Under development /FMF750DC-66A Commercially available

Contributes to energy saving and downsizing
for inverters in traction motors, DC-power transmitters,
large industrial machinery

Features

- Suitable chip set combination for high speed switching
- Reducesd power loss compared to the conventional products*
- Low inductance pakcage maximize SiC perfomance

* Si product: Mitsubishi Electric HVIGBT, CM600DC-66X

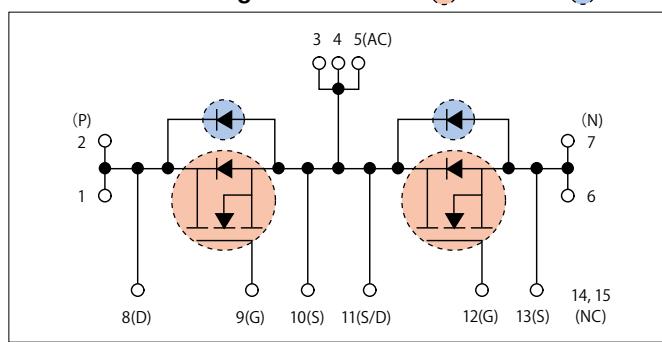
Product lineup

	Model	Rated Voltage	Rated Current	Circuit configuration	External size (D x W)
Full SiC	FMF375DC-66A**	3300V	375A	2 in 1	100 × 140 mm
	FMF750DC-66A		750A		

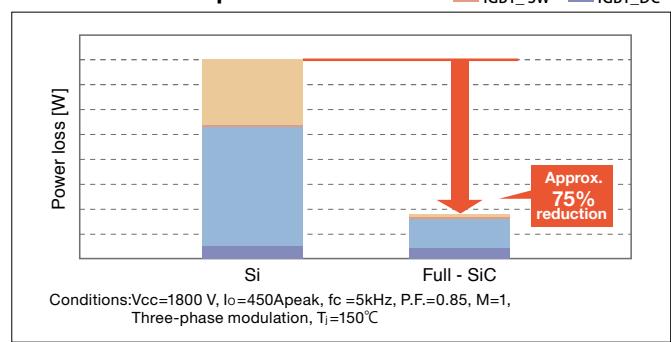
** Under Development



Internal circuit diagram



Power loss comparison



1700V/1200A Hybrid SiC Power Modules for Traction Inverters CMH1200DC-34S Commercially available

High-power/low-loss/highly reliable modules appropriate for use in traction inverters

Features

- Power loss reduced approximately 30% compared to the conventional product*
- Highly reliable design appropriate for use in traction
- Package compatible with the conventional product*

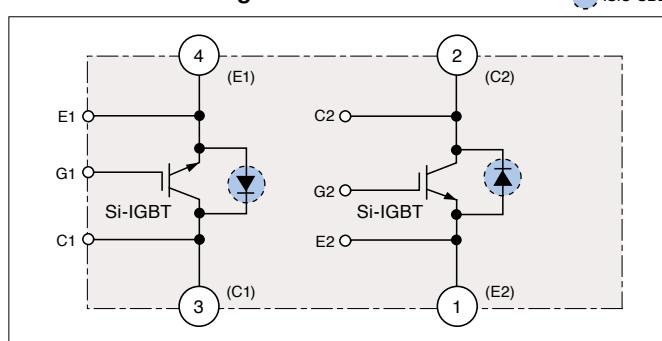
* Conventional product: Mitsubishi Electric Power Module CM1200DC-34N

Main specifications

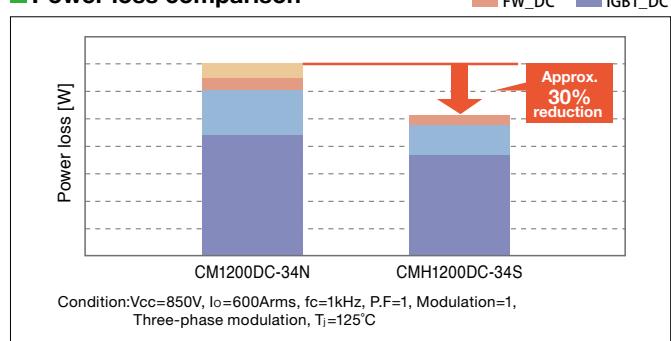
Module	Max.operating temperature	150°C
	Isolation voltage	4000Vrms
Si-IGBT @150°C	Collector-emitter saturation voltage	2.3V
	Switching loss 850V/1200V	turn-on 140mJ turn-off 390mJ
SiC-SBD @150°C	Emitter-collector voltage	2.3V
	Capacitive charge	9.0μC



Internal circuit diagram



Power loss comparison



SiC Power Modules



15A/25A Super mini Full SiC DIPIPMTM

for Home Appliances

PSF15S92F6-A/PSF25S92F6-A

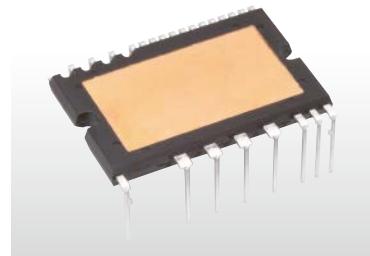
Commercially available

Contributes to extremely high power-efficiency in air conditioners,
and easily applicable to industrial equipment

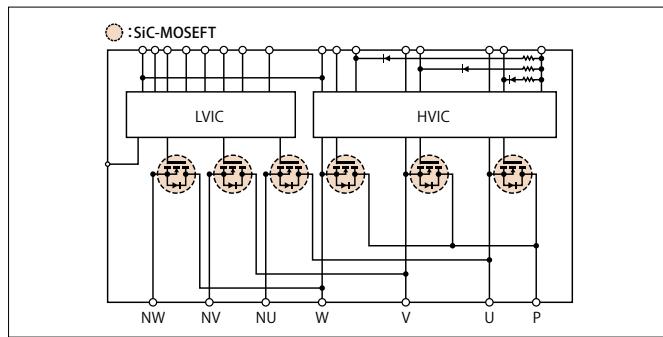
Features

- SiC-MOSFET achieves reduction in ON resistance, power loss reduced approx. 70% compared to conventional product*
- Construct low-noise system by reducing recovery current
- Numerous built-in functions: Bootstrap diode for power supply to drive P-side, temperature information output, etc.
- Unnecessary minus-bias gate drive circuit using original high V_{th} SiC-MOSFET technology
- As package and pin layout compatibility with conventional products* is ensured, simply replace with this product to improve performance

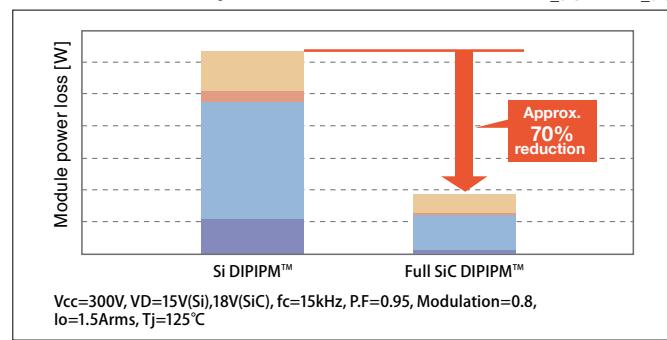
*Conventional product: Mitsubishi Electric Super mini DIPIPMTM Series



Internal block diagram



Power loss comparison



Super mini Hybrid / Full SiC DIPPFC™ for Home Appliances

PSH20L91A6-A / PSF20L91A6-A/

PSH30L92C6-W

Commercially available

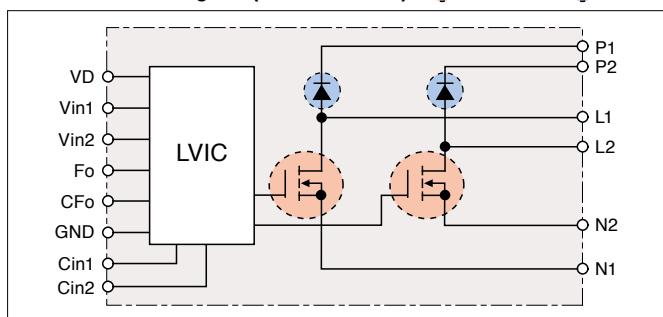
Utilizing SiC enables high-frequency switching and contributes to
reducing the size of peripheral components

Features

- Incorporating SiC chip in the Super mini package widely used in home appliances
- The SiC chip allows high-frequency switching (up to 40kHz) and contributes to downsizing the reactor, heat sink and other peripheral components
- Adopts the same package as the Super mini DIPIPMTM to eliminate the need for a spacer between the inverter and heat sink, and to facilitate its implementation

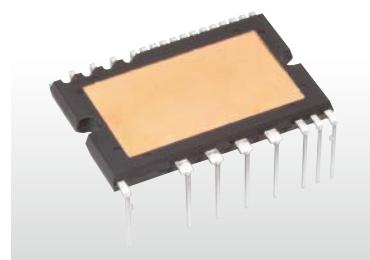
Internal block diagram (PSF20L91A6-A)

:SiC-MOSFET :SiC-SBD

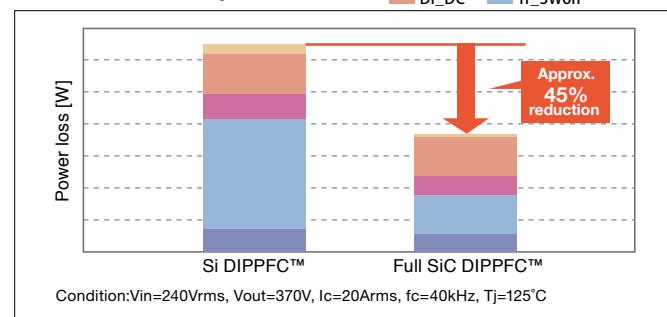


Product lineup

Model	Circuit configuration	Chips
PSH20L91A6-A	2phase Interleaved	Hybrid SiC
PSF20L91A6-A		Full SiC
PSH30L92C6-W	3phase Interleaved	Hybrid SiC

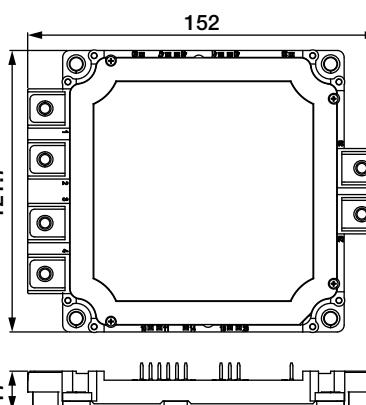
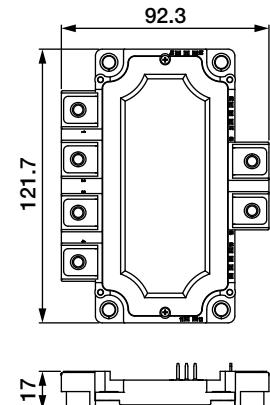
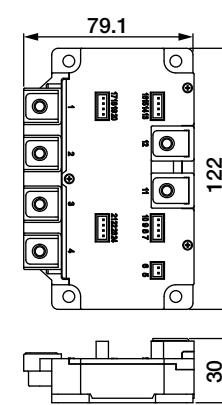
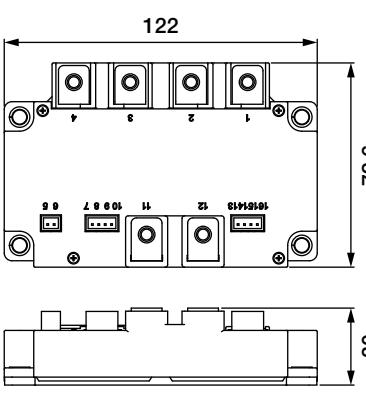
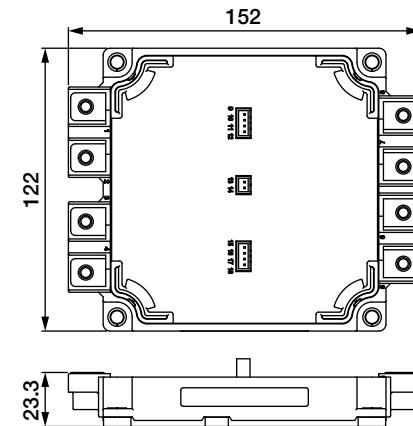
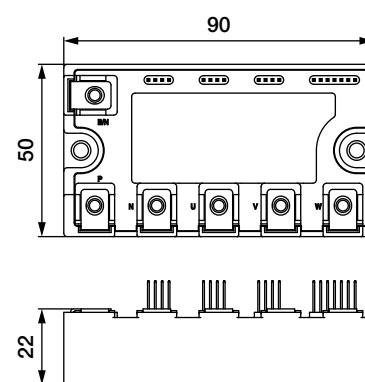
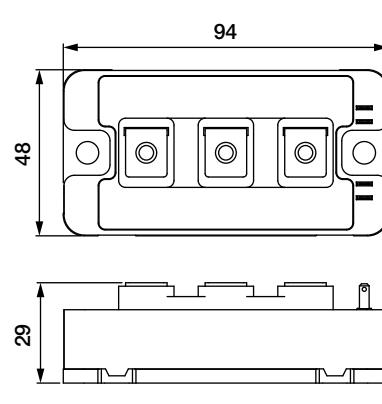
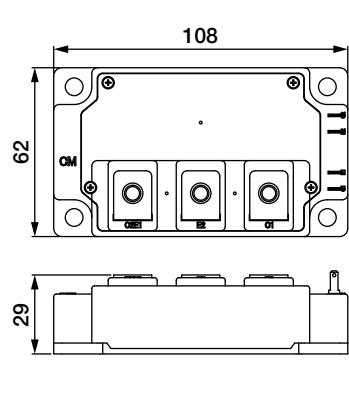
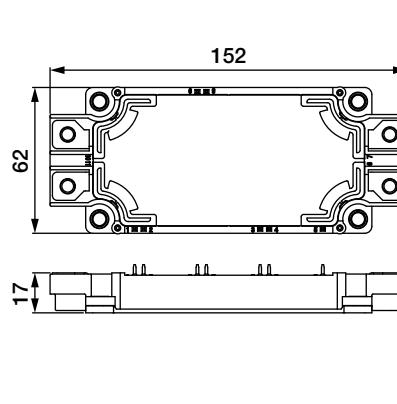


Power loss comparison



Outline Drawing of SiC Power Modules

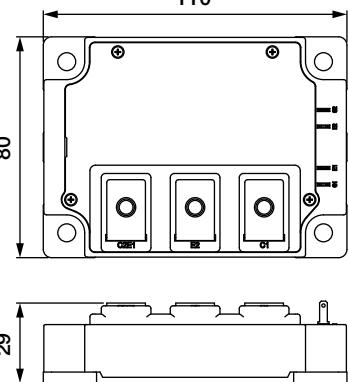
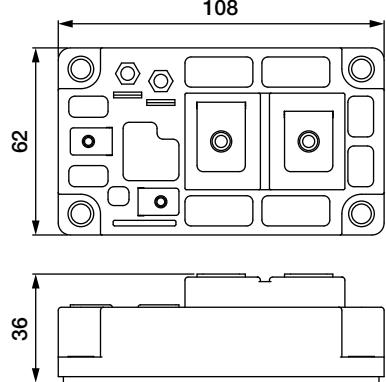
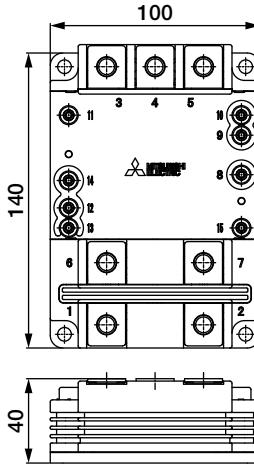
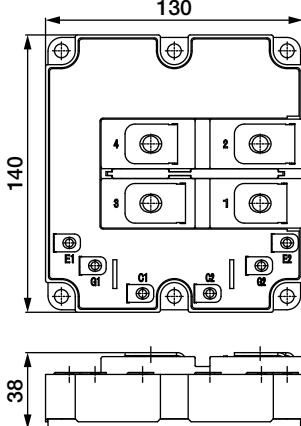
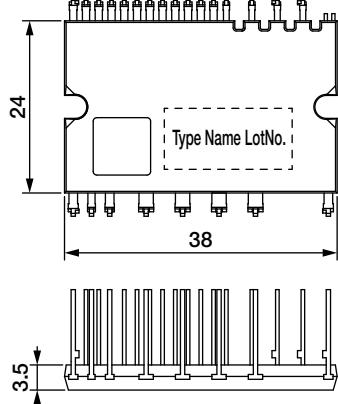
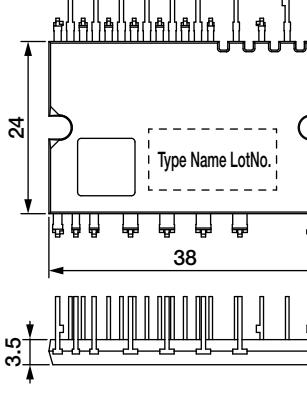
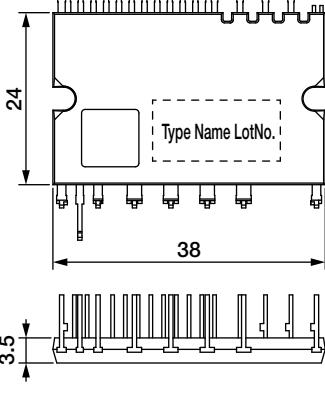
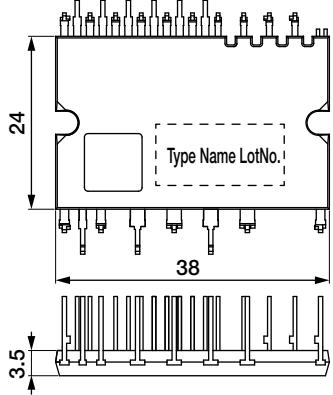
Unit:mm

<p>SiC-MOSFET Built-in Hybrid SiC Power Modules for Industrial Equipment FMH600STX-24B FMH600FX-24B</p> 	<p>Full SiC Power Modules for Industrial Equipment FMF400BX-24B, FMF800DX-24B</p> 	<p>Full SiC Power Modules for Industrial Equipment FMF300BXZ-24B FMF400BXZ-24B</p> 
<p>Full SiC Power Modules for Industrial Equipment FMF600DXZ-24B/FMF800DXZ-24B FMF300DXZ-34B/FMF300E3XZ-34B</p> 	<p>Full SiC Power Modules for Industrial Equipment FMF1200DXZ-24B</p> 	<p>Full SiC IPM for Industrial Equipment PMF75CGA120 PMF75CGAL120</p> 
<p>Hybrid SiC Power Modules for High-frequency Switching Applications CMH100DY-24NFH CMH150DY-24NFH</p> 	<p>Hybrid SiC Power Modules for High-frequency Switching Applications CMH200DU-24NFH CMH300DU-24NFH</p> 	<p>Hybrid SiC Power Modules for High-frequency Switching Applications CMH300DX-24NFH</p> 

SiC Power Modules

Outline Drawing of SiC Power Modules

Unit:mm

<p>Hybrid SiC Power Modules for High-frequency Switching Applications CMH400DU-24NFM CMH600DU-24NFM</p> 	<p>Hybrid SiC Power Modules for High-frequency Switching Applications CMH400HC6-24NFM</p> 	<p>3300V Full SiC Power Modules for Traction Inverters and HVDC system FMF375DC-66A/FMF750DC-66A</p> 
<p>1700V/1200A Hybrid SiC Power Module for Traction Inverters CMH1200DC-34S</p> 	<p>Super mini Full SiC DIPPM™ PSF15S92F6-A / PSF25S92F6-A Super mini Hybrid / Full SiC DIPPFC™ PSH20L91A6-A/PSF20L91A6-A Long</p> 	<p>Super mini Full SiC DIPPM™ PSF15S92F6-C/PSF25S92F6-C Control side of Zigzag</p> 
<p>Super mini Full SiC DIPPM™ PSF15S92F6/PSF25S92F6 Short</p> 	<p>Super mini Hybrid SiC DIPPFC™ PSH30L92C6-W Both side of Zigzag</p> 	



SiC-SBD(Schottky Barrier Diode) for power supply systems 600V series 1200V series

Sample available

Contribute to reducing power loss and the size of power supply systems

■ Features

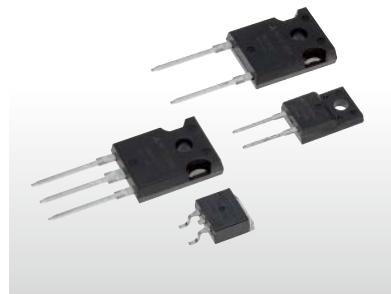
- Power loss is reduced by approx. 21%¹ compared to the conventional silicon (Si) products, contributing to energy conversion.
- The SiC-SBD allows high frequency switching and contributes to downsizing the reactor, heat sink and other peripheral components
- JBS² structure allows high forward surge capability and contributes to improving reliability

¹ Conventional Si (Silicon) product: Si diode which is equipped with Mitsubishi Electric DIPPFC™

² Junction Barrier Schottky

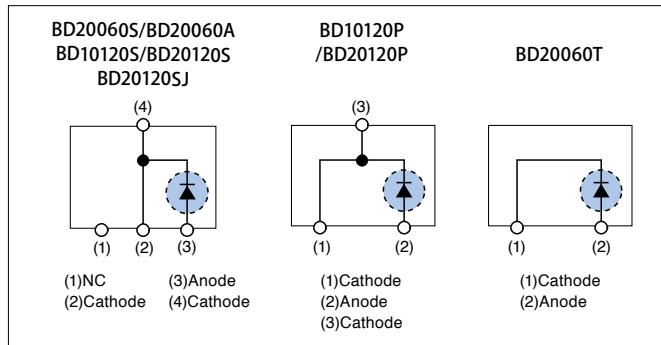
■ Product lineup

Application	Model	Rated Voltage	Rated Current	Package
Home appliance	BD20060T	600V	20A	TO-220FP-2
	BD20060S**			TO-247-3
	BD20060A**			TO-263-2
Industrial equipment	BD10120S**	10A	TO-247-3	
	BD10120P**		TO-247-2	
	BD20120S**	1200V	TO-247-3	
	BD20120P**	20A	TO-247-2	
Model	BD20120SJ**		TO-247-3	



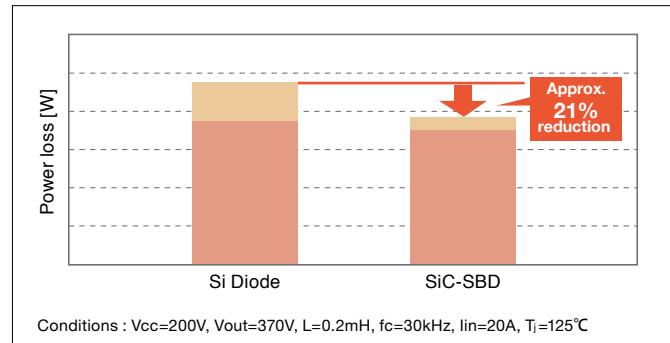
★★Under development

■ Inner circuit

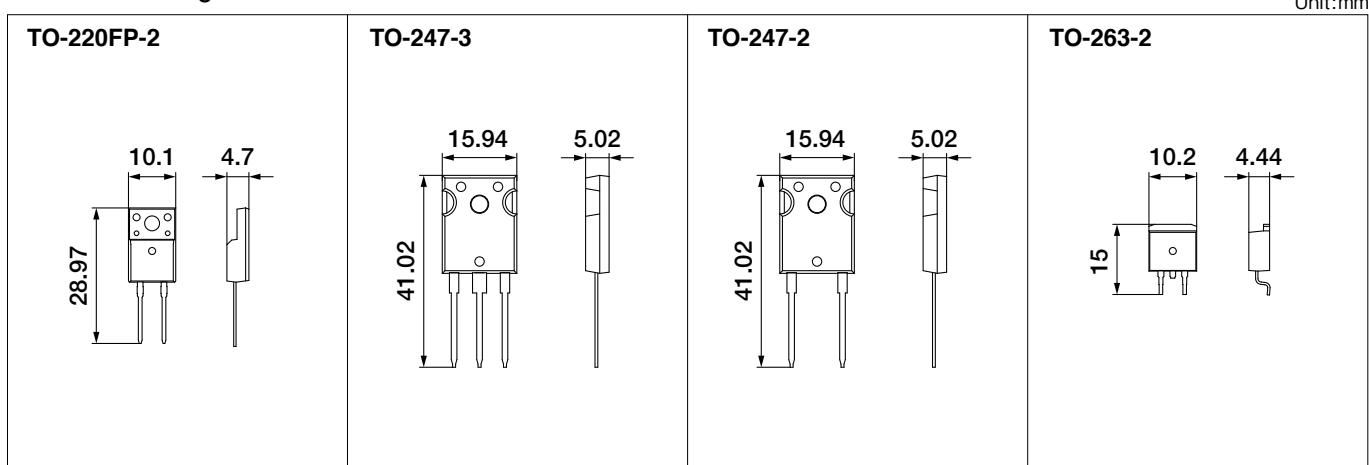


: SiC-SBD

■ Power loss comparison



■ Outline Drawing of SiC-SBD



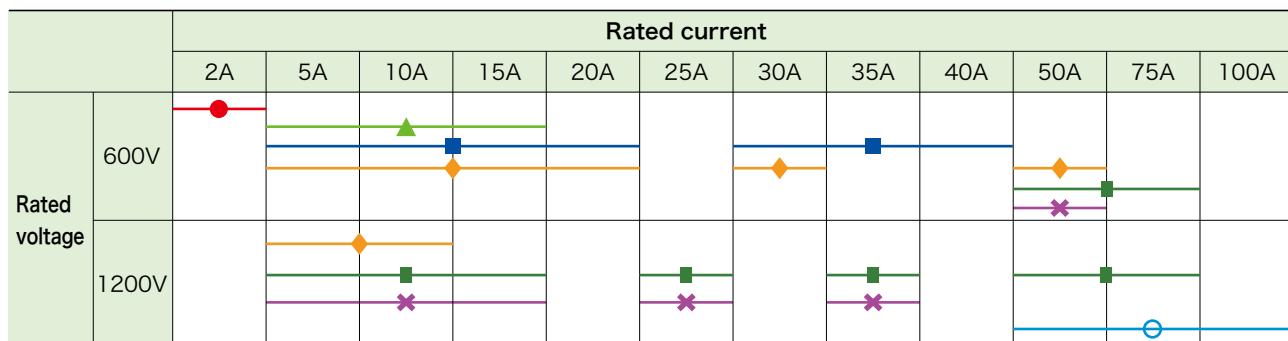
Package, Main Application

Package	Main application
SOPIPM	Fan motor
SLIMDIP	Air conditioner/Fan motor/Washing machine/Refrigerator
Super mini	Air conditioner/Washing machine/Servo/Robot
Mini	Air conditioner/Motion control
Large	Commercial air conditioner/Motion control
DIPIPM+	Commercial air conditioner/Motion control
Large DIPIPM+	Commercial air conditioner/Motion control

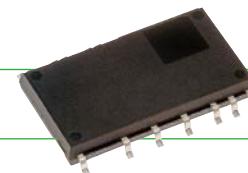
Data sheet
here



Rated Lineup



New Products



Surface mount package IPM SOPIPM™

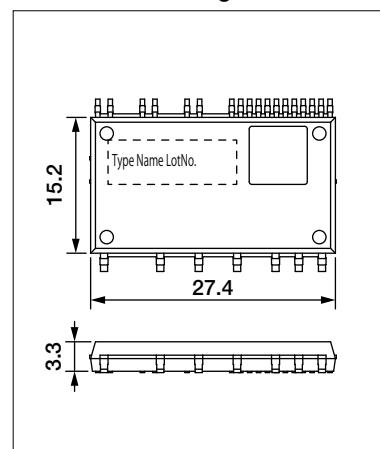
A small Surface mount package IPM has been newly developed for fan and low-power motor drive applications

<Main Features>

- Optimal pin layout realizes easier PCB wiring design and enables smaller PCB size
- Insulation distance between pins ensured, realizing easier board mounting without coating process
- Newly integrated interlock function in addition to conventional protection features for robust operation
- Installing RC-IGBT¹ simultaneously realizes compact package and low loss performance can go together
- Bootstrap diode is integrated for the P-side drive power supply like conventional DIPIPM™ series, reducing the number of peripheral external parts

*1 Reverse-conducting IGBT

Outline Drawing



■SOPIPM™

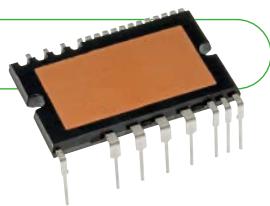
Type name	Rated current	Rated voltage	Chips	Protection	Shape
SP2SK	2A	600V	RC-IGBT, HVIC, LVIC, BSD	UV, SC, OT V _{OT} , IL	Surface mount package

[Term] UV : Power supply Under Voltage protection
SC : Short Circuit protection
OT : Over Temperature protection
V_{OT} : Analog Temperature Output
IL : Inter Lock



New Products

New design with expanded operating temperature range and lower noise contributes to easier system design and reduction in system cost



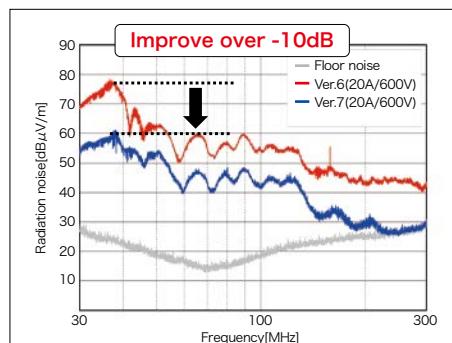
Super Mini DIPIPM™ Ver.7

<Main Features>

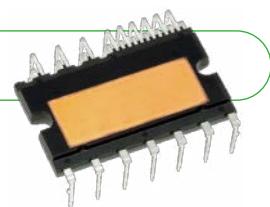
- New low-noise 7th-generation CSTBT^{*1} incorporated, keeping same efficiency as DIPIPM Ver.6 Series. System cost reduction for noise suppression parts achieved.
- Maximum junction temperature range expanded to 175°C, supporting instantaneous overcurrent capability at overload operation
- Wider terminal base shape contributes to improved terminal strength and suppresses increase in temperature
- High compatibility for terminal layout, easy to replace from the conventional series

*1 CSTBT™: Mitsubishi Electric's unique IGBT that makes use of the carrier cumulative effect

■ Radiation noise



Featured Products



Smaller package size realized by integrating newly designed RC-IGBT
Recommended for low-cost inverter and fan controller applications

SLIMDIP™

SLIMDIP-S, SLIMDIP-L, SLIMDIP-W

<Main Features>

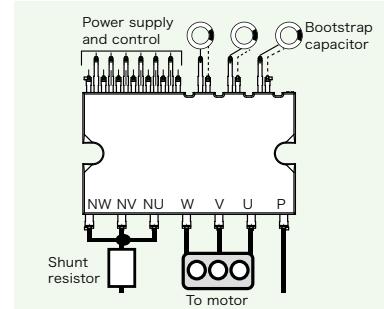
- RC-IGBT^{*1} incorporated, reducing package size 30% compared to Super mini DIPIPM
- Maximum case temperature expanded to 115°C, increasing the operating temperature range and leading to easier system design
- Additional terminals for floating supply and built-in bootstrap diodes simplify PCB wiring pattern
- Both V_{OT}^{*2} and OT^{*3} functions integrated for temperature protection
- New SLIMDIP-W line-up for washing machine, fans etc.

*1 Reverse conducting IGBT *2 V_{OT} : Analog Temperature Output *3 OT : Over Temperature protection

■ Product lineup

Type name	Main application
SLIMDIP-S	Fan, refrigerator
SLIMDIP-L	Air conditioner
SLIMDIP-W	Washing machine, Fan

■ Wiring example

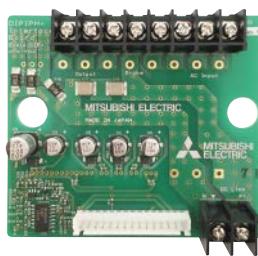


Customer Support

EVA Series evaluation boards for each DIPIPM Series to support system design



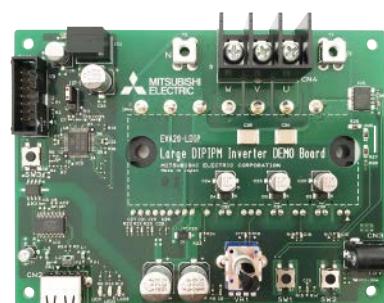
For Super mini DIPIPM
EVA11-SDIP



For DIPIPM+
EVA14-DIP+



For SOPIPIM
EVA18-SOP



For Large DIPIPM Series
(Microcomputer-embedded demonstration board)
EVA20-LDIP

* For further information, please contact sales office.

Lineup of DIPIPM™

■ Series Matrix of 600V DIPIPM™

V _{CES} (V)	600V						
I _C (A)	Series	Super mini		Mini		Large	DIPIPM+
		Ver.7	Ver.6	Ver.7	—	Ver.6	CIB/CI
5	SLIMDIP-S		PSS05S92F6-AG PSS05S92E6-AG		PSS05S51F6		
10	SLIMDIP-L SLIMDIP-W*		PSS10S92F6-AG PSS10S92E6-AG		PSS10S51F6		
15			PSS15S92F6-AG PSS15S92E6-AG		PSS15S51F6		
20		PSS20S93F6-AG* PSS20S93E6-AG*	PSS20S92F6-AG PSS20S92E6-AG	PSS20S73F6*	PSS20S51F6 PSS20S71F6		
30		PSS30S93F6-AG* PSS30S93E6-AG*	PSS30S92F6-AG PSS30S92E6-AG	PSS30S73F6*	PSS30S71F6		
35			PSS35S92F6-AG PSS35S92E6-AG				
40		PSS40S93F6-AG* PSS40S93E6-AG*					
50				PSS50S73F6*	PSS50S71F6	PSS50SA2F6*	PSS50MC1F6 PSS50NC1F6* ⁵
75						PSS75SA2F6*	
Chip	RC-IGBT	CSTBT	CSTBT	CSTBT	CSTBT	CSTBT	CSTBT
UV	P-side/N-side	P-side/N-side	P-side/N-side	P-side/N-side	P-side/N-side	P-side/N-side	P-side/N-side/ Brake part
SC	N-side	N-side	N-side	N-side	N-side	N-side with sense	N-side
OT	N-side	N-side* ¹	N-side* ¹	—	—	—	—
VOT	N-side	N-side* ¹	N-side* ¹	N-side	N-side	N-side	N-side
Active input	High(3/5V)	High(3/5V)	High(3/5V)	High(3/5V)	High(3/5V)	High(3/5V)	High(5V)
Emitter pin of N-side	Open	Open	Open	Open	Open	Open	Open
Fault output	N-side(UV,SC,OT)	N-side (UV,SC,OT)	N-side(UV,SC,OT)	N-side (UV,SC)	N-side (UV,SC)	N-side (UV,SC)	N-side (UV,SC)
Insulation voltage	2000Vrms* ²	1500Vrms* ²	1500Vrms* ²	2500Vrms	2500Vrms	2500Vrms	2500Vrms
Insulation structure	Insulation sheet	Insulation sheet	Insulation sheet	Insulation sheet	Molding resin* ⁴ /Insulation sheet	Insulation sheet	Insulation sheet
RoHS directive* ⁶	Compliant	Compliant	Compliant	Compliant	Compliant* ³	Compliant	Compliant
Pin type* ⁷	Control side of Zigzag (Normal, Short)	Long	Long	Short	Control side of Zigzag, Short	—	—

[Notes] *1 : PSSxxS9xE6 has OT function, PSSxxS9xF6 has V_OT function

*2 : AC60Hz, 1minute. Corresponds to isolation voltage 2500Vrms
in the case the convex-shaped heat sink

*3 : High melting point solder (Lead Over 85%) is used
for chip soldering of PSSxxS51F6 only.

*4 : Molding resin insulation for PSSxxS51F6/-C

*5 : PSS50NC1F6 is not included brake.

*6 : RoHS directive (2011/65/EU and (EU) 2015/863)

*7 : Refer the datasheet of each product for more detail

[Term] CSTBT™: Mitsubishi Electric's unique IGBT that makes use of
the carrier cumulative effect

RC-IGBT: Reverse conducting IGBT

HVIC: High Voltage IC

UV: Power supply Under Voltage protection

OT: Over Temperature protection

SC: Short Circuit protection

Vot: Analog Temperature Output

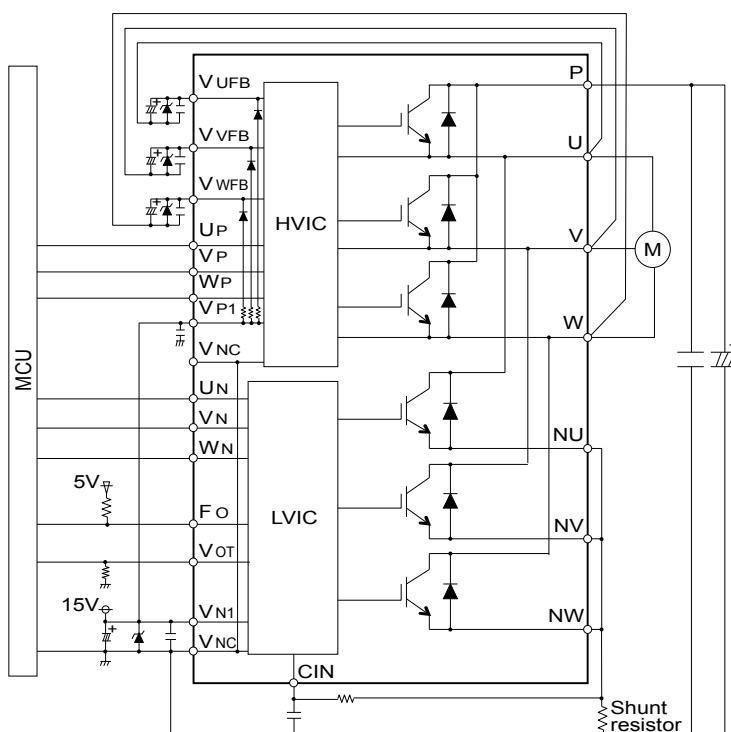
RoHS: Restriction of the use of certain Hazardous Substances
in electrical and electronic equipment

CIB: Converter Inverter Brake,

CI: Converter Inverter

★: New Product

■ Application circuit of super mini DIPIPM™



■ Series Matrix of 1200V DIPIPM™

V _{CES} (V)		1200V		
I _C (A)	Series	Mini	Large	DIPIPM+
		Ver.6	CIB/CI	CI
5	PSS05S72FT	PSS05SA2FT	PSS05MC1FT PSS05NC1FT*1	
10	PSS10S72FT	PSS10SA2FT	PSS10MC1FT PSS10NC1FT*1	
15		PSS15SA2FT	PSS15MC1FT PSS15NC1FT*1	
25		PSS25SA2FT	PSS25MC1FT PSS25NC1FT*1	
35		PSS35SA2FT	PSS35MC1FT PSS35NC1FT*1	
50		PSS50SA2FT		PSS50NE1CT**
75		PSS75SA2FT		PSS75NE1CT**
100				PSS100NE1CT**

Chip	CSTBT	CSTBT	CSTBT	CSTBT
UV	P-side/N-side	P-side/N-side	P-side/N-side/Brake	P-side/N-side
SC	N-side	N-side	N-side	N-side
OT	—	—	—	—
V _{OT}	N-side	N-side	N-side	N-side

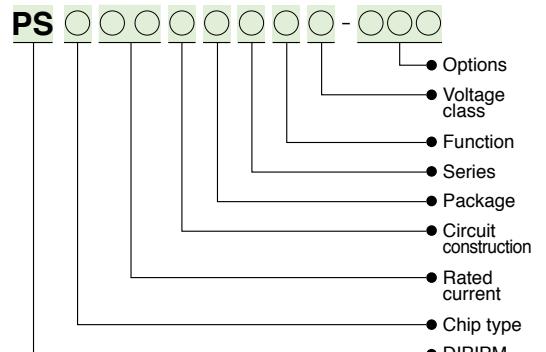
Active input	High(5V)	High(5V)	High(5V)	High(3/5V)
Emitter pin of N-side	Open	Open	Open	Open
Fault output	N-side (UV,SC)	N-side (UV,SC)	N-side (UV,SC)	N-side (UV,SC)
Insulation voltage	2500Vrms	2500Vrms	2500Vrms	2500Vrms
Insulation structure	Insulation sheet	Insulation sheet	Insulation sheet	Insulation sheet
RoHS directive*2	Compliant	Compliant	Compliant	Compliant
Pin type	—	—	—	—

★: New Product ★★: Under development

[Notes] *1: PSS**NC1FT is not included brake

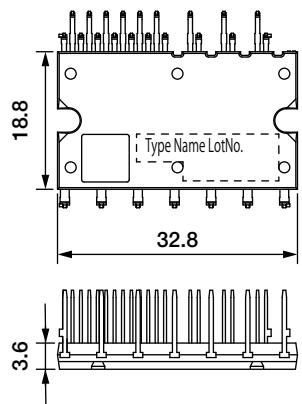
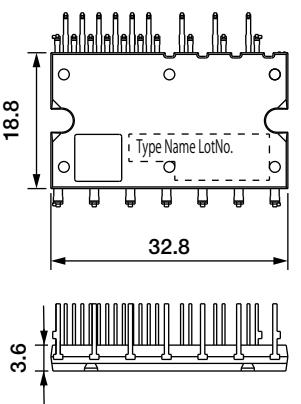
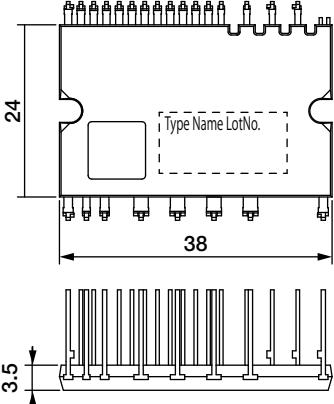
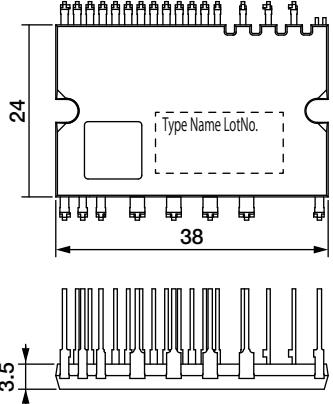
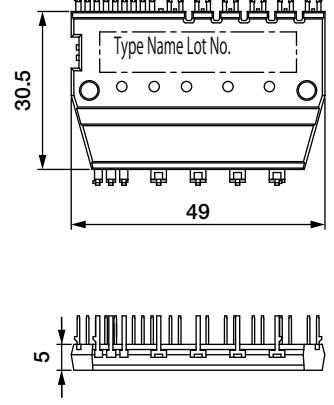
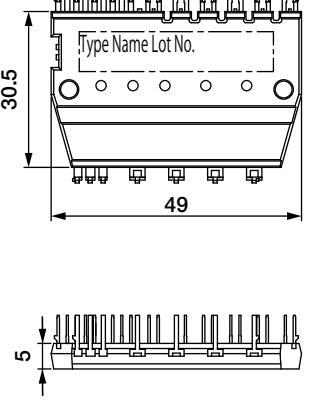
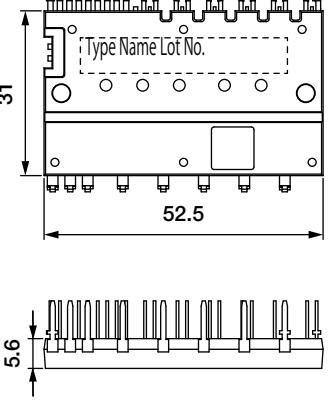
*2 : RoHS directive (2011/65/EU and (EU) 2015/863)

■ Type Name Definition of DIPIPM™



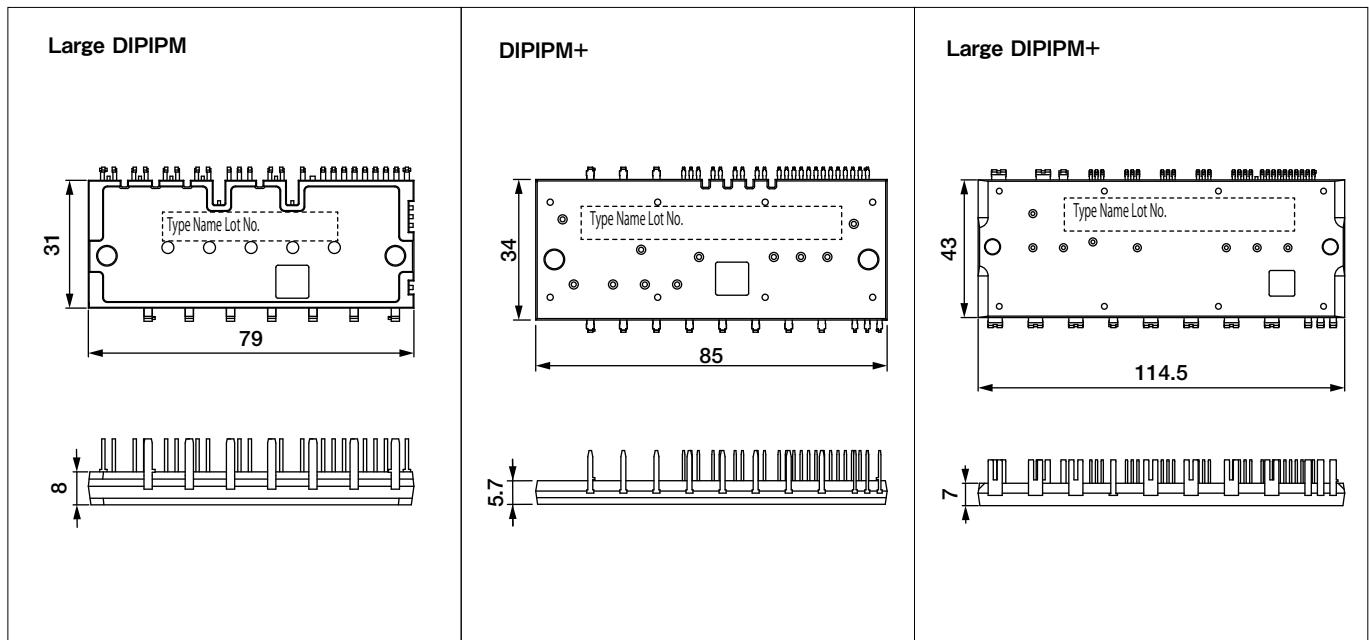
Lineup of DIPIPM™

Outline Drawing of DIPIPM™

		Unit:mm
SLIMDIP Normal	SLIMDIP Short	
		
Super mini DIPIPM Ver.6 Long	Super mini DIPIPM Ver.7 Long	
		
Mini DIPIPM (PSSxxS51F6)	Mini DIPIPM(PSSxxS51F6) Control side of Zigzag	Mini DIPIPM (PSSxxS7xF6) 1200V Mini DIPIPM
		

■ Outline Drawing of DIPIPM™

Unit:mm



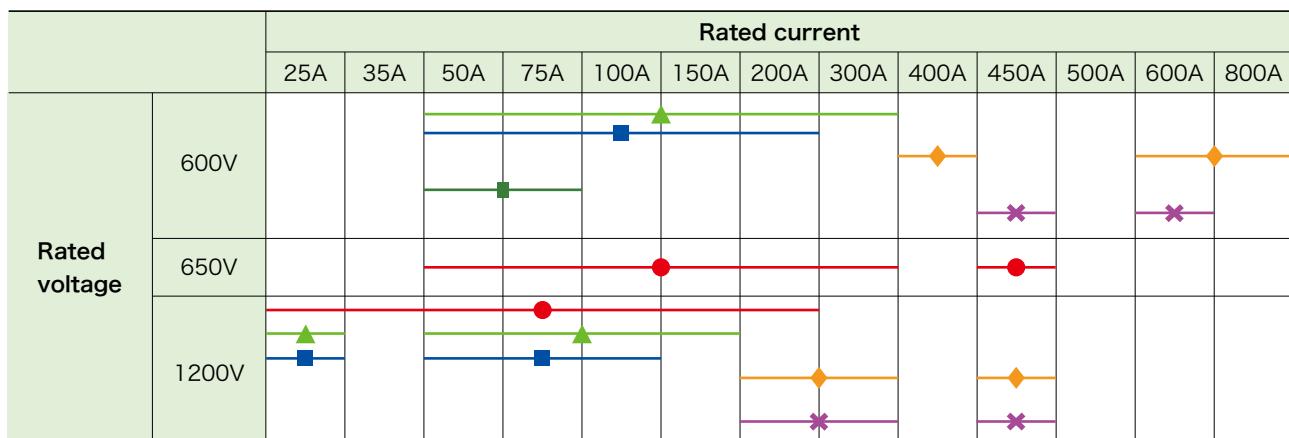
Series , Main Application

Series	Main Application
G1	●
L1	▲
S1	■
V1	◆
Photovoltaic	■
L	✗

Data sheet
here

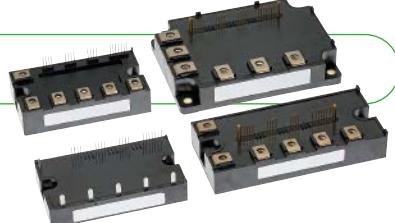


Rated Lineup



Featured Products

Loaded with built-in functions, contributing to inverters with enhanced energy savings



G1 Series IPM with 7th-generation IGBT

<Main Features>

- Power loss has been reduced with the introduction of the 7th-generation IGBT produced using CSTBT™¹ and a diode incorporating a RFC² structure that contributes to reducing the power consumed in inverters
- The new resin-insulated metal baseplate, originally introduced in 7th-generation IGBT modules, eliminates the solder-attached section, increasing the thermal cycle lifetime and improving inverter reliability
- In addition to the built-in functions of the previous product,³ automatic switching speed control, and error detection function contribute to lowering inverter loss and shortening design time

*1 CSTBT™: Mitsubishi Electric's unique IGBT that utilizes the carrier cumulative effect

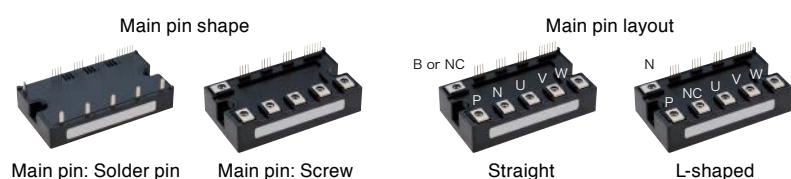
*2 RFC: Relaxed field cathode

*3 Conventional product: IPM L1-Series

Built-in functions: Supply Undervoltage lock protection (UV), Short-circuit protection (SC), Over-temperature protection (OT)

■ "A" package main pin shape and layout

For the "A" package 6-in-1 (CG1A) main pin shape, select either solder pin or screw type
For the pin layout, select either straight or L-shaped



Lineup of IPM

Matrix of IPM Modules 650V/600V (No.: Number of outline drawing, see page 22 to 23)

V _{CES} (V)	650V			600V															
	Series	G1 Series		L1 Series			S1 Series			V1 Series			Photovoltaic		L Series				
		Connection	No.	Connection	No.	Connection	No.	Connection	No.	Connection	No.	Connection	Connection	No.	Connection	No.			
50	PM50CG1A065	C	12	PM50CL1A060 PM50CL1B060 PM50RL1A060 PM50RL1B060 PM50RL1C060	C	01	PM50CS1D060	C	05	PM50B4LA060	B4	01	PM50B5LA060	B5	01				
	PM50RG1A065	R	12		C	02				PM50B6LA060	B6	01	PM50B4LB060	B4	02				
	PM50CG1B065	C	10		C	02				PM50B5LB060	B5	02	PM50B6LB060	B6	02				
	PM50RG1B065	R	10		R	01				PM50B4L1C060	B4	03	PM50B5L1C060	B5	03				
	PM50CG1AL065	C	12		R	02				PM50B6L1C060	B6	03	PM50B4LA060	B4	01				
	PM50CG1AP065	C	09		R	03				PM75B4LA060	B5	01	PM75B5LA060	B6	01				
	PM50CG1APL065	C	09		R	09				PM75B6LA060	B6	02	PM75B4LB060	B4	02				
	PM50RG1AP065	R	09							PM75B5LB060	B5	02	PM75B6LB060	B6	02				
	PM50RG1APL065	R	09							PM75B4L1C060	B4	03	PM75B5L1C060	B5	03				
75	PM75CG1A065	C	12	PM75CL1A060 PM75CL1B060 PM75RL1A060 PM75RL1B060	C	01	PM75CS1D060	C	05	PM75B4LA060	B4	01	PM75B5LA060	B5	01				
	PM75RG1A065	R	12		C	10				PM75B6LA060	B6	01	PM75B4LB060	B4	02				
	PM75CG1B065	C	10		C	02				PM75B5LB060	B5	02	PM75B6LB060	B6	02				
	PM75RG1B065	R	10		R	01				PM75B4L1C060	B4	03	PM75B5L1C060	B5	03				
	PM75CG1AL065	C	12		R	02				PM75B6L1C060	B6	03	PM75B4LA060	B4	01				
	PM75CG1AP065	C	09		R	02				PM75B5LA060	B5	01	PM75B6LA060	B6	01				
	PM75CG1APL065	C	09		R	09				PM75B4LB060	B4	02	PM75B5LB060	B5	02				
	PM75RG1AP065	R	09							PM75B6LB060	B6	02	PM75B4L1C060	B4	03				
	PM75RG1APL065	R	09							PM75B5L1C060	B5	03	PM75B6L1C060	B6	03				
100	PM100CG1A065	C	12	PM100CL1A060 PM100CL1B060 PM100RL1A060 PM100RL1B060	C	01	PM100CS1D060	C	05										
	PM100CG1B065	C	10		C	02													
	PM100RG1B065	R	10		C	01													
	PM100CG1AL065	C	12		R	01													
	PM100CG1AP065	C	09		R	02													
	PM100CG1APL065	C	09		R	09													
150	PM150CG1B065	C	10	PM150CL1A060 PM150CL1B060 PM150RL1A060 PM150RL1B060	C	01	PM150CS1D060	C	05										
	PM150RG1B065	R	10		C	02													
	PM200CG1B065	C	10		C	04													
	PM200RG1B065	R	11		R	04													
200	PM200CL1A060	C	04	PM200CS1D060	C	05													
	PM200CL1B060	C	11		R	04													
300	PM300CG1C065	C	11	PM300CL1A060 PM300RL1A060	C	04													
	PM300RG1C065	R	11		R	04													
400/450	PM450CG1C065	C	11				PM400DV1A060	D	06					PM450CLA060	C	08			
	PM450RG1C065	R	11																
600							PM600DV1A060	D	06					PM600CLA060	C	08			
800							PM800DV1B060	D	07										
IGBT chip	CSTBT*1 Emitter sensor installed Temperature sensor installed		CSTBT*1 Built-in emitter sensor Built-in temperature sensor		CSTBT*1 Built-in emitter sensor Built-in temperature sensor		CSTBT*1 Built-in emitter sensor Built-in temperature sensor		CSTBT*1 Built-in emitter sensor Built-in temperature sensor		CSTBT*2 Built-in emitter sensor Built-in temperature sensor								
	UV P-side/N-side		P-side/N-side		N-side		P-side/N-side		P-side/N-side		P-side/N-side								
Fault output	OT P-side/N-side		P-side/N-side		N-side		P-side/N-side		P-side/N-side		P-side/N-side								
	SC P-side/N-side		P-side/N-side		N-side		P-side/N-side		P-side/N-side		P-side/N-side								
Identification	P-side/N-side		—		—		—		—		—								
	RoHS directive*3		Compliant		Compliant		Compliant		Compliant		Compliant								
Compatibility	—		L Series		S-DASH SERVO		V Series		—		—								
	Connection		D		B4 °		B5 °		B6 °		C								

[Notes] *1: Full-gate CSTBT™ *2: PCM (Plugged Cell Merged) CSTBT™

*3: RoHS directive (2011/65/EU and (EU) 2015/863)

[Term] UV: Power supply Under Voltage protection

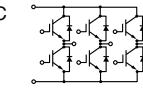
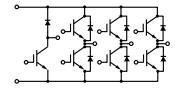
SC: Short Circuit protection

OT: Over Temperature protection

RoHS: Restriction of hazardous substances in electrical and electronic equipment

Lineup of IPM

Matrix of IPM Modules 1200V (No.: Number of outline drawing, see page 22 to 23)

V _{CES(V)} Series I _{C(A)}	1200V													
	G1 Series			L1 Series			S1 Series			V1 Series			L Series	
	Connection	No.		Connection	No.		Connection	No.		Connection	No.		Connection	No.
25	PM25CG1A120	C 12		PM25CL1A120	C 01		PM25CS1D120	C 05						
	PM25CG1B120	C 10		PM25CL1B120	C 02									
	PM25RG1A120	R 12		PM25RL1A120	R 01									
	PM25RG1B120	R 10		PM25RL1B120	R 02									
	PM25CG1AL120	C 12		PM25RL1C120	R 03									
	PM25CG1AP120	C 09												
	PM25CG1APL120	C 09												
	PM25RG1AP120	R 09												
35	PM35CG1A120	C 12												
	PM35CG1B120	C 10												
	PM35RG1A120	R 12												
	PM35RG1B120	R 10												
	PM35CG1AL120	C 12												
	PM35CG1AP120	C 09												
	PM35CG1APL120	C 09												
	PM35RG1AP120	R 09												
50	PM50CG1A120	C 12		PM50CL1A120	C 01		PM50CS1D120	C 05						
	PM50CG1B120	C 10		PM50CL1B120	C 02									
	PM50RG1B120	R 10		PM50RL1A120	R 01									
	PM50CG1AL120	C 12		PM50RL1B120	R 02									
	PM50CG1AP120	C 09												
	PM50CG1APL120	C 09												
75	PM75CG1B120	C 10		PM75CL1A120	C 01		PM75CS1D120	C 05						
	PM75RG1B120	R 10		PM75CL1B120	C 02									
100	PM100CG1B120	C 10		PM100CL1A120	C 04		PM100CS1D120	C 05						
	PM100CG1C120	C 11		PM100RL1A120	R 04									
	PM100RG1B120	R 10												
	PM100RG1C120	R 11												
150	PM150CG1C120	C 11		PM150CL1A120	C 04									
	PM150RG1C120	R 11		PM150RL1A120	R 04									
200	PM200CG1C120	C 11							PM200DV1A120	D 06	PM200CLA120	C 08		
	PM200RG1C120	R 11												
300									PM300DV1A120	D 06	PM300CLA120	C 08		
450									PM450DV1A120	D 06	PM450CLA120	C 08		
IGBT chip	CSTBT*1 Emitter sensor installed Temperature sensor installed		CSTBT*1 Built-in current sensor Built-in temperature sensor		CSTBT*1 Built-in current sensor Built-in temperature sensor		CSTBT*1 Built-in current sensor Built-in temperature sensor		CSTBT*2 Built-in current sensor Built-in temperature sensor					
Fault output	UV	P-side/N-side		P-side/N-side		N-side		P-side/N-side		P-side/N-side				
	OT	P-side/N-side		P-side/N-side		N-side		P-side/N-side		P-side/N-side				
	SC	P-side/N-side		P-side/N-side		N-side		P-side/N-side		P-side/N-side				
Identification	P-side/N-side	—		—		—		—		—				
	RoHS directive*2	Compliant		Compliant		Compliant		Compliant		Compliant				
Compatibility	—	L Series		S-DASH SERVO		V Series		—						
	Connection	D			C			R						

[Notes] *1: Full-gate CSTBT™ *2: PCM (Plugged Cell Merged) CSTBT™

*3: RoHS directive (2011/65/EU and (EU) 2015/863)

[Term] CSTBT™: Mitsubishi Electric's unique IGBT that makes use of the carrier cumulative effect

UV: Power supply Under Voltage protection

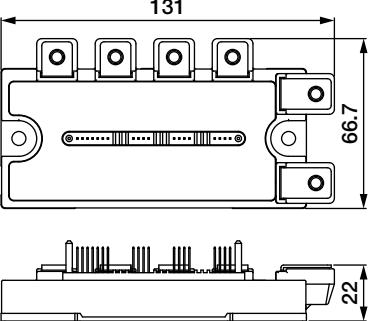
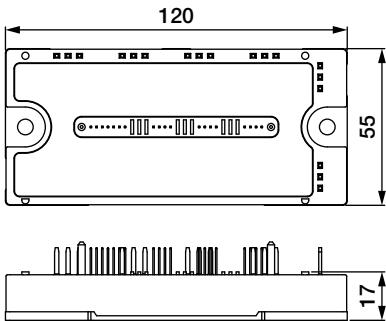
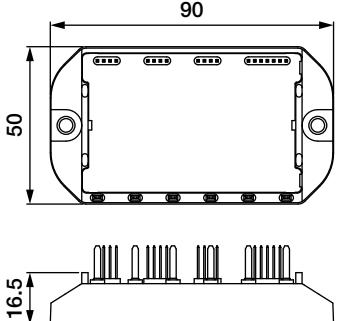
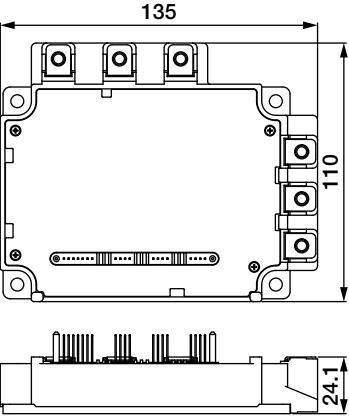
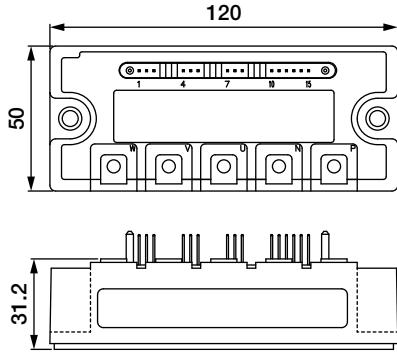
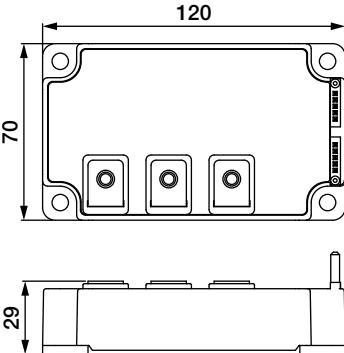
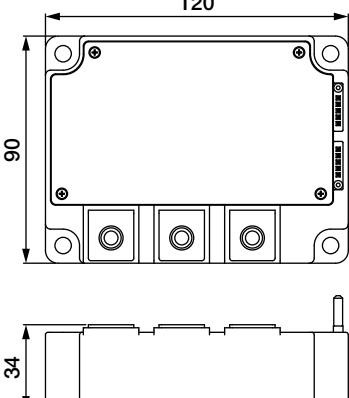
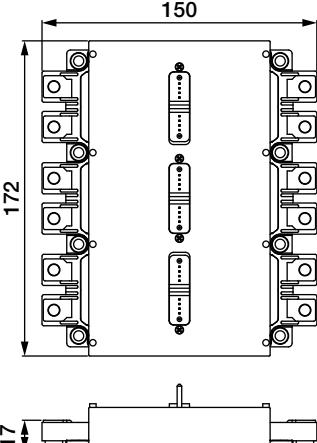
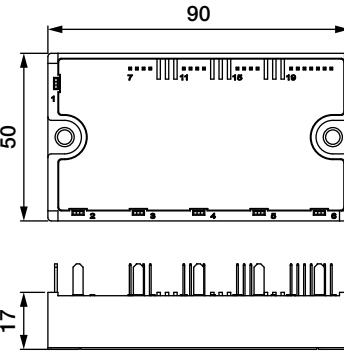
SC: Short Circuit protection

OT: Over Temperature protection

RoHS: the Restriction of the use of certain Hazardous Substances in electrical and electronic equipment

■ Outline Drawing of IPM

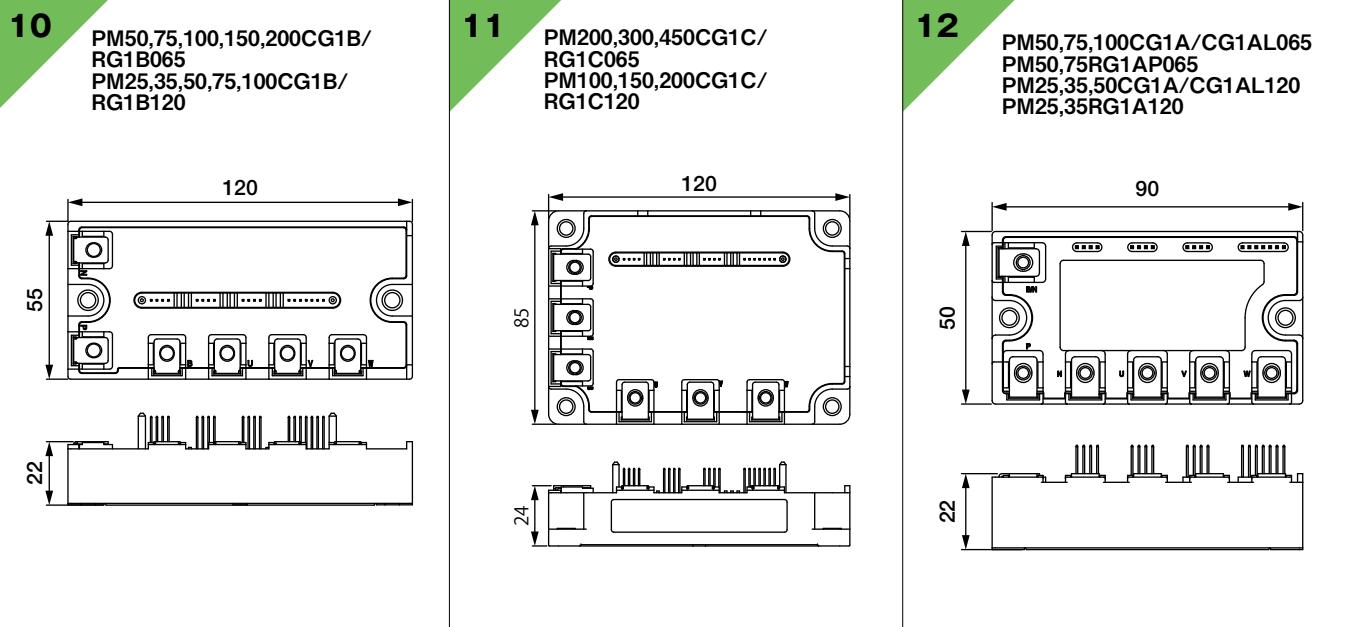
Unit:mm

01 PM50,75,100,150CL1A/RL1A060 PM25,50,75CL1A/RL1A120 PM50,75B4/B5/B6LA060	02 PM50,75,100,150CL1B/RL1B060 PM25,50,75CL1B/RL1B120 PM50,75B4/B5/B6LB060	03 PM50RL1C060 PM25RL1C120 PM50,75,B4/B5/B6L1C060
		
04 PM200,300CL1A/RL1A060 PM100,150CL1A/RL1A120	05 PM50,75,100,150,200CS1D060 PM25,50,75,100CS1D120	06 PM400,600DV1A060 PM200,300,450DV1A120
		
07 PM800DV1B060	08 PM450,600CLA060 PM200,300,450CLA120	09 PM50,75,100CG1AP/CG1APL065 PM50,75RG1AP065 PM25,35,50CG1AP/CG1APL120 PM25,35RG1AP120
		

Lineup of IPM

Outline Drawing of IPM

Unit:mm



IGBT Modules

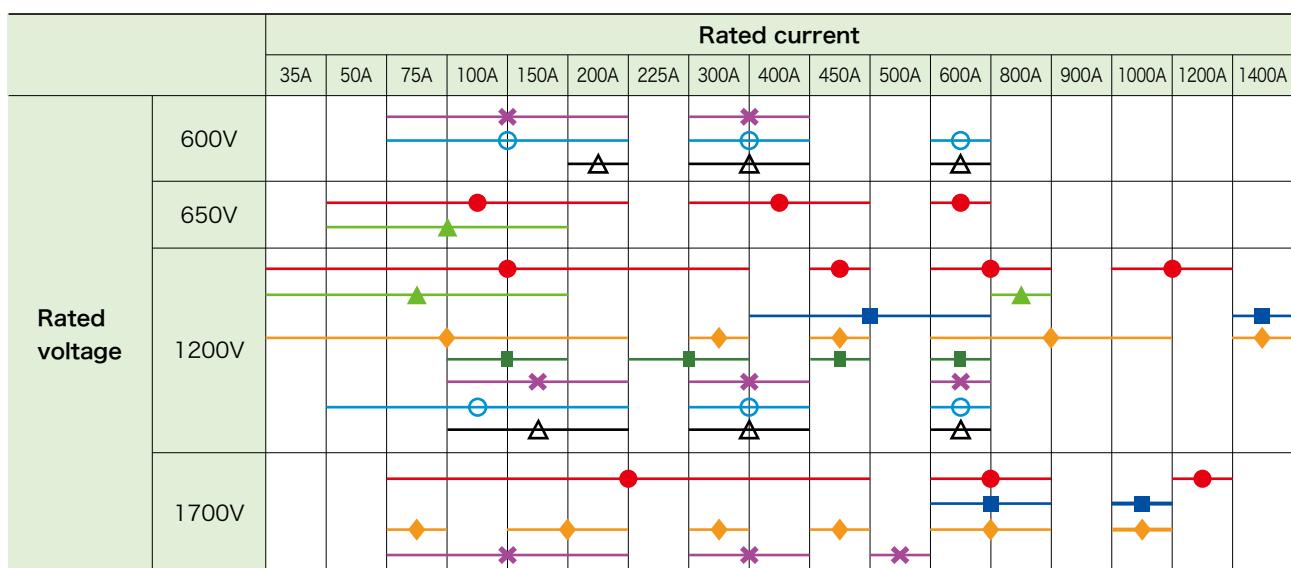
Series , Main Application

Series	Main Application
T	
T1	
For 3-level Inverters	
S	Motion control/Renewable energy /Power supply
S1	
A	
NF	
NF(NFH type)	

Data sheet
here



Rated Lineup



New Products

Under Development



Industrial IGBT module with new standard package "LV100" for high power density inverter

IGBT module T-series (LV100 for industrial)

IGBT module 2in1 type

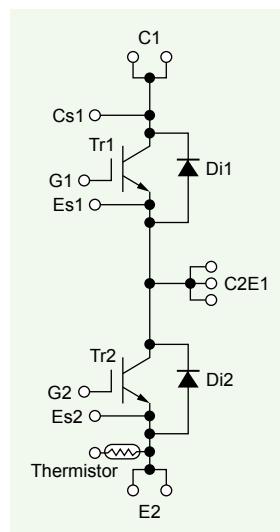
■Lineup

800A/1700V, 800A/1700V(with enhanced FWD), 1200A/1700V

800A/1200V, 1200A/1200V 2in1 type (Under development)

⟨Main Features⟩

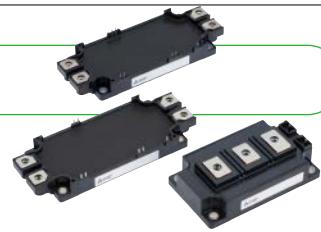
- Next generation high capacity standard package for industrial use
- Improved ease of use by applying low impedance package
- Reducing the switching loss and optimal for the applications that are used in 1 to 5KHz
- Isolation voltage 4kV





Featured Products

New lineup contributes to simple design downsizing, energy-savings of industrial inverters.



IGBT Module T/T1-Series

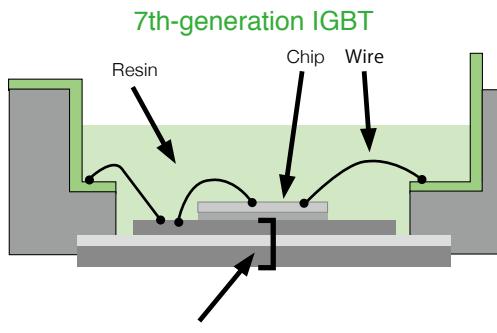
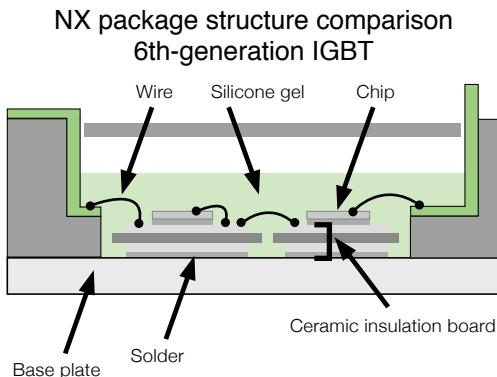
<Main Features>

- New modules equipped with three-phase converter, inverter, and brake circuit(CIB), contributes to simplifying design for inverter systems
- CIB modules contribute to compact inverter systems by reducing package size by 36% compared to the Mitsubishi Electric's existing module.(CIB)
- Power loss has been reduced with the introduction of the 7th-generation IGBT produced using CSTBT™² and a diode incorporating a relaxed field of cathode (RFC) structure
- The new structure introduced eliminates the solder-attached section, increasing the thermal cycle lifetime, which contributes to improving the reliability of inverters
- The introduction of press-fit pins and PC-TIM¹ contribute to simplifying the assembly process for inverters

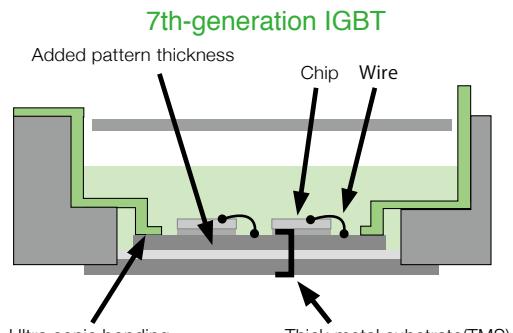
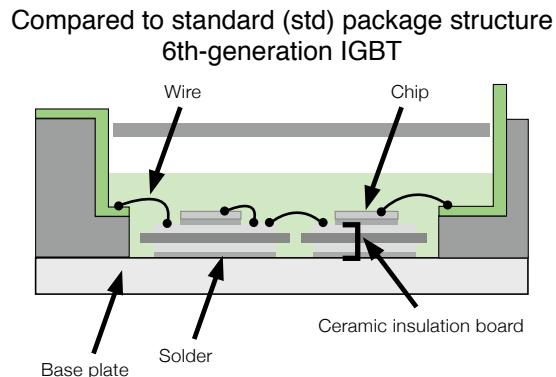
*1 PC-TIM: Phase change - thermal interface material

*2 CSTBT™: Mitsubishi Electric's unique IGBT that makes use of the carrier cumulative effect

■ New structure realizes improved reliability (improved thermal cycle lifetime)



※Adopts SoLid Cover(SLC) Technology



※Standard package is not available for CIB

◆ Press-fit terminal support (NX)

- Possible to select the control pin shape (soldered terminals/press-fit terminals)
- Solder attachment process eliminated

■ Press-fit pin



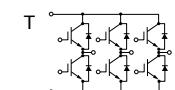
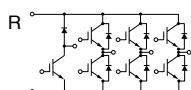
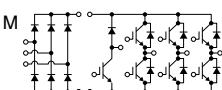
①Main pin

②Signal pin

Lineup of IGBT Modules

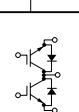
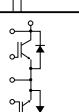
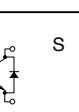
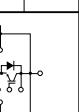
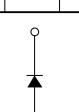
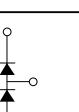
Matrix of IGBT Modules 650V/600V (No.: Number of outline drawing, see page 29 to 34)

RoHS directive (2011/65/EU, (EU)2015/863) compliant

V _{CES} (V)	650V						600V									
	Series Ic(A)	T/T1-Series NX Type	Connection	No.	T-Series std Type	Connection	No.	A-Series NX Type	Connection	No.	NF-Series	Connection	No.	NF-Series NFH Type	Connection	No.
50	CM50MXUB-13T CM50MXUB-13T1 CM50MXUBP-13T CM50MXUBP-13T1	M 42 M 42 M 46 M 46														
75	CM75MXUB-13T CM75MXUB-13T1 CM75MXUBP-13T CM75MXUBP-13T1	M 42 M 42 M 46 M 46			CM75MX-12A	M 01	CM75TL-12NF CM75RL-12NF	T R 07								
100	CM100TX-13T CM100TP-13T CM100MXUB-13T CM100MXUB-13T1 CM100MXUBP-13T CM100MXUBP-13T1 CM100MXUD-13T CM100MXUD-13T1 CM100MXUDP-13T CM100MXUDP-13T1	T 33 T 37 M 42 M 42 M 46 M 46 M 44 M 44 M 48 M 48	CM100DY-13T	D 30	CM100MX-12A CM100RX-12A	M R 01 02	CM100TL-12NF CM100RL-12NF	T R 07 07								
150	CM150TX-13T CM150TP-13T CM150RX-13T CM150RXP-13T CM150MXUD-13T CM150MXUD-13T1 CM150MXUDP-13T CM150MXUDP-13T1	T 33 T 37 R 34 R 38 M 44 M 44 M 48 M 48	CM150DY-13T	D 30	CM150RX-12A	R 02	CM150DY-12NF CM150TL-12NF CM150RL-12NF	D T R 08 07 07								
200	CM200TX-13T CM200TP-13T CM200RX-13T CM200RXP-13T	T 33 T 37 R 34 R 38	CM200DY-13T	D 30	CM200RX-12A	R 02	CM200DY-12NF CM200TL-12NF CM200RL-12NF	D T R 08 09 09	CM200DU-12NFH	D 13						
225																
300	CM300DX-13T CM300DXP-13T	D 28 D 39	CM300DY-13T	D 31	CM300DX-12A	D 03	CM300DY-12NF	D 08	CM300DU-12NFH	D 14						
400			CM400DY-13T	D 31	CM400DX-12A	D 03	CM400DY-12NF	D 10	CM400DU-12NFH	D 14						
450	CM450DX-13T CM450DXP-13T	D 28 D 39														
600	CM600DX-13T CM600DXP-13T	D 28 D 39	CM600DY-13T	D 32			CM600DY-12NF	D 11	CM600DU-12NFH	D 15						
1000																
Connection	D		T		R		M									

Matrix of Power Modules for 3-level Inverter (No.: Number of outline drawing, see page 30 to 32)

RoHS directive (2011/65/EU, (EU)2015/863) compliant

V _{CES} /V _{RRM}	1200 V IGBT Module				1700 V IGBT Module				1200 V Diode Module				1700 V Diode Module			
	Ic/I _f	T/S/S1-Series std Type	Connection	No.	S/S1-Series std Type	Connection	No.	S/S1-Series std Type	Connection	No.	S/S1-Series std Type	Connection	No.	S/S1-Series std Type	Connection	No.
400	CM400ST-24S1 CM400C1Y-24S	S C1	35 11													
450	CM450C1Y-24T	C1	32													
500	CM500C2Y-24S	C2	36													
600	CM600C1Y-24T	C1	32		CM600HA-34S	H	36						RM600DY-34S	D	32	
800					CM800HA-34S	H	36						RM800DY-34S	D	32	
1000					CM1000HA-34S	H	36									
1400	CM1400HA-24S	H	36					RM1400HA-24S*	H	36						
Connection	IGBT module	C1		C2		H		S		Diode module	H		D			

*Connection of diode module and IGBT module are different.

★: New Product

Lineup of IGBT Modules

Matrix of IGBT Modules 1200V (No.: Number of Outline Drawing, see page 29 to 34)

RoHS directive (2011/65/EU, (EU)2015/863) compliant

V _{ces} (V)		1200V													
Series I _c	T-Series LV100 Type Connection No.	T/T1-Series NX Type Connection No.		T-Series std Type Connection No.		S/S1-Series NX Type Connection No.		S/S1-Series std Type Connection No.		S/S1-Series MPD Type Connection No.		A-Series*1 NF-Series*1 Connection No.			
		CM35MXUA-24T CM35MXUA-24T1 CM35MXUAP-24T CM35MXUAP-24T1	M 41 M 41 M 45 M 45	CM35MXA-24S	M 04	CM50MXUA-24T CM50MXUA-24T1 CM50MXUAP-24T CM50MXUAP-24T1	M 41 M 41 M 45 M 45	CM50MXA-24S	M 04	CM50RL-24NF CM50TL-24NF	R 07 T 07				
35															
50															
75			CM75MXUB-24T CM75MXUB-24T1 CM75MXUBP-24T CM75MXUBP-24T1 CM75MXUC-24T CM75MXUC-24T1 CM75MXUCP-24T CM75MXUCP-24T1	M 42 M 42 M 46 M 46 M 43 M 43 M 47 M 47		CM75MXA-24S CM75TX-24S CM75RX-24S	M 04 T 05 R 02					CM75RL-24NF CM75TL24NF	R 07 T 07		
100			CM100TX-24T CM100TP-24T CM100RX-24T CM100RP-24T CM100MXUC-24T CM100MXUC-24T1 CM100MXUCP-24T CM100MXUCP-24T1	T 33 T 37 R 34 R 38 M 43 M 43 M 47 M 47	CM100DY-24T	D 30	CM100MXA-24S CM100TX-24S1 CM100RX-24S1	M 04 T 25 R 26				CM100DY-24A CM100DY-24NF CM100E3Y-24NF CM100RL-24NF CM100TL-24NF CM100DU-24NFH	D 08 D 08 E3 08 R 07 T 07 D 13		
150			CM150TX-24T CM150TP-24T CM150RX-24T CM150RP-24T CM150MXUD-24T CM150MXUD-24T1 CM150MXUDP-24T CM150MXUDP-24T1	T 33 T 37 R 34 R 38 M 44 M 44 M 48 M 48	CM150DY-24T	D 30	CM150DX-24S CM150EXS-24S CM150TX-24S1 CM150RX-24S1	D 03 E 24 T 25 R 26				CM150DY-24A CM150DY-24NF CM150E3Y-24NF CM150RL-24NF CM150TL-24NF CM150DU-24NFH	D 08 D 08 E3 08 R 09 T 09 D 13		
200			CM200TX-24T CM200TP-24T	T 33 T 37	CM200DY-24T	D 31	CM200EXS-24S CM200RXL-24S	E 24 R 21					CM200DY-24A CM200DY-24NF CM200RL-24NF CM200TL-24NF CM200DU-24NFH	D 08 D 10 R 09 T 09 D 14	
225			CM225DX-24T CM225DXP-24T	D 28 D 39			CM225DX-24S1	D 27							
300			CM300DX-24T CM300DXP-24T	D 28 D 39	CM300DY-24T	D 31	CM300DX-24S1 CM300EXS-24S CM300RXL-24S1	D 27 E 24 R 21	CM300DY-24S	D 10			CM300DY-24A CM300DY-24NF CM300DU-24NFH	D 10 D 11 D 14	
400														CM400DY-24A CM400HA-24A CM400DY-24NF CM400DU-24NFH	D 11 H 16 D 11 D 15
450			CM450DX-24T CM450DXP-24T	D 28 D 39	CM450DY-24T	D 32	CM450DX-24S1	D 27	CM450DY-24S	D 11					
600			CM600DX-24T CM600DXP-24T	D 28 D 39	CM600DY-24T	D 32	CM600DX-24S1 CM600DXL-24S	D 27 D 06	CM600DY-24S	D 11				CM600DY-24A CM600HA-24A CM600DU-24NF CM600DU-24NFH	D 11 H 16 D 12 D 15
800	CM800DW-24T**	D 49	CM800DX-24T1 CM800DXP-24T1	D 28 D 39					CM800DY-24S	D 12					
900														CM900DUC-24S	D 17
1000			CM1000DX-24T CM1000DXP-24T	D 29 D 40			CM1000DXL-24S	D 06							
1200	CM1200DW-24T**	D 49												CM1400HA-24S	H 36
1400														CM1400DUC-24S	D 17
Connection	H	D	T	R	M	E								E3	

*1: A-Series have model names ending with A, NF-Series have model name ending with NF/NFH

★★: Under Development

■ Matrix of IGBT Modules 1700V (No.: Number of Outline Drawing, see page 29 to 34)

RoHS directive (2011/65/EU, (EU)2015/863) compliant

V _{CES} (V) I _c	1700V														
	Series	T-Series LV100 Type		T-Series NX Type		T-Series std Type		S/S1-Series NX Type		S/S1-Series std Type		S/S1-Series MPD Type		A-Series std Type	
		Connection	No.	Connection	No.	Connection	No.	Connection	No.	Connection	No.	Connection	No.	Connection	No.
75						CM75DY-34T	D 30	CM75MXA-34SA CM75RX-34SA	M R 23 19					CM75DY-34A	D 08
100				CM100TX-34T CM100TPX-34T	T T 33 37	CM100DY-34T	D 30							CM100DY-34A	D 08
150				CM150TX-34T CM150TPX-34T	T T 33 37	CM150DY-34T	D 31	CM150DX-34SA CM150RXL-34SA	D R 20 21					CM150DY-34A	D 10
200						CM200DY-34T	D 31	CM200DX-34SA CM200EXS-34SA	D E 20 24					CM200DY-34A	D 10
225				CM225DX-34T CM225DXP-34T	D D 28 39										
300				CM300DX-34T CM300DXP-34T	D D 28 39	CM300DY-34T	D 32	CM300DX-34SA	D 20					CM300DY-34A	D 11
400						CM400DY-34T	D 32							CM400DY-34A	D 18
450				CM450DX-34T CM450DXP-34T	D D 28 39			CM450DXL-34SA	D 22						
500														CM500HA-34A	H 16
600				CM600DX-34T CM600DXP-34T	D D 28 39			CM600DXL-34SA	D 22	CM600HA-34S	H 36				
800	CM800DW-34T** CM800DW-34TA**	D D 49 49								CM800HA-34S	H 36				
1000										CM1000HA-34S	H 36	CM1000DUC-34SA	D 17		
1200	CM1200DW-34T**	D 49													
Connection	H		D		T		R		M		E				

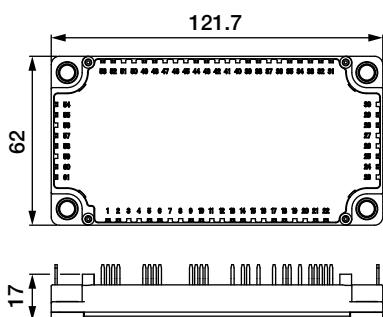
★★: Under Development

Lineup of IGBT Modules

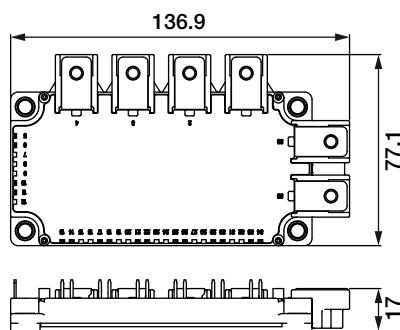
Outline Drawing of IGBT Modules

Unit:mm

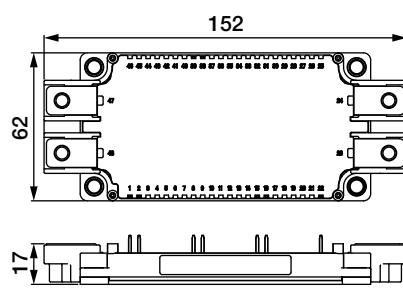
01 CM75,100MX-12A



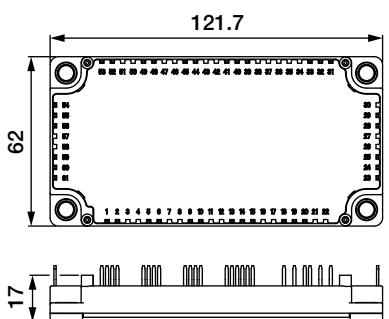
02 CM100,150,200RX-12A
CM75RX-24S



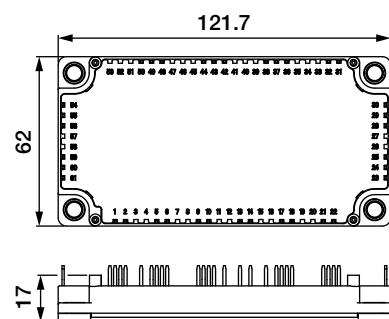
03 CM300,400DX-12A
CM150,200DX-24S



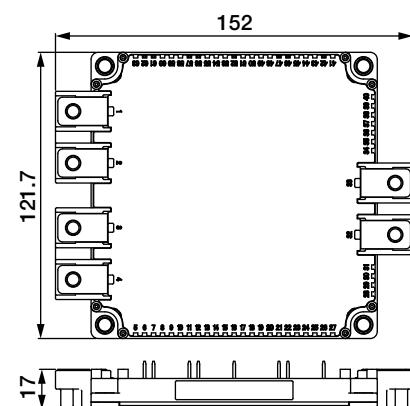
04 CM35,50,75,100Mxa-24S



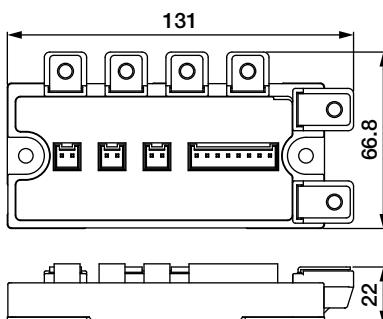
05 CM75TX-24S



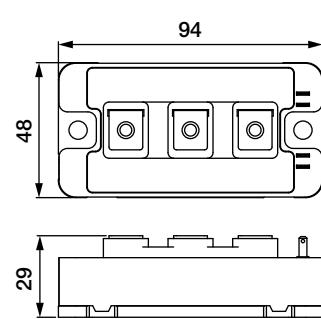
06 CM600,1000DXL-24S



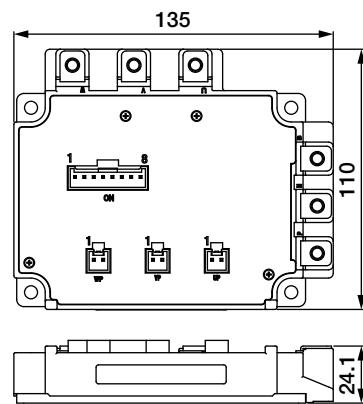
07 CM75,100,150TL/RL-12NF
CM50,75,100TL/RL-24NF



08 CM150,200,300DY-12NF
CM100,150DY-24NF
CM100,150,200DY-24A
CM75,100DY-34A
CM100,150E3Y-24NF



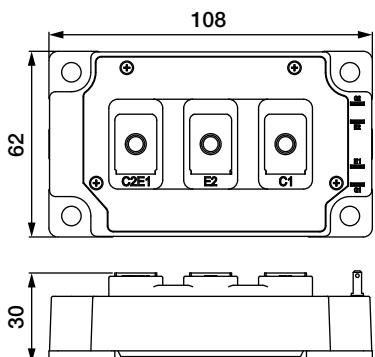
09 CM200TL/RL-12NF
CM150,200TL/RL-24NF



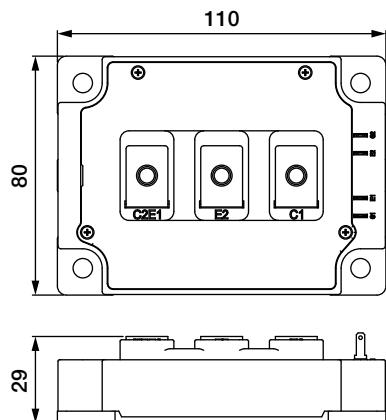
■ Outline Drawing of IGBT Modules

Unit:mm

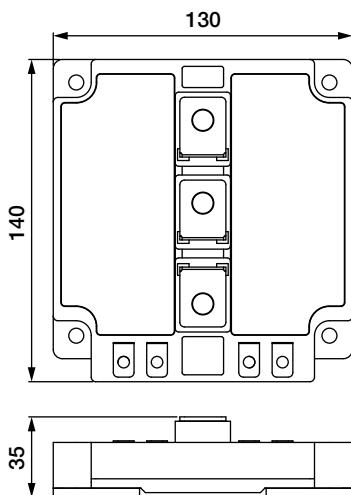
10
CM400DY-12NF
CM200DY-24NF
CM300DY-24A
CM300DY-24S
CM150,200DY-34A



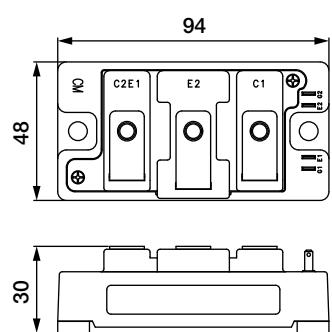
11
CM600DY-12NF CM400C1Y-24S
CM400DY-24NF CM450DY-24S
CM400,600DY-24A CM600DY-24S
CM300DY-34A CM300DY-24NF



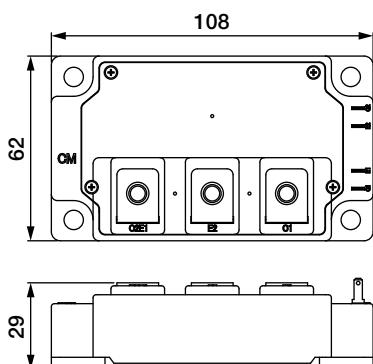
12
CM600DU-24NF
CM800DY-24S



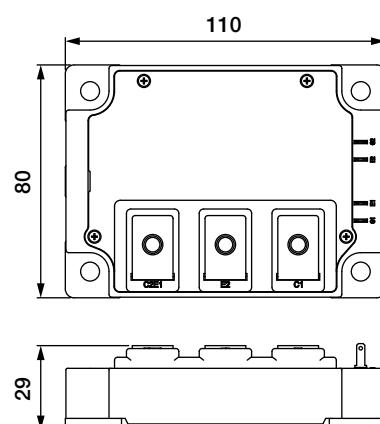
13
CM200DU-12NFH
CM100,150DU-24NFH



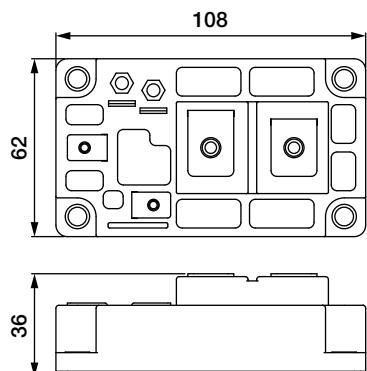
14
CM300,400DU-12NFH
CM200,300DU-24NFH



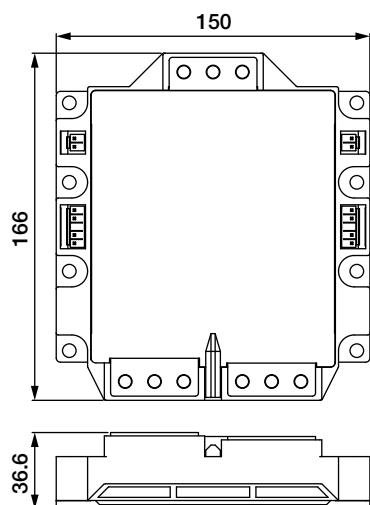
15
CM600DU-12NFH
CM400,600DU-24NFH



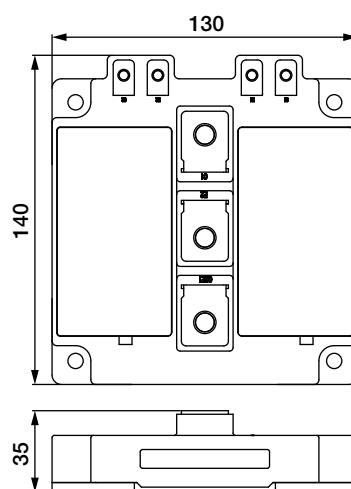
16
CM400,600HA-24A
CM500HA-34A



17
CM900,1400DUC-24S
CM1000DUC-34SA



18
CM400DY-34A

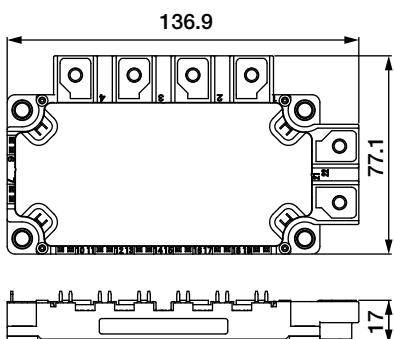


Lineup of IGBT Modules

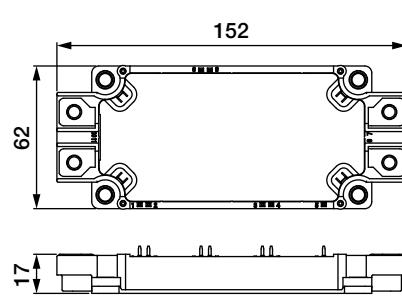
Outline Drawing of IGBT Modules

Unit:mm

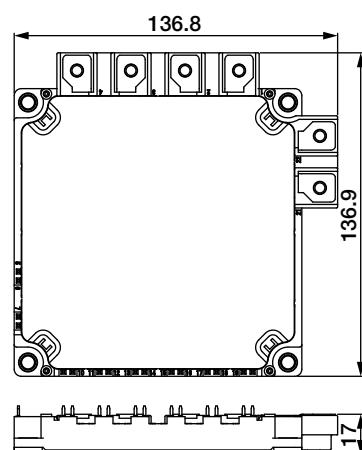
19 CM75RX-34SA



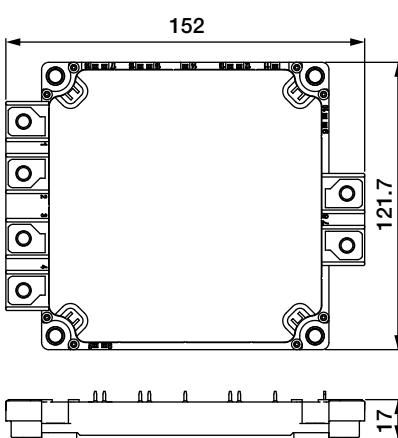
20 CM150DX-34SA
CM200DX-34SA
CM300DX-34SA



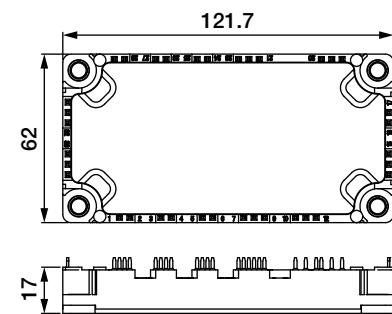
21 CM200RXL-24S
CM300RXL-24S1
CM150RXL-34SA



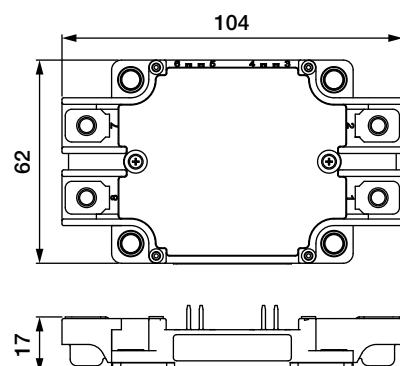
22 CM450DXL-34SA
CM600DXL-34SA



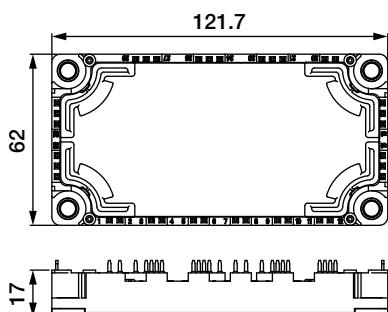
23 CM75Mxa-34SA



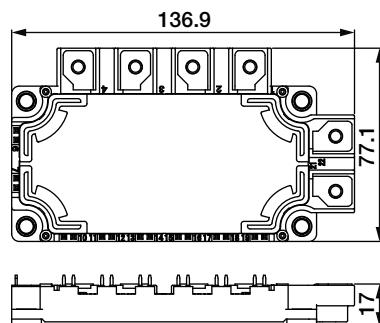
24 CM150EXS-24S
CM200EXS-24S
CM300EXS-24S
CM200EXS-34SA



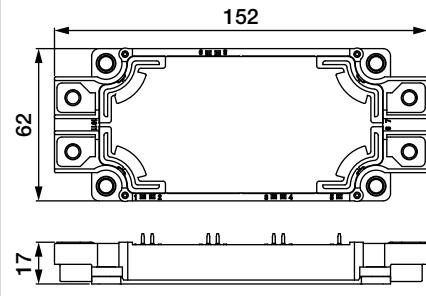
25 CM100TX-24S1
CM150TX-24S1



26 CM100RX-24S1
CM150RX-24S1



27 CM225DX-24S1
CM300DX-24S1
CM450DX-24S1
CM600DX-24S1

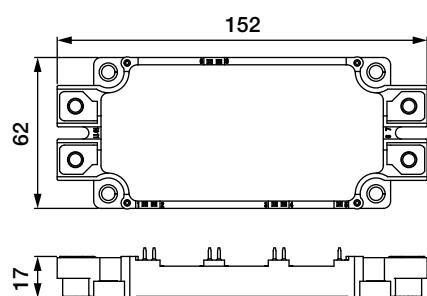


■ Outline Drawing of IGBT Modules

Unit:mm

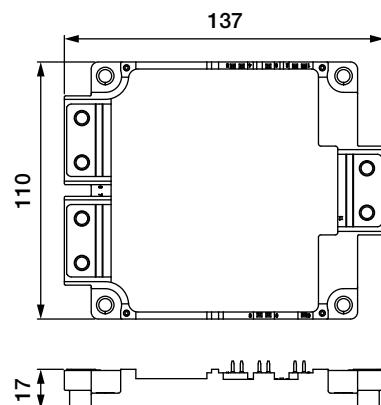
28

CM300,450,600DX-13T
CM225,300,450,600DX-24T
CM800DX-24T1
CM225,300,450DX,600DX-34T



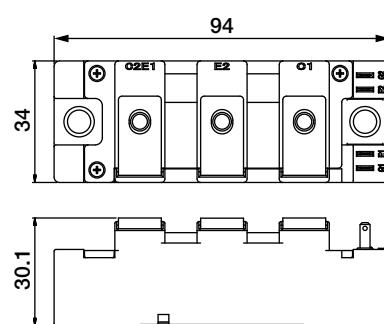
29

CM1000DX-24T



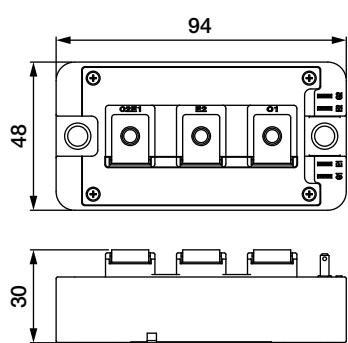
30

CM100,150,200DY-13T
CM100,150DY-24T
CM75,100DY-34T



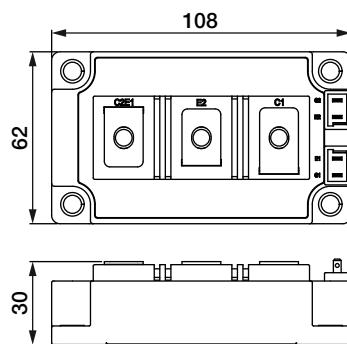
31

CM300,400DY-13T
CM200,300DY-24T
CM150,200DY-34T



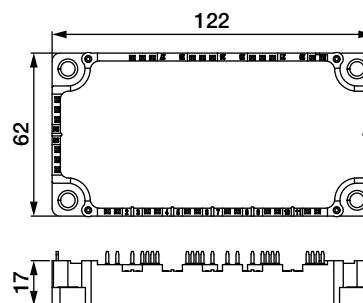
32

CM600DY-13T
CM450,600DY-24T
CM450,600C1Y-24T
CM300,400DY-34T
RM600,800DY-34S



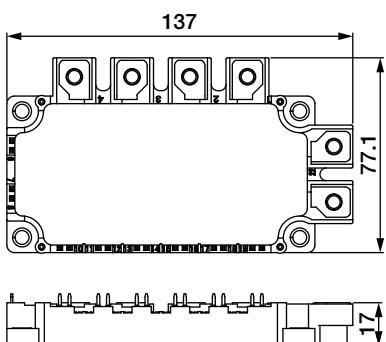
33

CM100,150,200TX-13T
CM100,150,200TX-24T
CM100,150TX-34T



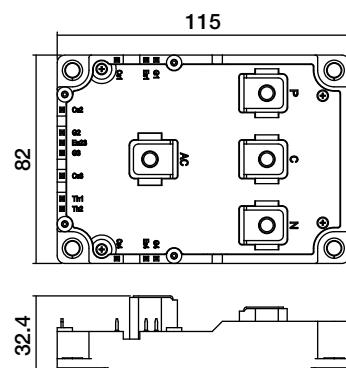
34

CM150,200RX-13T
CM100,150RX-24T



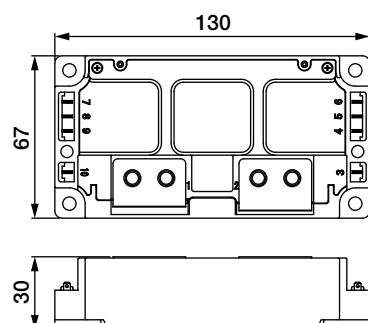
35

CM400ST-24S1



36

CM500C2Y-24S
CM1400HA-24S
CM600,800,1000HA-34S
RM1400HA-24S



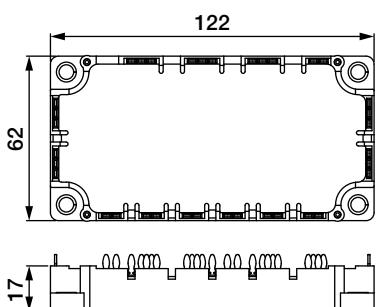
Lineup of IGBT Modules

Outline Drawing of IGBT Modules

Unit:mm

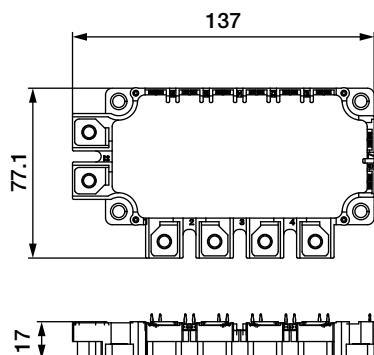
37

CM100,150,200TXP-13T
CM100,150,200TXP-24T
CM100,150TXP-34T



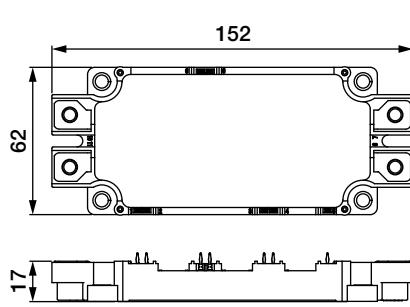
38

CM150,200RXP-13T
CM100,150RXP-24T



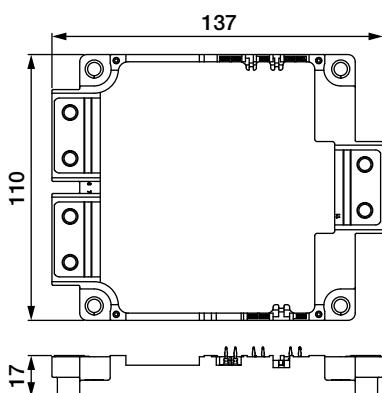
39

CM300,450,600DXP-13T
CM225,300,450,600DXP-24T
CM800DXP-24T1
CM225,300,450,600DXP-34T



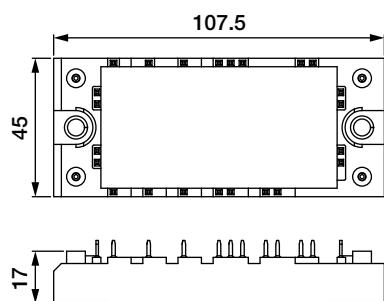
40

CM1000DXP-24T



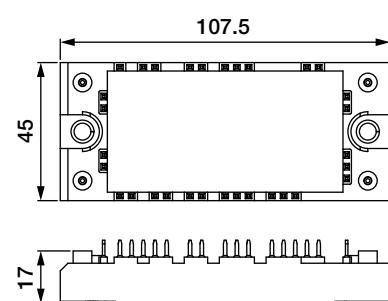
41

CM35,50MXUA-24T/24T1



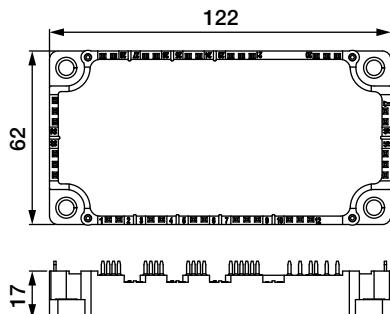
42

CM50,75,100MXUB-13T/13T1
CM75MXUB-24T/24T1



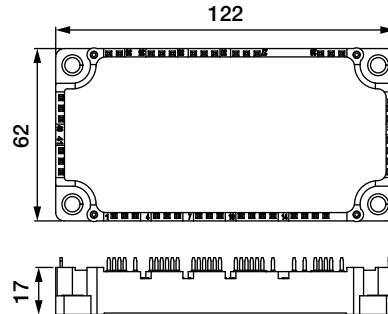
43

CM75,100MXUC-24T/24T1



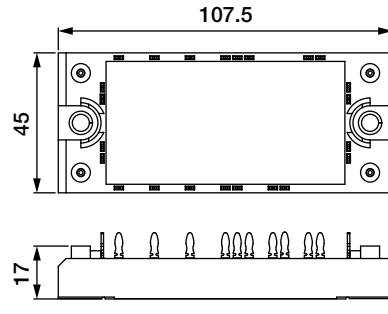
44

CM100/150MXUD-13T/T1
CM150MXUD-24T/T1



45

CM35/50MXUAP-24T/T1

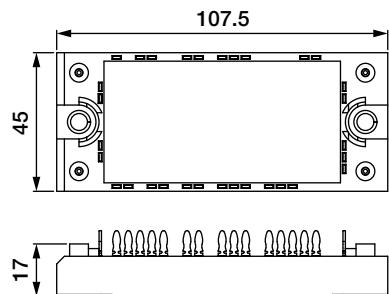


■ Outline Drawing of IGBT Modules

Unit:mm

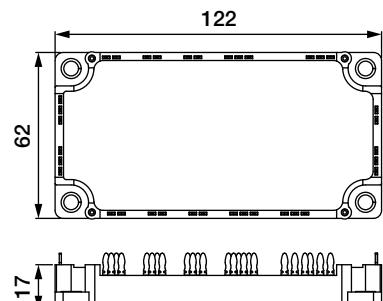
46

CM50/75/100MXUBP-13T/T1
CM75MXUBP-24T/T1



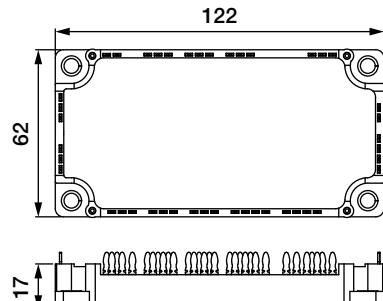
47

CM75/100MXUCP-24T/T1



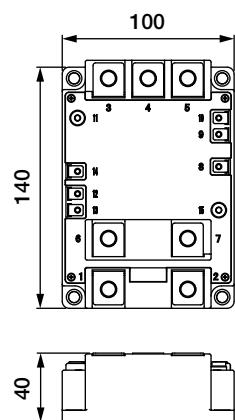
48

CM100/150MXUDP-13T/T1
CM150MXUDP-24T/T1



49

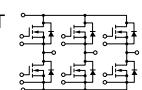
CM800,1200DW-24T
CM800,1200DW-34T/TA



Lineup of MOSFET Modules

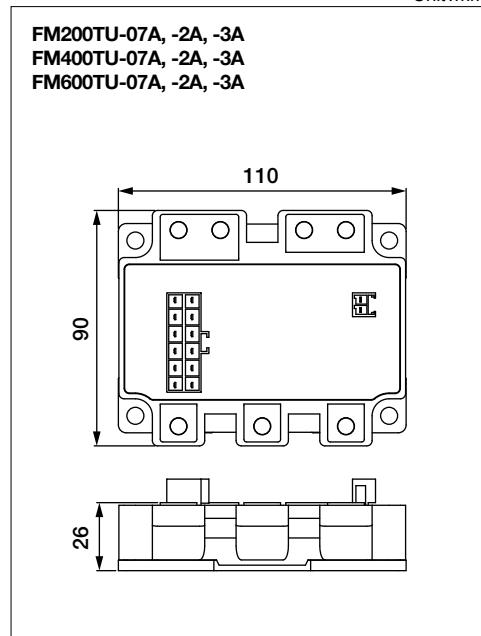
■ Series Matrix of MOSFET Modules

RoHS directive (2011/65/EU, (EU)2015/863) compliant

V _{DSS} I _D (A)	75V	Connection	100V	Connection	150V	Connection
100	FM200TU-07A	T	FM200TU-2A	T	FM200TU-3A	T
200	FM400TU-07A	T	FM400TU-2A	T	FM400TU-3A	T
300	FM600TU-07A	T	FM600TU-2A	T	FM600TU-3A	T
Connection						

■ Outline Drawing of MOSFET Modules

Unit:mm



Data sheet
here



HVIGBT Modules

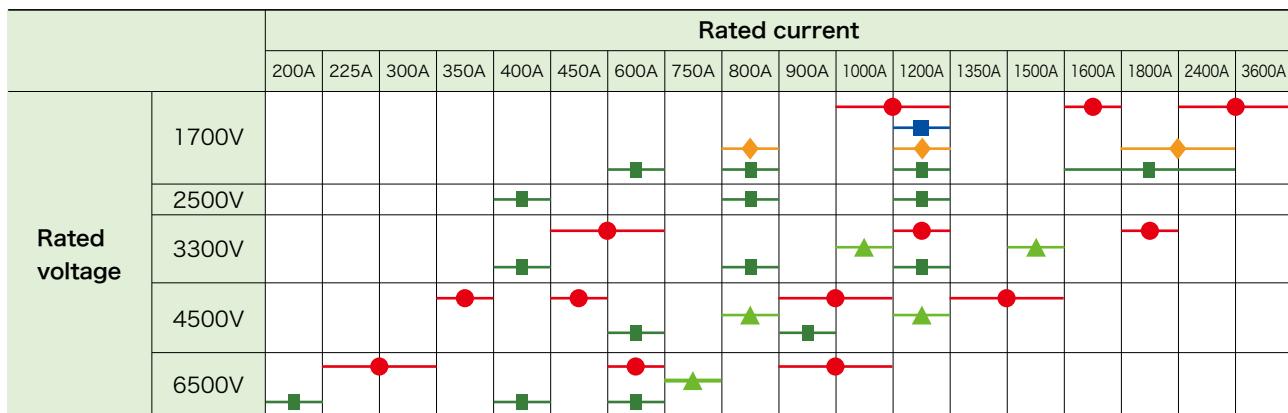
Series , Main Application

Series	Main Application
X	
R	
S	Traction/Power transmission/Motion control
N	
H	

Data sheet
here



Rated Lineup



New Products

X Series HVIGBT Modules std type

Existing compatible package: Standard type Contributes to smaller, higher-capacity inverter systems by expanding lineup



<Main Features>

- Power loss reduced by incorporating 7th-generation IGBT and RFC¹ diode
 - Industry-leading power² for increased inverter capacity
 - External size reduced 33% while maintaining the same voltage resistance and rated current as conventional products,³ contributing to inverter downsizing
 - Optimal package internal structure realizes improved heat dissipation, humidity resistance and flame retardance, increasing product life
- *1 RFC : Relaxed field of cathode
 *2 3.3kV - 6.5kV (as of Apr. 1, 2020 based on Mitsubishi Electric research)
 *3 Comparison of X Series CM1200HC-66X and H Series CM1200HC-66H

Product lineup

std type	1.7kV	3.3kV	4.5kV	6.6kV
	1200A 1600A 2400A	1200A	900A 1000A	600A
	2400A 3600A	1200A 1800A	900A 1350A 1500A	600A 900A 1000A

X Series HVIGBT Modules dual type

New common frame package: dual type Class-leading current density contributes to increased power output in inverter systems



<Main Features>

- Power loss reduced by incorporating 7th-generation IGBT and RFC¹ diode
- Industry's highest 3.3kV/600A Si module power density of 8.57A/cm²⁴ contributes to increased power output and efficiency
- Terminal layout optimized for easy paralleling and flexible inverter configurations and capacities
- New package structure offers extra reliability

*4 As of Apr. 1, 2020 based on Mitsubishi Electric research

Product lineup

LV100	1.7kV	3.3kV	4.5kV	6.6kV
	1000A 1200A	450A 600A		
		450A 600A	350A 450A	225A 300A

Lineup of HVIGBT Modules

■ Series Matrix of HVIGBT (No.: Number of Outline Drawing, see page 39 to 40)

V _{CE(S)} (V) I _C (A)	1700V						2500V						3300V						H-Series							
	X-Series			S-Series N-Series			H-Series			H-Series			X-Series			R-Series			H-Series							
	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.					
400A										CM400DY-50H	D1	B	08						CM400HG-66H CM400DY-66H	H D1	G B	05 08				
450A													CM450DC-66X* CM450DG-66X** ^(*)	D2	C G	09 10										
600A							CM600DY-34H CM600E2Y-34H	D1 E2	B B	01 01			CM600DC-66X* CM600DG-66X** ^(*)	D2	C G	09 10										
800A				CM800DZB-34N	D1	C	01	CM800DZ-34H	D1	C	01	CM800HB-50H	H	B	03					CM800HC-66H CM800E4C-66H CM800E6C-66H	H E4 E2	C C C	03 04 04			
1000A	CM1000DC-34X**	D2	C	09												CM1000HC-66R CM1000E4C-66R	H E4	C C	03 04							
1200A	CM1200DC-34X* CM1200E4C-34X**	D2 E4	C C	09 03	CM1200HCB-34N CM1200DC-34N CM1200E4C-34N CM1200DC-34S	H D1	C E4	03 01	CM1200HC-34H	H	C	02	CM1200HC-50H	H	C	04	CM1200HC-66X* CM1200HCB-66X* CM1200E4C-66X*	H H E4	C C C	03 04 04			CM1200HG-66H CM1200HC-66H	H H	C C	06 04
1500A																	CM1500HC-66R CM1500HG-66R	H H	C G	04 06						
1600A	CM1600HC-34X**	H	C	03						CM1600HC-34H	H	C	02													
1800A				CM1800HC-34N CM1800HCB-34N	H H	C C	03 04	CM1800HC-34H	H	C	04					CM1800HC-66X CM1800HG-66X*	H H E4	C G	04 06							
2400A	CM2400HC-34X* CM2400HCB-34X**	H C	C	03 04	CM2400HCB-34N CM2400HC-34N	H H	C C	03 04	CM2400HC-34H	H	C	04														
3600A	CM3600HC-34X**	H	C	04																						
Connection	H	E2/E6		E4					D1				D2													

[Type]

B: Cu base plate 6kV Isolation

C: AlSiC base plate 6kV Isolation

G: AlSiC base plate 10kV Isolation

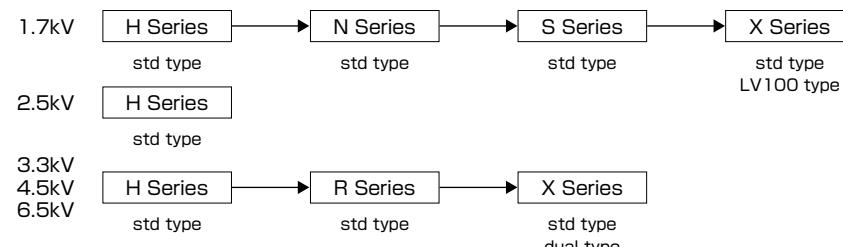
★★: Under Development ★: New Product

(*) Type name may change during development.

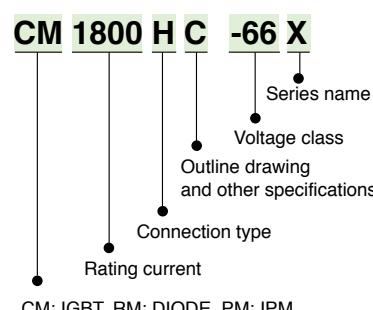
Please check the latest information on the website.

The outline drawing is written the figure of principal part numbers that have a common dimension.

■ Evolution of HVIGBT Module Series



■ Type Name Definition of IGBT Modules



■ Series Matrix of HVIGBT (No.: Number of Outline Drawing, see page 39 to 40)

V _{CES} (V) I _C (A)	4500V										6500V													
	X-Series				R-Series				H-Series				X-Series				R-Series				H-Series			
	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.			
200A																				CM200HG-130H	H	G	05	
225A												CM225DG-130X** ^(*)	D2	G	10									
300A												CM300DG-130X** ^(*)	D2	G	10									
350A	CM350DG-90X** ^(*)	D2	G	10																				
400A																				CM400HG-130H	H	G	07	
												CM400E2G-130H									E2	G	06	
												CM400E4G-130H									E4	G	06	
450A	CM450DG-90X** ^(*)	D2	G	10																				
600A									CM600HG-90H	H	G	07	CM600HG-130X** ^(*)	H	G	07					CM600HG-130H	H	G	06
									CM600HGB-130X** ^(*)	H	E4	06	CM600E4G-130X** ^(*)	H	G	06								
750A																	CM750HG-130R	H	G	06				
800A					CM800HC-90R	H	C	03	CM800HG-90R	H	G	07												
900A	CM900HC-90X** ^(*)	H	C	03					CM900HG-90X*	H	G	07	CM900HG-90H	H	C	04	CM900HG-130X*	H	G	06				
	CM900HG-90X*	H	G	07						H	G	06	CM900HGB-90H	H	C	04								
1000A	CM1000HG-90X*	H	G	07									CM1000HG-130XA	H	G	06								
1200A					CM1200HC-90R	H	C	04	CM1200HG-90RA	H	C	04												
					CM1200HG-90R	H	G	06																
1350A	CM1350HC-90X*	H	C	04																				
	CM1350HG-90X*	H	G	06																				
1500A	CM1500HC-90XA	H	C	04																				
	CM1500HG-90X*	H	G	06																				
Connection	H				E2/E6				E4				D2											

[Type]

B: Cu base plate 6kV Isolation

C: AISIC base plate 6kV Isolation

G: AISIC base plate 10kV Isolation

★★: Under Development ★: New Product

(*): Type name may change during development.

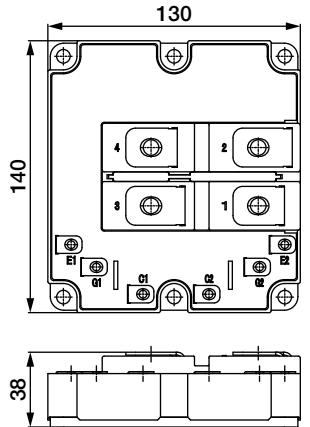
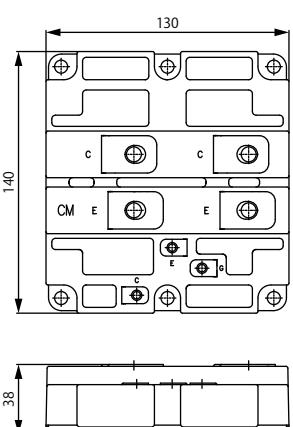
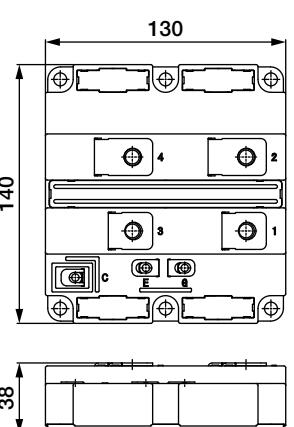
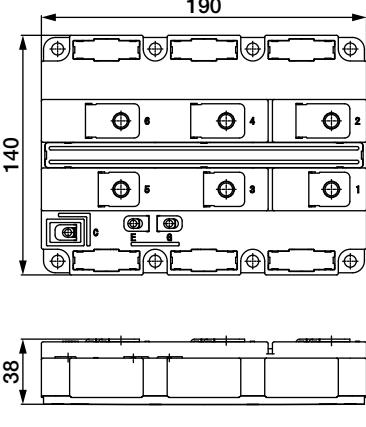
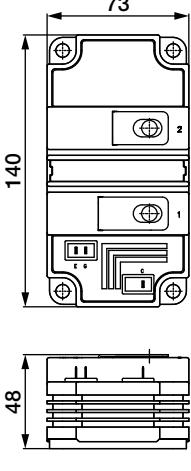
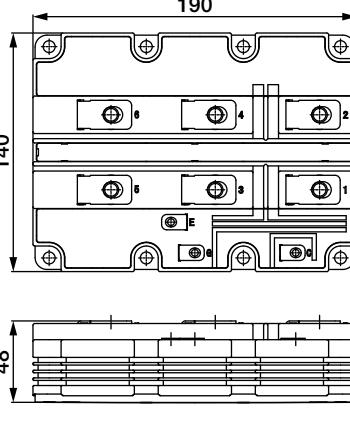
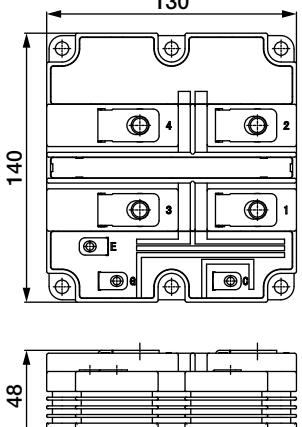
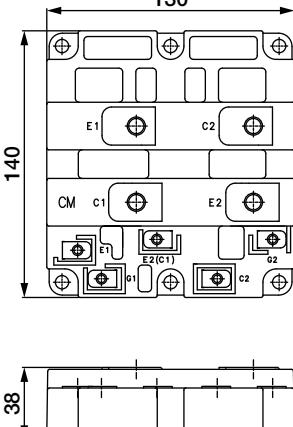
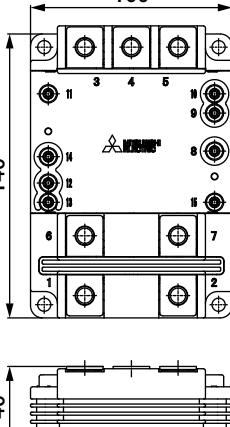
Please check the latest information on the website.

The outline drawing is written the figure of principal part numbers that have a common dimension.

Lineup of HVIGBT Modules

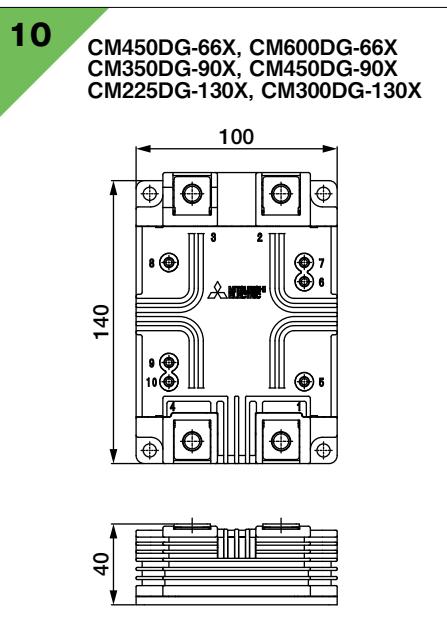
Outline Drawing of HVIGBT Modules

Unit:mm

01 CM1200DC-34N/S CM800DZB-34N CM600DY/E2Y-34H CM800DZ-34H	02 CM1200,1600HC-34H	03 CM1200E4C-34X CM1600,2400HC-34X CM1200HC-66X CM900HC-90X etc.
		
04 CM2400HCB-34X, CM3600HC-34X CM1200E4C-66X, CM1200HCB-66X CM1800HC-66X, CM1350HC-90X CM1500HC-90XA etc.	05 CM400HG-66H CM200HG-130H	06 CM1800HG-66X, CM900HGB-90X, CM900E4G-90X, CM1350HG-90X, CM1500HG-90X, CM600HGB-130X, CM600E4G-130X, CM900HG-130X, CM1000HG-130XA etc.
		
07 CM900, 1000HG-90X CM800HG-90R CM600HG-90H/130X CM400HG-130H	08 CM400DY-50H/66H	09 CM1000DC-34X, CM1200DC-34X CM450DC-66X, CM600DC-66X
		

■ Outline Drawing of HVIGBT Modules

Unit:mm



HVDIODE Modules

Series , Main Application

Series	Main Application
HVDIODE Modules	Traction/Power transmission/Motion control

Data sheet
here

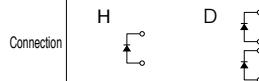


Rated Lineup

		Rated current										
		200A	250A	300A	400A	450A	600A	800A	900A	1000A	1200A	1500A
Rated voltage	1700V							●			●	
	3300V				●		●			●		
	4500V					●					●	
	6500V	●				●				●		

■ Series Matrix of HVDIODE Modules (No.: Number of outline drawing, see page 42)

V _{PRM} I _{F(A)}	1700V			3300V			4500V			6500V		
	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.	Connection	Type	No.
200										RM200DG-130S	D	G 13
250										RM250DG-130F	D	G 13
300							RM300DG-90S	D	G 13	RM300DG-130X**	D	G 13
400				RM400DG-66S RM400DY-66S	D D B 14	13	RM400DG-90F	D	G 13			
450							RM450DG-90X*	D	G 13	RM450DG-130X**	D	G 13
600				RM600DY-66S RM600DC-66X* RM600DG-66X**	D D C 14 D G 13	14	RM600HE-90S	H	C 13	RM600DG-130S RM600DG-130X**	D D G 13	G 13
800	RM800DC-34X**	D	C 11				RM800DG-90F	D	G 13			
900				RM900DG-66X**	D	G 13	RM900HC-90S RM900DB-90S RM900DG-90X**	H D D	C 14 B 14 G 13			
1000				RM1000DC-66F	D	C 14				RM1000DG-130XA*	D	G 13
1200	RM1200DB-34S RM1200DC-34X**	D D	B C 11	RM1200DG-66S RM1200HE-66S RM1200DB-66S RM1200DC-66X** RM1200DG-66X*	H H D D D	G C 12 B 14 C 14 G 13	RM1200DG-90F	D D	D 13			
1500				RM1500HE-66F RM1500DC-66F	H D	C 12 C 14	RM1500DC-90X** RM1500DG-90X**	D D	C 14 G 13			
1800	RM1800HE-34S	H	C 12									



[Type]

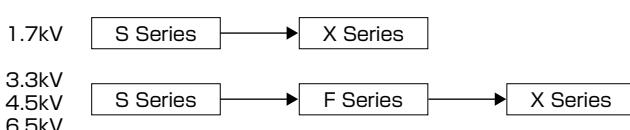
B: Cu base plate 6kV Isolation C: AlSiC base plate 6kV Isolation

G: AlSiC base plate 10kV Isolation

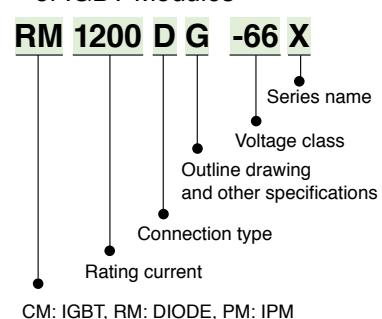
★: New product ★★: Under Development

The outline drawing is written the figure of principal part numbers that have a common dimension.

■ Evolution of HVDIODE Module Series



■ Type Name Definition of IGBT Modules

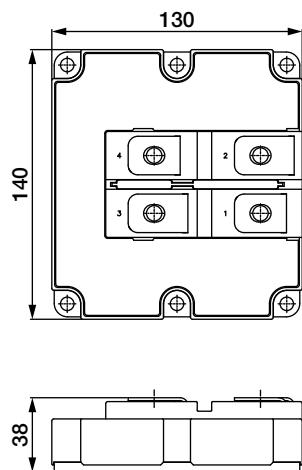


Lineup of HVDIODE Modules

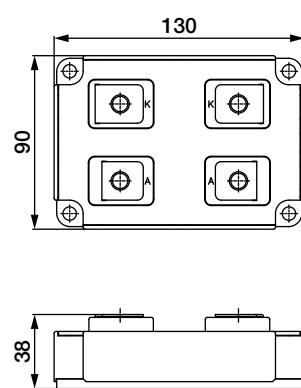
Outline Drawing of HVDIODE Modules

Unit:mm

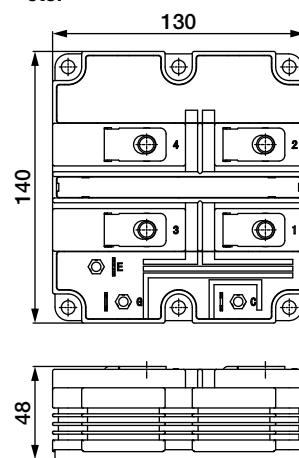
11
RM800,1200DC-34X
RM1200DB-34S



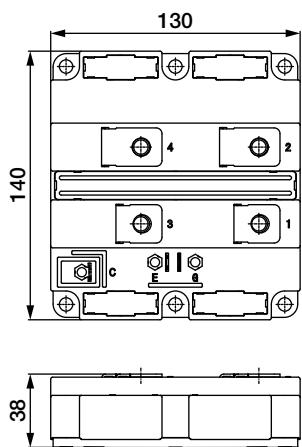
12
RM1800HE-34S, RM1500HE-66F
RM1200HE-66S, RM600HE-90S



13
RM600/900/1200DG-66X
RM450/900/1500DG-90X
RM300/450/600DG-130X
RM1000DG-130XA
etc.



14
RM600,1200DC-66X
RM1500DC-90X
RM1000,1500DC-66F
RM400,600DY-66S
RM1200DB-66S, RM900DB/HC-90S



Power Modules for xEV

Series , Main Application

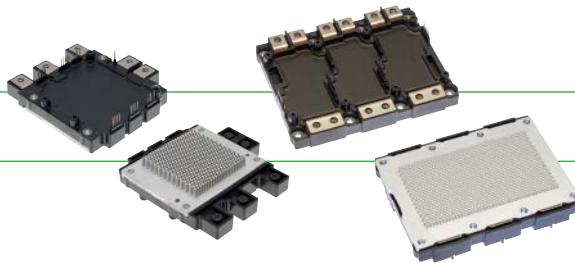
Series	Main Application
J1	xEV
J	

Rated Lineup

Rated voltage		Rated current			
		300A	600A	700A	1000A
650V				●	
1200V		●			



Featured Products



■ Block Diagram

Package with 6-in-1 connection and integrated water-cooled fin contributes to more compact, high-power inverters for xEV

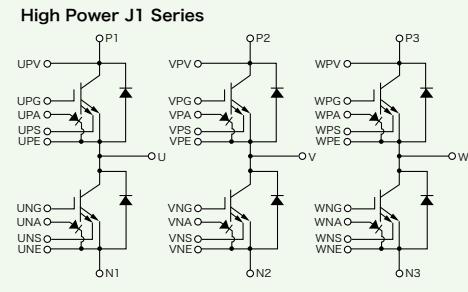
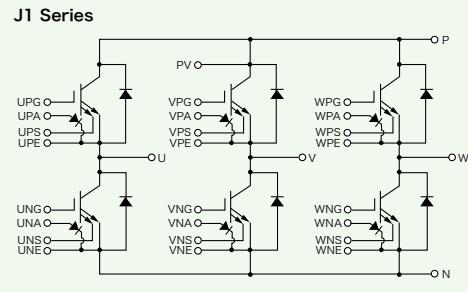
J1 Series / High Power J1 Series power Modules for xEV

CT600C1A060-A, CT700CJ1A060-A
CT1000CJ1B060, CT600CJ1B120

<Main Features>

- Integrated direct water-cooling structure with cooling fins and 6-in-1 connection contribute to more compact inverters for xEV
- Direct lead bonding (DLB) structure ensures high reliability
- Loss further reduced by incorporating 7th-generation IGBT built with a CSTBT™* structure
- On-chip current sensor that enables high-speed current-cutoff protection is installed
- Completely lead-free, confirms to RoHS directive (2011/65/EU)
- Suitable for a variety of electric and hybrid vehicle inverters

*CSTBT™: Mitsubishi Electric's unique IGBT that utilizes the carrier cumulative effect.



■ Features

Common

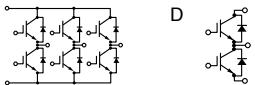
- Long power/temperature cycle life
- High-precision on-chip temperature sensor
- High traceability in managing materials/components for each product throughout the entire production process
- Package structure compliant with the End-of-Life-Vehicles Directive, regulations relating to substances of environmental concern

J Series T-PM (Transfer-molded Power Module)

- Structure incorporates transfer molding and original direct lead bonding(DLB) technique
- DLB structure reduces internal wiring resistance and inductance
- Completely Pb-free (including the pins)

Matrix of 650V Power Modules

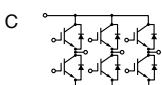
V _{CES} (V)	650V					
Series	J1 Series			J Series		
I _C (A)	Power Module with pin fin	Connection	No.	T-PM	Connection	No.
300	-	-	-	CT300DJG060	D	02
600	CT600CJ1A060-A	C	01	-	-	-
700	CT700CJ1A060-A	C	01	-	-	-
1000	CT1000CJ1B060	C	03	-	-	-



★★: Under Development

Matrix of 1200V Power Modules

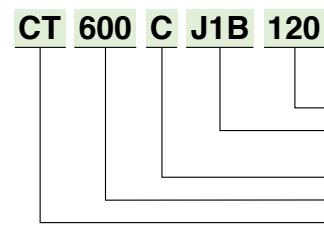
V _{CES} (V)	1200V		
Series	J1 Series		
I _C (A)	Power Module with pin fin	Connection	No.
300	CT300CJ1A120-A★★	C	01
600	CT600CJ1B120	C	03



★★: Under Development

NOTE: In case of CT1000CJ1B060 and CT600CJ1B120, each pair of arms is not connected internally.

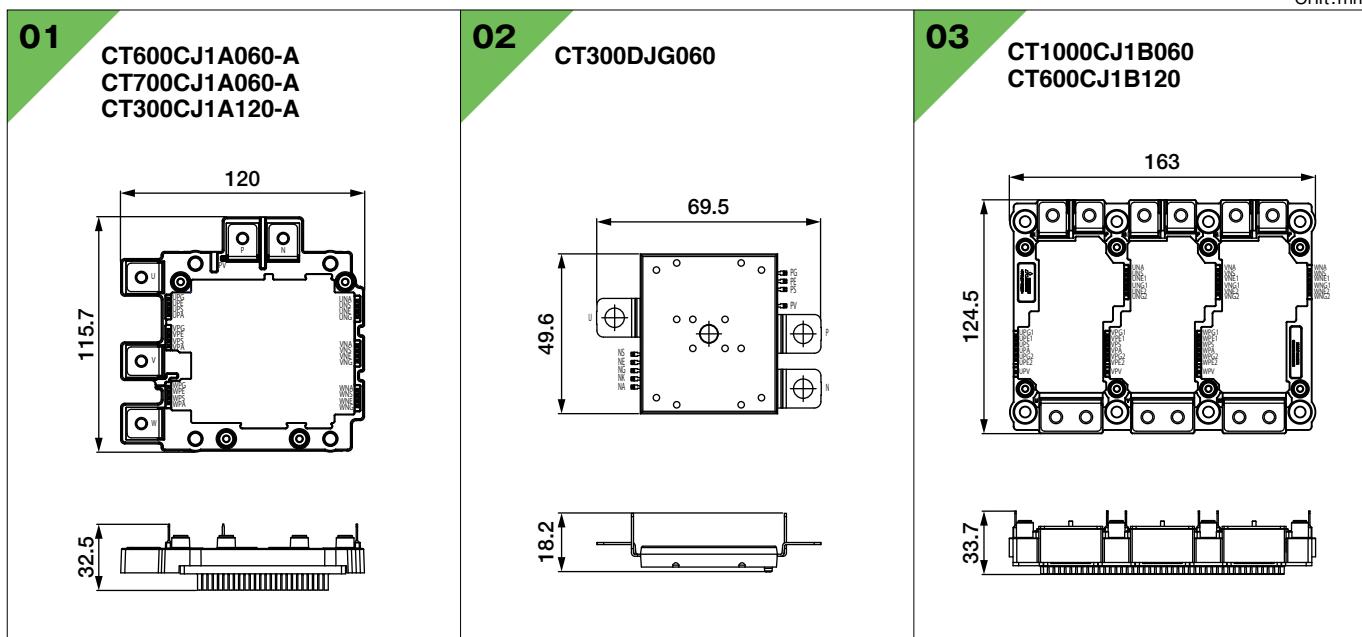
Type Name Definition of Power Modules for xEV



- Voltage class
- Series name and structure
- Connection type
- Rating current class
- CT: IGBT

Outline Drawing of Power Modules for xEV

Unit:mm



MEMO

MEMO

Mitsubishi Electric Semiconductors & Devices Website

www.MitsubishiElectric.com/semiconductors/



Keep safety first in your circuit designs!

- Mitsubishi Electric Corporation puts the maximum effort into making semiconductor products better and more reliable, but there is always the possibility that trouble may occur with them. Trouble with semiconductors may lead to personal injury, fire or property damage. Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of non-flammable material or (iii) prevention against any malfunction or mishap.

Notes regarding these materials

- These materials are intended as a reference to assist our customers in the selection of the Mitsubishi semiconductor product best suited to the customer's application; they do not convey any license under any intellectual property rights, or any other rights, belonging to Mitsubishi Electric Corporation or a third party.
 - Mitsubishi Electric Corporation assumes no responsibility for any damage, or infringement of any third-party's rights, originating in the use of any product data, diagrams, charts, programs, algorithms, or circuit application examples contained in these materials.
 - All information contained in these materials, including product data, diagrams, charts, programs and algorithms represents information on products at the time of publication of these materials, and are subject to change by Mitsubishi Electric Corporation without notice due to product improvements or other reasons. It is therefore recommended that customers contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for the latest product information before purchasing a product listed herein.
- The information described here may contain technical inaccuracies or typographical errors. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability, or other loss rising from these inaccuracies or errors. Please also pay attention to information published by Mitsubishi Electric Corporation by various means, including the Mitsubishi Semiconductor home page (<http://www.MitsubishiElectric.com/>).
- When using any or all of the information contained in these materials, including product data, diagrams, charts, programs, and algorithms, please be sure to evaluate all information as a total system before making a final decision on the applicability of the information and products. Mitsubishi Electric Corporation assumes no responsibility for any damage, liability or other loss resulting from the information contained herein.
 - Mitsubishi Electric Corporation semiconductors are not designed or manufactured for use in a device or system that is used under circumstances in which human life is potentially at stake. Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor when considering the use of a product contained herein for any specific purposes, such as apparatus or systems for transportation, vehicular, medical, aerospace, nuclear, or undersea repeater use.
 - The prior written approval of Mitsubishi Electric Corporation is necessary to reprint or reproduce in whole or in part these materials.
 - If these products or technologies are subject to the Japanese export control restrictions, they must be exported under a license from the Japanese government and cannot be imported into a country other than the approved destination.
 - Any diversion or reexport contrary to the export control laws and regulations of Japan and/or the country of destination is prohibited.
 - Please contact Mitsubishi Electric Corporation or an authorized Mitsubishi Semiconductor product distributor for further details on these materials or the products contained therein.



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
www.MitsubishiElectric.com

Revised publication, effective Jun. 2020.
Superseding publication of H-CT575-E May 2019.
Specifications subject to change without notice.

©2020 Mitsubishi Electric Corporation