



FE Fuji Electric
Innovating Energy Technology

Power Semiconductors **Selection Guide**

05|2023

www.fujielectric.com
www.fujielectric-europe.com

About Us

Fuji Electric Co., Ltd. was established in 1923 in Japan as a capital and technology alliance between Furukawa Electric Co., Ltd. and Siemens AG. The company name was derived from these two companies, with „Fu“ and „Si“ and the highest mountain in Japan mount Fuji.

The Fuji Electric Europe GmbH was founded 1984 in Germany and is a 100% subsidiary of Fuji Electric Co., Ltd. based in Japan. For more than 30 years, Fuji Electric has successfully supplied the European market with power semiconductors for power conversion systems.

With a strong team of sales, application and development engineers, we always support our customers from all over Europe in commercial and technical matters. Furthermore, our international distribution network ensures a special service quality and proximity to customers.

Fuji Electric offers innovative energy technologies to make a sustainable contribution to social and industrial infrastructure worldwide. Population growth and rapid industrial advances are making energy management and environmental protection increasingly important. Therefore, Fuji Electric strives continuously the development and improvement of existing technologies. Our innovative products in energy and environmental technology achieve high added value, outstanding eco-friendliness and energy with maximum efficient use.

Our Services

Application Portfolio

For a long while, the main applications of our power semiconductors were the electric drive technology (frequency converters, servo drives) and the uninterruptible power supply (UPS). The foundation stone was placed based on these applications for outstanding quality, high reliability and implementation of the latest technologies.

The application portfolio is growing steadily and it includes new applications today such as: renewable energy (wind energy, photovoltaic), hybrid/electric mobility, energy supply and distribution (smart grid), traction, etc. Technology development always requires new technical and efficient solutions with long service life as well as highest quality.

Our state-of-the-art production sites in front-end, back-end and warehouse locations enable us to supply the world's growing number of customers with power semiconductors.

Our 7th IGBT generation (X series) is currently replacing older generations in the market. The new products can easily replace existing products due to their electrical and mechanical compatibility while they are continuing to reduce losses.

Logistic Services

Our logistic center in Frankfurt offers our customers high availability and enables short delivery times as well as extensive logistics services.

Technical Support

Our competent application engineering team offers application support from A to Z, as well as special technical solutions. Furthermore, our development engineers support professionally and reliably with on-site design-in solutions.

Service for thermal interface material (TIM)

Our automated printing process guarantees consistent printing and improved thermal conductivity through accurate printing equipment, optimized module-specific printing patterns and software monitoring.



Fuji Electric provides Power Semiconductors well suited for various applications



Inverters (LV-INV)

Semiconductor products best suited for general-purpose inverters that carry out variable-speed operation of motors in products such as belt conveyors, fans and pumps.



Medium – Voltage Inverters (MV-INV)

Semiconductor products suitable for medium-voltage inverters that drive 3-phase AC 3kV/6kV/6.6kV high-voltage motors used in iron and steel plants, textile plants and paper mills.



Railroads (TRAIN)

Semiconductor products suited for the power electronics of railroad cars such as the main motor drive and auxiliary power supply equipment of rolling stock.



NC / Servos (SERVO)

Semiconductor products best suited to NC and servos that carry out speed control and positioning of machine tools, as well as robots that have multi-spindle control features used in assembly, welding and conveyance.



Elevator/Escalator

Semiconductor products suited for the inverters to drive elevators or escalators. Parts can be used for integrated solutions or machine room installations.



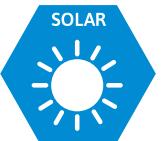
Wind Power Generation (WIND)

Semiconductor products suitable for AC/DC converters that convert the AC power output from wind turbine generators to DC power, as well as for inverters that convert DC power to AC power of commercial frequencies.



Welding Machines (WELDING)

Semiconductor products suitable for switching circuits that generate resistance heat in welding machines to melt and integrate by adding heat or pressure to two or more metallic members.



Solar (SOLAR)

Semiconductor products best suited for power conditioners that convert solar panel generated DC power into AC power to enable the residential consumption, as well as to facilitate the recovery of the power to the power systems of power companies.



PC / Servers (PC+SERVER)

Semiconductor products suitable for the power supplies of increasingly high-performance desktop PCs and servers, as well as of increasingly compact and lightweight notebook PCs.



UPS (UPS)

Semiconductor products ideal for the power conversion circuits of UPS (uninterruptible power supply) that prevent system shutdown during power outages and instantaneous power failures.



Switching Power Supplies (PSU)

Semiconductor products best suited for general-purpose switching power supplies used in a wide variety of applications such as equipment for general consumers and OA and communication devices.



White Goods

Semiconductor products which suits best to the needs of white goods, like low power (650V rating), compact size and integrated drive and protection functions.



Fuji Electric Power Semiconductors contributing energy management in various fields

Fuji Electric provides Power Semiconductors enabling high-efficiency energy usage in various fields such as industrial machinery, automobile, railroad, social infrastructure, renewable energy, consumer electronics and information equipment in order to achieve a low carbon society.



RENEWABLE ENERGY



INDUSTRY

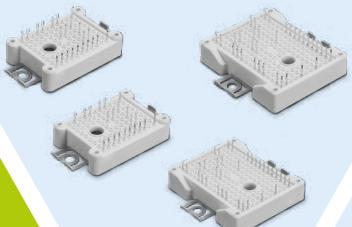


PUBLIC TRANSPORTATION

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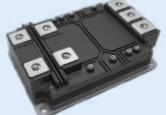
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Small PIM



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High Power next Core (HPnC)
SiC Modules



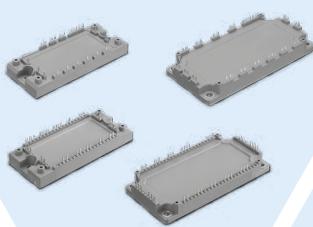
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Rectifier Diode; SiC-SBD



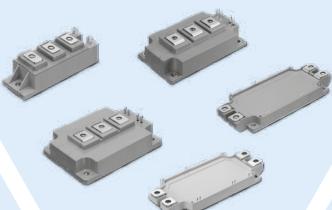
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PIM



Page 18 – 19

Standard 2-Pack



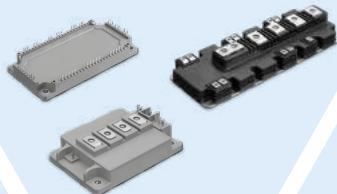
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Small IPM



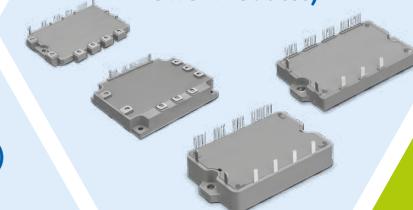
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Advanced T-type NPC 3-Level
Modules



Page 32 – 37

Package Outlines (in mm)



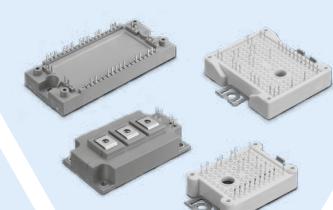
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6-Pack



Page 22

SiC Modules



Page 25

I-type NPC 3-Level Modules



Page 30

Discrete IGBT



* Note: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

Thermal interface material (TIM)

Fuji Electric's printing process of pre-applied TIM is automated and carried out by a computer controlled printing line under clean environment.

Precise printing equipment and optimized module specific printing patterns guarantee a uniform print and maximum thermal conductivity.



The range of modules with pre-applied TIM is being continually expanded.

For latest availability status please contact us:
info.semi@fujielectric-europe.com

3D-imaging tests ensure the compliance of our specified TIM thickness.

The whole process is controlled by our traceability system and qualified staff to ensure our high-quality standards.

Process - Benefits

- + Outsourcing of a dirty process
- + Stable quality level
- + Increased system reliability

Features

- + Optimized pattern for Fuji modules
- + Increase lifetime of IGBT
- + Advanced IGBT power density

Thermal - Benefits

- + Higher thermal conductivity
- + Uniform thermal resistance
- + Higher reliability and lifetime

New TIM

- + Capable for T_C up to 150 °C
- + Higher thermal conductivity
- + High reliability

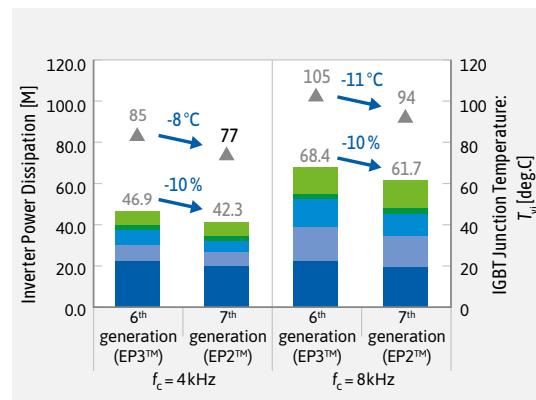


Features of IGBT module X series

1. Low power dissipation

The module has been optimized by reducing the thickness and miniaturizing the structure of the IGBT chip and diode chip that make up the module. This reduces power losses during inverter operation compared to the previous 6th generation V series.

Reduced inverter power dissipation by 10% and chip temperature by 10°C compared with the 6th generation V series EP3™ package (75A, at $f_c = 8\text{kHz}$).

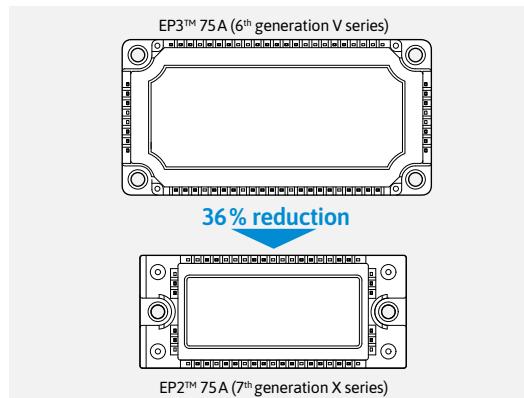


2. Miniaturization

The application of the newly developed insulating board has improved the heat dissipation of the module.

A smaller footprint of about 36 % has been achieved by reducing power loss and suppressing heat generation compared with the previous product.

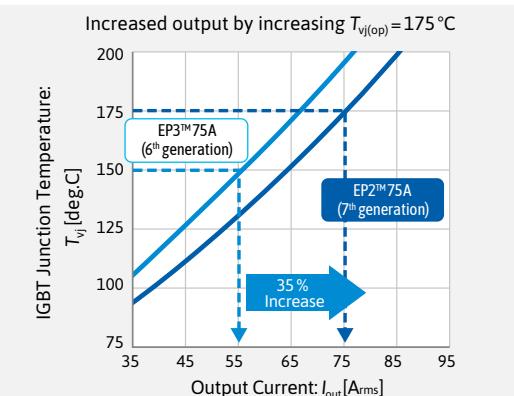
Application Example



3. High temperature operation

Achieves continuous operation at 175°C through chip optimization and improved package reliability and heat resistance.

- Up to 35 % more output than the previous generation
- ΔT_{vj} power cycle capability improvement (twice as high as before)



P_{rr}	: Reverse recovery loss
P_f	: FWD conduction loss
P_{on}	: Turn-on loss
P_{off}	: Turn-off loss
P_{sat}	: IGBT conduction loss
ΔT_{vj}	: Junction temperature

$V_{DC} : 600\text{V}, I_o : 35\text{ Arms}, f_o : 50\text{Hz},$
Power factor = +0.9, modulation factor = 1.0,
Reverse recovery dv/dt = 10 kV/μs

Note: PrimePACK™, EconoPIM™ and EconoPACK™ are registered trademarks of Infineon Technologies AG, Germany

Product Portfolio

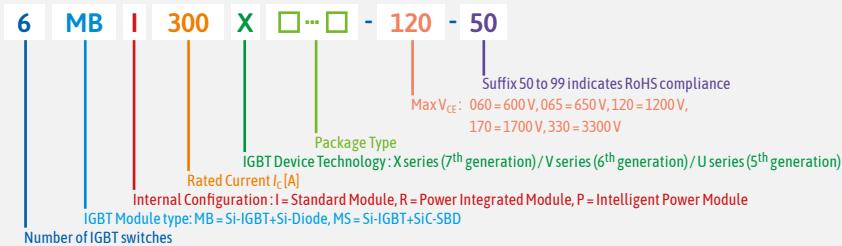
Number of Switches	Products Category	Internal Configuration						Max $V_{CE}(V_{RRM})$						Rated Current						Page				
		IGBT Module			Discrete IGBT	Rectifier Diode	Discrete SiC-SBD	600 V	650 V	1200 V	1700 V	2300 V	3300 V	$\leq 50 A$	$\geq 50 A$	$\leq 150 A$	$\geq 150 A$	$\leq 300 A$	$\geq 300 A$	$\leq 600 A$	$\geq 600 A$			
		Standard Module	Power Integrated Module	Intelligent Power Module																				
7	Small PIM EconoPIM™	•							•	•	•			•									14	
		•							•	•	•			•	•	•	•						15/16	
		•							•	•	•			•	•	•	•						15/16	
6	6-Pack EconoPACK™	•							•		•			•	•	•	•	•	•	•	•	•		17
2	Standard 2-Pack	•							•	•	•			•		•	•	•	•	•	•	•		18/19
1,2	High Power next Core	•												•										21/23
	PrimePACK™	•												•										20/21
2,6	SiC Module	•									•	•	•	•	•	•	•	•	•	•	•	•		22
4,12	T/I-type NPC 3-Level	Reverse-Blocking IGBTs are integrated.						•		•	•			•	•	•	•	•	•	•	•	•		24/25
6,7	Small IPM / IPM		•						•	•	•			•	•	•	•	•	•	•	•	•		25-29
1	Discrete IGBT			•					•	•	•			•	•	•	•	•	•	•	•	•		30
	Rectifier Diode				•				•	•	•			•	•	•	•	•	•	•	•	•		31
	SiC-SBD					•			•		•			•				•						31

Note: PrimePACK™, EconoPIM™ and EconoPACK™ are registered trademarks of Infineon Technologies AG, Germany



Type Name Explanation

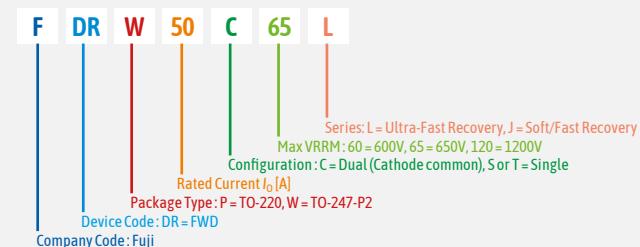
IGBT Module Production Number



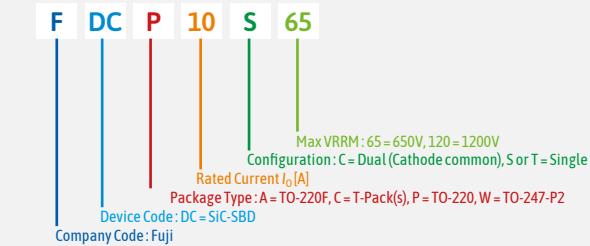
Discrete IGBT Production Number



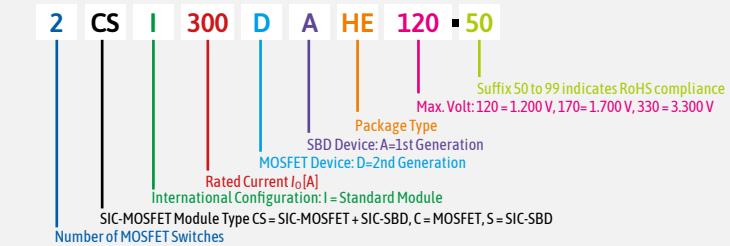
Rectifier Diode Production Number



SiC Schottky-Barrier Diode Production Number



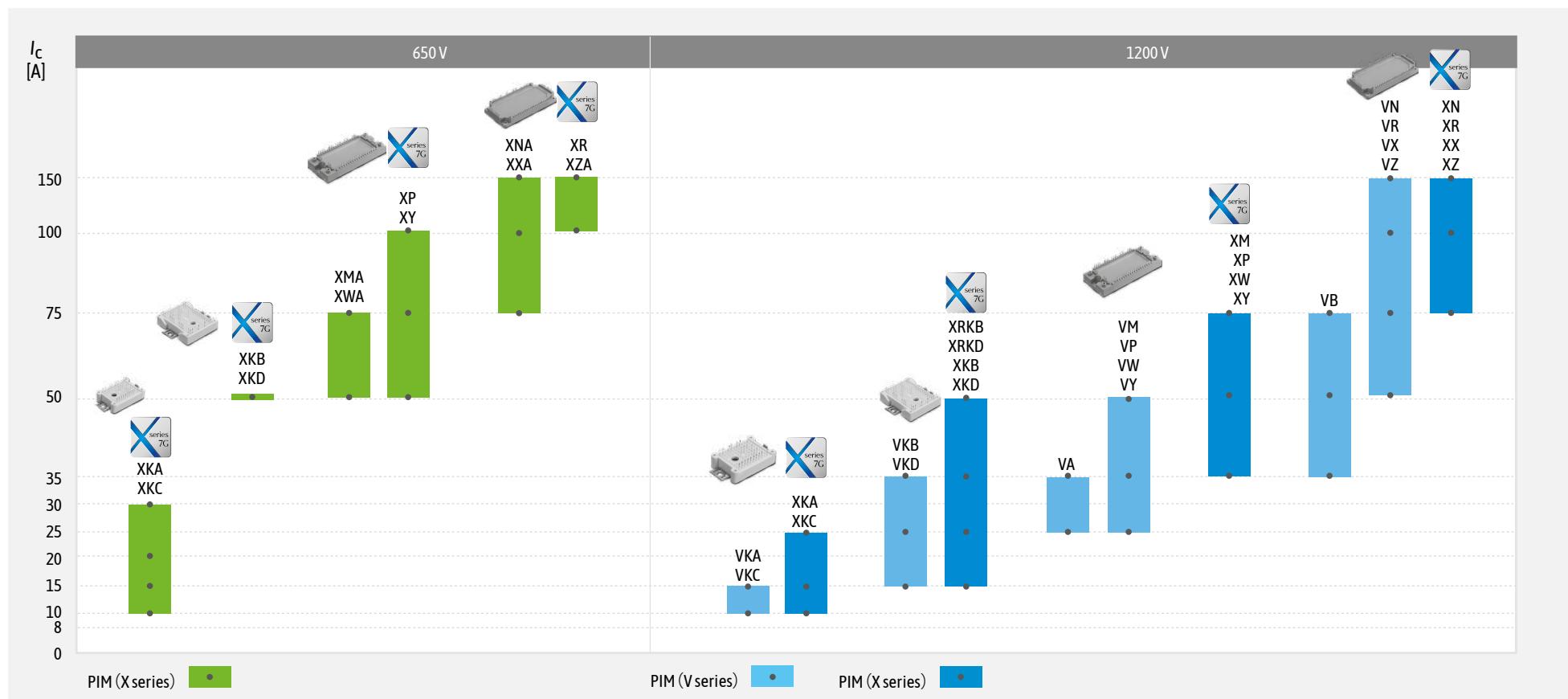
All-SiC Module Production Number



PIM (Power Integrated Modules) Product Map

7MBR	I_c	IGBT series & Package type				Size	Page		
		V series		X series					
	Solder pins	Press fit pins	Solder pins	Press fit pins					
	VKC	VKA	XKC	XKA	33.8 x 62.8 mm	14	EconoPIM™		
	VKD	VKB	XKD, XRKD	XKB, XRKB	56.7 x 62.8 mm				
	VA, VM, VP	VW, VY	XM, XP	XW, XY	45 x 107.5 mm	15/16			
	VB, VN, VR	VX, VZ	XN, XR	XX, XZ	62 x 122 mm	15/16			

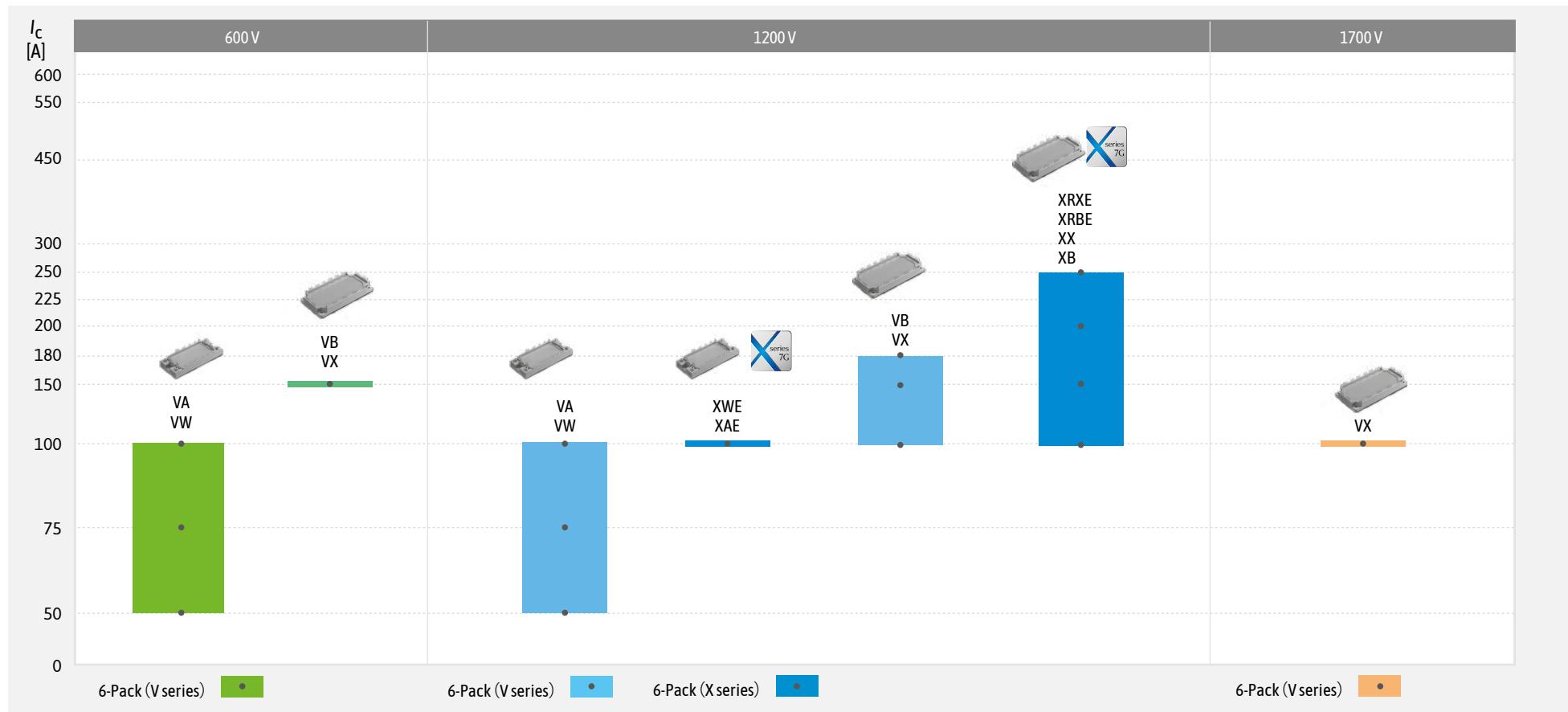
Note:
EconoPIM™ is registered trademark of
Infineon Technologies AG, Germany.



6-Pack Product Map

6MBI	I_c	IGBT series & Package type				Size	Page		
		Vseries		Xseries					
		Solder pins	Press fit pins	Solder pins	Press fit pins				
		VA	VW	XAE	XWE	45x107.5 mm	17		
		VB	VX	XB,XRBE	XX,XRXE	62x122 mm	17		

Note: EconoPACK™ is registered trademark of Infineon Technologies AG, Germany.

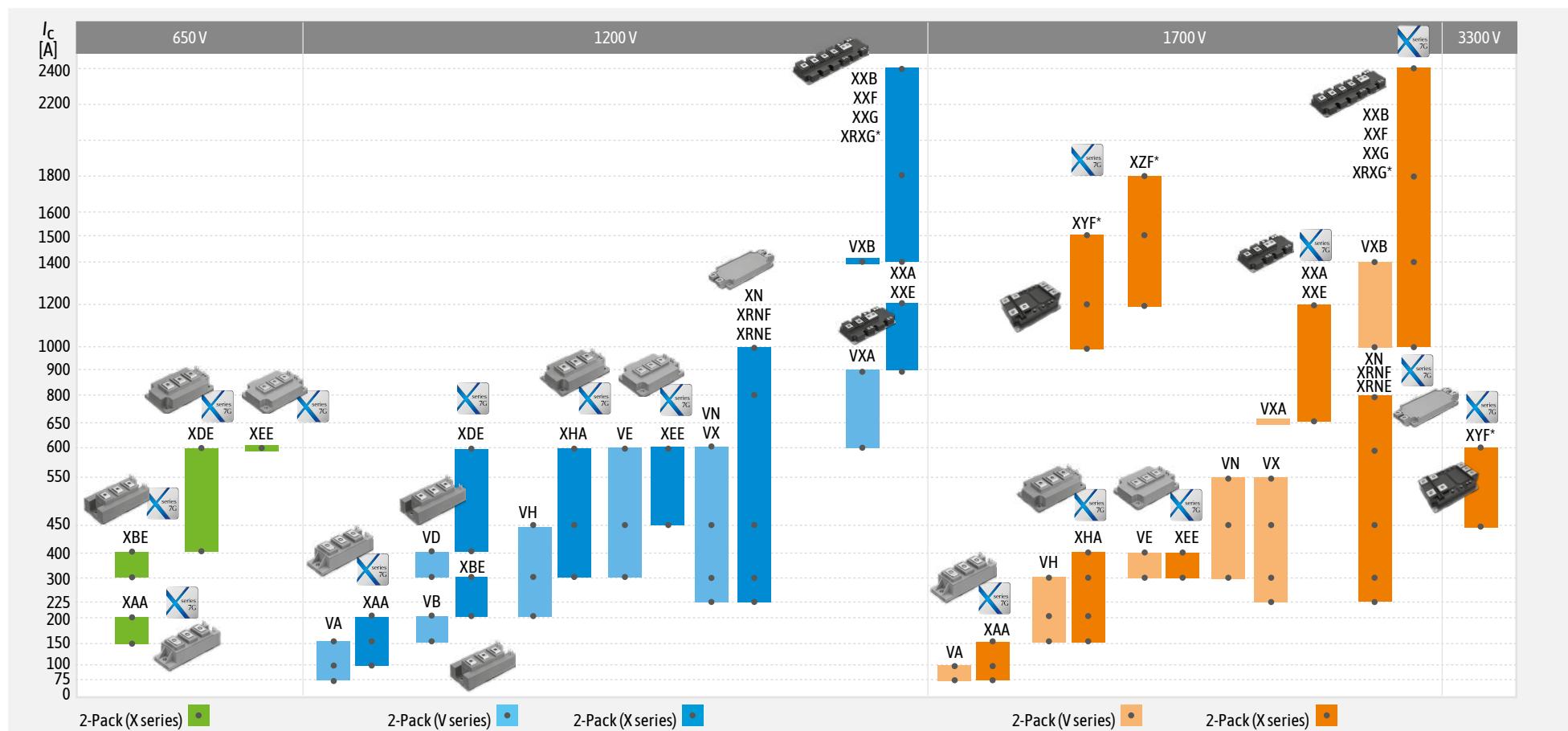


2-Pack Product Map

2MBI	I_c	IGBT series & Package type		Size		Page
		V series	X series			
100A	VA	XAA	34 x 94 mm	Standard Pack	18	
	VB	XBE	45 x 92 mm		18	
	VD	XDE	62 x 108 mm		18	
	VE	XEE	80 x 110 mm		18	
	VH	XHA	62 x 108 mm		18	
	VN, VX	XN, XRNE, XRNF	62 x 150 mm	Dual XT	19	
		XYF, XZF*	100 x 144 mm	HPnC	21	
	VXA	XXA, XXE	89 x 172 mm	PrimePACK™	20/21	
	VXB	XXB, XXF, XXG, XRXG	89 x 250 mm		20/21	

Note:
PrimePACK™ is registered trademark
of Infineon Technologies AG, Germany

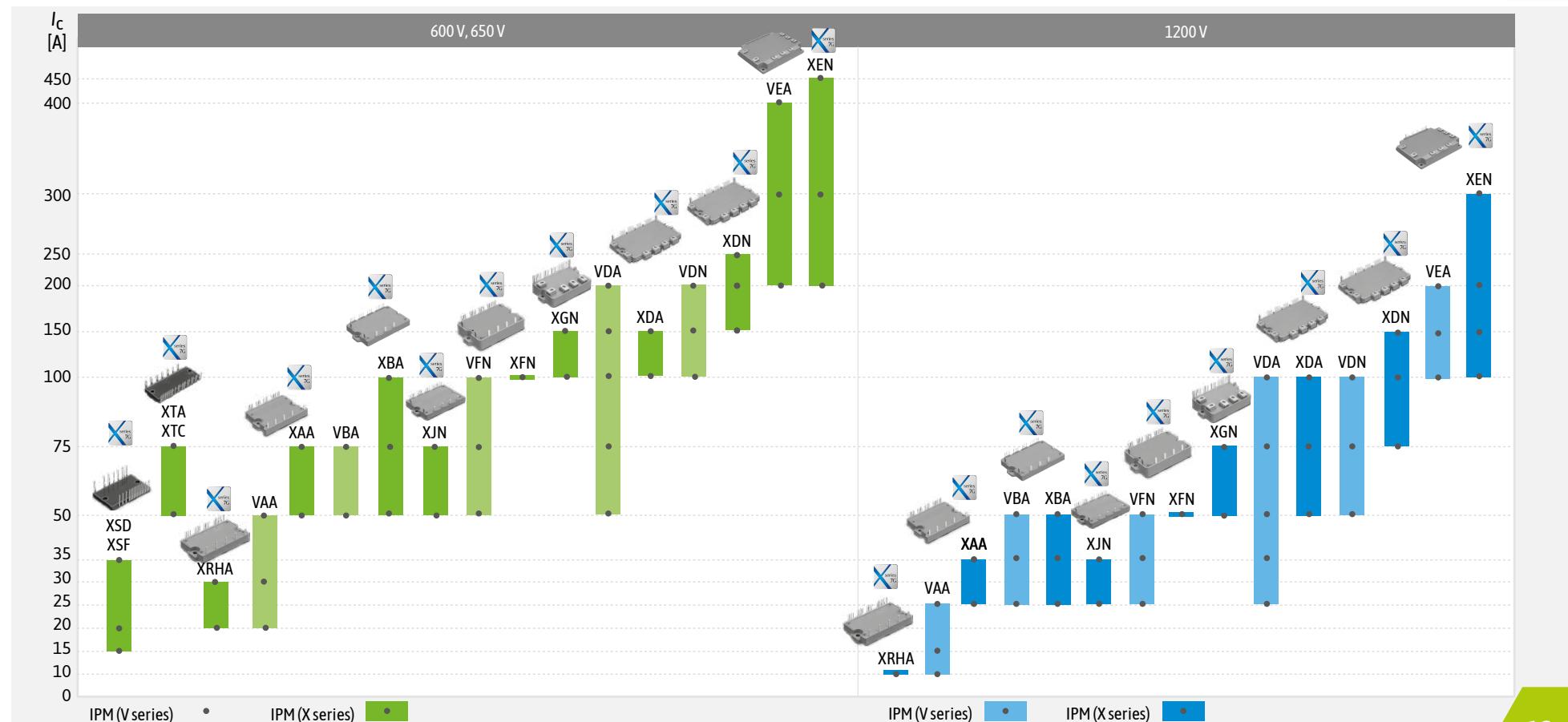
*Under development



* Under development

IPM (Intelligent Power Modules) Product Map

6/7MBP	I_C	IGBT series & Package type								Size	Page
		Vseries		Xseries		Vseries		Xseries			
		XSD, XSF		7 in 1	6 in 1	7 in 1	6 in 1				
VAA VBA VFN VDA, VDN VEA	XTA, XTC	XSD, XSF							•	26 x 43 mm	25
	XRHA	XTA, XTC							•	79 x 31 mm	25
	VAA	XAA							•	36 x 70 mm	26
	VBA	XBA				•			•	49.5 x 70 mm	26
	XJN								•	50.2 x 87 mm	26
	VFN	XFN	•		•				•	50.2 x 87 mm	26
	XGN								•	55 x 90 mm	27
	VDA, VDN	XDA, XDN	•		•				•	55 x 90 mm	27
	VEA	XEN	•		•				•	84 x 128.5 mm	28
									•	110 x 142 mm	29



Small PIM (Power Integrated Modules)

	I_C	650 V Xseries	1200 V Vseries	1200 V Xseries
With NTC, press fit pins	10 A	7MBR10XKA065-50	7MBR10VKA120-50	7MBR10XKA120-50
	15 A	7MBR15XKA065-50	7MBR15VKA120-50	7MBR15XKA120-50
	20 A	7MBR20XKA065-50		
	25 A			7MBR25XKA120-50
	30 A	7MBR30XKA065-50		
V: M726, X: M730	15 A		7MBR15VKB120-50	7MBR15XKB120-50
	25 A		7MBR25VKB120-50	7MBR25XKB120-50
	35 A		7MBR35VKB120-50	7MBR35XKB120-50
	50 A	7MBR50XKB065-50		7MBR50XRKB120-50*
V: M727, X: M731	10 A	7MBR10XKC065-50	7MBR10VKC120-50	7MBR10XKC120-50
	15 A	7MBR15XKC065-50	7MBR15VKC120-50	7MBR15XKC120-50
	20 A	7MBR20XKC065-50		
	25 A			7MBR25XKC120-50
	30 A	7MBR30XKC065-50		
With NTC, solder pins	15 A		7MBR15VKD120-50	7MBR15XKD120-50
	25 A		7MBR25VKD120-50	7MBR25XKD120-50
	35 A		7MBR35VKD120-50	7MBR35XKD120-50
	50 A	7MBR50XKD065-50		7MBR50XRKD120-50*
V: M728, X: M732	10 A	7MBR10XKC065-50	7MBR10VKC120-50	7MBR10XKC120-50
	15 A	7MBR15XKC065-50	7MBR15VKC120-50	7MBR15XKC120-50
	20 A	7MBR20XKC065-50		
	25 A			7MBR25XKC120-50
	30 A	7MBR30XKC065-50		
V: M729, X: M733	15 A		7MBR15VKD120-50	7MBR15XKD120-50
	25 A		7MBR25VKD120-50	7MBR25XKD120-50
	35 A		7MBR35VKD120-50	7MBR35XKD120-50
	50 A	7MBR50XKD065-50		7MBR50XRKD120-50*

*RC-IGBT

PIM (Power Integrated Modules) EconoPIM™

With NTC, solder pins. PIM

I_C	650V Xseries	1200V	
	X series 7G	Vseries	Xseries
25 A		7MBR25VA120-50	
35 A		7MBR35VA120-50	
35 A		7MBR35VB120-50	
50 A		7MBR50VB120-50	
75 A		7MBR75VB120-50	
25 A		7MBR25VM120-50	
35 A		7MBR35VM120-50	7MBR35XMA120-50
50 A	7MBR50XMA065-50	7MBR50VM120-50	7MBR50XMA120-50
75 A	7MBR75XMA065-50		7MBR75XME120-50
50 A		7MBR50VN120-50	
75 A	7MBR75XNA065-50	7MBR75VN120-50	7MBR75XNA120-50
100 A	7MBR100XNA065-50	7MBR100VN120-50	7MBR100XNA120-50
150 A	7MBR150XNA065-50	7MBR150VN120-50	7MBR150XNE120-50
25 A		7MBR25VP120-50	
35 A		7MBR35VP120-50	7MBR35XPA120-50
50 A	7MBR50XPA065-50	7MBR50VP120-50	7MBR50XPA120-50
75 A	7MBR75XPA065-50		7MBR50XPE120-50
100 A	7MBR100XPE065-50		7MBR75XPE120-50
50 A		7MBR50VR120-50	
75 A		7MBR75VR120-50	7MBR75XRA120-50
			7MBR75XRE120-50
100 A	7MBR100XRA065-50	7MBR100VR120-50	7MBR100XRA120-50
			7MBR100XRE120-50
150 A	7MBR150XRA065-50	7MBR150VR120-50	7MBR150XRE120-50

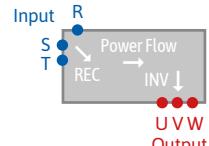
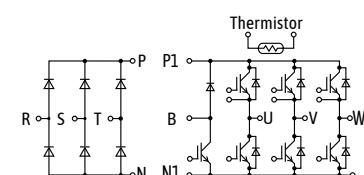
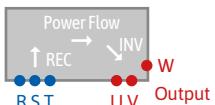
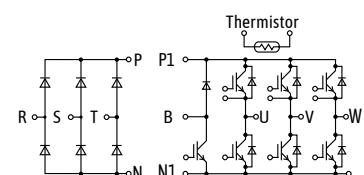
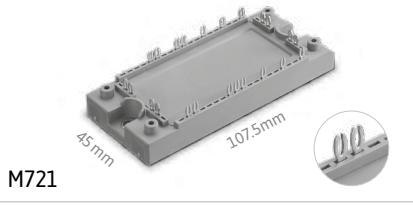
Note 1: Pin assignment of output terminals changes within the range of colored position depending on output current.

Note 2: EconoPIM™ is registered trademark of Infineon Technologies AG, Germany.

PIM (Power Integrated Modules) EconoPIM™

I_C	650V Xseries		1200V Xseries	
		Vseries		Xseries
25 A		7MBR25VW120-50		
35 A		7MBR35VW120-50	7MBR35XWA120-50	
50 A	7MBR50XWA065-50	7MBR50VW120-50	7MBR50XWA120-50	
75 A	7MBR75XWA065-50		7MBR75XWE120-50	
50 A		7MBR50VX120-50		
75 A	7MBR75XXA065-50	7MBR75VX120-50	7MBR75XXA120-50	
100 A	7MBR100XXA065-50	7MBR100VX120-50	7MBR100XXA120-50	
150 A	7MBR150XXA065-50	7MBR150VX120-50	7MBR150XXE120-50	
25 A		7MBR25VY120-50		
35 A		7MBR35VY120-50	7MBR35XYA120-50	
50 A	7MBR50XYA065-50	7MBR50VY120-50	7MBR50XYA120-50	
75 A	7MBR75XYA065-50		7MBR75XYE120-50	
100 A	7MBR100XYE065-50			
50 A		7MBR50VZ120-50		
75 A		77MBR75VZ120-50	7MBR75XZA120-50	
100 A	7MBR100XZA065-50	7MBR100VZ120-50	7MBR100XZA120-50	
150 A	7MBR150XZA065-50	7MBR150VZ120-50	7MBR150XZE120-50	

With NTC, press fit pins



Note 1: Pin assignment of output terminals changes within the range of colored position depending on output current.

Note 2: EconoPIM™ is registered trademark of Infineon Technologies AG, Germany.

6-Pack EconoPACK™

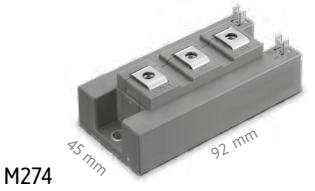
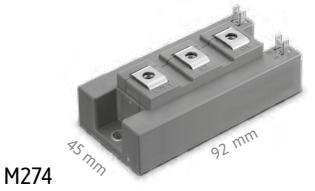
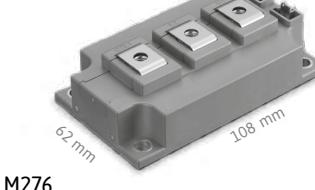
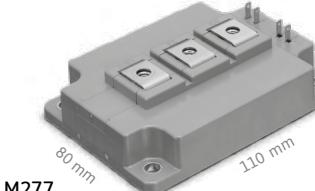
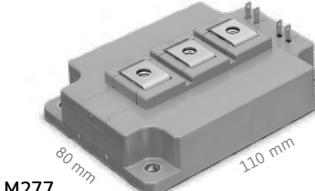
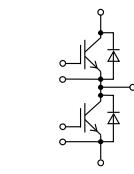
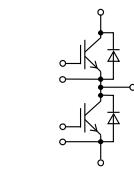
	I_C	600 V Vseries	1200 V Vseries	1200 V Xseries	1700 V Vseries
With NTC, solder pins					
V: M636, X: M669 Solder Pins	50 A	6MBI50VA-060-50	6MBI50VA-120-50		
	75 A	6MBI75VA-060-50	6MBI75VA-120-50		
	100 A	6MBI100VA-060-50	6MBI100VA-120-50	6MBI100XAE120-50	
	100 A		6MBI100VB-120-50	6MBI100XBA120-50	
	150 A	6MBI150VB-060-50	6MBI150VB-120-50	6MBI150XBA120-50	
	180 A		6MBI180VB-120-50	6MBI180VB-120-55 ^{*1}	
	200 A			6MBI200XBA120-50	
	250 A			6MBI200XBE120-50	
				6MBI250XRBE120-50 ^{*2}	
With NTC, press fit pins					
M647 Press fit Pins	50 A	6MBI50VW-060-50	6MBI50VW-120-50		
	75 A	6MBI75VW-060-50	6MBI75VW-120-50		
	100 A	6MBI100VW-060-50	6MBI100VW-120-50	6MBI100XWE120-50	
	100 A		6MBI100VX-120-50	6MBI100XXA120-50	6MBI100VX-170-50
	150 A	6MBI150VX-060-50	6MBI150VX-120-50	6MBI150XXA120-50	
	180 A		6MBI180VX-120-50	6MBI180VX-120-55	
	200 A			6MBI200XXA120-50	
	250 A			6MBI200XXE120-50	
				6MBI250XRXE120-50 ^{*2}	

Note: EconoPACK™ is registered trademark of Infineon Technologies AG, Germany.

^{*1)} 6MBI180VB-120-55, 6MBI180VX-120-55; 6MBI200XBE120-50; 6MBI200XXE120-50 ; Premium type (Low Thermal Impedance Version)

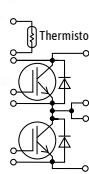
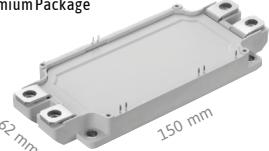
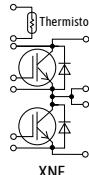
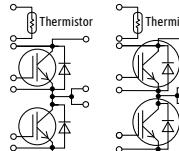
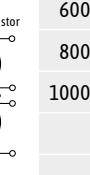
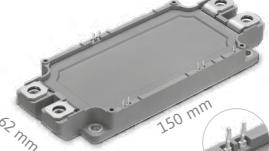
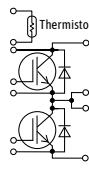
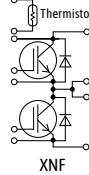
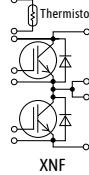
^{*2)} RC-IGBT

Standard 2-Pack

2-Pack		I _C	650 V	Xseries	1200 V	Vseries	Xseries	1700 V	Xseries
			650 V Xseries	Xseries 7G	1200 V Vseries	1200 V Xseries	Xseries 7G	Vseries	Xseries
		75 A			2MBI75VA-120-50			2MBI75VA-170-50	2MBI75XAA170-50
		100 A			2MBI100VA-120-50	2MBI100XAA120-50		2MBI100VA-170-50	2MBI100XAA170-50
		150 A	2MBI150XAA065-50		2MBI150VA-120-50	2MBI150XAA120-50			2MBI150XAA170-50
		200 A	2MBI200XAA065-50				2MBI200XAA120-50		
		150 A			2MBI150VB-120-50				
		200 A			2MBI200VB-120-50	2MBI200XBE120-50			
		300 A	2MBI300XBE065-50				2MBI300XBE120-50		
		400 A	2MBI400XBE065-50						
		300 A			2MBI300VD-120-50				
		400 A	2MBI400XDE065-50		2MBI400VD-120-50	2MBI400XDE120-50			
		600 A	2MBI600XDE065-50			2MBI600XDE120-50			
		150 A						2MBI150VH-170-50	2MBI150XHA170-50
		200 A			2MBI200VH-120-50			2MBI200VH-170-50	2MBI200XHA170-50
		300 A			2MBI300VH-120-50	2MBI300XHA120-50		2MBI300VH-170-50	2MBI300XHA170-50
		400 A							2MBI400XHA170-50
		450 A			2MBI450VH-120-50	2MBI450XHA120-50			
		600 A					2MBI600XHA120-50		
		300 A			2MBI300VE-120-50			2MBI300VE-170-50	2MBI300XEE170-50
		400 A						2MBI400VE-170-50	2MBI400XEE170-50
		450 A			2MBI450VE-120-50	2MBI450XEE120-50			
		600 A	2MBI600XEE065-50		2MBI600VE-120-50	2MBI600XEE120-50			

AC-Switch^{*1}

Standard 2-Pack

I _C	1200 V			1700 V					
	Vseries	Vseries with SiN-substrate ^{*1}	Xseries 	Vseries	Vseries with SiN-substrate ^{*1}	Xseries 			
With NTC, solder pins	M254	 62 mm 150 mm	 Thermistor	225 A 2MBI225VN-120-50	2MBI225VN-120S-50	2MBI225XNA120-50			2MBI225XNA170-50
	Premium Package	 62 mm 150 mm	 Thermistor	300 A 2MBI300VN-120-50	2MBI300VN-120S-50	2MBI300XNA120-50	2MBI300VN-170-50		2MBI300XNA170-50
	M285	 62 mm 150 mm	 XNE	450 A 2MBI450VN-120-50	2MBI450VN-120S-50	2MBI450XNA120-50	2MBI450VN-170-50		2MBI450XNA170-50
				550 A				2MBI550VN-170-50 ^{*1}	
				600 A	2MBI600VN-120-50	2MBI600XNG120-50 ^{*1}			2MBI600XNG170-50 ^{*1}
				600 A		2MBI600XNE120-50			2MBI600XNE170-50
				800 A		2MBI800XNE120-50			2MBI800XRNE170-50 ^{*2}
				1000 A		2MBI1000XRNE120-50 ^{*2}			
	M282	 62 mm 150 mm	 Thermistor	225 A 2MBI225VX-120-50		2MBI225XNB120-50	2MBI225VX-170-50		2MBI225XNB170-50
	Premium Package	 62 mm 150 mm	 XNF	300 A 2MBI300VX-120-50		2MBI300XNB120-50	2MBI300VX-170-50		2MBI300XNB170-50
With NTC, press fit pins	M286	 62 mm 150 mm	 XRNF	450 A 2MBI450VX-120-50		2MBI450XNB120-50	2MBI450VX-170-50		2MBI450XNB170-50
				550 A				2MBI550VX-170-50	
				600 A	2MBI600VX-120-50	2MBI600XNH120-50 ^{*1}			2MBI600XNH170-50 ^{*1}
				600 A		2MBI600XNF120-50			2MBI600XNF170-50
				800 A		2MBI800XNF120-50			2MBI800XRNF170-50 ^{*2}
				1000 A		2MBI1000XRNF120-50 ^{*2}			

Premium Package:

- High isolation capability
- High thermal performance

^{*1)} Low thermal impedance version

^{*2)} RC-IGBT

I _C	1200 V				1700 V			
	Vseries		Xseries	Vseries		Xseries		
	Low switching loss	Soft turn off		Low switching loss	Soft turn off			
M271	600 A	2MBI600VXA-120E-50 2MBI600VXA-120E-54						
	650 A					2MBI650VXA-170E-50 2MBI650VXA-170E-54 2MBI650VXA-170EA-50 2MBI650VXA-170EA-54		2MBI650XXA170-50
	900 A	2MBI900VXA-120E-50 2MBI900VXA-120E-54	2MBI900VXA-120P-50 2MBI900VXA-120P-54	2MBI900XXA120P-50				
	1200 A			2MBI1200XXE120P-50				2MBI1200XXE170-50
2-Pack	1000 A					2MBI1000VXB-170E-50 2MBI1000VXB-170E-54 2MBI1000VXB-170EA-50 2MBI1000VXB-170EA-54		2MBI1000XXB170-50
M272	1400 A	2MBI1400VXB-120E-50 2MBI1400VXB-120E-54	2MBI1400VXB-120P-50 2MBI1400VXB-120P-54	2MBI1400XXB120P-50	2MBI1400VXB-170E-50 2MBI1400VXB-170E-54	2MBI1400VXB-170P-50 2MBI1400VXB-170P-54	2MBI1400XXB170-50	
	1800 A			2MBI1800XXF120P-50				2MBI1800XXF170-50
	1800 A			2MBI1800XXG120P-50				2MBI1800XXG170-50
M291	XRXG	2400 A			2MBI2400XRXG120-50 ^{*1,2}			2MBI2400XRXG170-50 ^{*1,2}

Note 1: The products with 'EA' on this page have large FWD.

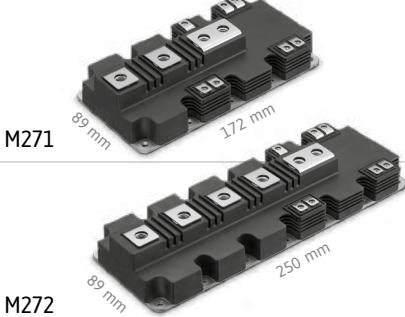
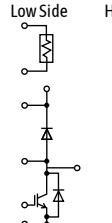
Note 2: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

Note 3: The products with suffix '-54' on this page are labeled to specify the rank of V_{sat} and V_f.

^{*1)} Under development

^{*2)} RC-IGBT

PrimePACK™

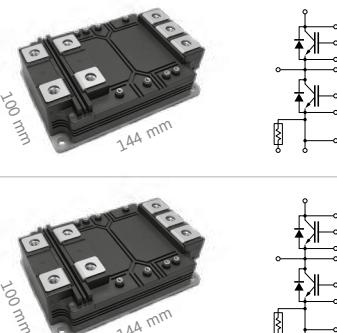
Chopper		 M271 89 mm 172 mm M272 89 mm 250 mm	 Low Side High Side		1200 V		1700 V	
					V series		V series	
					I _C	Low side configuration	High side configuration	Low side configuration
					650 A			1MBI650VXA-170EL-50
					900 A	1MBI900VXA-120PD-50 * ¹	1MBI900VXA-120PC-50 * ¹	1MBI650VXA-170EL-54 * ²
					1000 A	1MBI900VXA-120PD-54 * ²	1MBI900VXA-120PC-54 * ²	1MBI1000VXB-170EL-50
					1400 A	1MBI1400VXB-120PL-54 * ²	1MBI1400VXB-120PH-54 * ²	1MBI1000VXB-170EH-50
								1MBI1400VXB-170EH-54 * ²
								1MBI1400VXB-170PH-50
								1MBI1400VXB-170PH-54 * ²

Note: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

*¹) Antiparallel diode current rating is 120 A. Application circuit is Boost/Buck chopper only.

*²) The products with suffix '-54' on this page are labeled to specify the rank of V_{sat} and V_f.

High Power next Core (HPnC)

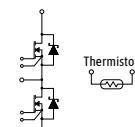
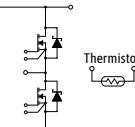
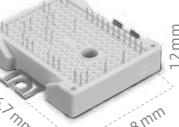
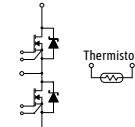
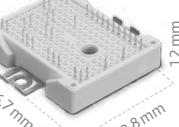
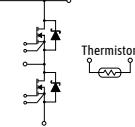
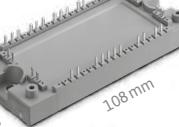
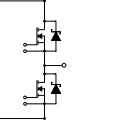
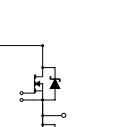
2-Pack		 For traction use M297 100 mm 144 mm For industrial use M298 100 mm 144 mm			1700 V			2300 V			3300 V		
					Xseries			Xseries			Xseries		
					7th generation	7th generation	7th generation	7th generation	7th generation	7th generation	7th generation	7th generation	7th generation
				450 A									
				600 A									2MBI600XYF330-50 * ¹
				1000 A									
				1200 A	2MBI1200XYF170-50 * ¹								
				1500 A	2MBI1500XYF170-50 * ¹								
				1200 A	2MBI1200XZF170-50 * ¹	2MBI1200XZF230-50 * ¹							
				1500 A	2MBI1500XZF170-50 * ¹								
				1800 A	2MBI1800XZF170-50 * ¹								

*¹) Under development

*²) Traction variant with MgSiC baseplate

*³) Industrial variant with Cu baseplate

Silicon Carbide (SiC) Modules

			1200V	1700V
		I_C	SiCMOSFET	SiCMOSFET
with solder pins	M293			50 A 2CSI50DAKC120-50* 75 A 2CSI75DAKC120-50* 100 A 2CSI100DAKC120-50* 150 A
	M697			50 A 6CSI50DAKC20-50* 75 A 100 A 150 A
	M294			50 A 75 A 100 A 2CSI100DAKD120-50* 150 A 2CSI150DAKD120-50* 200 A 2CSI200DAKD120-50*
	M680			50 A 6CSI50DAKD120-50* 75 A 6CSI75DAKD120-50* 100 A 6CSI100DAKD120-50* 150 A 200 A
	M669			50 A 6CSI50DAAA120-50* 75 A 6CSI75DAAA120-50* 100 A 6CSI100DAAA120-50* 150 A 6CSI150DAAA120-50* 200 A 100 A 150 A 200 A 300 A 2CSI300DAHE120-50* 400 A 450 A 2CSI450DAHE120-50* 600 A 2CSI600DAHE120-50* 750 A
	M295			100 A 150 A 200 A 300 A 400 A 450 A 600 A 750 A 2CSI200DAHE170-50* 2CSI300DAHE170-50* 2CSI400DAHE170-50*

* Under development

Silicon Carbide (SiC) Modules

		I_C	1700 V	2300 V	3300 V
			SiC MOSFET	SiC MOSFET	SiC MOSFET
2-Pack	For traction use	850 A			2CI850DYF330-50 ^{*1}
	M297 ^{*1,2}	1000 A	2CI1000DYF170-50 ^{*1}		
		1500 A	2CI1500DYF170-50 ^{*1}		
		1800 A	2CI1800DYF170-50 ^{*1}		
	For industrial use	1000 A	2CI1000DZF170-50 ^{*1}		
	M298 ^{*1,3}	1200 A		2CI1200EZF230-50 ^{*1}	
		1500 A	2CI1500DZF170-50 ^{*1}		
		1800 A	2CI1800DZF170-50 ^{*1}		

^{*1)} Under development

^{*2)} Traction variant with MgSiC baseplate

^{*3)} Industrial variant with Cu baseplate



Advanced T-type NPC 3-Level Modules

Note: AT-NPC (Advanced T-type Neutral-Point-Clamped) 3-level Module integrates RB-IGBT (Reverse Blocking-IGBT) in addition to ordinary IGBT and FWD in single package.

*1) Particular for Inverter of UPS or PCS *2) Particular for Converter of UPS *3) Under development *4) The products with suffix '-60' on this page are labeled to specify the rank of V_{out} and V_{in} .

I-type NPC 3-Level Module

I _C	1200 V	1700 V
	Vseries	Vseries
600 A 4MBI600VC-120-50		

1 Phase
M404 89 mm 250 mm

Small IPM (Intelligent Power Modules)

I _C	600 V	Xseries
	7G	
15 A 6MBP15XSD060-50		
20 A 6MBP20XSD060-50		
30 A 6MBP30XSD060-50		
35 A 6MBP35XSD060-50		
15 A 6MBP15XSF060-50		
20 A 6MBP20XSF060-50		
30 A 6MBP30XSF060-50		
35 A 6MBP35XSF060-50		
50 A 6MBP50XTA065-50		
75 A 6MBP75XTA065-50		
50 A 6MBP50XTC065-50		
75 A 6MBP75XTC065-50		

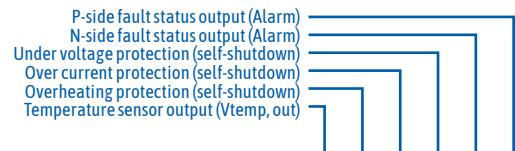
Small IPM with High Voltage Driver-I_C without Brake-Chopper

P633A 26 mm 43 mm

P642 31 mm 79 mm

IPM (Intelligent Power Modules)

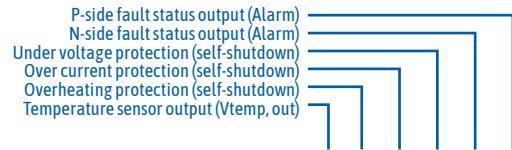
Built-in protection functions



	I _C	600 V	650 V	1200 V
		V series	Xseries 7G	V series
Without Brake-Chopper	10 A			6MBP10XRHA120-50
	20 A		6MBP20XRHA065-50	
	30 A		6MBP30XRHA065-50	
	10 A			6MBP10VAA120-50
	15 A			6MBP15VAA120-50
	20 A	6MBP20VAA060-50		6MBP25VAA120-50
	25 A			6MBP25XAA120-50
	30 A	6MBP30VAA060-50		6MBP35XAA120-50
	35 A			
	50 A	6MBP50VAA060-50	6MBP50XAA065-50	
With Brake-Chopper	75 A		6MBP75XAA065-50	
	25 A			6MBP25VBA120-50
	35 A			6MBP35VBA120-50
	50 A	6MBP50VBA060-50	6MBP50XBA065-50	6MBP50VBA120-50
	75 A	6MBP75VBA060-50	6MBP75XBA065-50	
	100 A		6MBP100XBA065-50	
	25 A			7MBP25XJN120-50
	35 A			7MBP35XJN120-50
	50 A		7MBP50XJN065-50	
	75 A		7MBP75XJN065-50	

IPM (Intelligent Power Modules)

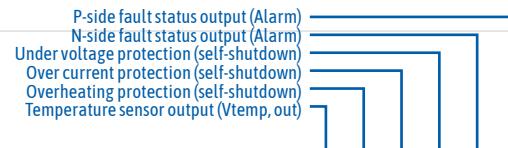
Built-in protection functions



	I _c	600V Vseries	650V Xseries Xseries 7G	1200V Vseries	1200V Xseries Xseries 7G
Without Brake-Chopper	25A			6MBP25VFN120-50	
	35A			6MBP35VFN120-50	
	50A	6MBP50VFN060-50		6MBP50VFN120-50	6MBP50XFN120-50
	75A	6MBP75VFN060-50			
	100A	6MBP100VFN060-50	6MBP100XFN065-50		
With Brake- Chopper	25A			7MBP25VFN120-50	
	35A			7MBP35VFN120-50	
	50A	7MBP50VFN060-50		7MBP50VFN120-50	7MBP50XFN120-50
	75A	7MBP75VFN060-50			
	100A	7MBP100VFN060-50	7MBP100XFN065-50		
P636	25A				
	35A				
	50A				
	75A				
	100A				
P638	25A				
	35A				
	50A			6MBP50XGN120-50	
	75A			6MBP75XGN120-50	
	100A		6MBP100XGN065-50		
	150A		6MBP150XGN065-50		

IPM (Intelligent Power Modules)

Built-in protection functions



	I_C	600 V Vseries	650 V Xseries 7G	1200 V Vseries	1200 V Xseries 7G
Without Brake-Chopper					
6MBP□XDA□-50 6MBP□XDN□-50	25 A			6MBP25VDA120-50	
6MBP□VDA□-50 6MBP□VDN□-50	35 A			6MBP35VDA120-50	
6MBP□XDA□-50 6MBP□XDN□-50	50 A	6MBP50VDA060-50		6MBP50VDA120-50	6MBP50XDA120-50
6MBP□VDA□-50 6MBP□VDN□-50	75 A	6MBP75VDA060-50		6MBP75VDA120-50	6MBP75XDA120-50
6MBP□VDA□-50 6MBP□VDN□-50	100 A	6MBP100VDA060-50	6MBP100XDA065-50	6MBP100VDA120-50	6MBP100XDA120-50
6MBP□VDA□-50 6MBP□VDN□-50	150 A	6MBP150VDA060-50	6MBP150XDA065-50		
6MBP□VDA□-50 6MBP□VDN□-50	200 A	6MBP200VDA060-50	6MBP200XDA065-50		
6MBP□VDA□-50 6MBP□VDN□-50	250 A		6MBP250XDA065-50		
With Brake-Chopper					
7MBP□XDA□-50 7MBP□XDN□-50	25 A			7MBP25VDA120-50	
7MBP□VDA□-50 7MBP□VDN□-50	35 A			7MBP35VDA120-50	
7MBP□XDA□-50 7MBP□XDN□-50	50 A	7MBP50VDA060-50		7MBP50VDA120-50	7MBP50XDA120-50
7MBP□VDA□-50 7MBP□VDN□-50	75 A	7MBP75VDA060-50		7MBP75VDA120-50	7MBP75XDA120-50
7MBP□VDA□-50 7MBP□VDN□-50	100 A	7MBP100VDA060-50	7MBP100XDA065-50	7MBP100VDA120-50	7MBP100XDA120-50
7MBP□VDA□-50 7MBP□VDN□-50	150 A	7MBP150VDA060-50	7MBP150XDA065-50		
7MBP□VDA□-50 7MBP□VDN□-50	200 A	7MBP200VDA060-50	7MBP200XDA065-50		
7MBP□VDA□-50 7MBP□VDN□-50	250 A		7MBP250XDA065-50		

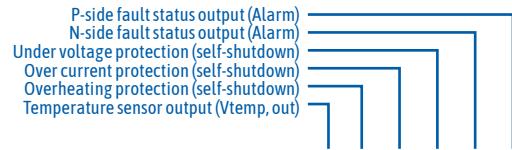
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Note 1: The products with 'VDN'/'XDN' on this page have high heat dissipation characteristics.

Note 1: The products with 'VDN' on this page have high heat dissipation characteristics.

IPM (Intelligent Power Modules)

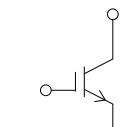
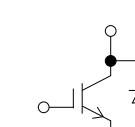
Built-in protection functions



	I _C	600 V	650 V	1200 V	
		Vseries	Xseries X _{series} 7G	Vseries	Xseries X _{series} 7G
Without Brake-Chopper	100A			6MBP100VEA120-50	6MBP100XEN120-50
	150A			6MBP150VEA120-50	6MBP150XEN120-50
	200A	6MBP200VEA060-50	6MBP200XEN065-50	6MBP200VEA120-50	6MBP200XEN120-50
	300A	6MBP300VEA060-50	6MBP300XEN065-50		6MBP300XEN120-50
	400A	6MBP400VEA060-50	6MBP450AEN065-50		
	450A				
With Brake-Chopper	100A			7MBP100VEA120-50	7MBP100XEN120-50
	150A			7MBP150VEA120-50	7MBP150XEN120-50
	200A	7MBP200VEA060-50	7MBP200XEN065-50	7MBP200VEA120-50	7MBP200XEN120-50
	300A	7MBP300VEA060-50	7MBP300XEN065-50		7MBP300XEN120-50
	400A	7MBP400VEA060-50			
	450A		7MBP450XEN065-50		

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Discrete IGBT

	I _C	600 V			650 V			1200 V			
		V series	High speed V series	RB series	High speed W series	XS series	V series	High speed V series	High speed W series	XS series	
 	15 A							FGW15N120H			
	25 A								FGW25N120W		
	30 A				FGW30N65W	FGW30XS65		FGW30N120H			
	35 A	FGW35N60H			FGW40N65W	FGW40XS65		FGW40N120H			
	40 A				FGW50N60H	FGW50XS65		FGW40N120H	FGW40N120W	FGW40XS120	
	50 A										
	60 A					FGW60N65W					
	75 A	FGW75N60H			FGW75N65W	FGW75XS65				FGW75XS120	
	15 A						FGW15N120VD	FGW15N120HD			
	25 A						FGW25N120VD		FGW25N120WD/WE		
 	30 A	FGW30N60VD				FGW30XS65		FGW30N120HD			
	35 A		FGW35N60HD/HC								
	40 A				FGW40N65WD/WE	FGW40XS65C	FGW40N120VD	FGW40N120HD	FGW40N120WD/WE	FGW40XS120C	
	50 A	FGW50N60VD	FGW50N60HD/HC		FGW50N65WD/WE	FGW50XS65C/D					
	60 A				FGW60N65WD/WE						
	75 A		FGW75N60HD/HC		FGW75N65WE	FGW75XS65C/D				FGW75XS120C	
	85 A			FGW85N60RB							
	40 A								FGZ40N120WE		
	50 A				FGZ50N65WD/WE						
	75 A				FGZ75N65WE	FGZ75XS65C				FGZ75XS120C	

Recommended operating frequency

-10 kHz	-20 kHz	-40 kHz	-100 kHz
V/RB			
High speed V			
XS series		High speed W	

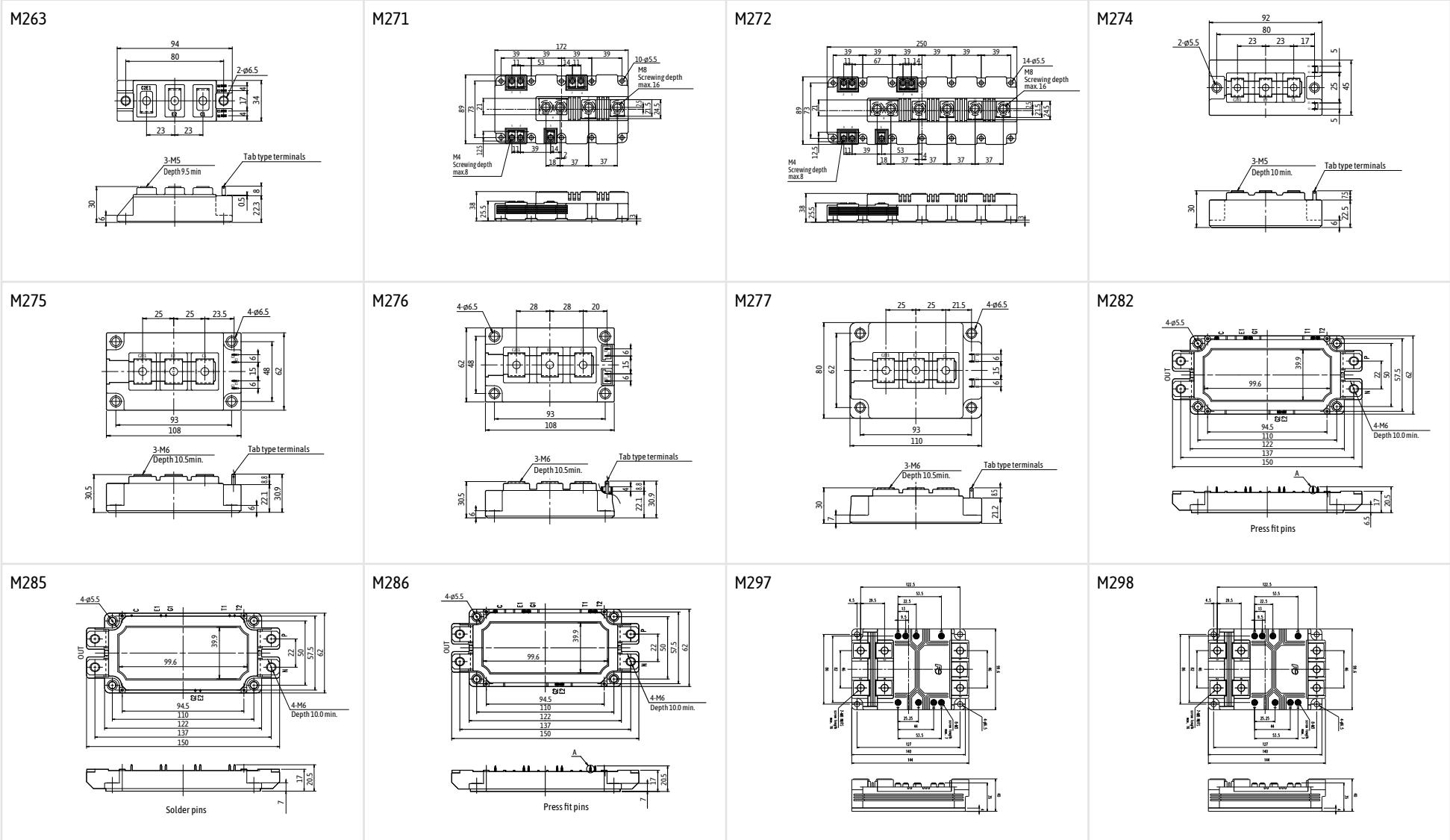
Rectifier Diode

I _C	Ultra-Fast Recovery Diodes			Soft Recovery - Fast Recovery Diodes	
	600 V		650 V	1200 V	
	15 A	FDRP15S60L			
TO-220	25 A	FDRP25S60L			
	30 A				
	75 A				
TO-247-P2	12 A				FDRW12S120J
	15 A	FDRW15S60L			
	20 A				FDRW20S120J
	25 A	FDRW25S60L			
	30 A				FDRW30S120J
	35 A	FDRW35S60L			
	40 A				FDRW40C120J
	50 A		FDRW50C60L		
	60 A				
	70 A	FDRW70C60L			
TO-247-2-P2	60 A	FDRW60T60L			
	75 A		FDRW75T65L		

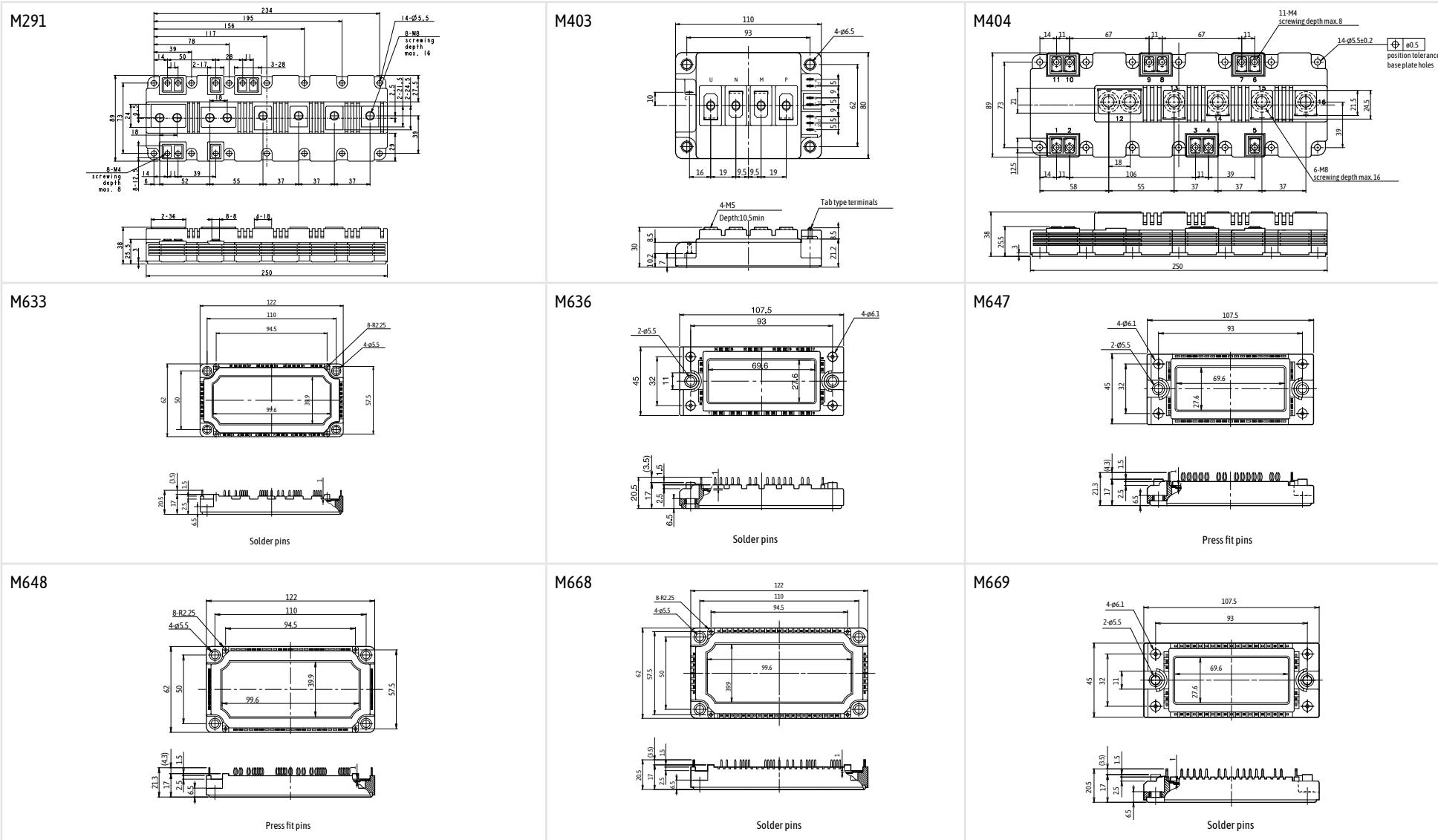
SiC-SBD

I _C	Ultra-Fast Recovery Diodes			Soft Recovery - Fast Recovery Diodes	
	650 V		1200 V		
10 A	FDCC10S65				
20 A		FDCC20C65			
25 A	FDCC25S65				
T-Pack(s)					
TO-220-2	10 A	FDCP10S65			
	25 A	FDCP25S65			
TO-220	20 A		FDCP20C65		
				FDCA20C65	
TO-220F	20 A			FDCA10S65	
				FDCA25S65	FDCA18S120
TO-220F-2	10 A	FDCY10S65			
	18 A				FDCY18S120
TO-247	25 A	FDCA25S65			
			FDCA25S65		FDCY36C120
TO-247-2-P2	10 A			FDCA50C65	
	18 A				FDCW18T120

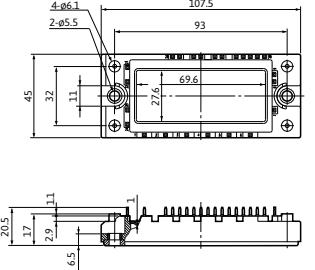
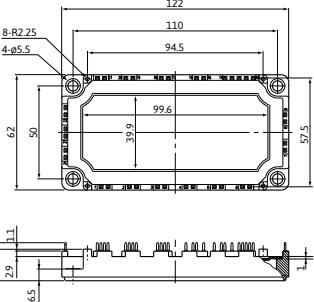
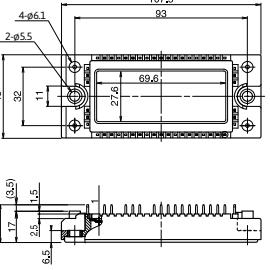
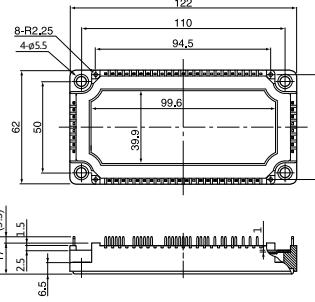
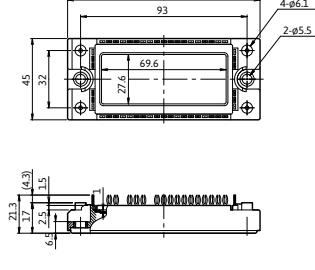
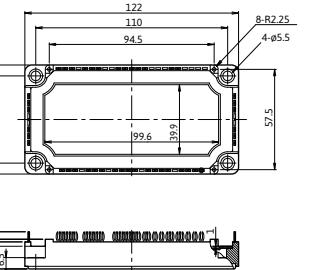
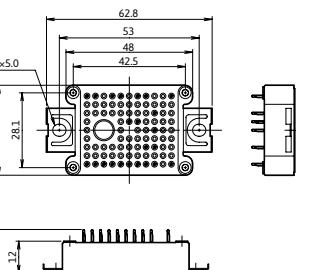
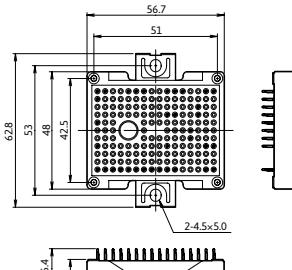
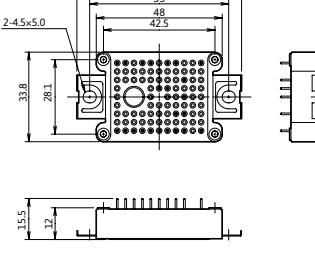
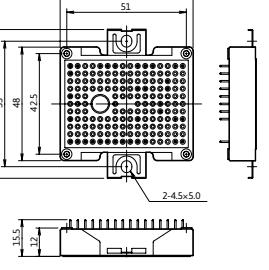
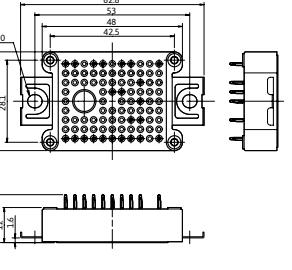
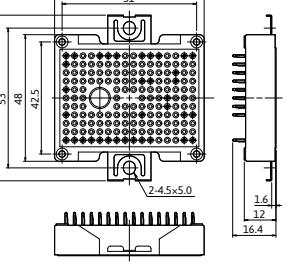
Package Outlines (in mm)



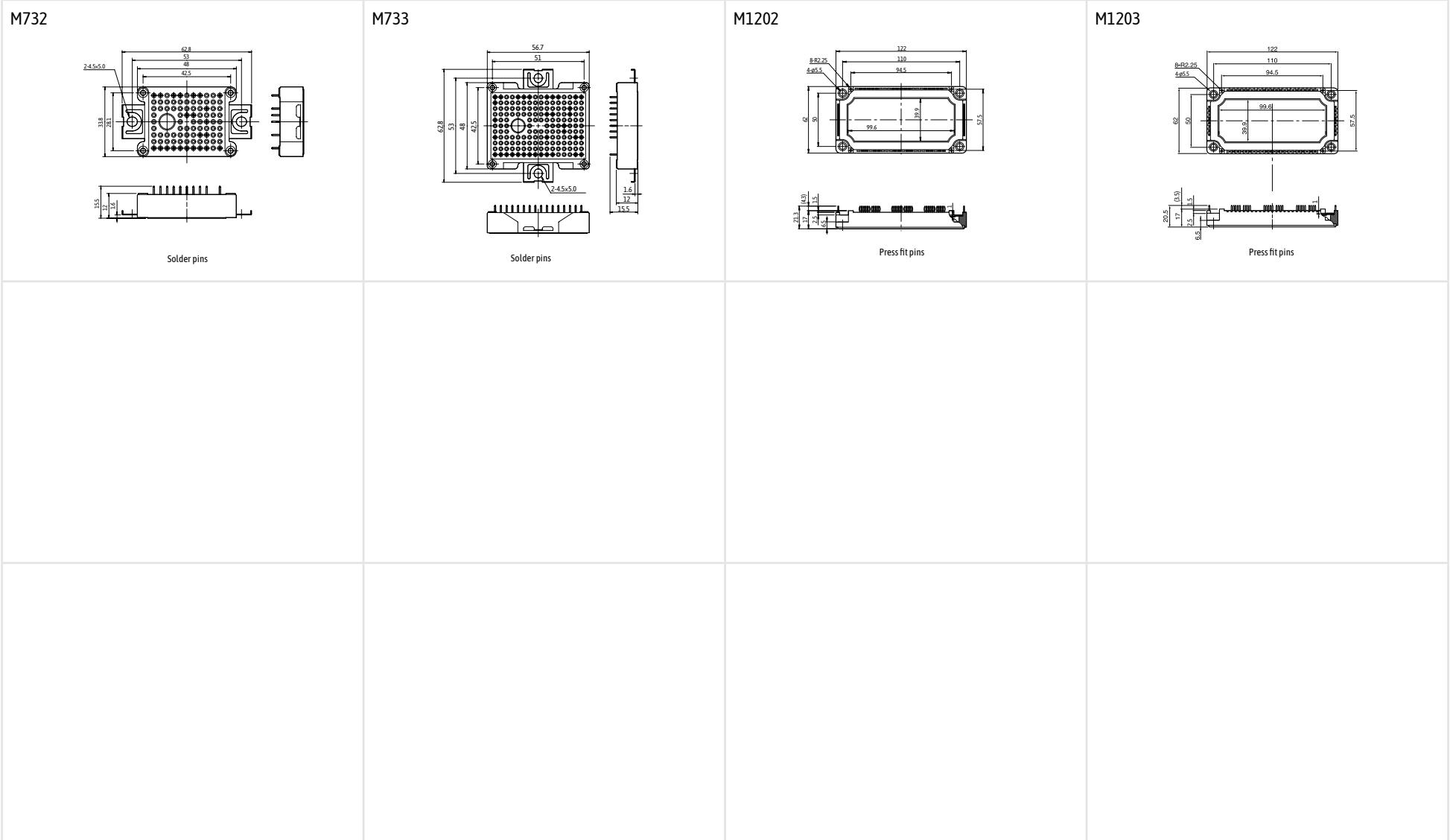
Package Outlines (in mm)



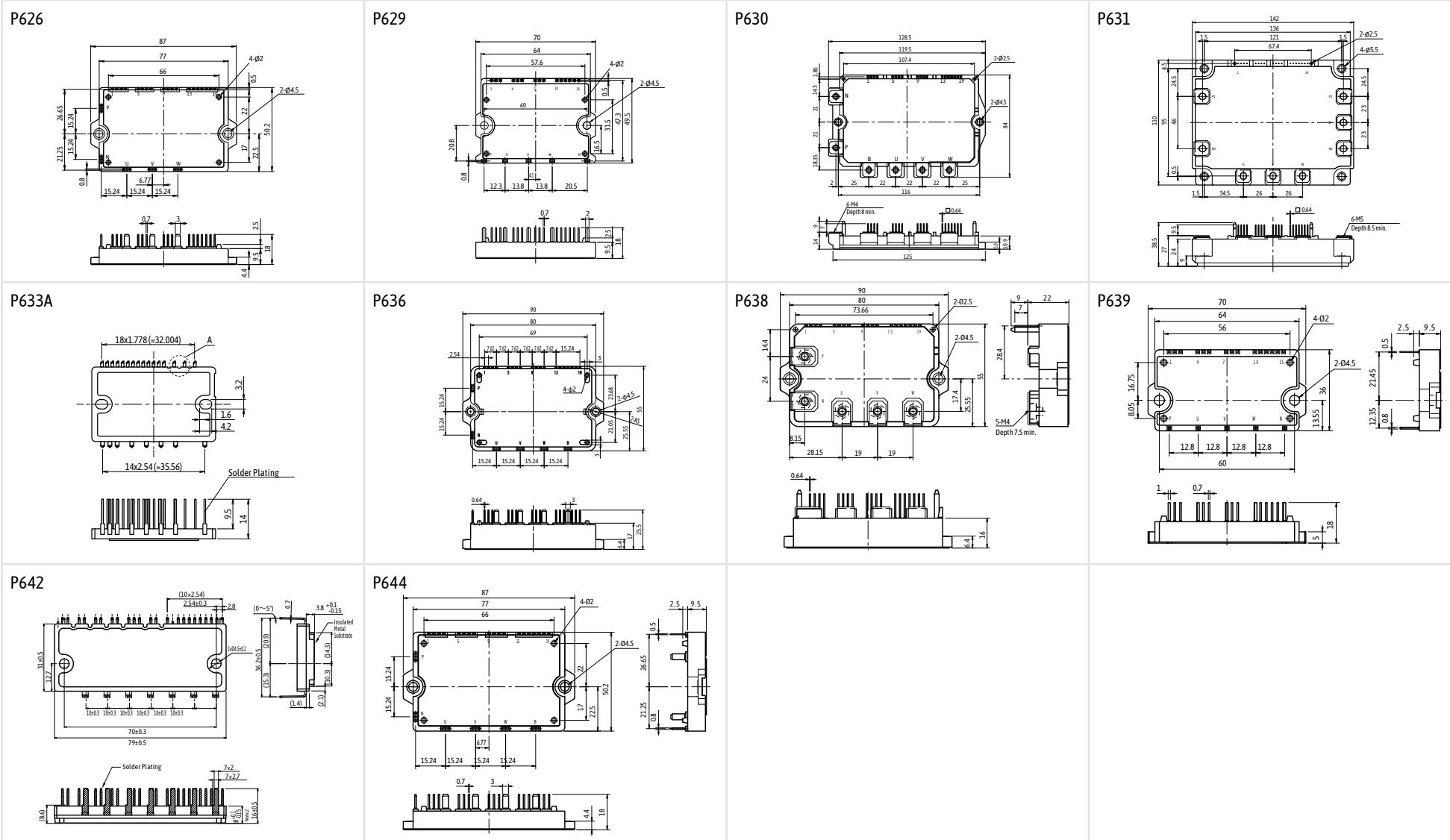
Package Outlines (in mm)

<p>M711</p>  <p>Solder pins</p>	<p>M712</p>  <p>Solder pins</p>	<p>M719</p>  <p>Solder pins</p>	<p>M720</p>  <p>Solder pins</p>
<p>M721</p>  <p>Press fit pins</p>	<p>M722</p>  <p>Press fit pins</p>	<p>M726</p>  <p>Press fit pins</p>	<p>M727</p>  <p>Press fit pins</p>
<p>M728</p>  <p>Solder pins</p>	<p>M729</p>  <p>Solder pins</p>	<p>M730</p>  <p>Press fit pins</p>	<p>M731</p>  <p>Press fit pins</p>

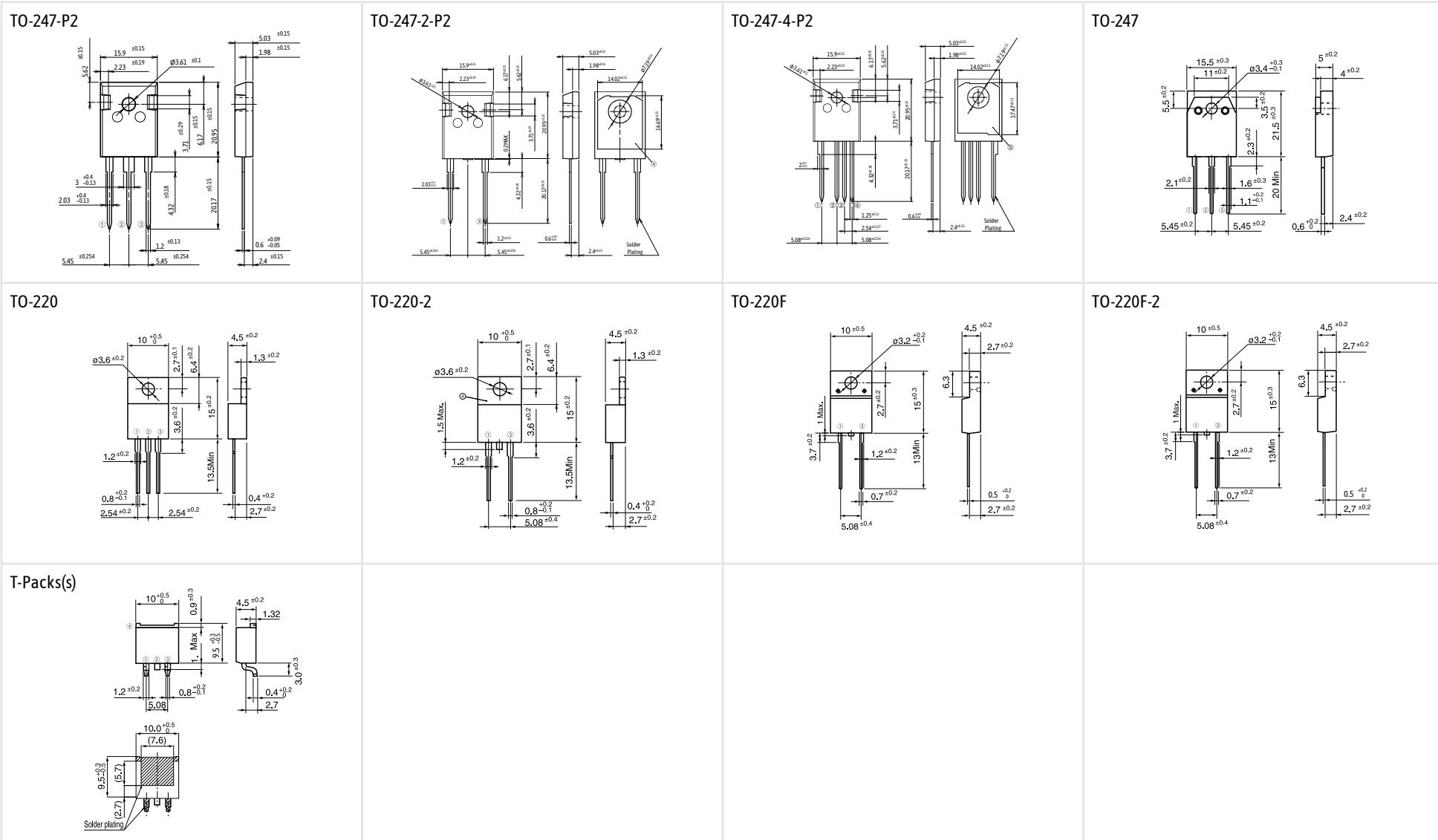
Package Outlines (in mm)



Package Outlines (in mm)



Package Outlines (in mm)



Contributing to the creation of a sustainable society

Fuji Electric contributes to the resolution of social and environmental issues through its business activities.

Fuji Electric Corporate Activities and SDGs



Fuji Electric's corporate policy is to contribute to the realization of a safe, secure, and sustainable society through its energy and environmental businesses, based on its management philosophy of "contribute to prosperity," "encouraging creativity," and "seek harmony with the environment." Acting in accordance with this code, Fuji Electric is contributing to the accomplishment of the United Nations Sustainable Development Goals through its business activities.

We have formulated nine SDG targets for all of our corporate activities. To help achieve these targets, we have established an SDG Promotion Committee and are carrying out initiatives that are in line with the international community's goal of achieving the SDGs.

Environmental Vision by 2050



Notes

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