

Power Semiconductors

IGBT Modules, MOSFETs, All SiC Modules, SiC-Schottky Diodes and Discrete IGBTs

<p>Pre-applied Thermal Interface Material (TIM) 1</p> 	<p>IGBT Modules for 3-Level inverters 4-5</p> 	<p>Hybrid IGBT-Modules with SiC Schottky Barrier Diodes 6-7</p> 	<p>PIM Power Integrated Modules Solder pins & PressFit contacts 8-11</p> 	<p>6-Pack IGBT-Modules, Solder pins & PressFit contacts 12</p> 	<p>2-Pack IGBT-Modules, Spring-, Pin- & PressFit contacts 13</p> 
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Industrialized Process for Pre-applied 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 guaranty a uniform print and maximum thermal conductivity.

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

The whole process is controlled by our qualified staff to ensure our high quality standards.

Features

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

Process - Benefits

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

Thermal - Benefits

- + Higher thermal conductivity
- + Uniform thermal resistance
- + Higher reliability and life time.

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

For latest availability status please contact us

About Type Name

The Type Name is not exactly the item code for the ordering process

1. Modules with Standard IGBT-Chips

2 M Bi 450 V H - 120 - 50

Suffix - 50 = RoHS compliant

Voltage class: $060 = 600V$ · $065 = 650V$ · $120 = 1200V$ · $170 = 1700V$ · $330 = 3300V$

Package type

IGBT-series (here V-Series) / IGBT-technology

Current class $I_c [A]$

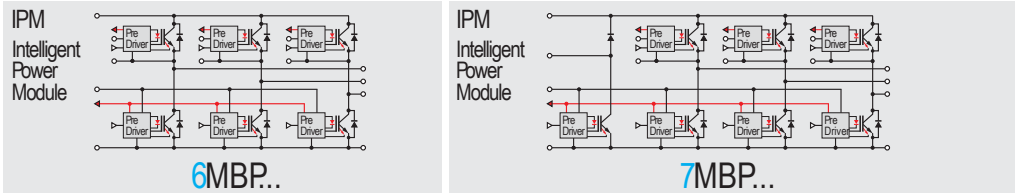
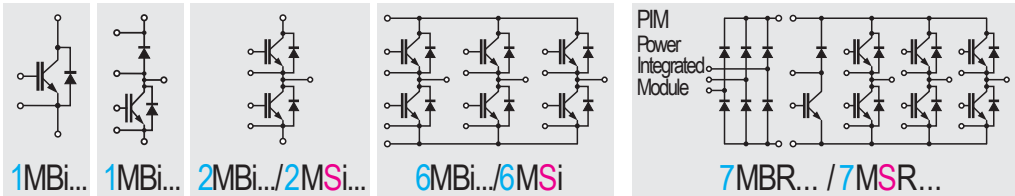
Device type & configuration

MBi : Standard IGBT module (1-, 2- and 6-pack)

MBR : PIM IGBT (Power Integrated Module)

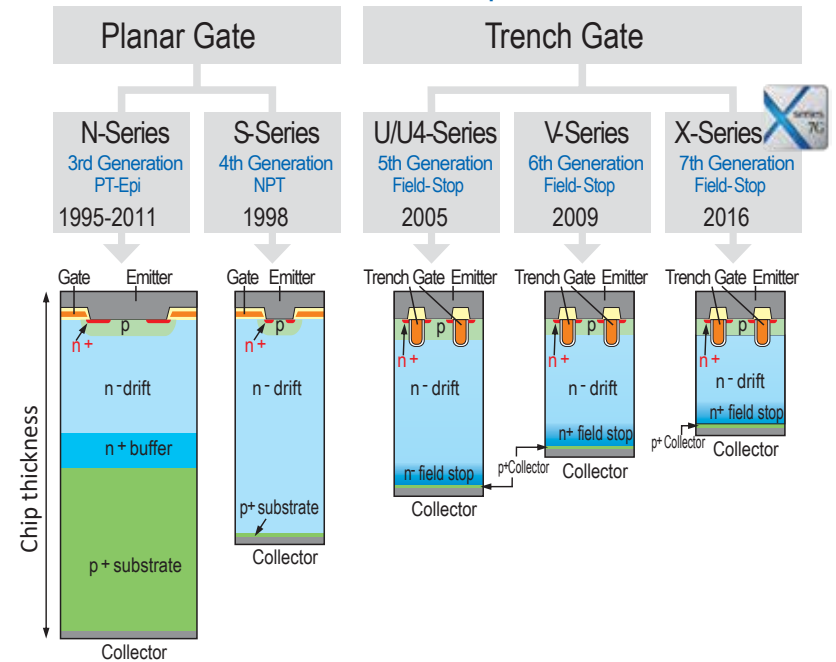
MBP : IPM IGBT (Intelligent Power Module)

MSi, MSR: The "S" indicates hybrid module with Si-IGBT & SiC Schottky free wheeling diodes



Number of IGBT-switches (not chips)

IGBT development



About Type Name

The Type Name is not exactly the item code for the ordering process

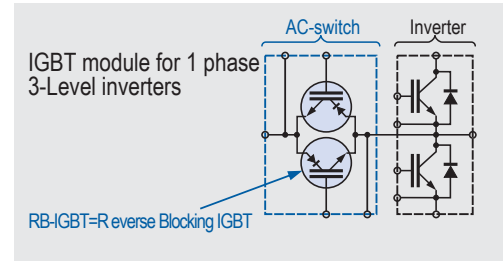
2. Modules with RB-IGBT (Reverse Blocking IGBT)

4 M Bi3 00 V G - 1 2 0 R 1 - 5 0

Voltage class of inverter part

060= 600V
120=1200V
170=1700V

R = 600V
R1= 900V
R2=1200V



3. Discrete IGBTs

F G W 3 5 N 6 0 H D

Fuji IGBT
Package
 I_c [A] N-channel
Series
Voltage: $60=600V \cdot 65=650V \cdot 120=1200V$

4. Super- Junction MOSFETs

F M P 6 0 N 1 3 3 S 2 F D

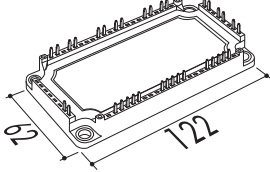
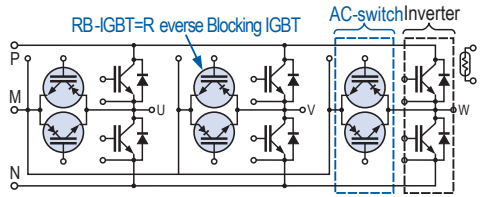
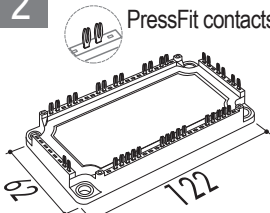
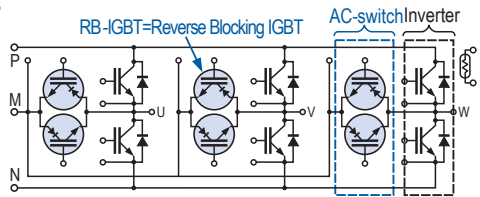
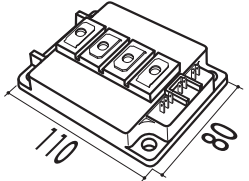
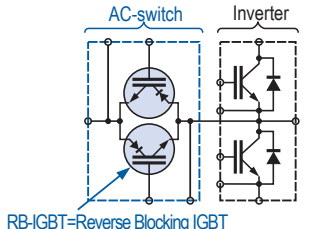
Fuji MOSFET
N-channel
With built-in FRED
Super- Junction MOSFET, S2-Series
 $R_{DS(on),max}$ [mW]
 V_{DS} : $60= 600V \cdot 65= 650V$
Package

5. SiC Schottky Barrier Diodes

F D C P 2 5 S 6 5

Fuji SiC-Diode
Package
Voltage: $65=650V \cdot 120=1200V$
 I_{FAV} [A]
Configuration C=Dual S=Single

IGBT -Modules for 3-Level Inverters



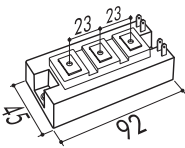
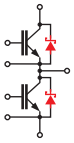
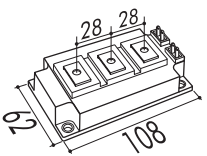
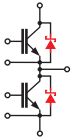
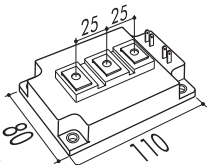
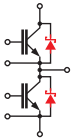
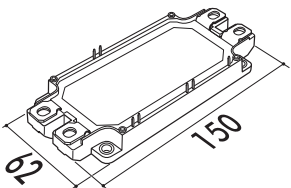
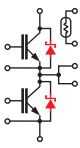
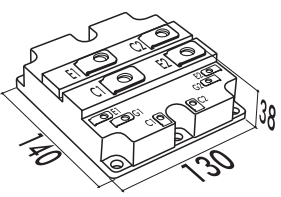
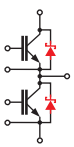
		600V		1200V		1700V	
		V-Series 6th Generation	AC-switch	V-Series 6th Generation	AC-switch	V-Series 6th Generation	AC-switch
3 Phase	1 Solder pins  M1203 	50A		12MBi 50VN-120-50	600V		
		75A		12MBi 75VN-120-50	600V		
		100A		12MBi 100VN-120-50	600V		
	2 PressFit contacts  M1202 	50A		12MBi 50VX-120-50	600V		
		75A		12MBi 75VX-120-50	600V		
		100A		12MBi 100VX-120-50	600V		
1 Phase	3  M403 	220A				4MBi 220VF-170R2-50	1200V
		300A		4MBi 300VG-120R-50	600V		
		340A		4MBi 300VG-120R1-50	900V		
		400A	4MBi 340VF-120R-50	600V			
		400A	4MBi 400VG-060R-50	600V	4MBi 400VF-120R-50	600V	

IGBT -Modules for 3-Level Inverters

		I_C	1200V		1700V	
			V-Series 6th Generation	AC-switch	V-Series 6th Generation	AC-switch
1 Phase	4	600A	4MBi600VC-120-50			
	T-Type	450A	4MBi450VB-120R1-50	900V	4MBi450VB-170R2-50	1200V
		600A			4MBi600VB-170R2-50	1200V
		900A	4MBi900VB-120R1-50	900V		

AC - switch

		I_C	1200V
			V-Series 6th Generation
2-Pack	5	450A	2MBi450VH-120F-50

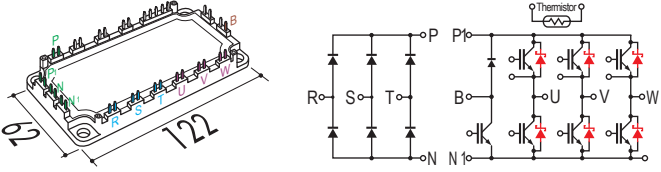
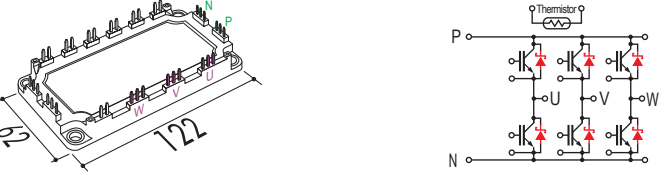
Hybrid IGBT-Modules with SiC-SBD 			I_C	1200V	1700V	
				V-Series 6th Generation	V-Series 6th Generation	
2-Pack	6			200A	2MSi 200VAB-120-53	
	7			300A	2MSi 300VAH-120C-53	
	8	 M277		400A		2MSi 400VAE-170-53
	9			300A	2MSi 300VAN-120-53*	
				450A	2MSi 450VAN-120-53*	2MSi 450VAN-170-53*
550A					2MSi 550VAN-170-53*	
600A				2MSi 600VAN-120-53*		
10			1200A		2MSi 1200VAF-170 PC* 2MSi 1200VAF-170 EC*	

Suffix -53 = With $V_{CE,sat}$ & V_F rank label

* Under Development

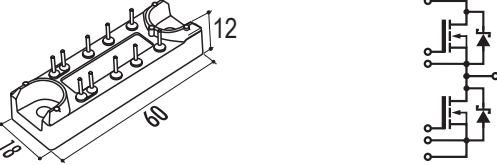
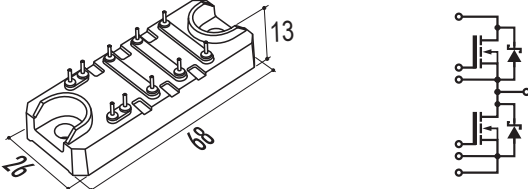
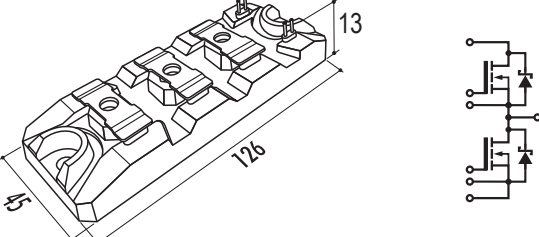
Hybrid IGBT-Modules with SiC-SBD 



			600V	1200V
			V-Series 6th Generation	V-Series 6th Generation
PIM	11		35A	
			50A	7MSR 50VB-060-50
			75A	7MSR 75VB-060-50
			100A	7MSR 100VB-060-50
6-Pack	12		100A	6MSi 100VB-120-50

All SiC 2in1modules (SiC MOS-FET & SiC Schottky diode)



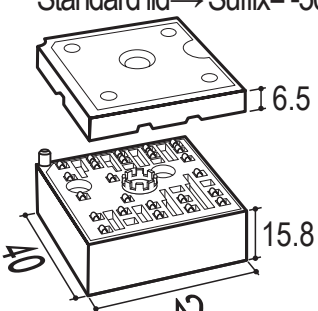
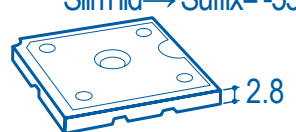
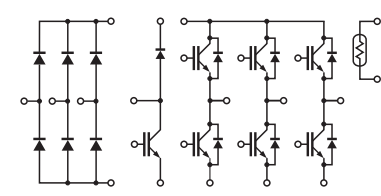
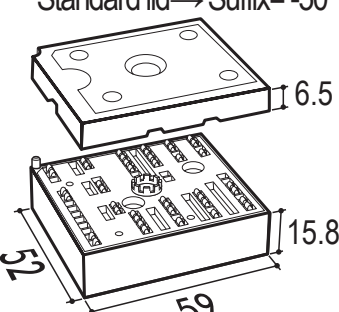
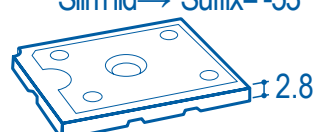
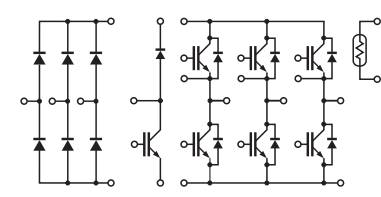
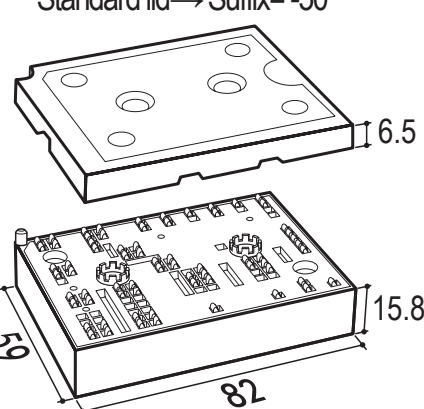
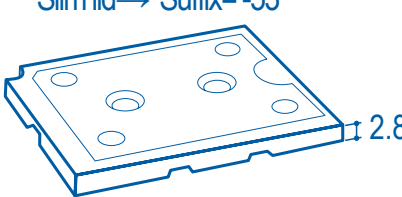
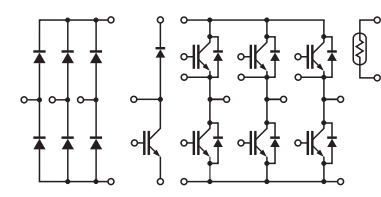
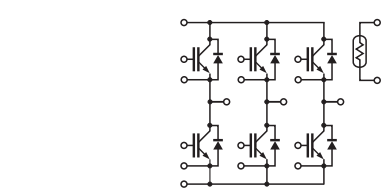
				1st gen. Trench MOS
2-Pack	13		25A	2CSi 25CAN120A-50 *
			50A	2CSi 50CAN120A-50 *
	14		75A	2CSi 75CAM120A-50 *
			100A	2CSi 100CAM120A-50 *
	15		200A	2CSi 200CAS120A-50 *
			300A	2CSi 300CAS120A-50 *
		400A	2CSi 400CAS120A-50 *	

* Under development

Small PIM IGBTs (Power Integrated Modules)

		600V	650V	1200V	
		V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation
				series 7G	
		I_c			
With PressFit Contacts	16 M726	10A	7MBR 10VKA-060-50	7MBR 10VKA-120-50	7MBR 10XKA120-50
		15A	7MBR 15VKA-060-50	7MBR 15VKA-120-50	7MBR 15XKA120-50
		20A	7MBR 20VKA-060-50		
		25A			7MBR 25XKA120-50
		30A	7MBR 30VKA-060-50	7MBR 30XKA065-50	
With PressFit Contacts	17 M727	15A		7MBR 15VKB-120-50	7MBR 15XKB120-50
		25A		7MBR 25VKB-120-50	7MBR 25XKB120-50
		35A		7MBR 35VKB-120-50	7MBR 35XKB120-50
		50A	7MBR 50VKB-060-50	7MBR 50XKB065-50	
With Solder Pins	18 M728	10A	7MBR 10VKC-060-50	7MBR 10VKC-120-50	7MBR 10XKC120-50
		15A	7MBR 15VKC-060-50	7MBR 15VKC-120-50	7MBR 15XKC120-50
		20A	7MBR 20VKC-060-50		
		25A			7MBR 25XKC120-50
		30A	7MBR 30VKC-060-50	7MBR 30XKC065-50	
With Solder Pins	19 M729	15A		7MBR 15VKD-120-50	7MBR 15XKD120-50
		25A		7MBR 25VKD-120-50	7MBR 25XKD120-50
		35A		7MBR 35VKD-120-50	7MBR 35XKD120-50
		50A	7MBR 50VKD-060-50	7MBR 50XKD065-50	

PIM and 6-PACK IGBTs with V-Series IGBT (MiniSKiiP® compatible)

						I_C	1200V V-Series 6th Generation
MiniSKiiP® 1	20	Standard lid → Suffix= -50 	Slim lid → Suffix= -53 	PIM-IGBT 		8A	7MBR 8VJA-120-50 7MBR 8VJA-120-53
						15A	7MBR 15VJA-120-50 7MBR 15VJA-120-53
MiniSKiiP® 2	21	Standard lid → Suffix= -50 	Slim lid → Suffix= -53 	PIM-IGBT 		25A	7MBR 25VJB-120-50 7MBR 25VJB-120-53
						35A	7MBR 35VJB-120-50 7MBR 35VJB-120-53 7MBR 35VJB-120A-50 <i>With larger rectifier diodes</i> 7MBR 35VJB-120A-53 <i>With larger rectifier diodes</i>
MiniSKiiP® 3	22	Standard lid → Suffix= -50 	Slim lid → Suffix= -53 	PIM-IGBT 		50A	7MBR 50VJC-120-50 7MBR 50VJC-120-53
						75A	7MBR 75VJC-120-50 7MBR 75VJC-120-53
				6-PACK-IGBT 		100A	7MBR 100VJC-120-50 7MBR 100VJC-120-53
						100A	6MBi 100VJC-120-50* 6MBi 100VJC-120-53*
150A	6MBi 150VJC-120-50* 6MBi 150VJC-120-53* 6MBi 150VJC-120-55* <i>With SiN-DCB</i>						

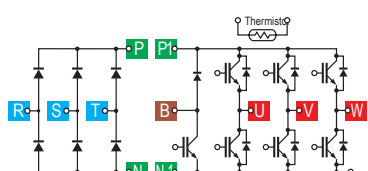
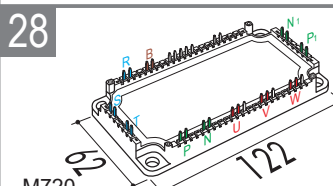
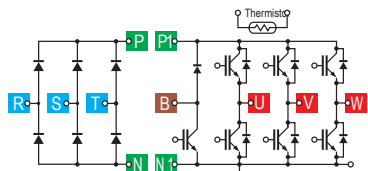
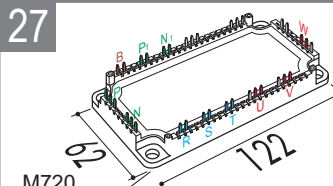
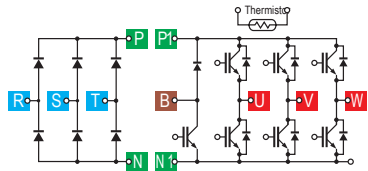
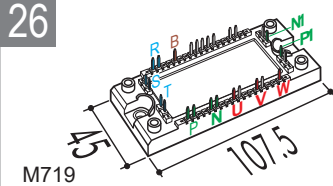
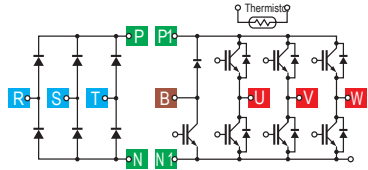
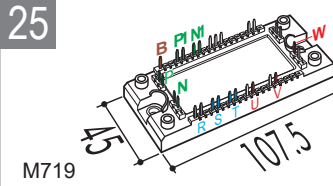
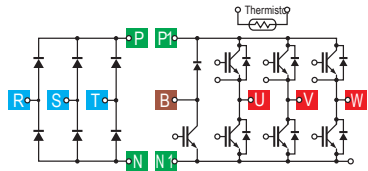
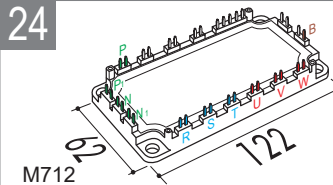
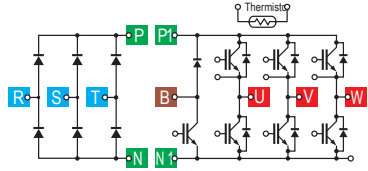
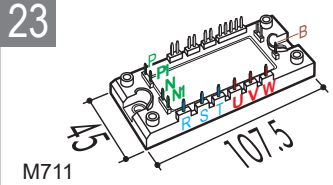
MiniSKiiP® is a trademark of SEMIKRON Elektronik GmbH & Co. KG - Germany

* Under development

PIM IGBTs (Power Integrated Modules) with Solder Pins

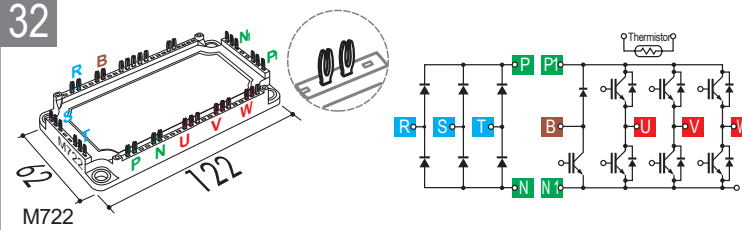
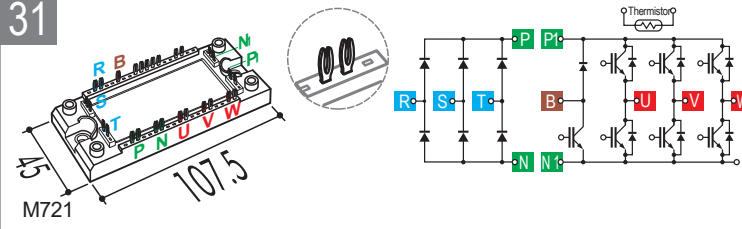
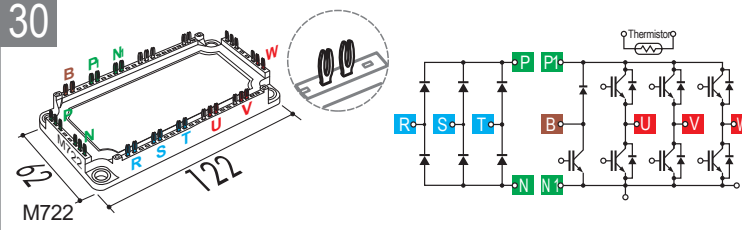
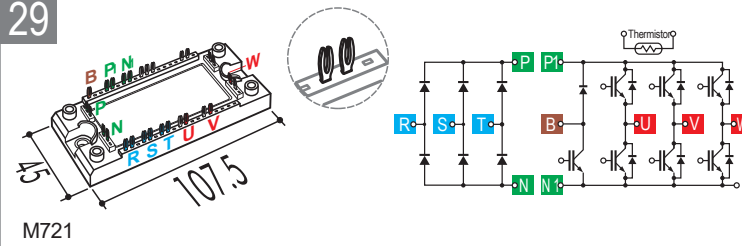
With Solder Pins

I_C	600V	650V	1200V	
	V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation
23	25A		7MBR 25VA-120-50	
	35A		7MBR 35VA-120-50	
	50A	7MBR 50VA-060-50		
24	35A		7MBR 35VB-120-50	
	50A		7MBR 50VB-120-50	
	75A	7MBR 75VB-060-50	7MBR 75VB-120-50	
	100A	7MBR 100VB-060-50		
25	25A		7MBR 25VM-120-50	
	35A		7MBR 35VM-120-50	7MBR 35XMA120-50
	50A	7MBR 50XMA065-50	7MBR 50VM-120-50	7MBR 50XMA120-50
	75A	7MBR 75XMA065-50		7MBR 75XME120-50
26	25A		7MBR 25VP-120-50	
	35A		7MBR 35VP-120-50	7MBR 35XPA120-50
	50A	7MBR 50XPA065-50	7MBR 50VP-120-50	7MBR 50XPA120-50
	75A	7MBR 75XPA065-50		7MBR 75XPE120-50
	100A	7MBR 100XPE065-50		
27	50A		7MBR 50VN-120-50	
	75A	7MBR 75XNA065-50	7MBR 75VN-120-50	7MBR 75XNA120-50
	100A	7MBR 100XNA065-50	7MBR 100VN-120-50	7MBR 100XNA120-50
	150A	7MBR 150XNA065-50	7MBR 150VN-120-50	7MBR 150XNE120-50
28	50A		7MBR 50VR-120-50	
	75A		7MBR 75VR-120-50	7MBR 75XRA120-50
	100A	7MBR 100XRA065-50	7MBR 100VR-120-50	7MBR 100XRA120-50
	150A	7MBR 150XRA065-50	7MBR 150VR-120-50	7MBR 150XRE120-50



PIM IGBTs (Power Integrated Modules) with PressFit Contacts

With PressFit Contacts

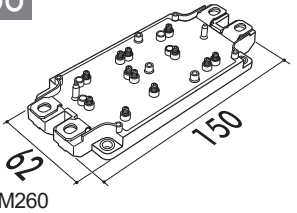
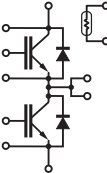
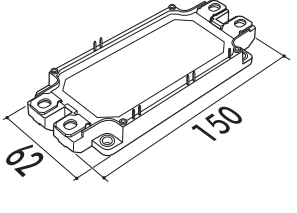
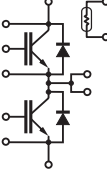
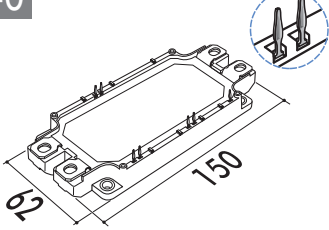
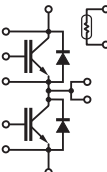


I_C	600V	650V	1200V	
	V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation
25A		7MBR 50XWA065-50	7MBR 25VW-120-50	
35A			7MBR 35VW-120-50	7MBR 35XWA120-50
50A			7MBR 50VW-120-50	7MBR 50XWA120-50
75A		7MBR 75XWA065-50		7MBR 75XWE120-50
50A			7MBR 50VX-120-50	
75A		7MBR 75XXA065-50	7MBR 75VX-120-50	7MBR 75XXA120-50
100A		7MBR 100XXA065-50	7MBR 100VX-120-50	7MBR 100XXA120-50
150A		7MBR 150XXA065-50	7MBR 150VX-120-50	7MBR 150XXE120-50
25A			7MBR 25VY-120-50	
35A			7MBR 35VY-120-50	7MBR 35XYA120-50
50A	7MBR 50VY-060-50	7MBR 50XYA065-50	7MBR 50VY-120-50	7MBR 50XYA120-50
75A	7MBR 75VY-060-50	7MBR 75XYA065-50		7MBR 75XYE120-50
100A	7MBR 100VY-060-50	7MBR 100XYE065-50		
50A			7MBR 50VZ-120-50	
75A			7MBR 75VZ-120-50	7MBR 75XZA120-50
100A	7MBR 100VZ-060-50	7MBR 100XZA065-50	7MBR 100VZ-120-50	7MBR 100XZA120-50
150A	7MBR 150VZ-060-50	7MBR 150XZA065-50	7MBR 150VZ-120-50	7MBR 150XZE120-50

6-Pack IGBTs




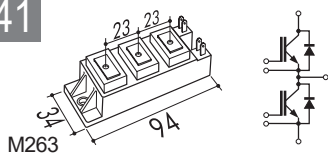
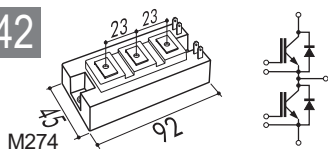
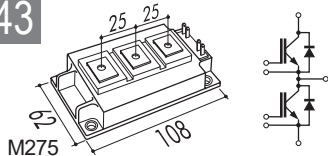
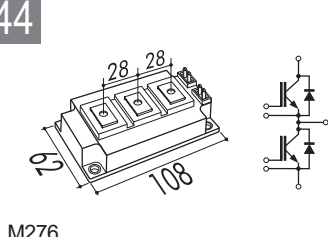
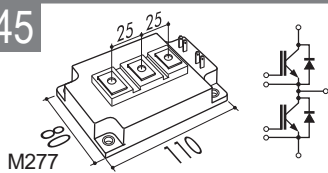
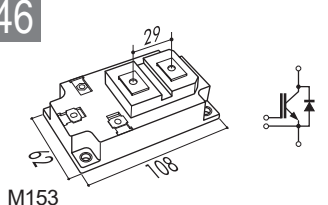
			600V	1200V		1700V	
			V-Series 6th Generation	V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	
		I_C					
With Solder Pins	33 M636		50A	6MBi 50VA-060-50	6MBi 50VA-120-50		
			75A	6MBi 75VA-060-50	6MBi 75VA-120-50		
			100A	6MBi 100VA-060-50	6MBi 100VA-120-50		
			100A		6MBi 100VB-120-50	6MBi 100XBA120-50	
With Solder Pins	34 M633		150A	6MBi 150VB-060-50	6MBi 150VB-120-50	6MBi 150XBA120-50	
			180A		6MBi 180VB-120-50		
			200A		6MBi 180VB-120-55 <i>Equivalent to 200A by lower $R_{th(j-c)}$</i>	6MBi 200XBA120-50 6MBi 200XBE120-50	
			200A				
With PressFit Contacts	35 M647		50A	6MBi 50VW-060-50	6MBi 50VW-120-50		
			75A	6MBi 75VW-060-50	6MBi 75VW-120-50		
			100A	6MBi 100VW-060-50	6MBi 100VW-120-50		
			100A		6MBi 100VX-120-50	6MBi 100XXA120-50	6MBi 100VX-170-50
With PressFit Contacts	36 M648		150A	6MBi 150VX-060-50	6MBi 150VX-120-50	6MBi 150XXA120-50	
			180A		6MBi 180VX-120-50		
			200A		6MBi 180VX-120-55 <i>Equivalent to 200A by lower $R_{th(j-c)}$</i>	6MBi 200XXA120-50 6MBi 200XXE120-50	
			200A				
High Power	37 M629		225A		6MBi 225V-120-50		
			300A		6MBi 300V-120-50		
			450A		6MBi 450V-120-50		
			550A		6MBi 550V-120-50		
		With solder pins				6MBi 300V-170-50	
						6MBi 450V-170-50	
						6MBi 550V-170-50	

2-Pack IGBT-Modules with Spring, Pin & PressFit Contacts

		1200V			1700		
		V-Series 6th Generation	V-Series 6th Generation With SiN-substrate 20% Lower thermal impedance	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation	
		I_C					
Spring Contacts 38	 	225A	2MBi 225VJ-120-50				
		300A	2MBi 300VJ-120-50				
		450A	2MBi 450VJ-120-50				
		550A				2MBi 550VJ-170-50	
		600A		2MBi 600VJ-120-50			
Solder Pins 39	 	225A	2MBi 225VN-120-50	2MBi 225VN-120S-50	2MBi 225XNA120-50 *	2MBi 225XNA170-50 *	
		300A	2MBi 300VN-120-50	2MBi 300VN-120S-50	2MBi 300XNA120-50 *	2MBi 300VN-170-50	2MBi 300XNA170-50 *
		450A	2MBi 450VN-120-50	2MBi 450VN-120S-50	2MBi 450XNA120-50 *	2MBi 450VN-170-50	2MBi 450XNA170-50 *
		550A				2MBi 550VN-170-50	
		600A		2MBi 600VN-120-50	2MBi 600XNE120-50		2MBi 600XNE170-50 *
		800A			2MBi 800XNE120-50		
PressFit Contacts 40	 	225A	2MBi 225VX-120-50		2MBi 225XNB120-50 *	2MBi 225VX-170-50	2MBi 225XNB 170-50 *
		300A	2MBi 300VX-120-50		2MBi 300XNB120-50 *	2MBi 300VX-170-50	2MBi 300XNB 170-50 *
		450A	2MBi 450VX-120-50		2MBi 450XNB120-50 *	2MBi 450VX-170-50	2MBi 450XNB 170-50 *
		550A				2MBi 550VX-170-50	
		600A		2MBi 600VX-120-50	2MBi 600XNF120-50 *		2MBi 600XNF170-50 *
		800A			2MBi 800XNF120-50 *		

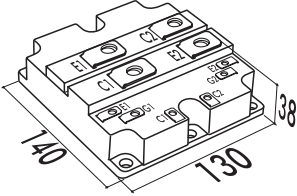
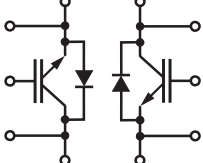
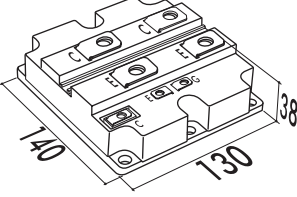
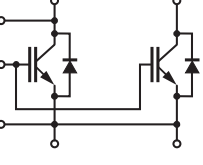
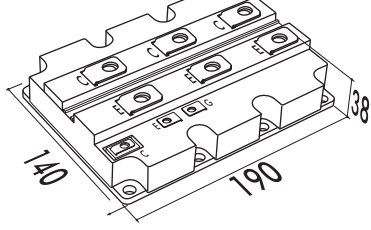
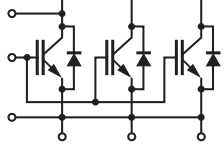
* Under development

Standard1 & 2-Pack



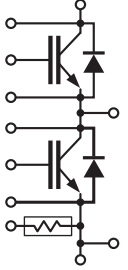
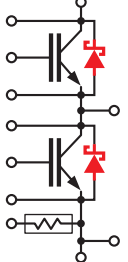
	I _C	600V		650V 		1200V 		1700V 	
		V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation	X-Series 7th Generation
41 	75A			2MBi 75VA-120-50		2MBi 75VA-170-50	2MBi 75XAA170-50*		
	100A	2MBi 100VA-060-50		2MBi 100VA-120-50	2MBi 100XAA120-50*	2MBi 100VA-170-50	2MBi 100XAA170-50*		
	150A	2MBi 150VA-060-50	2MBi 150XAA065-50*	2MBi 150VA-120-50	2MBi 150XAA120-50*		2MBi 150XAA170-50*		
	200A	2MBi 200VA-060-50	2MBi 200XAA065-50*		2MBi 200XAA120-50*				
42 	150A			2MBi 150VB-120-50					
	200A			2MBi 200VB-120-50	2MBi 200XBE120-50*				
	300A	2MBi 300VB-060-50	2MBi 300XBE065-50		2MBi 300XBE120-50*				
	400A	2MBi 400VB-060-50	2MBi 400XBE065-50						
43 	300A			2MBi 300VD-120-50					
	400A	2MBi 400VD-060-50	2MBi 400XDE065-50*	2MBi 400VD-120-50	2MBi 400XDE120-50*				
	600A	2MBi 600VD-060-50	2MBi 600XDE065-50*		2MBi 600XDE120-50*				
44 	150A					2MBi 150VH-170-50	2MBi 150XHA170-50*		
	200A			2MBi 200VH-120-50		2MBi 200VH-170-50	2MBi 200XHA170-50*		
	300A			2MBi 300VH-120-50	2MBi 300XHA120-50	2MBi 300VH-170-50	2MBi 300XHA170-50*		
	400A						2MBi 400XHA170-50*		
	450A			2MBi 450VH-120-50	2MBi 450XHA120-50				
	600A				2MBi 600XHA120-50				
45 	300A			2MBi 300VE-120-50		2MBi 300VE-170-50	2MBi 300XEE170-50*		
	400A					2MBi 400VE-170-50	2MBi 400XEE170-50*		
	450A			2MBi 450VE-120-50	2MBi 450XEE120-50*				
	600A	2MBi 600VE-060-50	2MBi 600XEE065-50*	2MBi 600VE-120-50	2MBi 600XEE120-50*				
46 	300A					1MBi 300V-170-50			
	400A			1MBi 400V-120-50 1MBi 400VF-120-50		1MBi 400V-170-50			
	600A			1MBi 600V-120-50 1MBi 600VF-120-50		1MBi 600V-170-50			
	900A			1MBi 900V-120-50					

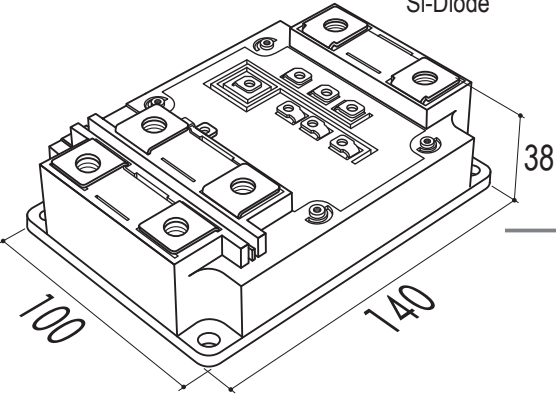
* Under development

High Power Modules 1 & 2 Pack

		1200V		1700V		3300V			
		V-Series 6th Generation With Cu-baseplate Soft turn-off	V-Series 6th Generation With Cu-baseplate Low switching loss	V-Series 6th Generation With AlSiC-baseplate Low switching loss	U-Series 5th Generation With AlSiC-baseplate Soft turn-off	U-Series 5th Generation With AlSiC-baseplate Low switching loss			
		I_C							
2-Pack	47			600A	2MBi 600VG-120P	2MBi 600VG-170E	2MBi 600VT-170E		
				800A	2MBi 800VG-120P	2MBi 800VG-170E	2MBi 800VT-170E		
				1200A	2MBi 1200VG-120P	2MBi 1200VG-170E	2MBi 1200VT-170E		
		M256, M278							
1-Pack	48			800A				1MBi 800UG-330	
				1000A				1MBi 1000UG-330	1MBi 1000UG-330B
				1200A	1MBi 1200VC-120P	1MBi 1200VC-170E	1MBi 1200VR-170E		
				1600A	1MBi 1600VC-120P	1MBi 1600VC-170E	1MBi 1600VR-170E		
				2400A	1MBi 2400VC-120P	1MBi 2400VC-170E	1MBi 2400VR-170E		
		M151, M155							
1-Pack	49			1200A				1MBi 1200UE-330	
				1500A				1MBi 1500UE-330	1MBi 1500UE-330B
				2400A	1MBi 2400VD-120P	1MBi 2400VD-170E	1MBi 2400VS-170E		
				3600A	1MBi 3600VD-120P	1MBi 3600VD-170E	1MBi 3600VS-170E		
	M152, M156								

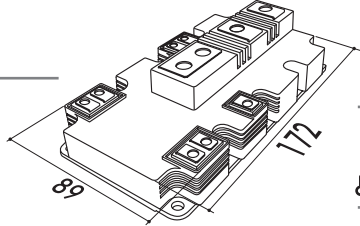

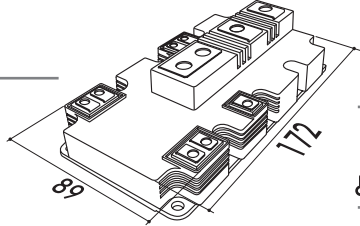
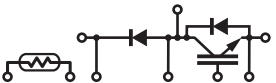
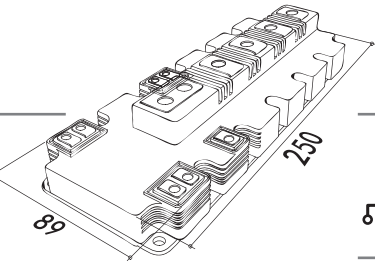

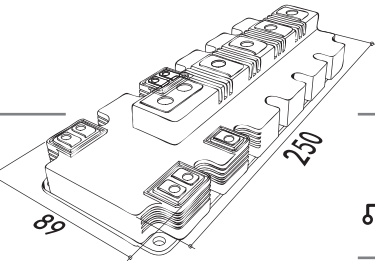
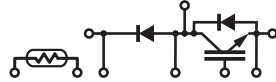
High Power next Core (HPnC)

		1700V 		3300V 	
		X-Series 7th Generation		X-Series 7th Generation	
All Silicon Modules Si-IGBT & Si-Diode	50	All Silicon Modules Si-IGBT (X-Series, 7th Generation) Si-Diode		I_C	
				450A	2MBi 450XUF330-50*
1000A	2MBi 1000XUF170-50*				
Hybrid Modules Si-IGBT & SiC Diode	100	Hybrid Modules Si-IGBT (X-Series, 7th generation) SiC-Schottky Diode		450A	2MSi 450XUF330-50*
				1000A	2MSi 1000XUF170-50*



* Under development

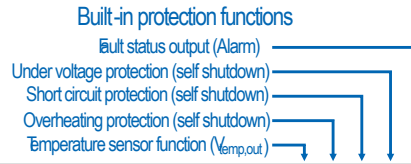
High Power Modules, 2-Pack & Chopper

		1200V		1700V			
		V-Series 6th Generation E-type (Low switching loss) P-type (Soft turn-off)	X-Series 7th Generation E-type (Low switching loss) P-type (Soft turn-off)	V-Series 6th Generation E-type (Low switching loss) P-type (Soft turn-off)	X-Series 7th Generation E-type (Low switching loss) P-type (Soft turn-off)		
2-Pack	51 		600A	2MBi 600VXA-120E-50			
			650A			2MBi 650VXA-170E-50 2MBi 650VXA-170EA-50 <i>(With larger free wheeling diode)</i>	2MBi 650XXA170E-50 *
			900A	2MBi 900VXA-120E-50 2MBi 900VXA-120P-50	2MBi 900XXA120E-50 * 2MBi 900XXA120P-50*		
			1200A		2MBi 1200XE120E-50 * 2MBi 1200XE120P-50*		2MBi 1200XE170P-50*
Chopper	M271 		650A			1MBi 650VXA-170EL-50	
			900A	1MBi 900VXA-120PD-50			
			650A			1MBi 650VXA-170EH-50	
			900A	1MBi 900VXA-120PC-50			
2-Pack	52 		1000A			2MBi 1000VXB-170E-50 2MBi 1000VXB-170EA-50 <i>(With larger free wheeling diode)</i>	2MBi 1000XXB170E-50 *
			1400A	2MBi 1400VXB-120E-50 2MBi 1400VXB-120P-50	2MBi 1400XXB120P-50*	2MBi 1400VXB-170E-50 2MBi 1400VXB-170P-50	2MBi 1400XXB170P-50*
			1800A		2MBi 1800XXF120P-50*		2MBi 1800XXF170P-50*
Chopper	M272 		1000A			1MBi 1000VXB-170EL-50	
			1400A	1MBi 1400VXB-120PL-50		1MBi 1400VXB-170EL-50	
			1000A			1MBi 1000VXB-170EH-50	
			1400A	1MBi 1400VXB-120PH-50		1MBi 1400VXB-170EH-50	

Above devices are available with $V_{CE(sat)}$ & V_F rank label for optimum paralleling (→suffix -54 instead of -50)

* Under development

IPM IGBTs (Intelligent Power Modules)

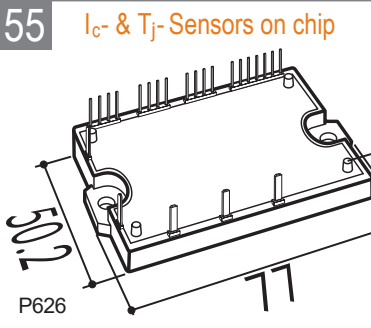
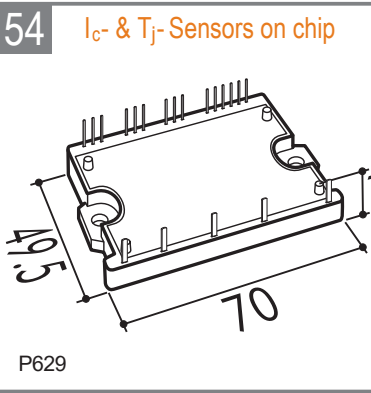
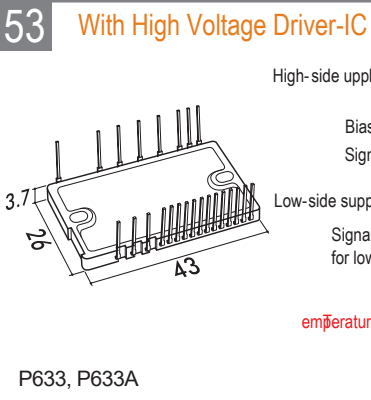


	Without Brake-Chopper	53 With High Voltage Driver-IC			I_C	600V		1200V
						V-Series 6th Generation	X-Series 7th Generation	V-Series 6th Generation
					15A		6MBP 15XSD060-50	
					20A		6MBP 20XSD060-50	
					30A		6MBP 30XSD060-50	
					35A		6MBP 35XSD060-50	
					15A		6MBP 15XSF060-50	
					20A		6MBP 20XSF060-50	
					30A		6MBP 30XSF060-50	
					35A		6MBP 35XSF060-50	
					10A			6MBP 10VAA-120-50
					15A			6MBP 15VAA-120-50
					20A		6MBP 20VAA-060-50	
					25A			6MBP 25VAA-120-50
					30A		6MBP 30VAA-060-50	
					50A		6MBP 50VAA-060-50	
					25A			6MBP 25VBA-120-50
					35A			6MBP 35VBA-120-50
					50A		6MBP 50VBA-060-50	
					75A		6MBP 75VBA-060-50	

Without Brake-Chopper

Without Brake-Chopper

Without Brake-Chopper



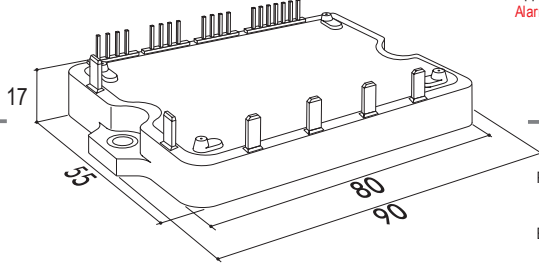
IPM IGBTs (Intelligent Power Modules)

Built-in protection functions

- Fault status output (Alarm)
- Under voltage protection (self shutdown)
- Short circuit protection (self shutdown)
- Overheating protection (self shutdown)
- Temperature sensor function (V_{temp.out})

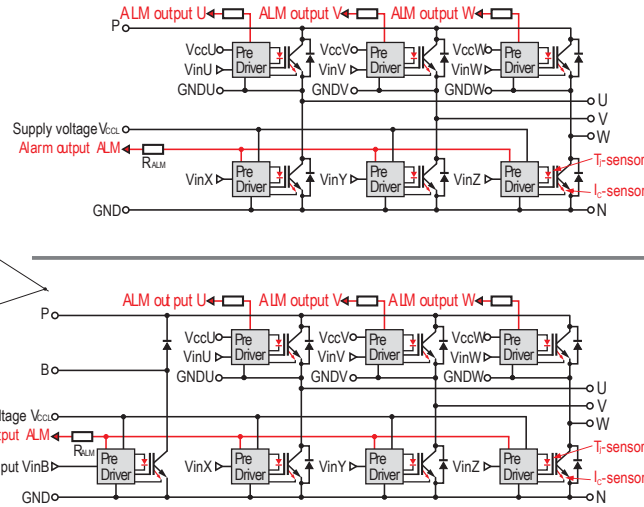
56 I_c- & T_j-Sensors on chip

Without Brake-Chopper



With Brake-Chopper

P636



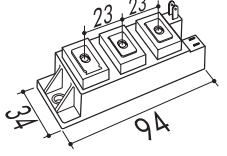
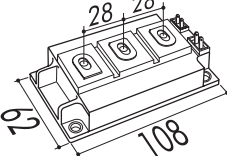
I _C	600V	1200V
	V-Series 6th Generation	V-Series 6th Generation
25A		6MBP 25VFN-120-50
35A		6MBP 35VFN-120-50
50A	6MBP 50VFN-060-50	6MBP 50VFN-120-50
75A	6MBP 75VFN-060-50	
100A	6MBP 100VFN-060-50	
25A		7MBP 25VFN-120-50
35A		7MBP 35VFN-120-50
50A	7MBP 50VFN-060-50	7MBP 50VFN-120-50
75A	7MBP 75VFN-060-50	
100A	7MBP 100VFN-060-50	

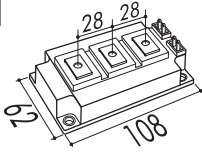
IPM IGBTs (Intelligent Power Modules)

- Built-in protection functions**
- Fault status output (Alarm)
 - Under voltage protection (self shutdown)
 - Short circuit protection (self shutdown)
 - Overheating protection (self shutdown)
 - Temperature sensor function ($V_{temp.out}$)

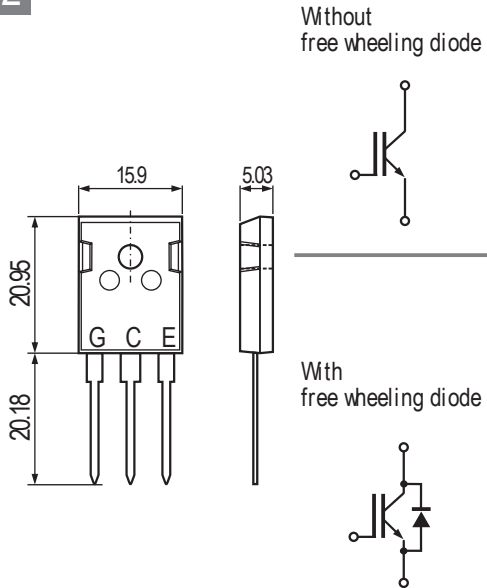
			I_c	600V V-Series 6th Generation	1200V V-Series 6th Generation
Without Brake-Chopper	57 I_c - & T_j -Sensors on chip		25A		6MBP 25VDA-120-50
			35A		6MBP 35VDA-120-50
			50A	6MBP 50VDA-060-50	6MBP 50VDA-120-50 6MBP 50VDN-120-50 ¹⁾
			75A	6MBP 75VDA-060-50	6MBP 75VDA-120-50 6MBP 75VDN-120-50 ¹⁾
			100A	6MBP 100VDA-060-50 6MBP 100VDN-060-50 ¹⁾	6MBP 100VDA-120-50 6MBP 100VDN-120-50 ¹⁾
			150A	6MBP 150VDA-060-50 6MBP 150VDN-060-50 ¹⁾	
			200A	6MBP 200VDA-060-50 6MBP 200VDN-060-50 ¹⁾	
With Brake-Chopper	P630		25A		7MBP 25VDA-120-50
			35A		7MBP 35VDA-120-50
			50A	7MBP 50VDA-060-50	7MBP 50VDA-120-50 7MBP 50VDN-120-50 ¹⁾
			75A	7MBP 75VDA-060-50	7MBP 75VDA-120-50 7MBP 75VDN-120-50 ¹⁾
			100A	7MBP 100VDA-060-50 7MBP 100VDN-060-50 ¹⁾	7MBP 100VDA-120-50 7MBP 100VDN-120-50 ¹⁾
			150A	7MBP 150VDA-060-50 7MBP 150VDN-060-50 ¹⁾	
			200A	7MBP 200VDA-060-50 7MBP 200VDN-060-50 ¹⁾	
Without Brake-Chopper	58 I_c - & T_j -Sensors on chip		100A		6MBP 100VEA-120-50
			150A		6MBP 150VEA-120-50
			200A	6MBP 200VEA-060-50	6MBP 200VEA-120-50
			300A	6MBP 300VEA-060-50	
			400A	6MBP 400VEA-060-50	
With Brake-Chopper	P631		100A		7MBP 100VEA-120-50
			150A		7MBP 150VEA-120-50
			200A	7MBP 200VEA-060-50	7MBP 200VEA-120-50
			300A	7MBP 300VEA-060-50	
			400A	7MBP 400VEA-060-50	

1) With high thermal performance

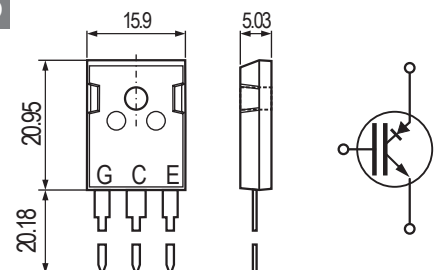
Chopper(Standard and high speed IGBTs)		I_C	1200V		
			Planar-NPT High Speed-Series	U-Series 5th Generation	V-Series 6th Generation
Chopper	59  M262	50A		1MBi 50U4F-120L-50	
		75A		1MBi 75U4F-120L-50	
		100A		1MBi 100U4F-120L-50	
	60  M259	150A			1MBi 150VA-120L-50
		200A			1MBi 200VA-120L-50
		200A	1MBi 200HH-120L-50	1MBi 200U4H-120L-50 Without thermistor	
	300A	1MBi 300HH-120L-50			
	400A	1MBi 400HH-120L-50			

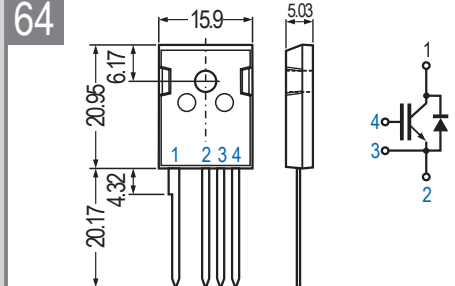
High Speed IGBTs		I_C	1200V
			Planar-NPT High Speed-Series
2-Pack	61  M259	100A	2MBi 100HJ-120-50
		150A	2MBi 150HJ-120-50
		200A	2MBi 200HJ-120-50
		300A	2MBi 300HJ-120-50

Discrete IGBTs

TO -247	62		I_c	V-Series, 6th Generation Low loss , ~10kHz		V-Series, 6th Generation High speed , 10~30kHz		W-Series, 6th Generation Ultra high speed , 20~100kHz	
				600V	1200V	600V	1200V	650V	1200V
				15A					FGW 15N 120H
25A							FGW 25N 120W		
30A						FGW 30N 120H			
35A						FGW 35N 60H			
40A						FGW 40N 120H	FGW 40N 65W	FGW 40N 120W	
50A						FGW 50N 60H	FGW 50N 65W		
60A							FGW 60N 65W		
75A						FGW 75N 60H			
15A				FGW 15N 120VD		FGW 15N 120HD			
25A				FGW 25N 120VD				FGW 25N 120WD FGW 25N 120WE	
30A				FGW 30N 60VD			FGW 30N 120HD	FGW 30N 65WD	
35A						FGW 35N 60HD FGW 35N 60HC ¹⁾			
40A					FGW 40N 120VD		FGW 40N 120HD	FGW 40N 65WD FGW 40N 65WE	FGW 40N 120WD FGW 40N 120WE
50A				FGW 50N 60VD		FGW 50N 60HD FGW 50N 60HC ¹⁾		FGW 50N 65WD FGW 50N 65WE	
60A								FGW 60N 65WD FGW 60N 65WE	
75A						FGW 75N 60HD FGW 75N 60HC ¹⁾		FGW 75N 65WE	

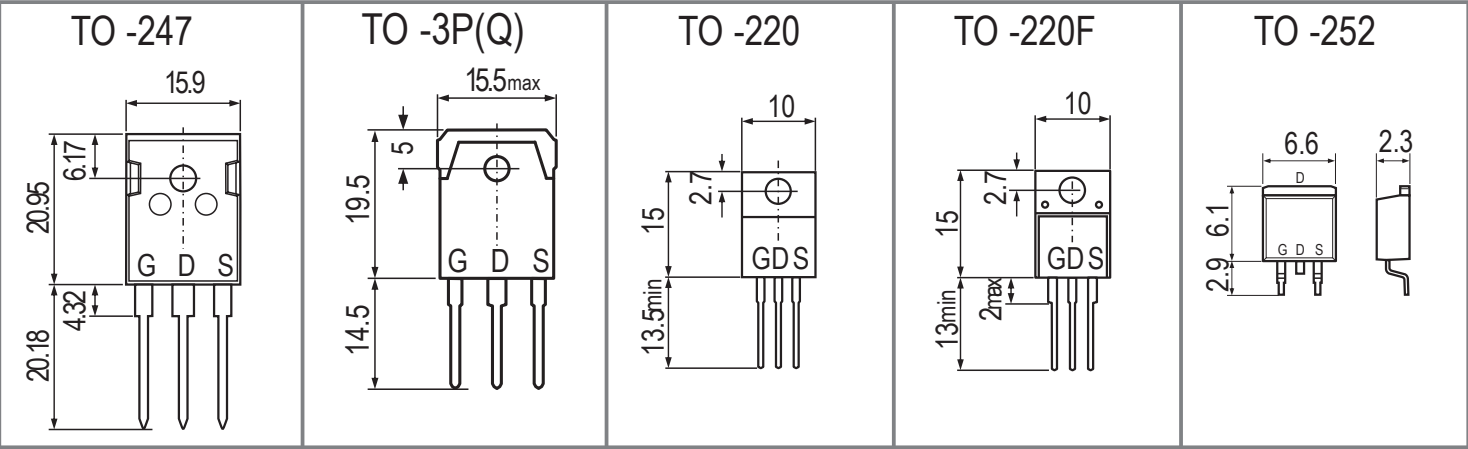
Reverse Blocking IGBT

TO -247	63		I_c	600V	650V	1200V
				85A		

TO -247-4	64		I_c	600V	650V	1200V	
				40A			FGZ 40N 120WE ¹⁾
				50A	FGZ 50N 65WD FGZ 50N 65WE ¹⁾		
75A	FGZ 75N 65WE ¹⁾						

1) With full rating free wheeling diode

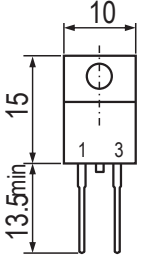
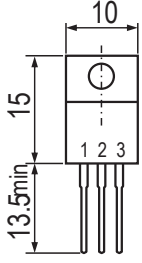
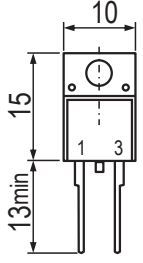
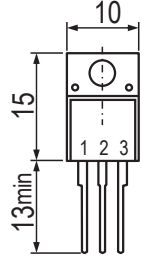
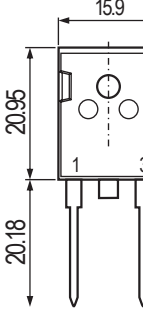
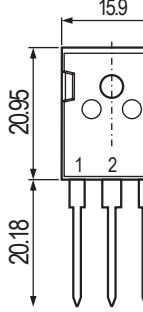
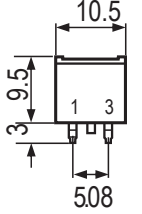
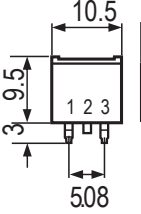

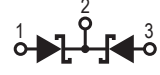



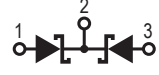

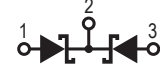
Super - Junction
MOSFET



V _{DS}	R _{DS(on), max}	I _D	TO -247		TO -3P(Q)		TO -220		TO -220F		TO -252		
			Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.	Part No.			
600V	25.4 mW	95.5 A	FM W 60N 025 S2										
	40.0 mW	66.2 A	FM W 60N 040 S2										
	55.0 mW	50.3 A	FM W 60N 055 S2										
	70.0 mW	39.4 A	FM W 60N 070 S2						FM V 60N 070 S2				
	79.0 mW	37.1 A	FM W 60N 079 S2				FM P 60N 079 S2		FM V 60N 079 S2				
	88.0 mW	32.8 A	FM W 60N 088 S2				FM P 60N 088 S2		FM V 60N 088 S2				
	99.0 mW	29.2 A	FM W 60N 099 S2				FM P 60N 099 S2		FM V 60N 099 S2				
	125.0 mW	23.4 A	FM W 60N 125 S2				FM P 60N 125 S2		FM V 60N 125 S2				
	160.0 mW	18.4 A	FM W 60N 160 S2				FM P 60N 160 S2		FM V 60N 160 S2				
	190.0 mW	15.5 A	FM W 60N 190 S2		FM H 60N 190 S2		FM P 60N 190 S2		FM V 60N 190 S2				
	280.0 mW	10.7 A			FM H 60N 280 S2		FM P 60N 280 S2		FM V 60N 280 S2		FM D 60N 280 S2		
	380.0 mW	8.1 A					FM P 60N 380 S2		FM V 60N 380 S2		FM D 60N 380 S2		
	With built-in FRED	27.0 mW	95.5 A	FM W 60N 027 S2 FD									
		43.0 mW	66.2 A	FM W 60N 043 S2 FD									
		59.0 mW	50.3 A	FM W 60N 059 S2 FD									
75.0 mW		39.4 A	FM W 60N 075 S2 FD						FM V 60N 075 S2 FD				
84.0 mW		37.1 A	FM W 60N 084 S2 FD				FM P 60N 084 S2 FD		FM V 60N 084 S2 FD				
94.0 mW		32.8 A	FM W 60N 094 S2 FD				FM P 60N 094 S2 FD		FM V 60N 094 S2 FD				
105.0 mW		29.2 A	FM W 60N 105 S2 FD				FM P 60N 105 S2 FD		FM V 60N 105 S2 FD				
133.0 mW		23.4 A	FM W 60N 133 S2 FD				FM P 60N 133 S2 FD		FM V 60N 133 S2 FD				
170.0 mW	18.4 A	FM W 60N 170 S2 FD				FM P 60N 170 S2 FD		FM V 60N 170 S2 FD					

* Under development

SiC Schottky Barrier Diodes 

		TO -220		TO -220F (insulated)		TO -247		T-Pack S	
									
		Single	Dual	Single	Dual	Single	Dual	Single	Dual
I_{FAV}									
650V	10A	FDCP 10S 65		FDCA 10S 65		FDCY 10S 65		FDCC 10S 65	
	20A		FDCP 20C 65		FDCA 20C 65		FDCY 20C 65		FDCC 20C 65
	25A	FDCP 25S 65		FDCA 25S 65		FDCY 25S 65		FDCC 25S 65	
	50A					FDCY 50C 65			
1200V	18A			FDCA 18S 120		FDCY 18S 120			
	36A					FDCY 36C 120			

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