

FUJI Power Semiconductors

# IGBT/SiC Devices Selection Guide



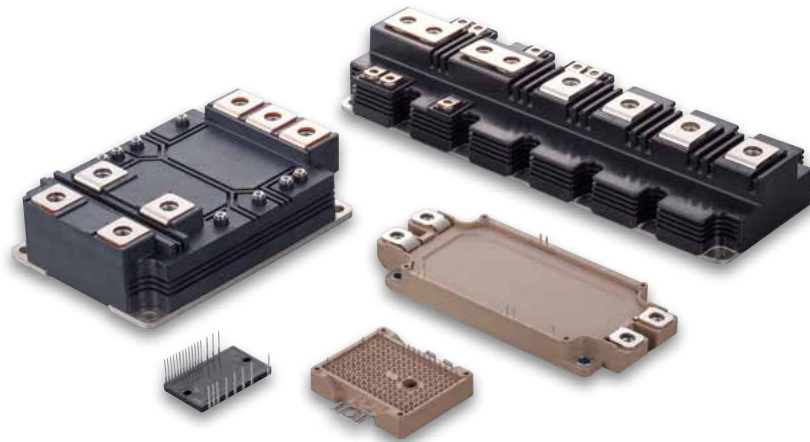
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Note: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.



## Features of IGBT Module X Series

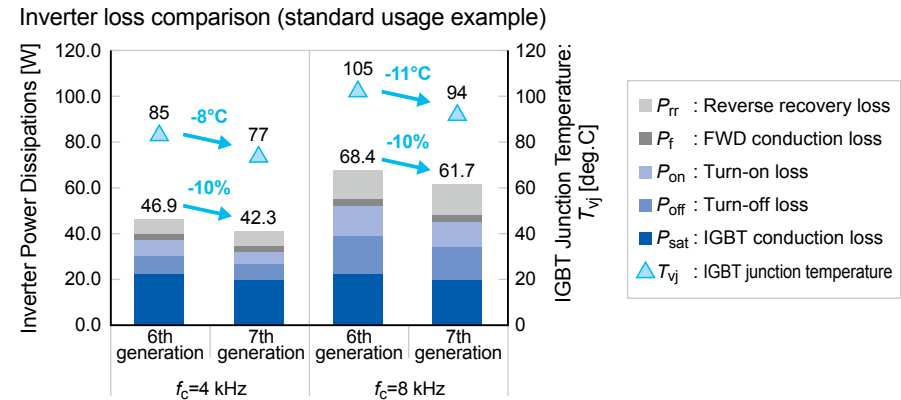


### 1. Low loss

The surface and vertical structures of the IGBT and diode chips are optimized. This reduces power dissipations during inverter operation compared with previous products (our 6th generation V series).



Reduces inverter power dissipation by 10% and IGBT Junction temperature by 11°C  
(Comparison with the 6th Generation V Series (75 A), at  $f_c = 8$  kHz)

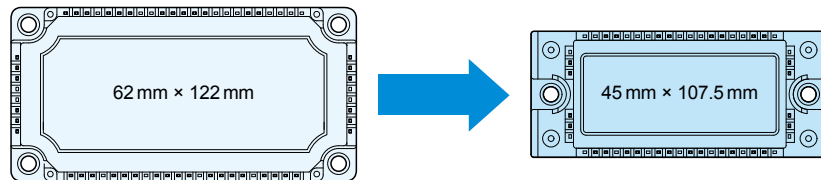


### 2. Miniaturization

The application of the newly developed insulating substrate has improved the heat dissipation of the module. By suppressing heat generation as well as reducing power loss, some products can be mounted in a package of about 36% smaller.

Application example)

**36% reduction**



1200V 75A (6th Generation V Series)

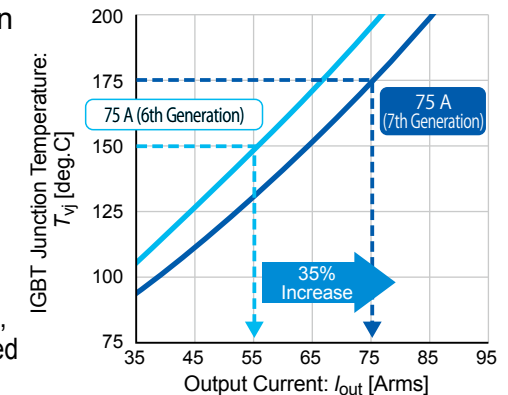
1200V 75A (7th Generation X Series)

### 3. High-temperature operation

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

Increased output current by  $T_{vj(op)}=175^\circ\text{C}$

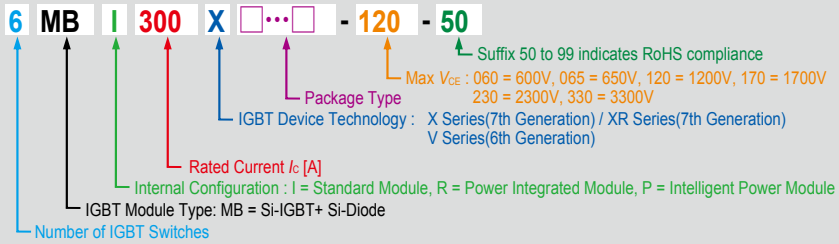
- 35% more output current than the previous generation
- $\Delta T_{vj}$  power cycle lifetime is doubled compared to the conventional products, thus the same level of lifetime is secured even at 175°C continuous operation.



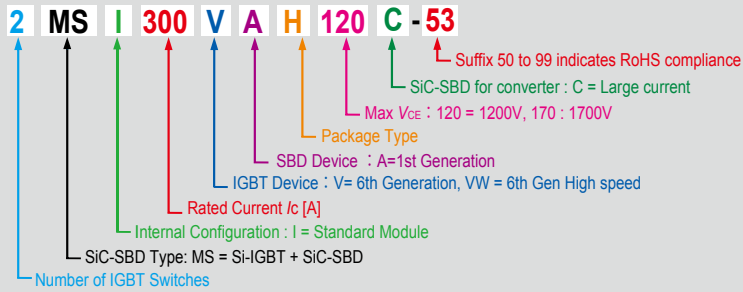
Number of Switches	Products Category	Page	Internal Configuration					Max $V_{CE}$ ( $V_{RRM}$ )						Rated Current						
			Power Module Standard Module	Power Integrated Module	Intelligent Power Module	3-level Module	Discrete IGBT	Discrete SiC-SBD	600V	650V	1200V	1700V	2300V	3300V	≤50A	>50A ≤150A	>150A ≤300A	>300A ≤600A	>600A ≤1200A	>1200A
6	Small IPM	9							✓	✓					✓	✓				
6,7	IPM	10,11							✓	✓	✓				✓	✓				
		12			✓				✓	✓	✓				✓	✓	✓			
		13							✓	✓	✓					✓	✓	✓		
7	Small PIM	14		✓					✓	✓	✓				✓					
	PIM EconoPIM™	15							✓	✓	✓				✓	✓				
		16		✓						✓	✓	✓				✓	✓			
6	6-Pack EconoPACK™ EconoPACK™+	17							✓		✓				✓	✓	✓			
		18	✓						✓		✓	✓			✓	✓	✓	✓		
2	Standard 2-Pack	19	✓						✓	✓	✓	✓				✓	✓	✓		
		20	✓								✓	✓					✓	✓	✓	
1	Standard 1-Pack	21	✓								✓	✓					✓	✓	✓	
	Chopper	21	✓						✓		✓					✓	✓	✓		
1,2	HPnC	22	✓								✓	✓	✓	✓				✓	✓	✓
	PrimePACK™	23,24	✓								✓	✓	✓	✓				✓	✓	✓
4,12	T/I-type NPC 3-level	25				✓			✓		✓	✓			✓	✓	✓	✓	✓	
2	Hybrid SiC Modules	26	✓								✓	✓					✓	✓		
	All-SiC Modules	27	✓								✓	✓					✓	✓		
1	Discrete IGBT	28					✓		✓	✓	✓				✓	✓				
-	SiC-SBD	29							✓	✓	✓				✓					

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

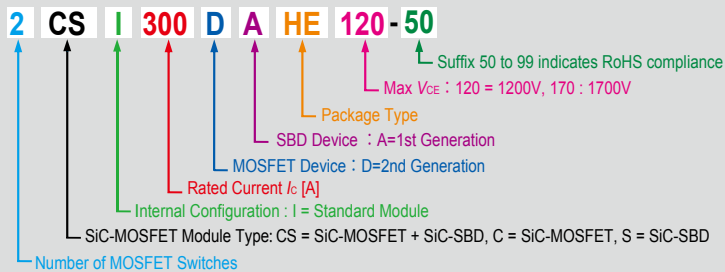
### IGBT Module Production Number



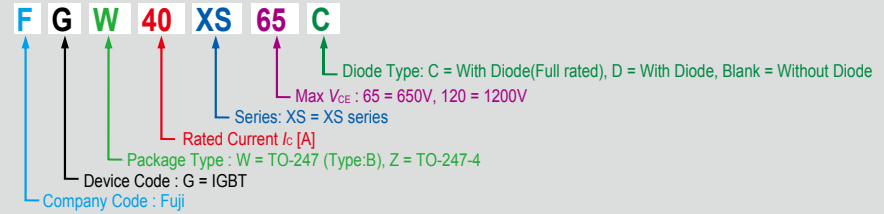
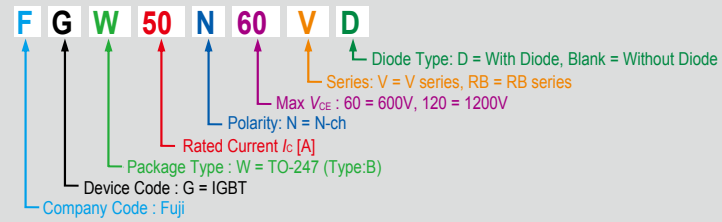
### IGBT Hybrid Module with SiC-SBD Production Number



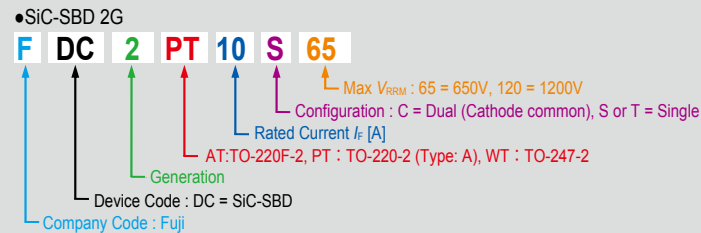
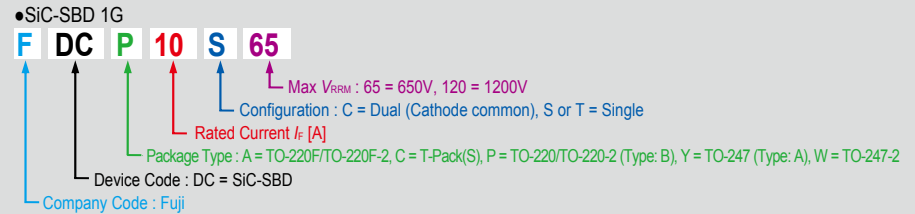
### All-SiC Module Production Number



### Discrete IGBT Production Number



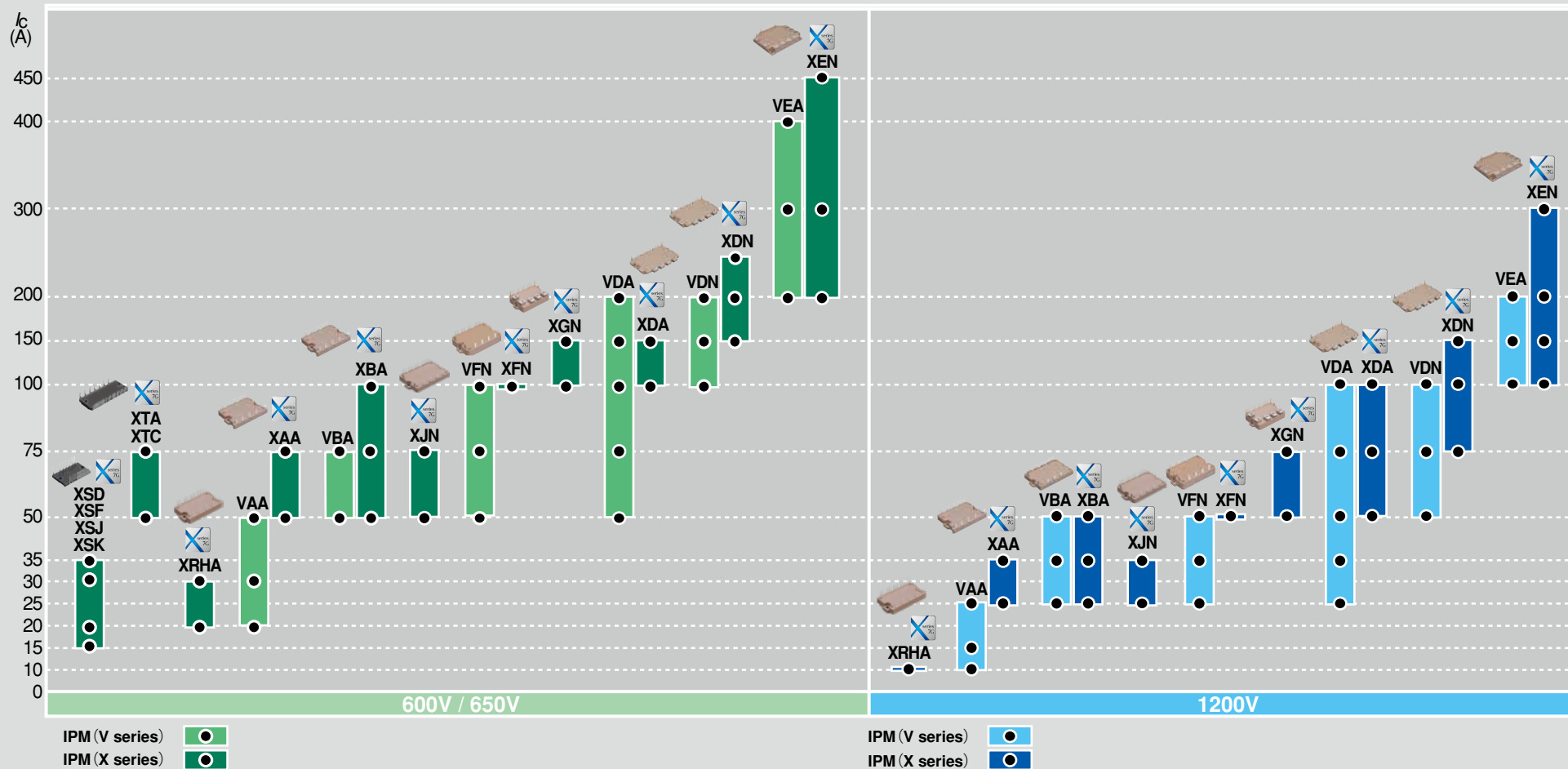
### SiC Schottky-Barrier Diode Production Number





# IPM (Intelligent Power Modules) Products Map

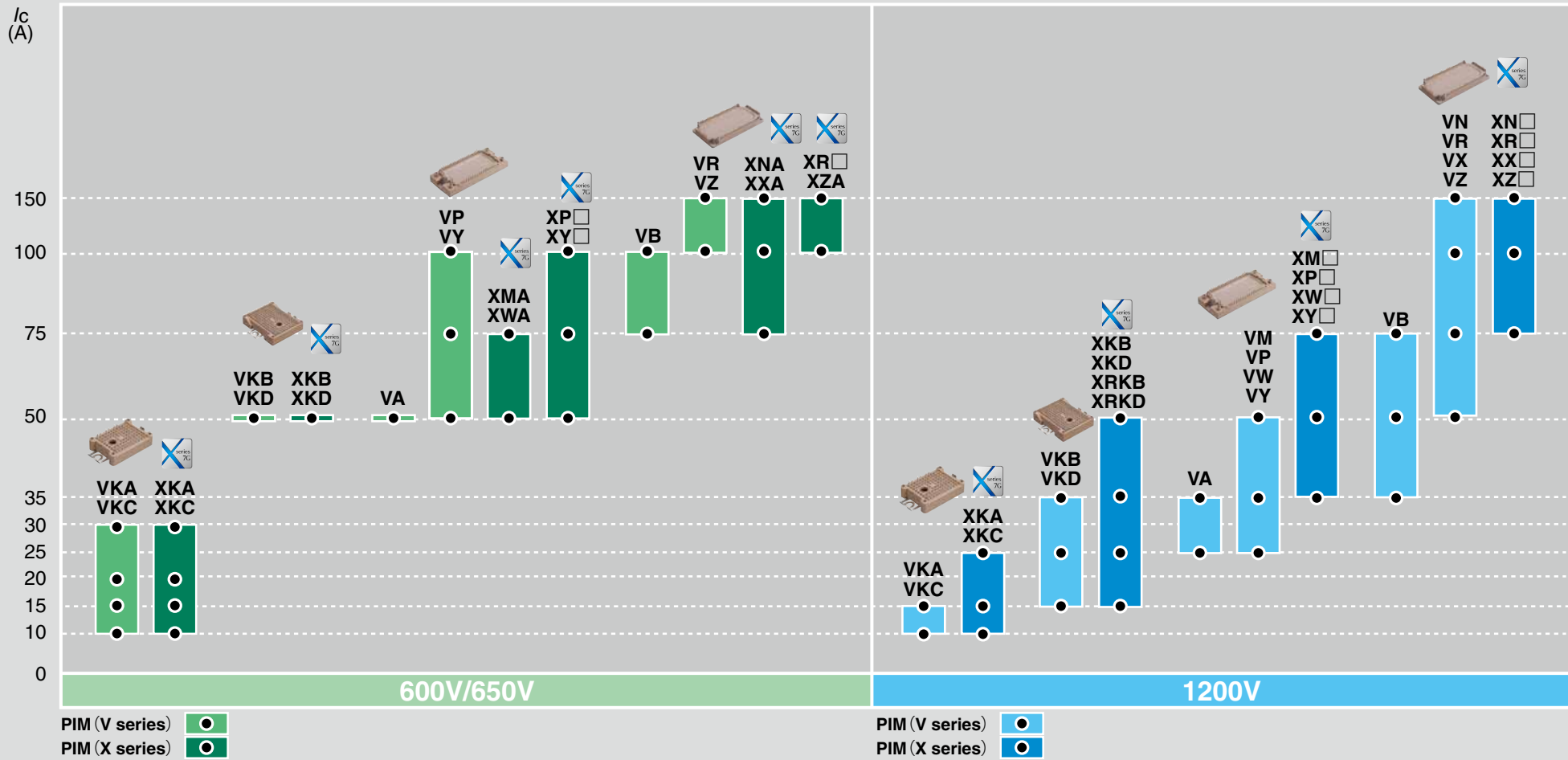
6/7MBP	Ic	IGBT series & Package type		Size	V series		X series		Page
		V series	X series		7 in 1	6 in 1	7 in 1	6 in 1	
-	-	-	XSD, XSF, XSJ, XSK	26×43mm	-	-	-	✓	9
-	-	-	XTA, XTC	31×79mm	-	-	-	✓	9
-	-	-	XRHA	36×70mm	-	-	-	✓	10
VAA	XAA	49.5×70mm	-	✓	-	✓	✓	10	
VBA	XBA	50.2×87mm	-	✓	-	-	✓	10	
-	XJN	50.2×87mm	-	-	-	✓	-	10	
VFN	XFN	55×90mm	✓	✓	✓	✓	✓	11	
-	XGN	55×90mm	-	-	-	-	✓	11	
VDA, VDN	XDA, XDN	84×128.5mm	✓	✓	✓	✓	✓	12	
VEA	XEN	110×142mm	✓	✓	✓	✓	✓	13	



# PIM (Power Integrated Modules) Products Map

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

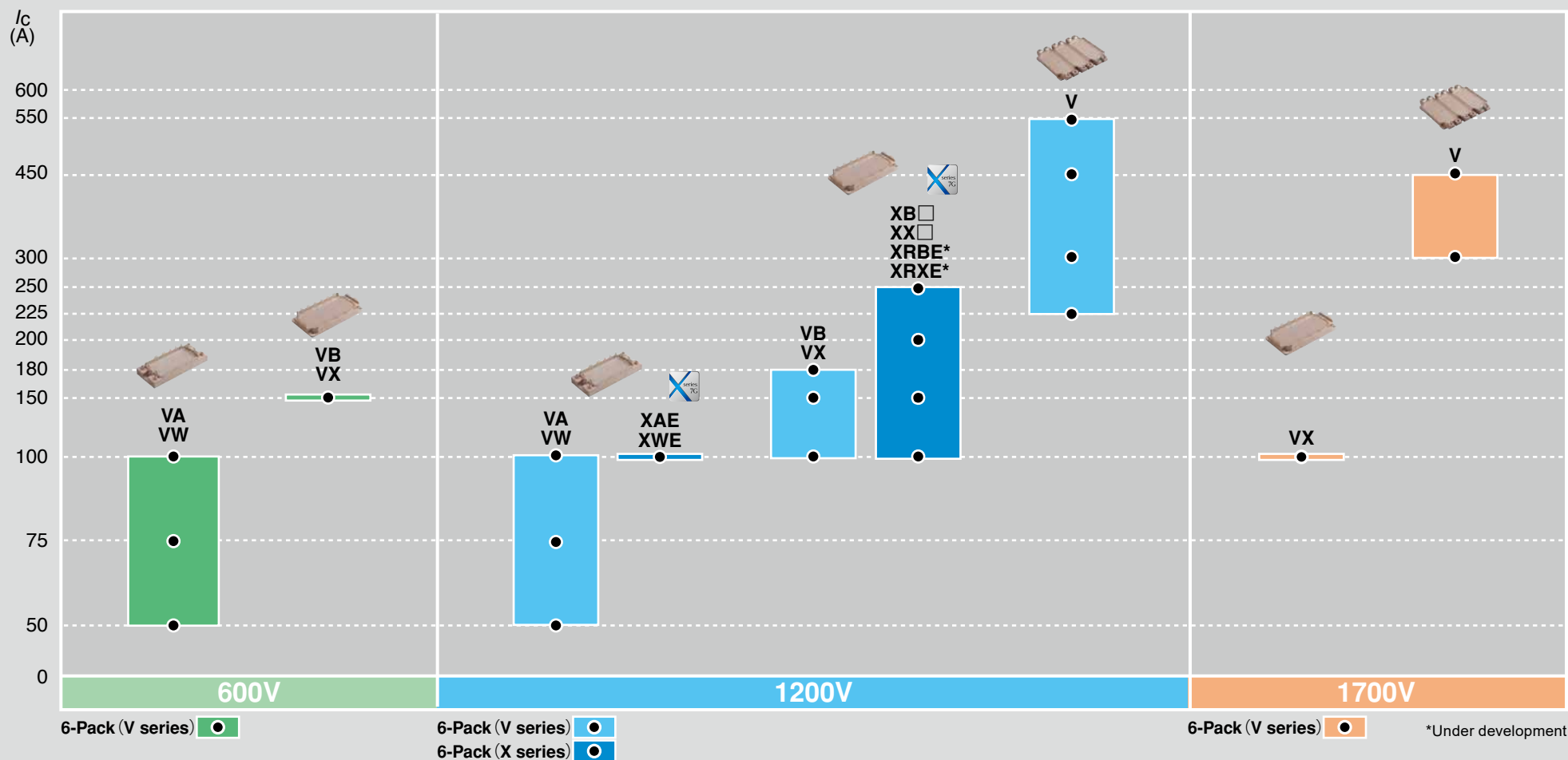
Note: EconoPIM™ is registered trademark of Infineon Technologies AG, Germany.



## 6-Pack Products Map

6MBI	Ic	IGBT series & Package type				Size	Page	
		V series		X series				
		Solder pins	Press fit pins	Solder pins	Press fit pins			
		<b>VA</b>	<b>VW</b>	<b>XAE</b>	<b>XWE</b>	45×107.5mm	17,18	EconoPACK™
		<b>VB</b>	<b>VX</b>	<b>XB□, XRBE</b>	<b>XX□, XRXE</b>	62×122mm	17,18	EconoPACK™
		<b>V</b>	-	-	-	150×162mm	18	EconoPACK™+

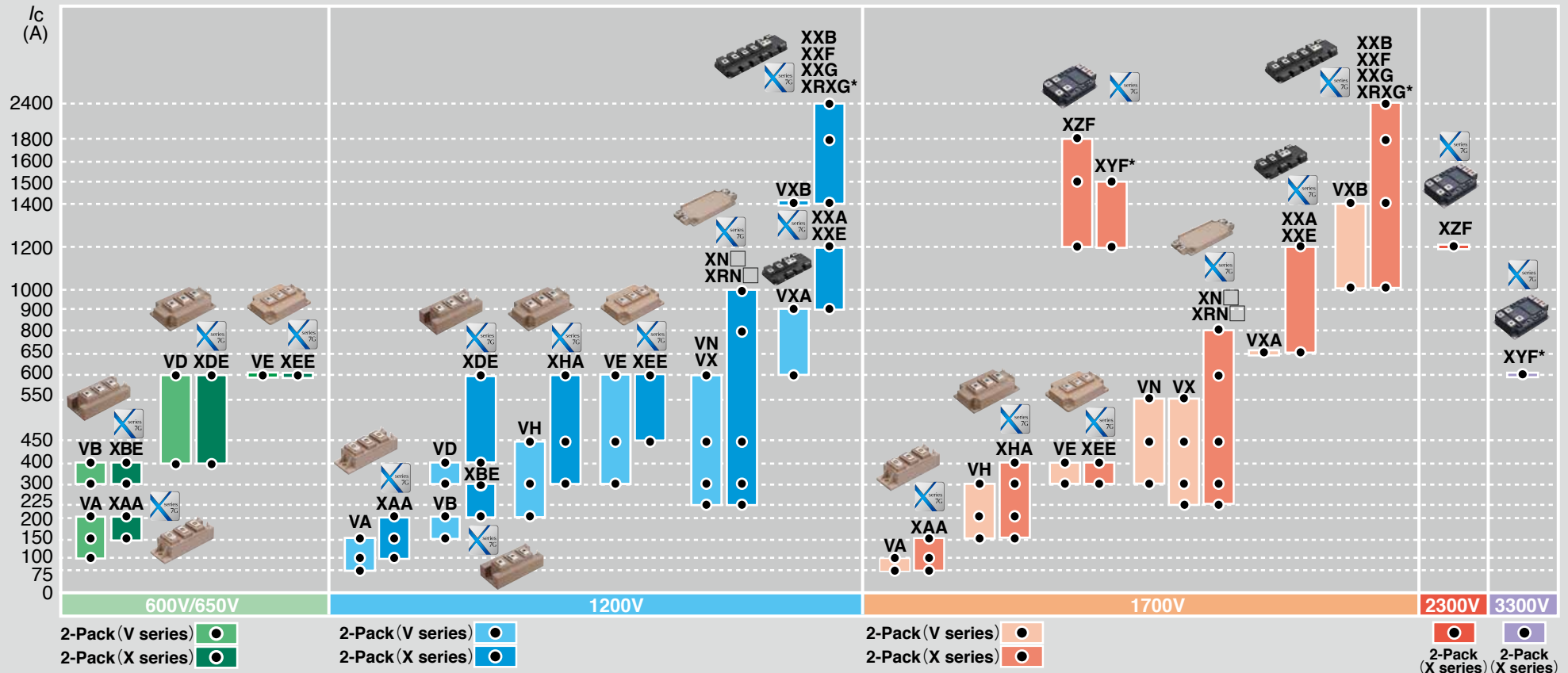
Note: EconoPACK™ and EconoPACK™+ are registered trademark of Infineon Technologies AG, Germany.



# 2-Pack Products Map

2MBI	Ic	IGBT series & Package type		Size	Page	
		V series	X series			
	VA	XAA		34×94mm	19	Standard Pack
	VB	XBE		45×92mm	19	
	VD, VH	XDE, XHA		62×108mm	19	
	VE	XEE		80×110mm	19	
	VN, VX	XN□, XRN□		62×150mm	20	
	-	XYF, XZF		99.5×144mm	22	HPnC
	VXA	XXA, XXE		89×172mm	23	PrimePACK™
	VXB	XXB, XXF, XXG, XRXG		89×250mm	23	

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

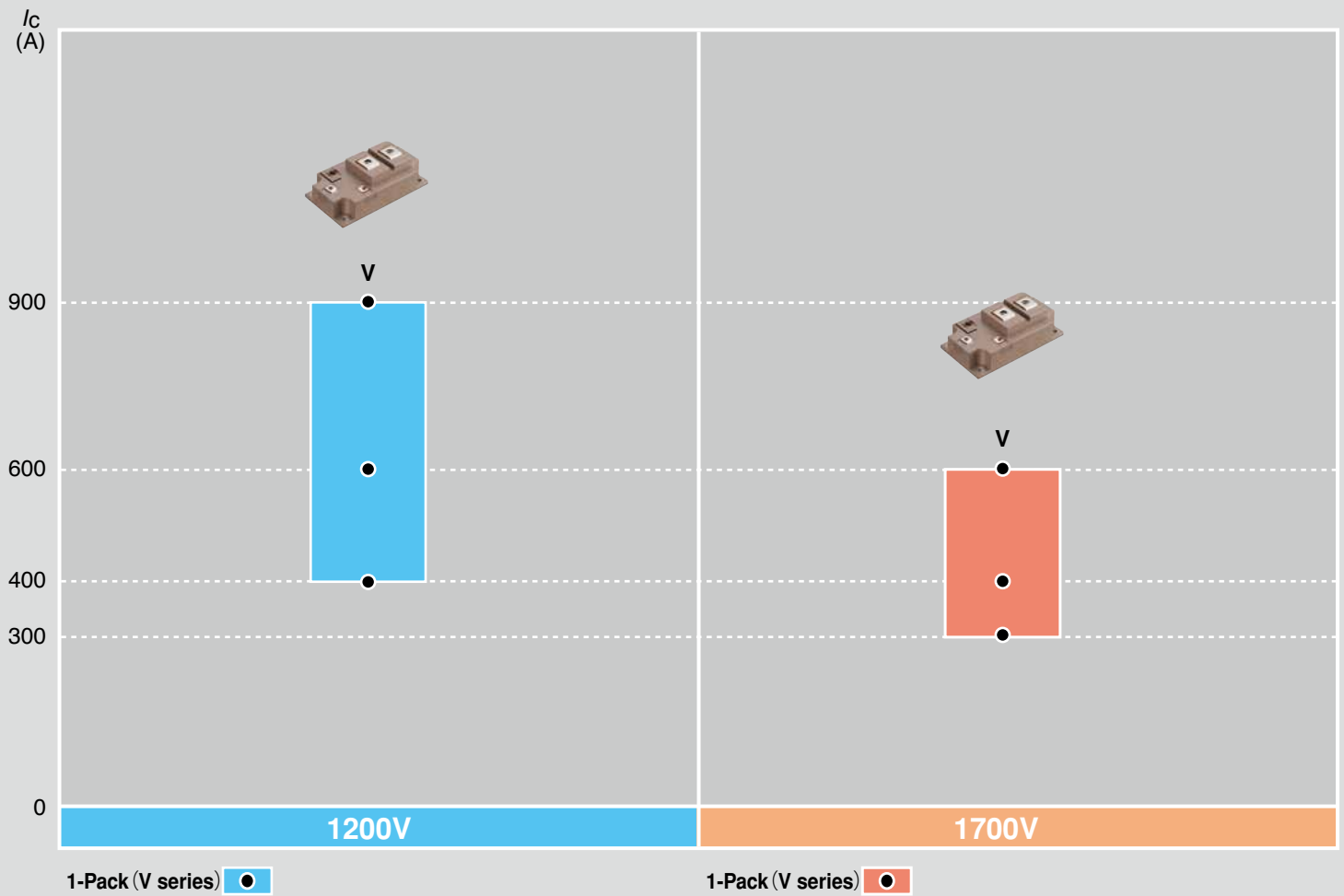


\*Under development



# 1-Pack Products Map

1MBI	Ic	IGBT series & Package type	Size	Page	
		V series	62×108mm	21	Standard Pack
		V			



# Small IPM (Intelligent Power Modules)

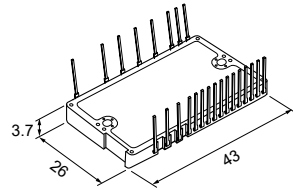
**Built-in protection functions**

- P-side fault status output (Alarm)
- N-side fault status output (Alarm)
- Under voltage protection (self shutdown)
- Over current protection (self shutdown)
- Overheating protection (self shutdown)
- Temperature sensor output (Vtemp, out)

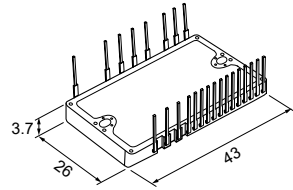
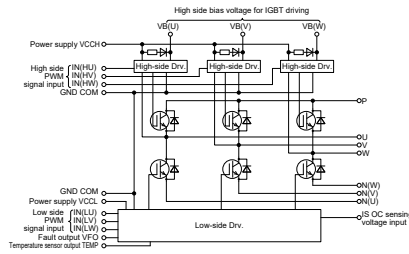
600 / 650V



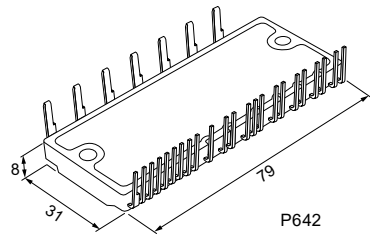
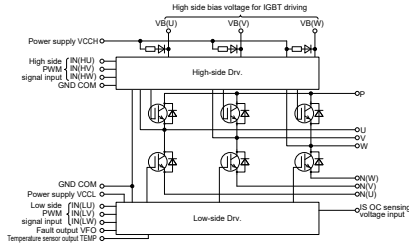
Small IPM with High Voltage Driver-IC without Brake-Chopper



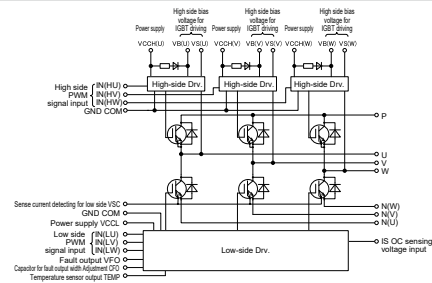
P633A



P633C



P642



Dimension [mm]

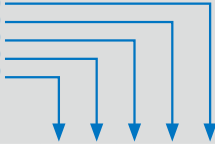
Ic

X series

IC	Series	15A	20A	30A	35A	50A	75A
15A	6MBP15XSD060-50	✓	—	✓	✓	—	—
20A	6MBP20XSD060-50	—	—	—	—	—	—
30A	6MBP30XSD060-50	—	—	—	—	—	—
35A	6MBP35XSD060-50	—	—	—	—	—	—
15A	6MBP15XSF060-50	✓	—	✓	✓	—	—
20A	6MBP20XSF060-50	—	—	—	—	—	—
30A	6MBP30XSF060-50	—	—	—	—	—	—
35A	6MBP35XSF060-50	—	—	—	—	—	—
15A	6MBP15XSJ065-50	✓	—	✓	✓	—	—
20A	6MBP20XSJ065-50	—	—	—	—	—	—
30A	6MBP30XSJ065-50	—	—	—	—	—	—
35A	6MBP35XSJ065-50	—	—	—	—	—	—
15A	6MBP15XSK065-50	✓	—	✓	✓	—	—
20A	6MBP20XSK065-50	—	—	—	—	—	—
30A	6MBP30XSK065-50	—	—	—	—	—	—
35A	6MBP35XSK065-50	—	—	—	—	—	—
50A	6MBP50XTA065-50	✓	—	✓	✓	—	—
75A	6MBP75XTA065-50	—	—	—	—	—	—
50A	6MBP50XTC065-50	✓	—	✓	✓	—	—
75A	6MBP75XTC065-50	—	—	—	—	—	—

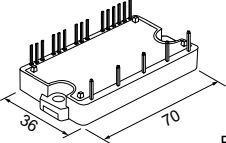
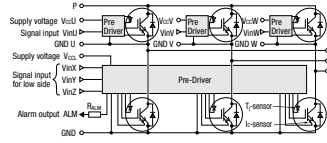
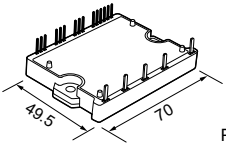
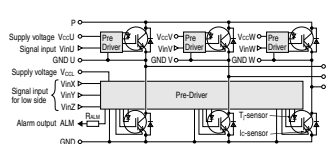
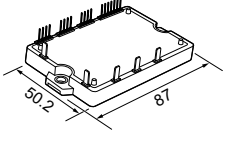
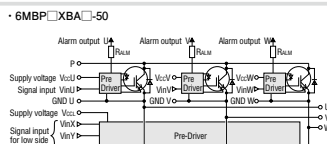
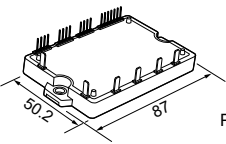
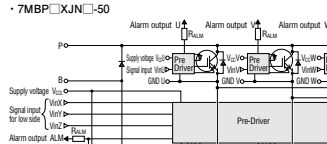
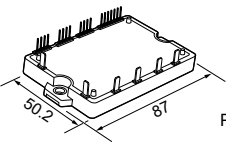
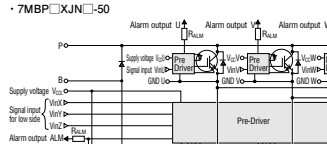
**Built-in protection functions**

- P-side fault status output (Alarm)
- N-side fault status output (Alarm)
- Under voltage protection (self shutdown)
- Over current protection (self shutdown)
- Overheating protection (self shutdown)



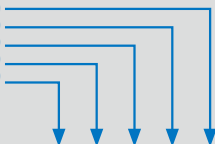
**IPM (Intelligent Power Modules)**

Dimension[mm]

	Dimension[mm]	P-side fault status output (Alarm)	N-side fault status output (Alarm)	Under voltage protection (self shutdown)	Over current protection (self shutdown)	Overheating protection (self shutdown)	650V		600V		1200V		
							X series	V series	X series	V series			
<b>Without Brake-Chopper</b>  <p>P639</p> 	36 x 70	✓	✓	✓	✓	—	10A						
							20A	6MBP20XRHA065-50			6MBP10XRHA120-50		
							30A	6MBP30XRHA065-50					
 <p>P629</p> 	49.5 x 70	✓	✓	✓	✓	—	10A					6MBP10VAA120-50	
							15A					6MBP15VAA120-50	
							20A		6MBP20VAA060-50				
							25A			6MBP25XAA120-50		6MBP25VAA120-50	
							30A		6MBP30VAA060-50				
							35A			6MBP35XAA120-50			
							50A	6MBP50XAA065-50	6MBP50VAA060-50				
<p>• 6MBP□XBA□-50</p>  <p>P626</p> 	50.2 x 87	✓	✓	✓	✓	✓	25A				6MBP25XBA120-50	6MBP25VBA120-50	
							35A				6MBP35XBA120-50	6MBP35VBA120-50	
							50A	6MBP50XBA065-50	6MBP50VBA060-50		6MBP50XBA120-50	6MBP50VBA120-50	
							75A	6MBP75XBA065-50	6MBP75VBA060-50				
							100A	6MBP100XBA065-50					
<p>• 6MBP□VBA□-50</p>  <p>P644</p> 	50.2 x 87	✓	✓	✓	✓	✓							
<p>• 7MBP□XJN□-50</p>  <p>P644</p> 	50.2 x 87	✓	✓	✓	✓	✓	25A				7MBP25XJN120-50		
							35A				7MBP35XJN120-50		
							50A	7MBP50XJN065-50					
							75A	7MBP75XJN065-50					

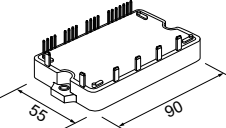
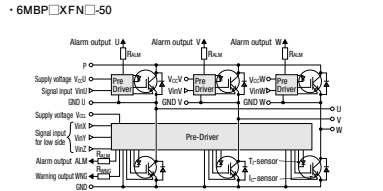
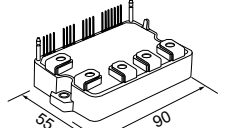
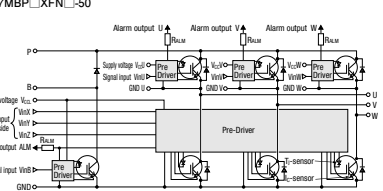
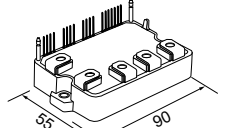
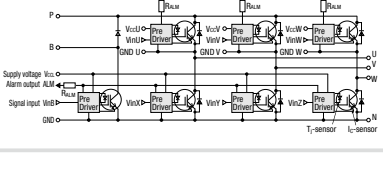
**Built-in protection functions**

- P-side fault status output (Alarm)
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- Under voltage protection (self shutdown)
- Over current protection (self shutdown)
- Overheating protection (self shutdown)



**IPM (Intelligent Power Modules)**

Dimension[mm]

	Dimension[mm]	Ic	650V		600V		1200V	
			X series	V series	X series	V series		
Without Brake-Chopper	 P636	 • 6MBP□XFN□-50	25A					6MBP25VFN120-50
			35A					6MBP35VFN120-50
			50A			6MBP50VFN060-50	6MBP50XFN120-50	6MBP50VFN120-50
			75A			6MBP75VFN060-50		
			100A	6MBP100XFN065-50	6MBP100VFN060-50			
With Brake-Chopper	 P638	 • 7MBP□XFN□-50	25A					7MBP25VFN120-50
			35A					7MBP35VFN120-50
			50A			7MBP50VFN060-50	7MBP50XFN120-50	7MBP50VFN120-50
			75A			7MBP75VFN060-50		
			100A	7MBP100XFN065-50	7MBP100VFN060-50			
Without Brake-Chopper	 P638	 • 7MBP□VFN□-50	50A					6MBP50XGN120-50
			75A					6MBP75XGN120-50
			100A	6MBP100XGN065-50				
			150A	6MBP150XGN065-50				



### Built-in protection functions

- P-side fault status output (Alarm)
- N-side fault status output (Alarm)
- Under voltage protection (self shutdown)
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- Overheating protection (self shutdown)

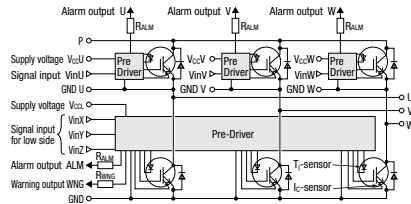
## IPM (Intelligent Power Modules)

Dimension [mm]

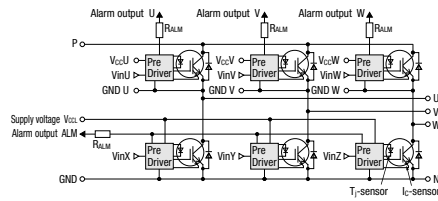
Without Brake-Chopper

With Brake-Chopper

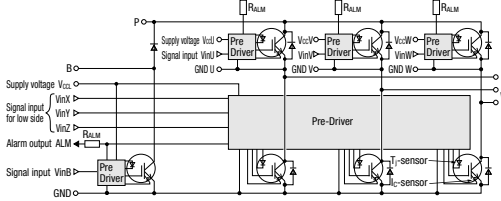
- 6MBP□XDA□-50
- 6MBP□XDN□-50



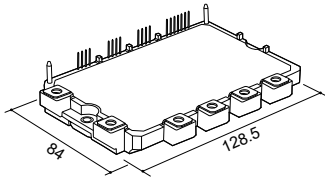
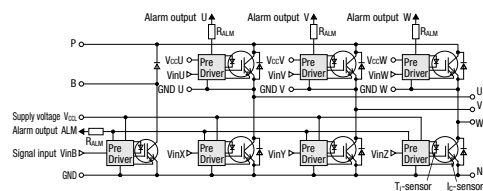
- 6MBP□VDA□-50
- 6MBP□VDN□-50



- 7MBP□XDA□-50
- 7MBP□XDN□-50

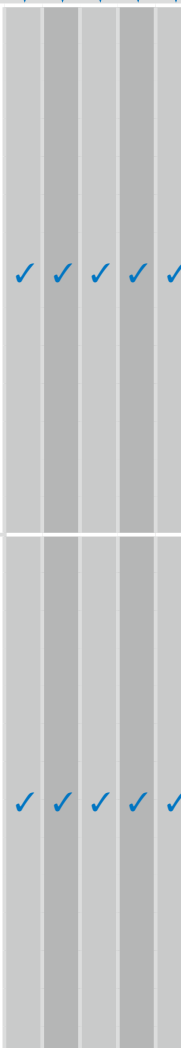


- 7MBP□VDA□-50
- 7MBP□VDN□-50



P630

Ic	650V		600V		1200V	
	X series		V series		X series	V series
25A						6MBP25VDA120-50
35A						6MBP35VDA120-50
50A			6MBP50VDA060-50		6MBP50XDA120-50	6MBP50VDA120-50
75A			6MBP75VDA060-50		6MBP75XDA120-50	6MBP75VDA120-50
100A	6MBP100XDA065-50		6MBP100VDA060-50		6MBP100XDA120-50	6MBP100VDA120-50
			6MBP100VDN060-50		6MBP100XDN120-50	6MBP100VDN120-50
150A	6MBP150XDA065-50		6MBP150VDA060-50			
	6MBP150XDN065-50		6MBP150VDN060-50		6MBP150XDN120-50	
200A			6MBP200VDA060-50			
			6MBP200VDN060-50			
250A						
			6MBP250XDN065-50			
25A						7MBP25VDA120-50
35A						7MBP35VDA120-50
50A			7MBP50VDA060-50		7MBP50XDA120-50	7MBP50VDA120-50
75A			7MBP75VDA060-50		7MBP75XDA120-50	7MBP75VDA120-50
					7MBP75XDN120-50	7MBP75VDN120-50
100A	7MBP100XDA065-50		7MBP100VDA060-50		7MBP100XDA120-50	7MBP100VDA120-50
			7MBP100VDN060-50		7MBP100XDN120-50	7MBP100VDN120-50
150A	7MBP150XDA065-50		7MBP150VDA060-50			
	7MBP150XDN065-50		7MBP150VDN060-50		7MBP150XDN120-50	
200A			7MBP200VDA060-50			
			7MBP200VDN060-50			
250A						
			7MBP250XDN065-50			



Note: The products with 'VDN,XDN' on this page have Low Thermal Impedance Version.



## Small PIM (Power Integrated Modules)

Dimension[mm]

Ic

650V



600V

1200V



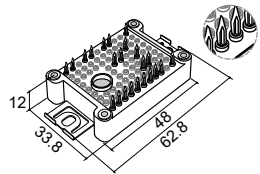
X series

V series

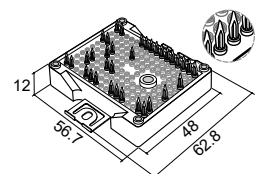
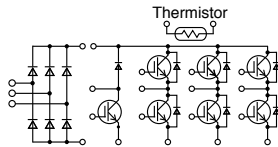
X series

V series

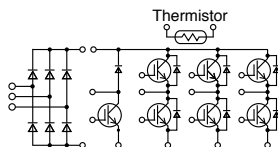
With NTC, Press fit pins



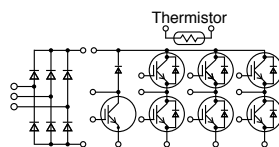
V: M726, X: M730



V: M727, X: M731

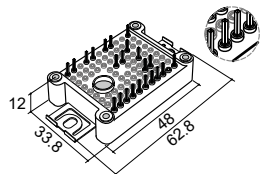


XKB, VKB

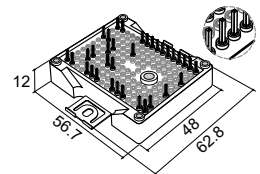
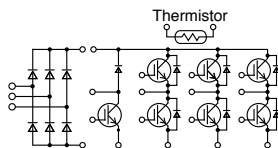


XRKB

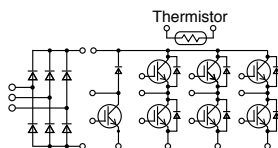
With NTC, Solder pins



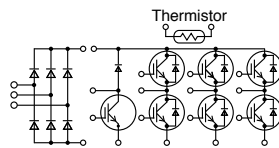
V: M728, X: M732



V: M729, X: M733



XKD, VKD



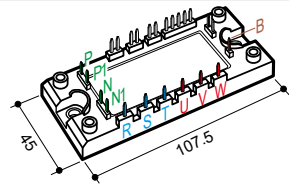
XRKD

Ic	650V		600V		1200V	
	X series	V series	X series	V series	X series	V series
10A	7MBR10XKA065-50	7MBR10VKA060-50	7MBR10XKA120-50	7MBR10VKA120-50		
15A	7MBR15XKA065-50	7MBR15VKA060-50	7MBR15XKA120-50	7MBR15VKA120-50		
20A	7MBR20XKA065-50	7MBR20VKA060-50				
25A			7MBR25XKA120-50			
30A	7MBR30XKA065-50	7MBR30VKA060-50				
15A			7MBR15XKB120-50	7MBR15VKB120-50		
25A			7MBR25XKB120-50	7MBR25VKB120-50		
35A			7MBR35XKB120-50	7MBR35VKB120-50		
50A	7MBR50XKB065-50	7MBR50VKB060-50	7MBR50XRKB120-50			
10A	7MBR10XKC065-50	7MBR10VKC060-50	7MBR10XKC120-50	7MBR10VKC120-50		
15A	7MBR15XKC065-50	7MBR15VKC060-50	7MBR15XKC120-50	7MBR15VKC120-50		
20A	7MBR20XKC065-50	7MBR20VKC060-50				
25A			7MBR25XKC120-50			
30A	7MBR30XKC065-50	7MBR30VKC060-50				
15A			7MBR15XKD120-50	7MBR15VKD120-50		
25A			7MBR25XKD120-50	7MBR25VKD120-50		
35A			7MBR35XKD120-50	7MBR35VKD120-50		
50A	7MBR50XKD065-50	7MBR50VKD060-50	7MBR50XRKD120-50			

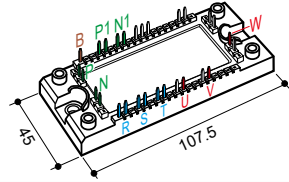
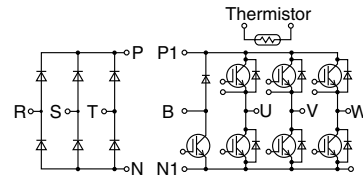
# PIM (Power Integrated Modules) EconoPIM™

Dimension[mm]

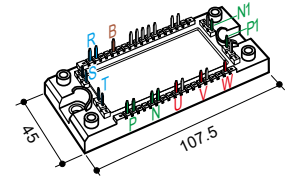
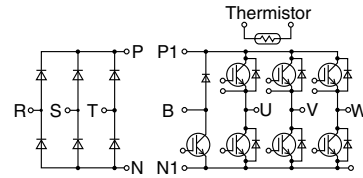
With NTC, Solder pins, PIM



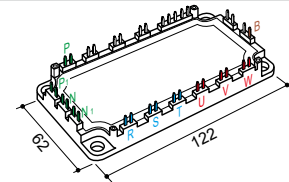
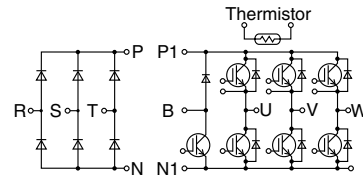
M711



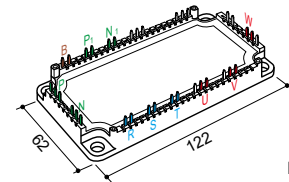
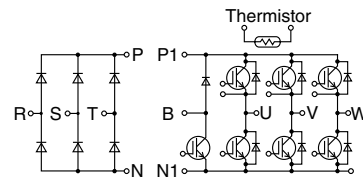
M719



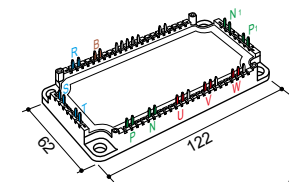
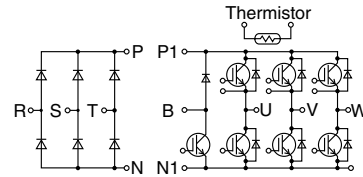
M719



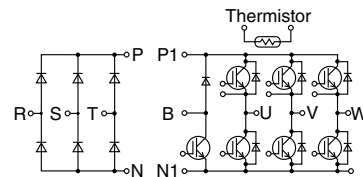
M712



M720



M720



Ic	650V		600V		1200V		
	X series		V series		X series		V series
25A							7MBR25VA120-50
35A							7MBR35VA120-50
50A			7MBR50VA060-50				
25A							7MBR25VM120-50
35A					7MBR35XMA120-50		7MBR35VM120-50
50A	7MBR50XMA065-50				7MBR50XMA120-50		7MBR50VM120-50
75A	7MBR75XMA065-50				7MBR75XME120-50		
25A							7MBR25VP120-50
35A					7MBR35XPA120-50		7MBR35VP120-50
50A	7MBR50XPA065-50		7MBR50VP060-50		7MBR50XPA120-50		7MBR50VP120-50
75A	7MBR75XPA065-50		7MBR75VP060-50		7MBR75XPE120-50		
100A	7MBR100XPE065-50		7MBR100VP060-50		7MBR75XPE120-50		
35A							7MBR35VB120-50
50A							7MBR50VB120-50
75A					7MBR75VB060-50		7MBR75VB120-50
100A					7MBR100VB060-50		
50A							7MBR50VN120-50
75A	7MBR75XNA065-50				7MBR75XNA120-50		7MBR75VN120-50
100A	7MBR100XNA065-50				7MBR100XNA120-50		7MBR100VN120-50
150A	7MBR150XNA065-50				7MBR150XNE120-50		7MBR150VN120-50
50A							7MBR50VR120-50
75A					7MBR75XRA120-50		7MBR75VR120-50
100A	7MBR100XRA065-50		7MBR100VR060-50		7MBR75XRE120-50		
150A	7MBR150XRA065-50		7MBR150VR060-50		7MBR100XRA120-50		7MBR100VR120-50
	7MBR150XRE065-50				7MBR100XRE120-50		7MBR150VR120-50

Note1: EconoPIM™ is registered trademark of Infineon Technologies AG, Germany.

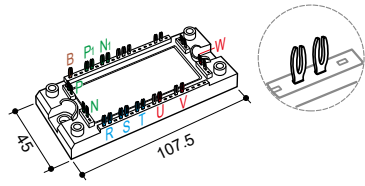
Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.



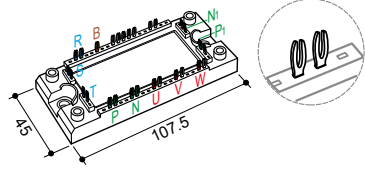
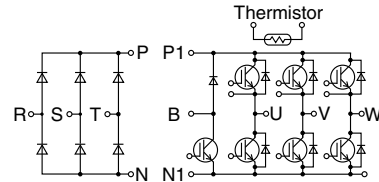
# PIM (Power Integrated Modules) EconoPIM™

Dimension[mm]

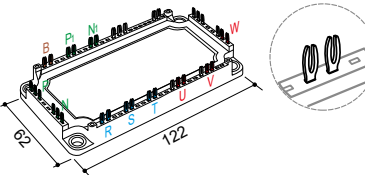
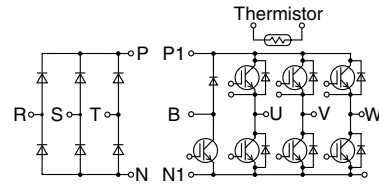
With NTC, Press fit pins, PIM



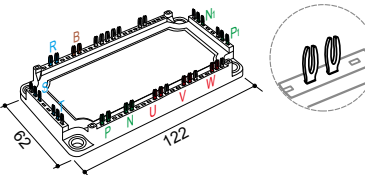
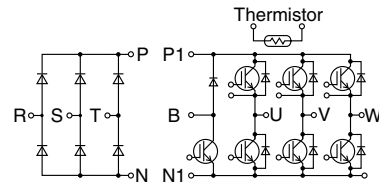
M721



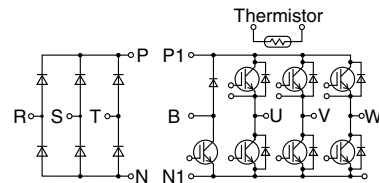
M721



M722



M722



Ic	650V		600V		1200V	
	X series		V series		X series	V series
25A						7MBR25VW120-50
35A					7MBR35XWA120-50	7MBR35VW120-50
50A	7MBR50XWA065-50				7MBR50XWA120-50	7MBR50VW120-50
75A	7MBR75XWA065-50				7MBR75XWE120-50	
25A						7MBR25VY120-50
35A					7MBR35XYA120-50	7MBR35VY120-50
50A	7MBR50XYA065-50		7MBR50VY060-50		7MBR50XYA120-50	7MBR50VY120-50
75A	7MBR75XYA065-50		7MBR75VY060-50		7MBR75XYE120-50	
100A	7MBR100XE065-50		7MBR100VY060-50			
50A						7MBR50VX120-50
75A	7MBR75XXA065-50				7MBR75XXA120-50	7MBR75VX120-50
100A	7MBR100XXA065-50				7MBR100XXA120-50	7MBR100VX120-50
150A	7MBR150XXA065-50				7MBR150XXE120-50	7MBR150VX120-50
50A						7MBR50VZ120-50
75A					7MBR75XZA120-50	7MBR75VZ120-50
100A	7MBR100XZA065-50		7MBR100VZ060-50		7MBR100XZA120-50	7MBR100VZ120-50
150A	7MBR150XZA065-50		7MBR150VZ060-50		7MBR150XZE120-50	7MBR150VZ120-50

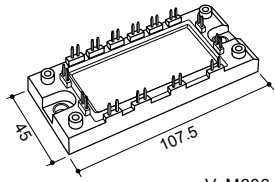
Note1: EconoPIM™ is registered trademark of Infineon Technologies AG, Germany.

Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

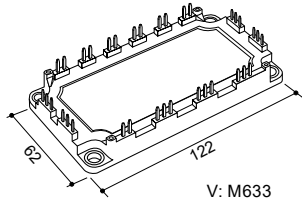
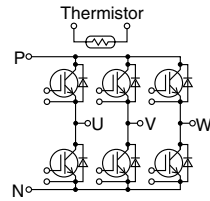
# 6-Pack EconoPACK™

Dimension[mm]

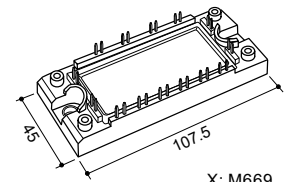
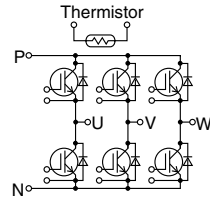
With NTC, Solder pins



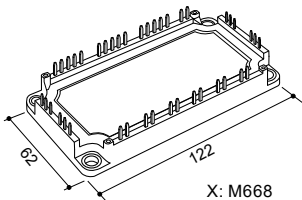
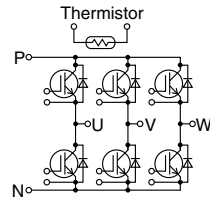
V: M636



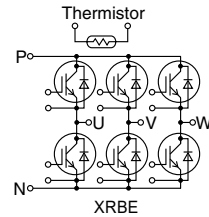
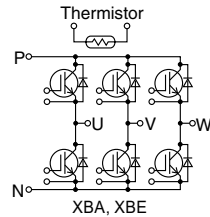
V: M633



X: M669



X: M668



Ic	600V		1200V	
	V series	X series	X series	V series
50A	6MBI50VA-060-50			6MBI50VA-120-50
75A	6MBI75VA-060-50			6MBI75VA-120-50
100A	6MBI100VA-060-50			6MBI100VA-120-50
100A				6MBI100VB-120-50
150A	6MBI150VB-060-50			6MBI150VB-120-50
180A				6MBI180VB-120-50
				6MBI180VB-120-55
100A		6MBI100XAE120-50		
100A		6MBI100XBA120-50		
150A		6MBI150XBA120-50		
200A		6MBI200XBA120-50		
		6MBI200XBE120-50		
250A		6MBI250XRBE120-50*		

Note1: 6MBI180VB-120-55; Low Thermal Impedance Version

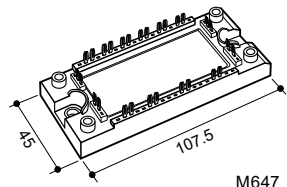
Note2: EconoPACK™ is registered trademark of Infineon Technologies AG, Germany.

Note3: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

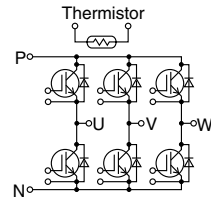
\*Under development

## 6-Pack EconoPACK™

With NTC, Press fit pins




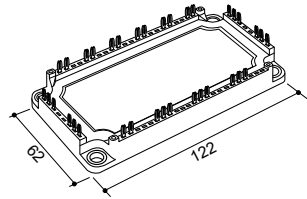
M647



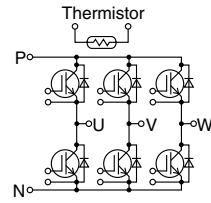
Dimension[mm]

Ic

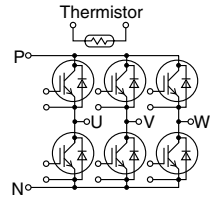
Ic	600V	X series 	1200V	1700V
	V series		V series	V series
50A	6MBI50VW-060-50		6MBI50VW-120-50	
75A	6MBI75VW-060-50		6MBI75VW-120-50	
100A	6MBI100VW-060-50	6MBI100XWE120-50	6MBI100VW-120-50	
100A		6MBI100XXA120-50	6MBI100VX-120-50	6MBI100VX-170-50
150A	6MBI150VX-060-50	6MBI150XXA120-50	6MBI150VX-120-50	
180A			6MBI180VX-120-50	
			6MBI180VX-120-55	
200A		6MBI200XXA120-50		
		6MBI200XXE120-50		
250A		6MBI250XRXE120-50*		



M648



XXA, XXE, VX



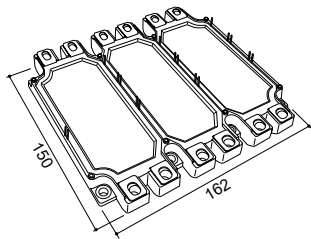
XRXE

Note1: 6MBI180VX-120-55; Premium type (Low Thermal Impedance Version)  
 Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.  
 Note3: EconoPACK™ is registered trademark of Infineon Technologies AG, Germany.

\*Under development

## 6-Pack EconoPACK™+

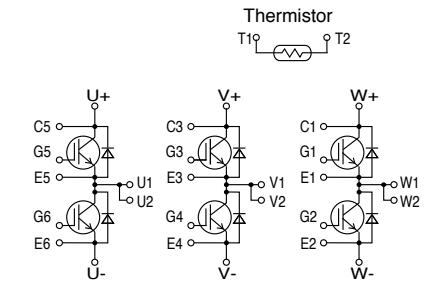
With NTC, High power 6-Pack



M629

Dimension[mm]

Ic



Ic	1200V	1700V
	V series	V series
225A	6MBI225V-120-50	
300A	6MBI300V-120-50	6MBI300V-170-50
450A	6MBI450V-120-50	6MBI450V-170-50
550A	6MBI550V-120-50	

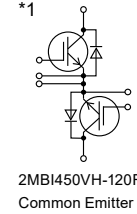
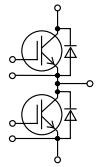
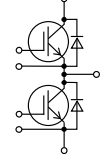
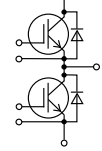
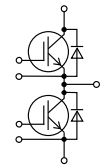
Note1: EconoPACK™+ is registered trademark of Infineon Technologies AG, Germany.  
 Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

# Standard 2-Pack

2-Pack

Dimension[mm]

Dimension[mm]	Ic	650V		600V		1200V		1700V	
		X series	V series	X series	V series	X series	V series	X series	V series
 M263	75A								
	100A		2MBI100VA-060-50	2MBI100XAA120-50	2MBI100VA-120-50	2MBI100XAA170-50	2MBI100VA-170-50		
	150A	2MBI150XAA065-50	2MBI150VA-060-50	2MBI150XAA120-50	2MBI150VA-120-50	2MBI150XAA170-50			
	200A	2MBI200XAA065-50	2MBI200VA-060-50	2MBI200XAA120-50					
 M274	150A						2MBI150VB-120-50		
	200A					2MBI200XBE120-50	2MBI200VB-120-50		
	300A	2MBI300XBE065-50	2MBI300VB-060-50	2MBI300XBE120-50					
	400A	2MBI400XBE065-50	2MBI400VB-060-50						
 M275	300A						2MBI300VD-120-50		
	400A	2MBI400XDE065-50	2MBI400VD-060-50	2MBI400XDE120-50	2MBI400VD-120-50				
	600A	2MBI600XDE065-50	2MBI600VD-060-50	2MBI600XDE120-50					
 M276	150A							2MBI150XHA170-50	2MBI150VH-170-50
	200A						2MBI200VH-120-50	2MBI200XHA170-50	2MBI200VH-170-50
	300A					2MBI300XHA120-50	2MBI300VH-120-50	2MBI300XHA170-50	2MBI300VH-170-50
	400A							2MBI400XHA170-50	
	450A					2MBI450XHA120-50	2MBI450VH-120-50		
	600A					2MBI450XHA120-81*	2MBI450VH-120F-50*1		
 M277	300A						2MBI300VE-120-50	2MBI300XEE170-50	2MBI300VE-170-50
	400A							2MBI400XEE170-50	2MBI400VE-170-50
	450A					2MBI450XEE120-50	2MBI450VE-120-50		
	600A	2MBI600XEE065-50	2MBI600VE-060-50	2MBI600XEE120-50	2MBI600VE-120-50				



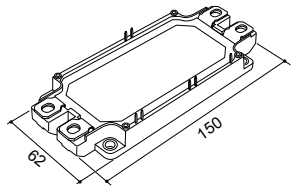
Note1: "-81": Pre-applied Thermal-Interface-Material for "-50".  
 Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

\*Under development

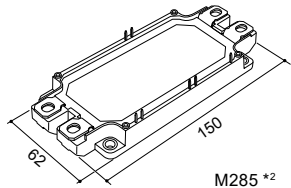
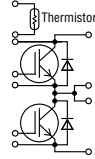
# Standard 2-Pack

Dimension[mm]

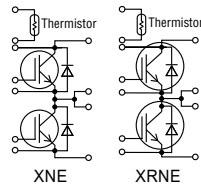
With NTC, Solder pins



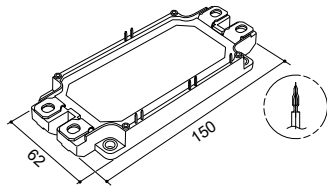
M254



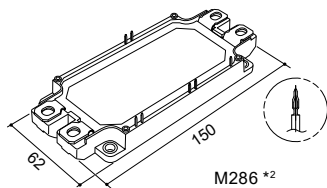
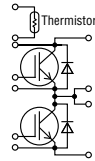
M285 \*2



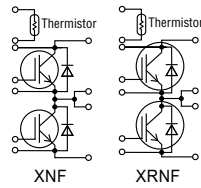
With NTC, Press fit pins



M282



M286 \*2



Ic	1200V			1700V		
	X series	V series	V series With SiN substrate *1	X series	V series	V series With SiN substrate *1
225A	2MBI225XNA120-50 2MBI225XNA120-81	2MBI225VN-120-50	2MBI225VN-120S-50	2MBI225XNA170-50		
300A	2MBI300XNA120-50	2MBI300VN-120-50	2MBI300VN-120S-50	2MBI300XNA170-50	2MBI300VN-170-50	
450A	2MBI450XNA120-50	2MBI450VN-120-50	2MBI450VN-120S-50	2MBI450XNA170-50	2MBI450VN-170-50	
550A						2MBI550VN-170-50
600A	2MBI600XNG120-50		2MBI600VN-120-50	2MBI600XNG170-50		
600A	2MBI600XNE120-50			2MBI600XNE170-50		
800A	2MBI800XNE120-50			2MBI800XRNE170-50		
1000A	2MBI1000XRNE120-50					
225A	2MBI225XNB120-50	2MBI225VX-120-50		2MBI225XNB170-50	2MBI225VX-170-50	
300A	2MBI300XNB120-50 2MBI300XNB120-81	2MBI300VX-120-50		2MBI300XNB170-50	2MBI300VX-170-50	
450A	2MBI450XNB120-50 2MBI450XNB120-81	2MBI450VX-120-50		2MBI450XNB170-50	2MBI450VX-170-50	
550A						2MBI550VX-170-50
600A	2MBI600XNH120-50 2MBI600XNH120-81		2MBI600VX-120-50	2MBI600XNH170-50		
600A	2MBI600XNF120-50			2MBI600XNF170-50		
800A	2MBI800XNF120-50 2MBI800XNF120-81			2MBI800XRNF170-50		
1000A	2MBI1000XRNF120-50 2MBI1000XRNF120-81					

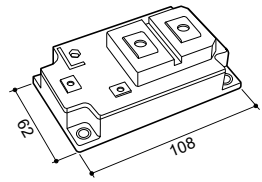
Note1: "-81": Pre-applied Thermal-Interface-Material for "-50".

Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

\*1 Low thermal impedance version

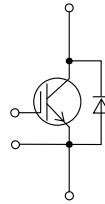
\*2 Low thermal impedance and high tracking capability type

## Standard 1-Pack



M153

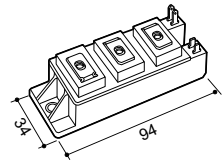
Dimension[mm]



Ic

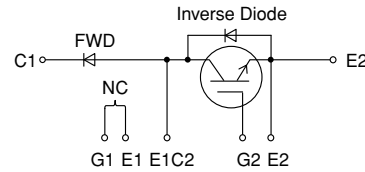
	1200V		1700V
	V series	V series with AlN substrate	V series
300A			1MBI300V-170-50
400A	1MBI400V-120-50	1MBI400VF-120-50	1MBI400V-170-50
600A	1MBI600V-120-50	1MBI600VF-120-50	1MBI600V-170-50
900A	1MBI900V-120-50		

## Chopper



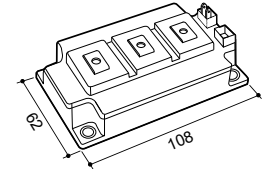
M262

Dimension[mm]

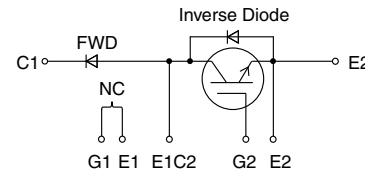


Ic

	600V	1200V
	V series	V series
150A		1MBI150VA-120L-50
200A		1MBI200VA-120L-50
400A	1MBI400VH-060L-50	



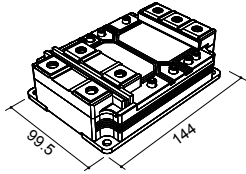
M283





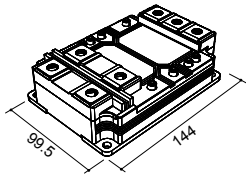
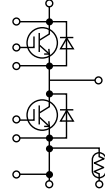
# High Power Modules HPnC

2-Pack

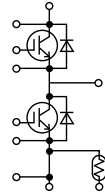





M297

Dimension[mm]



M298



Ic	1700V 		2300V 		3300V 	
	X series		X series		X series	
600A					2MBI600XYF330-50*	
1200A	2MBI1200XYF170-50*					
1500A	2MBI1500XYF170-50*					
1200A	2MBI1200XZF170-50		2MBI1200XZF230-50			
1500A	2MBI1500XZF170-50					
1800A	2MBI1800XZF170-50					

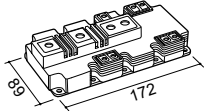
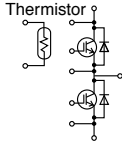
Note1: M297 : Mgsic-baseplate, M298 : Cu-baseplate.

Note2: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

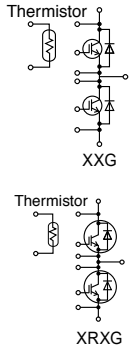
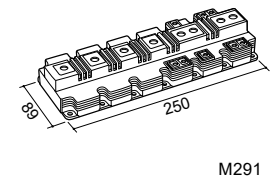
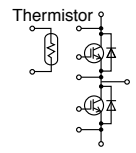
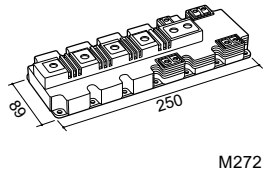
\*Under development

# PrimePACK™

Dimension[mm]

Dimension[mm]	Ic	X series	1200V			X series	1700V														
			V series	Low switching loss	Soft turn off		V series	Low switching loss	Soft turn off												
										Low switching loss	Low switching loss	Soft turn off									
 <p>M271</p>		<b>600A</b> 2MBI600VXA-120E-50 2MBI600VXA-120E-54																			
									<b>650A</b>				2MBI650XXA170-50	2MBI650VXA-170E-50 2MBI650VXA-170E-54 2MBI650VXA-170EA-50 2MBI650VXA-170EA-54							
															<b>900A</b>	2MBI900XXA120P-50 2MBI900XXA120P-81*	2MBI900VXA-120E-50 2MBI900VXA-120E-54	2MBI900VXA-120P-50 2MBI900VXA-120P-54			
																			<b>1200A</b>	2MBI1200XXE120P-50	2MBI1200XXE170-50
<b>1400A</b>	2MBI1400XXB120P-50 2MBI1400XXB120P-81*	2MBI1400VXB-120E-50 2MBI1400VXB-120E-54	2MBI1400VXB-120P-50 2MBI1400VXB-120P-54	2MBI1400XXB170-50	2MBI1400VXB-170E-50 2MBI1400VXB-170E-54	2MBI1400VXB-170P-50 2MBI1400VXB-170P-54															
							<b>1800A</b>	2MBI1800XXF120P-50	2MBI1800XXF170-50												
<b>1800A</b>	2MBI1800XXG120P-50 2MBI1800XXG120P-81*	2MBI1800XXG170-50 2MBI1800XXG170-81																			
			<b>2400A</b>	2MBI2400XRXC120-50*	2MBI2400XRXC170-50*																

2-Pack



Note1: The products with suffix '-54' on this page are labeled to specify the rank of  $V_{CE(sat)}$  and  $V_f$ .  
 Note2: "-81": Pre-applied Thermal-Interface-Material for "-50".  
 Note3: EA types reduce  $V_f$  and thermal resistance and are suitable for applications with high diode loads.  
 Note4: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.  
 Note5: The products with 'P' on this page are 'soft turn off' type  
 Note6: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

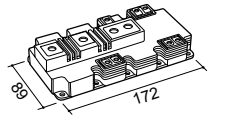
\*Under development

# PrimePACK™

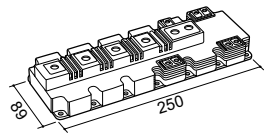
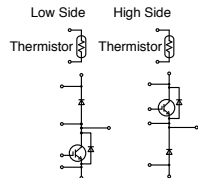
Dimension[mm]

Ic

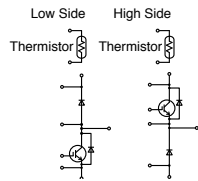
Chopper



M271



M272



		1200V		1700V	
		V series		V series	
		Low side configuration	High side configuration	Low side configuration	High side configuration
650A				1MBI650VXA-170EL-50	1MBI650VXA-170EH-50
				1MBI650VXA-170EL-54	1MBI650VXA-170EH-54
		1MBI900VXA-120PD-50 *1	1MBI900VXA-120PC-50 *1		
		1MBI900VXA-120PD-54 *1	1MBI900VXA-120PC-54 *1		
900A					
1000A				1MBI1000VXB-170EL-50	1MBI1000VXB-170EH-50
				1MBI1000VXB-170EL-54	1MBI1000VXB-170EH-54
1400A				1MBI1400VXB-170PL-50	1MBI1400VXB-170PH-50
		1MBI1400VXB-120PL-54	1MBI1400VXB-120PH-54	1MBI1400VXB-170PL-54	1MBI1400VXB-170PH-54

Note1: The products with suffix '-54' on this page are labeled to specify the rank of  $V_{CE(sat)}$  and  $V_f$ .

Note2: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

Note3: The range of modules with pre-applied TIM (Thermal-Interface-Material) is being continually expanded.

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

## T-type NPC 3-level Modules

	Dimension[mm]	Ic	600V		1200V		1700V	
			V series	RB-IGBT	V series	RB-IGBT	V series	RB-IGBT
3 Phase With NTC, Solder pins M1203		50A			12MBI50VN-120-50	600V		
		75A			12MBI75VN-120-50	600V		
		100A			12MBI100VN-120-50	600V		
3 Phase With NTC, Press fit pins M1202		50A			12MBI50VX-120-50	600V		
		75A			12MBI75VX-120-50	600V		
		100A			12MBI100VX-120-50	600V		
1 Phase M403		220A					4MBI220VF-170R2-50	1200V
		300A			4MBI300VG-120R-50	600V		
					4MBI300VG-120R1-50	900V		
		340A			4MBI340VF-120R-50	600V		
		400A	4MBI400VG-060R-50	600V	4MBI400VF-120R-50	600V		
1 Phase M404		450A			4MBI450VB-120R1-50	900V	4MBI450VB-170R2-50	1200V
					4MBI450VB-120R1-60	900V	4MBI450VB-170R2-60	1200V
		600A					4MBI600VB-170R2-50	1200V
							4MBI600VB-170R2-60	1200V
		650A			4MBI650VB-120R1-50	900V		
					4MBI650VB-120R1-60	900V		
		900A			4MBI900VB-120R1-50	900V		
			4MBI900VB-120R1-60	900V				
			4MBI900VB-120RA-50	600V				
			4MBI900VB-120RA-60	600V				

Note 1: 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.

Note 2: The products with suffix '-60' on this page are labeled the characteristic data.

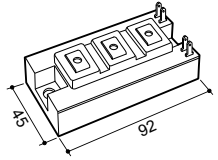
## I-type NPC 3-level Module

	Dimension[mm]	Ic	600V		1200V		1700V	
			V series	RB-IGBT	V series	RB-IGBT	V series	RB-IGBT
1 Phase M404		600A			4MBI600VC-120-50			
					4MBI600VC-120-60			

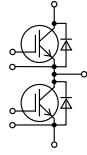
Note: The products with suffix '-60' on this page are labeled the characteristic data.

# Hybrid SiC Modules

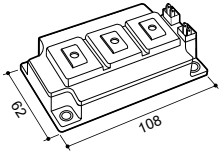
2-Pack



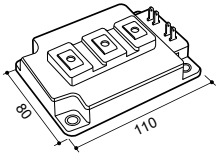
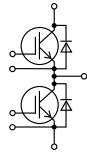
M274



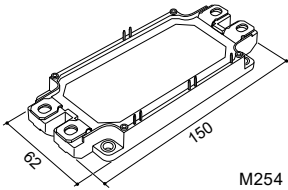
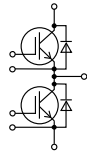
Dimension[mm]



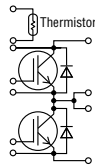
M276



M277



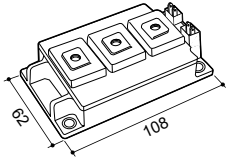
M254



Ic	1200V		1700V
	V series	VW series	V series
200A	2MSI200VAB-120-53		
200A		2MSI200VWAH-120-53	
300A	2MSI300VAH-120C-53	2MSI300VWAH-120-53	
400A			2MSI400VAE-170-53
300A	2MSI300VAN-120-53		
450A	2MSI450VAN-120-53		
600A	2MSI600VAN-120-53		

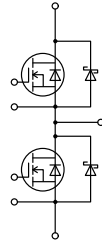
# All-SiC Modules

2-Pack





M295

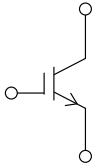
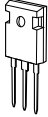
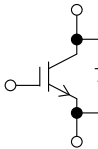
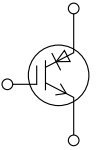

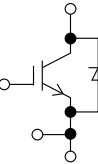
Dimension[mm]



$I_D$






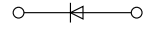
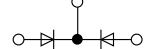
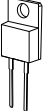
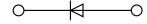
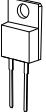
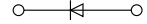
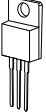
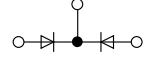
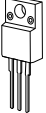
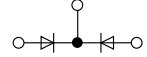
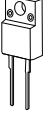
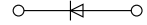
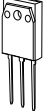
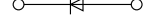
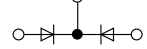
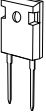
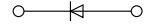
	1200V 	1700V 
	2G SiC-MOSFET Modules with 1G SiC-SBD	2G SiC-MOSFET Modules with 1G SiC-SBD
200A		2CSI200DAHE170-50
300A	2CSI300DAHE120-50	2CSI300DAHE170-50
400A		2CSI400DAHE170-50
450A	2CSI450DAHE120-50	
600A	2CSI600DAHE120-50	

# Discrete IGBT

		600V		650V	1200V		
		V series	RB series	XS series	XS series	V series	
TO-247 (Type:B)		30A		FGW30XS65			
		40A		FGW40XS65	FGW40XS120		
		50A		FGW50XS65			
		75A		FGW75XS65	FGW75XS120		
		15A				FGW15N120VD	
		25A				FGW25N120VD	
		30A	FGW30N60VD		FGW30XS65C		
		40A			FGW40XS65C	FGW40XS120C	FGW40N120VD
		50A	FGW50N60VD		FGW50XS65D		
		75A			FGW50XS65C FGW75XS65D FGW75XS65C	FGW75XS120C	
	RB-IGBT	85A	FGW85N60RB				
TO-247-4			75A		FGZ75XS65C	FGZ75XS120C	



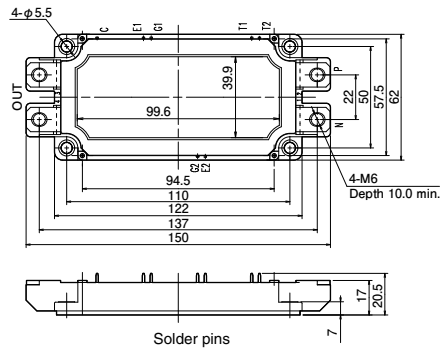
# SiC Schottky Barrier Diodes (SiC-SBD)

SiC Schottky Barrier Diodes (SiC-SBD)	IF	650V		1200V	
		SiC-SBD 2G 	SiC-SBD 1G 	SiC-SBD 2G 	SiC-SBD 
<b>T-Pack(s)</b> 	 	10A	FDCC10S65		
		20A			
		25A	FDCC25S65		
		20A	FDCC20C65		
<b>TO-220-2 (Type:A)</b> 		6A	FDC2PT06S65		
		8A	FDC2PT08S65		
		10A	FDC2PT10S65		
<b>TO-220-2 (Type:B)</b> 		10A	FDCP10S65		
		25A	FDCP25S65		
<b>TO-220</b> 		20A	FDCP20C65		
<b>TO-220F</b> 		20A	FDCA20C65		
<b>TO-220F-2</b> 		6A	FDC2AT06S65		
		8A	FDC2AT08S65		
		10A	FDC2AT10S65	FDCA10S65	
		18A			FDCA18S120
		25A		FDCA25S65	
<b>TO-247 (Type:A)</b> 	 	10A	FDCY10S65		
		18A			FDCY18S120
		25A	FDCY25S65		
		20A	FDCY20C65		
		36A			FDCY36C120
<b>TO-247-2</b> 		50A	FDCY50C65		
		18A			FDCW18T120
		20A		FDC2WT20S120	
		40A		FDC2WT40S120	

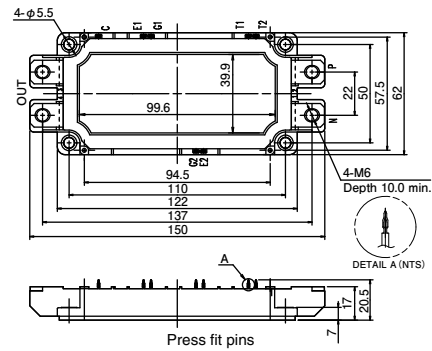


# Package Outlines, mm

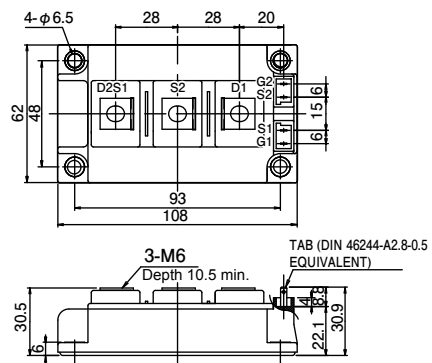
M285



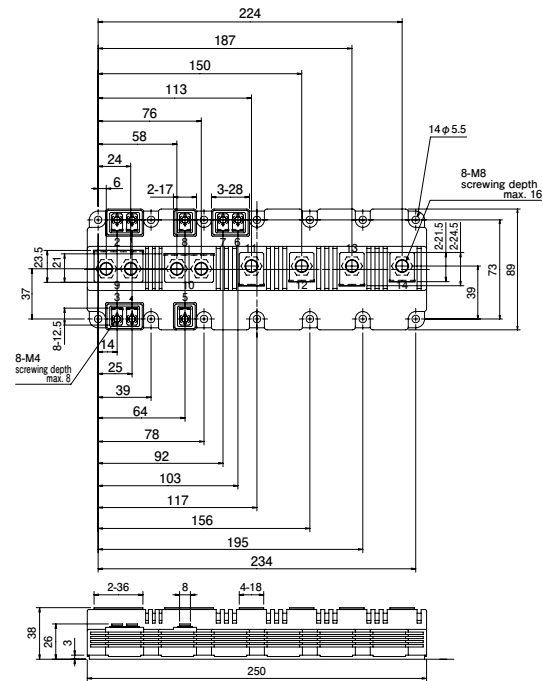
M286



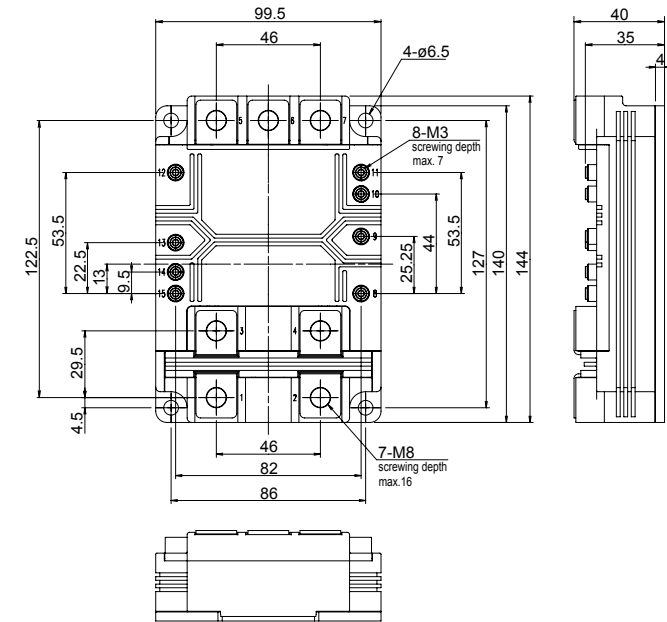
M295



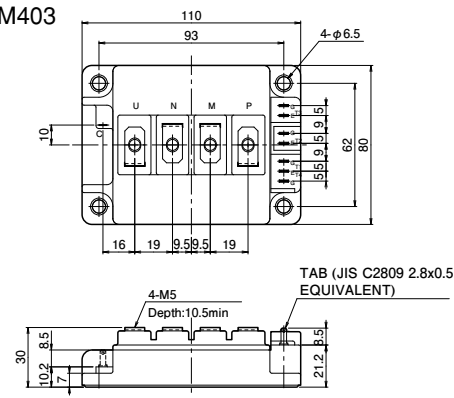
M291



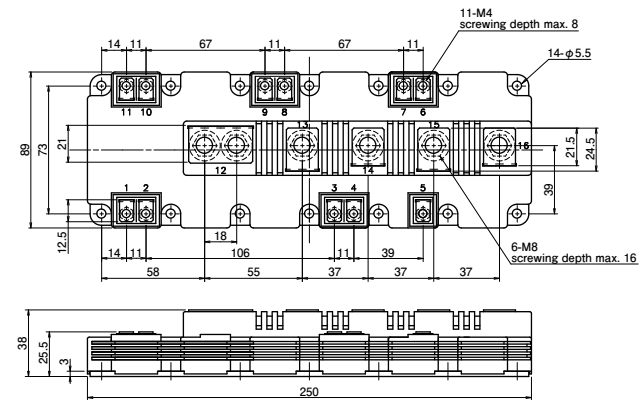
M297, M298



M403

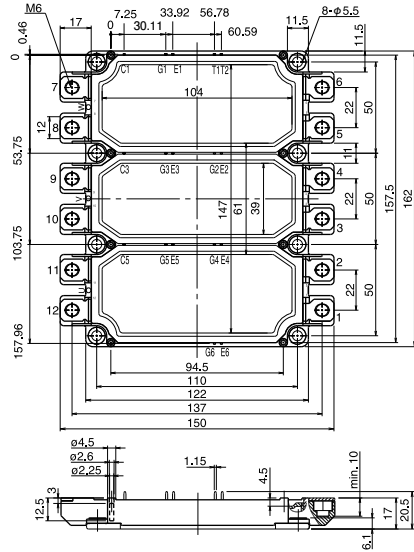


M404

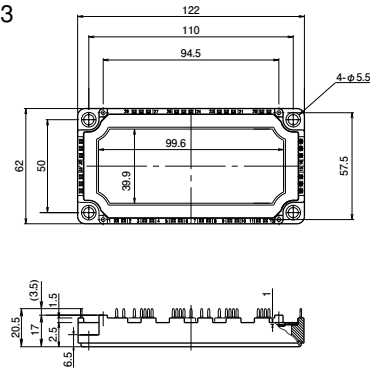


# Package Outlines, mm

M629

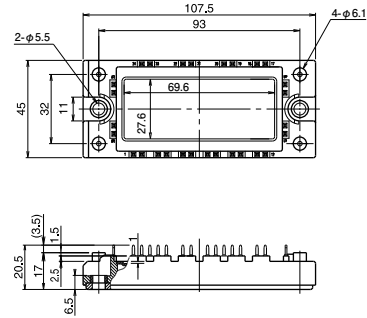


M633



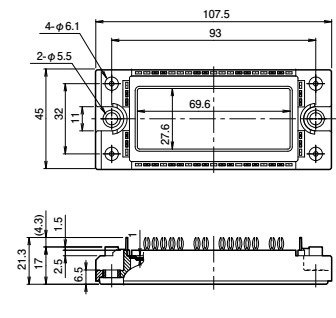
Solder pins

M636



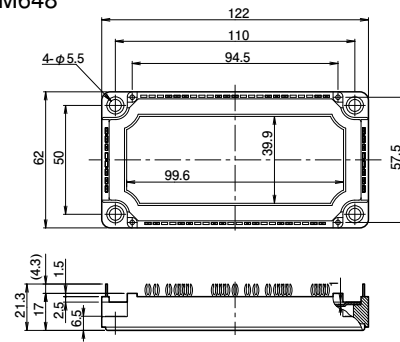
Solder pins

M647



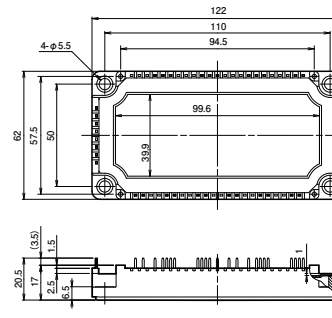
Press fit pins

M648



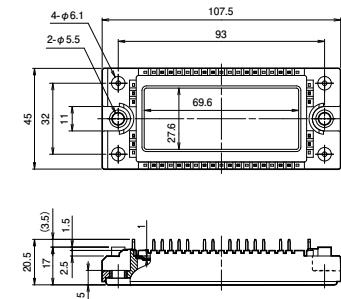
Press fit pins

M668



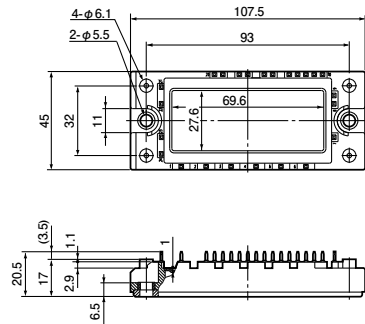
Solder pins

M669



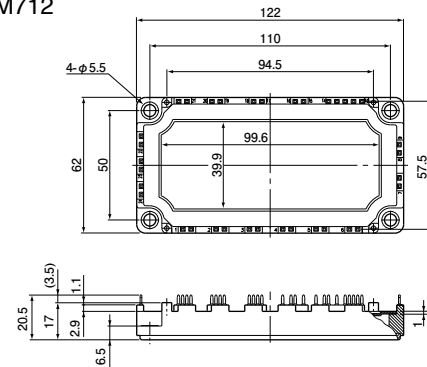
Solder pins

M711



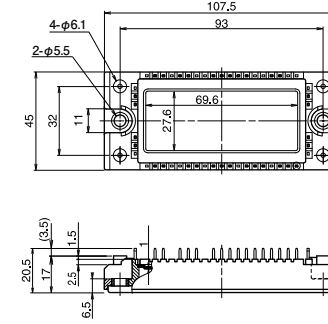
Solder pins

M712



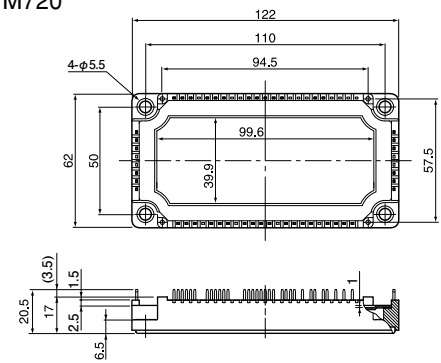
Solder pins

M719



Solder pins

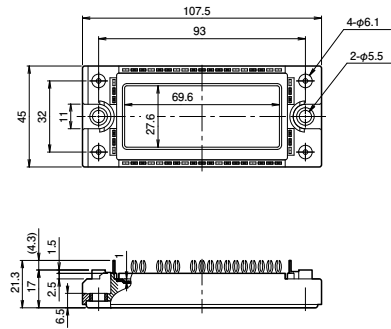
M720



Solder pins

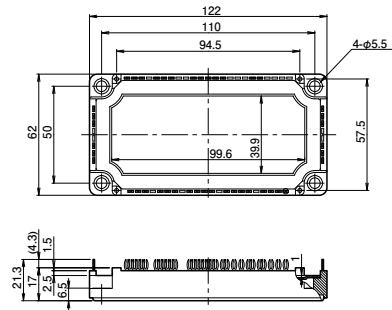
# Package Outlines, mm

M721



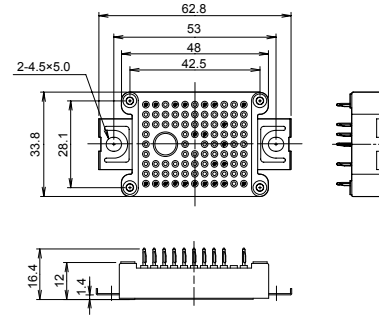
Press fit pins

M722



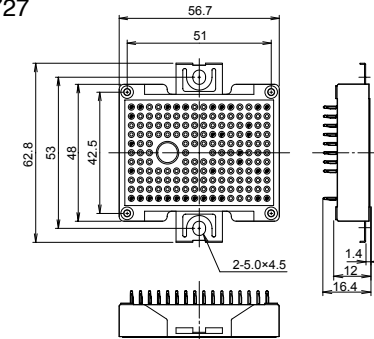
Press fit pins

M726



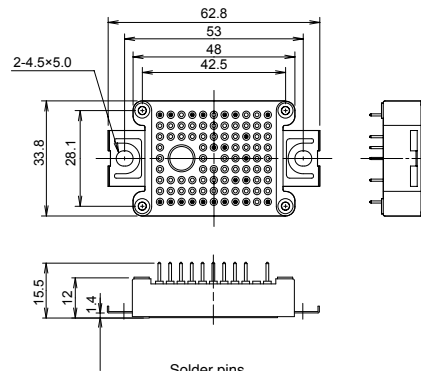
Press fit pins

M727



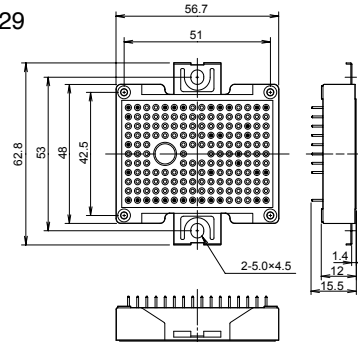
Press fit pins

M728



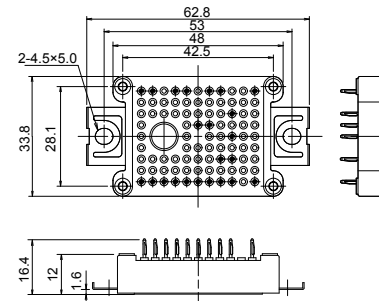
Solder pins

M729



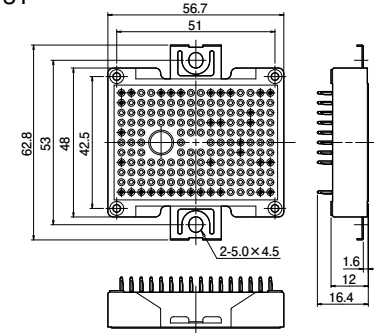
Solder pins

M730



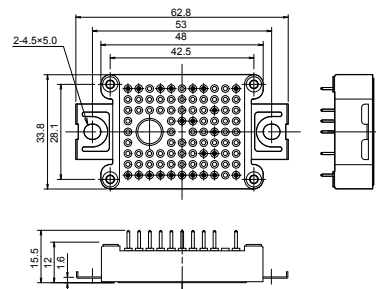
Press fit pins

M731



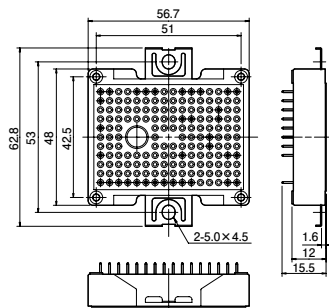
Press fit pins

M732



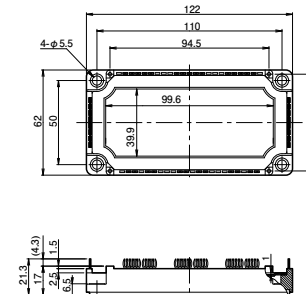
Solder pins

M733



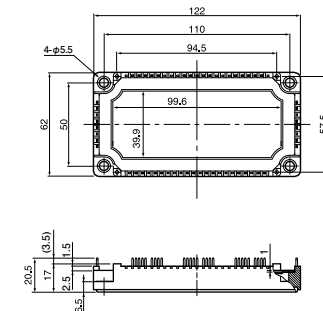
Solder pins

M1202



Press fit pins

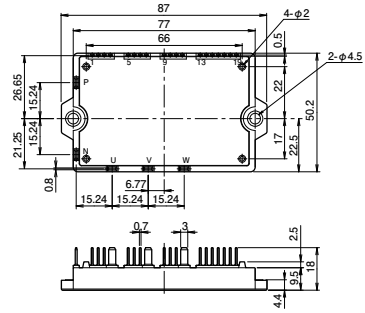
M1203



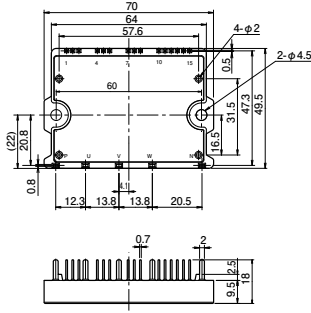
Solder pins

# Package Outlines, mm

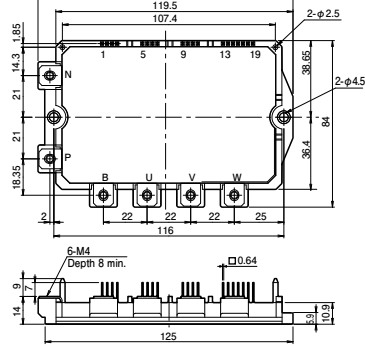
P626



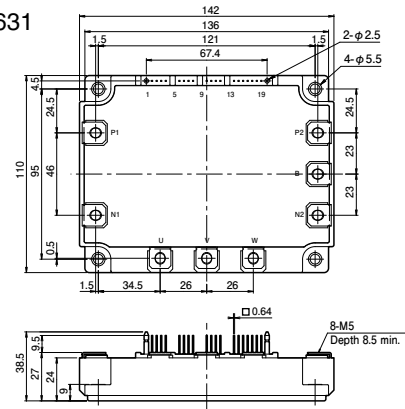
P629



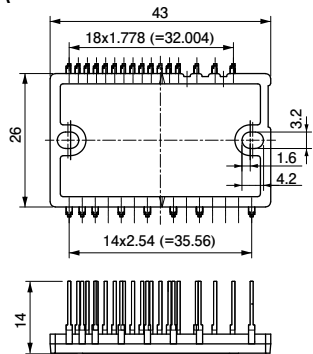
P630



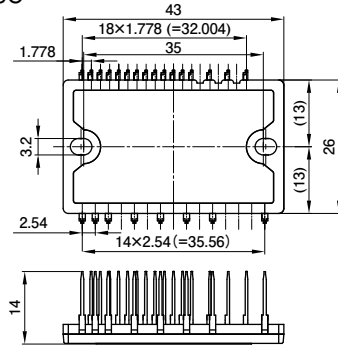
P631



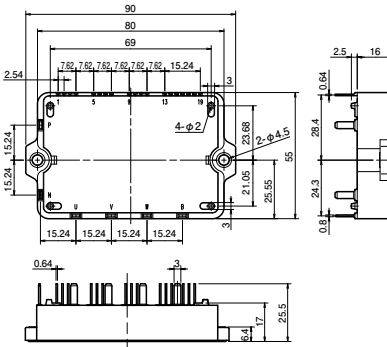
P633A



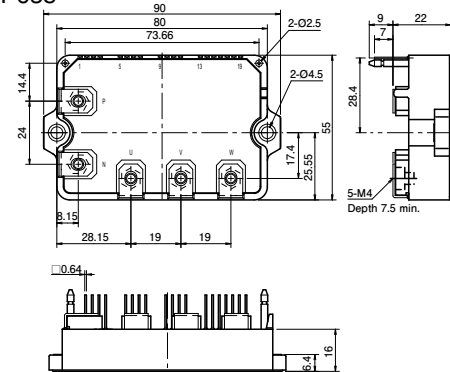
P633C



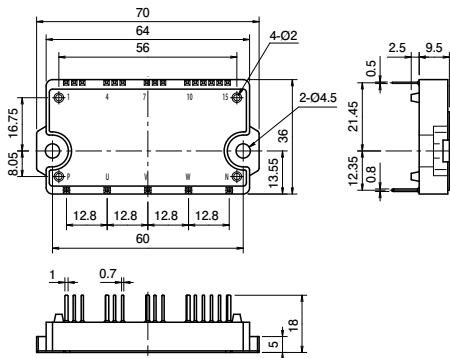
P636



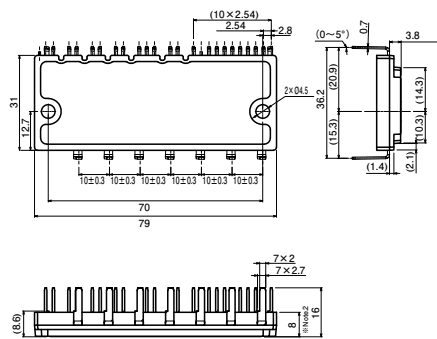
P638



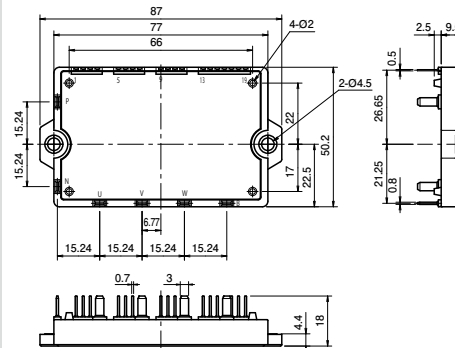
P639



P642

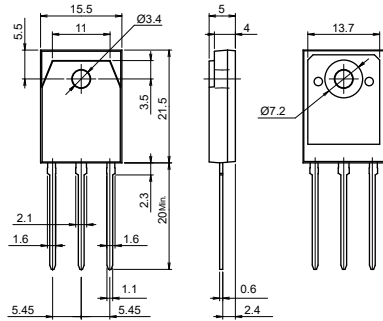


P644

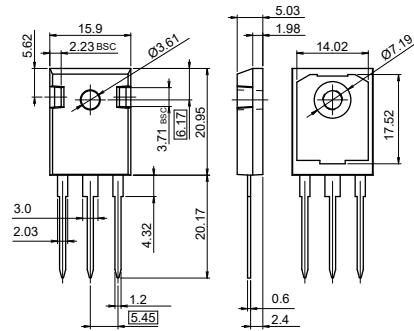


# Package Outlines, mm

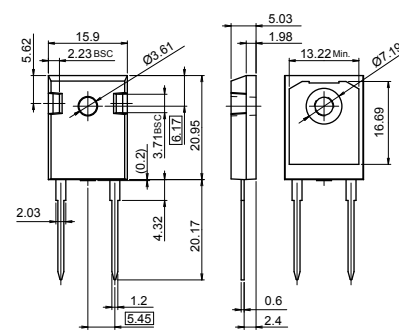
TO-247 (Type:A)



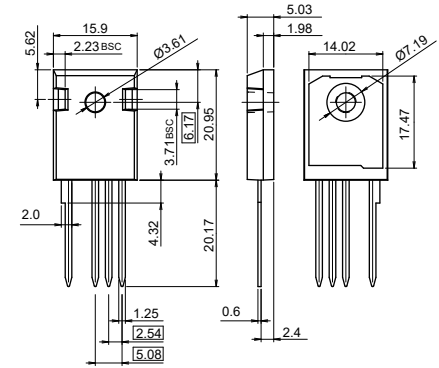
TO-247 (Type:B)



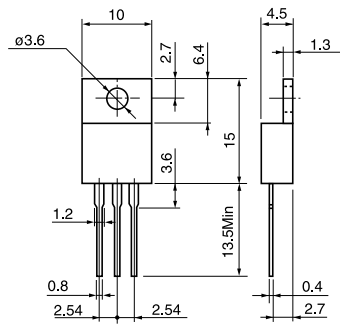
TO-247-2



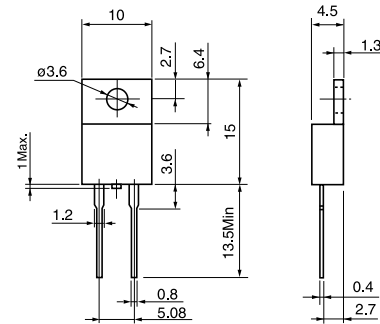
TO-247-4



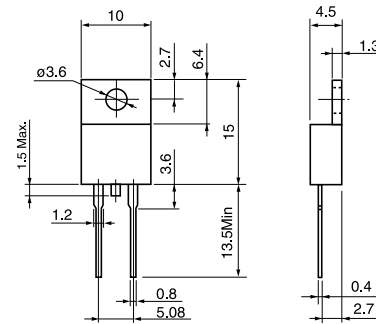
TO-220



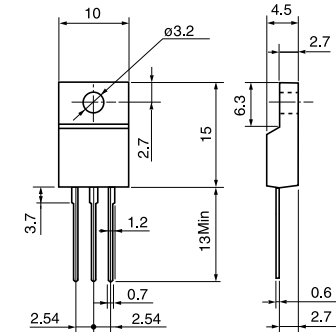
TO-220-2 (Type: A)



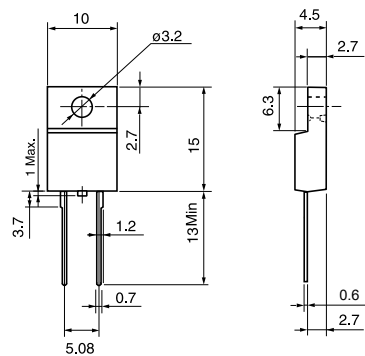
TO-220-2 (Type: B)



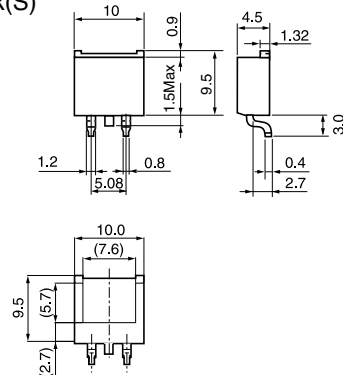
TO-220F



TO-220F-2



T-Pack(S)





**Package Outlines, mm**


**Package Outlines, mm**


## WARNING

1. This Catalog contains the product specifications, characteristics, data, materials, and structures as of March 2024.  
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  - Computers
  - OA equipment
  - Communications equipment (terminal devices)
  - Measurement equipment
  - Machine tools
  - Audiovisual equipment
  - Electrical home appliances
  - Personal equipment
  - Industrial robots etc.
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  - Transportation equipment (mounted on cars and ships)
  - Trunk communications equipment
  - Traffic-signal control equipment
  - Gas leakage detectors with an auto-shut-off feature
  - Emergency equipment for responding to disasters and anti-burglary devices
  - Safety devices
  - Medical equipment
6. Do not use products in this Catalog for the equipment requiring strict reliability such as the following and equivalents to strategic equipment (without limitation).
  - Space equipment
  - Aeronautic equipment
  - Nuclear control equipment
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\* The photo on the cover shows just one example of the many applications in which our power semiconductors are used, but should not be construed to mean that they are necessarily used in the product in the photo.

