

FUJI SEMICONDUCTORS



Supporting Society with
Energy and Environmental Technology

Fuji Electric Power Semiconductors contributing Energy Management in various fields



Renewable energy



Industry

01

Power Devices
(IGBT)

...P6

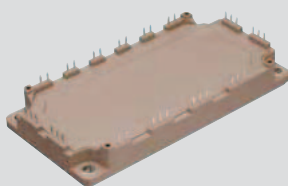
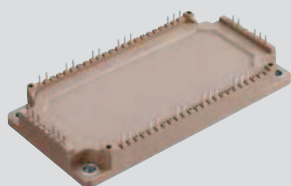
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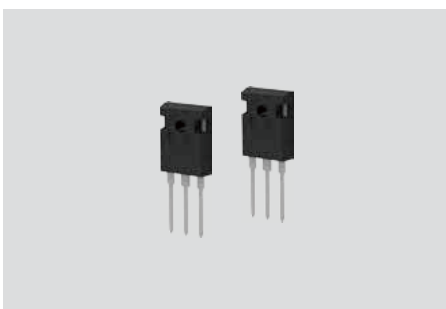
Fuji Electric provides Power Semiconductors enabling high-efficiency energy usage in various fields such as industrial machinery, automobile, railroad, social infrastructure, renewable energy, consumer electronics and information equipment in order to achieve low-carbon society.

Fuji Electric contributes to realization of safe and secure sustainable society through continuous technology innovation and product development of Power Semiconductors as key devices in Power Electronics technology.



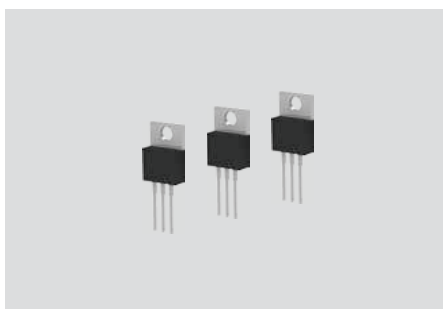
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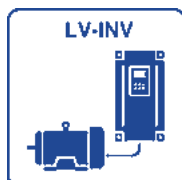
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Fuji Electric provides Power Semiconductors well suited for various applications. You will find more information on products for each application shown below at our Web site.

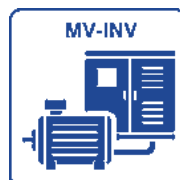
www.fujielectric.com/products/semiconductor/usage/

Inverters



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

Medium-Voltage Inverters



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

NC / Servos



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

Railroads



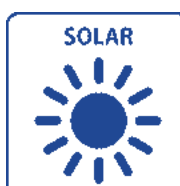
Semiconductor products suited for the power electronics of railroad cars such as the main motor drive and auxiliary power supply equipment of rolling stock

Wind Power Generation



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

Solar



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

Welding Machines



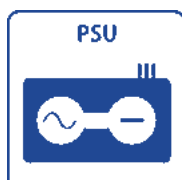
Semiconductor products suitable for switching circuits that generate resistance heat in welding machines to melt and integrate by adding heat or pressure to two or more metallic members

UPS



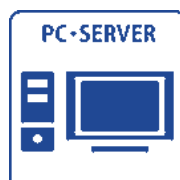
Semiconductor products ideal for the power conversion circuits of UPS (uninterruptible power supply) that prevent system shutdown during power outages and instantaneous power failures

Switching Power Supplies



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

PC / Servers



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

Flat-screen TVs



Semiconductor products ideal for the power supplies of TV sets that require low power consumption and large screens that are increasingly thinner and more lightweight

Automobiles



IGBT modules, power ICs, MOSFETs and pressure sensors as semiconductor products for automobiles developed with the theme "Car Electronics Solutions - Contributing to the Environment, Safety and Comfort"

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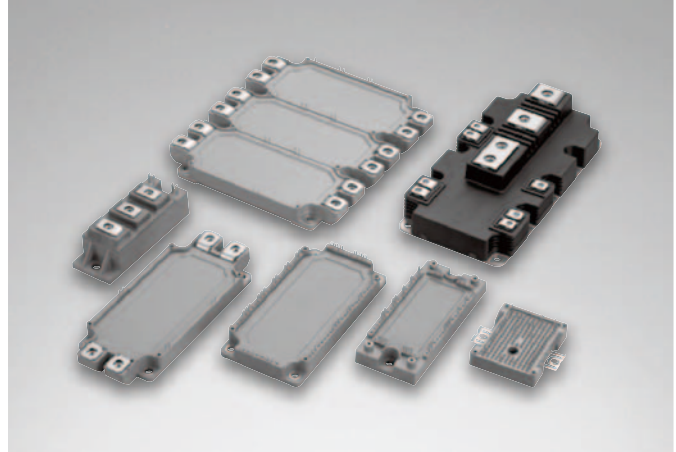
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IGBT Module



Fuji Electric has been developing IGBT modules designed to be used as switching elements for power converters of variable-speed drives for motors, uninterruptable power supplies, and more. IGBT has superior characteristics combining the high-speed switching performance of a power MOSFET with the high-voltage/high-current handling capabilities of a bipolar transistor.



Features of IGBT Module X Series



• Reduces power dissipation to contribute to energy saving

The IGBT and diode devices of Fuji electric's 7th-generation X series that constitute these modules have been made thinner and miniaturized, thereby optimizing the device structure. This has successfully reduced power dissipation in inverter operation compared with conventional products (Fuji Electric's 6th-generation V Series), contributing to energy saving and power cost reduction of the equipment on which the module is installed.

• Achieves equipment size reduction

A newly developed insulating substrate has been applied in order to improve the module's heat dissipation. Combined with the feature described above (reduced power dissipation) to suppress heat generation, an approximately 36%*1 reduction has been

achieved in comparison to the conventional module. In addition, the maximum temperature guaranteed in continuous operation has been increased from the conventional 150°C to 175°C, which allows the output current to be increased by up to 35%*2 while maintaining the size of the equipment on which the module is installed. This contributes to reducing the size and total cost of the equipment.

*1: Mounting area ratio with 1200 V 75A PIM models

*2: Value estimated from simulation results

• Contributes to improving equipment reliability

Newly developed structures and materials of the module have realized to increase its stability and durability in high-temperature operation. This contributes to improving the stability and reliability of the equipment on which the module is installed.

Features of IGBT Module V Series

• A compact design allows for greater power output

- High performance 6th-generation V series IGBT/FWD chipset
- $T_{vj(max.)}=175^{\circ}\text{C}$, $T_{vj(op)}=150^{\circ}\text{C}$

• Environmentally friendly modules

- Easy assemblage, solder free options
- RoHS compliant (Some parts are Non RoHS.)

• Turn-on switching characteristics

- Improved noise-loss trade-off
- Reduced turn-on dv/dt , excellent turn-on dic/dt

• Turn-off switching characteristic

- Soft switching behavior, turn-off oscillation free

Product lineup

Number of IGBT Switches	Products Category	Page	Internal Configuration				Max V_{CE}					Rated Current					
			IGBT Module			Discrete IGBT	600V	650V	1200V	1700V	3300V	$\leq 50A$	$>50A \leq 150A$	$>150A \leq 300A$	$>300A \leq 600A$	$>600A \leq 1200A$	$>1200A$
7	Small-PIM	11,13		✓			✓	✓	✓			✓					
	PIM EconoPIM™	14,17		✓			✓	✓				✓	✓				
		15,18							✓			✓	✓				
6	6-pack	20					✓		✓			✓	✓	✓			
		22	✓							✓			✓				
		23							✓	✓				✓	✓		
2	Standard 2-pack	24					✓	✓					✓	✓	✓		
		25,28	✓						✓				✓	✓	✓	✓	
		27,30								✓			✓	✓	✓		
1	Standard 1-pack	36	✓						✓	✓				✓	✓	✓	
	Chopper	38	✓				✓		✓			✓	✓	✓	✓		
1,2	High Speed Module	41	✓						✓				✓	✓	✓		
	High Power Module	32,33,37	✓						✓	✓	✓				✓	✓	✓
	PrimePACK™	34,35,39,40	✓						✓	✓					✓	✓	✓
4,12	T/I-type NPC 3-level	42,43	Reverse-Blocking IGBTs are integrated.				✓		✓	✓		✓	✓	✓	✓	✓	
6,7	IPM	44,45,46			✓		✓		✓			✓	✓	✓	✓		
1	Discrete IGBT	48				✓	✓	✓	✓			✓	✓				
1	Discrete RB-IGBT	50				✓	✓						✓				
6	6-pack for EV/HEV	51	✓					✓(750V)							✓	✓	

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

Part numbers

6MBI100XBA120-50 (example)

6	MB	I	100	X	BA	120	50
Number of IGBT Switches	IGBT Module	Internal Configuration	Rated Current	IGBT Device Technology	Package Type	Max. V_{CE}	RoHS Compliant
		I: Standard Modules	x 1 (A)	X: X series (7th Generation)	See the Products map	060: 600V	50 to 99 RoHS Compliant
		R: Power Integrated Modules	ex) 100:100A	XR: X series (7th Generation)		065: 650V	
		P: Intelligent Power Modules		V: V series (6th Generation)		120: 1200V	
				U: U series (5th Generation)		170: 1700V	
						330: 3300V	

Letter symbols

Letter symbols

V_{CES} : Collector-to-emitter rated voltage (Gate-to-emitter short-circuited)
 V_{GES} : Gate-to-emitter rated voltage (Collector-to-emitter short-circuited)
 I_C : Rated collector current
 P_C : Maximum power dissipation

$V_{CE(sat)}$: Collector-to-emitter saturation voltage
 t_{on} : Turn-on time
 t_{off} : Turn-off time
 t_f : Fall time
 $t_{d(on)}$: Turn-on time
 $t_{d(off)}$: Turn-off time

PIM (Power Integrated Modules)

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



6MBI	Ic	IGBT series & Package type
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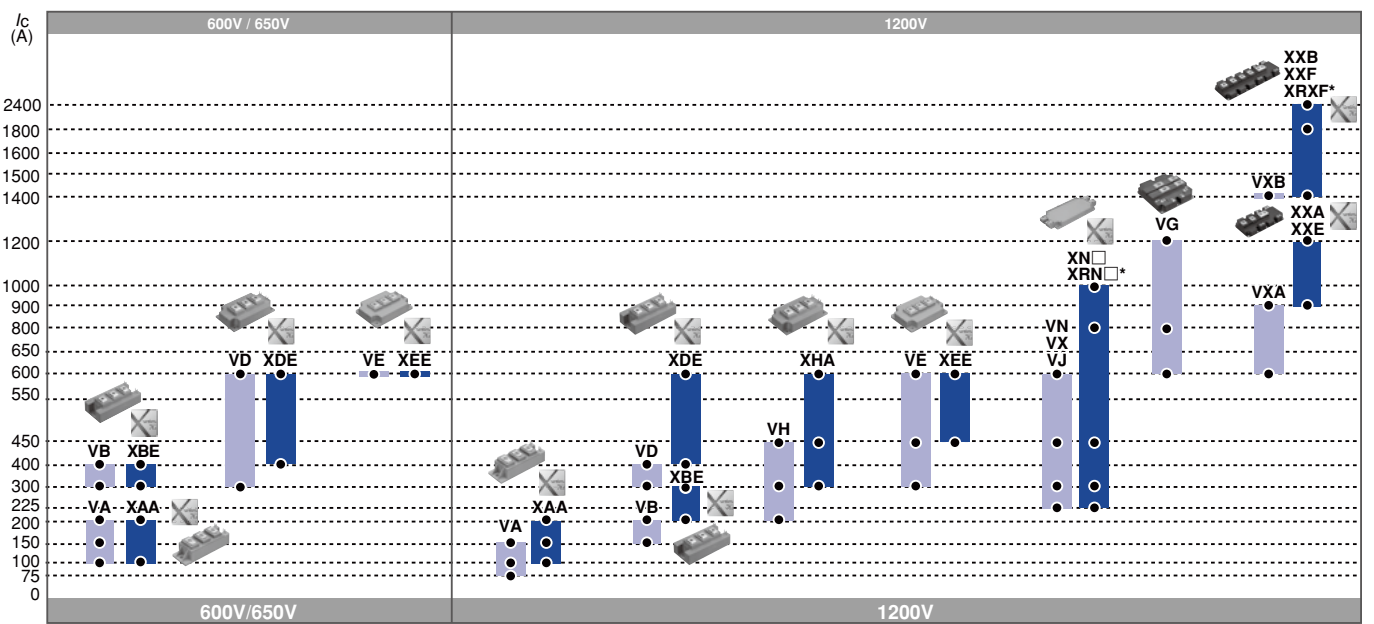
Note: EconoPACK™ and EconoPACK™+ are registered trademark of Infineon Technologies AG, Germany.



2-Pack

2MBI	Ic	IGBT series & Package type		Size	Page	
		V series	X series			
		VA	XAA	34×94mm	24,25,27	Standard Pack
		VB	XBE	45×92mm	24,25	
		VD	XDE	62×108mm	24,25	
		VE	XEE	80×110mm	24,25,27	
		VH	XHA	62×108mm	25,27	
		VJ, VN, VX	XN□, XRN□	62×150mm	28,30	
		-	XUF, XVF	100×140mm	32	HPnC
		VG, VT	-	140×130mm	33	High Power Module
		VXA	XXA, XXE	89×172mm	34,35	PrimePACK™
		VXB	XXB, XXF, XXG, XRXF	89×250mm	34,35	

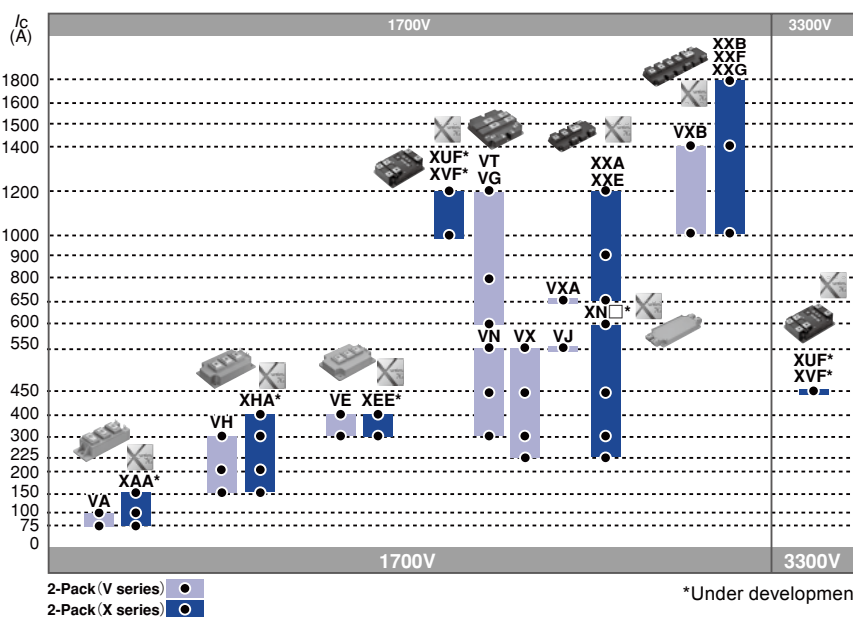
PrimePACK™ is registered trademark of Infineon Technologies AG, Germany



2-Pack (V series)
2-Pack (X series)

2-Pack (V series)
2-Pack (X series)

*Under development



2-Pack (V series)
2-Pack (X series)

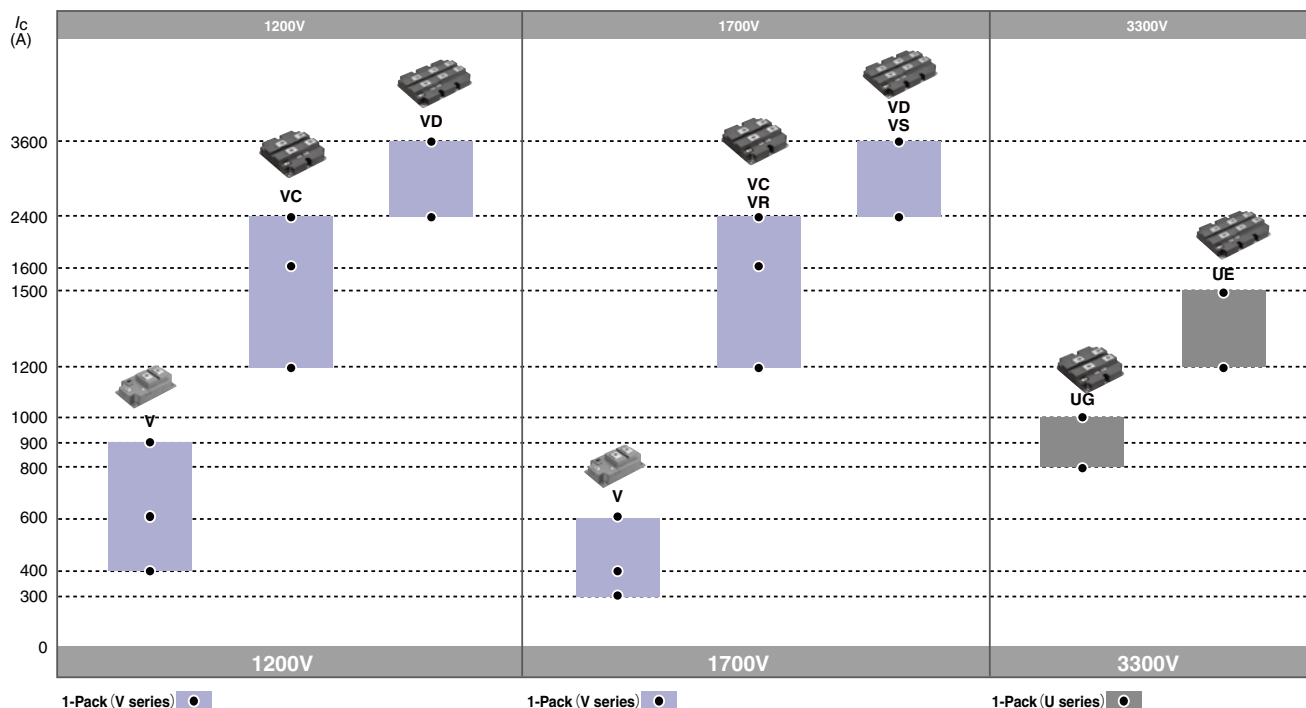
*Under development



Power Devices (IGBT)

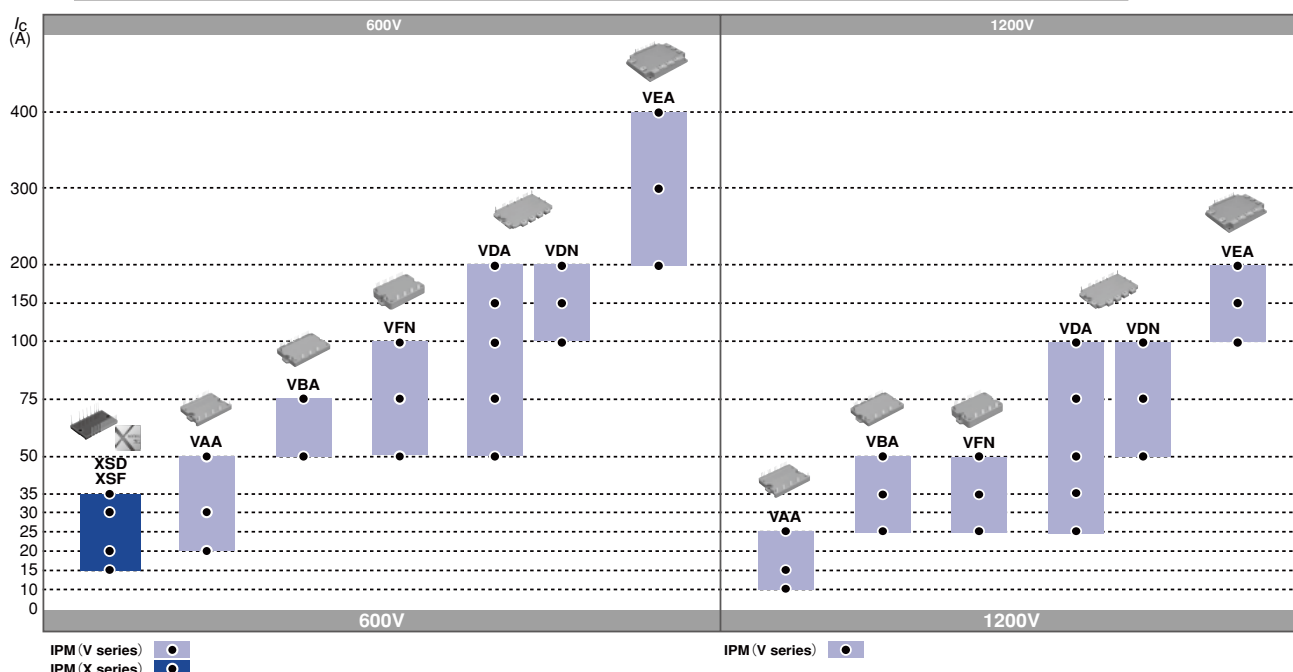
1-Pack

1MBI	Ic	IGBT series & Package type	Size	Page	
		V/U series			
		V	62×108mm	36	Standard Pack
		VC, VR, UG	140×130mm	37	High Power Module
		VD, VS, UE	140×190mm	37	



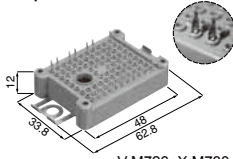
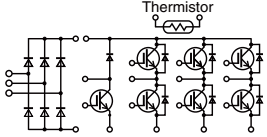
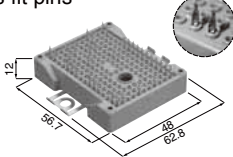
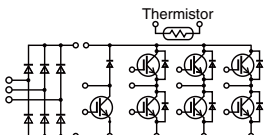
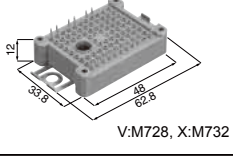
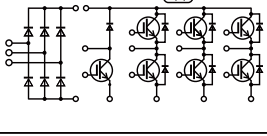
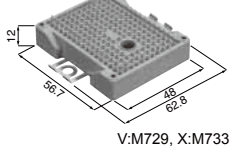
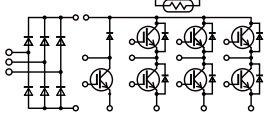
IPM (Intelligent Power Modules)

6/7MBP	Ic	IGBT series & Package type	Size	V series		X series	Page
				7 in 1	6 in 1	6 in 1	
		XSD, XSF	26×43mm	-	-	✓	44
		VAA	49.5×70mm	-	✓	-	45
		VBA	50.2×87mm	-	✓	-	45
		VFN	55×90mm	✓	✓	-	45
		VDA, VDN	84×128.5mm	✓	✓	-	46
		VEA	110×142mm	✓	✓	-	46



IGBT Module PIM < X series / V series >

■ Small PIM/Built-in converter and brake 650V, 600V class

Press fit pins	 V:M726, X:M730		I_c	650V	600V
				X series	V series
Press fit pins	 V:M727, X:M731		10A	7MBR10XKA065-50	7MBR10VKA060-50
			15A	7MBR15XKA065-50	7MBR15VKA060-50
			20A	7MBR20XKA065-50	7MBR20VKA060-50
			30A	7MBR30XKA065-50	7MBR30VKA060-50
Solder pins	 V:M728, X:M732		10A	7MBR10XKC065-50	7MBR10VKC060-50
			15A	7MBR15XKC065-50	7MBR15VKC060-50
			20A	7MBR20XKC065-50	7MBR20VKC060-50
			30A	7MBR30XKC065-50	7MBR30VKC060-50
Solder pins	 V:M729, X:M733		50A	7MBR50XKB065-50	7MBR50VKB060-50

Dimension [mm]

■ X series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_c	P_C	$V_{CE(sat)}$	V_{CES}	I_c	V_{RRM}	V_{RRM}	I_o	V_{FM}	I_{FSM}		
	Volts	Cont. Amps.	Watts	typ. Volts	Volts	Cont. Amps.	Volts	Volts	Cont. Amps.	typ. Volts	Amps.		
● 7MBR10XKA065-50	650	10	90	1.30	650	10	650	800	10	0.90	340	M730	25
● 7MBR15XKA065-50	650	15	110	1.30	650	15	650	800	15	0.95	340	M730	25
● 7MBR20XKA065-50	650	20	135	1.30	650	20	650	800	20	1.00	340	M730	25
● 7MBR30XKA065-50	650	30	180	1.30	650	30	650	800	30	1.05	340	M730	25
● 7MBR50XKB065-50	650	50	270	1.30	650	50	650	800	50	1.10	470	M731	45
● 7MBR10XKC065-50	650	10	90	1.30	650	10	650	800	10	0.90	340	M732	25
● 7MBR15XKC065-50	650	15	110	1.30	650	15	650	800	15	0.95	340	M732	25
● 7MBR20XKC065-50	650	20	135	1.30	650	20	650	800	20	1.00	340	M732	25
● 7MBR30XKC065-50	650	30	180	1.30	650	30	650	800	30	1.05	340	M732	25
● 7MBR50XKD065-50	650	50	270	1.30	650	50	650	800	50	1.10	470	M733	45

■ V series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_c	P_C	$V_{CE(sat)}$	V_{CES}	I_c	V_{RRM}	V_{RRM}	I_o	V_{FM}	I_{FSM}		
	Volts	Cont. Amps.	Watts	typ. Volts	Volts	Cont. Amps.	Volts	Volts	Cont. Amps.	typ. Volts	Amps.		
7MBR10VKA060-50	600	10	70	1.70	600	10	600	800	10	0.95	360	M726	25
7MBR15VKA060-50	600	15	85	1.75	600	15	600	800	15	1.00	360	M726	25
7MBR20VKA060-50	600	20	100	1.70	600	20	600	800	20	1.05	360	M726	25
7MBR30VKA060-50	600	30	125	1.70	600	30	600	800	30	1.15	360	M726	25
7MBR50VKB060-50	600	50	180	1.60	600	50	600	800	50	1.00	580	M727	45
7MBR10VKC060-50	600	10	70	1.70	600	10	600	800	10	0.95	360	M728	25
7MBR15VKC060-50	600	15	85	1.75	600	15	600	800	15	1.00	360	M728	25
7MBR20VKC060-50	600	20	100	1.70	600	20	600	800	20	1.05	360	M728	25
7MBR30VKC060-50	600	30	125	1.70	600	30	600	800	30	1.15	360	M728	25
7MBR50VKD060-50	600	50	180	1.60	600	50	600	800	50	1.00	580	M729	45

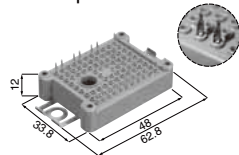
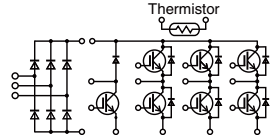
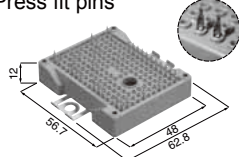
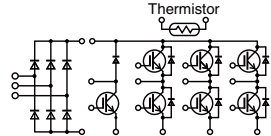
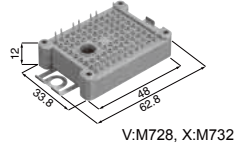
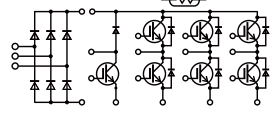
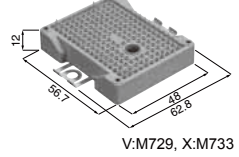
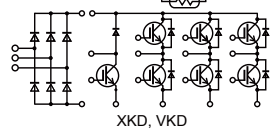
● : New products

 $V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^{\circ}\text{C}$, Chip



IGBT Module PIM < X series / V series >

Small PIM/Built-in converter and brake 1200V class

Press fit pins			I_c	1200V		
		X series		V series		
 V:M726, X:M730			10A	7MBR10XKA120-50	7MBR10VKA120-50	
			15A	7MBR15XKA120-50	7MBR15VKA120-50	
			25A	7MBR25XKA120-50		
Press fit pins				15A	7MBR15XKB120-50	7MBR15VKB120-50
 V:M727, X:M731		XKB, VKB		25A	7MBR25XKB120-50	7MBR25VKB120-50
				35A	7MBR35XKB120-50	7MBR35VKB120-50
				50A	7MBR50XRKB120-50	
Solder pins				10A	7MBR10XKC120-50	7MBR10VKC120-50
 V:M728, X:M732				15A	7MBR15XKC120-50	7MBR15VKC120-50
				25A	7MBR25XKC120-50	
Solder pins				15A	7MBR15XKD120-50	7MBR15VKD120-50
 V:M729, X:M733		XKD, VKD		25A	7MBR25XKD120-50	7MBR25VKD120-50
				35A	7MBR35XKD120-50	7MBR35VKD120-50
				50A	7MBR50XRKD120-50	

Dimension [mm]

X series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	typ. Volts	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.		Grams
● 7MBR10XKA120-50	1200	10	105	1.50	1200	10	1200	1600	10	0.95	300	M730	25
● 7MBR15XKA120-50	1200	15	135	1.50	1200	15	1200	1600	15	1.00	300	M730	25
● 7MBR25XKA120-50	1200	25	155	1.70	1200	25	1200	1600	25	1.05	300	M730	25
● 7MBR15XKB120-50	1200	15	135	1.50	1200	15	1200	1600	15	0.95	385	M731	45
● 7MBR25XKB120-50	1200	25	195	1.50	1200	25	1200	1600	25	1.00	385	M731	45
● 7MBR35XKB120-50	1200	35	255	1.50	1200	35	1200	1600	35	1.05	385	M731	45
○ 7MBR50XRKB120-50	1200	50	TBD	TBD	1200	35	1200	1600	35	1.05	385	M731	45
● 7MBR10XKC120-50	1200	10	105	1.50	1200	10	1200	1600	10	0.95	300	M732	25
● 7MBR15XKC120-50	1200	15	135	1.50	1200	15	1200	1600	15	1.00	300	M732	25
● 7MBR25XKC120-50	1200	25	155	1.70	1200	25	1200	1600	25	1.05	300	M732	25
● 7MBR15XKD120-50	1200	15	135	1.50	1200	15	1200	1600	15	0.95	385	M733	45
● 7MBR25XKD120-50	1200	25	195	1.50	1200	25	1200	1600	25	1.00	385	M733	45
● 7MBR35XKD120-50	1200	35	255	1.50	1200	35	1200	1600	35	1.05	385	M733	45
○ 7MBR50XRKD120-50	1200	50	TBD	TBD	1200	35	1200	1600	35	1.05	385	M733	45

● : New products
○ : Under development

$V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^{\circ}\text{C}$, Chip



■ V series

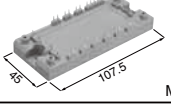
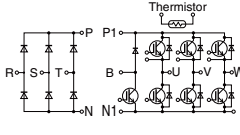
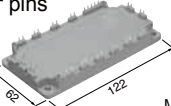
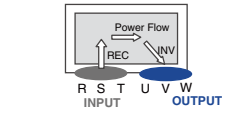
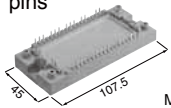
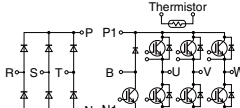
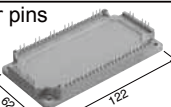
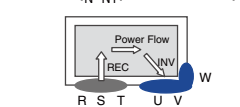
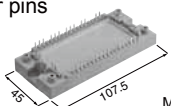
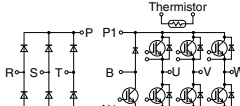
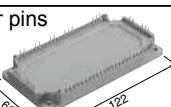
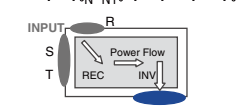
Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	Volts typ.	Volts	Amps.	Volts	Volts	Amps.	Volts typ.	Amps.		
7MBR10VKA120-50	1200	10	110	1.85	1200	10	1200	1600	10	0.95	245	M726	25
7MBR15VKA120-50	1200	15	135	1.90	1200	15	1200	1600	15	1.00	245	M726	25
7MBR15VKB120-50	1200	15	135	1.90	1200	15	1200	1600	15	1.00	245	M727	45
7MBR25VKB120-50	1200	25	180	1.85	1200	25	1200	1600	25	1.00	370	M727	45
7MBR35VKB120-50	1200	35	215	1.85	1200	35	1200	1600	35	1.05	370	M727	45
7MBR10VKC120-50	1200	10	110	1.85	1200	10	1200	1600	10	0.95	245	M728	25
7MBR15VKC120-50	1200	15	135	1.90	1200	15	1200	1600	15	1.00	245	M728	25
7MBR15VKD120-50	1200	15	135	1.90	1200	15	1200	1600	15	1.00	245	M729	45
7MBR25VKD120-50	1200	25	180	1.85	1200	25	1200	1600	25	1.00	370	M729	45
7MBR35VKD120-50	1200	35	215	1.85	1200	35	1200	1600	35	1.05	370	M729	45

$V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^{\circ}\text{C}$, Chip



IGBT Module PIM < X series / V series >

PIM/Built-in converter and brake EconoPIM™ 650V, 600V class

Solder pins		I_C	650V X series	600V V series
 M711		50A		7MBR50VA060-50
 M712		75A 100A		7MBR75VB060-50 7MBR100VB060-50
 M719		50A 75A	7MBR50XMA065-50 7MBR75XMA065-50	
 M720		75A 100A 150A	7MBR75XNA065-50 7MBR100XNA065-50 7MBR150XNA065-50	
 M719		50A 75A 100A	7MBR50XPA065-50 7MBR75XPA065-50 7MBR100XPE065-50	7MBR50VP060-50 7MBR75VP060-50 7MBR100VP060-50
 M720		100A 150A	7MBR100XRA065-50 7MBR150XRA065-50 7MBR150XRE065-50	7MBR100VR060-50 7MBR150VR060-50

Dimension [mm]

X series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass Grams
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	typ. Volts	Volts	Amps.	Volts	Volts	Amps.	typ. Volts	Amps.		
● 7MBR50XMA065-50	650	50	210	1.3	650	30	650	800	50	1.05	505	M719	200
● 7MBR75XMA065-50	650	75	270	1.3	650	50	650	800	75	1.15	505	M719	200
● 7MBR75XNA065-50	650	75	270	1.3	650	50	650	800	75	1.15	505	M720	310
● 7MBR100XNA065-50	650	100	330	1.3	650	50	650	800	100	1.1	745	M720	310
● 7MBR150XNA065-50	650	150	450	1.3	650	75	650	800	150	1.1	1260	M720	310
● 7MBR50XPA065-50	650	50	210	1.3	650	30	650	800	50	1.05	505	M719	200
● 7MBR75XPA065-50	650	75	270	1.3	650	50	650	800	75	1.15	505	M719	200
● 7MBR100XPE065-50	650	100	480	1.3	650	50	650	800	100	1.1	745	M719	200
● 7MBR100XRA065-50	650	100	330	1.3	650	50	650	800	100	1.1	745	M720	310
● 7MBR150XRA065-50	650	150	450	1.3	650	75	650	800	150	1.1	1260	M720	310
● 7MBR150XRE065-50	650	150	700	1.3	650	75	650	800	150	1.1	1260	M720	310

V series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass Grams
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	typ. Volts	Volts	Amps.	Volts	Volts	Amps.	typ. Volts	Amps.		
7MBR50VA060-50	600	50	200	1.6	600	50	600	800	50	1.3	210	M711	180
7MBR75VB060-50	600	75	300	1.6	600	50	600	800	75	1.25	500	M712	300
7MBR100VB060-50	600	100	335	1.6	600	50	600	800	100	1.25	700	M712	300
7MBR50VP060-50	600	50	200	1.6	600	50	600	800	50	1.3	210	M719	200
7MBR75VP060-50	600	75	300	1.6	600	50	600	800	75	1.25	500	M719	200
7MBR100VP060-50	600	100	430	1.85	600	50	600	800	100	1.25	700	M719	200
7MBR100VR060-50	600	100	335	1.6	600	50	600	800	100	1.25	700	M720	310
7MBR150VR060-50	600	150	485	1.6	600	75	600	800	150	1.25	960	M720	310

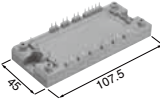
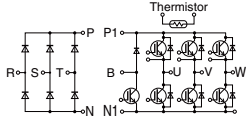
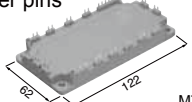
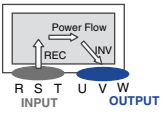
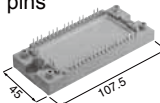
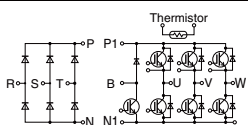
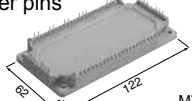
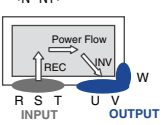
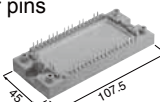
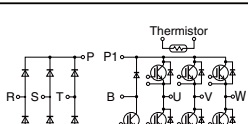
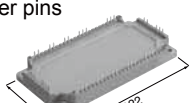
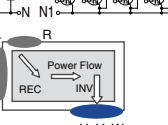
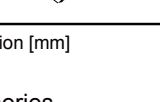
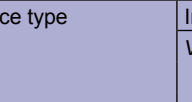
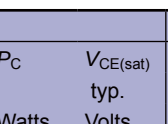
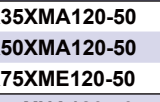
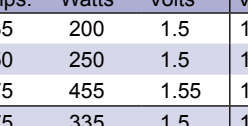
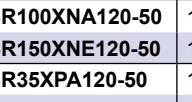
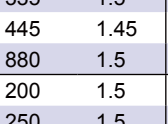
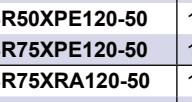
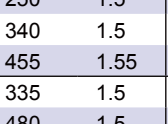
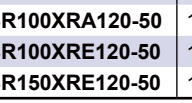
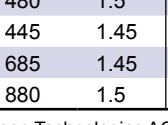
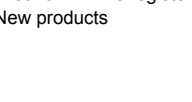
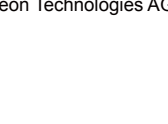
Note: EconoPIM™ is registered trademark of Infineon Technologies AG, Germany.

● : New products

$V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^\circ\text{C}$, Chip

IGBT Module PIM < X series / V series >

PIM/Built-in converter and brake EconoPIM™ 1200V class

Solder pins		I _C	1200V	
			X series	V series
 M711		25A		7MBR25VA120-50
		35A		7MBR35VA120-50
 M712		35A		7MBR35VB120-50
		50A		7MBR50VB120-50
 M719		75A		7MBR75VB120-50
 M720		25A		7MBR25VM120-50
		35A	7MBR35XMA120-50	7MBR35VM120-50
 M719		50A	7MBR50XMA120-50	7MBR50VM120-50
		75A	7MBR75XME120-50	
 M720		50A		7MBR50VN120-50
		75A	7MBR75XNA120-50	7MBR75VN120-50
 M719		100A	7MBR100XNA120-50	7MBR100VN120-50
		150A	7MBR150XNE120-50	7MBR150VN120-50
 M720		25A		7MBR25VP120-50
		35A	7MBR35XPA120-50	7MBR35VP120-50
 M719		50A	7MBR50XPA120-50	7MBR50VP120-50
		75A	7MBR50XPE120-50	
 M720		75A	7MBR75XPE120-50	
		50A		7MBR50VR120-50
 M720		75A	7MBR75XRA120-50	7MBR75VR120-50
			7MBR75XRE120-50	
 M720		100A	7MBR100XRA120-50	7MBR100VR120-50
			7MBR100XRE120-50	
 M720		150A	7MBR150XRE120-50	7MBR150VR120-50

Dimension [mm]

X series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V _{CES}	I _C	P _C	V _{CE(sat)}	V _{CES}	I _C	V _{RRM}	V _{RRM}	I _O	V _{FM}	I _{FSM}		
	Volts	Amps.	Watts	Volts	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.		Grams
● 7MBR35XMA120-50	1200	35	200	1.5	1200	25	1200	1600	35	1.05	385	M719	200
● 7MBR50XMA120-50	1200	50	250	1.5	1200	35	1200	1600	50	1.05	520	M719	200
● 7MBR75XME120-50	1200	75	455	1.55	1200	35	1200	1600	75	1.15	520	M719	200
● 7MBR75XNA120-50	1200	75	335	1.5	1200	50	1200	1600	75	1.15	520	M720	310
● 7MBR100XNA120-50	1200	100	445	1.45	1200	75	1200	1600	100	1.05	775	M720	310
● 7MBR150XNE120-50	1200	150	880	1.5	1200	75	1200	1600	150	1.05	1400	M720	310
● 7MBR35XPA120-50	1200	35	200	1.5	1200	25	1200	1600	35	1.05	385	M719	200
● 7MBR50XPA120-50	1200	50	250	1.5	1200	35	1200	1600	50	1.05	520	M719	200
● 7MBR50XPE120-50	1200	50	340	1.5	1200	35	1200	1600	50	1.05	520	M719	200
● 7MBR75XPE120-50	1200	75	455	1.55	1200	35	1200	1600	75	1.15	520	M719	200
● 7MBR75XRA120-50	1200	75	335	1.5	1200	50	1200	1600	75	1.15	520	M720	310
● 7MBR75XRE120-50	1200	75	480	1.5	1200	50	1200	1600	75	1.0	775	M720	310
● 7MBR100XRA120-50	1200	100	445	1.45	1200	75	1200	1600	100	1.05	775	M720	310
● 7MBR100XRE120-50	1200	100	685	1.45	1200	75	1200	1600	100	1.05	775	M720	310
● 7MBR150XRE120-50	1200	150	880	1.5	1200	75	1200	1600	150	1.05	1400	M720	310

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

V_{CE(sat)}, V_{FM}: at T_{vj}=25°C, Chip

● : New products



■ V series

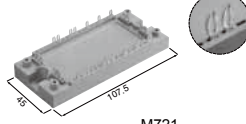
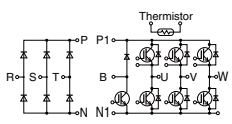
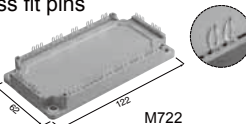
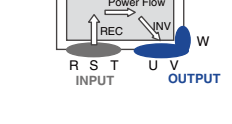
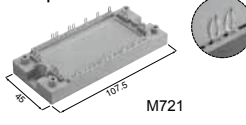
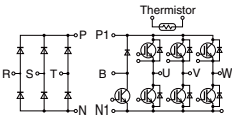
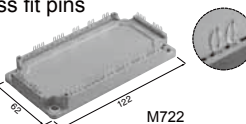
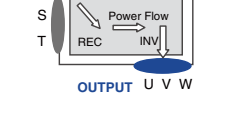
Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	Volts	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.		Grams
7MBR25VA120-50	1200	25	170	1.85	1200	25	1200	1600	25	1.42	155	M711	180
7MBR35VA120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M711	180
7MBR35VB120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M712	300
7MBR50VB120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M712	300
7MBR75VB120-50	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M712	300
7MBR25VM120-50	1200	25	170	1.85	1200	25	1200	1600	25	1.4	155	M719	200
7MBR35VM120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M719	200
7MBR50VM120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M719	200
7MBR50VN120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M720	310
7MBR75VN120-50	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M720	310
7MBR100VN120-50	1200	100	520	1.75	1200	75	1200	1600	100	1.5	520	M720	310
7MBR150VN120-50	1200	150	885	1.85	1200	100	1200	1600	150	1.4	780	M720	310
7MBR25VP120-50	1200	25	170	1.85	1200	25	1200	1600	25	1.4	155	M719	200
7MBR35VP120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M719	200
7MBR50VP120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M719	200
7MBR50VR120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M720	310
7MBR75VR120-50	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M720	310
7MBR100VR120-50	1200	100	520	1.75	1200	75	1200	1600	100	1.5	520	M720	310
7MBR150VR120-50	1200	150	885	1.85	1200	100	1200	1600	150	1.4	780	M720	310

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

$V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^{\circ}\text{C}$, Chip

IGBT Module PIM < X series / V series >

PIM/Built-in converter and brake EconoPIM™ 650V, 600V class

Press fit pins		IC	650V	600V
			X series	V series
 M721		50A	7MBR50XWA065-50	
		75A	7MBR75XWA065-50	
 M722		75A	7MBR75XXA065-50	
		100A	7MBR100XXA065-50	
		150A	7MBR150XXA065-50	
 M721		50A	7MBR50XYA065-50	7MBR50VY060-50
		75A	7MBR75XYA065-50	7MBR75VY060-50
		100A	7MBR100XE065-50	7MBR100VY060-50
 M722		100A	7MBR100XZA065-50	7MBR100VZ060-50
				7MBR100VZ060-80
		150A	7MBR150XZA065-50	7MBR150VZ060-50
				7MBR150VZ060-80
				7MBR150VZ060-80

Dimension [mm]

X series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	typ. Volts	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.		
● 7MBR50XWA065-50	650	50	210	1.3	650	30	650	800	50	1.05	505	M721	200
● 7MBR75XWA065-50	650	75	270	1.3	650	50	650	800	75	1.15	505	M721	200
● 7MBR75XXA065-50	650	75	270	1.3	650	50	650	800	75	1.15	505	M722	310
● 7MBR100XXA065-50	650	100	330	1.3	650	50	650	800	100	1.1	745	M722	310
● 7MBR150XXA065-50	650	150	450	1.3	650	75	650	800	150	1.1	1260	M722	310
● 7MBR50XYA065-50	650	50	210	1.3	650	30	650	800	50	1.05	505	M721	200
● 7MBR75XYA065-50	650	75	270	1.3	650	50	650	800	75	1.15	505	M721	200
● 7MBR100XE065-50	650	100	480	1.3	650	50	650	800	100	1.1	745	M721	200
● 7MBR100XZA065-50	650	100	330	1.3	650	50	650	800	100	1.1	745	M722	310
● 7MBR150XZA065-50	650	150	450	1.3	650	75	650	800	150	1.1	1260	M722	310

V series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	typ. Volts	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.		
7MBR50VY060-50	600	50	215	1.6	600	50	600	800	50	1.3	210	M721	200
7MBR75VY060-50	600	75	300	1.6	600	50	600	800	75	1.25	500	M721	200
7MBR100VY060-50	600	100	430	1.85	600	50	600	800	100	1.25	700	M721	200
7MBR100VZ060-50	600	100	335	1.6	600	50	600	800	100	1.25	700	M722	310
7MBR100VZ060-80	600	100	335	1.6	600	50	600	800	100	1.25	700	M722	310
7MBR150VZ060-50	600	150	485	1.6	600	75	600	800	150	1.25	960	M722	310
7MBR150VZ060-80	600	150	485	1.6	600	75	600	800	150	1.25	960	M722	310

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

 $V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^{\circ}\text{C}$, Chip

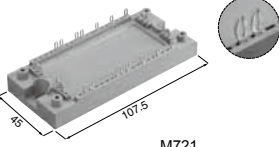
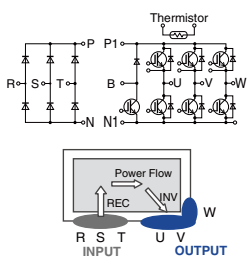
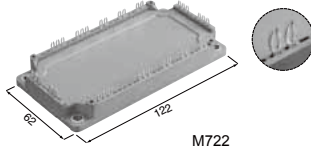
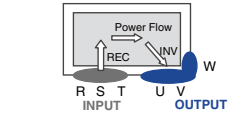
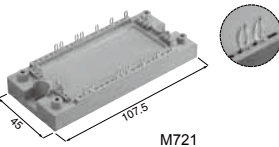
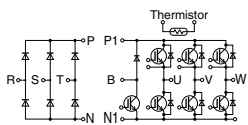
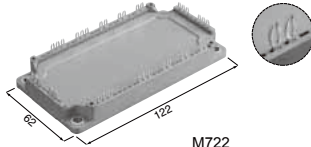
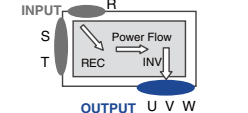
Note2: "-80" : Pre-Applied Thermal-Interface-Material

● : New products



IGBT Module PIM < X series / V series >

PIM/Built-in converter and brake EconoPIM™ 1200V class

Press fit pins		Ic	1200V	
			X series	V series
 M721		25A		7MBR25VW120-50
		35A	7MBR35XWA120-50	7MBR35VW120-50
		50A	7MBR50XWA120-50	7MBR50VW120-50
		75A	7MBR75XWE120-50	
 M722		50A		7MBR50VX120-50 7MBR50VX120-80
		75A	7MBR75XXA120-50	7MBR75VX120-50 7MBR75VX120-80
		100A	7MBR100XXA120-50	7MBR100VX120-50 7MBR100VX120-80
		150A	7MBR150XXE120-50	7MBR150VX120-50 7MBR150VX120-80
 M721		25A		7MBR25VY120-50
		35A	7MBR35XYA120-50	7MBR35VY120-50
		50A	7MBR50XYA120-50	7MBR50VY120-50
		75A	7MBR75XYE120-50	
 M722		50A		7MBR50VZ120-50 7MBR50VZ120-80
		75A	7MBR75XZA120-50	7MBR75VZ120-50 7MBR75VZ120-80
		100A	7MBR100XZA120-50	7MBR100VZ120-50 7MBR100VZ120-80
		150A	7MBR150XZE120-50	7MBR150VZ120-50 7MBR150VZ120-80

Dimension [mm]

X series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass
	V _{CES}	I _C	P _C	V _{CE(sat)}	V _{CES}	I _C	V _{RRM}	V _{RRM}	I _O	V _{FM}	I _{FSM}		
	Volts	Cont. Amps.	Watts	typ. Volts	Volts	Cont. Amps.	Volts	Volts	Cont. Amps.	typ. Volts	Amps.		Grams
● 7MBR35XWA120-50	1200	35	200	1.5	1200	25	1200	1600	35	1.05	385	M721	200
● 7MBR50XWA120-50	1200	50	250	1.5	1200	35	1200	1600	50	1.05	520	M721	200
● 7MBR75XWE120-50	1200	75	455	1.55	1200	35	1200	1600	75	1.15	520	M721	200
● 7MBR75XXA120-50	1200	75	335	1.5	1200	50	1200	1600	75	1.15	520	M722	310
● 7MBR100XXA120-50	1200	100	445	1.45	1200	75	1200	1600	100	1.05	775	M722	310
● 7MBR150XXE120-50	1200	150	880	1.5	1200	75	1200	1600	150	1.05	1400	M722	310
● 7MBR35XYA120-50	1200	35	200	1.5	1200	25	1200	1600	35	1.05	385	M721	200
● 7MBR50XYA120-50	1200	50	250	1.5	1200	35	1200	1600	50	1.05	520	M721	200
● 7MBR75XYE120-50	1200	75	455	1.55	1200	35	1200	1600	75	1.15	520	M721	200
● 7MBR75XZA120-50	1200	75	335	1.5	1200	50	1200	1600	75	1.15	520	M722	310
● 7MBR100XZA120-50	1200	100	445	1.45	1200	75	1200	1600	100	1.05	775	M722	310
● 7MBR150XZE120-50	1200	150	880	1.5	1200	75	1200	1600	150	1.05	1400	M722	310

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

Note2: "-80" : Pre-Applied Thermal-Interface-Material

● : New products

V_{CE(sat)}, V_{FM}: at T_{vj}=25°C, Chip

■ V series

Device type	Inverter [IGBT]				Brake [IGBT+FWD]			Converter [Diode]				Package	Net mass Grams
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Cont. Amps.	Watts	typ. Volts	Volts	Cont. Amps.	Volts	Volts	Cont. Amps.	typ. Volts	Amps.		
7MBR25VW120-50	1200	25	170	1.85	1200	25	1200	1600	25	1.4	155	M721	200
7MBR35VW120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M721	200
7MBR50VW120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M721	200
7MBR50VX120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M722	310
7MBR50VX120-80	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M722	310
7MBR75VX120-50	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M722	310
7MBR75VX120-80	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M722	310
7MBR100VX120-50	1200	100	520	1.75	1200	75	1200	1600	100	1.5	520	M722	310
7MBR100VX120-80	1200	100	520	1.75	1200	75	1200	1600	100	1.5	520	M722	310
7MBR150VX120-50	1200	150	885	1.85	1200	100	1200	1600	150	1.4	780	M722	310
7MBR150VX120-80	1200	150	885	1.85	1200	100	1200	1600	150	1.4	780	M722	310
7MBR25VY120-50	1200	25	170	1.85	1200	25	1200	1600	25	1.42	155	M721	200
7MBR35VY120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M721	200
7MBR50VY120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M721	200
7MBR50VZ120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M722	310
7MBR50VZ120-80	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M722	310
7MBR75VZ120-50	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M722	310
7MBR75VZ120-80	1200	75	385	1.85	1200	50	1200	1600	75	1.4	520	M722	310
7MBR100VZ120-50	1200	100	520	1.75	1200	75	1200	1600	100	1.5	520	M722	310
7MBR100VZ120-80	1200	100	520	1.75	1200	75	1200	1600	100	1.5	520	M722	310
7MBR150VZ120-50	1200	150	885	1.85	1200	100	1200	1600	150	1.4	780	M722	310
7MBR150VZ120-80	1200	150	885	1.85	1200	100	1200	1600	150	1.4	780	M722	310

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

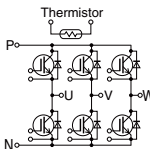
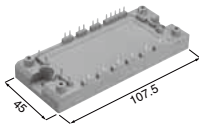
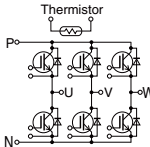
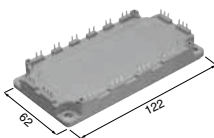
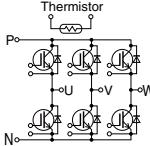
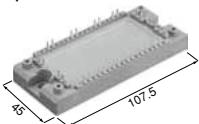
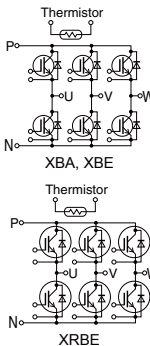
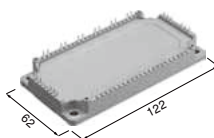
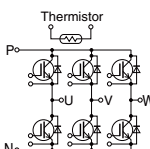
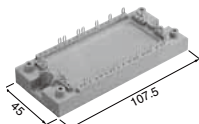
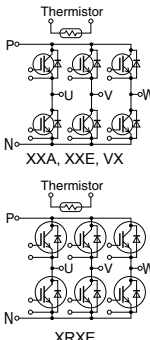
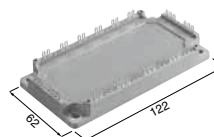
 $V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^{\circ}\text{C}$, Chip

Note2: "-80" : Pre-Applied Thermal-Interface-Material



IGBT Module 6-Pack < X series / V series >

6-Pack EconoPACK™ 600V, 1200V class

Solder pins			Ic	600V	1200V	
 M636	V 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	
Solder pins			100A			6MBI100VB-120-50
 M633	150A		6MBI150VB-060-50		6MBI150VB-120-50	
	180A				6MBI180VB-120-50	
					6MBI180VB-120-55	
Solder pins			100A		6MBI100XAE120-50	
 M669						
Solder pins			100A		6MBI100XBA120-50	
 M668	150A		6MBI150XBA120-50			
	200A		6MBI200XBA120-50			
			6MBI200XBE120-50			
	250A		6MBI250XRBE120-50			
Press fit pins			50A	6MBI50VW-060-50		6MBI50VW-120-50
 M647	75A		6MBI75VW-060-50		6MBI75VW-120-50	
	100A		6MBI100VW-060-50		6MBI100VW-120-50	
Press fit pins			100A		6MBI100XXA120-50	6MBI100VX-120-50
 M648					6MBI100VX-120-80	
	150A		6MBI150VX-060-50	6MBI150XXA120-50	6MBI150VX-120-50	
			6MBI150VX-060-80		6MBI150VX-120-80	
	180A				6MBI180VX-120-50	
					6MBI180VX-120-80	
				6MBI180VX-120-55		
				6MBI180VX-120-85		
200A			6MBI200XXA120-50			
			6MBI200XXE120-50			
250A		6MBI250XRXE120-50				

Dimension [mm]

■ X series

Device type	V_{CES} Volts	V_{GES} Volts	I_C Cont. Amps.	P_C Watts	$V_{CE(sat)}$ ($V_{GE}=15V$) typ.		Switching time			Package	Net mass Grams
					$V_{CE(sat)}$ Volts	I_C Amps.	$t_{d(on)}$ typ. μ sec.	$t_{d(off)}$ typ. μ sec.	t_f typ. μ sec.		
● 6MBI100XAE120-50	1200	± 20	100	685	1.45	100	0.21	0.29	0.1	M669	200
● 6MBI100XBA120-50	1200	± 20	100	445	1.45	100	0.21	0.29	0.1	M668	310
● 6MBI150XBA120-50	1200	± 20	150	625	1.40	150	0.31	0.35	0.15	M668	310
● 6MBI200XBA120-50	1200	± 20	200	750	1.45	200	0.27	0.34	0.12	M668	310
● 6MBI200XBE120-50	1200	± 20	200	1000	1.45	200	0.27	0.34	0.12	M668	310
○ 6MBI250XRBE120-50	1200	± 20	250	TBD	TBD	250	TBD	TBD	TBD	M668	310
● 6MBI100XXA120-50	1200	± 20	100	445	1.45	100	0.21	0.29	0.1	M648	310
● 6MBI150XXA120-50	1200	± 20	150	625	1.40	150	0.31	0.35	0.15	M648	310
● 6MBI200XXA120-50	1200	± 20	200	750	1.45	200	0.27	0.34	0.12	M648	310
● 6MBI200XXE120-50	1200	± 20	200	1000	1.45	200	0.27	0.34	0.12	M648	310
○ 6MBI250XXE120-50	1200	± 20	250	TBD	TBD	250	TBD	TBD	TBD	M648	310

■ V series

Device type	V_{CES} Volts	V_{GES} Volts	I_C Cont. Amps.	P_C Watts	$V_{CE(sat)}$ ($V_{GE}=15V$) typ.		Switching time			Package	Net mass Grams
					$V_{CE(sat)}$ Volts	I_C Amps.	t_{on} typ. μ sec.	t_{off} typ. μ sec.	t_f typ. μ sec.		
6MBI50VA-060-50	600	± 20	50	200	1.6	50	0.36	0.52	0.03	M636	180
6MBI75VA-060-50	600	± 20	75	275	1.6	75	0.36	0.52	0.03	M636	180
6MBI100VA-060-50	600	± 20	100	335	1.6	100	0.36	0.52	0.03	M636	180
6MBI150VB-060-50	600	± 20	150	485	1.6	150	0.36	0.52	0.03	M633	300
6MBI50VW-060-50	600	± 20	50	215	1.6	50	0.36	0.52	0.03	M647	200
6MBI75VW-060-50	600	± 20	75	300	1.6	75	0.36	0.52	0.03	M647	200
6MBI100VW-060-50	600	± 20	100	335	1.6	100	0.36	0.52	0.03	M647	200
6MBI150VX-060-50	600	± 20	150	485	1.6	150	0.36	0.52	0.03	M648	310
6MBI150VX-060-80	600	± 20	150	485	1.6	150	0.36	0.52	0.03	M648	310
6MBI50VA-120-50	1200	± 20	50	280	1.85	50	0.39	0.53	0.06	M636	180
6MBI75VA-120-50	1200	± 20	75	385	1.85	75	0.39	0.53	0.06	M636	180
6MBI100VA-120-50	1200	± 20	100	520	1.75	100	0.39	0.53	0.06	M636	180
6MBI100VB-120-50	1200	± 20	100	520	1.75	100	0.39	0.53	0.06	M633	300
6MBI150VB-120-50	1200	± 20	150	770	1.75	150	0.39	0.53	0.06	M633	300
6MBI180VB-120-50	1200	± 20	150	835	1.85	200	0.39	0.53	0.06	M633	300
6MBI180VB-120-55	1200	± 20	150	1075	1.85	200	0.39	0.53	0.06	M633	300
6MBI50VW-120-50	1200	± 20	50	280	1.85	50	0.39	0.53	0.06	M647	200
6MBI75VW-120-50	1200	± 20	75	385	1.85	75	0.39	0.53	0.06	M647	200
6MBI100VW-120-50	1200	± 20	100	520	1.75	100	0.39	0.53	0.06	M647	200
6MBI100VX-120-50	1200	± 20	100	520	1.75	100	0.39	0.53	0.06	M648	310
6MBI100VX-120-80	1200	± 20	100	520	1.75	100	0.39	0.53	0.06	M648	310
6MBI150VX-120-50	1200	± 20	150	770	1.75	150	0.39	0.53	0.06	M648	310
6MBI150VX-120-80	1200	± 20	150	770	1.75	150	0.39	0.53	0.06	M648	310
6MBI180VX-120-50	1200	± 20	150	835	1.85	200	0.39	0.53	0.06	M648	310
6MBI180VX-120-80	1200	± 20	150	835	1.85	200	0.39	0.53	0.06	M648	310
6MBI180VX-120-55	1200	± 20	150	1075	1.85	200	0.39	0.53	0.06	M648	310
6MBI180VX-120-85	1200	± 20	150	1075	1.85	200	0.39	0.53	0.06	M648	310

Note1: EconoPACK™ is registered trademarks of Infineon Technologies AG, Germany.

Note2: 6MBI180VB-120-55, 6MBI180VX-120-55; Premium type (Low Thermal Impedance Version)

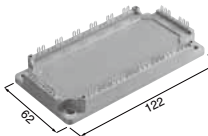
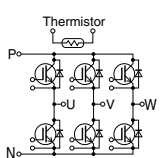
Note3: "-80", "-85": Pre-Applied Thermal-Interface-Material for "-50", "-55"

●: New products ○: Under development

 $V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip

IGBT Module 6-Pack < V series >

6-Pack EconoPACK™ 1700V class

Press fit pins		1700V	
		V series	
  M648		I_C	
		100A	6MBI100VX-170-50
			6MBI100VX-170-80

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Cont. Amps.	Watts	typ. Volts	I_C Amps.	t_{on} typ. μ sec.	t_{off} typ. μ sec.	t_f typ. μ sec.		
6MBI100VX-170-50	1700	± 20	100	665	2.00	100	0.63	0.70	0.10	M648	310
6MBI100VX-170-80	1700	± 20	100	665	2.00	100	0.63	0.70	0.10	M648	310

Note1: EconoPACK™ is registered trademarks of Infineon Technologies AG, Germany.

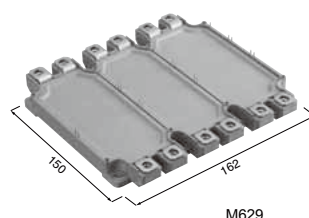
Note2: "-80" : Pre-Applied Thermal-Interface-Material for "-50"

$V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip

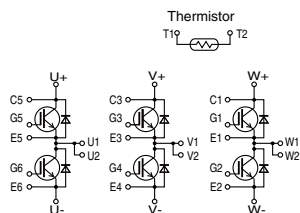
IGBT Module 6-Pack < V series >

6-Pack EconoPACK™+ 1200V, 1700V class

High power 6-pack



M629



I_C	1200V	1700V
	V series	V series
225A	6MBI225V-120-50	
300A	6MBI300V-120-50	6MBI300V-170-50
	6MBI300V-120-80	
450A	6MBI450V-120-50	6MBI450V-170-50
		6MBI450V-170-80
550A	6MBI550V-120-50	

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps. Cont.	Watts	typ.	I_C	t_{on}	t_{off}	t_f		
					Volts	Amps.	typ. $\mu sec.$	typ. $\mu sec.$	typ. $\mu sec.$		Grams
6MBI225V-120-50	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M629	950
6MBI300V-120-50	1200	± 20	300	1600	1.75	300	0.55	1.05	0.11	M629	950
6MBI300V-120-80	1200	± 20	300	1600	1.75	300	0.55	1.05	0.11	M629	950
6MBI450V-120-50	1200	± 20	450	2250	1.75	450	0.55	1.05	0.11	M629	950
6MBI550V-120-50	1200	± 20	550	2500	1.85	600	0.55	1.05	0.11	M629	950
6MBI300V-170-50	1700	± 20	300	1665	2.00	300	0.90	1.30	0.10	M629	950
6MBI450V-170-50	1700	± 20	450	2500	2.00	450	0.90	1.30	0.10	M629	950
6MBI450V-170-80	1700	± 20	450	2500	2.00	450	0.90	1.30	0.10	M629	950

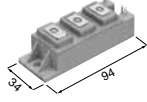
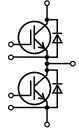
Note1: EconoPACK™ is registered trademarks of Infineon Technologies AG, Germany.

Note2: "-80" : Pre-Applied Thermal-Interface-Material

 $V_{CE(sat)}$: at $T_{vj}=25^\circ C$, Chip

IGBT Module 2-Pack < X series / V series >

Standard 2-Pack 650V, 600V class

			I_C	650V	600V
				X series	V series
			100A		2MBI100VA-060-50
			150A	2MBI150XAA065-50	2MBI150VA-060-50
			200A	2MBI200XAA065-50	2MBI200VA-060-50
			300A	2MBI300XBE065-50	2MBI300VB-060-50
			400A	2MBI400XBE065-50	2MBI400VB-060-50
			400A	2MBI400XDE065-50	2MBI400VD-060-50
			600A	2MBI600XDE065-50	2MBI600VD-060-50
			600A	2MBI600XEE065-50	2MBI600VE-060-50
					2MBI600VE-060-80

Dimension [mm]

X series

Device type	V_{CES}	V_{GES}	I_C Cont.	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_C	$t_{d(on)}$ typ.	$t_{d(off)}$ typ.	t_f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
● 2MBI150XAA065-50	650	± 20	150	435	1.30	150	0.39	0.38	0.11	M263	180
● 2MBI200XAA065-50	650	± 20	200	545	1.30	200	0.35	0.57	0.07	M263	180
● 2MBI300XBE065-50	650	± 20	300	1160	1.30	300	0.37	0.35	0.07	M274	240
● 2MBI400XBE065-50	650	± 20	400	1740	1.30	400	0.35	0.68	0.07	M274	240
● 2MBI400XDE065-50	650	± 20	400	1945	1.30	400	0.48	0.59	0.07	M275	370
● 2MBI600XDE065-50	650	± 20	600	2795	1.30	600	0.49	0.61	0.11	M275	370
● 2MBI600XEE065-50	650	± 20	600	2795	1.30	600	0.41	0.53	0.11	M277	470

V series

Device type	V_{CES}	V_{GES}	I_C Cont.	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_C	t_{on} typ.	t_{off} typ.	t_f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
2MBI100VA-060-50	600	± 20	100	330	1.60	100	0.65	0.60	0.04	M263	180
2MBI150VA-060-50	600	± 20	150	480	1.60	150	0.65	0.60	0.04	M263	180
2MBI200VA-060-50	600	± 20	200	640	1.60	200	0.65	0.60	0.04	M263	180
2MBI300VB-060-50	600	± 20	300	1360	1.60	300	0.65	0.60	0.07	M274	240
2MBI400VB-060-50	600	± 20	400	1970	1.60	400	0.65	0.60	0.07	M274	240
2MBI400VD-060-50	600	± 20	400	1970	1.60	400	0.65	0.60	0.07	M275	370
2MBI600VD-060-50	600	± 20	600	2940	1.60	600	0.75	0.75	0.07	M275	370
2MBI600VE-060-50	600	± 20	600	2940	1.60	600	0.75	0.75	0.07	M277	470
2MBI600VE-060-80	600	± 20	600	2940	1.60	600	0.75	0.75	0.07	M277	470

Note : -80 : Pre-Applied Thermal-Interface-Material

● : New products

$V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^\circ\text{C}$, Chip

IGBT Module 2-Pack < X series / V series >

■ Standard 2-Pack 1200V class

	I_c	1200V	
		X series	V series
 M263	75A		2MBI75VA-120-50
	100A	2MBI100XAA120-50	2MBI100VA-120-50
	150A	2MBI150XAA120-50	2MBI150VA-120-50
	200A	2MBI200XAA120-50	
 M274	150A		2MBI150VB-120-50
	200A	2MBI200XBE120-50	2MBI200VB-120-50
	300A	2MBI300XBE120-50	
 M275	300A		2MBI300VD-120-50
	400A	2MBI400XDE120-50	2MBI400VD-120-50
	600A	2MBI600XDE120-50	
 M276	200A		2MBI200VH-120-50
			2MBI200VH-120-80
	300A	2MBI300XHA120-50	2MBI300VH-120-50
			2MBI300VH-120-80
	450A	2MBI450XHA120-50	2MBI450VH-120-50
			2MBI450VH-120-80
			2MBI450VH-120F-50
			2MBI450VH-120F-80
 M277	600A	2MBI600XHA120-50	
	300A		2MBI300VE-120-50
			2MBI300VE-120-80
	450A	2MBI450XEE120-50	2MBI450VE-120-50
			2MBI450VE-120-80
	600A	2MBI600XEE120-50	2MBI600VE-120-50
			2MBI600VE-120-80

Dimension [mm]

■ X series

Device type	V_{CES}	V_{GES}	I_c Cont.	P_C Watts	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_c	$t_{d(on)}$ typ.	$t_{d(off)}$ typ.	t_f typ.		
	Volts	Volts	Amps.		Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
● 2MBI100XAA120-50	1200	± 20	100	460	1.40	100	0.34	0.33	0.12	M263	180
● 2MBI150XAA120-50	1200	± 20	150	575	1.50	150	0.25	0.32	0.16	M263	180
● 2MBI200XAA120-50	1200	± 20	200	735	1.45	200	0.34	0.32	0.07	M263	180
● 2MBI200XBE120-50	1200	± 20	200	1150	1.40	200	0.32	0.36	0.13	M274	240
● 2MBI300XBE120-50	1200	± 20	300	1760	1.50	300	0.23	0.35	0.11	M274	240
● 2MBI400XDE120-50	1200	± 20	400	2975	1.40	400	0.38	0.36	0.13	M275	370
● 2MBI600XDE120-50	1200	± 20	600	3985	1.45	600	0.40	0.37	0.11	M275	370
● 2MBI300XHA120-50	1200	± 20	300	1475	1.45	300	0.40	0.34	0.15	M276	370
● 2MBI450XHA120-50	1200	± 20	450	1850	1.45	450	0.39	0.35	0.13	M276	370
● 2MBI600XHA120-50	1200	± 20	600	2340	1.45	600	0.40	0.37	0.11	M276	370
● 2MBI450XEE120-50	1200	± 20	450	2975	1.45	450	0.35	0.34	0.14	M277	470
● 2MBI600XEE120-50	1200	± 20	600	3985	1.40	600	0.42	0.40	0.12	M277	470

● : New products

 $V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip



■ V series

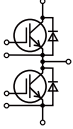
Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Cont. Amps.	Watts	typ. Volts	I_C Amps.	t_{on} typ. μ sec.	t_{off} typ. μ sec.	t_f typ. μ sec.		
2MBI75VA-120-50	1200	± 20	75	390	1.85	75	0.60	0.60	0.04	M263	180
2MBI100VA-120-50	1200	± 20	100	555	1.85	100	0.60	0.60	0.04	M263	180
2MBI150VA-120-50	1200	± 20	150	785	1.85	150	0.60	0.60	0.04	M263	180
2MBI150VB-120-50	1200	± 20	150	1070	1.85	150	0.60	0.80	0.08	M274	240
2MBI200VB-120-50	1200	± 20	200	1500	1.75	200	0.60	0.80	0.08	M274	240
2MBI300VD-120-50	1200	± 20	300	2200	1.85	300	0.60	0.80	0.08	M275	370
2MBI400VD-120-50	1200	± 20	400	3330	1.75	400	0.60	0.80	0.08	M275	370
2MBI200VH-120-50	1200	± 20	200	1110	1.75	200	0.60	0.80	0.08	M276	370
2MBI200VH-120-80	1200	± 20	200	1110	1.75	200	0.60	0.80	0.08	M276	370
2MBI300VH-120-50	1200	± 20	300	1600	1.75	300	0.60	0.80	0.08	M276	370
2MBI300VH-120-80	1200	± 20	300	1600	1.75	300	0.60	0.80	0.08	M276	370
2MBI450VH-120-50	1200	± 20	450	2400	1.80	450	0.60	0.80	0.08	M276	370
2MBI450VH-120-80	1200	± 20	450	2400	1.80	450	0.60	0.80	0.08	M276	370
2MBI450VH-120F-50	1200	± 20	450	2400	1.80	450	0.60	0.80	0.08	M276	370
2MBI450VH-120F-80	1200	± 20	450	2400	1.80	450	0.60	0.80	0.08	M276	370
2MBI300VE-120-50	1200	± 20	300	2200	1.85	300	0.60	0.80	0.08	M277	470
2MBI300VE-120-80	1200	± 20	300	2200	1.85	300	0.60	0.80	0.08	M277	470
2MBI450VE-120-50	1200	± 20	450	3350	1.80	450	0.60	0.80	0.08	M277	470
2MBI450VE-120-80	1200	± 20	450	3350	1.80	450	0.60	0.80	0.08	M277	470
2MBI600VE-120-50	1200	± 20	600	4800	1.75	600	0.60	0.80	0.08	M277	470
2MBI600VE-120-80	1200	± 20	600	4800	1.75	600	0.60	0.80	0.08	M277	470

Note : -80 : Pre-Applied Thermal-Interface-Material

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}C$, Chip

IGBT Module 2-Pack < X series / V series >

Standard 2-Pack 1700V class

	 M263		I_C	1700V	
				X series	V series
			75A	2MBI75XAA170-50	2MBI75VA-170-50
			100A	2MBI100XAA170-50	2MBI100VA-170-50
			150A	2MBI150XAA170-50	
			150A	2MBI150XHA170-50	2MBI150VH-170-50
					2MBI150VH-170-80
			200A	2MBI200XHA170-50	2MBI200VH-170-50
					2MBI200VH-170-80
			300A	2MBI300XHA170-50	2MBI300VH-170-50
					2MBI300VH-170-80
			400A	2MBI400XHA170-50	
			300A	2MBI300XEE170-50	2MBI300VE-170-50
					2MBI300VE-170-80
			400A	2MBI400XEE170-50	2MBI400VE-170-50
					2MBI400VE-170-80

Dimension [mm]

X series

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I_C	$t_{d(on)}$	$t_{d(off)}$	t_f		
	Volts	Volts	Amps.	Watts	Volts	Amps.	typ. μ sec.	typ. μ sec.	typ. μ sec.		Grams
○ 2MBI75XAA170-50	1700	± 20	75	TBD	TBD	75	TBD	TBD	TBD	M263	180
○ 2MBI100XAA170-50	1700	± 20	100	TBD	TBD	100	TBD	TBD	TBD	M263	180
○ 2MBI150XAA170-50	1700	± 20	150	TBD	TBD	150	TBD	TBD	TBD	M263	180
○ 2MBI150XHA170-50	1700	± 20	150	TBD	TBD	150	TBD	TBD	TBD	M276	370
○ 2MBI200XHA170-50	1700	± 20	200	TBD	TBD	200	TBD	TBD	TBD	M276	370
○ 2MBI300XHA170-50	1700	± 20	300	TBD	TBD	300	TBD	TBD	TBD	M276	370
○ 2MBI400XHA170-50	1700	± 20	400	TBD	TBD	400	TBD	TBD	TBD	M276	370
○ 2MBI300XEE170-50	1700	± 20	300	TBD	TBD	300	TBD	TBD	TBD	M277	470
○ 2MBI400XEE170-50	1700	± 20	400	TBD	TBD	400	TBD	TBD	TBD	M277	470

V series

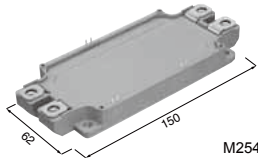
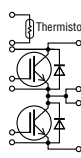
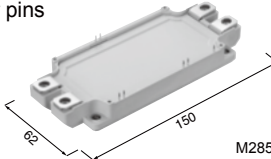
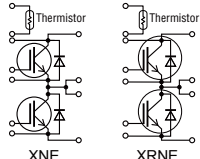
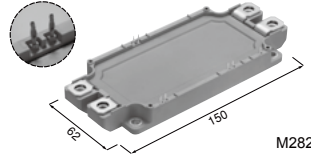
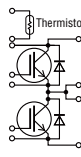
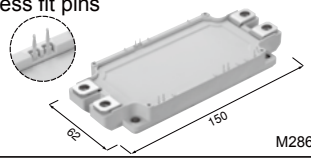
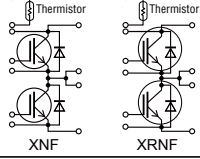
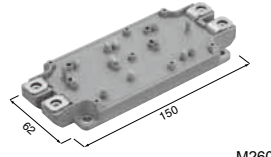
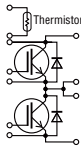
Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I_C	t_{on}	t_{off}	t_f		
	Volts	Volts	Amps.	Watts	Volts	Amps.	typ. μ sec.	typ. μ sec.	typ. μ sec.		Grams
2MBI75VA-170-50	1700	± 20	75	555	2.00	75	1.25	1.30	0.15	M263	180
2MBI100VA-170-50	1700	± 20	100	665	2.00	100	1.25	1.30	0.15	M263	180
2MBI150VH-170-50	1700	± 20	150	1110	2.00	150	0.95	1.05	0.14	M276	370
2MBI150VH-170-80	1700	± 20	150	1110	2.00	150	0.95	1.05	0.14	M276	370
2MBI200VH-170-50	1700	± 20	200	1250	2.00	200	1.15	1.05	0.14	M276	370
2MBI200VH-170-80	1700	± 20	200	1250	2.00	200	1.15	1.05	0.14	M276	370
2MBI300VH-170-50	1700	± 20	300	1805	2.00	300	1.15	1.05	0.14	M276	370
2MBI300VH-170-80	1700	± 20	300	1805	2.00	300	1.15	1.05	0.14	M276	370
2MBI300VE-170-50	1700	± 20	300	2830	2.00	300	1.15	1.05	0.14	M277	470
2MBI300VE-170-80	1700	± 20	300	2830	2.00	300	1.15	1.05	0.14	M277	470
2MBI400VE-170-50	1700	± 20	400	3840	2.00	400	1.15	1.05	0.14	M277	470
2MBI400VE-170-80	1700	± 20	400	3840	2.00	400	1.15	1.05	0.14	M277	470

Note : -80 : Pre-Applied Thermal-Interface-Material
○ : Under development

 $V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^\circ\text{C}$, Chip

IGBT Module 2-Pack < X series / V series >

Standard 2-Pack 1200V class

Solder pins		1200V			
		I_c	X series	V series	V series With SIN-substrate
 M254		225A	2MBI225XNA120-50	2MBI225VN-120-50 2MBI225VN-120-80	2MBI225VN-120S-50
		300A	2MBI300XNA120-50	2MBI300VN-120-50 2MBI300VN-120-80	2MBI300VN-120S-50 2MBI300VN-120S-80
		450A	2MBI450XNA120-50	2MBI450VN-120-50 2MBI450VN-120-80	2MBI450VN-120S-50 2MBI450VN-120S-80
		600A	2MBI600XNG120-50		2MBI600VN-120-50 2MBI600VN-120-80
 M285 ※2	 XNE XRNE	600A	2MBI600XNE120-50		
		800A	2MBI800XNE120-50		
		1000A	2MBI1000XRNE120-50		
 M282		225A	2MBI225XNB120-50	2MBI225VX-120-50 2MBI225VX-120-80	
		300A	2MBI300XNB120-50	2MBI300VX-120-50 2MBI300VX-120-80	
		450A	2MBI450XNB120-50	2MBI450VX-120-50 2MBI450VX-120-80	
		600A	2MBI600XNH120-50		2MBI600VX-120-50 2MBI600VX-120-80
 M286 ※2	 XNF XRNF	600A	2MBI600XNF120-50		
		800A	2MBI800XNF120-50		
		1000A	2MBI1000XRNF120-50		
 M260		225A		2MBI225VJ-120-50 2MBI225VJ-120-80	
		300A		2MBI300VJ-120-50 2MBI300VJ-120-80	
		450A		2MBI450VJ-120-50 2MBI450VJ-120-80	
		600A			2MBI600VJ-120-50 2MBI600VJ-120-80

Dimension [mm]

X series

Device type	V_{CES} Volts	V_{GES} Volts	I_c Cont. Amps.	P_C Watts	$V_{CE(sat)}$ ($V_{GE}=15V$) typ.		Switching time			Package	Net mass Grams
					Volts	I_c Amps.	$t_{d(on)}$ typ. μ sec.	$t_{d(off)}$ typ. μ sec.	t_f typ. μ sec.		
● 2MBI225XNA120-50	1200	±20	225	1030	1.45	225	0.23	0.33	0.05	M254	350
● 2MBI300XNA120-50	1200	±20	300	1325	1.40	300	0.26	0.36	0.05	M254	350
● 2MBI450XNA120-50	1200	±20	450	1760	1.40	450	0.37	0.40	0.07	M254	350
● 2MBI600XNG120-50*1	1200	±20	600	3125	1.45	600	0.42	0.42	0.07	M254	350
● 2MBI600XNE120-50*1	1200	±20	600	3125	1.45	600	0.42	0.42	0.07	M285*2	350
● 2MBI800XNE120-50*1	1200	±20	800	4050	1.45	800	0.47	0.45	0.08	M285*2	350
○ 2MBI1000XRNE120-50*1	1200	±20	1000	TBD	TBD	1000	TBD	TBD	TBD	M285*2	350
● 2MBI225XNB120-50	1200	±20	225	1030	1.45	225	0.23	0.33	0.05	M282	350
● 2MBI300XNB120-50	1200	±20	300	1325	1.40	300	0.26	0.36	0.05	M282	350
● 2MBI450XNB120-50	1200	±20	450	1760	1.40	450	0.37	0.40	0.07	M282	350
● 2MBI600XNH120-50*1	1200	±20	600	3125	1.45	600	0.42	0.42	0.07	M282	350
● 2MBI600XNF120-50*1	1200	±20	600	3125	1.45	600	0.42	0.42	0.07	M286*2	350
● 2MBI800XNF120-50*1	1200	±20	800	4050	1.45	800	0.47	0.45	0.08	M286*2	350
○ 2MBI1000XRNF120-50*1	1200	±20	1000	TBD	TBD	1000	TBD	TBD	TBD	M286*2	350

*1: The products with 'XNE, XNF, XNG, XNH' : Low Thermal Impedance Version

*2: Low thermal impedance and high tracking capability type

● : New products ○ : Under development

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}C$, Chip

■ V series

Device type	V_{CES}	V_{GES}	I_C Cont.	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_C	t_{on} typ.	t_{off} typ.	t_f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	$\mu sec.$	$\mu sec.$	$\mu sec.$		Grams
2MBI225VN-120-50	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M254	350
2MBI225VN-120-80	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M254	350
2MBI225VN-120S-50*3	1200	± 20	225	1360	1.85	225	0.40	0.55	0.05	M254	350
2MBI300VN-120-50	1200	± 20	300	1595	1.75	300	0.55	1.05	0.11	M254	350
2MBI300VN-120-80	1200	± 20	300	1595	1.75	300	0.55	1.05	0.11	M254	350
2MBI300VN-120S-50*3	1200	± 20	300	2000	1.75	300	0.45	0.65	0.06	M254	350
2MBI300VN-120S-80*3	1200	± 20	300	2000	1.75	300	0.45	0.65	0.06	M254	350
2MBI450VN-120-50	1200	± 20	450	2270	1.75	450	0.55	1.05	0.11	M254	350
2MBI450VN-120-80	1200	± 20	450	2270	1.75	450	0.55	1.05	0.11	M254	350
2MBI450VN-120S-50*3	1200	± 20	450	3000	1.75	450	0.47	0.70	0.07	M254	350
2MBI450VN-120S-80*3	1200	± 20	450	3000	1.75	450	0.47	0.70	0.07	M254	350
2MBI600VN-120-50	1200	± 20	600	3750	1.85	600	0.55	1.05	0.11	M254	350
2MBI600VN-120-80	1200	± 20	600	3750	1.85	600	0.55	1.05	0.11	M254	350
2MBI225VX-120-50	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M282	350
2MBI225VX-120-80	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M282	350
2MBI300VX-120-50	1200	± 20	300	1595	1.75	300	0.55	1.05	0.11	M282	350
2MBI300VX-120-80	1200	± 20	300	1595	1.75	300	0.55	1.05	0.11	M282	350
2MBI450VX-120-50	1200	± 20	450	2270	1.75	450	0.55	1.05	0.11	M282	350
2MBI450VX-120-80	1200	± 20	450	1595	1.75	450	0.55	1.05	0.11	M282	350
2MBI600VX-120-50	1200	± 20	600	3750	1.85	600	0.55	1.05	0.11	M282	350
2MBI600VX-120-80	1200	± 20	600	3750	1.85	600	0.55	1.05	0.11	M282	350
2MBI225VJ-120-50	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M260	360
2MBI225VJ-120-80	1200	± 20	225	1070	1.85	225	0.55	1.05	0.11	M260	360
2MBI300VJ-120-50	1200	± 20	300	1595	1.75	300	0.55	1.05	0.11	M260	360
2MBI300VJ-120-80	1200	± 20	300	1595	1.75	300	0.55	1.05	0.11	M260	360
2MBI450VJ-120-50	1200	± 20	450	2270	1.75	450	0.55	1.05	0.11	M260	360
2MBI450VJ-120-80	1200	± 20	450	2270	1.75	450	0.55	1.05	0.11	M260	360
2MBI600VJ-120-50	1200	± 20	600	3750	1.85	600	0.55	1.05	0.11	M260	360
2MBI600VJ-120-80	1200	± 20	600	3750	1.85	600	0.55	1.05	0.11	M260	360

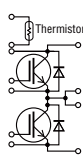
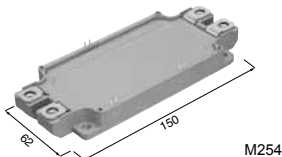
*3: The products with 'S' : Low Thermal Impedance Version
 Note: -80 : Pre-Applied Thermal-Interface-Material

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}C$, Chip

IGBT Module 2-Pack < X series / V series >

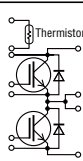
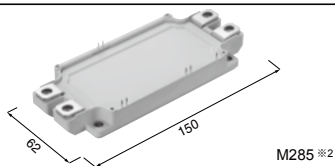
■ Standard 2-Pack 1700V class

Solder pins

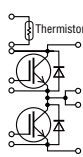
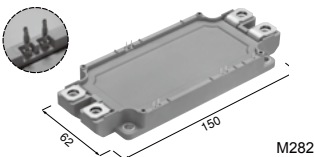


M254

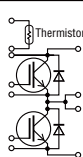
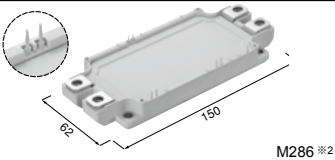
Solder pins



M285 ※2

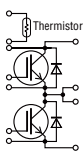
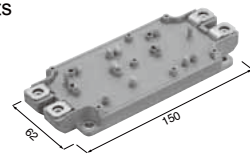
Press fit pins

M282

Press fit pins

M286 ※2

Spring contacts



M260

I _c	1700V		
	X series	V series	V series With SIN-substrate
225A	2MBI225XNA170-50		
300A	2MBI300XNA170-50	2MBI300VN-170-50	
		2MBI300VN-170-80	
450A	2MBI450XNA170-50	2MBI450VN-170-50	
		2MBI450VN-170-80	
550A			2MBI550VN-170-50
			2MBI550VN-170-80
600A	2MBI600XNG170-50		
600A	2MBI600XNE170-50		
225A	2MBI225XNB170-50	2MBI225VX-170-50	
		2MBI225VX-170-80	
300A	2MBI300XNB170-50	2MBI300VX-170-50	
		2MBI300VX-170-80	
450A	2MBI450XNB170-50	2MBI450VX-170-50	
		2MBI450VX-170-80	
550A			2MBI550VX-170-50
			2MBI550VX-170-80
600A	2MBI600XNH170-50		
600A	2MBI600XNF170-50		
550A			2MBI550VJ-170-50
			2MBI550VJ-170-80

Dimension [mm]

■ X series

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I_C	$t_{d(on)}$	$t_{d(off)}$	t_f		
					Volts	Amps.	typ. μ sec.	typ. μ sec.	typ. μ sec.		
○ 2MBI225XNA170-50	1700	±20	225	1470	1.60	225	0.35	0.46	0.13	M254	350
○ 2MBI300XNA170-50	1700	±20	300	1720	1.60	300	0.39	0.49	0.13	M254	350
○ 2MBI450XNA170-50	1700	±20	450	2340	1.60	450	0.41	0.52	0.14	M254	350
○ 2MBI600XNG170-50*1	1700	±20	600	3845	1.70	600	0.49	0.58	0.15	M254	350
○ 2MBI600XNE170-50*1	1700	±20	600	3845	1.70	600	0.49	0.58	0.15	M285*2	350
○ 2MBI225XNB170-50	1700	±20	225	1470	1.60	225	0.35	0.46	0.13	M282	350
○ 2MBI300XNB170-50	1700	±20	300	1720	1.60	300	0.39	0.49	0.13	M282	350
○ 2MBI450XNB170-50	1700	±20	450	2340	1.60	450	0.41	0.52	0.14	M282	350
○ 2MBI600XNH170-50*1	1700	±20	600	3845	1.65	600	0.49	0.58	0.15	M282	350
○ 2MBI600XNF170-50*1	1700	±20	600	3845	1.65	600	0.49	0.58	0.15	M286*2	350

*1: The products with 'XNE, XNF, XNG, XNH' : Low Thermal Impedance Version

*2: Low thermal impedance and high tracking capability type

○: Under development

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}\text{C}$, Chip

■ V series

Device type	V_{CES}	V_{GES}	I_C Cont.	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_C	t_{on} typ.	t_{off} typ.	t_f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	$\mu sec.$	$\mu sec.$	$\mu sec.$		Grams
2MBI300VN-170-50	1700	± 20	300	1665	2.00	300	0.90	1.30	0.10	M254	350
2MBI300VN-170-80	1700	± 20	300	1665	2.00	300	0.90	1.30	0.10	M254	350
2MBI450VN-170-50	1700	± 20	450	2500	2.00	450	0.90	1.30	0.10	M254	350
2MBI450VN-170-80	1700	± 20	450	2500	2.00	450	0.90	1.30	0.10	M254	350
2MBI550VN-170-50* ³	1700	± 20	550	3750	2.15	550	1.00	1.30	0.10	M254	350
2MBI550VN-170-80* ³	1700	± 20	550	3750	2.15	550	1.00	1.30	0.10	M254	350
2MBI225VX-170-50	1700	± 20	225	1500	2.00	225	0.90	1.05	0.08	M282	350
2MBI225VX-170-80	1700	± 20	225	1500	2.00	225	0.90	1.05	0.08	M282	350
2MBI300VX-170-50	1700	± 20	300	1665	2.00	300	0.90	1.30	0.10	M282	350
2MBI300VX-170-80	1700	± 20	300	1665	2.00	300	0.90	1.30	0.10	M282	350
2MBI450VX-170-50	1700	± 20	450	2500	2.00	450	0.90	1.30	0.10	M282	350
2MBI450VX-170-80	1700	± 20	450	2500	2.00	450	0.90	1.30	0.10	M282	350
2MBI550VX-170-50* ³	1700	± 20	550	3750	2.15	550	1.00	1.30	0.10	M282	350
2MBI550VX-170-80* ³	1700	± 20	550	3750	2.15	550	1.00	1.30	0.10	M282	350
2MBI550VJ-170-50* ³	1700	± 20	550	3750	2.15	550	1.00	1.30	0.10	M260	360
2MBI550VJ-170-80* ³	1700	± 20	550	3750	2.15	550	1.00	1.30	0.10	M260	360

*3: 550A Low Thermal Impedance Version

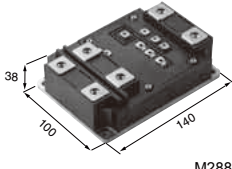
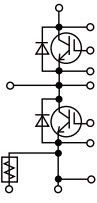
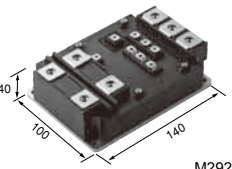
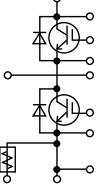
Note: -80 : Pre-Applied Thermal-Interface-Material

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}C$, Chip



IGBT Module 2-Pack < X series >

High Power Module HPnC 1700V, 3300V class

	I_C	1700V	3300V
		X series	X series
 M288 	450A		2MBI450XUF330-50
	1000A	2MBI1000XUF170-50	
	1200A	2MBI1200XUF170-50	
 M292 	450A		2MBI450XVF330-50
	1000A	2MBI1000XVF170-50	
	1200A	2MBI1200XVF170-50	

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I_C	$t_{d(on)}$	$t_{d(off)}$	t_f		
					Volts	Amps.	typ.	typ.	typ.		Grams
							$\mu sec.$	$\mu sec.$	$\mu sec.$		
○ 2MBI1200XUF170-50	1700	± 20	1200	TBD	1.7	1200	TBD	TBD	TBD	M288	670
○ 2MBI1200XVF170-50	1700	± 20	1200	TBD	1.7	1200	TBD	TBD	TBD	M292	720
○ 2MBI1000XUF170-50	1700	± 20	1000	4340	1.7	1000	0.75	1.3	0.6	M288	670
○ 2MBI1000XVF170-50	1700	± 20	1000	4340	1.7	1000	0.75	1.3	0.6	M292	720
○ 2MBI450XUF330-50	3300	± 20	450	TBD	TBD	450	TBD	TBD	TBD	M288	670
○ 2MBI450XVF330-50	3300	± 20	450	TBD	TBD	450	TBD	TBD	TBD	M292	720

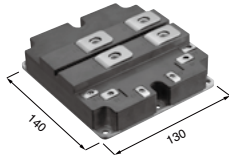
○ : Under development

Note: M288 and M292 are different in the dimensions of the output terminal.

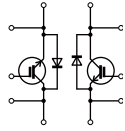
$V_{CE(sat)}$, V_{FM} : at $T_{vj}=25^\circ C$, Chip

IGBT Module 2-Pack < V series >

High Power Module 1200V, 1700V class



M256, M278



I_C	1200V	1700V	
	V series	V series	
	Cu-baseplate	Cu-baseplate	AlSiC-baseplate
600A	2MBI600VG-120P	2MBI600VG-170E	2MBI600VT-170E
800A	2MBI800VG-120P	2MBI800VG-170E	2MBI800VT-170E
1200A	2MBI1200VG-120P	2MBI1200VG-170E	2MBI1200VT-170E

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps. Cont.	Watts	typ. V_{CE}	typ. I_C	t_{on} typ. $\mu sec.$	t_{off} typ. $\mu sec.$	t_f typ. $\mu sec.$		
2MBI600VG-120P	1200	± 20	600	3940	1.70	600	1.86	1.25	0.12	M256	1500
2MBI800VG-120P	1200	± 20	800	5170	1.70	800	1.97	1.33	0.15	M256	1500
2MBI1200VG-120P	1200	± 20	1200	6810	1.70	1200	2.55	1.67	0.16	M256	1500
2MBI600VG-170E	1700	± 20	600	4410	2.00	600	2.28	2.07	0.58	M256	1500
2MBI800VG-170E	1700	± 20	800	5760	2.00	800	2.41	2.13	0.55	M256	1500
2MBI1200VG-170E	1700	± 20	1200	7500	2.00	1200	2.76	2.29	0.33	M256	1500
2MBI600VT-170E	1700	± 20	600	4280	2.00	600	1.51	2.07	0.58	M278	900
2MBI800VT-170E	1700	± 20	800	5370	2.00	800	2.00	2.13	0.55	M278	900
2MBI1200VT-170E	1700	± 20	1200	7040	2.00	1200	2.14	2.29	0.33	M278	900

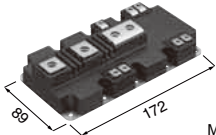
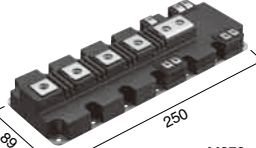
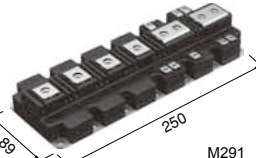
Note: M256: Cu-baseplate M278: AlSiC-baseplate

 $V_{CE(sat)}$: at $T_{vj}=25^\circ C$, Chip Switching time: at $T_{vj}=125^\circ C$



IGBT Module 2-Pack < X series / V series >

PrimePACK™ 1200V class

	I _C	1200V			
		X series		V series	
		Low switching loss	Soft turn off	Low switching loss	Soft turn off
 M271	600A			2MBI600VXA-120E-50	
				2MBI600VXA-120E-80	
				2MBI600VXA-120E-54	
	900A	2MBI900XXA120E-50	2MBI900XXA120P-50	2MBI900VXA-120E-50	2MBI900VXA-120P-50
 M272				2MBI900VXA-120E-80	2MBI900VXA-120P-80
				2MBI900VXA-120E-54	2MBI900VXA-120P-54
	1200A	2MBI1200XXE120E-50	2MBI1200XXE120P-50		
	1400A		2MBI1400XVB120P-50	2MBI1400VXB-120E-50	2MBI1400VXB-120P-50
 M291				2MBI1400VXB-120E-80	2MBI1400VXB-120P-80
				2MBI1400VXB-120E-54	2MBI1400VXB-120P-54
	1800A		2MBI1800XXF120P-50		
	2400A		2MBI2400XRXF120-50		

Dimension [mm]

X series

Device type	V _{CES}	V _{GES}	I _C Cont.	P _C	V _{CE(sat)} (V _{GE} =15V)		Switching time			Package	Net mass
					typ.	I _C	t _{d(on)} typ.	t _{d(off)} typ.	t _f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
● 2MBI900XXA120E-50	1200	±20	900	TBD	TBD	900	TBD	TBD	TBD	M271	850
● 2MBI900XXA120P-50	1200	±20	900	TBD	TBD	900	TBD	TBD	TBD	M271	850
● 2MBI1200XXE120E-50	1200	±20	1200	TBD	TBD	1200	TBD	TBD	TBD	M271	850
● 2MBI1200XXE120P-50	1200	±20	1200	TBD	TBD	1200	TBD	TBD	TBD	M271	850
● 2MBI1400XVB120P-50	1200	±20	1400	TBD	TBD	1400	TBD	TBD	TBD	M272	1250
● 2MBI1800XXF120P-50	1200	±20	1800	TBD	TBD	1800	TBD	TBD	TBD	M272	1250
○ 2MBI2400XRXF120-50	1200	±20	2400	TBD	TBD	2400	TBD	TBD	TBD	M291	TBD

V series

Device type	V _{CES}	V _{GES}	I _C Cont.	P _C	V _{CE(sat)} (V _{GE} =15V)		Switching time			Package	Net mass
					typ.	I _C	t _{on} typ.	t _{off} typ.	t _f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
2MBI600VXA-120E-50	1200	±20	600	3350	1.75	600	1.00	1.20	0.15	M271	850
2MBI600VXA-120E-80	1200	±20	600	3350	1.75	600	1.00	1.20	0.15	M271	850
2MBI600VXA-120E-54	1200	±20	600	3350	1.75	600	1.00	1.20	0.15	M271	850
2MBI900VXA-120E-50	1200	±20	900	5100	1.75	900	1.00	1.20	0.15	M271	850
2MBI900VXA-120E-80	1200	±20	900	5100	1.75	900	1.00	1.20	0.15	M271	850
2MBI900VXA-120E-54	1200	±20	900	5100	1.75	900	1.00	1.20	0.15	M271	850
2MBI1400VXB-120E-50	1200	±20	1400	7650	1.75	1400	1.00	1.20	0.15	M272	1250
2MBI1400VXB-120E-80	1200	±20	1400	7650	1.75	1400	1.00	1.20	0.15	M272	1250
2MBI1400VXB-120E-54	1200	±20	1400	7650	1.75	1400	1.00	1.20	0.15	M272	1250
2MBI900VXA-120P-50	1200	±20	900	5100	1.65	900	1.00	1.20	0.15	M271	850
2MBI900VXA-120P-80	1200	±20	900	5100	1.65	900	1.00	1.20	0.15	M271	850
2MBI900VXA-120P-54	1200	±20	900	5100	1.65	900	1.00	1.20	0.15	M271	850
2MBI1400VXB-120P-50	1200	±20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250
2MBI1400VXB-120P-80	1200	±20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250
2MBI1400VXB-120P-54	1200	±20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250

Note 1: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

Note 2: The products with suffix "-54" on this page are labeled to specify the rank of V_{CE(sat)} and V_f.

Note 3: "-80": Pre-Applied Thermal-Interface-Material for "-54"

●: New products ○: Under development

V_{CE(sat)}: at T_V=25°C, Chip

IGBT Module 2-Pack < X series / V series >

PrimePACK™ 1700V class

	I _C	1700V		
		X series	V series	
		Low switching loss	Low switching loss	Soft turn off
 M271	650A	2MBI650XXA170-50	2MBI650VXA-170E-50	
			2MBI650VXA-170E-80	
			2MBI650VXA-170E-54	
			2MBI650VXA-170EA-50	
			2MBI650VXA-170EA-80	
			2MBI650VXA-170EA-54	
		2MBI1200XXE170-50		
 M272	1000A	2MBI1000XXB170-50	2MBI1000VXB-170E-50	
			2MBI1000VXB-170E-80	
			2MBI1000VXB-170E-54	
			2MBI1000VXB-170EA-50	
			2MBI1000VXB-170EA-80	
			2MBI1000VXB-170EA-54	
		2MBI1400XXB170-50	2MBI1400VXB-170E-50	2MBI1400VXB-170P-50
 M291	1400A		2MBI1400VXB-170E-80	2MBI1400VXB-170P-80
			2MBI1400VXB-170E-54	2MBI1400VXB-170P-54
	1800A	2MBI1800XXF170-50		
	1800A	2MBI1800XXG170-50		

Dimension [mm]

X series

Device type	V _{CE(S)}	V _{GE(S)}	I _C	P _C	V _{CE(sat)} (V _{GE} =15V)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I _C	t _{d(on)}	t _{d(off)}	t _f		
					Volts	Amps.	μ sec.	μ sec.	μ sec.		
● 2MBI650XXA170-50	1700	±20	650	TBD	TBD	650	TBD	TBD	TBD	M271	850
● 2MBI1200XXE170-50	1700	±20	1200	TBD	TBD	1200	TBD	TBD	TBD	M271	850
● 2MBI1000XXB170-50	1700	±20	1000	TBD	TBD	1000	TBD	TBD	TBD	M272	1250
● 2MBI1400XXB170-50	1700	±20	1400	TBD	TBD	1400	TBD	TBD	TBD	M272	1250
● 2MBI1800XXF170-50	1700	±20	1800	TBD	TBD	1800	TBD	TBD	TBD	M272	1250
● 2MBI1800XXG170-50	1700	±20	1800	TBD	TBD	1800	TBD	TBD	TBD	M291	1350

Note 1: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

Note 2: The products with suffix '-54' on this page are labeled to specify the rank of V_{CE(sat)} and V_F.

Note 3: The products with 'EA' on this page have optimized FWD for the application causing heavy load through FWD.

The optimized FWD reduces V_F and thermal resistance.

Note 4: "-80": Pre-Applied Thermal-Interface-Material for "-54"

●: New products

V_{CE(sat)}: at T_{VJ}=25°C, Chip



■ V series

Device type	V_{CES}	V_{GES}	I_C Cont.	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_C	t_{on} typ.	t_{off} typ.	t_f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
2MBI650VXA-170E-50	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
2MBI650VXA-170E-80	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
2MBI650VXA-170E-54	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
2MBI650VXA-170EA-50	1700	± 20	650	4150	2.00	650	1.70	1.60	0.11	M271	850
2MBI650VXA-170EA-80	1700	± 20	650	4150	2.00	650	1.70	1.60	0.11	M271	850
2MBI650VXA-170EA-54	1700	± 20	650	4150	2.00	650	1.70	1.60	0.11	M271	850
2MBI1000VXB-170E-50	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
2MBI1000VXB-170E-80	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
2MBI1000VXB-170E-54	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
2MBI1000VXB-170EA-50	1700	± 20	1000	6250	2.00	1000	1.70	1.60	0.11	M272	1250
2MBI1000VXB-170EA-80	1700	± 20	1000	6250	2.00	1000	1.70	1.60	0.11	M272	1250
2MBI1000VXB-170EA-54	1700	± 20	1000	6250	2.00	1000	1.70	1.60	0.11	M272	1250
2MBI1400VXB-170E-50	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250
2MBI1400VXB-170E-80	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250
2MBI1400VXB-170E-54	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250
2MBI1400VXB-170P-50	1700	± 20	1400	8820	1.90	1400	1.35	1.80	0.20	M272	1250
2MBI1400VXB-170P-80	1700	± 20	1400	8820	1.90	1400	1.35	1.80	0.20	M272	1250
2MBI1400VXB-170P-54	1700	± 20	1400	8820	1.90	1400	1.35	1.80	0.20	M272	1250

Note 1: PrimePACK™ is registered trademark of Infineon Technologies AG, Germany.

$V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip

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

Note 3: The products with 'EA' on this page have optimized FWD for the application causing heavy load through FWD.

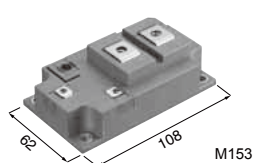
The optimized FWD reduces V_f and thermal resistance.

Note 4: "-80": Pre-Applied Thermal-Interface-Material for "-54"

○ : Under development

IGBT Module 1-Pack < V series >

■ Standard 1-Pack 1200V, 1700V class



I_C	1200V		1700V
	V series		V series
	Aluminium oxide DCB	Aluminium nitride DCB	Aluminium oxide DCB
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		

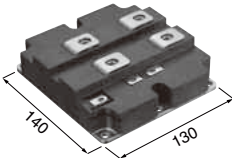
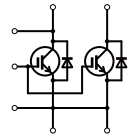
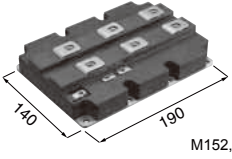
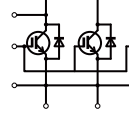
Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C Cont.	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
					typ.	I_C	t_{on} typ.	t_{off} typ.	t_f typ.		
	Volts	Volts	Amps.	Watts	Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
1MBI400V-120-50	1200	± 20	400	2410	1.75	400	0.60	1.10	0.14	M153	380
1MBI600V-120-50	1200	± 20	600	3000	1.75	600	0.70	0.90	0.10	M153	380
1MBI900V-120-50	1200	± 20	900	4280	1.90	900	0.70	0.85	0.10	M153	380
1MBI400VF-120-50	1200	± 20	400	3330	1.75	400	0.60	1.10	0.14	M153	380
1MBI600VF-120-50	1200	± 20	600	4680	1.75	600	0.70	0.90	0.10	M153	380
1MBI300V-170-50	1700	± 20	300	1705	2.00	300	0.70	0.80	0.14	M153	380
1MBI400V-170-50	1700	± 20	400	2500	2.00	400	0.70	0.80	0.14	M153	380
1MBI600V-170-50	1700	± 20	600	3610	2.00	600	0.70	0.80	0.14	M153	380

$V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip

IGBT Module 1-Pack < V series / U series >

■ High Power Module 1200V, 1700V, 3300V class

 M151, M155		I_C	1200V	1700V		3300V
			V series	V series		U series
			Cu-baseplate	Cu-baseplate	AlSiC-baseplate	AlSiC-baseplate
 M152, M156		800A				1MBI800UG-330
		1000A				1MBI1000UG-330
						1MBI1000UG-330B
		1200A	1MBI1200VC-120P	1MBI1200VC-170E	1MBI1200VR-170E	
		1600A	1MBI1600VC-120P	1MBI1600VC-170E	1MBI1600VR-170E	
		2400A	1MBI2400VC-120P	1MBI2400VC-170E	1MBI2400VR-170E	
		1200A				1MBI1200UE-330
		1500A				1MBI1500UE-330
						1MBI1500UE-330B
		2400A	1MBI2400VD-120P	1MBI2400VD-170E	1MBI2400VS-170E	
		3600A	1MBI3600VD-120P	1MBI3600VD-170E	1MBI3600VS-170E	

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps. Cont.	Watts	typ. $V_{CE(sat)}$	typ. I_C	t_{on} typ.	t_{off} typ.	t_f typ.		
					Volts	Amps.	$\mu sec.$	$\mu sec.$	$\mu sec.$		Grams
1MBI1200VC-120P	1200	± 20	1200	7890	1.70	1200	1.73	1.52	0.15	M151	1500
1MBI1600VC-120P	1200	± 20	1600	10340	1.70	1600	2.22	1.47	0.19	M151	1500
1MBI2400VC-120P	1200	± 20	2400	13630	1.70	2400	3.15	1.93	0.24	M151	1500
1MBI2400VD-120P	1200	± 20	2400	15780	1.70	2400	2.38	1.64	0.21	M152	2300
1MBI3600VD-120P	1200	± 20	3600	20540	1.70	3600	2.98	2.15	0.27	M152	2300
1MBI1200VC-170E	1700	± 20	1200	8820	2.00	1200	2.18	2.20	0.45	M151	1500
1MBI1600VC-170E	1700	± 20	1600	11700	2.00	1600	2.28	2.17	0.40	M151	1500
1MBI2400VC-170E	1700	± 20	2400	15000	2.00	2400	2.63	2.41	0.38	M151	1500
1MBI2400VD-170E	1700	± 20	2400	17640	2.00	2400	2.30	2.22	0.43	M152	2300
1MBI3600VD-170E	1700	± 20	3600	22380	2.00	3600	2.27	2.67	0.31	M152	2300
1MBI1200VR-170E	1700	± 20	1200	8570	2.00	1200	1.51	2.20	0.45	M155	900
1MBI1600VR-170E	1700	± 20	1600	10710	2.00	1600	1.83	2.17	0.40	M155	900
1MBI2400VR-170E	1700	± 20	2400	14010	2.00	2400	2.51	2.41	0.38	M155	900
1MBI2400VS-170E	1700	± 20	2400	16120	2.00	2400	2.09	2.22	0.43	M156	1300
1MBI3600VS-170E	1700	± 20	3600	21120	2.00	3600	2.70	2.66	0.32	M156	1300
1MBI800UG-330	3300	± 20	800	9600	2.28	800	3.40	2.40	0.40	M155	900
1MBI1000UG-330	3300	± 20	1000	10400	2.46	1000	2.50	2.00	0.50	M155	900
1MBI1000UG-330B	3300	± 20	1000	10400	2.75	1000	3.10	2.35	0.45	M155	900
1MBI1200UE-330	3300	± 20	1200	14700	2.28	1200	3.40	2.40	0.40	M156	1300
1MBI1500UE-330	3300	± 20	1500	15600	2.46	1500	3.10	2.60	0.50	M156	1300
1MBI1500UE-330B	3300	± 20	1500	15600	2.75	1500	3.10	2.35	0.45	M156	1300

Note1: M151, M152: Cu-baseplate M155, M156: AlSiC-baseplate

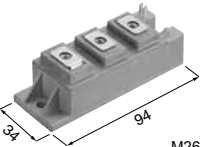
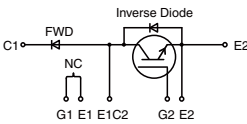
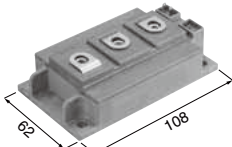
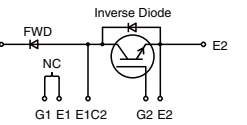
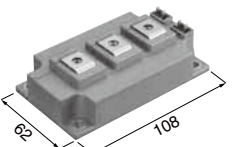
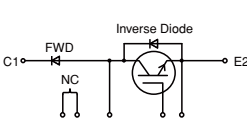
 $V_{CE(sat)}$: at $T_{vj}=25^\circ C$, Chip Switching time: at $T_{vj}=125^\circ C$, at $T_{vj}=150^\circ C$ (3300V-1000A, 1500A only)

Note2: -330B type: Low switching losses



IGBT Module Chopper < V series / U series >

Chopper 600V, 1200V class

	I_C	600V		1200V	
		U series	V series	U series	V series
 M262 	50A			1MBI50U4F-120L-50	
	75A			1MBI75U4F-120L-50	
	100A			1MBI100U4F-120L-50	
	150A				1MBI150VA-120L-50
	200A				1MBI200VA-120L-50
	200A			1MBI200U4H-120L-50	
 M259 	300A	1MBI300U2H-060L-50			
 M283 	400A		1MBI400VH-060L-50		

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I_C	t_{on}	t_{off}	t_f		
					Volts	Amps.	μ sec.	μ sec.	μ sec.		Grams
1MBI300U2H-060L-50	600	± 20	300	1000	2.45	300	0.40	0.48	0.07	M259	360
1MBI400VH-060L-50	600	± 20	400	1250	1.60	400	0.73	0.61	0.07	M283	370
1MBI50U4F-120L-50	1200	± 20	50	400	2.15	50	0.32	0.41	0.07	M262	180
1MBI75U4F-120L-50	1200	± 20	75	400	2.20	75	0.32	0.41	0.07	M262	180
1MBI100U4F-120L-50	1200	± 20	100	540	2.20	100	0.32	0.41	0.07	M262	180
1MBI200U4H-120L-50	1200	± 20	200	1040	2.25	200	0.32	0.41	0.07	M259	360
1MBI150VA-120L-50	1200	± 20	150	785	1.85	150	0.60	0.60	0.04	M262	180
1MBI200VA-120L-50	1200	± 20	200	880	1.80	200	0.60	0.60	0.04	M262	180

$V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip

IGBT Module Chopper < V series >

PrimePACK™ 1200V, 1700V class

Chopper			I_C	1200V		1700V	
				V series		V series	
				Low side configuration	High side configuration	Low side configuration	High side configuration
Chopper			650A			1MBI650VXA-170EL-50	1MBI650VXA-170EH-50
						1MBI650VXA-170EL-80	1MBI650VXA-170EH-80
						1MBI650VXA-170EL-54	1MBI650VXA-170EH-54
Chopper			1000A			1MBI1000VXB-170EL-50	1MBI1000VXB-170EH-50
						1MBI1000VXB-170EL-80	1MBI1000VXB-170EH-80
						1MBI1000VXB-170EL-54	1MBI1000VXB-170EH-54
			1400A	1MBI1400VXB-120PL-54	1MBI1400VXB-120PH-54	1MBI1400VXB-170PL-50	1MBI1400VXB-170PH-50
				1MBI1400VXB-120PL-80	1MBI1400VXB-120PH-80	1MBI1400VXB-170PL-54	1MBI1400VXB-170PH-54

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
			Cont.		typ.	I_C	t_{on}	t_{off}	t_f		
	Volts	Volts	Amps.	Watts	Volts	Amps.	typ. $\mu sec.$	typ. $\mu sec.$	typ. $\mu sec.$		
1MBI1400VXB-120PL-54	1200	± 20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250
1MBI1400VXB-120PL-80	1200	± 20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250
1MBI1400VXB-120PH-54	1200	± 20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250
1MBI1400VXB-120PH-80	1200	± 20	1400	7650	1.65	1400	1.00	1.20	0.15	M272	1250
1MBI650VXA-170EL-50	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
1MBI650VXA-170EL-80	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
1MBI650VXA-170EL-54	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
1MBI1000VXB-170EL-50	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
1MBI1000VXB-170EL-80	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
1MBI1000VXB-170EL-54	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
1MBI1400VXB-170PL-50	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250
1MBI1400VXB-170PL-54	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250
1MBI650VXA-170EH-50	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
1MBI650VXA-170EH-80	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
1MBI650VXA-170EH-54	1700	± 20	650	4150	2.00	650	1.25	1.55	0.15	M271	850
1MBI1000VXB-170EH-50	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
1MBI1000VXB-170EH-80	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
1MBI1000VXB-170EH-54	1700	± 20	1000	6250	2.00	1000	1.25	1.55	0.15	M272	1250
1MBI1400VXB-170PH-50	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250
1MBI1400VXB-170PH-54	1700	± 20	1400	8820	2.15	1400	1.25	1.55	0.15	M272	1250

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

Note2: The products with suffix '-54' on this page are labeled to specify the rank of $V_{CE(sat)}$ and V_f .

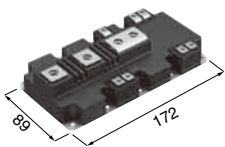
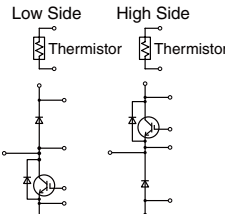
Note3: "-80": Pre-Applied Thermal-Interface-Material for "-54"

 $V_{CE(sat)}$: at $T_{vj}=25^\circ C$, Chip



IGBT Module Chopper < V series >

PrimePACK™ 1200V class

Chopper		1200V		
		V series		
				
		Boost (Low side) Chopper	Buck (High side) Chopper	
		900A	1MBI900VXA-120PD-50	1MBI900VXA-120PC-50
			1MBI900VXA-120PD-54	1MBI900VXA-120PC-54
	1MBI900VXA-120PD-80	1MBI900VXA-120PC-80		

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	typ.	I_C	t_{on}	t_{off}	t_f		
					Volts	Amps.	typ.	typ.	typ.		Grams
							$\mu sec.$	$\mu sec.$	$\mu sec.$		
1MBI900VXA-120PC-50	1200	± 20	900	5100	1.65	900	1.10	1.20	0.15	M271	850
1MBI900VXA-120PC-54	1200	± 20	900	5100	1.65	900	1.10	1.20	0.15	M271	850
1MBI900VXA-120PC-80	1200	± 20	900	5100	1.65	900	1.10	1.20	0.15	M271	850
1MBI900VXA-120PD-50	1200	± 20	900	5100	1.65	900	1.10	1.20	0.15	M271	850
1MBI900VXA-120PD-54	1200	± 20	900	5100	1.65	900	1.10	1.20	0.15	M271	850
1MBI900VXA-120PD-80	1200	± 20	900	5100	1.65	900	1.10	1.20	0.15	M271	850

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

$V_{CE(sat)}$: at $T_{vj}=25^\circ C$, Chip

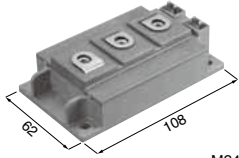
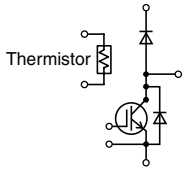
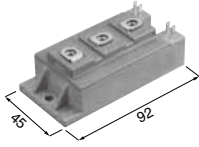
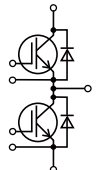
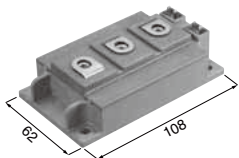
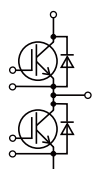
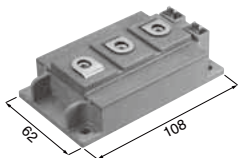
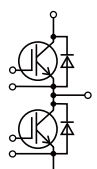
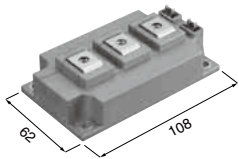
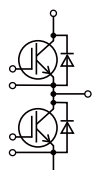
Note2: The products with suffix '-54' on this page are labeled to specify the rank of $V_{CE(sat)}$ and V_f .

Note3: Antiparallel diode current rating is 120A. Application circuit is Boost/Buck chopper only.

Note4: "-80": Pre-Applied Thermal-Interface-Material for "-54"

IGBT Module High Speed

■ High Speed 1200V class

Chopper	 M249		I_C	1200V
				High Speed IGBT
2-pack	 M233		200A	1MBI200HH-120L-50
			300A	1MBI300HH-120L-50
			400A	1MBI400HH-120L-50
2-pack	 M249		100A	2MBI100HB-120-50
2-pack	 M249		150A	2MBI150HH-120-50
			200A	2MBI200HH-120-50
2-pack	 M276		100A	2MBI100HJ-120-50
			150A	2MBI150HJ-120-50
			200A	2MBI200HJ-120-50
			300A	2MBI300HJ-120-50

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Cont. Amps.	Watts	typ.	I_C Amps.	t_{on} typ. μ sec.	t_{off} typ. μ sec.	t_f typ. μ sec.		
1MBI200HH-120L-50	1200	± 20	200	1390	3.10	200	0.2	0.3	0.05	M249	370
1MBI300HH-120L-50	1200	± 20	300	2090	3.20	300	0.2	0.3	0.05	M249	370
1MBI400HH-120L-50	1200	± 20	400	2500	3.10	400	0.2	0.4	0.05	M249	370
2MBI100HB-120-50	1200	± 20	100	1040	3.10	100	-	0.30	0.05	M233	240
2MBI150HH-120-50	1200	± 20	150	1390	3.20	150	-	0.30	0.05	M249	370
2MBI200HH-120-50	1200	± 20	200	1790	3.10	200	-	0.30	0.05	M249	370
2MBI100HJ-120-50	1200	± 20	100	655	3.20	100	0.25	0.30	0.05	M276	370
2MBI150HJ-120-50	1200	± 20	150	925	3.20	150	0.25	0.30	0.05	M276	370
2MBI200HJ-120-50	1200	± 20	200	1385	3.20	200	0.25	0.30	0.05	M276	370
2MBI300HJ-120-50	1200	± 20	300	1950	3.20	300	0.25	0.30	0.05	M276	370

 $V_{CE(sat)}$: at $T_{vj}=25^\circ\text{C}$, Chip

- Applicable to T/I-type NPC 3-level circuit, for high power conversion efficiency.
- There are 1-leg or 3-leg (3 phase) circuits in one package and it is easier to makes external wiring of module.
- Lower surge voltage by smaller internal package stray inductance.

- Lower power loss can be achieved by using RB-IGBT^{*3} as for T-type AC-SW device.
- Lowest power loss can be achieved by using 6th Gen. IGBT and FWD as for Main-SW device.

Dimension [mm]●: New products ○: Under development

Note 1: VF type is lower thermal impedance version.

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

*1 : Particular for Inverter

*2: Particular for Conv

verter *3:RB-IGBT

Reverse-Blocking IGBT, which has reverse blocking capability (between emitter and collector)

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}\text{C}$, Chip

I _c	T1, T2	1200V
	T3, T4	600V
50A	12MBI50VN-120-50	
75A	12MBI75VN-120-50	
100A	12MBI100VN-120-50	
50A	12MBI50VX-120-50	
75A	12MBI75VX-120-50	
100A	12MBI100VX-120-50	

Device type	T1, T2					T3, T4					Package	Net mass
	V _{CES}	I _C Cont.	P _C	V _{CE(sat)} (V _{GE} =15V)		V _{CES}	I _C Cont.	P _C	V _{CE(sat)} (V _{GE} =15V)			
	Volts	Amps.	Watts	Volts	Amps.	Volts	Amps.	Watts	Volts	Amps.		
12MBI50VN-120-50	1200	50	230	1.85	50	600	50	235	2.45	50	M1203	302
12MBI75VN-120-50	1200	75	320	1.85	75	600	75	305	2.45	75	M1203	302
12MBI100VN-120-50	1200	100	430	1.75	100	600	100	400	2.45	100	M1203	302
12MBI50VX-120-50	1200	50	230	1.85	50	600	50	235	2.45	50	M1202	302
12MBI75VX-120-50	1200	75	320	1.85	75	600	75	305	2.45	75	M1202	302
12MBI100VX-120-50	1200	100	430	1.75	100	600	100	400	2.45	100	M1202	302

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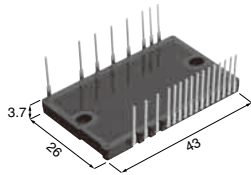
IGBT Module IPM < X series >

Small IPM (Intelligent Power Module) 600V class

Built-in protection functions

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

Small IPM with High Voltage Driver-*I*_c
without Brake-Chopper



P633A

						<i>I</i> _c	600V
							X series
✓	✓	✓	✓	✓		15A	6MBP15XSD060-50
						20A	6MBP20XSD060-50
						30A	6MBP30XSD060-50
						35A	6MBP35XSD060-50
						15A	6MBP15XSF060-50
						20A	6MBP20XSF060-50
✓	✓	✓	✓	✓		30A	6MBP30XSF060-50
						35A	6MBP35XSF060-50

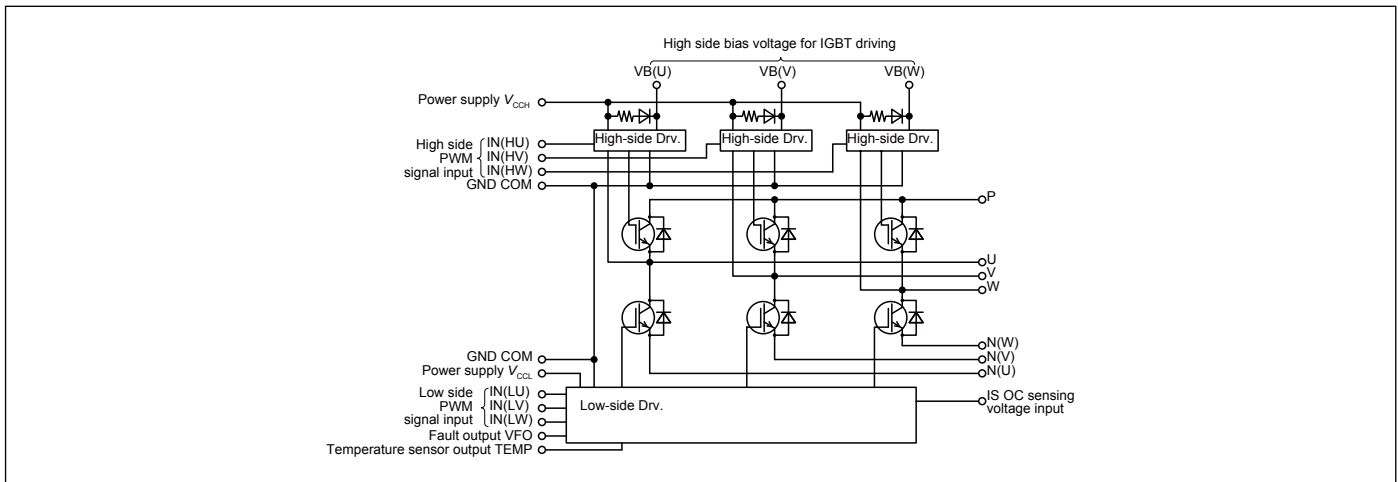
Dimension [mm]

Device type	Inverter			Control								Package	Net mass
	V_{CES}	I_C	$V_{CE(sat)}$	V_{CCL}	Boot-strap	Input signal	Protection function						
		Cont.	typ.	V_{CCH}	Diode	Active logic and Voltage level	UV	OC	V_{temp}	TOH	V_{FO} fault output		
	Volts	Amps.	Volts	Volts			V_{CCL}	*1	*2	*2			
							V_{CCH}						Grams
6MBP15XSD060-50	600	15	1.60	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	-	N-side(UV,OC)	P633A	9.3
6MBP20XSD060-50	600	20	1.60	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	-	N-side(UV,OC)	P633A	9.3
6MBP30XSD060-50	600	30	1.60	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	-	N-side(UV,OC)	P633A	9.3
6MBP35XSD060-50	600	35	1.40	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	-	N-side(UV,OC)	P633A	9.3
6MBP15XSF060-50	600	15	1.60	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	N-side(143±7℃)	N-side(UV,OC,TOH)	P633A	9.3
6MBP20XSF060-50	600	20	1.60	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	N-side(143±7℃)	N-side(UV,OC,TOH)	P633A	9.3
6MBP30XSF060-50	600	30	1.60	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	N-side(143±7℃)	N-side(UV,OC,TOH)	P633A	9.3
6MBP35XSF060-50	600	35	1.40	15	Built-in	High(3.3/5V)	P&N-side	N-side	N-side	N-side(143±7℃)	N-side(UV,OC,TOH)	P633A	9.3

*1: External current detection

*2: Temperature detection in LVIC

Block Diagram

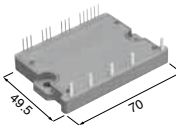
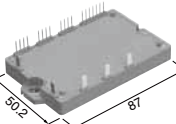
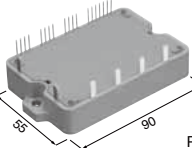


IGBT Module IPM < V series >

■ IPM (Intelligent Power Module) 600V, 1200V class

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)

						I _C	600V		1200V	
							V series		V series	
							Without Brake-Chopper	With Brake-Chopper	Without Brake-Chopper	With Brake-Chopper
 P629	✓	✓	✓	✓		10A			6MBP10VAA120-50	
						15A			6MBP15VAA120-50	
						20A	6MBP20VAA060-50			
						25A			6MBP25VAA120-50	
						30A	6MBP30VAA060-50			
						50A	6MBP50VAA060-50			
 P626	✓	✓	✓	✓		25A			6MBP25VBA120-50	
						35A			6MBP35VBA120-50	
						50A	6MBP50VBA060-50		6MBP50VBA120-50	
						75A	6MBP75VBA060-50			
 P636	✓	✓	✓	✓		25A			6MBP25VFN120-50	7MBP25VFN120-50
						35A			6MBP35VFN120-50	7MBP35VFN120-50
						50A	6MBP50VFN060-50	7MBP50VFN060-50	6MBP50VFN120-50	7MBP50VFN120-50
						75A	6MBP75VFN060-50	7MBP75VFN060-50		
						100A	6MBP100VFN060-50	7MBP100VFN060-50		

Dimension [mm]

Device type	Inverter			Brake		Control							Package	Net mass Grams
	V _{CES}	I _C	V _{CE(sat)}	V _{CES}	I _C	V _{CC}	I _{OC} [INV]	V _{UV}	T _{JOH}	Alarm signal hold time				
	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.	Volts	min. °C	OC typ.	UV typ.	T _{JOH} typ.		
6MBP20VAA060-50	600	20	1.4	-	-	15	30	11.0 to 12.5	150	2	4	8	P629	80
6MBP30VAA060-50	600	30	1.4	-	-	15	45	11.0 to 12.5	150	2	4	8	P629	80
6MBP50VAA060-50	600	50	1.4	-	-	15	75	11.0 to 12.5	150	2	4	8	P629	80
6MBP50VBA060-50	600	50	1.4	-	-	15	75	11.0 to 12.5	150	2	4	8	P626	100
6MBP75VBA060-50	600	75	1.4	-	-	15	113	11.0 to 12.5	150	2	4	8	P626	100
6MBP50VFN060-50	600	50	1.25	-	-	15	100	11.0 to 12.5	150	2	4	8	P636	190
6MBP75VFN060-50	600	75	1.25	-	-	15	150	11.0 to 12.5	150	2	4	8	P636	190
6MBP100VFN060-50	600	100	1.25	-	-	15	200	11.0 to 12.5	150	2	4	8	P636	190
7MBP50VFN060-50	600	50	1.25	600	30	15	100	11.0 to 12.5	150	2	4	8	P636	190
7MBP75VFN060-50	600	75	1.25	600	50	15	150	11.0 to 12.5	150	2	4	8	P636	190
7MBP100VFN060-50	600	100	1.25	600	50	15	200	11.0 to 12.5	150	2	4	8	P636	190
6MBP10VAA120-50	1200	10	1.7	-	-	15	15	11.0 to 12.5	150	2	4	8	P629	80
6MBP15VAA120-50	1200	15	1.7	-	-	15	23	11.0 to 12.5	150	2	4	8	P629	80
6MBP25VAA120-50	1200	25	1.7	-	-	15	38	11.0 to 12.5	150	2	4	8	P629	80
6MBP25VBA120-50	1200	25	1.7	-	-	15	38	11.0 to 12.5	150	2	4	8	P626	100
6MBP35VBA120-50	1200	35	1.7	-	-	15	53	11.0 to 12.5	150	2	4	8	P626	100
6MBP50VBA120-50	1200	50	1.7	-	-	15	75	11.0 to 12.5	150	2	4	8	P626	100
6MBP25VFN120-50	1200	25	1.7	-	-	15	50	11.0 to 12.5	150	2	4	8	P636	190
6MBP35VFN120-50	1200	35	1.7	-	-	15	70	11.0 to 12.5	150	2	4	8	P636	190
6MBP50VFN120-50	1200	50	1.7	-	-	15	100	11.0 to 12.5	150	2	4	8	P636	190
7MBP25VFN120-50	1200	25	1.7	1200	15	15	50	11.0 to 12.5	150	2	4	8	P636	190
7MBP35VFN120-50	1200	35	1.7	1200	25	15	70	11.0 to 12.5	150	2	4	8	P636	190
7MBP50VFN120-50	1200	50	1.7	1200	25	15	100	11.0 to 12.5	150	2	4	8	P636	190

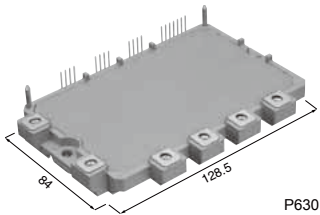
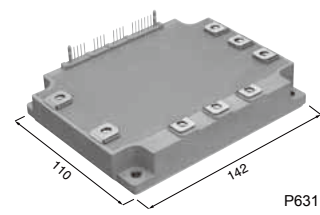


IGBT Module IPM < V series >

IPM (Intelligent Power Module) 600V, 1200V class

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)

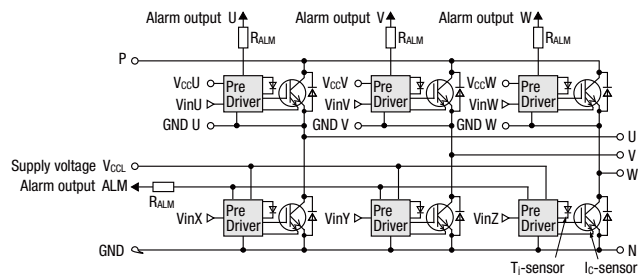
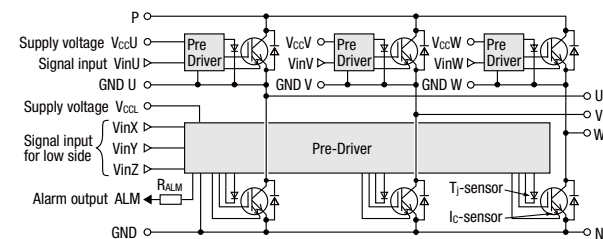
					Ic	600V		1200V	
						V series		V series	
						Without Brake-Chopper	With Brake-Chopper	Without Brake-Chopper	With Brake-Chopper
 P630	✓	✓	✓	✓	25A			6MBP25VDA120-50	7MBP25VDA120-50
	✓	✓	✓	✓	35A			6MBP35VDA120-50	7MBP35VDA120-50
	✓	✓	✓	✓	50A	6MBP50VDA060-50	7MBP50VDA060-50	6MBP50VDA120-50	7MBP50VDA120-50
	✓	✓	✓	✓	75A	6MBP75VDA060-50	7MBP75VDA060-50	6MBP75VDA120-50	7MBP75VDA120-50
	✓	✓	✓	✓	100A	6MBP100VDA060-50	7MBP100VDA060-50	6MBP100VDA120-50	7MBP100VDA120-50
	✓	✓	✓	✓	150A	6MBP150VDA060-50	7MBP150VDA060-50		
	✓	✓	✓	✓	200A	6MBP200VDA060-50	7MBP200VDA060-50		
	✓	✓	✓	✓		6MBP200VDN060-50	7MBP200VDN060-50		
 P631	✓	✓	✓	✓	100A			6MBP100VEA120-50	7MBP100VEA120-50
	✓	✓	✓	✓	150A			6MBP150VEA120-50	7MBP150VEA120-50
	✓	✓	✓	✓	200A	6MBP200VEA060-50	7MBP200VEA060-50	6MBP200VEA120-50	7MBP200VEA120-50
	✓	✓	✓	✓	300A	6MBP300VEA060-50	7MBP300VEA060-50		
	✓	✓	✓	✓	400A	6MBP400VEA060-50	7MBP400VEA060-50		
	✓	✓	✓	✓					

Dimension [mm]

Block Diagram

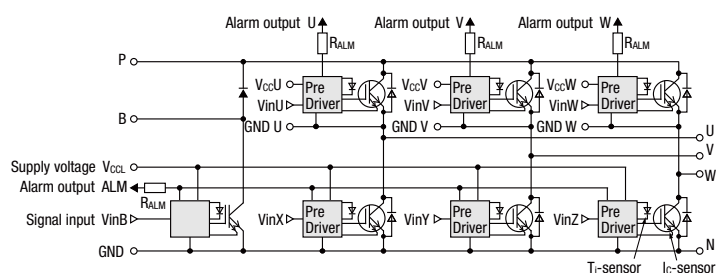
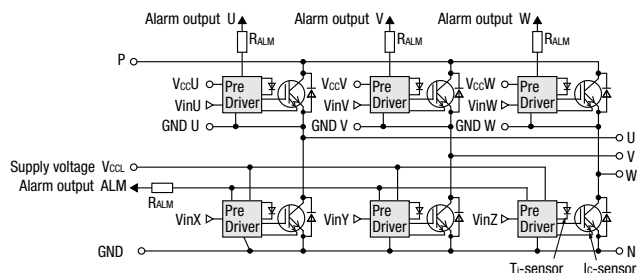
- 6MBP□VAA060-50
- 6MBP□VAA120-50

- 6MBP□VBA060-50
- 6MBP□VBA120-50



- 6MBP□VFN□-50
- 6MBP□VDA□-50
- 6MBP□VDN□-50
- 6MBP□VEA□-50

- 7MBP□VFN□-50
- 7MBP□VDA□-50
- 7MBP□VDN□-50
- 7MBP□VEA□-50



Device type	Inverter			Brake		Control							Package	Net mass
	V_{CES}	I_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{CC}	$I_{oc}[INV]$	V_{UV}	T_{JOH}	Alarm signal hold time				
	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.	Volts	min. °C	OC typ. ms	UV typ. ms	T_{JOH} typ. ms		
6MBP50VDA060-50	600	50	1.4	-	-	15	75	11.0 to 12.5	150	2	4	8	P630	290
6MBP75VDA060-50	600	75	1.4	-	-	15	113	11.0 to 12.5	150	2	4	8	P630	290
6MBP100VDA060-50	600	100	1.4	-	-	15	150	11.0 to 12.5	150	2	4	8	P630	290
6MBP100VDN060-50	600	100	1.4	-	-	15	150	11.0 to 12.5	150	2	4	8	P630	290
6MBP150VDA060-50	600	150	1.4	-	-	15	225	11.0 to 12.5	150	2	4	8	P630	290
6MBP150VDN060-50	600	150	1.4	-	-	15	225	11.0 to 12.5	150	2	4	8	P630	290
6MBP200VDA060-50	600	200	1.4	-	-	15	300	11.0 to 12.5	150	2	4	8	P630	290
6MBP200VDN060-50	600	200	1.4	-	-	15	300	11.0 to 12.5	150	2	4	8	P630	290
7MBP50VDA060-50	600	50	1.4	600	30	15	75	11.0 to 12.5	150	2	4	8	P630	290
7MBP75VDA060-50	600	75	1.4	600	50	15	113	11.0 to 12.5	150	2	4	8	P630	290
7MBP100VDA060-50	600	100	1.4	600	50	15	150	11.0 to 12.5	150	2	4	8	P630	290
7MBP100VDN060-50	600	100	1.4	600	50	15	150	11.0 to 12.5	150	2	4	8	P630	290
7MBP150VDA060-50	600	150	1.4	600	75	15	225	11.0 to 12.5	150	2	4	8	P630	290
7MBP150VDN060-50	600	150	1.4	600	75	15	225	11.0 to 12.5	150	2	4	8	P630	290
7MBP200VDA060-50	600	200	1.4	600	100	15	300	11.0 to 12.5	150	2	4	8	P630	290
7MBP200VDN060-50	600	200	1.4	600	100	15	300	11.0 to 12.5	150	2	4	8	P630	290
6MBP200VEA060-50	600	200	1.25	-	-	15	300	11.0 to 12.5	150	2	4	8	P631	940
6MBP300VEA060-50	600	300	1.25	-	-	15	450	11.0 to 12.5	150	2	4	8	P631	940
6MBP400VEA060-50	600	400	1.25	-	-	15	600	11.0 to 12.5	150	2	4	8	P631	940
7MBP200VEA060-50	600	200	1.25	600	100	15	300	11.0 to 12.5	150	2	4	8	P631	940
7MBP300VEA060-50	600	300	1.25	600	150	15	450	11.0 to 12.5	150	2	4	8	P631	940
7MBP400VEA060-50	600	400	1.25	600	200	15	600	11.0 to 12.5	150	2	4	8	P631	940
6MBP25VDA120-50	1200	25	1.7	-	-	15	38	11.0 to 12.5	150	2	4	8	P630	290
6MBP35VDA120-50	1200	35	1.7	-	-	15	53	11.0 to 12.5	150	2	4	8	P630	290
6MBP50VDA120-50	1200	50	1.7	-	-	15	75	11.0 to 12.5	150	2	4	8	P630	290
6MBP50VDN120-50	1200	50	1.7	-	-	15	75	11.0 to 12.5	150	2	4	8	P630	290
6MBP75VDA120-50	1200	75	1.7	-	-	15	113	11.0 to 12.5	150	2	4	8	P630	290
6MBP75VDN120-50	1200	75	1.7	-	-	15	113	11.0 to 12.5	150	2	4	8	P630	290
6MBP100VDA120-50	1200	100	1.7	-	-	15	150	11.0 to 12.5	150	2	4	8	P630	290
6MBP100VDN120-50	1200	100	1.7	-	-	15	150	11.0 to 12.5	150	2	4	8	P630	290
7MBP25VDA120-50	1200	25	1.7	1200	15	15	38	11.0 to 12.5	150	2	4	8	P630	290
7MBP35VDA120-50	1200	35	1.7	1200	15	15	53	11.0 to 12.5	150	2	4	8	P630	290
7MBP50VDA120-50	1200	50	1.7	1200	25	15	75	11.0 to 12.5	150	2	4	8	P630	290
7MBP50VDN120-50	1200	50	1.7	1200	25	15	75	11.0 to 12.5	150	2	4	8	P630	290
7MBP75VDA120-50	1200	75	1.7	1200	35	15	113	11.0 to 12.5	150	2	4	8	P630	290
7MBP75VDN120-50	1200	75	1.7	1200	35	15	113	11.0 to 12.5	150	2	4	8	P630	290
7MBP100VDA120-50	1200	100	1.7	1200	50	15	150	11.0 to 12.5	150	2	4	8	P630	290
7MBP100VDN120-50	1200	100	1.7	1200	50	15	150	11.0 to 12.5	150	2	4	8	P630	290
6MBP100VEA120-50	1200	100	1.7	-	-	15	150	11.0 to 12.5	150	2	4	8	P631	940
6MBP150VEA120-50	1200	150	1.7	-	-	15	225	11.0 to 12.5	150	2	4	8	P631	940
6MBP200VEA120-50	1200	200	1.7	-	-	15	300	11.0 to 12.5	150	2	4	8	P631	940
7MBP100VEA120-50	1200	100	1.7	1200	50	15	150	11.0 to 12.5	150	2	4	8	P631	940
7MBP150VEA120-50	1200	150	1.7	1200	75	15	225	11.0 to 12.5	150	2	4	8	P631	940
7MBP200VEA120-50	1200	200	1.7	1200	100	15	300	11.0 to 12.5	150	2	4	8	P631	940

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



TO-247-4-P2

0~	~10	~20	~30	~40	~50	~60	~70	~80	~90	~100	kHz
V/RB											
High speed V											
	XS										
	High speed W										

FGW40XS65C (example): XS series

FGW40N65WD (example) : XS シリーズを除く

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Discrete IGBT XS series 650V class

Features

- IGBT in Trench-gate structure and Field-stop technology
- Low $V_{CE(sat)}$ and low switching Loss

IGBT in field-stop technology and trench-gate structure with Ultra fast FWD
650V class

Device type	Maximum Ratings				$V_{CE(sat)}$ ($V_{GE}=15V$) typ. Volts	E_{on} ($r_g=10\Omega$) typ. mJ	E_{off} typ. mJ	Q_G typ. nC	V_F typ. Volts	I_F $T_c=100^\circ C$ Amps.	Q_{rr} typ. μC	Package	Net mass Grams
	V_{CES}	I_C $T_c=100^\circ C$	I_{CP}	P_D IGBT Watts									
	Volts	Amps.	Amps.	Watts									
● FGW30XS65	650	30	120	174	1.35	0.27	0.21	130	-	-	-	TO-247-P2	6.0
● FGW30XS65C	650	30	120	174	1.35	0.27	0.21	130	1.70	30	0.74	TO-247-P2	6.0
● FGW40XS65	650	40	160	234	1.35	0.40	0.30	160	-	-	-	TO-247-P2	6.0
● FGW40XS65C	650	40	160	234	1.35	0.40	0.30	160	1.70	40	0.90	TO-247-P2	6.0
● FGW50XS65	650	50	200	290	1.35	0.60	0.38	210	-	-	-	TO-247-P2	6.0
● FGW50XS65D	650	50	200	290	1.35	0.54	0.38	210	1.70	30	-	TO-247-P2	6.0
● FGW50XS65C	650	50	200	290	1.35	0.60	0.38	210	1.70	50	0.80	TO-247-P2	6.0
● FGW75XS65	650	75	300	437	1.35	1.30	0.94	300	-	-	-	TO-247-P2	6.0
● FGW75XS65D	650	50	200	290	1.35	1.00	0.94	300	1.70	30	0.50	TO-247-P2	6.0
● FGW75XS65C	650	75	300	437	1.35	1.30	0.94	300	1.70	75	1.10	TO-247-P2	6.0
● FGZ75XS65C	650	75	300	437	1.35	0.50	0.74	300	1.70	75	0.56	TO-247-4-P2	6.0

● : New products

Discrete IGBT High Speed W series 650V,1200V class

Features

- IGBT in Trench-gate structure and Field-stop technology
- Low $V_{CE(sat)}$ and low switching Loss
- High switching frequency (to 100kHz)

IGBT in field-stop technology and trench-gate structure with Ultra fast FWD
650V,1200V class

Device type	Maximum Ratings				$V_{CE(sat)}$ ($V_{GE}=15V$) typ. Volts	E_{on} ($r_g=10\Omega$) typ. mJ	E_{off} typ. mJ	Q_G typ. nC	V_F typ. Volts	I_F $T_c=100^\circ C$ Amps.	Q_{rr} typ. μC	Package	Net mass Grams
	V_{CES}	I_C $T_c=100^\circ C$	I_{CP}	P_D IGBT Watts									
	Volts	Amps.	Amps.	Watts									
FGW30N65W	650	30	120	180	1.8	0.12	0.15	128	-	-	-	TO-247-P2	6.0
FGW40N65W	650	40	160	260	1.8	0.29	0.29	180	-	-	-	TO-247-P2	6.0
FGW40N65WD	650	40	160	260	1.8	0.29	0.29	180	2.5	20	0.26	TO-247-P2	6.0
FGW40N65WE	650	40	160	260	1.8	0.29	0.29	180	2.5	40	0.29	TO-247-P2	6.0
FGW50N65W	650	50	200	330	1.8	0.42	0.46	215	-	-	-	TO-247-P2	6.0
FGW50N65WD	650	50	200	330	1.8	0.42	0.46	215	2.5	25	0.32	TO-247-P2	6.0
FGW50N65WE	650	50	200	330	1.8	0.42	0.46	215	2.5	50	0.35	TO-247-P2	6.0
FGZ50N65WD	650	50	200	330	1.8	0.12	0.40	215	2.5	25	0.32	TO-247-4-P2	6.0
FGZ50N65WE	650	50	200	330	1.8	0.12	0.40	215	2.5	50	0.35	TO-247-4-P2	6.0
FGW60N65W	650	60	240	405	1.8	0.6	0.67	250	-	-	-	TO-247-P2	6.0
FGW60N65WD	650	60	240	405	1.8	0.6	0.67	250	2.5	30	0.3	TO-247-P2	6.0
FGW60N65WE	650	60	240	405	1.8	0.6	0.67	250	2.5	60	0.33	TO-247-P2	6.0
FGW75N65W	650	75	300	520	1.8	0.95	1.2	300	-	-	-	TO-247-P2	6.0
FGW75N65WE	650	75	300	520	1.8	0.95	1.2	300	2.5	75	0.41	TO-247-P2	6.0
FGZ75N65WE	650	75	300	520	1.8	0.37	0.68	300	2.5	75	0.41	TO-247-4-P2	6.0
FGW25N120W	1200	25	100	270	2.0	0.9	1.3	80	-	-	-	TO-247-P2	6.0
FGW25N120WD	1200	25	100	270	2.0	0.9	1.3	80	2.2	12	0.6	TO-247-P2	6.0
FGW25N120WE	1200	25	100	270	2.0	0.9	1.3	80	2.2	25	0.6	TO-247-P2	6.0
FGW40N120W	1200	40	160	430	2.0	2.8	1.6	120	-	-	-	TO-247-P2	6.0
FGW40N120WD	1200	40	160	430	2.0	2.8	1.6	120	2.2	20	0.95	TO-247-P2	6.0
FGW40N120WE	1200	40	160	430	2.0	2.8	1.6	120	2.4	40	2.2	TO-247-P2	6.0
FGZ40N120WE	1200	40	160	430	2.0	1.1	1.4	120	2.4	40	2.2	TO-247-4-P2	6.0



Discrete IGBT V/High Speed V series 600V, 1200V class

Features

- IGBT in Trench-gate structure and Field-stop technology
- Low $V_{CE(sat)}$ and low switching Loss
(High Speed V series)
- Short circuit withstand time; $t_{sc}=10\mu s$ (V series)

IGBT in field-stop technology and trench-gate structure with Ultra fast FWD
600V class

Device type	Maximum Ratings				$V_{CE(sat)}$ ($V_{GE}=15V$) typ. Volts	E_{on} E_{off} ($r_g=10\Omega$) typ. mJ		Q_G typ. nC	V_F		Q_{rr} typ. μC	Package	Net mass Grams
	V_{CES}	I_C $T_c=100^\circ C$	I_{CP}	P_D IGBT					typ. Volts	I_F			
	Volts	Amps.	Amps.	Watts						Amps.			
FGW30N60VD	600	30	60	230	1.6	1.2	0.7	225	1.5	25	0.7	TO-247-P2	6.0
FGW35N60H	600	35	105	230	1.5	0.9	0.85	210	-	-	-	TO-247-P2	6.0
FGW35N60HD	600	35	105	230	1.5	0.9	0.85	210	2.0	15	0.06	TO-247-P2	6.0
FGW35N60HC	600	35	105	230	1.5	0.95	0.85	210	2.35	35	0.13	TO-247-P2	6.0
FGW50N60H	600	50	150	360	1.5	1.4	1.7	305	-	-	-	TO-247-P2	6.0
FGW50N60HD	600	50	150	360	1.5	1.4	1.7	305	2.0	25	0.08	TO-247-P2	6.0
FGW50N60HC	600	50	150	360	1.5	1.5	1.7	305	2.3	50	0.07	TO-247-P2	6.0
FGW50N60VD	600	50	100	360	1.6	2.4	1.4	360	1.5	35	0.75	TO-247-P2	6.0
FGW75N60H	600	75	225	500	1.5	3.0	4.2	460	-	-	0.12	TO-247-P2	6.0
FGW75N60HD	600	75	225	500	1.5	3.0	4.2	460	2.0	35	0.13	TO-247-P2	6.0
FGW75N60HC	600	75	225	500	1.5	3.8	4.2	460	2.3	75	0.3	TO-247-P2	6.0

1200V class

Device type	Maximum Ratings				$V_{CE(sat)}$ ($V_{GE}=15V$) typ. Volts	E_{on} E_{off} ($r_g=10\Omega$) typ. mJ		Q_G typ. nC	V_F		Q_{rr} typ. μC	Package	Net mass Grams
	V_{CES}	I_C $T_c=100^\circ C$	I_{CP}	P_D IGBT					typ. Volts	I_F			
	Volts	Amps.	Amps.	Watts						Amps.			
FGW15N120H	1200	15	45	155	1.8	0.6	0.8	140	-	-	-	TO-247-P2	6.0
FGW15N120HD	1200	15	45	155	1.8	0.6	0.8	140	2.2	12	0.6	TO-247-P2	6.0
FGW15N120VD	1200	15	30	155	1.85	1.1	0.8	150	1.7	15	0.85	TO-247-P2	6.0
FGW25N120VD	1200	25	50	260	1.85	2.2	1.4	235	1.7	25	1.2	TO-247-P2	6.0
FGW30N120H	1200	30	90	260	1.8	1.6	1.5	230	-	-	-	TO-247-P2	6.0
FGW30N120HD	1200	30	90	260	1.8	1.6	1.5	230	2.2	20	0.95	TO-247-P2	6.0
FGW40N120H	1200	40	120	340	1.8	2.8	1.8	300	-	-	-	TO-247-P2	6.0
FGW40N120HD	1200	40	120	340	1.8	2.8	1.8	300	2.2	30	1.35	TO-247-P2	6.0
FGW40N120VD	1200	40	80	340	1.85	4.3	2.2	320	1.7	30	1.45	TO-247-P2	6.0

Discrete RB-IGBT

Features

- Reverse blocking character is realized for 1 chip by Fuji's original technology.
- High efficiency by applying to T-type 3 level inverter circuit.

Characteristics

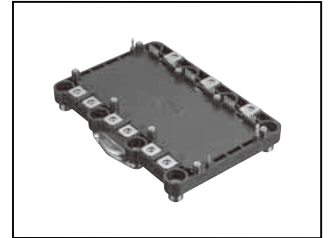
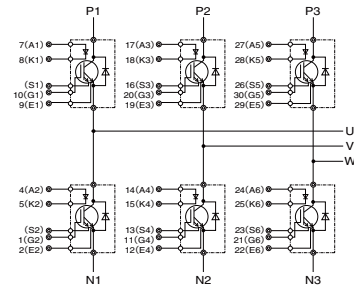
Device type	Maximum Ratings					$V_{CE(sat)}$ ($V_{GE}=15V$) typ. Volts	E_{on} E_{off} ($r_g=10\Omega$) typ. mJ		Q_G typ. nC	t_{rr}		Package	Net mass Grams
	V_{CES}	I_C $T_c=100^\circ C$	I_{CP}	t_{sc}	P_D IGBT					typ. n sec	typ. n sec		
	Volts	Amps.	Amps.	$\mu sec.$	Watts								
FGW85N60RB	600	85	170	10	600	2.45	4.7	2.4	300	165		TO-247-P2	6.0

IGBT Module for Electric Vehicle and Hybrid Electric Vehicle

IGBT Module for Electric Vehicle and Hybrid Electric Vehicle

Features

- 7th Generation “RC-IGBT” 750V-IGBT
- Direct liquid Cooling AL Water jacket
- High power density, small and light weight package
- High reliability : T_{vjmax} 175°C guaranteed
- RoHS compliant



Characteristics

$V_{CE(sat)}$: at $T_{vj}=25^{\circ}\text{C}$, Chip

Device type	V_{CES} Volts	$I_C(\text{Cont})$ Amps.	$I_C(\text{Peak})$ Amps.	$V_{CE(sat)}$ typ. Volts	V_F typ. Volts	Package	Net mass Grams
6MBI800XV-075V-01	750	570	1600	1.45 ($I_C=800\text{A}$)	1.50 ($I_F=800\text{A}$)	M653	560

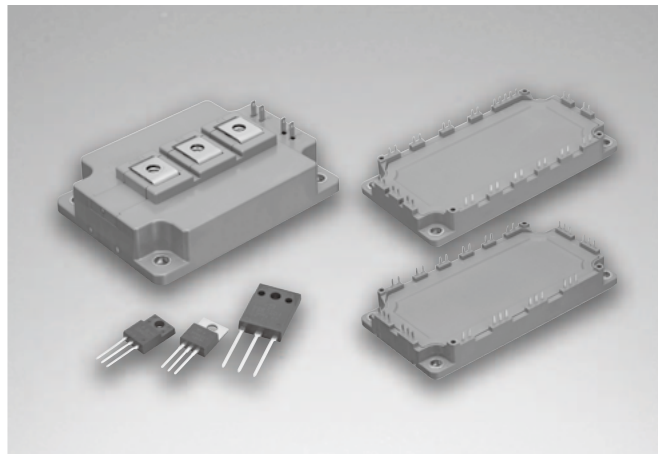
2 SiC Devices

SiC Devices



SiC devices have excellent characteristics that realize high blocking voltage, low power dissipation, high-frequency operation and high-temperature operation.

Power semiconductors that make use of SiC achieve significant reduction in energy consumption, and can be used to develop smaller and lighter products.



IGBT Hybrid Modules with SiC-SBD X series / V series



■ Features

- High performance chips
 - X series / V series IGBT for low loss operation
 - SiC-SBD for low loss operation
- The same package lineup as the conventional Si-IGBT modules

■ Part numbers

2MSI300VAH-120C-53 (example)

2	MS	I	300	V	A	H	120	C	53
Number of IGBT Switches	Chip : Si-IGBT+SiC-SBD	Internal Configuration	Rated Current	IGBT Device Technology	SBD Dvice	Package Type	Max V_{CE}	SiC-SBD for converter	RoHS Compliant
	MS: Si-IGBT+SiC-SBD	I: Standard Modules	× 1	V: V series (6th Generation)	A: 1st gen.		060: 600V	C: Large current	None, 01 to 49 Non RoHS Compliant
	S: SiC-SBD	R: Power Integrated Modules		X: X series (7th Generation)			120: 1200V		50 to 99 RoHS Compliant
				VW: VW series (6th Gen High speed)			170: 1700V		
							330: 3300V		

■ PIM/Built-in converter and brake EconoPIM™ 600, 1200V class

			600V	1200V
		I_c	IGBT Hybrid Modules with SiC-SBD V series	
35A				7MSR35VAB120-50
50A	7MSR50VAB060-50			7MSR50VAB120-50
75A	7MSR75VAB060-50			
100A	7MSR100VAB060-50			

Dimension [mm]

Device type	Inverter [IGBT]				Brake [IGBT+FED]			Converter [Diode]				Package	Net mass
	V_{CES}	I_C	P_C	$V_{CE(sat)}$	V_{CES}	I_C	V_{RRM}	V_{RRM}	I_O	V_{FM}	I_{FSM}		
	Volts	Amps.	Watts	Volts	Volts	Amps.	Volts	Volts	Amps.	Volts	Amps.		
○ 7MSR50VAB060-50	600	50	215	1.6	600	50	600	800	50	1.3	210	M712	330
○ 7MSR75VAB060-50	600	75	300	1.6	600	50	600	800	75	1.25	500	M712	330
○ 7MSR100VAB060-50	600	100	335	1.6	600	50	600	800	100	1.25	700	M712	330
○ 7MSR35VAB120-50	1200	35	210	1.85	1200	25	1200	1600	35	1.35	260	M712	330
○ 7MSR50VAB120-50	1200	50	280	1.85	1200	35	1200	1600	50	1.35	360	M712	330

○ : Under development

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

■ 6-pack EconoPACK™ 1200V class

	1200V
	IGBT Hybrid Modules with SiC-SBD V series
I_C	
100A	6MSI100VAB-120-50

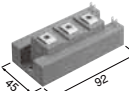
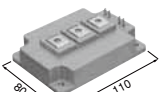
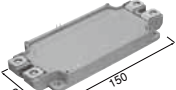
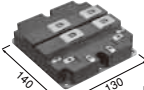
Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$	Switching time				Package	Net mass
			Cont.		($V_{GE}=15V$)	t_{on}	t_{off}	t_f			
	Volts	Volts	Amps.	Watts	Volts	typ. $\mu sec.$	typ. $\mu sec.$	typ. $\mu sec.$			
○ 6MSI100VAB-120-50	1200	± 20	100	520	1.75	100	0.39	0.42	0.05	M633	300

○ : Under development

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

■ Standard 2-pack 1200, 1700V class

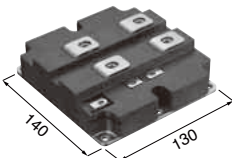
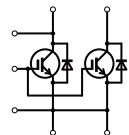
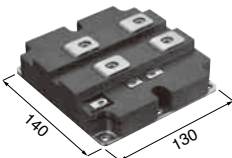
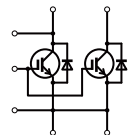
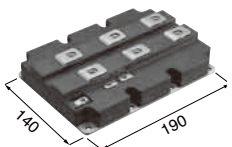
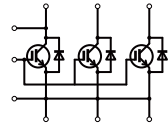
		I_C	1200V	1700V	1200V
			IGBT Hybrid Modules with SiC-SBD V series		IGBT Hybrid Modules with SiC-SBD VW series
 M274 		200A	2MSI200VAB-120-53		
 M276 		200A			2MSI200VWAH-120-53
		300A	2MSI300VAH-120C-53		2MSI300VWAH-120-53
 M277 		400A		2MSI400VAE-170-53	
 M254 		300A	2MSI300VAN-120-53		2MSI300VWAN-120-53
		450A	2MSI450VAN-120-53		
		550A		2MSI550VAN-170-53	
		600A	2MSI600VAN-120-53		
 M278 		1200A		2MSI1200VAT-170PC 2MSI1200VAT-170EC	

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C	P_C	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Amps.	Watts	Volts	I_C Amps.	t_{on} typ. μsec.	t_{off} typ. μsec.	t_f typ. μsec.		
● 2MSI200VAB-120-53	1200	±20	200	1500	1.75	200	0.64	0.70	0.07	M274	240
● 2MSI300VAH-120C-53	1200	±20	300	1600	1.75	300	0.82	0.84	0.09	M276	370
● 2MSI300VAN-120-53	1200	±20	300	1595	1.75	300	0.49	0.72	0.12	M254	300
● 2MSI450VAN-120-53	1200	±20	450	2270	1.75	450	0.36	0.72	0.07	M254	300
● 2MSI600VAN-120-53	1200	±20	600	3750	1.85	600	0.55	1.05	0.11	M254	300
○ 2MSI200VWAH-120-53	1200	±20	200	1500	2.35	200	0.18	0.28	0.07	M276	370
○ 2MSI300VWAH-120-53	1200	±20	300	1600	2.55	300	0.23	0.32	0.07	M276	370
○ 2MSI300VWAN-120-53	1200	±20	300	1600	2.6	300	0.3	0.4	0.11	M254	300
○ 2MSI550VAN-170-53	1700	±20	550	3750	2.15	550	0.69	1.18	0.10	M254	300
● 2MSI400VAE-170-53	1700	±20	400	4540	2.00	400	1.05	1.95	0.09	M277	470
○ 2MSI1200VAT-170PC	1700	±20	1200	7040	1.80	1200	2.63	2.60	0.50	M278	900
○ 2MSI1200VAT-170EC	1700	±20	1200	7040	2.00	1200	1.77	1.59	0.16	M278	900

● : New Products ○ : Under development

Standard 1-pack 3300V class

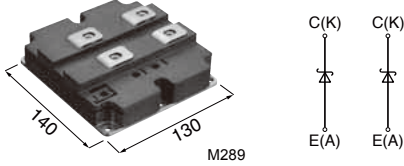
 M155 	I_C	3300V
		IGBT Hybrid Modules with SiC-SBD X series
 M155 	1200A	1MSI1200XAGF330-03
 M156 	1800A	1MSI1800XAEF330-03

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C		P_{tot}	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass
	Volts	Volts	Cont.	Amps.		typ.	I_C	$t_{d(on)}$	$t_{d(off)}$	t_f		
					Watts	Volts	Amps.	typ. $\mu sec.$	typ. $\mu sec.$	typ. $\mu sec.$		Grams
● 1MSI1200XAGF330-03	3300	± 20	1200	12500		2	1200	1.6	1.65	1.25	M155	900
● 1MSI1800XAEF330-03	3300	± 20	1800	18650		2	1800	1.6	1.8	1.3	M156	1300

● : New Products

Standard 2-pack 3300V class

	I_C	3300V SiC-SBD series
	900A	2Si900AGF330-03

Dimension [mm]

Device type	V_{CES}	V_{GES}	I_C Cont.	P_{tot}	$V_{CE(sat)}$ ($V_{GE}=15V$)		Switching time			Package	Net mass Grams
	Volts	Volts	Amps.	Watts	Volts	I_C Amps.	$t_{d(on)}$ typ. μsec.	$t_{d(off)}$ typ. μsec.	t_f typ. μsec.		
● 2Si900AGF330-03	3300	-	900	-	2.05	900	-	-	-	M289	900

● : New Products

SiC Schottky-Barrier Diodes (SBD)



■ Features

- High speed switching
 - High-frequency operation, miniaturization, weight saving
- Low- V_F
- Low- I_R
 - $T_{vj}=175^{\circ}\text{C}$ Guaranteed, High-temperature operation, Low-Loss, High efficiency
- High avalanche capability

■ Part numbers

FDCP10S65A(example)

F	DC		P		10	S		65		A	
Company code	Device code		Package code		Current	Polarity		Voltage		Application	
Fuji	DC	SiCSBD	A	TO-220F	× 1	S, T	Single	65	650V	A	For Automotive
			C	T-Pack(S)		C	Cathode Common	120	1200V		
			P	TO-220							
			Y	TO-247							
			W	TO-247-2-P2							

■ SiC-SBD Series

SiC-SBD Series			TO-220-2	TO-220	TO-220F-2	TO-220F	TO-247-2-P2	TO-247	T-Pack(S)
Chip	V_{RRM} (V)	I_F (A)							
Single	650	10	✓		✓			✓	✓
		25	✓		✓			✓	✓
	1200	18			✓		✓	✓	
Dual	650	20		✓		✓		✓	✓
		50						✓	
	1200	36						✓	

Device type	Maximum rating			Thermal rating T_{vj} max.($^{\circ}\text{C}$)	Characteristics ($T_a=25^{\circ}\text{C}$)		Package	Net mass Grams
	V_{RRM} Volts	I_F Amps.	I_{FSM}^{*1} Amps.		V_F max. Volts	I_{RRM}^{*2} max. μA		
FDCP10S65	650	10	50	175	1.8	10	TO-220-2	2.0
FDCP20C65	650	20	50	175	1.8	10	TO-220	2.0
FDCP25S65	650	25	100	175	1.6	10	TO-220-2	2.0
FDCA10S65	650	10	50	175	1.8	10	TO-220F-2	1.7
FDCA20C65	650	20	50	175	1.8	10	TO-220F	1.7
FDCA25S65	650	25	100	175	1.6	10	TO-220F-2	1.7
FDCY10S65	650	10	50	175	1.8	10	TO-247	6.4
FDCY20C65	650	20	50	175	1.8	10	TO-247	6.4
FDCY25S65	650	25	100	175	1.6	10	TO-247	6.4
FDCY50C65	650	50	100	175	1.6	10	TO-247	6.4
FDCC10S65	650	10	50	175	1.8	10	T-Pack(S)	1.6
FDCC20C65	650	20	50	175	1.8	10	T-Pack(S)	1.6
FDCC25S65	650	25	100	175	1.6	10	T-Pack(S)	1.6
FDCA18S120	1200	18	90	175	1.7	10	TO-220F-2	1.7
FDCY18S120	1200	18	90	175	1.7	10	TO-247	6.4
FDCW18T120	1200	18	90	175	1.7	10	TO-247-2-P2	6.0
FDCY36C120	1200	36	90	175	1.7	10	TO-247	6.4

*1: Half sine wave $t_p=10\text{ms}$ *2: $V_R=V_{RRM}$

■ Automotive SiC Schottky-Barrier Diodes

SiC-SBD Series			TO-220-2	TO-220	TO-247	T-Pack(S)
						
Chip	V_{RRM} (V)	I_F (A)				
Single	650	10	✓		✓	✓
		25	✓		✓	✓
	1200	18			✓	
Dual	650	20		✓	✓	✓
		50			✓	
	1200	36			✓	

Device type	Maximaum rating			Thermal rating T_{vj} and T_{stg} °C	Characteristics ($T_a=25^{\circ}\text{C}$)		Package	Net mass Grams
	V_{RRM} Volts	I_F Amps.	I_{FSM}^{*1} Amps.		V_F max. Volts	I_{RRM}^{*2} max. μA		
FDCP10S65A	650	10	50	-55 to +175	1.8	5	TO-220-2	2.0
FDCY10S65A	650	10	50	-55 to +175	1.8	5	TO-247	6.4
FDCC10S65A	650	10	50	-55 to +175	1.8	5	T-Pack(S)	1.6
FDCP20C65A	650	20	100	-55 to +175	1.8	5	TO-220	2.0
FDCY20C65A	650	20	100	-55 to +175	1.8	5	TO-247	6.4
FDCC20C65A	650	20	100	-55 to +175	1.8	5	T-pack(S)	1.6
FDCP25S65A	650	25	100	-55 to +175	1.7	10	TO-220-2	2.0
FDCY25S65A	650	25	100	-55 to +175	1.7	10	TO-247	6.4
FDCC25S65A	650	25	100	-55 to +175	1.7	10	T-pack(S)	1.6
FDCY50C65A	650	50	200	-55 to +175	1.7	10	TO-247	6.4
FDCY18S120A	1200	18	90	-55 to +175	1.8	10	TO-247	6.4
FDCY36C120A	1200	36	180	-55 to +175	1.8	10	TO-247	6.4

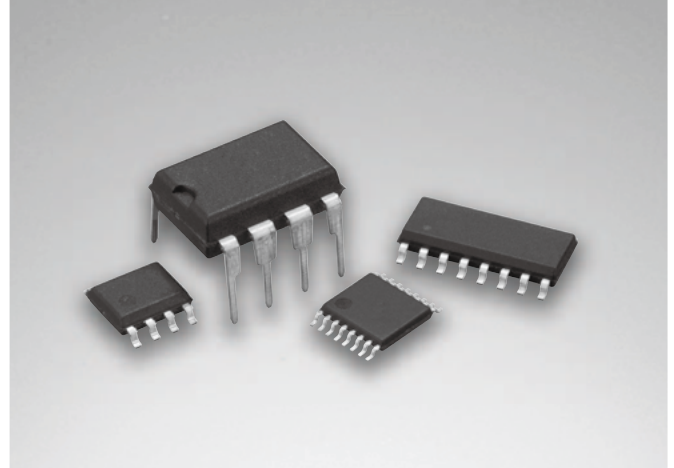
*1: Half sine wave $t_p=10\text{ms}$

*2: $V_R=V_{RRM}$

Integrated Circuits



Fuji Electric offers a lineup of AC/DC and DC/DC power supply control ICs that support a variety of power circuits. These highly efficient, low-noise products with low standby power consumption are compatible with environmental regulations. Furthermore, many protection functions are built into the ICs themselves, allowing for smaller power circuits.



Features of Power Supply control ICs

Green Mode PWM-ICs

■ Features

- Built-in 500/650V withstand voltage start up circuit
- Green mode functions (Intermittent Switching/Linerary reduced switching frequency)
- Protect functions (Over voltage/Brown out/2 stage Over power)
- Low EMI noise

Green Mode Quasi-resonant ICs

■ Features

- Built-in 500V withstand voltage start up circuit
- Green mode functions (Intermittent Switching/Linerary reduced switching frequency)
- Protect functions (Over voltage/Over load etc.)

Power Factor Correction ICs

■ Features

- Wide electric power range(From 75W to 1kW)
- Power factor ≥ 0.99
- Protect functions (FB Pin open short/Over voltage etc.)

Current Resonant ICs

■ Features

- Realize 1 convertor circuit structure at world wide input power
- Built-in High side driver
- Preventing capacitive region operation
- Protect functions
(Over current/Over voltage/Over load/Over heat/Brown out)
- Green mode function (Intermittent switching)

High and Low side driver IC

■ Features

- High negative transient voltage on VS terminal
- Wide range supply voltage up to 30V (FA5650/5651)
- 3.3V logic compatible
- Built-in under voltage lockout
- Allowable offset supply voltage transient dV_s/dt up to 50kV/us
- High speed response: Turn on/off delay time 125ns (Typ)
(FA5650/5651)

■ Part numbers

FA8A00N (example)

F		A		8		A		00	N	
Company Symbol		Control System		Series		Generation		Number	Package code	
F	Fuji	A	Analog	1	CRMPFC	A	1G	Two-digit integer	N	SOP
				6	LLC	B	2G		P	DIP
				8	PWM	C	3G			
						...	...			

FA5590N (example)

F		A		55		90	N	
Company Symbol		Control System		Series		Number	Package code	
F	Fuji	A	Analog	3X	AC/DC	Two-digit integer	M/N	SOP
				5X	AC/DC		P	DIP
				7X	DC/DC		V	TSSOP
				13X	AC/DC			

AC/DC Power Supply control ICs

● Green mode PWM-ICs (Current mode)

Type Name	Duty	Input voltage	Frequency		Current sense	Over load protection	Over power protection	Over voltage protection	Built-in start up circuit	Green mode function	X-Cap discharge function											
			65kHz	100kHz																		
With Brown out function																						
FA8A00N	83%	12 - 24V	✓		Positive	Auto-Recovery	2Stage (OPP ratio 1:1.4)	Latch	500V	Linearly frequency reduction Intermittent opration	✓											
FA8A40N				✓		Timer-latch																
FA8A01N			✓			Auto-Recovery	2Stage (OPP ratio 1:1.5)															
FA8A41N				✓																		
FA8B16N		10 - 28V	✓			Auto-Recovery	2Stage (OPP ratio 1:1.8)		650V													
FA8A27N						Timer-latch																
FA8A37N			✓			Timer-latch	1Stage															
FA8A39N																						
FA8A83N			10 - 24V	✓			Auto-Recovery		—													
FA8A86N						✓																
Without Brown out function																						
FA5680N	85%	11 - 24V	✓		Negative	Auto-Recovery			750V													
FA5681N			✓			Timer-latch																
FA8A60N	83%	10 - 24V	✓		Positive	Auto-Recovery	1Stage	Latch	500V	Linearly frequency reduction Intermittent opration	✓											
FA8A64N				✓		Timer-latch																
FA8A61N			✓																			
FA8A65N				✓		Auto-Recovery																
FA8A70N			✓			Timer-latch	2Stage															
FA8A74N				✓																		
FA8A71N			✓			Auto-Recovery	1Stage		650V													
FA8A75N				✓		Timer-latch																
FA8A12N			✓			Auto-Recovery																
FA8A80N			✓			Auto-Recovery																
FA8A84N				✓		Timer-latch																
FA8A81N			✓																			
FA8A85N				✓		Auto-Recovery	1Stage															
FA8A90N			✓			Timer-latch																
FA8A94N				✓																		
FA8A91N			✓			Timer-latch																
FA8A87N			✓																			
FA8A95N				✓																		

PKG: SOP-8

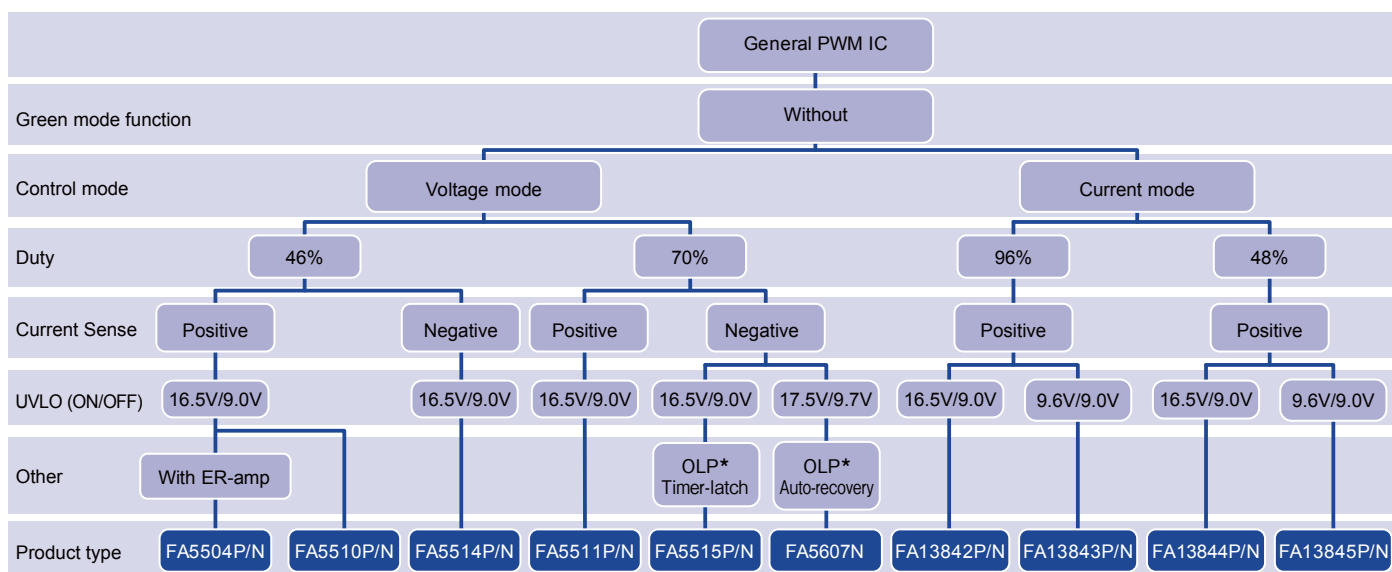
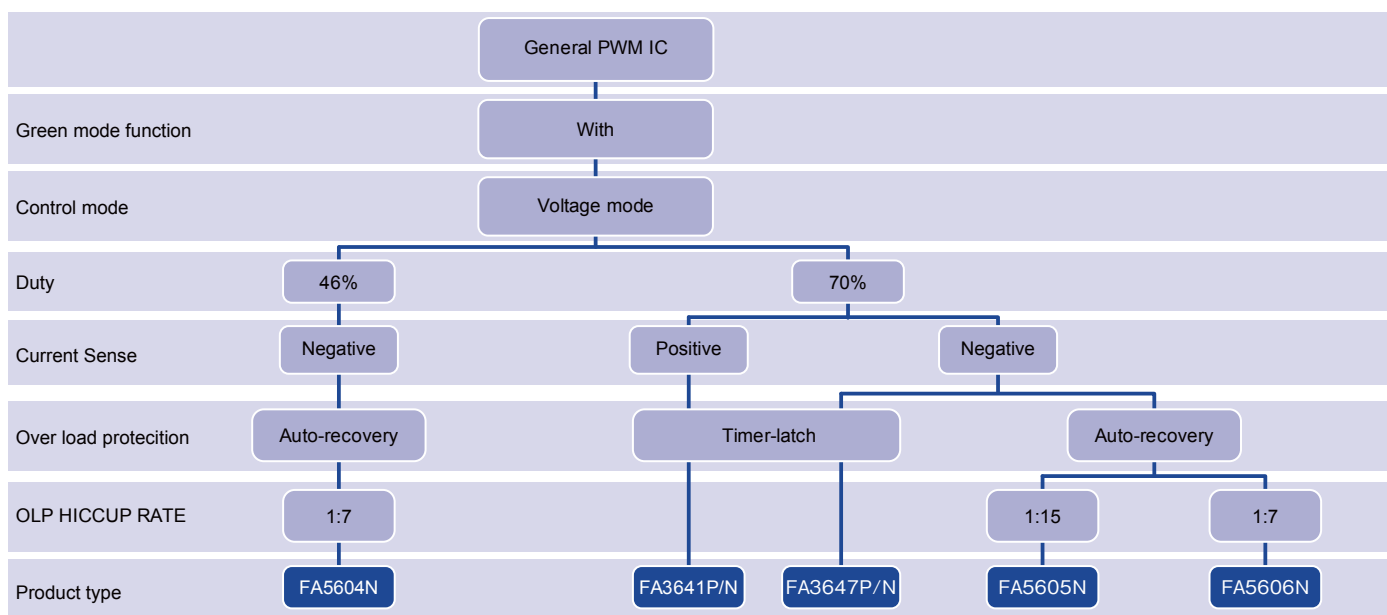
●: New Products

● General PWM-ICs

Type Name	Control mode	Duty	Input voltage	Current sense	Over load protection	Over voltage protection	Under-voltage lockout (ON/OFF)	Remarks	
With Green mode function									
FA3641P/N	Voltage mode	70%	10 - 28V	Positive	Timer-latch	Latch	16.5V/9.0V	Frequency reduction at light load	
FA3647P/N				Negative				Frequency reduction at light load	
FA5604N		46%	10 - 30V	Negative	Auto-Recovery		17.5V/9.7V	Overcurrent limit correction function Frequency reduction start/stop FB voltage under light load 1.8V/1.95V	
FA5605N								70%	Overcurrent limit correction function Frequency reduction start/stop FB voltage under light load 1.55V/1.65V
FA5606N									
Without Green mode function									
FA13842P/N	Current mode	96%	10 - 25V	Positive	-	-	16.5V/9.0V		
FA13843P/N							9.6V/9.0V		
FA13844P/N		48%					16.5V/9.0V		
FA13845P/N							9.6V/9.0V		
FA5504P/N	Voltage mode	46%	10 - 28V	Positive	Timer-latch	Latch	16.5V/9.0V	With error amplifier	
FA5510P/N									
FA5511P/N		70%							
FA5514P/N		46%							
FA5515P/N		70%		Negative	Auto-Recovery		17.5V/9.7V	Overcurrent limit correction function	
FA5607N			10 - 30V						

PKG: "P":DIP-8, "N":SOP-8
Frequency: Adjustable

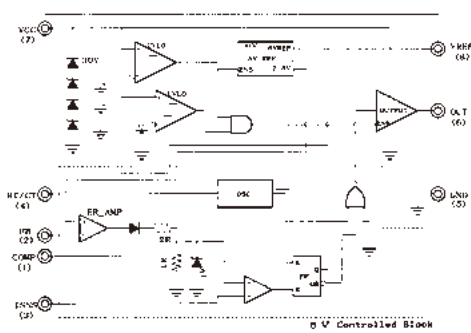
- General PWM-ICs



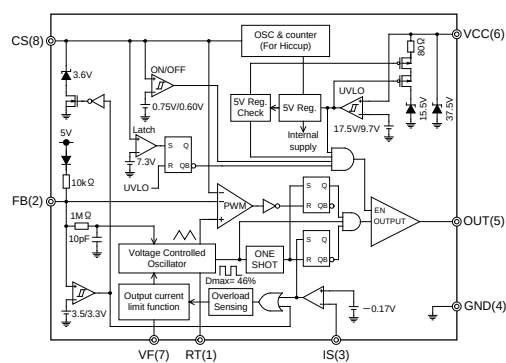
*OLP : Over Load Protection

- Block diagram (Main model)

FA13842P/N



FA5604N

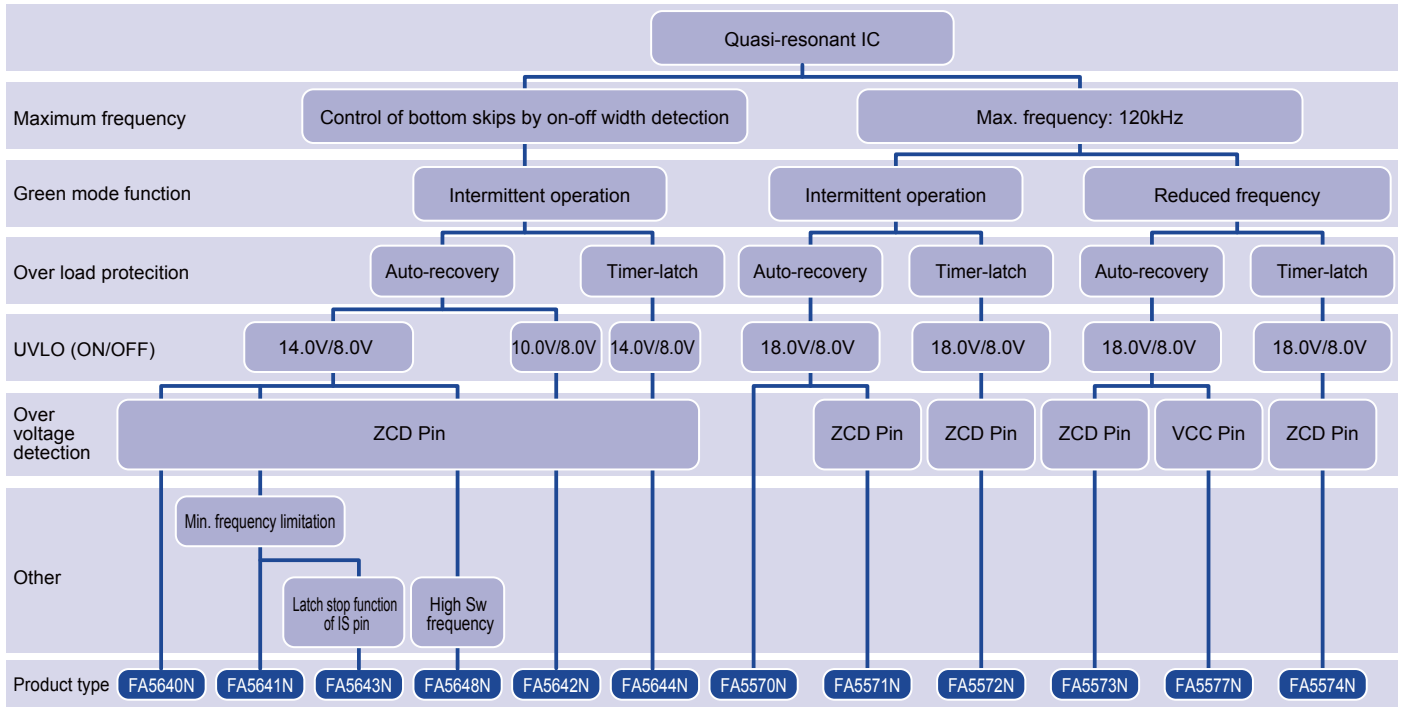


● Green mode Quasi-resonant ICs (Current mode)

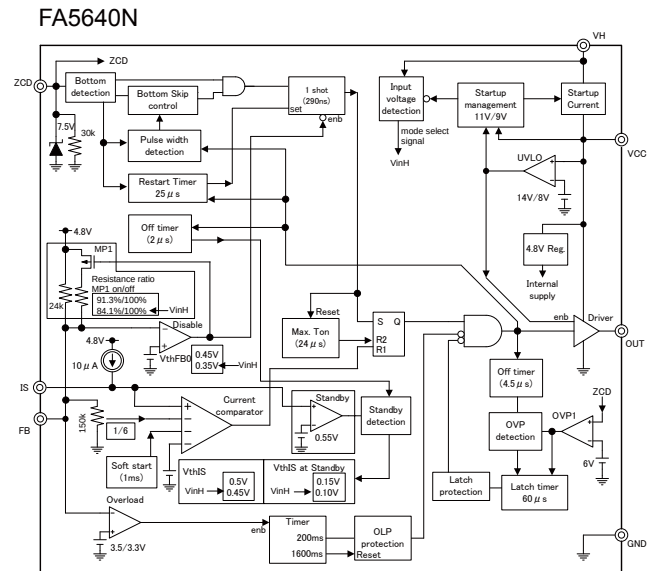
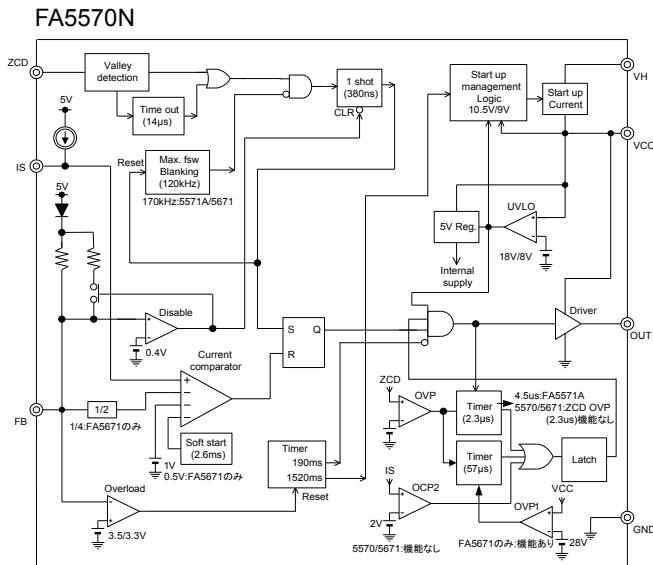
Type Name	Input voltage	Maximum frequency	Over load protection	Over voltage sense	Built-in start up circuit	Green mode function	Under-voltage lockout (ON/OFF)	Remarks
FA5570N	10 - 28V	Max. frequency limitation 120kHz	Auto-Recovery	—	500V	Intermittent operation	18V/8V	
FA5571N				ZCD Pin				Over voltage protection Latch
FA5572N			Timer-latch					
FA5573N			Auto-Recovery					
FA5574N			Timer-latch					
FA5577N			Auto-Recovery	VCC Pin				
FA5640N	11 - 26V	Bottom skip control by on-off width detection	Auto-Recovery	ZCD Pin	500V	Intermittent operation	14V/8V	
FA5641N								Min. frequency limitation
FA5642N							10V/8V	
FA5643N			14V/8V				Min. frequency limitation Latch stop function (IS pin)	
FA5644N								
FA5648N							For High SW frequency	

PKG: SOP-8

● Green mode Quasi-resonant ICs



● Block diagram (Main model)



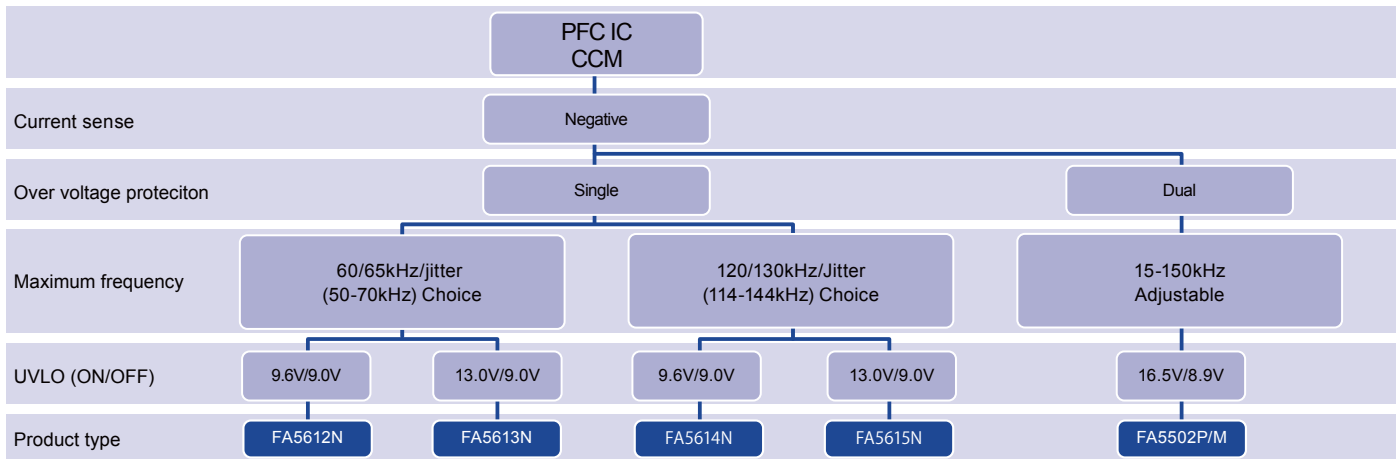
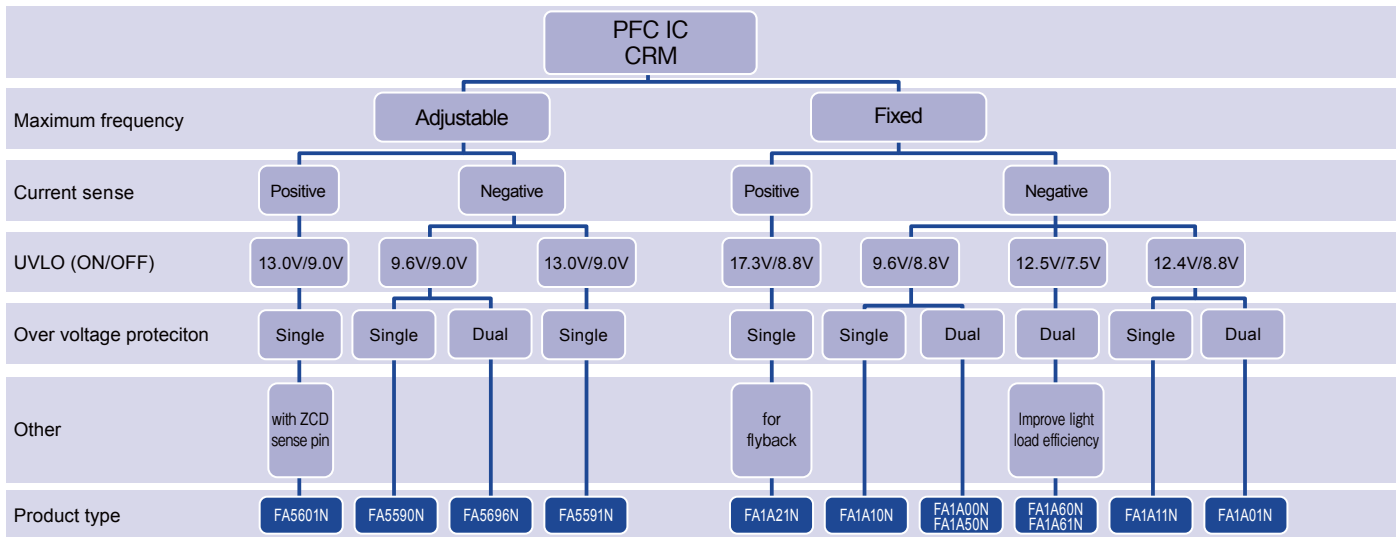
● Power factor correction ICs

Type Name	Input voltage	Duty	Current sense	Under-voltage lockout (ON/OFF)	Frequency	Maximum frequency	Zero Current Detection	FB open short protection	Over voltage protection	Remarks	
CRM PFC											
FA5590N	10 - 26V	—	Negative	9.6V/9.0V	Self-oscillation	Adjustable	Current sense	✓	Voltage-Limit by Pulse width		
FA5591N				13.0V/9.0V							
FA1A10N				9.6V/8.8V							
FA1A11N				12.4V/8.8V							
FA1A50N				9.6V/8.8V							
FA1A60N				12.5V/7.5V		Fixed				✓(Open protection only)	Voltage-Limit by Pulse width and Voltage-Limit
FA1A61N								Improve transient response Cooperate with FA6B21N			
FA5696N								9.6V/9.0V	Adjustable		
FA1A00N				9.6V/8.8V		Fixed		✓			
FA1A01N			12.4V/8.8V								
FA5601N			Positive	13.0V/9.0V	Adjustable	Auxiliary-winding			Voltage-Limit by Pulse width		
FA1A21N				17.3V/8.8V	Fixed		—		Voltage-Limit (V _{CC})	For Flyback Over load protection	
CCM PFC											
FA5502P/M	10 - 28V	94%	Negative	16.5V/8.9V	Adjustable	150kHz	—		—	Voltage-Limit	
FA5612N	10 - 26V			9.6V/9.0V	Choice 65/60kHz/jitter (50-70kHz)	—		—	✓	Voltage-Limit by Pulse width	Frequency diffusion function
FA5613N				13.0V/9.0V							
FA5614N	10 - 26V			9.6V/9.0V	Choice 130/120kHz/jitter (114-144kHz)						
FA5615N				13.0V/9.0V							

PKG: FA5502 "P":DIP16, "M":SOP-16(M), others are 8pin

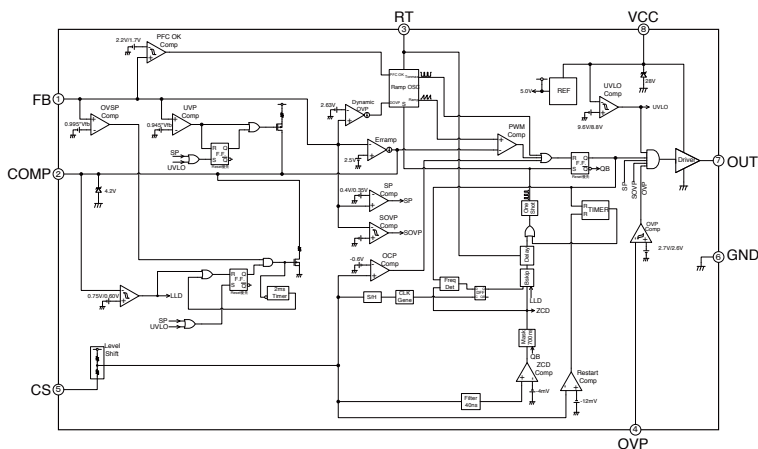
●: New Products

● Power factor correction ICs

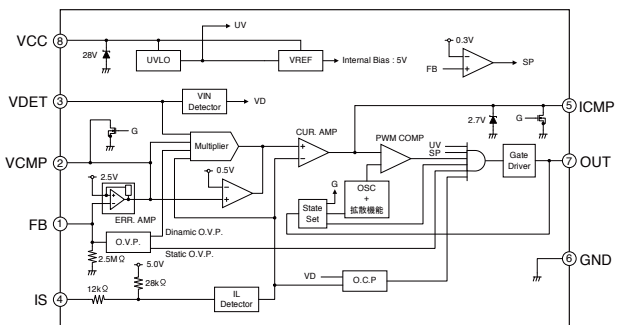


● Block diagram (Main model)

FA1A50N



FA5612N, FA5613N, FA5614N, FA5615N

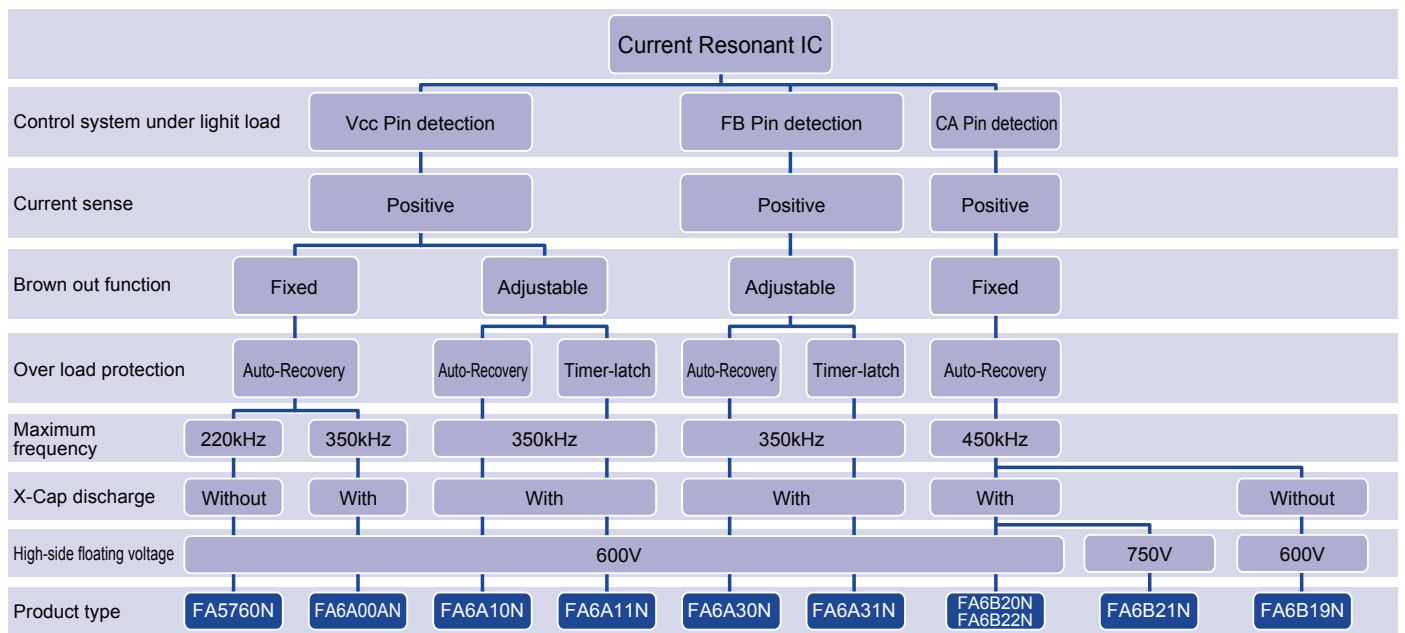


● Current Resonant ICs

Type Name	Control mode	Input voltage	Under-voltage lockout (ON/OFF)	Current sense	Frequency	Maximum frequency	Over load protection	Over voltage protection	Built-in start up circuit	High-side floating voltage	Brown out function	X-Cap discharge function						
FA5760N	Voltage mode	10 - 24V	12.0V/8.9V	Positive	Self-oscillation	220kHz	Auto-Recovery	Latch	600V	600V	Fixed	Without						
FA6A00AN		14 - 27V	12.0V/9.0V			350kHz							350kHz	Timer-latch	Auto-Recovery	Timer-latch	Adjustable	With
FA6A10N						350kHz					Timer-latch	Auto-Recovery						
FA6A11N							350kHz											
FA6A30N													350kHz	Timer-latch	Auto-Recovery	Timer-latch		
FA6A31N		350kHz	Timer-latch			Auto-Recovery					Timer-latch							
FA6B19N							14 - 29V	14.0V/9.0V				450kHz					Auto-Recovery	Auto-Recovery
FA6B20N																		
FA6B22N																		
FA6B21N																		

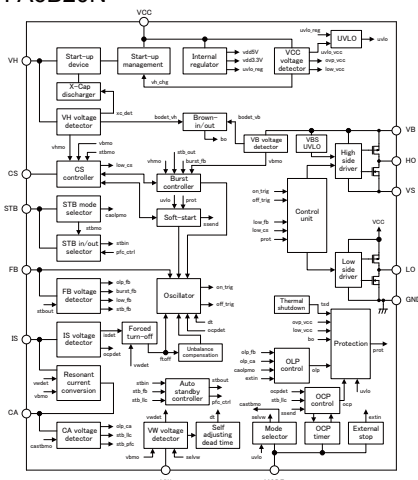
●: New Products PKG: SOP-16(N)

● Current Resonant ICs

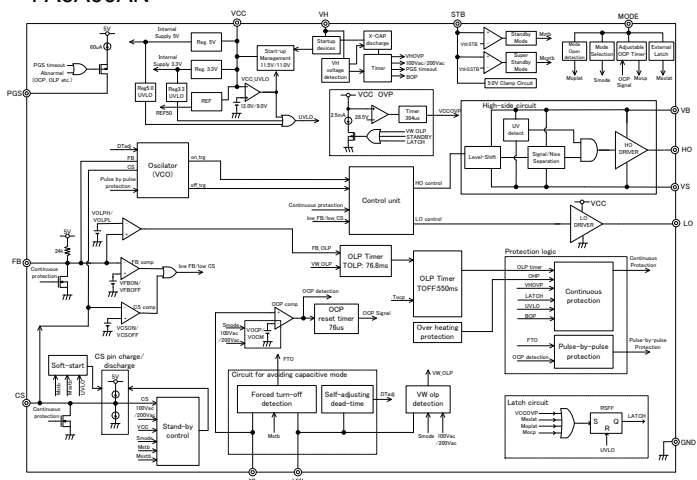


● Block diagram (Main model)

FA6B20N



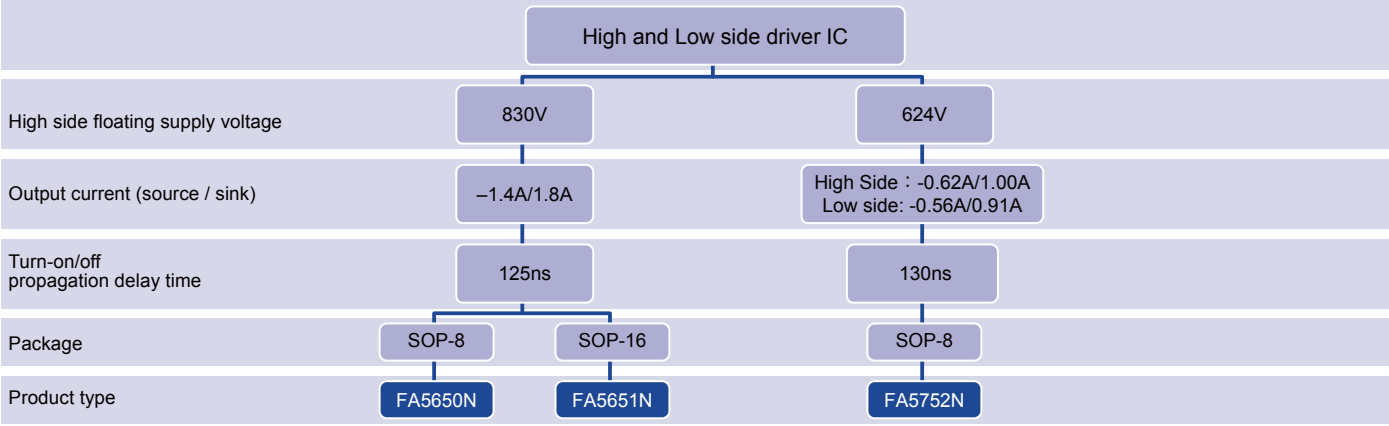
FA6A00AN



High and Low side driver ICs

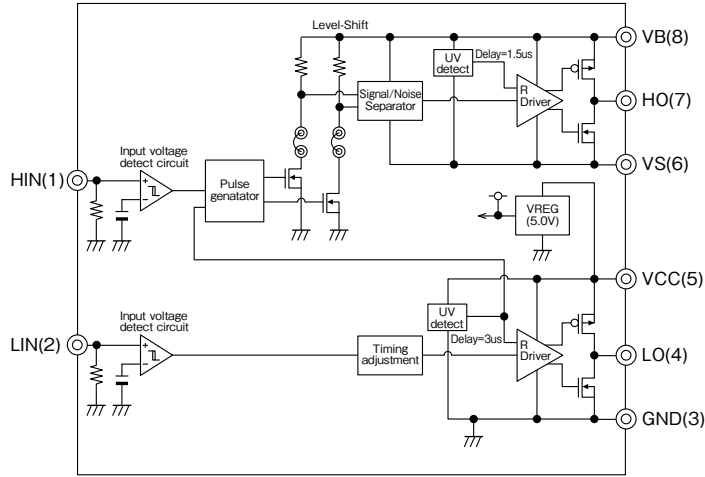
Type name	Absolute maximum ratings				Electrical characteristics				
	High side floating supply voltage	Maximum supply voltage	Output current source / sink	Maximum input frequency	Logic"1" / "0" Input voltage level (typ.)	Turn-on/off propagation delay time (typ.)	VCC and VBS supply under-voltage threshold (typ.)	Number of Input terminal	Package
FA5650N	830V	30V	-1.4A/1.8A	500kHz	Logic"1" 2.1V Logic"0" 1.1V	125ns	positive going 8.9V negative going 8.2V	2	SOP-8
FA5651N									SOP-16
FA5752N	624V	24V	High side IHO: -0.62A/1.00A Low side ILO: -0.56A/0.91A		Logic"1" 2.1V Logic"0" 1.3V	130ns			SOP-8

High and Low side driver IC

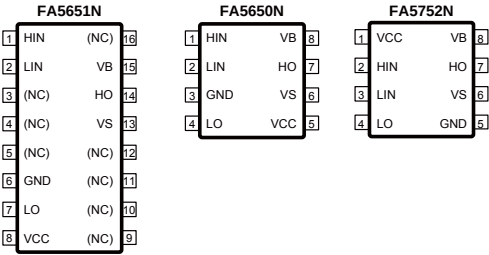


Block diagram (Main model)

FA5650N



Pin Layout

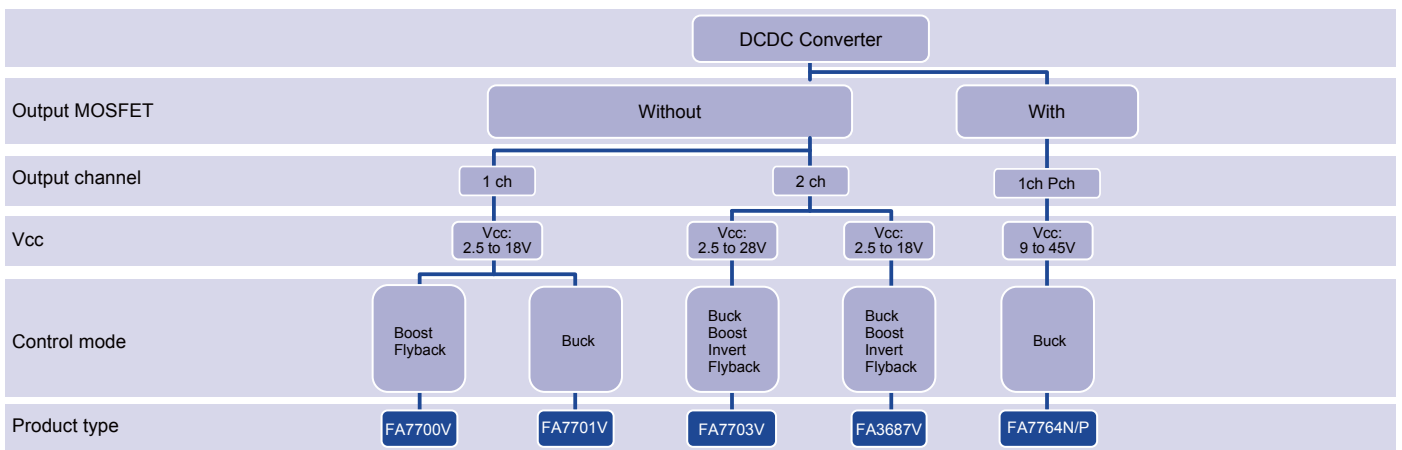


DC/DC Power Supply control ICs

● DC/DC Power Supply control ICs

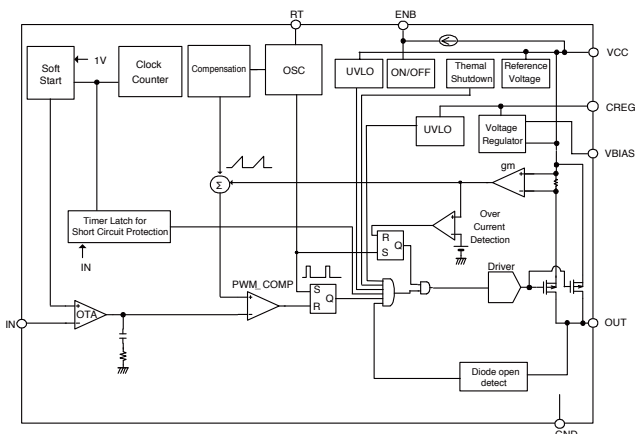
Type Name	Control mode				Output channel	Input voltage	Frequency	Reference Voltage	Operating Ambient Temperature	Output Current	Output MOSFET	Package
	Boost	Fly back	Buck	Inverting								
FA7700V	✓	✓			1	2.5 - 18V	50k - 1MHz	0.88V	-30 — +85°C	—	—	TSSOP-8
FA7701V			✓		1	2.5 - 18V	50k - 1MHz	0.88V	-30 — +85°C	—	—	TSSOP-8
FA7703V	✓	✓	✓	✓	2	2.5 - 28V	50k - 1MHz	1.0V	-30 — +85°C	—	—	TSSOP-16
FA3687V	✓	✓	✓	✓	2	2.5 - 18V	300k - 1.5MHz	1.0V	-40 — +85°C	—	—	TSSOP-16
FA7764N/P			✓		1	9 - 45V	30k - 400kHz	1.0V	-20 — +85°C	1.5A	With	N:SOP-8E P:DIP-8

● DC/DC Power Supply control ICs



● Block diagram (Main model)

FA7764N/P

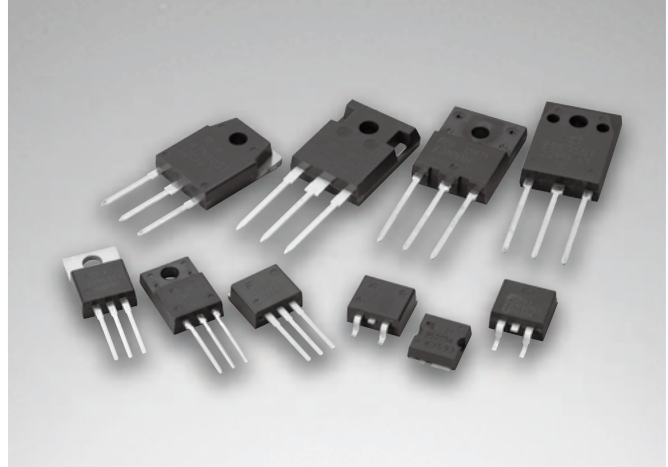


Power MOSFETs



Fuji Electric has a lineup of power MOSFETs ranging from medium to high-voltage types with features such as low power loss, low noise, and low on-resistance.

The "Super J-MOS[®]" Series uses superjunction technology, and was developed primarily for models with a withstand voltage of 600 V.

MOSFET Super J MOS[®] S2 Series

■ Concept

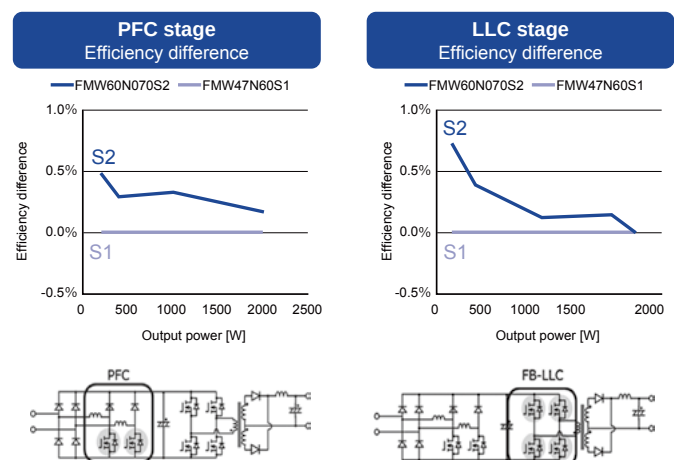
Superjunction technology has much improved trade-off characteristics between On-resistance and Breakdown voltage. Super J MOS[®] S2 has the same turn-off loss and turn-off dv/dt capabilities at conventional Super J MOS[®] S1. As a result, It contributes to high efficiency and miniaturization of power supply.

■ Applications

PFC or PWM converter for Server, PC, PCS, UPS, LCD-TV, Lighting and Standard power supply

■ Features & Benefit of Super J MOS[®] S2 series

Feature	Benefit
Low on-state resistance Low switching loss	➔ High efficiency High power density
Low gate charge (Q_G) Low energy stored in output capacitance (E_{OSS})	➔ High efficiency at low load
Easy to use (more controllable dv/dt by R_G and Low V_{DS} surge)	➔ Easy to design
100% avalanche tested	➔ High reliability

■ Benefit (Efficiency) of Super J MOS[®] S2 series

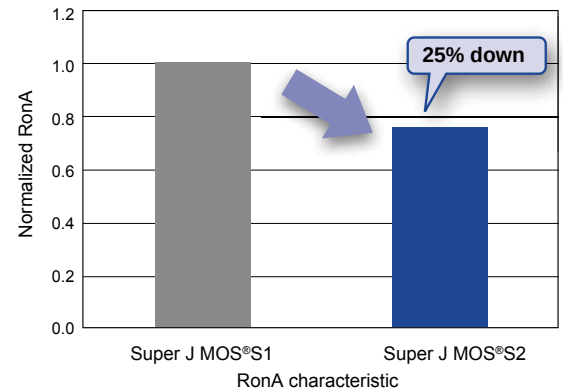
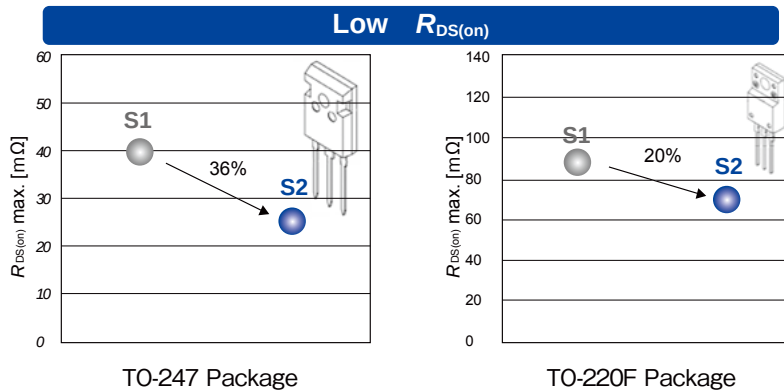
Circuit : PFC+LLC(Exchanged PFC MOS)
Input : 230V AC 50Hz
Output: 53.5V/ Iout=37A
External R_G : 2 Ω
Sample : 600V/70m Ω max

Circuit : PFC+LLC(Exchanged LLC MOS)
Input : 230V AC 50Hz
Output : 49V/ Iout=6.12~56.01A
External R_G : 5.1 Ω
Sample : 600V/70m Ω max.

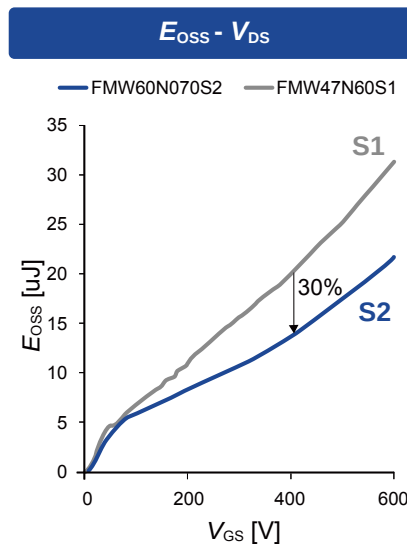
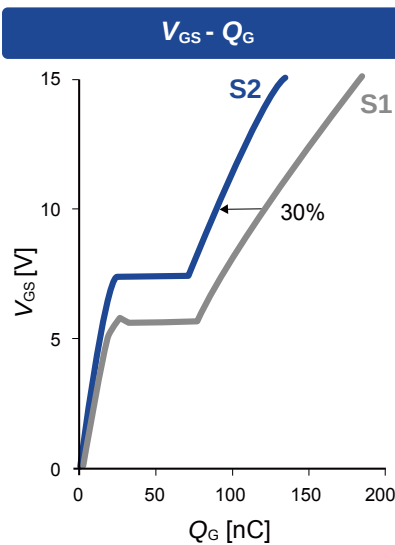
Super J MOS[®] is registered trademarks of Fuji Electric.

■ Features of Super J MOS[®] S2 series

- Low $R_{DS(on)}$ • A 25% lower than our conventional MOSFET (Super J MOS[®] S1)
- Due to low $R_{DS(on)}$, Selectable smaller package
ex) 600V/0.07Ω/TO-3P → 600V/0.07Ω/TO-220F



- Low Q_G 30% lower than our conventional MOSFET (Super J MOS[®] S1)
- Low E_{OSS} 30% lower than our conventional MOSFET (Super J MOS[®] S1)

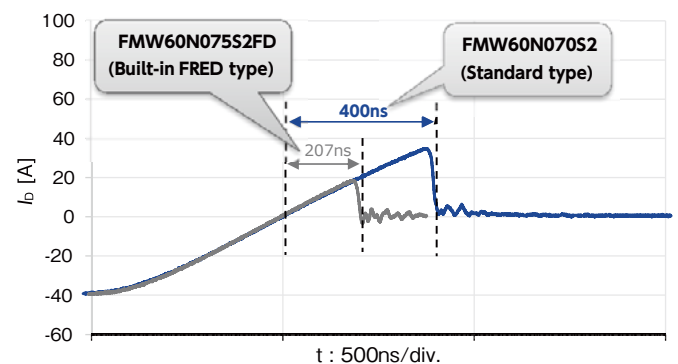


■ Features of Super J MOS[®] S2FD series (Built-in FRED type)

- t_{rr} of S2FD is 50% faster than S2
- High diode recovery ruggedness (High $-di_{DR}/dt$ ruggedness)
- Guaranteed avalanche robustness

■ Applications

For resonant switching topologies in applications like UPS, Server, Telecom, LED lighting, Power conditioner system and Power supply.



Conditions : $V_{DS}=400V$, $I_{DR}=39.4A$, $-di_{DR}/dt=100A/us$, $T_{ch}=25^\circ C$

Built-in diode recovery wave form

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Features of SuperFAP-E³, E^{3S} Series

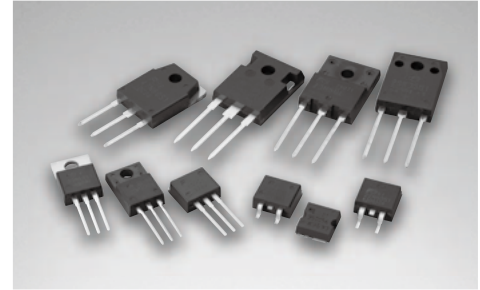
■ Concept

The second generation Quasi-Planer Junction technology copes with both low loss/noise and usability.

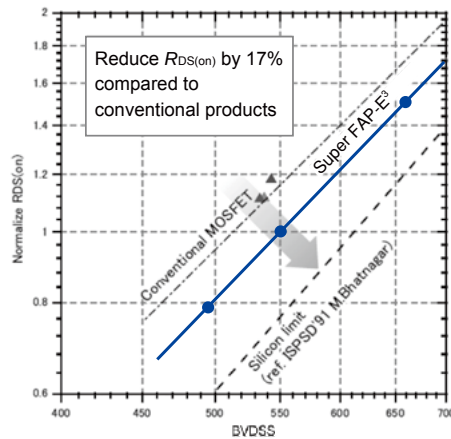
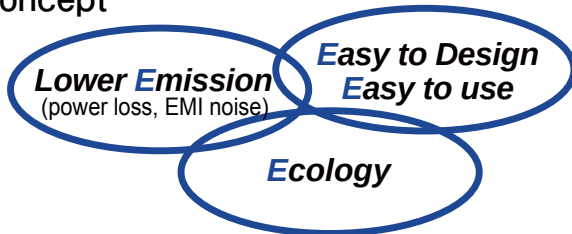
And this technology lets us achieve high performance for power supply's circuit design.

■ Features

- Coping with both low loss and low noise
- Low $R_{DS(on)}$
- High controllability of gate resistance during switching
- Low V_{GS} ringing waveform during switching
- Narrow band of the gate threshold voltage ($3.0 \pm 0.5V$)
- High avalanche durability



Concept



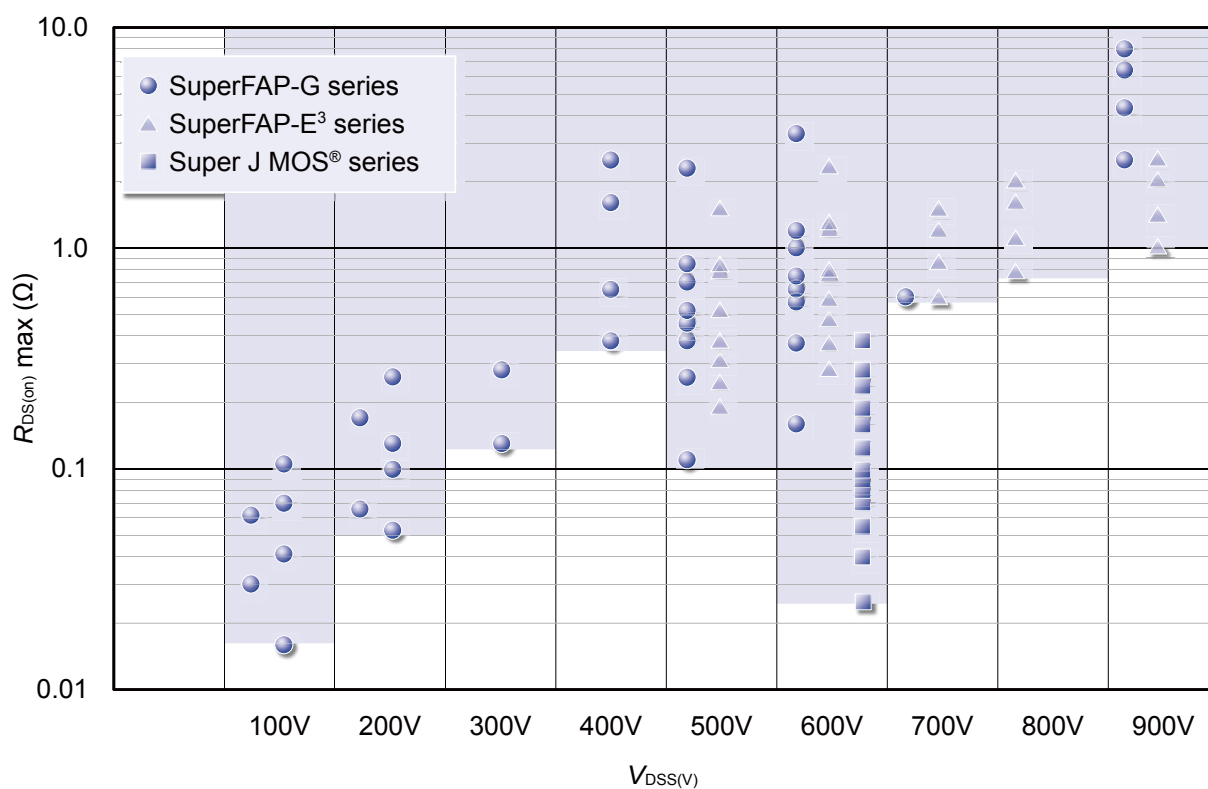
Features of SuperFAP-G Series

The Quasi-Planer Junction technology achieve low $R_{DS(on)}$ and low switching loss (low Q_{GD}).

■ Features

- Low turn off loss 75% lower than our conventional type
- Low Gate charge 60% lower than our conventional type
- High avalanche durability
- Due to low $R_{DS(on)}$, Selectable smaller package
ex) 500V/0.4Ω/TO-3P → 500V/0.38Ω/TO-220

Series map



Part numbers

FMV60N190S2 (example)

F	M	V	60	N	190	S2
Company Symbol	Device code	Package code	Voltage	Polarity	Ron(mΩ)	Series
Fuji	M MOSFET	C T-pack (S)	× 1/10	N N-ch	× 1	S2 Super J MOS® 2nd Gen.
		H TO-3P				S2FD Super J MOS® 2nd Gen. (FRED)
		L DFN8x8				S2A Super J MOS® 2nd Gen. for Automotive
		P TO-220				S2FDA Super J MOS® 2nd Gen. (FRED) for Automotive
		V TO-220F (SLS)				
		Y TO-247				
		W TO-247-P/T0-247-P2				

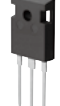
FMV20N50ES (example)

F	M	V	20	N	50	ES
Company Symbol	Device code	Package code	Current	Polarity	Voltage	Series
Fuji	M MOSFET	A TO-220F	× 1	N N-ch	× 1/10	E SuperFAP-E³
		C T-pack (S)				ES SuperFAP-E³S
		H TO-3P				G SuperFAP-G
		I T-pack (L)				GF SuperFAP-G (FRED)
		P TO-220				T2 Trench
		R TO-3PF				R 3G-Trench
		V TO-220F (SLS)				
		Y TO-247				
		W TO-247-P/T0-247-P2				

Super J MOS® is registered trademarks of Fuji Electric.

Super J MOS[®] S2 series

Low-on resistance, low switching noise and low switching loss

Super J MOS [®] S2 series			TO-220	TO-220F (SLS)	TO-3P(Q)	TO-247-P/TO-247-P2	DFN8x8
							
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)					
600	0.3800	10.0	✓	✓			
	0.2800	13.0	✓	✓	✓		
	0.2230	14.0					✓
	0.1900	20.0	✓	✓	✓	✓	
	0.1870	22.7					✓
	0.1600	23.9	✓	✓		✓	
	0.1460	28.7					✓
	0.1250	30.1	✓	✓		✓	
	0.1150	37.1					✓
	0.1030	41.3					✓
	0.0990	38.1	✓	✓		✓	
	0.0910	42.3					✓
	0.0880	42.3	✓	✓		✓	
	0.0790	47.9	✓	✓		✓	
	0.0700	53.2		✓		✓	
	0.0550	64.4				✓	
	0.0400	77.5				✓	
	0.0254	95.5				✓	

600V class

Device type	V_{DSS} Volts	I_D Amps.	I_D (pulse) Amps.	$R_{DS(on)}$ max. Ohms	P_{tot} Watts	V_{GS} Volts	$V_{GS(th)}$ Volts	Q_G typ. nC	Package	Net mass Grams
FMP60N380S2	600	10.0	32.4	0.3800	62	30	3.0±0.5	27.5	TO-220	2.0
FMV60N380S2	600	10.0	32.4	0.3800	20	30	3.0±0.5	27.5	TO-220F(SLS)	1.7
FMP60N280S2	600	13.0	41.6	0.2800	75	30	3.0±0.5	33	TO-220	2.0
FMV60N280S2	600	13.0	41.6	0.2800	26	30	3.0±0.5	33	TO-220F(SLS)	1.7
FMH60N280S2	600	13.0	41.6	0.2800	65	30	3.0±0.5	33	TO-3P(Q)	5.0
● FML60N223S2	600	14.0	56.0	0.2230	108	30	4.0±0.5	37	DFN8x8	0.2
FMP60N190S2	600	20.0	62.0	0.1900	113	30	3.0±0.5	46	TO-220	2.0
FMV60N190S2	600	20.0	62.0	0.1900	38	30	3.0±0.5	46	TO-220F(SLS)	1.7
FMH60N190S2	600	20.0	62.0	0.1900	94	30	3.0±0.5	46	TO-3P(Q)	5.0
FMW60N190S2	600	20.0	62.0	0.1900	94	30	3.0±0.5	46	TO-247-P/TO-247-P2	6.0
● FML60N187S2	600	22.7	66.0	0.1870	127	30	4.0±0.5	43	DFN8x8	0.2
FMP60N160S2	600	23.9	71.6	0.1600	127	30	4.0±0.5	43	TO-220	2.0
FMV60N160S2	600	23.9	71.6	0.1600	45	30	4.0±0.5	43	TO-220F(SLS)	1.7
FMW60N160S2	600	23.9	71.6	0.1600	110	30	4.0±0.5	43	TO-247-P/TO-247-P2	6.0
● FML60N146S2	600	28.7	83.6	0.1460	159	30	4.0±0.5	53	DFN8x8	0.2
FMP60N125S2	600	30.1	90.8	0.1250	160	30	4.0±0.5	53	TO-220	2.0
FMV60N125S2	600	30.1	90.8	0.1250	57	30	4.0±0.5	53	TO-220F(SLS)	1.7
FMW60N125S2	600	30.1	90.8	0.1250	140	30	4.0±0.5	53	TO-247-P/TO-247-P2	6.0
● FML60N115S2	600	37.1	108.0	0.1150	208	30	4.0±0.5	65	DFN8x8	0.2
● FML60N103S2	600	41.3	120.4	0.1030	232	30	4.0±0.5	72	DFN8x8	0.2
FMP60N099S2	600	38.1	117.0	0.0990	210	30	4.0±0.5	65	TO-220	2.0
FMV60N099S2	600	38.1	117.0	0.0990	75	30	4.0±0.5	65	TO-220F(SLS)	1.7
FMW60N099S2	600	38.1	117.0	0.0990	185	30	4.0±0.5	65	TO-247-P/TO-247-P2	6.0
● FML60N091S2	600	42.3	125.6	0.0910	263	30	4.0±0.5	80	DFN8x8	0.2

● : New Products

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Letter symbols

 V_{DSS} : Drain-source voltage I_D : Continuous drain current I_D (pulse): Pulsed drain current $R_{DS(on)}$: Drain-source on-state resistance P_{tot} : Maximum power dissipation V_{GS} : Gate-source voltage $V_{GS(th)}$: Gate threshold voltage Q_G : Total gate chargeThe Super J MOS[®] series products satisfies the quality assurance level of general consumer use.If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

■ 600V class

型 式	V_{DS} (V)	I_D (A)	I_D (pulse) (A)	$R_{DS(on)}$ max. (Ω)	P_{tot} (W)	V_{GS} (V)	$V_{GS(th)}$ (V)	Q_G typ. (nC)	Package	Net mass Grams
FMP60N088S2	600	42.3	131	0.0880	235	30	4.0±0.5	72	TO-220	2.0
FMV60N088S2	600	42.3	131	0.0880	85	30	4.0±0.5	72	TO-220F(SLS)	1.7
FMW60N088S2	600	42.3	131	0.0880	205	30	4.0±0.5	72	TO-247-P/TO-247-P2	6.0
FMP60N079S2	600	47.9	148	0.0790	270	30	4.0±0.5	80	TO-220	2.0
FMV60N079S2	600	47.9	148	0.0790	95	30	4.0±0.5	80	TO-220F(SLS)	1.7
FMW60N079S2	600	47.9	148	0.0790	235	30	4.0±0.5	80	TO-247-P/TO-247-P2	6.0
FMV60N070S2	600	53.2	158	0.0700	110	30	4.0±0.5	90	TO-220F(SLS)	1.7
FMW60N070S2	600	53.2	158	0.0700	270	30	4.0±0.5	90	TO-247-P/TO-247-P2	6.0
FMW60N055S2	600	64.4	200	0.0550	340	30	4.0±0.5	110	TO-247-P/TO-247-P2	6.0
FMW60N040S2	600	77.5	265	0.0400	435	30	4.0±0.5	147	TO-247-P/TO-247-P2	6.0
FMW60N025S2	600	95.5	286.5	0.0254	575	30	4.0±0.5	222	TO-247-P/TO-247-P2	6.0

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Super J MOS[®] S2FD series (Built-in FRED type)

Low-on resistance, low switching noise and low switching loss

Super J MOS [®] S2FD Series (Built-in FRED type)			TO-220	TO-220F (SLS)	TO-247-P/TO-247-P2	DFN8x8
						
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)				
600	0.191	22.7				✓
	0.170	23.9	✓	✓	✓	
	0.150	28.7				✓
	0.133	30.1	✓	✓	✓	
	0.118	37.1				✓
	0.105	38.1	✓	✓	✓	
	0.104	41.3				✓
	0.094	42.3	✓	✓	✓	
	0.093	42.3				✓
	0.084	47.9	✓	✓	✓	
	0.075	53.2		✓	✓	
	0.059	64.4			✓	
	0.043	77.5			✓	
	0.027	95.5			✓	

600V class

Device type	V_{DSS} Volts	I_D Amps.	I_D (pulse) Amps.	$R_{DS(on)}$ max. Ohms	P_{tot} Watts	V_{GS} Volts	$V_{GS(th)}$ Volts	Q_G typ. nC	t_{rr} typ. ns	Package	Net mass Grams
● FML60N191S2FD	600	22.7	66	0.191	127	30	4.0±1.0	48	150	DFN8x8	0.2
FMP60N170S2FD	600	23.9	71.6	0.170	127	30	4.0±1.0	48	150	TO-220	2.0
FMV60N170S2FD	600	23.9	71.6	0.170	45	30	4.0±1.0	48	150	TO-220F(SLS)	1.7
FMW60N170S2FD	600	23.9	71.6	0.170	110	30	4.0±1.0	48	150	TO-247-P/TO-247-P2	6.0
● FML60N150S2FD	600	28.7	83.6	0.150	159	30	4.0±1.0	59	160	DFN8x8	0.2
FMP60N133S2FD	600	30.1	90.8	0.133	160	30	4.0±1.0	59	160	TO-220	2.0
FMV60N133S2FD	600	30.1	90.8	0.133	57	30	4.0±1.0	59	160	TO-220F(SLS)	1.7
FMW60N133S2FD	600	30.1	90.8	0.133	140	30	4.0±1.0	59	160	TO-247-P/TO-247-P2	6.0
● FML60N118S2FD	600	37.1	108	0.118	208	30	4.0±1.0	75	174	DFN8x8	0.2
FMP60N105S2FD	600	38.1	117	0.105	210	30	4.0±1.0	75	174	TO-220	2.0
FMV60N105S2FD	600	38.1	117	0.105	75	30	4.0±1.0	75	174	TO-220F(SLS)	1.7
FMW60N105S2FD	600	38.1	117	0.105	185	30	4.0±1.0	75	174	TO-247-P/TO-247-P2	6.0
● FML60N104S2FD	600	41.3	120.4	0.104	232	30	4.0±1.0	83	185	DFN8x8	0.2
FMP60N094S2FD	600	42.3	131	0.094	235	30	4.0±1.0	83	185	TO-220	2.0
FMV60N094S2FD	600	42.3	131	0.094	85	30	4.0±1.0	83	185	TO-220F(SLS)	1.7
FMW60N094S2FD	600	42.3	131	0.094	205	30	4.0±1.0	83	185	TO-247-P/TO-247-P2	6.0
● FML60N093S2FD	600	42.3	125.6	0.093	263	30	4.0±1.0	93	190	DFN8x8	0.2
FMP60N084S2FD	600	47.9	148	0.084	270	30	4.0±1.0	93	190	TO-220	2.0
FMV60N084S2FD	600	47.9	148	0.084	95	30	4.0±1.0	93	190	TO-220F(SLS)	1.7
FMW60N084S2FD	600	47.9	148	0.084	235	30	4.0±1.0	93	190	TO-247-P/TO-247-P2	6.0
FMV60N075S2FD	600	53.2	158	0.075	110	30	4.0±1.0	97	207	TO-220F(SLS)	1.7
FMW60N075S2FD	600	53.2	158	0.075	270	30	4.0±1.0	97	207	TO-247-P/TO-247-P2	6.0
FMW60N059S2FD	600	64.4	200	0.059	340	30	4.0±1.0	129	215	TO-247-P/TO-247-P2	6.0
FMW60N043S2FD	600	77.5	265	0.043	435	30	4.0±1.0	177	250	TO-247-P/TO-247-P2	6.0
FMW60N027S2FD	600	95.5	286.5	0.027	575	30	4.0±1.0	256	288	TO-247-P/TO-247-P2	6.0

●: New Product

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SuperFAP-E³ series

Low-on resistance and low switching noise

SuperFAP-E ³ series			TO-220	TO-220 (SLS)	TO-3P (Q)	TO-3PF	T-Pack(L)	T-Pack(S)
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)						
500	1.5	5	✓	✓			✓	✓
	0.85	6.5	✓	✓			✓	✓
	0.79	7.5	✓	✓				
	0.52	12	✓	✓			✓	✓
	0.38	16	✓	✓	✓		✓	✓
	0.31	20	✓	✓	✓		✓	✓
	0.245	23		✓	✓	✓		
	0.19	28			✓	✓		
600	2.3	3	✓	✓			✓	✓
	1.3	6	✓	✓			✓	✓
	1.2	6	✓	✓				
	0.79	10	✓	✓			✓	✓
	0.75	11	✓	✓			✓	✓
	0.58	13	✓	✓			✓	✓
	0.47	16	✓	✓			✓	✓
	0.365	19		✓	✓	✓		
650	0.28	23			✓	✓		
	1.47	7		✓				
700	0.97	9		✓				
	1.5	7		✓	✓			
800	1.2	9		✓	✓			
	0.85	11		✓	✓			
	0.59	15		✓				
	2	6		✓	✓		✓	✓
900	1.6	8		✓	✓		✓	✓
	1.1	10		✓	✓			
	0.78	13		✓	✓			
	2.5	6		✓	✓		✓	✓
	2	7		✓	✓		✓	✓
900	1.4	9		✓	✓	✓		
	1	11		✓	✓	✓		

MOSFET

■ SuperFAP-E³ series

■ 500V class

Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS(th)}	Q _G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
FMP05N50E	500	5	20	1.5	60	30	3±0.5	21	TO-220	2.0
FMV05N50E	500	5	20	1.5	21	30	3±0.5	21	TO-220F(SLS)	1.7
FMI05N50E	500	5	20	1.5	60	30	3±0.5	21	T-Pack(L)	1.6
FMC05N50E	500	5	20	1.5	60	30	3±0.5	21	T-Pack(S)	1.6
FMP07N50E	500	6.5	26	0.85	90	30	3±0.5	32	TO-220	2.0
FMV07N50E	500	6.5	26	0.85	32	30	3±0.5	32	TO-220F(SLS)	1.7
FMI07N50E	500	6.5	26	0.85	90	30	3±0.5	32	T-Pack(L)	1.6
FMC07N50E	500	6.5	26	0.85	90	30	3±0.5	32	T-Pack(S)	1.6
FMP08N50E	500	7.5	30	0.79	105	30	3±0.5	35	TO-220	2.0
FMV08N50E	500	7.5	30	0.79	37	30	3±0.5	35	TO-220F(SLS)	1.7
FMP12N50E	500	12	48	0.52	165	30	3±0.5	60	TO-220	2.0
FMV12N50E	500	12	48	0.52	60	30	3±0.5	60	TO-220F(SLS)	1.7
FMI12N50E	500	12	48	0.52	165	30	3±0.5	60	T-Pack(L)	1.6
FMC12N50E	500	12	48	0.52	165	30	3±0.5	60	T-Pack(S)	1.6
FMP16N50E	500	16	64	0.38	225	30	3±0.5	60	TO-220	2.0
FMV16N50E	500	16	64	0.38	80	30	3±0.5	60	TO-220F(SLS)	1.7
FMI16N50E	500	16	64	0.38	225	30	3±0.5	60	T-Pack(L)	1.6
FMC16N50E	500	16	64	0.38	225	30	3±0.5	60	T-Pack(S)	1.6
FMH16N50E	500	16	64	0.38	195	30	3±0.5	60	TO-3P(Q)	5.1
FMP20N50E	500	20	80	0.31	270	30	3±0.5	77	TO-220	2.0
FMV20N50E	500	20	80	0.31	95	30	3±0.5	77	TO-220F(SLS)	1.7
FMI20N50E	500	20	80	0.31	270	30	3±0.5	77	T-Pack(L)	1.6
FMC20N50E	500	20	80	0.31	270	30	3±0.5	77	T-Pack(S)	1.6
FMH20N50E	500	20	80	0.31	235	30	3±0.5	77	TO-3P(Q)	5.1
FMV23N50E	500	23	92	0.245	130	30	3±0.5	93	TO-220F(SLS)	1.7
FMH23N50E	500	23	92	0.245	315	30	3±0.5	93	TO-3P(Q)	5.1
FMR23N50E	500	23	92	0.245	150	30	3±0.5	93	TO-3PF	6.0
FMH28N50E	500	28	112	0.19	400	30	3±0.5	130	TO-3P(Q)	5.1
FMR28N50E	500	28	112	0.19	200	30	3±0.5	130	TO-3PF	6.0

*1 R_{DS(on)}: V_{GS}=10V, *2 P_{tot}: T_C=25°C

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SuperFAP-E³ series

600 – 800V class

Device type	V _{DS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS} (th)	Q _G typ. nC	Package	Net mass Grams
FMP03N60E	600	3	12	2.3	60	30	3±0.5	21.5	TO-220	2.0
FMV03N60E	600	3	12	2.3	21	30	3±0.5	21.5	TO-220F(SLS)	1.7
FMI03N60E	600	3	12	2.3	60	30	3±0.5	21.5	T-Pack(L)	1.6
FMC03N60E	600	3	12	2.3	60	30	3±0.5	21.5	T-Pack(S)	1.6
FMP05N60E	600	5.5	22	1.3	90	30	3±0.5	33	TO-220	2.0
FMV05N60E	600	5.5	22	1.3	32	30	3±0.5	33	TO-220F(SLS)	1.7
FMI05N60E	600	5.5	22	1.3	90	30	3±0.5	33	T-Pack(L)	1.6
FMC05N60E	600	5.5	22	1.3	90	30	3±0.5	33	T-Pack(S)	1.6
FMP06N60E	600	6	24	1.2	105	30	3±0.5	35	TO-220	2.0
FMV06N60E	600	6	24	1.2	37	30	3±0.5	35	TO-220F(SLS)	1.7
FMP10N60E	600	10	40	0.79	165	30	3±0.5	47	TO-220	2.0
FMV10N60E	600	10	40	0.79	60	30	3±0.5	47	TO-220F(SLS)	1.7
FMI10N60E	600	10	40	0.79	165	30	3±0.5	47	T-Pack(L)	1.6
FMC10N60E	600	10	40	0.79	165	30	3±0.5	47	T-Pack(S)	1.6
FMP11N60E	600	11	44	0.75	180	30	3±0.5	48.5	TO-220	2.0
FMV11N60E	600	11	44	0.75	65	30	3±0.5	48.5	TO-220F(SLS)	1.7
FMI11N60E	600	11	44	0.75	180	30	3±0.5	48.5	T-Pack(L)	1.6
FMC11N60E	600	11	44	0.75	180	30	3±0.5	48.5	T-Pack(S)	1.6
FMP13N60E	600	13	52	0.58	225	30	3±0.5	60	TO-220	2.0
FMV13N60E	600	13	52	0.58	80	30	3±0.5	60	TO-220F(SLS)	1.7
FMI13N60E	600	13	52	0.58	225	30	3±0.5	60	T-Pack(L)	1.6
FMC13N60E	600	13	52	0.58	225	30	3±0.5	60	T-Pack(S)	1.6
FMP16N60E	600	16	64	0.47	270	30	3±0.5	76	TO-220	2.0
FMV16N60E	600	16	64	0.47	95	30	3±0.5	76	TO-220F(SLS)	1.7
FMI16N60E	600	16	64	0.47	270	30	3±0.5	76	T-Pack(L)	1.6
FMC16N60E	600	16	64	0.47	270	30	3±0.5	76	T-Pack(S)	1.6
FMV19N60E	600	19	76	0.365	130	30	3±0.5	105	TO-220F(SLS)	1.7
FMH19N60E	600	19	76	0.365	315	30	3±0.5	105	TO-3P(Q)	5.1
FMR19N60E	600	19	76	0.365	150	30	3±0.5	105	TO-3PF	6.0
FMH23N60E	600	23	92	0.28	400	30	3±0.5	130	TO-3P(Q)	5.1
FMR23N60E	600	23	92	0.28	200	30	3±0.5	130	TO-3PF	6.0
FMV07N65E	650	7	28	1.47	37	30	3±0.5	35	TO-220F(SLS)	1.7
FMV09N65E	650	9	36	0.97	60	30	3±0.5	47	TO-220F(SLS)	1.7
FMV07N70E	700	7	28	1.5	48	30	4±0.5	32	TO-220F(SLS)	1.7
FMH07N70E	700	7	28	1.5	115	30	4±0.5	32	TO-3P(Q)	5.1
FMV09N70E	700	9	36	1.2	60	30	4±0.5	38	TO-220F(SLS)	1.7
FMH09N70E	700	9	36	1.2	145	30	4±0.5	38	TO-3P(Q)	5.1
FMV11N70E	700	11	44	0.85	85	30	4±0.5	50	TO-220F(SLS)	1.7
FMH11N70E	700	11	44	0.85	205	30	4±0.5	50	TO-3P(Q)	5.1
FMV15N70E	700	15	60	0.59	120	30	4±0.5	66	TO-220F(SLS)	1.7
FMV06N80E	800	6	24	2.0	48	30	4±0.5	32	TO-220F(SLS)	1.7
FMH06N80E	800	6	24	2.0	115	30	4±0.5	32	TO-3P(Q)	5.1
FMI06N80E	800	6	24	2.0	135	30	4±0.5	32	T-Pack(L)	1.6
FMC06N80E	800	6	24	2.0	135	30	4±0.5	32	T-Pack(S)	1.6
FMV08N80E	800	8	32	1.6	60	30	4±0.5	38	TO-220F(SLS)	1.7
FMH08N80E	800	8	32	1.6	145	30	4±0.5	38	TO-3P(Q)	5.1
FMI08N80E	800	8	32	1.6	165	30	4±0.5	38	T-Pack(L)	1.6
FMC08N80E	800	8	32	1.6	165	30	4±0.5	38	T-Pack(S)	1.6
FMV10N80E	800	10	40	1.1	85	30	4±0.5	50	TO-220F(SLS)	1.7
FMH10N80E	800	10	40	1.1	205	30	4±0.5	50	TO-3P(Q)	5.1
FMV13N80E	800	13	52	0.78	120	30	4±0.5	66	TO-220F(SLS)	1.7
FMH13N80E	800	13	52	0.78	285	30	4±0.5	66	TO-3P(Q)	5.1

*1 R_{DS(on)} : V_{GS}=10V, *2 P_{tot}: T_C=25°C



Power MOSFETs

SuperFAP-E³ series

900V class

Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS (on)} max. *1	P _{tot} *2	V _{GS}	V _{GS (th)}	Q _G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
FMH06N90E	900	6	24	2.5	115	30	4±0.5	33	TO-3P(Q)	5.1
FMV06N90E	900	6	24	2.5	48	30	4±0.5	33	TO-220F(SLS)	1.7
FMI06N90E	900	6	24	2.5	135	30	4±0.5	33	T-Pack(L)	1.6
FMC06N90E	900	6	24	2.5	135	30	4±0.5	33	T-Pack(S)	1.6
FMH07N90E	900	7	28	2.0	145	30	4±0.5	39	TO-3P(Q)	5.1
FMV07N90E	900	7	28	2.0	60	30	4±0.5	39	TO-220F(SLS)	1.7
FMI07N90E	900	7	28	2.0	165	30	4±0.5	39	T-Pack(L)	1.6
FMC07N90E	900	7	28	2.0	165	30	4±0.5	39	T-Pack(S)	1.6
FMH09N90E	900	9	36	1.4	205	30	4±0.5	50	TO-3P(Q)	5.1
FMV09N90E	900	9	36	1.4	85	30	4±0.5	50	TO-220F(SLS)	1.7
FMR09N90E	900	9	36	1.4	100	30	4±0.5	50	TO-3PF	6.0
FMH11N90E	900	11	44	1.0	285	30	4±0.5	60	TO-3P(Q)	5.1
FMV11N90E	900	11	44	1.0	120	30	4±0.5	60	TO-220F(SLS)	1.7
FMR11N90E	900	11	44	1.0	135	30	4±0.5	60	TO-3PF	6.0

*1 R_{DS (on)} : V_{GS}=10V, *2 P_{tot}: T_C=25°C

SuperFAP-E^{3S} Low Qg series

Low-on resistance, low switching noise and low switching loss

SuperFAP-E ^{3S} Low Qg series			TO-220	TO-220F (SLS)	TO-3P (Q)	TO-3PF	T-Pack(L)	T-Pack(S)	TFP
									
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)							
500	0.5	12	✓	✓			✓	✓	✓
	0.38	16	✓	✓	✓		✓	✓	✓
	0.31	20	✓	✓	✓		✓	✓	✓
	0.27	21		✓	✓	✓			
	0.245	23		✓	✓	✓			
	0.19	28			✓	✓			
600	1.2	6	✓	✓			✓	✓	
	0.75	12	✓	✓			✓	✓	✓
	0.58	13	✓	✓	✓		✓	✓	✓
	0.47	16	✓	✓	✓		✓	✓	✓
	0.4	17		✓	✓	✓			
	0.365	19		✓	✓	✓			
	0.28	23			✓	✓			

500V class

Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS} (th)	Q _G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
FMP12N50ES	500	12	48	0.5	180	30	3.7±0.5	41	TO-220	2.0
FMV12N50ES	500	12	48	0.5	65	30	3.7±0.5	41	TO-220F(SLS)	1.7
FMI12N50ES	500	12	48	0.5	180	30	3.7±0.5	41	T-Pack(L)	1.6
FMC12N50ES	500	12	48	0.5	180	30	3.7±0.5	41	T-Pack(S)	1.6
FML12N50ES	500	12	48	0.5	180	30	3.7±0.5	41	TFP	1.6
FMP16N50ES	500	16	64	0.38	225	30	3.7±0.5	52	TO-220	2.0
FMV16N50ES	500	16	64	0.38	80	30	3.7±0.5	52	TO-220F(SLS)	1.7
FMI16N50ES	500	16	64	0.38	225	30	3.7±0.5	52	T-Pack(L)	1.6
FMC16N50ES	500	16	64	0.38	225	30	3.7±0.5	52	T-Pack(S)	1.6
FML16N50ES	500	16	64	0.38	195	30	3.7±0.5	52	TO-3P(Q)	5.1
FMP20N50ES	500	20	80	0.31	270	30	4.2±0.5	57	TO-220	2.0
FMV20N50ES	500	20	80	0.31	95	30	4.2±0.5	57	TO-220F(SLS)	1.7
FMI20N50ES	500	20	80	0.31	270	30	4.2±0.5	57	T-Pack(L)	1.6
FMC20N50ES	500	20	80	0.31	270	30	4.2±0.5	57	T-Pack(S)	1.6
FMH20N50ES	500	20	80	0.31	235	30	4.2±0.5	57	TO-3P(Q)	5.1
FML20N50ES	500	20	80	0.31	270	30	4.2±0.5	57	TFP	1.6
FMV21N50ES	500	21	84	0.27	120	30	4.2±0.5	67	TO-220F(SLS)	1.7
FMR21N50ES	500	21	84	0.27	135	30	4.2±0.5	67	TO-3PF	6.0
FMH21N50ES	500	21	84	0.27	285	30	4.2±0.5	67	TO-3P(Q)	5.1
FMV23N50ES	500	23	92	0.245	130	30	4.2±0.5	74	TO-220F(SLS)	1.7
FMR23N50ES	500	23	92	0.245	150	30	4.2±0.5	74	TO-3PF	6.0
FMH23N50ES	500	23	92	0.245	315	30	4.2±0.5	74	TO-3P(Q)	5.1
FMR28N50ES	500	28	112	0.19	200	30	4.2±0.5	92	TO-3PF	6.0
FMH28N50ES	500	28	112	0.19	400	30	4.2±0.5	92	TO-3P(Q)	5.1

*1 R_{DS(on)} : V_{GS}=10V, *2 P_{tot}: T_C=25°C

The SuperFAP-E^{3S} series products satisfies the quality assurance level of general consumer use.

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Do not use the products for equipment requiring strict reliability such as aerospace equipment.

SuperFAP-E^{3S} Low Qg series

600V class

Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS(th)}	Q _G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
FMP06N60ES	600	6	24	1.2	105	30	3.7±0.5	31	TO-220	2.0
FMV06N60ES	600	6	24	1.2	37	30	3.7±0.5	31	TO-220F(SLS)	1.7
FMI06N60ES	600	6	24	1.2	105	30	3.7±0.5	31	T-Pack(L)	1.6
FMC06N60ES	600	6	24	1.2	105	30	3.7±0.5	31	T-Pack(S)	1.6
FMP12N60ES	600	12	48	0.75	180	30	4.2±0.5	37	TO-220	2.0
FMV12N60ES	600	12	48	0.75	65	30	4.2±0.5	37	TO-220F(SLS)	1.7
FMI12N60ES	600	12	48	0.75	180	30	4.2±0.5	37	T-Pack(L)	1.6
FMC12N60ES	600	12	48	0.75	180	30	4.2±0.5	37	T-Pack(S)	1.6
FML12N60ES	600	12	48	0.75	180	30	4.2±0.5	37	TFP	1.6
FMP13N60ES	600	13	48	0.58	225	30	4.2±0.5	48	TO-220	2.0
FMV13N60ES	600	13	48	0.58	225	30	4.2±0.5	48	TO-220F(SLS)	1.7
FMI13N60ES	600	13	48	0.58	225	30	4.2±0.5	48	T-Pack(L)	1.6
FMC13N60ES	600	13	48	0.58	225	30	4.2±0.5	48	T-Pack(S)	1.6
FMH13N60ES	600	13	48	0.58	195	30	4.2±0.5	48	TO-3P(Q)	5.1
FML13N60ES	600	13	48	1.58	225	30	4.2±0.5	48	TFP	1.6
FMP16N60ES	600	16	64	0.47	270	30	4.2±0.5	56	TO-220	2.0
FMV16N60ES	600	16	64	0.47	95	30	4.2±0.5	56	TO-220F(SLS)	1.7
FMI16N60ES	600	16	64	0.47	270	30	4.2±0.5	56	T-Pack(L)	1.6
FMC16N60ES	600	16	64	0.47	270	30	4.2±0.5	56	T-Pack(S)	1.6
FMH16N60ES	600	16	64	0.47	235	30	4.2±0.5	56	TO-3P(Q)	5.1
FML16N60ES	600	16	64	0.47	270	30	4.2±0.5	56	TFP	1.6
FMV17N60ES	600	17	68	0.4	120	30	4.2±0.5	68	TO-220F(SLS)	1.7
FMR17N60ES	600	17	68	0.4	135	30	4.2±0.5	68	TO-3PF	6.0
FMH17N60ES	600	17	68	0.4	285	30	4.2±0.5	68	TO-3P(Q)	5.1
FMV19N60ES	600	19	76	0.365	130	30	4.2±0.5	74	TO-220F(SLS)	1.7
FMR19N60ES	600	19	76	0.365	150	30	4.2±0.5	74	TO-3PF	6.0
FMH19N60ES	600	19	76	0.365	315	30	4.2±0.5	74	TO-3P(Q)	5.1
FMR23N60ES	600	23	92	0.28	200	30	4.2±0.5	92	TO-3PF	6.0
FMH23N60ES	600	23	92	0.28	400	30	4.2±0.5	92	TO-3P(Q)	5.1

*1 R_{DS(on)} : V_{GS}=10V, *2 P_{tot}: T_C=25°C

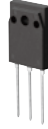
The SuperFAP-E^{3S} series products satisfies the quality assurance level of general consumer use.

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Do not use the products for equipment requiring strict reliability such as aerospace equipment.

SuperFAP-G series

Low-on resistance and low gate charge

SuperFAP-G series			TO-220	TO-220F	TO-220F (SLS)	TO-3PF	TO-247	T-Pack(L)	T-Pack(S)	TFP
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)								
100	0.062	29	✓	✓				✓	✓	
120	0.03	67	✓	✓				✓	✓	✓
150	0.105	23	✓	✓				✓	✓	
	0.07	33	✓	✓				✓	✓	✓
	0.041	57	✓	✓				✓	✓	✓
	0.016	100					✓			
200	0.17	18	✓	✓				✓	✓	✓
	0.066	45	✓	✓				✓	✓	✓
250	0.26	14	✓	✓				✓	✓	
	0.13	24			✓					
	0.1	37	✓	✓		✓		✓	✓	✓
	0.053	59				✓	✓			
300	0.28	15		✓						
	0.13	32	✓	✓				✓	✓	✓
450	2.5	3	✓	✓						
	1.6	4	✓	✓						
	0.65	10	✓	✓				✓	✓	
	0.38	17	✓	✓				✓	✓	✓
500	2.3	4	✓	✓				✓	✓	
	0.85	9	✓	✓				✓	✓	
	0.7	11	✓	✓				✓	✓	
	0.52	14	✓	✓				✓	✓	
	0.46	16	✓	✓				✓	✓	
	0.38	19	✓	✓			✓	✓	✓	✓
	0.26	25				✓	✓			
	0.11	51					✓			
600	3.3	3	✓	✓				✓	✓	
	1.2	8	✓	✓				✓	✓	
	1	9	✓	✓				✓	✓	
	0.75	12	✓	✓				✓	✓	
	0.65	13	✓	✓		✓				
	0.57	16	✓	✓			✓	✓	✓	
	0.37	21				✓	✓			
700	0.6	17				✓				
900	8	2.2	✓	✓						
	6.4	2.6	✓	✓				✓	✓	
	4.3	3.7	✓	✓						
	2.5	6.0						✓	✓	

MOSFET

SuperFAP-G series

100 – 250V class

Device type	V_{DS}	I_D	I_D (pulse)	$R_{DS(on)}$ max. *1	P_{tot} *2	V_{GS}	$V_{GS(th)}$	Q_G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
2SK3598-01	100	29	116	0.062	105	±30	3 to 5	22	TO-220	2.0
2SK3599-01MR	100	29	116	0.062	37	±30	3 to 5	22	TO-220F	1.7
2SK3600-01L, S	100	29	116	0.062	105	±30	3 to 5	22	T-pack	1.6
2SK3920-01	120	67	268	0.03	270	±30	3 to 5	52	TO-220	2.0
2SK3886-01MR	120	67	268	0.03	95	±30	3 to 5	52	TO-220F	1.7
2SK3921-01L, S	120	67	268	0.03	270	±30	3 to 5	52	T-pack	1.6
2SK3922-01	120	67	268	0.03	270	±30	3 to 5	52	TFP	0.8
2SK3602-01	150	23	92	0.105	105	±30	3 to 5	21	TO-220	2.0
2SK3603-01MR	150	23	92	0.105	37	±30	3 to 5	21	TO-220F	1.7
2SK3604-01L, S	150	23	92	0.105	105	±30	3 to 5	21	T-pack	1.6
2SK3648-01	150	33	132	0.07	150	±30	3 to 5	34	TO-220	2.0
2SK3649-01MR	150	33	132	0.07	53	±30	3 to 5	34	TO-220F	1.7
2SK3650-01L, S	150	33	132	0.07	150	±30	3 to 5	34	T-pack	1.6
2SK3474-01	150	33	132	0.07	150	±30	3 to 5	34	TFP	0.8
2SK3537-01MR	150	33	132	0.07	53	±20	1 to 2.5	46	TO-220F	1.7
2SK3590-01	150	57	228	0.041	270	±30	3 to 5	52	TO-220	2.0
2SK3591-01MR	150	57	228	0.041	95	±30	3 to 5	52	TO-220F	1.7
2SK3592-01L, S	150	57	228	0.041	270	±30	3 to 5	52	T-pack	1.6
2SK3593-01	150	57	228	0.041	270	±30	3 to 5	52	TFP	0.8
2SK3882-01	150	100	400	0.016	600	±30	3 to 5	140	TO-247	4.9
2SK3606-01	200	18	72	0.17	105	±30	3 to 5	21	TO-220	2.0
2SK3607-01MR	200	18	72	0.17	37	±30	3 to 5	21	TO-220F	1.7
2SK3608-01L, S	200	18	72	0.17	105	±30	3 to 5	21	T-pack	1.6
2SK3609-01	200	18	72	0.17	105	±30	3 to 5	21	TFP	0.8
2SK3594-01	200	45	180	0.066	270	±30	3 to 5	51	TO-220	2.0
2SK3595-01MR	200	45	180	0.066	95	±30	3 to 5	51	TO-220F	1.7
2SK3596-01L, S	200	45	180	0.066	270	±30	3 to 5	51	T-pack	1.6
2SK3597-01	200	45	180	0.066	270	±30	3 to 5	51	TFP	0.8
2SK3610-01	250	14	56	0.26	105	±30	3 to 5	21	TO-220	2.0
2SK3611-01MR	250	14	56	0.26	37	±30	3 to 5	21	TO-220F	1.7
2SK3612-01L, S	250	14	56	0.26	105	±30	3 to 5	21	T-pack	1.6
FMV24N25G	250	24	96	0.13	65	±30	3 to 5	36	TO-220F(SLS)	1.7
2SK3554-01	250	37	148	0.1	270	±30	3 to 5	44	TO-220	2.0
2SK3555-01MR	250	37	148	0.1	95	±30	3 to 5	44	TO-220F	1.7
2SK3556-01L, S	250	37	148	0.1	270	±30	3 to 5	44	T-pack	1.6
2SK3535-01	250	37	148	0.1	270	±30	3 to 5	44	TFP	0.8
2SK3651-01R	250	37	148	0.1	115	±30	3 to 5	44	TO-3PF	6.0
2SK3778-01	250	59	236	0.053	410	±30	3 to 5	80	TO-247	4.9
2SK3779-01R	250	59	236	0.053	210	±30	3 to 5	80	TO-3PF	6.0

*1 $R_{DS(on)}$: $V_{GS}=10V$, *2 P_{tot} : $T_C=25^\circ C$

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Do not use the products for equipment requiring strict reliability such as aerospace equipment.

SuperFAP-G series

300 – 500V class

Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS} (th)	Q _G typ. nC	Package	Net mass Grams
2SK3580-01MR	300	15	60	0.28	48	±30	3.5 to 4.5	23	TO-220F	1.7
2SK3772-01	300	32	128	0.13	270	±30	3 to 5	44.5	TO-220	2.0
2SK3773-01MR	300	32	128	0.13	95	±30	3 to 5	44.5	TO-220F	1.7
2SK3774-01L, S	300	32	128	0.13	270	±30	3 to 5	44.5	T-pack	1.6
2SK3775-01	300	32	128	0.13	270	±30	3 to 5	44.5	TFP	0.8
2SK3725-01	450	3	12	2.5	50	±30	3 to 5	10.5	TO-220	2.0
2SK3726-01MR	450	3	12	2.5	17	±30	3 to 5	10.5	TO-220F	1.7
2SK3916-01	450	4.3	17.2	1.6	21	±30	3 to 5	13	TO-220	2.0
2SK3917-01MR	450	4.3	17.2	1.6	21	±30	3 to 5	13	TO-220F	1.7
2SK3514-01	450	10	40	0.65	135	±30	3 to 5	22	TO-220	2.0
2SK3515-01MR	450	10	40	0.65	48	±30	3 to 5	22	TO-220F	1.7
2SK3516-01L, S	450	10	40	0.65	135	±30	3 to 5	22	T-pack	1.6
2SK3692-01	450	17	68	0.38	225	±30	3 to 5	33	TO-220	2.0
2SK3693-01MR	450	17	68	0.38	80	±30	3 to 5	33	TO-220F	1.7
2SK3694-01L, S	450	17	68	0.38	225	±30	3 to 5	33	T-pack	1.6
2SK4040-01	450	17	68	0.38	225	±30	3 to 5	33	TFP	0.8
2SK3985-01	500	3.6	14.4	2.3	60	±30	3 to 5	13	TO-220	2.0
2SK3986-01MR	500	3.6	14.4	2.3	21	±30	3 to 5	13	TO-220F	1.7
2SK3987-01L, S	500	3.6	14.4	2.3	60	±30	3 to 5	13	T-pack	1.6
2SK3519-01	500	9	36	0.85	135	±30	3 to 5	20	TO-220	2.0
2SK3520-01MR	500	9	36	0.85	48	±30	3 to 5	20	TO-220F	1.7
2SK4004-01MR	500	9	36	0.85	48	±30	2.5 to 3.5	24	TO-220F	1.7
2SK3521-01L, S	500	9	36	0.85	135	±30	3 to 5	20	T-pack	1.6
2SK3931-01	500	11	44	0.70	165	±30	3 to 5	25	TO-220	2.0
2SK3932-01MR	500	11	44	0.70	60	±30	3 to 5	25	TO-220F	1.7
2SK3933-01L, S	500	11	44	0.70	165	±30	3 to 5	25	T-pack	1.6
2SK3468-01	500	14	56	0.52	195	±30	3 to 5	30	TO-220	2.0
2SK3469-01MR	500	14	56	0.52	70	±30	3 to 5	30	TO-220F	1.7
2SK3512-01L, S	500	14	56	0.52	195	±30	3 to 5	30	T-pack	1.6
2SK3504-01	500	16	64	0.46	225	±30	3 to 5	33	TO-220	2.0
2SK3505-01MR	500	16	64	0.46	80	±30	3 to 5	33	TO-220F	1.7
2SK3581-01L, S	500	16	64	0.46	225	±30	3 to 5	33	T-pack	1.6
2SK3682-01	500	19	76	0.38	270	±30	3 to 5	32	TO-220	2.0
2SK3683-01MR	500	19	76	0.38	95	±30	3 to 5	32	TO-220F	1.7
2SK3684-01L, S	500	19	76	0.38	270	±30	3 to 5	32	T-pack	1.6
2SK3685-01	500	19	76	0.38	235	±30	3 to 5	32	TO-247	4.9
FML19N50G	500	19	76	0.38	270	±30	3 to 5	32	TFP	0.8
2SK3522-01	500	25	100	0.26	335	±30	3 to 5	54	TO-247	4.9
2SK3523-01R	500	25	100	0.26	160	±30	3 to 5	54	TO-3PF	6.0
2SK3680-01	500	51	208	0.11	600	±30	3 to 5	118	TO-247	4.9

*1 R_{DS(on)} : V_{GS}=10V, *2 P_{tot}: T_C=25°C

SuperFAP-G series

600 – 900V class

Device type	V_{DS}	I_D	$I_{D(pulse)}$	$R_{DS(on)}$ max. ^{*1}	P_{tot} ^{*2}	V_{GS}	$V_{GS(th)}$	Q_G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
2SK3988-01	600	3	12	3.3	60	±30	3 to 5	13	TO-220	2.0
2SK3989-01MR	600	3	12	3.3	21	±30	3 to 5	13	TO-220F	1.7
2SK3990-01L, S	600	3	12	3.3	60	±30	3 to 5	13	T-pack	1.6
2SK3524-01	600	8	32	1.2	135	±30	3 to 5	20	TO-220	2.0
2SK3525-01MR	600	8	32	1.2	48	±30	3 to 5	20	TO-220F	1.7
2SK3526-01L, S	600	8	32	1.2	135	±30	3 to 5	20	T-pack	1.6
2SK3887-01	600	9	36	1.0	165	±30	3 to 5	25	TO-220	2.0
2SK3888-01MR	600	9	36	1.0	60	±30	3 to 5	25	TO-220F	1.7
2SK3889-01L, S	600	9	36	1.0	165	±30	3 to 5	25	T-pack	1.6
2SK3501-01	600	12	48	0.75	195	±30	3 to 5	30	TO-220	2.0
2SK3502-01MR	600	12	48	0.75	70	±30	3 to 5	30	TO-220F	1.7
2SK3513-01L, S	600	12	48	0.75	195	±30	3 to 5	30	T-pack	1.6
2SK3450-01	600	13	52	0.65	225	±30	3 to 5	34	TO-220	2.0
2SK3451-01MR	600	13	52	0.65	80	±30	3 to 5	34	TO-220F	1.7
2SK3753-01R	600	13	52	0.65	95	±30	3 to 5	34	TO-3PF	6.0
2SK3686-01	600	16	64	0.57	270	±30	3 to 5	33	TO-220	2.0
2SK3687-01MR	600	16	64	0.57	97	±30	3 to 5	33	TO-220F	1.7
2SK3688-01L, S	600	16	64	0.57	270	±30	3 to 5	33	T-pack	1.6
2SK3689-01	600	16	64	0.57	235	±30	3 to 5	33	TO-247	4.9
2SK3527-01	600	21	84	0.37	335	±30	3 to 5	54	TO-247	4.9
2SK3528-01R	600	21	84	0.37	160	±30	3 to 5	54	TO-3PF	6.0
2SK3681-01	600	43	172	0.16	600	±30	3 to 5	118	TO-247	4.9
2SK3891-01R	700	17	68	0.6	170	±30	3 to 5	46	TO-3PF	6.0
2SK3727-01	900	2.2	8.8	8.0	75	±30	3.5 to 4.5	8.3	TO-220	2.0
2SK3728-01MR	900	2.2	8.8	8.0	26	±30	3.5 to 4.5	8	TO-220F	1.7
2SK3981-01	900	2.6	10.4	6.4	90	±30	3 to 5	13	TO-220	2.0
2SK3982-01MR	900	2.6	10.4	6.4	32	±30	3 to 5	13	TO-220F	1.7
2SK3983-01L, S	900	2.6	10.4	6.4	90	±30	3 to 5	13	T-pack	1.6
2SK3698-01	900	3.7	14.8	4.3	120	±30	3.5 to 4.5	13	TO-220	2.0
2SK3699-01MR	900	3.7	14.8	4.3	43	±30	3.5 to 4.5	13	TO-220F	1.7
2SK3676-01L, S	900	6	24	2.5	195	±30	3 to 5	21.5	T-pack	1.6

^{*1} $R_{DS(on)}$: $V_{GS}=10V$, ^{*2} P_{tot} : $T_C=25^{\circ}C$

SuperFAP-G Built-in FRED series

SuperFAP-G Built-in FRED series			TO-220	TO-220F	TO-247	T-Pack (L)	T-Pack (S)
							
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)					
500	0.55	13	✓	✓			
600	0.8	11	✓	✓		✓	✓
	0.17	42			✓		

500 – 600V class

Device type	V_{DS}	I_D	I_D (pulse)	$R_{DS(on)}$ max. ^{*1}	P_{tot} ^{*2}	V_{GS}	$V_{GS(th)}$	Q_G typ. nC	Package	Net mass Grams
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			
2SK3695-01	500	13	52	0.55	195	±30	3 to 5	28	TO-220	2.0
2SK3696-01MR	500	13	52	0.55	70	±30	3 to 5	28	TO-220F	1.7
2SK3928-01	600	11	44	0.8	195	±30	3 to 5	30	TO-220	2.0
2SK3929-01MR	600	11	44	0.8	70	±30	3 to 5	30	TO-220F	1.7
2SK3930-01L, S	600	11	44	0.8	195	±30	3 to 5	30	T-pack	1.6
2SK3697-01	600	42	168	0.17	600	±30	3 to 5	105	TO-247	4.9

^{*1} $R_{DS(on)}$: V_{GS} =10V, ^{*2} P_{tot} : T_C =25°C

Trench Power MOSFET

Low-on resistance and high gate capability

Trench Power MOSFET			TO-220	TO-220F	TO-3P (Q)	TO-247	T-Pack(L)	T-Pack(S)	D2-pack
									
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)							
40	0.060	70				✓			
60	0.0065	70		✓					
		80	✓				✓	✓	✓
	0.0065	100			✓				
75	0.0079	70		✓					
	0.0085	70						✓	
100	0.0067	80						✓	
	0.0067	100				✓			
	0.0128	80	✓	✓			✓	✓	
		80	✓	✓			✓	✓	
150	0.0245	65	✓	✓			✓	✓	
200	0.0470	49	✓	✓			✓	✓	

60 – 100V class

Device type	V_{DS} Volts	I_D Amps.	I_D (pulse) Amps.	$R_{DS(on)}$ max. *1 Ohms	P_{tot} *2 Watts	V_{GS} Volts	$V_{GS(th)}$ typ. Volts	Package	Net mass Grams
2SK4068-01	40	70	280	0.006	115	+30/-20	3.0±0.5	TO-247	4.9
2SK3273-01MR	60	70	280	0.0065	70	+30/-20	3.0±0.5	TO-220F	1.7
2SK3270-01	60	80	320	0.0065	135	+30/-20	3.0±0.5	TO-220	2.0
2SK3272-01L, S	60	80	320	0.0065	135	+30/-20	3.0±0.5	T-pack (L, S)	1.6
2SK3272-01SJ	60	80	320	0.0065	135	+30/-20	3.0±0.5	D2-pack	1.6
2SK4047-01S	60	80	320	0.0065	195	+30/-20	3.0±0.5	T-pack (S)	1.6
2SK3271-01	60	100	400	0.0065	155	+30/-20	3.0±0.5	TO-3P	5.5
2SK3730-01MR	75	70	280	0.0079	70	±20	3.0±0.5	TO-220F	1.7
2SK3804-01S	75	70	280	0.0085	162	±20	3.0±0.5	T-pack (S)	1.6
FMC80N10R6	100	80	320	0.0067	180	+30/-20	2 to 4	T-pack (S)	1.6
FMY100N10R6	100	100	400	0.0067	280	+30/-20	2 to 4	TO-247	6.3

*1 $R_{DS(on)}$: $V_{GS}=10V$, *2 P_{tot} : $T_C=25^{\circ}C$

100 – 200V class

Device type	V_{DS} Volts	I_D Amps.	I_D (pulse) Amps.	$R_{DS(on)}$ max. *1 Ohms	P_{tot} *2 Watts	V_{GS} Volts	$V_{GS(th)}$ typ. Volts	Package	Net mass Grams
FMP80N10T2	100	80	320	0.0128	270	+30/-20	2 to 4	TO-220	2.0
FMA80N10T2	100	80	320	0.0128	95	+30/-20	2 to 4	TO-220F	1.7
FMI80N10T2	100	80	320	0.0128	270	+30/-20	2 to 4	T-pack(L)	1.6
FMC80N10T2	100	80	320	0.0128	270	+30/-20	2 to 4	T-pack(S)	1.6
FMP65N15T2	150	65	260	0.0245	270	+30/-20	2 to 4	TO-220	2.0
FMA65N15T2	150	65	260	0.0245	95	+30/-20	2 to 4	TO-220F	1.7
FMI65N15T2	150	65	260	0.0245	270	+30/-20	2 to 4	T-pack(L)	1.6
FMC65N15T2	150	65	260	0.0245	270	+30/-20	2 to 4	T-pack(S)	1.6
FMP49N20T2	200	49	196	0.047	270	+30/-20	2 to 4	TO-220	2.0
FMA49N20T2	200	49	196	0.047	95	+30/-20	2 to 4	TO-220F	1.7
FMI49N20T2	200	49	196	0.047	270	+30/-20	2 to 4	T-pack(L)	1.6
FMC49N20T2	200	49	196	0.047	270	+30/-20	2 to 4	T-pack(S)	1.6

*1 $R_{DS(on)}$: $V_{GS}=10V$, *2 P_{tot} : $T_C=25^{\circ}C$

The Trench Power MOSFET series products satisfies the quality assurance level of general consumer use.

If you intend to use the products for equipment requiring higher reliability, such as equipment for automobiles and medical equipment, please contact Fuji Electric.
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

Automotive Super J MOS[®] S2 series



Low-on resistance, low switching noise and low switching loss

Automotive Super J MOS [®] S2 Series			TO-247	T-Pack(S)
				
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)		
600	0.190	20.0		✓
	0.160	17.9	✓	✓
	0.125	22.8	✓	✓
	0.099	29.3	✓	✓
	0.088	32.8	✓	✓
	0.079	37.1	✓	✓
	0.070	39.4	✓	
	0.040	66.2	✓	
	0.025	95.5	✓	

600V class

Device type	V_{DS}	I_D	I_D (pulse)	$R_{DS(on)}$ max. ^{*1}	P_{tot} ^{*2}	V_{GS}	$V_{GS(th)}$ typ.	Q_G typ.	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts	nC		Grams
FMC60N190S2A	600	20.0	46.5	0.190	113	30	3.0±0.5	46	T-Pack	1.6
FMY60N160S2A	600	17.9	53.7	0.160	110	30	4.0±0.5	43	TO-247	6.4
FMC60N160S2A	600	17.9	53.7	0.160	127	30	4.0±0.5	43	T-Pack	1.6
FMY60N125S2A	600	22.8	68.2	0.125	140	30	4.0±0.5	53	TO-247	6.4
FMC60N125S2A	600	22.8	68.2	0.125	160	30	4.0±0.5	53	T-Pack	1.6
FMY60N099S2A	600	29.3	87.7	0.099	185	30	4.0±0.5	65	TO-247	6.4
FMC60N099S2A	600	29.3	87.7	0.099	210	30	4.0±0.5	65	T-Pack	1.6
FMY60N088S2A	600	32.8	98.4	0.088	205	30	4.0±0.5	72	TO-247	6.4
FMC60N088S2A	600	32.8	98.4	0.088	235	30	4.0±0.5	72	T-Pack	1.6
FMY60N079S2A	600	37.1	111.3	0.079	235	30	4.0±0.5	80	TO-247	6.4
FMC60N079S2A	600	37.1	111.3	0.079	270	30	4.0±0.5	80	T-Pack	1.6
FMY60N070S2A	600	39.4	118.2	0.070	270	30	4.0±0.5	90	TO-247	6.4
FMY60N040S2A	600	66.2	198.6	0.040	435	30	4.0±0.5	147	TO-247	6.4
FMY60N025S2A	600	95.5	286.5	0.025	575	30	4.0±0.5	222	TO-247	6.4

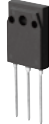
^{*1} $R_{DS(on)}$: $V_{GS}=10V$, ^{*2} P_{tot} : $T_C=25^\circ C$

Super J MOS[®] is registered trademarks of Fuji Electric.

The Automotive Super J MOS[®] S2 series of products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101). Do not use the products for equipment requiring strict reliability such as aerospace equipment.

Automotive Super J MOS[®] S2FD series (Built-in FRED type)



Automotive Super J MOS [®] S2FD series (Built-in FRED type)			TO-247	T-Pack(S)
				
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)		
400	0.060	42		✓
500	0.071	38.9	✓	✓
600	0.133	22.8	✓	✓
	0.105	29.3	✓	✓
	0.081	37.1	✓	✓

400V, 500V class

Device type	V_{DSS}	I_D	I_D (pulse)	$R_{DS(on)}$ max. *1	P_{tot} *2	V_{GS}	$V_{GS(th)}$ typ.	Q_G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
FMC40N060S2FDA	400	42	126	0.060	270	30	4.0±1	120	T-Pack	1.6
FMY50N071S2FDA	500	38.9	116.7	0.071	235	30	4.0±1	98	TO-247	6.4
FMC50N071S2FDA	500	38.9	116.7	0.071	270	30	4.0±1	98	T-Pack	1.6

600V class

Device type	V_{DSS}	I_D	I_D (pulse)	$R_{DS(on)}$ max. *1	P_{tot} *2	V_{GS}	$V_{GS(th)}$ typ.	Q_G typ. nC	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts			Grams
FMY60N133S2FDA	600	22.8	68.2	0.133	140	30	4.0±1	59	TO-247	6.4
FMC60N133S2FDA	600	22.8	68.2	0.133	160	30	4.0±1	59	T-Pack	1.6
FMY60N105S2FDA	600	29.3	87.7	0.105	185	30	4.0±1	75	TO-247	6.4
FMC60N105S2FDA	600	29.3	87.7	0.105	210	30	4.0±1	75	T-Pack	1.6
FMY60N081S2FDA	600	37.1	111.3	0.081	235	30	4.0±1	93	TO-247	6.4
FMC60N081S2FDA	600	37.1	111.3	0.081	270	30	4.0±1	93	T-Pack	1.6

*1 $R_{DS(on)}$: $V_{GS}=10V$, *2 P_{tot} : $T_C=25^\circ C$

Super J MOS[®] is registered trademarks of Fuji Electric.

The Automotive Super J MOS[®] S2FD series of products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101).
Do not use the products for equipment requiring strict reliability such as aerospace equipment.

Automotive MOSFET (Trench Power MOS, SuperFAP-E^{3S})

Automotive Trench Power MOSFET SuperFAP-E ^{3S} Low Qg series			TO-220	TO-220F	TO-3P (Q)	TO-247	T-Pack(L)	T-Pack(S)	D2-pack
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)							
40	0.006	70				✓			
60	0.0065	70		✓					
		80	✓				✓	✓	✓
	0.0065	100			✓	✓		✓	
75	0.0079	70		✓					
	0.0085	70						✓	
100	0.0067	80					✓		
	0.0128	80							
	0.0067	100				✓			
300	0.072	50				✓			
	0.045	72				✓			
600	0.28	24				✓			
	0.20	31				✓			
	0.16	36				✓			

Automotive SuperFAP-E^{3S} Low Qg series

300 – 600V class



Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS} (th) typ.	Q _G typ.	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts	nC		Grams
FMY50N30ES	300	50	200	0.072	400	+30/-30	4.2±0.5	97	TO-247	6.4
FMY72N30ES	300	72	288	0.045	570	+30/-30	4.2±0.5	155	TO-247	6.4
FMY24N60ES	600	24	96	0.280	400	+30/-30	4.2±0.5	95	TO-247	6.4
FMY31N60ES	600	31	124	0.200	495	+30/-30	4.2±0.5	125	TO-247	6.4
FMY36N60ES	600	36	144	0.160	570	+30/-30	4.2±0.5	155	TO-247	6.4

*1 R_{DS(on)}: V_{GS}=10V, *2 P_{tot}: T_C=25°C

The Automotive SuperFAP-E^{3S} Low Qg series of products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101). Do not use the products for equipment requiring strict reliability such as aerospace equipment.

Automotive Trench Power MOSFET

40 – 100V class

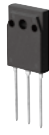
Device type	V _{DSS}	I _D	I _D (pulse)	R _{DS(on)} max. *1	P _{tot} *2	V _{GS}	V _{GS} (th) typ.	Package	Net mass
	Volts	Amps.	Amps.	Ohms	Watts	Volts	Volts		Grams
2SK4068-01	40	70	280	0.006	115	+30/-20	3.0±0.5	TO-247	4.9
2SK3273-01MR	60	70	280	0.0065	70	+30/-20	3.0±0.5	TO-220F	1.7
2SK3270-01	60	80	320	0.0065	135	+30/-20	3.0±0.5	TO-220	2.0
2SK3272-01L, S	60	80	320	0.0065	135	+30/-20	3.0±0.5	T-pack	1.6
2SK3272-01SJ	60	80	320	0.0065	135	+30/-20	3.0±0.5	D2-pack	1.6
2SK4047-01S	60	80	320	0.0065	195	+30/-20	3.0±0.5	T-pack	1.6
FMY100N06T *1	60	100	400	0.0065	135	+30/-20	3.0±0.5	TO-247	6.3
2SK3271-01	60	100	400	0.0065	155	+30/-20	3.0±0.5	TO-3P	5.5
2SK3730-01MR	75	70	280	0.0079	70	±20	3.0±0.5	TO-220F	1.7
2SK3804-01S	75	70	280	0.0085	135	±20	3.0±0.5	T-pack	1.6
FMC80N10R6	100	80	320	0.0067	324	+30/-20	2 to 4	T-Pack	1.6
FMY100N10R6 *1	100	100	400	0.0067	280	+30/-20	2 to 4	TO-247	6.3

*1 R_{DS(on)}: V_{GS}=10V, *2 P_{tot}: T_C=25°C

The Automotive Trench Power MOSFET series products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101). Do not use the products for equipment requiring strict reliability such as aerospace equipment.

Automotive SuperFAP-E^{3S} Low Qg Built-in FRED series



Automotive SuperFAP-E ^{3S} Low Qg series (Built-in FRED type)			TO-247
			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	
300	0.085	47	✓
	0.053	67	✓
600	0.29	22	✓
	0.21	30	✓
	0.17	35	✓

Low-on resistance, low switching noise and low switching loss

300 – 600V class

Device type	V_{DSS} Volts	I_D Amps.	I_D (pulse) Amps.	$R_{DS(on)}$ max. *1 Ohms	P_{tot} *2 Watts	V_{GS} Volts	$V_{GS(th)}$ typ. Volts	Q_G typ. nC	t_{rr} typ. nsec	Package	Net mass Grams
FMY47N30ESF	300	47	188	0.085	400	+30/-30	4.2±1.0	96	130	TO-247	6.4
FMY67N30ESF	300	67	268	0.053	570	+30/-30	4.2±1.0	155	150	TO-247	6.4
FMY22N60ESF	600	22	88	0.290	400	+30/-30	4.2±1.0	95	150	TO-247	6.4
FMY30N60ESF	600	30	120	0.210	495	+30/-30	4.2±1.0	125	160	TO-247	6.4
FMY35N60ESF	600	35	140	0.170	570	+30/-30	4.2±1.0	155	160	TO-247	6.4

*1 $R_{DS(on)}$: $V_{GS}=10V$, *2 P_{tot} : $T_C=25^{\circ}C$

Automotive SuperFAP-E^{3S} Low Qg Built-in FRED series of products satisfies the quality assurance level of general automobile use (conforms to AEC-Q101). Do not use the products for equipment requiring strict reliability such as aerospace equipment.

Automotive IPS series (Intelligent Power Switches)

Self protection

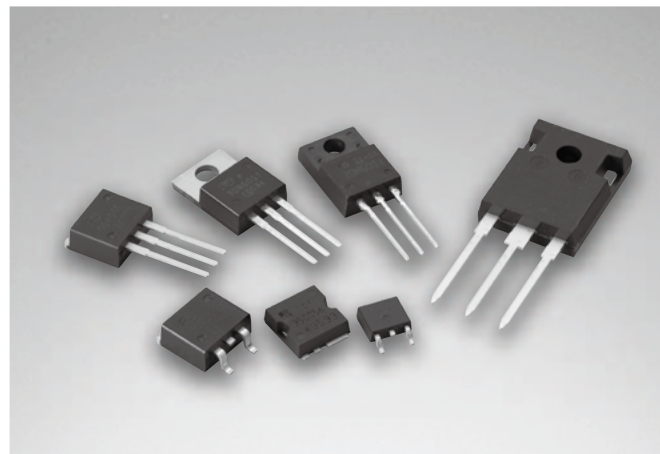
Device type	Type	Channels	V_{CC} DC (pulse) Volts	I_D Amps.	$R_{DS(on)}$ typ. Ohms	$R_{DS(on)}$ max. Ohms	P_{tot} Watts	Package	Net mass Grams	Remarks
F5106H	High side	1	35 (50)	2	0.1 *1	0.12 *1	1.5	SOP-8	0.2	Built-in Amp
F5112H	High side	1	35 (50)	2	0.1 *1	0.12 *1	2	SOP-8	0.2	
F5114H	High side	2	35 (50)	1.6	0.1 *1	0.12 *1	1.5	SSOP-12	0.2	
F5074H	High side	1	35 (50)	80	0.004 *1	0.005 *1	114	PSOP-12	0.4	
F5018	Low side	1	40	8	0.088 *2	0.14 *2	15	K-pack	0.6	
F5019	Low side	1	40	12	0.088 *2	0.14 *2	30	T-pack	1.6	
F5020	Low side	1	40	3	0.25 *2	0.40 *2	10	K-pack	0.6	
F5033	Low side	2	40	1	0.41 *2	0.60 *2	1.5	SOP-8	0.2	
F5041	Low side	2	40	1	0.47 *2	0.60 *2	1.5	SOP-8	0.2	
F5042	Low side	1	40	8	0.088 *2	0.14 *2	15	K-pack	0.6	High frequency switching version for F5018
F5043	Low side	1	40	12	0.088 *2	0.14 *2	30	T-pack	1.6	High frequency switching version for F5019
F5055	Low side	2	40	5.9	0.088 *2	0.14 *2	7.8	SSOP-20	0.3	
F5063L	Low side	2	40	1.9	0.095 *2	0.14 *2	1.75	SOP-8	0.2	

*1 $R_{DS(on)}$: $V_{CC}=13V$, *2 $R_{DS(on)}$: $V_{IN}/V_{GS}=5V$

Rectifier Diodes



Fuji Electric's rectifier diodes have features such as low V_F characteristics and low I_R , and are compatible with PFC circuits of power supplies and secondary-side rectification circuits.



Features of SBD, LLD

Ultra Low-IR SBD (Schottky-Barrier Diode)

■ Features

- Guaranteed $T_{vj}=175^{\circ}\text{C}$
- V_F is same level and I_R is reduced by less than 1/10.

LLD (Low Loss Diode) Super LLD series for PFC circuit

■ Features

Super LLD-3 for CCM-PFC

- Realize acceleration and low V_F compared with existing model.

Super LLD-2 for CRM-PFC

- Achieved low power loss by low V_F
- Achieved low noise by soft recovery

■ Part numbers

FDRW50C60L (example)

F	DR		W		50	C		60		L	
Company code	Device code		Package code		Current	Polarity		Voltage		Series	
Fuji	DR	FWD	P	T0-220	$\times 1$	S.T	Single	60	600V	L	Ultra Fast Recovery
			W	T0-247-P2		C	Cathode Common	65	650V		Sort/Fast Recovery
								120	1200V	J	

■ Part numbers

YA875C10R (example)

YA		87		5		C		10						R
Package code		Series		Current		Polarity		Voltage						Additional code
KP	K-Pack (L)	8x	SBD	1	5A	S	Single	SBD	02	20V	LLD	2	200V	R or RR
KS	K-Pack (S)	9x	LLD	2	10A	C	Cathode Common		03	30V		3	300V	
MS	TFP			3	15A				04	40V		4	400V	
PA	TO-3P			4	15A				06	60V		6	600V	
PG	TO-3PF			5	20A				08	80V		8	800V	
PH	TO-247			6	30A				09	90V		10	1000V	
TP	T-Pack (L)			8	30A				10	100V		12	1200V	
TS	T-Pack (S)			9	40A				12	120V		15	1500V	
YA	TO-220	0	40A	15	150V									
YG	TO-220F					20	200V							

■ Part numbers

ESAD92M02R (example)

ESA		D			92		M		02						R	
Chip		Current			Series		Package code		Voltage						Additional code	
ESA	Dual chips	Lead	ERA	≤ 1A	8x	SBD	non	Non Isolation	SBD	004	40V	LLD	02	200V	R or RR	
ER	Single chip		ERB	≤ 2A	9x	LLD	M	Full mold		006	60V		03	300V		
			ERC	≤ 3A						009	90V					
			ERD	-												
		TOPKG	ERC	≤ 5A												
			ESAB	5A-10A												
			ESAC	10A-20A												
			ESAD	20A-30A												

Schottky-Barrier Diodes (SBD)

Schottky-Barrier Diodes(SBD)					TO-220F	K-Pack(L)	K-Pack(S)	TFP
								
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (mA)				
Single	40	5	0.55	5	✓		✓	
	45	10	0.60	2	✓			
	60	5	0.59	5	✓			
		15	0.63	20	✓			
Dual	20	7	0.39	10		✓	✓	
	30	5	0.47	5			✓	
	40	5	0.55	5	✓		✓	
		10	0.55	5	✓			
		20	0.6	15	✓			
		30	0.53	8	✓			✓
	60	5	0.58	5	✓			
		10	0.58	5	✓			
		15	0.58	5	✓			
		20	0.58	15	✓			
		30	0.58	3				✓
	90	5	0.9	5			✓	
	100	5	0.8	0.7	✓			
		10	0.8	1.2	✓			
		20	0.8	2.5	✓			
		30	0.8	20	✓			

1 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)			Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} max. Volts	I _{RRM} *3 max. mA	R _{th(j-c)} °C/W		
KS826S04	40	5.0 (T _C =110°C)	80	-40 to +150	0.55 (I _F =5.0A)	5	10	K-pack(S)	0.6
YG811S04R	40	5.0 (T _C =122°C)	120	-40 to +150	0.55 (I _F =5.0A)	5	5.0	TO-220F	1.7
YG812S04R	45	10 (T _C =124°C)	120	-40 to +150	0.6 (I _F =10A)	2	2.5	TO-220F	1.7
YG811S06R	60	5.0 (T _C =127°C)	80	-40 to +150	0.59 (I _F =5.0A)	5	5.0	TO-220F	1.7
YG804S06R	60	15 (T _C =99°C)	120	-40 to +150	0.63 (I _F =15A)	20	2.2	TO-220F	1.7

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms *3: V_R=V_{RRM}

Letter symbols

V_{RRM} Repetitive peak reverse voltage
 V_{RSM} Non-repetitive peak reverse voltage
 I_O Average output current
 I_{FSM} Surge current
 T_{vj} Junction temperature
 T_a Ambient temperature
 T_C Case temperature

T_{stg} Storage temperature
 V_{FM} Forward voltage
 I_{RRM} Reverse current
 t_{rr} Reverse recovery time
 R_{th(j-c)} Thermal resistance (Junction to case)
 T_I Lead temperature
 I_{F(AV)} Average forward current



Schottky-Barrier Diodes (SBD)

2 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)			Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} *3 max. Volts	I _{RRM} *4 max.mA	R _{th(j-o)} °C/W		
KP883C02	20	7.0 (T _C =89°C)	60	-40 to +125	0.39 (I _F =2.5A)	10	10.0	K-Pack(L)	0.6
KS883C02	20	7.0 (T _C =89°C)	60	-40 to +125	0.39 (I _F =2.5A)	10	10.0	K-pack(S)	0.6
KS823C03	30	5.0 (T _C =117°C)	60	-40 to +150	0.47 (I _F =2.5A)	5	10.0	K-pack(S)	0.6
KS823C04	40	5.0 (T _C =107°C)	60	-40 to +150	0.55 (I _F =2.5A)	5	10.0	K-pack(S)	0.6
YG801C04R	40	5.0 (T _C =125°C)	100	-40 to +150	0.55 (I _F =2.0A)	5	5.0	TO-220F	1.7
YG802C04R	40	10 (T _C =110°C)	120	-40 to +150	0.55 (I _F =4.0A)	5	3.5	TO-220F	1.7
YG805C04R	40	20 (T _C =100°C)	120	-40 to +150	0.6 (I _F =10A)	15	2.5	TO-220F	1.7
YG838C04R	40	30 (T _C =85°C)	180	-40 to +150	0.53 (I _F =12.5A)	8	2.0	TO-220F	1.7
MS838C04	40	30 (T _C =111°C)	180	-40 to +150	0.53 (I _F =12.5A)	8	1.2	TFP	0.8
YG801C06R	60	5.0 (T _C =125°C)	60	-40 to +150	0.58 (I _F =2.0A)	5	5.0	TO-220F	1.7
YG802C06R	60	10 (T _C =118°C)	80	-40 to +150	0.58 (I _F =4.0A)	5	3.5	TO-220F	1.7
YG803C06R	60	15 (T _C =94°C)	100	-40 to +150	0.58 (I _F =6.0A)	5	3.0	TO-220F	1.7
YG805C06R	60	20 (T _C =108°C)	80	-40 to +150	0.58 (I _F =8.0A)	15	2.5	TO-220F	1.7
MS808C06	60	30 (T _C =118°C)	150	-40 to +150	0.58 (I _F =12.5A)	3	1.2	TFP	0.8
KS823C09	90	5.0 (T _C =100°C)	60	-40 to +150	0.9 (I _F =2.5A)	5	10.0	K-pack(S)	0.6
YG801C10R	100	5.0 (T _C =117°C)	60	-40 to +150	0.8 (I _F =1.5A)	0.7	5.0	TO-220F	1.7
YG802C10R	100	10 (T _C =102°C)	80	-40 to +150	0.8 (I _F =3.0A)	1.2	3.5	TO-220F	1.7
YG805C10R	100	20 (T _C =91°C)	100	-40 to +150	0.8 (I _F =5.0A)	2.5	2.5	TO-220F	1.7
YG808C10R	100	30 (T _C =80°C)	180	-40 to +150	0.8 (I _F =10A)	20	2.0	TO-220F	1.7

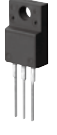
() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element *3: I_F=0.5I_O per element

*4: V_R=V_{RRM} per element

Ultra Low IR Schottky-Barrier Diodes

Ultra Low IR Schottky-Barrier Diodes					TO-220	TO-220F
						
Chip	V_{RRM} (V)	I_O (A)	V_F (V)	I_R (mA)		
Dual	100	10	0.82	0.015	✓	✓
		20	0.86	0.02	✓	✓
		30	0.86	0.03	✓	✓
	120	10	0.84	0.015	✓	✓
		20	0.88	0.02	✓	✓
		30	0.88	0.03	✓	✓
	150	10	0.86	0.015	✓	✓
		20	0.89	0.02	✓	✓
		30	0.89	0.03	✓	✓
	200	10	0.89	0.015	✓	✓
		20	0.93	0.02	✓	✓
		30	0.93	0.03	✓	✓

2 in one-package

Device type	Maximum rating		I_{FSM}^{*2}	Thermal rating	Characteristics ($T_a=25^\circ\text{C}$)			Package	Net mass
	V_{RRM}	I_O^{*1}			V_{FM}^{*3}	I_{RRM}^{*4}	$R_{th(j-c)}$		
	Volts	Amps.	Amps.	T_{vj} and T_{stg} $^\circ\text{C}$	max. Volts	max.mA	$^\circ\text{C/W}$		Grams
YG872C10R	100	10 ($T_C=146^\circ\text{C}$)	125	-40 to +175	0.82	0.015	3.5	TO-220F	1.7
YA872C10R	100	10 ($T_C=158^\circ\text{C}$)	125	-40 to +175	0.82	0.015	2.0	TO-220	2.0
YG875C10R	100	20 ($T_C=131^\circ\text{C}$)	145	-40 to +175	0.86	0.020	2.5	TO-220F	1.7
YA875C10R	100	20 ($T_C=144^\circ\text{C}$)	145	-40 to +175	0.86	0.020	1.75	TO-220	2.0
YG878C10R	100	30 ($T_C=122^\circ\text{C}$)	160	-40 to +175	0.86	0.030	2.0	TO-220F	1.7
YA878C10R	100	30 ($T_C=142^\circ\text{C}$)	160	-40 to +175	0.86	0.030	1.25	TO-220	2.0
YG872C12R	120	10 ($T_C=143^\circ\text{C}$)	125	-40 to +175	0.84	0.015	3.5	TO-220F	1.7
YA872C12R	120	10 ($T_C=158^\circ\text{C}$)	125	-40 to +175	0.84	0.015	2.0	TO-220	2.0
YG875C12R	120	20 ($T_C=127^\circ\text{C}$)	145	-40 to +175	0.88	0.020	2.5	TO-220F	1.7
YA875C12R	120	20 ($T_C=144^\circ\text{C}$)	145	-40 to +175	0.88	0.020	1.75	TO-220	2.0
YG878C12R	120	30 ($T_C=116^\circ\text{C}$)	160	-40 to +175	0.88	0.030	2.0	TO-220F	1.7
YA878C12R	120	30 ($T_C=141^\circ\text{C}$)	160	-40 to +175	0.88	0.030	1.25	TO-220	2.0
YG872C15R	150	10 ($T_C=144^\circ\text{C}$)	125	-40 to +175	0.86	0.015	3.5	TO-220F	1.7
YA872C15R	150	10 ($T_C=157^\circ\text{C}$)	125	-40 to +175	0.86	0.015	2.0	TO-220	2.0
YG875C15R	150	20 ($T_C=130^\circ\text{C}$)	145	-40 to +175	0.89	0.020	2.5	TO-220F	1.7
YA875C15R	150	20 ($T_C=143^\circ\text{C}$)	145	-40 to +175	0.89	0.020	1.75	TO-220	2.0
YG878C15R	150	30 ($T_C=120^\circ\text{C}$)	160	-40 to +175	0.89	0.030	2.0	TO-220F	1.7
YA878C15R	150	30 ($T_C=140^\circ\text{C}$)	160	-40 to +175	0.89	0.030	1.25	TO-220	2.0
YG872C20R	200	10 ($T_C=143^\circ\text{C}$)	125	-40 to +175	0.89	0.015	3.5	TO-220F	1.7
YA872C20R	200	10 ($T_C=157^\circ\text{C}$)	125	-40 to +175	0.89	0.015	2.0	TO-220	2.0
YG875C20R	200	20 ($T_C=127^\circ\text{C}$)	145	-40 to +175	0.93	0.020	2.5	TO-220F	1.7
YA875C20R	200	20 ($T_C=141^\circ\text{C}$)	145	-40 to +175	0.93	0.020	1.75	TO-220	2.0
YG878C20R	200	30 ($T_C=116^\circ\text{C}$)	160	-40 to +175	0.93	0.030	2.0	TO-220F	1.7
YA878C20R	200	30 ($T_C=138^\circ\text{C}$)	160	-40 to +175	0.93	0.030	1.25	TO-220	2.0

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element *3: $I_F=0.5I_O$ per element

*4: $V_R=V_{RRM}$ per element



Rectifier Diodes

Low IR Schottky-Barrier Diodes

Low IR Schottky-Barrier Diodes					TO-220	TO-220F	TO-3P (Q)	TO-3PF	TO-247	T-Pack(L)	T-Pack(S)	TFP
												
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (mA)								
Single	120	5	0.88	0.15		✓						
	150	5	0.9	0.15		✓						
Dual	45	20	0.63	0.175	✓	✓					✓	✓
		30	0.63	0.2	✓	✓					✓	✓
	60	10	0.68	0.15	✓	✓					✓	
		20	0.74	0.175	✓	✓					✓	
		30	0.74	0.2	✓	✓					✓	
		40	0.7	0.2	✓	✓				✓		
	80	10	0.76	0.15	✓	✓					✓	✓
		20	0.76	0.175	✓	✓					✓	✓
		30	0.76	0.2	✓	✓					✓	
		40	0.71	0.2	✓	✓				✓		
	100	10	0.86	0.15	✓	✓					✓	
		20	0.86	0.175	✓	✓					✓	✓
		30	0.86	0.2	✓	✓	✓			✓	✓	✓
		40	0.82	0.2	✓	✓				✓		
	120	10	0.88	0.15	✓	✓				✓	✓	
		20	0.88	0.15	✓	✓			✓	✓	✓	✓
		30	0.88	0.2	✓	✓			✓		✓	✓
		40	0.95	0.2	✓	✓						
	150	10	0.9	0.15	✓	✓				✓	✓	
		20	0.9	0.15	✓	✓		✓	✓	✓	✓	✓
		30	0.9	0.2	✓	✓	✓		✓		✓	✓
		40	0.97	0.2	✓	✓						

1 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)			Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} *3 max. Volts	I _{RRM} *4 max.mA	R _{th(j-o)} °C/W		
YG861S12R	120	5 (T _C =104°C)	75	-40 to +150	0.88	0.15	5.0	TO-220F	1.7
YG861S15R	150	5 (T _C =94°C)	75	-40 to +150	0.90	0.15	5.0	TO-220F	1.7

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms *3: I_F=I_O

*4: V_R=V_{RRM}

Low IR Schottky-Barrier Diodes

2 in one-package

Device type	Maximum rating			Thermal rating T_{vj} and T_{stg} °C	Characteristics ($T_a=25^{\circ}\text{C}$)			Package	Net mass Grams
	V_{RRM} Volts	I_O^{*1} Amps.	I_{FSM}^{*2} Amps.		V_{FM}^{*3} max. Volts	I_{RRM}^{*4} max.mA	$R_{th(j-c)}$ °C/W		
YG865C04R	45	20 ($T_C=115^{\circ}\text{C}$)	145	-40 to +150	0.63	0.175	2.5	TO-220F	1.7
YA865C04R	45	20 ($T_C=126^{\circ}\text{C}$)	145	-40 to +150	0.63	0.175	1.75	TO-220	2.0
TS865C04R	45	20 ($T_C=126^{\circ}\text{C}$)	145	-40 to +150	0.63	0.175	1.75	T-pack(S)	1.6
MS865C04	45	20 ($T_C=125^{\circ}\text{C}$)	145	-40 to +150	0.63	0.175	1.75	TFP	0.8
YG868C04R	45	30 ($T_C=105^{\circ}\text{C}$)	160	-40 to +150	0.63	0.20	2.0	TO-220F	1.7
YA868C04R	45	30 ($T_C=122^{\circ}\text{C}$)	160	-40 to +150	0.63	0.20	1.25	TO-220	2.0
TS868C04R	45	30 ($T_C=122^{\circ}\text{C}$)	160	-40 to +150	0.63	0.20	1.25	T-pack(S)	1.6
MS868C04	45	30 ($T_C=122^{\circ}\text{C}$)	160	-40 to +150	0.63	0.20	1.25	TFP	0.8
YG862C06R	60	10 ($T_C=124^{\circ}\text{C}$)	125	-40 to +150	0.68	0.15	3.5	TO-220F	1.7
YA862C06R	60	10 ($T_C=136^{\circ}\text{C}$)	125	-40 to +150	0.68	0.15	2.0	TO-220	2.0
TS862C06R	60	10 ($T_C=136^{\circ}\text{C}$)	125	-40 to +150	0.68	0.15	2.0	T-pack(S)	1.6
YG865C06R	60	20 ($T_C=109^{\circ}\text{C}$)	145	-40 to +150	0.74	0.175	2.5	TO-220F	1.7
YA865C06R	60	20 ($T_C=122^{\circ}\text{C}$)	145	-40 to +150	0.74	0.175	1.75	TO-220	2.0
TS865C06R	60	20 ($T_C=122^{\circ}\text{C}$)	145	-40 to +150	0.74	0.175	1.75	T-pack(S)	1.6
YG868C06R	60	30 ($T_C=101^{\circ}\text{C}$)	160	-40 to +150	0.74	0.20	2.0	TO-220F	1.7
YA868C06R	60	30 ($T_C=119^{\circ}\text{C}$)	160	-40 to +150	0.74	0.20	1.25	TO-220	2.0
TS868C06R	60	30 ($T_C=119^{\circ}\text{C}$)	160	-40 to +150	0.74	0.20	1.25	T-pack(S)	1.6
YG869C06R	60	40 ($T_C=105^{\circ}\text{C}$)	190	-40 to +150	0.70	0.20	1.2	TO-220F	1.7
YA869C06R	60	40 ($T_C=114^{\circ}\text{C}$)	190	-40 to +150	0.70	0.20	1.0	TO-220	2.0
TP869C06R	60	40 ($T_C=114^{\circ}\text{C}$)	190	-40 to +150	0.70	0.20	1.0	T-Pack(L)	1.6
YG862C08R	80	10 ($T_C=109^{\circ}\text{C}$)	125	-40 to +150	0.76	0.15	3.5	TO-220F	1.7
YA862C08R	80	10 ($T_C=126^{\circ}\text{C}$)	125	-40 to +150	0.76	0.15	2.0	TO-220	2.0
TS862C08R	80	10 ($T_C=126^{\circ}\text{C}$)	125	-40 to +150	0.76	0.15	2.0	T-pack(S)	1.6
MS862C08	80	10 ($T_C=115^{\circ}\text{C}$)	125	-40 to +150	0.76	0.15	3.0	TFP	0.8
YG865C08R	80	20 ($T_C=89^{\circ}\text{C}$)	145	-40 to +150	0.76	0.175	2.5	TO-220F	1.7
YA865C08R	80	20 ($T_C=107^{\circ}\text{C}$)	145	-40 to +150	0.76	0.175	1.75	TO-220	2.0
TS865C08R	80	20 ($T_C=107^{\circ}\text{C}$)	145	-40 to +150	0.76	0.175	1.75	T-pack(S)	1.6
MS865C08	80	20 ($T_C=108^{\circ}\text{C}$)	145	-40 to +150	0.76	0.175	1.75	TFP	0.8
YG868C08R	80	30 ($T_C=72^{\circ}\text{C}$)	160	-40 to +150	0.76	0.20	2.0	TO-220F	1.7
YA868C08R	80	30 ($T_C=105^{\circ}\text{C}$)	160	-40 to +150	0.76	0.20	1.25	TO-220	2.0
TS868C08R	80	30 ($T_C=105^{\circ}\text{C}$)	160	-40 to +150	0.76	0.20	1.25	T-pack(S)	1.6
YG869C08R	80	40 ($T_C=86^{\circ}\text{C}$)	190	-40 to +150	0.71	0.20	1.2	TO-220F	1.7
YA869C08R	80	40 ($T_C=98^{\circ}\text{C}$)	190	-40 to +150	0.71	0.20	1.0	TO-220	2.0
TP869C08R	80	40 ($T_C=98^{\circ}\text{C}$)	190	-40 to +150	0.71	0.20	1.0	T-Pack(L)	1.6

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element

*3: $I_F=0.5I_O$ per element

*4: $V_R=V_{RRM}$ per element



Low IR Schottky-Barrier Diodes

2 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)			Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} *3 max. Volts	I _{RRM} *4 max.mA	R _{th(j-c)} °C/W		
YG862C10R	100	10 (T _C =118°C)	125	-40 to +150	0.86	0.15	3.5	TO-220F	1.7
YA862C10R	100	10 (T _C =132°C)	125	-40 to +150	0.86	0.15	2.0	TO-220	2.0
TS862C10R	100	10 (T _C =132°C)	125	-40 to +150	0.86	0.15	2.0	T-pack(S)	1.6
YG865C10R	100	20 (T _C =103°C)	145	-40 to +150	0.86	0.175	2.5	TO-220F	1.7
YA865C10R	100	20 (T _C =117°C)	145	-40 to +150	0.86	0.175	1.75	TO-220	2.0
TS865C10R	100	20 (T _C =117°C)	145	-40 to +150	0.86	0.175	1.75	T-pack(S)	1.6
MS865C10	100	20 (T _C =117°C)	145	-40 to +150	0.86	0.175	1.75	TFP	0.8
YG868C10R	100	30 (T _C =91°C)	160	-40 to +150	0.86	0.20	2.0	TO-220F	1.7
YA868C10R	100	30 (T _C =113°C)	160	-40 to +150	0.86	0.20	1.25	TO-220	2.0
TS868C10R	100	30 (T _C =113°C)	160	-40 to +150	0.86	0.20	1.25	T-pack(S)	1.6
TP868C10R	100	30 (T _C =113°C)	160	-40 to +150	0.86	0.20	1.25	T-Pack(L)	1.6
MS868C10	100	30 (T _C =114°C)	160	-40 to +150	0.86	0.20	1.2	TFP	0.8
PA868C10R	100	30 (T _C =107°C)	160	-40 to +150	0.86	0.20	1.5	TO-3P(Q)	5.1
YG869C10R	100	40 (T _C =94°C)	190	-40 to +150	0.82	0.20	1.2	TO-220F	1.7
YA869C10R	100	40 (T _C =105°C)	190	-40 to +150	0.82	0.20	1.0	TO-220	2.0
TP869C10R	100	40 (T _C =105°C)	190	-40 to +150	0.82	0.20	1.0	T-Pack(L)	1.6
YG862C12R	120	10 (T _C =122°C)	75	-40 to +150	0.88	0.15	3.00	TO-220F	1.7
YA862C12R	120	10 (T _C =137°C)	75	-40 to +150	0.88	0.15	1.20	TO-220	2.0
TP862C12R	120	10 (T _C =137°C)	75	-40 to +150	0.88	0.15	1.50	T-Pack(L)	1.6
TS862C12R	120	10 (T _C =137°C)	75	-40 to +150	0.88	0.15	1.50	T-pack(S)	1.6
YG865C12R	120	20 (T _C =116°C)	150	-40 to +150	0.88	0.15	1.75	TO-220F	1.7
YA865C12R	120	20 (T _C =126°C)	150	-40 to +150	0.88	0.15	1.25	TO-220	2.0
PH865C12	120	20 (T _C =126°C)	150	-40 to +150	0.88	0.15	1.50	TO-247	4.9
TP865C12R	120	20 (T _C =126°C)	150	-40 to +150	0.88	0.15	1.25	T-Pack(L)	1.6
TS865C12R	120	20 (T _C =126°C)	150	-40 to +150	0.88	0.15	1.25	T-pack(S)	1.6
MS865C12	120	20 (T _C =126°C)	150	-40 to +150	0.88	0.15	1.25	TFP	0.8
YG868C12R	120	30 (T _C =116°C)	190	-40 to +150	0.88	0.20	1.20	TO-220F	1.7
YA868C12R	120	30 (T _C =122°C)	190	-40 to +150	0.88	0.20	1.00	TO-220	2.0
PH868C12	120	30 (T _C =122°C)	190	-40 to +150	0.88	0.20	1.20	TO-247	4.9
TS868C12R	120	30 (T _C =122°C)	190	-40 to +150	0.88	0.20	1.00	T-pack(S)	1.6
MS868C12	120	30 (T _C =115°C)	190	-40 to +150	0.88	0.20	1.20	TFP	0.8
YG869C12R	120	40 (T _C =95°C)	190	-40 to +150	0.95	0.20	1.20	TO-220F	1.7
YA869C12R	120	40 (T _C =104°C)	190	-40 to +150	0.95	0.20	1.00	TO-220	2.0
YG862C15R	150	10 (T _C =117°C)	75	-40 to +150	0.90	0.15	3.00	TO-220F	1.7
YA862C15R	150	10 (T _C =134°C)	75	-40 to +150	0.90	0.15	1.50	TO-220	2.0
TP862C15R	150	10 (T _C =134°C)	75	-40 to +150	0.90	0.15	1.50	T-Pack(L)	1.6
TS862C15R	150	10 (T _C =134°C)	75	-40 to +150	0.90	0.15	1.50	T-pack(S)	1.6
YG865C15R	150	20 (T _C =101°C)	150	-40 to +150	0.90	0.15	1.75	TO-220F	1.7
PH865C15	150	20 (T _C =109°C)	150	-40 to +150	0.90	0.15	1.50	TO-247	4.9
PG865C15R	150	20 (T _C =80°C)	150	-40 to +150	0.90	0.15	2.50	TO-3PF	6.0
YA865C15R	150	20 (T _C =115°C)	150	-40 to +150	0.90	0.15	1.25	TO-220	2.0
TP865C15R	150	20 (T _C =115°C)	150	-40 to +150	0.90	0.15	1.25	T-Pack(L)	1.6
TS865C15R	150	20 (T _C =115°C)	150	-40 to +150	0.90	0.15	1.25	T-pack(S)	1.6
MS865C15	150	20 (T _C =115°C)	150	-40 to +150	0.90	0.15	1.25	TFP	0.8
YG868C15R	150	30 (T _C =113°C)	190	-40 to +150	0.90	0.20	1.20	TO-220F	1.7
YA868C15R	150	30 (T _C =119°C)	190	-40 to +150	0.90	0.20	1.00	TO-220	2.0
TS868C15R	150	30 (T _C =119°C)	190	-40 to +150	0.90	0.20	1.00	T-pack(S)	1.6
MS868C15	150	30 (T _C =113°C)	190	-40 to +150	0.90	0.20	1.20	TFP	0.8
PA868C15R	150	30 (T _C =129°C)	190	-40 to +150	0.90	0.20	1.20	TO-3P	5.5
PH868C15	150	30 (T _C =129°C)	190	-40 to +150	0.90	0.20	1.20	TO-247	4.9
YG869C15R	150	40 (T _C =90°C)	190	-40 to +150	0.97	0.20	1.20	TO-220F	1.7
YA869C15R	150	40 (T _C =100°C)	190	-40 to +150	0.97	0.20	1.00	TO-220	2.0

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element

*3: I_F=0.5I_O per element

*4: V_R=V_{RRM} per element

Super LLD 2 (Critical mode PFC)

Super LLD 2 (Critical mode PFC)						TO-220	TO-220F	TO-247
								
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (μA)	t _{rr} (μsec)			
Single	600	8	1.55	10	0.05	✓	✓	
		10	1.55	10	0.05	✓	✓	
	800	5	2.2	10	0.05		✓	
Dual	600	10	1.55	10	0.05	✓	✓	✓

1 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} max. Volts	I _{RRM} *3 max. μA	t _{rr} *4 μ sec.	R _{th(j-c)} °C/W		
YA971S6R	600	8 (T _C =116°C)	70	-40 to +150	1.55 (I _F =8A)	10	0.05	2.5	TO-220	2.0
YG971S6R	600	8 (T _C =89°C)	70	-40 to +150	1.55 (I _F =8A)	10	0.05	4.5	TO-220F	1.7
YA972S6R	600	10 (T _C =115°C)	100	-40 to +150	1.55 (I _F =10A)	10	0.05	2.0	TO-220	2.0
YG972S6R	600	10 (T _C =89°C)	100	-40 to +150	1.55 (I _F =10A)	10	0.05	3.5	TO-220F	1.7
YG971S8R	800	5 (T _C =93°C)	60	-40 to +150	2.2 (I _F =5A)	10	0.05	4.5	TO-220F	1.7

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms *3: V_R=V_{RRM}

*4: I_F=0.1A, I_R=0.2A, I_{rec}=0.05A

2 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} max. Volts	I _{RRM} *3 max. μA	t _{rr} *4 μ sec.	R _{th(j-c)} °C/W		
YA975C6R	600	20 (T _C =106°C)	100	-40 to +150	1.55 (I _F =10A)	10	0.05	1.25	TO-220	2.0
YG975C6R	600	20 (T _C =89°C)	100	-40 to +150	1.55 (I _F =10A)	10	0.05	1.75	TO-220F	1.7
PH975C6	600	20 (T _C =97°C)	100	-40 to +150	1.55 (I _F =10A)	10	0.05	1.5	TO-247	4.9

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element *3: V_R=V_{RRM} per element

*4: I_F=0.1A, I_R=0.2A, I_{rec}=0.05A



Super LLD 3 (Continuous mode PFC)

Super LLD 3 (Continuous mode PFC)						TO-220	TO-220F	TO-247	T-Pack (S)
									
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (μA)	t _{rr} (μsec)				
Single	600	8	3	25	0.026	✓	✓		
		10	3	30	0.028	✓	✓		
Dual	600	16	3	25	0.026	✓	✓		✓
		20	3	30	0.028	✓	✓	✓	✓

1 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} max. Volts	I _{RRM} *3 max. μA	t _{rr} *4 μ sec.	R _{th(j-c)} °C/W		
YA981S6R	600	8 (T _C =99°C)	40	-40 to +150	3.0 (I _F =8A)	25	0.026	2.5	TO-220	2.0
YG981S6R	600	8 (T _C =58°C)	40	-40 to +150	3.0 (I _F =8A)	25	0.026	4.5	TO-220F	1.7
YA982S6R	600	10 (T _C =99°C)	50	-40 to +150	3.0 (I _F =10A)	30	0.028	2.0	TO-220	2.0
YG982S6R	600	10 (T _C =60°C)	50	-40 to +150	3.0 (I _F =10A)	30	0.028	3.5	TO-220F	1.7

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms

*3: V_R=V_{RRM}

*4: I_F=0.1A, I_R=0.2A, I_{rec}=0.05A

2 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} max. Volts	I _{RRM} *3 max. μA	t _{rr} *4 μ sec.	R _{th(j-c)} °C/W		
YA982C6R	600	16 (T _C =88°C)	40	-40 to +150	3.0 (I _F =8A)	25	0.026	1.5	TO-220	2.0
TS982C6R	600	16 (T _C =88°C)	40	-40 to +150	3.0 (I _F =8A)	25	0.026	1.5	T-pack(S)	1.6
YG982C6R	600	16 (T _C =68°C)	40	-40 to +150	3.0 (I _F =8A)	25	0.026	2	TO-220F	1.7
YA985C6R	600	20 (T _C =86°C)	50	-40 to +150	3.0 (I _F =10A)	30	0.028	1.25	TO-220	2.0
TS985C6R	600	20 (T _C =86°C)	50	-40 to +150	3.0 (I _F =10A)	30	0.028	1.25	T-pack(S)	1.6
YG985C6R	600	20 (T _C =60°C)	50	-40 to +150	3.0 (I _F =10A)	30	0.028	1.75	TO-220F	1.7
PH985C6	600	20 (T _C =73°C)	50	-40 to +150	3.0 (I _F =10A)	30	0.028	1.5	TO-247	4.9

() Conditions

*1: 50Hz Square wave duty 1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element *3: V_R=V_{RRM} per element

*4: I_F=0.1A, I_R=0.2A, I_{rec}=0.05A

Low-Loss Fast Recovery Diodes (LLD)

Low-Loss Fast Recovery Diodes (LLD)						TO-220F	K-Pack(L)	K-Pack(S)	TFP
									
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (μA)	t _{rr} (μsec)				
Single	200	5	0.95	100	0.035	✓	✓	✓	
		10	0.98	200	0.035	✓			
	300	5	1.2	100	0.035	✓			
Dual	200	5	0.95	100	0.035	✓	✓	✓	
		10	0.95	100	0.035	✓			
		20	0.98	200	0.035	✓			✓
	300	5	1.2	100	0.035	✓			
		10	1.2	100	0.035	✓			
		20	1.2	200	0.035				✓
		20	1.2	200	0.035				✓

1 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} *3 max. Volts	I _{RRM} *4 max. μA	t _{rr} *5 μ sec.	R _{th(j-c)} °C/W		
KP926S2	200	5 (T _C =106°C)	70	-40 to +150	0.95	100	0.035	10.0	K-Pack(L)	0.6
KS926S2	200	5 (T _C =106°C)	70	-40 to +150	0.95	100	0.035	10.0	K-pack(S)	0.6
YG911S2R	200	5 (T _C =134°C)	50	-40 to +150	0.95	100	0.035	3.5	TO-220F	1.7
YG912S2R	200	10 (T _C =116°C)	80	-40 to +150	0.98	200	0.035	3.5	TO-220F	1.7
YG911S3R	300	5 (T _C =128°C)	40	-40 to +150	1.2	100	0.035	3.5	TO-220F	1.7

() Conditions

*1: 50Hz Square wave duty 1/2

*2: Sine wave, 10ms

*3: I_F=I_O

*5: I_F=0.1A. I_R=0.2A. I_{rec}=0.05A

*4: V_R=V_{RRM}

2 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM} Volts	I _O *1 Amps.	I _{FSM} *2 Amps.		V _{FM} *3 max. Volts	I _{RRM} *4 max. μA	t _{rr} *5 μ sec.	R _{th(j-c)} °C/W		
KP923C2	200	5 (T _C =103°C)	50	-40 to +150	0.95	100	0.035	10.0	K-Pack(L)	0.6
KS923C2	200	5 (T _C =103°C)	50	-40 to +150	0.95	100	0.035	10.0	K-pack(S)	0.6
YG901C2R	200	5 (T _C =120°C)	25	-40 to +150	0.95	100	0.035	5.0	TO-220F	1.7
YG902C2R	200	10 (T _C =115°C)	50	-40 to +150	0.95	100	0.035	3.5	TO-220F	1.7
YG906C2R	200	20 (T _C =102°C)	80	-40 to +150	0.98	200	0.035	2.5	TO-220F	1.7
MS906C2	200	20 (T _C =105°C)	80	-40 to +150	0.98	200	0.035	2.0	TFP	0.8
YG901C3R	300	5 (T _C =105°C)	25	-40 to +150	1.2	100	0.035	5.0	TO-220F	1.7
YG902C3R	300	10 (T _C =101°C)	40	-40 to +150	1.2	100	0.035	3.5	TO-220F	1.7
MS906C3	300	20 (T _C =95°C)	80	-40 to +150	1.2	200	0.035	2.0	TFP	0.8

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element

*3: I_F=0.5I_O per element

*4: V_R=V_{RRM} per element

*5: I_F=0.1A. I_R=0.2A. I_{rec}=0.05A



Low-Loss Fast Soft Recovery Diodes (LLD)

Low-Loss Fast Soft Recovery Diodes (LLD)						TO-220	TO-220F	TO-3PF	T-Pack (S)	K-Pack (S)	TFP
											
Chip	V_{RRM} (V)	I_O (A)	V_F (V)	I_R (μA)	t_{rr} (μsec)						
Single	300	5	1.3	20	0.04					✓	
	400	5	1.45	20	0.05					✓	
Dual	300	10	1.3	20	0.04	✓	✓		✓		
		20	1.3	35	0.04	✓	✓	✓	✓		✓
	400	10	1.45	20	0.05	✓	✓		✓		
		20	1.45	35	0.05	✓	✓	✓	✓		✓

1 in one-package

Device type	Maximum rating			Thermal rating Tvj and Tstg °C	Characteristics (Ta=25°C)				Package	Net mass Grams
	VRRM	IO *1	IFSM *2		VFM *3	IRRM *4	trr *5	Rth (j-c)		
	Volts	Amps.	Amps.		max. Volts	max. μA	μ sec.	°C/W		
KS986S3	300	5 (TC=128°C)	90	-40 to +150	1.3	20	0.04	3.5	K-pack(S)	0.6
KS986S4	400	5 (TC=125°C)	80	-40 to +150	1.45	20	0.05	3.5	K-pack(S)	0.6

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms *3: $I_F=I_O$ per element

*4: $V_R=V_{RRM}$

*5: $I_F=0.1A$, $I_R=0.2A$, $I_{rec}=0.05A$

2 in one-package

Device type	Maximum rating			Thermal rating T _{vj} and T _{stg} °C	Characteristics (T _a =25°C)				Package	Net mass Grams
	V _{RRM}	I _O *1	I _{FSM} *2		V _{FM} *3	I _{RRM} *4	t _{rr} *5	R _{th} (j-c)		
	Volts	Amps.	Amps.		max. Volts	max. μA	μ sec.	°C/W		
YG982C3R	300	10 (T _C =112°C)	90	-40 to +150	1.3	20	0.04	3	TO-220F	1.7
YA982C3R	300	10 (T _C =128°C)	90	-40 to +150	1.3	20	0.04	1.75	TO-220	2.0
TS982C3R	300	10 (T _C =128°C)	90	-40 to +150	1.3	20	0.04	1.75	T-pack(S)	1.6
YG985C3R	300	20 (T _C =105°C)	110	-40 to +150	1.3	35	0.04	1.75	TO-220F	1.7
YA985C3R	300	20 (T _C =118°C)	110	-40 to +150	1.3	35	0.04	1.25	TO-220	2.0
TS985C3R	300	20 (T _C =118°C)	110	-40 to +150	1.3	35	0.04	1.25	T-pack(S)	1.6
MS985C3	300	20 (T _C =118°C)	110	-40 to +150	1.3	35	0.04	1.25	TFP	0.8
PG985C3R	300	20 (T _C =73°C)	110	-40 to +150	1.3	35	0.04	3	TO-3PF	6.0
YG982C4R	400	10 (T _C =107°C)	80	-40 to +150	1.45	20	0.05	3	TO-220F	1.7
YA982C4R	400	10 (T _C =125°C)	80	-40 to +150	1.45	20	0.05	1.75	TO-220	2.0
TS982C4R	400	10 (T _C =125°C)	80	-40 to +150	1.45	20	0.05	1.75	T-pack(S)	1.6
YG985C4R	400	20 (T _C =100°C)	100	-40 to +150	1.45	35	0.05	1.75	TO-220F	1.7
YA985C4R	400	20 (T _C =114°C)	100	-40 to +150	1.45	35	0.05	1.25	TO-220	2.0
TS985C4R	400	20 (T _C =114°C)	100	-40 to +150	1.45	35	0.05	1.25	T-pack(S)	1.6
MS985C4	400	20 (T _C =114°C)	100	-40 to +150	1.45	35	0.05	1.25	TFP	0.8
PG985C4R	400	20 (T _C =64°C)	100	-40 to +150	1.45	35	0.05	3	TO-3PF	6.0

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element

*3: $I_F=0.5I_O$ per element

*4: $V_R=V_{RRM}$ per element

*5: $I_F=0.1A$, $I_R=0.2A$, $I_{rec}=0.05A$

Schottky-Barrier Diodes (SBD)

Schottky-Barrier Diodes (SBD)						TO-3P(Q)	TO-3PF	T-Pack (S)	T-Pack (L)
									
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (mA)					
Dual	40	10	0.55	5				✓	✓
		20	0.6	15				✓	
		30	0.55	20		✓	✓		
	60	30	0.58	20		✓	✓	✓	

2 in one-package

Device type	Maximum rating		I _{FSM} *2	Thermal rating	Characteristics (T _a =25°C)			Package	Net mass
	V _{RRM}	I _O *1			V _{FM} *3	I _{RRM} *4	R _{th(j-c)}		
	Volts	Amps.	Amps.	°C	max. Volts	max. mA	°C/W		Grams
TP802C04R	40	10 (T _C =116°C)	120	-40 to +150	0.55 (I _F =4.0A)	5	3.0	T-Pack(L)	1.6
TS802C04R	40	10 (T _C =116°C)	120	-40 to +150	0.55 (I _F =4.0A)	5	3.0	T-pack(S)	1.6
TS805C04R	40	20 (T _C =110°C)	120	-40 to +150	0.6 (I _F =10A)	15	2.0	T-pack(S)	1.6
ESAD83M-004RR	40	30 (T _C =105°C)	150	-40 to +150	0.55 (I _F =12.5A)	20	1.7	TO-3PF	6.0
ESAD83-004R	40	30 (T _C =118°C)	150	-40 to +150	0.55 (I _F =12.5A)	20	1.2	TO-3P	5.5
ESAD83M-006RR	60	30 (T _C =106°C)	120	-40 to +150	0.58 (I _F =12.5A)	20	1.7	TO-3PF	6.0
TS808C06R	60	30 (T _C =115°C)	120	-40 to +150	0.58 (I _F =12.5A)	20	1.2	T-pack(S)	1.6
ESAD83-006R	60	30 (T _C =119°C)	120	-40 to +150	0.58 (I _F =12.5A)	20	1.2	TO-3P	5.5

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element

*3: per element

*4: V_R=V_{RRM} per element

Low-Loss Fast Recovery Diodes (LLD)

Low-Loss Fast Recovery Diodes (LLD)						TO-3P(Q)	TO-3PF	T-Pack (S)	T-Pack (L)
									
Chip	V _{RRM} (V)	I _O (A)	V _F (V)	I _R (μA)	t _{rr} (μsec)				
Dual	200	5	0.95	100	0.035				✓
		10	0.95	100	0.035			✓	✓
		20	0.95	200	0.04	✓	✓		
		20	0.98	200	0.035			✓	✓
	300	10	1.2	100	0.035			✓	✓
		20	1.2	200	0.04	✓	✓		
	400	20	1.5	500	0.05	✓			

2 in one-package

Device type	Maximum rating		I _{FSM} *2	Thermal rating	Characteristics (T _a =25°C)			Package	Net mass
	V _{RRM}	I _O *1			V _{FM} *3	I _{RRM} *4	t _{rr} *5		
	Volts	Amps.	Amps.	°C	max. Volts	max. μA	μ sec.		Grams
TP901C2R	200	5 (T _C =120°C)	25	-40 to +150	0.95 (I _F =2.5A)	100	0.035	T-Pack(L)	1.6
TP902C2R	200	10 (T _C =125°C)	50	-40 to +150	0.95 (I _F =5A)	100	0.035	T-Pack(L)	1.6
TS902C2R	200	10 (T _C =125°C)	50	-40 to +150	0.95 (I _F =5A)	100	0.035	T-pack(S)	1.6
ESAD92M-02RR	200	20 (T _C =108°C)	100	-40 to +150	0.95 (I _F =10A)	200	0.04	TO-3PF	6.0
TP906C2R	200	20 (T _C =110°C)	80	-40 to +150	0.98 (I _F =10A)	200	0.035	T-Pack(L)	1.6
TS906C2R	200	20 (T _C =110°C)	80	-40 to +150	0.98 (I _F =10A)	200	0.035	T-pack(S)	1.6
ESAD92-02R	200	20 (T _C =115°C)	100	-40 to +150	0.95 (I _F =10A)	200	0.04	TO-3P	5.5
TP902C3R	300	10 (T _C =115°C)	40	-40 to +150	1.2 (I _F =5A)	100	0.035	T-Pack(L)	1.6
TS902C3R	300	10 (T _C =115°C)	40	-40 to +150	1.2 (I _F =5A)	100	0.035	T-pack(S)	1.6
ESAD92-03R	300	20 (T _C =110°C)	80	-40 to +150	1.2 (I _F =10A)	200	0.04	TO-3P	5.5
ESAD92M-03RR	300	20 (T _C =96°C)	80	-40 to +150	1.2 (I _F =10A)	200	0.04	TO-3PF	6.0
ESAE92-03R	300	30 (T _C =99°C)	115	-40 to +150	1.2 (I _F =15A)	300	0.04	TO-3P	5.5
ESAF92-03R	300	60 (T _C =86°C)	240	-40 to +150	1.2 (I _F =30A)	600	0.04	TO-3P	5.5
PA905C4R	400	20 (T _C =107°C)	70	-40 to +150	1.5 (I _F =10A)	500	0.05	TO-3P	5.5

() Conditions

*1: 50Hz Square wave duty=1/2 (Average forward current of centertap full wave connection)

*2: Sine wave, 10ms per element

*3: per element

*4: V_R=V_{RRM} per element

*5: I_F=0.1A, I_R=0.2A, I_{rec}=0.05A



Ultra Fast Recovery Diodes

Ultra Fast Recovery Diodes						TO-220	TO-247-2L-P2	TO-247-P2	TO-247-2-P2
									
Chip	V_{RRM} (V)	I_O (A)	V_F (V)	I_R (μA)	t_{rr} (μsec)				
Single	600	15	2.6	250	0.031	✓	✓		
		25	2.6	250	0.033	✓	✓		
		35	2.6	250	0.036		✓		
		75	2.95	250	0.060				✓
	650	60	3.2	250	0.060				✓
Dual	600	50	2.6	250	0.033			✓	
		70	2.6	250	0.036			✓	

1 in one-package

Device type	Maximum rating			Thermal rating T_{vj} and T_{stg} °C	Characteristics ($T_a=25^{\circ}\text{C}$)				Package	Net mass Grams
	V_{RRM} Volts	I_O^{*1} Amps.	I_{FSM}^{*2} Amps.		V_{FM}^{*3} max. Volts	I_{RRM}^{*4} max. μA	t_{rr}^{*5} μsec.	$R_{th(j-c)}$ °C/W		
FDRP15S60L	600	15 ($T_C=98^{\circ}\text{C}$)	110	-40 to +150	2.6	250	0.031	1.6	TO-220	2.0
FDRW15S60L	600	15 ($T_C=85^{\circ}\text{C}$)	110	-40 to +150	2.6	250	0.031	2.0	TO-247-2L-P2	4.9
FDRP25S60L	600	25 ($T_C=86^{\circ}\text{C}$)	125	-40 to +150	2.6	250	0.033	1.2	TO-220	2.0
FDRW25S60L	600	25 ($T_C=86^{\circ}\text{C}$)	125	-40 to +150	2.6	250	0.033	1.2	TO-247-2L-P2	4.9
FDRW35S60L	600	35 ($T_C=91^{\circ}\text{C}$)	140	-40 to +150	2.6	250	0.036	0.8	TO-247-2L-P2	4.9
FDRW75T60L	600	75 ($T_C=49^{\circ}\text{C}$)	300	-40 to +150	2.95	250	0.060	0.57	TO-247-2-P2	4.9
FDRW60T65L	650	60 ($T_C=50^{\circ}\text{C}$)	250	-40 to +150	3.2	250	0.060	0.68	TO-247-2-P2	4.9

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms 1shot

*3: $I_F=I_O$

*4: $V_R=V_{RRM}$ *5: $V_R=30V$, $I_F=0.1 I_O$, $-di/dt=200A/\mu s$

2 in one-package

Device type	Maximum rating			Thermal rating T_{vj} and T_{stg} °C	Characteristics ($T_a=25^{\circ}\text{C}$)				Package	Net mass Grams
	V_{RRM} Volts	I_O^{*1} Amps.	I_{FSM}^{*2} Amps.		V_{FM}^{*3} max. Volts	I_{RRM}^{*4} max. μA	t_{rr}^{*5} μsec.	$R_{th(j-c)}$ °C/W		
FDRW50C60L	600	50 ($T_C=86^{\circ}\text{C}$)	125	-40 to +150	2.6	250	0.033	0.6	TO-247-P2	4.9
FDRW70C60L	600	70 ($T_C=91^{\circ}\text{C}$)	140	-40 to +150	2.6	250	0.036	0.4	TO-247-P2	4.9

() Conditions

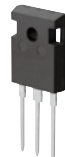
*1: 50Hz Square wave duty=1/2, Output Current of center tap full wave connection

*2: Sine wave, 10ms 1shot, Rating per element *3: $I_F=0.5 I_O$, Rating per element

*4: $V_R=V_{RRM}$, Rating per element

*5: $V_R=30V$, $I_F=0.05 I_O$, $-di/dt=200A/\mu s$, Rating per element

Soft Recovery Fast Recovery Diodes

Soft Recovery Fast Recovery Diodes						TO-247-2L-P2	TO-247-P2
							
Chip	V_{RRM} (V)	I_O (A)	V_F (V)	I_R (μA)	t_{rr} (μsec)		
Single	1200	12	2.8	250	0.042	✓	
		20	2.8	250	0.055	✓	
		30	2.8	250	0.063	✓	
Dual	1200	40	2.8	250	0.055		✓
		60	2.8	250	0.063		✓

1 in one-package

Device type	Maximum rating			Thermal rating T_{vj} and T_{stg} °C	Characteristics ($T_a=25^\circ\text{C}$)				Package	Net mass Grams
	V_{RRM} Volts	I_O^{*1} Amps.	I_{FSM}^{*2} Amps.		V_{FM}^{*3} max. Volts	I_{RRM}^{*4} max. μA	t_{rr}^{*5} μsec.	$R_{th(j-c)}$ °C/W		
FDRW12S120J	1200	12 ($T_C=97^\circ\text{C}$)	100	-40 to +150	2.8	250	0.042	1.6	TO-247-2L-P2	4.9
FDRW20S120J	1200	20 ($T_C=88^\circ\text{C}$)	120	-40 to +150	2.8	250	0.055	1.2	TO-247-2L-P2	4.9
FDRW30S120J	1200	30 ($T_C=89^\circ\text{C}$)	150	-40 to +150	2.8	250	0.063	0.781	TO-247-2L-P2	4.9

() Conditions

*1: 50Hz Square wave duty=1/2

*2: Sine wave, 10ms 1shot

*3: $I_F=I_O$

*4: $V_R=V_{RRM}$ *5: $V_R=30V$, $I_F=0.1 I_O$, $-di/dt=200A/us$

2 in one-package

Device type	Maximum rating			Thermal rating T_{vj} and T_{stg} °C	Characteristics ($T_a=25^\circ\text{C}$)				Package	Net mass Grams
	V_{RRM} Volts	I_O^{*1} Amps.	I_{FSM}^{*2} Amps.		V_{FM}^{*3} max. Volts	I_{RRM}^{*4} max. μA	t_{rr}^{*5} μsec.	$R_{th(j-c)}$ °C/W		
FDRW40C120J	1200	40 ($T_C=98^\circ\text{C}$)	120	-40 to +150	2.8	250	0.055	0.5	TO-247-P2	4.9
FDRW60C120J	1200	60 ($T_C=87^\circ\text{C}$)	150	-40 to +150	2.8	250	0.063	0.397	TO-247-P2	4.9

() Conditions

*1: 50Hz Square wave duty=1/2, Output Current of center tap full wave connection

*2: Sine wave, 10ms 1shot, Rating per element *3: $I_F=0.5 I_O$, Rating per element

*4: $V_R=V_{RRM}$, Rating per element

*5: $V_R=30V$, $I_F=0.05 I_O$, $-di/dt=200A/us$, Rating per element

Pressure Sensors



Fuji Electric's pressure sensors combine piezo resistance, adjustment circuits, and EMC protection on single chip and contribute to reduction of system size. They operate in wide pressure range and are applicable to various uses.



Features of Pressure Sensors

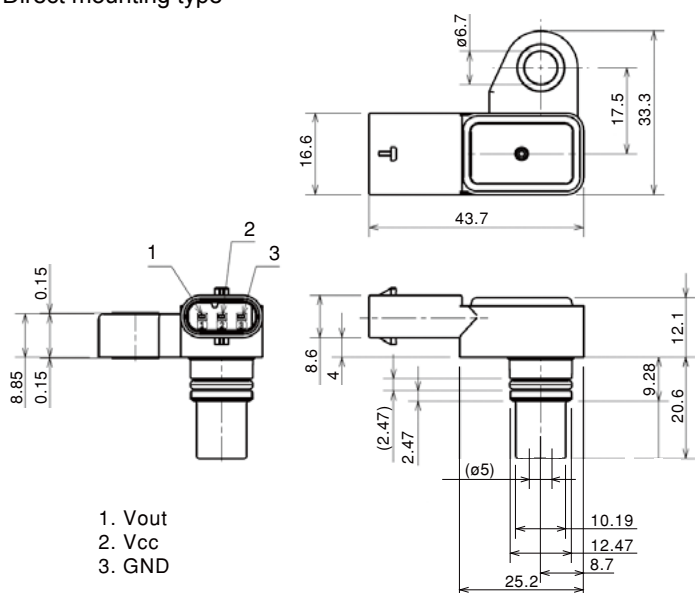
- Absolute pressure measurement
- High accuracy with digital trimming
- Wide pressure range, full scale of 100kPa to 300kPa
- Provided with overvoltage protection circuit, EMC filter, and surge protective device in the sensor chip
- Surge protection conforms to ISO7637-level 3 (2011) for automotive components
- Diagnostic self-detecting function in the event of a wire opened among Vcc, Vout and GND terminals
- High reliability ensured by EPROM bit redundancy

Products

Device type	Max. applied voltage (kPa.abs)	Allowable voltage (V)	Operating temperature (°C)	Operating pressure (kPa.abs)	Operating voltage (V)	Output Voltage range (V)	Absolute pressure/ Relative pressure	Package
EPL4PC-R3S	500	7	-40 to 125	20 to 106.7	5.0±0.25	0.789 to 4.211	Absolute pressure	Assembly type
EPL6GC-R3S	500	7	-40 to 125	25 to 242	5.0±0.25	0.5 to 4.5	Absolute pressure	Assembly type

Dimensions, mm

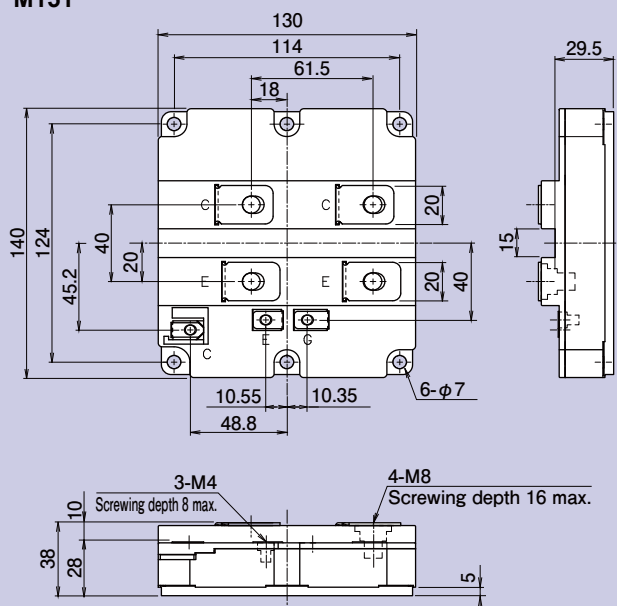
Direct mounting type



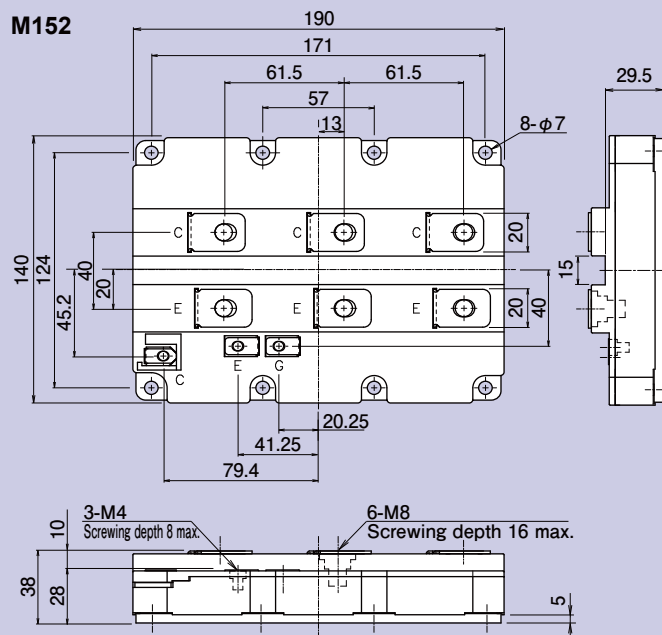
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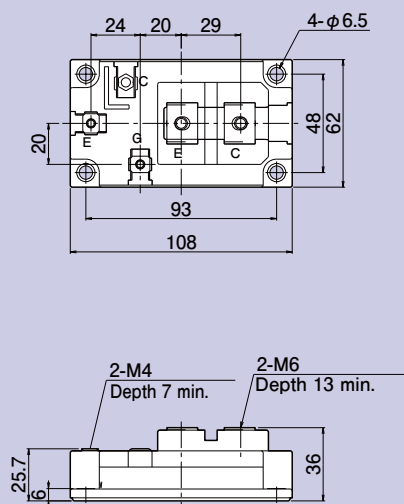
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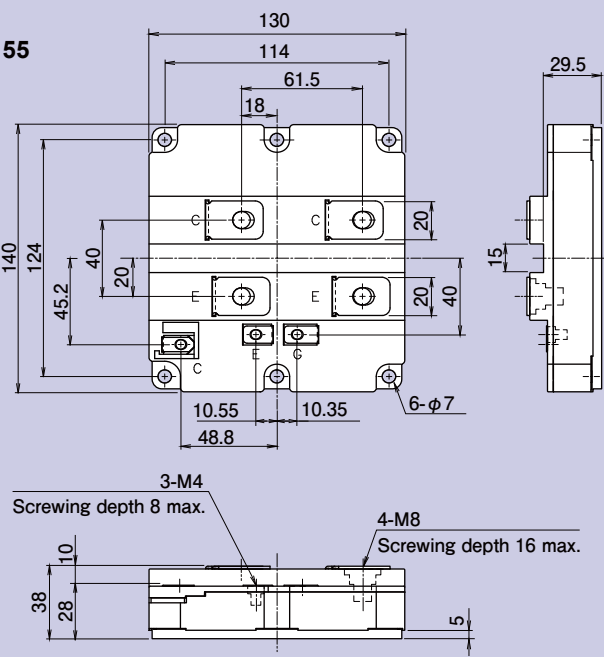
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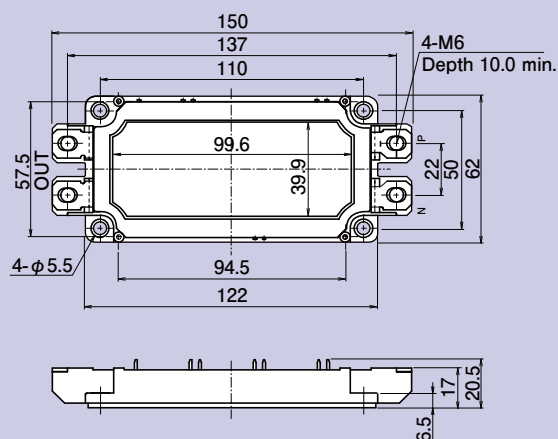


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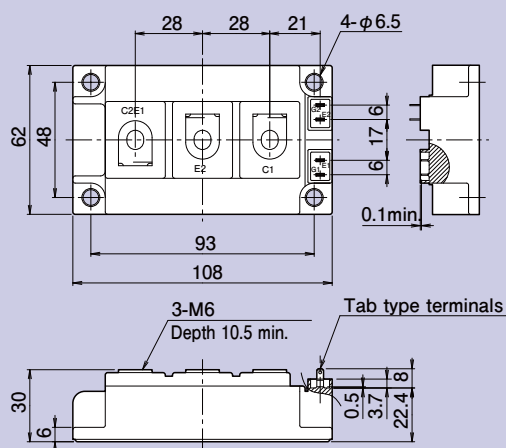
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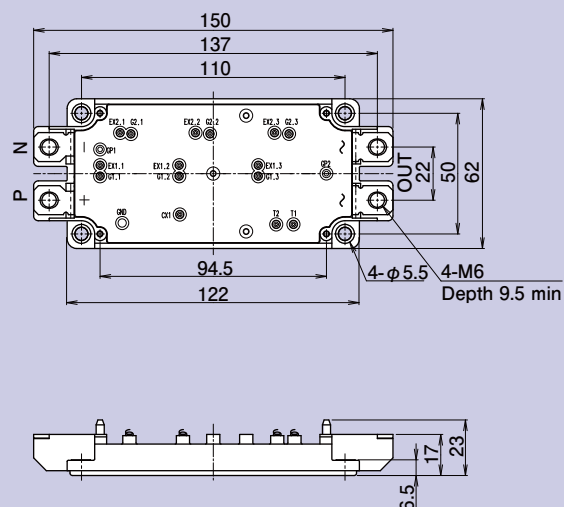


Unit: mm

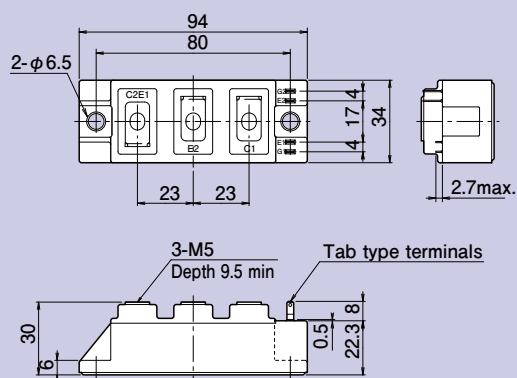
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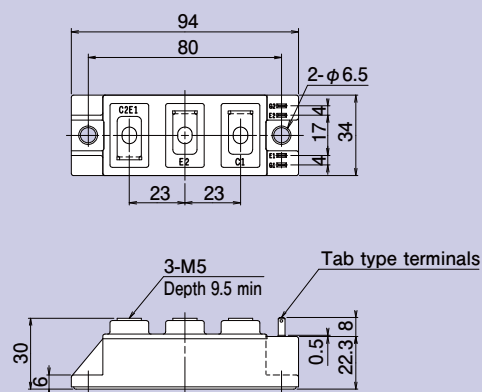
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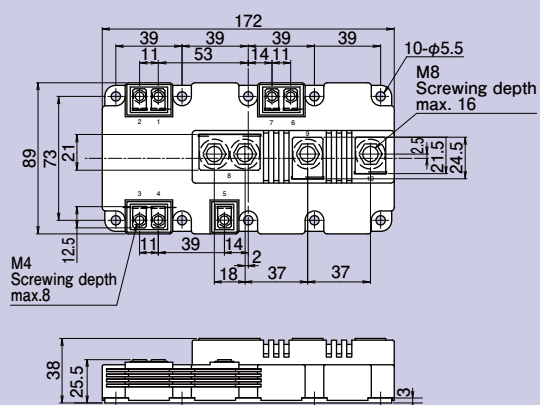
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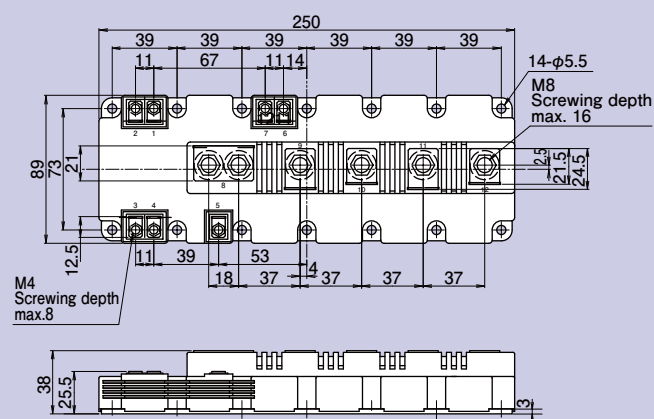
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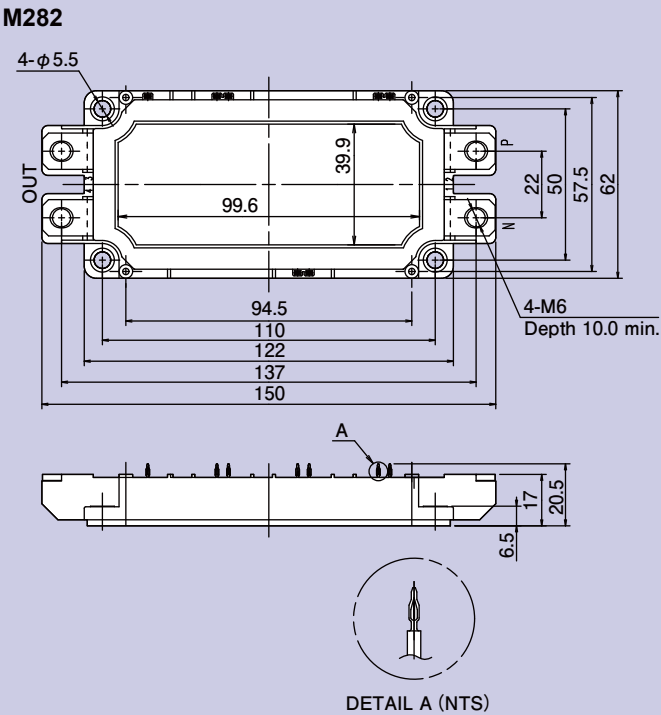
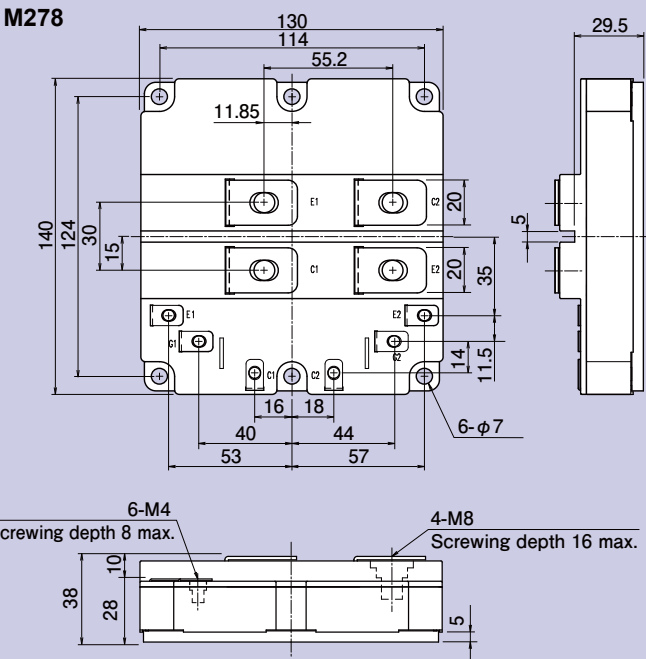
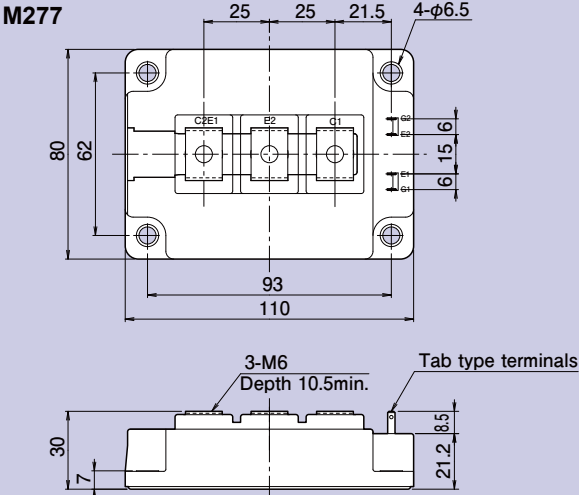
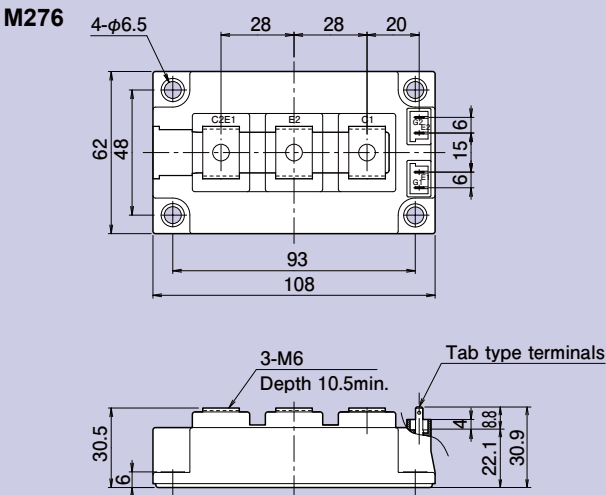
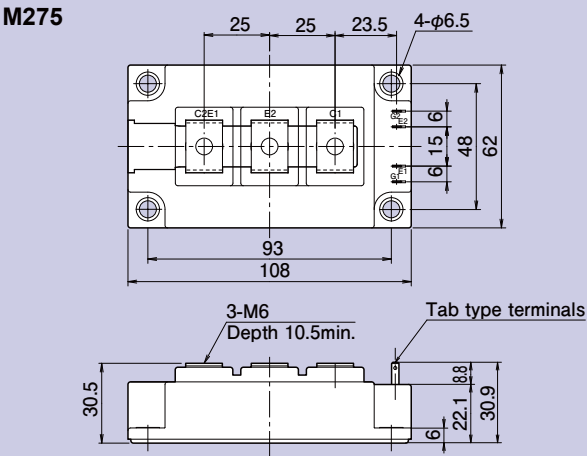
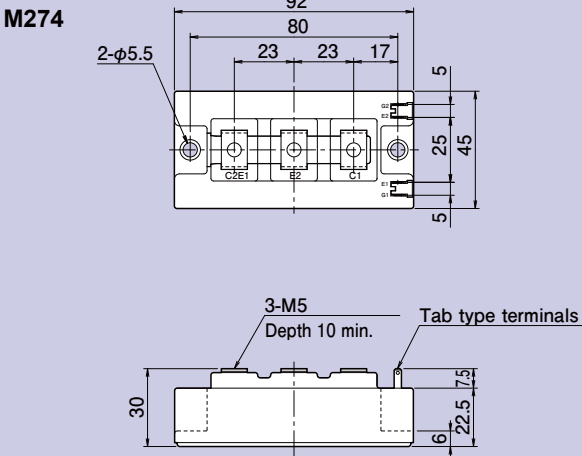
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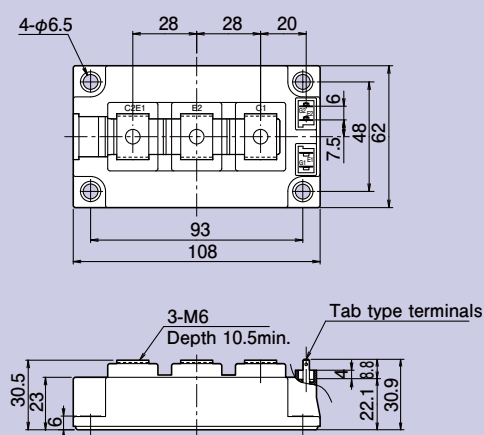
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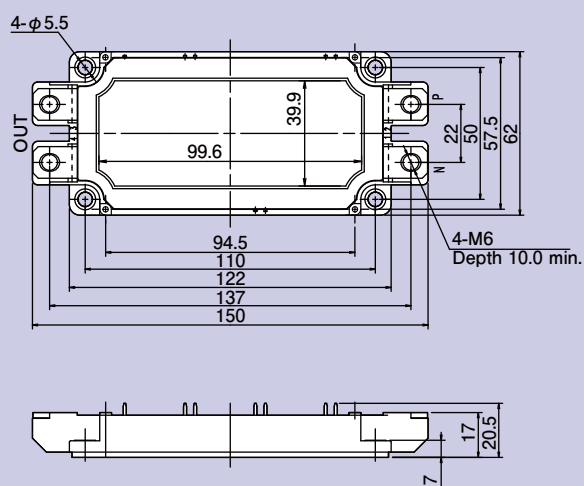
Unit: mm



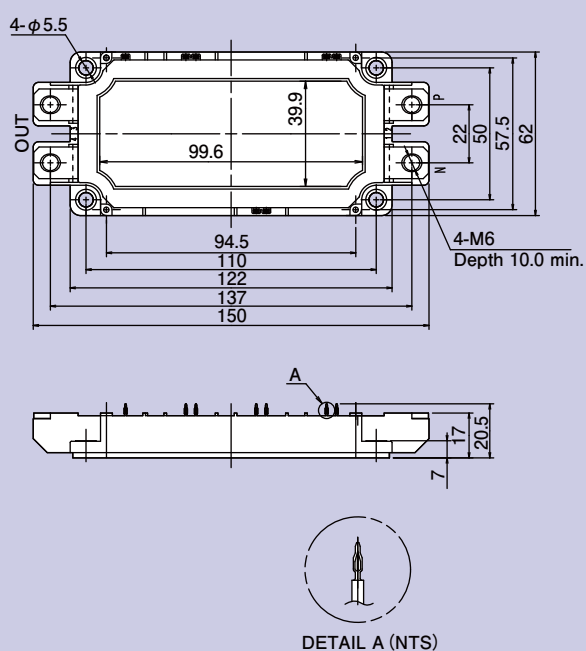
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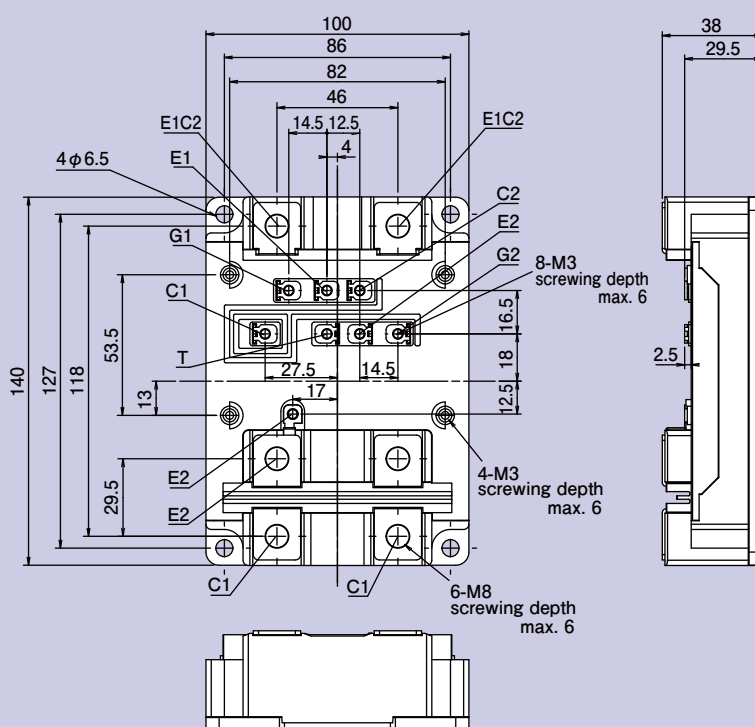
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M286

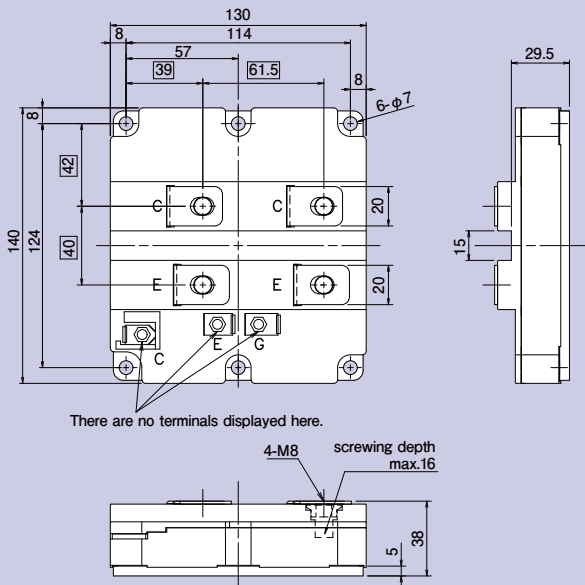


M288

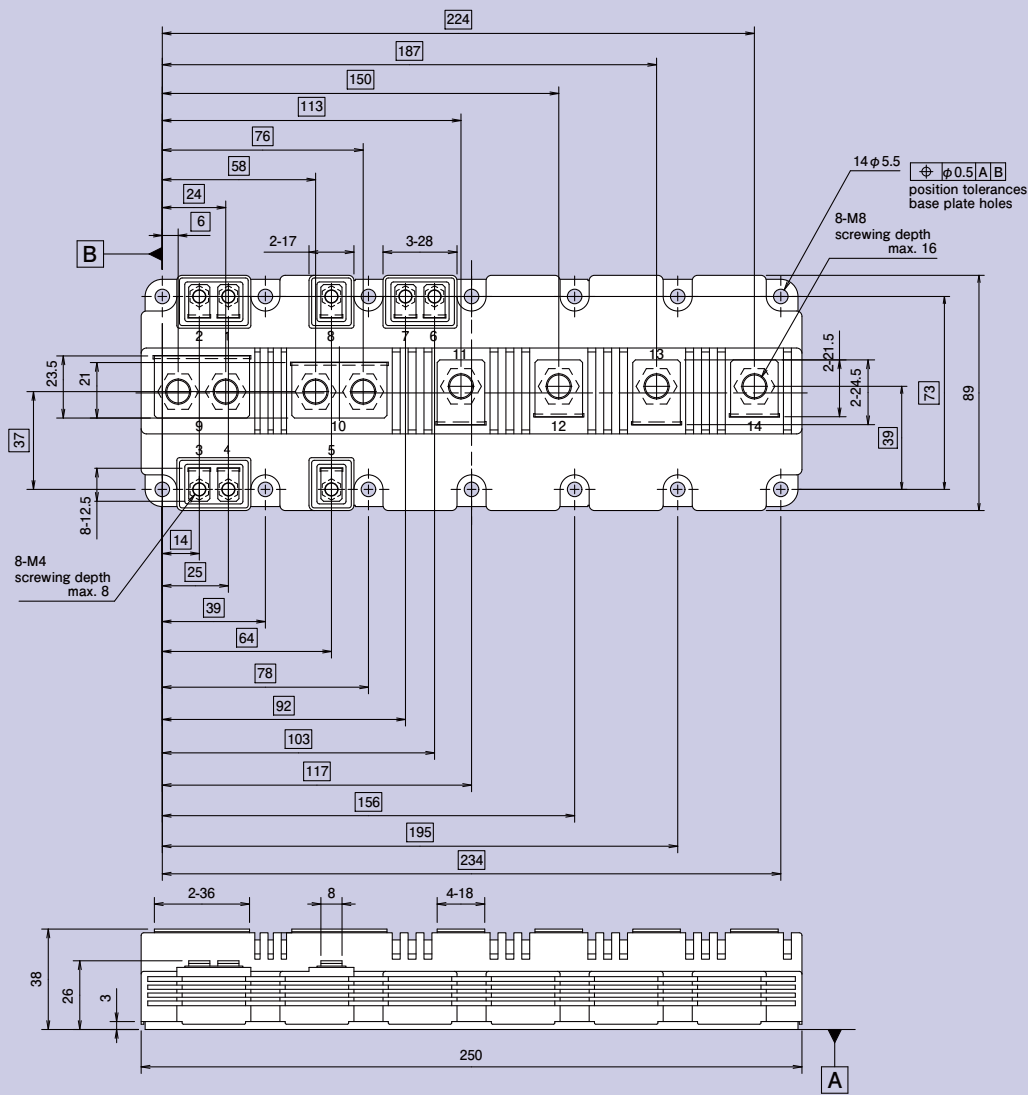


Unit: mm

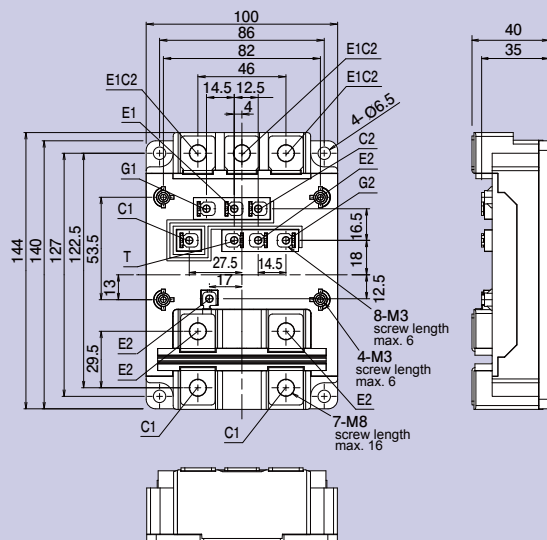
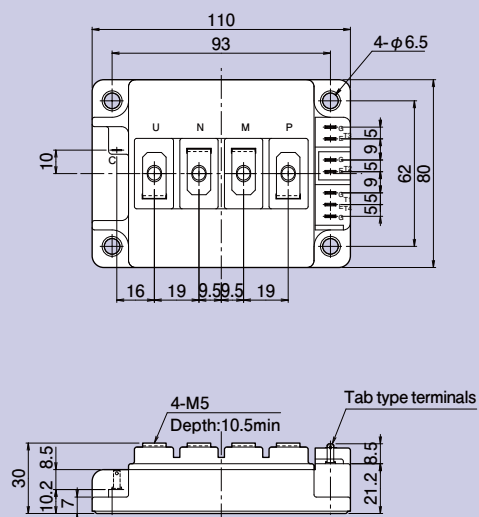
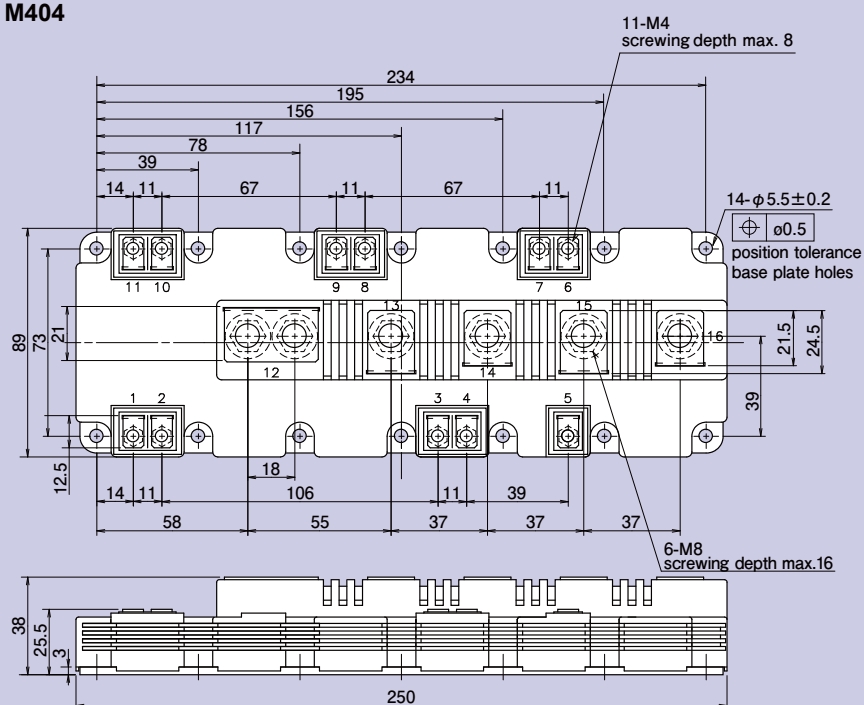
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M291

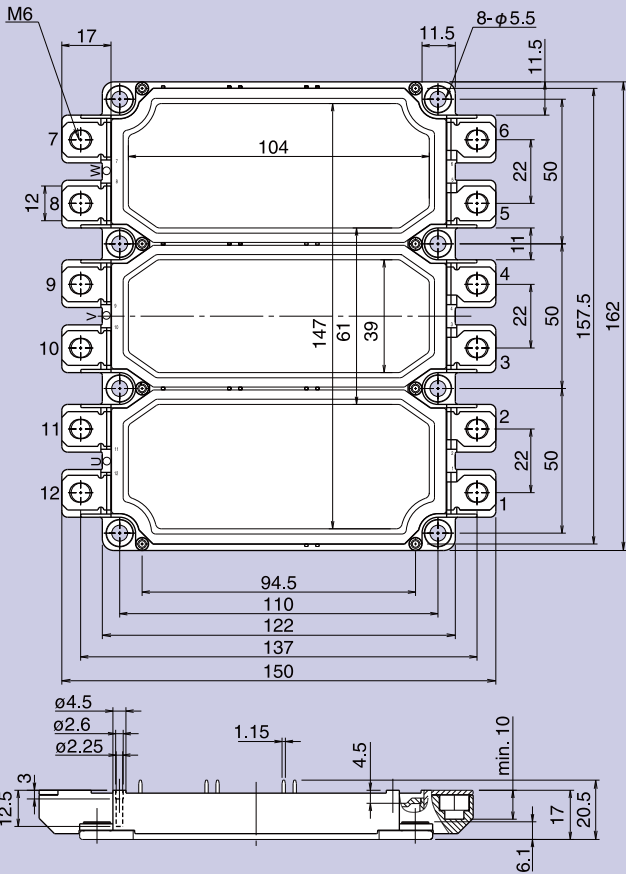


Unit: mm

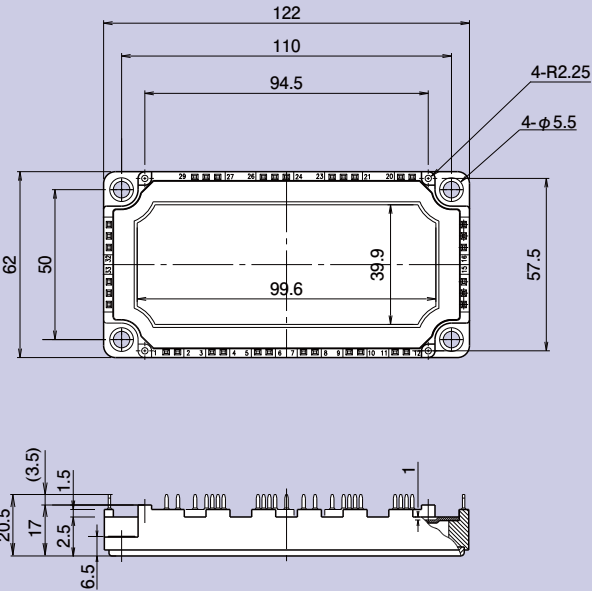
M292**M403****M404**

Unit: mm

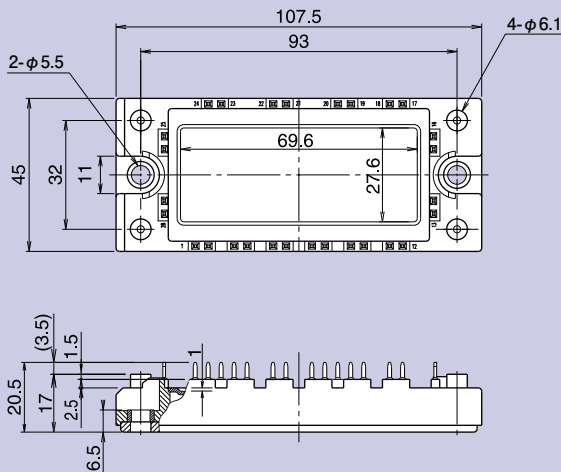
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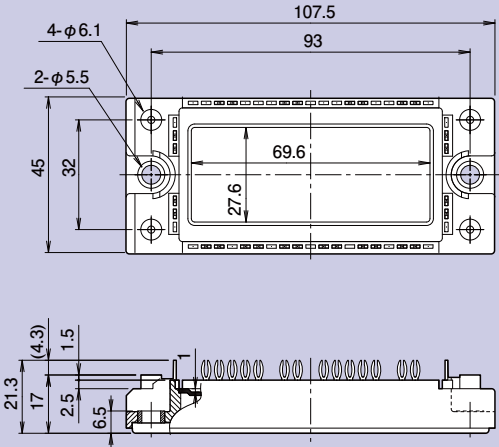
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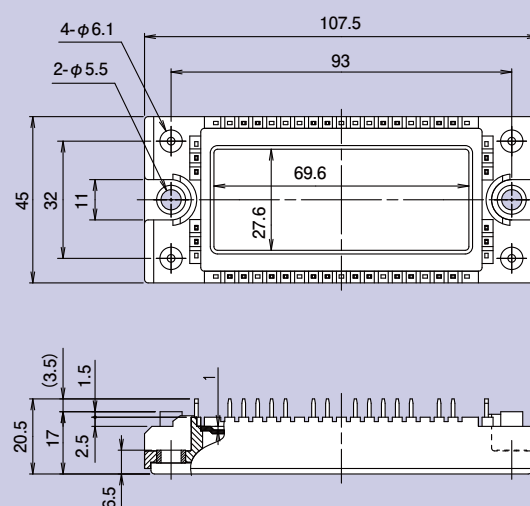
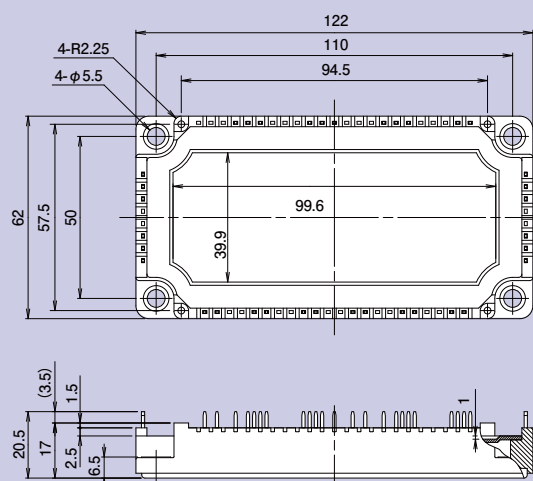
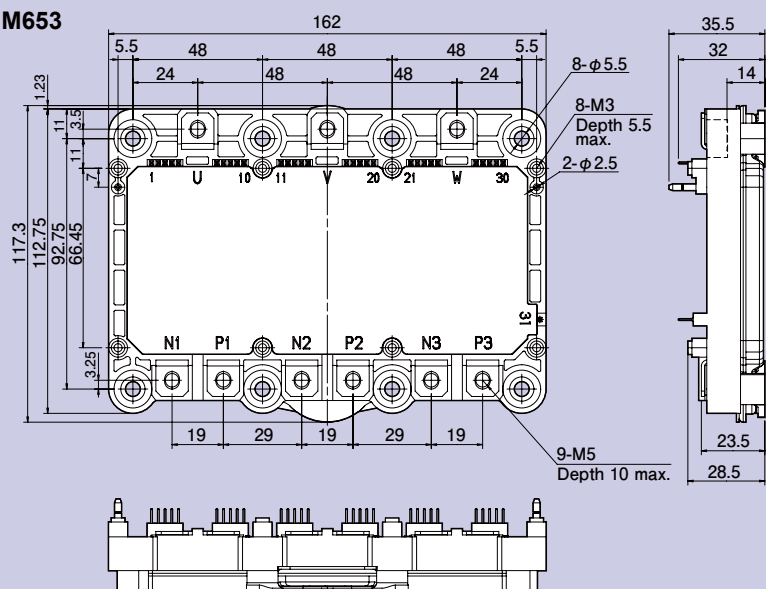
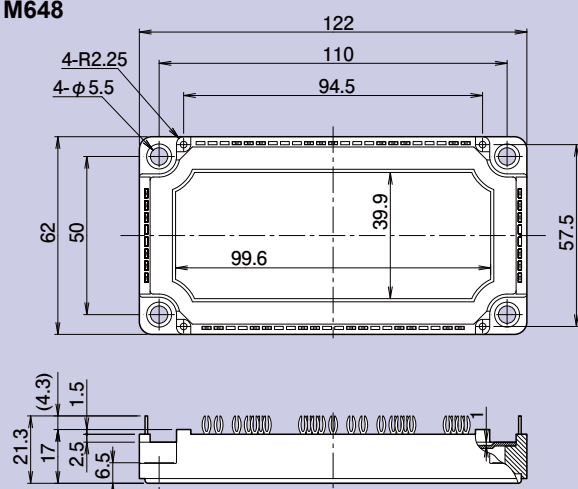


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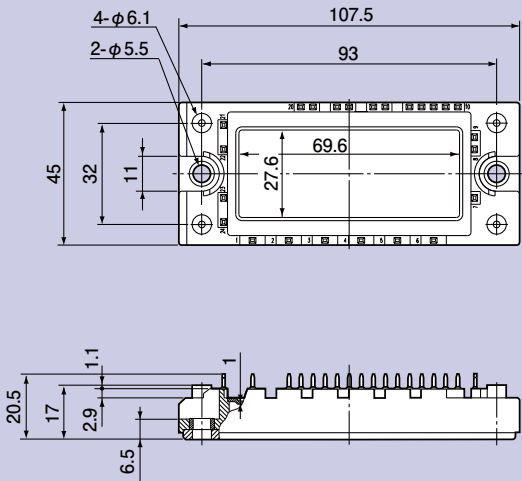
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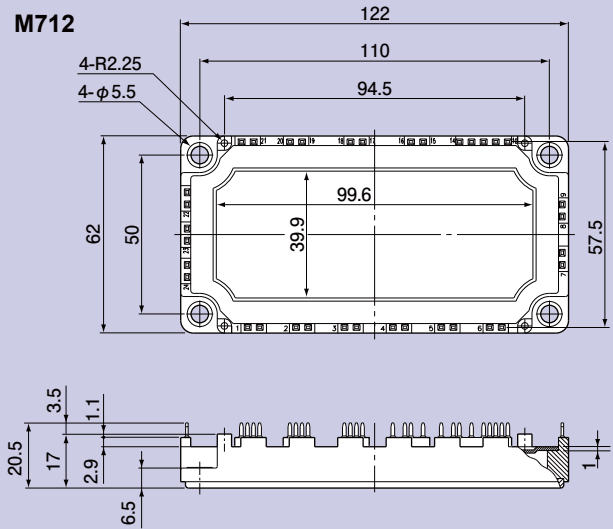


Unit: mm

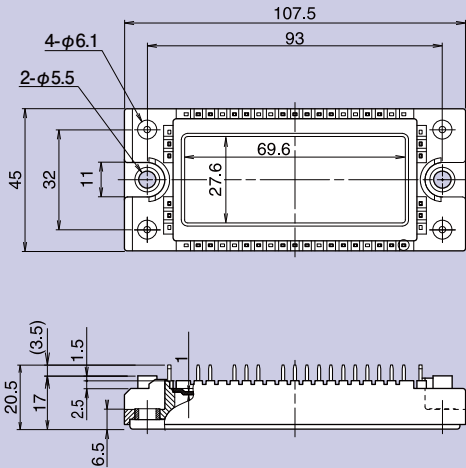
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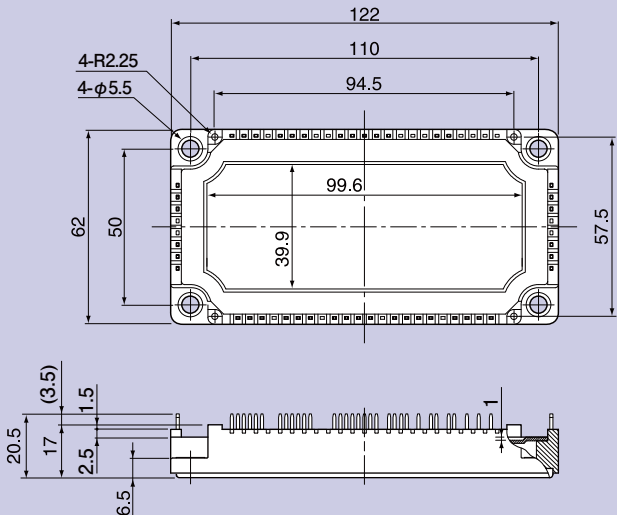
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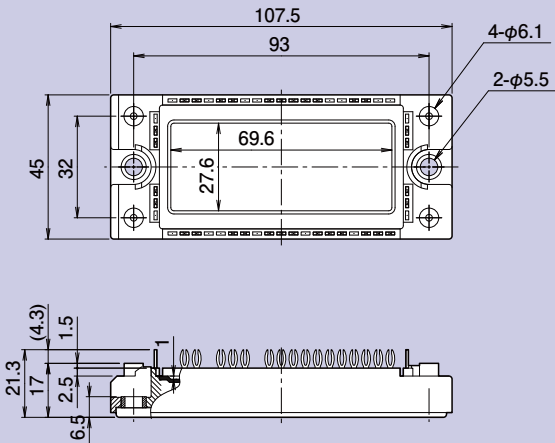
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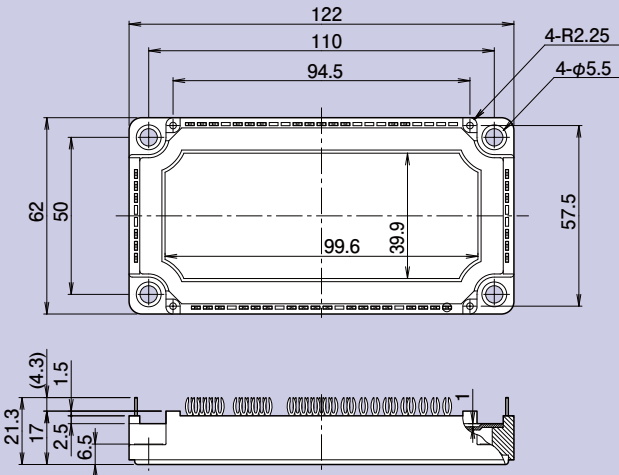
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M721

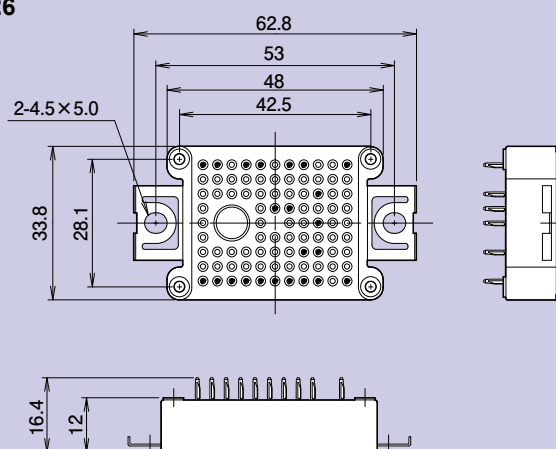


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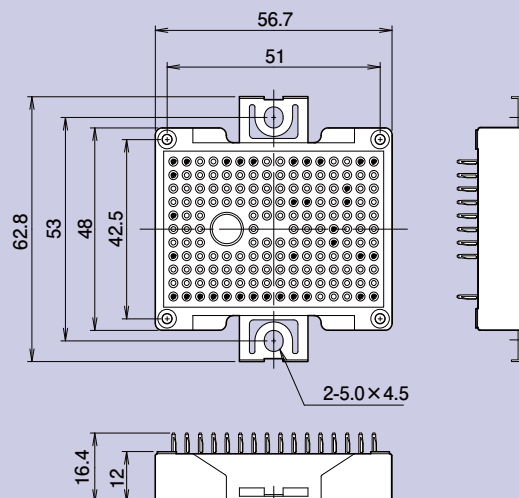


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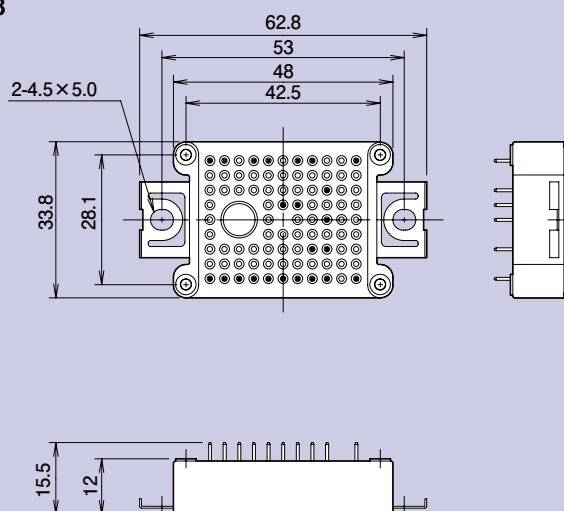
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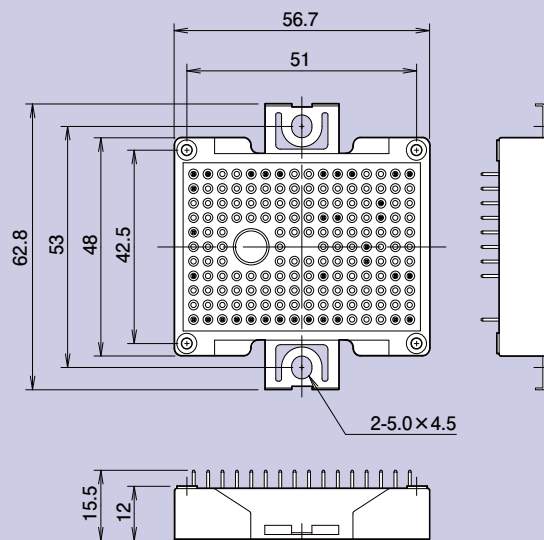
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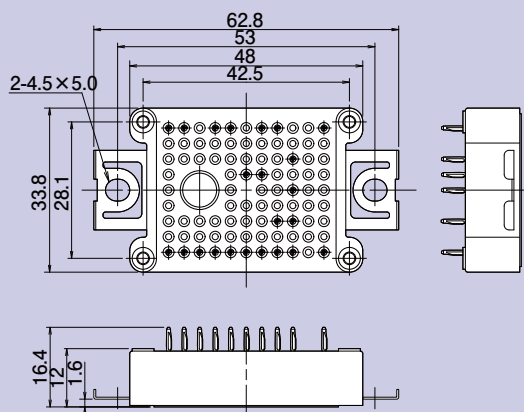
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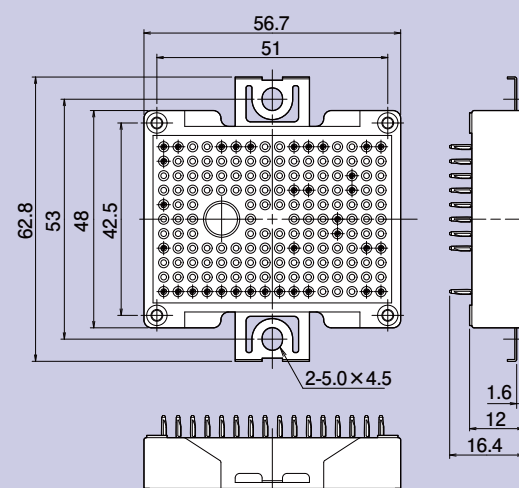
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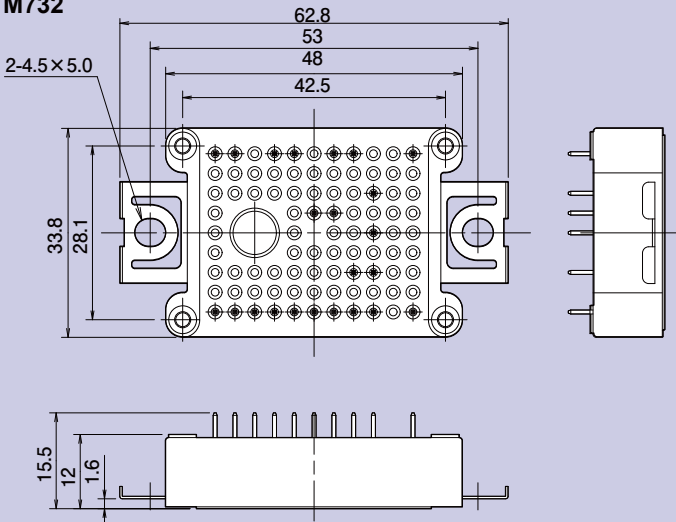


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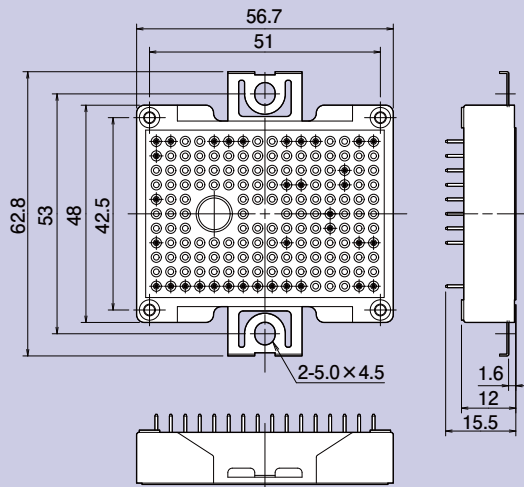


Unit: mm

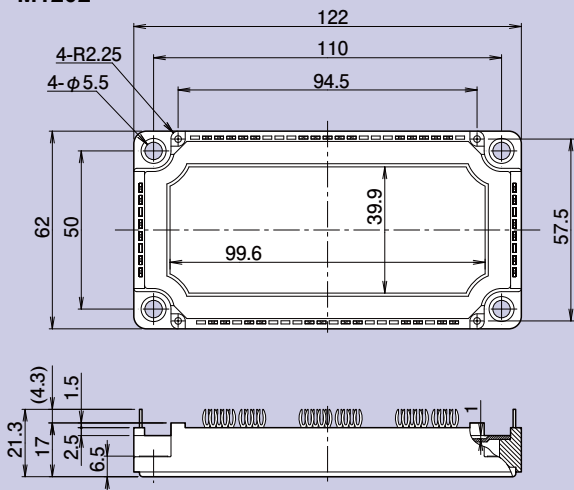
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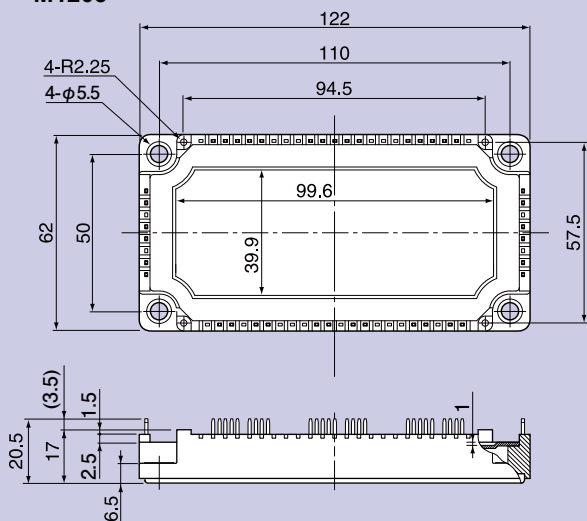
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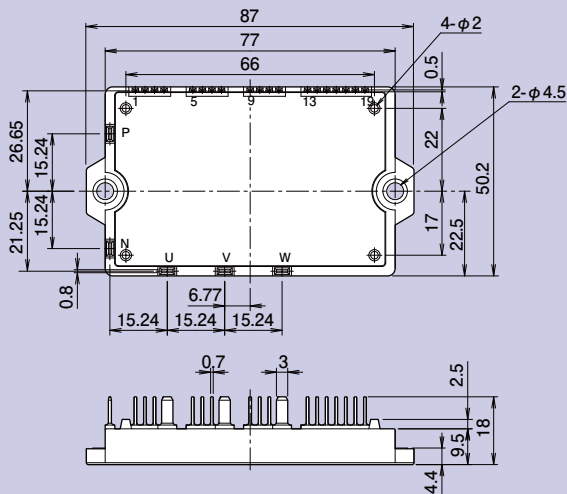
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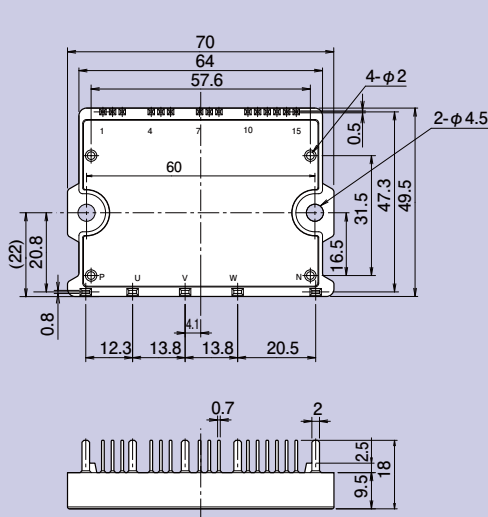
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P626

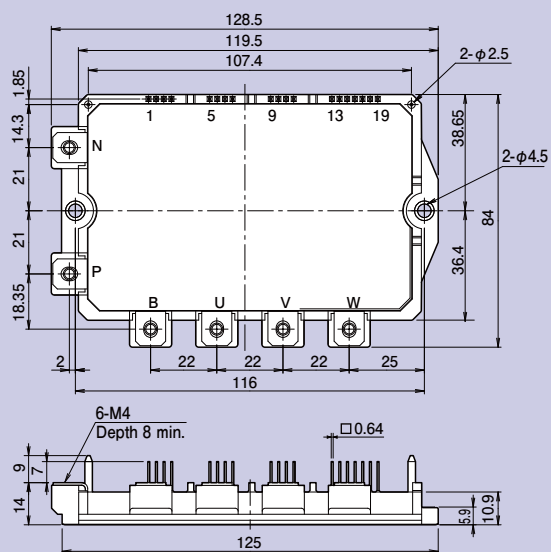


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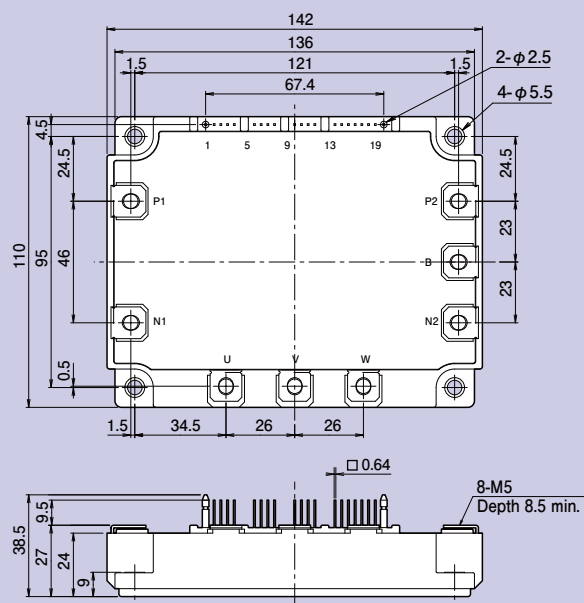


Unit: mm

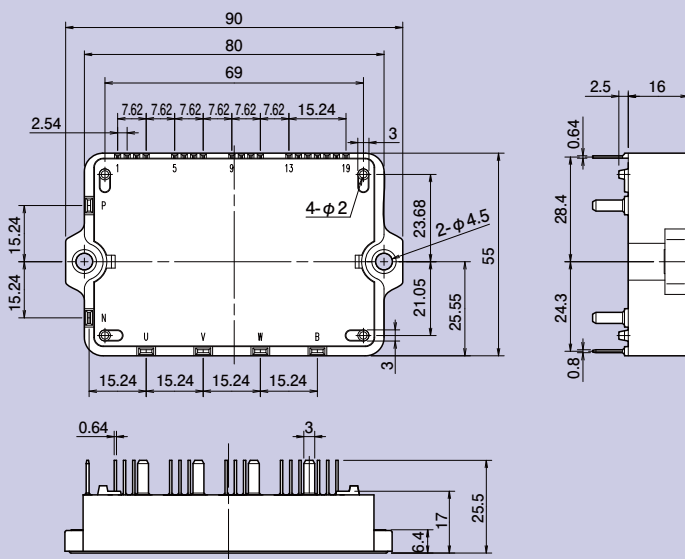
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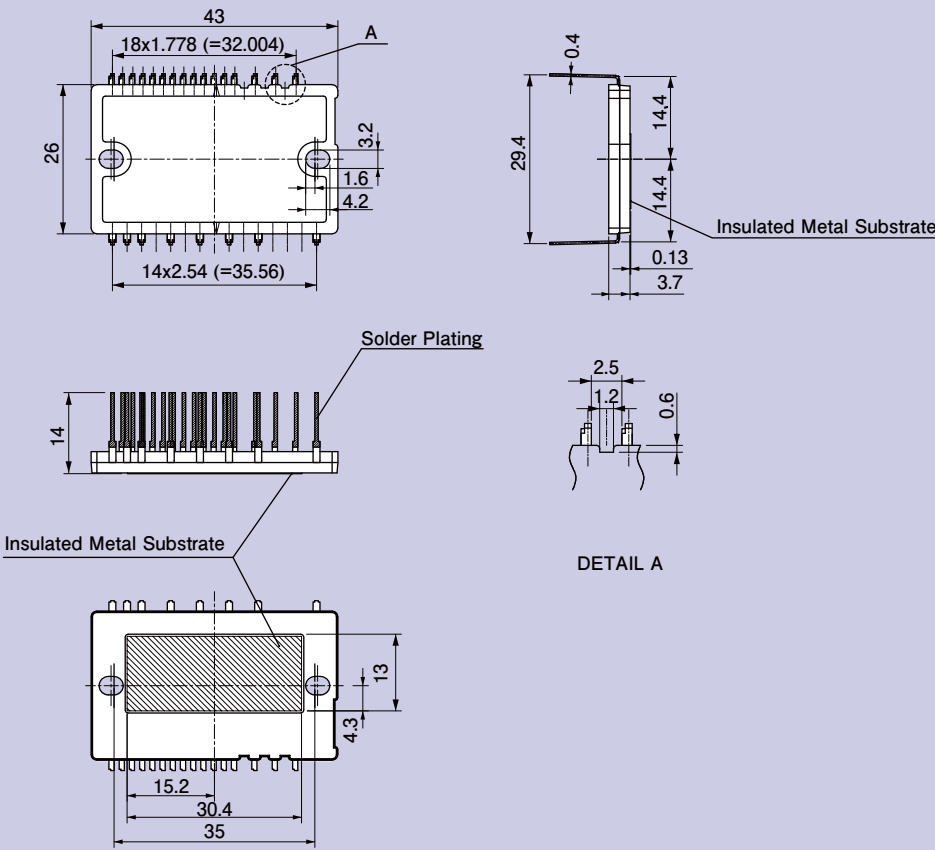


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Unit: mm

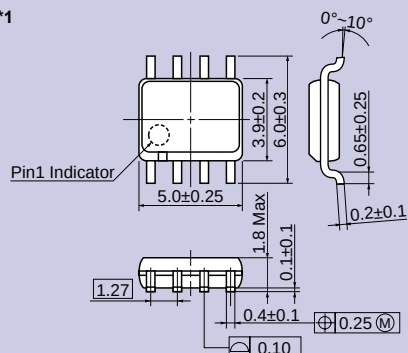
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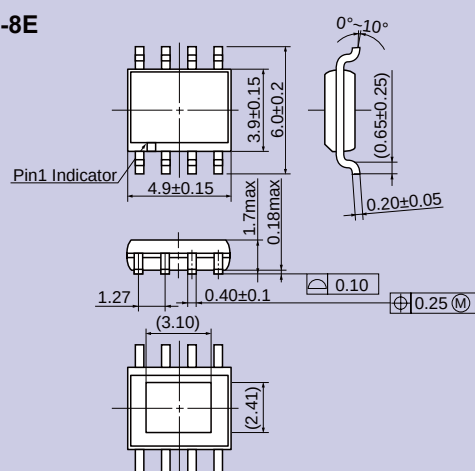
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Unit: mm

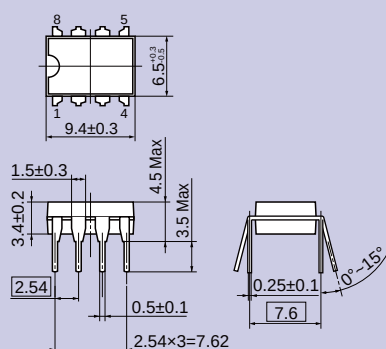
SOP-8*1



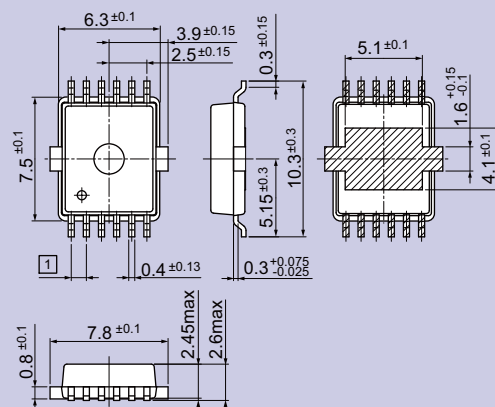
SOP-8E



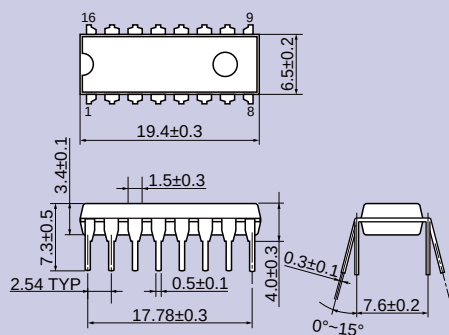
DIP-8



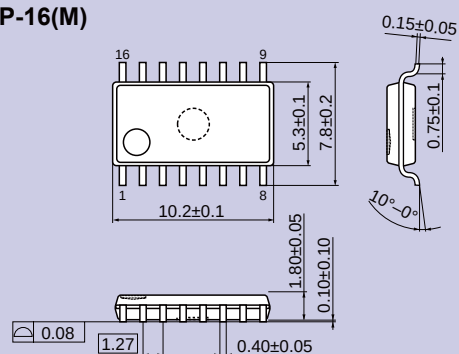
PSOP-12



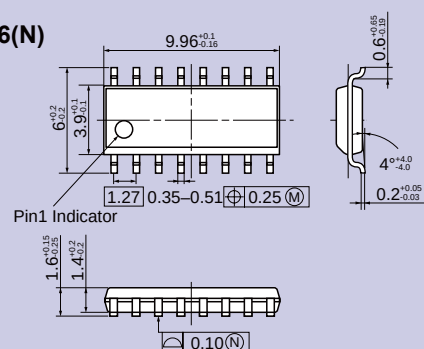
DIP-16



SOP-16(M)



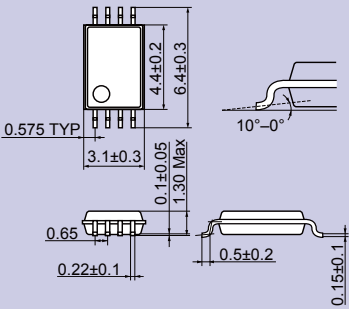
SOP-16(N)



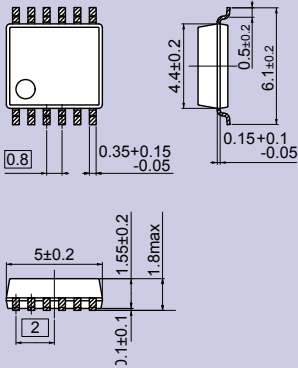
*1) This is the package size for the representative device type (FA8AxxN). For other ICs, please refer to the separate application note (specifications).

Unit: mm

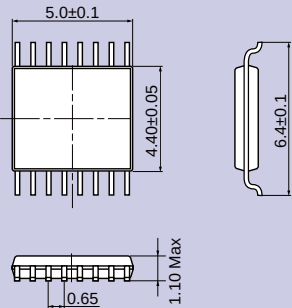
TSSOP-8



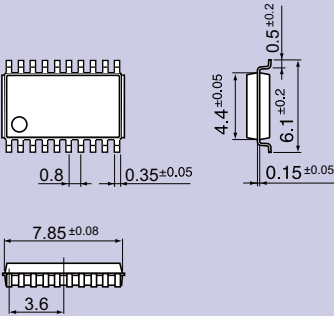
SSOP-12



TSSOP-16



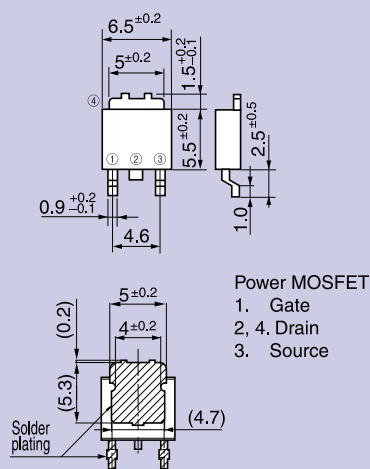
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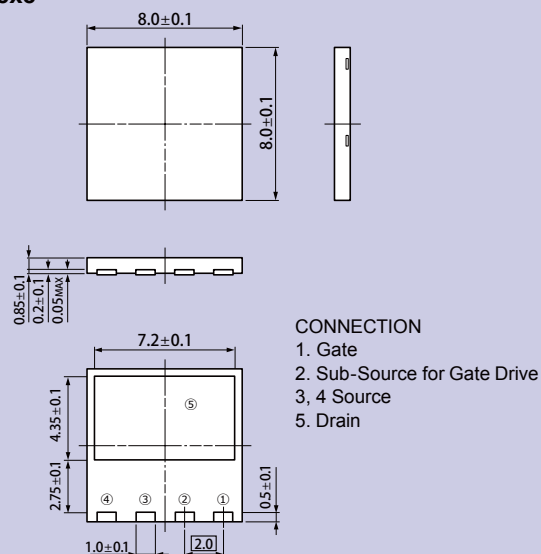
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Unit: mm

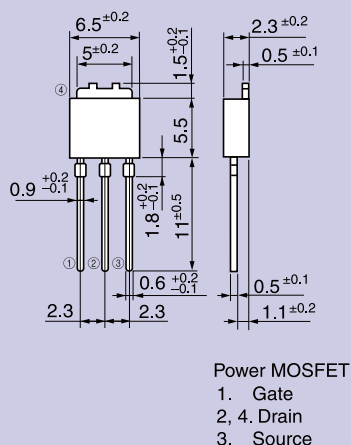
K-pack(S)



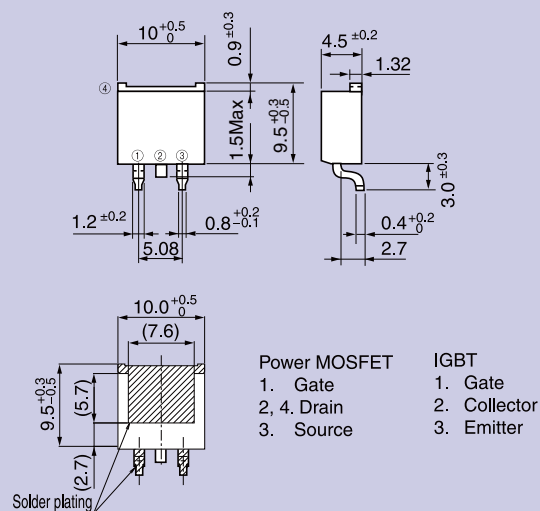
DFN8x8



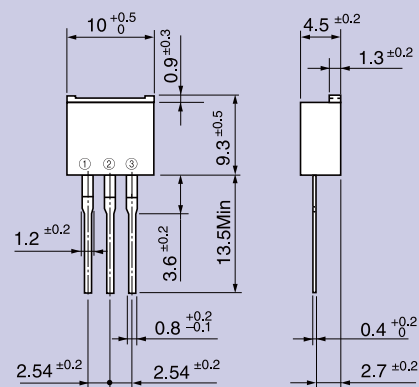
K-pack(L)/I-pack: Power MOSFET
K-pack(P)/I-pack: Diode



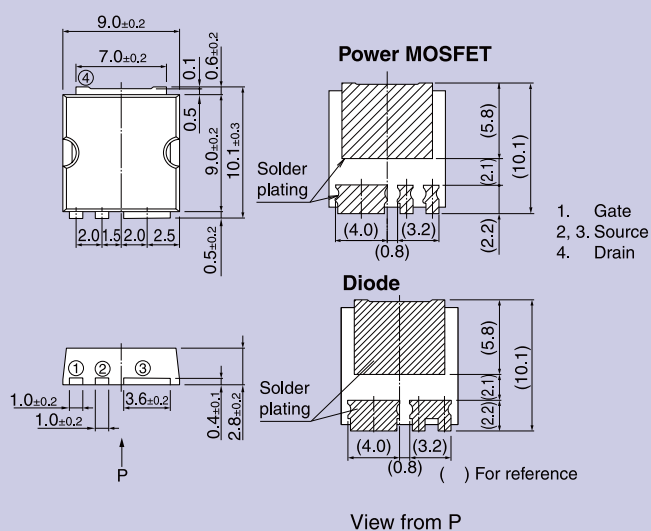
T-pack(S)



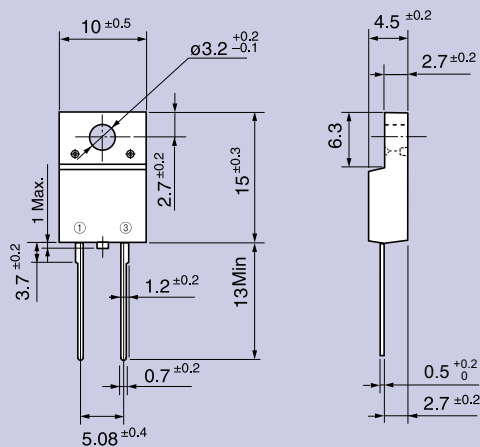
T-pack(L): Power MOSFET
T-pack(P): Diode



TFP

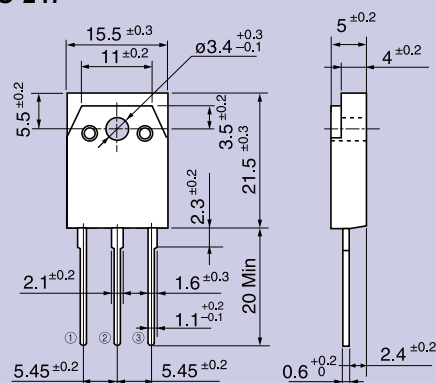


TO-220F-2



Unit: mm

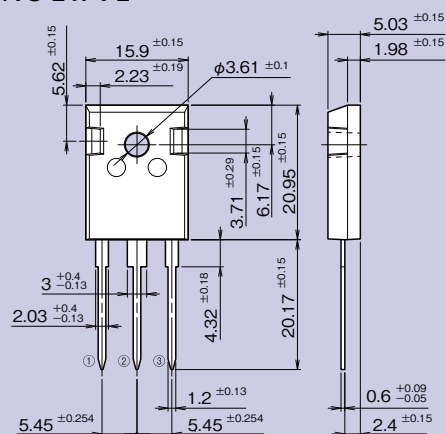
TO-247



Power MOSFET

1. Gate
2. Drain
3. Source

TO-247-P/TO-247-P2



Power MOSFET

1. Gate
2. Drain
3. Source

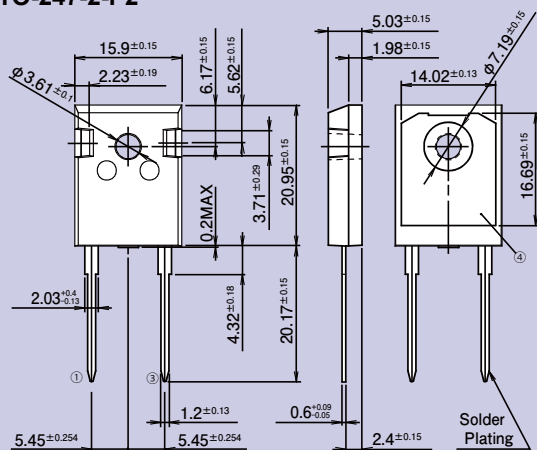
IGBT

1. Gate
2. Collector
3. Emitter

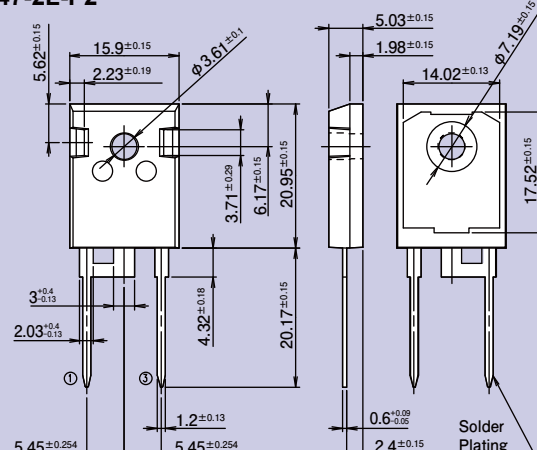
FWD

1. Anode
2. Cathode
3. Anode

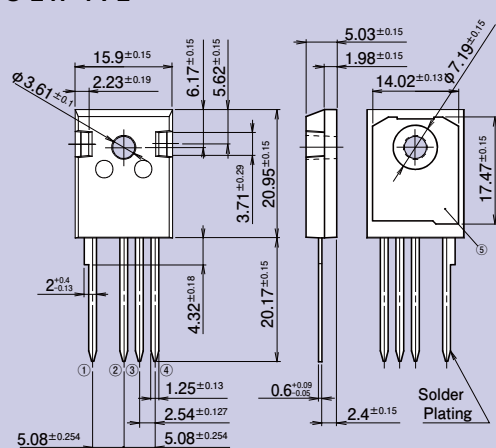
TO-247-2-P2

CONNECTION
①, ④ CATHODE
③ ANODE

TO-247-2L-P2

CONNECTION
① CATHODE
③ ANODE

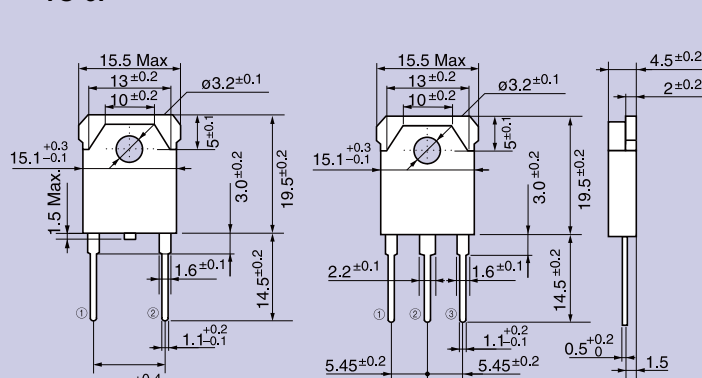
TO-247-4-P2



CONNECTION

1. COLLECTOR
2. EMITTER
3. SUB EMITTER
4. GATE

TO-3P



Power MOSFET

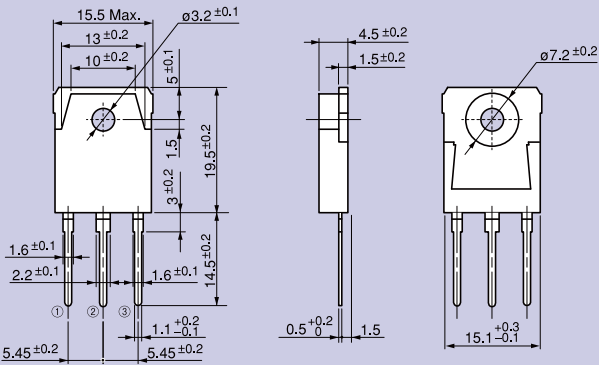
1. Gate
2. Drain
3. Source

IGBT

1. Gate
2. Collector
3. Emitter

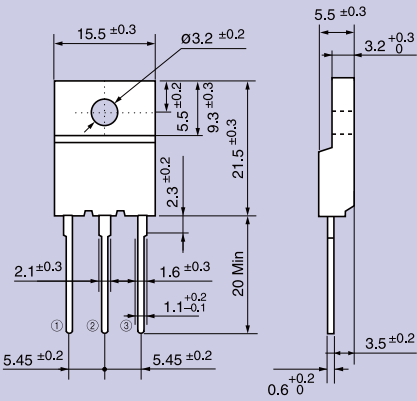
Unit: mm

TO-3P(Q)



Power MOSFET
1. Gate
2. Drain
3. Source

TO-3PF



Power MOSFET
1. Gate
2. Drain
3. Source

- Order unit is the number in “Min. quantity per order” or its integral multiplication.
- This table covers single or reel package items (Except for taping items).
- Order unit of taping package is different for each specification.
Please contact us for more detail.

Products	Package	Type number	Min. quantity per order	Min. quantity per packing
Power MOSFETs Diodes	TO-220	All types	100	500
	TO-220F/TO-220F(SLS)		100	500
	TO-220F-2		1,000	1,000
	TO-247		100	500
	TO-247-2-P2		600	600
	TO-247-4-P2		600	600
	TO-247-2L-P2		600	600
	TO-3P, TO-3P(Q)		100	500
	TO-3PF		100	500
	TO-3PL		50	50
	TFP		1,500	1,500
	K-pack (S)		3,000	3,000
	T-pack (S)		1,000	1,000
	K-pack (L, P)		500	500
	T-pack (L, P)		100	500
	DFN8x8		3,000	3,000
	TO-220	-S2□PP (Tube)	1,000	1,000
	TO-220F	-S3□PP (Tube)	1,000	1,000
Power MOSFETs Discrete IGBTs Diodes	TO-247-P2	All types	600	600
ICs		All types (except for below types)	2,000	2,000
		FA8A-□□, FA6A-□□, FA1A-□□	3,000	3,000
		FA5627, 28	3,000	3,000
		FA5637	3,000	3,000
		FA5641, 42, 43, 44	3,000	3,000
		FA5680, FA5681	3,000	3,000
		FA5696	3,000	3,000
		FA5651	3,000	3,000
		FA5752	3,000	3,000
		FA5760	3,000	3,000

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12MBI100VX-120-50	43	1MBI400VF-120-50	36	2MBI1400VB-120E-54	34	2MBI225XNB120-50	28	2MBI450VH-120F-80	26	2MBI600XNE170-50	30
12MBI50VN-120-50	43	1MBI400VH-060L-50	38	2MBI1400VB-120E-80	34	2MBI225XNB170-50	30	2MBI450VJ-120-50	29	2MBI600XNF120-50	28
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12MBI75VX-120-50	43	1MBI600V-170-50	36	2MBI1400VB-120P-80	34	2MBI300VB-060-50	24	2MBI450VN-120-80	29	2MBI600XNG170-50	30
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1MBI1000UG-330B	37	1MBI650VXA-170EH-50	39	2MBI1400VB-170E-54	36	2MBI300VE-120-50	26	2MBI450VN-120S-80	29	2MBI600XNH170-50	30
1MBI1000VXB-170EH-50	39	1MBI650VXA-170EH-54	39	2MBI1400VB-170E-80	36	2MBI300VE-120-80	26	2MBI450VN-170-50	31	2MBI650VXA-170E-50	36
1MBI1000VXB-170EH-54	39	1MBI650VXA-170EH-80	39	2MBI1400VB-170P-50	36	2MBI300VE-170-50	27	2MBI450VN-170-80	31	2MBI650VXA-170E-54	36
1MBI1000VXB-170EH-80	39	1MBI650VXA-170EL-50	39	2MBI1400VB-170P-54	36	2MBI300VE-170-80	27	2MBI450VX-120-50	29	2MBI650VXA-170E-80	36
1MBI1000VXB-170EL-50	39	1MBI650VXA-170EL-54	39	2MBI1400VB-170P-80	36	2MBI300VH-120-50	26	2MBI450VX-120-80	29	2MBI650VXA-170EA-50	36
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1MBI1200VC-170E	37	1MBI900VXA-120PC-54	40	2MBI150VA-120-50	26	2MBI300VN-120-50	29	2MBI450XNA170-50	30	2MBI75XAA170-50	27
1MBI1200VR-170E	37	1MBI900VXA-120PC-80	40	2MBI150VB-120-50	26	2MBI300VN-120-80	29	2MBI450XNB120-50	28	2MBI800VG-120P	33
1MBI1400VXB-120PH-54	39	1MBI900VXA-120PD-50	40	2MBI150VH-170-50	27	2MBI300VN-120S-50	29	2MBI450XNB170-50	30	2MBI800VG-170E	33
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1MBI1500UE-330	37	2MBI1000VXB-170EA-50	36	2MBI1800XXG170-50	35	2MBI300XBE065-50	24	2MBI550VX-170-80	31	2MBI900VXA-120P-54	34
1MBI1500UE-330B	37	2MBI1000VXB-170EA-54	36	2MBI200HH-120-50	41	2MBI300XBE120-50	25	2MBI600VD-060-50	24	2MBI900VXA-120P-80	34
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1MBI2400VD-170E	37	2MBI100VA-170-50	27	2MBI200XHA170-50	27	2MBI400VE-170-50	27	2MBI600VT-170E	33	2MSI400VAE-170-53	54
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FGW60N65WD	49	FMC60N133S2FDA	92	FMI13N60E	81	FMP60N079S2	77	FMV12N60ES	84	FMW60N170S2FD	78
FGW60N65WE	49	FMC60N160S2A	91	FMI13N60ES	84	FMP60N084S2FD	78	FMV13N60E	81	FMW60N190S2	76
FGW75N60H	50	FMC60N190S2A	91	FMI16N50E	80	FMP60N088S2	77	FMV13N60ES	84	FMV100N06T	93
FGW75N60HC	50	FMC65N15T2	90	FMI16N50ES	83	FMP60N094S2FD	78	FMV13N80E	81	FMV100N10R6	90
FGW75N60HD	50	FMC80N10R6	90	FMI16N60E	81	FMP60N099S2	76	FMV15N70E	81	FMV100N10R6	93
FGW75N65W	49	FMC80N10R6	93	FMI16N60ES	84	FMP60N105S2FD	78	FMV16N50E	80	FMV22N60ESF	94
FGW75N65WE	49	FMC80N10T2	90	FMI20N50E	80	FMP60N125S2	76	FMV16N50ES	83	FMV24N60ES	93
FGW75XS65	49	FMH06N80E	81	FMI20N50ES	83	FMP60N133S2FD	78	FMV16N60E	81	FMV30N60ESF	94
FGW75XS65C	49	FMH06N90E	82	FMI49N20T2	90	FMP60N160S2	76	FMV16N60ES	84	FMV31N60ES	93
FGW75XS65D	49	FMH07N70E	81	FMI65N15T2	90	FMP60N170S2FD	78	FMV17N60ES	84	FMV35N60ESF	94
FGW85N60RB	50	FMH07N90E	82	FMI80N10T2	90	FMP60N190S2	76	FMV19N60E	81	FMV36N60ES	93
FGZ40N120WE	49	FMH08N80E	81	FML12N50ES	83	FMP60N280S2	76	FMV19N60ES	84	FMV47N30ESF	94
FGZ50N65WD	49	FMH09N70E	81	FML12N60ES	84	FMP60N380S2	76	FMV20N50E	80	FMV50N071S2FDA	92
FGZ50N65WE	49	FMH09N90E	82	FML13N60ES	84	FMP65N15T2	90	FMV20N50ES	83	FMV50N30ES	93
FGZ75N65WE	49	FMH10N80E	81	FML16N50ES	83	FMP80N10T2	90	FMV21N50ES	83	FMV60N025S2A	91
FGZ75XS65C	49	FMH11N70E	81	FML16N60ES	84	FMR09N90E	82	FMV23N50E	80	FMV60N040S2A	91
FMA49N20T2	90	FMH11N90E	82	FML19N50G	87	FMR11N90E	82	FMV23N50ES	83	FMV60N070S2A	91
FMA65N15T2	90	FMH13N60ES	84	FML20N50ES	83	FMR17N60ES	84	FMV24N25G	86	FMV60N079S2A	91
FMA80N10T2	90	FMH13N80E	81	FML60N091S2	76	FMR19N60E	81	FMV60N070S2	77	FMV60N081S2FDA	92
FMC03N60E	81	FMH16N50E	80	FML60N093S2FD	78	FMR19N60ES	84	FMV60N075S2FD	78	FMV60N088S2A	91
FMC05N50E	80	FMH16N50ES	83	FML60N103S2	76	FMR21N50ES	83	FMV60N079S2	77	FMV60N099S2A	91
FMC05N60E	81	FMH16N60ES	84	FML60N104S2FD	78	FMR23N50E	80	FMV60N084S2FD	78	FMV60N105S2FDA	92
FMC06N60ES	84	FMH17N60ES	84	FML60N115S2	76	FMR23N50ES	83	FMV60N088S2	77	FMV60N125S2A	91
FMC06N80E	81	FMH19N60E	81	FML60N118S2FD	78	FMR23N60E	81	FMV60N094S2FD	78	FMV60N133S2FDA	92
FMC06N90E	82	FMH19N60ES	84	FML60N146S2	76	FMR23N60ES	84	FMV60N099S2	76	FMV60N160S2A	91
FMC07N50E	80	FMH20N50E	80	FML60N150S2FD	78	FMR28N50E	80	FMV60N105S2FD	78	FMV67N30ESF	94
FMC07N90E	82	FMH20N50ES	83	FML60N187S2	76	FMR28N50ES	83	FMV60N125S2	76	FMV72N30ES	93

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MS865C12	102	TS868C06R	101	YA975C6R	103	YG872C12R	99				
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MS868C04	101	TS868C10R	102	YA982C3R	106	YG872C20R	99				
MS868C10	102	TS868C12R	102	YA982C4R	106	YG875C10R	99				
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MS985C3	106	TS982C3R	106	YA985C6R	104	YG878C12R	99				
MS985C4	106	TS982C4R	106	YG801C04R	98	YG878C15R	99				
PA868C10R	102	TS982C6R	104	YG801C06R	98	YG878C20R	99				
PA868C15R	102	TS985C3R	106	YG801C10R	98	YG901C2R	105				
PA905C4R	107	TS985C4R	106	YG802C04R	98	YG901C3R	105				
PG865C15R	102	TS985C6R	104	YG802C06R	98	YG902C2R	105				
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PH868C12	102	YA862C15R	102	YG805C06R	98	YG912S2R	105				
PH868C15	102	YA865C04R	101	YG805C10R	98	YG971S6R	103				
PH975C6	103	YA865C06R	101	YG808C10R	98	YG971S8R	103				
PH985C6	104	YA865C08R	101	YG811S04R	97	YG972S6R	103				
TP802C04R	107	YA865C10R	102	YG811S06R	97	YG975C6R	103				
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TP865C12R	102	YA868C04R	101	YG861S12R	100	YG982C4R	106				
TP865C15R	102	YA868C06R	101	YG861S15R	100	YG982C6R	104				
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Maintenance products

- Models listed below are for maintenance products only.
- Do not use them for new designing

Products	Type number	Products	Type number	Products	Type number
Power Devices	2MBI100TA-060-50	Power Devices	7MBP150RTB060	Power MOSFET	FMW20N60S1
	2MBI150TA-060-50		7MBP150RTB060-50		FMW20N60S1FD
	2MBI150U2A-060-50		7MBP150RTJ060		FMW22N60S1
	2MBI200U2A-060-50		7MBP150TEA060-50		FMW22N60S1FD
	2MBI300U2B-060-50		7MBP160RTA060-50		FMW30N60S1
	2MBI400U2B-060-50		7MBP200RA060		FMW30N60S1FD
	6MBP100RA060		7MBP200RUC060		FMW35N60S1
	6MBP100RA120		7MBP200RUC060-50		FMW35N60S1FD
	6MBP100RTB060		7MBP25RA120		FMW40N60S1
	6MBP100RTB060-50		7MBP25RU2A120-50		FMW40N60S1FD
	6MBP100RTD060-50		7MBP50RE120		FMW47N60S1
	6MBP100RTJ060		7MBP50RTA060-50		FMW47N60S1FD
	6MBP100TEA060		7MBP50RTB060-50		FMW57N60S1
	6MBP100TEA060-50		7MBP50RU2A120-50		FMW57N60S1FD
	6MBP150RA060		7MBP75RE120		FMW79N60S1
	6MBP150RA120		7MBP75RTB060-50		FMW79N60S1FD
	6MBP150RTB060		7MBP75RU2A120		
	6MBP150RTB060-50		7MBP75RU2A120-50		
	6MBP150RTJ060		7MBP75TEA060-50		
	6MBP150TEA060-50		7MBP75TEA120-50		
	6MBP15RA120		7MBP80RTA060-50		
	6MBP200RA060	Power MOSFET	FMH13N60S1		
	6MBP20RTA060		FMH15N60S1		
	6MBP25RA120		FMH20N60S1		
	6MBP25RJ120		FMH20N60S1FD		
	6MBP25RU2A120		FMH22N60S1		
	6MBP25TEA120-50		FMH22N60S1FD		
	6MBP300RA060		FMH30N60S1		
	6MBP30RTB060		FMH30N60S1FD		
	6MBP30RTB060-50		FMH35N60S1		
	6MBP35RJB120-50		FMH35N60S1FD		
	6MBP50RA060		FMH40N60S1		
	6MBP50RA120		FMH40N60S1FD		
	6MBP50RJ120		FMH47N60S1		
	6MBP50RTB060		FMH47N60S1FD		
	6MBP50RTB060-50		FMP07N60S1		
	6MBP50RTJ060		FMP08N60S1		
	6MBP50RU2A120		FMP10N60S1		
	6MBP50TBA060-50		FMP13N60S1		
	6MBP50TEA060		FMP15N60S1		
	6MBP50TEA060-50		FMP20N60S1		
	6MBP50TEA120-50		FMP20N60S1FD		
	6MBP75RA060		FMP22N60S1		
	6MBP75RA120		FMP22N60S1FD		
	6MBP75RJ120		FMP30N60S1		
	6MBP75RTB060		FMP30N60S1FD		
	6MBP75RTB060-50		FMV07N60S1		
	6MBP75RTJ060		FMV08N60S1		
	6MBP75RU2A120		FMV10N60S1		
	6MBP75RU2A120-50		FMV13N60S1		
	6MBP75TBA060-50		FMV15N60S1		
	6MBP75TEA060-50		FMV20N60S1		
	6MBP75TEA120-50		FMV20N60S1FD		
	7MBP100RA060		FMV22N60S1		
	7MBP100RA120		FMV22N60S1FD		
	7MBP100RTA060-50		FMV30N60S1		
	7MBP100RTB060		FMV30N60S1FD		
	7MBP100RTB060-50		FMV35N60S1		
	7MBP100RTJ060		FMV35N60S1FD		
	7MBP100TEA060-50		FMV40N60S1		
	7MBP150RA060		FMV15N60S1		
	7MBP150RA120		FMV20N60S1		

Discontinued products

- Models listed below are discontinued products.
- Do not use them for new designing

Products	Type number	Products	Type number	Products	Type number
Power Devices	1MBI1200U4C-120	Power Devices	2MBI200PB-140	Power Devices	2MBI75U4A-120
	1MBI1200U4C-170		2MBI200S-120		2MBI75U4A-120-50
	1MBI150NH-060		2MBI200U4B-120		2MBI75UA-120
	1MBI150NK-060		2MBI200U4B-120-50		2MBI75UA-120-50
	1MBI1600U4C-120		2MBI200U4D-120		2MBI800U4G-120
	1MBI1600U4C-170		2MBI200U4D-120-50		2MBI800U4G-170
	1MBI200N-120		2MBI200U4H-120		6MBI100S-060
	1MBI200NH-060		2MBI200U4H-120-50		6MBI100S-120
	1MBI200NK-060		2MBI200U4H-170		6MBI100S-140
	1MBI2400U4D-120		2MBI200U4H-170-50		6MBI100U4B-120-50
	1MBI2400U4D-170		2MBI200UB-120		6MBI100U4B-170-50
	1MBI300N-120		2MBI200UB-120-50		6MBI100UB-120-50
	1MBI300NN-120		2MBI200UC-120-50		6MBI10S-120
	1MBI300NP-120		2MBI200UD-120-50		6MBI150U4B-120-50
	1MBI300U4-120		2MBI200UM-120		6MBI150U4B-170-50
	1MBI3600U4D-120		2MBI200UM-120-50		6MBI150UB-120-50
	1MBI3600U4D-170		2MBI225U4J-120-50		6MBI15S-120
	1MBI400N-120		2MBI225U4N-120-50		6MBI225U4-120
	1MBI400NN-120		2MBI225U4N-170-50		6MBI225U4-120-50
	1MBI400NP-120		2MBI300N-060		6MBI25S-120
	1MBI400U4-120		2MBI300N-060-04		6MBI300U4-120
	1MBI600NN-060		2MBI300N-120		6MBI300U4-120-50
	1MBI600NP-060		2MBI300N-120-01		6MBI300U4-170
	1MBI600PX-120		2MBI300NB-060		6MBI35S-120
	1MBI600PX-140		2MBI300NB-060-01		6MBI35S-140
	1MBI600U4-120		2MBI300P-140		6MBI35U4A-120-50
	1MBI600U4B-120		2MBI300S-120		6MBI450U-120
	1MBI800U4B-120		2MBI300U4D-120		6MBI450U-170
	2FI1200U4L-120		2MBI300U4D-120-50		6MBI450U4-120
	2MBI100N-060		2MBI300U4E-120		6MBI450U4-120-50
	2MBI100N-120		2MBI300U4H-120		6MBI450U4-170
	2MBI100NB-120		2MBI300U4H-120-50		6MBI50S-060
	2MBI100NC-120		2MBI300U4H-170		6MBI50S-120
	2MBI100PC-140		2MBI300U4H-170-50		6MBI50S-140
	2MBI100SC-120		2MBI300U4J-120-50		6MBI50U4A-120-50
	2MBI100U4A-120		2MBI300U4N-120-50		6MBI50UA-120-50
	2MBI100U4A-120-50		2MBI300U4N-170-50		6MBI75S-060
	2MBI100U4H-170-50		2MBI300UC-120		6MBI75S-120
	2MBI1200U4G-120		2MBI300UC-120-50		6MBI75S-140
	2MBI1200U4G-170		2MBI300UC-170		6MBI75U4A-120-50
	2MBI150N-060		2MBI300UD-120		6MBI75U4B-120-50
	2MBI150N-120		2MBI300UD-120-50		6MBI75UA-120-50
	2MBI150NB-120		2MBI300UE-120		6MBP15RH060-50
	2MBI150NC-060		2MBI400N-060		6MBP20RH060-50
	2MBI150NC-120		2MBI400N-060-01		6MBP30RH060-50
	2MBI150PC-140		2MBI400U4H-120		7MBR100SB060
	2MBI150SC-120		2MBI400U4H-120-50		7MBR100SD060
	2MBI150U4A-120		2MBI400U4H-170		7MBR100SD060-50
	2MBI150U4A-120-50		2MBI400U4H-170-50		7MBR100U4B120-50
	2MBI150U4B-120		2MBI450U4E-120		7MBR100UB120-50
	2MBI150U4B-120-50		2MBI450U4J-120-50		7MBR10SA120
	2MBI150U4H-120		2MBI450U4N-120-50		7MBR10SA140
	2MBI150U4H-120-50		2MBI450U4N-170-50		7MBR10SC120
	2MBI150U4H-170		2MBI450UE-120		7MBR10SC120-50
	2MBI150U4H-170-50		2MBI50N-060		7MBR10UF120
	2MBI150UA-120		2MBI50N-120		7MBR15SA120
	2MBI150UA-120-50		2MBI50P-140		7MBR15SA140
	2MBI150UB-120-50		2MBI600NT-060		7MBR15SC060-50
	2MBI200N-060		2MBI600U4G-120		7MBR15SC120
	2MBI200N-060-03		2MBI600U4G-170		7MBR15SC120-50
	2MBI200N-120		2MBI75N-060		7MBR15UF060
	2MBI200NB-120		2MBI75N-120		7MBR15UF120
	2MBI200NB-120-01		2MBI75P-140		7MBR20SC060

Discontinued products

Products	Type number	Products	Type number	Products	Type number
Power Devices	7MBR20SC060-50	Integrated Circuits	FA7763R-R1	Rectifier Diodes	SD863-06
	7MBR20UF060	Hybrid ICs for IGBT Drive	EXB840		SD863-10
	7MBR25SA120		EXB841		SD882-02
	7MBR25SA140	IPS (Intelligent Power switch)	F5016H		SD883-02
	7MBR25SC120		F5017H		SD883-04
	7MBR25SC120-50		F5021H		TP858C12R
	7MBR25U4P120-50		F5022		TP869C04R
	7MBR25UA120-50		F5038H		TS862C04R
	7MBR30SA060	Rectifier Diodes			TS906C3R
	7MBR30SC060		CB803-03		TS952C6R
	7MBR30SC060-50		CB863-06		TS955C6R
	7MBR30UF060		CB863-12		YA852C12R
	7MBR35SB120		CB863-15		YA852C15R
	7MBR35SB140		CB903-4		YA855C12R
	7MBR35SD120		ERA81-004		YA855C15R
	7MBR35SD120-50		ERA82-004		YA858C12R
	7MBR35U4A120-50		ERA83-004		YA858C15R
	7MBR35U4P120-50		ERA83-006		YA862C04R
	7MBR35UA120-50		ERA84-009		YA869C04R
	7MBR35UB120-50		ERA85-009		YA951S6R
	7MBR50SA060		ERA91-02		YA952C6R
	7MBR50SB060		ERA92-02		YA952S6R
	7MBR50SB120		ERB81-004		YA955C6R
	7MBR50SB140		ERB83-004		YG801C09R
	7MBR50SC060		ERB83-006		YG802C03R
	7MBR50SC060-50		ERB84-009		YG802C09R
	7MBR50SD060-50		ERB91-02		YG803C04R
	7MBR50SD120		ERC81-004		YG811S09R
	7MBR50SD120-50		ERC81-006		YG831C03R
	7MBR50U4P120-50		ERC81S-004		YG831C04R
	7MBR50UA120-50		ERC84-009		YG832C03R
	7MBR50UB120-50		ERC91-02		YG832C04R
	7MBR75SB060		FD867-12		YG835C03R
	7MBR75SD060		FD867-15		YG835C04R
	7MBR75SD060-50		FD868-12		YG838C03R
	7MBR75U4B120-50		FD868-15		YG852C12R
	7MBR75U4R120-50		FDLA20C20		YG852C15R
	7MBR75UB120-50		FDLC20C20		YG855C12R
Integrated Circuits	FA3630V-H1		FDLH20C20		YG855C15R
	FA3635S-H1		FDLP20C20		YG858C12R
	FA3675F-H1		FDLR20C20		YG858C15R
	FA3686V-H1		KP823C03		YG862C04R
	FA3702AV-H1		KP823C04		YG864S06R
	FA5316P		KP823C09		YG869C04R
	FA5317S		PA955C6R		YG881C02R
	FA5701P-A2		PG985C6R		YG882C02R
	FA5705AP-A2		SC802-04		YG885C02R
	FA5707AP-A2		SC802-06	Power MOSFET	YG906C3R
	FA5708AP-A2		SC802-09		YG951S6R
	FA7709R-H1		SC902-2		YG952C6R
	FA7711V-H1		SD832-03		YG952S6R
	FA7716R-H4		SD832-04		YG955C6R
	FA7723R-H4		SD833-03		2SJ314-01L, S
	FA7724AR-H4		SD833-04		2SJ472-01L, S
	FA7728F-D1		SD833-06		2SJ473-01L, S
	FA7729R-H1		SD833-09		2SJ474-01L, S
	FA7730F-D1		SD834-03		2SJ475-01
	FA7731F-D1		SD834-04		2SJ476-01L, S
	FA7743N-D1		SD862-04		2SJ477-01MR
	FA7761R-R1		SD863-04		2SK2687-01
	FA7763AR-R1				2SK2688-01L, S
					2SK2689-01MR

Discontinued products

Products	Type number	Products	Type number
Power MOSFET	2SK2690-01	Power MOSFET	2SK3781-01R
	2SK2691-01R		2SK3788-01
	2SK2806-01		2SK3789-01R
	2SK2807-01L, S		2SK3870-01
	2SK2808-01MR		2SK3871-01MR
	2SK2809-01MR		2SK3872-01L, S
	2SK2890-01MR		2SK3873-01
	2SK2891-01		2SK3874-01R
	2SK2892-01R		2SK3875-01
	2SK2893-01		2SK3876-01R
	2SK2894-01R		2SK3883-01
	2SK2895-01		2SK3884-01
	2SK2896-01L, S		2SK3885-01
	2SK2897-01MR		2SK3913-01MR
	2SK2898-01		2SK3914-01
	2SK2899-01R		2SK3915-01MR
	2SK2900-01		2SK3923-01
	2SK2901-01L, S		2SK3924-01L, S
	2SK2902-01MR		2SK3925-01
	2SK2903-01MR		2SK3926-01MR
	2SK2904-01		2SK3927-01L, S
	2SK2905-01R		2SK4005-01MR
	2SK2906-01		2SK4006-01L, S
	2SK2907-01R		FMA18N25G
	2SK3362-01		
	2SK3363-01		
	2SK3364-01		
	2SK3517-01		
	2SK3518-01MR		
	2SK3529-01		
	2SK3530-01MR		
	2SK3531-01		
	2SK3532-01MR		
	2SK3533-01		
	2SK3534-01MR		
	2SK3549-01		
	2SK3550-01R		
	2SK3586-01		
	2SK3587-01MR		
	2SK3588-01L, S		
	2SK3589-01		
	2SK3601-01		
	2SK3605-01		
	2SK3613-01		
	2SK3644-01		
	2SK3645-01MR		
	2SK3646-01L, S		
	2SK3647-01		
	2SK3673-01MR		
	2SK3674-01L, S		
	2SK3675-01		
	2SK3677-01MR		
	2SK3678-01		
	2SK3679-01MR		
	2SK3690-01		
	2SK3691-01MR		
	2SK3769-01MR		
	2SK3770-01MR		
	2SK3771-01MR		
	2SK3776-01		
	2SK3777-01R		
	2SK3780-01		

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