



Power Semiconductors

IGBTs . MOSFETs . IGBT-Drivers

<p>TIM Thermal Interface Material 3</p> 	<p>P I M (Power Integrated Module) 4-6 Solder pins & Pressfit contacts</p> 	<p>6-Pack, Standard Packages 7 Solder pins & Pressfit contacts</p> 	<p>2-Pack, Spring- & Pin-Type 8</p> 	<p>Chopper Modules 8</p> 	<p>Standard 1- & 2-Pack, U-Series 9</p> 
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Type name

2 **MBi** **450** **VH** - **120** - **50**

↑ Suffix -50 = RoHS compliant

$X10 = \text{Max. } V_{CE} : 060 = 600V \cdot 120 = 1200V \cdot 170 = 1700V \cdot 330 = 3300V$

↑ Package Style

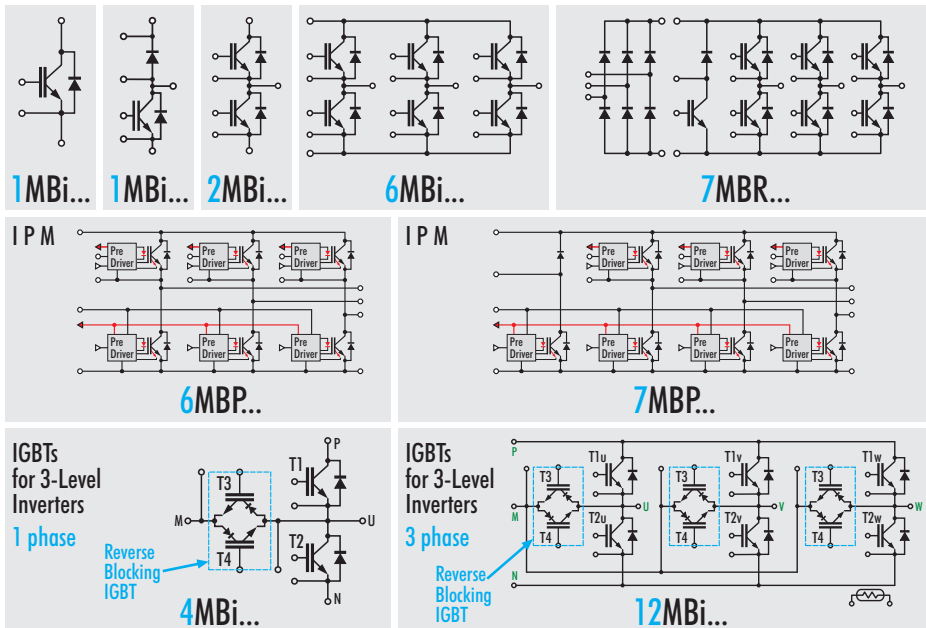
↑ IGBT-Series (here V-Series) / IGBT-Technology

↑ Rated current I_c [A]

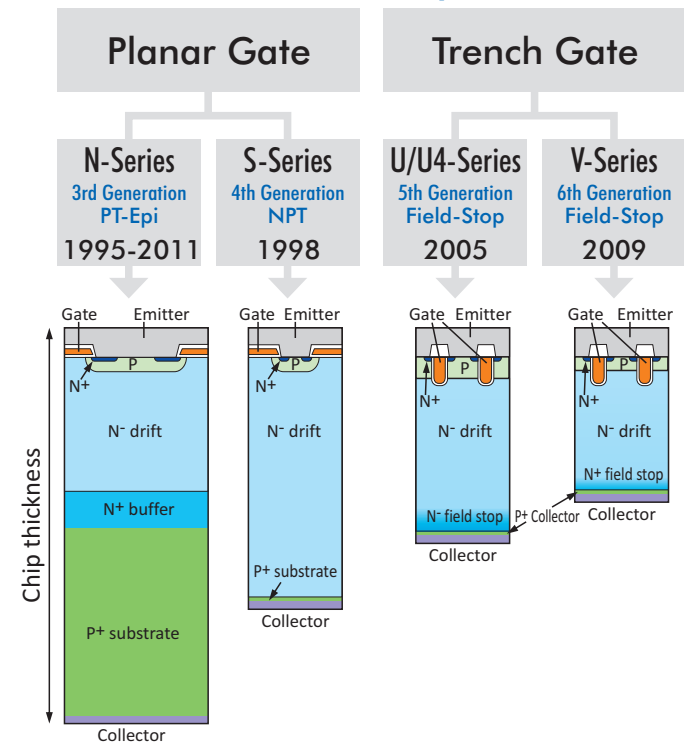
↑ Device type

- MBi : Standard IGBT module (MB = IGBT)
- MBR : PIM IGBT (Power Integrated Module)
- MBP : IPM IGBT (Intelligent Power Module)

↑ Number of IGBT-switches (not chips)



IGBT development





Pre-applied Thermal Interface Material (TIM)

The ongoing increase of power densities within the thermal interface between power module and heat sink requires an optimized thermal distribution.

Fuji Electric has developed the pre-applied thermal interface material (TIM) which achieves a stable quality and reproducible thermal performance level of power electronic devices.

TIM not only provides a significant low thermal resistance, it also fulfills the highest quality standards given for power modules to achieve the longest lifetime and highest system reliability.

Features

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

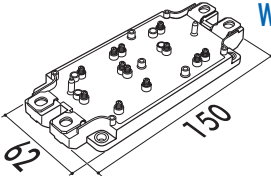
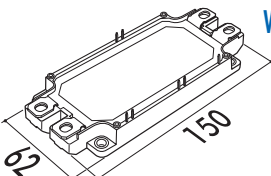
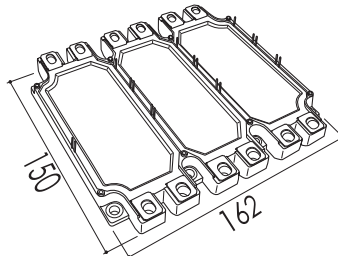
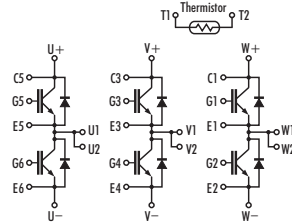
Process - Benefits

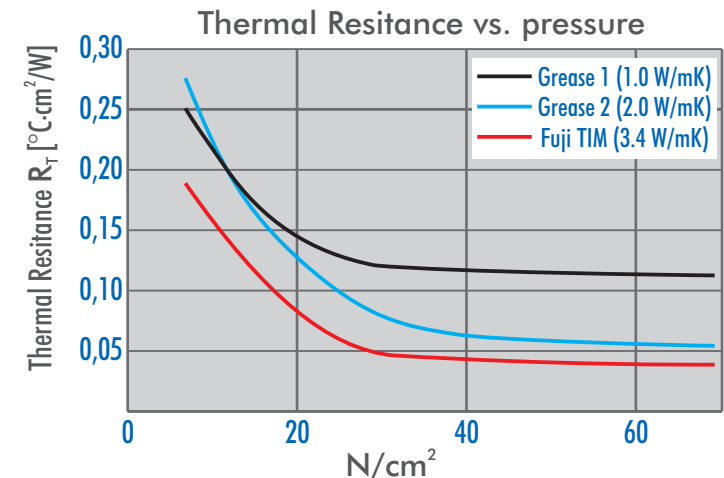
- + Outsourcing a dirty process
- + Stable quality level
- + Increased system reliability

Thermal - Benefits

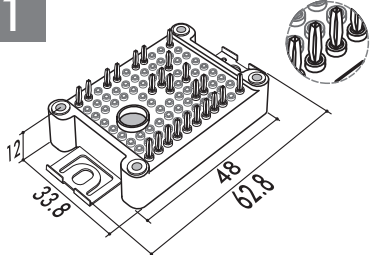
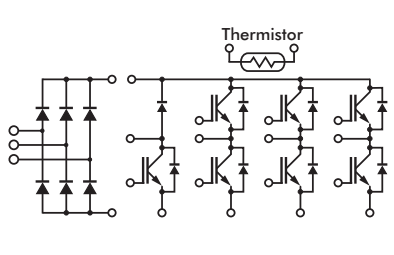
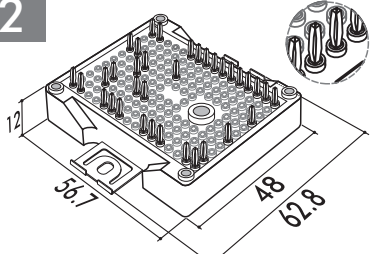
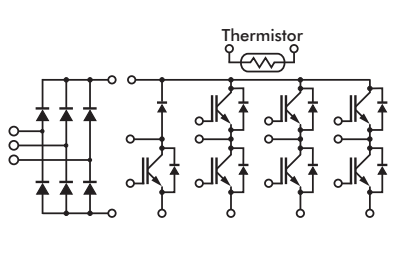
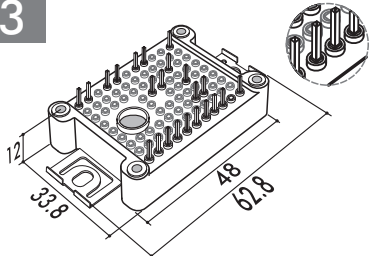
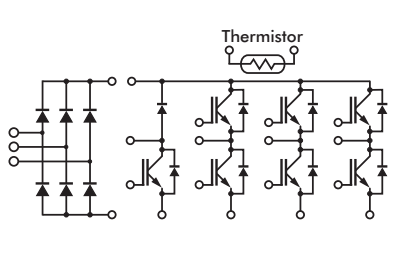
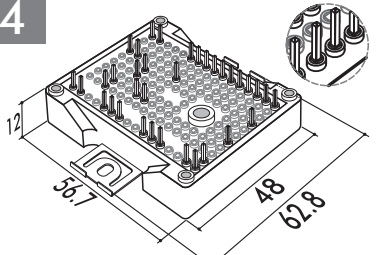
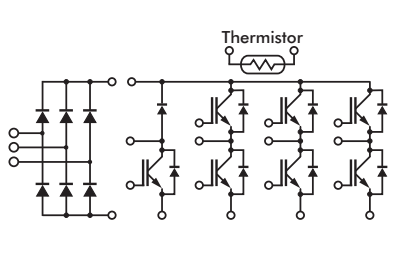
- + Higher thermal conductivity
- + Decrease R_{th} -value significantly

Available modules with TIM

		I_C	1200V Trench-FS, V-Series	
2-Pack	With spring contacts 	450A	2MBi 450VJ-120-85	
		600A	2MBi 600VJ-120-85	
	With solder pins 	225A	2MBi 225VN-120-85	
		450A	2MBi 450VN-120-85	
		600A	2MBi 600VN-120-85	
				Thermistor
6-Pack 			Thermistor	
	225A	6MBi 225V-120-85		
	300A	6MBi 300V-120-85		
	450A	6MBi 450V-120-85		



PIM IGBTs (Power Integrated Module)

		I_c	600V Trench-FS (V-Series)	1200V Trench-FS (V-Series)	
With PressFit Contacts	1 		10A	7MBR 10VKA-060-50	7MBR 10VKA-120-50
			15A	7MBR 15VKA-060-50	7MBR 15VKA-120-50
			20A	7MBR 20VKA-060-50	
			30A	7MBR 30VKA-060-50	
With PressFit Contacts	2 		15A		7MBR 15VKB-120-50
			25A		7MBR 25VKB-120-50
			35A		7MBR 35VKB-120-50
			50A	7MBR 50VKB-060-50	
With Solder Pins	3 		10A	7MBR 10VKC-060-50	7MBR 10VKC-120-50
			15A	7MBR 15VKC-060-50	7MBR 15VKC-120-50
			20A	7MBR 20VKC-060-50	
			30A	7MBR 30VKC-060-50	
	4 		15A		7MBR 15VKD-120-50
			25A		7MBR 25VKD-120-50
			35A		7MBR 35VKD-120-50
			50A	7MBR 50VKD-060-50	

+ 6-Pack configuration is under development

PIM IGBTs (Power Integrated Module) / Solder pins

		I_c	600V	1200V	
			Trench-FS (V-Series)	Trench-FS (V-Series)	
5			25A	7MBR 25VA-120-50	
			35A	7MBR 35VA-120-50	
			50A	7MBR 50VA-060-50	
6			35A	7MBR 35VB-120-50	
			50A	7MBR 50VB-120-50	
			75A	7MBR 75VB-060-50	7MBR 75VB-120-50
			100A	7MBR 100VB-060-50	
7			25A	7MBR 25VM-120-50	
			35A	7MBR 35VM-120-50	
			50A	7MBR 50VM-120-50	
8			25A	7MBR 25VP-120-50	
			35A	7MBR 35VP-120-50	
			50A	7MBR 50VP-060-50	7MBR 50VP-120-50
			75A	7MBR 75VP-060-50	
			100A	7MBR 100VP-060-50	
9			50A	7MBR 50VN-120-50	
			75A	7MBR 75VN-120-50	
			100A	7MBR 100VN-120-50	
			150A	7MBR 150VN-120-50	
10			50A	7MBR 50VR-120-50	
			75A	7MBR 75VR-120-50	
			100A	7MBR 100VR-060-50	7MBR 100VR-120-50
			150A	7MBR 150VR-060-50	7MBR 150VR-120-50

With solder pins

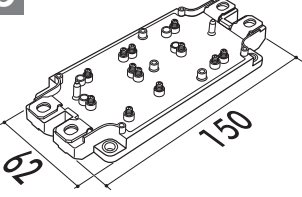
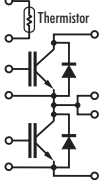
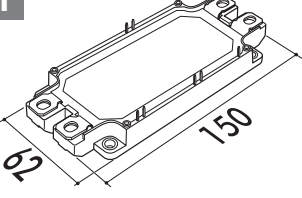
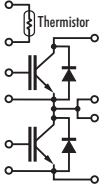
PIM IGBTs (Power Integrated Module) / PressFit contacts

				I_C	600V Trench-FS (V-Series)	1200V Trench-FS (V-Series)
With PressFit contacts	11			25A		7MBR 25VW-120-50
				35A		7MBR 35VW-120-50
				50A		7MBR 50VW-120-50
	12			50A		7MBR 50VX-120-50
				75A		7MBR 75VX-120-50
				100A		7MBR 100VX-120-50
				150A		7MBR 150VX-120-50
	13			25A		7MBR 25VY-120-50
				35A		7MBR 35VY-120-50
				50A	7MBR 50VY-060-50	7MBR 50VY-120-50
				75A	7MBR 75VY-060-50	
				100A	7MBR 100VY-060-50	
14			50A		7MBR 50VZ-120-50	
			75A		7MBR 75VZ-120-50	
			100A	7MBR 100VZ-060-50	7MBR 100VZ-120-50	
			150A	7MBR 150VZ-060-50	7MBR 150VZ-120-50	

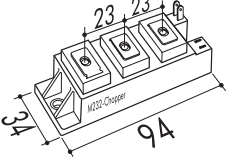
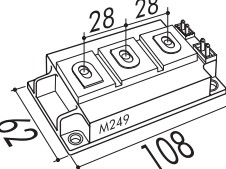
6-Pack IGBTs

			600V	1200V	1700V	
		I_C	Trench-FS (V-Series)	Trench-FS (V-Series)	Trench-FS (U-Series)	
With solder pins	15			6MBi 50VA-060-50	6MBi 50VA-120-50	
				6MBi 75VA-060-50	6MBi 75VA-120-50	
				6MBi 100VA-060-50	6MBi 100VA-120-50	
With solder pins	16			6MBi 100VB-060-50	6MBi 100VB-120-50	6MBi 100U4B-170-50
				6MBi 150VB-060-50	6MBi 150VB-120-50	6MBi 150U4B-170-50
				6MBi 180VB-120-50	6MBi 180VB-120-50	
				6MBi 200A	6MBi 180VB-120-55 <i>Equivalent to 200A by lower R_{th}</i>	
With PressFit contacts	17			6MBi 50VW-060-50	6MBi 50VW-120-50	
				6MBi 75VW-060-50	6MBi 75VW-120-50	
				6MBi 100VW-060-50	6MBi 100VW-120-50	
With PressFit contacts	18			6MBi 100VX-060-50	6MBi 100VX-120-50	
				6MBi 150VX-060-50	6MBi 150VX-120-50	
				6MBi 180VX-120-50	6MBi 180VX-120-50	
				6MBi 200A	6MBi 180VX-120-55 <i>Equivalent to 200A by lower R_{th}</i>	
High Power	19			6MBi 225V-120-50	6MBi 225V-120-50	
				6MBi 300V-120-50	6MBi 300V-120-50	6MBi 300V-170-50
				6MBi 450V-120-50	6MBi 450V-120-50	6MBi 450V-170-50
				6MBi 550A	6MBi 550V-120-50	

2-Pack IGBTs, Spring- & Pin-Type

			1200V	1700V	
		I_C	Trench-FS (V-Series)	Trench-FS (V-Series)	
Spring Contacts	20 		225A	2MBi 225VJ-120-50	
			300A	2MBi 300VJ-120-50	
			450A	2MBi 450VJ-120-50	
			550A		2MBi 550VJ-170-50
			600A	2MBi 600VJ-120-50	
Soldering Pins	21 		225A	2MBi 225VN-120-50	2MBi 225VN-170-50
			300A	2MBi 300VN-120-50	2MBi 300VN-170-50
			450A	2MBi 450VN-120-50	2MBi 450VN-170-50
			550A		2MBi 550VN-170-50
			600A	2MBi 600VN-120-50	

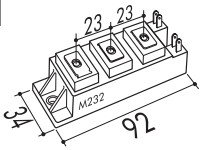
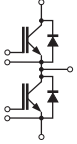
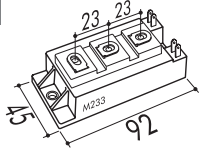
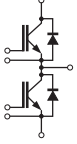
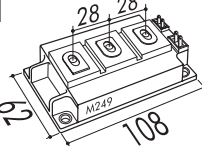
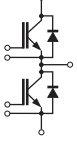
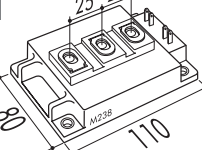
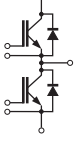
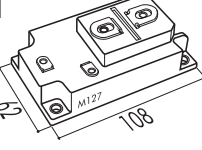
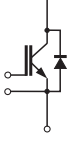
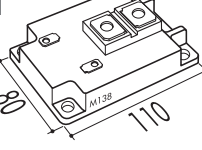
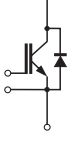
Chopper (Standard and High Speed IGBTs)

			1200V		
		I_C	Planar-NPT High Speed-Series	Trench-FS (U-Series)	Trench-FS (V-Series)
Chopper	22 	50A		1MBi 50U4F-120L-50	
		75A		1MBi 75U4F-120L-50	
		100A		1MBi 100U4F-120L-50	
		150A			1MBi 150VA-120L-50 *
	23 	200A	1MBi 200HH-120L-50	1MBi 200U4H-120L-50 ¹⁾	
		300A	1MBi 300HH-120L-50		
		400A	1MBi 400HH-120L-50		

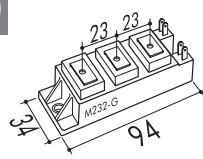
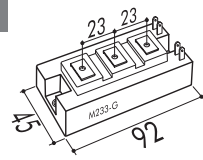
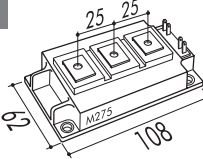
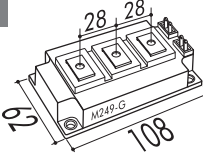
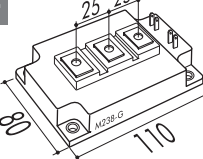
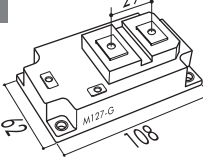
1) Without thermistor

*) Under development

1- & 2-Pack IGBTs, U-Series

		600V		1200V		1700V
		Planar-NPT (U2-Series)	Trench-FS (U-Series)	Planar-NPT High Speed-Series	Trench-FS (U-Series)	
		I_C				
2 - Pack	24  	75A		2MBi 75U4A-120		
		100A	2MBi 100TA-060-50	2MBi 100U4A-120-50		
		150A	2MBi 150U2A-060-50	2MBi 150U4A-120-50		
		200A	2MBi 200U2A-060-50			
	25  	100A			2MBi 100HB-120-50	
		150A		2MBi 150U4B-120-50		
		200A		2MBi 200U4B-120-50		
		300A	2MBi 300U2B-060-50			
		400A	2MBi 400U2B-060-50			
	26  	150A		2MBi 150U4H-120-50	2MBi 150HH-120-50	
		200A		2MBi 200U4H-120-50	2MBi 200HH-120-50	2MBi 200U4H-170
		300A		2MBi 300U4H-120-50		2MBi 300U4H-170
400A			2MBi 400U4H-120-50		2MBi 400U4H-170	
27  	300A		2MBi 300U4E-120			
	450A		2MBi 450U4E-120			
	600A	2MBi 600U2E-060				
1 - Pack	28  	300A		1MBi 300U4-120		
		400A		1MBi 400U4-120		
		600A		1MBi 600U4-120		
	29  	600A		1MBi 600U4B-120		
		800A		1MBi 800U4B-120		

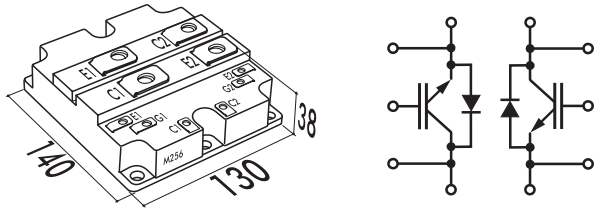
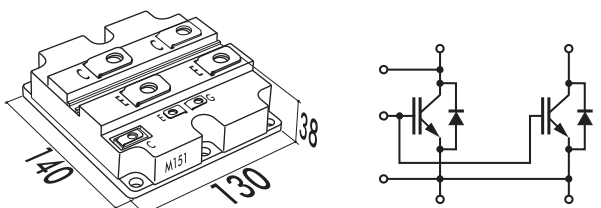
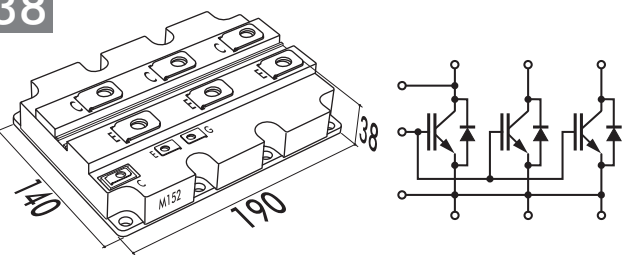
1- & 2-Pack Module, V-series¹⁾ I_C

			600V Trench-FS (V-Series)	1200V Trench-FS (V-Series)	1700V Trench-FS (V-Series)
2 - Pack	30 	75A		2MBi 75VA-120-50	2MBi 75VA-170-50
		100A	2MBi 100VA-060-50	2MBi 100VA-120-50	2MBi 100VA-170-50
		150A	2MBi 150VA-060-50	2MBi 150VA-120-50	2MBi 150VA-170-50
		200A	2MBi 200VA-060-50		
	31 	150A		2MBi 150VB-120-50	
		200A		2MBi 200VB-120-50	
		300A	2MBi 300VB-060-50		
		400A	2MBi 400VB-060-50		
	32 	300A		2MBi 300VD-120-50	
		400A	2MBi 400VD-060-50	2MBi 400VD-120-50	
		600A	2MBi 600VD-060-50		
	33 	150A			2MBi 150VH-170-50
200A			2MBi 200VH-120-50	2MBi 200VH-170-50	
300A			2MBi 300VH-120-50	2MBi 300VH-170-50	
450A			2MBi 450VH-120-50		
34 	300A		2MBi 300VE-120-50		
	450A		2MBi 450VE-120-50		
	600A	2MBi 600VE-060-50	2MBi 600VE-120-50		
1 - Pack	35 	400A		1MBi 400V-120-50	
		600A		1MBi 600V-120-50	
		900A		1MBi 900V-120-50	

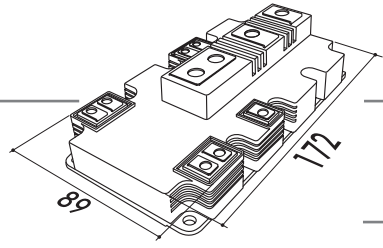
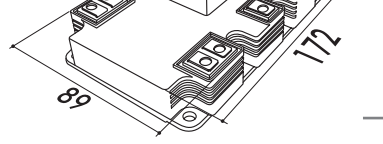
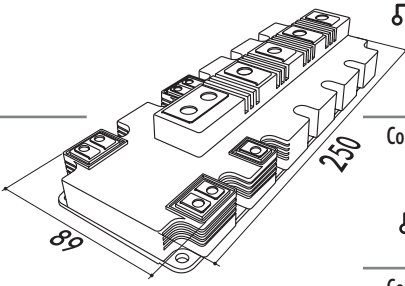
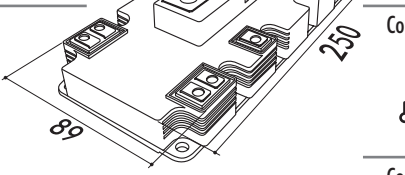
¹⁾ Improved package concept with V-series Chips

- ❖ Lower $V_{CE, sat}$ / lower power losses , fast switching
- ❖ Improved thermal cycling capability
- ❖ Significantly lower internal inductance
- ❖ $T_{j, max} = 175^{\circ}C$

High Power Modules 1- & 2-Pack

				1200V	1700V		3300V
				With Cu-baseplate Trench-FS (V-Series) P-type (Soft turn-off)	With Cu-baseplate Trench-FS (V-Series) E-type (Low switching losses)	With AlSiC-baseplate Trench-FS (V-Series) E-type (Low switching losses)	With AlSiC-baseplate Trench-FS (U-Series)
		I_c					
2-Pack	36		600A	2MBi 600VG-120P	2MBi 600VG-170E	2MBi 600VT-170E	
	800A		2MBi 800VG-120P	2MBi 800VG-170E	2MBi 800VT-170E		
	1200A		2MBi 1200VG-120P	2MBi 1200VG-170E	2MBi 1200VT-170E		
1-Pack	37		800A				1MBi 800UG-330
			1000A				1MBi 1000UG-330
			1200A	1MBi 1200VC-120P	1MBi 1200VC-170E	1MBi 1200VR-170E	
			1600A	1MBi 1600VC-120P	1MBi 1600VC-170E	1MBi 1600VR-170E	
			2400A	1MBi 2400VC-120P	1MBi 2400VC-170E	1MBi 2400VR-170E	
	38		1200A				1MBi 1200UE-330
			1500A				1MBi 1500UE-330
			2400A	1MBi 2400VD-120P	1MBi 2400VD-170E	1MBi 2400VS-170E	
			3600A	1MBi 3600VD-120P	1MBi 3600VD-170E	1MBi 3600VS-170E	

High Power Modules, 2-Pack & Chopper

		I_C	1200V		1700V	
			Trench-FS (V-Series) E-type (Low switching losses)	Trench-FS (V-Series) P-type (Soft turn-off)	Trench-FS (V-Series) E-type (Low switching losses)	Trench-FS (V-Series) P-type (Soft turn-off)
2-Pack	<div data-bbox="129 295 201 343" style="background-color: #cccccc; padding: 2px;">39</div> 	600A	2MBi 600VXA-120E-50			
		650A			2MBi 650VXA-170E-50 2MBi 650VXA-170EA-50 (With large Free Wheeling Diode)	
		900A	2MBi 900VXA-120E-50	2MBi 900VXA-120P-50		
Chopper		650A			1MBi 650VXA-170EL-50	
		650A			1MBi 650VXA-170EH-50	
2-Pack	<div data-bbox="129 853 201 901" style="background-color: #cccccc; padding: 2px;">40</div> 	1000A			2MBi 1000VXB-170E-50 2MBi 1000VXB-170EA-50 (With large Free Wheeling Diode)	2MBi 1000VXB-170P-50 *
		1400A	2MBi 1400VXB-120E-50	2MBi 1400VXB-120P-50	2MBi 1400VXB-170E-50	2MBi 1400VXB-170P-50
		1000A			1MBi 1000VXB-170EL-50	
Chopper		1400A		1MBi 1400VXB-120PL-50	1MBi 1400VXB-170EL-50 *	
		1000A			1MBi 1000VXB-170EH-50	
		1400A		1MBi 1400VXB-120PH-50	1MBi 1400VXB-170EH-50 *	

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

*) Under development

IPM IGBT (Intelligent Power Module) , V-Series

Built-in protection functions

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

	Without Brake-Chopper	41	<p>3.71 26 43</p> <p>With High Voltage Driver-IC</p>			I _C	600V	1200V	
							Trench-FS V-Series	Trench-FS V-Series	
						15A	6MBP 15VRA-060-50		
						20A	6MBP 20VSA-060-50		
						30A	6MBP 30VSA-060-50		
						15A	6MBP 15VRC-060-50		
						20A	6MBP 20VSC-060-50		
						30A	6MBP 30VSC-060-50		
	Without Brake-Chopper	42	<p>49.5 12 70</p> <p>I_C & T_j-Sensors on Chip</p>			10A		6MBP 10VAA-120-50	
							15A		6MBP 15VAA-120-50
							20A	6MBP 20VAA-060-50	
							25A		6MBP 25VAA-120-50
							30A	6MBP 30VAA-060-50	
							50A	6MBP 50VAA-060-50	
	Without Brake-Chopper	43	<p>50.2 12 87</p> <p>I_C & T_j-Sensors on Chip</p>			25A		6MBP 25VBA-120-50	
							35A		6MBP 35VBA-120-50
							50A	6MBP 50VBA-060-50	6MBP 50VBA-120-50
							75A	6MBP 75VBA-060-50	

IPM IGBT (Intelligent Power Module) , V-Series

Built-in protection functions

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

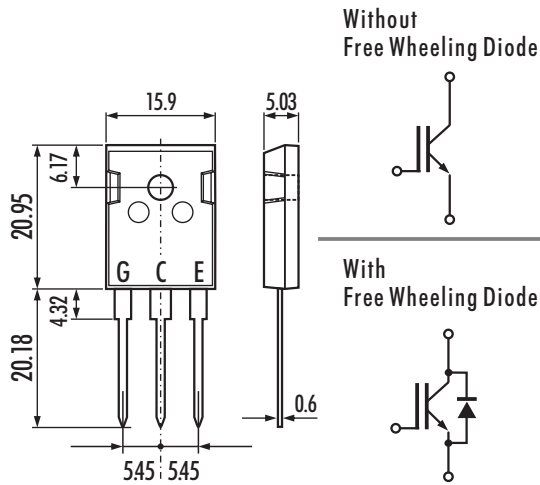
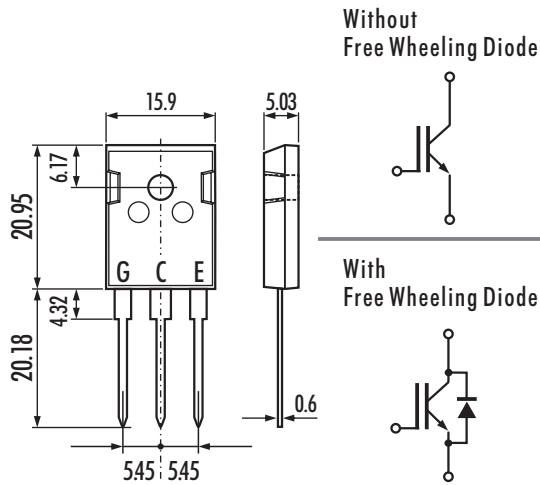
		I_c	600V Trench-FS V-Series	1200V Trench-FS V-Series
Without Brake-Chopper	<p>44</p> <p><i>I_c & T_j-Sensors on Chip</i></p>	25A		6MBP 25VDA-120-50
		35A		6MBP 35VDA-120-50
With Brake-Chopper	<p>44</p> <p><i>I_c & T_j-Sensors on Chip</i></p>	50A	6MBP 50VDA-060-50	6MBP 50VDA-120-50
		75A	6MBP 75VDA-060-50	6MBP 75VDA-120-50
		100A	6MBP 100VDA-060-50	6MBP 100VDA-120-50
		150A	6MBP 150VDA-060-50	
		200A	6MBP 200VDA-060-50	
		25A		7MBP 25VDA-120-50
35A		7MBP 35VDA-120-50		
50A	7MBP 50VDA-060-50	7MBP 50VDA-120-50		
75A	7MBP 75VDA-060-50	7MBP 75VDA-120-50		
100A	7MBP 100VDA-060-50	7MBP 100VDA-120-50		
150A	7MBP 150VDA-060-50			
200A	7MBP 200VDA-060-50			
Without Brake-Chopper	<p>45</p> <p><i>I_c & T_j-Sensors on Chip</i></p>	100A		6MBP 100VEA-120-50
		150A		6MBP 150VEA-120-50
		200A	6MBP 200VEA-060-50	6MBP 200VEA-120-50
		300A	6MBP 300VEA-060-50	
		400A	6MBP 400VEA-060-50	
With Brake-Chopper	<p>45</p> <p><i>I_c & T_j-Sensors on Chip</i></p>	100A		7MBP 100VEA-120-50
		150A		7MBP 150VEA-120-50
		200A	7MBP 200VEA-060-50	7MBP 200VEA-120-50
		300A	7MBP 300VEA-060-50	
		400A	7MBP 400VEA-060-50	

IGBT-Modules for 3-Level-Inverters

		T1&T2=600V		T1&T2=1200V		T1&T2=1700V			
		I_C	Trench-FS (V-Series)	T3&T4	Trench-FS (V-Series)	T3&T4	Trench-FS (V-Series)	T3&T4	
3 Phase	46 Solder Pins 		50A			12MBi 50VN-120-50*	600V		
			75A			12MBi 75VN-120-50*	600V		
			100A			12MBi 100VN-120-50	600V		
	47 PressFit Contacts 		50A			12MBi 50VX-120-50*	600V		
			75A			12MBi 75VX-120-50*	600V		
			100A			12MBi 100VX-120-50	600V		
1 Phase	48 		200A					4MBi 200VG-170R2-50*	1200V
			300A			4MBi 300VG-120R-50 4MBi 300VG-120R1-50	600V 900V		
			400A	4MBi 400VG-060R-50	600V	4MBi 400VG-120R-50	600V		
	49 	I-Type 	600A			4MBi 600VC-120-50*	1200V		
		T-Type 	450A			4MBi 450VB-120R1-50*	900V	4MBi 450VB-170R2-50*	1200V
			600A					4MBi 600VB-170R2-50*	1200V
650A					4MBi 650VB-120R1-50*	900V			
	900A			4MBi 900VB-120R1-50*	900V				

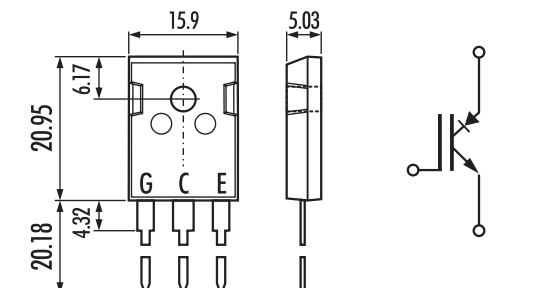
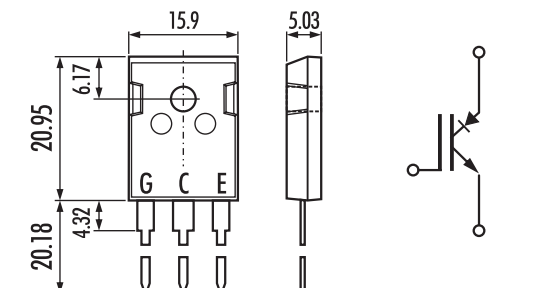
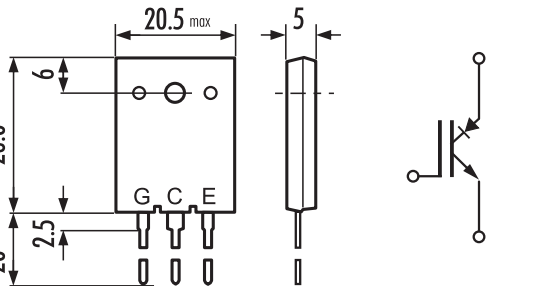
*) Under development

Discrete IGBTs

TO-247		I_C	Low loss V-series		High speed V-Series			
			600V	1200V	600V	1200V		
TO-247		Without Free Wheeling Diode	15A				FGW15N 120H	
			30A				FGW30N 120H	
			35A			FGW35N 60H		
			40A				FGW40N 120H	
			50A			FGW50N 60H		
			75A			FGW75N 60H		
		With Free Wheeling Diode	15A		FGW15N 120VD ¹⁾			FGW15N 120HD ²⁾
			25A		FGW25N 120VD ¹⁾			
			30A	FGW30N 60VD ¹⁾				FGW30N 120HD ²⁾
			35A			FGW35N 60HD ²⁾		
			40A		FGW40N 120VD ¹⁾			FGW40N 120HD ²⁾
			50A	FGW50N 60VD ¹⁾			FGW50N 60HD ²⁾	
75A	FGW75N 75VD ¹⁾			FGW75N 60HD ²⁾				

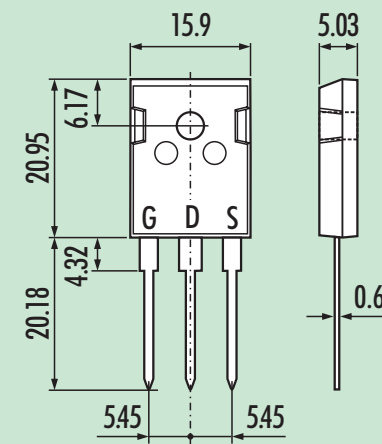
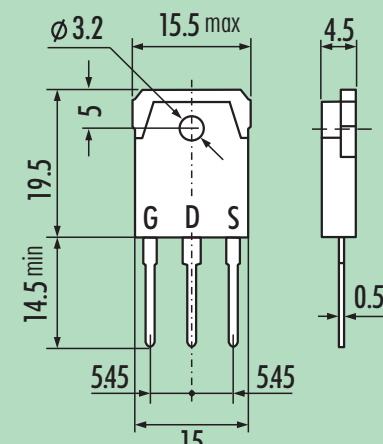
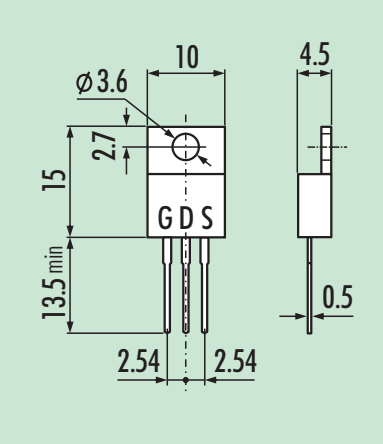
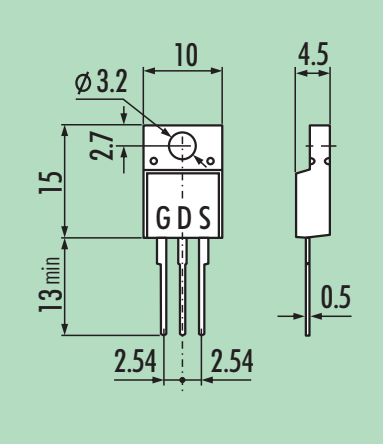
1) With Soft Recovery Diode
2) With UltraFast Diode

Reverse Blocking Discrete IGBTs

TO-247		I_C	600V	1200V
			40A	FGW40N 60 RB *
TO-247		85A	FGW85N 60 RB	
		TO-3PL		50A

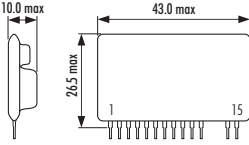
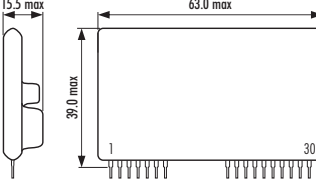
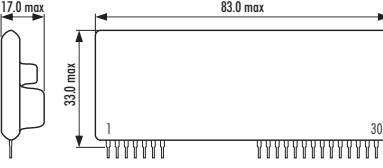
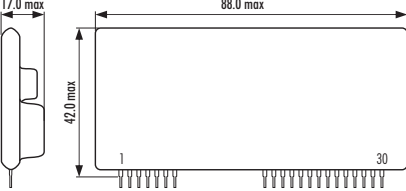


*) Under development

Super-Junction MOSFET

		600V TO-247-P2	600V TO-3P	600V TO-220AB	600V TO-220F(SLS)
$R_{DS(on)}$ max.	I_D				
40mΩ	68A	FMW 79N60S1 HF			
70mΩ	47A	FMW 47N60S1 HF	FMH 47N60S1 FMH 47N60S1 HF		
125mΩ	30A	FMW 30N60S1 HF	FMH 30N60S1 FMH 30N60S1 HF	FMP 30N60S1 FMP 30N60S1 HF	FMV 30N60S1 FMV 30N60S1 HF
190mΩ	20A	FMW 20N60S1 HF	FMH 20N60S1 FMH 20N60S1 HF	FMP 20N60S1 FMP 20N60S1 HF	FMV 20N60S1 FMV 20N60S1 HF

Suffix HF = Pb free lead terminal; RoHS compliant; uses Halogen-free molding compound

IGBT-Drivers

		Max $V_{ces(IGBT)}$		Output current I_{peak}	$V_{iso,max}$	Max. switching frequency	Comment	
		1200V	1700V					
Single Drivers		Single	VLA 517-01R	-	4A	2.5kV	40kHz	Single power supply needed with $V_{DC} = +20V$
		Single	VLA 551-01R	-	5A	2.5kV	20kHz	Built-In Power supply
			-	VLA 551K-01R	5A	4.0kV	20kHz	
		Single	VLA 500-01R	-	12A	2.5kV	20kHz	Built-In Power supply
-			VLA 500K-01R	12A	4.0kV	20kHz		
	Single	-	VLA 539-01R	24A	4.0kV	10kHz	Built-In Power supply	
Dual Driver		Dual	VLA 536-01R	-	5A	2.5kV	20kHz	Built-In Power supply
		Dual	VLA 559-01R	-	24A	4.0kV	5kHz	Built-In Power supply
			-	VLA 559-02R	24A	4.0kV	5kHz	