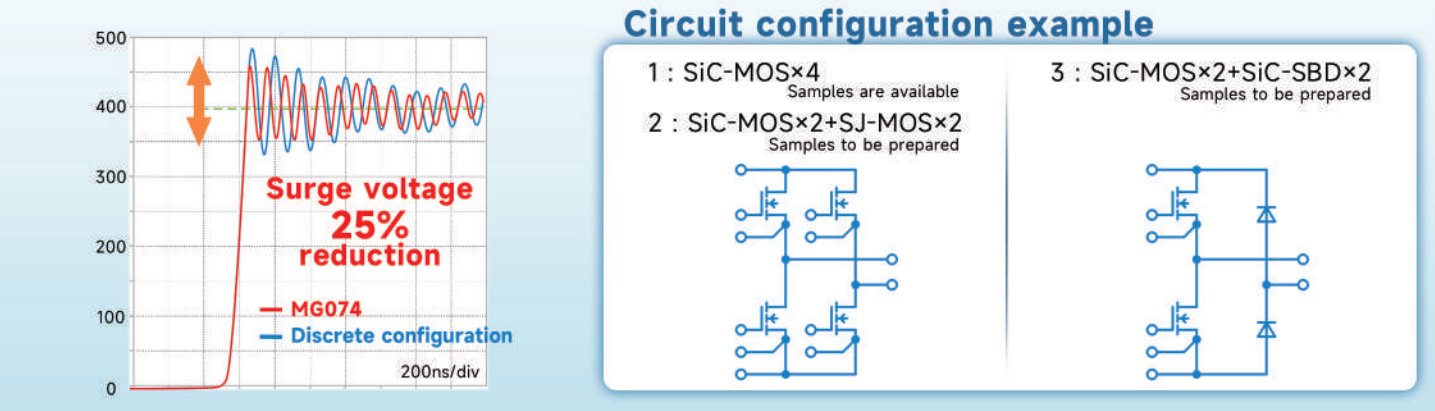


Totem-pole Bridgeless PFC/Full-Bridge SiC-MOSFET Power Module

- Miniaturization (30% reduction, world's smallest*)
- 25% reduction in surge voltage (Patent application for our original low inductance structure is pending)
- Insulation Type
- 650V/20-50mΩ SiC-MOSFET Equipped with 4 elements
- Sample are available!

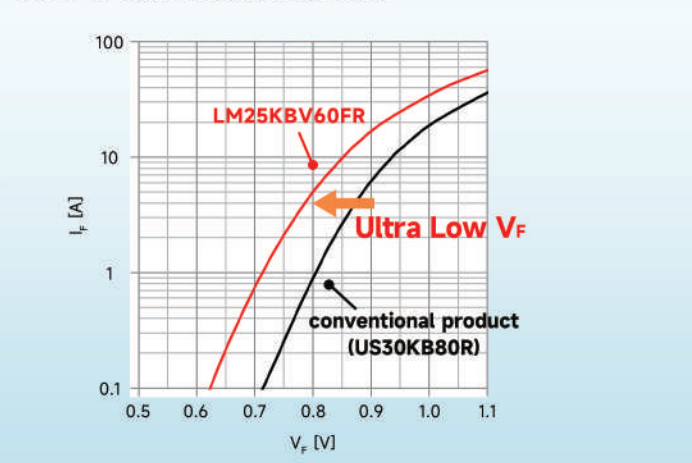
*Comparison with TO-247 4 elements. According to our research



Low VF Bridge Diode LM series

- Ultra Low V_F (No.1 in the world*)
- Large I_{FSM}
- 600V/25A
- Mass production

*Based on Shindengen internal research



SiC Schottky Barrier Diodes

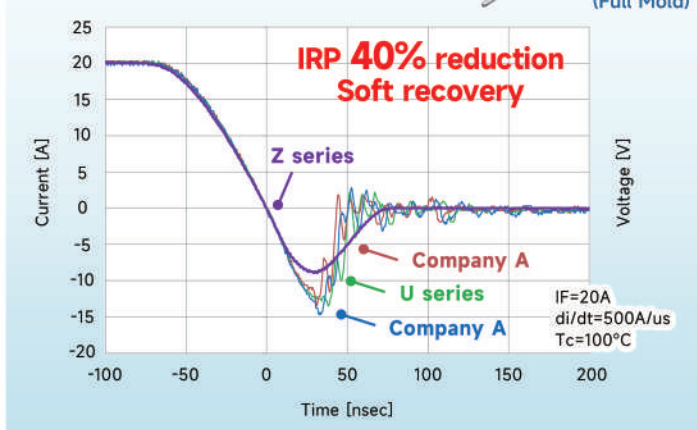
- New SiC-SBD (Low V_F)
- Compact surface mount package
- AEC-Q101 compliant (planned)
- 650V/5A,10A
- Samples are available



5th Gen FRD for PFC Z series

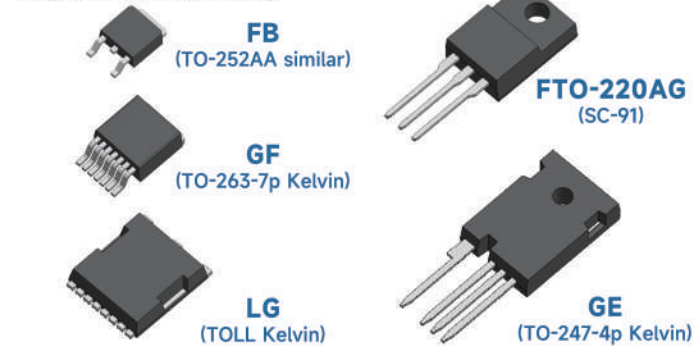
- Ultra Fast
- 650V/10A, 20A
- Low Recovery (40% reduction*)
- Samples are available
- Low Noise (Reduction of noise countermeasure parts)

* Based on Shindengen internal research



SiC MOSFETs

- Low loss (world's highest level)
- Ultra-high withstand voltage
- High speed switching
- 650V/15mΩ,60mΩ
- Samples are available



BRIDGE DIODES

Bridge Diodes are suitable for the rectification of commercial frequency. Variations are available for various packaging as well as high voltage (Max 1600V), high IFSM, low V_F , and low noise.

Small Bridge Diodes

Surface Mount		JEDEC Code JEITA Code House Name	Fig.	$I_{F(AV)}$ [A]	V_{RRM} [V]			Remarks
Package					600	800	1000	
	7.0 × 4.7 × 2.6(mm)	TO-269AA -1Z	C2-1	0.8	S1ZB60	S1ZB80		
	6.2 × 5.15 × 1.45(mm)	SOPA-4	C1	1		D1UBA80		
	10.0 × 6.8 × 2.6(mm)	-1N	C4	1	S1NB60	S1NB80		
	10.0 × 6.8 × 2.6(mm)	-	C6-1	1		S1NB80		
	10.0 × 6.8 × 2.6(mm)	-		1.5	S1NBC60	S1NBC80		
	10.6 × 10.2 × 3.1(mm)	-1W	C8	2		S2NBC100		

THD (Through Hole Device)		JEDEC Code JEITA Code House Name	Fig.	$I_{F(AV)}$ [A]	V_{RRM} [V]			Remarks
Package					600	800	1000	
	3.8 × 4.7 × 2.5(mm)	-1Z	C3	0.8	S1ZB60	S1ZB80		
	6.5 × 6.8 × 2.5(mm)	-1N	C5	1	S1NB60	S1NB80		
	6.5 × 6.8 × 2.5(mm)	-1NA	C7	1		S1NB80		
	6.5 × 6.8 × 2.5(mm)	-	C9	1.5	S1NBC60	S1NBC80		
	6.2 × 10.2 × 3.0(mm)	-1W		2		S2NBC100		
	6.2 × 10.2 × 3.0(mm)	-		2	S1WB(A)60 S1WB(A)60B	S1WB(A)80 S2WB(A)80		

SIP (Single In-line Package) Bridge Diodes

THD (Through Hole Device)		JEDEC Code JEITA Code House Name	Fig.	$I_{F(AV)}$ [A]	V_{RRM} [V]			Remarks
Package					600	800	1000	
	24.0 × 13.8 × 3.1(mm)	-D3K	D1	2		UD2KB80 ★UD2KB80H		
	24.5 × 20.0 × 3.5(mm)	-2S	D2	3		UD3KB80 ★UD3KB80H		
	25.2 × 25.0 × 4.2(mm)	-JB	D5	4		UD4KB80 UD6KB80 ★UD6KB80H		
	32.5 × 25.0 × 4.6(mm)	-3S	D3	6		UD8KB80		
	37.1 × 22.1 × 3.45(mm)	-D6K	D11	8		D2SBA60 D2SB60 D6JBB60V D8JBB60V D10JBB60V		
	29.4 × 29.0 × 4.6(mm)	-JA	D6	10		D3SBA60 D3SB60 D4SB60L D10XB60 D10XB60H		
	37.5 × 30.0 × 4.6(mm)	-5S	D4	15		D15XB80 D25XB80 ★D25XB80H		
	37.5 × 30.0 × 4.6(mm)	-		25		D15XB80 D20XB80 ★D25XB80H		
	37.5 × 30.0 × 4.6(mm)	-		30		D15XB80 D20XB80 ★D25XB80H		
	37.5 × 30.0 × 4.6(mm)	-		35		D15XB80 D20XB80 ★D25XB80H		
	37.5 × 30.0 × 4.6(mm)	-		40		D15XB80 D20XB80 ★D25XB80H		
	37.5 × 30.0 × 4.6(mm)	-		45		D15XB80 D20XB80 ★D25XB80H		

	47.0 × 45.7 × 7.5(mm)	-TSB(4pin)	D7	50		D50XB80		
	47.0 × 45.7 × 7.5(mm)	-JC(4pin)		50		D50JCB80V		

■: New product ★: Under development

3 Phase Bridge Diodes

THD (Through Hole Device)		JEDEC Code JEITA Code House Name	Fig.	$I_{F(AV)}$ [A]	V_{RRM} [V]			Remarks
Package					800	1200	1600	
	47.0 × 45.7 × 7.5(mm)	-TSB(5pin)	D8	30	D30XT80			
	47.0 × 45.7 × 7.5(mm)	-JC(5pin)		45	D45XT80		D45XT160	
	47.0 × 45.7 × 7.5(mm)	-	D9	30		D30JCT120V		
	47.0 × 45.7 × 7.5(mm)	-		45		D45JCT120V	D45JCT160V	
	47.0 × 45.7 × 7.5(mm)	-JF	D9	75		D75JFT80V		
	45.7 × 30.0 × 8.6(mm)	-JH	D10-2	100		D100JHT80V	D100JHT120V D100JHT160V	

3 Phase Bridge Diodes

THD (Through Hole Device)		JEDEC Code JEITA Code House Name	Fig.	$I_{F(AV)}$ [A]	V_{RRM} [V]			Remarks
Package					600	800	1600	
	36.0 × 36.0 × 24.0(mm)	-SVT	E15	10	S10VT60	S10VT80		
	36.0 × 36.0 × 24.0(mm)	-	E14	15	S15VT60	S15VT80		
	36.0 × 36.0 × 24.0(mm)	-		20	S20VT60	S20VT80		
	36.0 × 36.0 × 24.0(mm)	-	F7	30	S30VT60	S30VT80		
	36.0 × 36.0 × 24.0(mm)	-		10	S10VTA60	S10VTA80		
	36.0 × 36.0 × 24.0(mm)	-	F9	15	S15VTA60	S15VTA80		
	36.0 × 36.0 × 24.0(mm)	-		20	S20VTA60	S20VTA80		
	36.0 × 36.0 × 24.0(mm)	-	F10	30	S30VTA60	S30VTA80		
	36.0 × 36.0 × 24.0(mm)	-		150				
	36.0 × 36.0 × 24.0(mm)	-		200				
	36.0 × 36.0 × 24.0(mm)	-		75				
	36.0 × 36.0 × 24.0(mm)	-		100				
	36.0 × 36.0 × 24.0(mm)	-		100				
	36.0 × 36.0 × 24.0(mm)	-		150				
	36.0 × 36.0 × 24.0(mm)	-		200				

■: New product ★: Under development

TVS (Transient Surge Suppressor)

TVSs are low voltage PN junction type devices. These devices utilize technologically stable glass passivation (an in-house design) with a structural advantage that brings high resistance against heat and humidity. They are available with a voltage range between 12 to 320V and peak pulse power from 200 to 8000W.

TVS

- Features
- High speed response.
 - Absorption energy tolerance capacity.
 - Lineup of Bi-directional type (DL series) for surge absorption.
- Applications
- Narrow clamping voltage width.
 - IC protection for telephones.
 - IC protection against abnormal voltage.
 - Protection for load dump noise.

Peak pulse power		200W		600W	2000W		
Package		3.5 × 1.6 × 0.8(mm)	5.0 × 2.5 × 2.0(mm)	4.7 × 2.4 × 0.98(mm)	7.6 × 4.0 × 2.8(mm)	6.5 × 4.5 × 1.1(mm)	
JEDEC Code JEITA Code House Name		DO-219AB similar SC-109	DO-214AC	DO-214AC	-	TO-277A similar	
Fig.		B1-2	1F	1F	CE	FY	
Internal Circuit		①↔②	①↔②	①↔②	①↔②	①↔②	
V_{BR} (typ) [V]	12.5	ST02-12G1	ST04-12F1				
	14	ST02-14G1	ST04-14F1				
	16	ST02-16G1	ST04-16F1				
	18	ST02-18G1	ST04-18F1	DL04-18F1	ST06-18CE		★ST20-18FY
	20	ST02-20G1	ST04-20F1				
	24	ST02-24G1	ST04-24F1				
	27	ST02-27G1	ST04-27F1				
	30	ST02-30G1	ST04-30F1				
	33	ST02-33G1	ST04-33F1	DL04-33F1	ST06-27CE		
	36	ST02-36G1	ST04-36F1	DL04-36F1	ST06-30CE		
	39	ST02-39G1	ST04-39F1		ST06-33CE		
	43	ST02-43G1	ST04-43F1		ST06-36CE		
	47	ST02-47G1	ST04-47F1				
	58	ST02-58G1	ST04-58F1				
	68	ST02-68G1	ST04-68F1				
	75	ST02-75G1	ST04-75F1				
	82	ST02-82F1	ST04-82F1				
	100	ST02-100F1	ST04-100F1				
	120	ST02-120F1	ST04-120F1				
	145	ST02-140F1	ST04-140F1				
	170	ST02-170F1	ST04-170F1				
	200	ST02-200F1	ST04-200F1				
	240	ST02-240F1	ST04-240F1				
	280	ST02-280F1	ST04-280F1				
	320	ST02-320F1	ST04-320F1				

■: New product ★: Under development

TVS

Peak pulse power	6000 ~ 8000W (Load Dump Surge Protecting)		
Package	 9.0 × 7.0 × 9.0(mm)	 13.2 × 10.2 × 4.7(mm)	 15.0 × 10.2 × 4.0(mm)
JEDEC Code JEITA Code House Name Fig.	- MCP E1	SC-83 similar STO-220 H1-6	TO-263AB FZ H6
Internal Circuit			
VBR (typ) [V]	14	ST80-14MF	
	22	 ST70-22MF	
	27	ST70-27MF	ST70-27F
	30	ST70-30MF	
	40	ST60-40MF	
48	ST60-48MF		

: New product

Power Clampers

- Features
- Absorption energy tolerance capacity.
 - Narrow clampingvoltage width.
 - High speed response.
 - Reverse blocking type.
- Applications
- Snubber circuit in the primary side of switch-mode power supplies.

Peak pulse power	6000 ~ 8000W (Load Dump Surge Protecting)		
Package	 7.6 × 4.0 × 2.8(mm)	 5.0 × 4.0 (mm)	 7.0 × 4.4 (mm)
JEDEC Code JEITA Code House Name Fig.	- 2F B9-3	- AX078 A4-2	- AX10 A5-2
Internal Circuit			
VBR (typ) [V]	82	ST02D-82	ST03D-82
	145	ST02D-140	ST03D-140
	170	ST02D-170	ST03D-170
	200	ST02D-200	ST03D-200
	240		ST03DH-240

POWER MOSFETs

The EETMOS series offer world-class performance applying a trench-gate structure with an optimized layout hence lowered Qg.

Series	Feature
EETMOS2	Evenly balanced Ron and Qg
EETMOS3/3Z	Low Ron, Low Qg
EETMOS4	Ultra Low Ron, Low Qg
EETMOS5	Ultra Low Ron, Low Qg

How to read **P20LF4QTKD**

lo Package Voss/10

Series E=EETMOS2 S=EETMOS3 Q=EETMOS4 G=EETMOS5

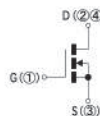
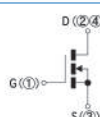
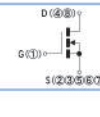
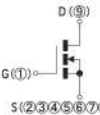
D=Dual type non=Single type
K=for Automotive non=for Consumer goods
Vth typ N=5V L=2V T=2V(Low Capacitance) M=other

EETMOS Series (Nch Single)

Surface Mount		JEDEC Code JEITA Code House Name	Fig.	Io [A]	Voss [V]				Remarks
Package					40	60	75	100	
	6.0 × 4.9 × 1.0(mm)	- LA	G6	15				P15LA12SL	D (5)(6)(7)(8) G (4) S (1)(2)(3)
				18				P18LA12SL	
				19				P19LA10SL	
				23				P23LA10SL	
				25				P25LA12SL	
				30				P30LA10SL	
				56	P56LA4SN				
				18	 P18LF6QLK  P18LF6QNK			P15LA12SL	
				24	 P24LF4QLK  P24LF4QMK  P24LF4QNK				
				25				P25LF12SLK P25LF12SL P25LF12SNK P25LF12SN	
				26	 P26LF6GLK				
				32				P32LF10SLK P32LF10SL P32LF10SNK P32LF10SN	
				38	 P38LF6QLK  P38LF6QL  P38LF6QNK  P38LF6QN				
				40				P40LF12SLK P40LF12SL P40LF12SNK P40LF12SN	
				46				P46LF7R5SLK P46LF7R5SL P46LF7R5SNK P46LF7R5SN	
				50				P50LF10SLK P50LF10SL P50LF10SNK P50LF10SN	
				56	 P56LF6GMK				
				58	 P58LF6GLK				
				64	 P64LF6QLK  P64LF6QL  P64LF6QNK  P64LF6QN				
				70	 P70LF4QLK  P70LF4QL  P70LF4QNK  P70LF4QN				
				72				P72LF7R5SLK P72LF7R5SL P72LF7R5SNK P72LF7R5SN	
				88	 P88LF6GMK				
				90	 P90LF6GLK				
				98	 P98LF6QLK  P98LF6QL  P98LF6QNK  P98LF6QN				
				105	 P105LF4QLK P105LF4QL P105LF4QNK P105LF4QN				
				120	P120LF6GLK P120LF6GMK				
				140	P140LF4QLK P140LF4QL P140LF4QNK P140LF4QN				

: New product : Under development

EETMOS Series (Nch Single)

Surface Mount		JEDEC Code JEITA Code House Name	Fig.	Io [A]	Voss [V]						Remarks
Package					40	60	75	100	120	150	
 10.0 × 6.6 × 2.3(mm)	TO-252AA FB	G2-1	8				 P8B10SBK P8B10SB				
			16		 P16B6SBK P16B6SB						
			20					 P20B12SLK P20B12SL P20B12SN			
			24	 P24B4SBK P24B4SB					 P24B15SL		
			25		P25B6EB						
			26				 P26B10SLK P26B10SL P26B10SN				
			30				P30B10EL				
			32					 P32B12SLK P32B12SN			
			40		 P40B6SLK P40B6SL			P40B10SL P40B10SN			
			54	 P54B4SLK P54B4SN							
			60		P60B4EL P60B6EN P60B6SN						
 9.5 × 6.6 × 2.65(mm)	TO-252AB similar SC-63 FE	G3-2	8				P8FE10SBK				
			12			P12FE7R5SBK					
			14		P14FE6SBK						
			20					P20FE12SLK			
			22	P22FE4SBK							
			26								
			30	P30FE4SLK	P30FE6SLK	P30FE7R5SLK					
 15.0 × 10.2 × 4.0(mm)	TO-263SC FZ-7p	H7	170		 P170FZ6QNKA						
			240	 P240FZ4QLA P240FZ4QNKA							
 11.68 × 9.8 × 2.3(mm)	MO-299B - LG	G9 (TOLL)	92						 P92LG20GNK		
			104						 P104LG20GNK		
			120						 P120LG20GNK		
			130				 P130LG10GN  P130LG10GNK  P168LG10GN  P168LG10GNK				
			168				 P200LG10GN  P232LG10GN  P232LG10GNK				
			200								
			232								

 : New product  : Under development

: New product : Under development

THD (Through Hole Device)

Package	JEDEC Code JEITA Code House Name	Fig.	V _{oss} [V]					Remarks
 28.5 × 10.0 × 4.5(mm)	SC-91 FTO-220AG	J8-2	50	60	75	100	120	
			22			P22F10SN		
			32				P32F12SN	
			34	P34F6EL				
			40			P40F10SN	P40F12SN	
			42	P42F6EN				
			50			P50F10SN		
			55	P55F6EN				
			66		P66F7R5SNK P66F7R5SN P70F7R5EN P82F7R5SN			
			70	P70F5EN				
			82					
			86		P86F6SN			

EETMOS Series (Nch Dual)

Surface Mount		JEDEC Code JEITA Code House Name	Fig.	Io [A]	Voss [V]			Remarks
Package					40	60	100	
	6.05 × 5.00 × 1.05(mm)	MO-235B - LF-Dual	G8	12			 P12LF10SLKD	
				15		 P15LF6QTKD		
				17			 P17LF10SLKD	
				20	 P20LF4QTKD			
				33		 P33LF6QLKD  P33LF6QTKD  P39LF6QTKD		
				39				
				41	 P41LF4QTKD			
				50	 P50LF4QTKD			

: New product

EETMOS Series (Pch Single)

Surface Mount		JEDEC Code JEITA Code House Name	Fig.	Io [A]	Voss [V]		Remarks
Package					-40	-60	
	6.05 × 5.00 × 1.05(mm)	MO-235B similar - LF	G7-2	-56	 P56LF4PQLK		
				-74	 P74LF4PQLK		
				-96	 P96LF4PQLK		

: Under development

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