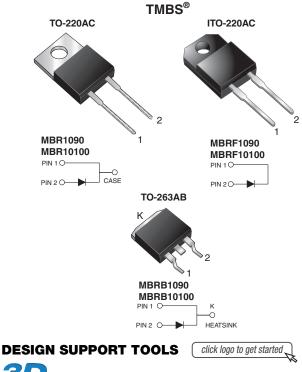
Vishay General Semiconductor

MBR10xxx-E3, MBRF10xxx-E3, MBRB10xxx-E3

# High Voltage Trench MOS Barrier Schottky Rectifier



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PRIMARY CHARACTERISTICS						
I <sub>F(AV)</sub>	10 A					
V <sub>RRM</sub>	90 V, 100 V					
I <sub>FSM</sub>	150 A					
V <sub>F</sub>	0.65 V					
T <sub>J</sub> max.	150 °C					
Package	TO-220AC, ITO-220AC, D <sup>2</sup> PAK (TO-263AB)					
Circuit configuration	Single					

### FEATURES

- Trench MOS Schottky technology
- · Lower power losses, high efficiency
- Low forward voltage drop
- High forward surge capability
- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C (for TO-263AB package)
- Solder bath temperature 275 °C maximum, 10 s, per JESD 22-B106 (for TO-220AC and ITO-220AC package)
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

## **TYPICAL APPLICATIONS**

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, DC/DC converters or polarity protection application.

### **MECHANICAL DATA**

Case: TO-220AC, ITO-220AC, D<sup>2</sup>PAK (TO-263AB)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade

**Terminals:** matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 1A whisker test

### Polarity: as marked

Mounting Torque: 10 in-lbs maximum

PARAMETER	SYMBOL	MBR1090	MBR10100	UNIT
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	90	100	V
Working peak reverse voltage	V <sub>RWM</sub>	90	100	V
Maximum DC blocking voltage	V <sub>DC</sub>	90	100	V
Maximum average forward rectified current at $T_C = 133$ °C	I <sub>F(AV)</sub>	10		А
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	150		А
Non-repetitive avalanche energy at $T_J = 25 \text{ °C}$ , L = 60 mH	E <sub>AS</sub>	130		mJ
Peak repetitive reverse current at $t_p = 2 \ \mu s$ , 1 kHz, T <sub>J</sub> = 38 °C ± 2 °C per diode	I <sub>RRM</sub>	0.5		А
Voltage rate of change (rated V <sub>R</sub> )	dV/dt	10 000		V/µs
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V <sub>AC</sub>	1500		V
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150		°C

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1

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## RoHS





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<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	MAX.	UNIT	
	I <sub>F</sub> = 10 A	T <sub>C</sub> = 25 °C		0.80		
Maximum instantaneous forward voltage	I <sub>F</sub> = 10 A	T <sub>C</sub> = 125 °C	V <sub>F</sub> <sup>(1)</sup>	0.65	V	
	I <sub>F</sub> = 20 A	T <sub>C</sub> = 125 °C		0.75		
Maximum reverse current per at working peak reverse voltage		T <sub>J</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	100	μΑ	
		T <sub>J</sub> = 125 °C		6.0	mA	

#### Notes

<sup>(1)</sup> Pulse test: 300 µs pulse width, 1 % duty cycle

<sup>(2)</sup> Pulse test: Pulse width  $\leq$  40 ms

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT	
Typical thermal resistance	$R_{ ext{ heta}JA}$	60	-	60	°C/W	
	$R_{\theta JC}$	2.0	3.5	2.0	C/W	

ORDERING INFORMATION (Example)							
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
TO-220AC	MBR10100-E3/4W	1.845	4W	50/tube	Tube		
ITO-220AC	MBRF10100-E3/4W	1.661	4W	50/tube	Tube		
TO-263AB	MBRB10100-E3/4W	1.384	4W	50/tube	Tube		
TO-263AB	MBRB10100-E3/8W	1.384	8W	800/reel	Tape and reel		

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## RATINGS AND CHARACTERISTICS CURVES (T<sub>A</sub> = 25 °C unless otherwise noted)

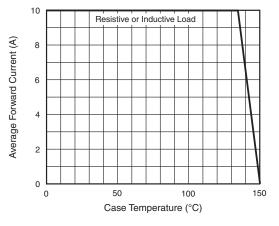


Fig. 1 - Forward Current Derating Curve

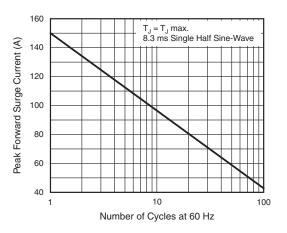


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current



# MBR10xxx-E3, MBRF10xxx-E3, MBRB10xxx-E3

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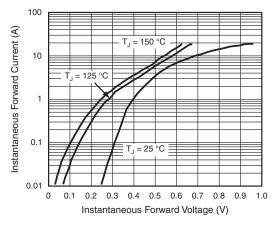


Fig. 3 - Typical Instantaneous Forward Characteristics

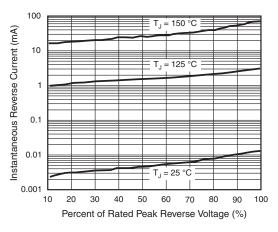


Fig. 4 - Typical Reverse Characteristics

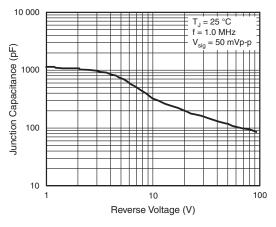


Fig. 5 - Typical Junction Capacitance

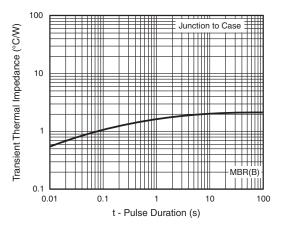


Fig. 6 - Typical Transient Thermal Impedance

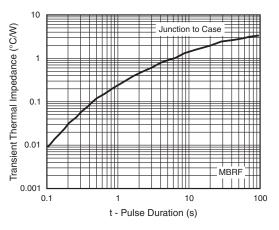


Fig. 7 - Typical Transient Thermal Impedance

Revision: 11-Jun-18

3

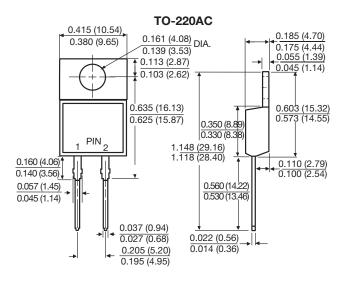
Document Number: 89034

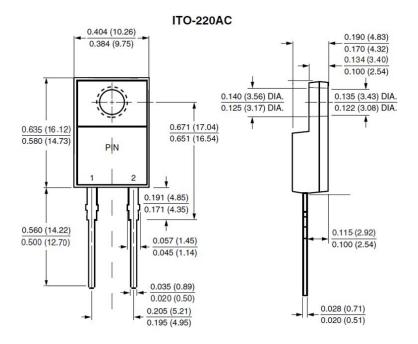
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## **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)

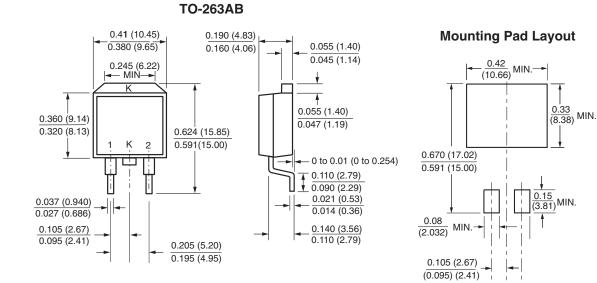






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