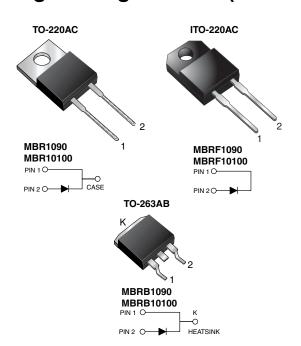


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# High Voltage TMBS® (Trench MOS Barrier Schottky) Rectifier



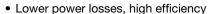
### **LINKS TO ADDITIONAL RESOURCES**



PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	10 A				
$V_{RRM}$	90 V, 100 V				
I <sub>FSM</sub>	150 A				
$V_{F}$	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





· 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 <a href="https://www.vishay.com/doc?99912">www.vishay.com/doc?99912</a>

#### **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

<b>MAXIMUM RATINGS</b> (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MBR1090	MBR10100	UNIT	
Maximum repetitive peak reverse voltage	$V_{RRM}$	90	100	V	
Working peak reverse voltage	$V_{RWM}$	90	100	V	
Maximum DC blocking voltage	$V_{DC}$	90	100	V	
Maximum average forward rectified current at T <sub>C</sub> = 133 °C	I <sub>F(AV)</sub>	10		Α	
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 <sub>J</sub> = 25 °C, L = 60 mH	E <sub>AS</sub>	130		mJ	
Peak repetitive reverse current at $t_p$ = 2 $\mu$ s, 1 kHz, $T_J$ = 38 °C $\pm$ 2 °C per diode	I <sub>RRM</sub>	0.5		Α	
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	

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

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<b>ELECTRICAL CHARACTERISTICS</b> (T <sub>A</sub> = 25 °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		T <sub>J</sub> = 25 °C	I_ (2)	100	μΑ	
reverse voltage		T <sub>J</sub> = 125 °C	- I <sub>R</sub> <sup>(2)</sup>	6.0	mA	

#### **Notes**

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

(2) Pulse test: Pulse width ≤ 40 ms

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

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		

### **RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25$ °C unless otherwise noted)

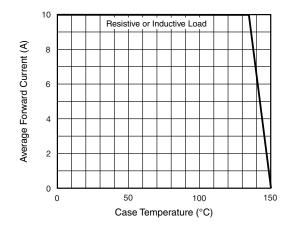


Fig. 1 - Forward Current Derating Curve

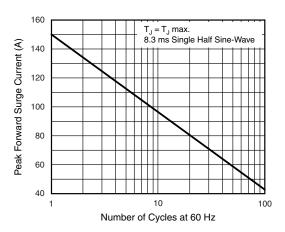


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

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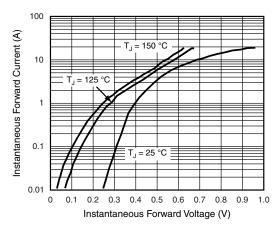


Fig. 3 - Typical Instantaneous Forward Characteristics

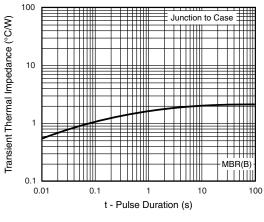


Fig. 6 - Typical Transient Thermal Impedance

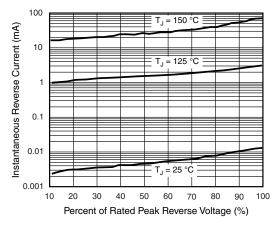


Fig. 4 - Typical Reverse Characteristics

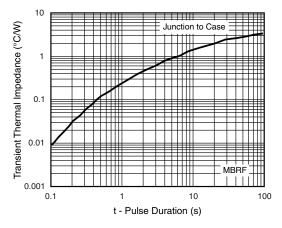


Fig. 7 - Typical Transient Thermal Impedance

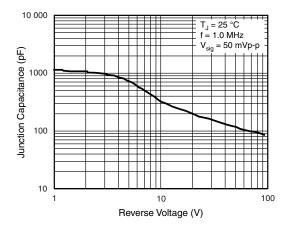


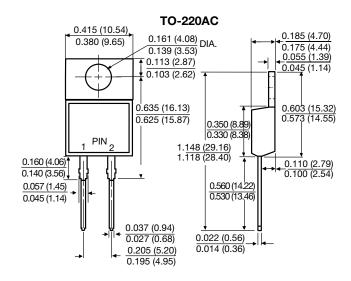
Fig. 5 - Typical Junction Capacitance

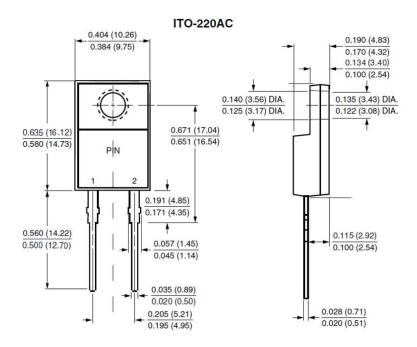


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### **PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





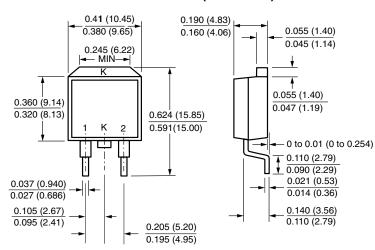


# MBR10xxx-E3, MBRF10xxx-E3, MBRB10xxx-E3

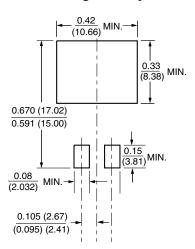
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### D<sup>2</sup>PAK (TO-263AB)



### **Mounting Pad Layout**





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