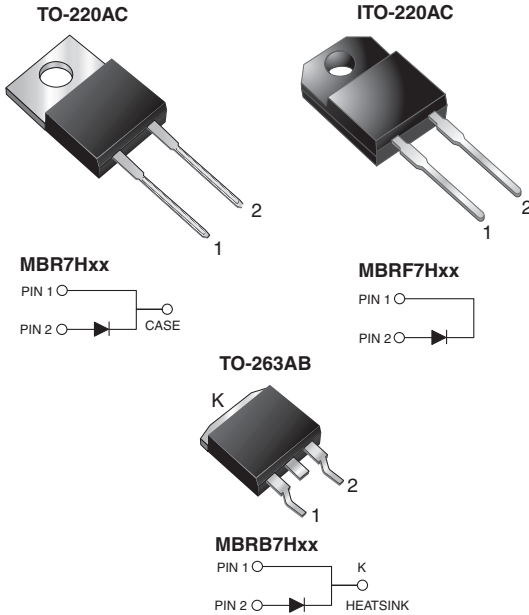


## Schottky Barrier Rectifier

High Barrier Technology for Improved HighTemperature Performance



### FEATURES

- Power pack
- Guardring for overvoltage protection
- Low power loss, high efficiency
- Low forward voltage drop
- Low leakage current
- 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)
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### PRIMARY CHARACTERISTICS

$I_{F(AV)}$	7.5 A
$V_{RRM}$	35 V, 45 V, 50 V, 60 V
$I_{FSM}$	150 A
$V_F$	0.55 V, 0.61 V
$I_R$	50 $\mu$ A
$T_J$ max.	175 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, TO-263AB

Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-E3 - RoHS-compliant, commercial grade  
 Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

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

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** As marked

**Mounting Torque:** 10 in-lbs maximum

### MAXIMUM RATINGS ( $T_C = 25$ °C unless otherwise noted)

PARAMETER	SYMBOL	MBR7H35	MBR7H45	MBR7H50	MBR7H60	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	35	45	50	60	V
Working peak reverse voltage	$V_{RWM}$	35	45	50	60	
Maximum DC blocking voltage	$V_{DC}$	35	45	50	60	
Maximum average forward rectified current (fig.1)	$I_{F(AV)}$	7.5				A
Non-repetitive avalanche energy at 25 °C, $I_{AS} = 4$ A, $L = 10$ mH	$E_{AS}$	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	150				A
Peak repetitive reverse surge current at $t_p = 2.0$ $\mu$ s, 1 kHz	$I_{RRM}$	1.0		0.5		
Peak non-repetitive reverse energy (8/20 $\mu$ s waveform)	$E_{RSM}$	20		10		mJ
Electrostatic discharge capacitor voltage human body model: $C = 100$ pF, $R = 1.5$ kW	$V_C$	25				kV
Operating junction and storage temperature range	$T_J, T_{STG}$	- 65 to + 175				°C
Voltage rate of change (rated $V_F$ )	$dV/dt$	10 000				V/ $\mu$ s
Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1$ min	$V_{AC}$	1500				V



ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MBR7H35 MBR7H45		MBR7H50 MBR7H60		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage	V <sub>F</sub> <sup>(1)</sup>	I <sub>F</sub> = 7.5 A	T <sub>C</sub> = 25 °C	-	0.63	-	0.73	V
		I <sub>F</sub> = 7.5 A	T <sub>C</sub> = 125 °C	0.50	0.55	0.58	0.61	
		I <sub>F</sub> = 15 A	T <sub>C</sub> = 25 °C	-	0.75	-	0.87	
		I <sub>F</sub> = 15 A	T <sub>C</sub> = 125 °C	0.61	0.66	0.68	0.72	
Maximum reverse current	I <sub>R</sub> <sup>(2)</sup>	Rated V <sub>R</sub>	T <sub>C</sub> = 25 °C	-	50	-	50	μA
			T <sub>C</sub> = 125 °C	3.0	10	2.0	10	mA

**Note**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance, junction to case	R <sub>θJC</sub>	3.0	5.0	3.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	MBR7H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF7H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB7H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB7H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR7H45HE3/45 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AC	MBRF7H45HE3/45 <sup>(1)</sup>	1.94	45	50/tube	Tube
TO-263AB	MBRB7H45HE3/45 <sup>(1)</sup>	1.33	45	50/tube	Tube
TO-263AB	MBRB7H45HE3/81 <sup>(1)</sup>	1.33	81	800/reel	Tape and reel

**Note**

- (1) AEC-Q101 qualified



## RATINGS AND CHARACTERISTICS CURVES

( $T_A = 25\text{ }^\circ\text{C}$  unless otherwise noted)

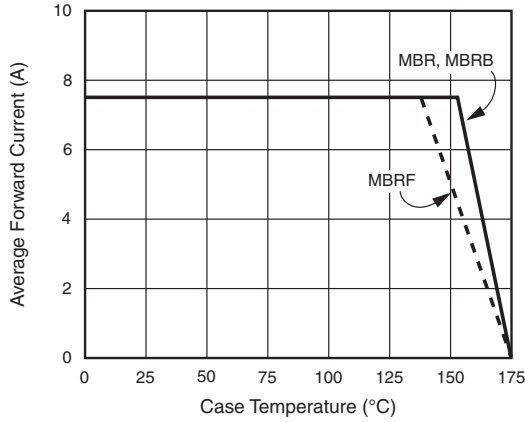


Fig. 1 - Forward Current Derating Curve

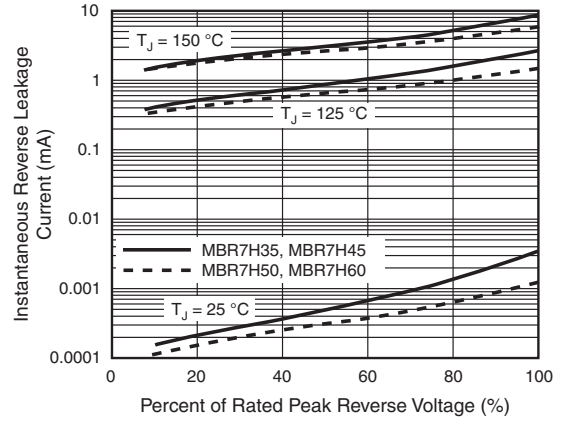


Fig. 4 - Typical Reverse Characteristics Per Leg

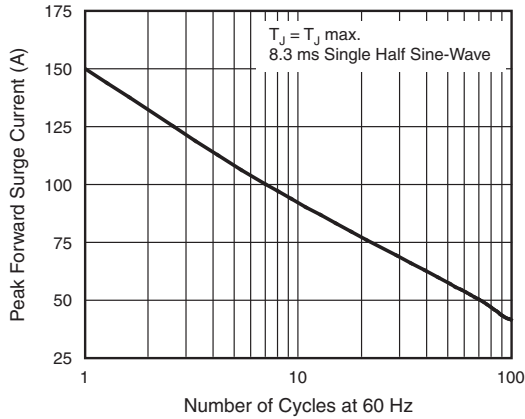


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current Per Leg

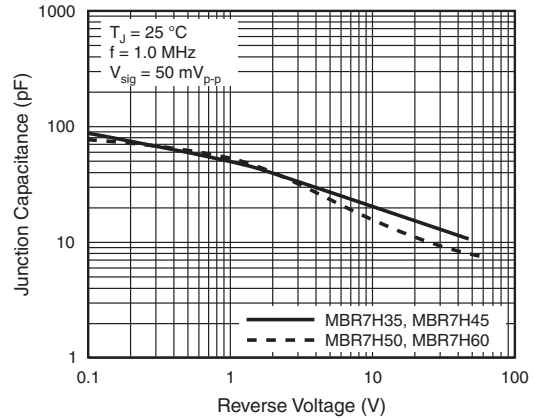


Fig. 5 - Typical Junction Capacitance Per Leg

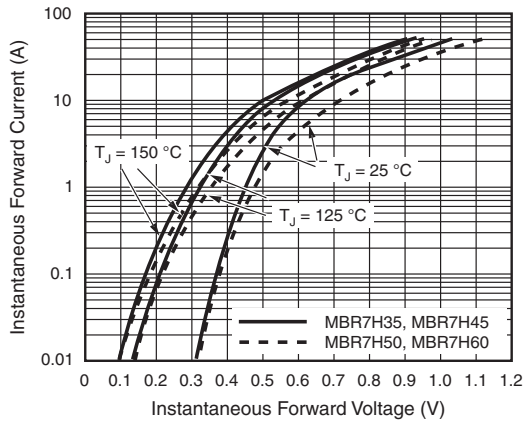


Fig. 3 - Typical Instantaneous Forward Characteristics Per Leg

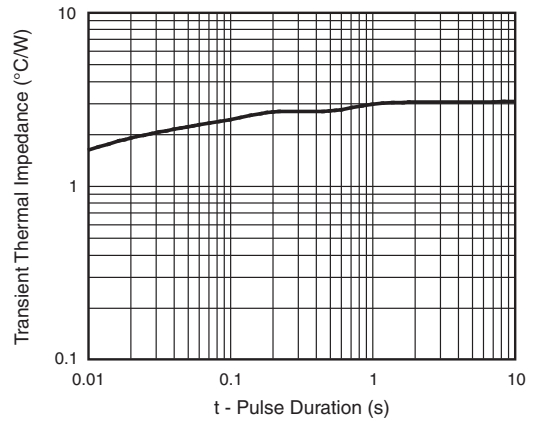
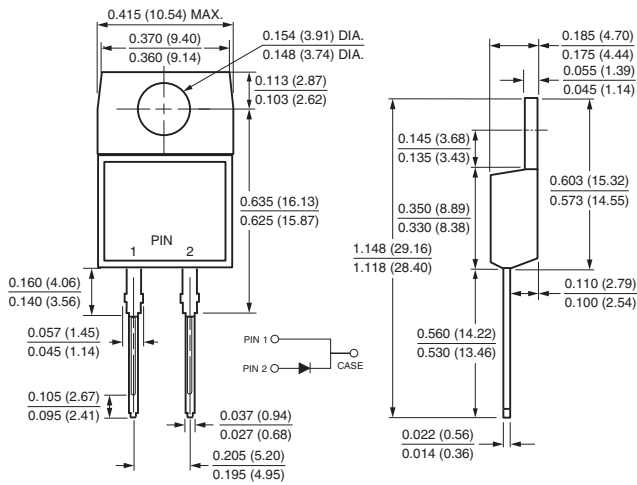


Fig. 6 - Typical Transient Thermal Impedance Per Leg

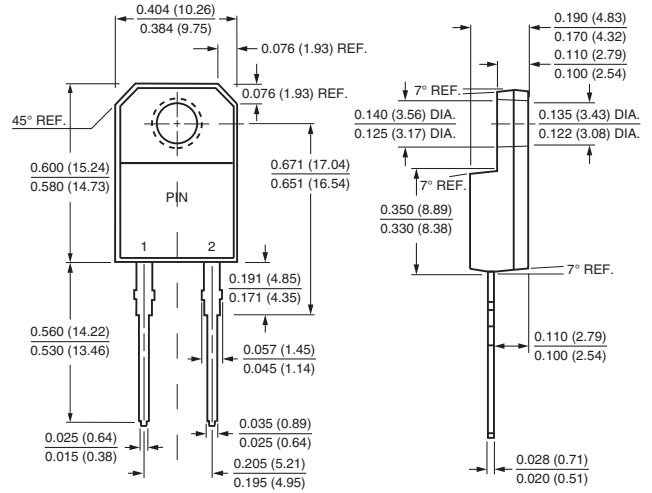


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

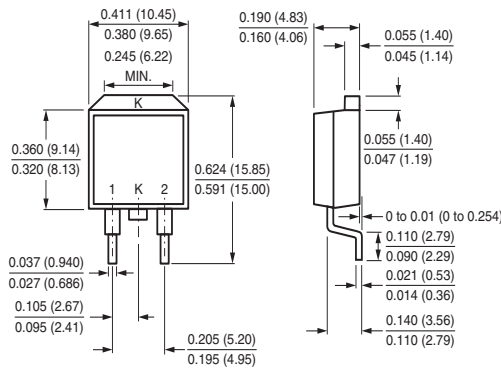
#### TO-220AC



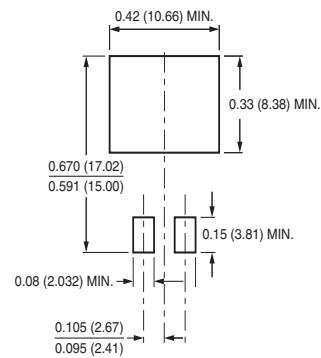
#### ITO-220AC



#### TO-263AB



#### Mounting Pad Layout





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