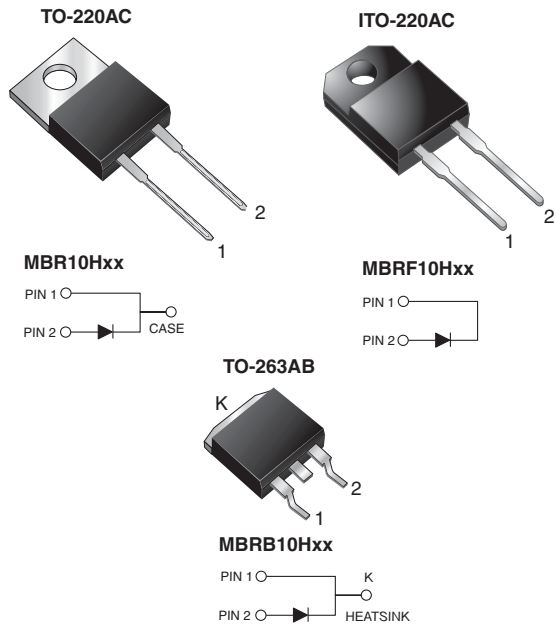




Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature 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



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.

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

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	100 μ A
T_J max.	175 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single

MAXIMUM RATINGS ($T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR10H35	MBR10H45	MBR10H50	MBR10H60	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)	$I_{F(AV)}$	10				A
Non-repetitive avalanche energy at 25 °C, $I_{AS} = 4\text{ A}$, $L = 10\text{ mH}$	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 current at $t_p = 2.0\text{ }\mu\text{s}$, 1 kHz	I_{RRM}	1.0		0.5		
Peak non-repetitive reverse energy (8/20 μs waveform)	E_{RSM}	20		10		mJ
Electrostatic discharge capacitor voltage Human body model: $C = 100\text{ pF}$, $R = 1.5\text{ k}\Omega$	V_C	25				kV
Voltage rate of change (rated V_F)	dV/dt	10 000				V/ μs
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1\text{ min}$	V_{AC}	1500				V



ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MBR15H35CT MBR15H45CT		MBR15H50CT MBR15H60CT		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage	V _F ⁽¹⁾	I _F = 10 A	T _J = 25 °C	-	0.63	-	0.71	V
		I _F = 10 A	T _J = 125 °C	0.49	0.55	0.57	0.61	
		I _F = 20 A	T _J = 25 °C	-	0.75	-	0.85	
		I _F = 20 A	T _J = 125 °C	0.62	0.68	0.68	0.71	
Maximum reverse current	I _R ⁽²⁾	Rated V _R	T _J = 25 °C	-	100	-	100	μA
			T _J = 125 °C	4.0	12	2.0	12	mA

Note

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

THERMAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance	R _{θJC}	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	MBR10H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB10H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB10H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR10H45HE3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H45HE3/45 ⁽¹⁾	1.94	45	50/tube	Tube
TO-263AB	MBRB10H45HE3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	MBRB10H45HE3/81 ⁽¹⁾	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)

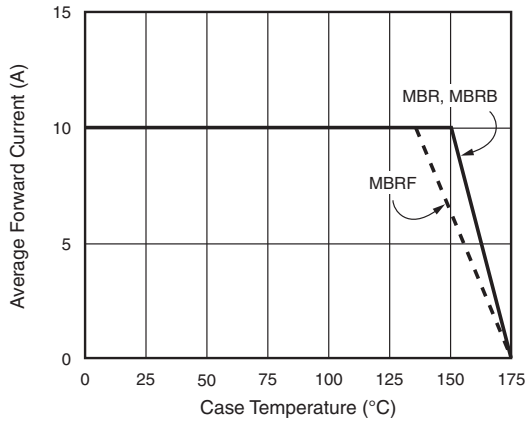


Fig. 1 - Forward Current Derating Curve

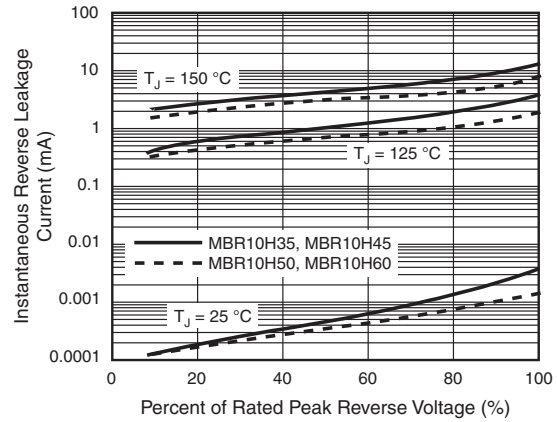


Fig. 4 - Typical Reverse Characteristics

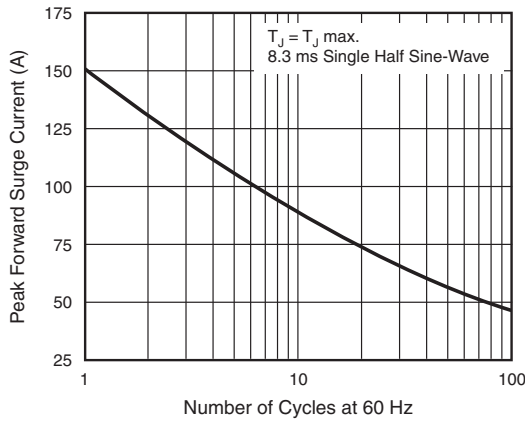


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

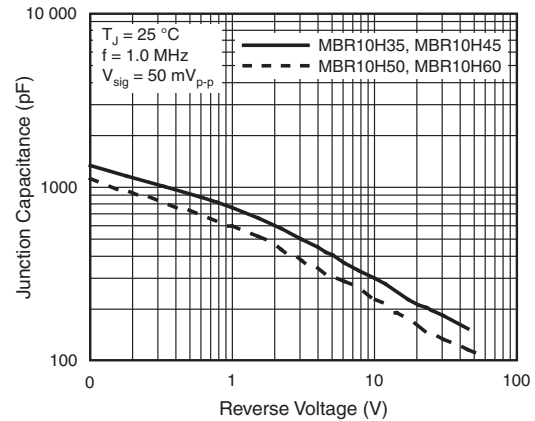


Fig. 5 - Typical Junction Capacitance

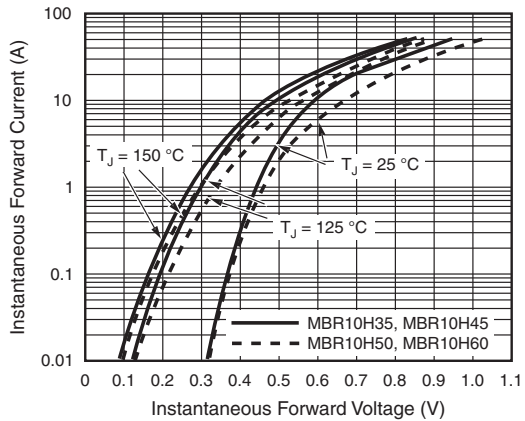


Fig. 3 - Typical Instantaneous Forward Characteristics

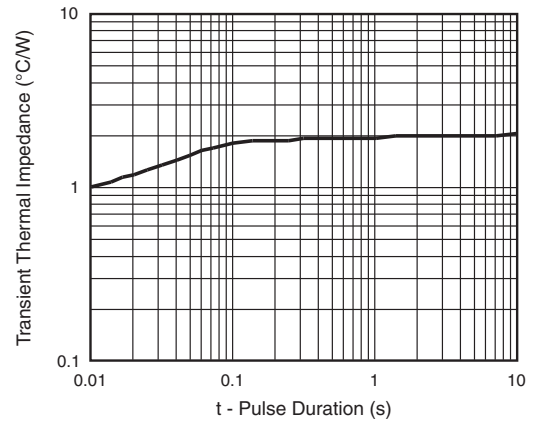
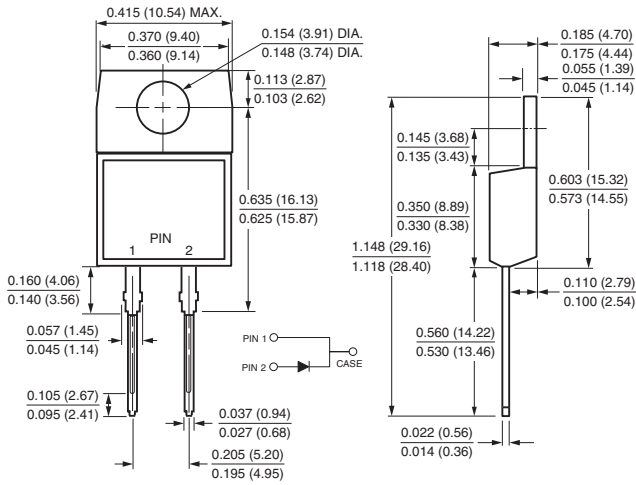


Fig. 6 - Typical Transient Thermal Impedance

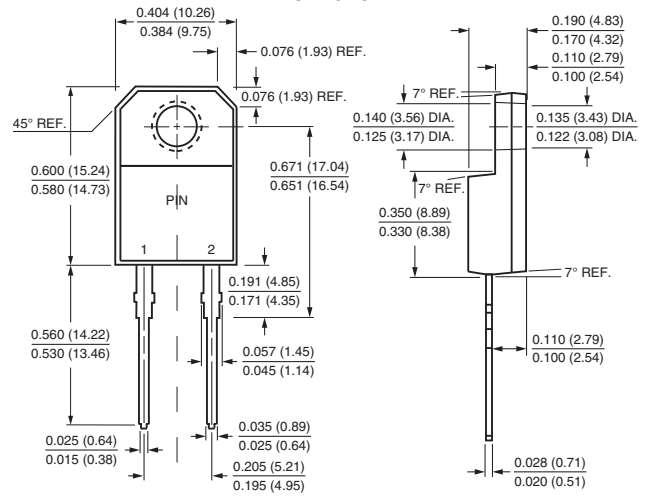


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

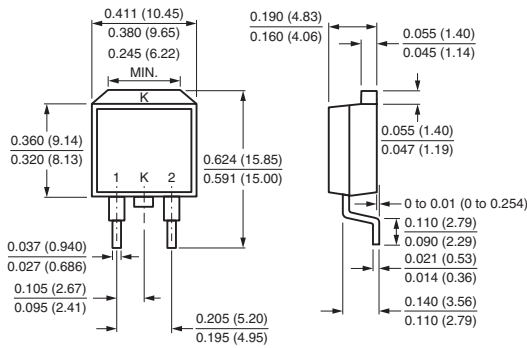
TO-220AC



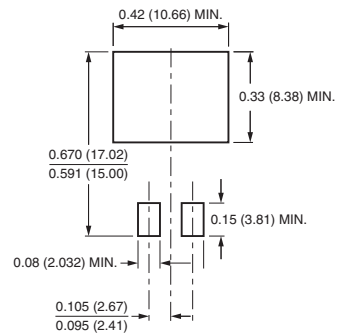
ITO-220AC



TO-263AB



Mounting Pad Layout





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