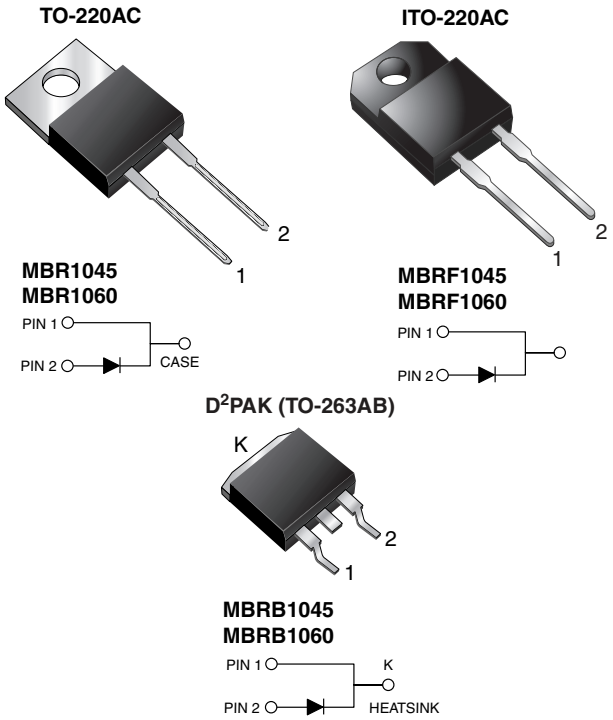
Schottky Barrier Rectifier



FEATURES

- Power pack
- Low power loss, 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)
- AEC-Q101 qualified available
  - Automotive ordering code:
  Base P/NHE3 (for ITO-220AC)
  Base P/NHM3 (for D²PAK (TO-263AB package)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE Available

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, D²PAK (TO-263AB) Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant, AEC-Q101 qualified

("_X" denotes revision code, e.g. A, B, ...)

Base P/N-M3 - RoHS-compliant, halogen-free, commercial grade

Base P/NHM3 - RoHS-compliant, halogen-free, AEC-Q101 qualified

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

E3 and M3 suffix meets JESD 201 class 1A whisker test, HE3 and HM3 suffix meets JESD 201 class 2 whisker test

Polarity: as marked

Mounting Torque: 10 in-lbs maximum

LINKS TO ADDITIONAL RESOURCES

3D Models

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	10 A
V_{RRM}	45 V, 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.70 V
T_J max.	150 °C
Package	TO-220AC, ITO-220AC, D²PAK (TO-263AB)
Circuit configuration	Single

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)				
PARAMETER	**SYMBOL**	**MBR1045 MBRF1045 MBRB1045**	**MBR1060 MBRF1060 MBRB1060**	**UNIT**
Maximum repetitive peak reverse voltage	V_{RRM}	45	60	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	10		A
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 µs, 1 kHz	I_{RRM}	1.0	0.5	
Voltage rate of change (rated V_R)	dV/dt	10 000		V/µs
Operating junction and storage temperature range	T_J	-65 to +150		°C
	T_{STG}	-65 to +175		
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500		V

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MBR1045 MBRF1045 MBRB1045**	**MBR1060 MBRF1060 MBRB1060**	**UNIT**
Maximum instantaneous forward voltage	V_F (1)	I_F = 10 A	T_J = 25 °C	-	0.80	V
		I_F = 10 A	T_J = 125 °C	0.57	0.70	
		I_F = 20 A	T_J = 25 °C	0.84	0.95	
		I_F = 20 A	T_J = 125 °C	0.72	0.85	
Maximum instantaneous reverse current at DC blocking voltage	I_R (2)	Rated V_R	T_J = 25 °C	0.10		mA
			T_J = 125 °C	15		

Notes

(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 from junction to case	$R_{\theta JC}$	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	MBR1045-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF1045-E3/45	1.94	45	50/tube	Tube
D^2PAK (TO-263AB)	MBRB1045-M3/I	1.33	I	800/reel	Tape and reel
ITO-220AC	MBRF1045HE3_A/P (1)	1.94	P	50/tube	Tube
D^2PAK (TO-263AB)	MBRB1045HM3/I (1)	1.33	I	800/reel	Tape and reel

Note

(1) AEC-Q101 qualified, available in ITO-220AC and D^2PAK (TO-263AB) package

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

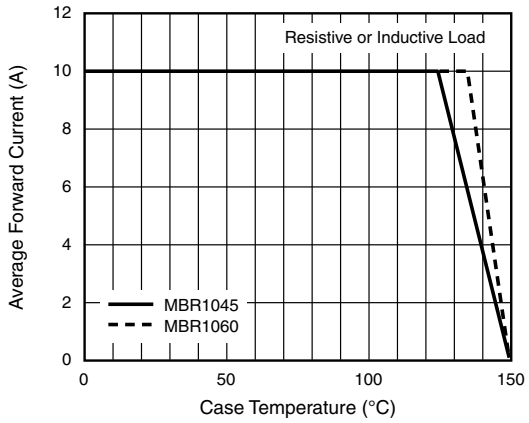


Fig. 1 - Forward Current Derating Curve

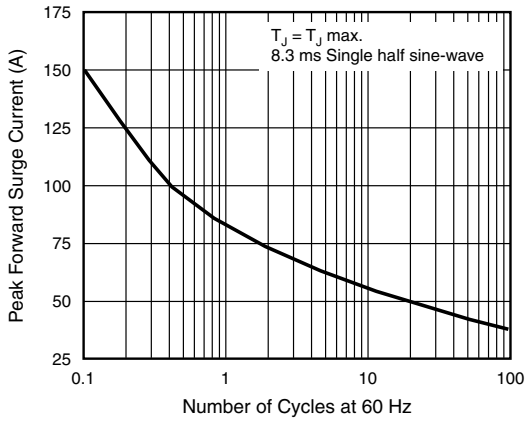


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

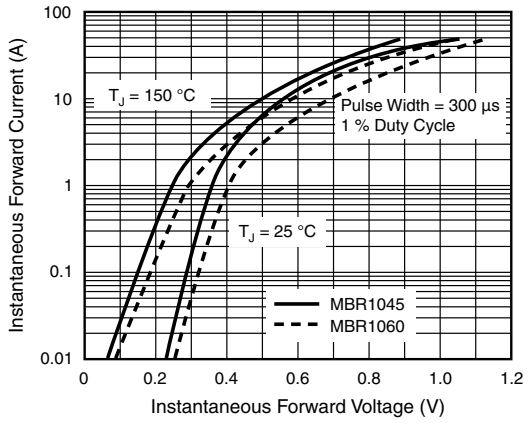


Fig. 3 - Typical Instantaneous Forward Characteristics

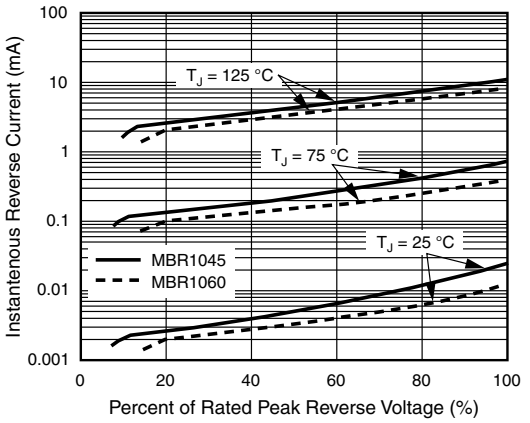


Fig. 4 - Typical Reverse Characteristics

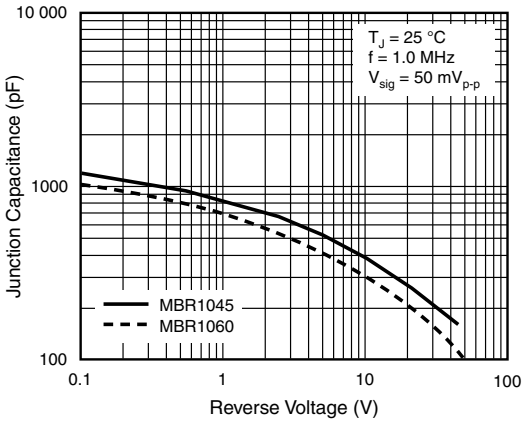


Fig. 5 - Typical Junction Capacitance

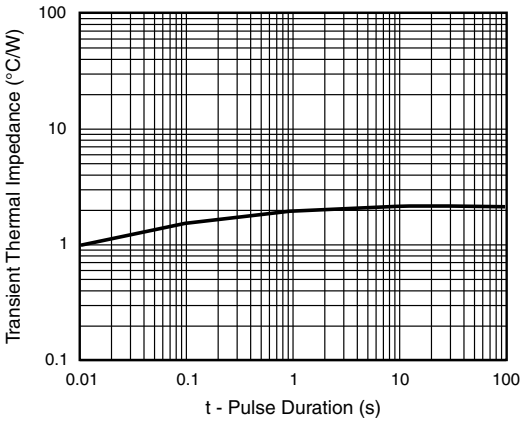
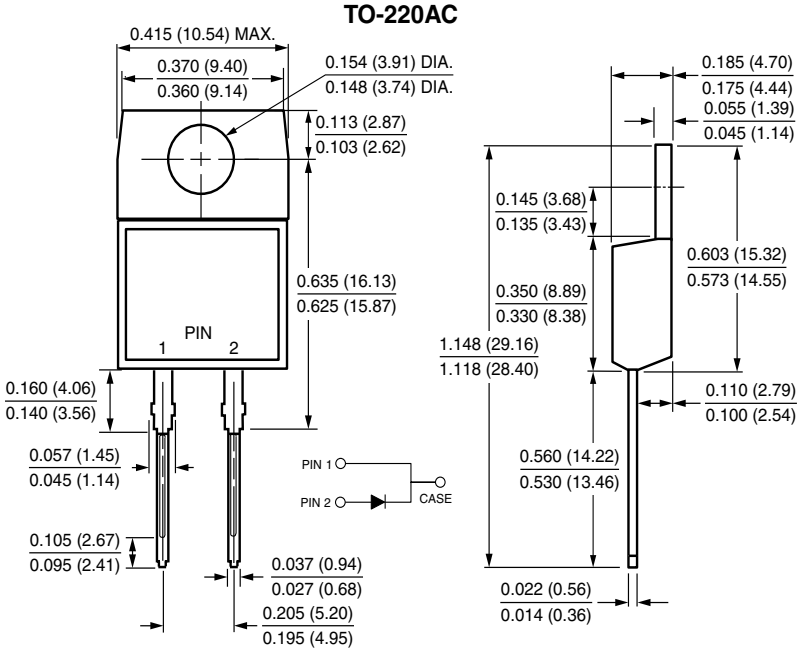


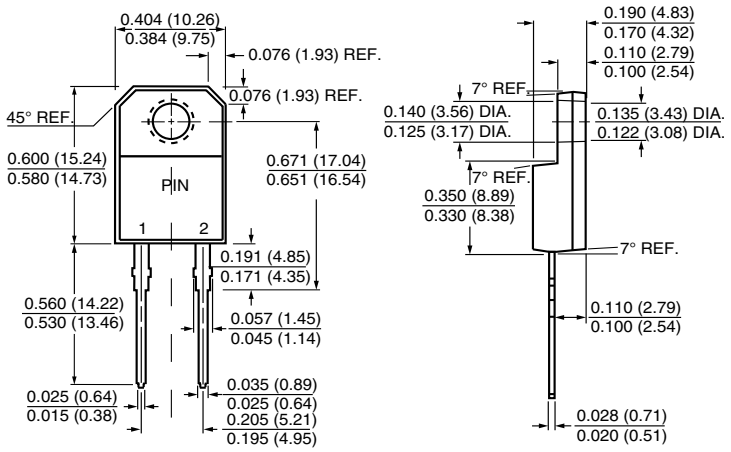
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

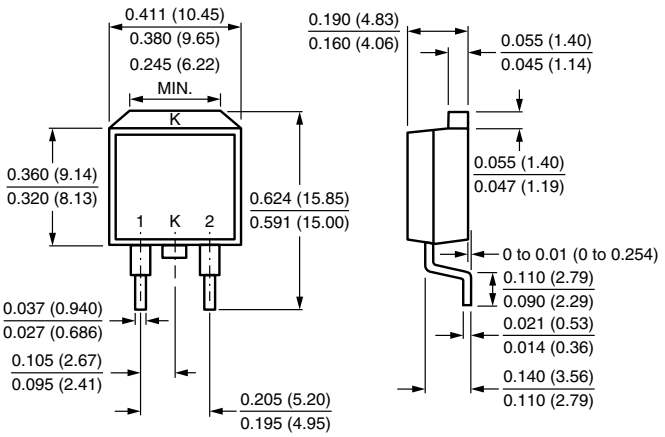
TO-220AC



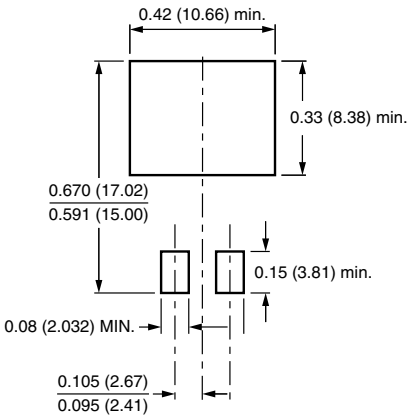
ITO-220AC



D^2PAK (TO-263AB)



Mounting Pad Layout



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