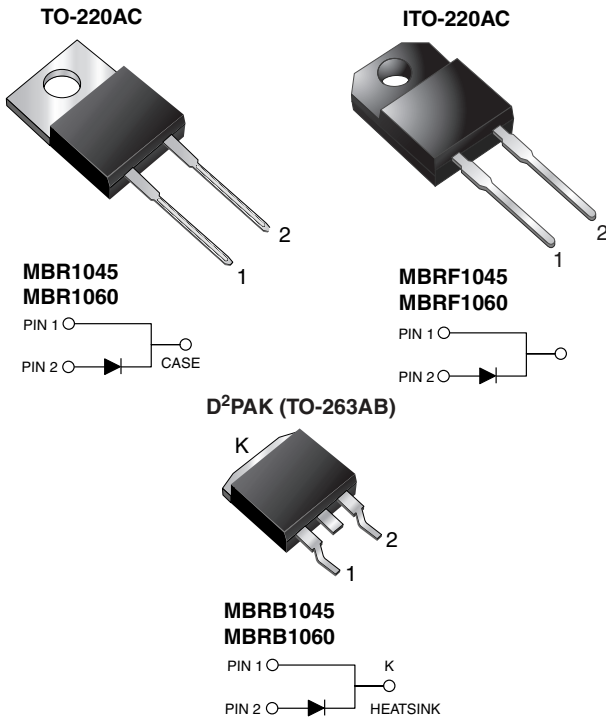


Schottky Barrier Rectifier



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



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



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
$T_J \text{ max.}$	150 °C
Package	TO-220AC, ITO-220AC, D²PAK (TO-263AB)
Circuit configuration	Single



MAXIMUM RATINGS ($T_C = 25\text{ }^\circ\text{C}$ 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 $t_p = 2.0\text{ }\mu\text{s}$, 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		$^\circ\text{C}$
	T_{STG}	-65 to +175		
Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1\text{ min}$	V_{AC}	1500		V

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

Notes(1) Pulse test: 300 μs pulse width, 1 % duty cycle(2) Pulse test: pulse width $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_C = 25\text{ }^\circ\text{C}$ 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	$^\circ\text{C/W}$

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 ² PAK (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 ² PAK (TO-263AB)	MBRB1045HM3/I ⁽¹⁾	1.33	I	800/reel	Tape and reel

Note(1) AEC-Q101 qualified, available in ITO-220AC and D²PAK (TO-263AB) package



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

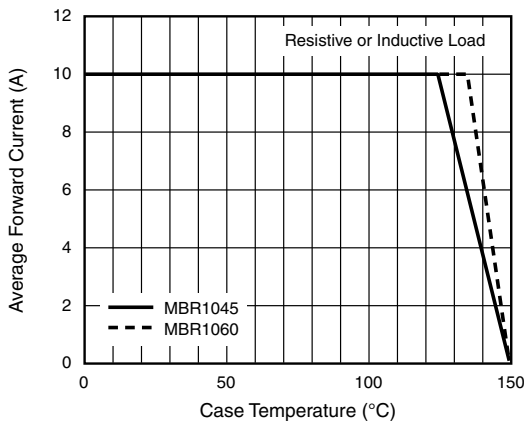


Fig. 1 - Forward Current Derating Curve

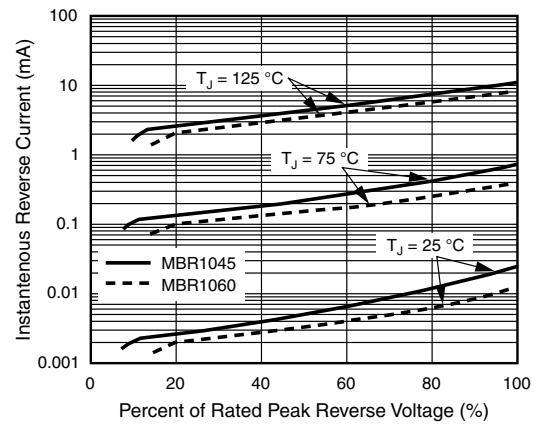


Fig. 4 - Typical Reverse Characteristics

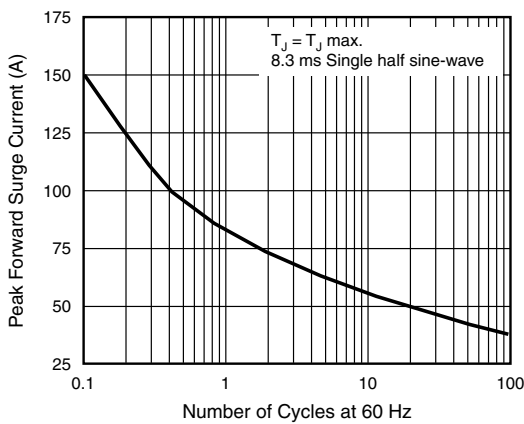


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

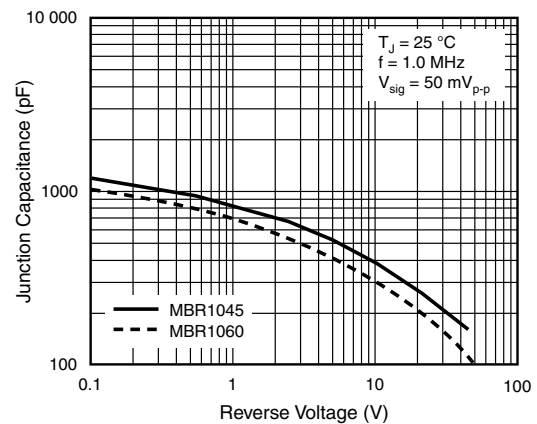


Fig. 5 - Typical Junction Capacitance

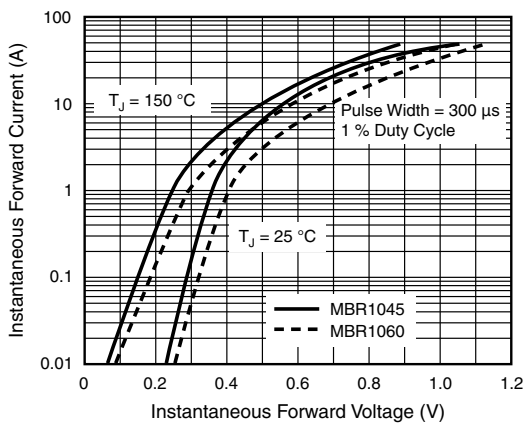


Fig. 3 - Typical Instantaneous Forward Characteristics

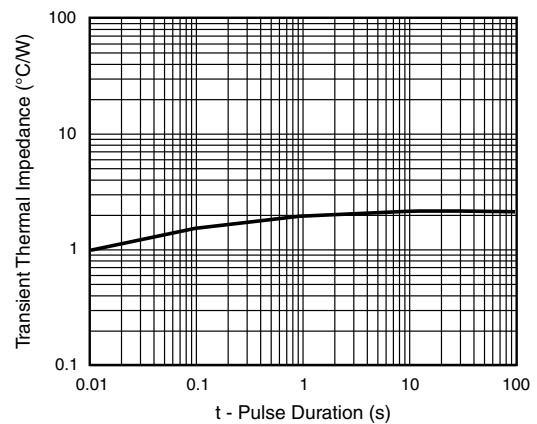
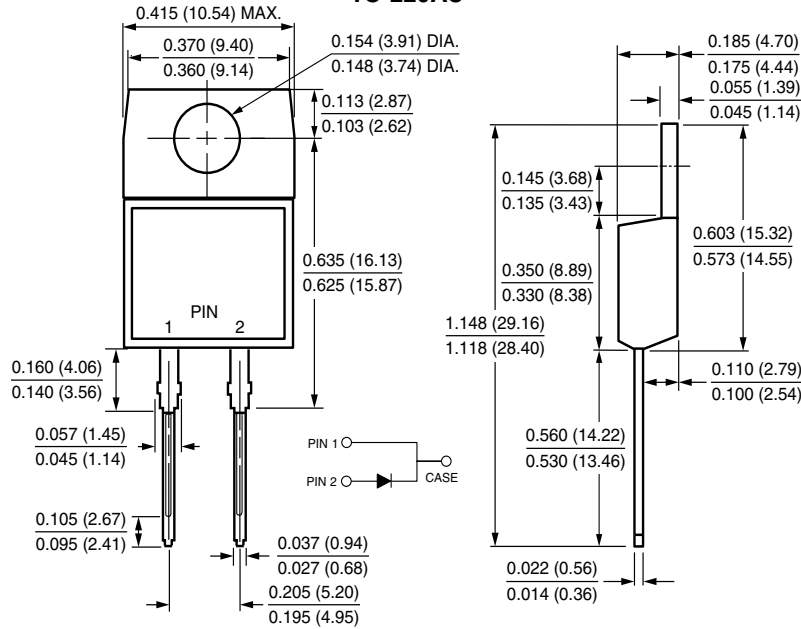


Fig. 6 - Typical Transient Thermal Impedance

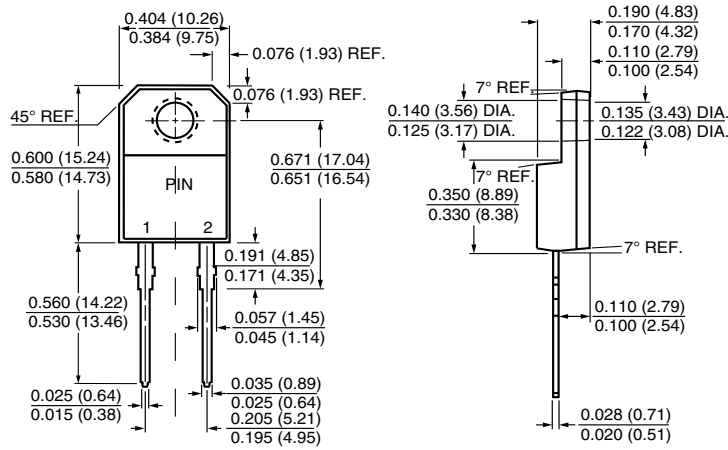


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

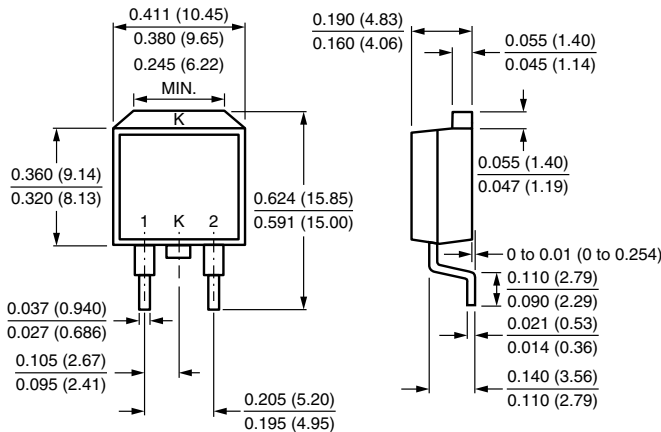
TO-220AC



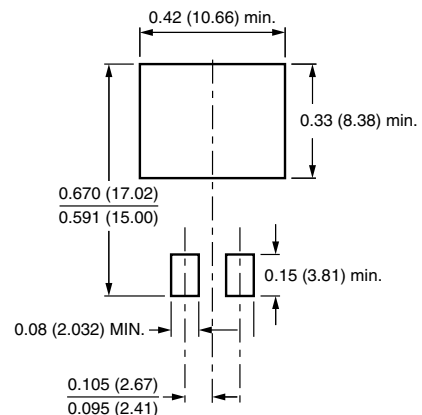
ITO-220AC



D²PAK (TO-263AB)



Mounting Pad Layout





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