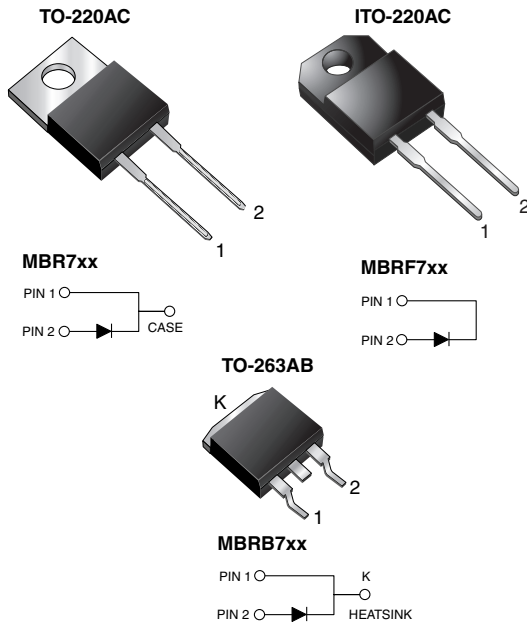


Schottky Barrier Rectifier



FEATURES

- Power pack
- Guardring for overvoltage protection
- 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_A
- 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
 Base P/NHE3_X - RoHS-compliant, AEC-Q101 qualified
 ("_X" denotes revision code, e.g. A, B, ...)

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	
$I_{F(AV)}$	7.5 A
V_{RRM}	45 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.65 V
$T_J \text{ max.}$	150 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single

MAXIMUM RATINGS ($T_C = 25 \text{ °C}$ unless otherwise noted)				
PARAMETER	SYMBOL	MBR745	MBR760	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	45	60	V
Working peak reverse voltage	V_{RWM}	45	60	
Maximum DC blocking voltage	V_{DC}	45	60	
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	7.5		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150		
Peak repetitive reverse surge 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		
Operating junction temperature range	T_J	-65 to +150		°C
Operating storage temperature range	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		MBR745	MBR760	UNIT
Maximum instantaneous forward voltage	$V_F^{(1)}$	$I_F = 7.5\text{ A}$	$T_C = 25\text{ }^\circ\text{C}$	-	0.75	V
		$I_F = 7.5\text{ A}$	$T_C = 125\text{ }^\circ\text{C}$	0.57	0.65	
		$I_F = 15\text{ A}$	$T_C = 25\text{ }^\circ\text{C}$	0.84	-	
		$I_F = 15\text{ A}$	$T_C = 125\text{ }^\circ\text{C}$	0.72	-	
Maximum reverse current at DC blocking voltage	$I_R^{(2)}$	Rated V_R	$T_C = 25\text{ }^\circ\text{C}$	0.1	0.5	mA
			$T_C = 125\text{ }^\circ\text{C}$	15	50	

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	$R_{\theta JC}$	3.0	5.0	3.0	$^\circ\text{C/W}$

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	MBR745-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF745-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB745-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB745-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR745HE3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	MBRF745HE3/45 ⁽¹⁾	1.94	45	50/tube	Tube
TO-263AB	MBRB745HE3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	MBRB745HE3/81 ⁽¹⁾	1.33	81	800/reel	Tape and reel
TO-263AB	MBRB745HE3_A/P ⁽¹⁾	1.33	P	50/tube	Tube
TO-263AB	MBRB745HE3_A/I ⁽¹⁾	1.33	I	800/reel	Tape and reel

Note

- (1) AEC-Q101 qualified



RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

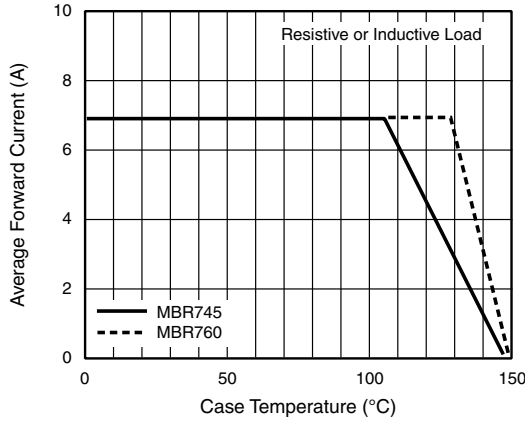


Fig. 1 - Forward Current Derating Curve

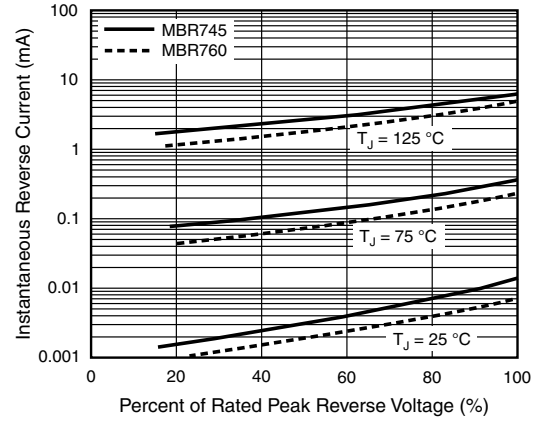


Fig. 4 - Typical Reverse Characteristics

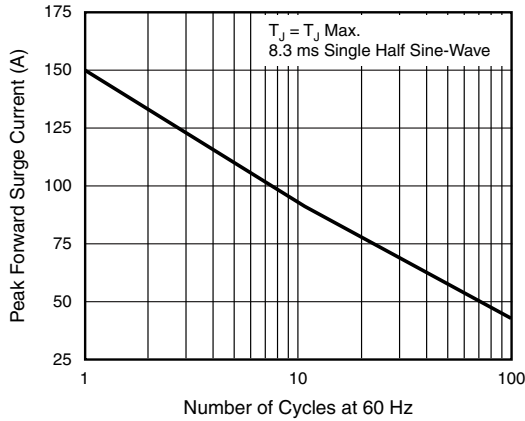


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

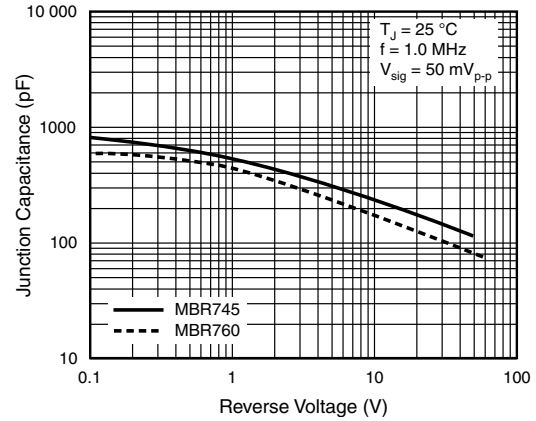


Fig. 5 - Typical Junction Capacitance

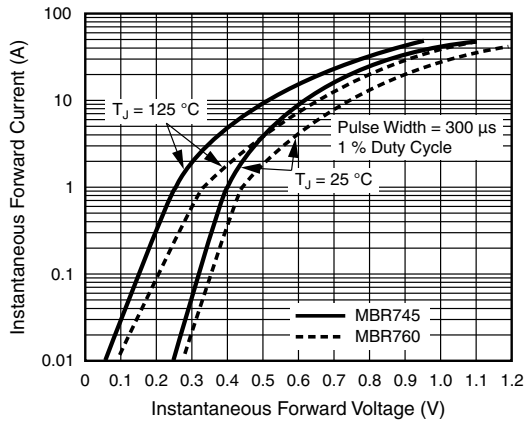


Fig. 3 - Typical Instantaneous Forward Characteristics

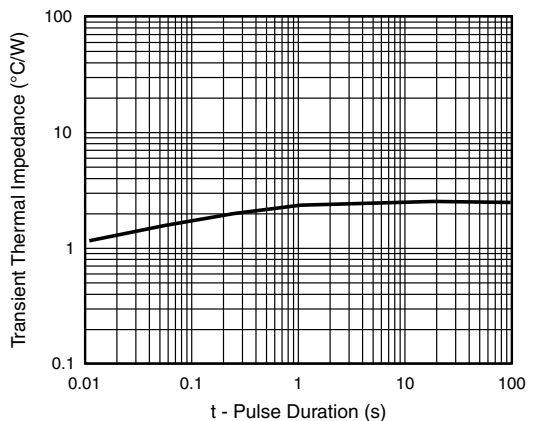
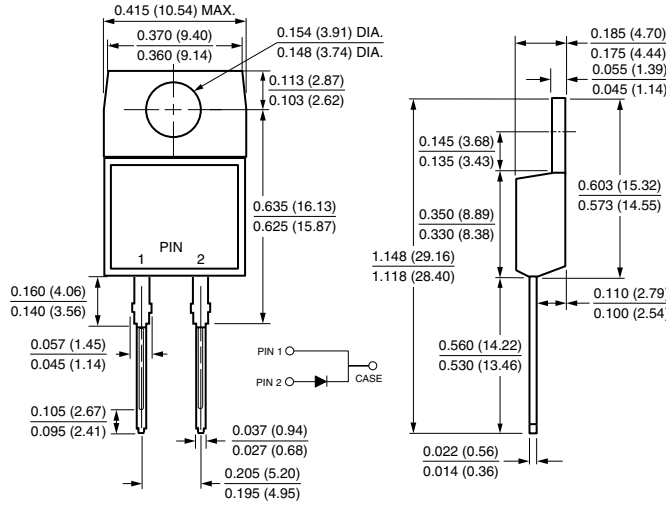


Fig. 6 - Typical Transient Thermal Impedance

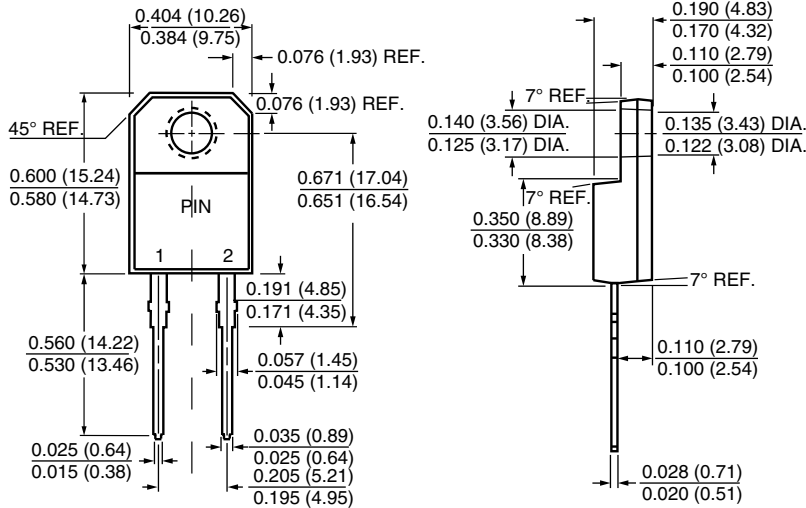


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

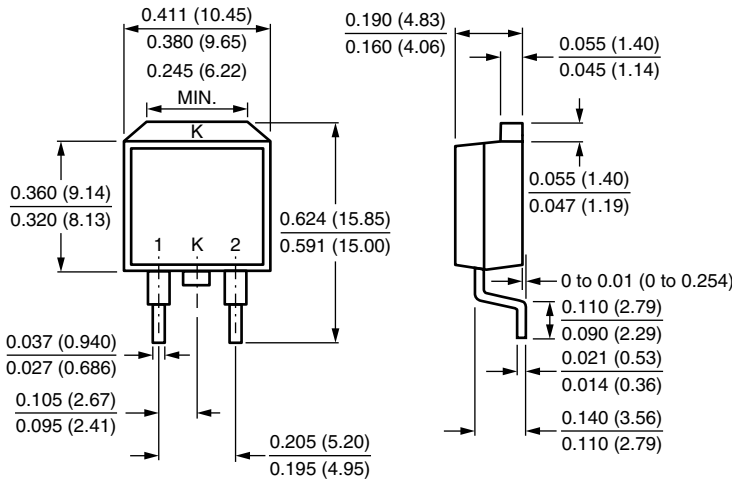
TO-220AC



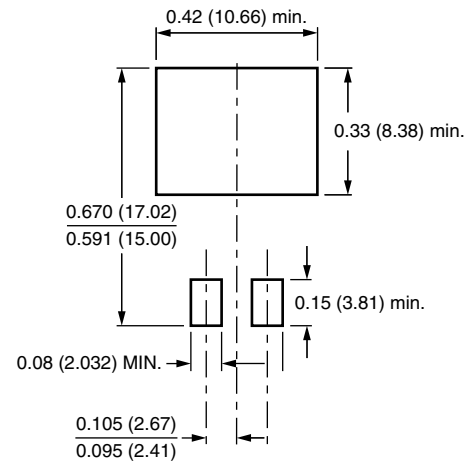
ITO-220AC



D²PAK (TO-263AB)



Mounting Pad Layout





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