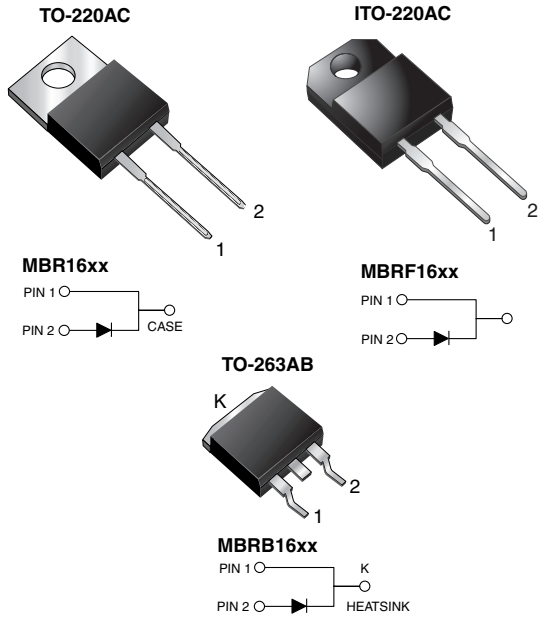
Schottky Barrier Rectifier



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.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	16 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.57 V, 0.65 V
T_J max.	150 °C
Package	TO-220AC, ITO-220AC, TO-263AB
Diode variations	Single die

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

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

PARAMETER	SYMBOL	MBR1635	MBR1645	MBR1660	UNIT
Maximum repetitive peak reverse voltage	V_{RRM}	35	45	60	V
Working peak reverse voltage	V_{RWM}	35	45	60	
Maximum DC blocking voltage	V_{DC}	35	45	60	
Maximum average forward rectified current at T_C = 125 °C	$I_{F(AV)}$	16			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	150			
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 temperature range	T_J	-65 to +150			°C
Storage temperature range	T_{STG}	-65 to +175			
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V_{AC}	1500			V

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ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MBR1635**	**MBR1645**	**MBR1660**	**UNIT**
Maximum instantaneous forward voltage	V_F (1)	I_F = 16 A	T_C = 25 °C	0.63		0.75	V
		I_F = 16 A	T_C = 125 °C	0.57		0.65	
Maximum instantaneous reverse current at DC blocking voltage	I_R (1)	Rated V_R	T_C = 25 °C	0.2		1.0	mA
			T_C = 125 °C	40		50	

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	$R_{\theta JC}$	1.5	3.0	1.5	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	**PREFERRED P/N**	**UNIT WEIGHT (g)**	**PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
TO-220AC	MBR1645-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF1645-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB1645-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB1645-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR1645HE3/45 (1)	1.80	45	50/tube	Tube
ITO-220AC	MBRF1645HE3/45 (1)	1.94	45	50/tube	Tube
TO-263AB	MBRB1645HE3/45 (1)	1.33	45	50/tube	Tube
TO-263AB	MBRB1645HE3/81 (1)	1.33	81	800/reel	Tape and reel
TO-263AB	MBRB1645HE3_A/P (1)	1.33	P	50/tube	Tube
TO-263AB	MBRB1645HE3_A/I (1)	1.33	I	800/reel	Tape and reel

Note

(1) AEC-Q101 qualified

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

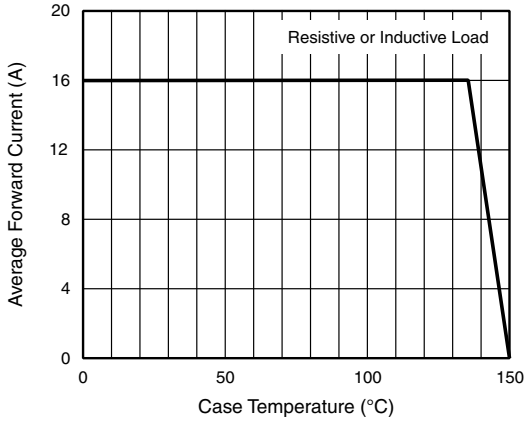

Fig. 1 - Forward Current Derating Curve

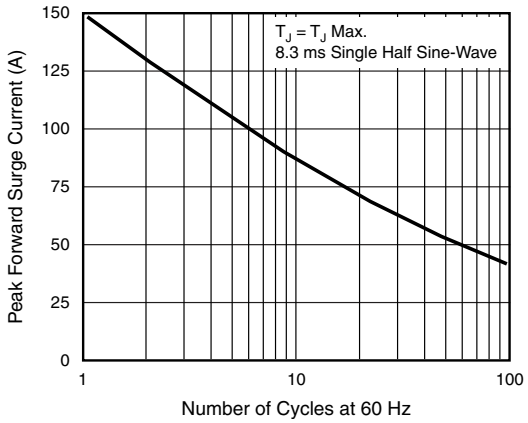

Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

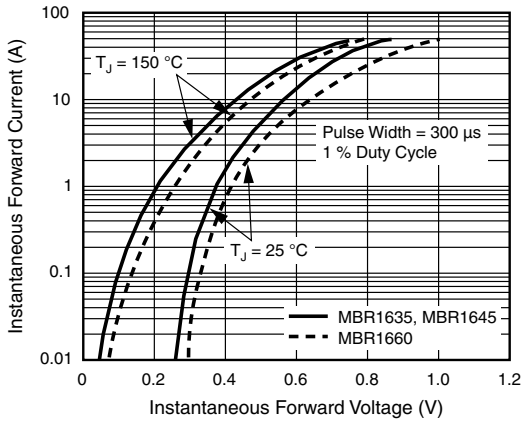

Fig. 3 - Typical Instantaneous Forward Characteristics

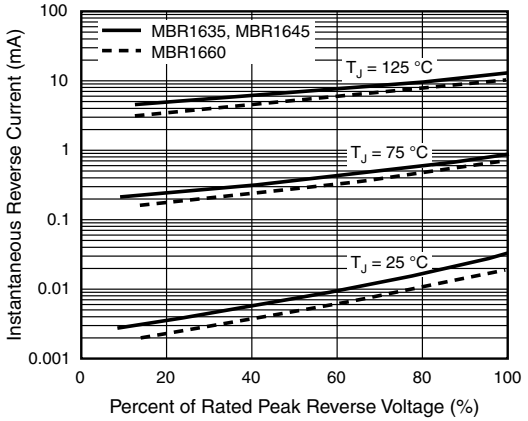

Fig. 4 - Typical Reverse Characteristics

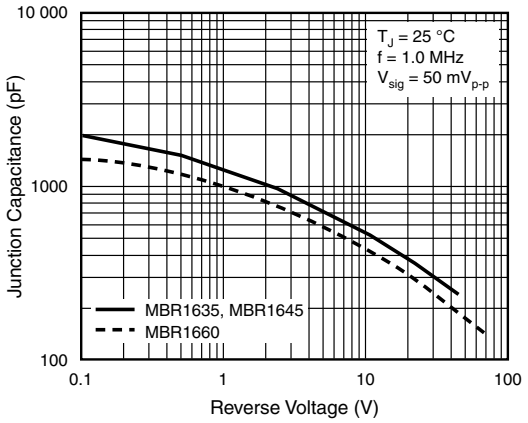

Fig. 5 - Typical Junction Capacitance

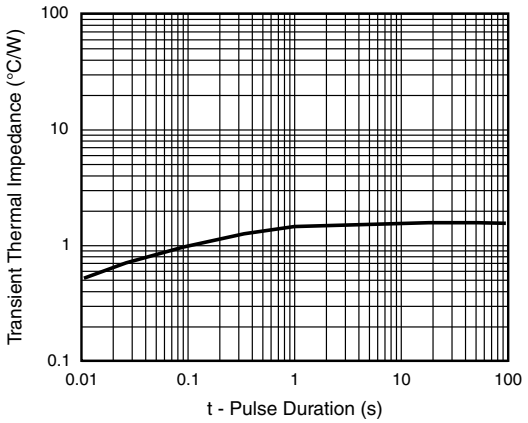

Fig. 6 - Typical Transient Thermal Impedance

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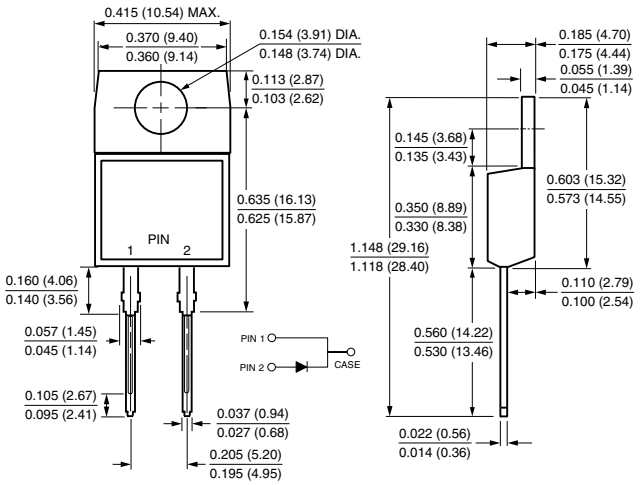
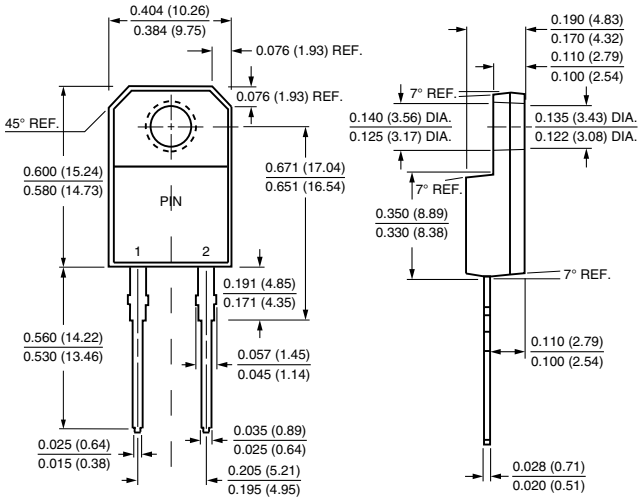
PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

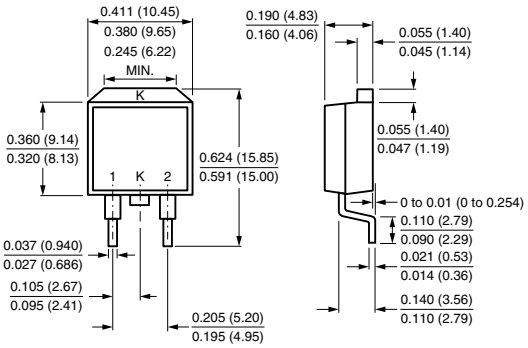
TO-220AC



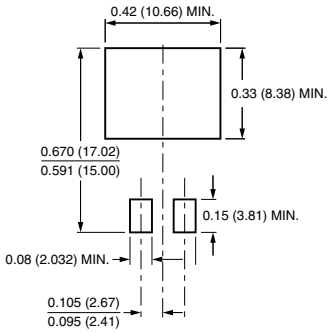
ITO-220AC



TO-263AB



Mounting Pad Layout



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