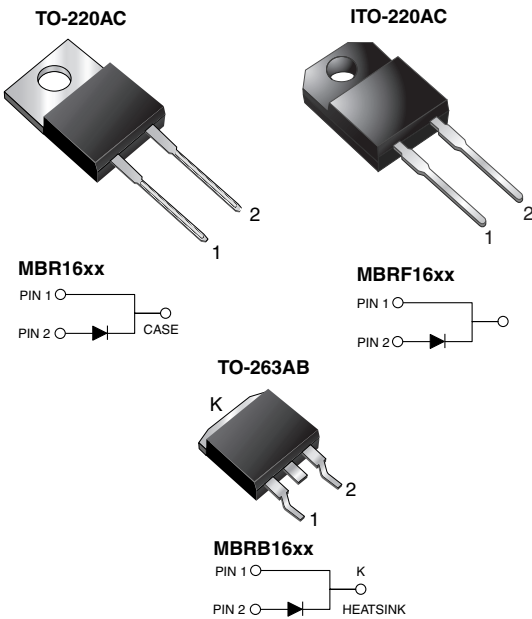


## Schottky Barrier Rectifier



### 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](http://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	
$I_{F(AV)}$	16 A
$V_{RRM}$	35 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 die

MAXIMUM RATINGS ( $T_C = 25\text{ °C}$ 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 $T_C = 125\text{ °C}$	$I_{F(AV)}$	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 $t_p = 2.0\ \mu\text{s}$ , 1 kHz	$I_{RRM}$	1.0		0.5	
Voltage rate of change (rated $V_R$ )	$dV/dt$	10 000			V/ $\mu\text{s}$
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 $t = 1\ \text{min}$	$V_{AC}$	1500			V



<b>ELECTRICAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MBR1635	MBR1645	MBR1660	UNIT
Maximum instantaneous forward voltage	$V_F^{(1)}$	$I_F = 16\text{ A}$	$T_C = 25\text{ }^\circ\text{C}$	0.63		0.75	V
		$I_F = 16\text{ A}$	$T_C = 125\text{ }^\circ\text{C}$	0.57		0.65	
Maximum instantaneous reverse current at DC blocking voltage	$I_R^{(1)}$	Rated $V_R$	$T_C = 25\text{ }^\circ\text{C}$	0.2		1.0	mA
			$T_C = 125\text{ }^\circ\text{C}$	40		50	

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

<b>THERMAL CHARACTERISTICS</b> ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance from junction to case	$R_{\theta JC}$	1.5	3.0	1.5	$^\circ\text{C/W}$

<b>ORDERING INFORMATION</b> (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 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AC	MBRF1645HE3/45 <sup>(1)</sup>	1.94	45	50/tube	Tube
TO-263AB	MBRB1645HE3/45 <sup>(1)</sup>	1.33	45	50/tube	Tube
TO-263AB	MBRB1645HE3/81 <sup>(1)</sup>	1.33	81	800/reel	Tape and reel
TO-263AB	MBRB1645HE3_A/P <sup>(1)</sup>	1.33	P	50/tube	Tube
TO-263AB	MBRB1645HE3_A/I <sup>(1)</sup>	1.33	I	800/reel	Tape and reel

**Note**

(1) AEC-Q101 qualified



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

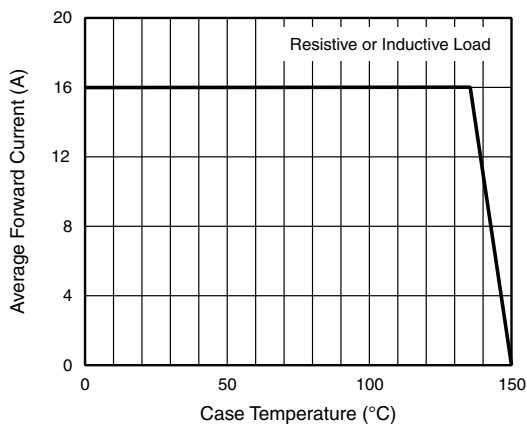


Fig. 1 - Forward Current Derating Curve

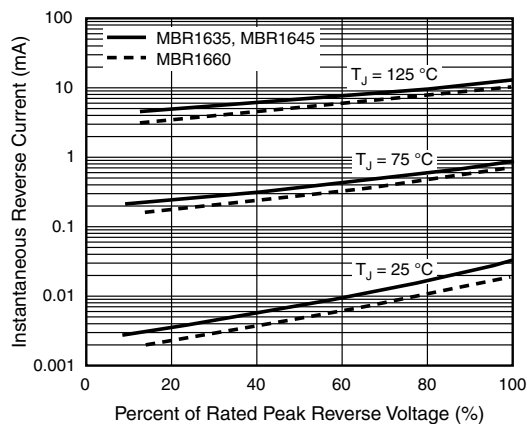


Fig. 4 - Typical Reverse Characteristics

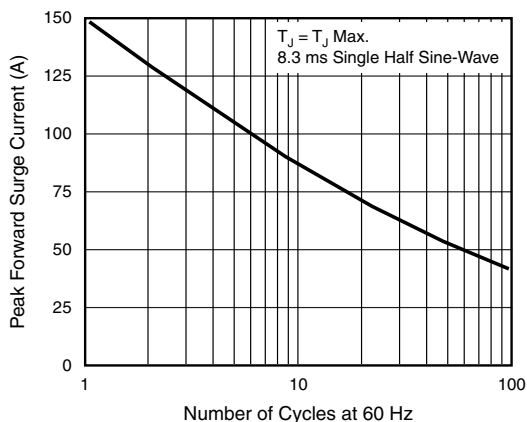


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

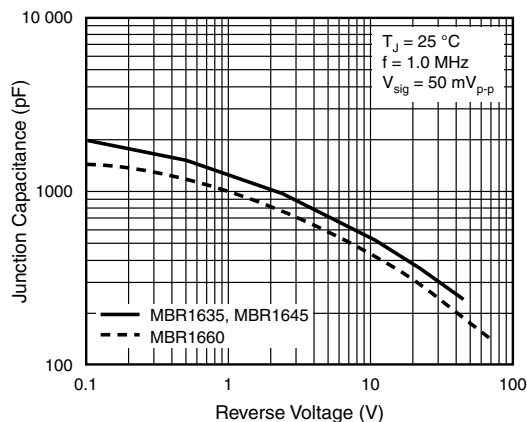


Fig. 5 - Typical Junction Capacitance

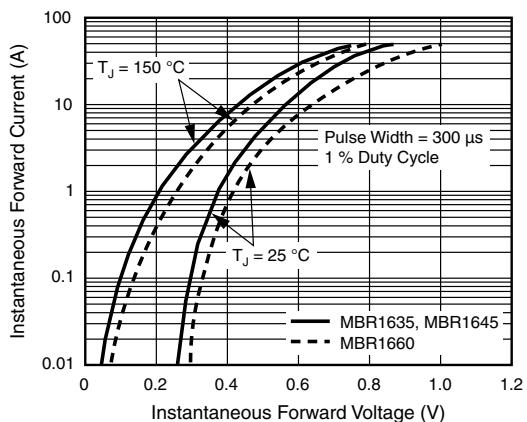


Fig. 3 - Typical Instantaneous Forward Characteristics

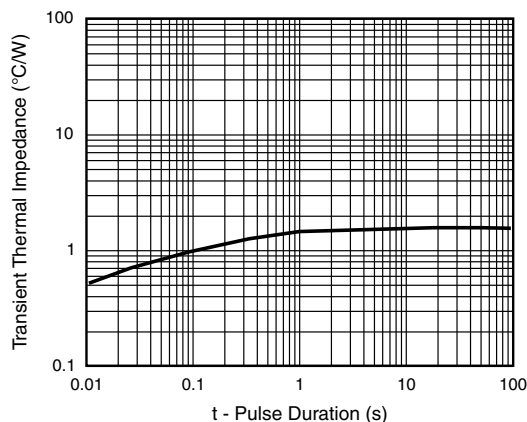
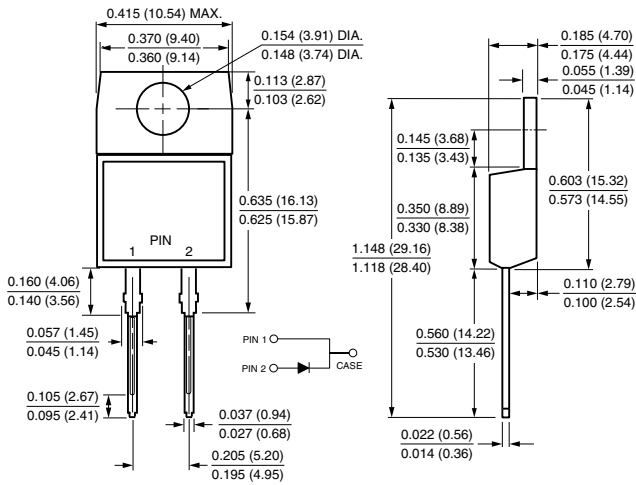


Fig. 6 - Typical Transient Thermal Impedance

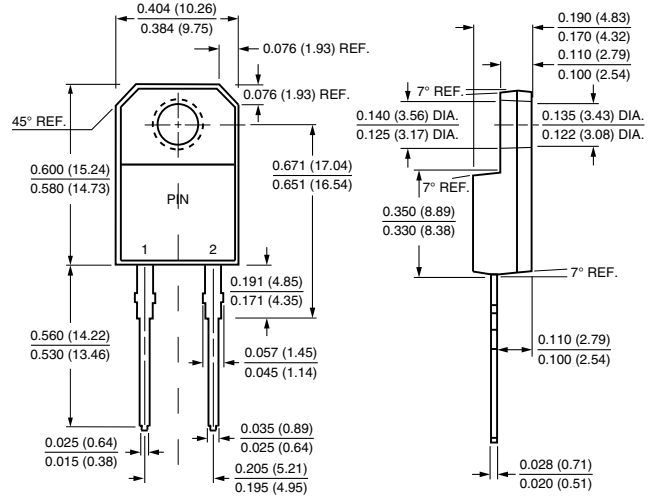


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

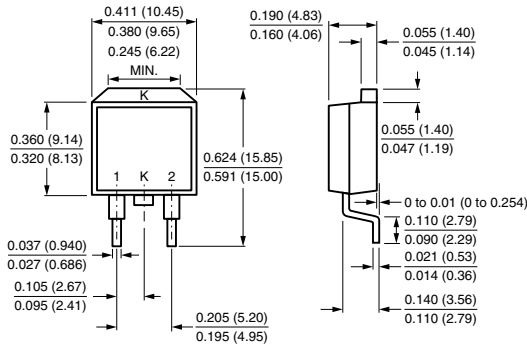
#### TO-220AC



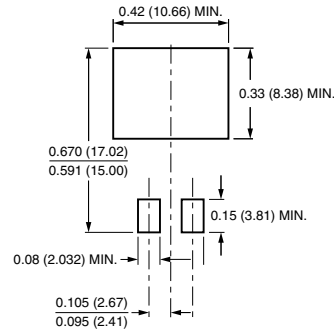
#### ITO-220AC



#### TO-263AB



#### Mounting Pad Layout





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