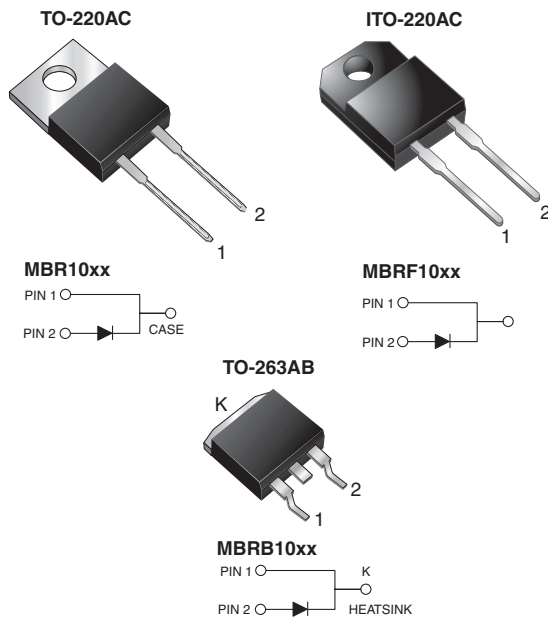


## Schottky Barrier Rectifier



### 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
- 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

**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	
$I_{F(AV)}$	10 A
$V_{RRM}$	35 V to 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, TO-263AB
Diode variations	Single die

MAXIMUM RATINGS ( $T_C = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR1035	MBR1045	MBR1050	MBR1060	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	35	45	50	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 $t_p = 2.0 \mu\text{s}$ , 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 and storage temperature range	$T_J$	- 65 to + 150				°C
	$T_{STG}$	- 65 to + 175				
Isolation voltage (ITO-220AC only) from terminal to heatsink $t = 1 \text{ min}$	$V_{AC}$	1500				V



ELECTRICAL CHARACTERISTICS ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MBR1535	MBR1545	MBR1550	MBR1560	UNIT
Maximum instantaneous forward voltage	$V_F$ <sup>(1)</sup>	$I_F = 10\text{ A}$	$T_J = 25\text{ }^\circ\text{C}$	-		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	$I_R$ <sup>(2)</sup>	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  $\mu\text{s}$  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
TO-263AB	MBRB1045-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB1045-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR1045HE3/45 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AC	MBRF1045HE3/45 <sup>(1)</sup>	1.94	45	50/tube	Tube
TO-263AB	MBRB1045HE3/45 <sup>(1)</sup>	1.33	45	50/tube	Tube
TO-263AB	MBRB1045HE3/81 <sup>(1)</sup>	1.33	81	800/reel	Tape and reel

**Note**

(1) AEC-Q101 qualified



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

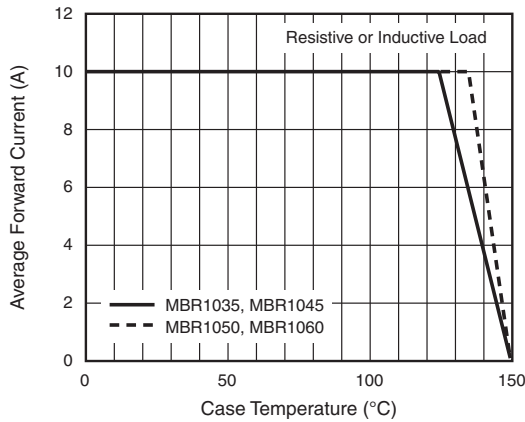


Fig. 1 - Forward Current Derating Curve

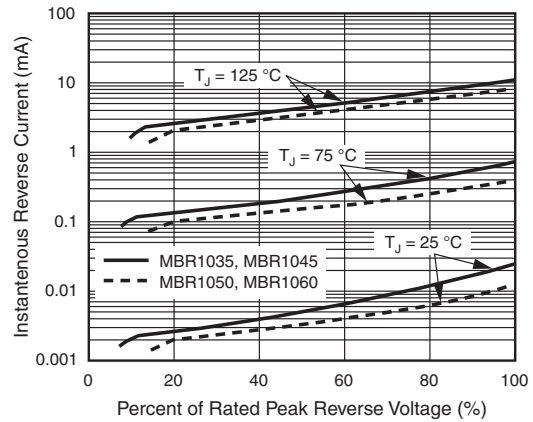


Fig. 4 - Typical Reverse Characteristics

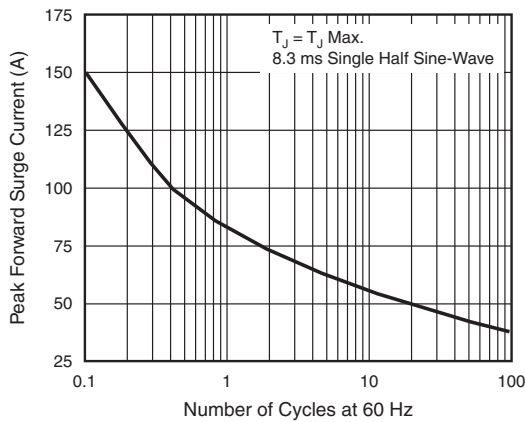


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

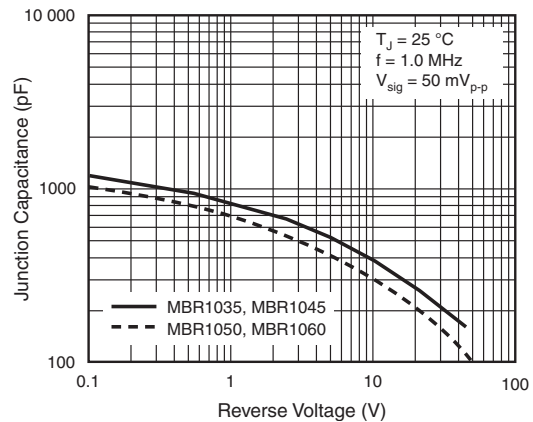


Fig. 5 - Typical Junction Capacitance

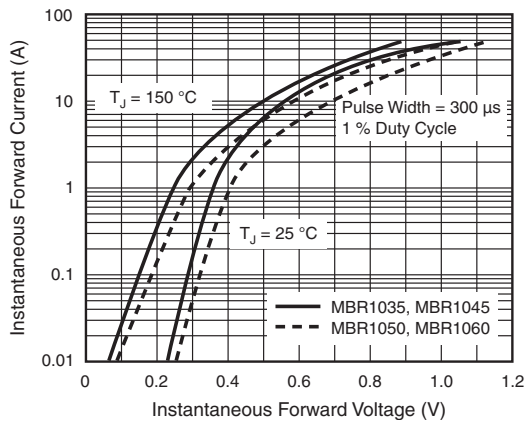


Fig. 3 - Typical Instantaneous Forward Characteristics

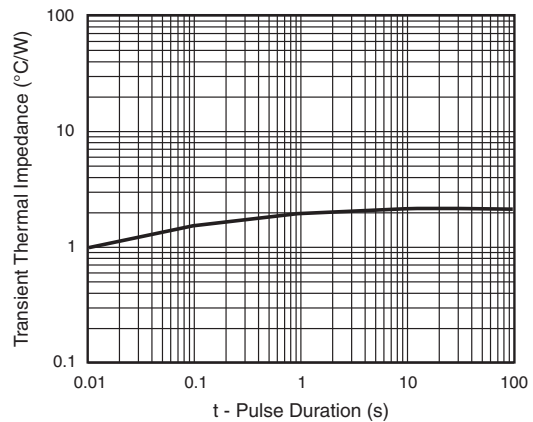
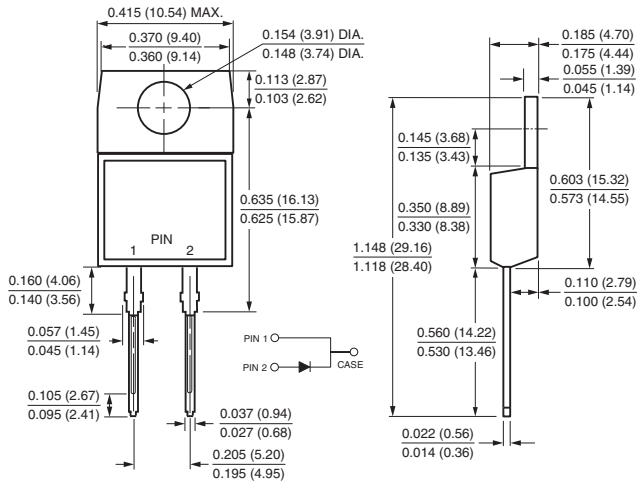


Fig. 6 - Typical Transient Thermal Impedance

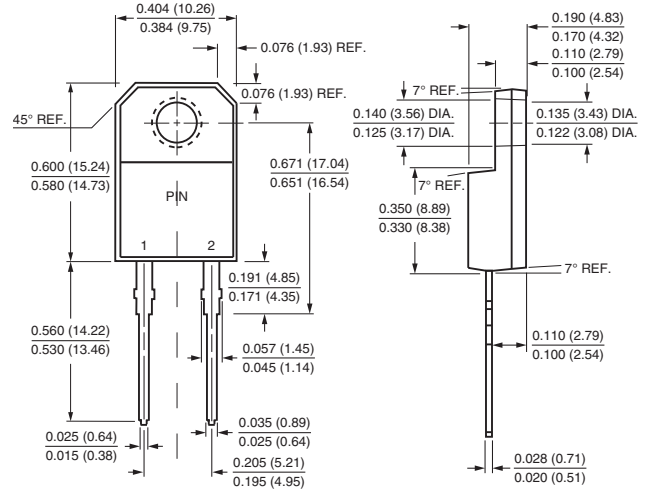
### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



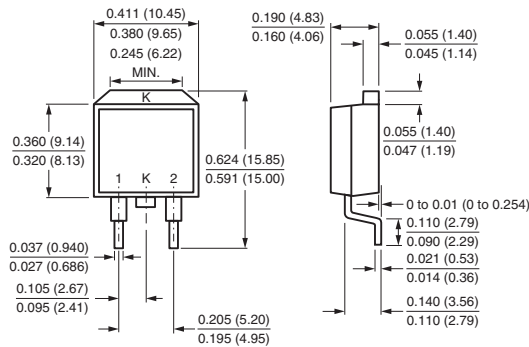
### TO-220AC



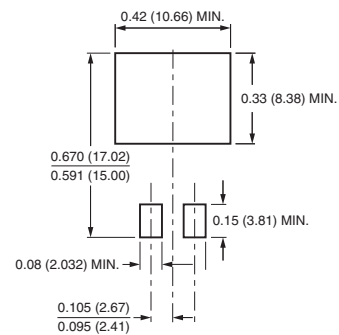
### ITO-220AC



### TO-263AB



### Mounting Pad Layout





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