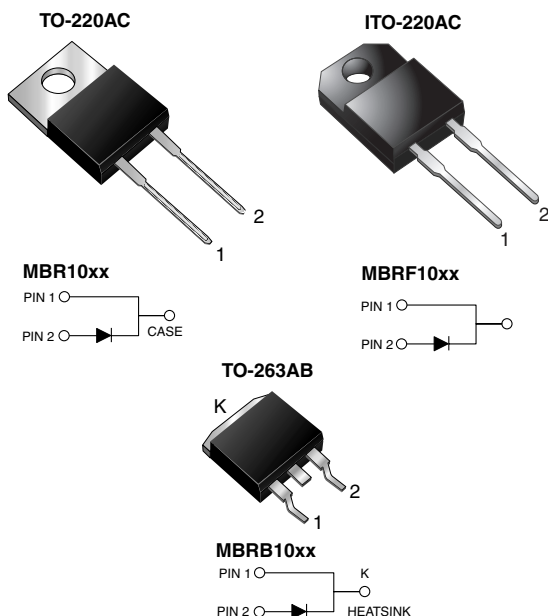


## Schottky Barrier Rectifier



### FEATURES

- 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 dip 260 °C, 40 s (for TO-220AC and ITO-220AC package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

For use in low voltage, high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters and polarity protection application.

### MECHANICAL DATA

**Case:** TO-220AC, ITO-220AC, TO-263AB

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), 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
$T_J$ max.	150 °C

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

MAXIMUM RATINGS (T <sub>C</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR1035	MBR1045	MBR1050	MBR1060	UNIT
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	35	45	50	60	V
Maximum average forward rectified current (Fig. 1)	I <sub>F(AV)</sub>	10				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	150				A
Peak repetitive reverse current at t <sub>p</sub> = 2.0 μs, 1 kHz	I <sub>RRM</sub>	1.0		0.5		A
Voltage rate of change (rated V <sub>R</sub> )	dV/dt	10 000				V/μs
Operating junction temperature range	T <sub>J</sub>	- 65 to + 150				°C
Storage temperature range	T <sub>STG</sub>	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V <sub>AC</sub>	1500				V

ELECTRICAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	MBR1035	MBR1045	MBR1050	MBR1060	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	I <sub>F</sub> = 10 A	T <sub>J</sub> = 25 °C	V <sub>F</sub>	-		0.80		V
	I <sub>F</sub> = 10 A	T <sub>J</sub> = 125 °C		0.57		0.70		
	I <sub>F</sub> = 20 A	T <sub>J</sub> = 25 °C		0.84		0.95		
	I <sub>F</sub> = 20 A	T <sub>J</sub> = 125 °C		0.72		0.85		
Maximum instantaneous reverse current at rated DC blocking voltage <sup>(1)</sup>		T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C	I <sub>R</sub>	0.10 15				mA

**Note:**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ( $T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Maximum 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) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

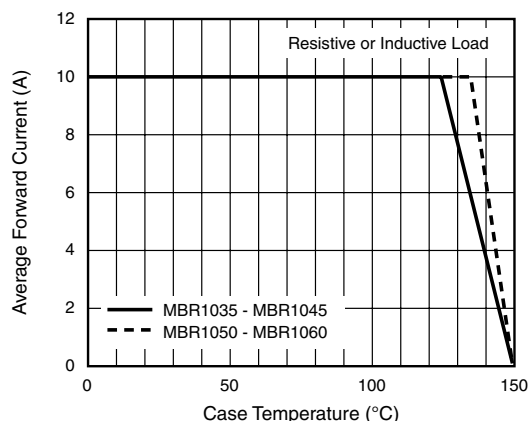


Figure 1. Forward Current Derating Curve

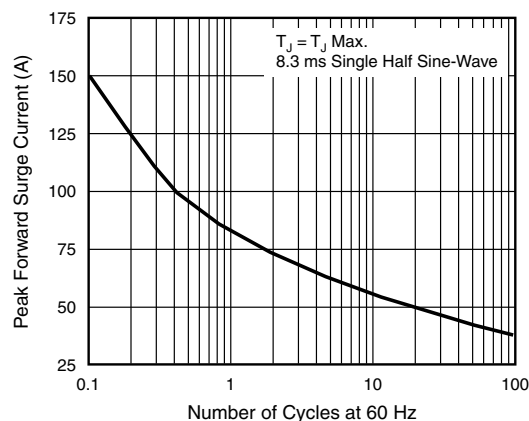


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

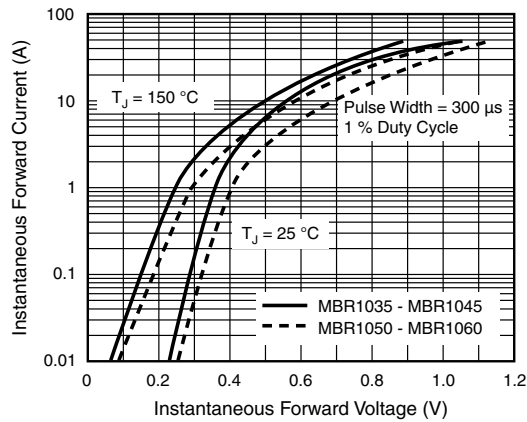


Figure 3. Typical Instantaneous Forward Characteristics

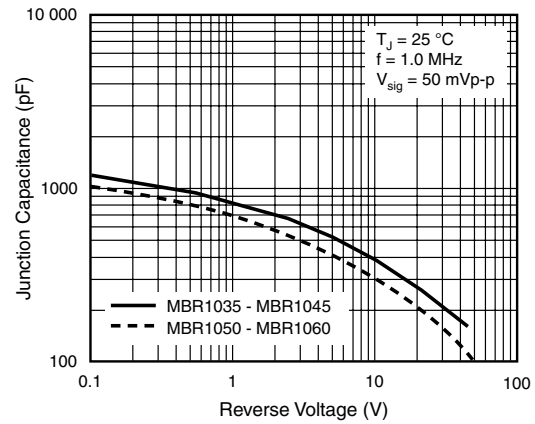


Figure 5. Typical Junction Capacitance

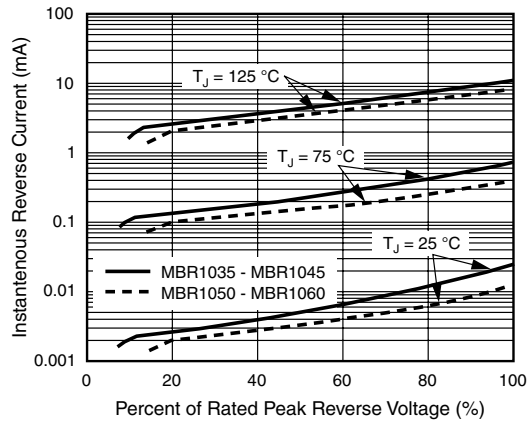


Figure 4. Typical Reverse Characteristics

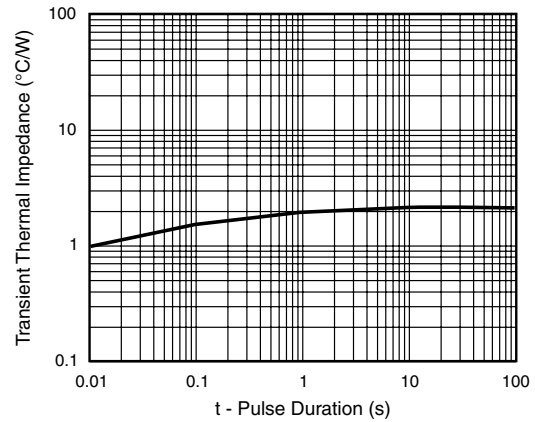
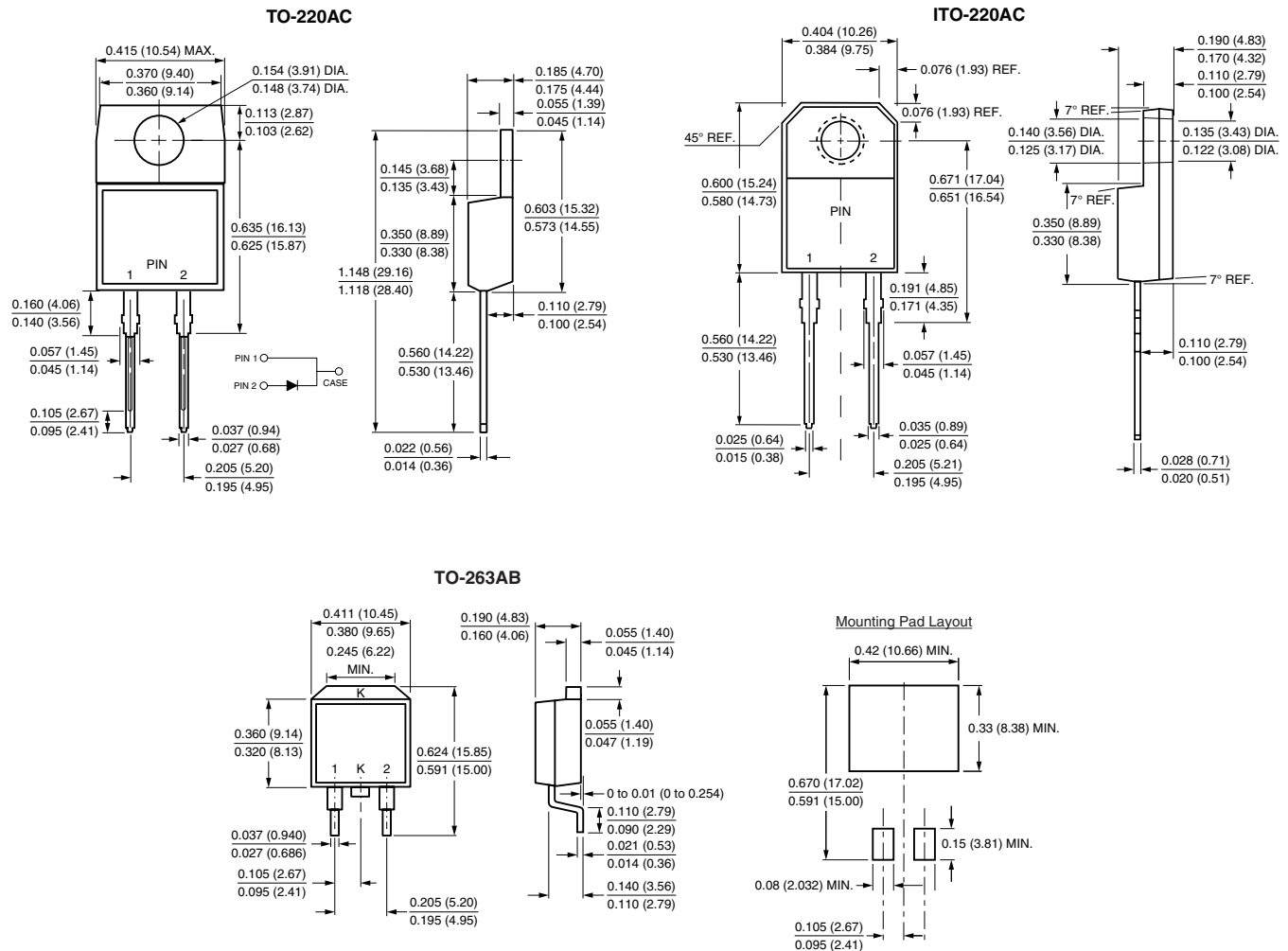


Figure 6. Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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