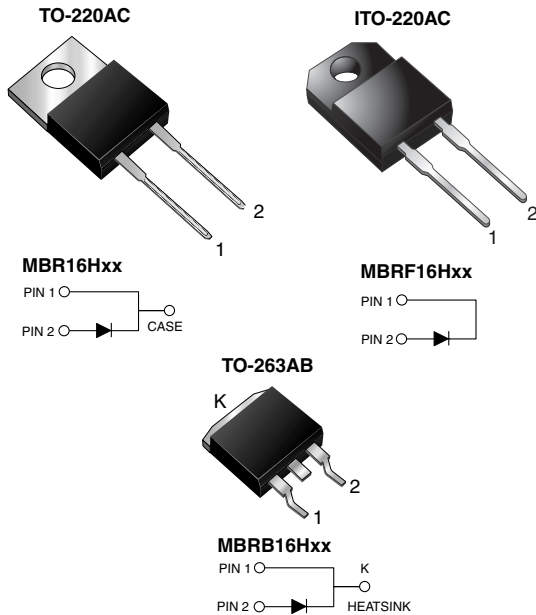


## Schottky Barrier Rectifier

High Barrier Technology for Improved High Temperature Performance



### FEATURES

- Guardring for overvoltage protection
- Lower power losses, high efficiency
- Low forward voltage drop
- Low leakage current
- 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 or 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	
$I_{F(AV)}$	16 A
$V_{RRM}$	35 V to 60 V
$I_{FSM}$	150 A
$V_F$	0.56 V, 0.62 V
$I_R$	100 $\mu$ A
$T_J$ max.	175 °C

MAXIMUM RATINGS ( $T_C = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR16H35	MBR16H45	MBR16H50	MBR16H60	UNIT
Maximum repetitive peak reverse voltage	$V_{RRM}$	35	45	50	60	V
Working peak reverse voltage	$V_{RWM}$	35	45	50	60	V
Maximum DC blocking voltage	$V_{DC}$	35	45	50	60	V
Max. average forward rectified current (Fig. 1)	$I_{F(AV)}$	16				A
Non-repetitive avalanche energy at 25 °C, $I_{AS} = 4\text{ A}$ , $L = 10\text{ mH}$	$E_{AS}$	80				mJ
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	150				A
Peak repetitive reverse surge current at $t_p = 2.0\text{ }\mu\text{s}$ , 1 kHz	$I_{RRM}$	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 $\mu\text{s}$ waveform)	$E_{RSM}$	20				mJ
Electrostatic discharge capacitor voltage human body model: $C = 100\text{ pF}$ , $R = 1.5\text{ k}\Omega$	$V_C$	25				kV
Voltage rate of change (rated $V_R$ )	dV/dt	10 000				V/ $\mu\text{s}$

# MBR(F,B)16H35 thru MBR(F,B)16H60

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MAXIMUM RATINGS (T <sub>C</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR16H35	MBR16H45	MBR16H50	MBR16H60	UNIT
Operating junction temperature range	T <sub>J</sub>	- 65 to + 175				°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	MBR16H35 MBR16H45		MBR16H50 MBR16H60		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage <sup>(1)</sup>	I <sub>F</sub> = 16 A I <sub>F</sub> = 16 A	T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C	V <sub>F</sub>	- 0.52	0.66 0.56	- 0.58	0.73 0.62	V
Maximum reverse current at rated V <sub>R</sub> <sup>(2)</sup>		T <sub>J</sub> = 25 °C T <sub>J</sub> = 125 °C	I <sub>R</sub>	- 6.0	100 20	- 4.0	100 20	μA mA

**Notes:**

- (1) Pulse test: 300 μs pulse width, 1 % duty cycle
- (2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T <sub>C</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT	
Thermal resistance, junction to case	R <sub>θJC</sub>	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	MBR16H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF16H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB16H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB16H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR16H45HE3/45 <sup>(1)</sup>	1.80	45	50/tube	Tube
ITO-220AC	MBRF16H45HE3/45 <sup>(1)</sup>	1.94	45	50/tube	Tube
TO-263AB	MBRB16H45HE3/45 <sup>(1)</sup>	1.33	45	50/tube	Tube
TO-263AB	MBRB16H45HE3/81 <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)

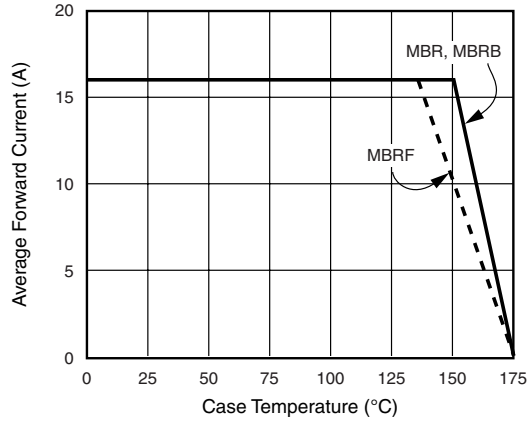


Figure 1. Forward Current Derating Curve

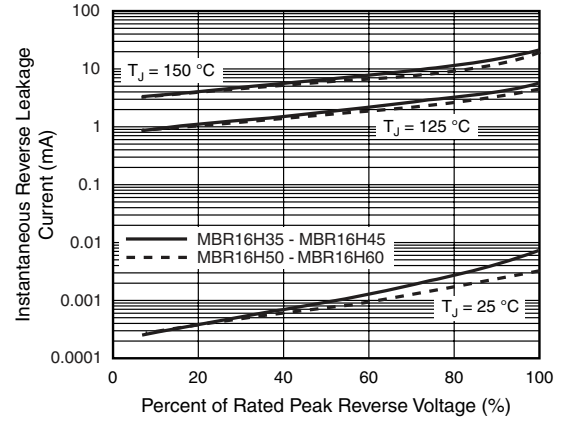


Figure 4. Typical Reverse Characteristics

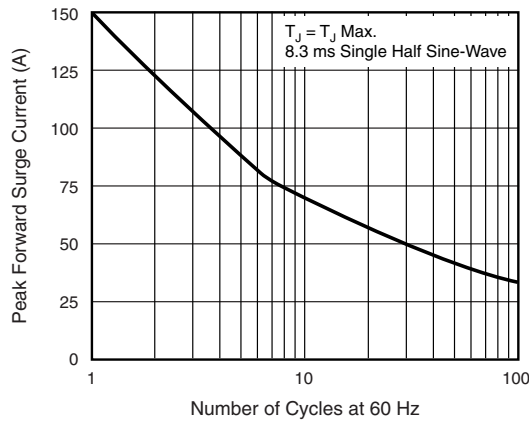


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

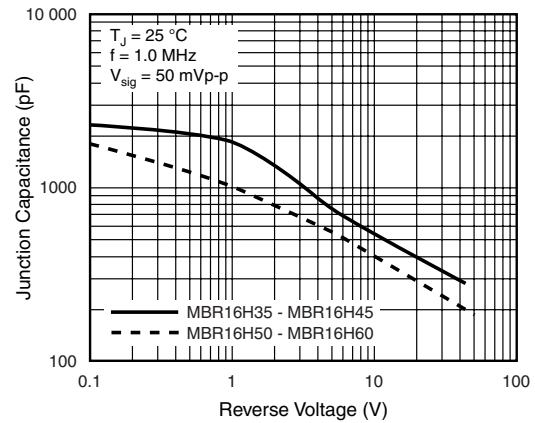


Figure 5. Typical Junction Capacitance

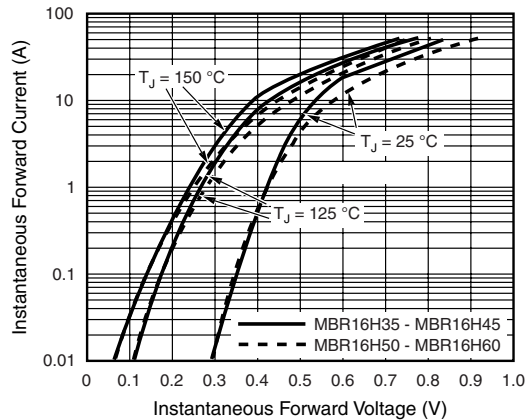


Figure 3. Typical Instantaneous Forward Characteristics

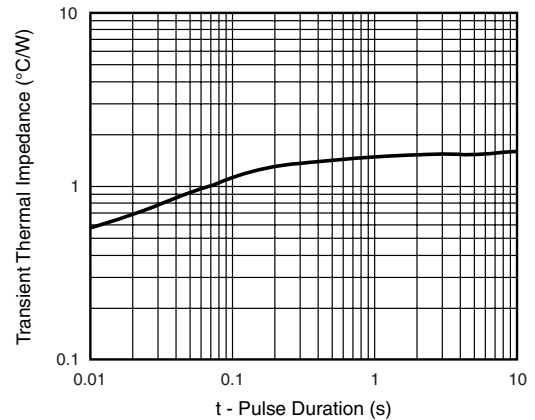


Figure 6. Typical Transient Thermal Impedance

# MBR(F,B)16H35 thru MBR(F,B)16H60

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## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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