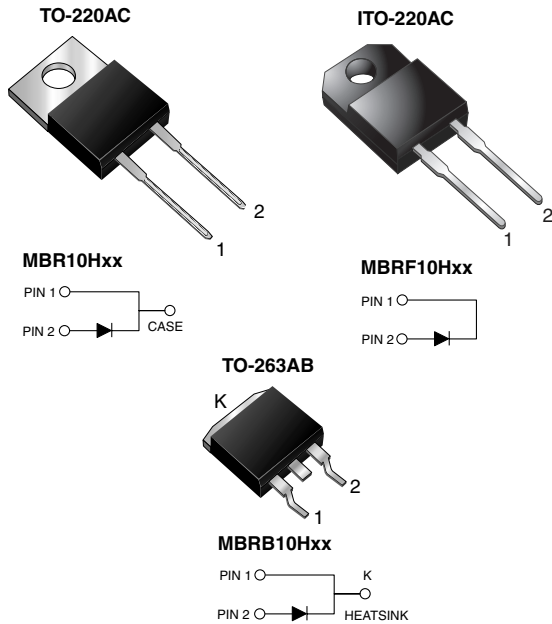


Schottky Barrier Rectifier

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	
$I_{F(AV)}$	10 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	100 μ A
T_J max.	175 °C

MAXIMUM RATINGS ($T_C = 25$ °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR10H35	MBR10H45	MBR10H50	MBR10H60	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
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	10				A
Non-repetitive avalanche energy at 25 °C, $I_{AS} = 4$ A, $L = 10$ 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 current at $t_p = 2.0$ μ s, 1 kHz	I_{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 μ s waveform)	E_{RSM}	20		10		mJ
Electrostatic discharge capacitor voltage human body model: $C = 100$ pF, $R = 1.5$ k Ω	V_C	25				kV
Voltage rate of change (rated V_R)	dV/dt	10 000				V/ μ s

MBR(F,B)10H35 thru MBR(F,B)10H60

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MAXIMUM RATINGS (T _C = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR10H35	MBR10H45	MBR10H50	MBR10H60	UNIT
Operating junction temperature range	T _J	- 65 to + 175				°C
Storage temperature range	T _{STG}	- 65 to + 175				°C
Isolation voltage (ITO-220AC only) from terminal to heatsink t = 1 min	V _{AC}	1500				V

ELECTRICAL CHARACTERISTICS (T _C = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	MBR10H35 MBR10H45		MBR10H50 MBR10H60		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage ⁽¹⁾	I _F = 10 A	T _J = 25 °C	V _F	-	0.63	-	0.71	V
	I _F = 10 A	T _J = 125 °C		0.49	0.55	0.57	0.61	
	I _F = 20 A	T _J = 25 °C		-	0.75	-	0.85	
	I _F = 20 A	T _J = 125 °C		0.62	0.68	0.68	0.71	
Maximum reverse current at rated V _R ⁽²⁾		T _J = 25 °C T _J = 125 °C	I _R	- 4.0	100 12	- 2.0	100 12	μA mA

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
Maximum thermal resistance	R _{θJC}	2.0	4.0	2.0	°C/W

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	MBR10H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB10H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB10H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR10H45HE3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	MBRF10H45HE3/45 ⁽¹⁾	1.94	45	50/tube	Tube
TO-263AB	MBRB10H45HE3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	MBRB10H45HE3/81 ⁽¹⁾	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)

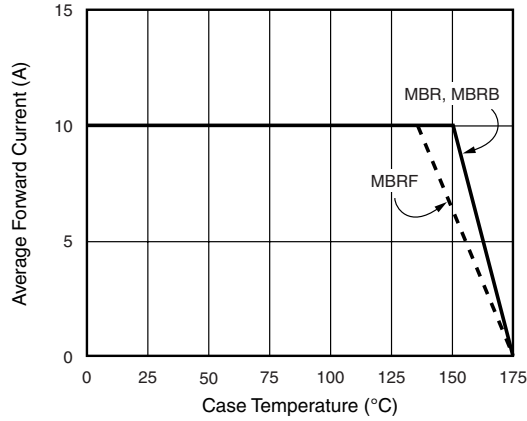


Figure 1. Forward Current Derating Curve

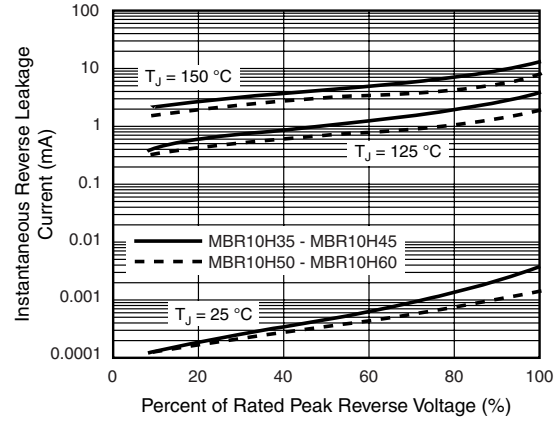


Figure 4. Typical Reverse Characteristics

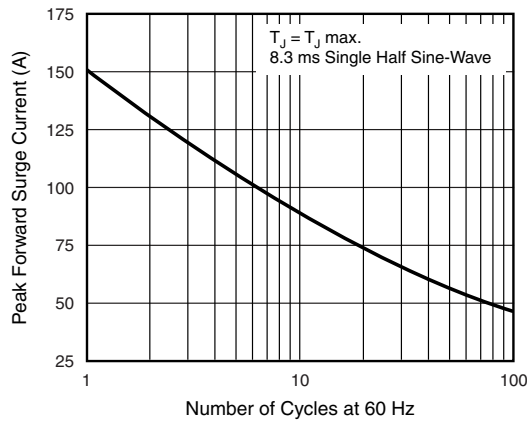


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

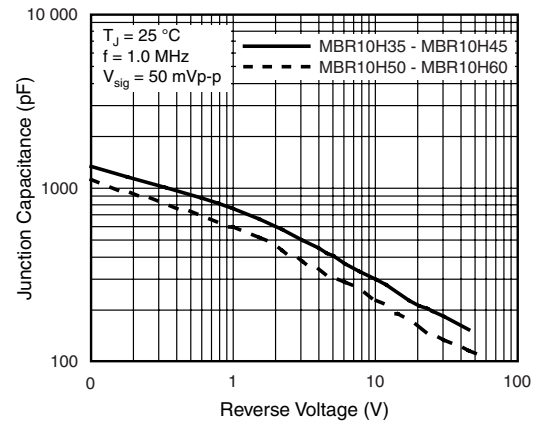


Figure 5. Typical Junction Capacitance

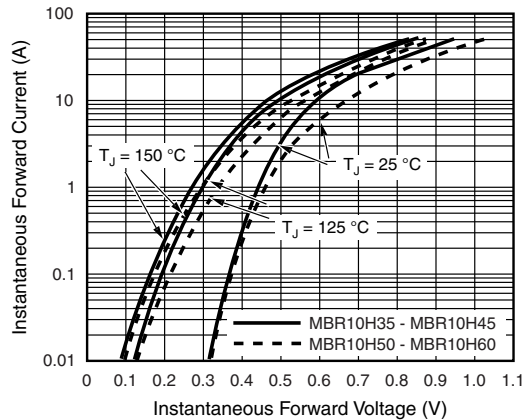


Figure 3. Typical Instantaneous Forward Characteristics

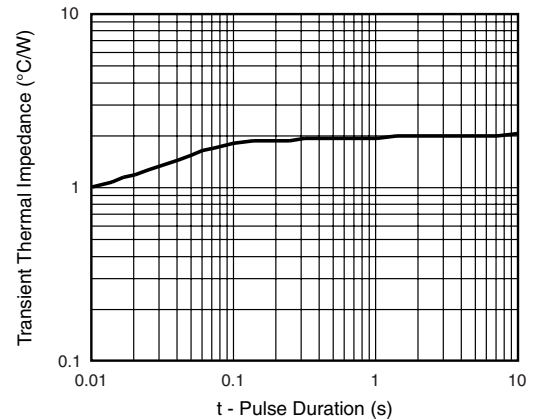


Figure 6. Typical Transient Thermal Impedance

MBR(F,B)10H35 thru MBR(F,B)10H60

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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