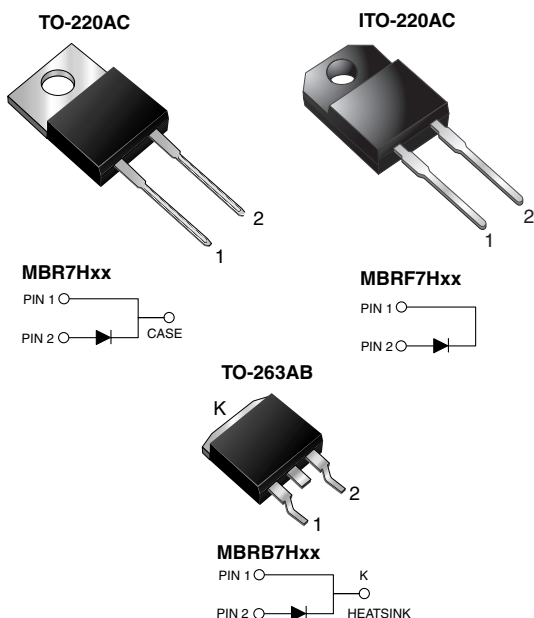




Schottky Barrier Rectifier

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.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	7.5 A
V_{RRM}	35 V to 60 V
I_{FSM}	150 A
V_F	0.55 V, 0.61 V
I_R	50 μ A
T_J max.	175 °C

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

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

PARAMETER	SYMBOL	MBR7H35	MBR7H45	MBR7H50	MBR7H60	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)}	7.5				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 surge current at t _p = 2.0 μs, 1 kHz	I _{RRM}	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 μs waveform)	E _{RSM}	20		10		mJ
Electrostatic discharge capacitor voltage human body model: C = 100 pF, R = 1.5 kΩ	V _C	25				kV
Voltage rate of change (rated V _R)	dV/dt	10 000				V/μs

MBR(F,B)7H35 thru MBR(F,B)7H60

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MAXIMUM RATINGS ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR7H35	MBR7H45	MBR7H50	MBR7H60	UNIT
Operating junction and storage temperature range	T_J, T_{STG}	- 65 to + 175				$^{\circ}\text{C}$
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	TEST CONDITIONS		SYMBOL	MBR7H35 MBR7H45		MBR7H50 MBR7H60		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage ⁽¹⁾	$I_F = 7.5\text{ A}$	$T_C = 25\text{ }^{\circ}\text{C}$	V_F	-	0.63	-	0.73	V
	$I_F = 7.5\text{ A}$	$T_C = 125\text{ }^{\circ}\text{C}$		0.50	0.55	0.58	0.61	
	$I_F = 15\text{ A}$	$T_C = 25\text{ }^{\circ}\text{C}$		-	0.75	-	0.87	
	$I_F = 15\text{ A}$	$T_C = 125\text{ }^{\circ}\text{C}$		0.61	0.66	0.68	0.72	
Maximum reverse current at rated V_R ⁽²⁾	$T_C = 25\text{ }^{\circ}\text{C}$ $T_C = 125\text{ }^{\circ}\text{C}$		I_R	-	50	-	50	μA mA
				3.0	10	2.0	10	

Notes:

(1) Pulse test: 300 μs 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	
Thermal resistance, junction to case	$R_{\theta JC}$	3.0	5.0	3.0	$^{\circ}\text{C/W}$	

ORDERING INFORMATION (Example)					
PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AC	MBR7H45-E3/45	1.80	45	50/tube	Tube
ITO-220AC	MBRF7H45-E3/45	1.94	45	50/tube	Tube
TO-263AB	MBRB7H45-E3/45	1.33	45	50/tube	Tube
TO-263AB	MBRB7H45-E3/81	1.33	81	800/reel	Tape and reel
TO-220AC	MBR7H45HE3/45 ⁽¹⁾	1.80	45	50/tube	Tube
ITO-220AC	MBRF7H45HE3/45 ⁽¹⁾	1.94	45	50/tube	Tube
TO-263AB	MBRB7H45HE3/45 ⁽¹⁾	1.33	45	50/tube	Tube
TO-263AB	MBRB7H45HE3/81 ⁽¹⁾	1.33	81	800/reel	Tape and reel

Note:

(1) Automotive grade AEC Q101 qualified

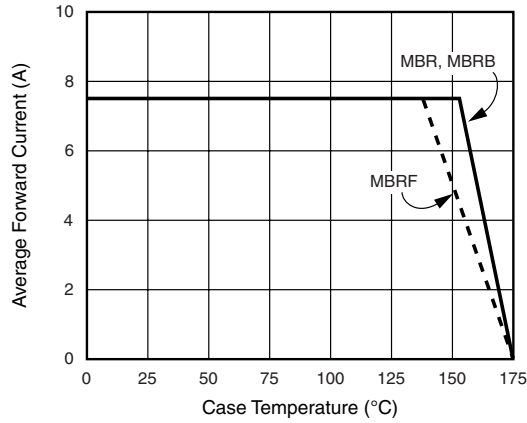
**RATINGS AND CHARACTERISTICS CURVES** $(T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Figure 1. Forward Current Derating Curve

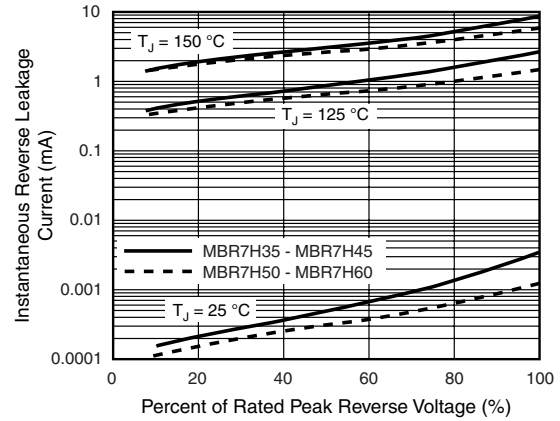


Figure 4. Typical Reverse Characteristics Per Leg

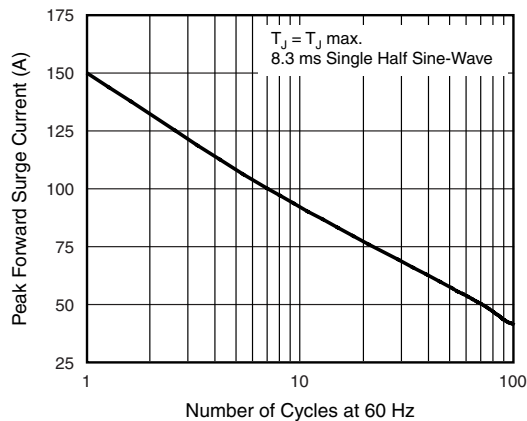


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Leg

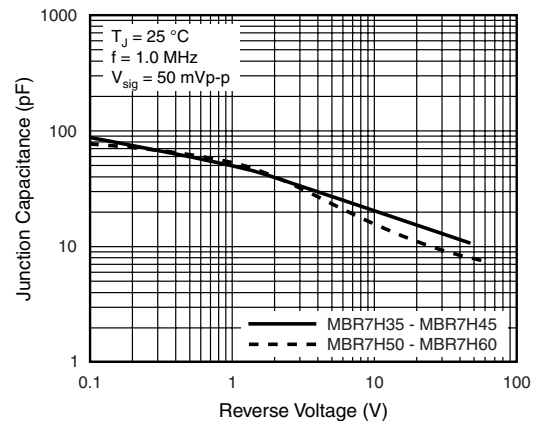


Figure 5. Typical Junction Capacitance Per Leg

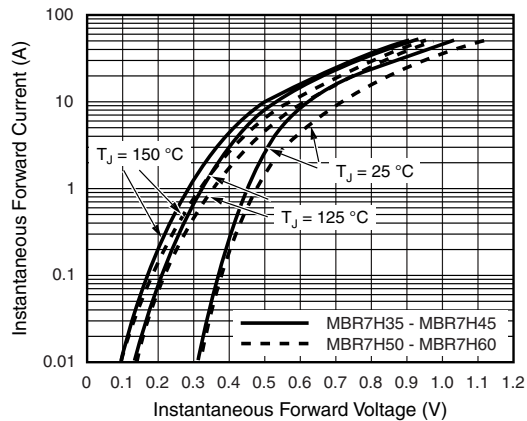


Figure 3. Typical Instantaneous Forward Characteristics Per Leg

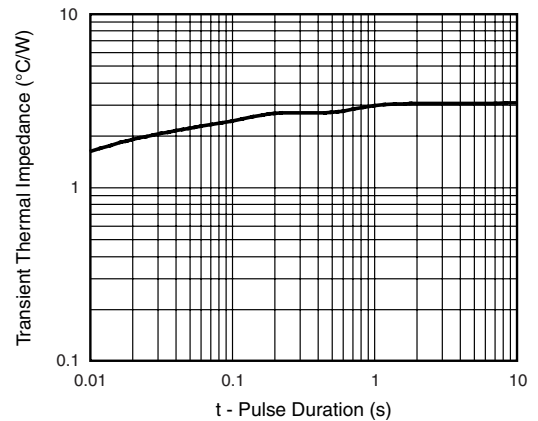


Figure 6. Typical Transient Thermal Impedance Per Leg

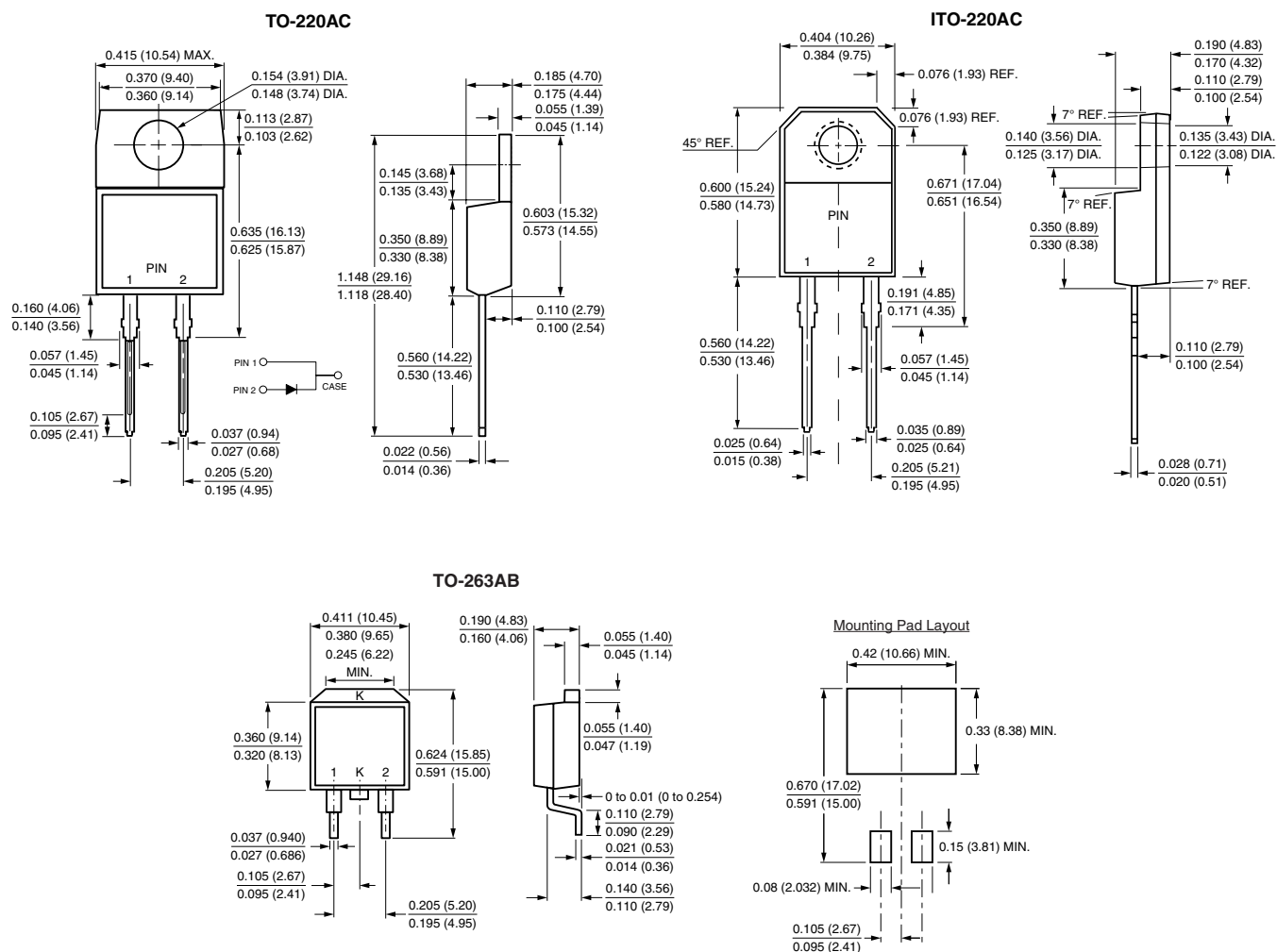
MBR(F,B)7H35 thru MBR(F,B)7H60

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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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