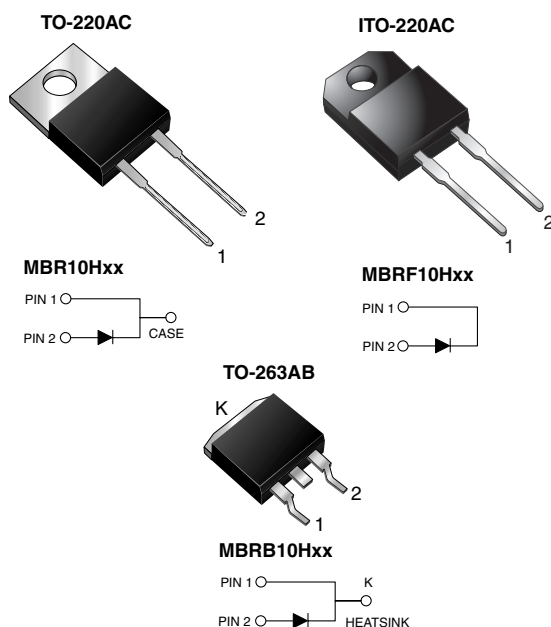


Schottky Barrier Rectifier

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

Vishay General Semiconductor



MAXIMUM RATINGS ($T_C = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	MBR10H35	MBR10H45	MBR10H50	MBR10H60	UNIT
Operating junction temperature range	T_J	- 65 to + 175				$^{\circ}\text{C}$
Storage temperature range	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	MBR10H35 MBR10H45		MBR10H50 MBR10H60		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage ⁽¹⁾	$I_F = 10\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	V_F	-	0.63	-	0.71	V
	$I_F = 10\text{ A}$	$T_J = 125\text{ }^{\circ}\text{C}$		0.49	0.55	0.57	0.61	
	$I_F = 20\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$		-	0.75	-	0.85	
	$I_F = 20\text{ A}$	$T_J = 125\text{ }^{\circ}\text{C}$		0.62	0.68	0.68	0.71	
Maximum reverse current at rated V_R ⁽²⁾		$T_J = 25\text{ }^{\circ}\text{C}$ $T_J = 125\text{ }^{\circ}\text{C}$	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 $\leq 40\text{ ms}$

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

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

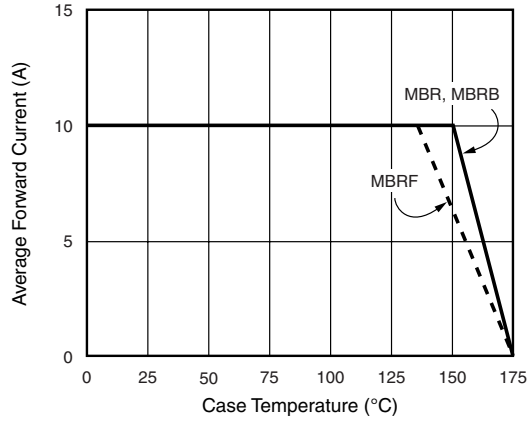


Figure 1. Forward Current Derating Curve

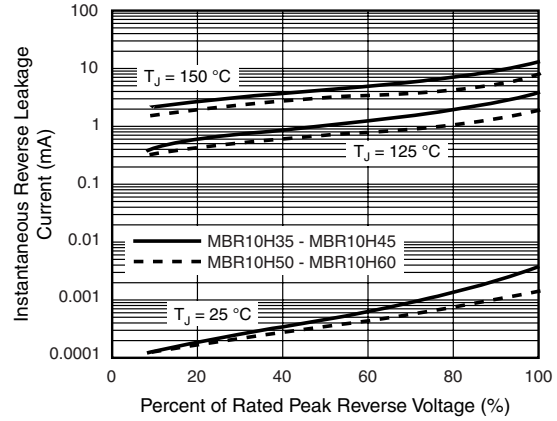


Figure 4. Typical Reverse Characteristics

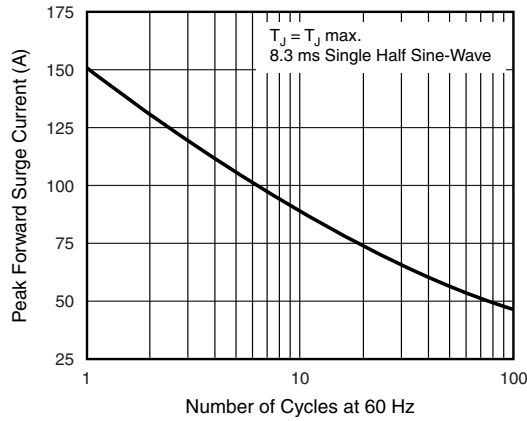


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

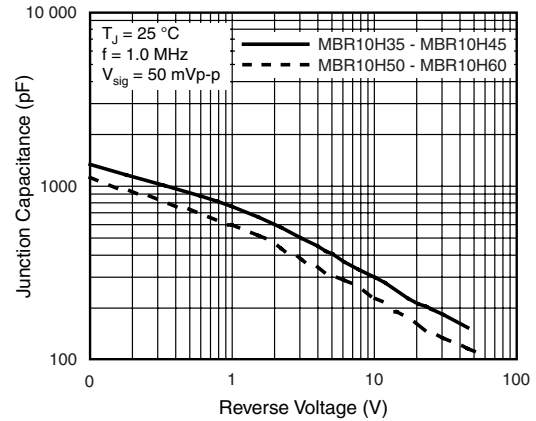


Figure 5. Typical Junction Capacitance

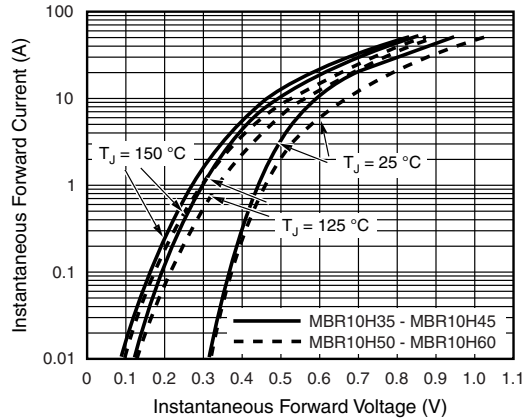


Figure 3. Typical Instantaneous Forward Characteristics

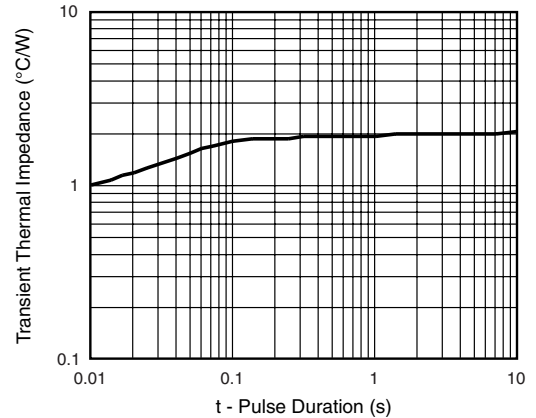
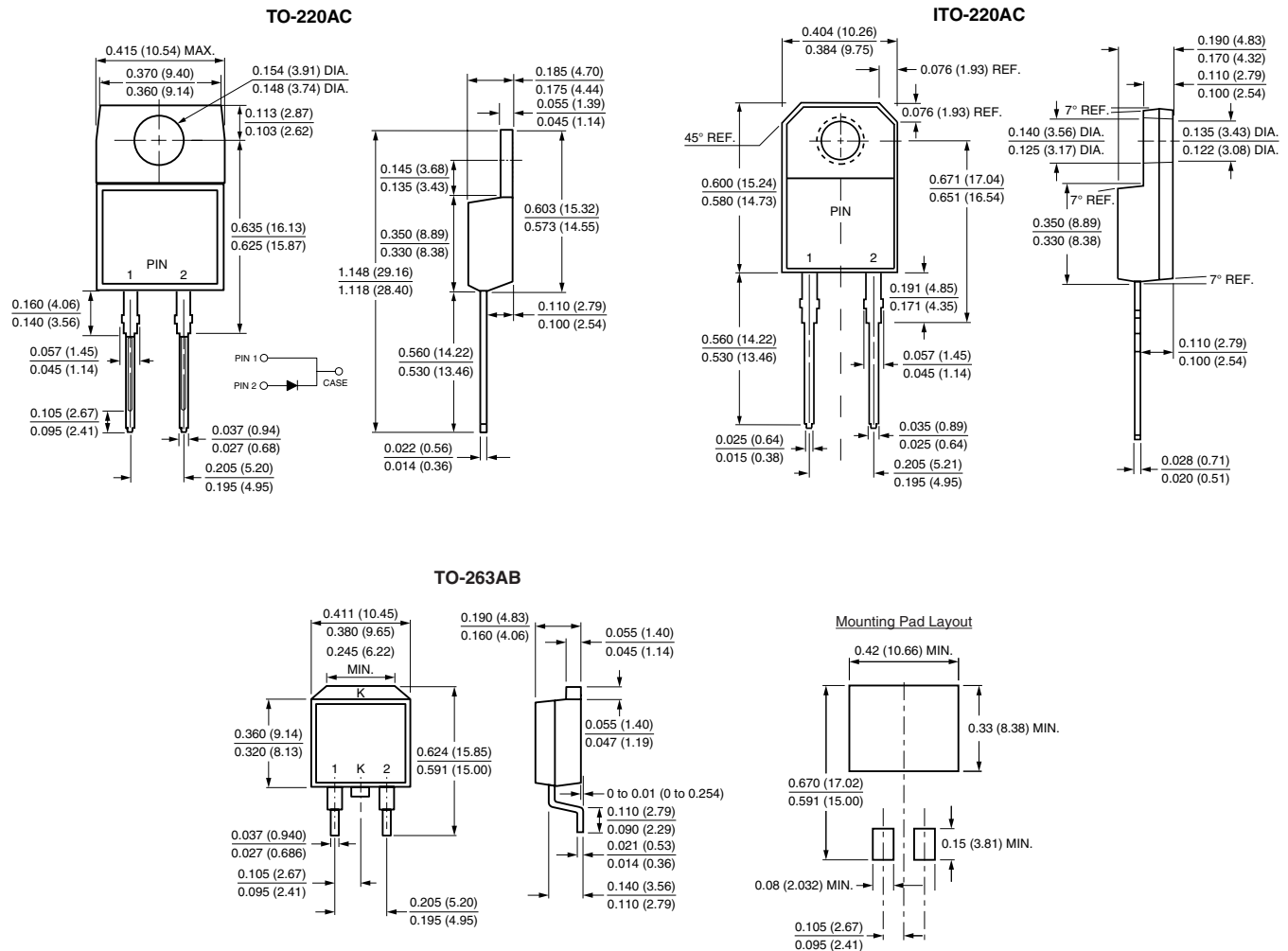


Figure 6. Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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