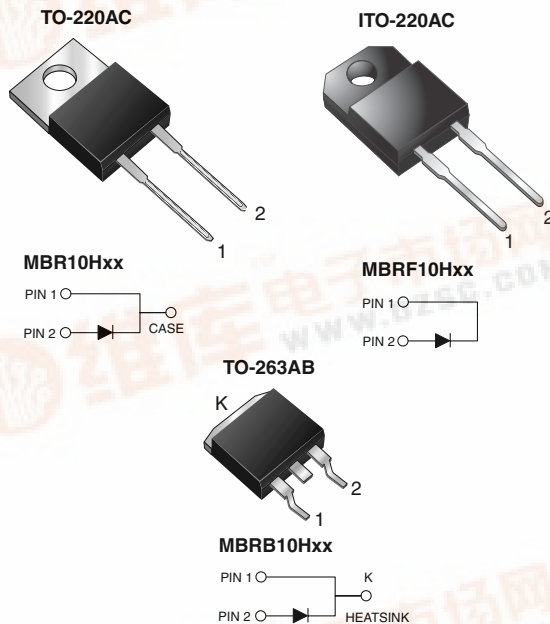


## Schottky Barrier Rectifier

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 $\mu$ 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 $t_p = 2.0$ $\mu$ s, 1 kHz	$I_{RRM}$	1.0		0.5		A
Peak non-repetitive reverse energy (8/20 $\mu$ s waveform)	$E_{RSM}$	20		10		mJ
Electrostatic discharge capacitor voltage human body model: $C = 100$ pF, $R = 1.5$ k $\Omega$	$V_C$	25				kV
Voltage rate of change (rated $V_R$ )	dV/dt	10 000				V/ $\mu$ s

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



Vishay General Semiconductor

MAXIMUM RATINGS (T <sub>C</sub> = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	MBR10H35	MBR10H45	MBR10H50	MBR10H60	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	MBR10H35 MBR10H45		MBR10H50 MBR10H60		UNIT
				TYP.	MAX.	TYP.	MAX.	
Maximum instantaneous forward voltage (1)	I <sub>F</sub> = 10 A	T <sub>J</sub> = 25 °C	V <sub>F</sub>	-	0.63	-	0.71	V
	I <sub>F</sub> = 10 A	T <sub>J</sub> = 125 °C		0.49	0.55	0.57	0.61	
	I <sub>F</sub> = 20 A	T <sub>J</sub> = 25 °C		-	0.75	-	0.85	
	I <sub>F</sub> = 20 A	T <sub>J</sub> = 125 °C		0.62	0.68	0.68	0.71	
Maximum reverse current at rated V <sub>R</sub> (2)			I <sub>R</sub>	-	100	-	100	μA mA
				T <sub>J</sub> = 25 °C	4.0	12	2.0	
		T <sub>J</sub> = 125 °C						

**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
Maximum thermal resistance	R <sub>θJC</sub>	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)

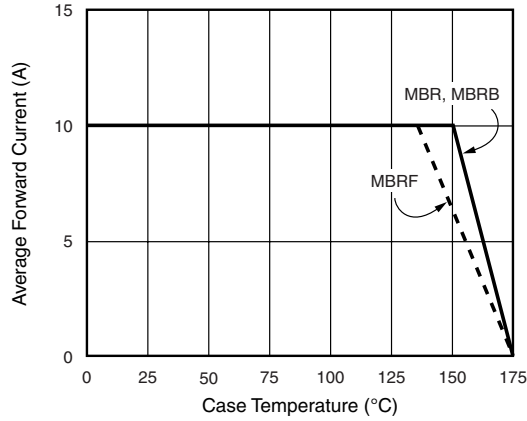


Figure 1. Forward Current Derating Curve

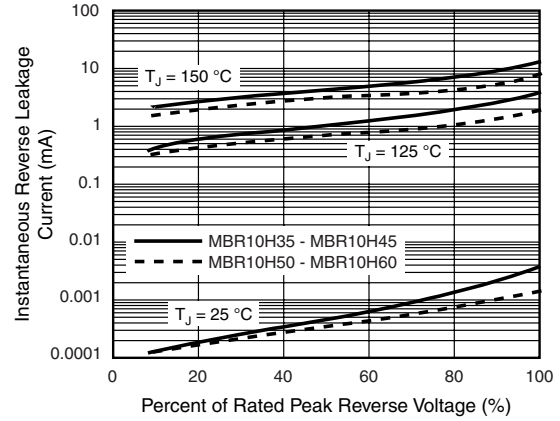


Figure 4. Typical Reverse Characteristics

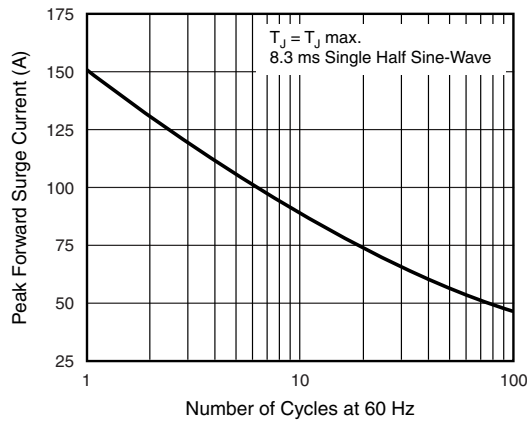


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

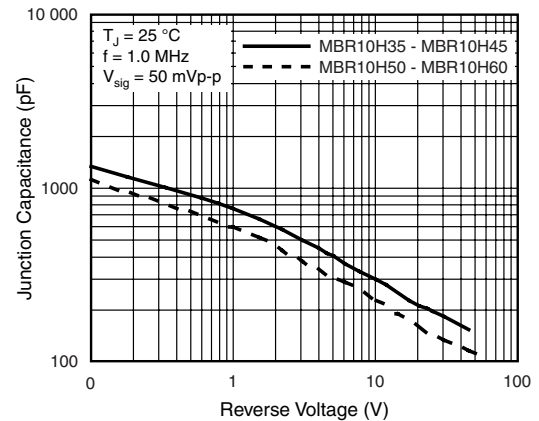


Figure 5. Typical Junction Capacitance

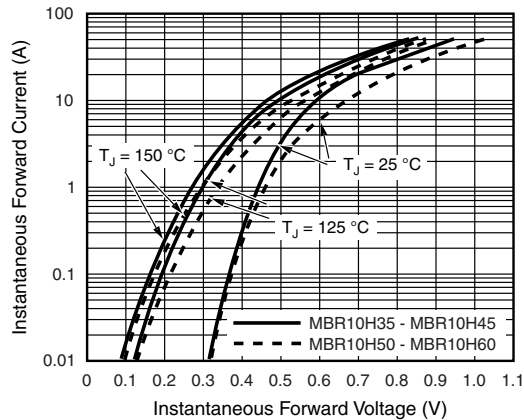


Figure 3. Typical Instantaneous Forward Characteristics

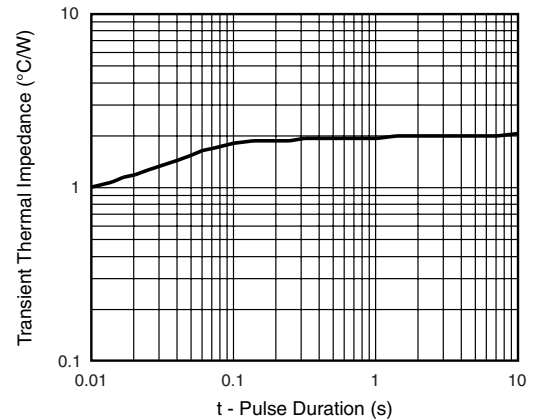


Figure 6. Typical Transient Thermal Impedance

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

Vishay General Semiconductor



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.