Dual Common-Cathode High-Voltage Schottky Rectifier
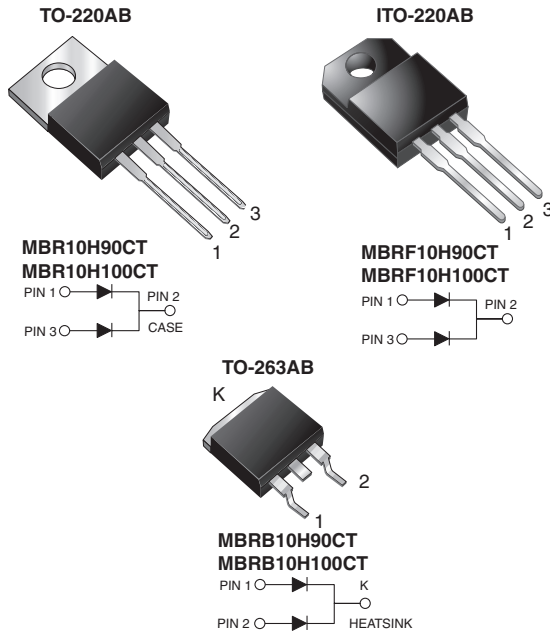
High Barrier Technology for Improved High Temperature Performance

TO-220AB

MBR10H90CT
MBR10H100CT

PIN 1 — PIN 2
PIN 3 — CASE

ITO-220AB

MBRF10H90CT
MBRF10H100CT

PIN 1 — PIN 2
PIN 3

TO-263AB

K

MBRB10H90CT
MBRB10H100CT

PIN 1 — K
PIN 2 — HEATSINK

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-220AB and ITO-220AB package)
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Pb-free

e3

RoHS
COMPLIANT

TYPICAL APPLICATIONS

For use in high frequency rectifier of switching mode power supplies, freewheeling diodes, dc-to-dc converters or polarity protection application.

MECHANICAL DATA

Case: TO-220AB, ITO-220AB, 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

$I_{F(AV)}$	5 A x 2
V_{RRM}	90 V, 100 V
I_{FSM}	150 A
V_F	0.61 V
I_R	3.5 μA
T_J max.	175 °C

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

PARAMETER		SYMBOL	MBR10H90CT	MBR10H100CT	UNIT
Maximum repetitive peak reverse voltage		V_{RRM}	90	100	V
Working peak reverse voltage		V_{RWM}	90	100	V
Maximum DC blocking voltage		V_{DC}	90	100	V
Maximum average forward rectified current at T_C = 105 °C	total device per diode	$I_{F(AV)}$	10 5.0		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load per diode		I_{FSM}	150		A
Peak repetitive reverse current per diode at t_p = 2 μs, 1 kHz		I_{RRM}	0.5		A
Voltage rate of change (rated V_R)		dV/dt	10 000		V/μs
Operating junction and storage temperature range		T_J, T_{STG}	- 65 to + 175		°C
Isolation voltage (ITO-220AB only) from terminals to heatsink t = 1 min		V_{AC}	1500		V

MBR(F,B)10H90CT & MBR(F,B)10H100CT

Vishay General Semiconductor

ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage per diode [1]	I_F = 5.0 A I_F = 5.0 A I_F = 10 A I_F = 10 A	T_J = 25 °C T_J = 125 °C T_J = 25 °C T_J = 125 °C	V_F	0.76 0.61 0.85 0.71	V
Maximum reverse current per diode at working peak reverse voltage [1]		T_J = 25 °C T_J = 100 °C	I_R	3.5 4.5	µA mA

Note:

(1) Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T_C = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	MBR	MBRF	MBRB	UNIT
Typical thermal resistance per diode	$R_{\theta JC}$	2.2	5.2	2.2	°C/W

ORDERING INFORMATION (Example)

PACKAGE	PREFERRED P/N	UNIT WEIGHT (g)	PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
TO-220AB	MBR10H100CT-E3/45	1.85	45	50/tube	Tube
ITO-220AB	MBRF10H100CT-E3/45	1.79	45	50/tube	Tube
TO-263AB	MBRB10H100CT-E3/45	1.35	45	50/tube	Tube
TO-263AB	MBRB10H100CT-E3/81	1.35	81	800/reel	Tape reel
TO-220AB	MBR10H100CTHE3/45 [1]	1.85	45	50/tube	Tube
ITO-220AB	MBRF10H100CTHE3/45 [1]	1.79	45	50/tube	Tube
TO-263AB	MBRB10H100CTHE3/45 [1]	1.35	45	50/tube	Tube
TO-263AB	MBRB10H100CTHE3/81 [1]	1.35	81	800/reel	Tape reel

Note:

(1) Automotive grade AEC Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

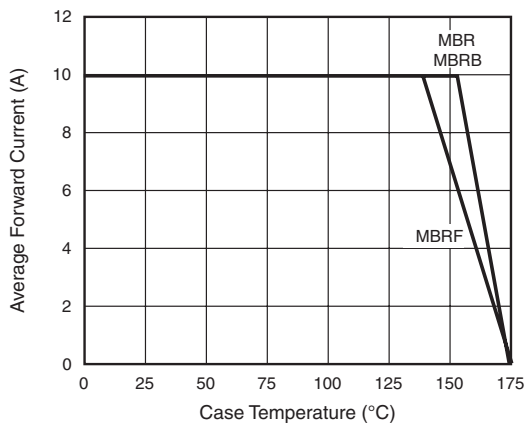(T_A = 25 °C unless otherwise noted)
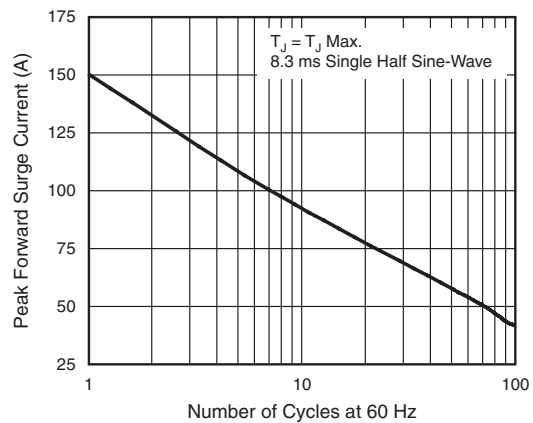

Figure 1. Forward Derating Curve Per Diode

Figure 2. Maximum Non-Repetitive Peak Forward Surge Current Per Diode
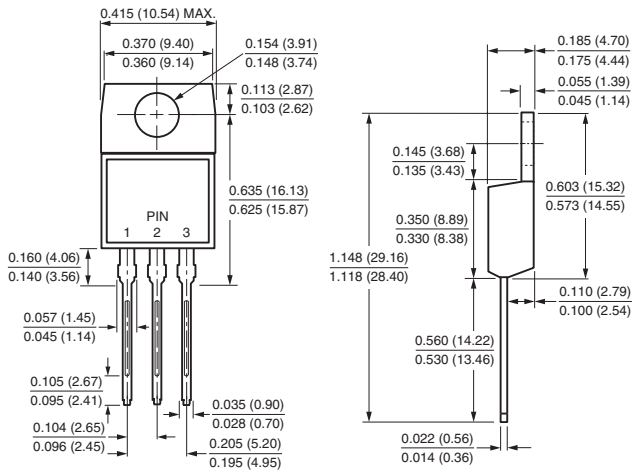
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Vishay General Semiconductor

VISHAY

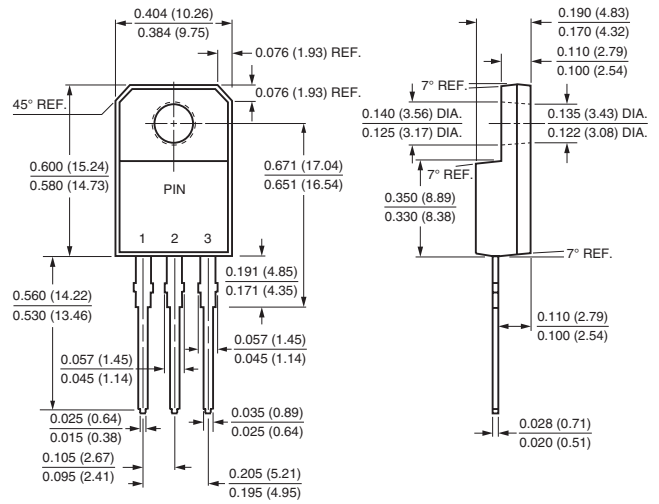## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

TO-220AB

0.415 (10.54) MAX.
0.370 (9.40) / 0.360 (9.14)
0.154 (3.91) / 0.148 (3.74)
0.113 (2.87) / 0.103 (2.62)
0.635 (16.13) / 0.625 (15.87)
PIN 1 2 3
0.160 (4.06) / 0.140 (3.56)
0.057 (1.45) / 0.045 (1.14)
0.105 (2.67) / 0.095 (2.41)
0.104 (2.65) / 0.096 (2.45)
0.035 (0.90) / 0.028 (0.70)
0.205 (5.20) / 0.195 (4.95)

0.185 (4.70) / 0.175 (4.44)
0.055 (1.39) / 0.045 (1.14)
0.145 (3.68) / 0.135 (3.43)
0.603 (15.32) / 0.573 (14.55)
0.350 (8.89) / 0.330 (8.38)
1.148 (29.16) / 1.118 (28.40)
0.110 (2.79) / 0.100 (2.54)
0.560 (14.22) / 0.530 (13.46)
0.022 (0.56) / 0.014 (0.36)

ITO-220AB

0.404 (10.26) / 0.384 (9.75)
0.076 (1.93) REF.
0.076 (1.93) REF.
45° REF.
0.600 (15.24) / 0.580 (14.73)
PIN 1 2 3
0.671 (17.04) / 0.651 (16.54)
0.560 (14.22) / 0.530 (13.46)
0.191 (4.85) / 0.171 (4.35)
0.057 (1.45) / 0.045 (1.14)
0.025 (0.64) / 0.015 (0.38)
0.035 (0.89) / 0.025 (0.64)
0.105 (2.67) / 0.095 (2.41)
0.205 (5.21) / 0.195 (4.95)

0.190 (4.83) / 0.170 (4.32)
0.110 (2.79) / 0.100 (2.54)
7° REF.
0.140 (3.56) DIA. / 0.125 (3.17) DIA.
0.135 (3.43) DIA. / 0.122 (3.08) DIA.
7° REF.
0.350 (8.89) / 0.330 (8.38)
7° REF.
0.110 (2.79) / 0.100 (2.54)
0.028 (0.71) / 0.020 (0.51)

TO-263AB

0.411 (10.45) / 0.380 (9.65)
0.245 (6.22) MIN.
K
0.360 (9.14) / 0.320 (8.13)
0.624 (15.85) / 0.591 (15.00)
1 K 2
0.037 (0.940) / 0.027 (0.686)
0.105 (2.67) / 0.095 (2.41)
0.205 (5.20) / 0.195 (4.95)

0.190 (4.83) / 0.160 (4.06)
0.055 (1.40) / 0.045 (1.14)
0.055 (1.40) / 0.047 (1.19)
0 to 0.01 (0 to 0.254)
0.110 (2.79) / 0.090 (2.29)
0.021 (0.53) / 0.014 (0.36)
0.140 (3.56) / 0.110 (2.79)

Mounting Pad Layout

0.42 (10.66) MIN.
0.33 (8.38) MIN.
0.670 (17.02) / 0.591 (15.00)
0.15 (3.81) MIN.
0.08 (2.032) MIN.
0.105 (2.67) / 0.095 (2.41)

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