

MBR440MFS, NRVB440MFS

SWITCHMODE Power Rectifiers

These state-of-the-art devices have the following features:

Features

- Low Power Loss / High Efficiency
- New Package Provides Capability of Inspection and Probe After Board Mounting
- Guardring for Stress Protection
- Low Forward Voltage Drop
- 175°C Operating Junction Temperature
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- WF Suffix for Products with Wettable Flanks
- These are Pb-Free and Halide-Free Devices

Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets Flammability Rating UL 94-0 @ 0.125 in.
- Lead Finish: 100% Matte Sn (Tin)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL 1 Requirements

Applications

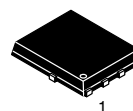
- Ideally Suited for use as an Output Rectifier in High Frequency (up to 2 MHz) Automotive and Non-Automotive Applications
- Output Rectification in Compact Portable Consumer Applications
- Freewheeling Diode used with Inductive Loads



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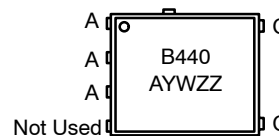
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**SCHOTTKY BARRIER
RECTIFIERS
4 AMPERES
40 VOLTS**



**SO-8 FLAT LEAD
CASE 488AA
STYLE 2**

MARKING DIAGRAM



B440 = Specific Device Code
A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

ORDERING INFORMATION

Device	Package	Shipping†
MBR440MFST1G	SO-8 FL (Pb-Free)	1500 / Tape & Reel
MBR440MFST3G	SO-8 FL (Pb-Free)	5000 / Tape & Reel
NRVB440MFST1G	SO-8 FL (Pb-Free)	1500 / Tape & Reel
NRVB440MFST3G	SO-8 FL (Pb-Free)	5000 / Tape & Reel
NRVB440MFSWFT1G	SO-8 FL (Pb-Free)	1500 / Tape & Reel
NRVB440MFSWFT3G	SO-8 FL (Pb-Free)	5000 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	40	V
Average Rectified Forward Current (Rated V_R , $T_C = 165^\circ\text{C}$)	$I_{F(AV)}$	4.0	A
Peak Repetitive Forward Current, (Rated V_R , Square Wave, 20 kHz, $T_C = 165^\circ\text{C}$)	I_{FRM}	8.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	40	A
Storage Temperature Range	T_{stg}	-65 to +175	$^\circ\text{C}$
Operating Junction Temperature	T_J	-55 to +175	$^\circ\text{C}$
Unclamped Inductive Switching Energy (10 mH Inductor, Non-repetitive)	E_{AS}	10	mJ
ESD Rating (Human Body Model)		3B	
ESD Rating (Machine Model)		M4	

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance, Junction-to-Case, Steady State (Assumes 600 mm ² 1 oz. copper bond pad, on a FR4 board)	$R_{\theta JC}$	-	2.4	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS

Instantaneous Forward Voltage (Note 1) ($i_F = 4$ Amps, $T_J = 125^\circ\text{C}$) ($i_F = 4$ Amps, $T_J = 25^\circ\text{C}$)	V_F	0.58 0.59	0.63 0.65	V
Instantaneous Reverse Current (Note 1) (Rated dc Voltage, $T_J = 125^\circ\text{C}$) (Rated dc Voltage, $T_J = 25^\circ\text{C}$)	i_R	10 0.070	15 0.8	mA

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

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TYPICAL CHARACTERISTICS

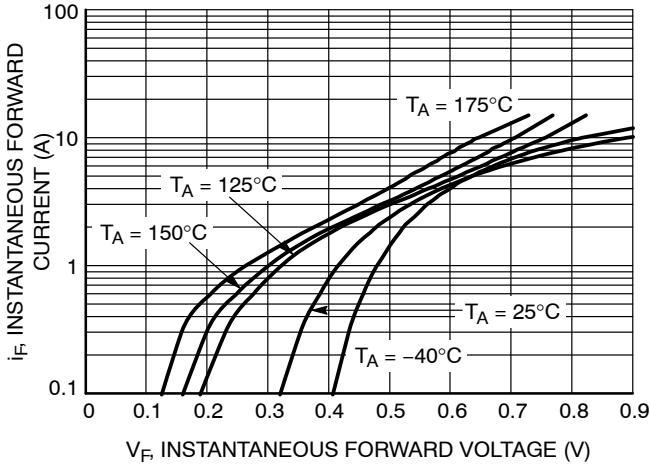


Figure 1. Typical Instantaneous Forward Characteristics

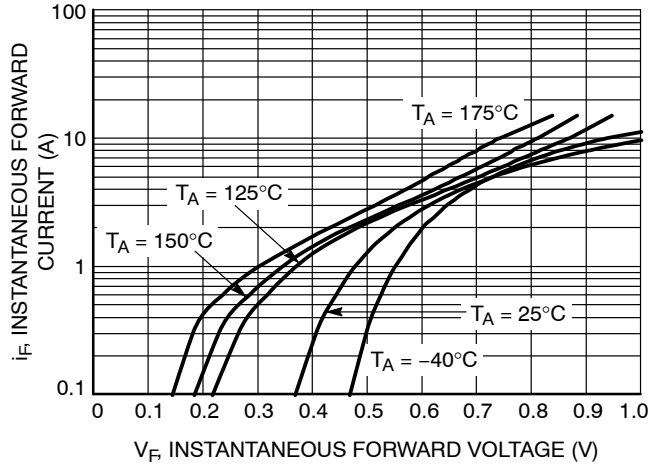


Figure 2. Maximum Instantaneous Forward Characteristics

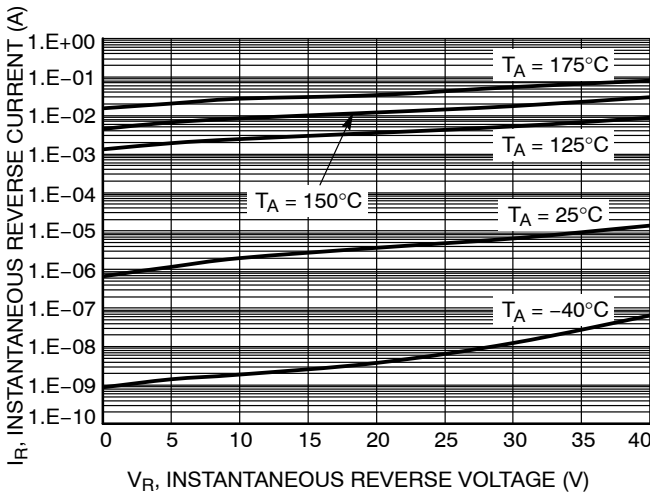


Figure 3. Typical Reverse Characteristics

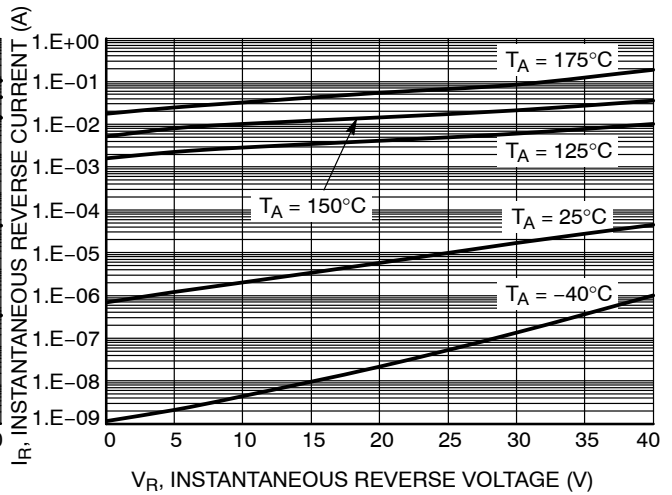


Figure 4. Maximum Reverse Characteristics

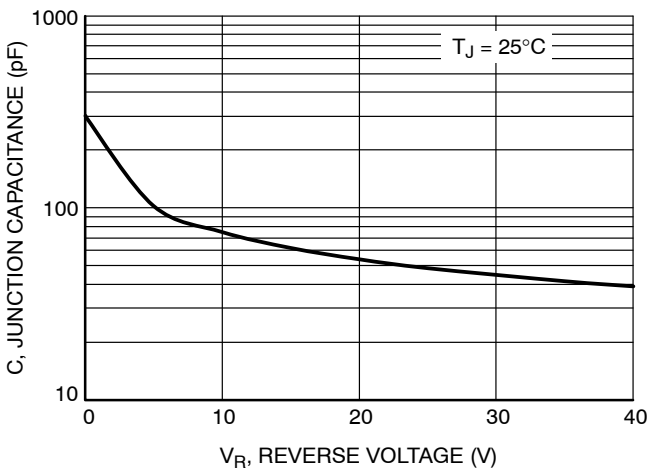


Figure 5. Typical Junction Capacitance

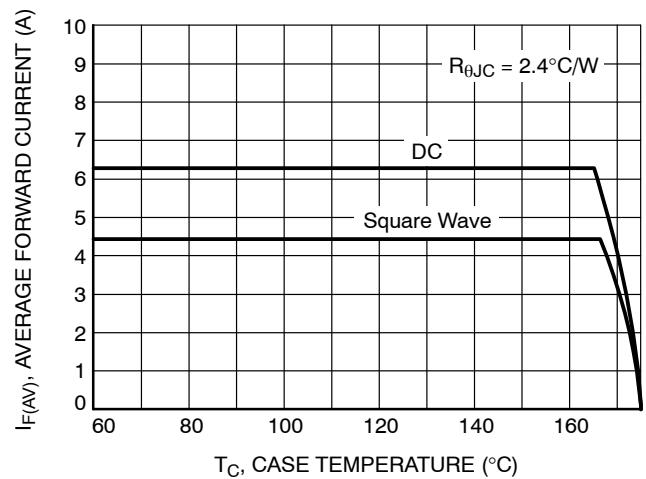


Figure 6. Current Derating TO-220AB

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TYPICAL CHARACTERISTICS

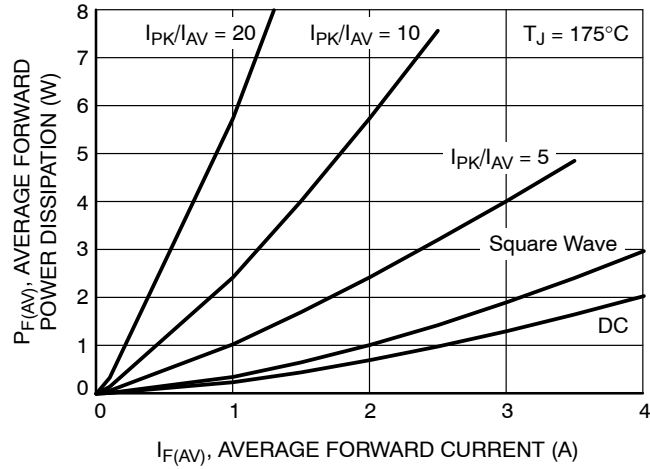


Figure 7. Forward Power Dissipation

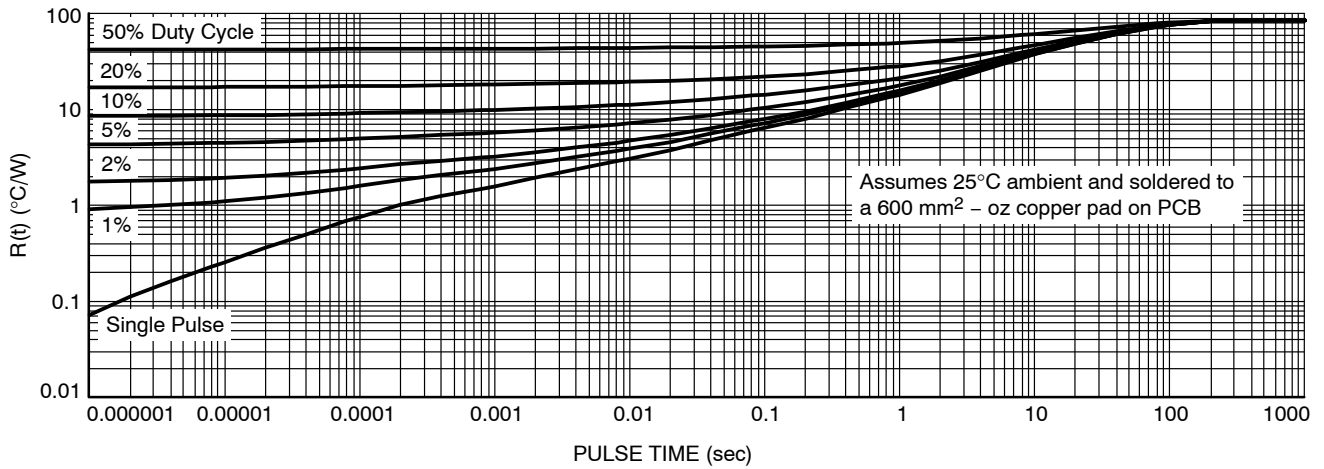


Figure 8. Thermal Characteristics

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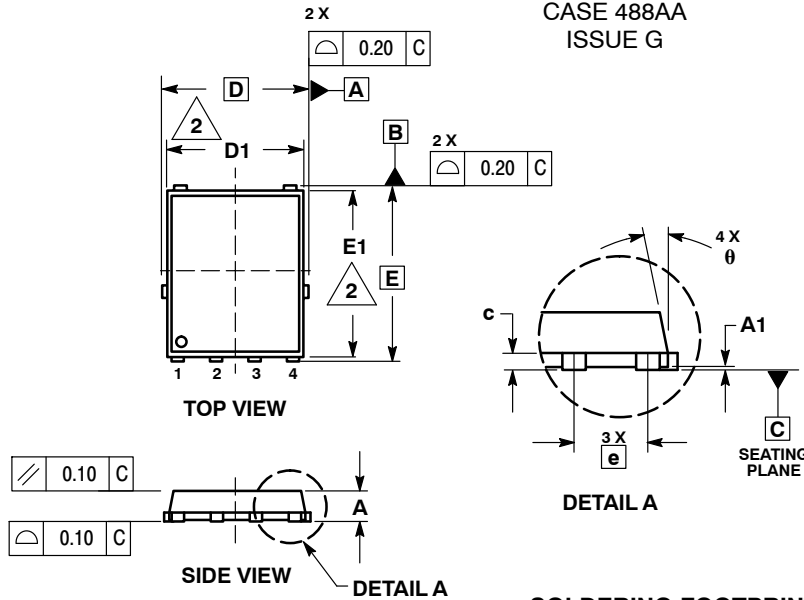
PACKAGE DIMENSIONS

DFN5 5x6, 1.27P
(SO-8FL)
CASE 488AA
ISSUE G

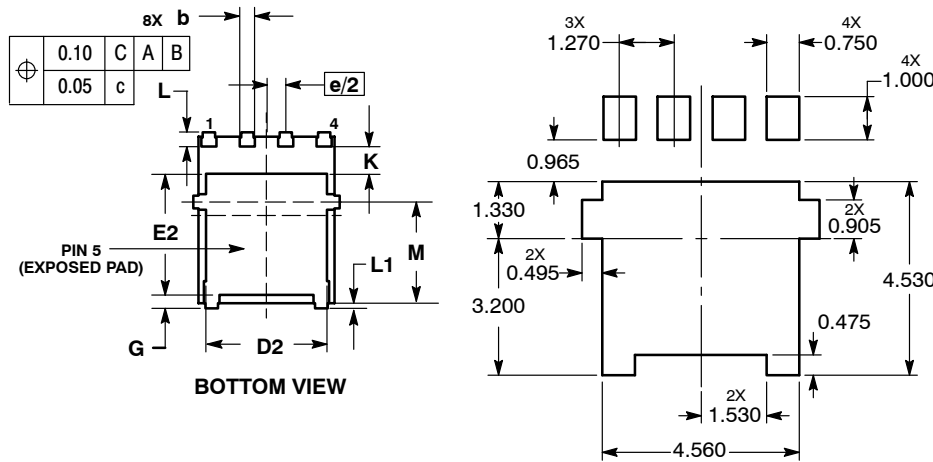
NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.90	1.00	1.10
A1	0.00	----	0.05
b	0.33	0.41	0.51
c	0.23	0.28	0.33
D	5.15 BSC		
D1	4.50	4.90	5.10
D2	3.50	----	4.22
E	6.15 BSC		
E1	5.50	5.80	6.10
E2	3.45	----	4.30
e	1.27 BSC		
G	0.51	0.61	0.71
K	1.20	1.35	1.50
L	0.51	0.61	0.71
L1	0.05	0.17	0.20
M	3.00	3.40	3.80
θ	0 °	----	12 °



SOLDERING FOOTPRINT*



STYLE 2:

1. ANODE
2. ANODE
3. ANODE
4. NO CONNECT
5. CATHODE

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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