MBR2045MFS, NRVB2045MFS

Switch Mode 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
- 150°C Operating Junction Temperature
- Wettable Flacks Option Available
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable*
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS Compliant

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

- Output Rectification in Compact Portable Consumer Applications
- Freewheeling Diode used with Inductive Loads

ON Semiconductor®

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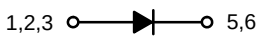
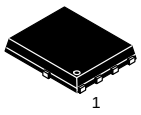
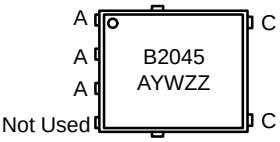
SCHOTTKY BARRIER RECTIFIERS 20 AMPERES 45 VOLTS





SO−8 FLAT LEAD CASE 488AA STYLE 2

MARKING DIAGRAM



B2045	= Specific Device Code
A	= Assembly Location
Y	= Year
W	= Work Week
ZZ	= Lot Traceability

ORDERING INFORMATION

Device	Package	Shipping†
MBR2045MFST1G	SO−8 FL (Pb−Free)	1500 / Tape & Reel
NRVB2045MFST1G*	SO−8 FL (Pb−Free)	1500 / Tape & Reel
MBR2045MFST3G	SO−8 FL (Pb−Free)	5000 / Tape & Reel
NRVB2045MFST3G*	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	 45	V
Average Rectified Forward Current (Rated V_R, T_C = 130°C)	$I_{F(AV)}$	20	A
Peak Repetitive Forward Current, (Rated V_R, Square Wave, 20 kHz, T_C = 135°C)	I_{FRM}	40	A
Non−Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	400	A
Storage Temperature Range	T_{stg}	−65 to +175	°C
Operating Junction Temperature	T_J	−55 to +150	°C
Unclamped Inductive Switching Energy (10 mH Inductor, Non−repetitive)	E_{AS}	150	mJ
ESD Rating (Human Body Model)		3B	
ESD Rating (Machine Model)		M4	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

NOTE: The heat generated must be less than the thermal conductivity from Junction−to−Ambient: dPD/dTJ < 1/RJA

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)	$R_{\theta JC}$	−	1.6	°C/W
Thermal Resistance, Junction−to−Ambient, Steady State (Assumes 600 mm^2, 2−oz, 2 layer on a FR4 board)	$R_{\theta JA}$	−	45	°C/W

ELECTRICAL CHARACTERISTICS

Instantaneous Forward Voltage (Note 1) (i_F = 15 A, T_J = 125°C) (i_F = 15 A, T_J = 25°C) (i_F = 30 A, T_J = 125°C) (i_F = 30 A, T_J = 25°C)	v_F	 0.35 0.44 0.46 0.51	 0.41 0.49 0.58 0.61	V
Instantaneous Reverse Current (Note 1) (Rated dc Voltage, T_J = 125°C) (Rated dc Voltage, T_J = 25°C)	i_R	 200 0.3	 300 0.6	mA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

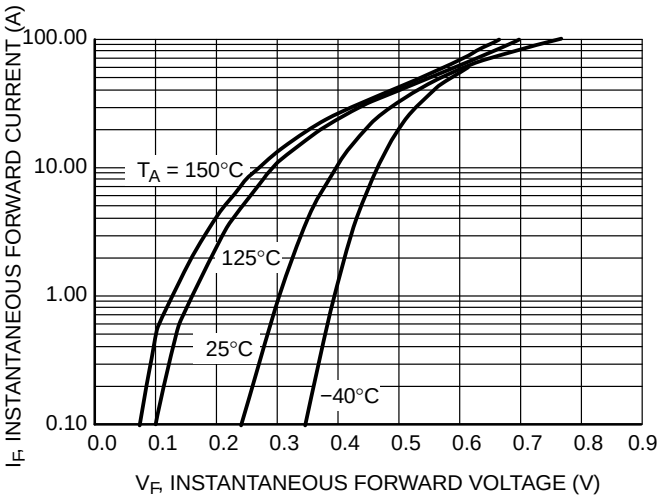


Figure 1. Typical Instantaneous Forward Voltage

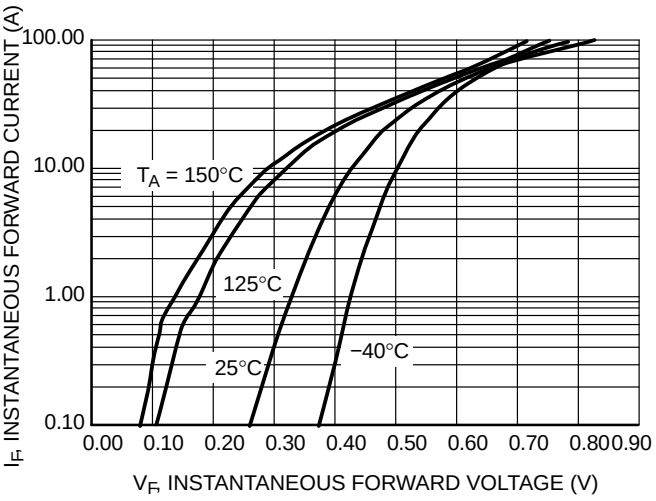


Figure 2. Maximum Instantaneous Forward Voltage

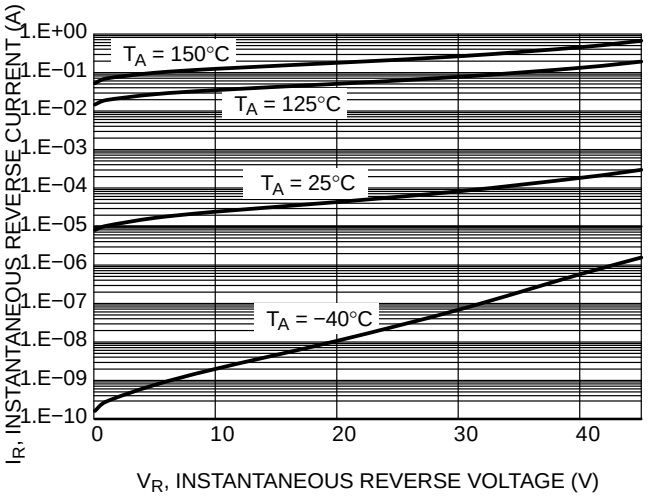


Figure 3. Typical Reverse Characteristics

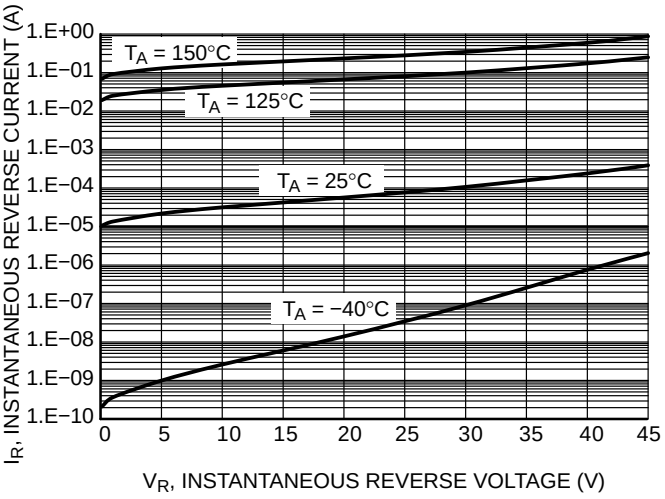


Figure 4. Maximum Reverse Characteristics

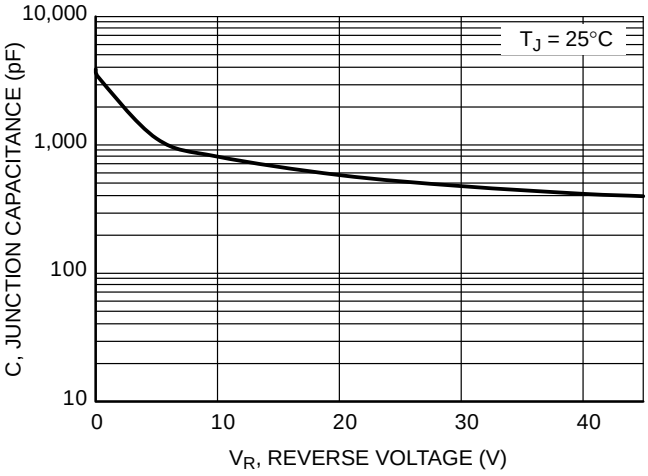


Figure 5. Typical Junction Capacitance

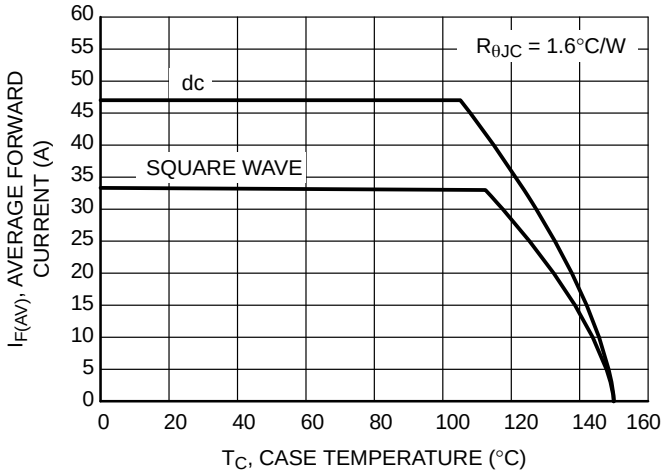


Figure 6. Current Derating TO−220AB

TYPICAL CHARACTERISTICS

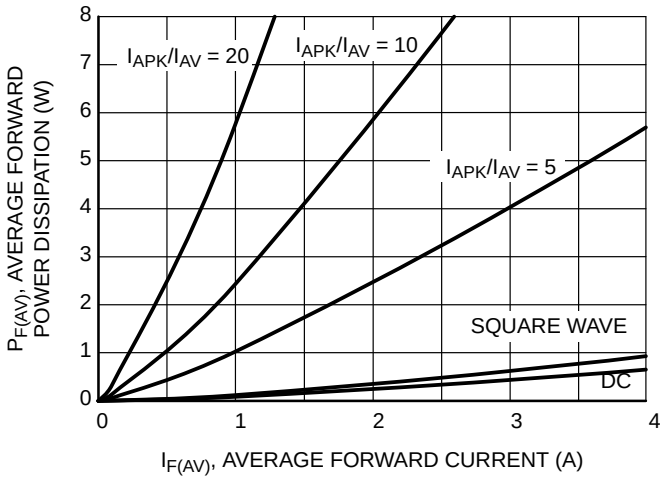


Figure 7. Forward Power Dissipation

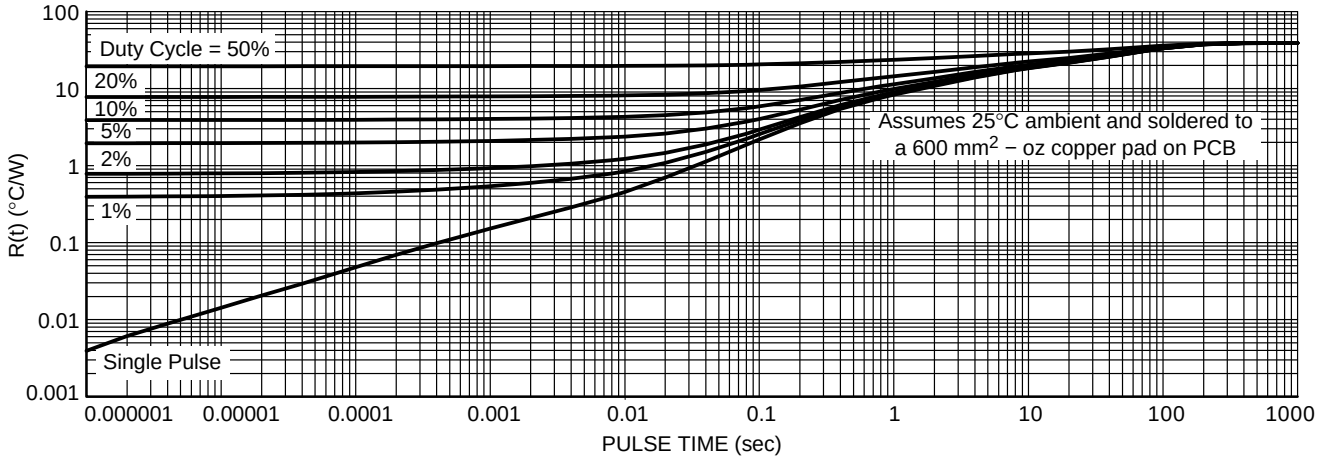
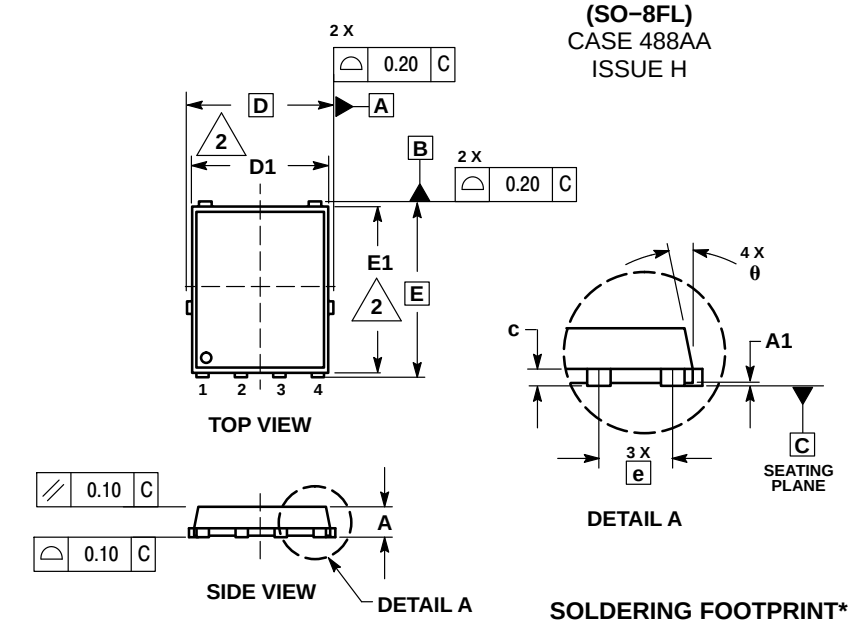
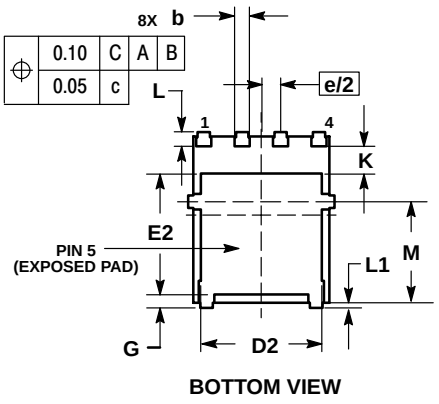


Figure 8. Thermal Response

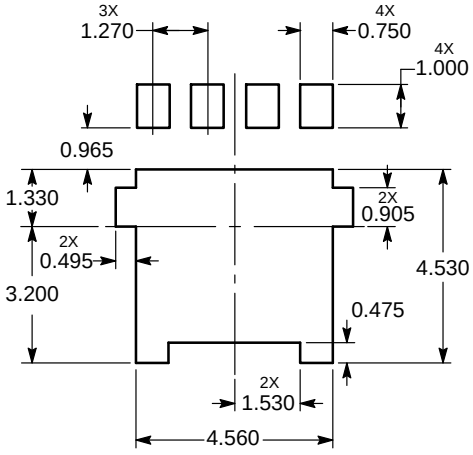
PACKAGE DIMENSIONS

DFN5 5x6, 1.27P
(SO−8FL)
CASE 488AA
ISSUE H





SOLDERING FOOTPRINT*



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.

	MILLIMETERS		
DIM	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	4.70	4.90	5.10
D2	3.80	4.00	4.20
E		6.15 BSC	
E1	5.70	5.90	6.10
E2	3.45	3.65	3.85
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 °

STYLE 2:
PIN 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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