Switch-mode Power Rectifiers

MBR2045EMFS, NRVB2045EMFS

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
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q101 Qualified and PPAP Capable
- These are Pb−Free and Halide−Free Devices

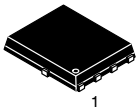
Mechanical Characteristics:

- 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

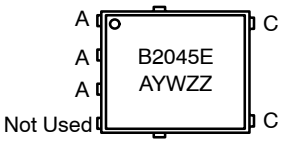
- Excellent Alternative to DPAK in Space−Constrained Automotive Applications
- Output Rectification in Compact Portable Consumer Applications
- Freewheeling Diode used with Inductive Loads

SCHOTTKY BARRIER RECTIFIERS 20 AMPERES 45 VOLTS



SO−8 FLAT LEAD CASE 488AA STYLE 2

MARKINGDIAGRAM



B2045E	= Specific Device Code
A	= Assembly Location
Y	= Year
W	= Work Week
ZZ	= Lot Traceability

ORDERING INFORMATION

Device	Package	Shipping†
NRVB2045EMFST1G	SO−8 FL (Pb−Free)	1,500 / Tape & Reel
NRVB2045EMFST3G	SO−8 FL (Pb−Free)	5,000 / Tape & Reel

DISCONTINUED (Note 1)

MBR2045EMFST1G	SO−8 FL (Pb−Free)	1,500 / Tape & Reel
MBR2045EMFST3G	SO−8 FL (Pb−Free)	5,000 / 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.

1. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.

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MAXIMUM RATINGS

Symbol	Rating	Value	Unit
V_{RRM} V_{RWM} V_R	Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	 45	V
$I_{F(AV)}$	Average Rectified Forward Current (Rated V_R, T_C = 130°C)	20	A
I_{FRM}	Peak Repetitive Forward Current, (Rated V_R, Square Wave, 20 kHz, T_C = 120°C)	40	A
I_{FSM}	Non−Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	400	A
T_{stg}	Storage Temperature Range	−65 to +175	°C
T_J	Operating Junction Temperature	−55 to +150	°C
E_{AS}	Unclamped Inductive Switching Energy (10 mH Inductor, Non−repetitive)	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

Symbol	Characteristic	Typ	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction−to−Case, Steady State (Assumes 600 mm^2 1 oz. copper bond pad, on a FR4 board)	−	1.6	°C/W

ELECTRICAL CHARACTERISTICS

Symbol	Characteristic	Typ	Max	Unit
V_F	Instantaneous Forward Voltage (Note 1) (i_F = 10 A, T_J = 125°C) (i_F = 10 A, T_J = 25°C) (i_F = 20 A, T_J = 125°C) (i_F = 20 A, T_J = 25°C)	 0.35 0.45 0.43 0.51	 0.47 0.56 0.58 0.64	V
i_R	Instantaneous Reverse Current (Note 1) (Rated dc Voltage, T_J = 125°C) (Rated dc Voltage, T_J = 25°C)	 48 0.09	 100 0.40	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

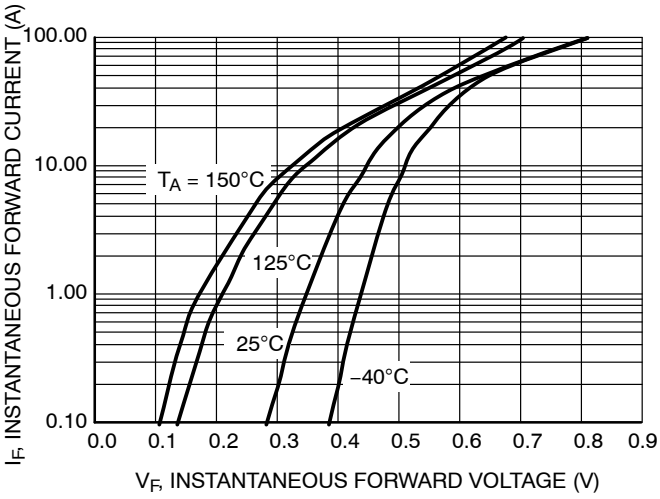


Figure 1. Typical Instantaneous Forward Voltage

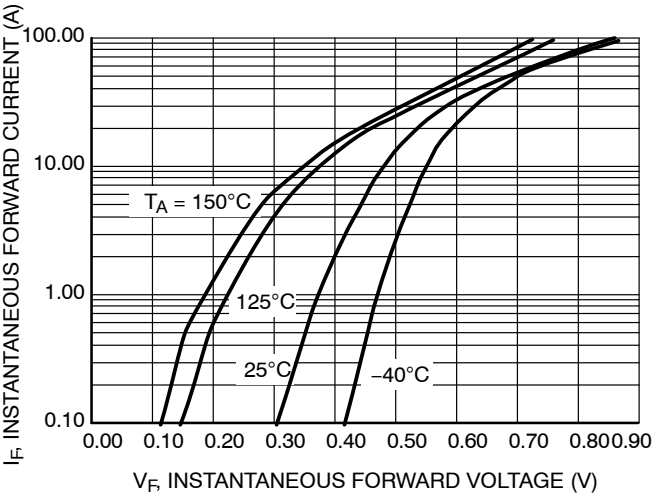


Figure 2. Maximum Instantaneous Forward Voltage

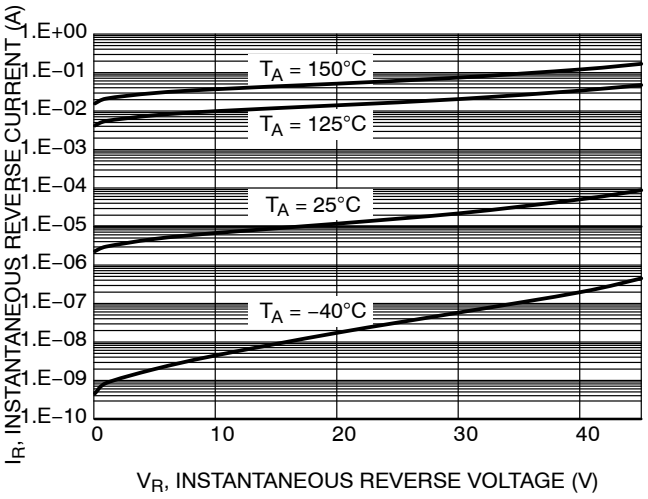


Figure 3. Typical Reverse Characteristics

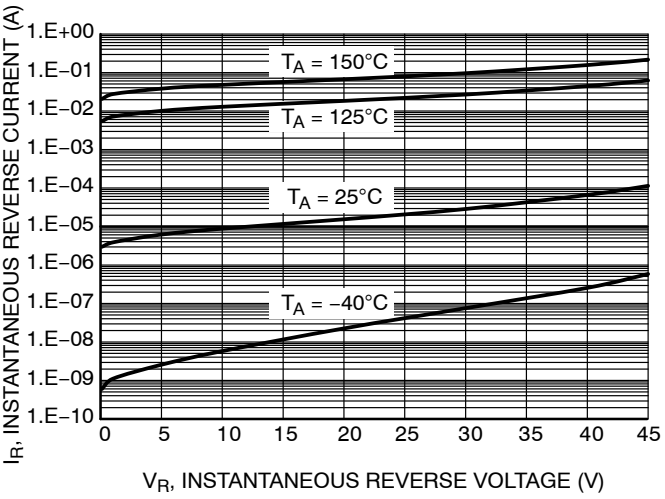


Figure 4. Maximum Reverse Characteristics

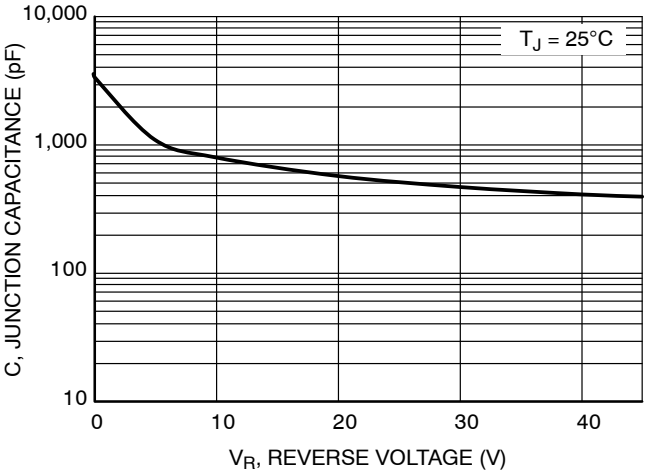


Figure 5. Typical Junction Capacitance

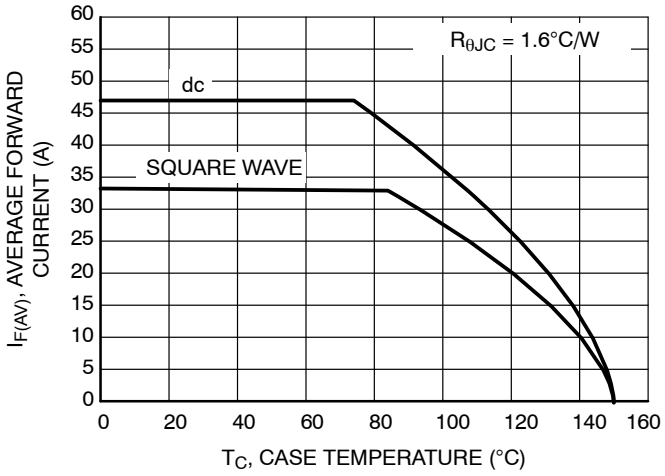


Figure 6. Current Derating

TYPICAL CHARACTERISTICS (continued)

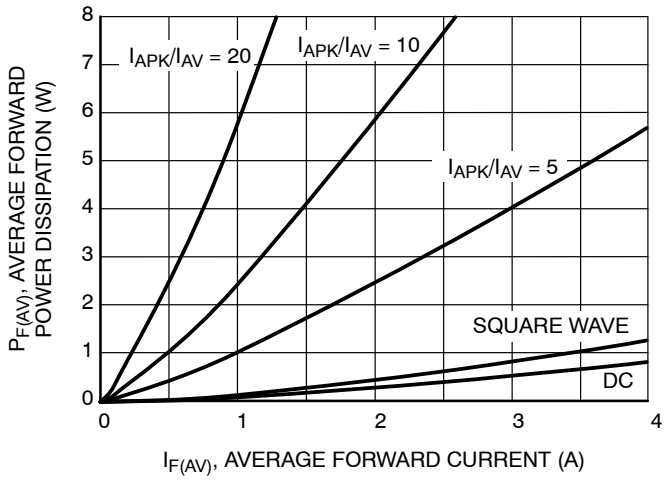


Figure 7. Forward Power Dissipation

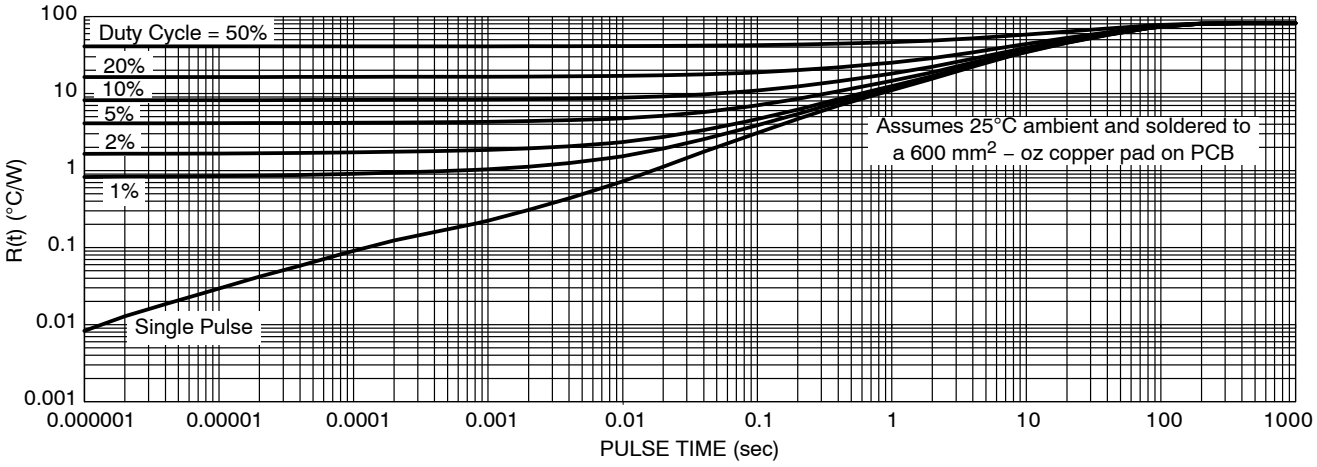
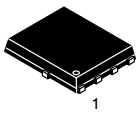


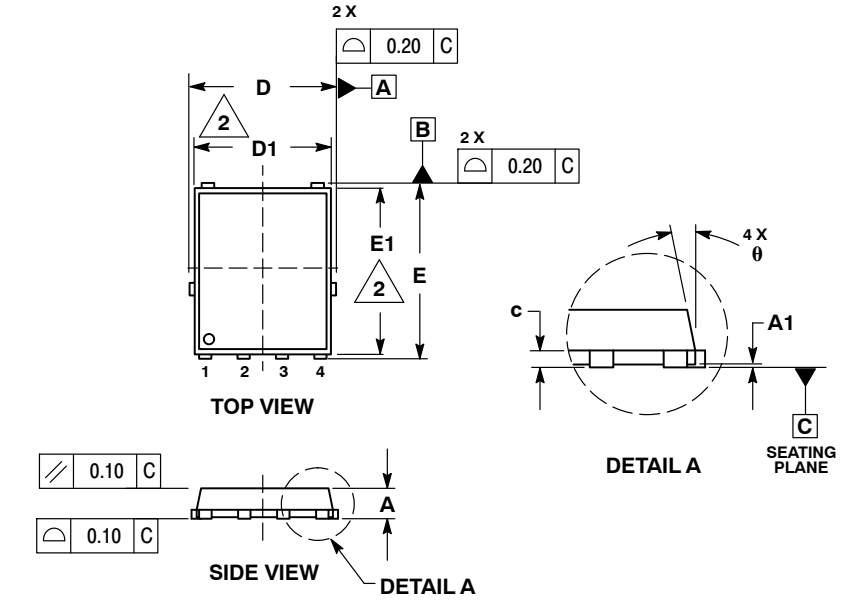
Figure 8. Thermal Response



SCALE 2:1

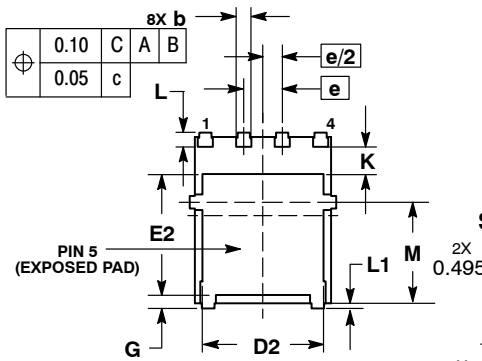
DFN5 5x6, 1.27P
(SO−8FL)
CASE 488AA
ISSUE N

DATE 25 JUN 2018

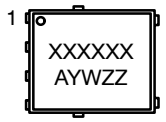


NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

	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	5.00	5.15	5.30
D1	4.70	4.90	5.10
D2	3.80	4.00	4.20
E	6.00	6.15	6.30
E1	5.70	5.90	6.10
E2	3.45	3.65	3.85
e	1.27 BSC		
G	0.51	0.575	0.71
K	1.20	1.35	1.50
L	0.51	0.575	0.71
L1	0.125 REF		
M	3.00	3.40	3.80
θ	0 °	–––	12 °



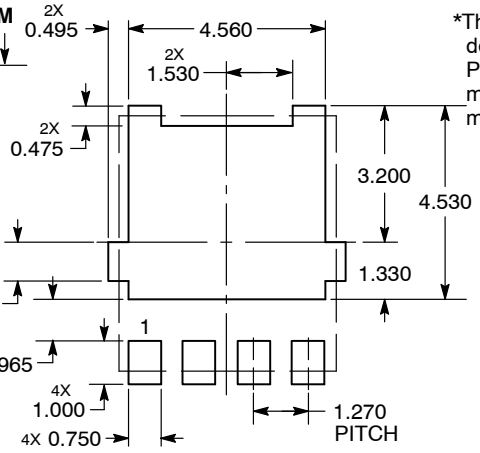
GENERIC MARKING DIAGRAM*



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

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “ ▪”, may or may not be present. Some products may not follow the Generic Marking.

RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

STYLE 1:
PIN 1. SOURCE
2. SOURCE
3. SOURCE
4. GATE
5. DRAIN

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 **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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DESCRIPTION:	**DFN5 5x6, 1.27P (SO−8FL)**		**PAGE 1 OF 1**

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