Surface Mount Schottky Power Rectifier

MBRAF440, NRVBAF440

SCHOTTKY BARRIER RECTIFIER 4.0 AMPERE 40 VOLTS

This device employs the Schottky Barrier principle in a large area metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency rectification, or as free wheeling and polarity protection diodes in surface mount applications where compact size and weight are critical to the system.

Features

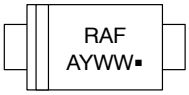
- Low Profile Package for Space Constrained Applications
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- 150 °C Operating Junction Temperature
- Guard−Ring for Stress Protection
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These are Pb−Free and Halide−Free Devices

Mechanical Charactersistics

- Case: Epoxy, Molded, Epoxy Meets UL 94, V-0
- Weight: 95 mg (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260 °C Max. for 10 Seconds
- Cathode Polarity Band
- Device Meets MSL 1 Requirements

SMA−FL
CASE 403AA
STYLE 6

MARKING DIAGRAM



RAF	= Specific Device Code
A	= Assembly Location
Y	= Year
WW	= Work Week
▪	= Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping†
MBRAF440T3G	SMA−FL (Pb−Free)	5000 / Tape & Reel
NRVBAF440T3G	SMA−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 (At Rated V_R, T_L = 107 °C)	I_O	4.0	A
Non−Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	100	A
Storage/Operating Case Temperature	T_{stg}, T_C	−55 to +150	°C
Operating Junction Temperature (Note 1)	T_J	−55 to +150	°C
Voltage Rate of Change (Rated V_R, T_J = 25 °C)	dv/dt	10,000	V/μs
ESD Rating Human Body Model Machine Model	ESD_{HBM} ESD_{MM}	3B 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.

1. The heat generated must be less than the thermal conductivity from Junction-to-Ambient: $dP_D/dT_J < 1/R_{\theta JA}$.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance - Junction-to-Lead (Note 2) Thermal Resistance - Junction-to-Ambient (Note 2)	$R_{\theta JL}$ $R_{\theta JA}$	25 90	°C/W

2. 1 inch square pad size (1 × 0.5 inch) for each lead on FR4 board.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value		Unit
Maximum Instantaneous Forward Voltage (Note 3) (I_F = 4.0 A)	V_F	**T_J = 25 °C**	**T_J = 100 °C**	V
		0.485	0.435	
Maximum Instantaneous Reverse Current (V_R = 40 V)	I_R	**T_J = 25 °C**	**T_J = 100 °C**	mA
		0.3	15	

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.

3. Pulse Test: Pulse Width ≤ 250 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

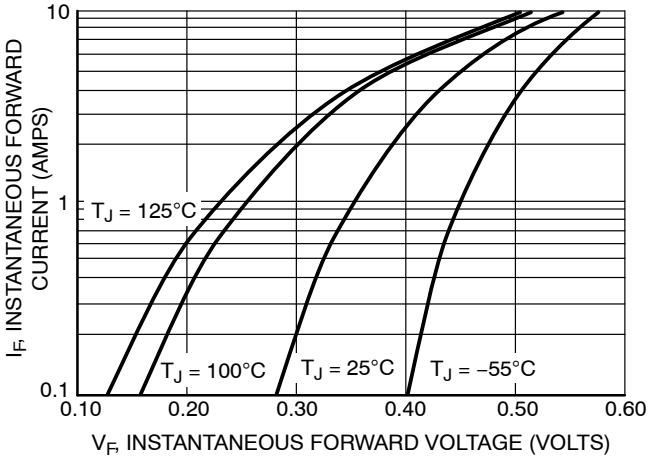


Figure 1. Typical Forward Voltage

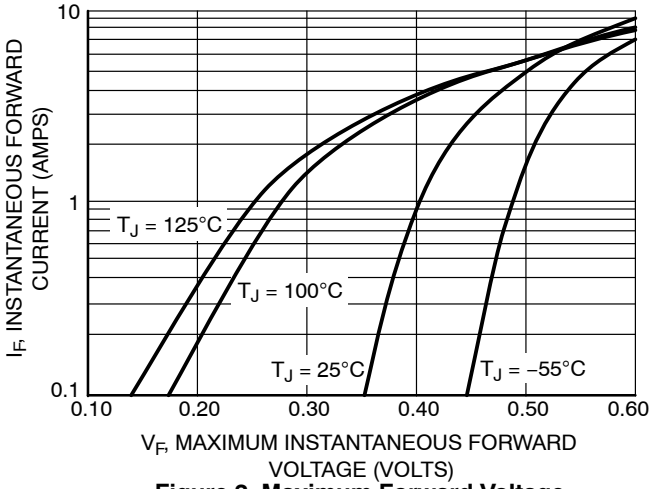


Figure 2. Maximum Forward Voltage

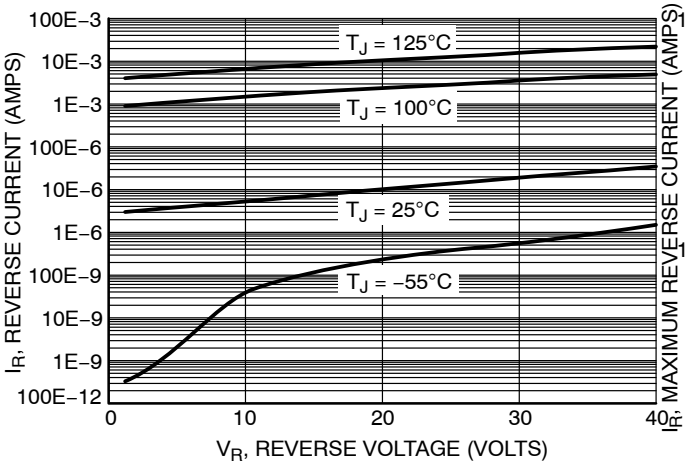


Figure 3. Typical Reverse Current

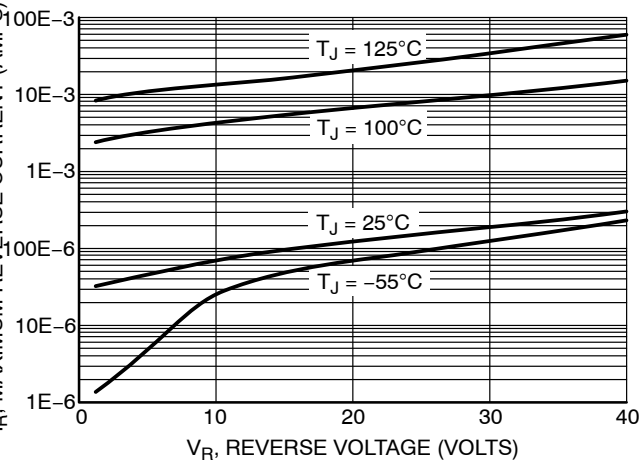


Figure 4. Maximum Reverse Current

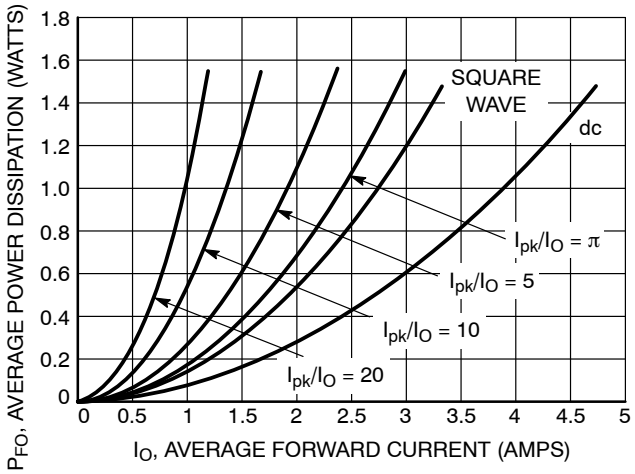


Figure 5. Forward Power Dissipation

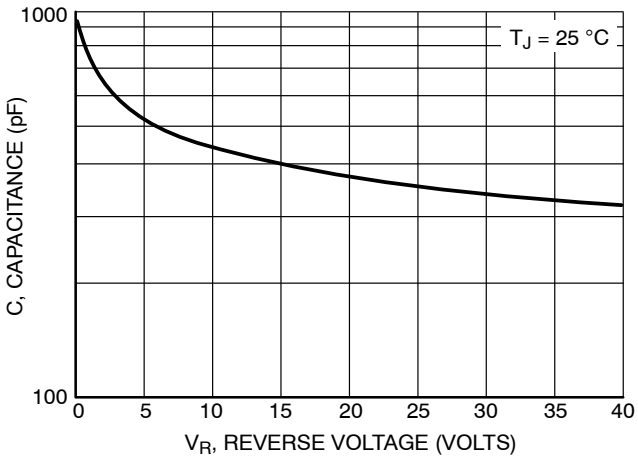


Figure 6. Capacitance

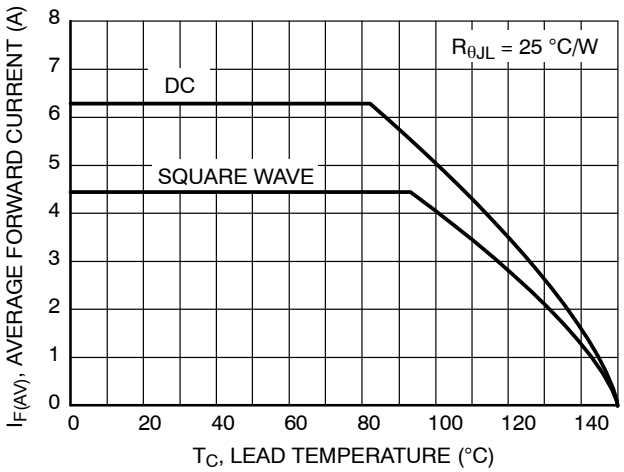


Figure 7. Current Derating

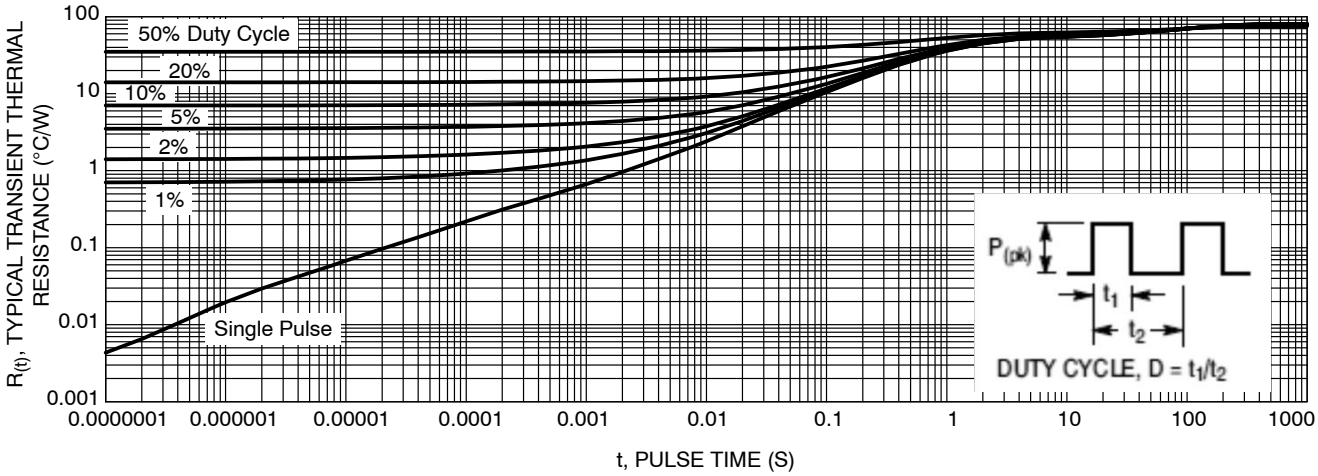
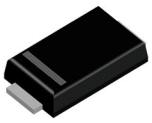
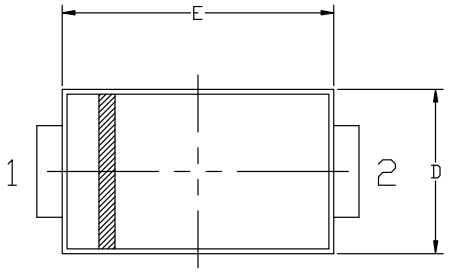


Figure 8. Typical Transient Thermal Response, Junction−to−Ambient

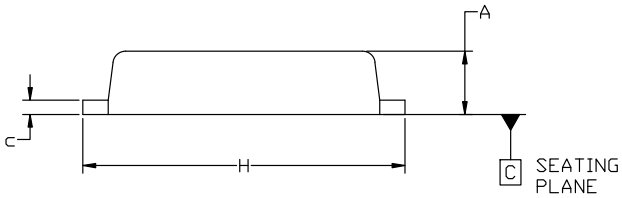


SMA 2.60x4.30x1.00
CASE 403AA
ISSUE A

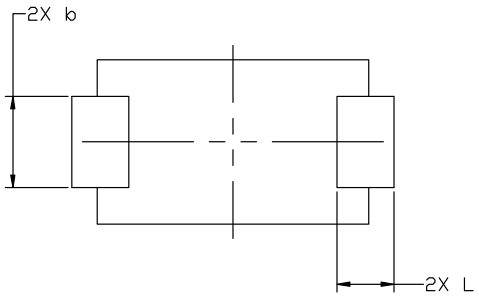
DATE 18 JAN 2024



TOP VIEW



SIDE VIEW

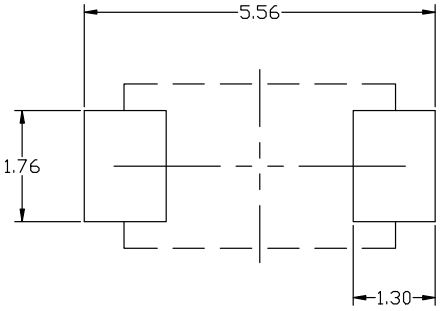


BOTTOM VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING AS PER ASME Y14.5M, 2018.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. FL

MILLIMETERS			
DIM	MIN	NOM	MAX
A	0.90	1.00	1.10
b	1.25	1.45	1.65
c	0.15	0.225	0.30
D	2.40	2.60	2.80
E	4.00	4.30	4.60
H	4.80	5.10	5.40
L	0.70	0.90	1.10



RECOMMENDED MOUNTING FOOTPRINT

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

GENERIC MARKING DIAGRAM*

XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb−Free Package

*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.

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