

MBRA1H100T3G, NRVBA1H100T3G

Surface Mount Schottky Power Rectifier

SMA Power Surface Mount Package

Employing 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 diodes in surface mount applications where compact size and weight are critical to the system.

Features

- Small Compact Surface Mountable Package with J-Bent Leads
- Rectangular Package for Automated Handling
- Highly Stable Oxide Passivated Junction
- Low Forward Voltage Drop
- Guardring for Stress Protection
- AEC-Q101 Qualified and PPAP Capable
- NRVBA Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- This is a Pb-Free Device*

Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 70 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
- Polarity: Cathode Lead Indicated by Polarity Band
- ESD Ratings:
 - ◆ Machine Model = C
 - ◆ Human Body Model = 3B
- Device Meets MSL 1 Requirements



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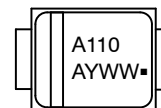
**SCHOTTKY BARRIER
RECTIFIER
1.0 AMPERES, 100 VOLTS**



SMA
CASE 403D
PLASTIC



MARKING DIAGRAMS



A110 = Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping†
MBRA1H100T3G	SMA (Pb-Free)	5,000 / Tape & Reel **
NRVBA1H100T3G	SMA (Pb-Free)	5,000 / Tape & Reel **

** 12 mm Tape, 13" 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.

*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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MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	100	V
Average Rectified Forward Current ($T_L = 167^\circ\text{C}$)	I_O	1.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	50	A
Storage and Operating Junction Temperature Range (Note 1)	T_{stg}, T_J	-65 to +175	$^\circ\text{C}$

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.

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)	Ψ_{JCL}	14	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	75	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (Note 3)	$R_{\theta JA}$	280	$^\circ\text{C}/\text{W}$

2. Mounted with 700 mm² copper pad size (Approximately 1 in²) 1 oz FR4 Board.

3. Mounted with pad size approximately 6 mm² copper, 1 oz FR4 Board.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 4) ($I_F = 1.0 \text{ A}, T_J = 25^\circ\text{C}$) ($I_F = 2.0 \text{ A}, T_J = 25^\circ\text{C}$) ($I_F = 1.0 \text{ A}, T_J = 125^\circ\text{C}$) ($I_F = 2.0 \text{ A}, T_J = 125^\circ\text{C}$)	V_F	0.76 0.84 0.61 0.68	V
Maximum Instantaneous Reverse Current (Note 4) (Rated dc Voltage, $T_J = 25^\circ\text{C}$) (Rated dc Voltage, $T_J = 125^\circ\text{C}$)	I_R	40 0.5	μA mA

4. Pulse Test: Pulse Width $\leq 380 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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TYPICAL CHARACTERISTICS

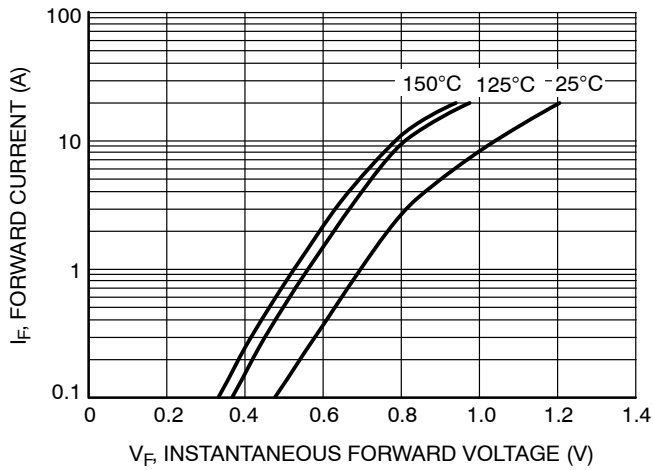


Figure 1. Typical Forward Voltage

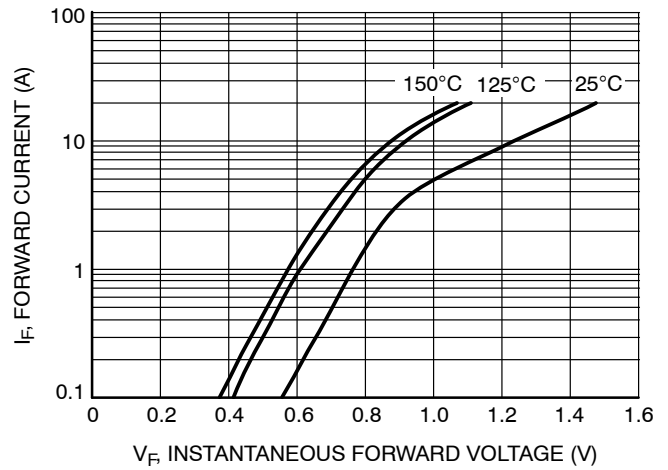


Figure 2. Maximum Forward Voltage

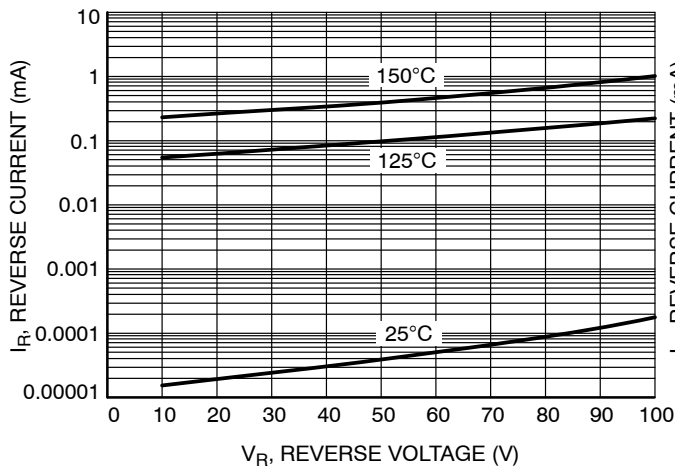


Figure 3. Typical Reverse Current

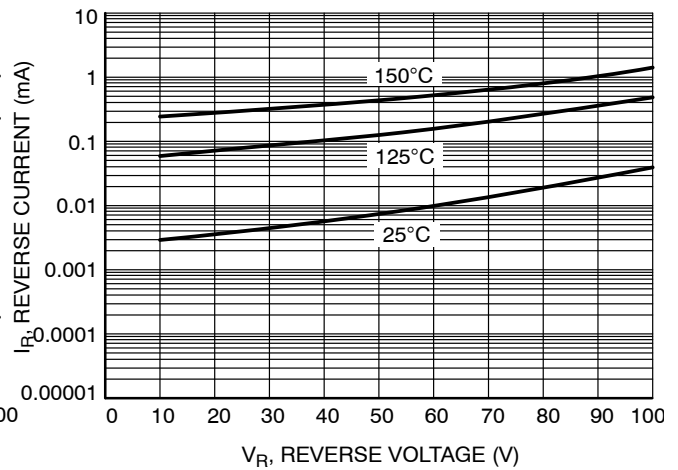


Figure 4. Maximum Reverse Current

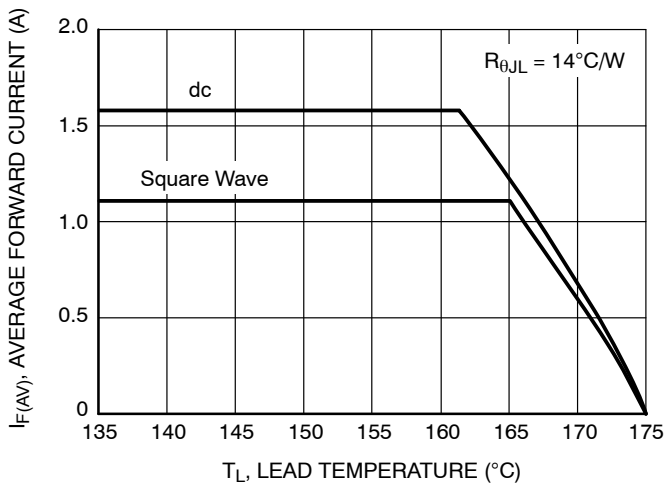


Figure 5. Current Derating

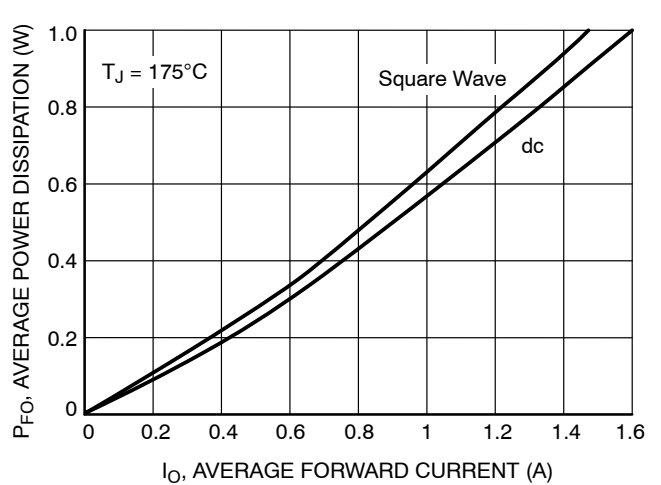


Figure 6. Forward Power Dissipation

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TYPICAL CHARACTERISTICS

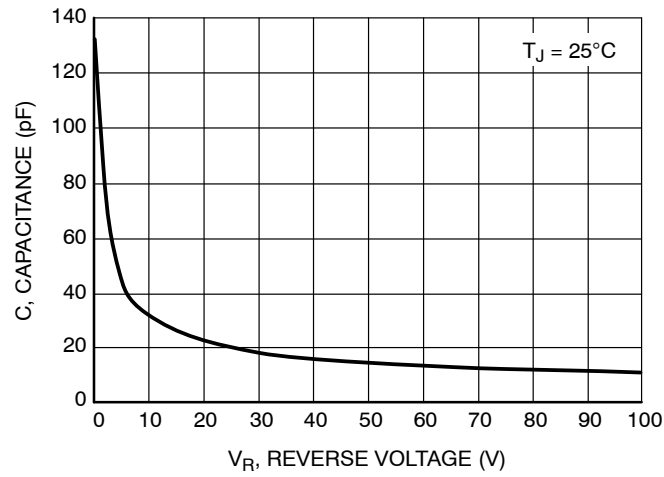


Figure 7. Capacitance

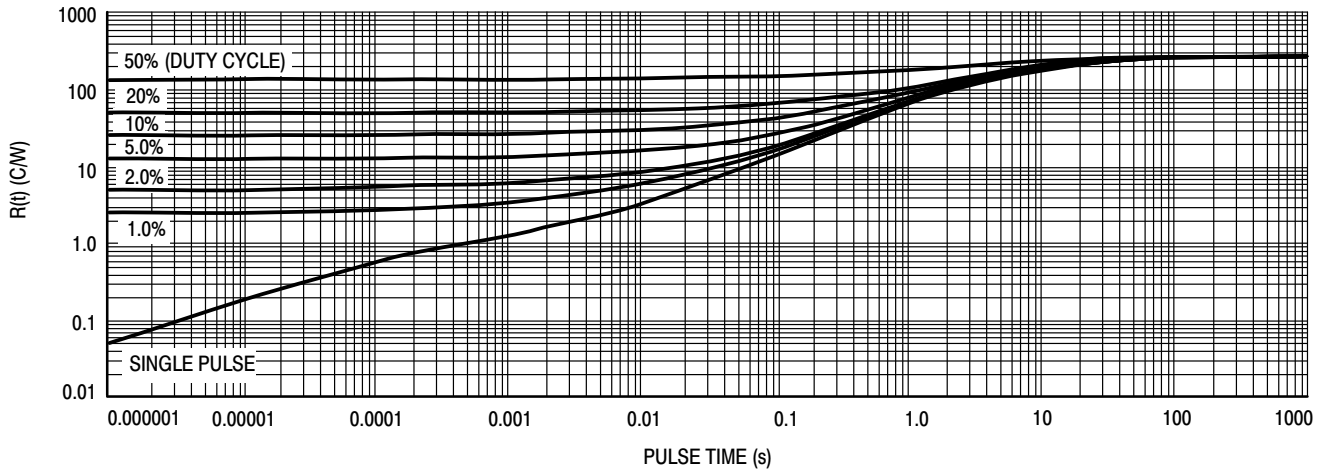


Figure 8. Thermal Response, Junction-to-Ambient (6 mm² pad)

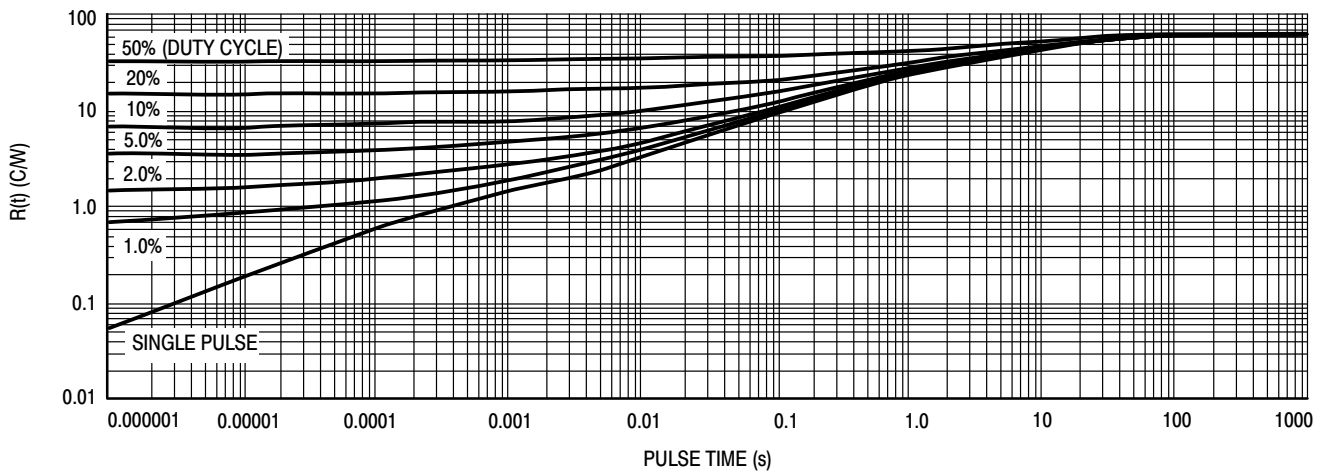
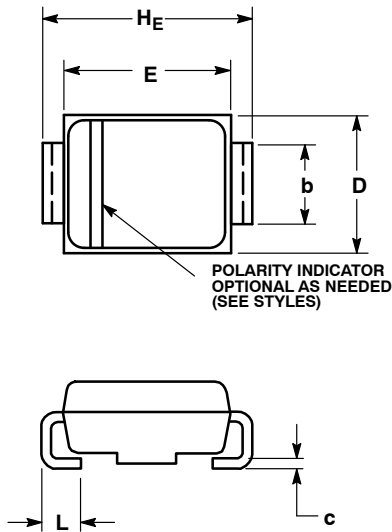


Figure 9. Thermal Response, Junction-to-Ambient (1 in² pad)

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PACKAGE DIMENSIONS

SMA CASE 403D-02 ISSUE F

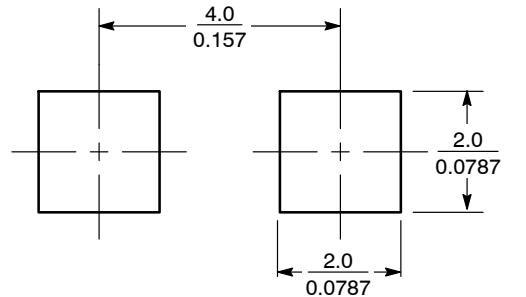


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 403D-01 OBSOLETE, NEW STANDARD IS 403D-02.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.97	2.10	2.20	0.078	0.083	0.087
A1	0.05	0.10	0.15	0.002	0.004	0.006
b	1.27	1.45	1.63	0.050	0.057	0.064
c	0.15	0.28	0.41	0.006	0.011	0.016
D	2.29	2.60	2.92	0.090	0.103	0.115
E	4.06	4.32	4.57	0.160	0.170	0.180
HE	4.83	5.21	5.59	0.190	0.205	0.220
L	0.76	1.14	1.52	0.030	0.045	0.060

- STYLE 1:
PIN 1: CATHODE (POLARITY BAND)
2: ANODE

SOLDERING FOOTPRINT*



SCALE 8:1 ($\frac{\text{mm}}{\text{inches}}$)

*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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