

MBRS2H100T3G, NBR2H100T3G, MBRA2H100T3G, NRVBA2H100T3G,



ON Semiconductor®

<http://onsemi.com>

Surface Mount Schottky Power Rectifier SMA/SMB Power Surface Mount Package

This device employs the Schottky Barrier principle in a metal-to-silicon power rectifier. Features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies; free wheeling diodes and polarity protection diodes.

Features

- Compact Package with J-Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guard-Ring for Overvoltage Protection
- Low Forward Voltage Drop
- NBR and NRVB Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- All Packages are Pb-Free*

Mechanical Characteristics

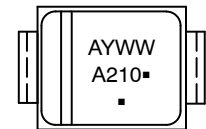
- Case: Molded Epoxy
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: 70 mg (SMA), 95 mg (SMB) (Approximately)
- Cathode Polarity Band
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- ESD Ratings:
 - ◆ Machine Model = C
 - ◆ Human Body Model = 3B
- Device Meets MSL1 Requirements

SCHOTTKY BARRIER RECTIFIER 2.0 AMPERES, 100 VOLTS

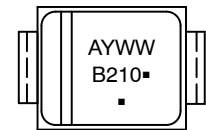
MARKING DIAGRAMS



**SMA
CASE 403D**



**SMB
CASE 403A**



A210 = MBRA2H100T3G
NRVBA2H100T3G
B210 = MBRS2H100T3G
NBR2H100T3G
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

Device	Package	Shipping†
MBRA2H100T3G	SMA (Pb-Free)	5,000 / Tape & Reel
NRVBA2H100T3G	SMA (Pb-Free)	5,000 / Tape & Reel
MBRS2H100T3G	SMB (Pb-Free)	2,500 / Tape & Reel
NBR2H100T3G	SMB (Pb-Free)	2,500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications 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 ($T_L = 150^\circ\text{C}$)	I_O	2.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	I_{FSM}	130	A
Storage Temperature Range	T_{stg}	-65 to +175	$^\circ\text{C}$
Operating Junction Temperature (Note 1)	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.

- 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) MBRA2H100T3G, NRVBA2H100T3G MBRS2H100T3G, NBR2H100T3G	Ψ_{JCL}	14 12	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient (Note 2) MBRA2H100T3G, NRVBA2H100T3G MBRS2H100T3G, NBR2H100T3G	$R_{\theta JA}$	75 71	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient (Note 3) MBRA2H100T3G, NRVBA2H100T3G MBRS2H100T3G, NBR2H100T3G	$R_{\theta JA}$	275 230	$^\circ\text{C/W}$

- Mounted with 700 mm square copper pad size (Approximately 1 inch square) 1 oz FR4 Board.
- Mounted with minimum recommended pad size 1 oz FR4 Board.

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value		Unit
		$T_J = 25^\circ\text{C}$	$T_J = 125^\circ\text{C}$	
Maximum Instantaneous Forward Voltage (Note 4) ($I_F = 2.0\text{ A}$)	V_F	0.79	0.65	V
Maximum Instantaneous Reverse Current (Note 4) ($V_R = 100\text{ V}$)	I_R	0.008	1.5	mA

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

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TYPICAL CHARACTERISTICS

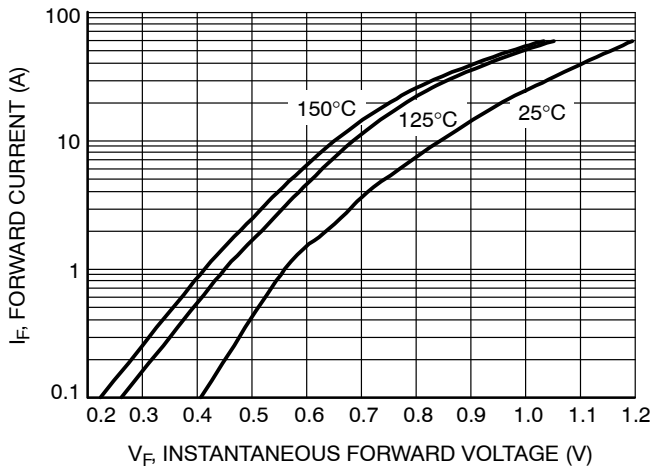


Figure 1. Typical Forward Voltage

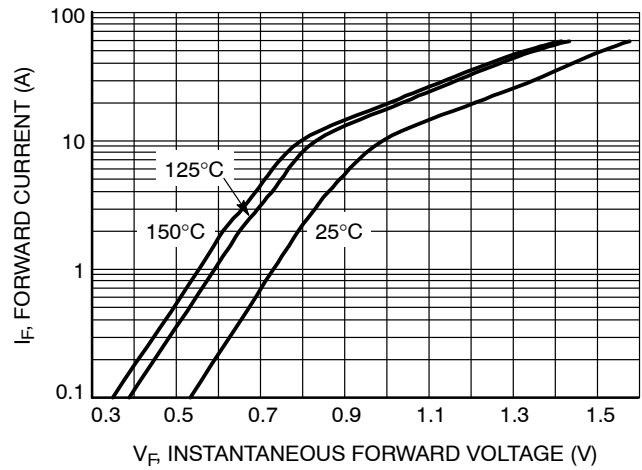


Figure 2. Maximum Forward Voltage

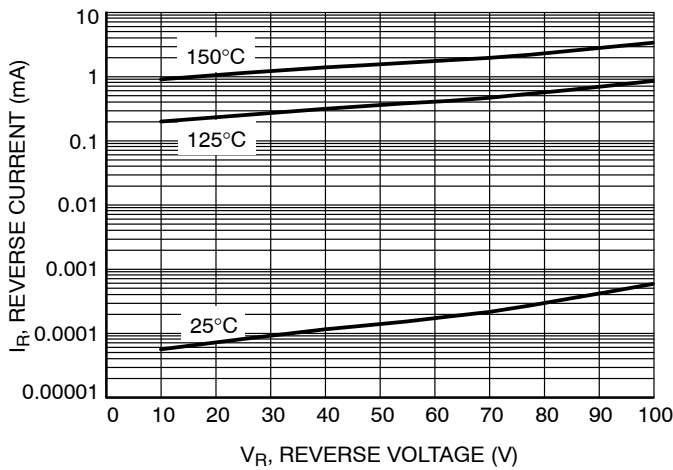


Figure 3. Typical Reverse Current

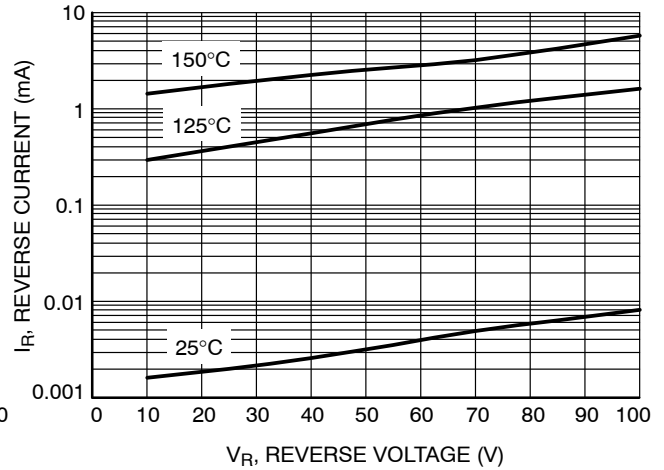


Figure 4. Maximum Reverse Current

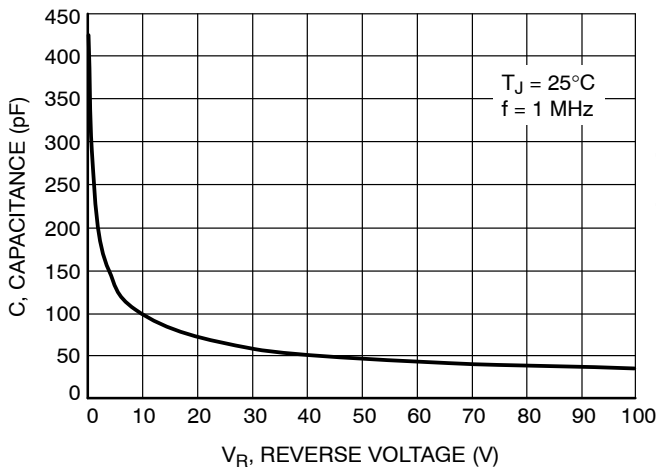


Figure 5. Typical Capacitance

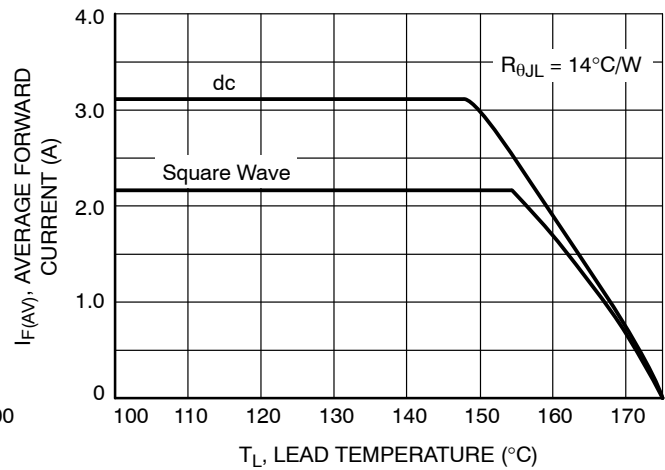


Figure 6. Current Derating – Lead

MBRS2H100T3G, NBR2H100T3G, MBRA2H100T3G, NRVBA2H100T3G,

TYPICAL CHARACTERISTICS

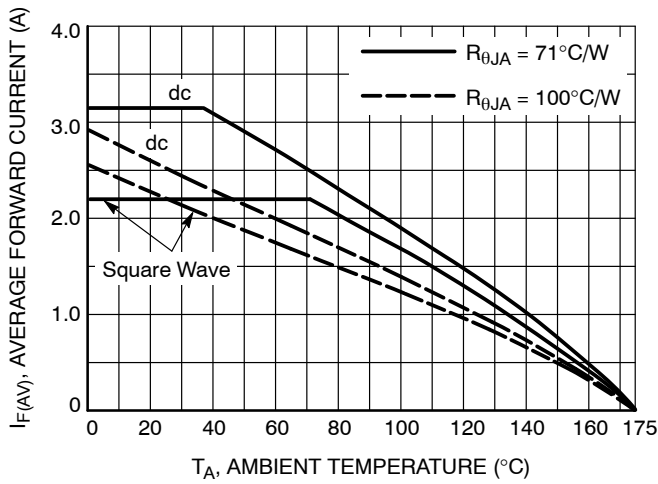


Figure 7. Current Derating, Ambient

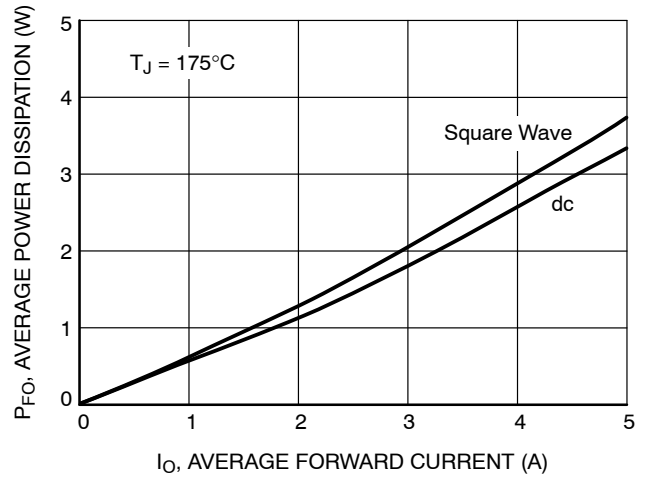


Figure 8. Maximum Forward Power Dissipation

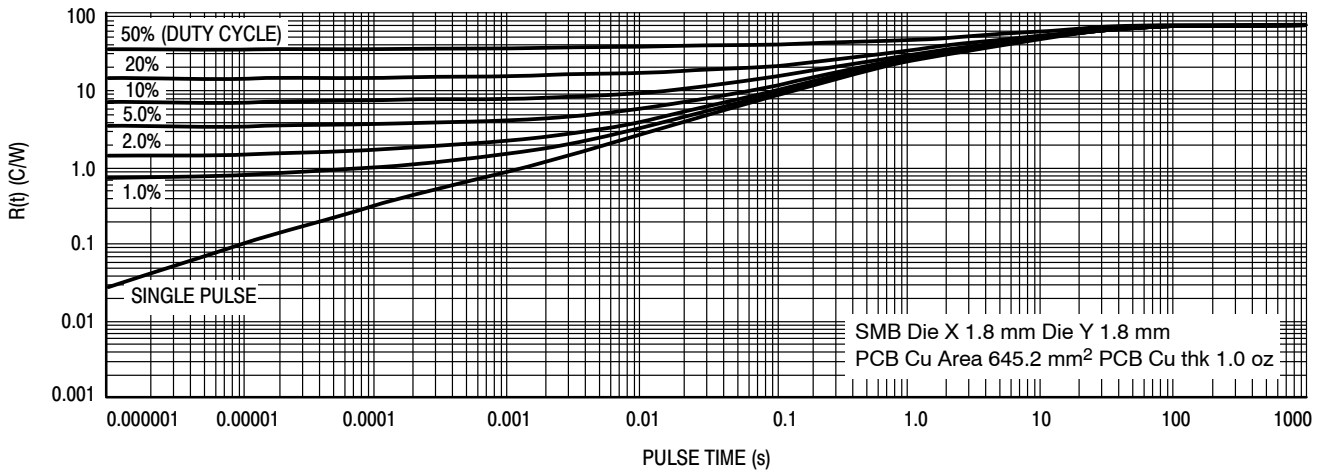


Figure 9. Thermal Response, Junction-to-Ambient (1 inch pad) – MBRS2H100T3G/NBR2H100T3G

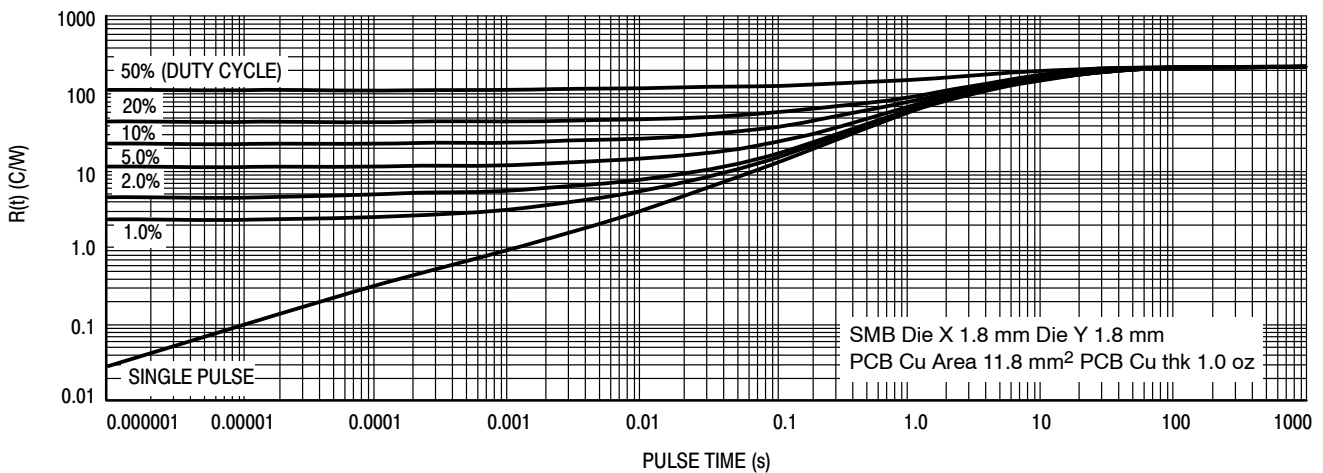


Figure 10. Thermal Response, Junction-to-Ambient (min pad) – MBRS2H100T3G/NBR2H100T3G

MBRS2H100T3G, NBR2H100T3G, MBRA2H100T3G, NRVBA2H100T3G,

TYPICAL CHARACTERISTICS

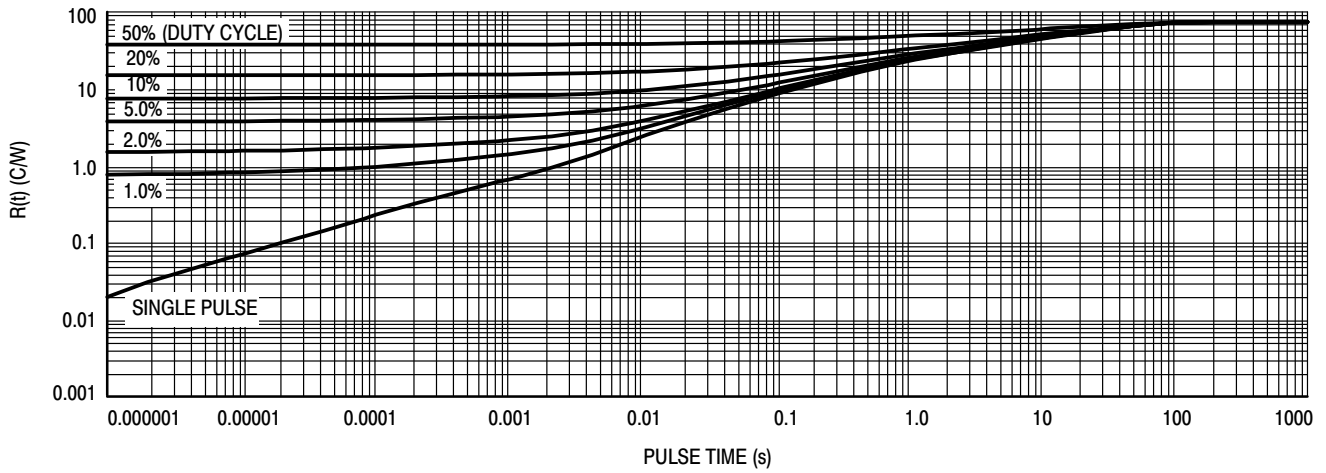


Figure 11. Thermal Response, Junction-to-Ambient (1 inch pad) – MBRA2H100T3G/NRVBA2H100T3G

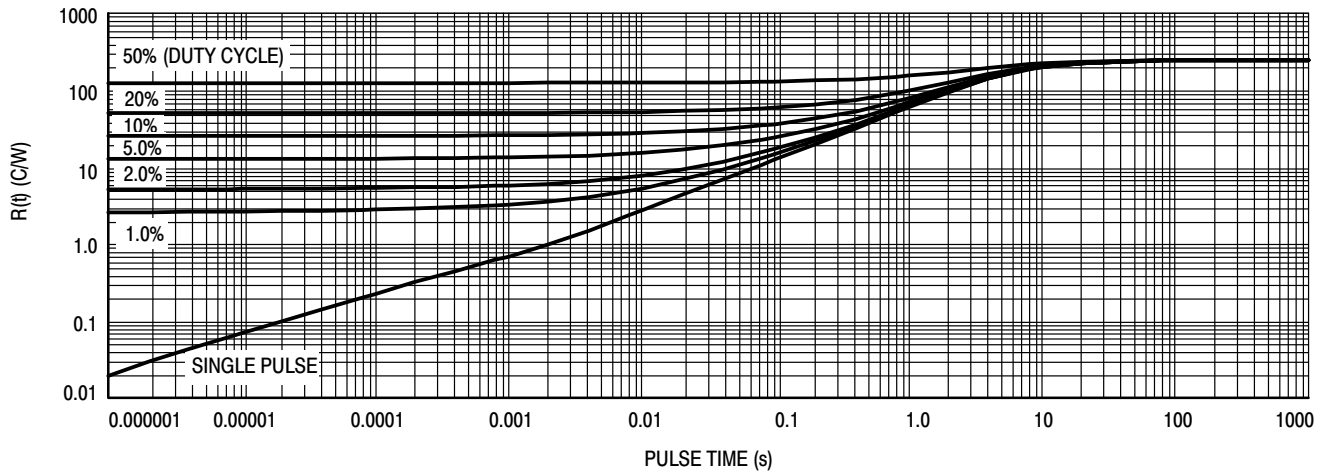


Figure 12. Thermal Response, Junction-to-Ambient (min pad) – MBRA2H100T3G/NRVBA2H100T3G

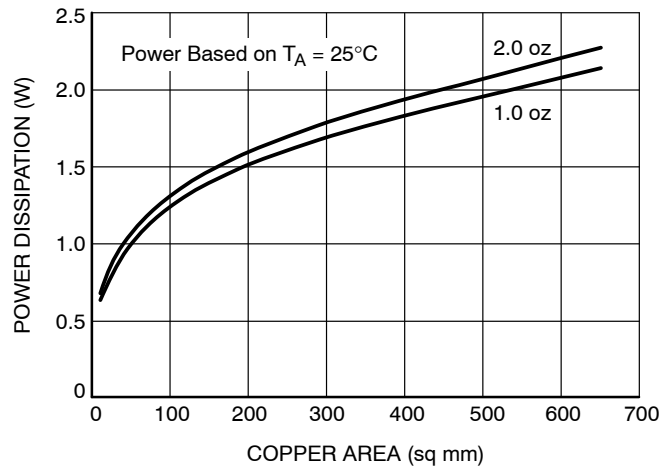
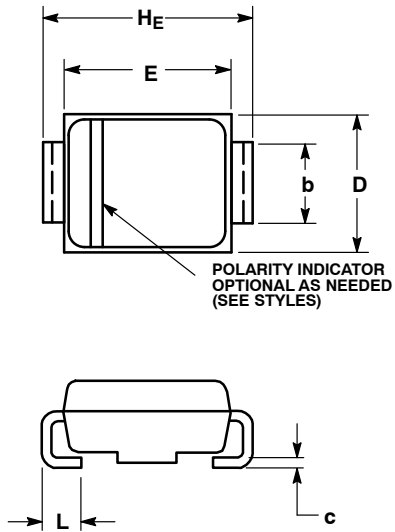


Figure 13. P_D , Junction-to-Ambient (URS copper area)

MBRS2H100T3G, NBR2H100T3G, MBRA2H100T3G, NRVBA2H100T3G,

PACKAGE DIMENSIONS

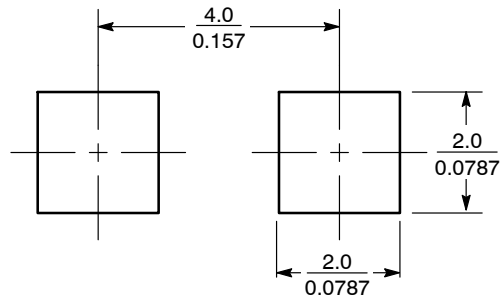
SMA CASE 403D-02 ISSUE F



- 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

SOLDERING FOOTPRINT*



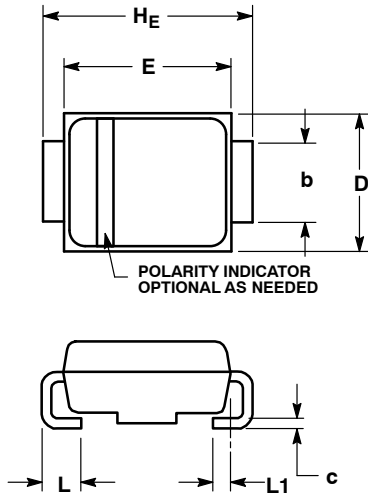
SCALE 8:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

*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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PACKAGE DIMENSIONS

SMB CASE 403A-03 ISSUE H

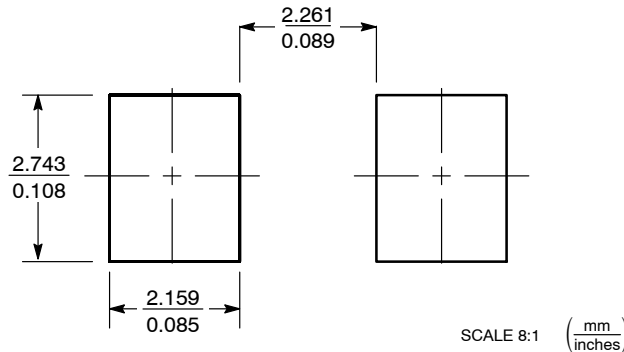


NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.90	2.20	2.28	0.075	0.087	0.090
A1	0.05	0.10	0.19	0.002	0.004	0.007
b	1.96	2.03	2.20	0.077	0.080	0.087
c	0.15	0.23	0.31	0.006	0.009	0.012
D	3.30	3.56	3.95	0.130	0.140	0.156
E	4.06	4.32	4.60	0.160	0.170	0.181
HE	5.21	5.44	5.60	0.205	0.214	0.220
L	0.76	1.02	1.60	0.030	0.040	0.063
L1	0.51 REF			0.020 REF		

SOLDERING FOOTPRINT*



*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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