MBRS2H100T3G, NBRS2H100T3G, MBRA2H100T3G, NRVBA2H100T3G,

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
- These Devices are Pb−Free and are RoHS Compliant*

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

*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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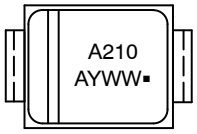
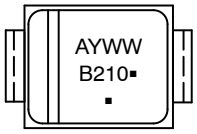
SCHOTTKY BARRIER RECTIFIER 2.0 AMPERES, 100 VOLTS

MARKING DIAGRAMS

SMA CASE 403D



SMB CASE 403A



A210 = MBRA2H100T3G, NRVBA2H100T3G
B210 = MBRS2H100T3G, NBRS2H100T3G
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
NBRS2H100T3G	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.

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°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	°C
Operating Junction Temperature (Note 1)	T_J	−65 to +175	°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) MBRA2H100T3G, NRVBA2H100T3G MBRS2H100T3G, NBRS2H100T3G	Ψ_{JCL}	 14 12	°C/W
Thermal Resistance, Junction−to−Ambient (Note 2) MBRA2H100T3G, NRVBA2H100T3G MBRS2H100T3G, NBRS2H100T3G	$R_{\theta JA}$	 75 71	°C/W
Thermal Resistance, Junction−to−Ambient (Note 3) MBRA2H100T3G, NRVBA2H100T3G MBRS2H100T3G, NBRS2H100T3G	$R_{\theta JA}$	 275 230	°C/W

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

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value		Unit
		T_J = 25°C	T_J = 125°C	
Maximum Instantaneous Forward Voltage (Note 4) (i_F = 2.0 A)	v_F	0.79	0.65	V
Maximum Instantaneous Reverse Current (Note 4) (V_R = 100 V)	I_R	0.008	1.5	mA

4. Pulse Test: Pulse Width ≤ 380 μs, Duty Cycle ≤ 2.0%.

TYPICAL CHARACTERISTICS

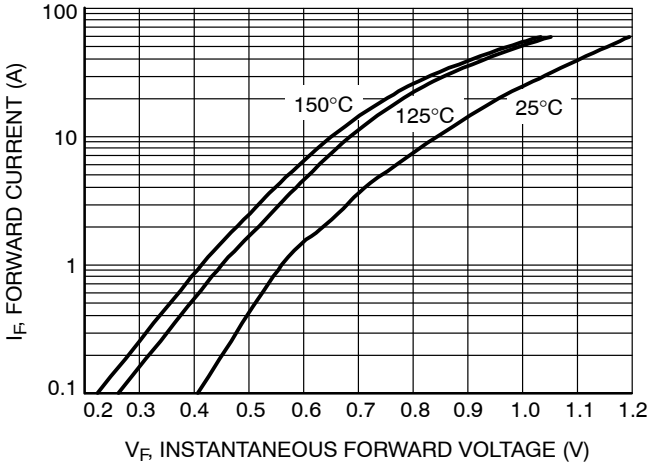


Figure 1. Typical Forward Voltage

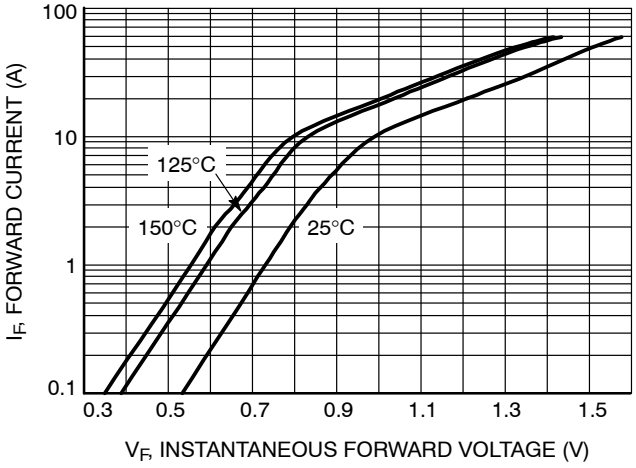


Figure 2. Maximum Forward Voltage

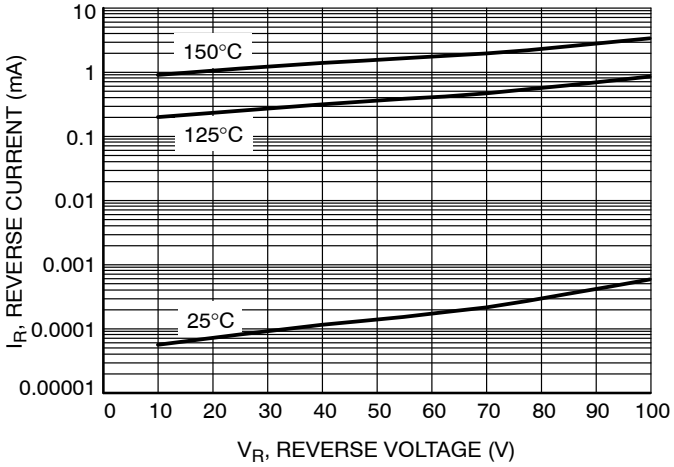


Figure 3. Typical Reverse Current

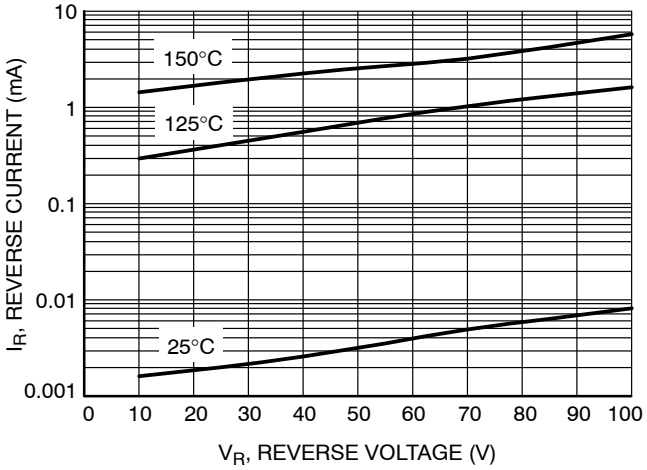


Figure 4. Maximum Reverse Current

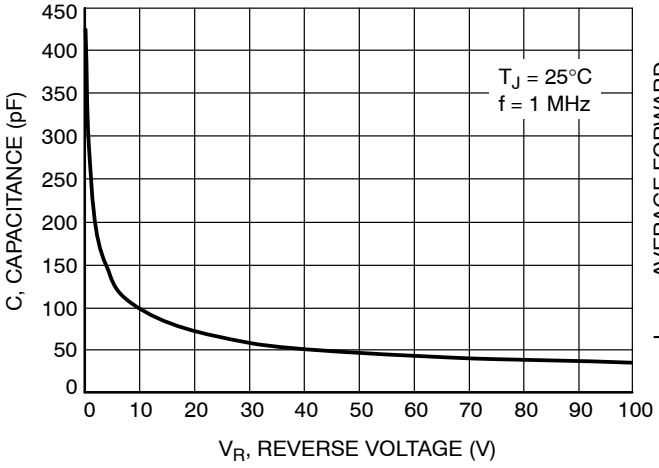


Figure 5. Typical Capacitance

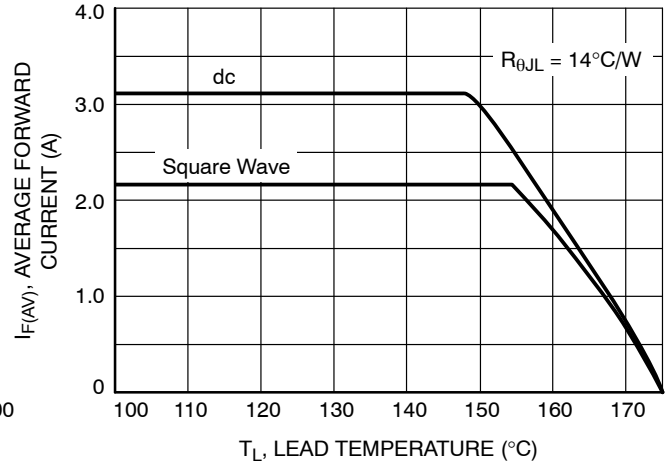


Figure 6. Current Derating – Lead

TYPICAL CHARACTERISTICS

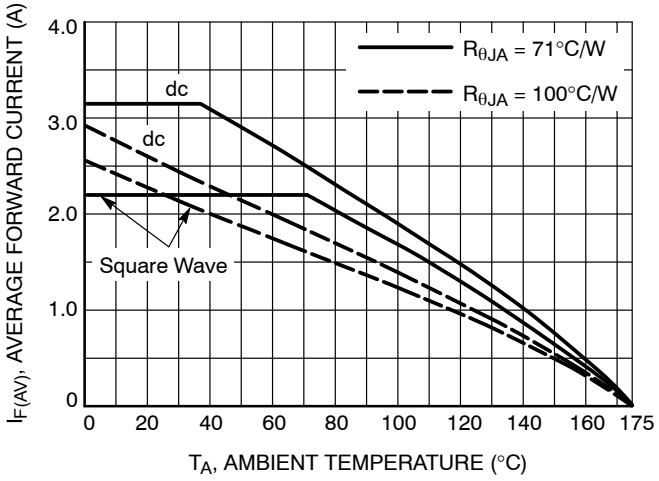


Figure 7. Current Derating, Ambient

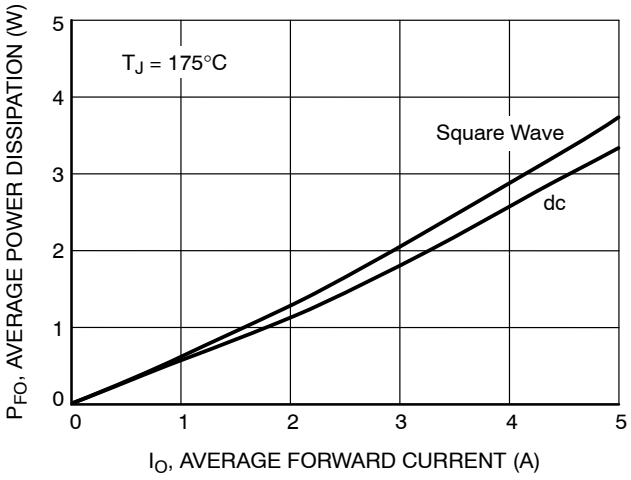


Figure 8. Maximum Forward Power Dissipation

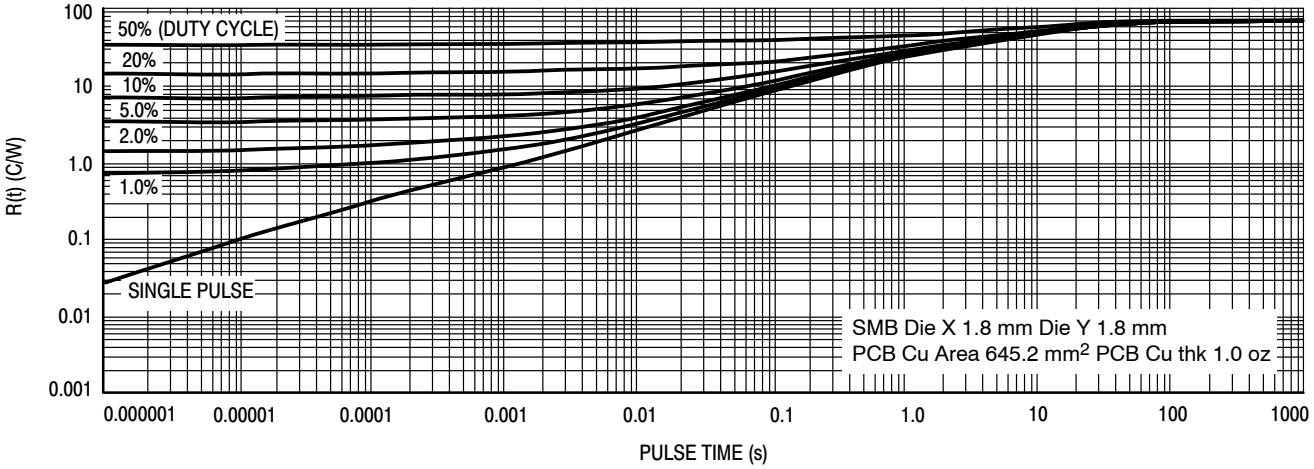


Figure 9. Thermal Response, Junction−to−Ambient (1 inch pad) − MBRS2H100T3G/NBRS2H100T3G

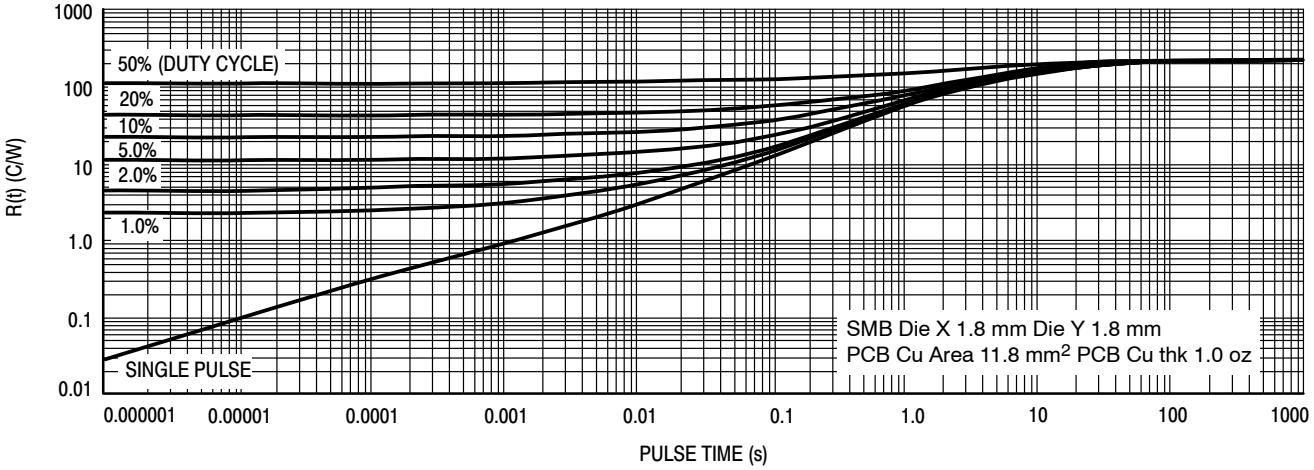


Figure 10. Thermal Response, Junction−to−Ambient (min pad) − MBRS2H100T3G/NBRS2H100T3G

TYPICAL CHARACTERISTICS

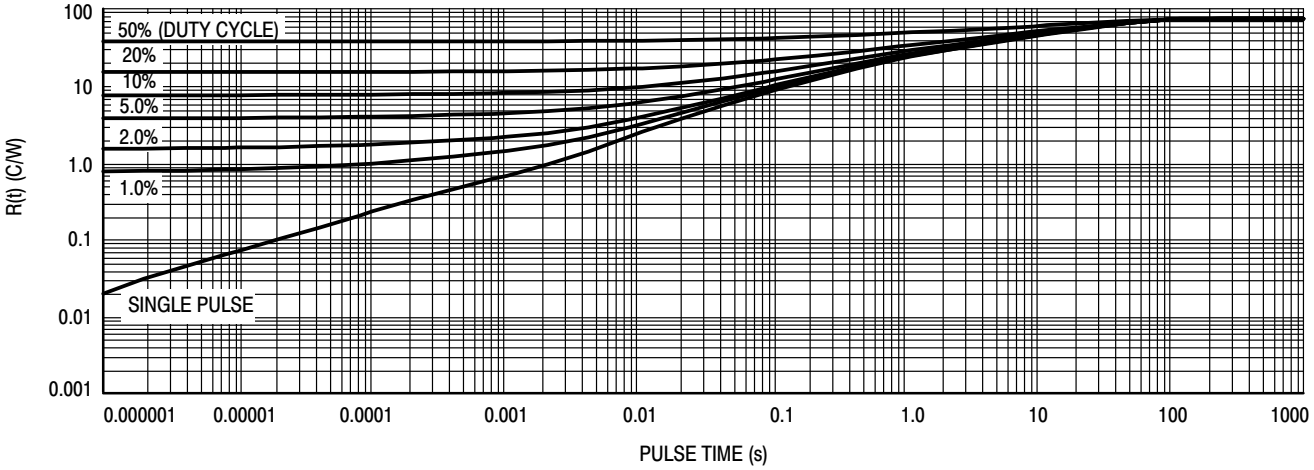


Figure 11. Thermal Response, Junction−to−Ambient (1 inch pad) − MBRA2H100T3G/NRVBA2H100T3G

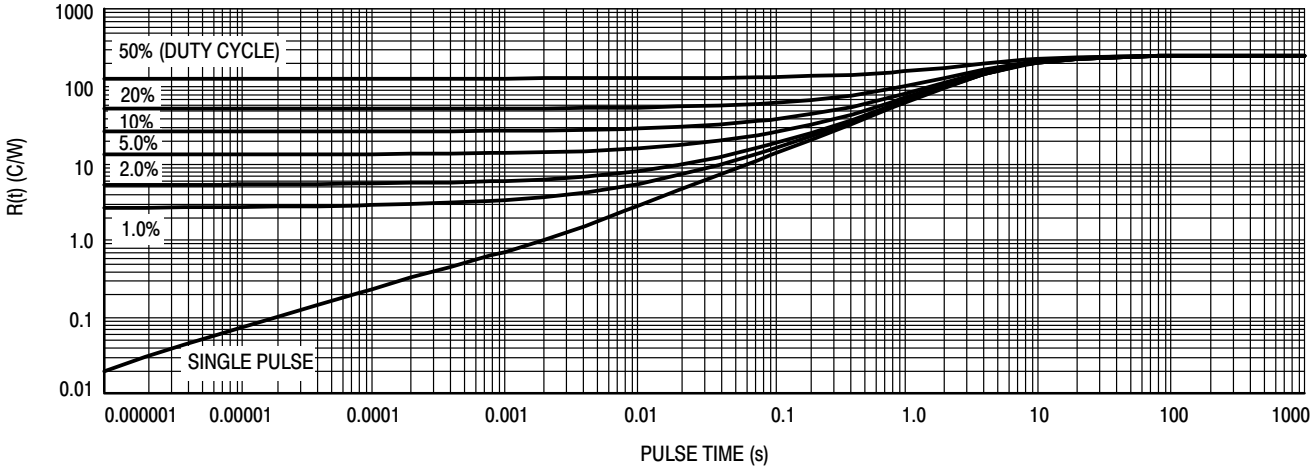


Figure 12. Thermal Response, Junction−to−Ambient (min pad) − MBRA2H100T3G/NRVBA2H100T3G

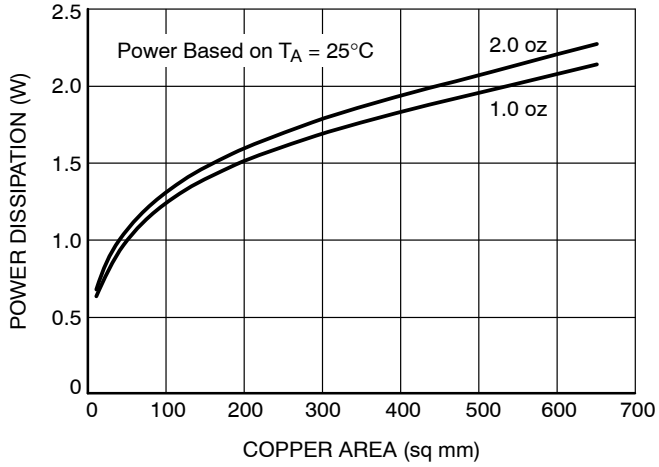
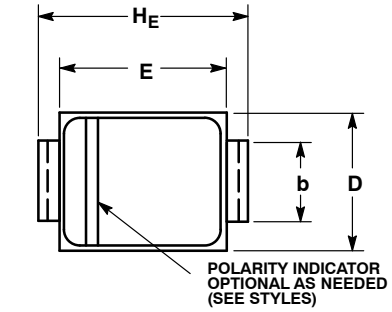


Figure 13. P_D, Junction−to−Ambient (URS copper area)

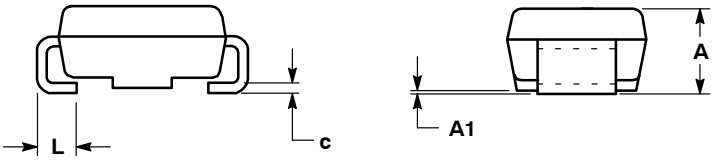
PACKAGE DIMENSIONS

SMA
CASE 403D−02
ISSUE G

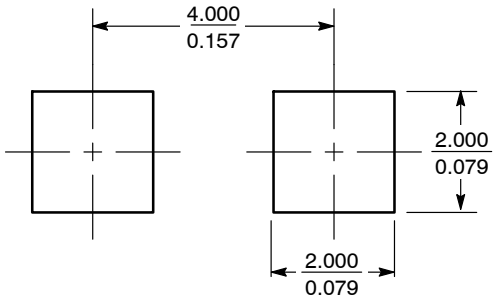


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	1.97	2.10	2.20	0.078	0.083	0.087
A1	0.05	0.10	0.20	0.002	0.004	0.008
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
H_E	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*

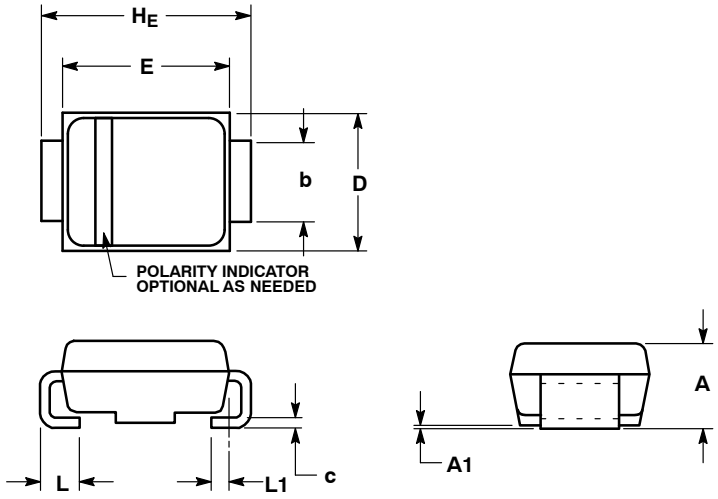


SCALE 8:1 $\left(\frac{mm}{inches}\right)$

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PACKAGE DIMENSIONS

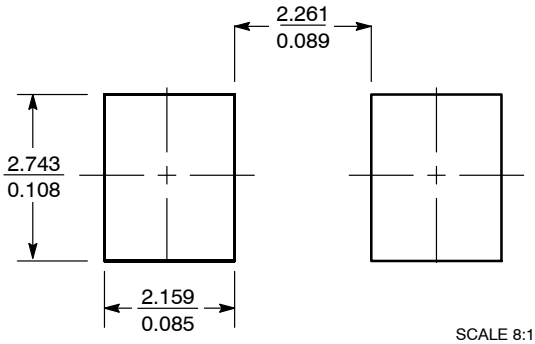
SMB
CASE 403A−03
ISSUE J



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION b SHALL BE MEASURED WITHIN DIMENSION L1.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	1.95	2.30	2.47	0.077	0.091	0.097
A1	0.05	0.10	0.20	0.002	0.004	0.008
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
H_E	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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