MBRA210ET3

Surface Mount Schottky Power Rectifier

SMA 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. Typical applications are AC/DC and DC−DC converters, reverse battery protection, and “Oring” of multiple supply voltages and any other application where performance and size are critical.

Features

- Low I_R, Extends Battery Life
- 1st in the Market Place with a 10 V_R Schottky Rectifier
- Compact Package with J−Bend Leads Ideal for Automated Handling
- Highly Stable Oxide Passivated Junction
- Guardring for Over−Voltage Protection
- Optimized for Low Leakage Current
- Pb−Free Package is Available

Mechanical Characteristics

- Case: Molded Epoxy
- Epoxy Meets UL 94 V−0 @ 0.125 in
- 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: Polarity Band Indicates Cathode Lead
- ESD Ratings:
  Machine Model = C
  Human Body Model = 3B

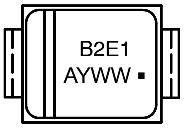
ON Semiconductor®

http://onsemi.com

SCHOTTKY BARRIER
RECTIFIER
2 AMPERES
10 VOLTS

SMA
CASE 403D
PLASTIC

MARKING DIAGRAM



B2E1	=	Device Code
A	=	Assembly Location
Y	=	Year
WW	=	Work Week
▪	=	Pb−Free Package

ORDERING INFORMATION

Device	Package	Shipping†
MBRA210ET3	SMA	5000/Tape & Reel
MBRA210ET3G	SMA (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 Specifications Brochure, BRD8011/D.

August, 2008 − Rev. 6

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	10	V
Average Rectified Forward Current (At Rated V_R, T_C = 125°C)	I_O	2.0	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	−65 to +150	°C
Operating Junction Temperature	T_J	−65 to +150	°C
Voltage Rate of Change (Rated V_R, T_J = 25°C)	dv/dt	10,000	V/μs

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Characteristic	Symbol	Min Pad	1 Inch Pad	Unit
Thermal Resistance, Junction−to−Lead (Note 1)	$R_{\theta JL}$	22	15	°C/W
Thermal Resistance, Junction−to−Ambient (Note 1)	$R_{\theta JA}$	150	81	

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 2)	V_F	**T_J = 25°C**	**T_J = 100°C**	V
(I_F = 0.1 A)		0.405	0.275	
(I_F = 1.0 A)		0.480	0.355	
(I_F = 2.0 A)		0.500	0.385	
Maximum Instantaneous Reverse Current	I_R	**T_J = 25°C**	**T_J = 100°C**	μA
(V_R = 5.0 V)		15	200	
(V_R = 10 V)		50	500	

1. Mounted on a 3″ square FR4 PC Board with min. pads or 1″ square copper heat spreader.
2. Pulse Test: Pulse Width ≤ 250 μs, Duty Cycle ≤ 2%.

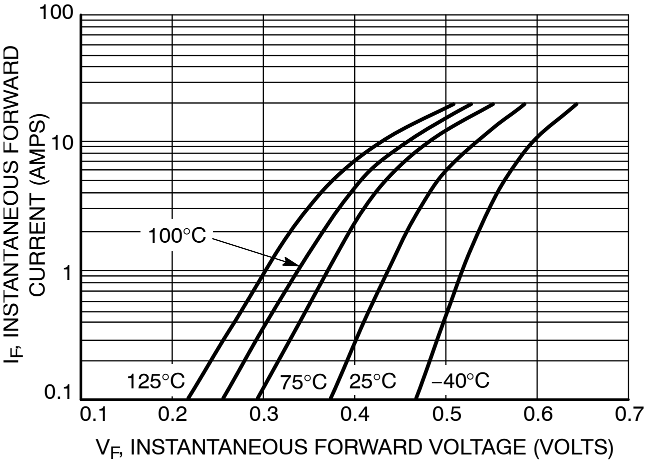


Figure 1. Typical Forward Voltage

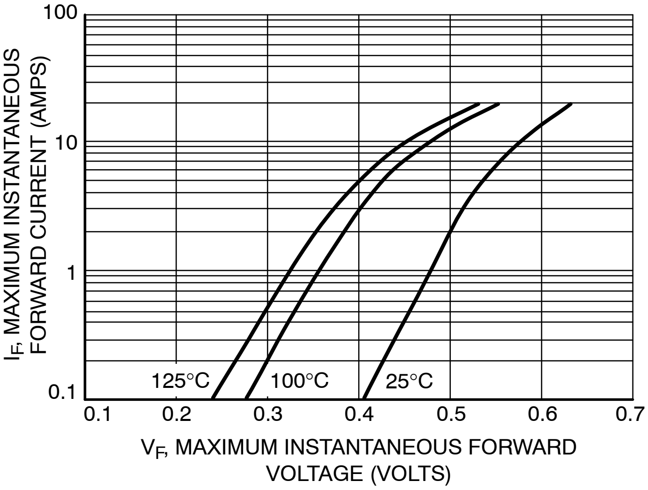


Figure 2. Maximum Forward Voltage

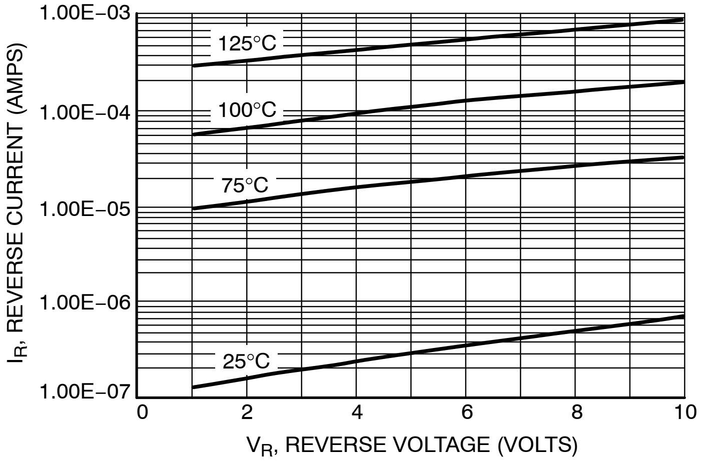


Figure 3. Typical Reverse Current

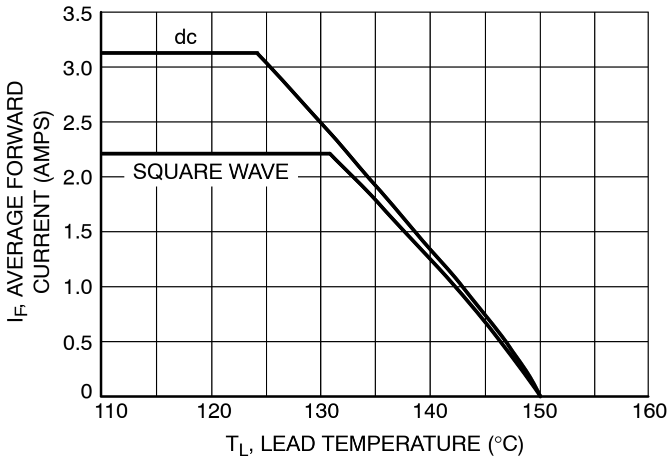


Figure 4. Current Derating − Junction to Lead

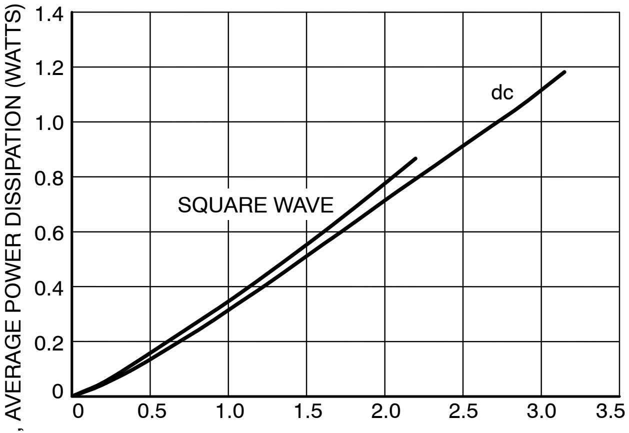


Figure 5. Forward Power Dissipation

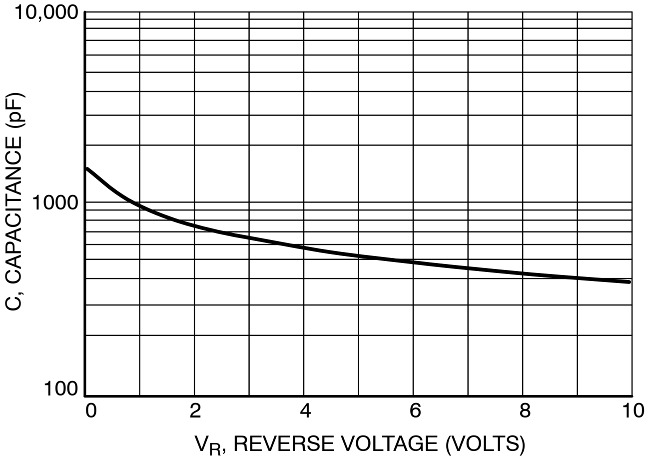


Figure 6. Typical Capacitance

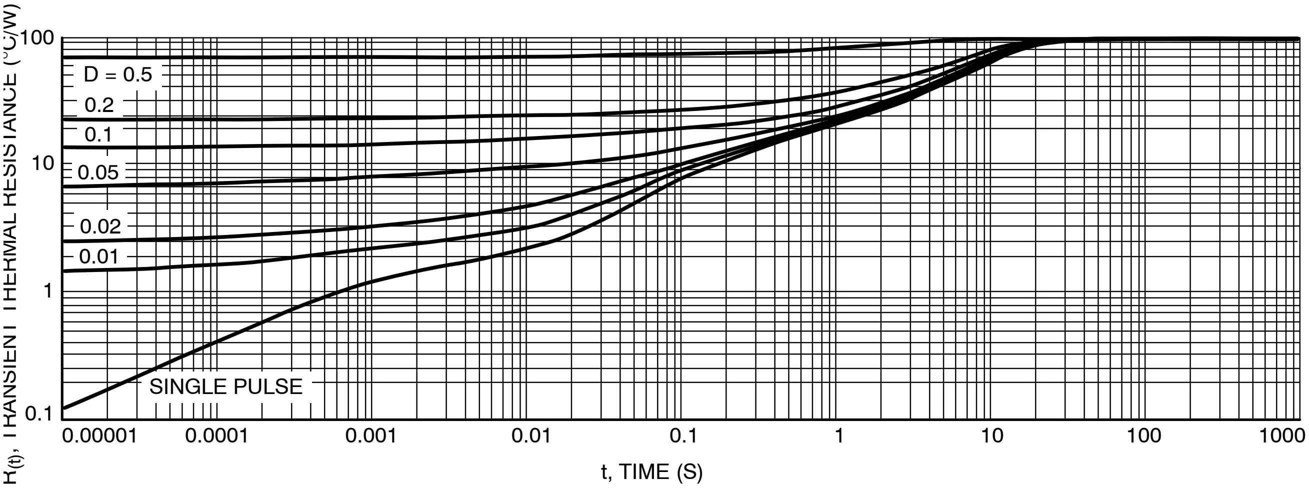


Figure 7. Thermal Response, Junction to Ambient (min pad)

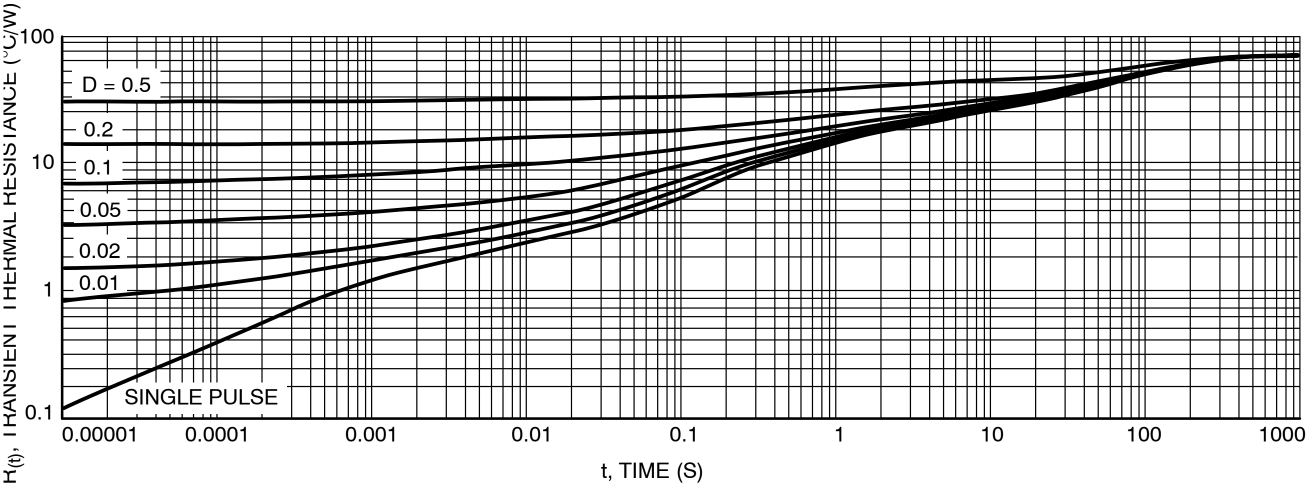
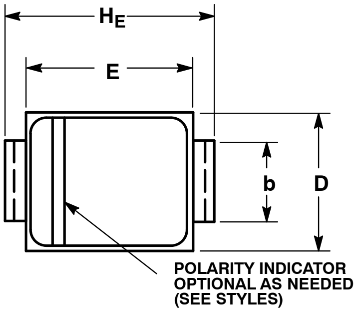


Figure 8. Thermal Response, Junction to Ambient (1 inch pad)

PACKAGE DIMENSIONS

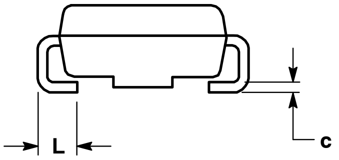
SMA

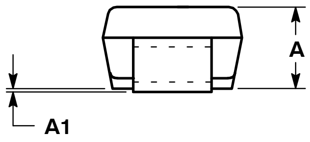
CASE 403D−02
ISSUE D



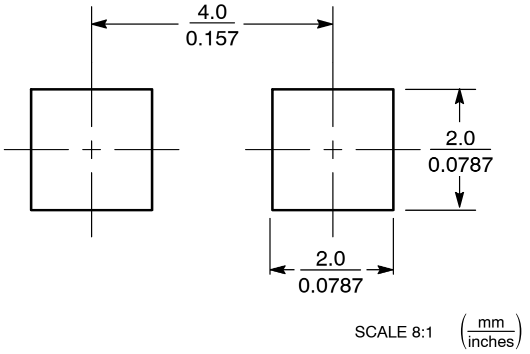
NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 403D−01 OBSOLETE, NEW STANDARD IS 403D−02.

	MILLIMETERS			INCHES		
DIM	**MIN**	**NOM**	**MAX**	**MIN**	**NOM**	**MAX**
A	1.92	2.17	2.27	0.076	0.085	0.089
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
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*



*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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