

# 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®**

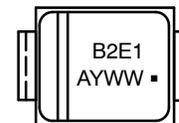
<http://onsemi.com>

**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.

# MBRA210ET3

## 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 $V_R$ , $T_C = 125^\circ\text{C}$ )	$I_O$	2.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	100	A
Storage/Operating Case Temperature	$T_{stg}$ , $T_C$	-65 to +150	$^\circ\text{C}$
Operating Junction Temperature	$T_J$	-65 to +150	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )	$dv/dt$	10,000	V/ $\mu\text{s}$

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	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	150	81	

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 2)  ( $I_F = 0.1\text{ A}$ ) ( $I_F = 1.0\text{ A}$ ) ( $I_F = 2.0\text{ A}$ )	$V_F$	<b><math>T_J = 25^\circ\text{C}</math></b>	<b><math>T_J = 100^\circ\text{C}</math></b>	V
		0.405	0.275	
		0.480	0.355	
Maximum Instantaneous Reverse Current  ( $V_R = 5.0\text{ V}$ ) ( $V_R = 10\text{ V}$ )	$I_R$	<b><math>T_J = 25^\circ\text{C}</math></b>	<b><math>T_J = 100^\circ\text{C}</math></b>	$\mu\text{A}$
		15	200	
		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  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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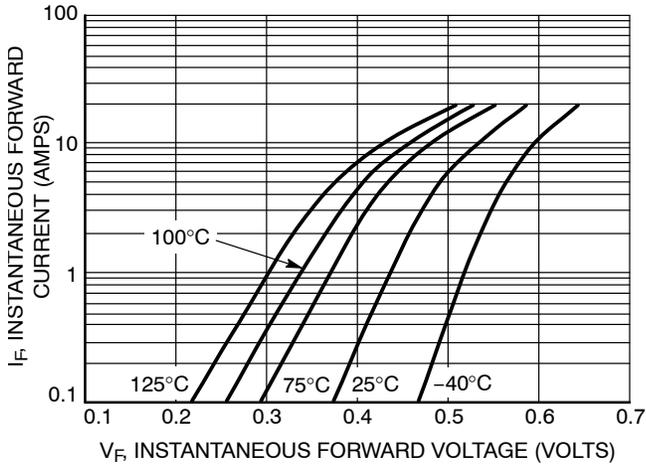


Figure 1. Typical Forward Voltage

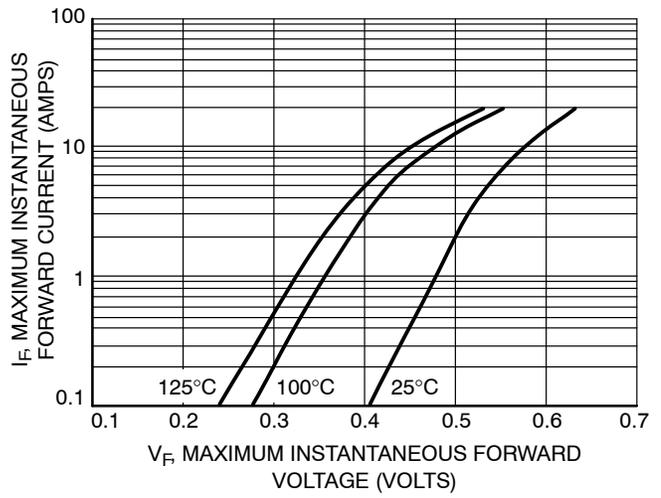


Figure 2. Maximum Forward Voltage

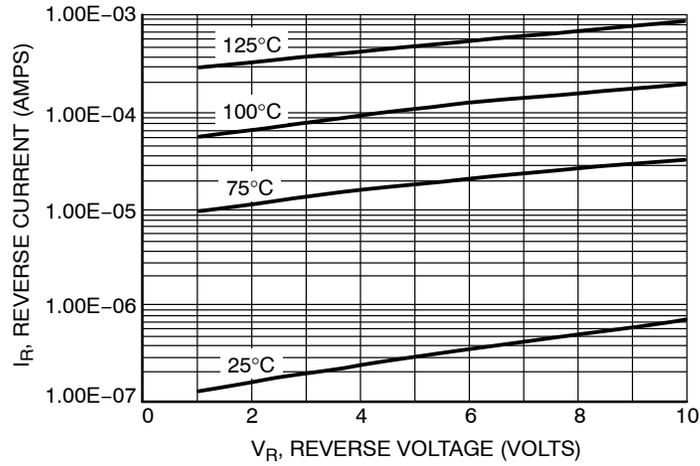


Figure 3. Typical Reverse Current

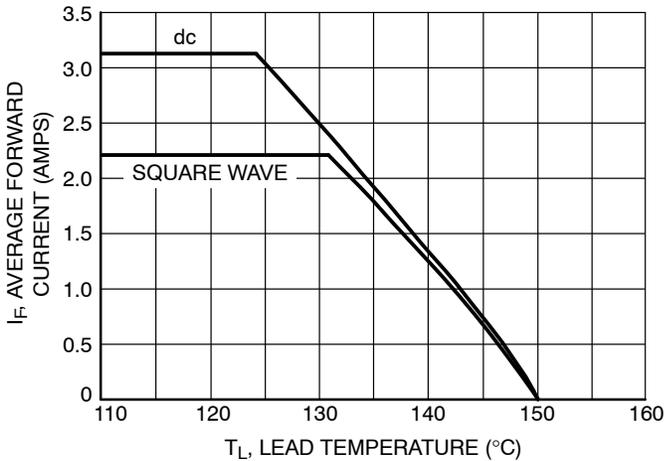


Figure 4. Current Derating - Junction to Lead

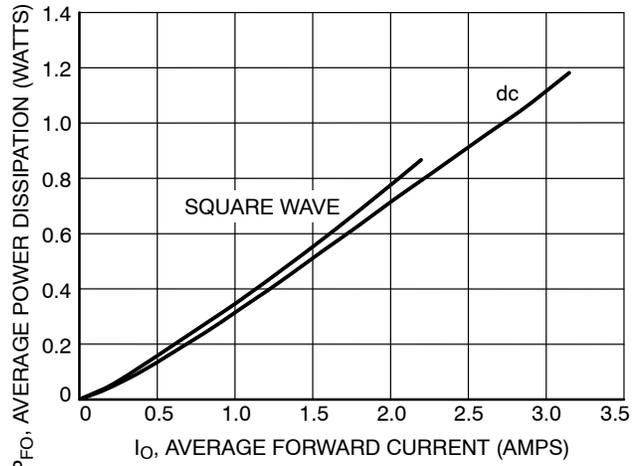


Figure 5. Forward Power Dissipation

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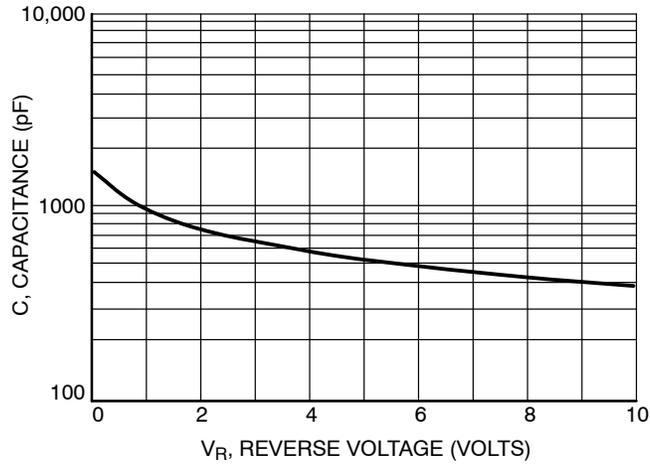


Figure 6. Typical Capacitance

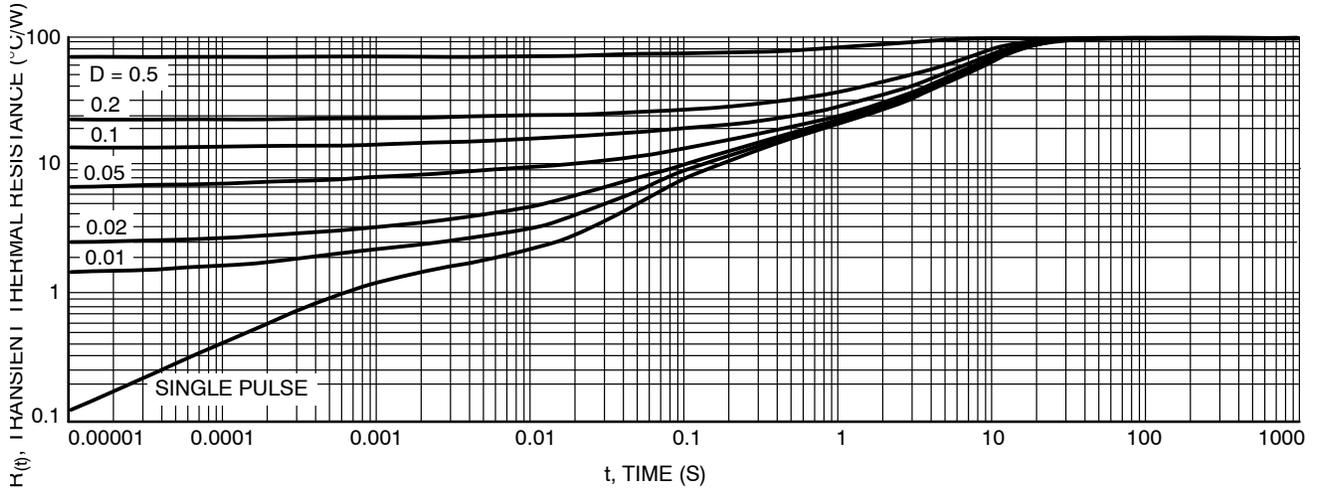


Figure 7. Thermal Response, Junction to Ambient (min pad)

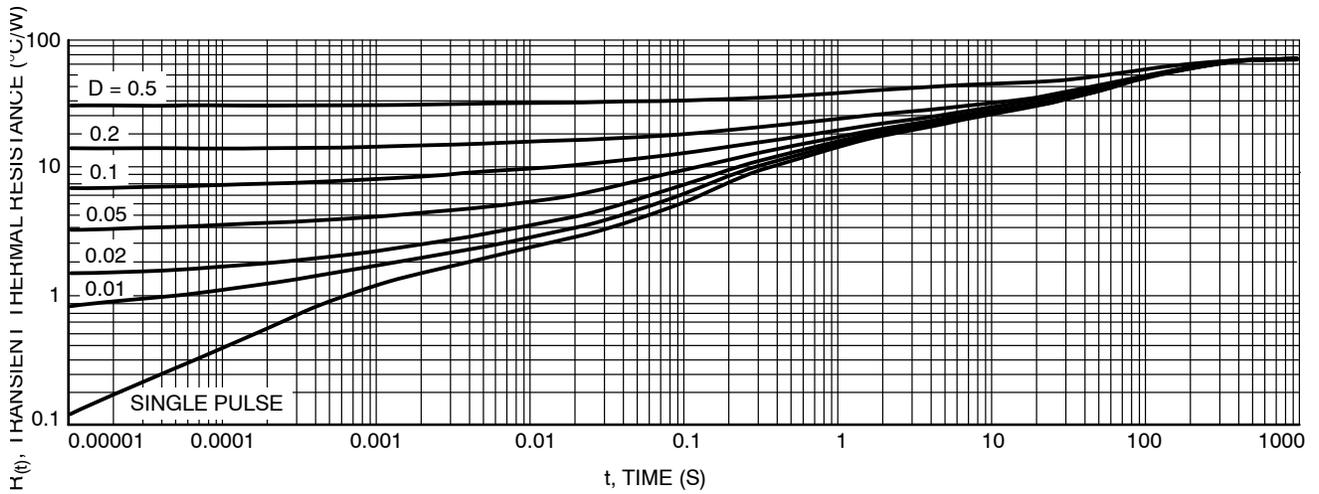
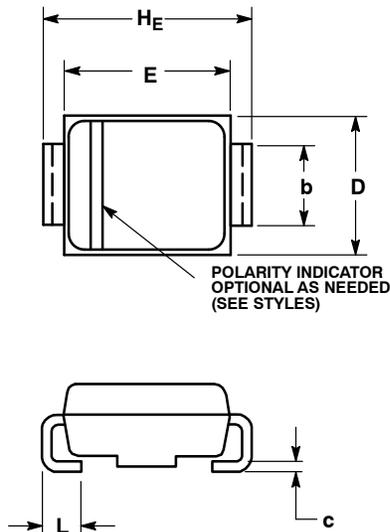


Figure 8. Thermal Response, Junction to Ambient (1 inch pad)

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## PACKAGE DIMENSIONS

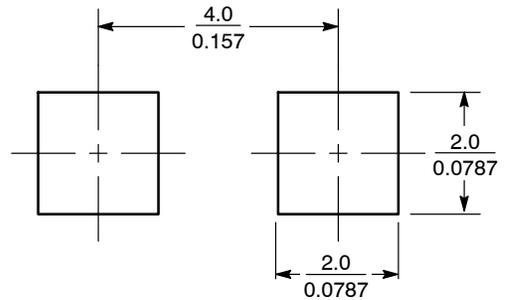
SMA  
CASE 403D-02  
ISSUE D



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

DIM	MILLIMETERS			INCHES		
	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
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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