

# MBRA120ET3

## Surface Mount Schottky Power Rectifier

### SMA Power Surface Mount Package

... employing 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.

- 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

#### Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL94,  $V_O$  at 1/8"
- 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
- Available in 12 mm Tape, 5000 Units per 13 inch Reel
- Device Meets MSL1 Requirements
- ESD Ratings: Machine Model, C (>400 V)  
Human Body Model, 3B (>8000 V)
- Marking: B1E2

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	20	V
Average Rectified Forward Current (At Rated $V_R$ , $T_C = 125^\circ\text{C}$ )	$I_O$	1.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	40	A
Storage Temperature	$T_{stg}$	-55 to +150	°C
Operating Junction Temperature	$T_J$	-55 to +150	°C
Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )	$dv/dt$	10,000	V/ $\mu\text{s}$



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### SCHOTTKY BARRIER RECTIFIER 1 AMPERE 20 VOLTS



SMA  
CASE 403D  
PLASTIC

#### MARKING DIAGRAM



B1E2 = Device Code

#### ORDERING INFORMATION

Device	Package	Shipping†
MBRA120ET3	SMA	5000/Tape & 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.

# MBRA120ET3

## THERMAL CHARACTERISTICS

Characteristic	Symbol	5 mm x 5 mm (Note 2)	1 Inch x 1/2 inch (Note 3)	Unit
Thermal Resistance – Junction–to–Lead	$R_{\theta JL}$	34	20	$^{\circ}C/W$
Thermal Resistance – Junction–to–Ambient	$R_{\theta JA}$	138	77	

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 1), See Figure 2  ( $I_F = 0.1$ A) ( $I_F = 1.0$ A) ( $I_F = 2.0$ A)	$V_F$	$T_J = 25^{\circ}C$	$T_J = 100^{\circ}C$	V
		0.455	0.360	
		0.530	0.455	
Maximum Instantaneous Reverse Current, See Figure 4  ( $V_R = 20$ V) ( $V_R = 10$ V) ( $V_R = 5.0$ V)	$I_R$	$T_J = 25^{\circ}C$	$T_J = 100^{\circ}C$	$\mu A$
		10	1600	
		1.0	500	
		0.5	300	

1. Pulse Test: Pulse Width  $\leq 250$   $\mu s$ , Duty Cycle  $\leq 2\%$ .
2. Mounted on a Pad Size of 5 mm x 5 mm, PC Board FR4 (2 pads).
3. Mounted on a Pad Size of 1 inch x 1/2 inch, PC Board FR4 (2 pads).

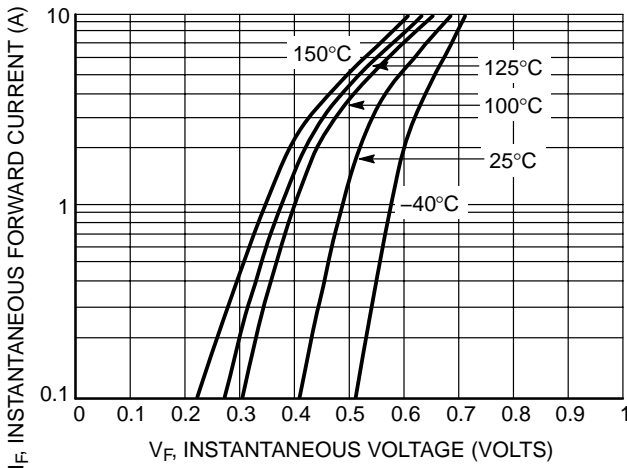


Figure 1. Typical Forward Voltage

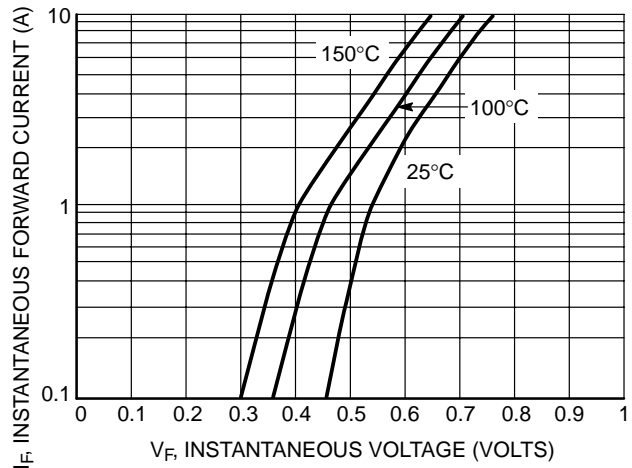


Figure 2. Maximum Forward Voltage

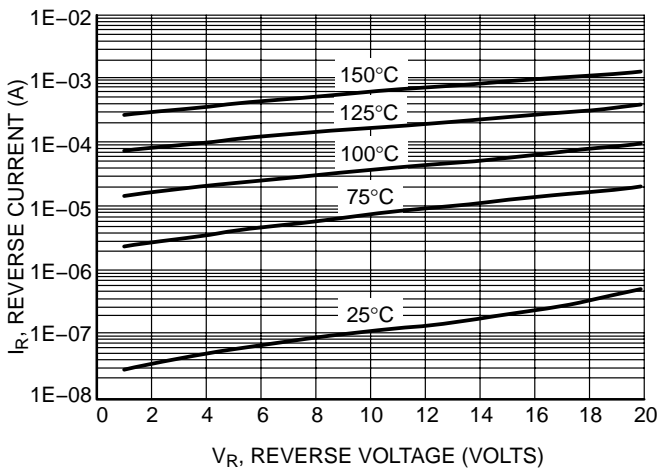


Figure 3. Typical Reverse Current

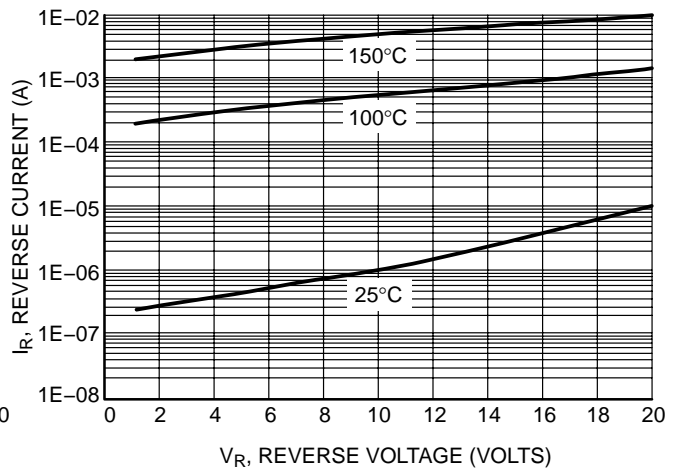


Figure 4. Maximum Reverse Current

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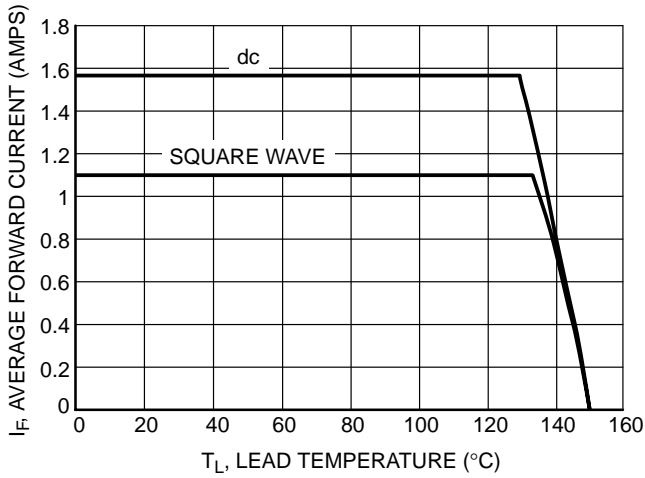


Figure 5. Current Derating

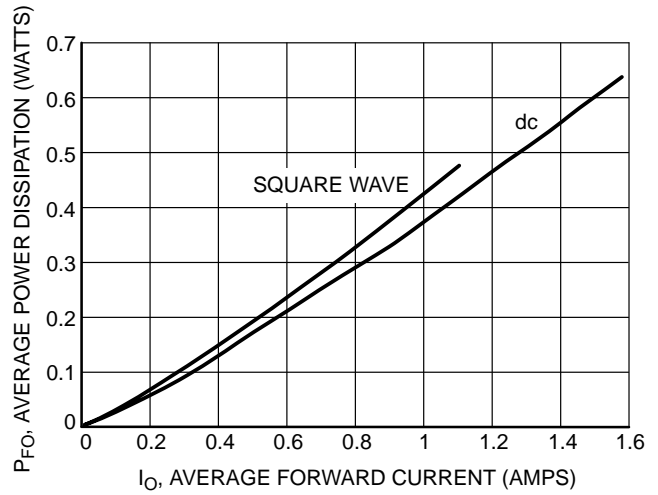


Figure 6. Forward Power Dissipation

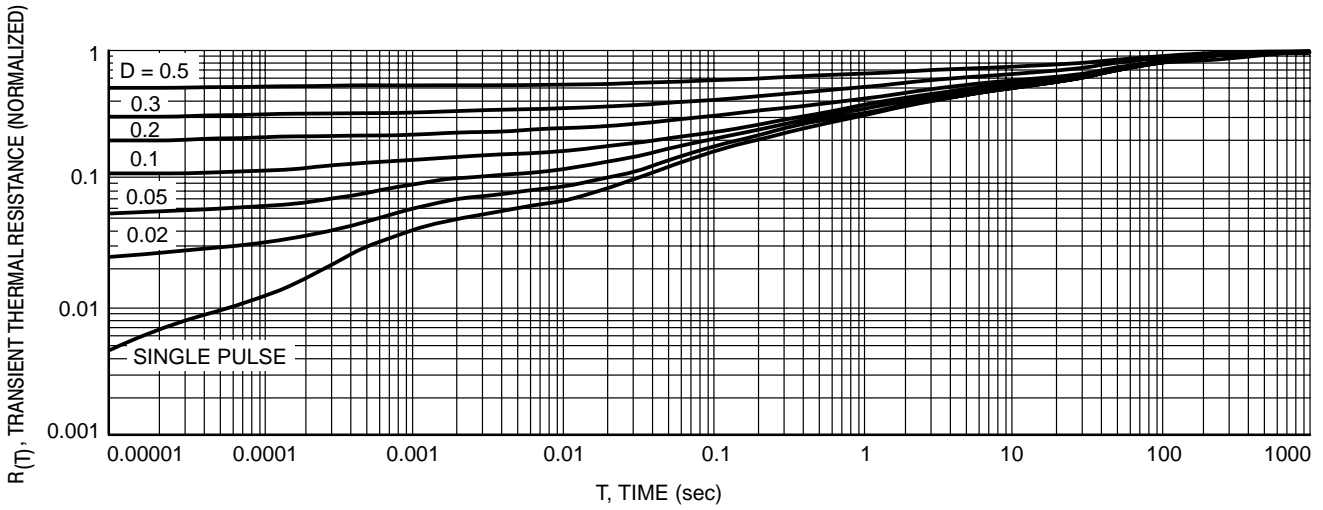


Figure 7. Thermal Resistance

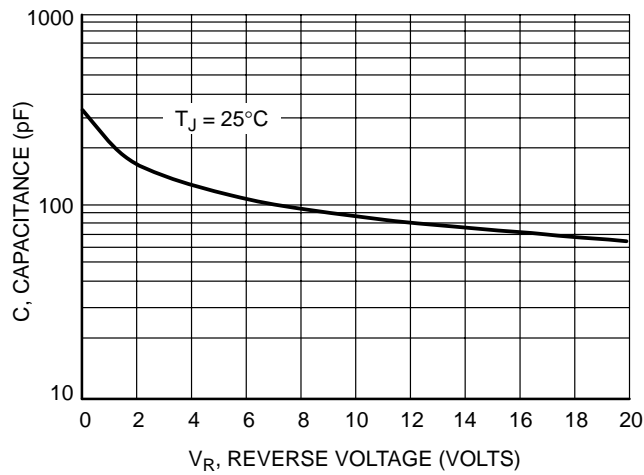
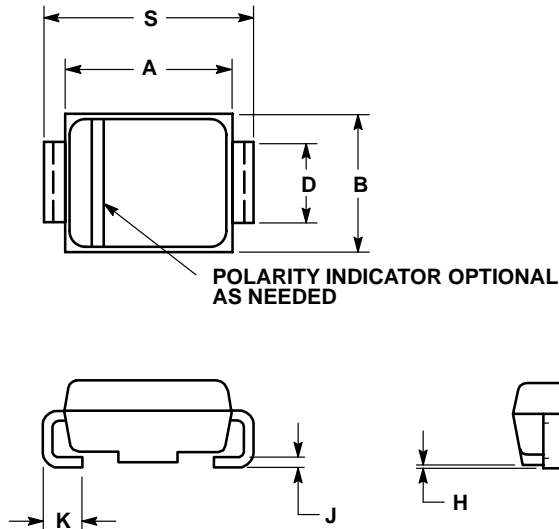


Figure 8. Typical Junction Capacitance

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## PACKAGE DIMENSIONS

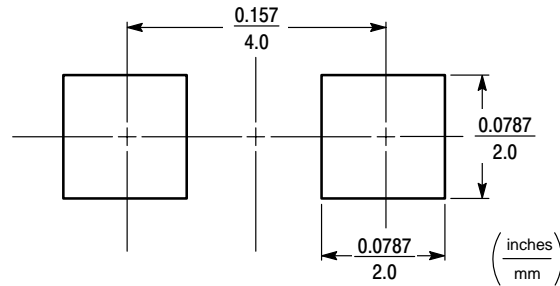
**SMA**  
CASE 403D-02  
ISSUE A



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.090	0.115	2.29	2.92
C	0.075	0.095	1.91	2.41
D	0.050	0.064	1.27	1.63
H	0.002	0.006	0.05	0.15
J	0.006	0.016	0.15	0.41
K	0.030	0.060	0.76	1.52
S	0.190	0.220	4.83	5.59

### SOLDERING FOOTPRINT\*



### SMA 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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