

# MBRM110ET1G, NRVBM110ET1G

## Schottky Power Rectifier, Surface Mount, 1.0 A, 10 V

The Schottky POWERMITE<sup>®</sup> employs the Schottky Barrier principle with a barrier metal and epitaxial construction that produces optimal forward voltage drop–reverse current tradeoff. The advanced packaging techniques provide for a highly efficient micro miniature, space saving surface mount Rectifier. With its unique heatsink design, the POWERMITE<sup>®</sup> has the same thermal performance as the SMA while being 50% smaller in footprint area, and delivering one of the lowest height profiles, < 1.1 mm in the industry. Because of its small size, it is ideal for use in portable and battery powered products such as cellular and cordless phones, chargers, notebook computers, printers, PDAs and PCMCIA cards. 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<sub>R</sub> Extends Battery Life
- Low Profile – Maximum Height of 1.1 mm
- Small Footprint – Footprint Area of 8.45 mm<sup>2</sup>
- 150°C Operating Junction Temperature
- Low Thermal Resistance with Direct Thermal Path of Die on Exposed Cathode Heat Sink
- ESD Ratings:
  - ◆ Human Body Model = 3B (> 16 kV)
  - ◆ Machine Model = V (> 400 V)
- AEC–Q101 Qualified and PPAP Capable
- NRVB Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb–Free\*

### Mechanical Characteristics:

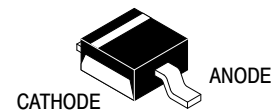
- POWERMITE<sup>®</sup> is JEDEC Registered as D0–216AA
- Case: Molded Epoxy
- Epoxy Meets UL 94 V–0 @ 0.125 in
- Weight: 16.3 mg (Approximately)
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Maximum for 10 Seconds



ON Semiconductor<sup>®</sup>

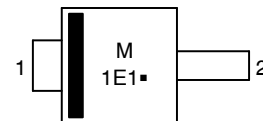
<http://onsemi.com>

## SCHOTTKY BARRIER RECTIFIER 1.0 AMPERES, 10 VOLTS



POWERMITE  
CASE 457  
PLASTIC

### MARKING DIAGRAM



M = Date Code  
1E1 = Device Code  
▪ = Pb–Free Package

### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
MBRM110ET1G	POWERMITE (Pb–Free)	3,000 / Tape & Reel
NRVBM110ET1G	POWERMITE (Pb–Free)	3,000 / Tape & Reel
MBRM110ET3G	POWERMITE (Pb–Free)	12,000 / Tape & Reel

<sup>†</sup>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.

# MBRM110ET1G, NRVBM110ET1G

## 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 ( $T_L = 100^\circ\text{C}$ )	$I_O$	1.0	A
Non-Repetitive Peak Surge Current (Non-Repetitive peak surge current, halfwave, single phase, 60 Hz)	$I_{FSM}$	50	A
Storage Temperature	$T_{stg}$	-55 to +150	$^\circ\text{C}$
Operating Junction Temperature	$T_J$	-55 to +150	$^\circ\text{C}$
Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )	dv/dt	10,000	V/ $\mu\text{s}$

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.

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction-to-Lead (Anode) (Note 1)	$R_{tjl}$	35	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Tab (Cathode) (Note 1)	$R_{tjtab}$	23	
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{tja}$	277	

1. Mounted with minimum recommended pad size, PC Board FR4, See Figures 8 and 9.

## ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Value		Unit
Maximum Instantaneous Forward Voltage (Note 2)  ( $I_F = 0.1\text{ A}$ ) ( $I_F = 1.0\text{ A}$ ) ( $I_F = 2.0\text{ A}$ )	$V_F$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	V
	$V_F$	0.455 0.530 0.595	0.360 0.455 0.540	V
Maximum Instantaneous Reverse Current (Note 2)  ( $V_R = 5.0\text{ V}$ ) ( $V_R = 10\text{ V}$ )	$I_R$	$T_J = 25^\circ\text{C}$	$T_J = 100^\circ\text{C}$	$\mu\text{A}$
		0.5	300	
		1.0	500	

2. Pulse Test: Pulse Width  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

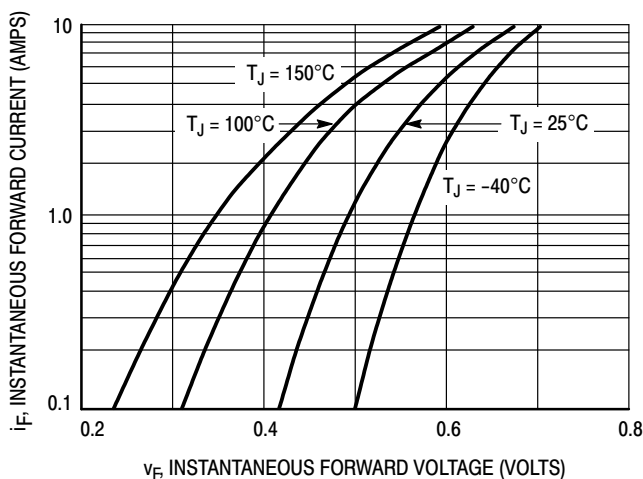


Figure 1. Typical Forward Voltage

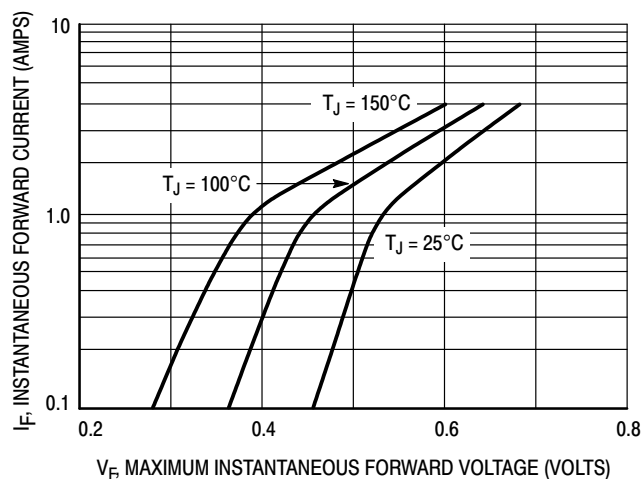


Figure 2. Maximum Forward Voltage

# MBRM110ET1G, NRVBM110ET1G

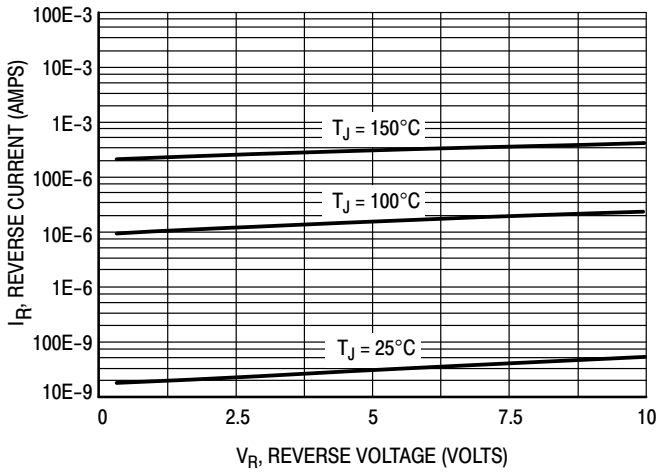


Figure 3. Typical Reverse Current

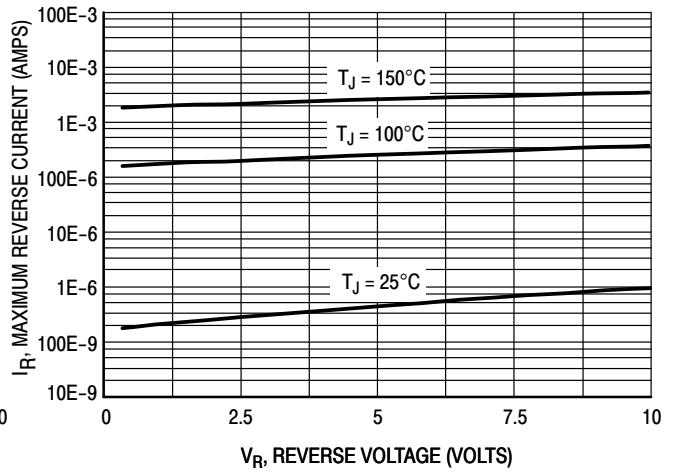


Figure 4. Maximum Reverse Current

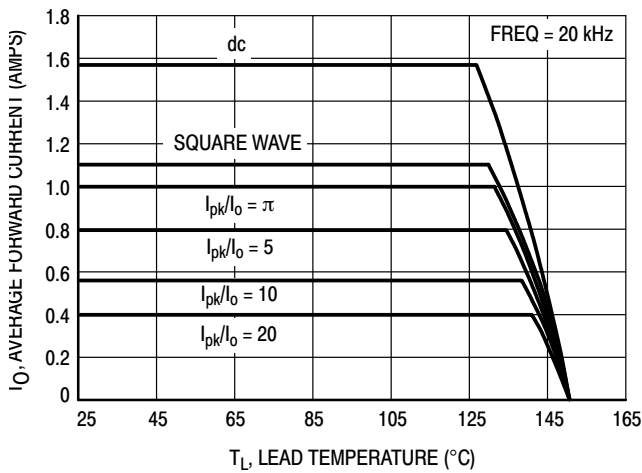


Figure 5. Current Derating

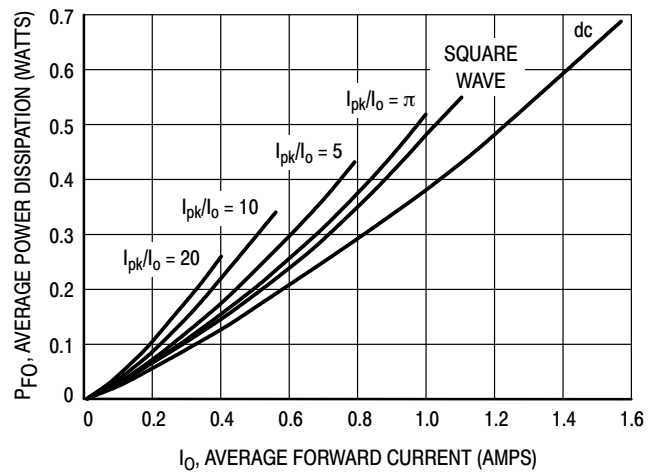


Figure 6. Forward Power Dissipation

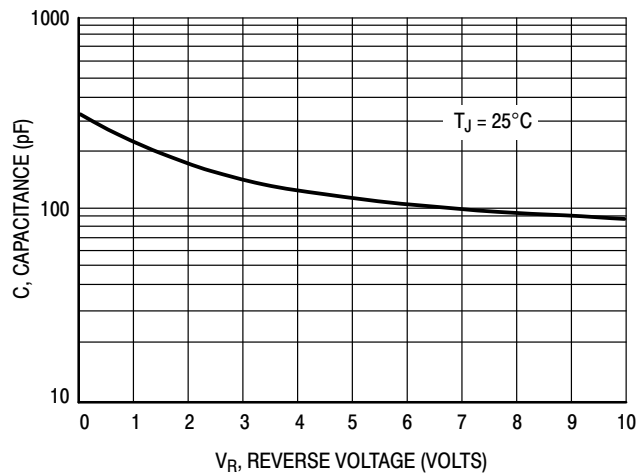


Figure 7. Capacitance

# MBRM110ET1G, NRVBM110ET1G

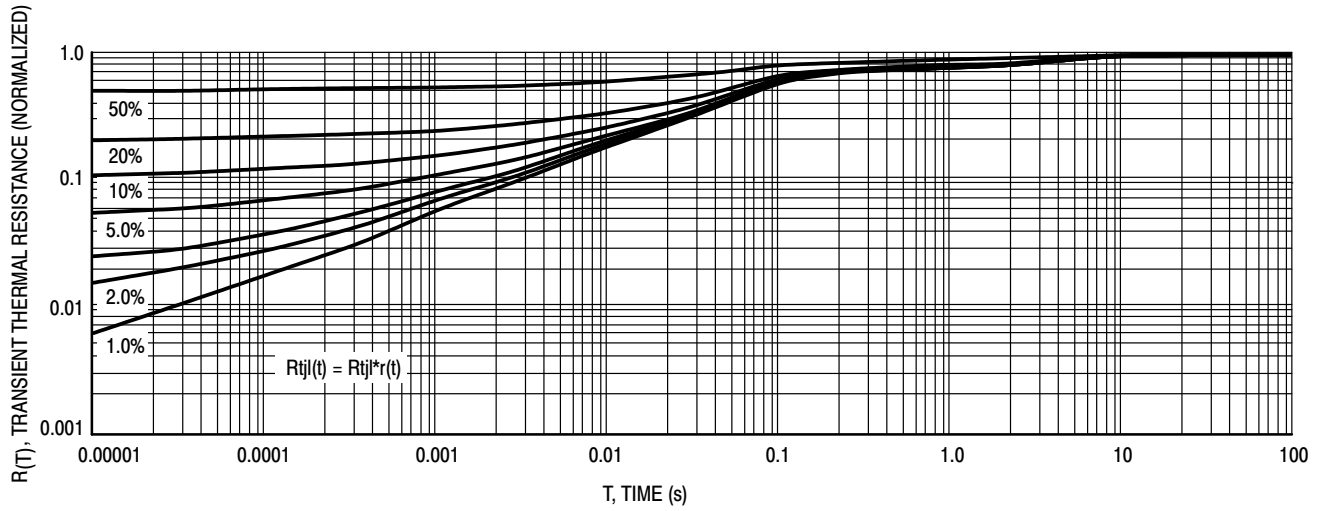


Figure 8. Thermal Response Junction to Lead

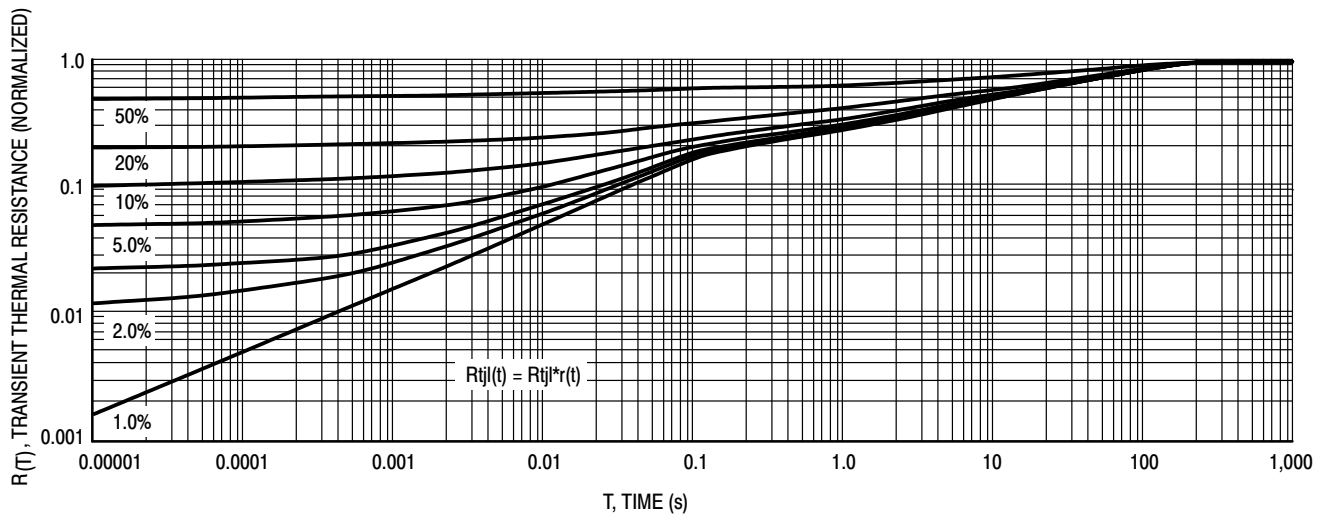
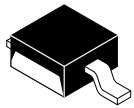


Figure 9. Thermal Response Junction to Ambient

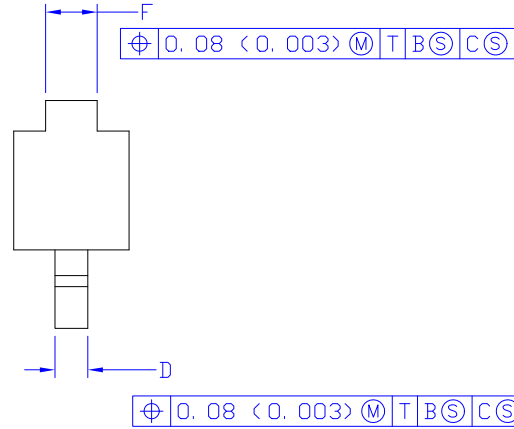
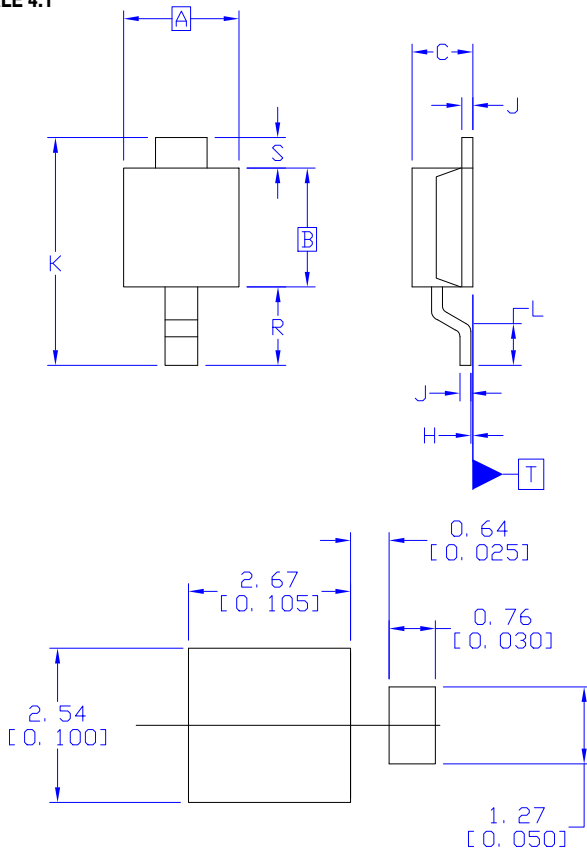
# MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



SCALE 4:1

## POWERMITE CASE 457 ISSUE G

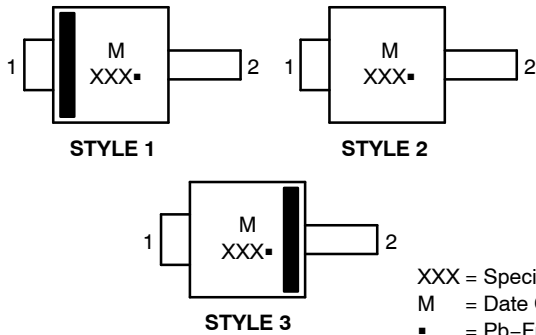
DATE 12 JAN 2022



RECOMMENDED  
MOUNTING FOOTPRINT

DIM	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.75	2.05	0.069	0.081
B	1.75	2.18	0.069	0.086
C	0.85	1.15	0.033	0.045
D	0.40	0.69	0.016	0.027
F	0.70	1.00	0.028	0.039
H	-0.05	0.10	-0.002	0.004
J	0.10	0.25	0.004	0.010
K	3.60	3.90	0.142	0.154
L	0.50	0.80	0.020	0.031
R	1.20	1.50	0.047	0.059
S	0.50 REF		0.019 REF	

### GENERIC MARKING DIAGRAMS\*



XXX = Specific Device Code  
M = Date Code  
■ = Pb-Free Package

#### NOTES:

- DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
- CONTROLLING DIMENSION: MILLIMETERS
- DIMENSION *b* APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30mm FROM THE TERMINAL TIP.

#### STYLE 1:

- CATHODE
- ANODE

#### STYLE 2:

- ANODE OR CATHODE
- CATHODE OR ANODE (BI-DIRECTIONAL)

#### STYLE 3:

- ANODE
- CATHODE

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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