

# MBRM110E

## Surface Mount Schottky Power Rectifier

### POWERMITE® Power Surface Mount Package

The Schottky Powermite 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 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  $I_R$  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

#### Mechanical Characteristics:

- Powermite is JEDEC Registered as D0–216AA
- Case: Molded Epoxy
- Epoxy Meets UL 94V–O at 1/8”
- Weight: 62 mg (approximately)
- Lead and Mounting Surface Temperature for Soldering Purposes. 260°C Maximum for 10 Seconds

#### MAXIMUM RATINGS

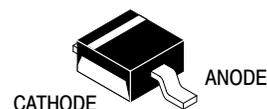
Please See the Table on the Following Page



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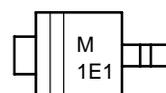
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### SCHOTTKY BARRIER RECTIFIER 1.0 AMPERES 10 VOLTS



POWERMITE  
CASE 457  
PLASTIC

#### MARKING DIAGRAM



1E1 = Device Code  
M = Date Code

#### ORDERING INFORMATION

Device	Package	Shipping
MBRM110ET1	POWERMITE	3,000/Tape & Reel
MBRM110ET3	POWERMITE	12,000/Tape & Reel

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## 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	$\text{V}/\mu\text{s}$

## THERMAL CHARACTERISTICS

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	

## 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
		0.455	0.360	
		0.530	0.455	
Maximum Instantaneous Reverse Current (Note 2) ( $V_R = 5.0\text{ V}$ ) ( $V_R = 10\text{ V}$ )	$I_R$	<b><math>T_J = 25^\circ\text{C}</math></b>	<b><math>T_J = 100^\circ\text{C}</math></b>	$\mu\text{A}$
		0.5	300	
		1.0	500	

1. Mounted with minimum recommended pad size, PC Board FR4, See Figures 8 and 9.
2. Pulse Test: Pulse Width  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

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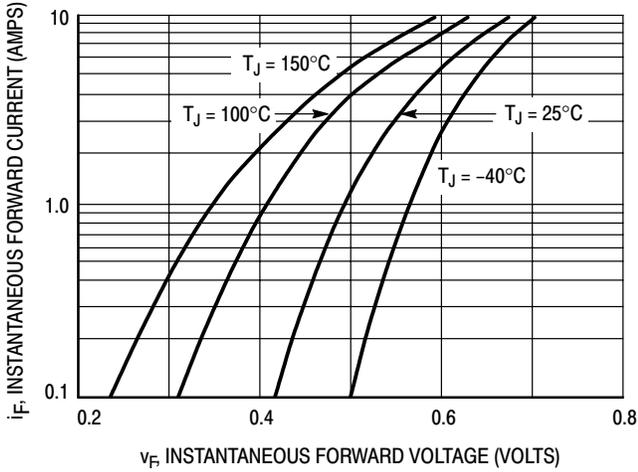


Figure 1. Typical Forward Voltage

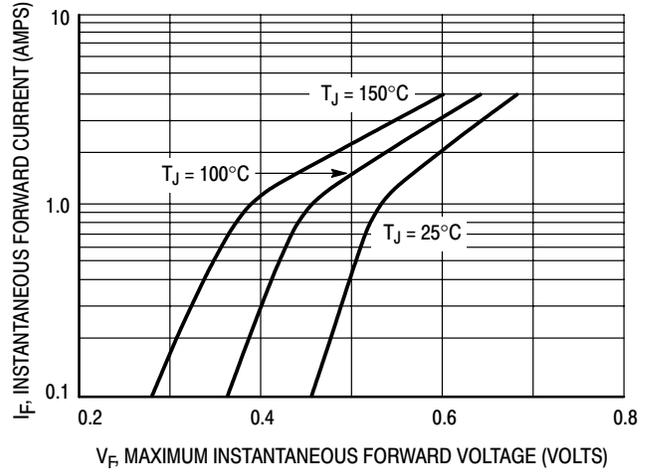


Figure 2. Maximum Forward Voltage

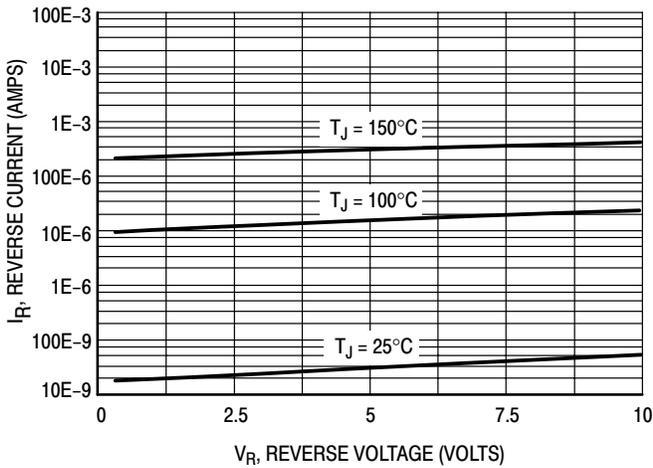


Figure 3. Typical Reverse Current

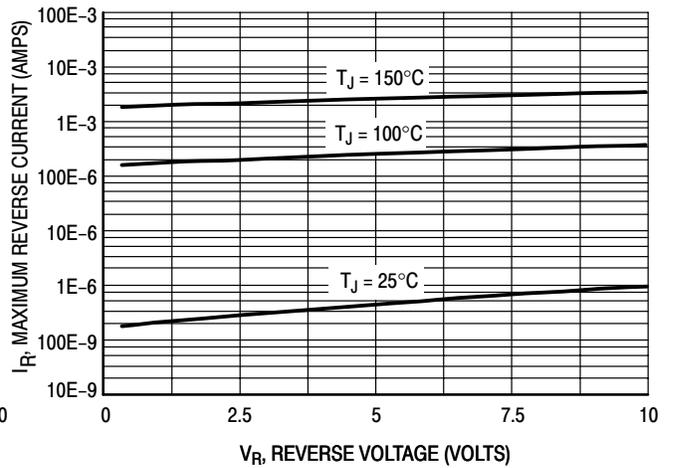


Figure 4. Maximum Reverse Current

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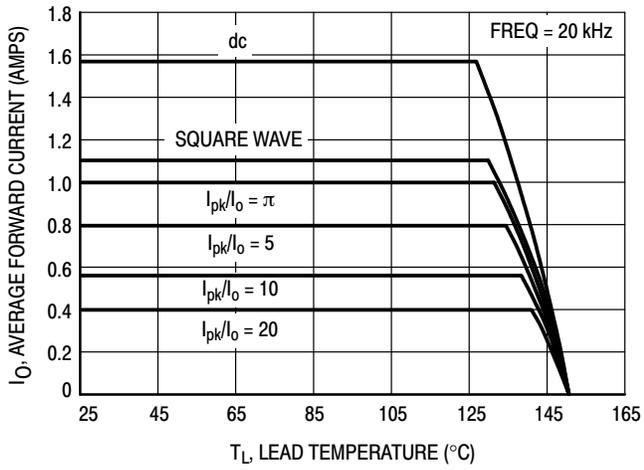


Figure 5. Current Derating

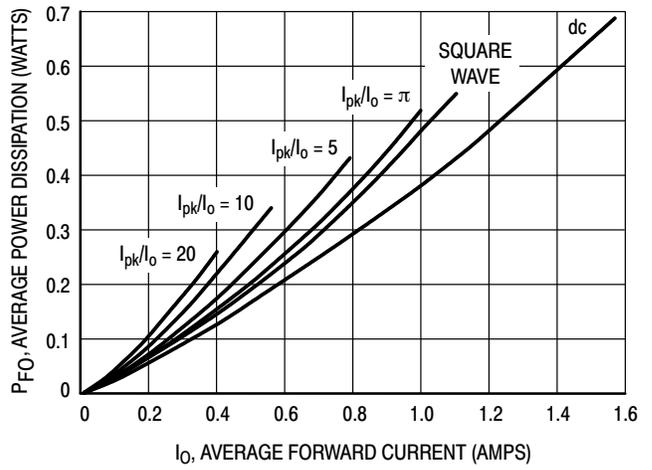


Figure 6. Forward Power Dissipation

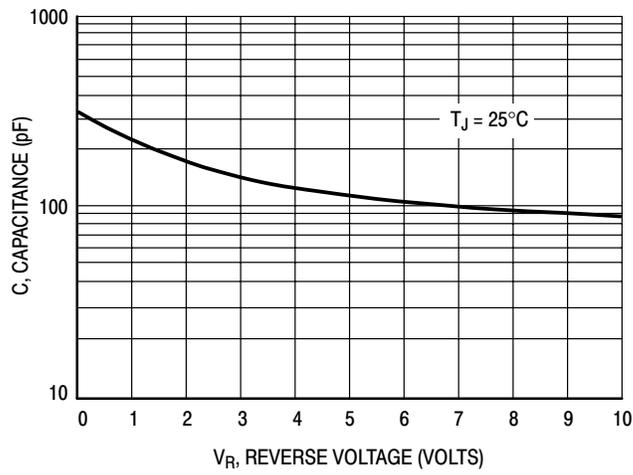


Figure 7. Capacitance

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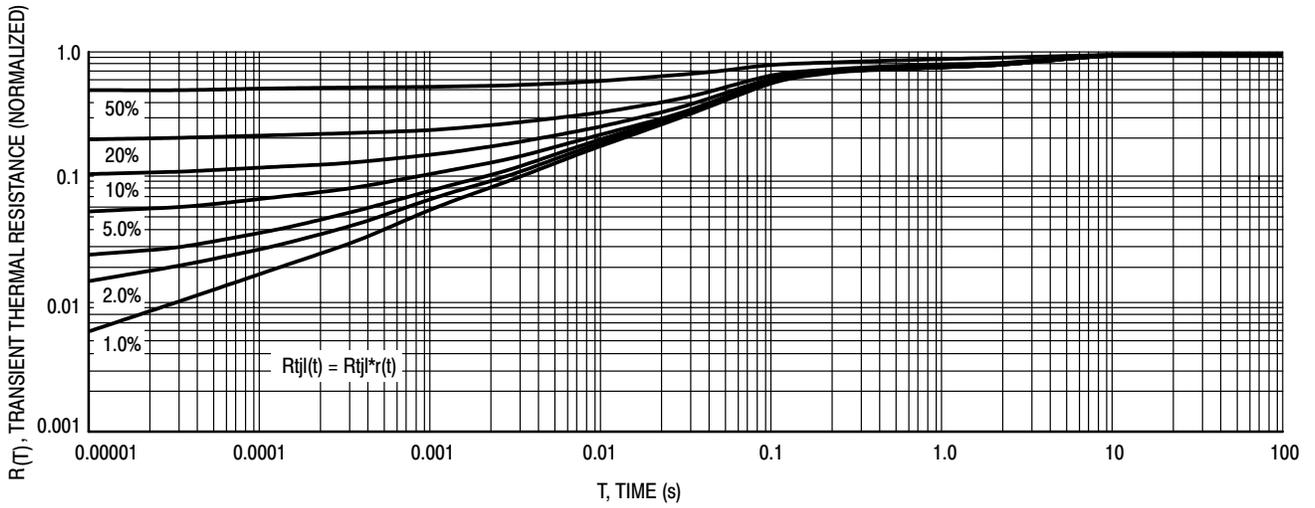


Figure 8. Thermal Response Junction to Lead

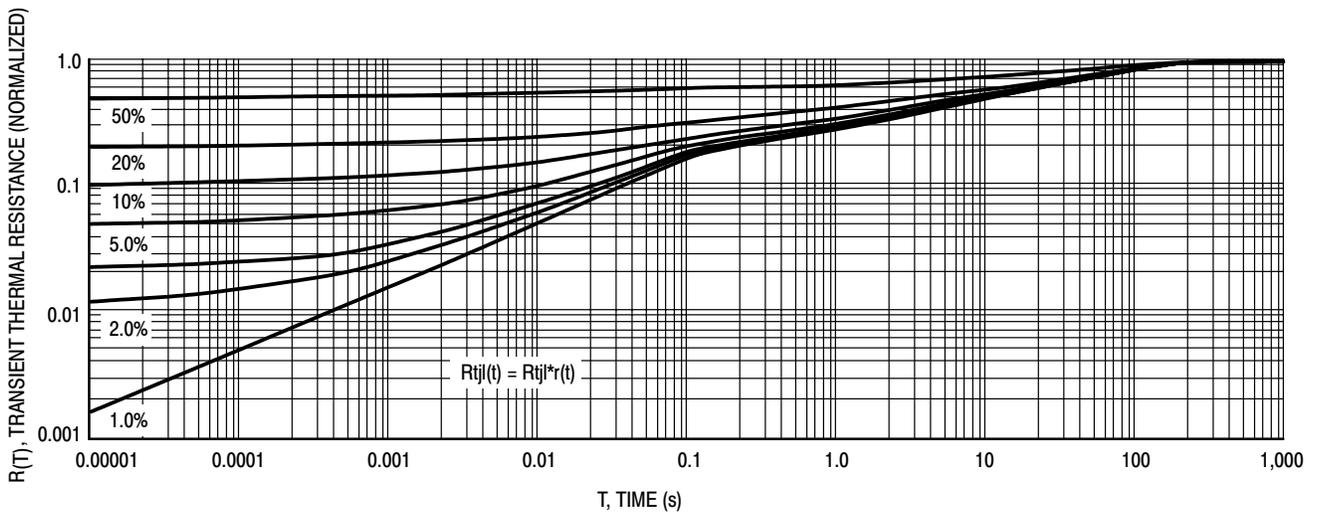
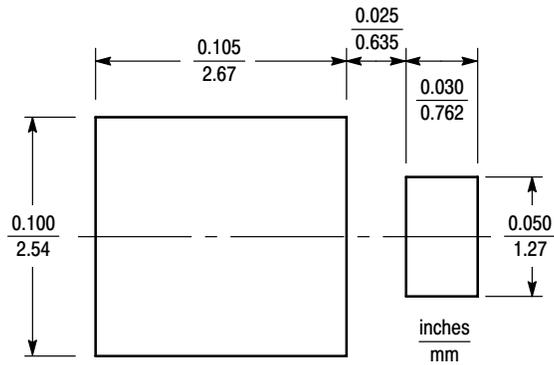


Figure 9. Thermal Response Junction to Ambient

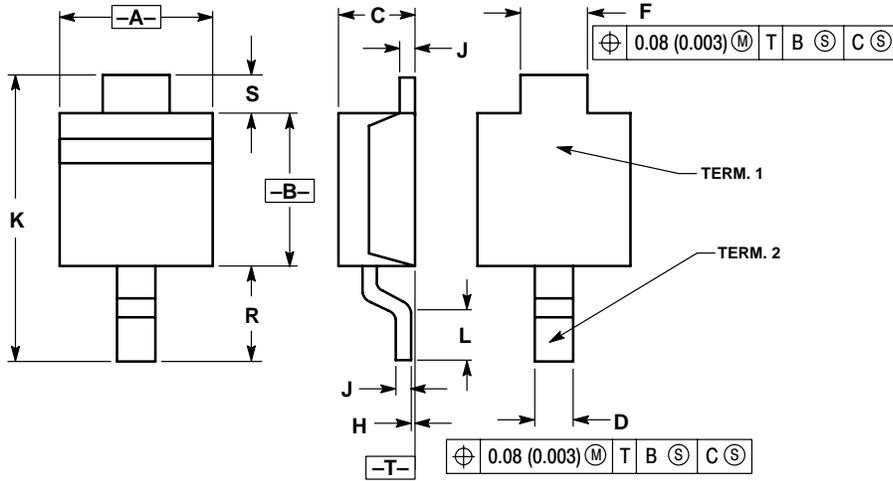


Minimum Recommended Footprint

# MBRM110E

## PACKAGE DIMENSIONS

### POWERMITE PLASTIC PACKAGE CASE 457-04 ISSUE D



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.

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

**Notes**

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