

*Advance Information*

**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 Profile — Maximum Height of 1.1 mm
- Small Footprint — Footprint Area of 8.45 mm<sup>2</sup>
- Low  $V_F$  Provides Higher Efficiency and Extends Battery Life
- Supplied in 12 mm Tape and Reel — 12,000 Units per Reel
- 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 UL94, VO at 1/8”
- Weight: 62 mg (approximately)
- Device Marking: BCD
- Lead and Mounting Surface Temperature for Soldering Purposes. 260°C Maximum for 10 Seconds

**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 $V_R$ , $T_C = 135^\circ\text{C}$ )	$I_O$	1.0	A
Peak Repetitive Forward Current (At Rated $V_R$ , Square Wave, 100 kHz, $T_C = 135^\circ\text{C}$ )	$I_{FRM}$	2.0	A
Non–Repetitive Peak Surge Current (Non–Repetitive peak surge current, halfwave, single phase, 60 Hz)	$I_{FSM}$	50	A
Storage / Operating Case Temperature	$T_{stg}, T_C$	–55 to 150	°C
Operating Junction Temperature	$T_J$	–55 to 125	°C
Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )	$dv/dt$	10,000	V/ $\mu\text{s}$

**THERMAL CHARACTERISTICS**

Thermal Resistance – Junction–to–Lead (Anode) (1)	$R_{tjl}$	35	°C/W
Thermal Resistance – Junction–to–Tab (Cathode) (1)	$R_{tjtab}$	15	
Thermal Resistance – Junction–to–Ambient (1)	$R_{tja}$	248	

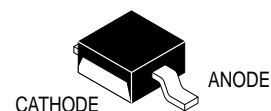
(1) Pulse Test: Pulse Width  $\leq 250 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .

This document contains information on a new product. Specifications and information herein are subject to change without notice.

POWERMITE is a registered trademark of MicroSemi Corporation

**MBRM120LT3**

**SCHOTTKY BARRIER  
RECTIFIER  
1.0 AMPERES  
20 VOLTS**



**CASE 457–03  
ISSUE B**

(Replaces MBRM5817T3/D)

# MBRM120LT3

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1), See Figure 2 ( $I_F = 0.1$ A) ( $I_F = 1.0$ A) ( $I_F = 3.0$ A)	$V_F$	$T_J = 25^\circ\text{C}$	$T_J = 85^\circ\text{C}$	V
		0.34	0.26	
		0.45	0.415	
Maximum Instantaneous Reverse Current, See Figure 4 ( $V_R = 20$ V) ( $V_R = 10$ V)	$I_R$	$T_J = 25^\circ\text{C}$	$T_J = 85^\circ\text{C}$	mA
		0.40	25	
		0.10	18	

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

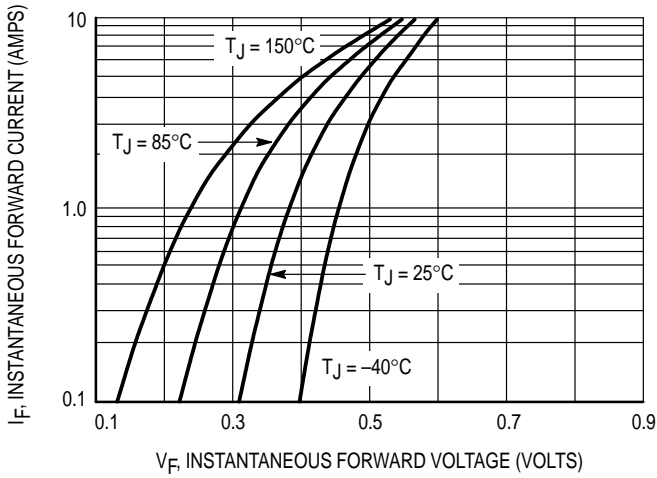


Figure 1. Typical Forward Voltage

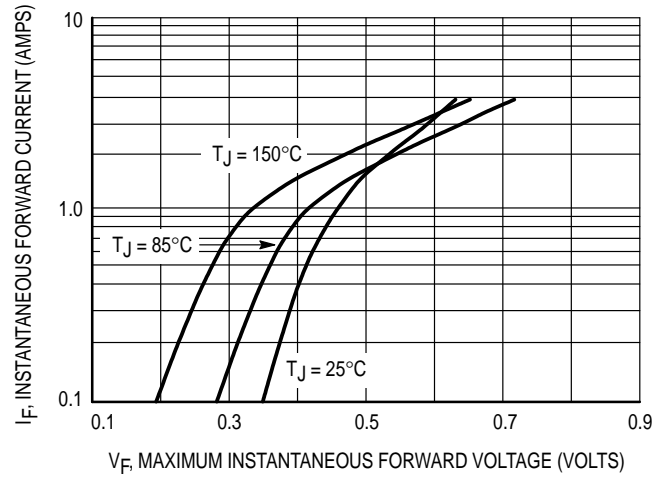


Figure 2. Maximum Forward Voltage

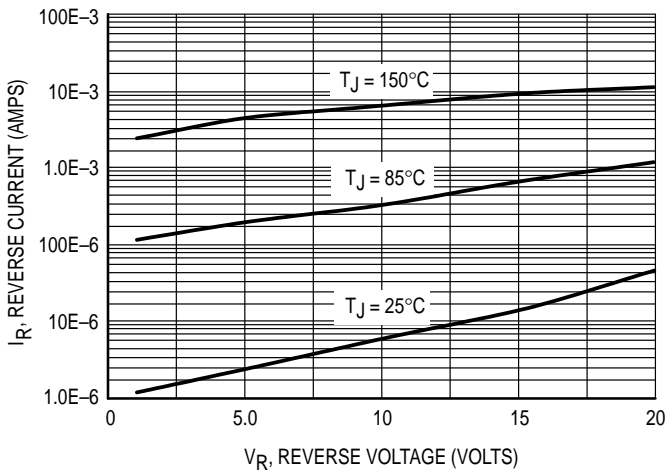


Figure 3. Typical Reverse Current

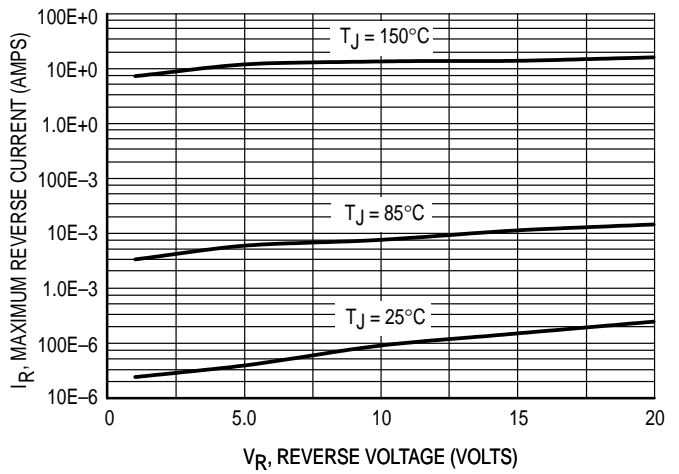
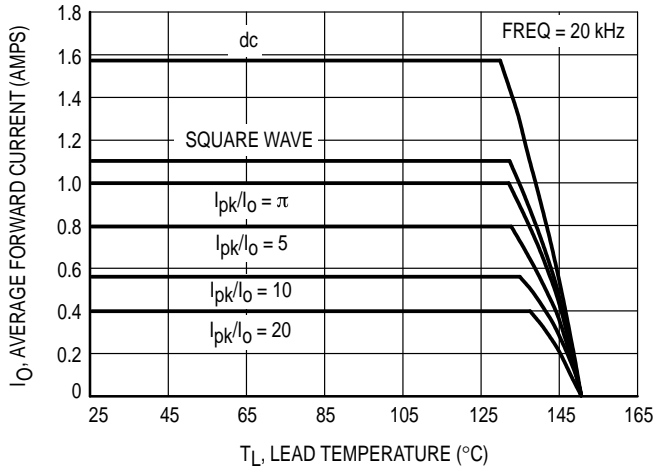
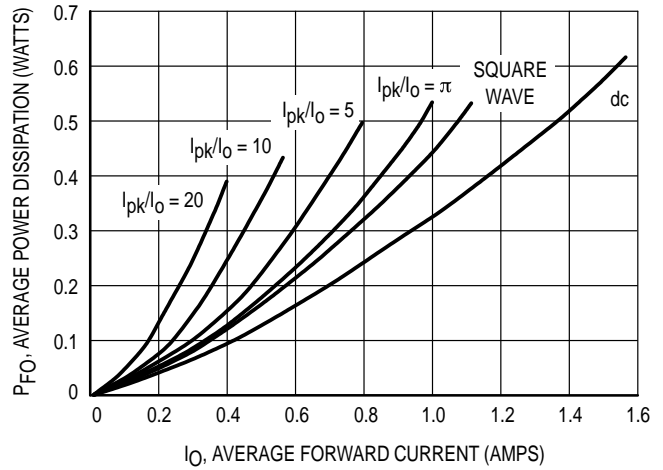


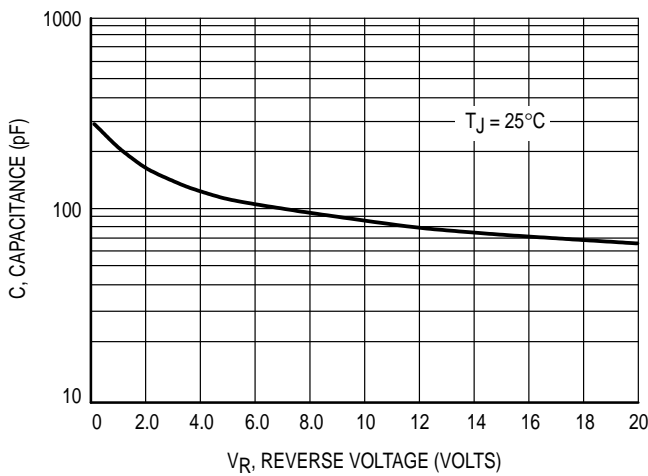
Figure 4. Maximum Reverse Current



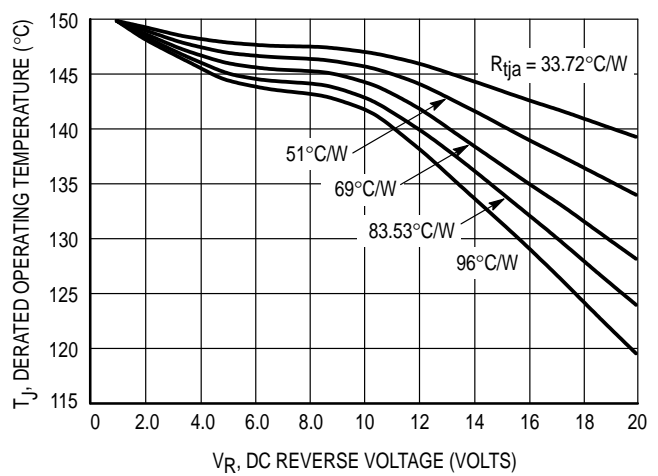
**Figure 5. Current Derating**



**Figure 6. Forward Power Dissipation**



**Figure 7. Capacitance**



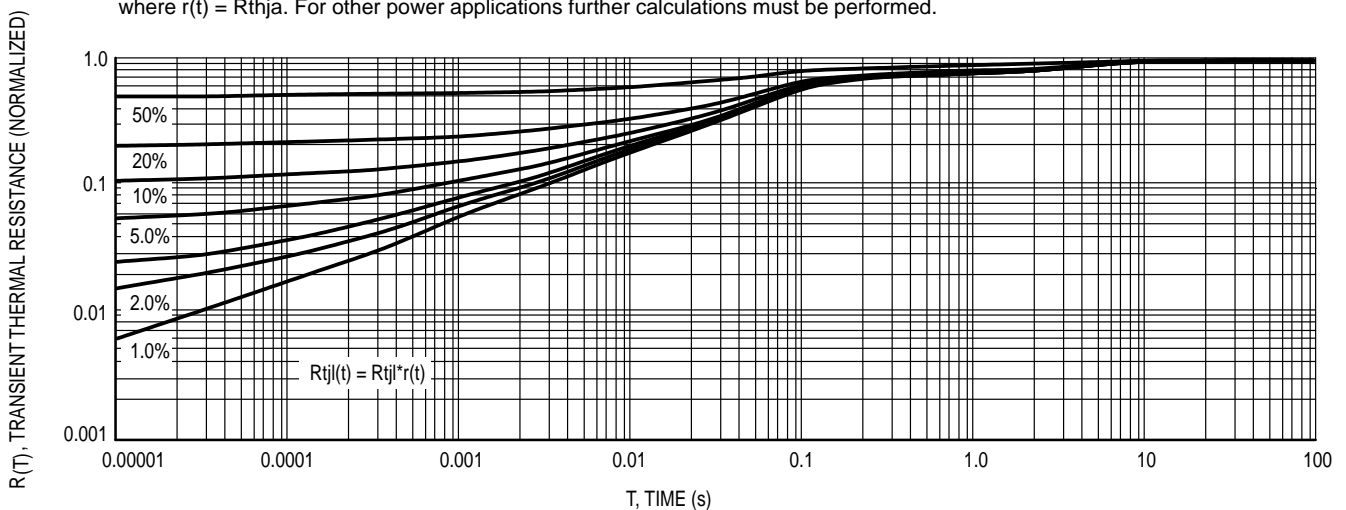
**Figure 8. Typical Operating Temperature Derating\***

\* Reverse power dissipation and the possibility of thermal runaway must be considered when operating this device under any reverse voltage conditions. Calculations of  $T_J$  therefore must include forward and reverse power effects. The allowable operating  $T_J$  may be calculated from the equation:

$$T_J = T_{Jmax} - r(t)(P_f + P_r) \text{ where}$$

$r(t)$  = thermal impedance under given conditions,  
 $P_f$  = forward power dissipation, and  
 $P_r$  = reverse power dissipation

This graph displays the derated allowable  $T_J$  due to reverse bias under DC conditions only and is calculated as  $T_J = T_{Jmax} - r(t)P_r$ , where  $r(t) = R_{thja}$ . For other power applications further calculations must be performed.



**Figure 9. Thermal Response Junction to Lead**

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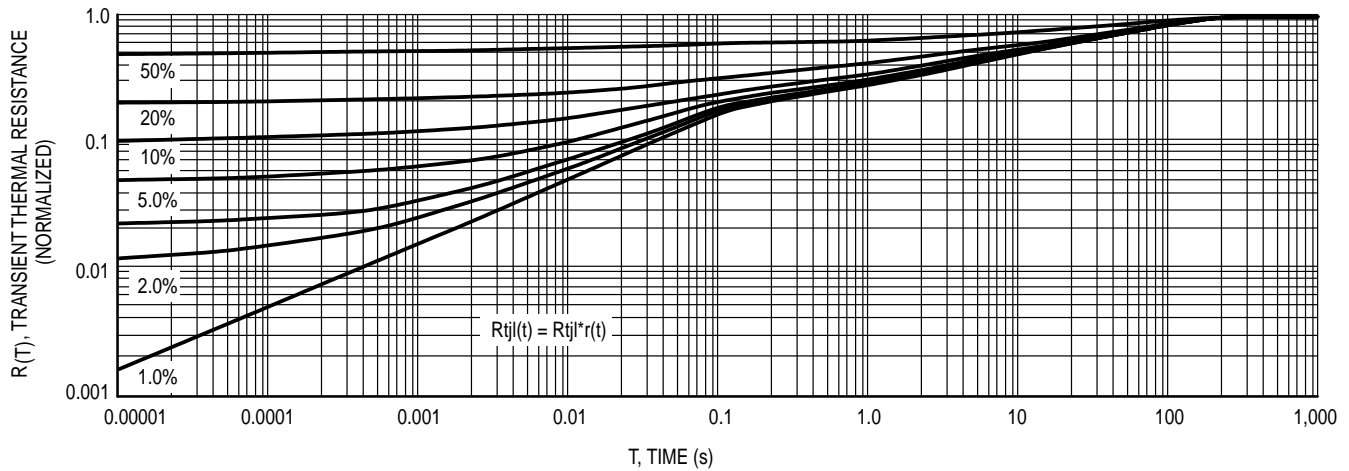
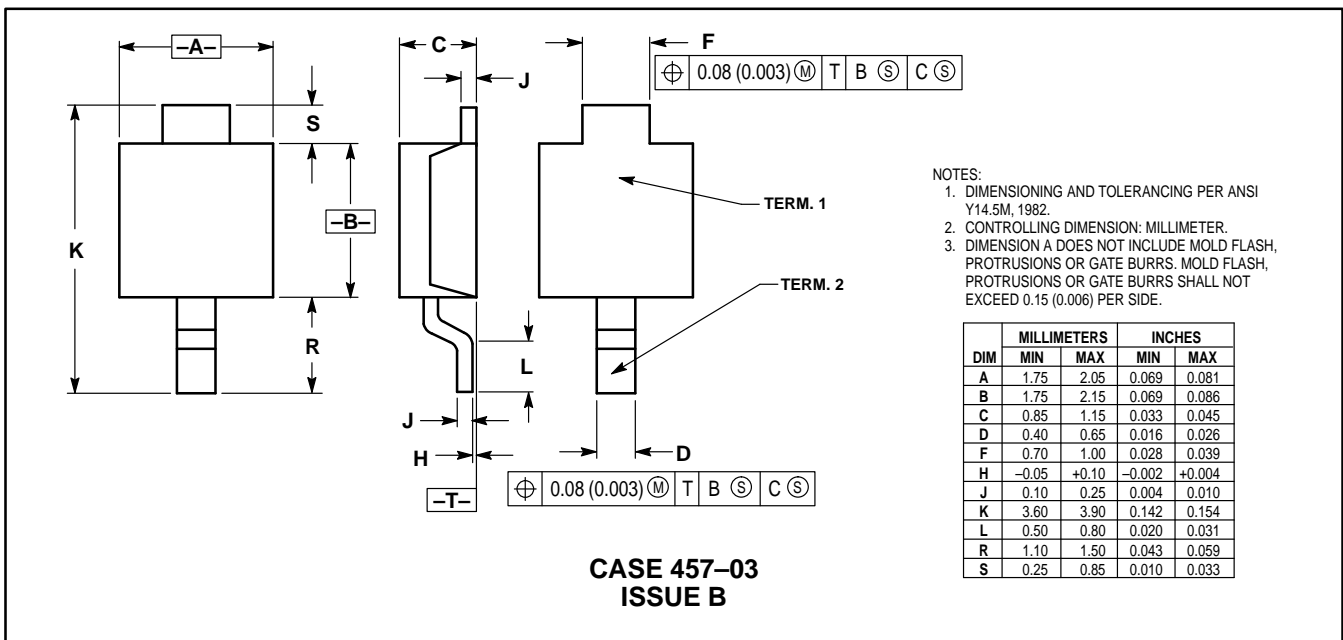


Figure 10. Thermal Response Junction to Ambient

## PACKAGE DIMENSIONS



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