Advance Information

Surface Mount Schottky Power Rectifier

SMB Power Surface Mount Package

MBRS140LT3

SCHOTTKY BARRIER RECTIFIER 1.0 AMPERES 40 VOLTS

CASE 403A–03 SMB

. . . 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
- Low Forward Voltage Drop

Mechanical Characteristics:

- Case: Molded Epoxy
- Epoxy Meets UL94, VO at 1/8″
- Weight: 95 mg (approximately)
- Polarity: Notch in Plastic Body Indicates Cathode Lead
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Available in 12 mm Tape, 2500 Units per 13″ Reel, Add “T3” Suffix to Part Number
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Marking: B14L

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	40	Volts
Average Rectified Forward Current (At Rated V_R, T_C = 110°C)	I_O	1.0	Amps
Peak Repetitive Forward Current (At Rated V_R, Square Wave, 100 kHz, T_C = 110°C)	I_{FRM}	2.0	Amps
Non–Repetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz)	I_{FSM}	40	Amps
Storage / Operating Case Temperature	Tstg, 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°C)	dv/dt	10,000	V/μs

THERMAL CHARACTERISTICS

Thermal Resistance — Junction–to–Lead (2) Thermal Resistance — Junction–to–Ambient (2)	$R_{\theta JL}$ $R_{\theta JA}$	24 80	°C/W

ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (1)		V_F	**T_J = 25°C**	**T_J = 125°C**	Volts
	(I_F = 1.0 A)		0.5	0.425	
see Figure 2	(I_F = 2.0 A)		0.6	0.58	
Maximum Instantaneous Reverse Current		I_R	**T_J = 25°C**	**T_J = 100°C**	mA
	(V_R = 40 V)		0.4	10	
see Figure 4	(V_R = 20 V)		0.02	5.0	

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

(1) Pulse Test: Pulse Width ≤ 250 μs, Duty Cycle ≤ 2.0%.

(2) Mounted with minimum recommended pad size, PC Board FR4.

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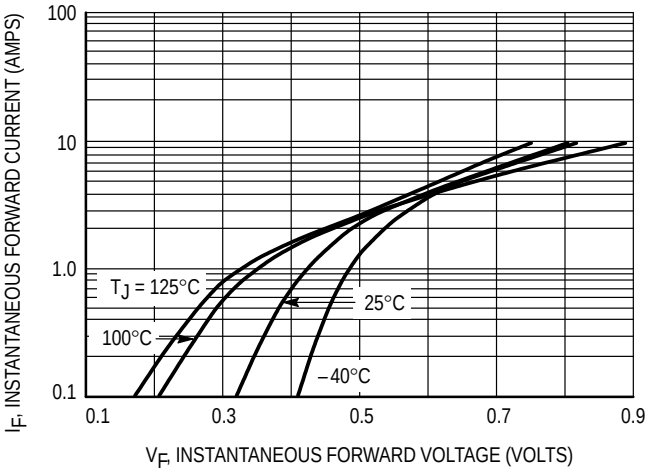


Figure 1. Typical Forward Voltage

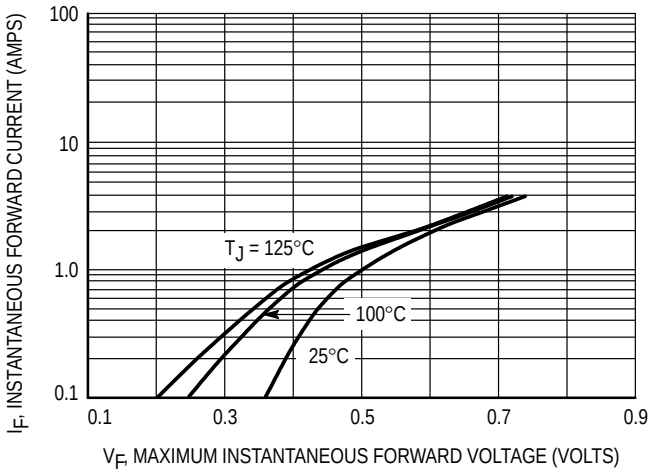


Figure 2. Maximum Forward Voltage

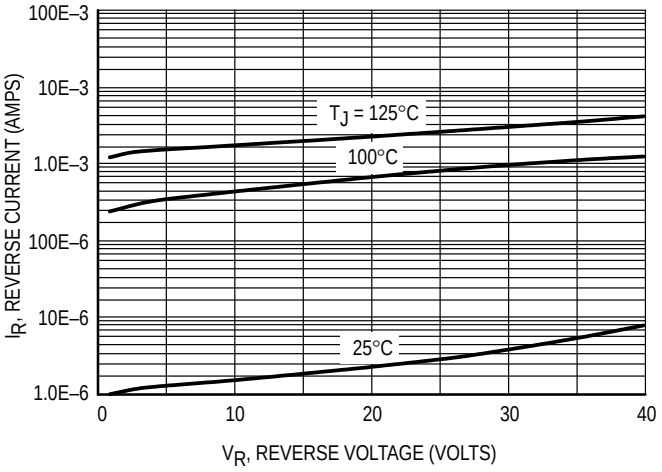


Figure 3. Typical Reverse Current

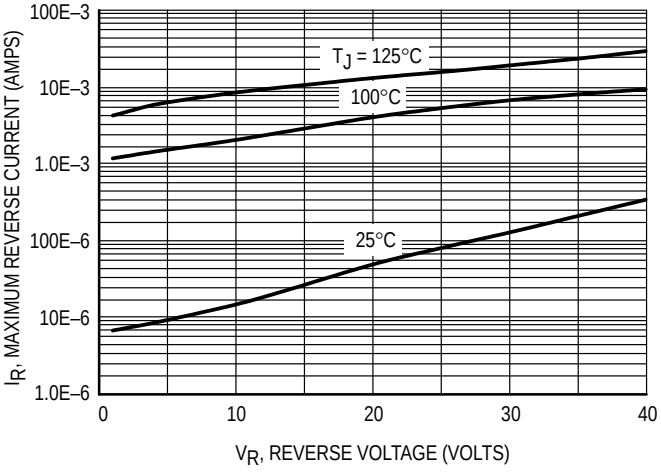


Figure 4. Maximum Reverse Current

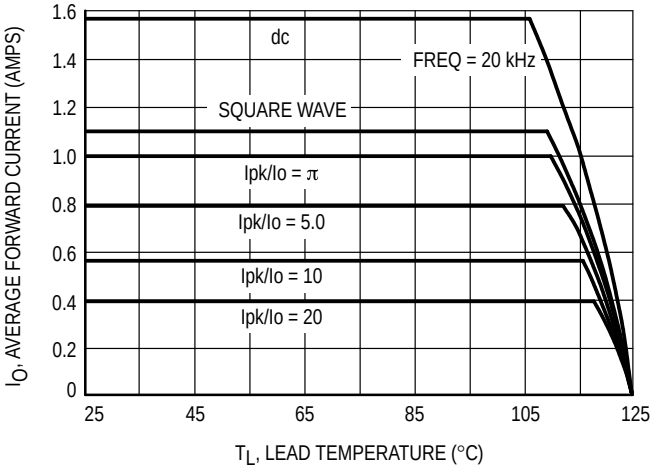


Figure 5. Current Derating

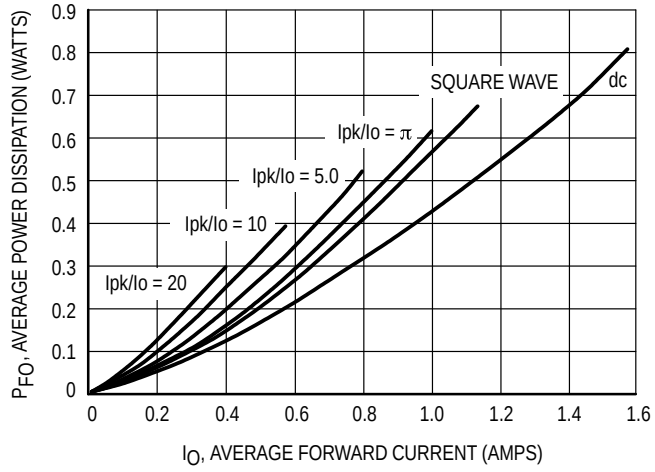


Figure 6. Forward Power Dissipation

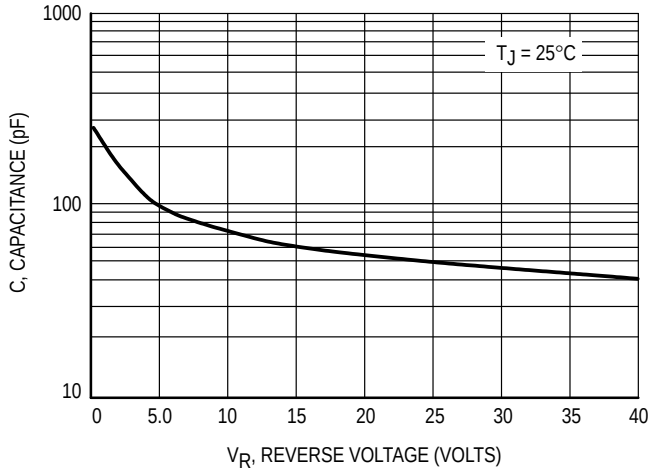


Figure 7. Capacitance

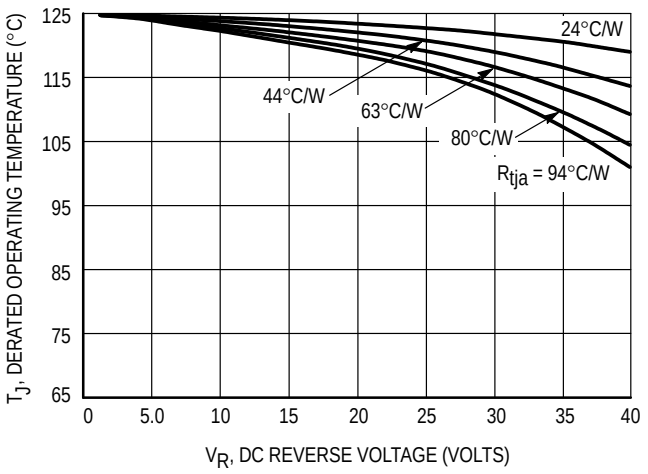


Figure 8. Typical Operating Temperature Derating*

* 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: $T_J = T_{Jmax} - r(t)(Pf + Pr)$ where
r(t) = thermal impedance under given conditions,
Pf = forward power dissipation, and
Pr = reverse power dissipation
This graph displays the derated allowable T_J due to reverse bias under DC conditions only and is calculated as $T_J = T_{Jmax} - r(t)Pr$, where r(t) = Rthja. For other power applications further calculations must be performed.

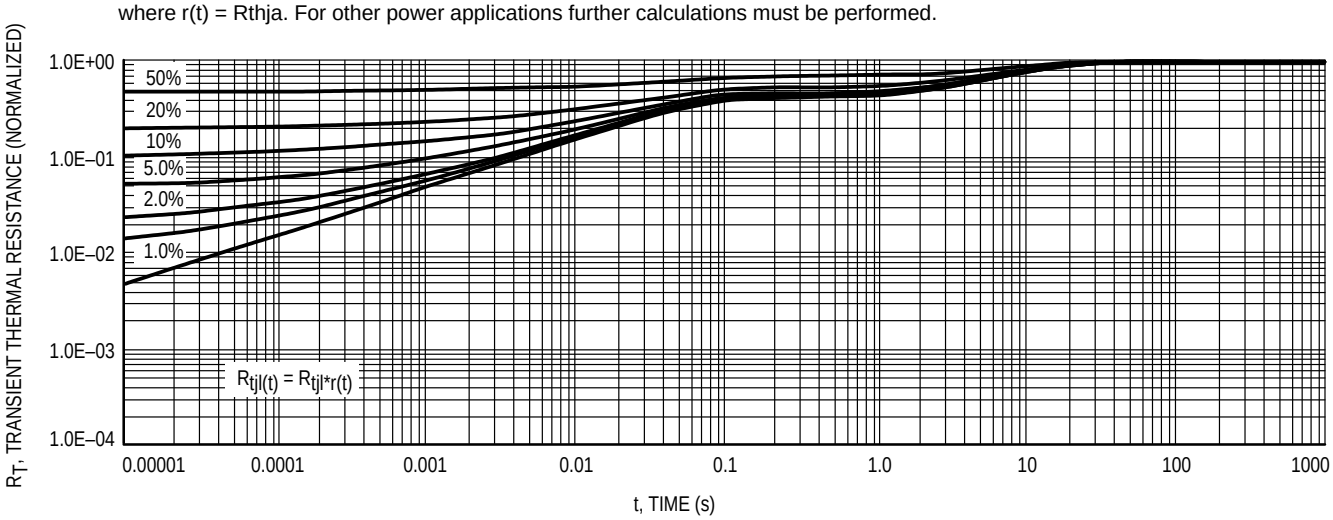


Figure 9. Thermal Response — Junction to Lead

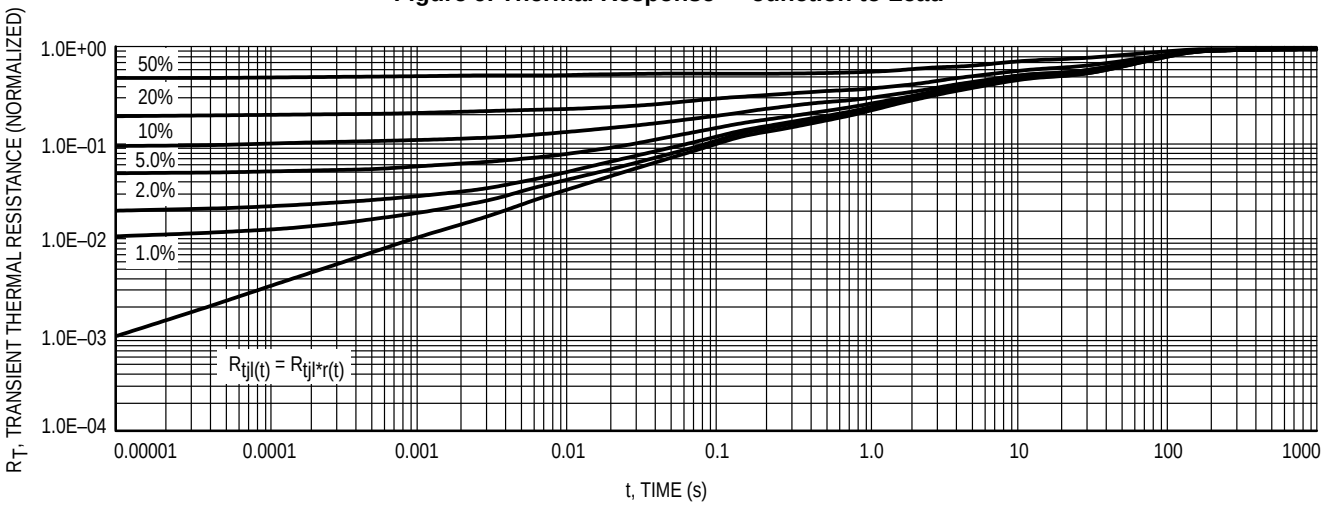
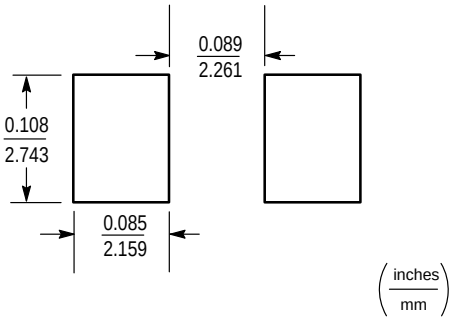
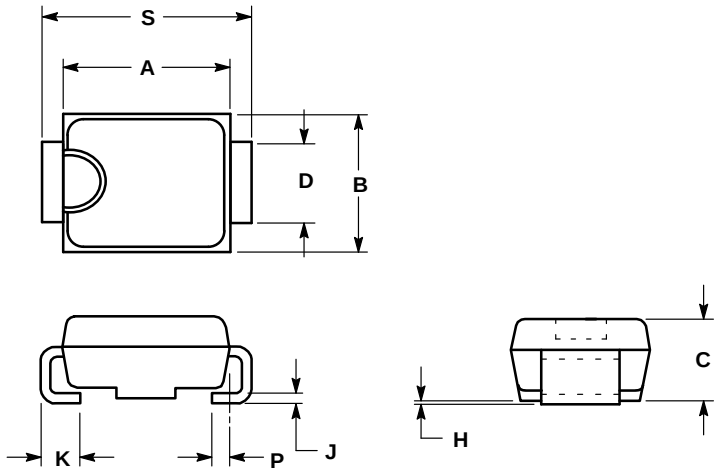


Figure 10. Thermal Response — Junction to Ambient



SMB

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.130	0.150	3.30	3.81
C	0.075	0.095	1.90	2.41
D	0.077	0.083	1.96	2.11
H	0.0020	0.0060	0.051	0.152
J	0.006	0.012	0.15	0.30
K	0.030	0.050	0.76	1.27
P	0.020 REF		0.51 REF	
S	0.205	0.220	5.21	5.59

CASE 403A–03
ISSUE B

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