



## DESCRIPTION

The MBR120LSF is available in SOD-123 Package.

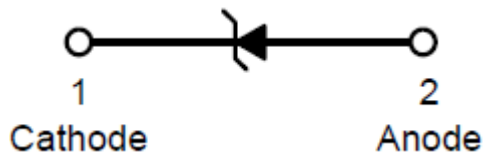
## ORDERING INFORMATION

Package Type	Part Number
SOD-123	MBR120LSF
Note	3,000pcs /Reel
AiT provides all RoHS Compliant Products	

## FEATURES

- Guarding for Stress Protection
- Low Forward Voltage
- 125°C Operating Junction Temperature
- Epoxy Meets UL 94V-0 @ 0.125 in
- Package Designed for Optimal Automated Board Assembly
- ESD Ratings: Machine Model, C  
Human Body Model, 3B
- Available in SOD-123 Package

## PIN DESCRIPTION



## APPLICATION

**Polarity Designator:** Cathode Band

**Weight:** 11.7mg (approximately)

**Case:** Epoxy, Molded



## ABSOLUTE MAXIMUM RATINGS

Parameter	Value	Unit
$V_{RRM}$ , Peak Repetitive Reverse Voltage $V_{RWM}$ , Working Peak Reverse Voltage $V_R$ , DC Blocking Voltage	20	V
$I_O$ , Average Rectified Forward Current (At Rated $V_R$ , $T_L = 115^\circ\text{C}$ )	1.0	A
$I_{FRM}$ , Peak Repetitive Forward Current (At Rated $V_R$ , Square Wave, 100 kHz, $T_L = 110^\circ\text{C}$ )	2.0	A
$I_{FSM}$ , Non-Repetitive Peak Surge Current (Non-Repetitive peak surge current, halfwave, single phase, 60Hz)	5.5	A
$T_{stg}$ , Storage Temperature	-55 to 150	$^\circ\text{C}$
$T_J$ , Operating Junction Temperature	-55 to 125	$^\circ\text{C}$
$dv/dt$ , Voltage Rate of Change (Rated $V_R$ , $T_J = 25^\circ\text{C}$ )	10000	V/ $\mu\text{s}$

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

## THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance-Junction-to-Lead <sup>NOTE1</sup>	$R_{tjl}$	26	$^\circ\text{C/W}$
Thermal Resistance-Junction-to-Lead <sup>NOTE2</sup>	$R_{tjl}$	21	
Thermal Resistance-Junction-to-Ambient <sup>NOTE1</sup>	$R_{tja}$	325	
Thermal Resistance-Junction-to-Ambient <sup>NOTE2</sup>	$R_{tja}$	82	

NOTE1: Mounted with minimum recommended pad size, PC Board FR4.

NOTE2: Mounted with 1 in. copper pad (Cu area 700 mm<sup>2</sup>).



## ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Characteristic	T <sub>J</sub> = 25°C	T <sub>J</sub> = 85°C	Unit
Maximum Instantaneous Forward Voltage <sup>NOTE3</sup> (See Figure 2)	V <sub>F</sub>	I <sub>F</sub> = 0.1A	0.34	0.26	V
		I <sub>F</sub> = 1.0A	0.45	0.415	
Maximum Instantaneous Reverse Current <sup>NOTE3</sup> (See Figure 4)	I <sub>R</sub>	V <sub>R</sub> = 20V	0.4	25	mA
		V <sub>R</sub> = 10V	0.1	18	

NOTE3. Pulse Test: Pulse Width ≤ 250μs, Duty Cycle ≤ 2%.



## TYPICAL PERFORMANCE CHARACTERISTICS

Figure. 1 Typical Forward Voltage

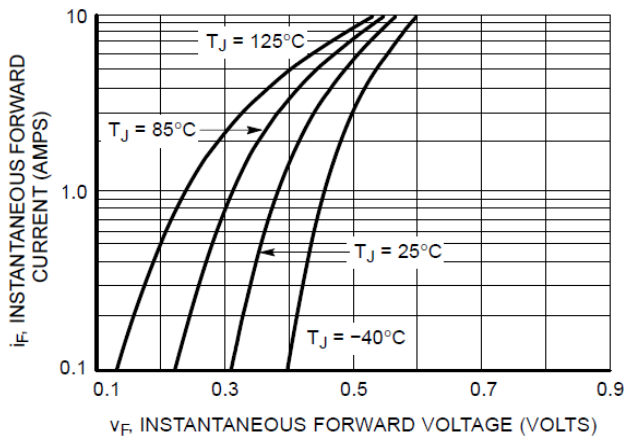


Figure. 2 Maximum Forward Voltage

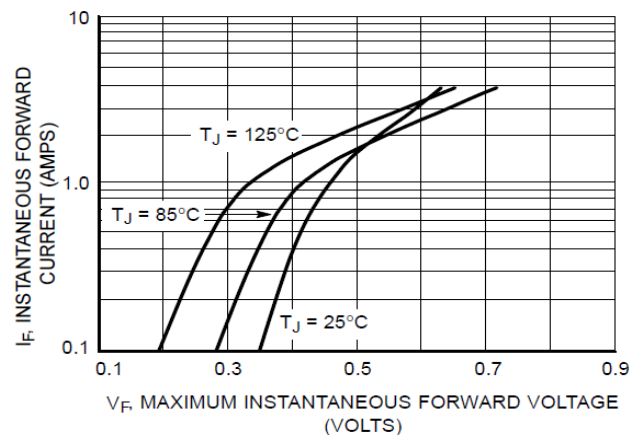


Figure. 3 Typical Reverse Current

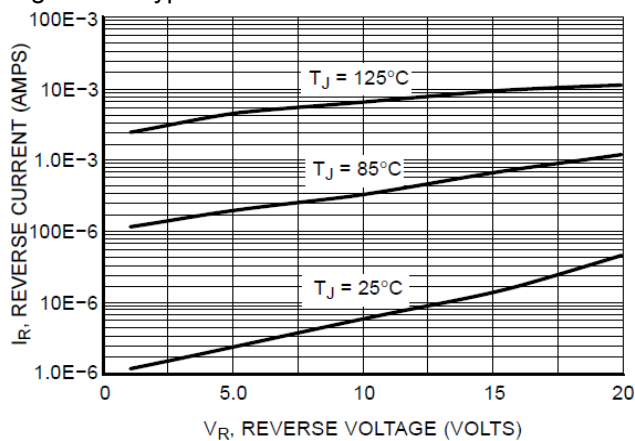


Figure. 4 Maximum Reverse Current

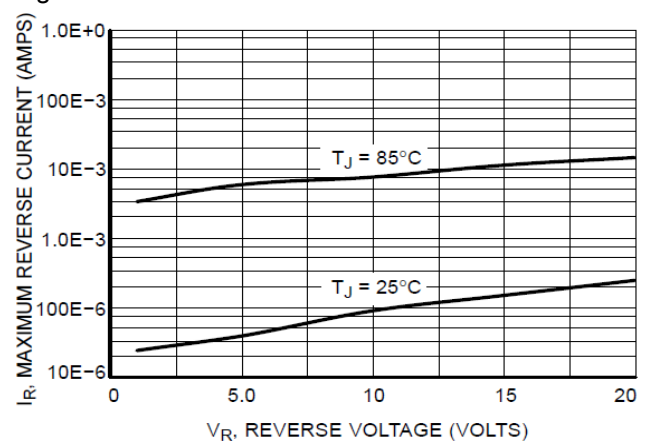


Figure. 5 Current Derating

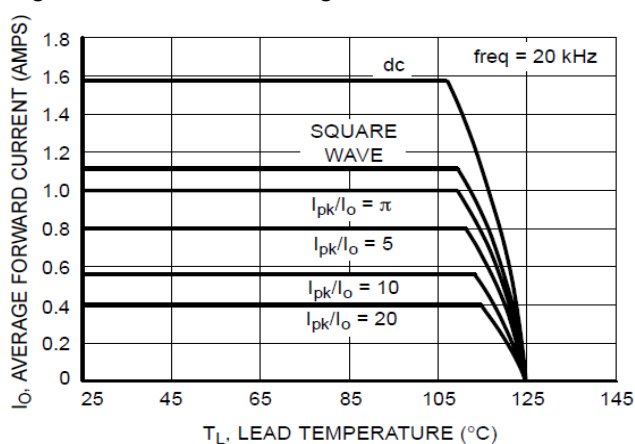


Figure. 6 Forward Power Dissipation

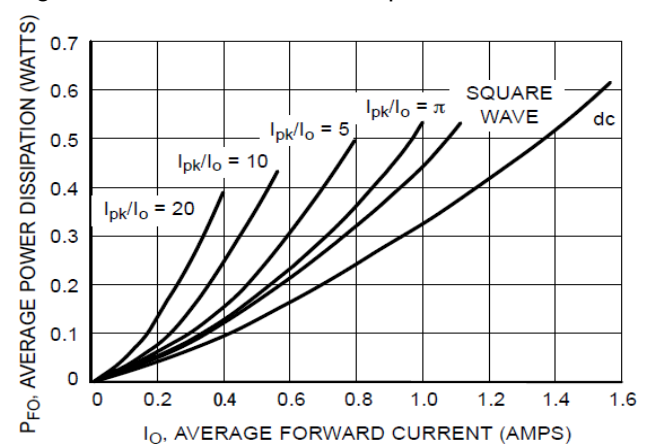




Figure. 7 Capacitance

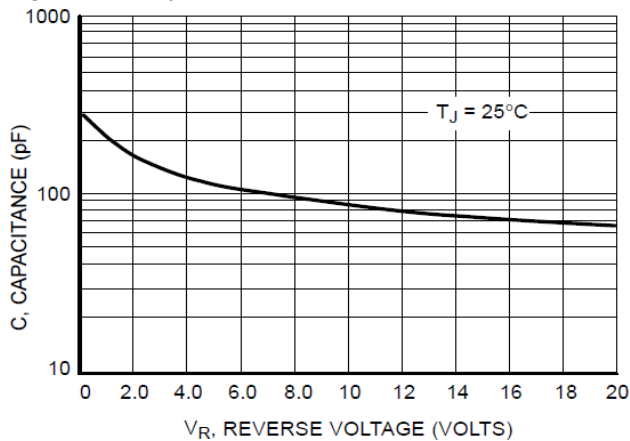


Figure. 8 Typical Operating Temperature Derating <sup>NOTE4</sup>

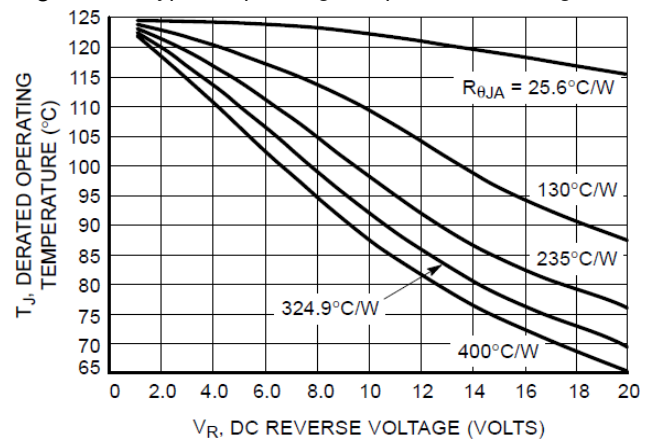
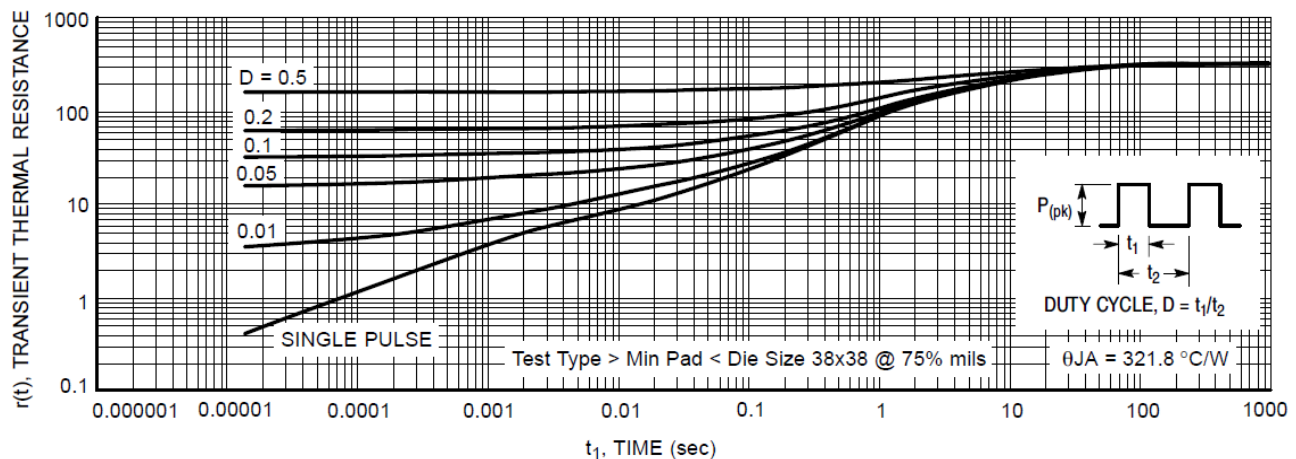


Figure. 9 Thermal Response



NOTE4: 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:  $T_J = T_{Jmax} - r(t)(P_f + P_r)$  where

$r(t)$  = thermal impedance under given conditions,

$P_f$  = forward power dissipation, and

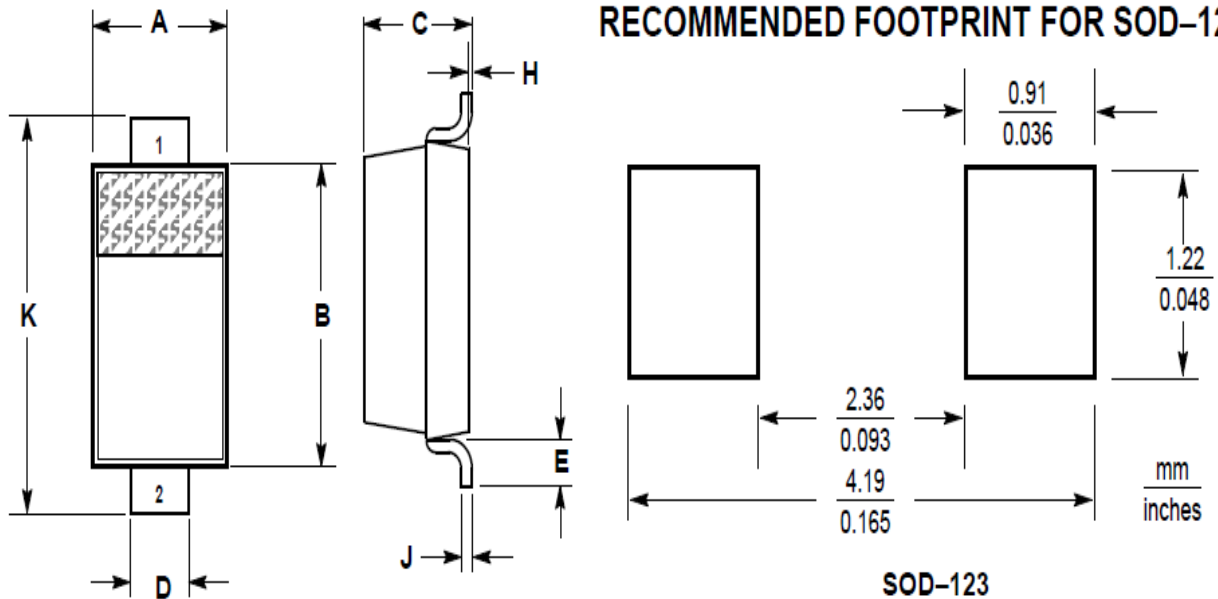
$P_r$  = reverse power dissipation

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.



## PACKAGE INFORMATION

Dimension in SOD-123 Package (Unit: mm)



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.055	0.071	1.40	1.80
B	0.100	0.112	2.55	2.85
C	0.037	0.053	0.95	1.35
D	0.020	0.028	0.50	0.70
E	0.004	-	0.25	-
H	0.000	0.004	0.00	0.10
J	-	0.006	-	0.15
K	0.140	0.152	3.55	3.85



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