

### Features

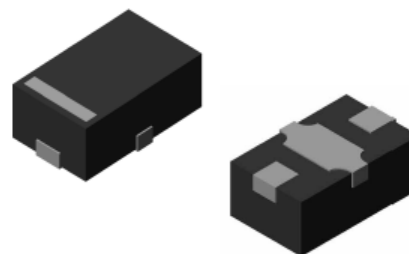
- Low Junction Capacitance for Low Insertion Loss and High Isolation :  $C_{T6} < 0.3 \text{ pF}$
- Low Series Resistance for High Isolation:  $R_S < 1 \Omega$
- Nominal I layer width :  $W = 10 \mu\text{m}$
- Compact surface mount plastic package
- RoHS\* Compliant

### Description

The MLP7120-2012 limiter PIN diode is a low series resistance The MLP7120-2012 limiter PIN diode is a low series resistance, low capacitance limiter PIN diode packaged in a surface mount, low-parasitic plastic package. It is manufactured using a proprietary diode process for excellent performance and high reliability.

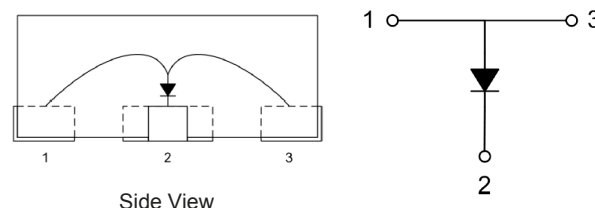
The  $10 \mu\text{m}$  nominal I layer width of this diode produces a threshold level of 20 dBm nominal, for demanding receiver protection applications. The low series resistance ( $< 1 \Omega$ ), and low total capacitance ( $< 0.3 \text{ pF}$ ) of MLP7120-2012 produce excellent isolation and insertion loss in shunt, receiver protection applications.

The MLP7120-2012 limiter PIN diode is designed to be used in receiver protection applications.



2012

### Pin Out / Schematic



### Ordering Information

Part Number	Package
MLP7120-2012-R	3000 piece reel
MLP7120-2012-B	100 per bag bulk
MLP7120-2012-W	400 piece waffle pack

### Handling Procedures

Please observe the following precautions to avoid damage:

### Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these HBM Class 0 devices.

### Moisture Sensitivity

These electronic devices are rated MSL 1.

### Environmental Capabilities

Capable of meeting the environmental requirements of MIL-STD-750 and MIL-STD-883.

1 \* Restrictions on Hazardous Substances, European Union Directive 2011/65/EU.

**Electrical Specifications:  $T_A = +25^\circ\text{C}$  (measured on evaluation board)**

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Breakdown Voltage ( $V_B$ )	$I_R = 10 \mu\text{A}$	V	120	—	180
Forward Voltage ( $V_F$ )	$I_F = 100 \text{ mA}$	V	—	0.95	1.2
Total Capacitance <sup>1</sup> ( $C_T$ )	$V_R = 6 \text{ V}$ , 1 MHz	pF	—	—	0.3
Series Resistance <sup>2</sup> ( $R_S$ )	$I_F = 1 \text{ mA}$ , 1 GHz $I_F = 10 \text{ mA}$ , 1 GHz	$\Omega$	—	3.5 1.0	—
Recovery Time ( $T_R$ )	End of the RF input to 1 dB excess insertion loss	ns	—	50	—
Minority Carrier Lifetime ( $T_L$ )	50% control to 90% output voltage, $I_F = 10 \text{ mA}$ , $I_R = 6 \text{ mA}$ , 1 KHz	ns	—	50	—
Thermal Resistance ( $\theta_{JC}$ )	—	$^\circ\text{C/W}$	—	—	45
I layer Thickness (W)	—	$\mu\text{m}$	—	10	—

1. Total capacitance ( $C_T$ ) is the sum of the diode junction capacitance ( $C_J$ ) and the package capacitance ( $C_{PKG}$ ).
2. Series resistance ( $R_S$ ) is measured on the HP 4291 Impedance Analyzer.

**Absolute Maximum Ratings**

Parameter	Test Conditions	Absolute Maximum
Forward DC Current	—	150 mA
Reverse DC Voltage	—	180 V
Forward DC Voltage	$I_F = 150 \text{ mA}$	1.3 V
Peak RF Input Power	Pulse Width = 1 $\mu\text{s}$ , Duty Cycle = 1%	60 dBm
CW Input Power	—	37 dBm
Junction Temperature	—	+175 $^\circ\text{C}$
Operating Temperature	—	-55 $^\circ\text{C}$ to +150 $^\circ\text{C}$
Storage Temperature	—	-65 $^\circ\text{C}$ to +100 $^\circ\text{C}$
Assembly Temperature	$t = 10 \text{ s}$	+260 $^\circ\text{C}$

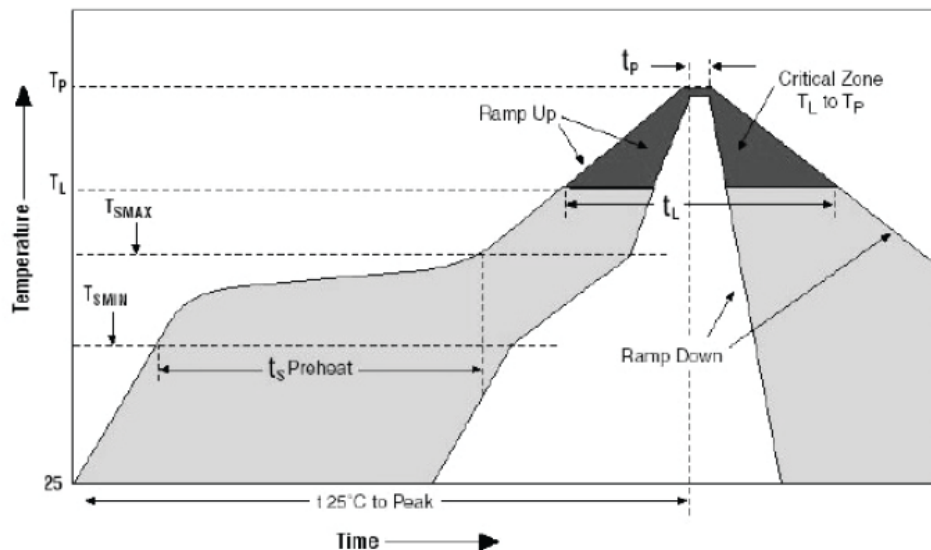
## Assembly Instructions

Diodes may be placed onto circuit boards with pick and place manufacturing equipment from tape-reel. The devices are attached to the circuit using conventional solder re-flow or wave soldering procedures with RoHS type or Sn 60 / Pb 40 type solders.

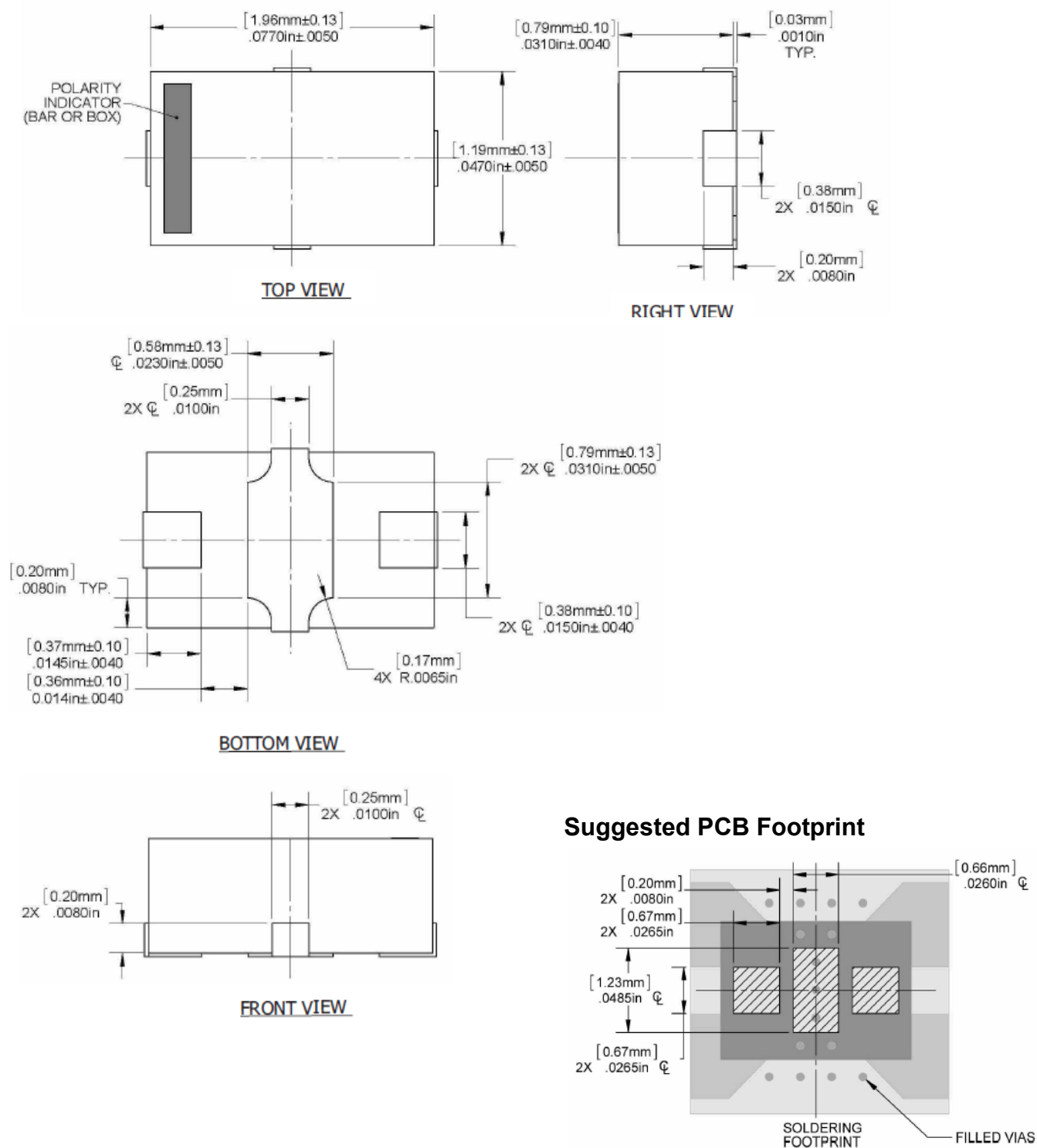
**Table 1. Time-Temperature Profile for Sn60/Pb40 or RoHS Type Solders**

Profile Feature	SnPb Solder Assembly	Pb-Free Solder Assembly
Average Ramp-Up Rate ( $T_L$ to $T_P$ )	3°C /second maximum	3°C /second maximum
Preheat: -Temperature Min ( $T_{SMIN}$ ) -Temperature Max ( $T_{SMAX}$ ) -Time (min to max)( $t_S$ )	100°C 150°C 60 - 120 s	150°C 200°C 60 - 180 s
$T_{SMAX}$ to $T_L$ - Ramp-Up Rate		3°C /s maximum
Time Maintained Above: -Temperature ( $T_L$ ) - Time ( $t_L$ )	183°C 60 - 150 s	217°C 60 - 150 s
Peak temperature ( $T_P$ )	225 +0/-5°C	260 +0/-5°C
Time Within 5°C of Actual Peak Temperature ( $t_P$ )	10 – 30 s	20 – 40 s
Ramp-Down Rate	6°C /s maximum	6°C /s maximum
Time 25°C to Peak Temperature	6 minutes maximum	8 minutes maximum

**Figure 1. Solder Re-Flow Time-Temperature Profile**



### Outline (2012)



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