

**DATA SHEET**

# SMP1330 Series: Plastic Packaged Limiter Diodes

## Features


- Low-distortion design
- Limiter performance to 2 GHz and higher
- Low insertion loss
- Low-cost plastic package
- Available in tape and reel packaging
- Available lead (Pb)-free and RoHS-compliant



## Description

The SMP1330 series of limiter diodes in plastic packages is designed for use as a passive receiver protector in wireless and other RF systems covering 2 GHz and higher. It employs Skyworks limiter diode technology to produce a gold doped thin base limiter chip for low-loss, low-distortion performance and good limiter action. This device has been characterized in limiter circuits and tightly specified to insure consistent performance.

**NEW** Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.






## Absolute Maximum Ratings

Characteristic	Value
Reverse voltage ( $V_R$ )	20 V
Forward current ( $I_F$ )	100 mA
CW incident power @ 25 °C lead temperature	1 W
Peak incident power @ 1% duty factor 1 $\mu$ S pulse	100 W
Power dissipation @ 25 °C lead temperature ( $P_D$ )	250 mW
Storage temperature ( $T_{ST}$ )	-65 °C to +150 °C
Operating temperature ( $T_{OP}$ )	-65 °C to +150 °C
ESD human body model	Class 2

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

**CAUTION:** Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

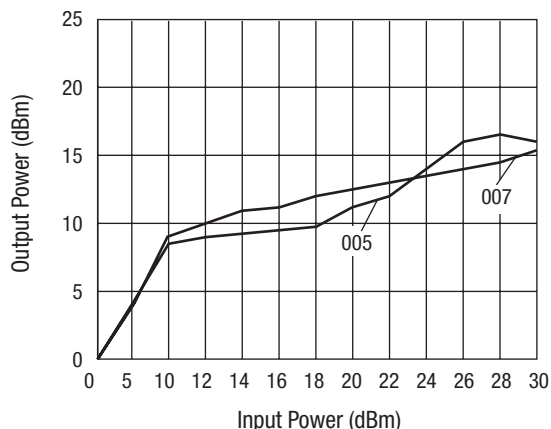
	
Series Pair	Low Inductance
SOT-23	SOT-23
<b>SMP1330-005</b>	<b>SMP1330-007</b>
Marking: PQ2	Marking: PQB
<b>SMP1330-005LF</b>	<b>SMP1330-007LF</b>
Marking: RQ2	Marking: RQB
$L_S = 1.5$ nH	$L_S = 0.4$ nH

 LF denotes lead (Pb)-free, RoHS-compliant packaging option as an alternative to our standard tin/lead (Sn/Pb) packaging.

### Electrical Specifications at 25 °C

Parameter	Condition	Min.	Typ.	Max.	Unit
Series resistance ( $R_S$ )	10 mA, 100 MHz		1.2	1.5	$\Omega$
Capacitance ( $C_T$ )	0 V, 1 MHz		0.7	1	pF
Capacitance ( $C_T$ )	0 V, 1 GHz		0.7		pF
Conductance (G)	0 V, 1 GHz		50		$\mu$ s
Carrier lifetime (TI)	$I_F = 10$ mA		4		ns
I region width			3		$\mu$ m
Breakdown voltage ( $V_{BR}$ )	$I_R = 10$ $\mu$ A	20	35	50	V

### Typical Performance Data



Typical 1 GHz Limiter Performance

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SMP1330	Condition	-005
Connection		Parallel
Insertion loss	$P = -20$ dBm	0.3 dB
IP3	$P = < 0$ dBm	30 dBm
1 dB compression		10 dBm
Attenuation at 20 dBm		8.8 dB
Attenuation at 30 dBm		14 dB

### Recommended Solder Reflow Profiles

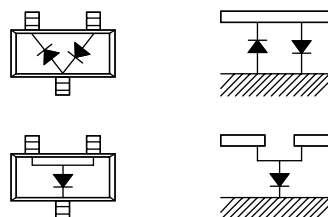
Refer to the [“Recommended Solder Reflow Profile”](#) Application Note.

### Tape and Reel Information

Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

### Packages

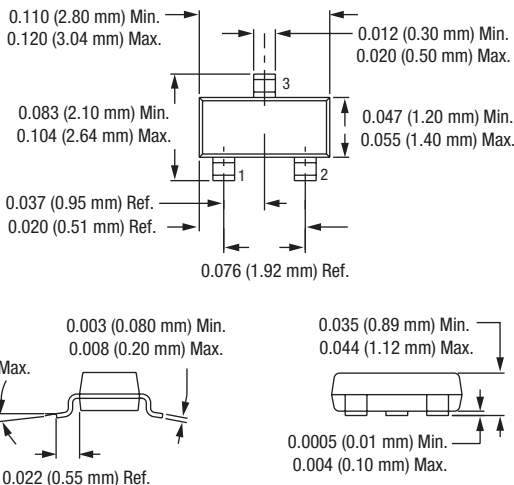
The SMP1330 series is available in two wiring configurations, each utilizing industry standard SOT-23.



### SMP1330-005 Series Pair SOT-23

This series pair is designed for use as antiparallel limiter diodes by externally connecting pins 1 and 2 of the SOT-23 package. In a limiter circuit, no DC return is needed and limiting action is improved because inductance is reduced to approximately 0.8 nH. A small increase in loss occurs from the higher capacitance and conductance.

### SOT-23



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