DATA SHEET

SMPA1302-079LF: Switch and Attenuator Plastic Packaged PIN Diode

Automotive Applications

- Infotainment
- Navigation
- Telematics
- Garage door openers
- Wireless control systems

Features

- AEC-Q101 qualified
- ISO/TS16949 certified facility
- Designed for large signal switching applications
- Designed for low distortion attenuator applications
- Low capacitance (< 0.30 pF) for high isolation performance
- Package rated MSL1 @ 260 °C per JEDEC J-STD-020

Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to *Skyworks Definition of Green™*, document number SQ04–0074.

Description

The SMPA1302-079LF plastic packaged, surface mountable, low capacitance (0.3 pF) silicon PIN diode is designed for switch and attenuator applications used in vehicle infotainment.

The nominal 50 µm I region width, combined with a maximum resistance of 3 Ω at 10 mA, makes these diodes useful in large signal switch applications.

The low capacitance (< 0.30 pF) is ideal for high isolation switching, and the long lifetime (700ns) makes this part ideal for low distortion attenuator applications.

Table 1 describes the SMPA1302-079LF package and marking.

Table 1. Package and Marking


Single
SC-79 Green™
SMPA1302-079LF Marking: Cathode and C3
L_S = 0.7 nH

The Pb-free symbol or "LF" in the part number denotes a lead-free, RoHS-compliant package unless otherwise noted as Green™. Tin/lead (Sn/Pb) packaging is not recommended for new designs.

Electrical and Mechanical Specifications

The absolute maximum ratings of the SMPA1302-079LF are provided in Table 2. Electrical specifications are provided in Table 3. Resistance versus temperature measurements are provided in Table 4.

Typical performance characteristics of the SMPA1302-079LF are illustrated in Figures 1 to 4. Package dimensions are shown in Figure 5, and tape and reel dimensions are provided in Figure 6.

Table 2. SMPA1302-079LF Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Minimum	Maximum	Units
Reverse voltage	V_R		200	V
Power dissipation @ 25 °C lead temperature	P_D		250	mW
Storage temperature	T_{STG}	–65	+150	°C
Operating temperature	T_A	–65	+150	°C
Electrostatic discharge: Human Body Model (HBM), Class 1C	ESD	 1000	 2000	 V

Note 1: Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.

***CAUTION**: Although this device is designed to be as robust as possible, electrostatic discharge (ESD) 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 should be used at all times.*

Table 3. SMPA1302-079LF Electrical Specifications (Note 1)
(T_A = +25 °C, Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typical	Max	Units
Reverse current	I_R	V_R = 200 V			10	µA
Capacitance	C_T	f = 1 MHz, V = 30 V			0.3	pF
Resistance	R_S	f = 100 MHz I = 1 mA I = 10 mA I = 100 mA		 15	 20 3 1.5	 Ω Ω Ω
Forward voltage	V_F	I_F = 10 mA		0.8		V
Carrier lifetime	TI	I_F = 10 mA		0.7		µs
I region width				50		µm

Note 1: Performance is guaranteed only under the conditions listed in this table.

Package and Handling Information

Instructions on the shipping container label regarding exposure to moisture after the container seal is broken must be followed. Otherwise, problems related to moisture absorption may occur when the part is subjected to high temperature during solder assembly.

The SMPA1302-079LF is rated to Moisture Sensitivity Level 1 (MSL1) at 260 °C. It can be used for lead or lead-free soldering.

For additional information, refer to the Skyworks Application Note, *Solder Reflow Information*, document number 200164.

Care must be taken when attaching this product, whether it is done manually or in a production solder reflow environment. Production quantities of this product are shipped in a standard tape and reel format.

Table 4. Resistance vs Temperature @ 100 MHz

I_F (mA)	R_S @ –55 °C (Ω)	R_S @ –15 °C (Ω)	R_S @ +25 °C (Ω)	R_S @ +65 °C (Ω)	R_S @ +100 °C (Ω)
0.02	599	653	692	715	722
0.10	123	135	143	154	161
0.3	42.2	46.6	49.7	54.3	56.8
1.0	13.5	15.0	16.2	17.9	18.8
10	2.0	2.3	2.6	2.9	3.0
20	1.34	1.50	1.70	2.00	2.00
100	0.60	0.74	1.00	1.10	1.10

Typical Performance Characteristics

(T_A = +25 °C, Unless Otherwise Noted)

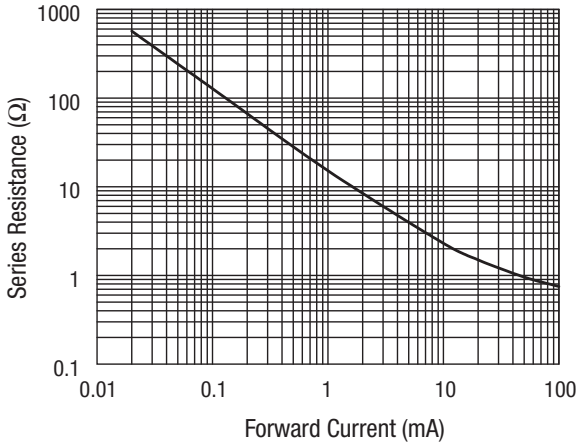


Figure 1. Series Resistance vs Current @ 100 MHz

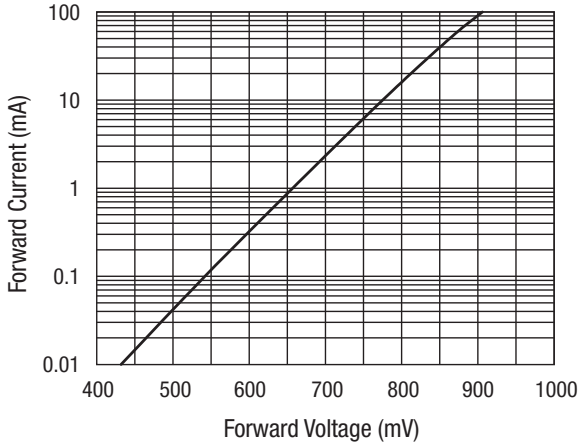


Figure 2. DC Characteristic

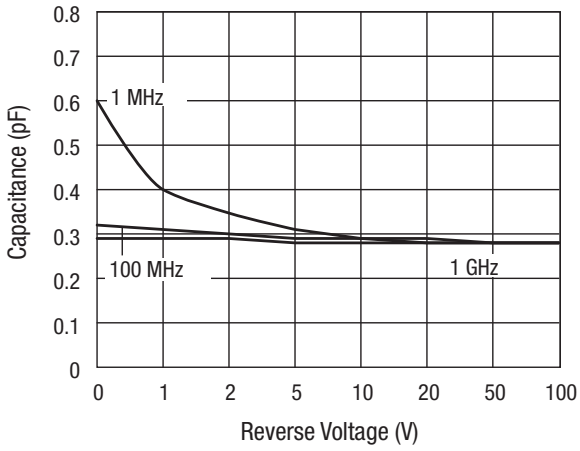


Figure 3. Capacitance vs Reverse Voltage

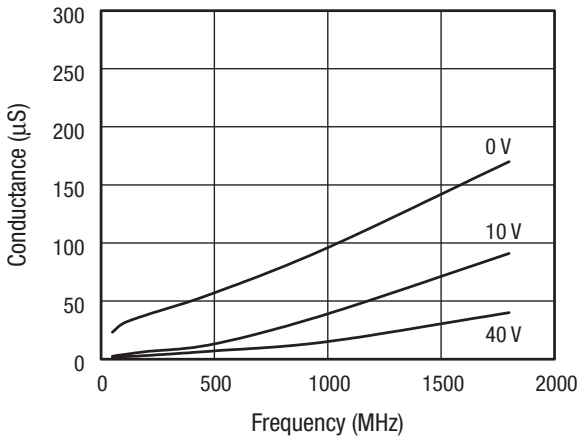
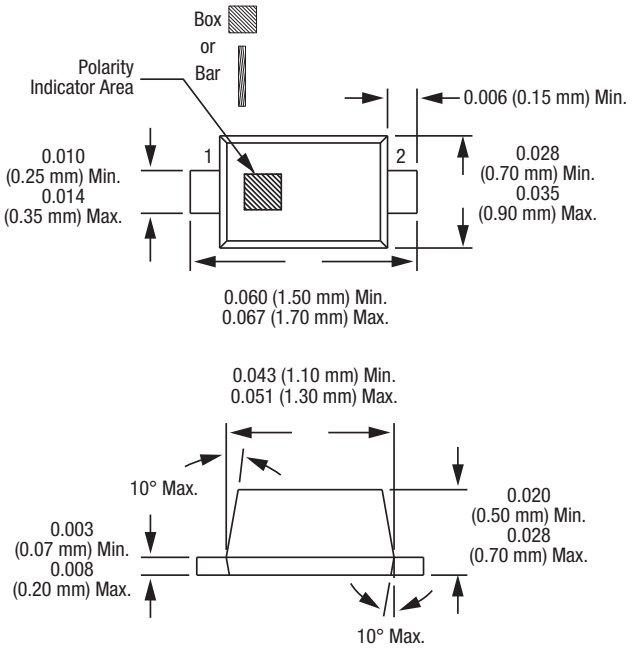
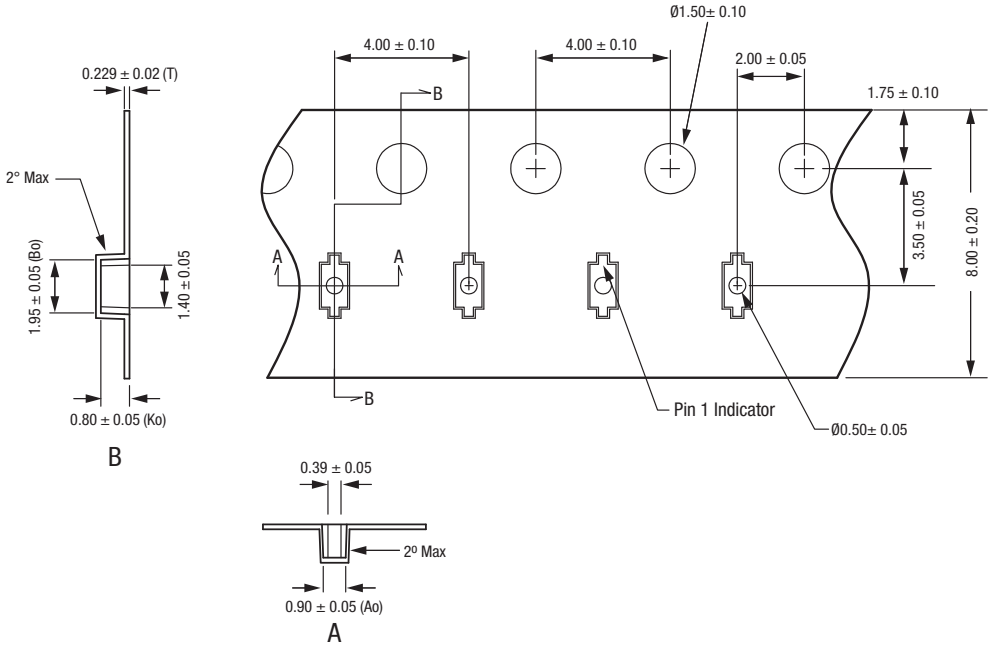


Figure 4. Conductance vs Frequency and Reverse Voltage



Dimensions are in inches (millimeters shown in parentheses) **S1652**

Figure 5. SC-79 Package Dimension Drawing



Notes:
1. *Carrier tape: black conductive polycarbonate or polystyrene.*
2. *Cover tape material: transparent conductive PSA.*
3. *Cover tape size: 5.4 mm width.*
4. *ESD-surface resistivity is ≤1 x 10^8 Ohms/square per EIA, JEDEC TNR Specification.*
4. *All measurements are in millimeters.*

S2929

Figure 6. SC-79 Tape and Reel Dimensions