

DATA SHEET

PIN Diode Chips Supplied on Film Frame

Applications

- Switches
- Attenuators

Features

- Preferred device for module applications
- PIN diodes supplied are 100% tested, saw cut, and mounted on film frame
- Low cost



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 PIN diodes that comprise this family of diodes supplied on film frames are designed for high-volume applications from 10 MHz to over 3 GHz. This family contains two groups of PIN diodes:

1. Low-capacitance, low-resistance PIN diodes designed primarily for RF switching applications:

SMP1320-099
SMP1321-099
SMP1322-099
SMP1331-099
SMP1340-099

2. PIN diodes with thick I-layers designed for low-distortion RF variable attenuator applications:

SMP1353-099
SMP1302-099
SMP1304-099
SMP1307-099

These PIN diodes are provided as 100 percent tested, diced wafers mounted on film frames for optimal compatibility with high-volume pick-and-place assembly techniques.

Absolute maximum ratings are provided in Table 1. Electrical specifications are provided in Table 2. Chip dimensions are shown in Table 3. Typical performance characteristics are illustrated in Figures 1 through 4. Figure 5 describes the wafer film frame.

Table 1. PIN Diode Chips Absolute Maximum Ratings¹

Parameter	Symbol	Minimum	Maximum	Units
Reverse voltage	V _R		Voltage rating	V
Power dissipation @ 25 °C at the base of the chip	P _D		250	mW
Operating temperature	T _{OP}	-65	+150	°C
Storage temperature	T _{STG}	-65	+150	°C
Electrostatic discharge: Human Body Model (HBM), Class 1C	ESD		1000	V

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.

CAUTION: Although these devices are designed to be as robust as possible, electrostatic discharge (ESD) can damage them. These devices 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 2. PIN Diode Chips Electrical Specifications¹
(T_{OP} = 25 °C)

Part Number	I Region (μm) Nominal	Voltage Rating (V)	Max C _J (pF) V _R = 30 V, f = 1 MHz	Typ V _F (mV) @ I _F = 10 mA	Max R _s (Ω) I _F = 1 mA, f = 100 MHz	Max R _s (Ω) I _F = 10 mA, f = 100 MHz	Typ T _L (ns) I _F = 10 mA	Application
SMP1320-099	7	50	0.175	850	2 typ	0.9	400	Switch
SMP1321-099	12	100	0.150	860	3 typ	2.0	400	Switch
SMP1322-099	7	50	0.850	825	1.5	0.45 typ	400	Switch
SMP1331-099	30	200	0.16	800	14.5	1.7 typ	600	Switch and attenuator
SMP1340-099	5	50	0.15 @ 10 V	880	1.7 typ	1.2	100	Switch
SMP1353-099	50	200	0.13 @ 20 V	850	15	2.8	2000	Switch and attenuator
SMP1302-099	50	200	0.15	800	17 typ	3	700	Switch and attenuator
SMP1304-099	100	200	0.15	800	50	7	1000	Attenuator
SMP1307-099	175	200	0.20	850	75 typ	15	1500	Attenuator

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

Reverse current is specified @ 10 μA maximum at the voltage rating. This voltage should not be exceeded.

The PIN diodes listed here are processed on 100 mm silicon wafers, 100% DC tested, saw cut, and shipped on 6-inch film frame hoops.

Electrical rejects are identified with black ink on the film frame.

Attenuators are 100% series resistance tested @ 1 mA/100 MHz.

Table 3. PIN Diode Chip Dimensions

Part Number	Quantity of Good Diodes Per Wafer		Chip Size (In)	Chip Height (In)	Anode Contact (In)
	Minimum	Nominal			
SMP1320-099	40000	46000	0.0135 ± 0.001	0.005 ± 0.001	0.0030 ± 0.0003
SMP1321-099	40000	46000	0.0135 ± 0.001	0.005 ± 0.001	0.0030 ± 0.0003
SMP1322-099	40000	46000	0.0135 ± 0.001	0.005 ± 0.001	0.0075 ± 0.0005
SMP1331-099	40000	46000	0.0135 ± 0.001	0.005 ± 0.001	0.0075 ± 0.0005
SMP1340-099	65000	72000	0.0105 ± 0.001	0.005 ± 0.001	0.0029 ± 0.0003
SMP1353-099	65000	72000	0.0105 ± 0.001	0.005 ± 0.001	0.0070 ± 0.0005
SMP1302-099	40000	46000	0.0135 ± 0.001	0.005 ± 0.001	0.0085 ± 0.0005
SMP1304-099	40000	46000	0.0135 ± 0.001	0.009 ± 0.001	0.0085 ± 0.0005
SMP1307-099	20000	25000	0.0185 ± 0.001	0.009 ± 0.001	0.0110 ± 0.0005

Typical Performance Characteristics
(TOP = 25 °C)

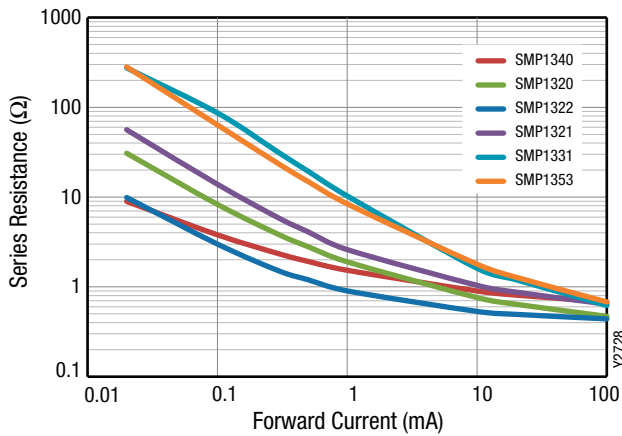


Figure 1. Series Resistance vs Forward Current @ 100 MHz

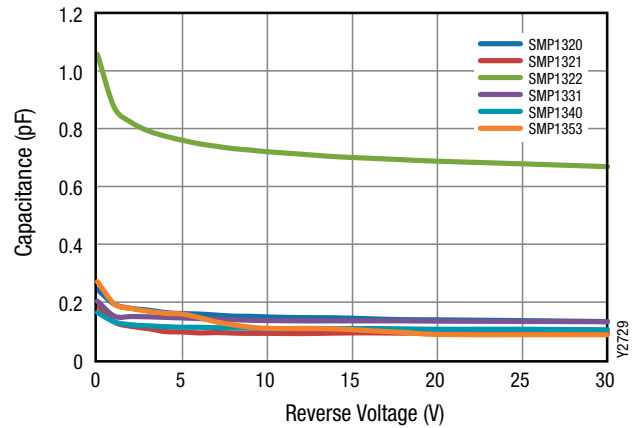


Figure 2. Capacitance vs Reverse Voltage

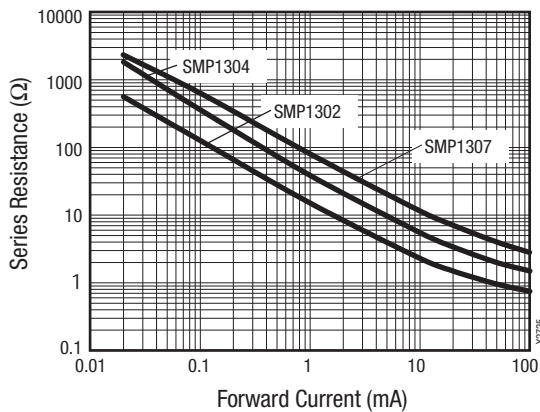


Figure 3. Series Resistance vs Forward Current @ 100 MHz

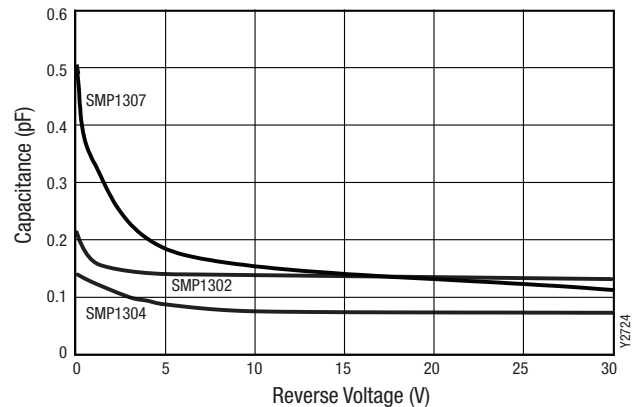


Figure 4. Capacitance vs Reverse Voltage

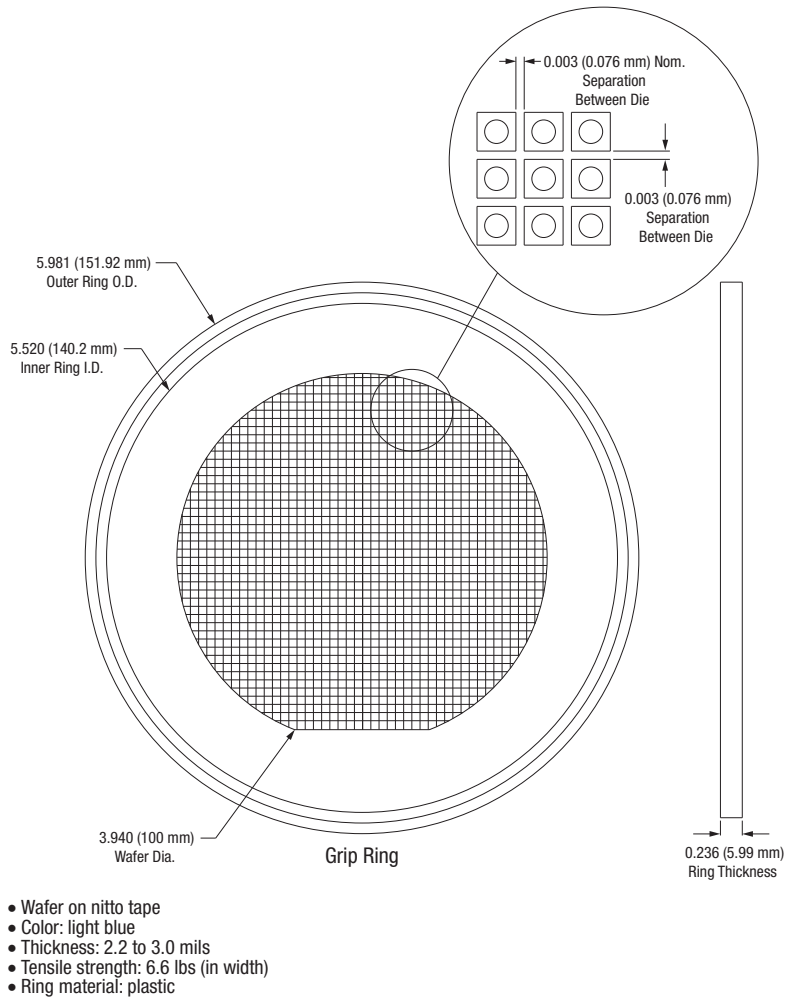


Figure 5. Wafer Film Frame Description

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