DATA SHEET

SMP1340 Series: Fast Switching Speed, Low Capacitance, Plastic Packaged PIN Diodes

Applications

- Fast speed wireless switch applications

Features

- Resistance: 1.0 Ω @ 10 mA
- Capacitance: 0.3 pF
- Packages 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 SMP1340 series of plastic packaged, surface mountable PIN diodes is designed for high volume switch applications from 10 MHz to more than 10 GHz. The short carrier lifetime of 100 ns (typical), combined with their thin I-region width of 7 μm (nominal) results in a group of fast speed RF switching PIN diodes.

The RF performance of the SMP1340 series is assured by virtue of their low capacitance (0.3 pF) and low resistance (1.0 Ω at 10 mA).

Table 1 describes the various packages and marking of the SMP1340 series.

Table 1. SMP1340 Series Packaging and Marking

							
Common Anode	Common Cathode	Series Pair	Single	Common Cathode	Single	Low Inductance	Single
SOT-23	SOT-23	SOT-23	SOD-323 Green™	SC-70	SC-79 Green™	SOT-23 Green™	SOD-882 Green™
SMP1340-003 Marking: PS9	♦ **SMP1340-004** Marking: PS3	**SMP1340-005** Marking: PS2		**SMP1340-074** Marking: PS3		**SMP1340-007LF** Marking: RSB	**SMP1340-040LF** Marking: D
SMP1340-003LF Green™ Marking: RS9	♦ **SMP1340-004LF** Green™ Marking: RS3	**SMP1340-005LF** Green™ Marking: RS2	**SMP1340-011LF** Marking: RS	**SMP1340-074LF** Green™ Marking: RS3	♦ **SMP1340-079LF** Marking: Cathode		
L_S = 1.5 nH	L_S = 1.5 nH	L_S = 1.5 nH	L_S = 1.5 nH	L_S = 1.4 nH	L_S = 0.7 nH	L_S = 0.4 nH	
		SC-70		SC-70			
		SMP1340-075LF Green™ Marking: RS2					
		L_S = 1.4 nH					L_S = 0.45 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.

Innovation to Go™
Select Linear Products (indicated by ♦) now available for purchase online.

Table 2. SMP1340 Series Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Units
Reverse voltage	V_R		50	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

Note: 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. The SMP1340 series PIN diodes are Class 1A ESD devices.*

Electrical and Mechanical Specifications

The absolute maximum ratings of the SMP1340 series 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 SMP1340 series are illustrated in Figures 1 to 4. Package dimensions are shown in Figures 5 to 13 (odd numbers), and tape and reel dimensions are provided in Figures 6 to 14 (even numbers).

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 SMP1340 series 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 3. SMP1340 Series 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 = 50 V			10	µA
Capacitance	C_T	F = 1 MHz, V = 5 V		0.21	0.30	pF
Resistance	R_S	F = 100 MHz				
		I = 1 mA		1.7		Ω
		I = 5 mA		1.0	2.0	Ω
		I = 10 mA		0.85	1.2	Ω
Forward voltage	V_F	I_F = 10 mA		0.85		V
Carrier lifetime	TI	I_F = 10 mA		100		ns
I region width				7		µm

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

Table 4. Resistance vs Temperature @ 500 MHz

I_F (mA)	R_S @ –55 °C (Ω)	R_S @ –40 °C (Ω)	R_S @ –15 °C (Ω)	R_S @ +25 °C (Ω)	R_S @ +65 °C (Ω)	R_S @ +85 °C (Ω)	R_S @ +100 °C (Ω)
0.02	9.92	9.68	9.30	8.95	8.95	9.01	9.12
0.10	3.90	3.86	3.79	3.80	3.85	3.94	4.03
0.30	2.32	2.33	2.30	2.33	2.35	2.43	2.49
0.50	1.91	1.93	1.90	1.92	1.92	1.99	2.05
1.0	1.54	1.55	1.52	1.53	1.50	1.56	1.61
10	0.95	0.96	0.91	0.90	0.82	0.85	0.89
20	0.86	0.87	0.82	0.81	0.73	0.75	0.79
100	0.72	0.73	0.70	0.68	0.59	0.62	0.65

Typical Performance Characteristics

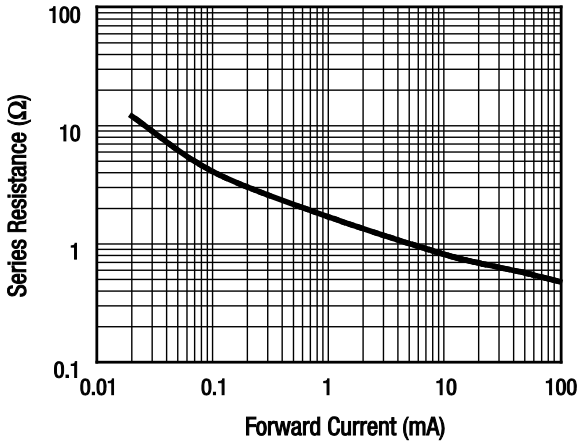


Figure 1. Series Resistance vs Current @ 100 MHz

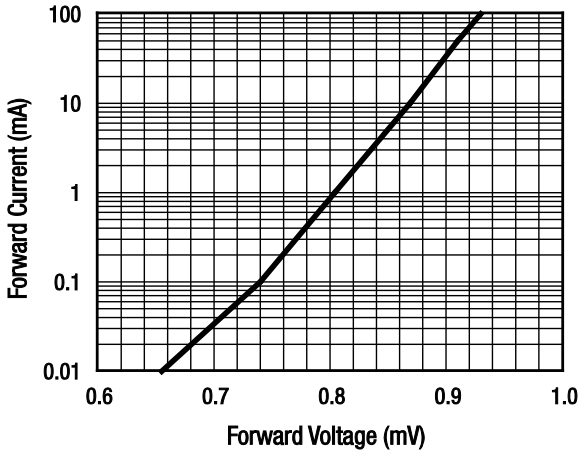


Figure 2. DC Characteristics

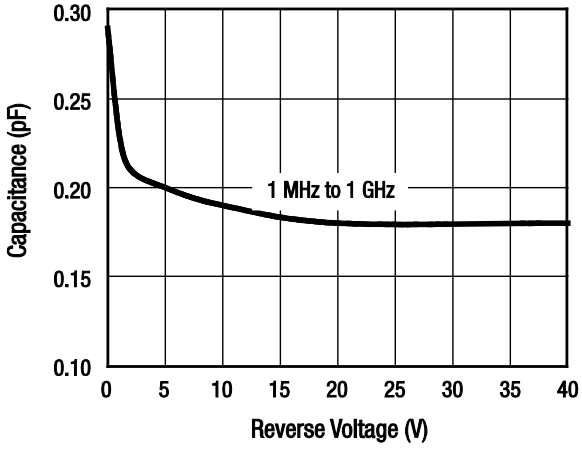


Figure 3. Capacitance vs Reverse Voltage

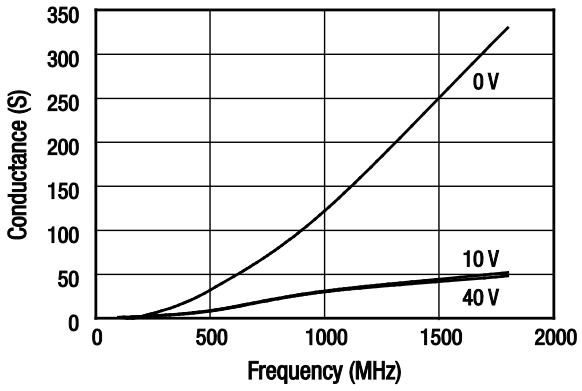


Figure 4. Conductance vs Frequency and Reverse Voltage

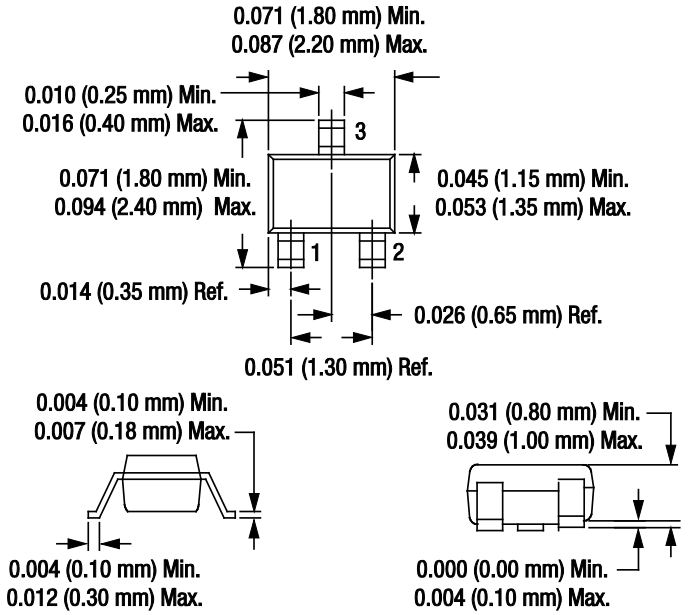
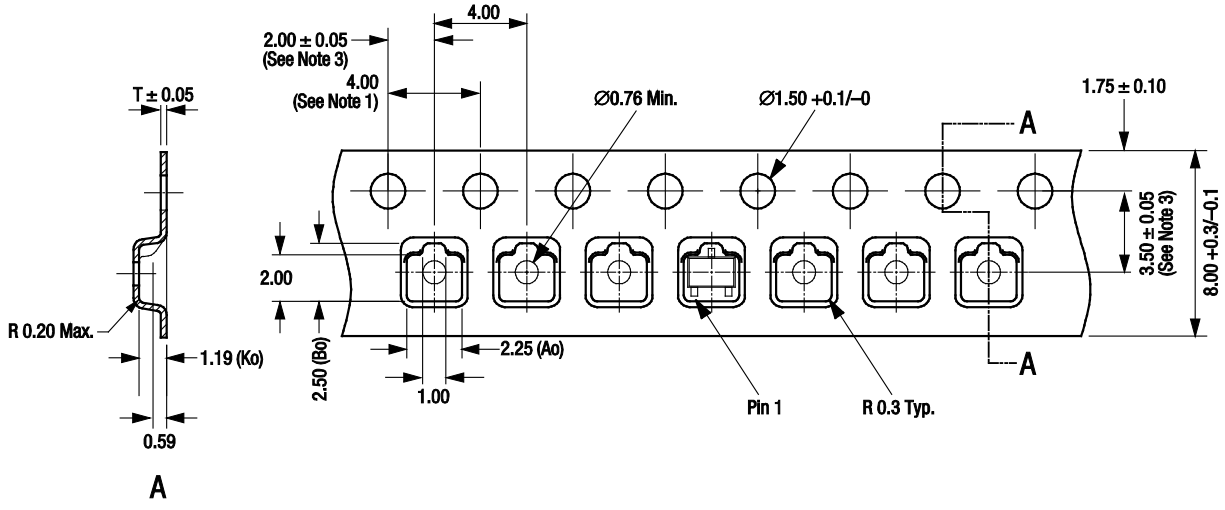


Figure 5. SC-70 Package Dimension Drawing



Notes:
1. *Sprocket hole pitch cumulative tolerance ±0.2.*
2. *Carrier tape: black conductive polystyrene.*
3. *Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole.*
4. *Cover tape material: transparent conductive PSA with 9.2 mm width.*
5. *All measurements are in millimeters.*

S1685c

Figure 6. SC-70 Tape and Reel Dimensions

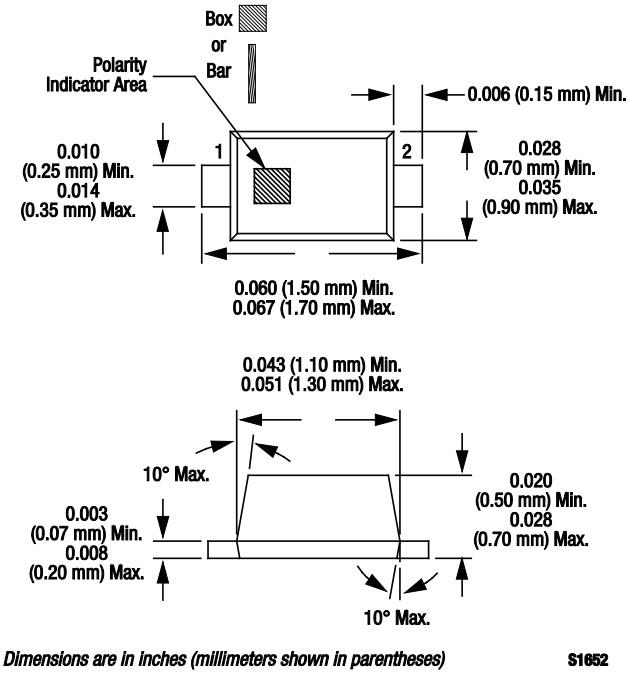
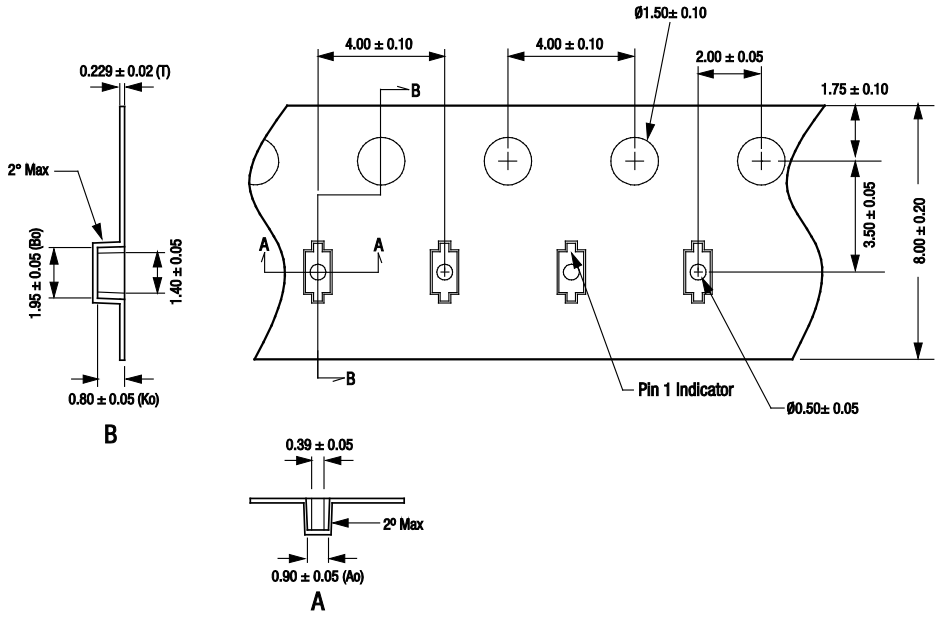


Figure 7. SC-79 Package Dimension Drawing



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 8. SC-79 Tape and Reel Dimensions

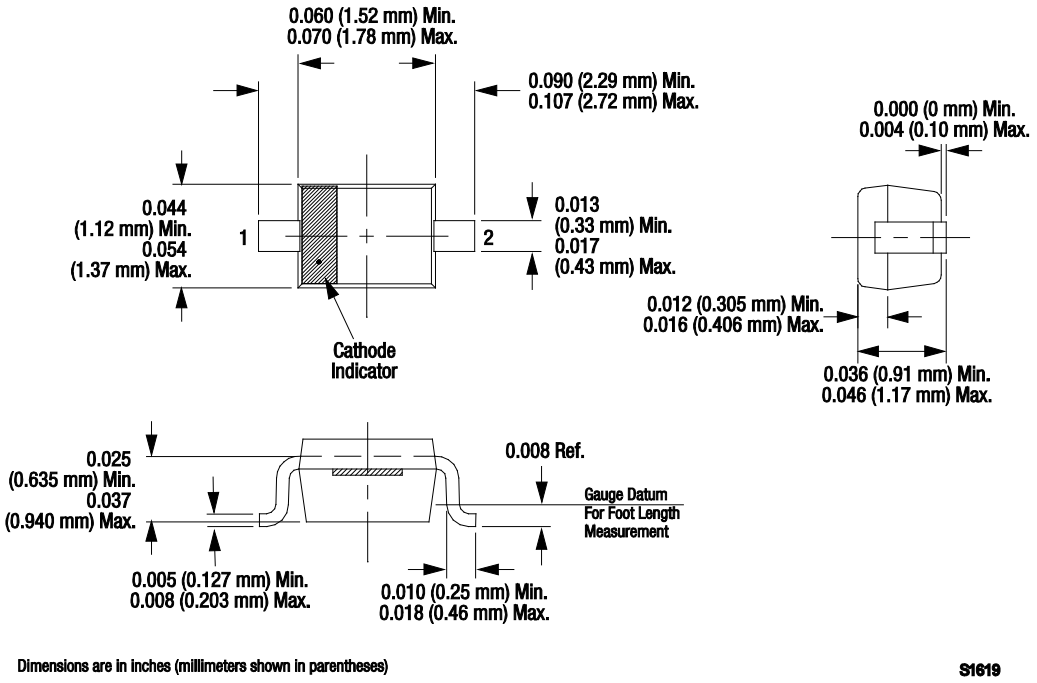
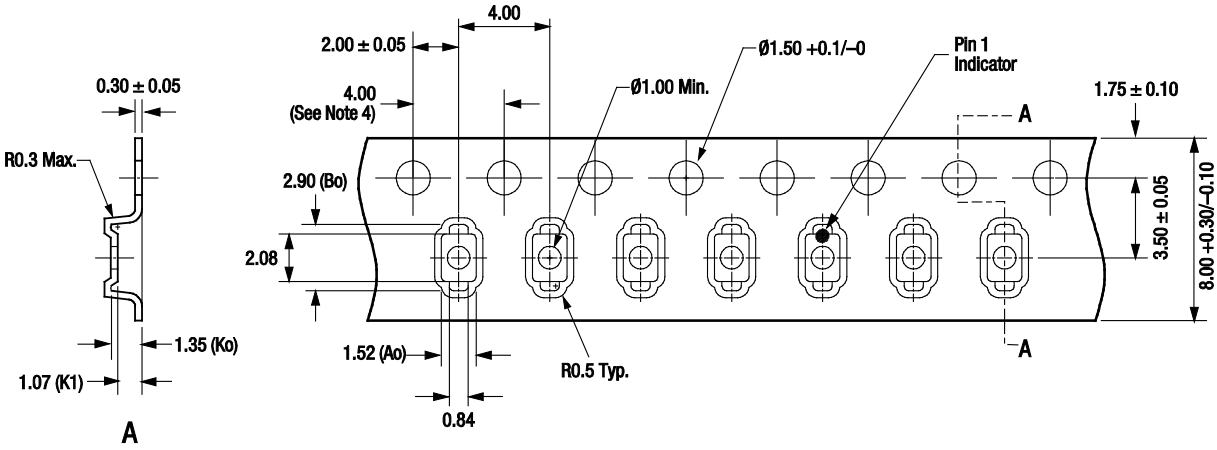


Figure 9. SOD-323 Package Dimension Drawing



Notes:
1. *Carrier tape: black conductive polystyrene.*
2. *Cover tape: transparent conductive PSA.*
3. *Cover tape size: 5.4 mm width.*
4. *10 sprocket hole pitch cumulative tolerance: ±0.20 mm.*
5. *All measurements are in millimeters.*

S2910

Figure 10. SOD-323 Tape and Reel Dimensions

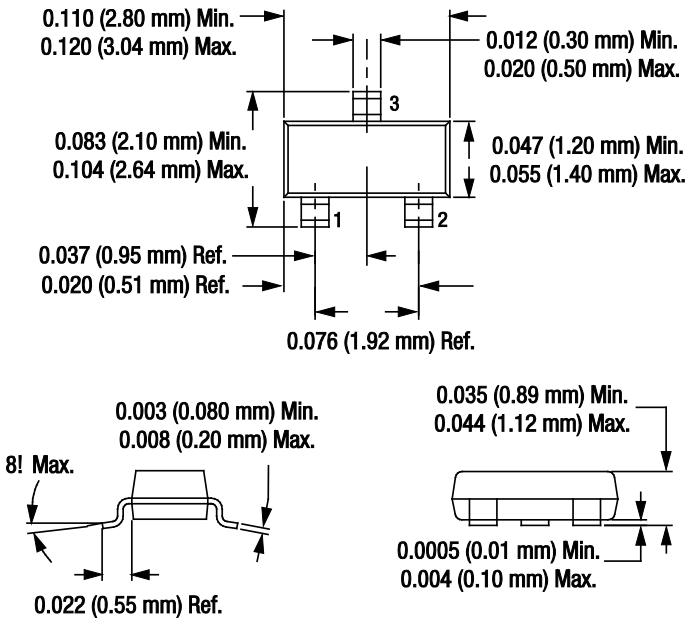
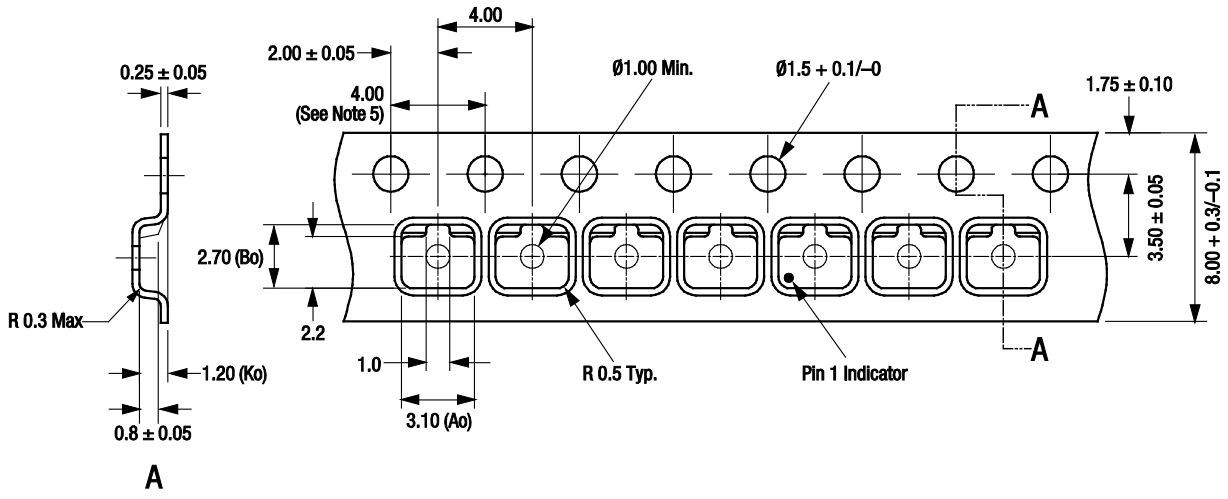


Figure 11. SOT-23 Package Dimension Drawing



Notes:
1. *Carrier tape: black conductive polycarbonate.*
2. *Cover tape material: transparent conductive PSA.*
3. *Cover tape size: 5.40 mm width.*
4. *Tolerance ±0.10 mm.*
5. *Ten sprocket hole pitch cumulative tolerance: ±0.2 mm.*
6. *All measurements are in millimeters.*

S1684b

Figure 12. SOT-23 Tape and Reel Dimensions

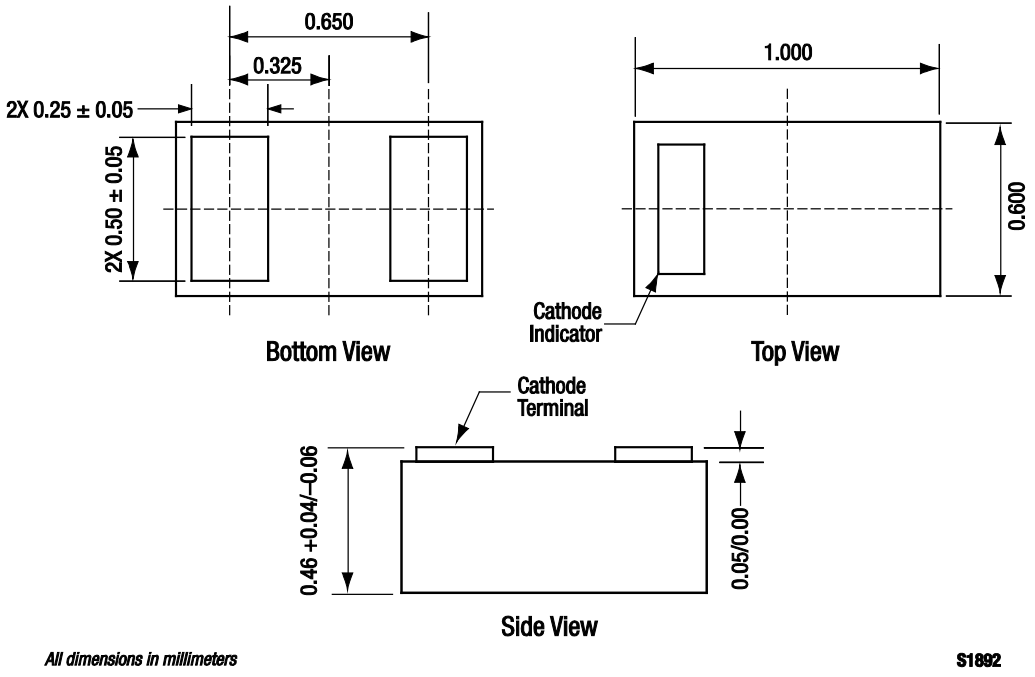


Figure 13. SOD-882 Package Dimension Drawing

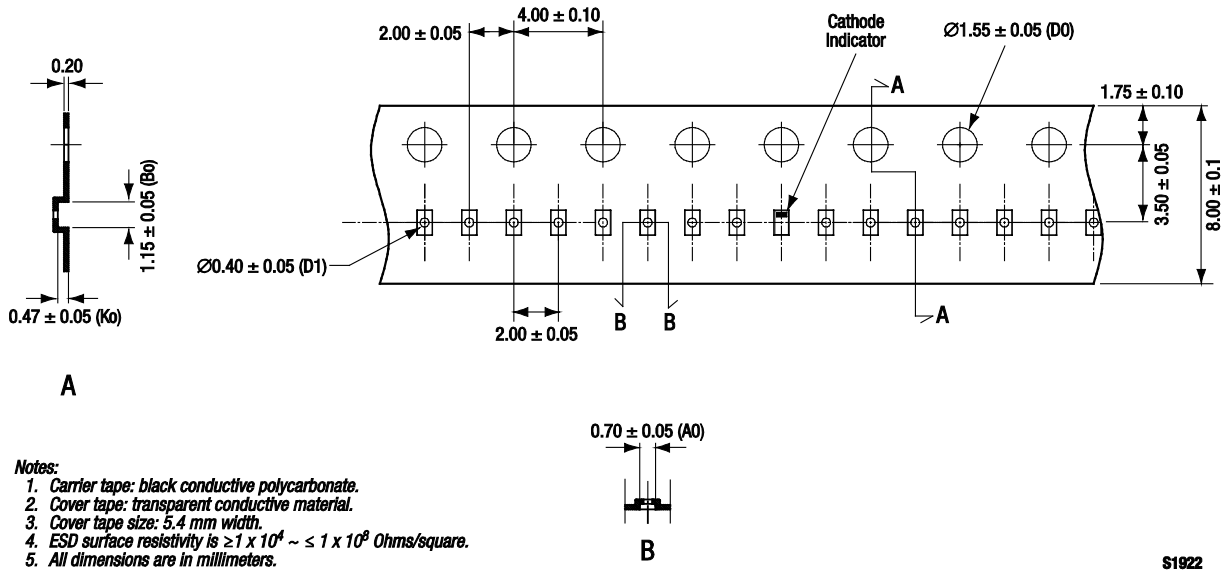


Figure 14. SOD-882 Tape and Reel Dimensions