

DATA SHEET

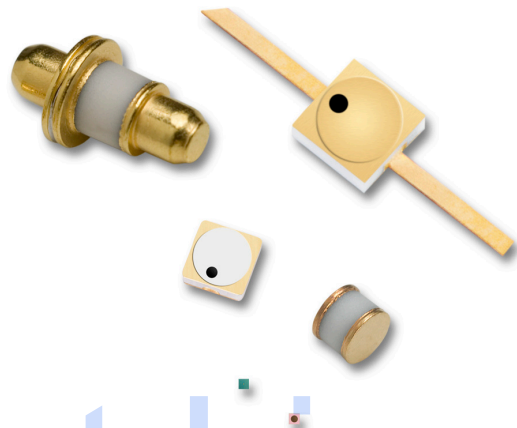
APD Series: Silicon PIN Diodes Packaged and Bondable Chips

Applications

- Switches
- Attenuators

Features

- Established Skyworks PIN diode process
- Low capacitance designs to 0.05 pF
- Voltage ratings to 200 V
- Chip size smaller than 15 mils square
- Lead (Pb)-free, RoHS-compliant, and Green™



Description

Skyworks APD Series of silicon PIN diodes are designed for use as switch and attenuator devices in high-performance RF and microwave circuits. These PIN diode designs are useful over a wide range of frequencies from below 100 MHz to beyond 30 GHz. These devices utilize Skyworks well-established silicon technology resulting in high resistivity and tightly controlled I region width PIN diodes. APD0505-000 through APD0810-000 are designed for fast speed through moderate speed switch applications. They have low resistance and capacitance at zero bias and reverse bias. The thick I region APD2220-000 is designed for low-distortion attenuator applications.

NEW



Skyworks Green™ products are RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, are halogen free according to IEC-61249-2-21, and contain <1,000 ppm antimony trioxide in polymeric materials.

Absolute Maximum Ratings

Characteristic	Value
Power dissipation	$P_{diss} = \frac{175 - T_{amb}}{\theta} \text{ W}$
Operating temperature	-65 °C to +175 °C
Storage temperature	-65 °C to +200 °C
Reverse voltage	Voltage rating

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 Ratings. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: Although these devices are designed to be robust, ESD (Electrostatic Discharge) can cause permanent damage. 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.

Electrical Specifications at 25 °C

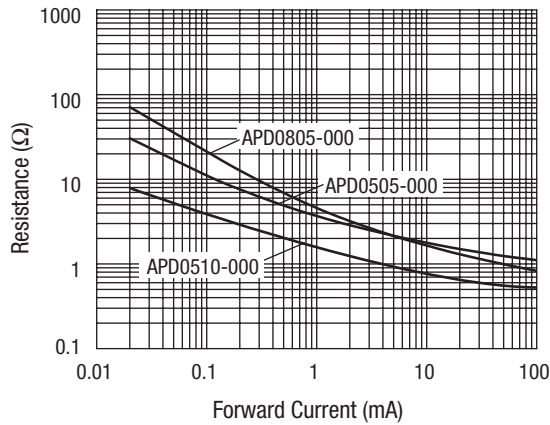
Part Number	Capacitance $V_R = 50\text{ V}$, 1 MHz (pF)	Capacitance $V_R = 0\text{ V}$, 1 MHz (pF)	R_S $I = 10\text{ mA}$, 500 MHz (Ω)	TL $I = 10\text{ mA}$ (ns)	Voltage Rating ⁽¹⁾ (V)	I Region Thickness (μm)	Thermal Resistance (°C/W)	Contact Diameter (Mils)	Outline Drawing
	Max.	Typ.	Max.	Typ.		Nom.	Max.	Nom.	
Switching Applications									
APD0505-000	0.05	0.1	2	20	50	5	100	1.5	150-806
APD0510-000	0.1	0.2	1.5	40	50	5	80	2.5	150-801
APD0520-000	0.2	0.25	1	50	50	5	80	3.5	150-801
APD0805-000	0.05	0.1	2	100	100	8	80	2	150-801
APD0810-000	0.1	0.15	1.5	160	100	8	60	3	150-801
APD1510-000	0.1	0.2	2	300	200	15	60	3	150-813
APD1520-000	0.2	0.25	1.2	900	200	15	30	4	150-802
Attenuator Applications									
APD2220-000	0.2	0.2	4	700	100	50	80	7.5	149-815

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

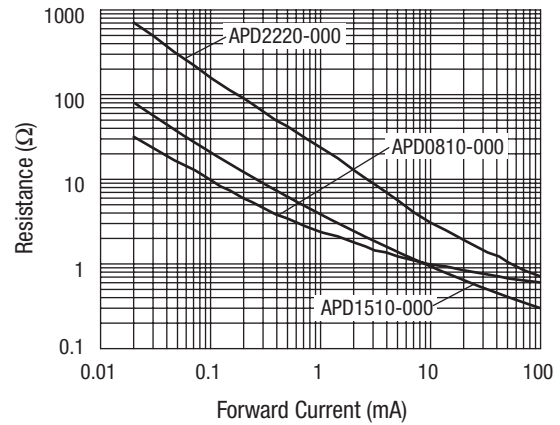
Hermetic Packages

Hermetic Stripline 240	Typical θ_{JC} (°C/W)	Hermetic Pill 203	Typical θ_{JC} (°C/W)	Hermetic Pill 210	Typical θ_{JC} (°C/W)	Hermetic Pill 219	Typical θ_{JC} (°C/W)
APD0505-240	190	APD0505-203	130	APD0505-210	120	APD0505-219	190
APD0510-240	180	APD0510-203	110	APD0510-210	100	APD0510-219	180
APD0520-240	180	APD0520-203	110	APD0520-210	100	APD0520-219	180
APD0805-240	180	APD0805-203	110	APD0805-210	100	APD0805-219	180
APD0810-240	160	APD0810-203	90	APD0810-210	80	APD0810-219	160
APD1510-240	160	APD1510-203	90	APD1510-210	80	APD1510-219	160
APD1520-240	130	APD1520-203	60	APD1520-210	50	APD1520-219	130
APD2220-240	110	APD2220-203	100	APD2220-210	100	APD2220-219	110

Typical Performance Data

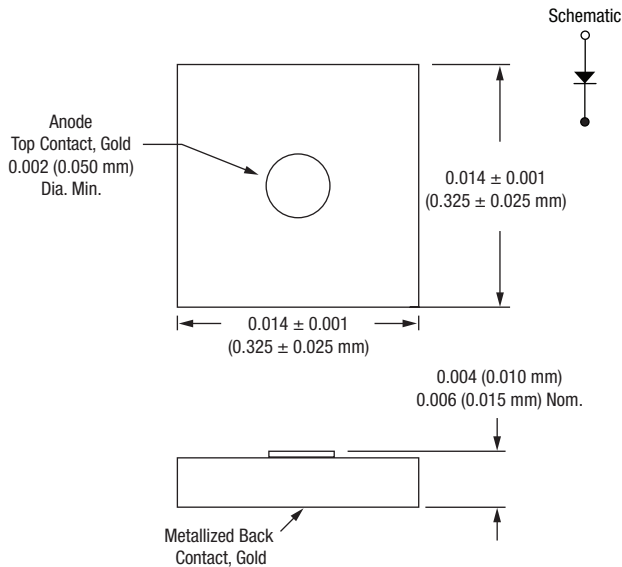


Resistance vs. Forward Current @ 1 GHz

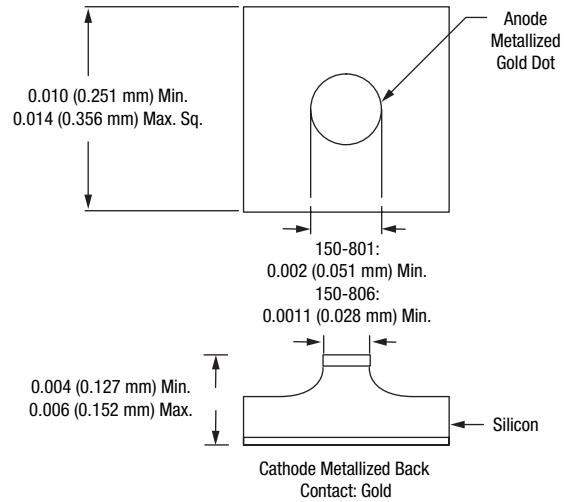


Resistance vs. Forward Current @ 1 GHz

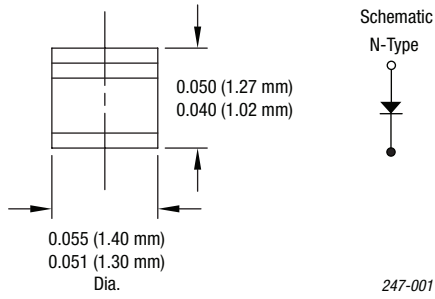
149-815



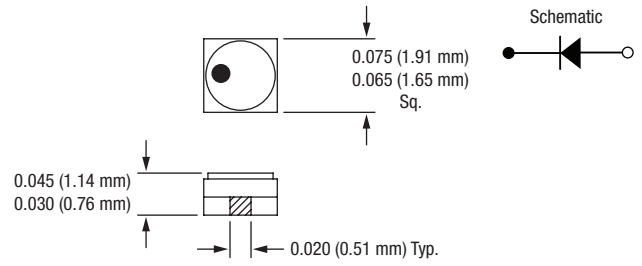
150 Series



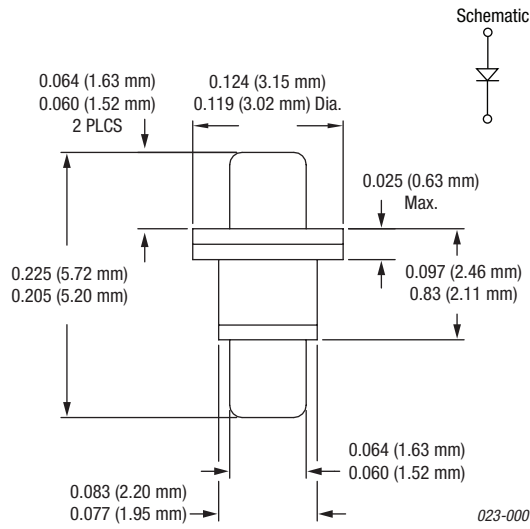
-203



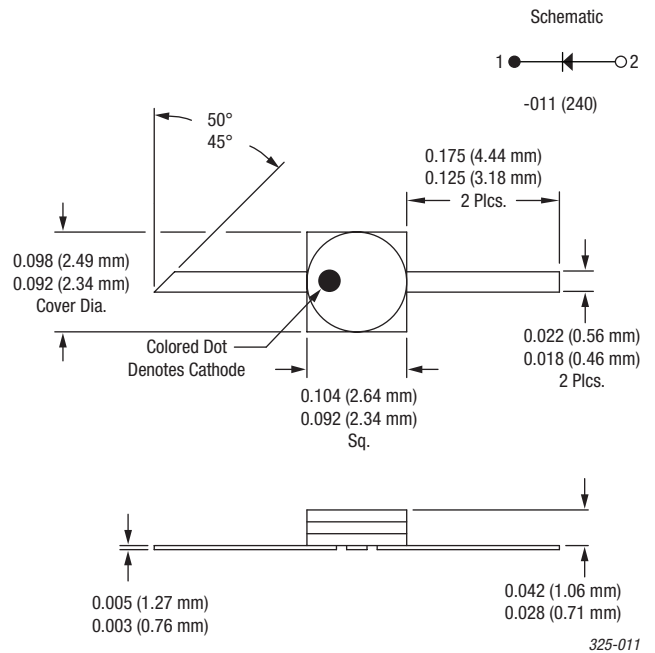
-219



-210



-240



Copyright © 2002, 2003, 2004, 2005, 2006, 2007, 2008, Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of stated published specifications or parameters.

Skyworks, the Skyworks symbol, and "Breakthrough Simplicity" are trademarks or registered trademarks of Skyworks Solutions, Inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at www.skyworksinc.com, are incorporated by reference.