

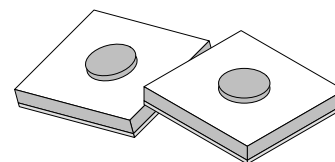
Silicon PIN Chip and Packaged Diodes



APD Series

Features

- Switch and Attenuator Applications
- Voltage Ratings to 1000 Volts
- Low Rs and Low Capacitance Designs
- Surface Mount Microwave Packages
- Tightly Controlled PIN Characteristics
- For High Rel Applications



Description

Alpha's product line of silicon chip and packaged PIN diodes are designed to cover a wide variety of microwave and RF applications. The PIN designs have been designated and characterized for fast speed switches, low distortion attenuators and high RF voltage applications. Alpha's PIN semiconductor materials and processing technology allows for a superior combination of Rs, capacitance and voltage ratings.

The PIN diode chip offering is specified for electrical and physical parameters allowing designers of hybrid circuits to be assured of consistent microwave and geometric properties. All high voltage designs incorporate glass passivation resulting in a reliable low leakage current device.

Maximum Ratings

Storage Temperature: -65°C to $+200^{\circ}\text{C}$

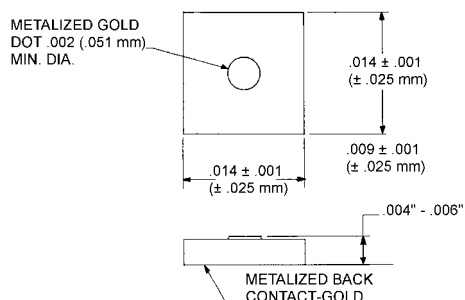
Operating Temperature: -65°C to $+175^{\circ}\text{C}$

The packaged PIN diodes were selected as the most commonly employed PIN diode chip designs in standard packages. These designs are adaptable to many RF and microwave requirements that utilize packaged PIN diode components and are available for quick delivery. All ceramic packaged PIN diodes are hermetically sealed.

This product line of PIN diodes are designed to be capable of meeting electrical and environmental screening requirements of military and space applications.

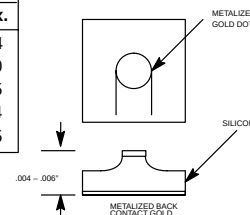
Outline Dimensions

149-815



150 Series

Chip Style	Bonding Pad Nominal (In.)	Chip Size (In.)	
		Min.	Max.
150-801	.002 (min)	.010	.014
150-802	.002 (min)	.016	.020
150-804	.008 (nom)	.013	.015
150-806	.0011 (min)	.010	.014
150-813	.002 (min)	.033	.035



Electrical Specifications at 25°C

Silicon PIN Diode Chips

Part Number	Voltage Rating ¹ (V)	C _J ² (pF)	R _S ³ @10 mA (Ω)	T _L (10 mA) (ns)	I–Region (μM)	Size (Sq. Mils)	Contact Dia. (Mils)	Thermal Resistance ⁴ (C/W)	Outline Drawing Number
	Min.	Max.	Max.	Typ.	Nom.	Nom.	Typ.	Max.	
PIN Diodes For Switch Applications									
▶ APD0505–000	50	0.05	2.0	30	5	13–15	1.5	100	150–813
▶ APD0510–000	50	0.10	1.5	60	5	13–15	2.5	80	150–813
APD0520–000	50	0.20	1.0	80	5	13–15	3.5	80	150–813
▶ APD0805–000	100	0.05	2.0	80	8	13–15	2	80	150–813
▶ APD0810–000	100	0.10	1.5	100	8	13–15	3	60	150–813
APD0820–000	100	0.20	1.2	120	8	13–15	4.5	40	150–813
▶ APD1510–000	200	0.10	2.0	300	15	13–15	3	60	150–813
APD1520–000	200	0.20	1.2	500	15	18–20	4	30	150–802
APD1550–000	200	0.50	0.8	700	15	18–20	7	30	150–802

Part Number	Voltage Rating ¹ (V)	C _J ² (pF)	R _s ³ @10 mA (Ω)	I _F (R _s = 50Ω) (mA)	T _L (10 mA) (μS)	I – Region (μM)	Size (Sq. Mils)	Contact Dia. (Mils)	Thermal Resistance ⁴ (C/W)	Outline Drawing Number
	Min.	Max.	Max.	Typ.	Typ.	Nom.	Nom.	Typ.	Max.	
PIN Diodes For Attenuator Applications										
APD2220–000	100	0.20	3	0.3	.75	50	13–15	7.5	80	149–815
APD4420–000	100	0.20	7	1.0	1.0	100	13–15	7.5	80	149–815
APD7720–000	100	0.20	15	2.0	2.0	175	13–15	10	80	149–815

Part Number	Voltage Rating ¹ (V)	C _J ² (pF)	R _S @100 mA (Ω)	T _L (10 mA) (μS)	I – Region (μM)	Size (Sq. Mils)	Contact Dia. (Mils)	Thermal Resistance ⁴ (Θ C/W)	Outline Drawing Number
	Min.	Max.	Max.	Typ.	Nom.	Nom.	Typ.	Max.	
High Voltage PIN Diodes									
▶ APD5020–000	500	0.20	0.60	2	50	18–20	6	20	150–802
APD5035–000	500	0.35	0.45	2	50	33–35	9	15	150–804
▶ APD5070–000	500	0.70	0.30	3	50	33–35	16	10	150–804
APD9920–000	1000	0.20	1.0	3	100	18–20	7.5	15	150–802
▶ APD9960–000	1000	0.6	0.60	4	100	33–35	16	10	150–804

▶ Available through distribution.

1. Voltage rating @ I_R = 10 μA.
2. Junction capacitance measured @ 1 MHz, 50 volts.
3. Series resistance measured @ 500 MHz.
4. Thermal Resistance for chip on infinite heat sink.

Electrical Specifications at 25°C

Packaged Silicon PIN Diodes

Part Number	Voltage Rating ¹ (V)	C _T ² (pF)	R _S ³ @10 mA (Ω)	T _L (10 mA) (nS)	I-Region (μM)	Thermal Resistance ⁴ C/W
	Min.	Max.	Max.	Typ.	Typ.	Max.
Switch PIN Diodes						
▶ APD0505–210	50	0.30	2.0	30	5	100
▶ APD0810–210	100	0.35	1.5	100	8	60
APD1520–210	200	0.45	1.2	500	15	30

Part Number	Voltage Rating ¹ (V)	C _T ² (pF)	R _S ³ @10 mA (Ω)	I _F (R _S = 50 Ω) (mA)	T _L (10 mA) (μS)	I-Region (μM)	Thermal Resistance ⁴ C/W
	Min.	Max.	Max.	Typ.	Typ.	Typ.	Max.
Attenuator PIN Diodes							
APD2220–210	100	0.45	3	0.3	1	50	80
APD4420–210	100	0.45	7	1.0	2	100	80
APD7720–210	100	0.45	15	2.0	3	175	80

Part Number	Voltage Rating ¹ (V)	C _T ² (pF)	R _S ³ @100 mA (Ω)	T _L (10 mA) (μS)	I-Region (μM)	Thermal Resistance ⁴ (C/W)
	Min.	Max.	Max.	Typ.	Typ.	Max.
High Voltage PIN Diodes						
▶ APD5020–210	500	0.45	0.6	2	50	20
APD5070–210	500	0.95	0.3	3	50	10
APD9920–210	1000	0.45	1	3	100	15
APD9960–210	1000	0.85	0.6	4	100	10

▶ Available through distribution.

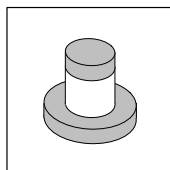
1. Voltage rating @ I_R = 10 μA.
2. Total capacitance measured @ 1 MHz, 50 volts.
3. Series resistance measured @ 500 MHz.
4. Thermal resistance for cathode on infinite heat sink.

Ordering Information

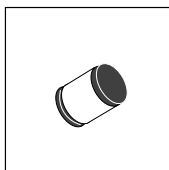
The above table shows the part number with the standard package –210. Other package styles are also available. To order part in a different package just replace the “–210” in above part numbers with a package style listed below. For example, APD9920–210 becomes APD9920–202.

Available Package Outlines: 202, 203, 204, 210, 219, 230, 240,

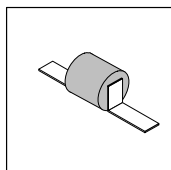
Refer to the Outline Drawings section in this catalog for the total selection of outline (package) dimensions. The APD5035, APD5070 and APD9960 are only available in 210 and 202 outline drawing numbers. Refer to the Outline Drawing section for dimensions.



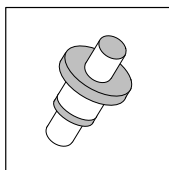
202



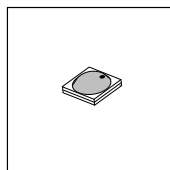
203



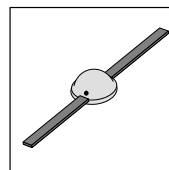
204



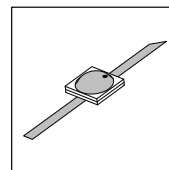
210



219



230



240