

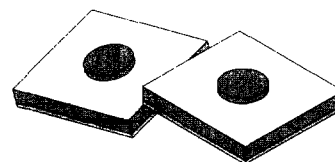
Silicon PIN Chip and Packaged Diodes



APD Series

Features

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



Maximum Ratings

Storage Temperature: -65°C to $+200^{\circ}\text{C}$
Operating Temperature: -65°C to $+175^{\circ}\text{C}$

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 R_s , 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.

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.

Electrical Specifications

Silicon PIN Diode Chips

Part Number	Voltage Rating (Volts) ¹	C _j @ 50V (pF) ²	Rs @ 10mA (Ohms) ³	TL @10 mA (ns)	I-Region (uM)	Size (Sq. mils)	Contact Dia. (mils)	Thermal Resistance (C/W) ⁴	Outline Drawing Number
	Min	Max	Max	Typ	Nom	Nom	Typ		
PIN Diodes For Switch Applications									
APD0505-00	50	0.05	2.0	30	5	13-15	1.5	100	150-813
APD0510-00	50	0.10	1.5	60	5	13-15	2.5	80	150-813
APD0520-00	50	0.20	1.0	80	5	13-15	3.5	80	150-813
APD0805-00	100	0.05	2.0	80	8	13-15	2	80	150-813
APD0810-00	100	0.10	1.5	100	8	13-15	3	60	150-813
APD0820-00	100	0.20	1.2	120	8	13-15	4.5	40	150-813
APD1510-00	200	0.10	2.0	300	15	13-15	3	60	150-813
APD1520-00	200	0.20	1.2	500	15	18-20	4	30	150-802
APD1550-00	200	0.50	0.8	700	15	18-20	7	30	150-802

Part Number	Voltage Rating (Volts) ¹	C _j @ 50V (pF) ²	I _f @ R _s = 50 Ohms (mA)	R _s @10 mA (Ohms)	TL @10 mA (μs)	I-Region (μM)	Size (Sq. Mils)	Contact Dia. (mils)	Thermal Resistance (C/W) ⁴	Outline Drawing Number
	Min	Max	Typ	Max	Typ	Nom	Nom	Typ		
PIN Diodes For Attenuator Applications										
APD2220-00	100	0.20	3	0.3	1	50	13-15	7.5	80	149-815
APD4420-00	100	0.20	7	1.0	2	100	13-15	7.5	80	149-815
APD7720-00	100	0.20	15	2.0	3	175	13-15	10	80	149-815

Part Number	Voltage Rating (Volts) ¹	Cj @ 50V (pF) ²	Rs @100 mA	TL @10 mA (μs)	I-Region (uM)	Size (Sq. Mils)	Contact Dia. (mils)	Thermal Resistance (Θ C/W) ⁴	Outline Drawing Number
	Min	Max	Typ	Typ	Nom	Nom	Typ		
High Voltage PIN Diodes									
APD5020-00	500	0.20	0.60	2	50	18-20	6	20	150-802
APD5035-00	500	0.35	0.45	2	50	33-35	9	15	150-804
APD5070-00	500	0.70	0.30	3	50	33-35	16	10	150-804
APD9920-00	1000	0.20	1.0	3	100	18-20	7.5	15	150-802
APD9960-00	1000	0.6	0.60	4	100	33-35	16	10	150-804

1. Voltage Rating @ I_r = 10 μA.
2. Junction capacitance measured @ 1 MHz.
3. Series resistance measured @ 100 MHz.
4. Thermal Resistance for chip on infinite heat sink.

Electrical Specifications

Packaged Silicon PIN Diodes

Part Number	Voltage Rating Volts ¹	CT @ 50V pF ²	Rs @ 10 mA Ohms ³	TL @10 mA nS	I-region uM	Thermal Resistance C/W ⁴
	Min	Max	Max	Typ	Typ	
Switch PIN Diodes						
APD0510-023-001	50	0.3	1.5	60	5	80
APD0810-023-001	100	0.3	1.5	100	8	60
APD1520-023-001	200	0.4	1.2	500	15	30

Part Number	Voltage Rating Volts ¹	CT @ 50V pF ²	Rs @10 mA (Ohms)	If @ Rs = 50 Ohms (mA)	TL @10 mA μS	I-region uM	Thermal Resistance C/W ⁴
	Min	Max	Typ	Max	Typ	Typ	
Attenuator PIN Diodes							
APD2220-023-001	100	0.4	0.3	3	1	50	80
APD4420-023-001	100	0.4	1.0	7	2	100	80
APD7720-023-001	100	0.4	2.0	15	3	175	80

Part Number	Voltage Rating Volts ¹	CT @ 50V pF ²	Rs @ 100 mA Ohms ³	TL @10 mA μS	I-region uM	Thermal Resistance C/W ⁴
	Min	Max	Max	Typ	Typ	
High Voltage PIN Diodes						
APD5020-023-001	500	0.4	0.6	2	50	20
APD5070-023-001	500	0.9	0.3	3	50	10
APD9920-023-001	1000	0.4	1	3	100	15
APD9960-023-001	1000	0.8	0.6	4	100	10

Notes

1. Voltage rating @ Ir = 10 uA.

2. Total capacitance measured @ 1 MHz.

3. Series resistance measured @ 100 MHz.

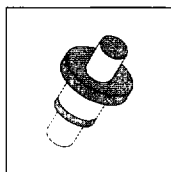
4. Thermal resistance for cathode on infinite heat sink.

Ordering Information

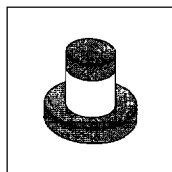
The above table shows the part number with the standard package -023-001. Other package styles are also available. To order part in a different package just replace the "-023-001" in above part numbers with a package style listed below. For example, APD9920-023-001 becomes APD9920-168-001.

Available Packages Outlines: 023-001, 168-001, 247-001, 247-807, 325-011, 404-801, 464-011

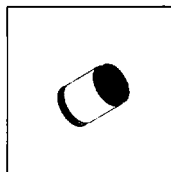
Refer to the Outline Drawings section in this catalog for the total selection of outline (package) dimensions. The APD5070 and APD9960 are only available in 023-001 and 168-001 outline drawing numbers. Refer to the Outline Drawing section for dimensions.



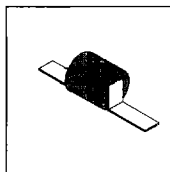
023-001



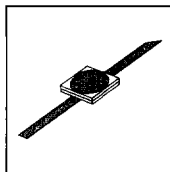
168-001



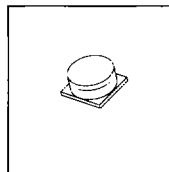
247-001



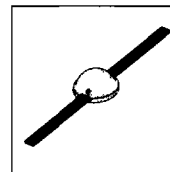
247-807



325-011



404-801



464-011