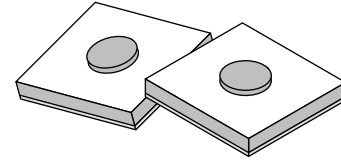


Features

- Established Alpha PIN Diode Process
- For Switch and Attenuator Applications
- Low Capacitance Designs to 0.05 pF
- Voltage Ratings to 200 V
- Chip Size Smaller than 15 Mils Square



Description

Alpha's APD Series of silicon PIN diode chips are designed for use as switch and attenuator devices in high performance hybrid microwave integrated circuits. These PIN diode designs are useful over a wide range of frequencies from below 100 MHz to beyond 30 GHz. These devices utilize Alpha's well established silicon technology resulting in high resistivity and tightly controlled I region width PIN diodes. APD0505-00 through APD1510-000 are primarily 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 primarily designed for low distortion attenuator applications.

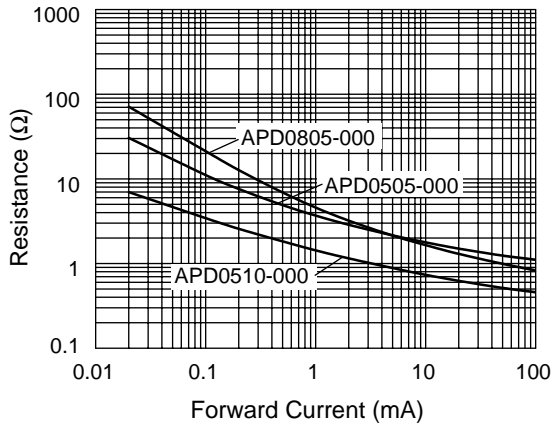
Absolute Maximum Ratings

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

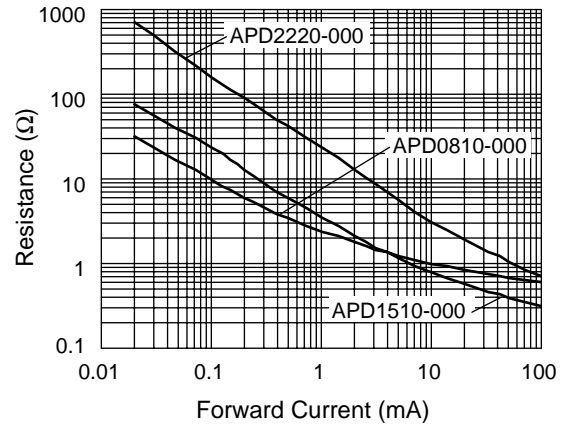
Electrical Specifications at 25°C

Part Number	Capacitance $V_R = 50 \text{ V}$, 1 MHz (pF)	Capacitance $V_R = 0 \text{ V}$, 1 GHz (pF)	R_s $I = 10 \text{ mA}$, 500 MHz (Ω)	TL $I = 10 \text{ mA}$ (nS)	Voltage Rating $I_R = 10 \text{ uA}$ (V)	I Region (μM)	θ Thermal Resistance (C/W)	Contact Diameter (Mils)	Outline Drawing
	Max.	Typ.	Max.	Typ.	Min.	Nom.	Max.	Nom.	
APD0505-000	0.05	0.10	2.0	20	50	5	100	1.5	150-806
APD0510-000	0.10	0.20	1.5	40	50	5	80	2.5	150-801
APD0805-000	0.05	0.10	2.0	50	100	8	80	2.0	150-801
APD0810-000	0.10	0.15	1.5	160	100	8	60	3.0	150-801
APD1510-000	0.10	0.20	2.0	300	200	15	60	3.0	150-801
APD2220-000	0.20	0.20	4.0	400	100	50	80	7.5	149-815

Typical Performance Data



Resistance vs. Forward Current @ 1 GHz



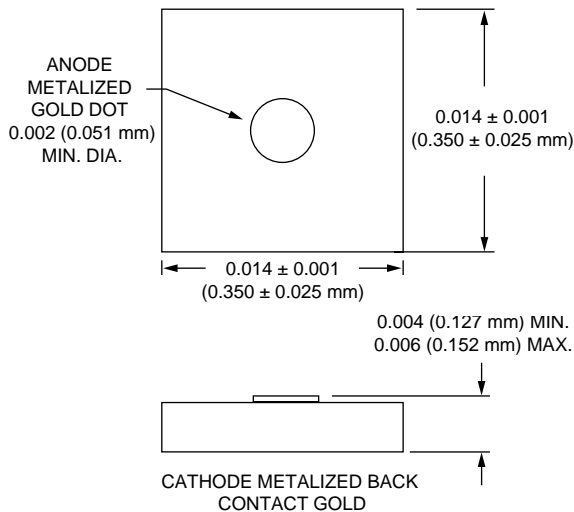
Resistance vs. Forward Current @ 1 GHz

SPICE Model Parameters

Description	Symbol	APD0505-000	APD0510-000	APD0805-000	APD0810-000	APD1510-000	APD2220-000	Unit
Saturation Current	I_S	6.40E-14	5.50E-17	1.20E-11	1.50E-12	1.60E-10	2.00E-09	A
Series Resistance	R_S	0.25	0.50	1.00	0.30	1.00	0.20	Ω
Emission Coefficient	N	1.40	1.02	1.70	1.48	1.80	1.90	
Reverse Breakdown	B_V	50.00	50.00	100.00	100.00	200.00	200.00	V
Current at B_V	I_{BV}	10E-06	10E-06	10E-06	10E-06	10E-06	10E-06	A
Zero Bias Capacitance	C_{J0}	0.12E-12	0.18E-12	0.13E-12	0.16E-12	0.25E-12	0.2E-12	F
Junction Potential	V_J	1.00	1.00	1.00	1.00	1.00	1.00	V
Grading Coefficient	M	0.50	0.50	0.50	0.50	0.50	0.50	
Transit Time	TT	20E-9	40E-9	50E-9	160E-9	300E-9	400E-9	s

Outline Drawings

149-815



150 Series

