Agilent Technologies
Innovating the HP Way

Small Signal RF PIN Diode Chips for Hybrid Integrated Circuits

Technical Data

HPND-0001
HPND-0002

Features

- **Thermocompression/ Thermosonically Bondable**
- **Ideal for Hybrid Integrated Circuits**
- **Gold Metallization**
- **Silicon Nitride Passivation**
- **Uniform Electrical Characteristics**
- **Batch Matched Versions Available**
- **Planar Construction**

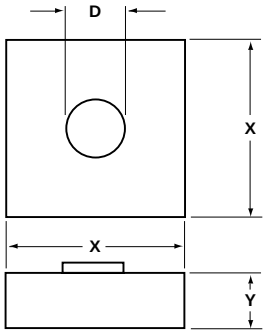
Description

These PIN/NIP diode chips are specifically designed for hybrid applications requiring thermosonic or thermocompression bonding techniques. The top metallization is a layer of gold for a tarnish free surface that allows either thermosonic or thermocompression bonding techniques. The bottom metallization is also gold, suitable for epoxy or eutectic die attach method.

Applications

These small signal, general purpose PIN/NIP diode chips are optimized for various analog and digital applications such as switches, digital phase shifters, pulse and amplitude modulators, limiters, leveling, and attenuating.

Outline 01B
Chip Dimensions



DIMENSIONS	FOR EPOXY OR EUTECTIC DIE ATTACH PART NO. HPND-	
	-0001	-0002
D (0.03) (1)	0.25 (10)	0.20 (8)
X (0.05) (2)	0.51 (20)	0.38 (15)
Y (0.03) (1)	0.15 (6)	0.15 (6)
TOP CONTACT	CATHODE	CATHODE
BOTTOM CONTACT	ANODE	ANODE

DIMENSIONS IN MILLIMETERS (1/1000 INCH).

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Maximum Ratings

Junction Operating and Storage
Temperature Range .....-65°C to +150°C
T_A = 25°C
P_D Power Dissipation .....250 mW
(Measured in an infinite heat sink derated linearly to zero at 150°C.)

Operation in excess of any one of these conditions may result in permanent damage to this device.

Electrical Specifications at T_A = 25°C

Chip for Epoxy or Eutectic Die Attach HPND-	Nearest Equivalent Surface Mount Part No. HSMP-	Nearest Equivalent Axial Lead Part No. 5082-	Minimum Breakdown Voltage V_{BR} (V)	Maximum Capacitance C_j (pF)	Typical Parameters		
					Series Resistance R_S (Ω)	Typical Carrier Lifetime τ (ns)	Typical Reverse Recovery Time t_{rr} (ns)
0001	3800	3080	100	0.20	2.0	1800	500
0002	3810	3081	100	0.20	3.5	1500	300
Test Conditions			$V_R = V_{BR}$ Measure $I_R \leq 10$ mA	V_R = 50 V *V_R = 20 V f = 1.0 MHz	I_F = 100 mA *I_F = 10 mA	I_F = 50 mA I_R = 250 mA *I_F = 10 mA *I_R = 6 mA	I_F = 20 mA V_R = 10 V 90% Recovery

Assembly and Handling Procedures for PIN Chips

1. Storage

Devices should be stored in a dry nitrogen purged dessicator or equivalent.

2. Cleaning

If required, surface contamination may be removed with electronic grade solvents. Typical solvents, such as freon (T.F. or T.M.C.), acetone, deionized water, and methanol, or their locally approved equivalents, can be used singularly or in combinations. Typical cleaning times per solvent are one to three minutes. DI water and methanol should be used (in that order) in the final cleans. Final drying can be accomplished by placing the cleaned dice on clean filter paper and drying with an infrared lamp for 5-10 minutes. Acids such as hydrofluoric (HF), nitric (HNO_3), and hydrochloric (HCl) should not be used.

The effects of cleaning methods/solutions should be verified on small samples prior to submitting the entire lot.

Following cleaning, dice should be either used in assembly (typically within a few hours) or stored in clean containers in a reducing atmosphere or a vacuum chamber.

3. Die Attach

a. Eutectic

Eutectic die attach can be accomplished by "scrubbing" the die with/without a preform on the header to combine with the silicon in the die. Temperature is approximately 400°C, with heating times of 5-10 seconds. (Note–times and temperature utilized may vary depending on the type, composition, and heat capacity of the header or substrate used.) This method is recommended for the HPND-000X series.

b. Epoxy

For epoxy die-attach, conductive silver-filled epoxies are recommended. This method can be used for all Agilent PIN chips.

4. Wire Bonding

Either ultrasonic, thermosonic or thermocompression bonding techniques can be employed. Suggested wire is pure gold, 0.7 to 1.5 mil diameter.

www.semiconductor.agilent.com
Data subject to change.

Obsoletes 5954-2108
5965-9143E (11/99)