AT&T

Lightwave Data Sheet

105A/C Pin Photodetectors

FEATURES

- 1.1 to 1.6 μm Wavelength
- High Performance: High Speed, High Responsivity Low Dark Current
- Planar Structure For High Reliability
- 100% High-Temperature Burn-in
- T0-18 Package With Transparent Window (105A)
- T0-18 Package (105C)

DESCRIPTION

The 105A and C Pin Photodetectors are available for use as optical detectors in lightwave applications. Both codes are fabricated from InGaAsP and designed to detect long wavelength (1.1 to 1.6 μm) light. They are versatile devices, usable as either the light detecting element in a lightwave receiver, or as a laser backface monitor in a transmitter. The active diode area of the photodetectors is a circle 10 mils in diameter.

The 105A and C Photodetectors are high performance devices. When used at the recommended reverse bias voltage of 5 volts and terminated by a 50-ohm load, the rise/fall time is typically less than 1 nsec. The low dark current (typically 10 nA) simplifies the detection of very low levels of light. Responsivity (light power in/electrical power out) is typically 0.80 amps/watt.

The 105A and C differ only in package construction. The 105A consists of a hermetic TO-18 package with a transparent window in the top of the device to allow light to impinge on the photodetector chip. The 105C uses a TO-18 package in which the chip has been silicone-coated for moisture protection. Additionally, in the 105C package the optical fiber is positioned next to the chip through a hole in the ceramic submount.

The chips have a planar structure for high reliability. Their failure rate is projected at less than 10 FITs over a 25-year period when operated at room temperature using the recommended bias voltage. All devices are burned-in at high temperature to eliminate early failures.

July 1985

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CHARACTERISTICS

(Vr = 5V)

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Capacitance (F=1 MHz, Vr=5V)	–	–	6.0	10.0	pF
Dark Current (Ir in the absence of light)	Ir	–	10	20	nA

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Rise/Fall Time	τ_r/τ_f	–	<1	–	ns
Responsivity (λ = 1.3 μm)	R	0.75	0.80	–	A/W

Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Reverse Voltage	Vr	–	10	V
Storage Temperature	–	–40	+125	°C
Operating Temperature	–	–40	+85	°C
Forward Voltage	–	–	0.0	V
Photocurrent	–	–	1	mA

NOTES:

1. The recommended bias voltage, Vr, is 5 volts.
2. Electrostatic discharge protection must be used when handling the devices.

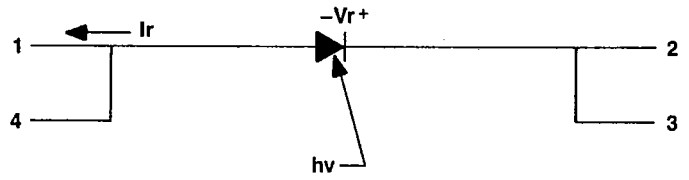

Figure 1. 105A/105C Schematic Drawing

Typical Characteristic Curves

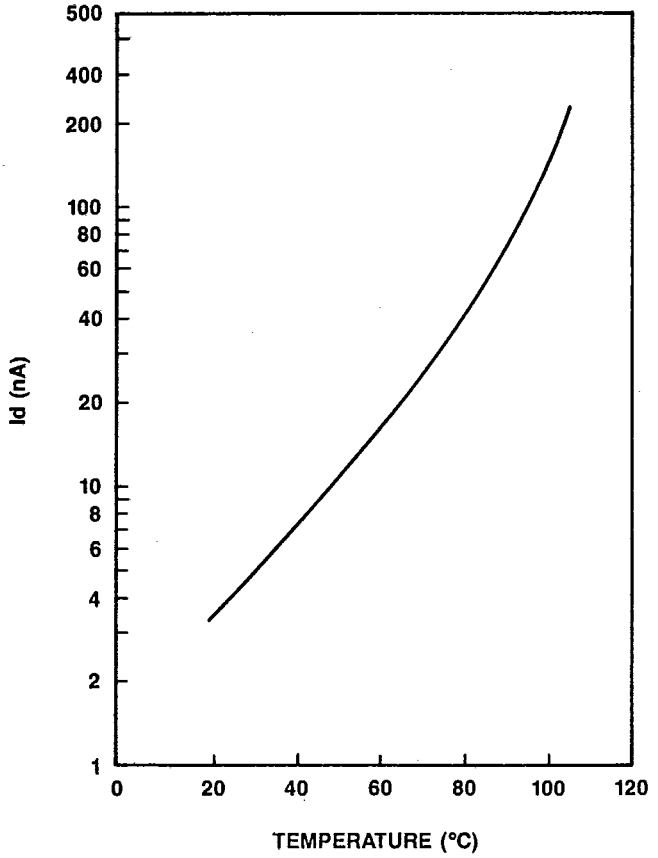

Figure 2. Typical Temperature Dependence of Reverse Current

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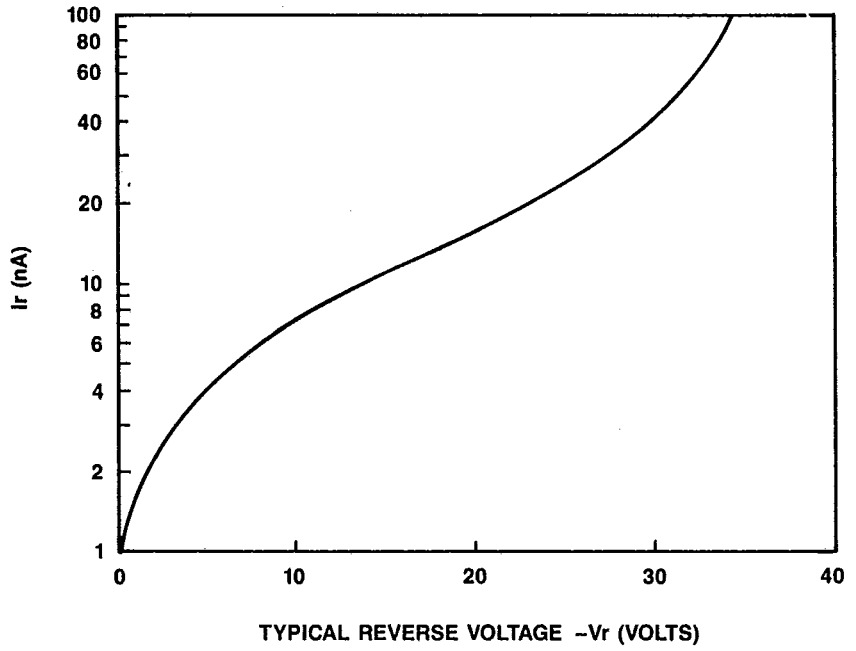

Figure 3. Typical Reverse Current as a Function of Reverse Voltage at 23°C

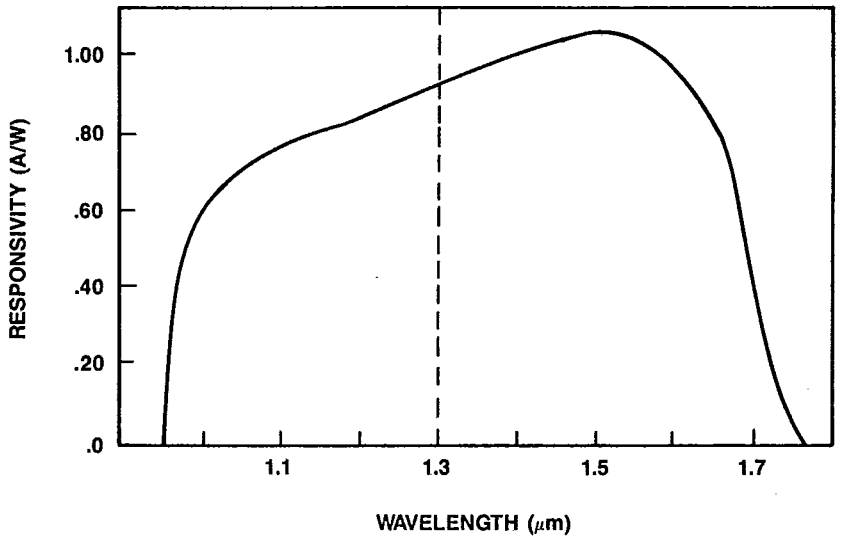

Figure 4. Typical Responsivity as a Function of Wavelength

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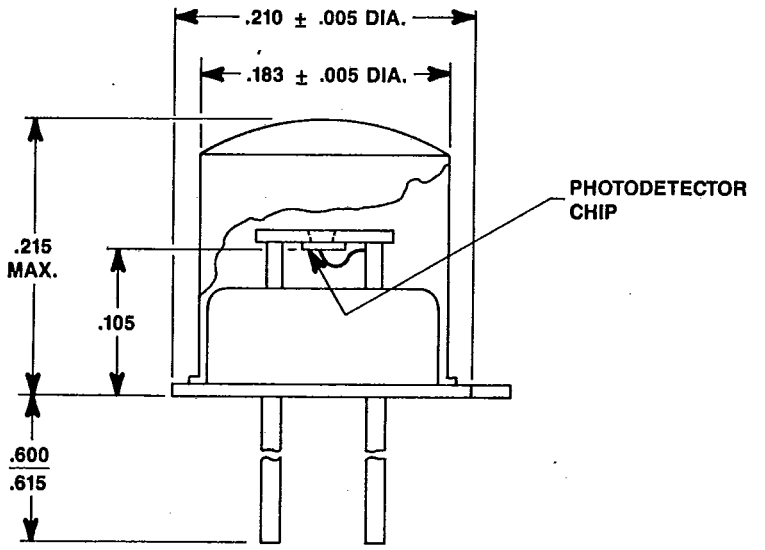
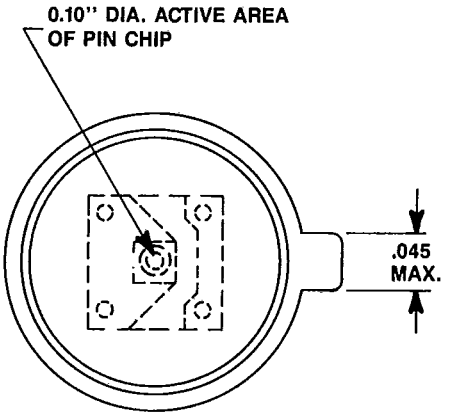
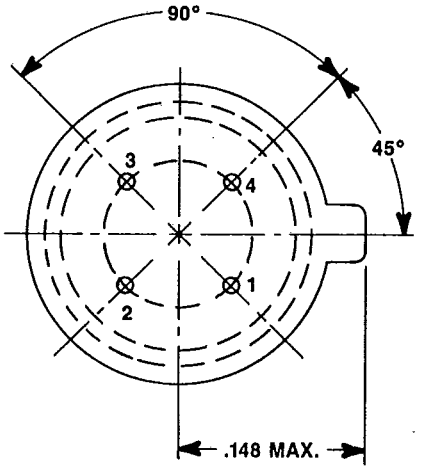
OUTLINE DRAWINGS

(Dimensions in Inches)





Top View



105A Pin Photodetector

105A/C Pin Photodetectors

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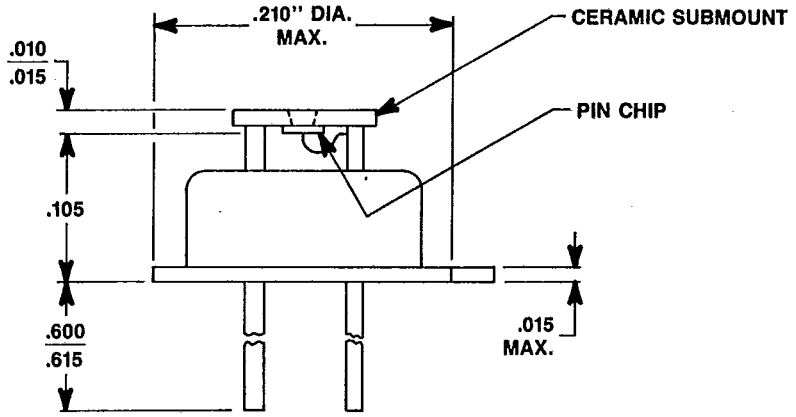
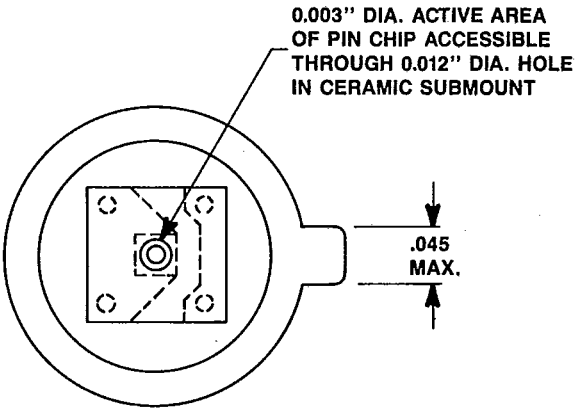
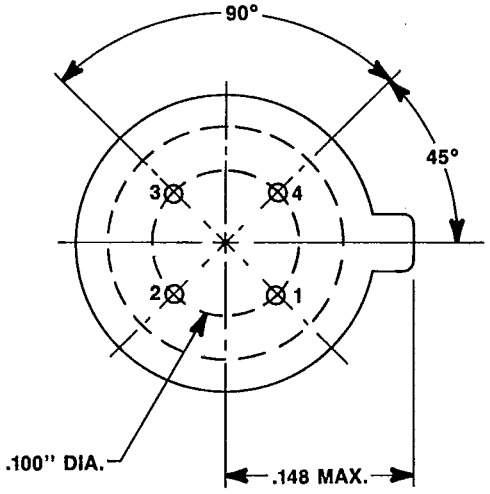




Top View



105C Pin Photodetector

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ORDERING INFORMATION

Part Number	Package	COMCODE
105A	TO-18 Transparent Window	103810339
105C	TO-18	104200308