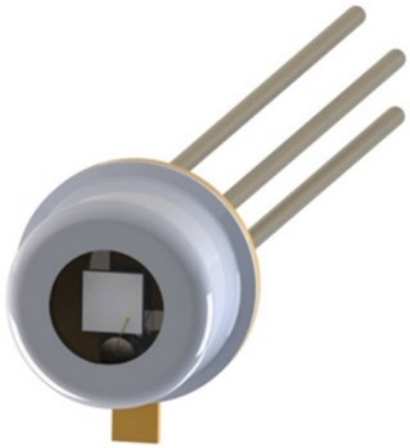
GPD OPTOELECTRONICS

Low Polarization-Dependent Loss InGaAs Photodiodes

1.7µm cutoff wavelength

0.3mm to 10mm dia. active areas



APPLICATIONS

- Back-facet laser diode monitor
- Optical power meters
- Polarization characterization of optical fibers, fiber couplers, and connectors
- LD/LED test and measurement

AVAILABLE OPTIONS

- Area independent (0.3 to 10 mm diameter)
- High sensitivity
- Cutoff wavelength at 1.7 µm (lattice matched)
- Low polarization-dependent response
- Active device receptacles (FC, SC, ST, SMA)

SPECIFICATIONS

Low Polarization Dependent Loss (PDL) InGaAs Photodiodes

Part Number	N17P30-XX	N17P50-XX	N17P100-XX	N17P150-XX	N17P200-XX	N17P300-XX	N17P500-XX	Units
Optoelectronic Characteristics @ 23 ºC ± 2 ºC								
Active Diameter	0.3	0.5	1.0	1.5	2	3	5	mm
Peak Wavelength (typ)	1.6 ± 0.1	1.6 ± 0.1	1.6 ± 0.1	1.6 ± 0.1	1.6 ± 0.1	1.6 ± 0.1	1.6 ± 0.1	µm
Cutoff Wavelength (50%)	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	1.7 ± 0.1	µm
Responsivity @ λ_p (min/typ)	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	0.9/1.0	A/W
Shunt Resistance (min)	250	125	50	40	30	8	1.5	MΩ
Dark Current (typ)	1 @ 5V	6 @ 5V	25 @ 5V	50 @ 5V	50 @ 1V	200 @ 1V	200 @ 0.1V	nA
Capacitance (typ) @ 5V	4	8	30	75	300 @ 0V	600 @ 0V	1800 @ 0V	pF
Bandwidth w/ 50 Ω @ 0V	800	400	106	44	10 @ 0V	5 @ 0V	2 @ 0V	MHz
Rise time w/50 Ω @ 5V	0.4	0.9	3.3	8	33 @ 0V	66 @ 0V	200 @ 0V	ns
PDL @ 0V (typ/max)	5/10	5/10	5/10	5/10	5/10	5/10	5/10	mdB
NEP @ λ_{PEAK} (typ) @ 0V	8×10^{-15}	11×10^{-15}	18×10^{-15}	20×10^{-15}	23×10^{-15}	45×10^{-15}	104×10^{-15}	$W/Hz^{1/2}$
Linearity (± 0.2 dB @ 0V)	6	6	6	6	6	6	6	dBm
Package	TO-46 window cap	TO-46 window cap	TO-46 window cap	TO-46 window cap	TO-5 window cap	TO-5 window cap	TO-5 window cap	
Maximum Ratings @ 23 °C ± 2 °C								
Storage Temperture	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125	°C
Operating Temperture	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85	°C
Reverse Voltage	25	2	2	2	2	1	1	V
Reverse Current	10	10	10	10	10	10	10	mA
Forward Current	10	10	10	10	10	10	10	mA
Power Dissipation	50	50	50	50	50	50	50	mW

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Figure 1. InGaAs Response vs. Wavelength vs. Temperature

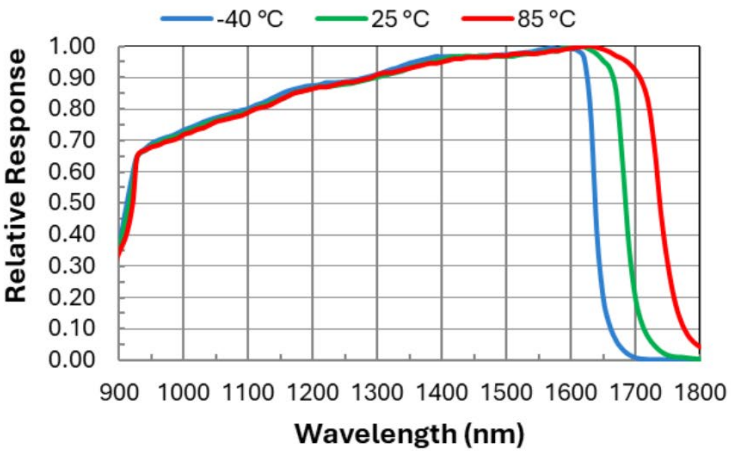


Figure 2. InGaAs Response vs. Wavelength vs. Temperature (Cont.)

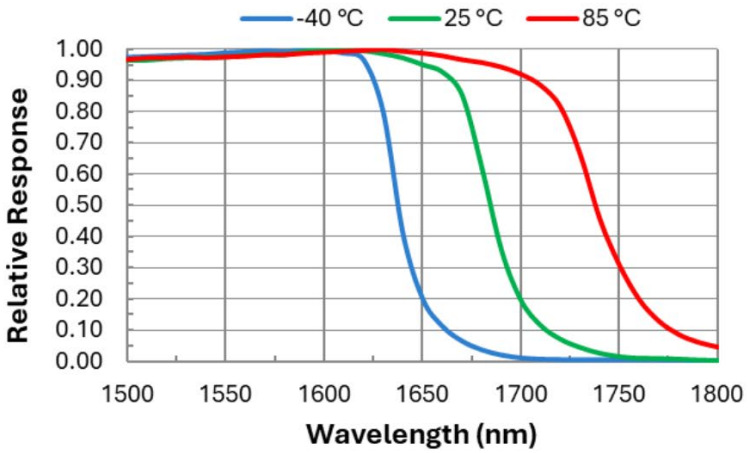


Figure 3. Dark Current vs. Reverse Voltage vs. Diameter

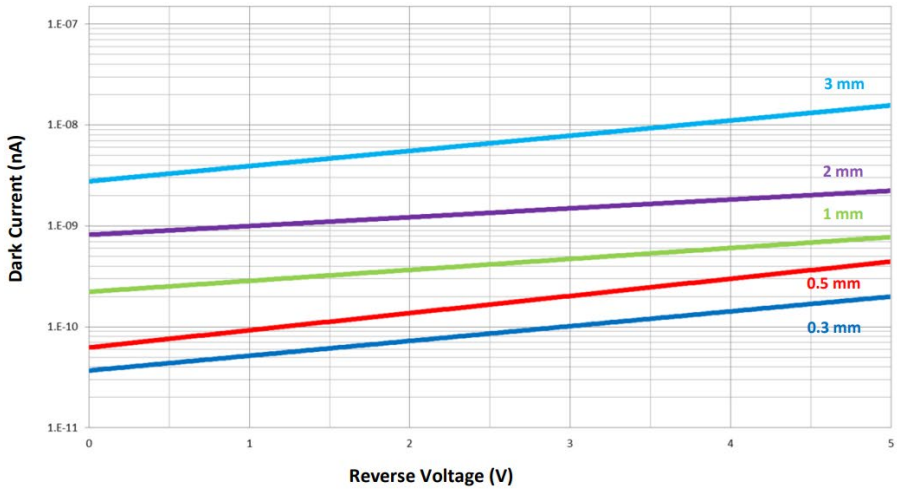
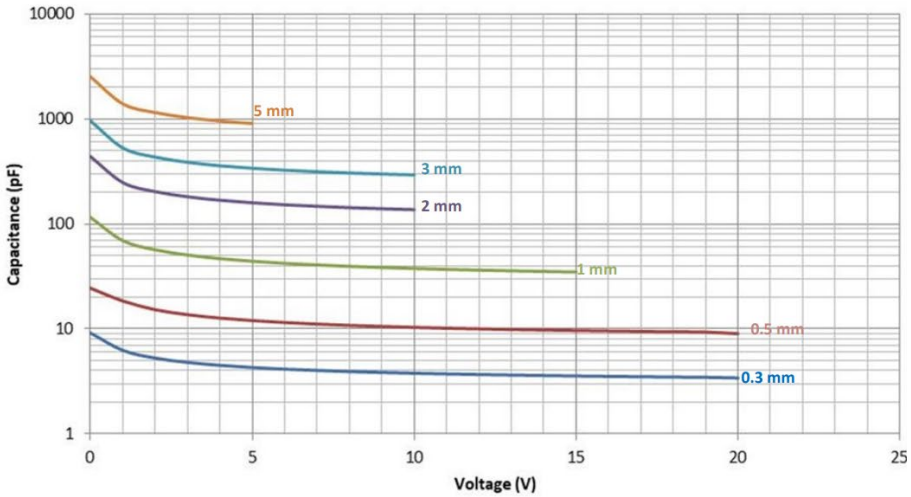


Figure 4. Capacitance (pF) vs. Reverse Voltage (V) vs. Diameter (mm)



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PACKAGING CAPABILITIES

Packaging Configurations							
Diameter (mm)	TO Header				Ceramic Leadless Chip Carrier		
	TO-46	TO-18	TO-5	TO-8	LCC-6	LCC-28	BNC
0.3	•						
0.5	•						
1.0	•	•	•		•		
1.5	•	•	•		•		
2.0			•		•		
3.0			•			•	•
5.0			•	•		•	•
Window (Other Options Available)							
Material	Molded Clear Glass				Borosilicate Glass		
Thickness (mm)	0.25				0.5		

GPD QUALIFICATIONS

Our compliance, certificates, and capabilities

- ✓ ISO 9001:2005
- ✓ Quality Assurance Provisions
- ✓ DDTC/ITAR registered
- ✓ MIL-STD-883
- ✓ MIL-STD-750
- ✓ Space-qualified designs
- ✓ High-reliable assembly and environmental/ radiation test
- ✓ Manufactured in Salem, NH

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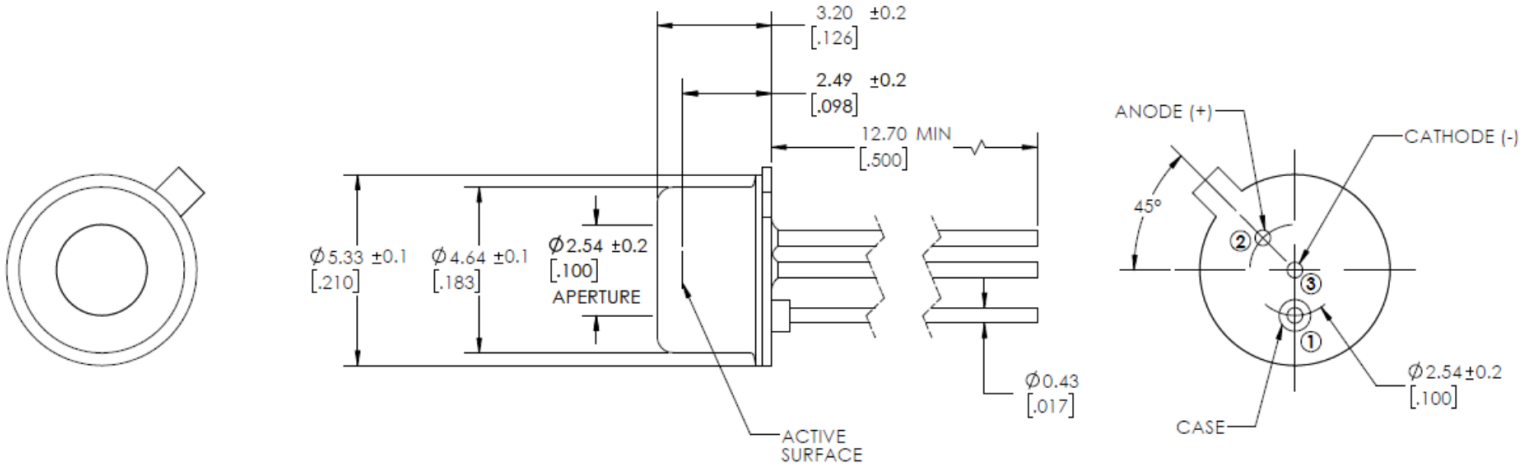
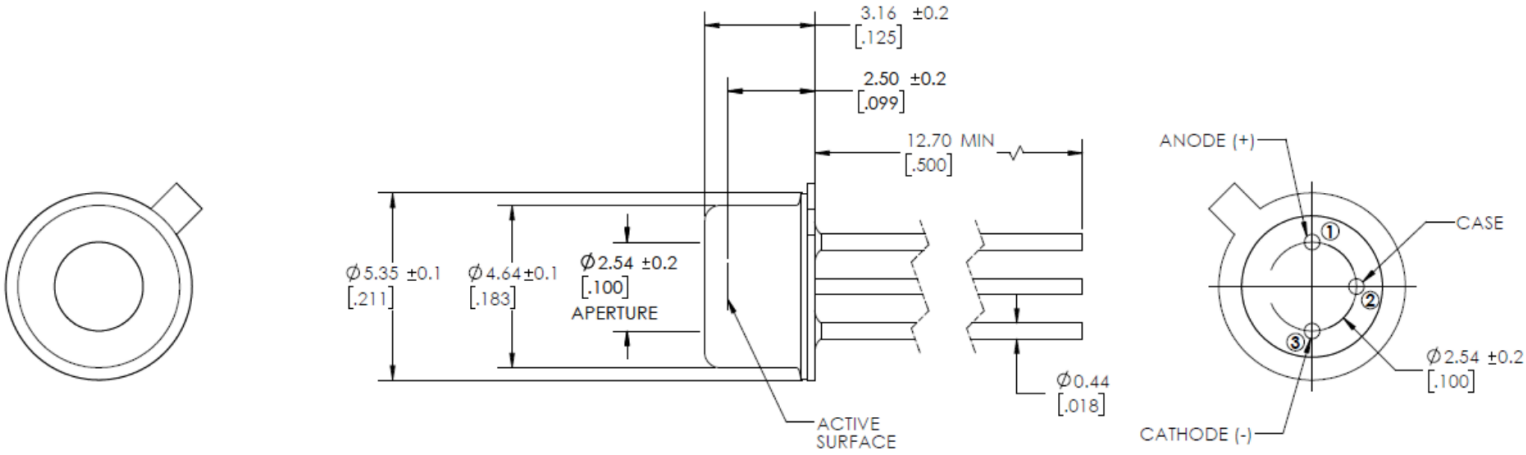
Packaging Outline

TO-46



TO-18



DIMENSIONS IN MM [INCH]

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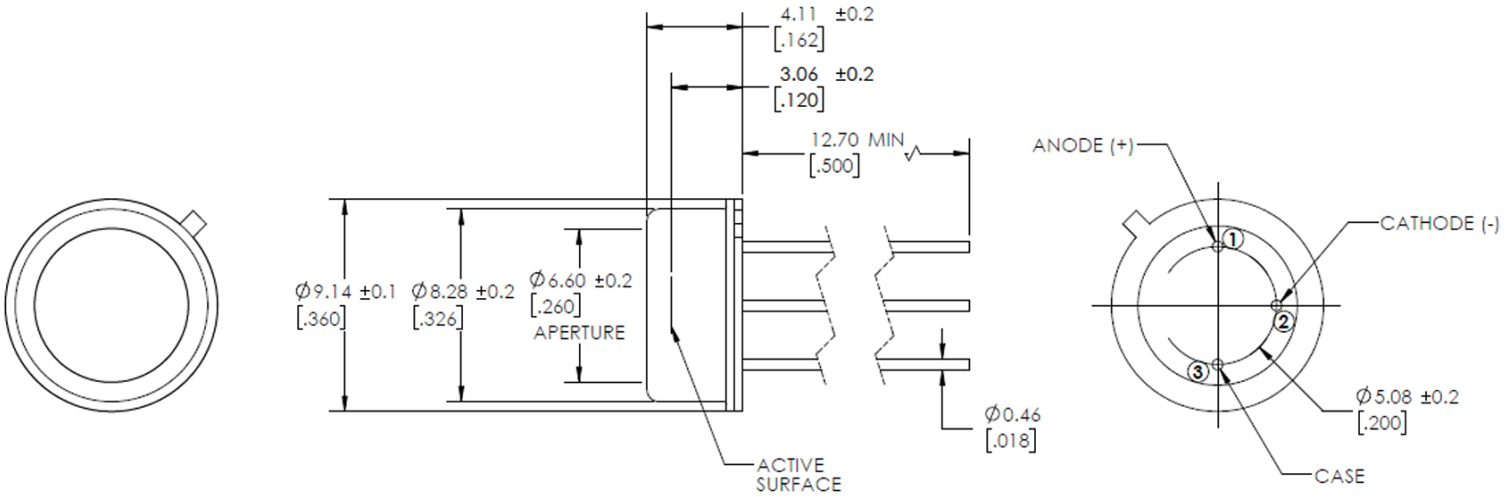
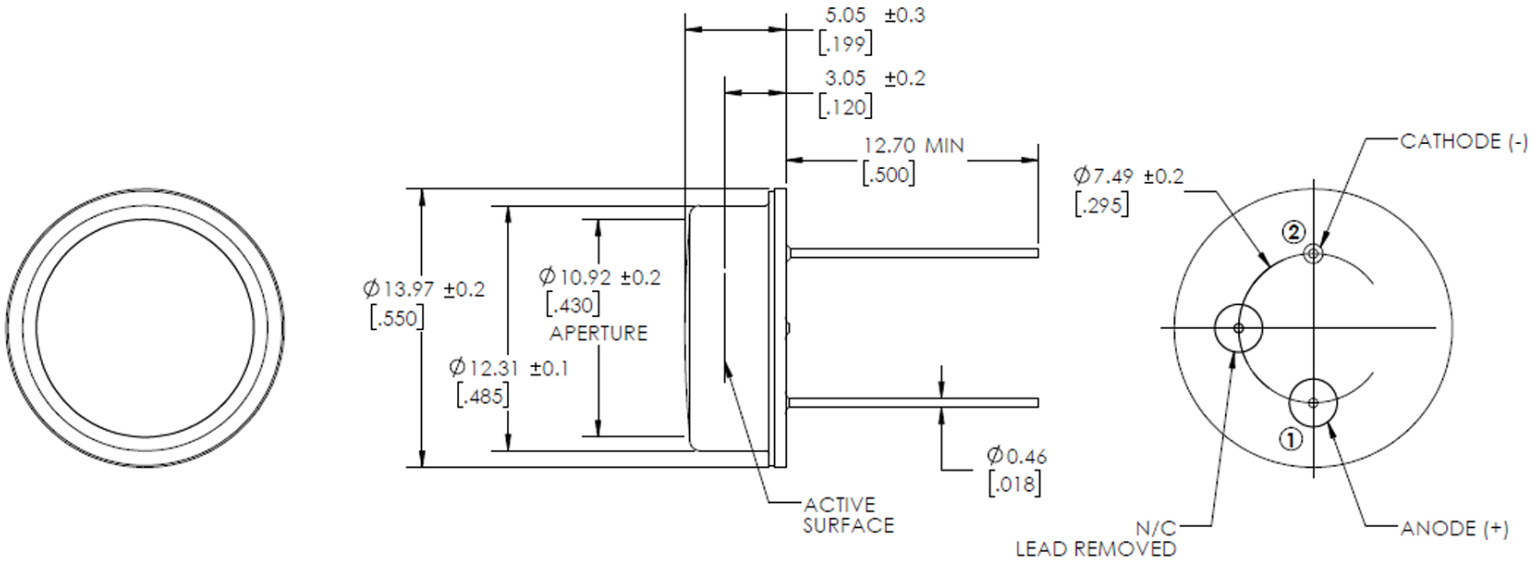
Packaging Outline

TO-5



TO-8



DIMENSIONS IN MM [INCH]

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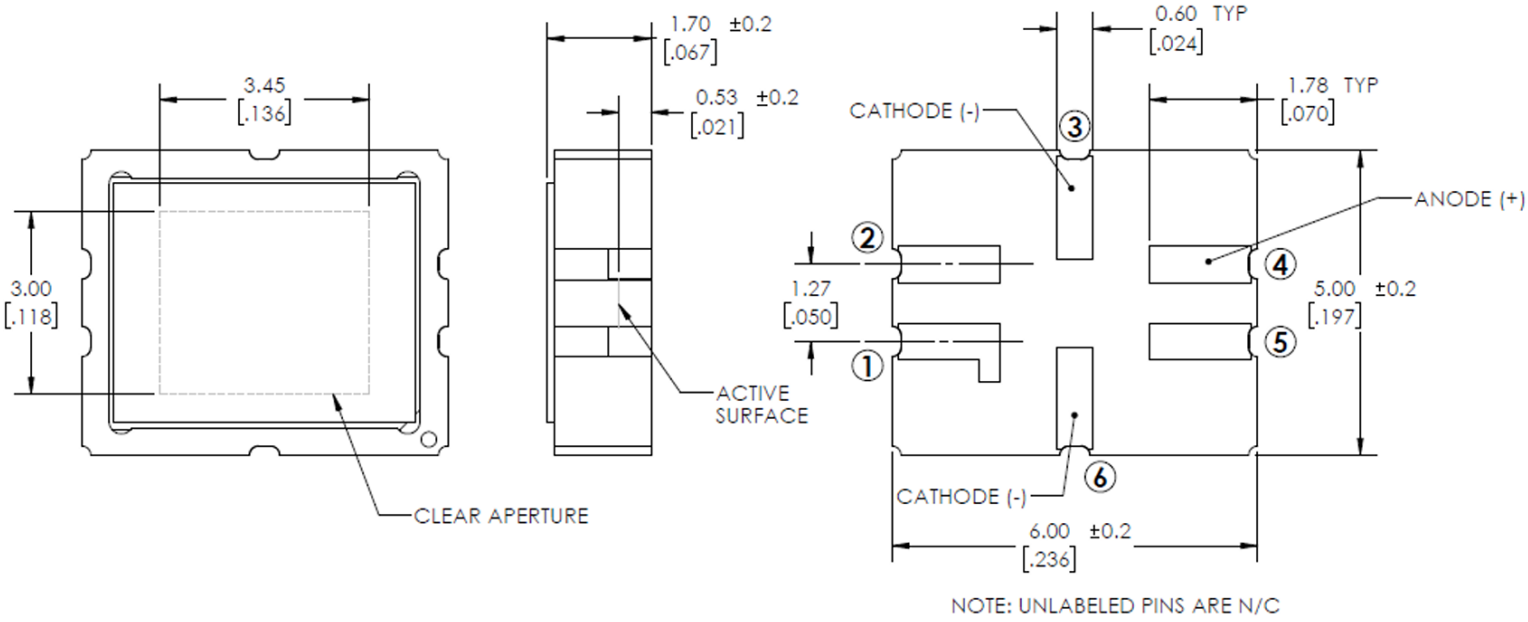
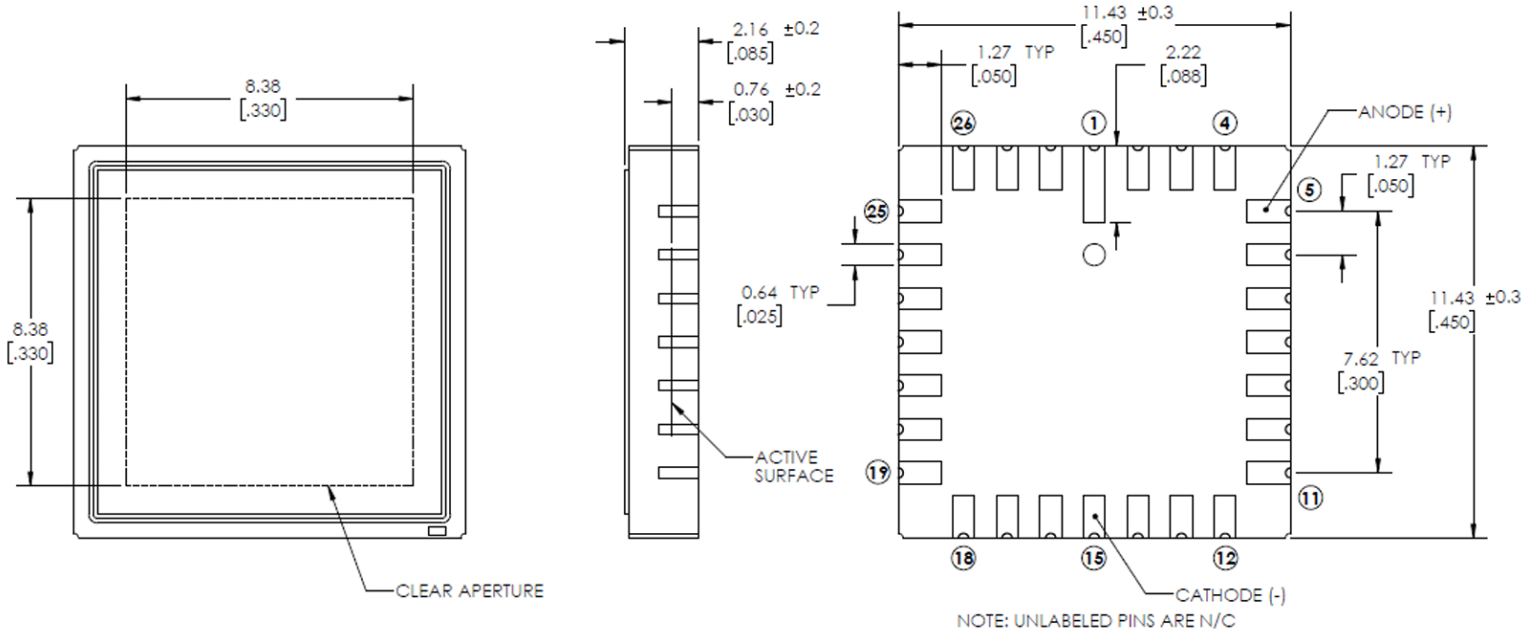
Packaging Outline

LCC-6



LCC-28



DIMENSIONS IN MM [INCH]

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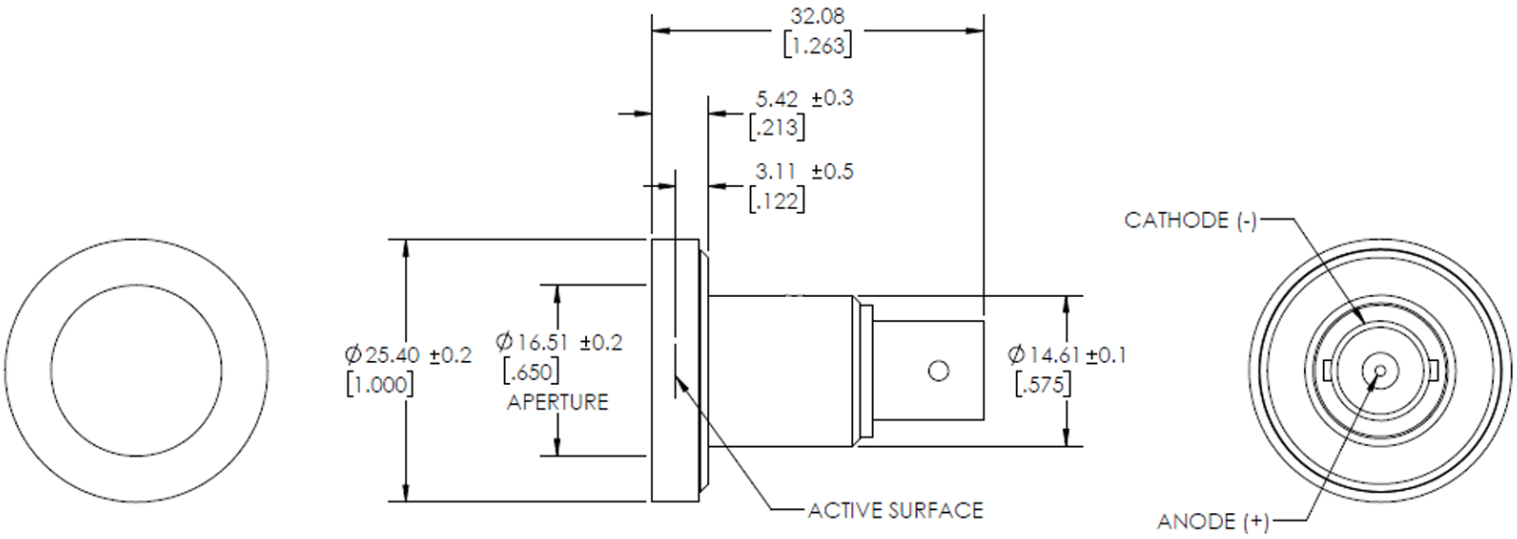
Packaging Outline

BNC



DIMENSIONS IN MM [INCH]

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ORDERING INFORMATION

GPD is proud to offer multiple packaging solutions to best fit the needs of your application. Our Standard configurations are mentioned below, and custom packaging is also available.

Selection is based on the size of the photodiode and the package requirements of your application. Refer to packaging capabilities chart below for more information.

N 1 7 P 1 0 0 - T 4 6

Material
InGaAs PIN Photodiode

Performance	
P	Low PDL

Cut-off Wavelength	
17	1.7µm

Diameter	
30	0.3mm
50	0.5mm
100	1.0mm
200	2.0mm
300	3.0mm
500	5.0mm

Package*	
T46	TO-46
T18	TO-18
T5	TO-5
T8	TO-8
LCC6	6 contact
LCC28	28 contact
BNC	BNC

*More packages available upon request

NOTE: GPD Optoelectronics may update product details without prior notice, and any use or application of our products is at your own discretion.

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Handling and Processing Precautions

Electrostatic Discharge (ESD) Warning

Our detectors are highly susceptible to damage from electrostatic discharge (ESD). To prevent damage, use ESD protective measures, such as grounding straps, when unpacking and handling these devices.

To guarantee the optimal performance of a photodiode, it is crucial to adhere strictly to the device's electrical specifications. Photodiodes are highly sensitive to values that surpass their absolute maximum ratings. Exceeding these limits can lead to damage or total failure of the device. Users should employ handling techniques that avoid electrostatic discharges and other electrical surges during both the handling and operation of these devices.

Cleanroom Packaging and Handling

Our detectors are packaged in a clean state under cleanroom conditions, eliminating the need for cleaning before processing. In fact, cleaning is not recommended as it may introduce contaminants.

Processing Guidelines

To maintain the cleanliness of our detectors:

- Process under the cleanest conditions possible, including clean workplaces and room air.
- Wear suitable gloves or fingerstalls to prevent fingerprint contamination (mainly fats and organic acids).
- Ensure the soldering process is designed to prevent the need for post-soldering cleaning.

Cleaning Optical Windows (if necessary)

If exceptional circumstances require cleaning the optical windows:

- First, identify the type of contamination.
- For loose particles, gently blow them off with nitrogen gas or clean, dry air.
- For attached particles or other contaminating materials, clean with solvents such as isopropyl alcohol, or First Contact™ Polymer

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