

## APPLICATIONS

- Beam Steering and Light Position Sensing
- Laser Guidance for Free-Space Optical Communication
- Optical Tweezers
- Beam Profiling

## AVAILABLE OPTIONS

- Extended Wavelengths to 2.6  $\mu\text{m}$
- Advanced Pattern Configurations
- Low Capacitance Variants
- Custom Windows, Filters, and Anti-Reflective Coatings
- Integrated Electronics:
  - Thermo-Electric Cooler
  - Transimpedance Amplifier
  - Thermistor

## Specifications

InGaAs Quadrant Photodiodes							
Part Number	N17S4x0MC-50-XX	N17S4x0MC-100-XX	N17S4x0MC-150-XX	N17S4x0MC-200-XX	N17S4x0MC-300-XX	N17S4x0MC-500-XX	Units
Optoelectronic Characteristics @ 23 °C $\pm$ 2 °C							
Active Diameter *	0.5	1	1.5	2	3	5	mm
Sector Area	0.0423	0.184	0.423	0.76	1.73	4.83	mm <sup>2</sup>
Element Gap (typ)	0.02	0.02	0.02	0.03	0.03	0.03	mm
Crosstalk (typ/max)	2/5	2/5	2/5	2/5	2/5	2/5	%
Spectral Response Range †	800-1700	800-1700	800-1700	800-1700	800-1700	800-1700	nm
Peak Wavelength (typ)	1550	1550	1550	1550	1550	1550	nm
Responsivity @ 850 nm (min/typ)	0.2/0.35	0.2/0.35	0.2/0.35	0.25/0.35	0.2/0.35	0.2/0.35	A/W
Responsivity @ 1300 nm (min/typ)	0.85/1.0	0.85/1.0	0.85/1.0	0.85/1.0	0.85/1.0	0.85/1.0	A/W
Responsivity @ 1550 nm (min/typ)	0.93/1.1	0.9/31.1	0.93/1.1	0.93/1.1	0.93/1.1	0.93/1.1	A/W
R <sub>SHUNT</sub> @ 10 mV (min/typ) ‡	50/180	10/50	5/30	5/15	2/15		M $\Omega$
I <sub>DARK</sub> @ V <sub>R</sub> (typ/max)	1/8 @ 5 V	0.8/10 @ 1 V	3/10 @ 2 V	5/15 @ 1 V	10/200 @ 0.5 V		nA
Capacitance @ 0 V (max) ‡	10	31	68	125	275		pF
Capacitance @ V <sub>R</sub> (max) ‡	6 @ 5 V	15 @ 5 V	30 @ 5 V	40 @ 3 V	100 @ 2 V		pF
NEP @ $\lambda_{\text{PEAK}}$ @ 0 V (typ)	12	16	25	30	40		fW/ $\sqrt{\text{Hz}}$
Linearity ( $\pm$ 0.2 dB) @ 0 V (min/typ)	6/8	6/8	6/8	6/8	6/8		dBm
Storage Temperature	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125		°C
Operating Temperature	-40 to 85	-40 to 85	-40 to 85	-40 to 85	-40 to 85		°C
Maximum Ratings @ 23 °C $\pm$ 2 °C							
Reverse Voltage	15	15	15	15	12		V
Reverse Current	10	10	10	10	10		mA
Forward Current	10	10	10	10	10		mA

CONTACT GPD FOR MORE INFORMATION

\* Smaller/ Larger Sizes Available

† Shorter wavelengths available

‡ Per Cell

Figure 1. InGaAs Response vs. Wavelength vs. Temperature

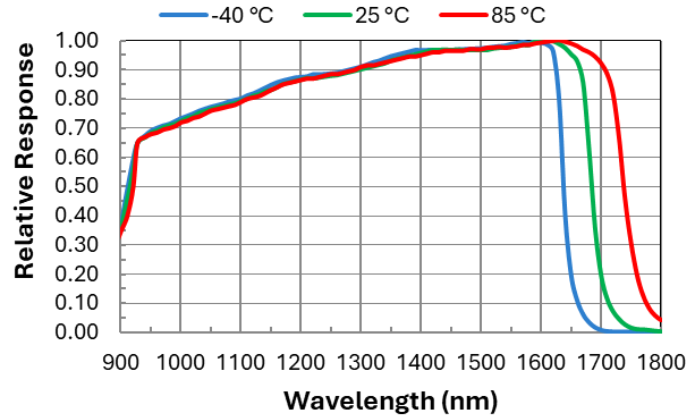
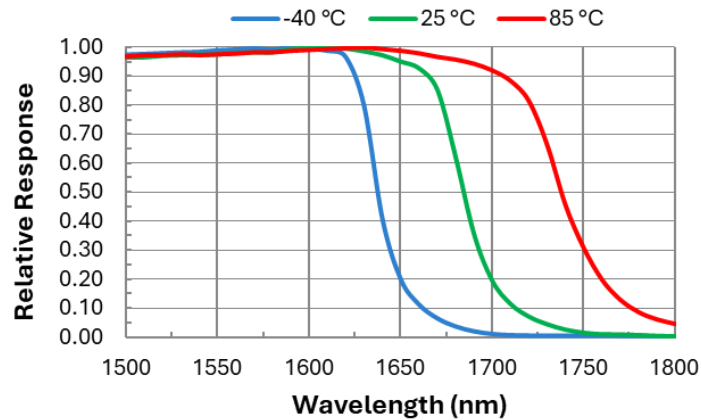


Figure 2. InGaAs Response vs. Wavelength vs. Temperature (Cont.)



### Packaging Capabilities

Packaging Configurations					
Diameter (mm)	TO Headers			Ceramic Leadless Chip Carriers	
	TO-46	TO-5	TO-8	LCC-6	LCC-28
0.5	•	•		•	
1	•	•		•	
1.5	•	•		•	
2		•		•	
3		•			•
5		•	•		•
Window (Other Options Available)					
Material	Molded Clear Glass, Sapphire			Silicon, Borosilicate	
Thickness (mm)	0.25			0.5	

### GPD QUALIFICATIONS

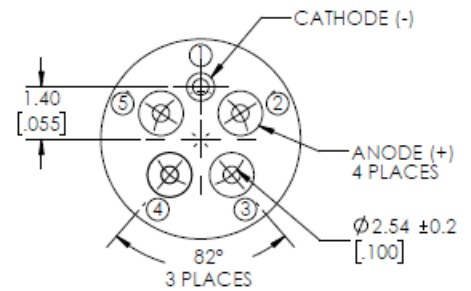
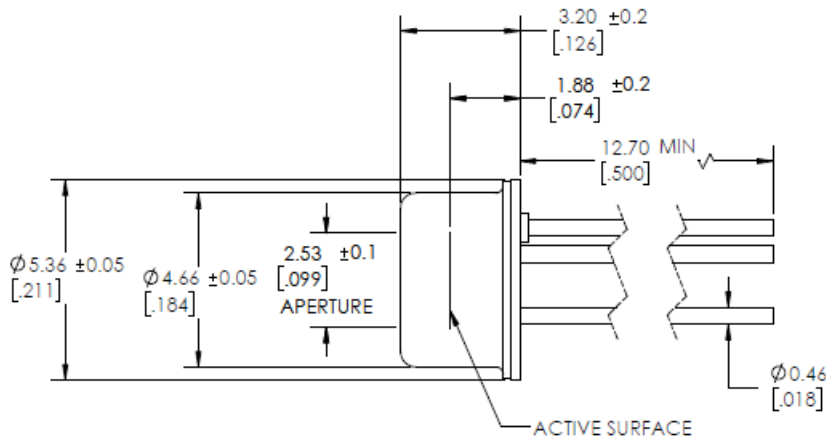
#### Our compliance, certificates, and capabilities

- ✓ ISO 9001:2015
- ✓ Quality Assurance Provisions
- ✓ DDTC/ITAR registered
- ✓ MIL-STD-883
- ✓ MIL-STD-750
- ✓ Space-qualified designs
- ✓ High-reliability assembly and environmental/radiation test
- ✓ Manufactured in Salem, NH

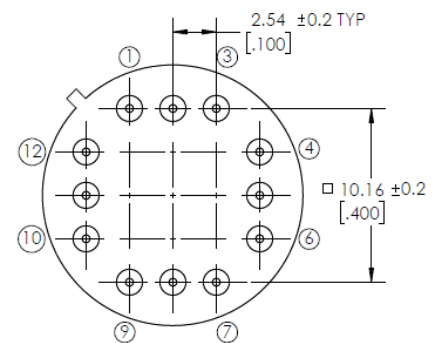
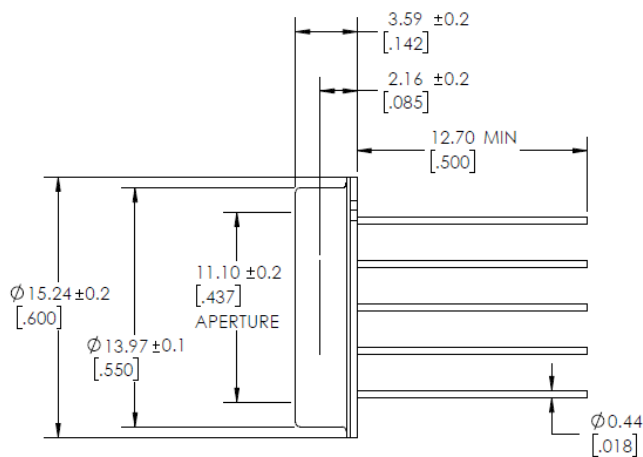


## Package Outlines

### TO-46

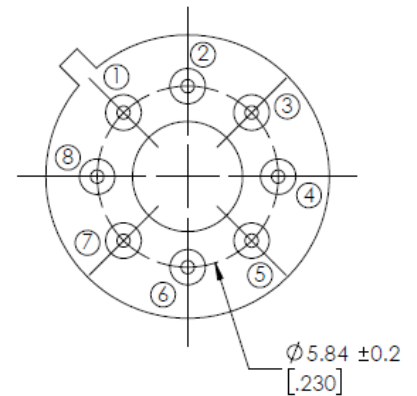
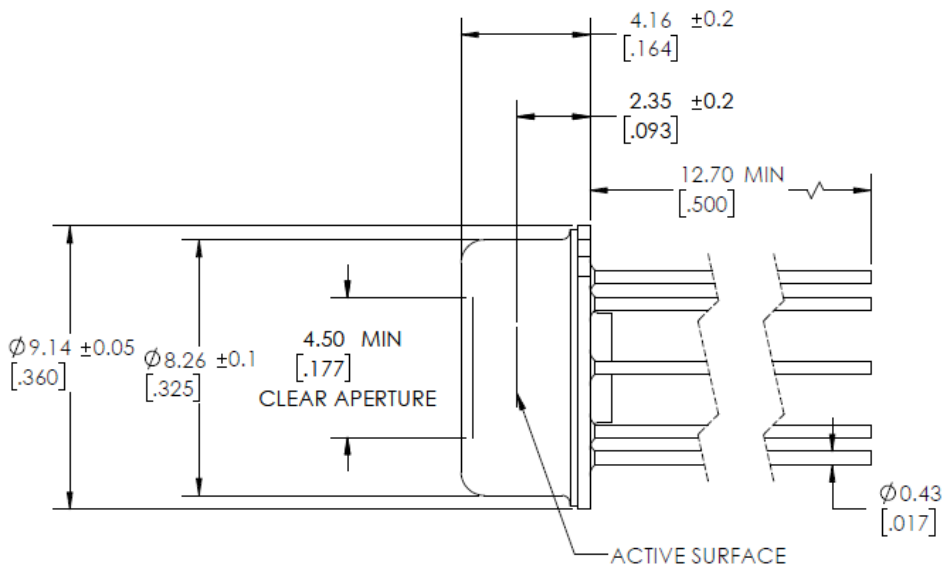


### TO-8



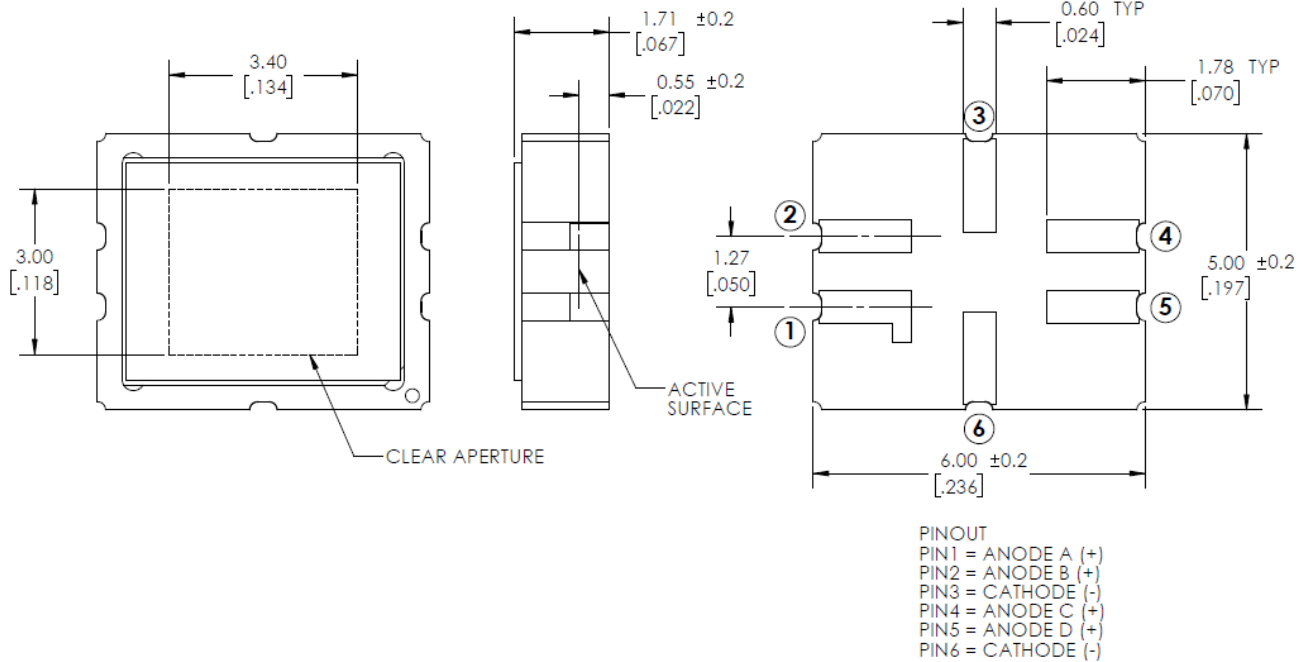
## Package Outlines

### TO-5

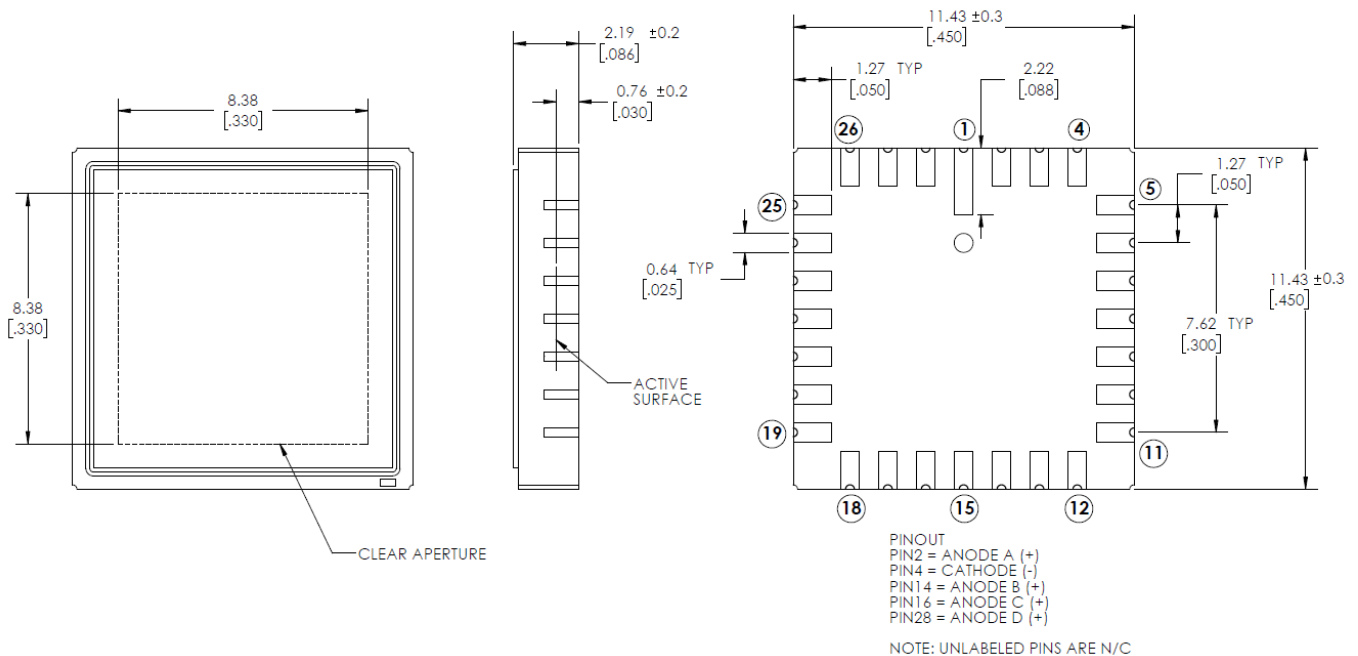


## Package Outlines

### LCC-6



### LCC-28

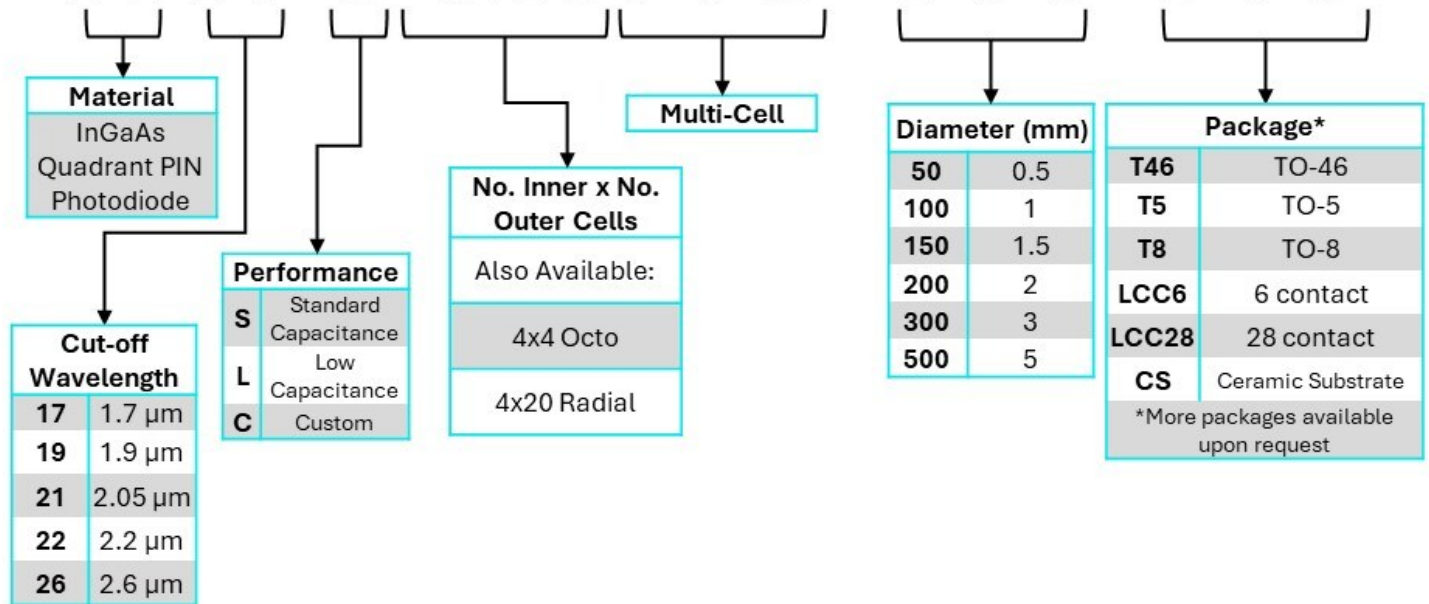


## Ordering Information

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.

# N17S4x0MC-100-T46



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

### **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