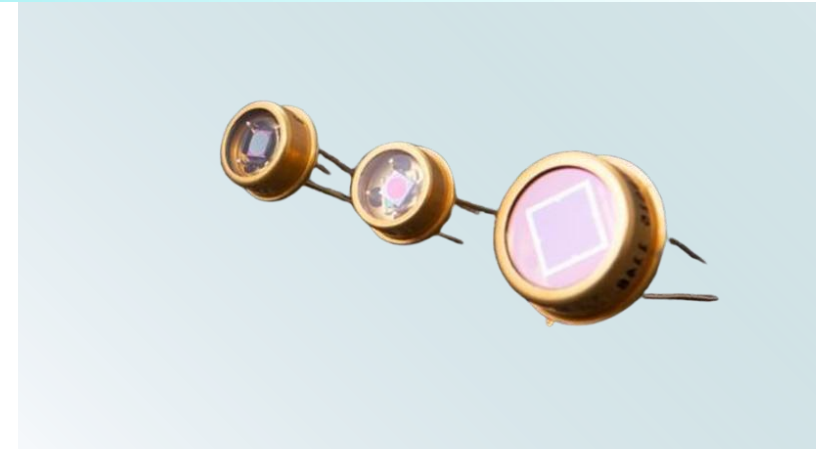
GPD Optoelectronics

Precision Photodiode Solutions
for Demanding Optical Applications









GPD
OPTOELECTRONICS

The GPD Difference

Precision Detection for
Demanding Environments

When precision and reliability matter, we deliver.

Our indium gallium arsenide photodetectors form the core of our short-wave infrared detection portfolio. InGaAs detectors offer the responsivity, speed, and stability that telecommunications, spectroscopy, aerospace, optical communications and defense applications depend on. Our engineering team tunes each design to the specific tradeoffs a customer's application demands, whether that means optimizing for bandwidth, minimizing dark current, or extending detection range further into the infrared.

For applications requiring the widest possible spectral coverage, our germanium photodetectors extend sensitivity into ranges InGaAs cannot reach cost-effectively. Germanium remains a proven, economical choice for near-infrared detection where budget or spectral range calls for a different approach.

When higher sensitivity or higher gain becomes the priority, our avalanche photodetectors deliver internal signal amplification suited to low-light or long-distance detection. APDs solve problems standard photodiodes cannot.

Our thermoelectric cooling options extend performance in demanding thermal environments. Our sealed metal packaging meets the ruggedness aerospace and industrial customers require. We work on custom configurations. We refuse to force every application into an off-the-shelf mold. This flexibility often makes the difference between a workable solution and a solution that meets specifications.

We have driven photodetector technology innovation for years and will continue to do so. Learn more about our solutions, products, capabilities, and company.

Company

Decades of Optical Innovation

GPD Optoelectronics has been advancing photodetector technology since its founding in 1973 as Germanium Power Devices Corporation.

What began as a manufacturer of high-quality germanium transistors quickly evolved into a leader in optoelectronic solutions. Since the early 1980s, GPD has built a strong reputation for designing and producing germanium and indium gallium arsenide (InGaAs) photodiodes, as well as multi-element photodetectors for a wide range of demanding applications.



Our Core Values Are Found In A Commitment To Excellence

At the heart of GPD's success is a commitment to our core values: innovation, quality, integrity, and community. We believe that operating with transparency and trust fosters continuous improvement and strengthens long-term partnerships with our customers and employees. Our mission—"Sensing Further Together"—reflects our collaborative approach to solving complex challenges.

Product Reliability & Customization

Customer success is our top priority, and we deliver reliable, high-performance products on time, backed by responsive service and technical support.



GPD offers custom and commercial off-the-shelf (COTS) solutions, giving customers flexibility for varying timelines and technical requirements. While many customers rely on our standard product offerings to meet immediate needs, we specialize in developing tailored solutions that meet unique application requirements. This ability to rapidly design, iterate, and scale sets us apart in industries where precision and speed are critical.

Learn More
Company

Capabilities

Precision Manufacturing, Proven Quality, and Reliable Delivery

GPD Optoelectronics combines advanced manufacturing, rigorous quality assurance, and a resilient global supply chain to deliver high-performance photodetection solutions for mission-critical applications.

From vertically integrated production to strict compliance with industry standards, our capabilities ensure consistency, traceability, and reliability at every stage. Whether supporting aerospace, defense, or scientific innovation, GPD provides the operational excellence and technical expertise customers need to move from concept to deployment.

World Leader in Photodiode Manufacturing

GPD Optoelectronics' manufacturing operations deliver precision, reliability, and performance at every stage of production. As a vertically integrated manufacturer, GPD controls the entire process—from semiconductor fabrication through assembly, test, and final inspection—ensuring unmatched quality, traceability, and consistency.

Global & Local Supply Chain Network

GPD's global supply chain network is strategically designed to ensure continuity, flexibility, and resilience in even the most demanding market conditions.

Advanced Quality Assurance & Compliance

GPD's quality assurance framework meets the highest standards of precision, reliability, and compliance required by aerospace, defense, and advanced scientific markets. Anchored by industry-recognized certifications, including ISO 9001:2015 and ISO 14001:2015.

Learn More
Capabilities

Qualifications

- ISO 9001:2015 Registered
- First Article Inspection per AS9102
- Sampling Inspection per ANSI/ASQ Z1.4
- Testing per MIL-STD-883
- Testing per MIL-STD-750
- Optical Components per MIL-PRF-13830B
- ITAR Registered with DDTC
- CMMC Level 2
- NIST SP 800-171 Compliant
- REACH Compliant
- RoHS Compliant
- Conflict Minerals Compliant
- Space-qualified designs
- High-reliability assembly with environmental and radiation testing
- Custom packaging
- Photodetector design and wafer fabrication
- US manufacturer: Salem, NH

GPD OPTOELECTRONICS

SOLUTIONS

Defense



Mission-Ready Photodetectors for Defense Applications

GPD Optoelectronics builds rugged photodetectors designed for the demanding conditions of defense and aerospace environments.

Engineered to withstand wide temperature swings, vibration, shock, and harsh field use, our devices deliver reliable, consistent performance in mission-critical applications. Our technologies support defense and aerospace systems with highly sensitive detection, fast response times, and stable operation, even in the most demanding field conditions.

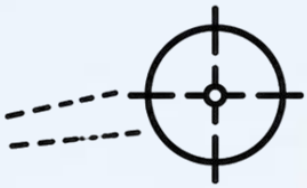
To ensure stable performance across harsh conditions, we offer several packaging options, including:

- Hermetic TO-can enclosures
- Ruggedized housings
- Integrated optics
- Thermoelectric cooling

GPD Optoelectronics photodetection technologies deliver the accuracy and durability today's next-generation defense systems require.

Learn More
Defense

Key Defense Applications



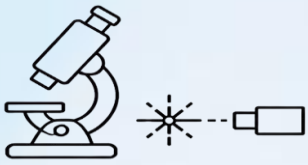
Laser Rangefinding and Targeting

Photodetectors enable precise detection of reflected laser signals for rangefinding, targeting, and guidance systems.



Optical Communication Systems

Enable secure, high-speed optical links for military communications and data transmission.



Research and Development

Support advanced defense research in photonics, sensing technologies, and next-generation optical systems

Contact our team to learn more about our products and available configurations.

GPD OPTOELECTRONICS

SOLUTIONS

Aerospace



Reliable Photodetectors for Aerospace Optical Systems

GPD photodetectors are engineered for stable, high-precision optical performance in demanding aerospace environments, including both airborne and spaceborne applications.

With low noise, high sensitivity, and fast response, our photodiodes and APDs support sensing, communications, and navigation systems where reliability is mission-critical.

With over 50,000 position sensing devices (PSDs) currently in orbit, GPD has a proven track record in space applications. Our rugged detectors withstand extreme temperatures, vibration, and radiation encountered in air and space systems, enabling precise measurement for space, LIDAR, and navigation. We offer hermetic TO-can packages, custom housings, integrated optics, and thermoelectric cooling for stable performance across wide temperature ranges.

Learn More
Aerospace

Key Aerospace Applications



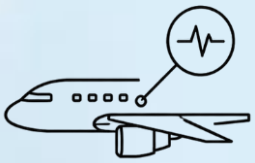
Remote Sensing and LIDAR Systems

Photodetectors play a critical role in aerospace sensing technologies, enabling high-sensitivity detection for long-range measurements, atmospheric analysis, and terrain mapping.



Avionics and Navigation Systems

Optical sensors support positioning, motion tracking, and guidance systems used in aircraft and spacecraft, improving operational accuracy and safety.



Structural Health Monitoring

Fiber-optic and photonic sensing technologies are used to monitor stress, strain, and structural integrity in aircraft components, helping detect issues before failure.



Laser Communications and Optical Systems

High-speed photodetectors support aerospace laser communication systems and optical links, enabling fast, reliable data transmission between platforms.

Contact our team to learn more about our products and available configurations.

GPD OPTOELECTRONICS

SOLUTIONS

Optical Communications

High-Performance Photodetectors for Optical Communications and Network Infrastructure

GPD Optoelectronics provides high-performance photodetectors designed to meet the demanding needs of modern telecommunications systems.

Engineered for stability, speed, and long-term reliability, our devices deliver consistent optical performance across high-bandwidth networks and critical communications infrastructure.

Learn More
Optical Communications

Our photodiodes and avalanche photodiodes (APDs) are optimized for high-speed optical signal detection, power monitoring, and network performance validation. With low noise, fast response, and stable operation, they maintain signal integrity across complex optical architectures.

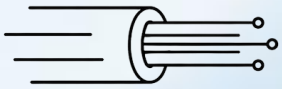
These detectors excel in fiber-optic communications, coherent detection systems, optical power monitoring, free-space optical links and high-speed data transmission, supporting applications such as data center optics, fiber testing and optical amplifiers.

Key Optical Communications Applications



Optical Power Monitoring

Enable accurate, real-time monitoring of signal strength to maintain network performance and stability.



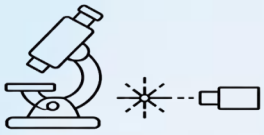
High-Speed Data Transmission

Support high-bandwidth optical links with fast response times and low-noise performance.



Network Testing & Measurement

Provide precise optical detection for system validation, calibration, and troubleshooting.



Research & Development

Support experimental work in advanced optical communications, including next-generation fiber systems and photonic devices

Contact our team to learn more about our products and available configurations.

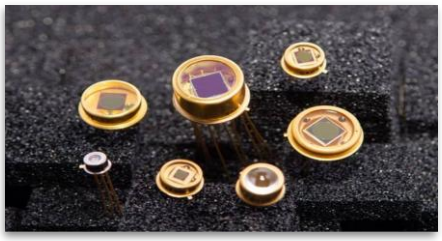
GPD OPTOELECTRONICS

PRODUCTS

Photodiodes

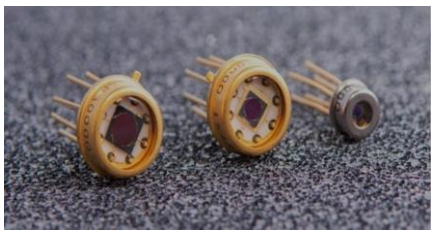
High-Performance Photodiodes for NIR & SWIR Detection

GPD Optoelectronics offers a broad lineup of photodiodes designed for precision detection from NIR to SWIR wavelengths.



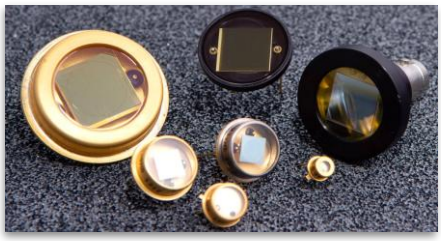
InGaAs Photodiodes

InGaAs Photodiodes cover a range of performance needs: standard small-area devices provide fast response and low capacitance for high-speed detection, and standard large-area devices improve sensitivity for larger beams. Extended InGaAs expands wavelength coverage, and high-speed InGaAs supports demanding applications.



Position-Sensing Photodiodes

Position-Sensing Photodiodes detect both light intensity and position by comparing signals across segmented or continuous active areas. They enable precise beam alignment, tracking, and displacement measurement for optical positioning, stabilization, and alignment systems.



Germanium Photodiodes

Germanium Photodiodes are used for NIR power measurement in cost-sensitive or large-area applications. While they have higher dark current and noise than InGaAs, they perform well when signals are strong. GPD's HS series offers higher shunt resistance for improved performance.



Avalanche Photodiodes (APDs)

APDs provide higher sensitivity than standard photodiodes by using internal gain through impact ionization. This avalanche effect amplifies weak signals, making APDs ideal for very low-light applications such as LiDAR and optical comms.

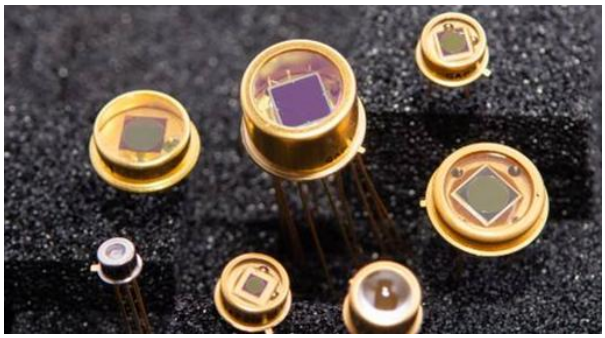
Learn More
Photodiodes

GPD OPTOELECTRONICS

InGaAs Photodiodes

High-Performance InGaAs Photodiodes for Near-Infrared Detection

Our InGaAs (indium gallium arsenide) photodiodes provide highly sensitive, low-noise detection throughout the near-infrared spectrum. Available in standard, extended-wavelength, and high-speed configurations.

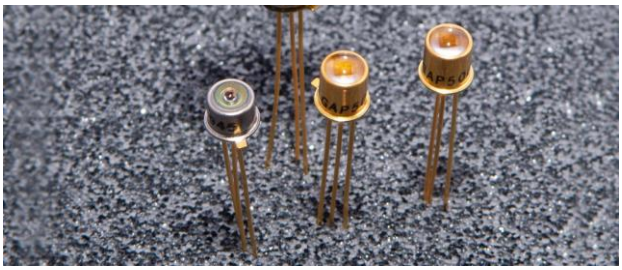


Standard InGaAs Photodiodes

GPD's Standard InGaAs Photodiodes provide reliable, low-noise detection across the near-infrared spectrum. Designed for precision measurement, they convert NIR light into stable electrical signals with high sensitivity, supporting wavelengths from approximately 850 nm to 1700 nm, with extended options available for longer ranges.

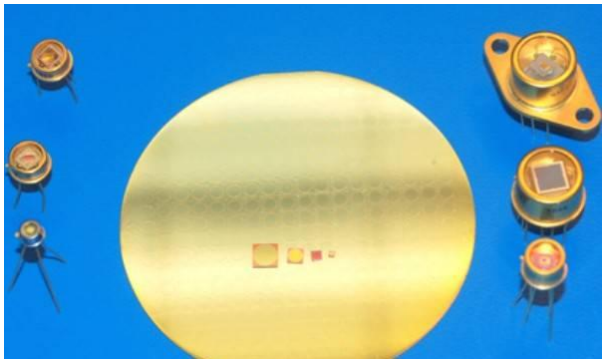
Learn More

InGaAs Photodiodes
Standard InGaAs Photodiodes
Extended InGaAs Photodiodes
High-Speed InGaAs Photodiodes



High-Speed InGaAs Photodiodes

High-speed InGaAs photodiodes provide fast response times, high quantum efficiency, and excellent linearity across the near-infrared spectrum for demanding fiber-optic communications, spectroscopy, optical sensing, and laser power monitoring.



Extended InGaAs Photodiodes

Extended InGaAs photodiodes are designed to detect longer near-infrared wavelengths beyond the cutoff of standard InGaAs devices. This broader response allows detection in spectral regions that conventional InGaAs cannot reach.

GPD OPTOELECTRONICS

Germanium Photodiodes

Infrared Detection and Telecom Applications

Germanium photodiodes are widely used for measuring optical power in the near-infrared (NIR) range, particularly in cost-sensitive systems or applications requiring large-area detectors.

Compared with similarly sized InGaAs detectors, however, germanium devices typically exhibit lower shunt resistance and higher dark current, which leads to increased noise.

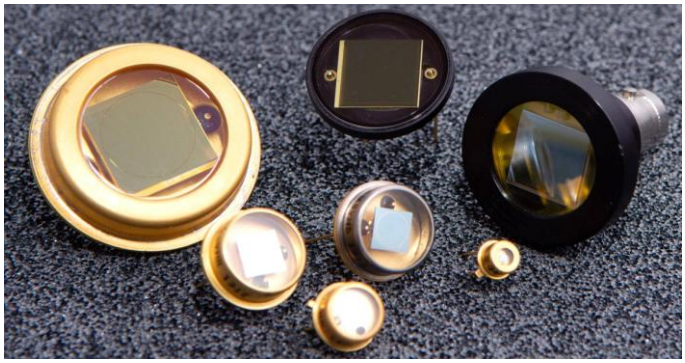
As a result, germanium photodiodes are best suited for applications in which the detected signal is significantly higher than the noise floor. To improve performance, GPD Optoelectronics offers its “HS” series of germanium photodiodes, designed with higher-than-typical shunt resistance.

Key Applications

Germanium photodiodes are well suited to environments where precise power measurement matters, from calibrating laser sources on a production line to verifying output in fiber optic test equipment. Their sensitivity makes them a practical fit for near-infrared sensing tasks, including moisture analysis and gas detection systems that rely on absorption in that band. In eye-safe laser systems, the combination of available bias configurations and packaging options allows engineers to build compact, reliable detection sensors.

Learn More

Germanium Photodiodes



Technical Specifications

Germanium photodiodes span chip sizes from 1 mm to 10 mm and cover a spectral range of 800 nm to 1700 nm, with high linearity above 10 dBm, making them well-suited to optical power meters and spectroscopy. Packaging options include TO packages, BNC configurations, and chip-on-ceramic submounts, plus optional windows, lenses, optical filters, and thermoelectric cooling. This combination of chip variety and packaging flexibility makes it straightforward to match a detector to the specific mechanical and optical demands of an application.

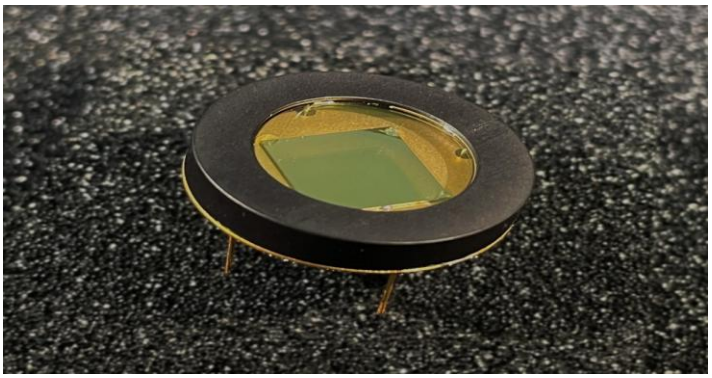
Chip selection also depends on preferred operating voltage: the GM series suits high-speed applications with reverse bias above 10 V, while the HS series is designed for reverse bias under 5 V. The VHS and VHR series both support zero-bias operation, with VHR built for applications that need high shunt resistance. These distinctions matter across applications like LED/LD characterization, burn-in diagnostics, and eye-safe laser detection, where bias requirements can vary significantly.

Position-Sensing Photodiodes

Position Sensing Photodiodes for Accurate Beam Alignment

Position-sensing photodiodes accurately measure the location and movement of light spots by converting spatial variations in photocurrent into precise positional data. These detectors are ideal for alignment, tracking, and feedback control in optical systems where spatial accuracy is critical.





Multi-Cell Photodiodes

Multi-cell photodiodes contain multiple segmented light-sensitive regions within a single sensor, enabling precise detection of optical position and movement along one or more axes. By comparing signals from each segment, they provide high-resolution beam alignment and tracking for demanding applications.

- Quadrant Photodiodes: Our standard InGaAs Quadrant Photodiode consists of four separate active regions within a single detector.
- Octo™ Photodiodes: A monolithic optical sensor designed for dual-scale beam position detection using a concentric, segmented architecture.

Tetralateral Photodiodes

Tetralateral Photodiodes from GPD are optical detectors designed for continuous, gap-free position sensing across a large active area. Using a tetralateral photodiode architecture, they convert incident light into precise X- and Y-position signals, making them well-suited for accurate beam tracking, alignment, and motion monitoring.

Learn More

Position-Sensing Photodiodes
Multi-Cell Photodiodes
Quadrant Photodiodes
Octo™ Photodiodes
Tetralateral Photodiodes

Avalanche Photodiodes

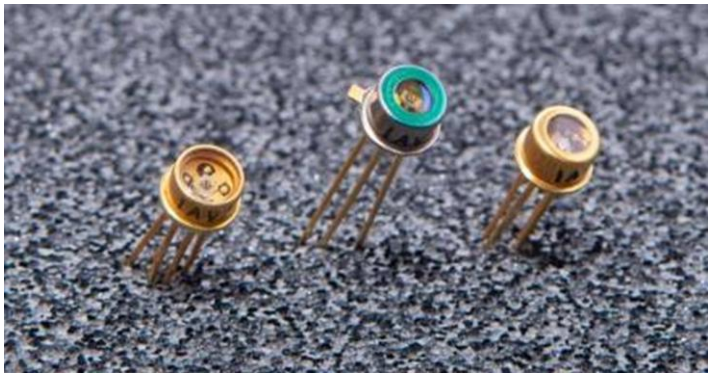
Low-Light and High-Gain Applications

We offer two avalanche photodiode (APD) options designed for high-sensitivity detection in low-light environments: InGaAs Avalanche & Germanium Avalanche photodiodes.

Both types use internal gain to amplify weak optical signals. InGaAs APDs are optimized for high-performance detection in the near-infrared, while germanium avalanche devices provide a cost-effective solution for longer-wavelength detection that requires high gain.

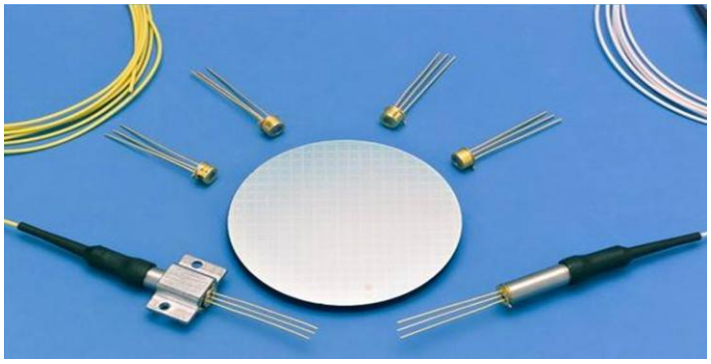
InGaAs Avalanche Photodiodes (APDs)

InGaAs avalanche photodiodes are used when greater sensitivity is needed than standard photodiodes can provide. These devices employ an internal gain mechanism in which impact ionization generates secondary electrons, triggering an electron avalanche that amplifies the original optical signal. This internal amplification enables reliable measurement of very weak signals. InGaAs APDs are commonly used in applications such as LiDAR, optical communications, and systems where signal levels are extremely low.



Germanium Avalanche Photodiodes

Germanium Avalanche Photodiodes are often used to measure optical power in the near-infrared range, particularly in cost-sensitive applications or where a large-area detector is required. Compared with similarly sized InGaAs detectors, germanium devices generally have lower shunt resistance and higher dark current, resulting in higher overall noise. As a result, they are best suited for applications where the detected signal is well above the noise floor.



Learn More
Avalanche Photodiodes

Packaging Options

Engineered Packaging Options for Demanding Applications

Discover the range of packaging solutions GPD Optoelectronics offers to ensure reliable performance, protection, and integration for photodiodes and sensors across applications.

From precision fiber coupling to advanced thermal and optical configurations, our options are engineered to meet demanding technical requirements and enhance system compatibility.



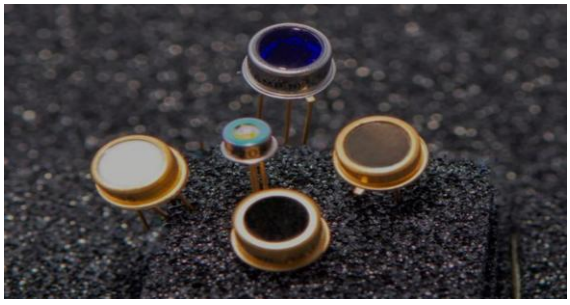
Fiber Coupling

Precision fiber coupling solutions designed for reliable optical interconnections and engineered for low insertion loss, stable alignment, and seamless integration across photonics, sensing, and optical systems.



Mounting Configurations

Explore our mounting configurations, including standard TO packages and ceramic submount options. Custom packaging is also available to meet size or pinout requirements.



Optical Filters and Coatings

When you need to manipulate the light incident on your detector, the best course of action may be to apply a coating or filter specific to your application. For maximum signal, AR coatings can be applied to one or both sides of windows, and also to the photodiode chip itself..

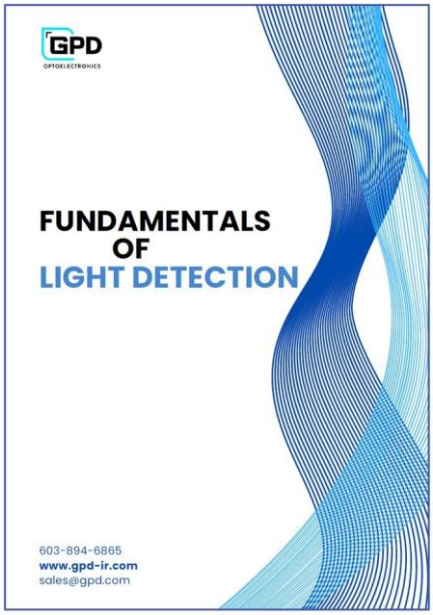


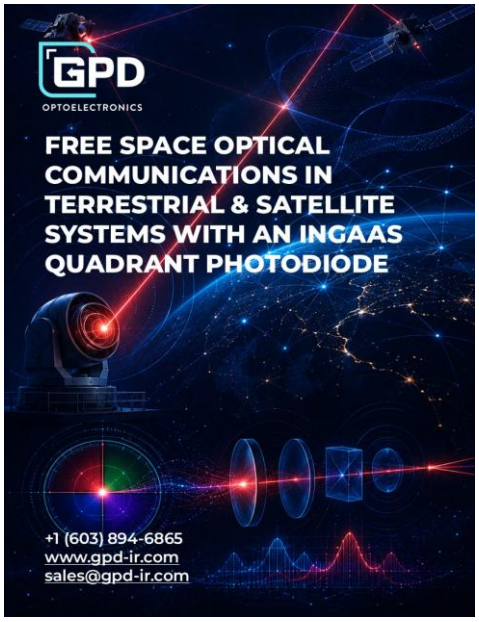
Optical Windows and Lenses

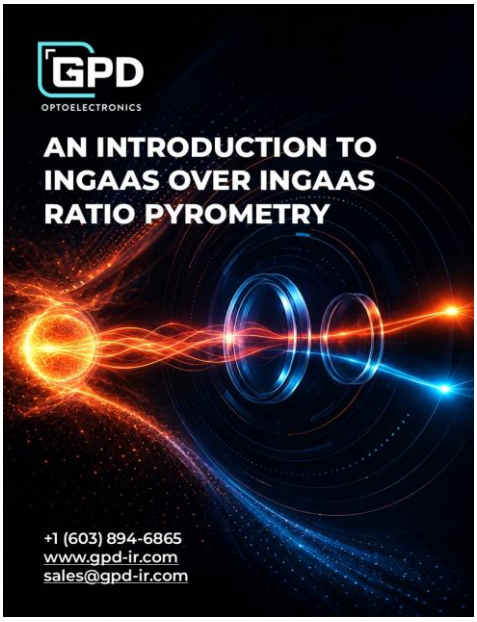
Many of our photodiode packages include standard optical windows made from glass or sapphire to protect the device while maintaining high optical transmission. We also offer custom optical windows to meet specific wavelength, environmental, or application requirements.

GPD OPTOELECTRONICS

White Papers & Datasheets









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Quadrant Photodiodes

Specialty Photodiodes

Standard InGaAs Photodiodes

Tetralateral Photodiodes

Thermoelectric Cooling

Two-Color Detectors

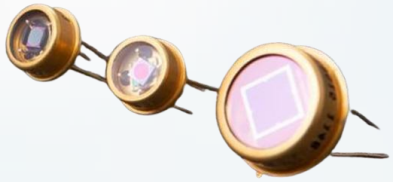
Precision Photodiode Solutions for Demanding Optical Applications

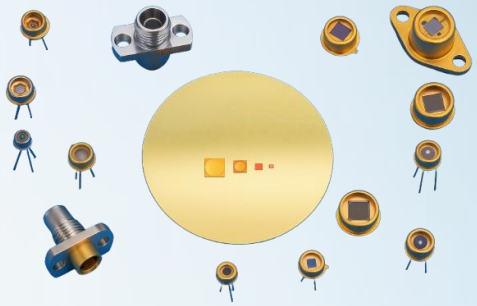
Our photodetectors and sensing solutions deliver high performance trusted across aerospace, defense, telecom, and advanced scientific industries.

With full in-house fabrication and engineering, we offer unmatched precision, reliability, and the ability to customize products to exact specifications.

Since 1973, our expertise has ensured consistent performance even in the most demanding environments.







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GPD OPTOELECTRONICS