Tuesday, May 9, 2023

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InGaAs Photodiode Detectors: Packaging, Performance, and SWIR Applications

Wednesday, May 10, 2023 1:00 PM - 2:00 PM EDT

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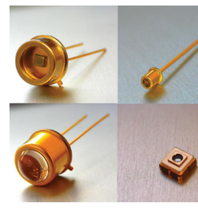
Presented by

Marktech Optoelectronics

.: About This Webinar



Vince Forte of Marktech Optoelectronics reviews InGaAs detector types, packaging, performance characteristics, and applications in the NIR and SWIR wavelength bands. He focuses particularly on photo detector types, key parameters of photo detectors, and their advantages within InGaAs SWIR detector applications. First, he provides an overview of the InGaAs photodiode manufacturing steps including the metal organic chemical vapor deposition (MOCVD) growth of InGaAs/InP epiwafers, device fabrication, wafer probing, die and wire bonding, packaging, and finished component testing. Optoelectronic performance specifications of InGaAs photodiodes are critical for selecting the right photodiode for a specific application.

Next Forte reviews how these optical and electrical specifications are measured along with the laboratory equipment used to perform these tests. He also discusses the breadth of InGaAs photodiode types available including single element photodiodes with a range of active areas, multi-segment linear arrays, quadrant photodiodes, and InGaAs detectors co-packaging with silicon photodiodes, SWIR LEDs, TIAs, and TECs. He shares insights into how InGaAs photodiode active area size and cutoff wavelength impacts response speed, gain or sensitivity, and dark current. Next, Forte compares InGaAs photodiode performance specifications to the silicon and germanium photodiodes and addresses variations in InGaAs performance with speed, gain, and dark current with cutoff type, active area size, and packaging form factor. Packaging significantly impacts photodiode long-term reliability, performance, and a detector's suitability for specific applications. Forte covers the different packaging forms available, including TO can, plastic molded, pigtail, chip-on-board (COB), and the hermetic ATLAS2.0 SMD package.

Finally Forte discusses the applications of 1.7 micron and extended 2.6 micron cutoff InGaAs photodiode detectors in the NIR and SWIR wavelength band applications including:

- Medical diagnostics.
- Sensing through obscured environments such as smoke, fog, and rain.
- Optical pyrometry.
- Gas, moisture, and chemical analysis.
- 1550nm and 2050nm eye-safe LiDAR.
- Optical communications.
- Plastic and food sorting.

In summary, this presentation provides a comprehensive overview of InGaAs photodiodes and their applications.

Who should attend:
Engineers, researchers, and scientists who are interested in the use of InGaAs photodiodes in their development projects. Those who utilize detectors and sensors, electronics, fiber optics, laser accessories, LEDs, optical components, and spectroscopy in industries such as aerospace, agriculture, biophotonics, consumer, defense, and medicine.

About the presenter:
Vince Forte has served as the CTO of Marktech Optoelectronics since the company's founding in 1985. As CTO, he leads all R&D, applications engineering, testing and evaluation, custom design development, failure analysis, and quality initiatives for Marktech's full portfolio of optoelectronics and LED technologies. With more than 35 years of experience in the optoelectronics space, he leads all development of new and enhanced LEDs, photodetectors, emitters, and related hybrid technologies. He is known for his applications engineering expertise in LiDAR, medical and consumer-grade wearables, industrial automation, defense, process control, safety and security, and medical equipment. Under Forte's leadership, Marktech has become globally renowned for its proven capabilities to produce custom LEDs, detector components, and assemblies in virtually any quantity.

About Marktech Optoelectronics:
Marktech Optoelectronics is a leading provider of high-quality InGaAs and silicon photodiode detectors, LEDs, emitters, assemblies, innovative packaging, and custom solutions for various industries. With a strong focus on innovation and customer satisfaction, Marktech delivers reliable, cutting-edge products designed to meet unique detection and emission needs from 250nm to 3100nm for UV, visible, NIR, and SWIR spectral bands. In addition, their testing laboratory can measure all optical and electrical parameters of detectors and emitters.

This webinar is pre-recorded.

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