

Kyosemi products.

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Abstract : Development of advanced industrial apparatus, such as High speed communication device, an encoder device, a bill identification device, ITS (intelligent transport system), image processing, a surveillance camera, a plant factory, sterilization, and gas analysis, is progressing.

The scope of optical sensing has also kyosemi is developing various products, such as LED, Photodiode, and Phototransistor, taking advantage of the technology corresponding to a broad domain from ultraviolet rays to infrared rays.

Keywords Photodiode, Avalanche Photodiode, LED, VCSEL

1. Optical communication devices

Amongst the various types of optical communication devices, Kyosemi Corporation is concentrating its efforts in the field of fiber-optic power monitors for Optical communication Networking Systems.

Kyosemi is proud to hold the dominant worldwide market share. Fiber-optic power monitors are primarily used in long-haul (backbone) systems and metropolitan networks. The market continues to grow and expand into Data communications and CATV markets. We are striving to capture market share in the field of Duplexer or Triplexer modules for FTTH and FTTP. We expect to see a rapid increase in demand for both domestic and overseas markets such as Korea, Taiwan, China and USA in the fields of not only the receiver but also the transceiver for FTTH and FTTP solutions in future.

1.1 Long-wavelength Photodiodes

The long-wavelength photodiodes and its related module products developed and manufactured by Kyosemi Corporation support long-haul and metropolitan networking systems based on DWDM (Dense Wavelength Division Multiplex) and FTTH (Fiber to the Home/ Fiber to the Building/ Fiber to the Premises /etc.). Our optoelectronic components are incorporated into DWDM systems, Optical Amplifiers, ONUs (Optical Networking Unit), ONTs (Optical Network Terminal), Routers, Receivers and Transmitters, etc. And, these are photo-conversion devices used in Internet and LAN (Local Area Network) that are electronic components essential to build an optical

network infrastructure to support the worldwide community.

- InGaAs Photodiodes
- InGaAs PD-TIA Receivers
- InGaAs Avalanche Photodiodes
- InGaAs APD-TIA Receivers
- GaAs Photodiodes GaAs
- PD-TIA Receivers
- Si PIN Photodiodes



Fig. 1 Photodiode



Fig. 2 Pigtail type Photodiode

1.2 Semiconductor Lasers

Kyosemi VCSEL (Vertical Cavity Surface Emitting Laser diode, VCSEL) with the peak wavelength of 850nm is designed for application of short range and high-data-rate transmission systems. Our VCSEL product lineup comprises 3 types in 3 kinds of packages, respectively.

Two kinds of VCSEL devices are hermetically sealed ; one is packaged in metal can with a lens, and another is packaged in isolated mini can.

Last is LC-receptacle type of TOSA (Transmitter Optical Sub-Assembly).

Each signal modulation is available up to 4GHz.

2. Photodevices for sensors

Kyosemi Corporation is one of the leading optoelectronic component suppliers to manufacturers of Bank note readers and Rotary encoding devices.

We are expanding our market reach into Intelligent Transport System (ITS) applications and making efforts in developing new applications for Image processing, Surveillance camera, Light source for plant growth, Sterilization/Disinfection equipment and Gas analyzer and so on.

At the present, Ultraviolet (UV) photodiodes and LEDs based on GaN, are being developed in UV-A (315-400nm) for the shorter wavelength region less than visible light, Moreover, GaN based UV sensors in UV-B (280-315nm) are still going under development. On the other hand, the photodiodes and LEDs based on InGaAs are developed in Near Infra Red region (NIR) (0.780-3.0 μ m) as well as in Mid-Infrared (3.0-50 μ m) for the longer wavelength more than infrared light, too. We have actively enhanced our product lineup thus far.

In the market of short wavelength light, photo-detecting devices are going to be used for flame-detector, LED and Mercury lamp monitors and UV radiometer. On the other hand, light emitting devices are to be used for curing epoxy resin, bill validation and light source for analyzer, etc.

In the market of long wavelength light, Applications for Moisture detection assay by NIR photodiode that combines a NIR LED (Near-Infrared Spectroscopy: NIRS) as well as an illuminating LED for NIR camera are very anticipated in future.

For your information, Si-based UV sensors are available in the market well before above GaN based ones.

2.1 LEDs

Emission wavelengths range from 365nm that is the shortest among UV-A to the longest of 1650nm in NIR.

Our featured LED lineup from these all includes point source LEDs, Parallel beam LEDs, multi-wavelength LEDs, GaN · InGaN UV LEDs (367 and 373 nm), InGaAsP NIR LEDs (1300,1450,1550 and 1650 nm), etc.

Plastic molding, hermetically sealing, epoxy potting, SMD ceramic package sealing, and SMD packaging by a transfer mold process are available on customers' requests, and furthermore, plastic molds with special emission patterns such as cylindrical Top Flat and square shaped Side-Looking, etc.



Fig. 3 LED

Fig. 4 LED

Fig. 5 LED

2.2 Photodiodes

PIN photodiode(850nm), silicon based UV sensors (254 and 365nm), GaN/InGaN/AlGaIn based UV sensors (260, 315, 340, 355 and 365 nm), InGaAs based long wavelength photodiodes (1550, 1950, 2200 and 2400nm), InGaAs and InAs based long wavelength photodiodes with thermoelectric cooler (1550 and 3000nm), high speed photodiodes (fc=1 or 2 GHz), 1 silicon based 16 channel photodiode array. Above-mentioned is all for our featured photodiode lineup.

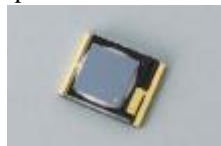


Fig. 6 Photodiode chip



Fig. 7 Photodiode chip

2.1 Avalanche Photodiodes and Phototransistors

Silicon based APD photodiodes with cut-off frequencies of 1.5, 0.6 and 0.25 GHz, respectively. Silicon based phototransistors with hermetically sealing, visible cut filtering, 3mm ϕ ceramic packaging or plastic molding.



Fig. 8 Avalanche Photodiode



Fig. 9 Phototransistor

3. Photovoltaic power converter KPC8-T

High efficient power converter from 1300-1600nm laser light into electrical power.

Features

- Conversion of 1300-1600nm laser light into electric power
- Up to 3V-20mA output
- Single mode fiber pigtailed
- Complete electrical isolation

Applications

- Remote powered equipments
- Electro-magnetic sensitive antenna

