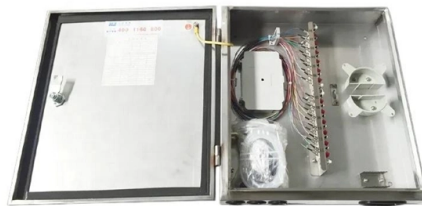


What is an optical-to-electrical converter module



Overview

These O/E converters are ideal solutions for characterizing or troubleshooting high-speed optical signals in the system level testing.

Key Takeaways

Optical-to-electrical (O/E) converter modules—such as the Keysight N7004A (DC–33 GHz), N7005A (DC–60 GHz), and Teledyne LeCroy OE6250G-M (up to 36 GHz)—convert optical communication signals into calibrated electrical outputs for real-time oscilloscopes. These modules support telecom wavelengths (typically 750–1650 nm) and are used for NRZ, PAM4, and high-speed optical transmitter testing.

Optical-to-electrical converter modules are precision photodetector systems that translate modulated optical signals into electrical waveforms for analysis on high-bandwidth oscilloscopes. They are essential for characterizing high-speed optical communication systems, including NRZ and PAM4 formats.

Key Commercial Modules

1. Keysight N7004A (33 GHz)

- Bandwidth: DC to 33 GHz.
- Wavelengths: 750–1650 nm (supports 850, 1310, 1550 nm).
- Inputs: Single-mode & multimode.

- Applications: 28 Gbps optical testing, reference receiver testing, transmitter characterization.

- Compatible with: Infiniium UXR, V-Series, Z-Series, 90000X/Q oscilloscopes.

2. Keysight N7005A (60 GHz)

- Bandwidth: DC to 60 GHz (brickwall).

- Wavelengths: 1310 nm & 1550 nm.

- Input: Single-mode (9 μ m).

- Ideal for: 56 Gbaud PAM4, high-speed coherent and intensity-modulated systems.

- Compatible with: Infiniium UXR (≥ 40 GHz).

3. Teledyne LeCroy OE6250G-M (up to 36 GHz)

- Bandwidth:

- 36 GHz (flat response)

- 25 GHz (4th-order Bessel-Thomson)

- Wavelengths: 830–1600 nm.

- Features: Real-time acquisition, calibrated performance, PAM4 & NRZ analysis tools.

- Compatible with: WaveMaster 8 Zi, LabMaster 9 Zi-A, LabMaster 10 Zi.

4. Additional Options (Industry Highlights)

- Highland Technology J736: DC–12 GHz, InGaAs photodiode, telecom wavelengths.

- Anritsu MN4765B-0140: Up to 40 GHz, 1250–1650 nm, ideal for coherent/PAM4 testing.

Typical Applications

- High-speed optical transmitter characterization

- Eye diagram, jitter, and TDECQ measurements

- PAM4 and NRZ signal analysis

- Reference receiver emulation

- System-level optical interconnect testing

Summary

O/E converter modules provide the calibrated, high-bandwidth optical detection required for modern photonics and high-speed communication testing, with leading solutions from Keysight, Teledyne LeCroy, Highland Technology, and Anritsu.

Article Content

What is an Optical to Electrical Converter?

An optical-to-electrical converter is the main component for designing optical instruments. As the name suggests it is a

Optical to Electrical Converter

These O/E converters are ideal solutions for characterizing or troubleshooting high-speed optical signals in the system level testing.

Optical module

OverviewElectrical Interface TypesOptical modulation and multiplexing typesIn-module componentsElectrical cable equivalentFront panel optical module MSAsOn-Board Optical module MSAsUsers of Optical Modules

An optical module is a typically hot-pluggable optical transceiver used in high-bandwidth data communications applications. Optical modules typically have an electrical interface on the side that connects to the inside of the system and an optical interface on the side that connects to the outside world through a fiber optic cable. The form factor and electrical interface are often specified by an interested group using a multi-source agreement (MSA). Optical modules can either plug into a front pa

OPTICAL TO ELECTRICAL CONVERTER

The O2E is a high bandwidth, broadband optical to electrical converter available in a range of configurations. The O2E can be

N7005A 60 GHz Optical-to-Electrical Converter

The N7005A Optical-to-Electrical Converter is a high-sensitivity photodetector module for optical-to-electrical conversion of optical

Electrical-to-Optical and Optical-to-Electrical (E/O ad O/E)

Conceptually, the job of the optical modulator is to place a microwave signal as modulation onto an optical carrier. Similarly, the job

6-channel VME optical-to-electrical converter | Highland Technology

The V730 is a six-channel logic-level optical-to-electrical converter, packaged as a single-width, 6U VME module. When used with

What is Optical Link Module?

What is Optical Link Module? An optical link module is a compact device that converts electrical signals into light signals and

N7004A Optical-to-Electrical Converter, 33 GHz

The N7004A is the first fully-integrated optical-to-electrical converter solution for Infiniium real-time oscilloscopes. A full suite of

Electrical-to-Optical and Optical-to-Electrical (E/O and O/E)

The frequency response characterization of these electrical-to-optical (E/O, modulators sometimes integrated with lasers) and optical

N7004A Optical-to-Electrical Converter, 33 GHz

The adapter provides from DC to 33 GHz of electrical bandwidth. When used with an Infiniium V-Series or Z-Series 33 GHz

Opto-isolator

An opto-isolator (also called an optocoupler, photocoupler, or optical isolator) is an electronic component that transfers electrical

What is an Electrical to Optical Converter?

This converter acts as an interface between electronic systems that generate electrical signals and optical systems

Optical module

An optical module is a typically hot-pluggable optical transceiver used in high-bandwidth data communications applications. Optical

O/E Optical to electrical

O/E (Optical to Electrical) conversion is a fundamental process in various fields, including fiber-optic communication,

OP710-ANX Multichannel Optical to Electrical Converter

The OP710-ANX incorporates individual channels of optical to electrical (O/E) converters and is an easy-to-implement multichannel

OE6250G-M Optical-to-Electrical Converter Datasheet

Teledyne LeCroy's OE6250G-M optical-to-electrical converter enables measurement of intensity-modulated optical signals up to 28

Circuits for Optical-to-Electrical Conversion | part of Network ...

This chapter contains sections titled: Introduction Optical to Electrical-to-Optical Conversion Signal Amplification Phase-Locked

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