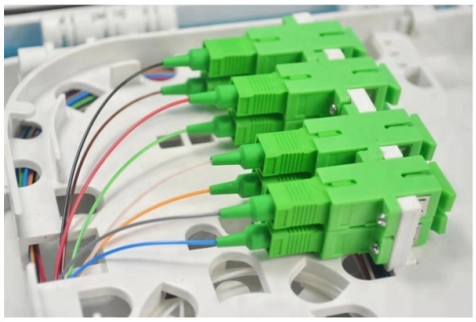
The extinction ratio of the IQ modulator is very small



Article Overview

A very small extinction ratio in an IQ modulator reduces signal contrast, increases distortion, and degrades sideband suppression, but can be mitigated through careful design and digital pre-distortion techniques.

Understanding Extinction Ratio

The extinction ratio (ER) of an IQ modulator is the ratio of the optical power in the “on” state to the “off” state of the modulated signal. A high ER ensures clear distinction between logical levels, while a small ER indicates poor modulation depth, leading to residual carrier leakage and reduced sideband suppression in optical systems . In Mach-Zehnder-based IQ modulators, ER is influenced by the balance of the interferometer arms, phase shifter lengths, and fabrication imperfections .

Implications of Low ER
• Signal Distortion: Low ER introduces nonlinearities in the modulated signal, which can degrade the error vector magnitude (EVM) and increase bit error rate (BER) in digital communication systems .
• Sideband Suppression: In optical IQ modulators, insufficient ER reduces the suppression of unwanted sidebands, affecting spectral efficiency and signal quality .
• Sensitivity to High-Order Modulation: Advanced modulation formats (e.g., 16-QAM, 64-QAM) are particularly sensitive to low ER, as small amplitude errors translate into significant constellation distortion ....

Article Content

Apr 07, 2026

MXIQER-LN-30

The MXIQER-LN-30 optical IQ modulator is a wide bandwidth, low insertion loss and high extinction ratio Dual Parallel Mach

Jul 19, 2026

New method of measurement on the extinction ratio of silicon

Traditional method is useful in the measurement of single MZ modulators, but not accurate in that of IQ modulators. In this paper, a

May 19, 2026

4. Mach-Zehnder modulator (MZM) — Luceda Academy 2026.06

As explained in the introduction, a Mach-Zehnder modulator is based on a Mach-Zehnder interferometer (MZI), which splits the light

Apr 28, 2026

Unlocking quantum communication potential

The MXIQER-LN-30 optical IQ modulator is a wide bandwidth, low insertion loss and high extinction ratio Dual

Sep 26, 2025

New method of measurement on the extinction ratio of silicon

Extinction ratio (ER) is one of the important characteristics of a SiPh Mach-Zehnder (MZ) in-phase and quadrature (IQ) modulator.

Jan 30, 2026

Digital Pre-Distortion Techniques for Finite Extinction Ratio IQ-Mach ...

innler Abstract—We present a digital pre-distortion (DPD) technique to compensate for IQ-Mach-Zehnder modulators with finite ex-tincti.

Aug 11, 2025

High-Performance IQ Modulator MXIQER-LN-30

The MXIQER-LN-30 is an optical IQ modulator operating in the 1550 nm band. It has very high extinction ratio, wide bandwidth up to

Mar 09, 2026

Design and Characterization of a 50-GHz-Bandwidth IQ Modulator for

This paper presents the design and experimental characterization of a silicon-on-insulator-based in-phase and quadrature electro

Aug 22, 2025

Mitigation and Monitoring of the Impact of Extinction Ratio of IQ ...

We present the analysis of the distortion of optical constellations, induced by IQ-modulator with finite extinction ratio,

Nov 16, 2025

Optimization of coherent optical OFDM transmitter using DP-IQ

In this paper, we analyze the operation of DP-IQ modulator that has nonlinear response and limited extinction ratio.

Dec 23, 2025

High extinction ratio of silicon photonics Mach–Zehnder IQ-modulators ...

Compared to the convention method, our algorithm is still robust in a large range of extinction ratio from 10 dB to 45

Nov 20, 2025

MXIQER-LN-30 Performance Highlights

ModBox-QAM, ModBox-CS-SSB The MXIQER-LN-30 optical IQ modulator is a high bandwidth, low insertion loss, high extinction

Jan 13, 2026

Digital Predistortion Techniques for Finite Extinction Ratio IQ Mach ...

We present a digital predistortion (DPD) technique to compensate for in-phase and quadrature (IQ) Mach-Zehnder

Dec 11, 2025

Generation of High-Extinction-Ratio PPM Signals Using a Single IQ Modulator

We propose a novel method to generate a pulse-position modulation (PPM) signal having a high extinction ratio (ER)

May 26, 2026

Inherent Residual Optical Carrier Assisted Phase Retrieval Receiver ...

An inherent residual optical carrier-based phase retrieval receiver using finite extinction ratio (ER) IQ modulator is proposed,

Dec 26, 2025

New method of measurement on the extinction ratio of silicon

Our method enables an extinction-ratio-independent and calibration-free electrical measurement of Mach-Zehnder

Jun 17, 2026

Extremely high extinction ratio electro-optic modulator via frequency ...

In particular, they are required for the control and manipulation of atomic systems such as atomic clocks and quantum

Apr 18, 2026

AN-1039: Correcting Imperfections in IQ Modulators to Improve

The imperfections of the IQ modulator now manifest themselves as out-of-band effects, which can be filtered away, resulting in in

Sep 22, 2025

Optical IQ modulators for coherent 100G and beyond

Although LiNbO 3 modulators offer excellent performance for today''s 100G networks, next gen large capacity

May 14, 2026

1550 nm band Very High Extinction Ratio IQ Modulator MXIQER-LN-30

Our proprietary Magic Junction confers it an unmatched low insertion loss with high optical extinction ratio, and its X-cut design

May 17, 2026

AN-1100: Wireless Transmitter IQ Balance and Sideband Suppression

A good IQ modulator comes with minimal LO gain and phase errors, so that they do not limit the system sideband suppression

Jul 08, 2026

Typical extinction ratio characteristics for used child and parent ...

Download scientific diagram | Typical extinction ratio characteristics for used child and parent modulator. from publication:

Sep 05, 2025

Requirements for Good Communications Link Performance: IQ Modulation ...

Requirements for Analog IQ Modulator and Demodulator Table 1 shows the results of a literature survey of articles

Mar 26, 2026

Generation of pulse-position modulated signals having high extinction ...

Abstract and Figures We propose and experimentally demonstrate a method for generating M-ary pulse-position

Jul 18, 2026

MXIQER-LN-30

MXIQER-LN-30 1550 nm band Very High Extinction Ratio IQ Modulator The MXIQER-LN-30 optical IQ modulator is a wide

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: https://www.chromadecksigns-eastrand.co.za
Email: sales@chromadecksigns-eastrand.co.za
Phone: +32 2 318 5792
Address: Avenue Louise 500, 1050 Brussels, Belgium

This document is for informational purposes only. Specifications subject to change without notice.