



10 GHz 1550 Low-Drive Electro-Optic Intensity Modulator IM-1550-10G-LTZ

Overview

IM-1550-10G is used for optical signal intensity modulation and laser pulse shaping. The 45mm long device is composed of a high polarization extinction ratio polarizer, an integrated push-pull electro-optic Mach-Zander interferometer and an integrated electro-optical DC bias controller. Based on Lithium Niobate (LiNbO₃) material, IM-1550-10G-LTZ is fabricated with optical waveguides using High Temperature Proton Exchange (HTPE) process. The IM-1550-10G-LTZ features on-off extinction ratio (ER) exceeding 25 dB with low-drive voltage of 6 Volts at 10 GHz. The device is highly reliable in performance, operates over very wide temperature range and has extended life time in comparison with competing technologies such as InP and silicon photonics.

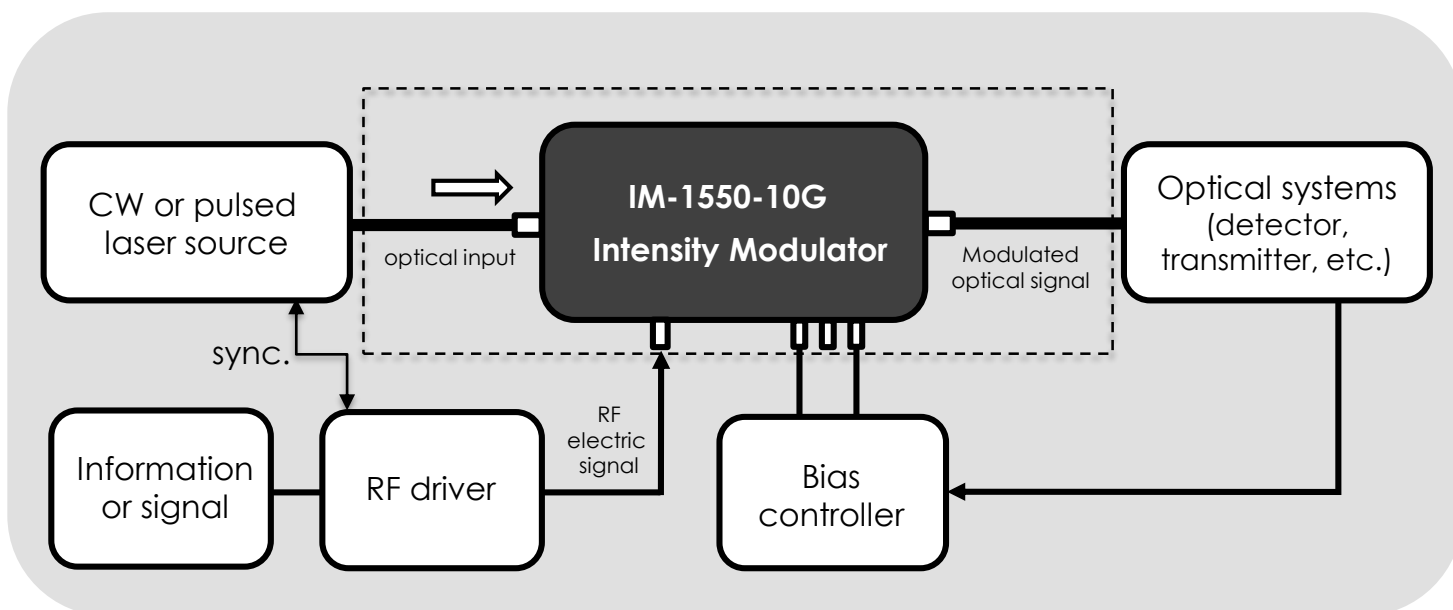
Features

- ▶ 1550 ± 30 nm operation
- ▶ EO bandwidth (-3dB) > 10 GHz
- ▶ Insertion loss : typ. 4.5 dB, max. 5dB
- ▶ V_{π} (RF port, at 1 GHz) < 4.5 V
- ▶ V_{π} (RF port, at 10 GHz) < 6.0 V
- ▶ Push-pull electrode design

Applications

- ▶ Telecommunication & Lidar
- ▶ NRZ,RZ,DPSK formats
- ▶ Pulsed shaping and laser modulation
- ▶ Quantum key distribution (QKD) system
- ▶ RF-over-fiber (RFoF) system
- ▶ Analog transmission link
- ▶ Delay lines telemetry systems
- ▶ Research and development

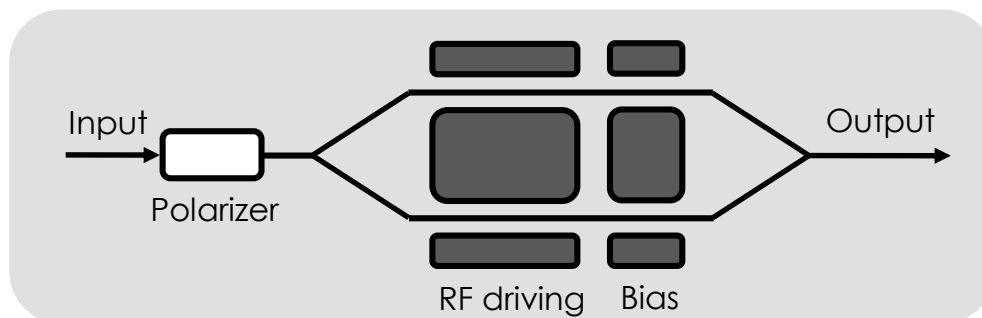
Application Diagram





Specifications	
Model	IM-1550-10G-LTZ
Substrate	X-cut, Y-propagation Lithium Niobate
Operation wavelength	1550 ± 30 nm
Input optical power	70 mW (typ.), 100 mW (max.)
Chirp value	≤ 0.2 (zero chirp design)
Insertion loss (bare chip)	typ. 4.0 dB, max. 4.5 dB
Insertion loss (pigtailed)	typ. 4.5 dB, max. 5.0 dB
$V_{\pi,RF}$ (RF port, 1 GHz)	≤ 4.5 V
$V_{\pi,Bias}$ (Bias port)	Typ. 5.5 V (at 1 GHz)
On-off extinction ratio (ER)	≥ 25 dB, up to 30 dB.
EO 3dB Bandwidth (RF Port)	≥ 10 GHz, Max. to 20 GHz available
Polarization extinction ratio	≥ 60 dB
Optical return loss	≤ -45 dB
Return Loss (RF Port)	≤ -10 dB (DC to 10 GHz)
RF Input Power	26 dBm max.
Impedance (RF Port)	50 ± 5 Ω
Chip polished angle	6 ± 0.5 degree
Chip dimension	45 mm (L) x 1.8 mm (W) x 1 mm (H), tolerance 10 %
Operating Temperature	- 30 °C ~ + 70 °C
Storage Temperature	- 50 °C ~ + 80 °C

Mechanical Drawing



Customization

- Special customization for on-off ER higher than 30dB
- ODM Customization for other EO modulator design, including polarizer, dual-phase modulators, Y splitter/combiner and anti-reflection