

O/C Band 145 GHz Mach-Zehnder Modulator

Key Features

- 3-dB electro-optical bandwidth >145 GHz
- Lumped, low-capacitance RF design
- Chip dimensions 1.5 mm x 2 mm
- O/C band operation
- Balanced (bMZM) or imbalanced (iMZM) geometry
- Available as single or 4-channel device



Performance Data

	O band bMZM	O band iMZM	C band bMZM	C band iMZM
Peak wavelength	1310 nm	~1310 nm	1550 nm	~1550 nm
Insertion loss (IL)	<17 dB	<17 dB	<16 dB	<16 dB
Static extinction ratio (ER)	>25 dB	>20 dB	>25 dB	>20 dB
DC bias on/off voltage	<1.5 V	<1.5 V	<1.5 V	<1.5 V
3-dB EO bandwidth	>145 GHz	>145 GHz	>145 GHz	>145 GHz
$V_{n,eq}$ @ 100 kHz @ 50 Ohm*	<4 V	<4 V	<5 V	<5 V

Maximum Ratings

	O band bMZM	O band iMZM	C band bMZM	C band iMZM
Optical input power**	tbd	tbd	3 dBm	3 dBm
RF input power @ 50 Ohm	18 dBm	18 dBm	18 dBm	18 dBm
DC voltage at RF input	0 V	0 V	0 V	0 V
DC bias voltage	2.5 V	2.5 V	2.5 V	2.5 V
DC bias current	15 mA	15 mA	15 mA	15 mA
Operating / storage temperature	~25 °C	~25 °C	~25 °C	~25 °C

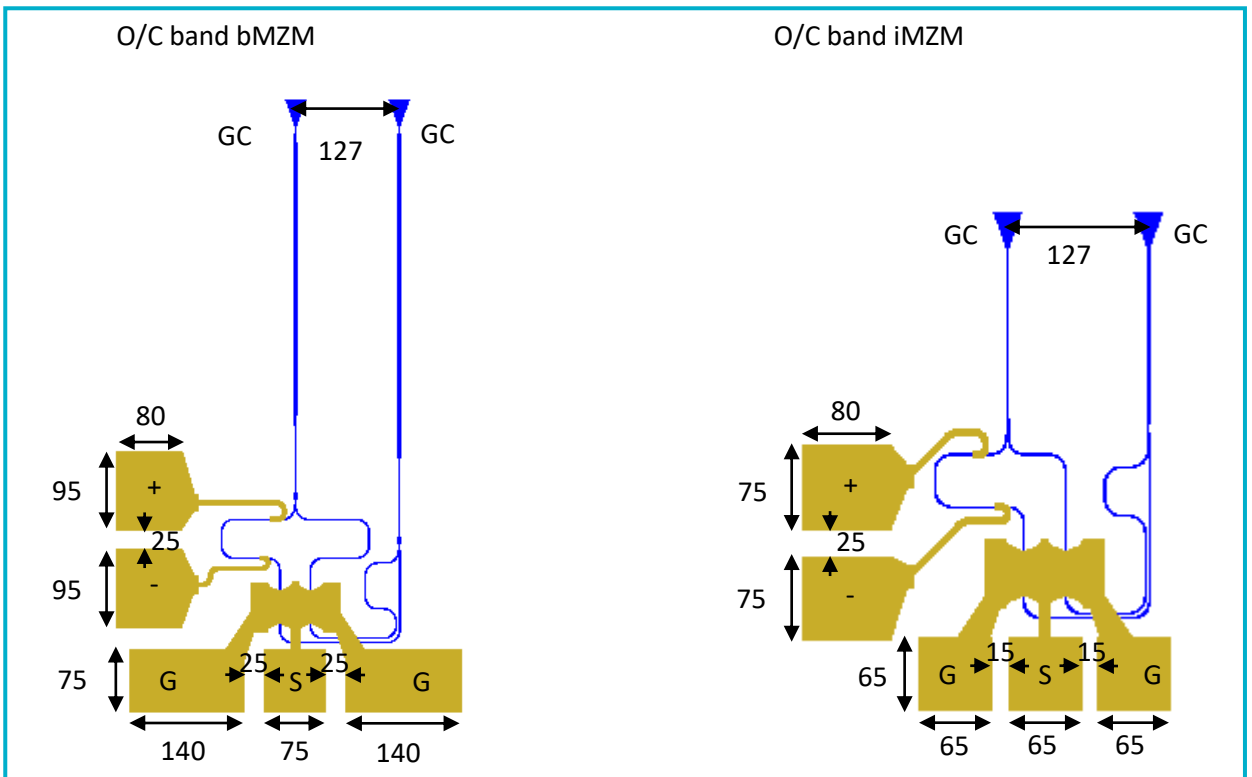
* Plasmonic modulators are high-impedance devices. Twice the voltage provided by a 50-Ohm signal source will drop across the plasmonic modulator. Using a DC source or a high-impedance-matched driver, double the voltage is required to switch the modulator from the on to the off state.

** Operation time of 8000 h at 20°C with a V_{π} degradation < 10%.

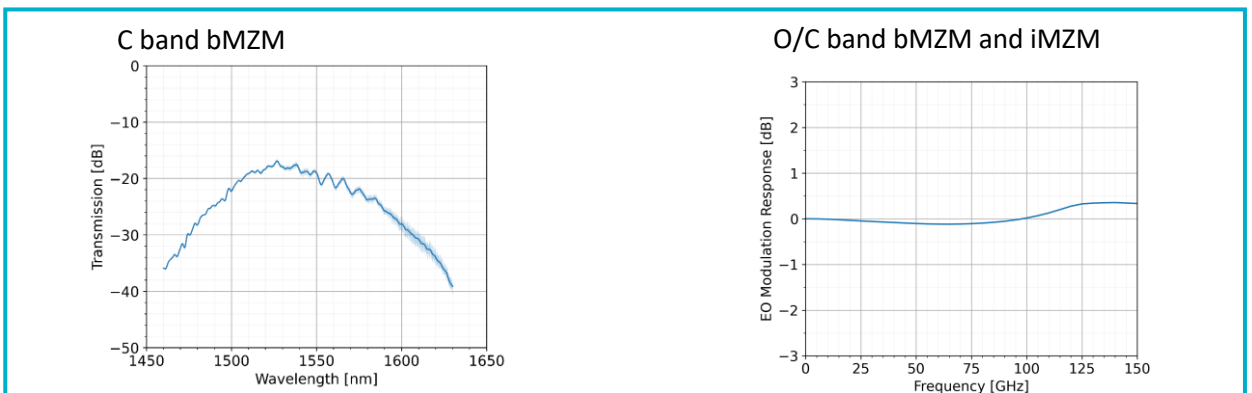
Mechanical and Optical Specifications

	bMZM	iMZM
Optical input and output	Grating coupler (GC), 127 μm pitch	Grating coupler (GC), 127 μm pitch
Center wavelength at GC angle	1310/1550 nm at 8°	1310/1550 nm at 8°
Optical source needed	Peak WL laser source	Tunable laser source, peak WL ± 10 nm range
Electrical RF interface	G-S-G, 65 – 200 μm pitch	G-S-G, 50 – 110 μm pitch
Electrical DC interface	+/-, 30 – 210 μm pitch	+/-, 30 – 170 μm pitch

Drawings and Dimensions

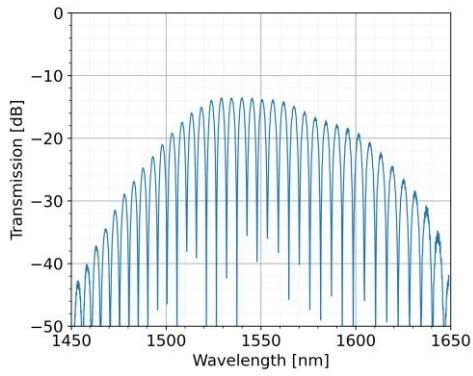


Key Plots

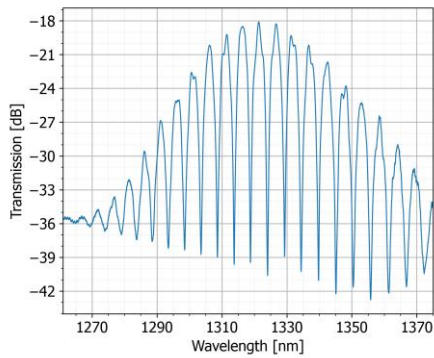


iMZM Transmission Spectrum

C band iMZM

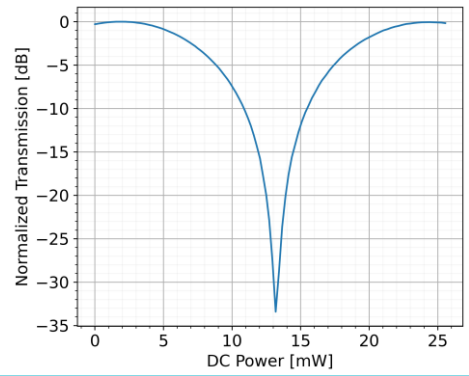


O band iMZM



DC Bias Power

O/C band bMZM



S11 Simulation

O/C band bMZM and iMZM

