

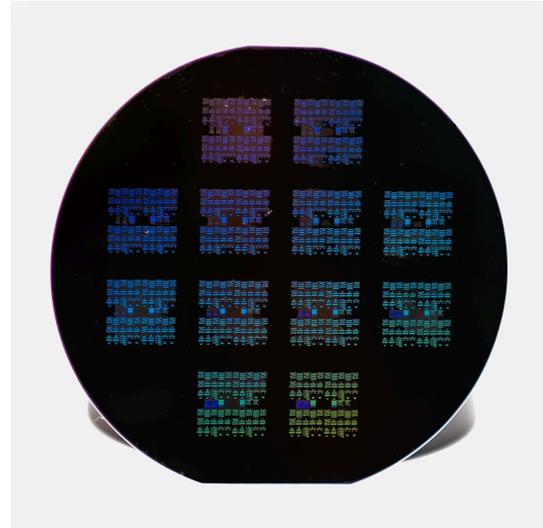
# O/C Band 145 GHz Ring Resonator Modulator

## RRM-C145

The RRM-C145 from Polariton Technologies is a compact, chip-scale ring resonator modulator that delivers ultra-fast electro-optic modulation. Designed for operation in the O and C bands, it exceeds 145 GHz bandwidth and fits easily into small-footprint systems. As a result, it's ideal for cutting-edge applications like radio-over-fiber, optical transport, and high-speed testing setups.

### Key Features

-  3-dB electro-optic bandwidth >145 GHz
-  Lumped, low-capacitance RF design
-  Chip dimensions 1.5 mm x 2 mm
-  O/C band operation
-  Possible electrical drive: Single, differential, or dual
-  Available as single, 4-channel or 8-channel device



## Description

The **RRM-C145 Ring Resonator Modulator** uses a resonant structure to generate intensity modulation with excellent performance. It achieves stable operation beyond 145 GHz—and tests have shown functionality up to 170 GHz. This makes it a solid choice for engineers building next-generation optical systems.

Importantly, the RRM-C145 doesn't require a bias voltage source. Instead, users can simply tune the laser wavelength to adjust the operating point. This approach simplifies integration and saves valuable board space.

You can order the RRM-C145 as a bare chip or in a semi-packaged format. In both cases, Polariton ensures mechanical compatibility and thermal stability.

# Variants & Specifications

## PRODUCT SPECIFICATION

Polariton is offering this device in various variants, being single, quad and octo channel, ideal for a wide range of optical interconnect solutions.

EO bandwidth	Optical band	RR variant	Ordering code
145 GHz	O band	single-ended, differential, dual	RRM-C145-o
145 GHz	C band	single-ended, differential, dual	RRM-C145-c

(1) A probable 4-channel version with GSG probes for GS operation is available on demand.

## Performance Specifications

	O band	C band
Peak wavelength	1310 nm	1550 nm
Insertion loss (IL)	<10 dB	<8 dB
Static extinction ratio (ER)	>8 dB	>8 dB
DC bias on/off voltage	<1.5 V	<1.5 V
3-dB EO bandwidth	>145 GHz	>145 GHz
$V_{drive}$ @ 100 kHz, @ 50 Ohm*	<2 V	<2 V
Free Spectral Range	~4.7 nm	~4.7 nm

## Maximum Ratings

	O band	C band
Optical input power**	<u>Contact Polariton</u>	7 dBm
RF input power @ 50 Ohm	18 dBm	18 dBm
DC voltage at RF input	0 V	0 V
DC bias voltage	2.5V	2.5V
DC bias current	15 mA	15 mA
Operating / storage temperature	~25 °C	~25°C - 50 °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.

\*\* Based on reliability data for 500 h at 50°C and 9 dBm input power with a  $V_n$  degradation < 10%.

## Mechanical and Optical Specifications

	O band	C band
Optical input and output	Grating coupler (GC), 127 $\mu$ m pitch	Grating coupler (GC), 127 $\mu$ m pitch
Center wavelength at GC angle	1310 nm at 8°	1550 nm at 8°
Optical source needed	Tunable laser source, 1310 nm $\pm$ 10 nm range	Tunable laser source, 1550 nm $\pm$ 10 nm range
Electrical RF interface	G-S, S-G, S- $\bar{S}$ , $\bar{S}$ -S, or S <sub>1</sub> -S <sub>2</sub> , 30 – 170 $\mu$ m pitch	G-S, S-G, S- $\bar{S}$ , $\bar{S}$ -S, or S <sub>1</sub> -S <sub>2</sub> , 30 – 170 $\mu$ m pitch
Electrical DC interface	+/-, 75 – 245 $\mu$ m pitch	+/-, 75 – 245 $\mu$ m pitch