

## O/C Band 110 GHz Ring Resonator Modulator

### Key Features

- 3-dB electro-optical bandwidth >110 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 or 4-channel device



### Performance Data

|                              | 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            | >110 GHz | >110 GHz |
| $V_{drive, eq}$ @ 50 Ohm*    | <2 V     | <2 V     |
| Free Spectral Range          | ~ 4.7 nm | ~ 4.7 nm |

### Maximum Ratings

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

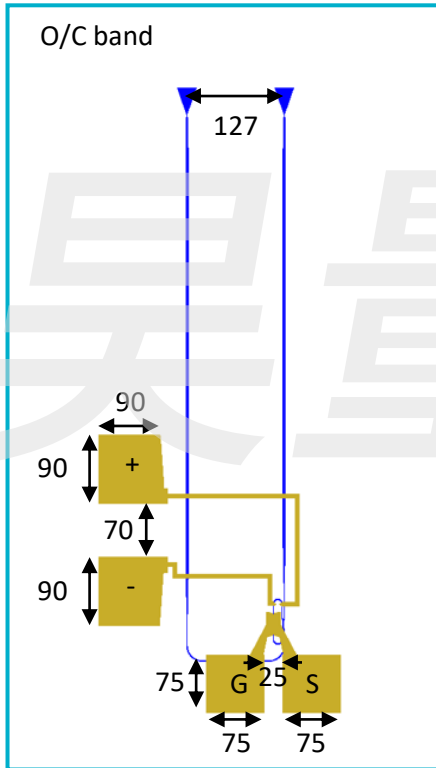
\* Plasmonic modulators are high-impedance devices. Twice the voltage provided by a 50-Ohm signal source will drop across the plasmonic modulator. Using a DC source or a high-impedance-matched driver, double the voltage is required to switch the modulator from the on to the off state.

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

## Mechanical and Optical Specifications

|                               | O band   | C band   |
|-------------------------------|--|--|
| Optical input and output      | Grating coupler (GC), 127 $\mu\text{m}$ pitch  | Grating coupler (GC), 127 $\mu\text{m}$ 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><br>30 – 170 $\mu\text{m}$ pitch | G-S, S-G, S- $\bar{S}$ , $\bar{S}$ -S, or S <sub>1</sub> -S <sub>2</sub><br>30 – 170 $\mu\text{m}$ pitch |
| Electrical DC interface       | +/-, 75 – 245 $\mu\text{m}$ pitch  | +/-, 75 – 245 $\mu\text{m}$ pitch  |

## Drawings and Dimensions



## Transmission Spectrum

