EOSPACE

Exceptionally-Low-Loss $LiNbO_3$ Electro-Optical Devices & ICs

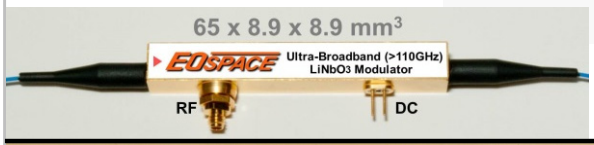
Technology Originally Developed for Defense/Aerospace Systems

6222 185th AVE NE, Suite 100, Redmond, WA 98052-5034 www.EOspace.com 425-869-8673 Info@EOspace.com

2024 Advanced Products

λ (0.65, 0.78, 0.85, 0.98, 1.06, 1.3, 1.55, 1.7, 2.0+ μm)

- **Ultra-wide band** (40, 50, 60GHz) 1x1, 1x2, 2x2 Intensity modulators (5V, 4V versions)
- **Ultra-wide band** (40, 50, 60GHz) Phase modulators (5V, 4V versions)
- **Very-Low-Vπ (3V)** Phase Modulators (20, 40, 60 GHz versions)
- **1x1, 1x2 Dual-Drive Low-Vπ** (<2.5V/side) **10 & 20 & 40 & 65** GHz Modulators
- Custom: **Extremely-High Extinction-ratio** (**>30, >40, >50 , >60dB**) Modulators
- Custom: **High power-handling** Modulators:**λ1.55μm**(1+W); **λ1μm**(1+W); **0.8μm**(please call)
- Custom: **Extremely-High temperature-handling** Modulators: **-55°C → +150°C**



- Custom: **Ultra-wideband (DC → 100+GHz)** $LiNbO_3$ Modulators
- Custom: **Y-branch 1x2 Phase** modulators
- Custom: **Ultra-compact** $LiNbO_3$ modulators
- Custom: **Application-specific** $LiNbO_3$ components

65x9x9mm³ with 2.9mm RF connector; thinner 65x5x9mm³ with GPPO

Low-Vπ 1x1, 1x2 , 2x2 X-cut (0-chirp) Compact Modulators

- **20G** *version: Low-Vπ ~ 4V@1GHz; >20-25GHz; <4dB (<3dB option)*
- **40G** *version: Large BW~ 30-40GHz; Vπ ~5V@1GHz; <4dB (<3dB option)*
- **Extended frequency** operation versions *(to ~65+GHz) available*

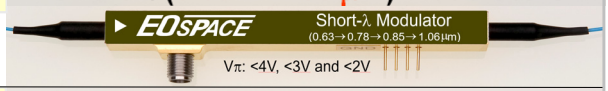
Low-Vπ QPSK (I/Q) Dual-Parallel MZM (X-cut Single-Drive)

- *25+ Gbaud version: Low-Vπ ~2.9-3.3V@1GHz; >20-25GHz; Excess Loss: <4dB*
- *50+ Gbaud version: >30-40GHz; Vπ ~3.9-4.3V@1GHz; Excess Loss: <4dB*

Short-λ: 0.65→0.78→0.85→0.98→1.06μm Phase & Intensity

- *10 & 20 & 40 & 65 GHz, Vπ: <4V,<3V & <2V, Insertion loss:<4, <3 & 2dB-custom*
- *High-Extinction-Ratio versions (λ=1.06μm: 30, 40 & 50dB)*

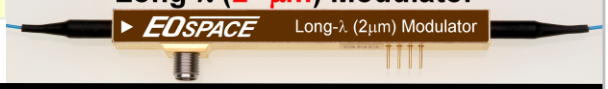
Short-λ (0.63 →→1.06 μm) Modulators

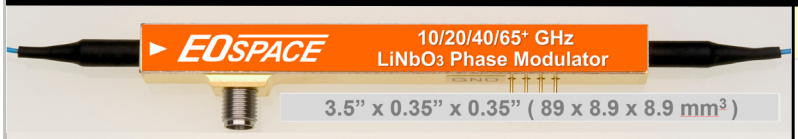


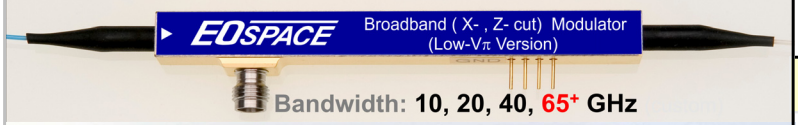
Long-λ: 2μm Intensity & Phase Modulators (10 & 20 & 40+GHz)

- *Insertion loss: <4dB, 3dB & (2dB – custom)*
- *Vπ : Intensity modulator: <7V,(5V-opt.); Phase Modulator: Vπ <10V,(7V, 6V-opt.)*

Long-λ (2+ μm) Modulator

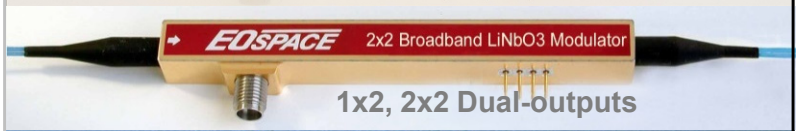






10 & 20 & 40 & 60+ GHz Phase Modulators

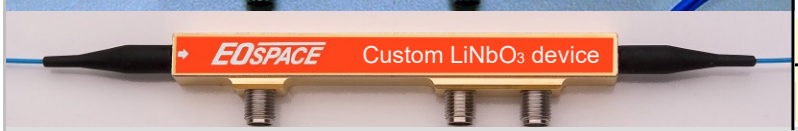
- *Very-Low-Loss version: ~2dB & ~3dB, ~4dB*
- *Vπ ~ 5V, 4V and Ultra-low-Vπ ~ 3V, 2.5V-custom)*
- *Bandwidth; 10, 20 , 40 GHz*
- *Extended frequency of operation option: ~50, ~60, ~70GHz*



Intensity (Z-cut & X-cut) Modulators

- ***Z-cut: Pre-chirp:*** *Low-Loss ~3dB, (~2dB option)*
  - *BW >12GHz, (>18GHz version); Vπ <5V, ~4V@1GHz*
  - *Extended Frequency of operation option: **40 GHz, 65+ GHz***
  - *Lower-Vπ versions: Vπ ~3.5V@1GHz; ~3V, ~2.5V (custom)*
- ***X-cut: Zero-chirp:*** *Low-Loss ~4dB, (~3dB, ~2dB option)*
  - *BW >12GHz, (>18GHz version); Vπ ~5, ~4V@1GHz*
  - *Extened Frequency of operation: **40 GHz, 65+ GHz***
  - *Lower-Vπ versions: Vπ ~3V, ~2.5V (custom)*

- **1x2, 2x2 (Dual-Outputs) 10-65GHz Modulators**

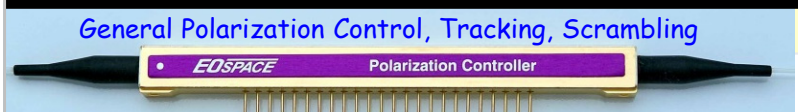


- **Dual-Drive Modulators** (*Vπ ~2.5V/side, <2V/side*)

Other available : • *1x2 (& 2x2) Dual-Outputs* • *Dual-λ:1300/1550nm* • *Integrated PD* • *Ultra-High-Power Handling (>1W, >2W)*

device versions : • *High Extinction-Ratio (>30 & >40 & >50 & >60dB)* • *Extended Temperature Range (-40°& -55°C → +100°C)*

General Polarization Control, Tracking, Scrambling



High-speed Polarization Controllers

- *Low Insertion Loss <3dB , (~2dB option)*
- *Multiple Integrated Device Stages: 1, 3, 4, 6, 8*

High-speed 1x2, 2x2, 1xN, NxN Switches

Single-Polarization (SP) or **Polarization-Independent (PI)**

1x2 (2x2) SP switch