
Products for Aerospace Applications

Optoplex Corporation is a leading technology company with proprietary optical technologies and products for applications from Telecom, Datacom, Optical Sensing, to Optical Spectral Instrumentations. In addition to commercial applications, Optoplex has been designing and manufacturing high reliability products submarine and aerospace applications.

Particularly for aerospace applications, the major products are described as below.

High-Speed Photodetector

A miniature high-speed photodetector is specially designed and manufactured for aerospace laser communications. Key features are

- C-Band
- High-Saturation Power: $\geq 10\text{dBm}$
- -3dB Bandwidth: $> 18\text{GHz}$
- High DC Responsivity: $\geq 0.65\text{A/W}$
- Low Dark Current (@RT): $< 10\text{nA}$
- V-Connector Output
- Large Working Temperature Range: -55C to $+110\text{C}$



DPSK Optical Phase Demodulators

Optoplex has been the dominant supplier of DPSK phase demodulators for Satellite (aerospace) laser communications for data rates of 2.5Gbps or 5.0Gbps. Free-space optics with athermal design to offer extremely environmental stability. These products have been widely used by aerospace and defense companies. Qualified against MIL-STD-883 and AS9100 standard.

Major features

- FSR: 2.5GHz (2.65, 2.88GHz); 5.0GHz
- Low insertion loss
- Low PDFS
- Large Spectral Tuning Range: > 10 FSR
- Extreme Working Temperature Range: -40C to $+85\text{C}$
- Low Pressure Environment
- High Mechanical Shock/Vibration



One major application is for laser communications in space (between satellites, or between satellite and space vehicle; or between satellite/space vehicle and ground equipment).

Another one is for satellite to monitor and track fast moving object by tracking the Doppler frequency shift.

90deg Optical Hybrid and Integrated with Balanced Receiver

For space coherent detection in DPSK or BPSK optical communications; or for coherent balanced detection on Lidar systems. Offers superior performance.

- Wavelength Range: C-band, 1310nm or 1064nm
- Free-space optics and athermal design
- Low insertion loss
- Small Skew
- High CMRR
- Super I/Q Balance
- Selections of Bandwidth: 15MHz, 100MHz, 200MHz, 400MHz, and 1600MHz. Other BW available upon request



Wavelength Lockers

Similar to the DPSK Phase Demodulators, Optoplex's wavelength lockers, based on free-space optics micro-interferometer platform, have been used by many aerospace and defense companies.

Key Features

- Working Wavelength Range: C-band, 1310nm, or 1064nm
- Athermal design
- FSR: 25, 50, 100 or 200GHz. Or customer specific
- Small TDFS



Comb Filters/Etalon

Applications include: wavelength reference, noise suppressions or spectral shaping.

Key Features

- Free-space optics and athermal design
- Very small temperature dependent frequency shift (TDFS)
- Low insertion loss
- Selections of FSR: 25, 33.33, 37.5, 50, 100, and 200GHz. Other FSR available upon request
- Spectral Shape: can be tailored per customer request



MOPA Filters

MOPA: Master Optical Power Amplifiers

- Center Wavelength: 1064nm or others
- FWHM: 1 ~ 3 nm or customer specific
- High Transmission: > 90% (typical 95%)
- Side-Band Blocking Wavelength Range: 300 ~ 1200nm
- Blocking Optical Density (OD): > OD 4 over 300 ~ 1200nm

Lidar Filters

- Center Wavelength: 1064nm or others
- FWHM: < 1nm or customer specific
- High Transmission: > 90% (typical 95%)
- Side-Band Blocking Wavelength Range: 300 ~ 1200nm
- Blocking Optical Density (OD): > OD 4 over 300 ~ 1200nm

Rayleigh Laser Line Filters

A very steep slope band-pass filter to separate the Brillouin or Raman scattering signals from the Rayleigh laser signal to increase the detection sensitivity and dynamic range.

Key Features

- Center Wavelength: customer specific
- FWHM: ~ 10GHz
- Slope: > 750dB/nm
- Low insertion loss
- Free-space optics and Athermal design to offer very small TDFS

