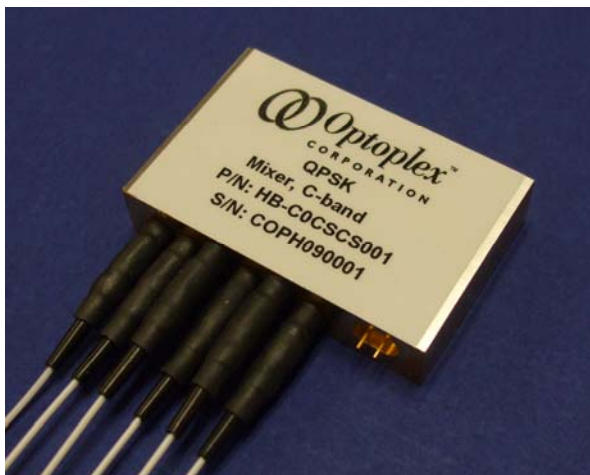
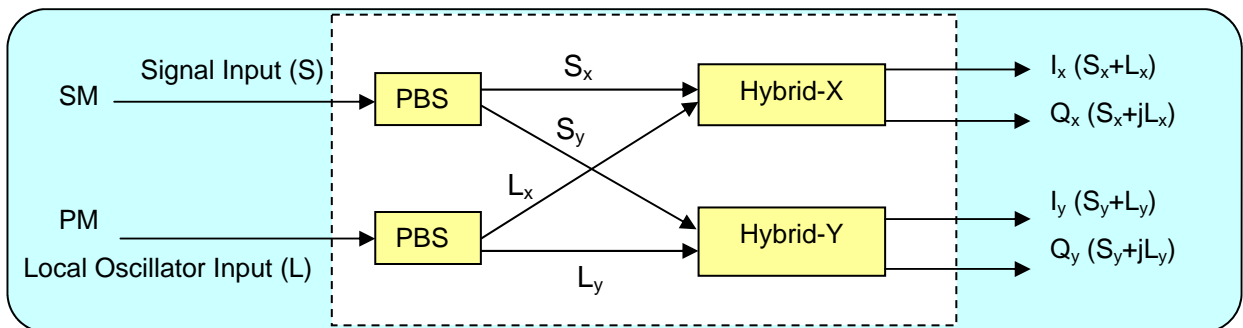


## 2x4 QPSK Mixer – Polarization Diversified Optical Hybrid

Optoplex's 2x4 polarization diversified optical hybrid (aka QPSK Mixer) mixes an incoming signal with a local oscillator. The device features a monolithic optical core integrating a PBS with an interferometer which is also widely used in Optoplex's interleavers and DPSK-demodulators. This device is athermal, colorless, data-rate independent and compact size. The four outputs of this device can be coupled with four single-ended detectors (see the function diagram below). This platform can also be extended to a 2x8 polarization diversified hybrid to incorporate with 4 pairs of balanced detectors.

The QPSK mixer is a key building block in the ever-popular polarization- and phase-diversified QPSK modulation scheme which is not only one of the leading contenders for the 100-Gb/s systems but also a significant cost-effective alternative for the 40-Gb/s systems where 10-Gb/s modulator and electronics can be used.



### Key Features and Benefits

- Free-space bulk-optics design
- Purely passive (no temperature control)
- Low insertion loss
- Low phase error
- <1 ps skew
- Colorless (wavelength independent)
- Data-rate independent

### Applications

- For the next-generation optical transmission system
- Key component for the optical coherent detection

## 2x4 QPSK Mixer Standard Product Datasheet<sup>1</sup>

Parameter	Unit	Specification	
Wavelength Range (C-Band)	<i>nm</i>	1527 ~ 1567	
Phase Difference <sup>1</sup> (between I <sub>k</sub> and Q <sub>k</sub> ), k=x or y	<i>degree</i>	90±10	
Insertion Loss <sup>1</sup> (not including connector)	S (polarization scrambled) → All Outputs	<i>dB</i>	9.5 ~ 11.5
	L (45° linear polarized) → All Outputs	<i>dB</i>	9.5 ~ 11.5
Insertion Loss Uniformity <sup>1</sup>	Among S → All Outputs; Among L → All Outputs	<i>dB</i>	<0.7
	Among All Others	<i>dB</i>	<1.0
Optical Return Loss	<i>dB</i>	>27	
Optical Path Difference <sup>1</sup> (Skew, among S → All Outputs)	<i>ps</i>	<1	
Optical Path Difference <sup>1</sup> (Skew, among L → All Outputs)	<i>ps</i>	<1	
Polarization extinction ratio <sup>1</sup> (for either S or L)	<i>dB</i>	>18	
Max. Input Optical Power	<i>mW</i>	300	
Operating Temperature Range	°C	0 ~ 65	
Storage Temperature Range	°C	-40 ~ 85	
Size (L x W x H) <sup>2</sup>	<i>mm</i>	48 x 31 x 10	
Fiber Type (for S, I <sub>x</sub> , I <sub>y</sub> , Q <sub>x</sub> , Q <sub>y</sub> )	-	SMF-28 with 900 μm tight buffer	
Fiber Type (for L)	-	PM with 900 μm loose tube	
Fiber Pigtail Length	<i>m</i>	TBD	
Connector Type	-	TBD	

**Note:**

1. Over the stated spectral and operating temperature ranges and all polarization states.
2. Not including six collimator sleeves extending from one longer side by ~18 mm.

**Optoplex Corporation**, located in Fremont, California, is an ISO9001:2000 certified supplier of cutting-edge photonic components and modules for dynamic wavelength management and signal conditioning. The company designs, develops, manufactures, and markets innovative fiber-optic products to communications networks, and provides customized solutions to instrument, defense, spectroscopy and sensing industries. By combining its proprietary optical design and packaging technology with its state-of-the-art optical coating expertise and facility, Optoplex supplies DPSK demodulators, DQPSK demodulators, 90° optical hybrids, 2-port tunable optical filters, 3-port reconfigurable optical add/drop multiplexers (ROADMs), optical interleavers, flat-top comb filters, optical performance monitors (OPMs), and portable spectrometers.