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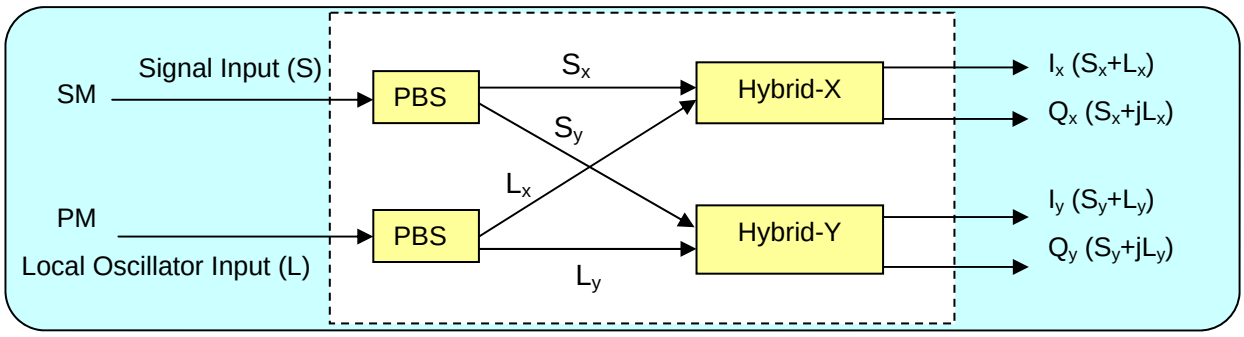
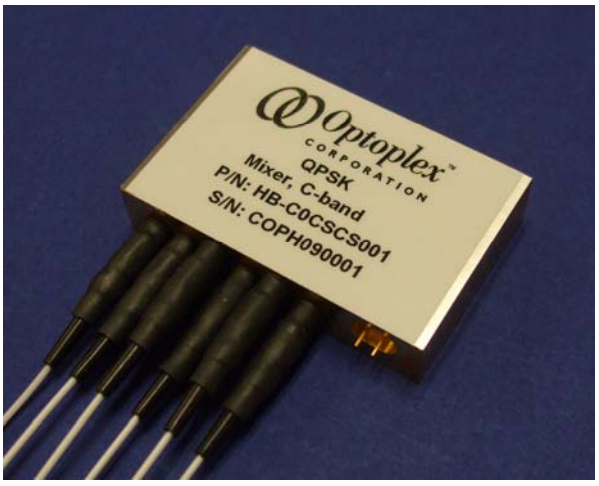
2x4 QPSK Mixer – Polarization Diversified Optical Hybrid

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[1]

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