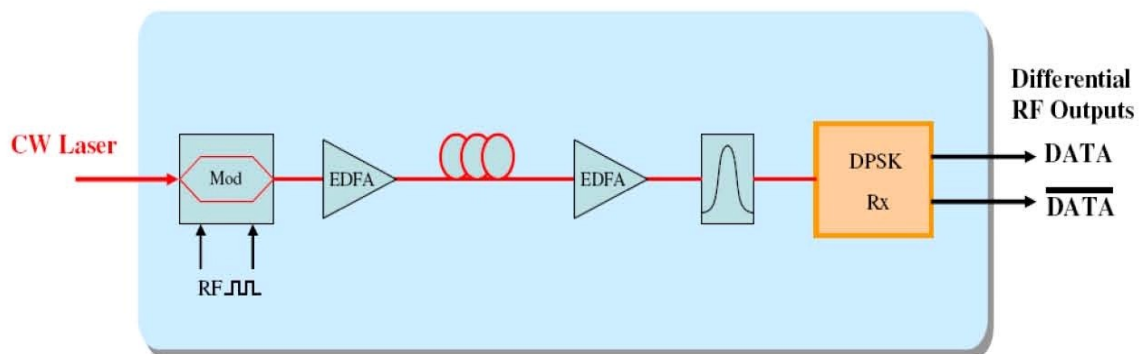


## 40Gb/s Integrated DPSK Receivers

Targeting for the next-generation 40Gb/s system based on advanced optical differential phase shift keying (DPSK) demodulation, CAOG's 40Gb/s Integrated DPSK Receiver (DPSK Rx) demodulates an incoming DPSK optical signal into a pair of differentially (amplitude) modulated RF outputs at data rate up to 43Gb/s in a compact package.

Phase modulated optical signals offer much better dispersion performance compared with traditional amplitude modulated counterparts because the carrier light stays on all the time so that the intensity-dependent nonlinear effects in the transmission link are avoided, resulting in longer transmission distances.



The integrated DPSK receiver combines a delay-line interferometer (DLI) with a balanced receiver to achieve compact size in a butterfly package. Compared with discrete components, the integrated receiver couples optical outputs from the DLI directly into the balanced photodetectors, resulting in smaller insertion loss and low channel skew, in addition to the elimination of fiber routing and matching.

The DLI demodulator is based on CAOG's proprietary, patent-pending free-space micro-optics, through which the incoming phase modulated optical signal is converted into a pair of differential, amplitude-modulated optical signal for detection by the balanced photodetectors. Due to its unique materials and design, the DLI exhibits highly athermal behavior in terms of insertion loss and phase error. The RF outputs from the balanced photodetectors are further amplified by a limiting TIA. As optional features, monitoring input tap with PD and/or 3dB attenuation (on one arm) can also be incorporated into the package.

CAOG's 40Gb/s Integrated DPSK Receivers can be configured at different FSR such as 43GHz, 50GHz, 57GHz or other customer specified values. A colorless version with the spectrum peaks aligned to the ITU grid is also available.

### Key Features and Benefits

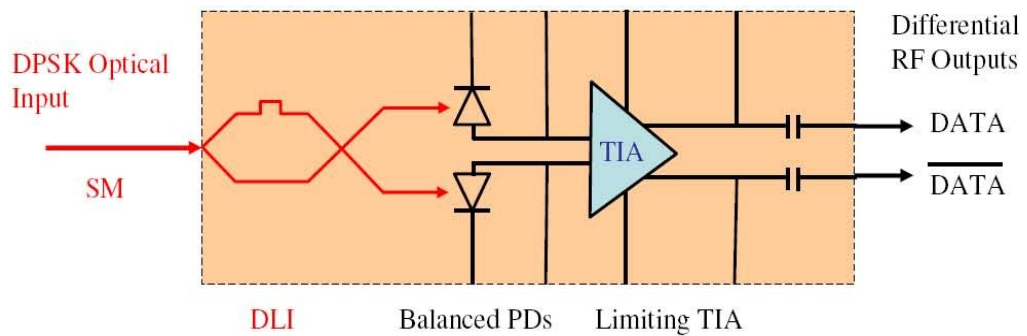
- Compact size
- Low insertion loss
- Low phase error
- <1 ps skew
- Customizable FSR

### Applications

- 40G DPSK Transponder



## 40Gb/s Integrated DPSK Receiver Product Datasheet



Parameter	Unit	Specification <sup>1</sup>
Wavelength Range (C-band)	nm	1520 -1570
Free Spectral Range (typical) <sup>2</sup>	GHz	21.5, 25, 33.3, 43, 50, 57, 65, 66.7
Temperature Dependent Frequency Shift	GHz	< 10
Extinction Ratio	dB	> 16
Skew	ps	< 1.0
Phase Tuning Range	FSR	> 1.5
Polarization Dependent Phase Shift	deg	< 5
Differential Conversion Gain	V/W	> 1500
Differential Output Eye Amplitude	mV <sub>pp</sub>	550
DC Responsivity @ Optimum DLI Phase	A/W	> 0.2
Optical Input Power	dBm	-6 to +8
Polarization Dependent Loss	dB	< 0.6
Optical Return Loss	dB	> 27
Bit Rate (NRZ-DPSK)	Gbps	43
O-E Bandwidth (S21 3dB Cut-off Frequency)	GHz	> 28
Photodiode Dark Current (per PD)	nA	< 100
Electrical Return Loss (S22)	dB	-10 (DC-20GHz) -4 (20-45GHz)
Amplifier Supply Voltage	V	-5.2
Power Consumption	W	< 1.5
Phase Tuning Speed	s	< 1
OSNR Performance	dB	20
Package Dimensions (excluding collimator sleeves and electrical pins)	mm	50 x 30 x 7.5

**Notes:** 1. Over the stated spectral and operating temperature ranges and all polarization states.  
2. Other FSR available upon request.