

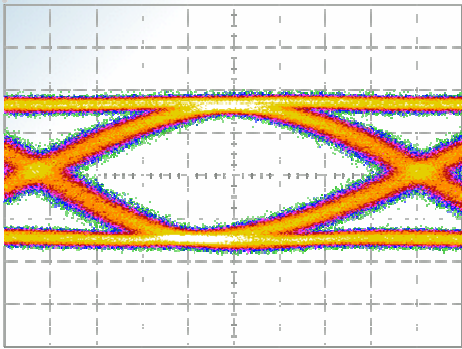


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Datasheet

SHF 46212A

Duobinary Transmitter



Description

The SHF 46212 A is an optical duobinary transmitter unit, in the style of a half-width plug-in for the SHF 10000 A mainframe. Field installation or upgrade by the end-user is possible for this equipment.

The SHF 46212 A Optical Transmitter converts an NRZ electrical signal into an optical duobinary signal at a data rate of 40 - 44 Gbps.

The main elements of the SHF 46212 A is a chirp-free Lithium Niobate Mach-Zehnder modulator driven by an optimised duobinary driver amplifier.

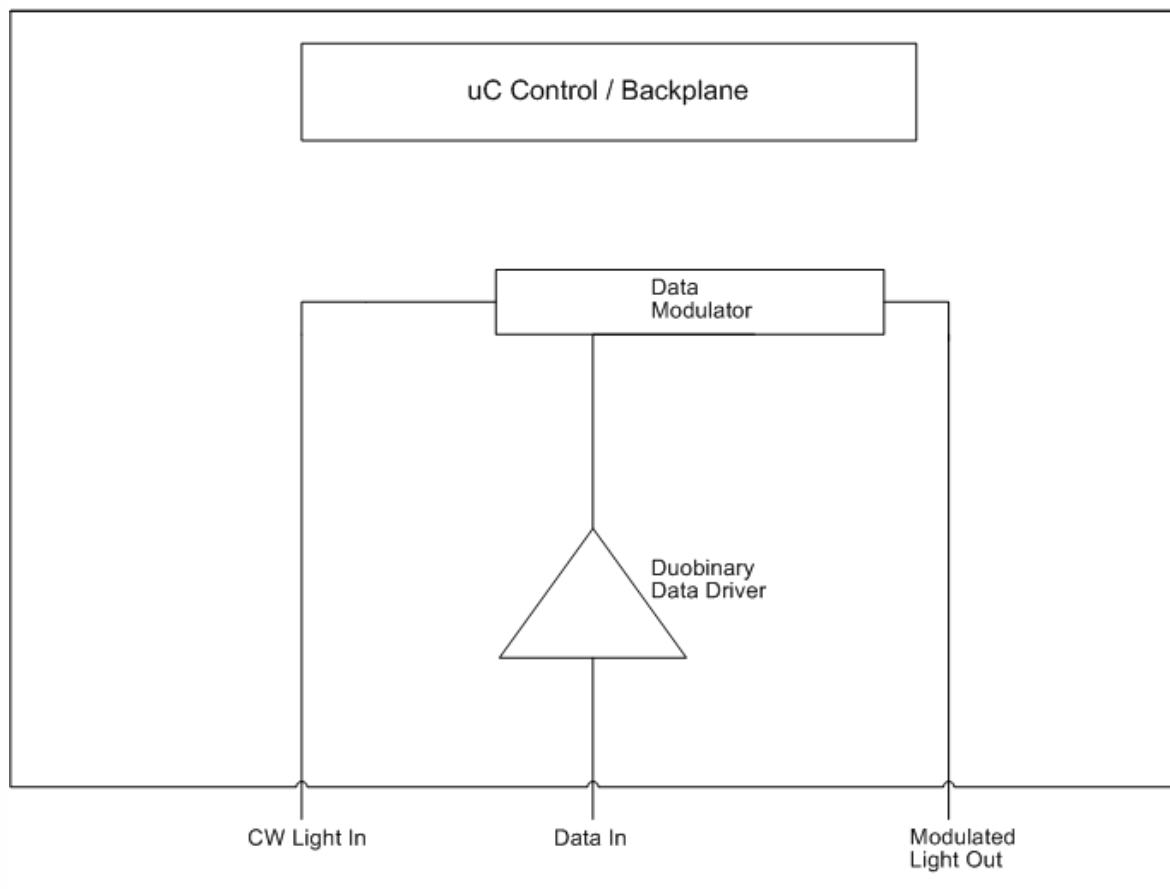
The duobinary amplifier generates an electrical 3-level signal, driving the LiNbO₃-modulator at $2 \times V\pi$.

An automatic modulator DC bias control loop ensures high stability of the optical output signal.

Features

- 40 – 44 Gbps optical data streams
- Quick optimization of optical eye diagram performance by user adjustable gain and modulator bias control
- Modulators' bias condition controlled automatically
- Selectable automatic or manual bias control (ABC circuit)
- SONET/SDH compatible
- All features controlled using custom software (BCC) via Standard Ethernet

Functional block diagram





Specifications – SHF 46210 B

Parameter	Unit	Min.	Typ.	Max.	Comment
Optical parameters					
Wavelength range		C- and L-band			
Insertion loss	dB		6	8	connector to connector, maximum transmission without modulation
DC Extinction ratio	dB		20		
Return loss	dB		30		without optical connector
Chirp (Alpha parameter)					small signal measurement method ¹
Positive slope				0.2	
Negative slope				-0.2	
Electrical and electro-optical parameters					
Electro-optical bandwidth of modulator	GHz	25			-3dB electrical
Electrical bandwidth of drive amplifier	GHz		15		
Drive amplifier electrical return loss	dB			-10	
Drive amplifier input level	Vpp (dBm)	0.32 (-6)		0.45 (-3)	
Dynamic extinction ratio @ 40 Gbps	dB	10	11		measured between data '1' and long sequence of '0'
Dynamic signal to noise ratio @ 40 Gbps		10	11		
Output timing jitter <RMS> @ 40 Gbps	ps		1	1.3	Measured with SHF Pattern Generator with low jitter output option, precision timebase DCA. De-embedded from 40 Gb/s NRZ electrical data source
Auto-bias control (ABC)					
Dither signal frequency	kHz		10		

¹ (F. Devaux, Y. Sorel and J.F. Kerdiles, "Simple Measurement of Fiber Dispersion and of Chirp Parameter of Intensity Modulated Light Emitter", J. Lightwave Technol., vol. 11, no. 12, December 1993)



Absolute maximum ratings

Parameter	Unit	Min.	Typ.	Max.	Conditions
Optical input power	dBm			17	
Data amplifier input power	dBm			10	NRZ data

General specifications

Parameter	Unit	Min.	Typ.	Max.	Conditions
Weight	kg		3.3		
Dimensions	mm		59x213x450		w/o Frontpanel - Connectors
Power consumption	W		20		
Operating temperature	°C	10		35	
Electrical data input connector			V (1.85mm)		
Optical connectors			FC/PC		



Test Measurements

The following equipment was used in obtaining these results:

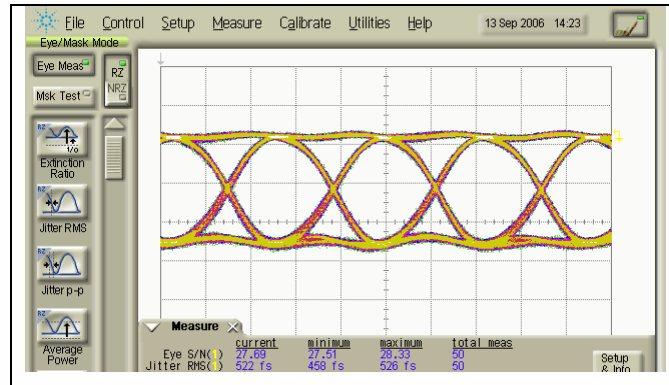
SHF12100 B S/N 6022 Pattern Generator

SHF 1550DFB Laser source set to 15mW output power @ 1550 nm.

AMPAQ EDFA + 1nm bandpass filter

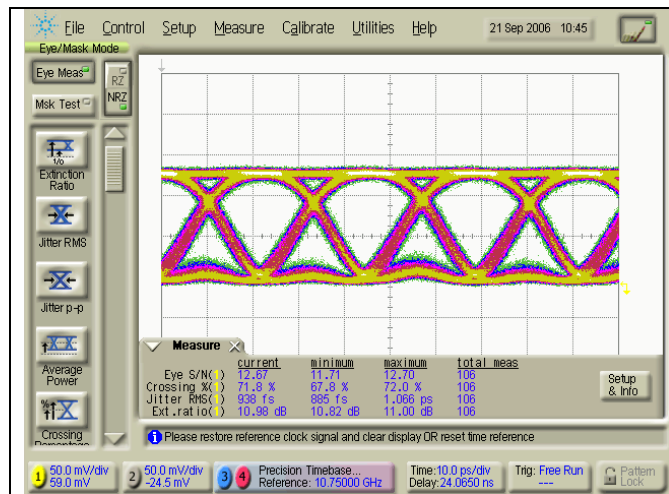
Agilent 86100A DCA with 70GHz plugin and precision timebase module

Typical transmitter data input signal



43 Gbps electrical signal. S/N: 15.9; RMS Jitter: 522 fs

Transmitter data output signal



43 Gbps optical output signal. S/N: 13; RMS Jitter: 940 fs



Change note:
new