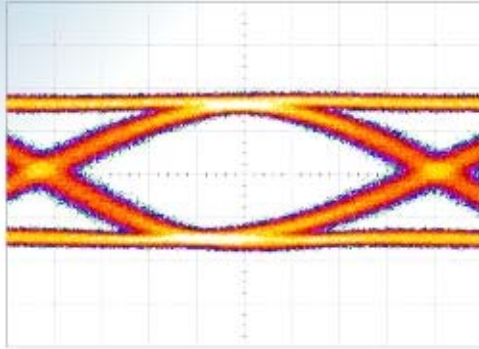




SHF Communication Technologies AG,

Amalienstrasse 14 • 12247 Berlin – Lankwitz, Phone ++49 30 / 772 05 10, Fax ++49 30 / 753 10 78,

E-Mail: mail@shf.biz, Web: <http://www.shf.biz>



Preliminary Datasheet

SHF 5003 NRZ

Optical Transmitter





Description

The SHF 5003 NRZ Optical Transmitter converts electrical signals into optical signals at a data rate of up to 50 Gbps.

The main element of the SHF 5003 NRZ is a chirp-free Corning OTI X-cut Lithium Niobate Mach-Zehnder modulator driven by an optimized SHF amplifier. The amplifier is specially tuned to match the characteristics of the modulator to ensure the best optical output signal.

The modulator exhibits very stable DC bias and an automatic bias circuit ensure high stability of the output signal. All features on the instrument can be controlled remotely via a GPIB connection.

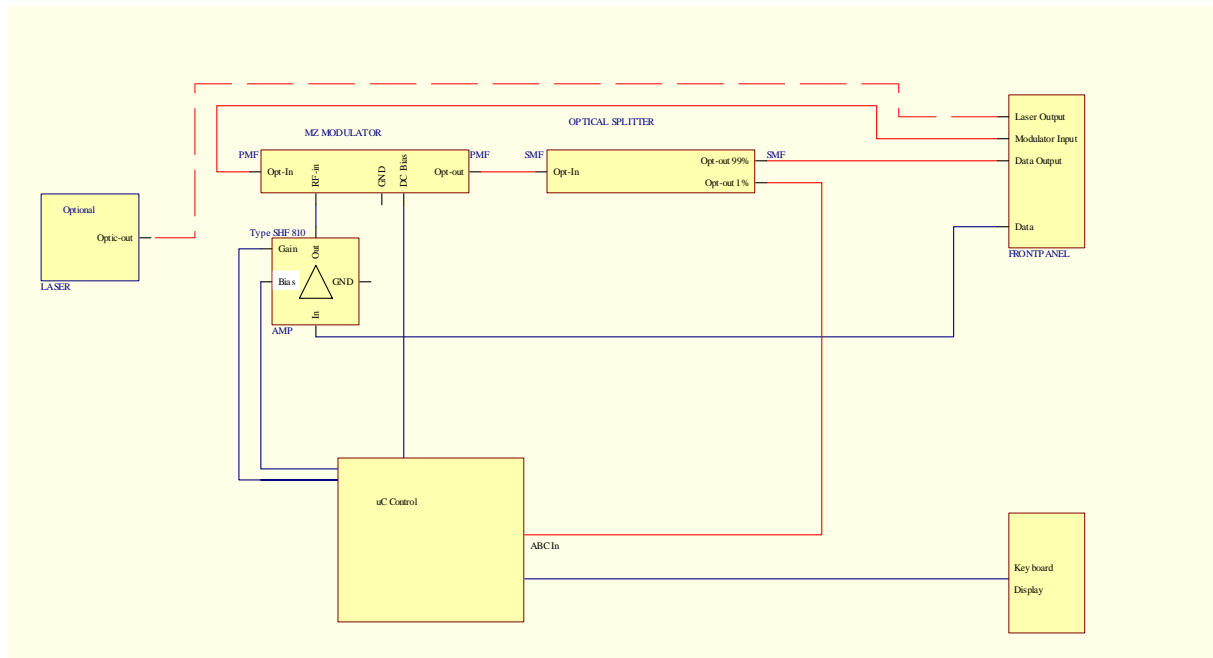
Features

- 50 GBit/s TDM NRZ optical data streams
- <10 ps rise and fall time digital optical signals at 44 GBit/s
- 50 kHz to >40 GHz E/O conversion bandwidth (typical)
- Quick optimization of optical eye diagram performance by user adjustable gain and modulator bias control
- GPIB connector for remote control
- Modulator bias conditions controlled automatically
- Selectable automatic and manual bias control (ABC circuit)

Option

Built-in 1550nm DFB peltier cooled laser with PM fiber loop to allow external laser to be attached.

Functional Block Diagram





Specifications

Parameter	Unit	Min.	Typ.	Max.	Conditions
Optical parameters					
Wavelength range		C- and L-band			
Insertion loss	dB		3.5	4	connector to connector, maximum transmission without modulation
Extinction ratio	dB	20			
Return loss	dB		50		without optical connector
Chirp (Alpha parameter)					small signal measurement method ¹
Positive slope			0.03	0.1	
Negative slope			-0.01	-0.1	
Electrical and electro-optical parameters					
Electro-optical bandwidth of modulator	GHz	30			-3dB electrical
Bit rate	Gbps			50	
Drive amplifier electrical return loss	dB			-10	
Drive amplifier input level	V _{pp} (dBm)	0.35 (-5)	0.4 (-4)	0.45 (-3)	
Dynamic extinction ratio	dB	11	12		measured between data '1' and long sequence of '0' at 44 Gbps
Dynamic signal to noise ratio			14		
Output rise and fall times	ps		9	10	20%...80% as displayed on oscilloscope
Position of crossing point	%	45	50	55	
Auto-bias control					
Dither signal frequency	kHz		10		
Dither signal amplitude (% of 40Gb/s drive data signal)	%		1		
Absolute maximum ratings					
Optical input power	dBm			20	CW
Amplifier input power	dBm			4 10	in operation without power supply
General					
Weight	kg		9		
Dimensions	mm				472x365x110
Power supply	V	90 180	110 230	135 270	47...63 Hz
Power consumption	W		60		
Operating temperature	°C	15		35	
Storage temperature	°C	-20		85	
Electrical data input connector					V (1.85 mm) male
Optical connectors (input and output)					FC/PC (others available on request)

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)



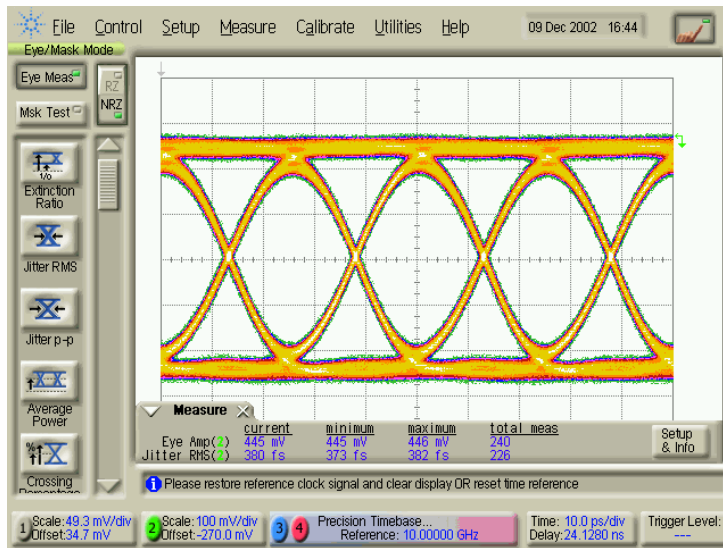
Internal laser specifications (optional)

Parameter	Unit	Min.	Typ.	Max.	Conditions
Wavelength parameters					
Center	nm		1550		
Adjustment	nm		0.01		
Resolution	nm	0.05			
Stability	nm	0.005			over 24 hours
Spectral width	MHz		0.5	2	-3dB
Side mode suppression ratio	dB	30	45		

Output Waveforms

The signal source used in these measurements was an SHF BPG 44 E LJ operating at 40 Gbps. Optical output signals from the SHF 5003 NRZ were detected with a high speed photodetector and displayed on an Agilent 86100A oscilloscope with an 86118A 70 GHz plug-in and precision time base.

Input electrical waveform



Optical output waveform

