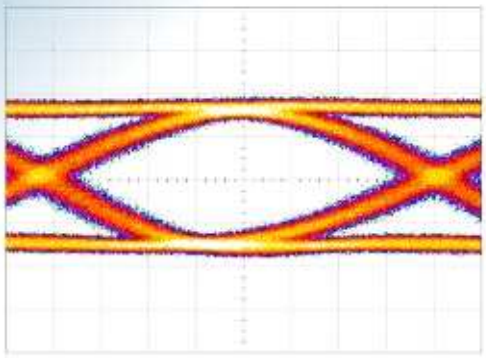
SHF Communication Technologies AG

Wilhelm-von-Siemens-Str. 23 • Aufgang D • 12277 Berlin • Germany

Phone ++49 30 / 772 05 10 • Fax ++49 30 / 753 10 78

E-Mail: mail@shf.de • Web: http://www.shf.de



Datasheet

SHF 47214A

50 Gbps Optical DPSK Receiver

Description

The SHF 47214A optical DPSK receiver offers a solution for demodulation of DPSK-encoded optical signals and conversion back into electrical signals for further analysis. It is a field replaceable plug-in module which needs to be installed in a mainframe type SHF 10001B or SHF 10000A. Together with other plug-in modules from this instruments series, a modular and scalable measurement system can be put together. In conjunction with the multiformat optical DPSK transmitter SHF 46210A optical transmitter, tests for optical DSPK transmission can be performed very efficiently.

The mainframe with the installed modules is controlled over a standard Ethernet connection by an external computer which is a standard part of the package. An easy to use software package provides not only a user friendly interface for changing the operating parameters but also the capabilities of feature enhancement through firmware & software upgrades

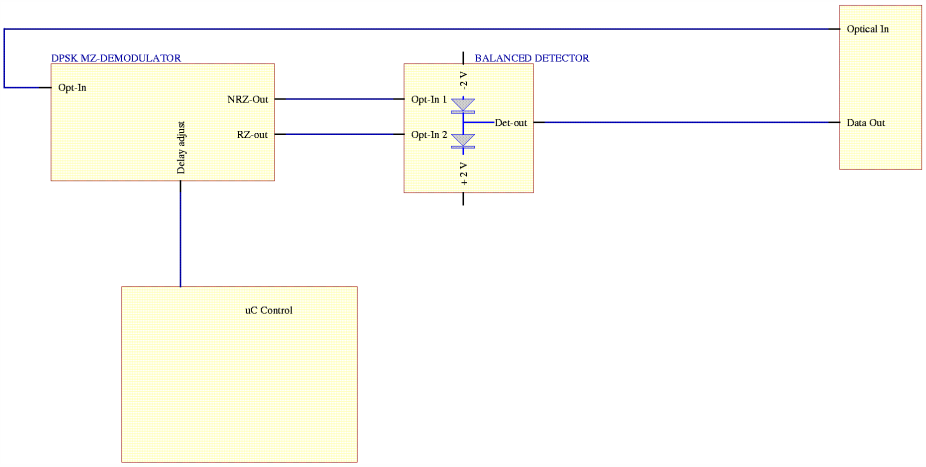
To assist the customer in performing efficient measurements and to make the instrument robust against variations of the wavelength of the input signal, a tracking mode is implemented. When operating the instrument in this mode, the instrument automatically monitors the output signal and compensates for any changes in the wavelength of the laser light. This feature is a powerful tool for long term measurements.

Differential phase-shift keying (DPSK) is a well-known coding method which is of current interest in the transmission of high bit rate signals through optical fibers. Compared to the more conventional amplitude-shift keying (ASK), DPSK offers higher sensitivity and enhanced robustness against the impact of non-linear effects in DWDM transmission.

Features

- Scalable and modular system
- Windows Style Bert Control Center software package
- Computer controlled operation over the Ethernet which also enables remote access.
- Feature enhancement through firmware & software upgrades
- User-specified bit rate (narrowband operation)
- Ruggedized 1.85 mm male connector for electrical data output
- Decodes NRZ, RZ and CS-RZ DPSK signals
- High sensitivity

Functional Block Diagram



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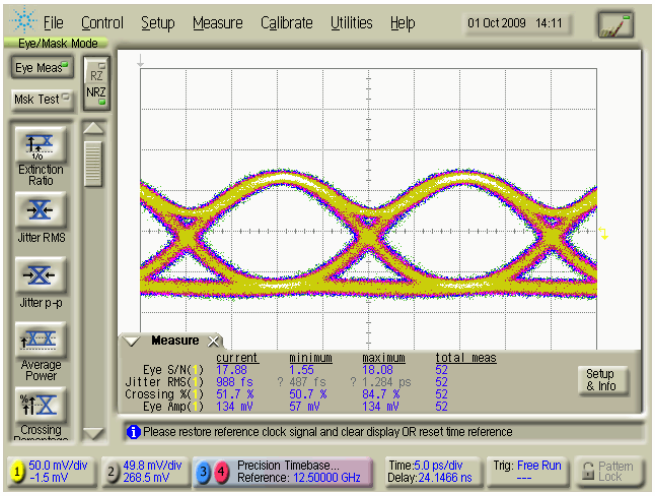
Specifications

Parameter	Unit	Min.	Typ.	Max.	Conditions
Decoder					
Optical Connector Type					FC/PC, other types on request
Operating wavelength	nm	1520		1620	
Optical input power into receiver	dBm			10	mean power
Optical return loss	dB		25		
Decoder Excess optical loss	dB		1.6	2.2	
Data rate	Gb/s	48		55	One fixed data rate per decoder. User to specify.
Decoder phase tuning range	FSR			2	
Phase tuning response	second			2	fiber heater operation only
Balanced detector					
Electro-optic bandwidth	GHz		45		broad band operation
Detector responsivity		0.5	0.6		at DC
Detector responsivity matching	%		10		
Common-mode rejection	dB	12 12			Up to 20 GHz 20 to 50 GHz
PDL			0.4	0.8	
Output signal					
Connector type			50 Ω		ruggedized 1.85 mm (V-compatible) male connector
Electrical output return loss	dB			-10	
Positive and negative pulse amplitude matching	%			20	worst case
Positive and negative pulse delay matching	ps			3	

Parameter	Unit	Min.	Typ.	Max.	Conditions
Output pulse amplitude	mV		180		+10 dBm mean optical input power
Output pulse width (FWHM) RZ CS-RZ	ps		 10 15		
Output pulse zero crossing	mV		0		
Absolute maximum ratings					
Optical input power into receiver	dBm			13	CW
General					
Weight	kg		2.5		
Operating temperature	℃	10		35	
Storage temperature	℃	-20		70	

Eye diagram



50 Gbps output signal. S/N: 17.9; RMS Jitter: 988 fs

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