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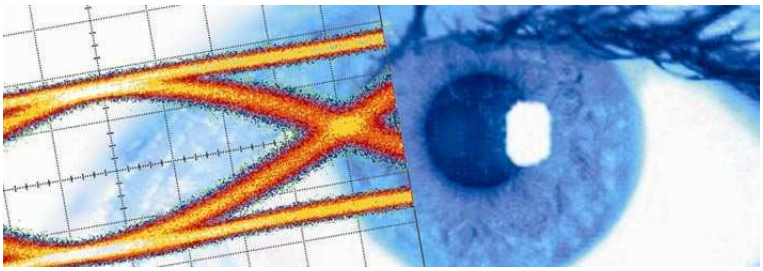
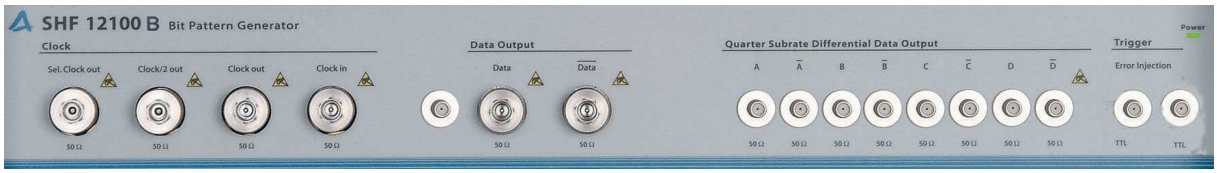


Datasheet

SHF 12100 B

50 Gbps Bit Pattern Generator



Description

The SHF 12100 B is a bit pattern generator plug-in which can be fitted into the SHF 10000 Series mainframes.

Operation is from 1.5 Gbps up to 56 Gbps[1]. It allows the production of PRBS signals with pattern lengths of 2^7-1, 2^9-1, 2^{11}-1, 2^{15}-1, 2^{20}-1, 2^{23}-1 and 2^{31}-1. User-programmed patterns can also be loaded into the instrument.

The operating bit rate is determined by the clock frequency – the instrument can operate at both full clock and half clock, so either a 25 GHz or a 50 GHz signal is required for 50 Gbps operation. Sub rate outputs can be optionally fitted to provide either four channels with data rates from 1.5 …12.5 Gbps or two channels with data rates from 3 …25 Gbps.

Features

- Broadband operation up to 56 Gbps[1]
- Operation by intuitive software interface
- High quality adjustable output signals
- Seven built-in PRBS patterns: 2^7-1, 2^9-1, 2^{11}-1, 2^{15}-1, 2^{20}-1, 2^{23}-1, 2^{31}-1
- Pattern coding and decoding of DQPSK transmission experiments
- Up to 128 MBit user pattern
- Two independent, programmable frame trigger outputs
- Sub-rate clock outputs

Options

010 – Four differential 1.5 to 12.5 Gbps sub-rate outputs

020 – Two differential 3 to 28 Gbps[1] sub-rate outputs

56 – Guaranteed operation up to 56 Gbps

Note:
- Option 010 and 020 cannot be fitted at the same time

[1] Depending of the configuration of the particular system

Specifications – SHF 12100 B

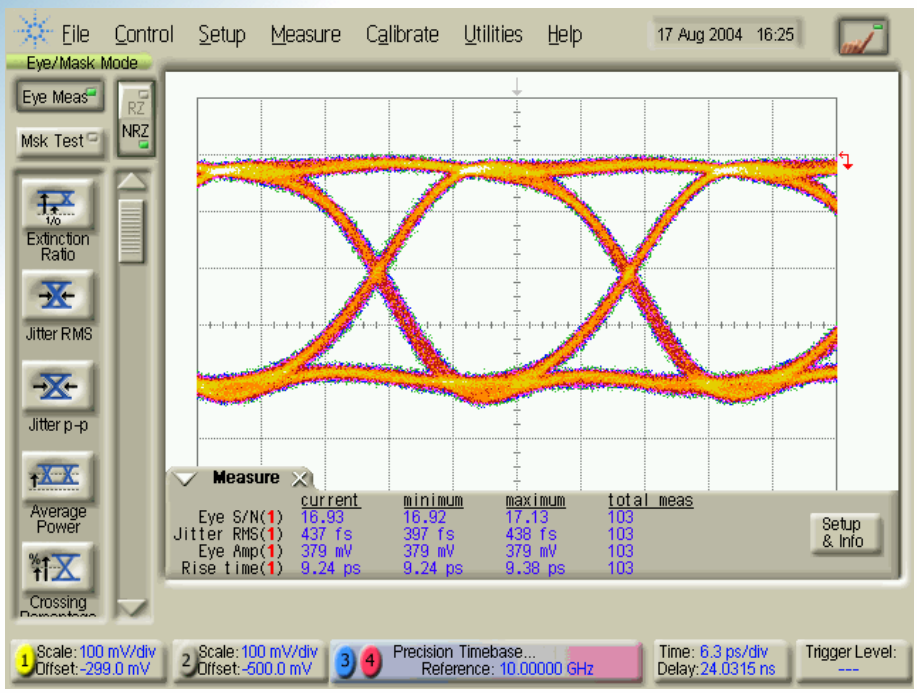
Parameter	Unit	Min.	Typ.	Max.	Comment
50G Data Outputs					
Bit Rate With option 56	Gbps	6		50 56	
Output level	mV	350	400		adjustable by up to -3dB,
Jitter (RMS)	fs		500	550	on scope display, measured at 50 Gbps with Agilent 86100A with 70 GHz sampling head and precision time base
Rise/fall time	ps			10	20%...80%
Connector Type			50 Ω		ruggedized 1.85 mm male connector
25G Data Outputs					
Bit Rate With option 56	Gbps	3		25 28	
Output Level	mV	600	800	1000[2]	Fixed
Jitter (RMS)	fs		600	900	on scope display, measured at 25 Gbps with Agilent 86100A with 70 GHz sampling head and precision time base
Connector Type			50 Ω		2.92mm female
Rise/fall time	ps			12	20%..80%
12.5G Data Outputs					
Bit Rate	Gbps	1.5		12.5	
Output Level	mV_{pp}	250		1000	adjustable output level
DC bias on data outputs	mV	-1000		+1000	in 10 mV steps
Connector Type			50 Ω		SMA female

[2] For PRBS patterns only

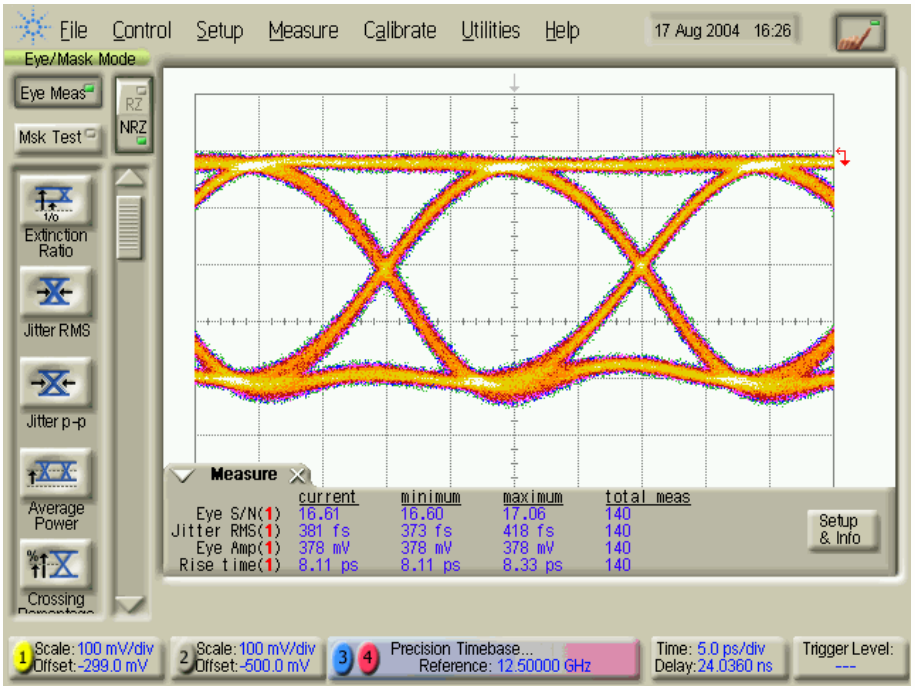
Clock					
Connector type			50 Ω		
Clock input					ruggedized 1.85 mm male connector
Clock output					ruggedized 1.85 mm male connector
Clock/2, Sel. Clock Output					ruggedized 2.9 mm male connector
Clock input frequency	GHz	3		25	half clock mode
		6		50	full clock mode
With option 56		3		28	half clock mode
		6		56	full clock mode
Input level	V	0.6		1	
Output level	mV	300	600		clock
		300	450		clock/2
S_{11}	dB			-10	
Output frequency	GHz	3		50	clock
	GHz	3[3]		25	clock/2
	GHz	0.2[3]		3.1	sel. Clock
					sel: can be switched between bitrate/N (N=16,32,64,128,256, 512)
Frame Trigger Outputs					
Connector Type			50 Ω		SMA female
Output level Frame 1	mV		800		AC coupled
Output level Frame 2	mV		3300		LVTTL-Level
Patterns					
Data patterns			2^7-1 2^9-1 2^{11}-1 2^{15}-1 2^{20}-1 2^{23}-1 2^{31}-1		
User-programmable pattern	Mbit			128	
Back to back Q factor	linear	25	30		measured with SHF 11100 A @ 40 Gbps, 2^{31}-1, 400 mV amplitude
	dB	28	30		

[3] clock/2 and sel. clock output signals between fin = 3….6 GHz are enabled with an input signal slew rate = ~10V / ns

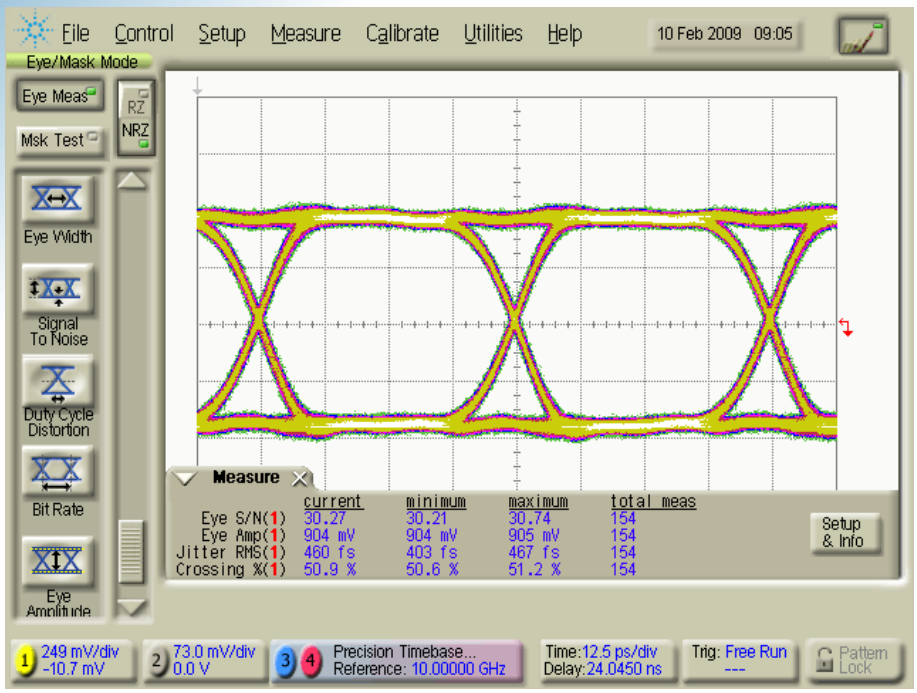
Typical output waveforms



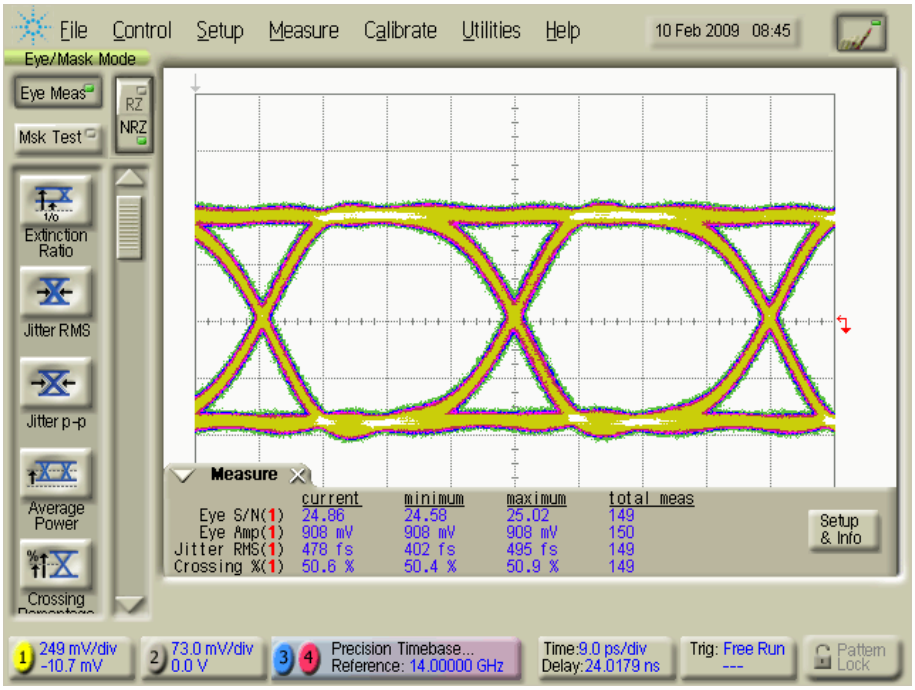
40 Gbps output eye at maximum output level



50 Gbps output eye at maximum output level



20 Gbps sub rate output eye



28 Gbps sub rate output eye