

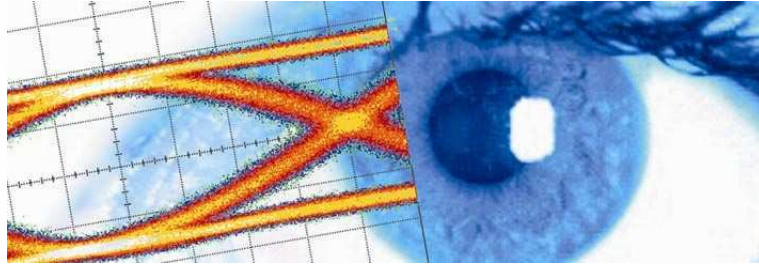


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Datasheet

SHF 12110 A

SHF 12122 A

Bit Pattern Generators





Description

The SHF 12110 A and SHF 12122 A are bit pattern generators for applications where cost, space and functionalities need to be carefully balanced. They are particularly suited for 40G components, module and subsystem production tests.

The units contain a built-in frequency synthesizer¹ to access bit rates from 39.8 to 44 Gbps and all equivalent sub-rate bands of 20, 10, 5 and 2.5 Gbps; therefore rendering them equally valuable as a general purpose multiple bit rate band data source for a wide range of digital test applications covering the key bit rate bands from 2.5 to 44 Gbps.

The devices allow the generation 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 $2^{31}-1$.

The units are controlled over a standard Ethernet connection by an external computer. 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.

The plug-in version SHF 12110 A is to be used together with the SHF 10000 B and SHF 10001 A mainframes to allow an individual test setup together with modules from the broad selection of SHF 10000 series extension modules. For production testing up to 4 SHF 12110 A can be combined into one mainframe for multiple device testing.

The stand alone bench top unit SHF 12122 A is a small size unit to be used in the case that no further extension modules are required.

Feature

- Internal frequency synthesizer for all bit rate operations
- Supports external frequency reference input
- Supports multiple sub-rate bit rate bands of 39.8 to 44
- Differential data output signal
- Operation by intuitive software interface
- Seven built-in PRBS patterns: 2^7-1 , 2^9-1 , $2^{11}-1$, $2^{15}-1$, $2^{20}-1$, $2^{23}-1$, $2^{31}-1$
- Sub-rate clock outputs (1/2 clock, 1/4 clock, 1/16 clock, 1/32 and 1/64 clock)
- Wordframe trigger output
- External error injection using LVTTTL signal

¹ The unit can also be operated by using an external reference clock of either 1/64th or 1/32nd of the upper bit rate range (39.8 to 44 Gbps).



Preliminary Specifications – SHF 12110A and SHF 12122 A

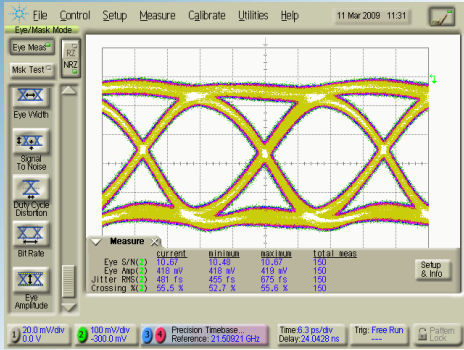
Parameter	Unit	Min.	Typ.	Max.	Comment
Data Outputs					
Connector Type			50 Ω		1.85 mm female
Bit rate	Gbps	39.8 19.9 9.95 4.98 2.49		44 22 11 5.5 2.75	
Output level	mV	300		500	Single ended, V_{pp} Ground-Referenced CML
Jitter (RMS)	fs		600	800	on scope display, measured at 39.81312 Gbps with Agilent 86100A with 70 GHz sampling head and precision timebase
Rise/fall time	ps			15	20%...80% on scope display, measured at 39.81312 Gbps with Agilent 86100A with 70 GHz sampling head and precision timebase



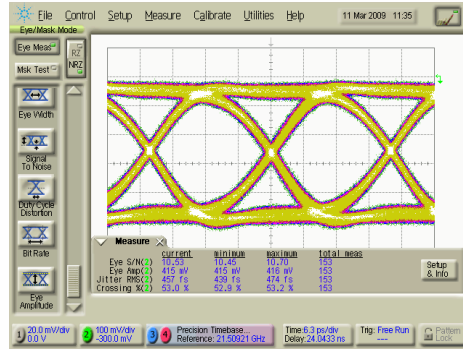
Clock Input					
Connector type			50 Ω		SMA female
Reference Clock input					
Reference Clock input frequency	MHz	1243.75		1375	Clock/32 reference clock
	MHz	621.875		687.5	Clock/64 reference clock
Reference Clock Input level	mV			800	V _{pp} , internal AC coupled
Clock Output					
Connector type			50 Ω		SMA female
Reference Clock output					
Clock/2					2.92 mm female
Clock/4					2.92 mm female
Clock/16					SMA female
Output level	mV				V _{pp}
Reference Clock output		500		1100	internal AC coupled
Clock/2		200		500	Ground-Referenced CML
Clock/4		400		500	Ground-Referenced CML
Clock/16		400		500	Ground-Referenced CML
Output frequency	GHz	19.9		22	Clock/2
	GHz	9.95		11	Clock/4
	MHz	1243.75		1375	Clock/32 reference clock
	MHz	621.875		687.5	Clock/64 reference clock
Frame Trigger Output					
Connector Type			50 Ω		SMA female
Output level	mV			1100	AC coupled, V _{pp}
Error Injection Input					
Connector Type					SMA female
Input level	mV			3300	LVTTL
Patterns					
Standard CCITT PRBS			2 ⁷ -1		Apply to all bit rates
			2 ⁹ -1		
			2 ¹¹ -1		
			2 ¹⁵ -1		
			2 ²⁰ -1		
			2 ²³ -1		
			2 ³¹ -1		



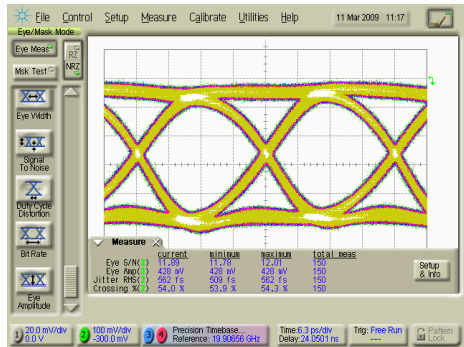
Typical output waveforms



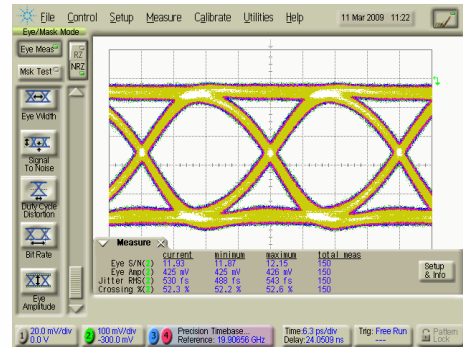
Data @ 43.018 Gbps



/Data @ 43.018 Gbps



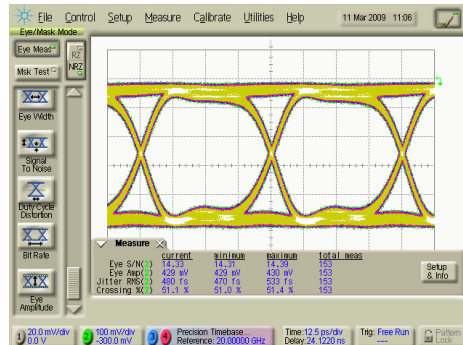
Data @ 39.813 Gbps



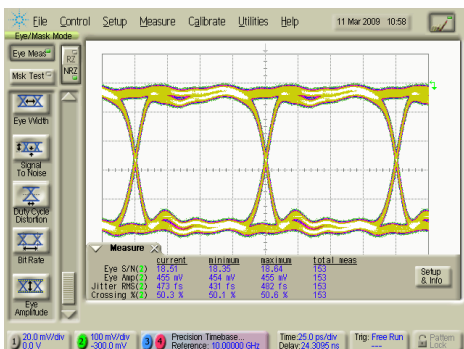
/Data @ 39.813 Gbps



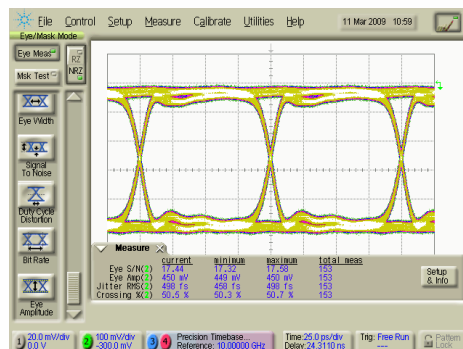
Data @ 20 Gbps



/Data @ 20 Gbps



Data @ 10 Gbps



/Data @ 10 Gbps