DATA SHEET

N4975A PRBS Generator 56 Gb/s

Features

- Self-contained PRBS generator
- Built-in, quarter-rate clock source (14.0 GHz) for 56 Gb/s operation
- 1010, 1100, and PRBS-15 patterns
- 500-1000 mV differential, adjustable output
- Quarter rate (Clk/4) clock input
- Quarter and half rate clock outputs
- Pattern trigger output

Description

The Keysight Technologies, Inc. N4975A PRBS generator 56 Gb/s is a self-contained pattern generator capable of operating at either 56 Gb/s data rate using the internal oscillator or operating over a wider data rate range of 39.8 to 56 Gb/s when used with an external quarter-rate clock source. This is made possible through comprehensive integration of the key building blocks into monolithic integrated circuits founded on SiGe technology. The performance generated from the N4975A PRBS generator 56 Gb/s is world class with the typical data signal having 500 fs rms jitter, 500 mV of output swing and 9 ps rise time.

Application

The N4975A PRBS generator 56 Gb/s, in conjunction with a high speed digital communications analyzer can be used to make eye and jitter measurements of 56 Gb/s components such as modulator drivers, optical modulators, MUX, and DEMUX components. The superior rise time, fall time, and excellent jitter of the N4975A PRBS generator 56 Gb/s make it desirable for production component test where the source performance needs to be as good as possible to meet production specification margins. The low price of the N4975A PRBS generator 56 Gb/s make it desirable for manufacturing environments which are cost sensitive.

KEYSIGHT TECHNOLOGIES

Figure 1. Front of N4975A PRBS generator 56 Gb/s.

Figure 2. Back of N4975A PRBS generator 56 Gb/s.

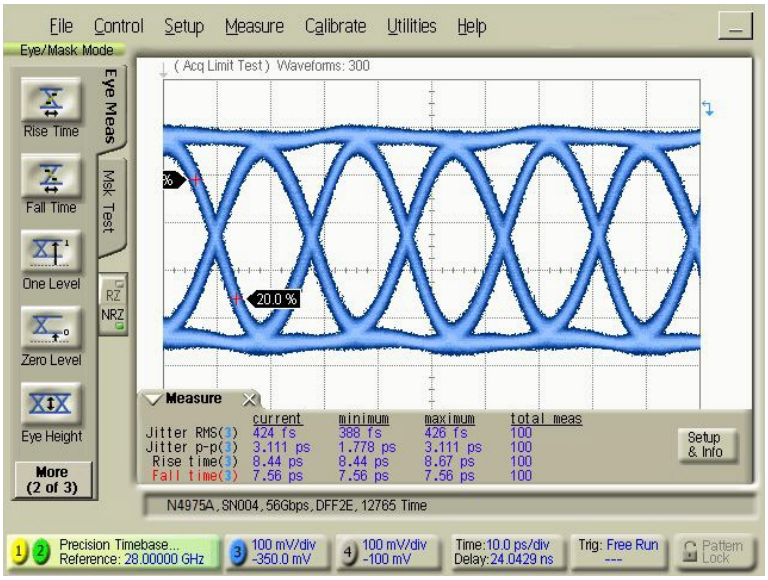

Figure 3. 56 Gb/s typical eye diagram time parameters.

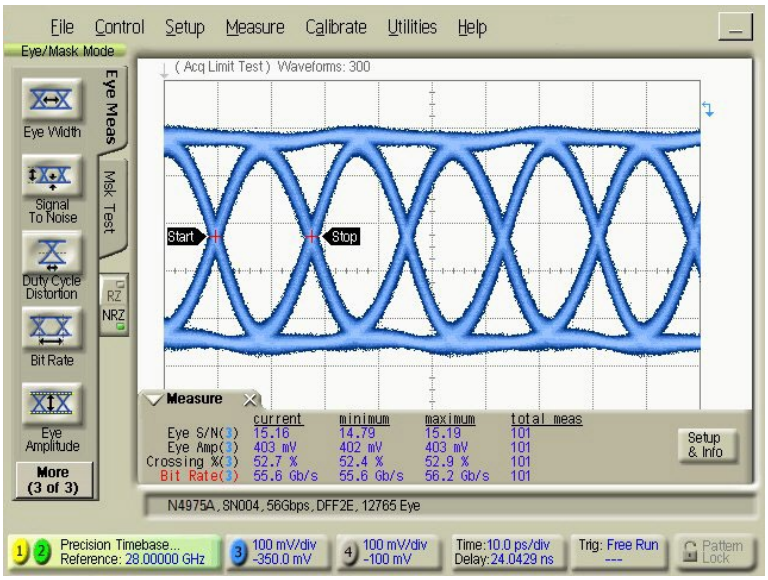

Figure 4. 56 Gb/s typical eye diagram amplitude parameters.

N4975A PRBS generator specifications

Data output	
Data rate	39.8 to 56 Gb/s[1]
Patterns	PRBS 215-1 : 1 + X14 + X15 Divided Clock 1010, and 1100
Output amplitude (single-ended)	500 mV p-p typical (at maximum setting on amplitude adjust control)
Output amplitude adjustment range	0 to −6 dB typical
Output level	high: 0 V nominal low: -500 mV nominal
Jitter	500 fs rms typical
Rise/fall time (20% to 80%)	9 ps typical
External interface	Differential. DC coupled, 50 Ω nominal, 1.85 mm female connectors Note: outputs are CML and must be externally DC terminated with 50 Ω to GND.
Clock/4 input	
External quarter-rate clock input range	9.95 to 14 GHz
External half-rate clock input power required	+4 to +15 dBm (1 to 3.5 V p-p)
External interface (Clk/4 In)	Single-ended. AC coupled, 50 Ω nominal, SMA female connector
Internal clock/4	
Internal quarter-rate clock frequency	14.0 GHz internal oscillator (for 56 Gb/s data rate)
Frequency accuracy	< ±20 ppm typical
Output power	+7.5 dBm typical (1.5 V p-p)
External interface (Clk/4 Out)	Single-ended. AC coupled, 50 Ω nominal, SMA female connector

(Buffered) clock/4 output	
Frequency range	9.95 to 14 GHz
Output power	+2 dBm typical (800 mV p-p)
External interface (Clk/4 Buf)	Single-ended. AC coupled, 50 Ω nominal, SMA female connector
Clock/2 Output	
Frequency range	19.9 to 28 GHz
Output power	0 dBm typical (630 mV p-p)
External interface (Clk/4 Buf)	Single-ended. AC coupled, 50 Ω nominal, 2.92 mm female connector
Pattern trigger output [2]	
Frequency	(Bit_rate)/(128*(215-1)) e.g. at 56 Gb/s frequency = 13.35 kHz
Output amplitude	600 mV p-p nominal
External interface	Single-ended. DC coupled, SMA female connector

1 With an external clock. Internal clock (14 GHz) provides fixed 56 Gb/s data rate operation.
2 Available only with PRBS-15 pattern. Pattern trigger is a square wave output.

General specifications

General and mechanical parameters	
Operating temperature	+10 to +40 °C
Storage temperature	–40 to +70 °C
Power requirements	25 W External AC Adaptor (included) • 100 to 240 V AC, 50 to 60 Hz
Physical dimensions (W x H x D)	178 mm (7 in) x 63.5 mm (2.5 in) x 229 mm (9 in)

Regulatory standards

EMC

Complies with European EMC Directive 2004/108/EC

- IEC/EN 61326-1
- CISPR Pub 11 Group 1, class A
- AS/NZS CISPR 11
- ICES/NMB-001

This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme a la norme NMB-001 du Canada.

Ordering information

N4975A PRBS generator 56 Gb/s

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

KEYSIGHT TECHNOLOGIES