



Agilent

N4970A PRBS generator 10 Gb/s with integrated clock test accessory (TG2P1A)

Data Sheet



Key features

- Fixed-frequency clock source
- Wide operating range, from
- 50 Mb/s to 12.5 Gb/s
- RMS jitter ~ 1.5 ps
- Fast rise/fall times ~ 25 ps
- Small size – 3.5" x 3.5" x 1"
- Multiple output patterns:
- 27, 210, 215, 223, 231
- Multiple mark ratios: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$
- Differential outputs

Description

The N4970A PRBS generator 10 Gb/s (TG2P1A) is a self contained 10 Gb/s pseudo random bit sequence (PRBS) generator. The N4970A PRBS generator 10 Gb/s (TG2P1A) can be configured to use an external clock source allowing operation from 50 Mb/s to 12.5 Gb/s. Five different PRBS pattern lengths and three mark density ratios are available via user selectable jumpers. Differential data outputs provide CML compatible signal levels via the front panel SMA connectors. The N4970A PRBS generator 10 Gb/s' (TG2P1A's) small size, measuring just 3.5 x 3.5 x 1.0", allows for close placement to the device under test. The generator is self contained and plugs into standard PC power supplies.

Application

The N4970A PRBS generator 10 Gb/s (TG2P1A) can be used as a digital source for stimulus/response measurements of high speed logic devices. Characterizing waveform distortion of high speed telecommunication components is simplified with the source's low jitter and fast rise/fall times. Production environments can take advantage of the source's simple interface, low power consumption and small size.



Key specifications

Description	Minimum	Typical	Maximum
Int. clock speed	–	10.0 GHz	–
Ext. clock speed	0.05 GHz	–	12.5 GHz
Output bit rate ¹	0.05 Gb/s	–	12.5 Gb/s
RMS jitter (data) ²	–	0.9 ps	–
RMS jitter (int. clock)	–	1.0 ps	–
20-80 rise/fall times	–	23 ps	25 ps
Eye height	200 mV _(p-p)	250 mV _(p-p)	–
Eye amplitude	250 mV _(p-p)	300 mV _(p-p)	–
OPT008 eye amplitude	700 mV _(p-p)	800 mV _(p-p)	–
Eye SNR ³	18	22	–
Output voltage low	–	–150 mV	–
Output voltage high	–	+150 mV	–
Clock power	-1 dBm	+2 dBm	+3 dBm

¹ Min rate depends on input slew rate; lower rates are possible with fast input

² Measured with external clock and precision timebase

³ As measured by the Agilent 86100A

Typical output waveforms

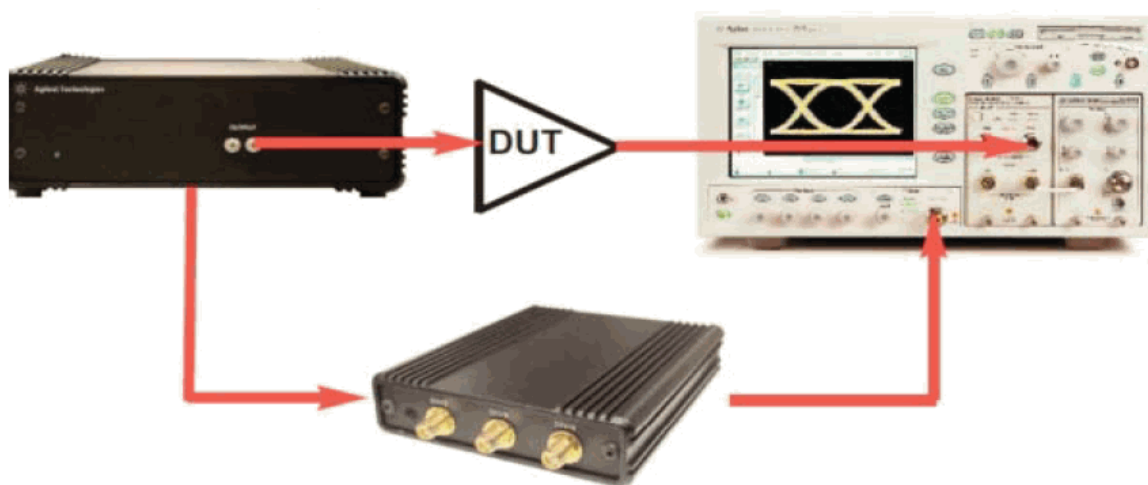


Figure 1. EYE quality measurement setup using the N4970A PRBS generator 10 Gb/s (TG2P1A), DUT and oscilloscope

Typical output waveforms, *continue*

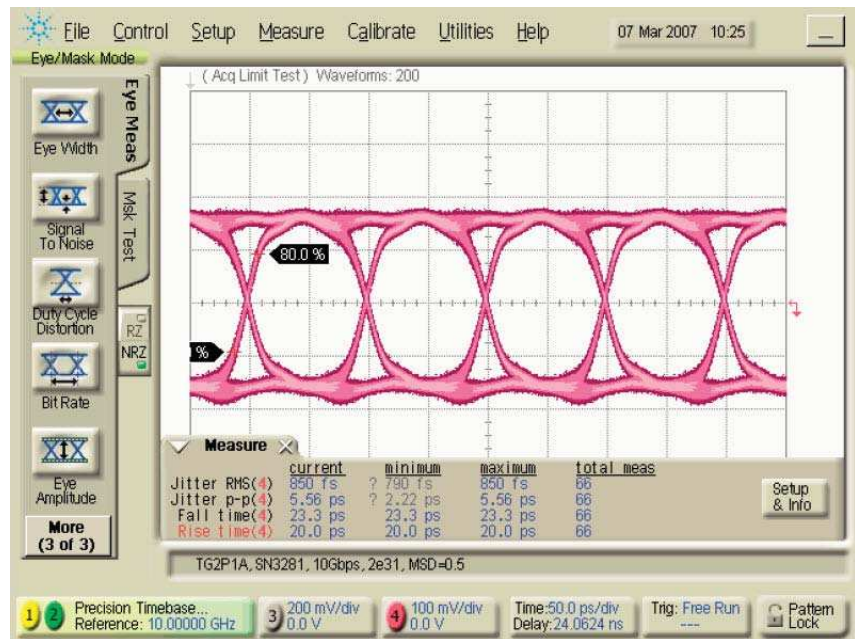


Figure 2. 10 Gb/s, 231-1, mark density $\frac{1}{2}$

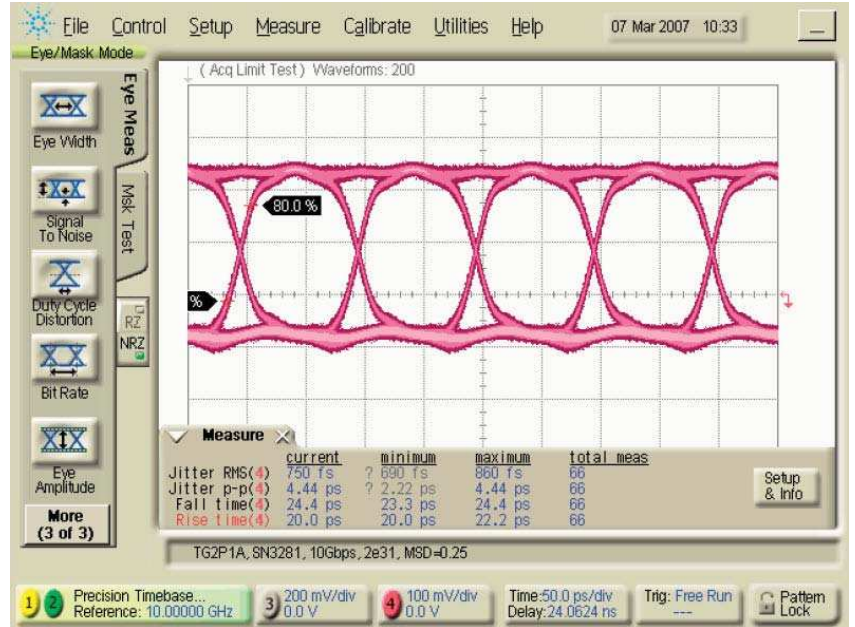


Figure 3. 10 Gb/s, 231-1, mark density $\frac{1}{4}$

Typical output waveforms, *continue*

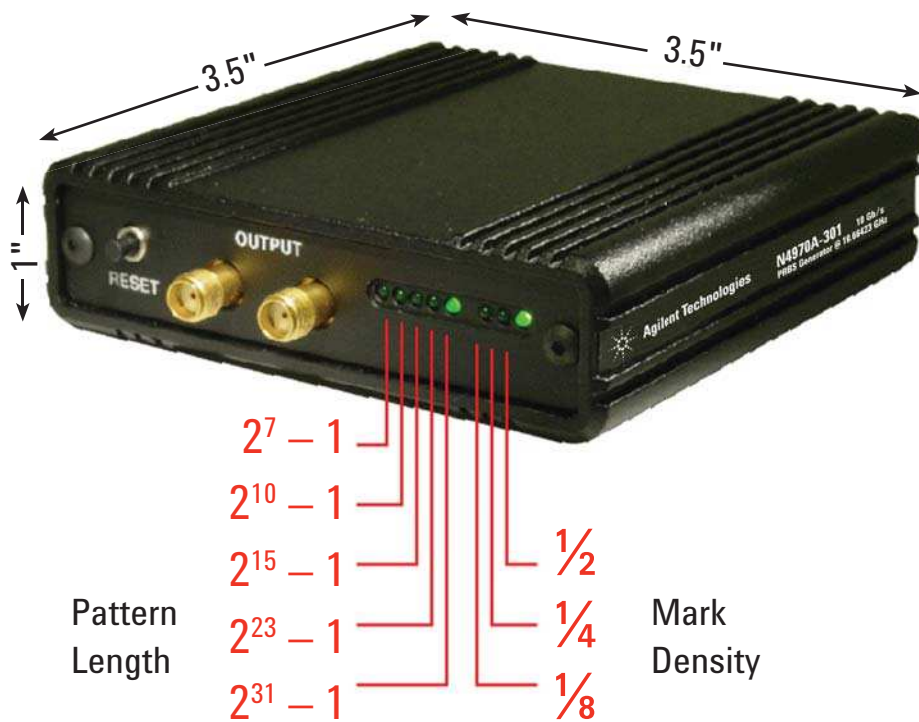


Figure 4. N4970A PRBS generator 10 Gb/s (TG2P1A) front panel outputs and LED annunciators

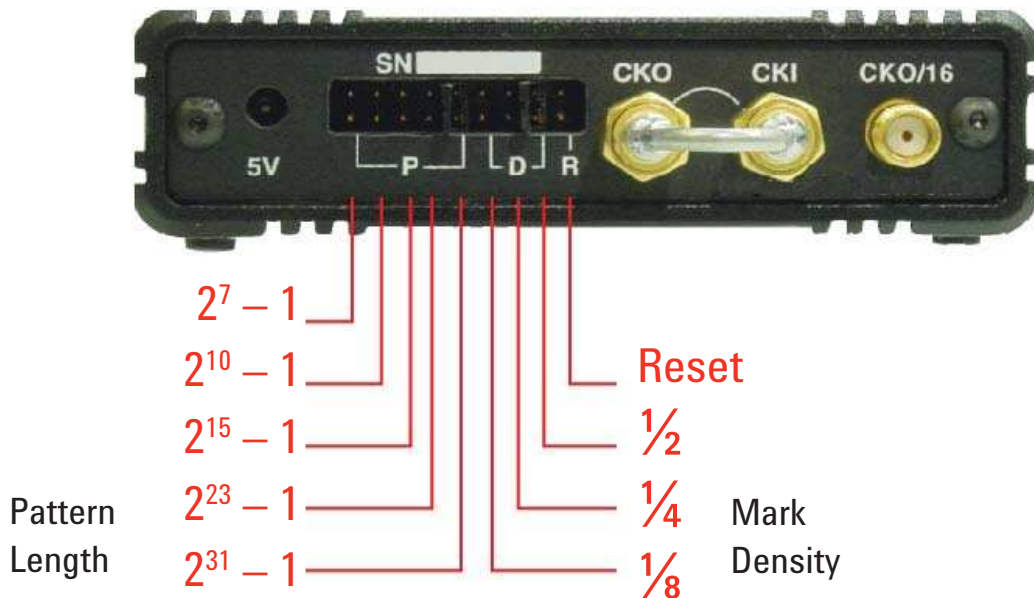


Figure 5. N4970A PRBS generator 10 Gb/s (TG2P1A) rear panel inputs and controls

General and mechanical parameters

Operating Temperature	+10°C to +40°C
Storage Temperature	-40°C to +70°C
Power Requirements	16 W External AC Adaptor (included) <ul style="list-style-type: none">• 100 to 240 V, 50 to 60 Hz. 0.6 A
Physical Dimensions	Width: 3.5", Height: 1", Depth: 3.5"

Regulatory standards

EMC	Complies with European EMC Directive 2004/108/EC <ul style="list-style-type: none">• IEC/EN 61326-1• CISPR Pub 11 Group 1, class A• AS/NZS CISPR 11• ICES/NMB-001 <p>This ISM device complies with Canadian ICES-001. Cet appareil ISM est conforme a la norme NMB-001 du Canada.</p>
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Ordering information

N4970A PRBS generator 10 Gb/s (TG2P1A 10G PRBS), includes 1-year warranty

Warranty and calibration service

For warranty and calibration service information, contact your local authorized Agilent distributor or Agilent sales department.



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