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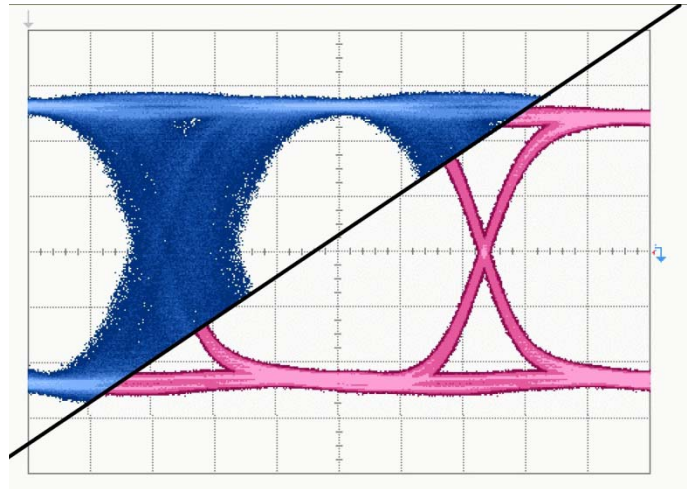
Errata Notice

This document contains references to “Centellax.” Please note that the test and measurement product portfolio once owned by Centellax, Inc. is now part of Agilent Technologies. For more information about these products and support, go to **www.agilent.com/find/bert-news**.

TG7P1A Preliminary Datasheet

4-Tap De-Emphasis Pattern Generator Head

Highly cost effective solution for accurately characterizing
crosstalk, backplanes and multi-lane serial data interfaces



Product Highlights

- Pattern Generation AND 4-tap De-emphasis integrated into the same small package
- 1.5-12.5 Gb/s range of operation
- Integrated 4-tap de-emphasis with pre and post cursor adjustment
- Fully programmable generator output parameters
- Low RMS jitter and very fast rise time
- Transparent jitter pass-through
- Swept aggressor channel delay for crosstalk characterization
- Compact size
- Programmable via PCB12500 Parallel Channel BERT

TG7P1A Preliminary Datasheet

TG7P1A Generator Head

Each head connects to the PCB12500 controller through a 1 m cable. This allows it to be located near the signal connection points in the device under test, minimizing cable loss.

The modular architecture allows you to purchase only the heads your application requires. No need to spend more on unused output or input channels.

Integrated 4-Tap De-Emphasis

TG7P1A generator heads include integrated four tap de-emphasis conditioning. Commonly used in higher data rate systems to open eyes by counteracting high frequency loss in the channel, applying de-emphasis to the test signal is required for receiver testing. Other vendors' generators require additional dedicated external signal processors. The internal de-emphasis conditioning in the TG7P1A generator heads eliminates the expense of additional signal processors, as well as the associated signal degradation resulting from the extra cables used to connect them.

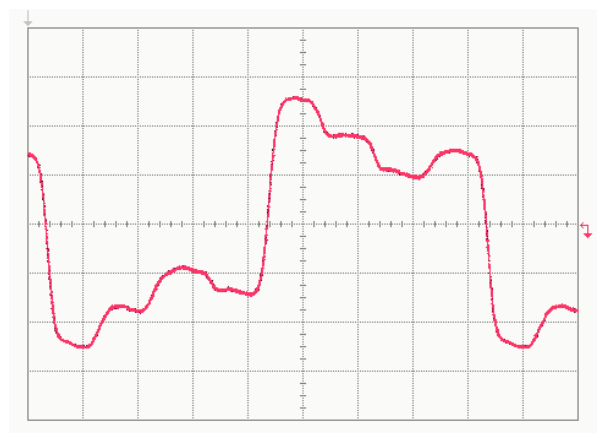
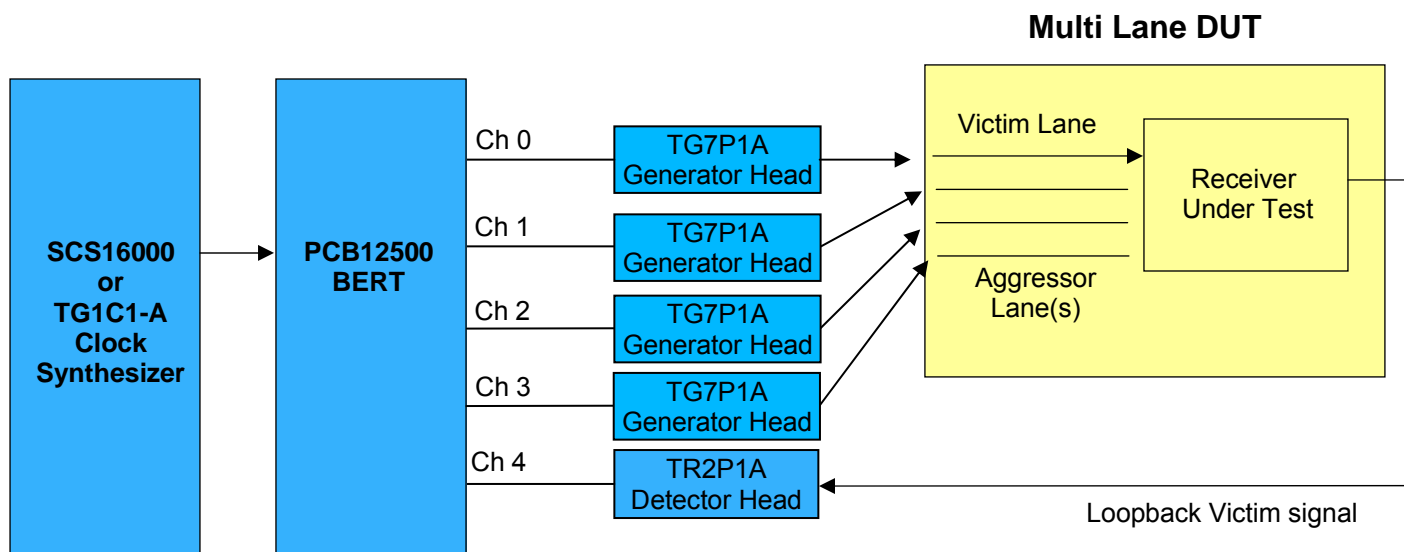


Figure 1: Example of variable de-emphasis on one pre-cursor and two post-cursor

Typical Measurement System Setup – Crosstalk Susceptibility



TG7P1A Preliminary Datasheet

Specifications

TG7P1A Generator Head	
Signal Configuration	Differential. Will operate in single-ended mode
Data Line Coding	Non-return to Zero (NRZ)
Output Data Rate	1.5 Gb/s – 12.5 Gb/s
Patterns	PRBS 2^n-1 , $n=7, 10, 15, 23, 31$ Divided clock patterns (div by 2/4/8/16/32/64) e.g. $\div 2 = 1010$ pattern, $\div 4 = 1100$ pattern; $\div 64 = 32 \times '1$'s followed by $32 \times '0$'s
Pattern Invert	Logic 0, Logic 1
Output Amplitude	Available on all PRBS patterns
Transition Times 20% to 80%	0.6 to 1.2 V in 5 mV steps, each side
Intrinsic Jitter	30 ps maximum, 25 ps typical
Output DC Offset	10 ps p-p, typical, data rates ≥ 2.5 Gb/s 20 ps p-p, typical, data rates < 2.5 Gb/s
Termination Voltage	-1.8 to +1.8 V in 5 mV steps
Cross over	-2.0 to +2.0 in 5 mV steps
De-Emphasis	20 to 80% in 1% steps
Error Injection	4-tap (1 pre-cursor, 2 post-cursor) Pre-cursor 0 to +8 dB in 0.1 dB steps Post1 cursor 0 to -10 dB in 0.1 dB steps Post2 cursor 0 to -8 dB in 0.1 dB steps (Combination of Post1 and Post2 limited to -10 dB)
Delay Range	Single error injection or injection rates with BER = 10^{-N} , N=3,4,5,6,7,8,9
Skew Delay	$\pm 1,000$ UI, 1 mUI steps (Determined by PCB12500)
Swept Delay	± 99.999 UI, 1 mUI steps (Determined by PCB12500)
Data Connectors	0, 1, 2, 4 UI p-p
	2.92 mm, female

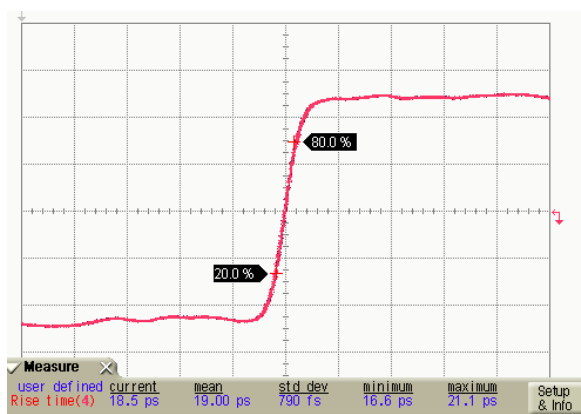


Figure 2: Typical rise time

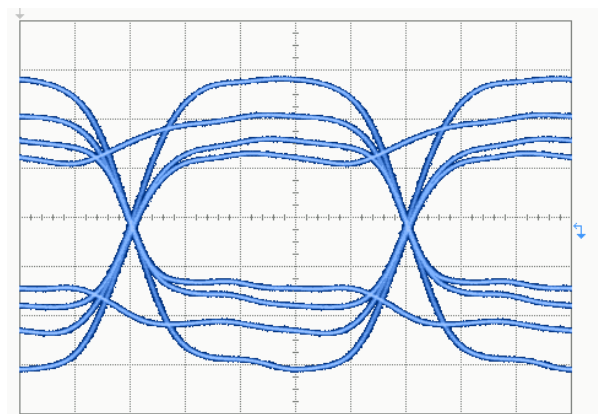


Figure 3: PRBS7 pattern with de-emphasis

TG7P1A Preliminary Datasheet

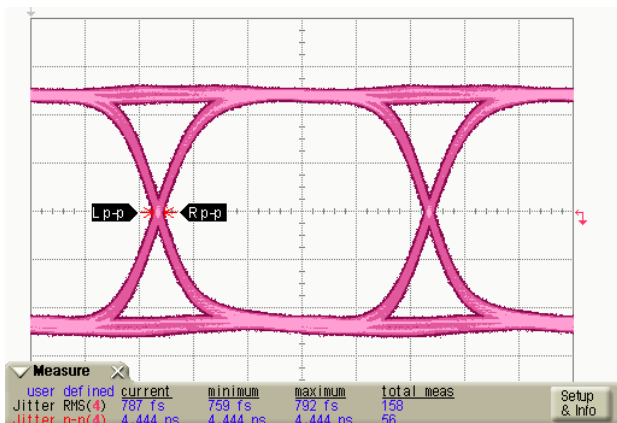


Figure 4: PRBS 2³¹ data signal

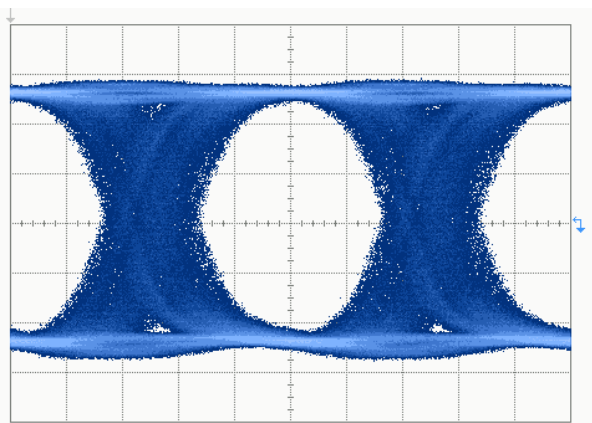


Figure 5: PRBS 2³¹ data signal with Sinusoidal Jitter

Typical use of de-emphasis is to compensate for some of the signal degradation caused by a lossy channel, i.e. cables, backplanes.

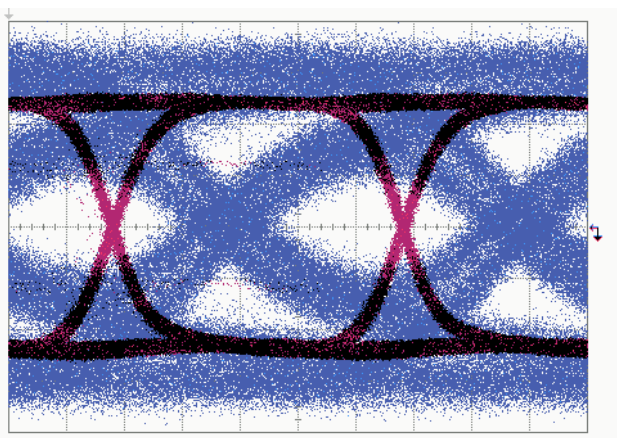


Figure 6: No TX de-emphasis (red trace) results in a closed eye (blue trace) at the receiver input.

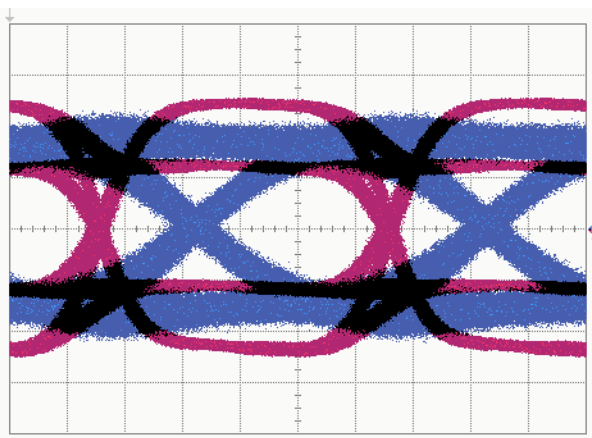


Figure 7: TX de-emphasis enabled (red trace) results in an open eye (blue trace) at the receiver input.

Physical and Environmental

Temperature: Operating, (Non-Operating)

+10° to +40° C, (-40° to +70° C)

Dimensions (*Height, Width, and Depth*)

33 mm (1.3 in) x 72 mm (2.8 in) x 130 mm (5.1 in)

Weight

0.38 kg (13.4 oz)

Compliance

EMC

Complies with:

European EMC Directive 2004/108/EC, IEC/EN 61326, CISPR 11 Group 1 Class A, AS/NZS CISPR 11, ICES/NMB-001

TG7P1A Preliminary Datasheet

Ordering Information

Product Code	Description
TG7P1A	1.5-12.5Gb/s 4-Tap Pattern Generator Remote Head

TG7P1A includes: 2ea. cable, 12.7 cm (5 in) SMA-M to SMA-M, 1 ea. terminator, 50 Ω , SMA-M, printed Quick Start Guide, standard 1 year warranty

Warranty and Calibration Services

-OPT300	1 Year Warranty Extended to 3 Years
-OPT301	1 Year Warranty Extended to 5 Years
-OPT320	Centellax Calibration – Per Incident
-OPT321	Annual Centellax Calibration for 3 Years
-OPT322	Annual Centellax Calibration for 5 Years

More Information

For additional information, to schedule a product demonstration, or to request a quote, contact your local authorized Centellax Distributor or:

Centellax Sales Department
Tel: 1-866-522-6888
Fax: 1-707-568-7647
E-mail: sales@centellax.com
www.centellax.com