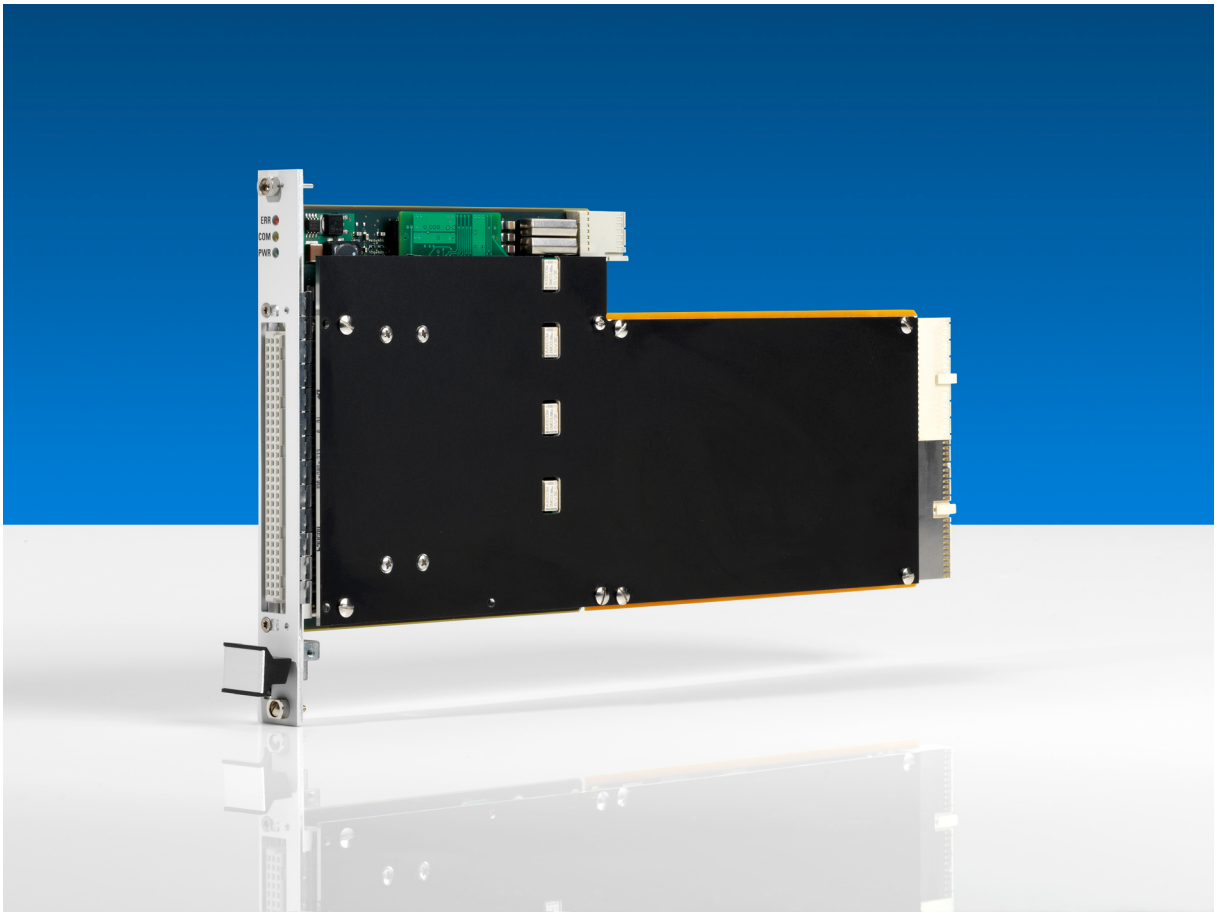
Technical Information

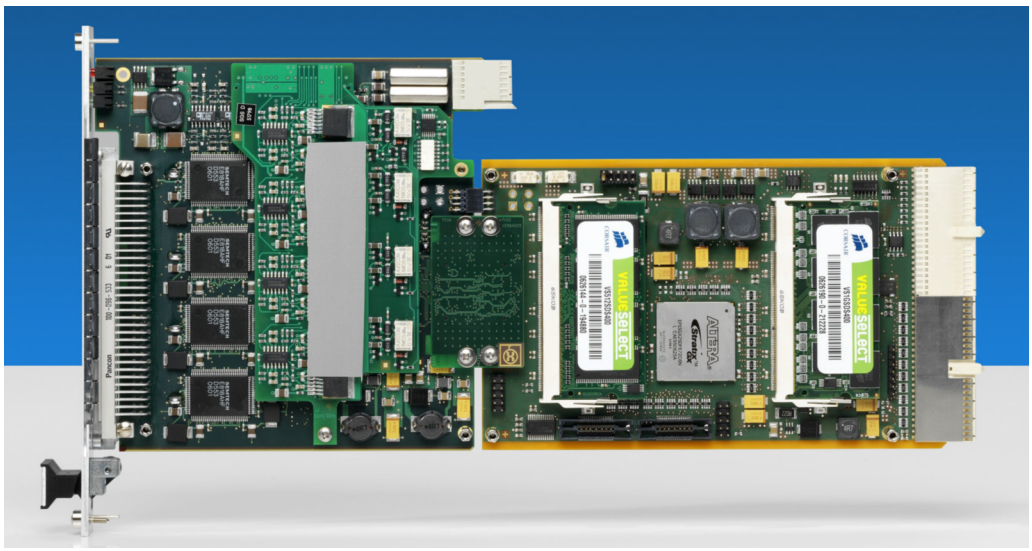


High-Speed Digital Test Module
R&S TS-PHDT

- For component and board test
- High pattern rate 40 MHz
- 32 Outputs + 32 Inputs
- Level range -3 V to +10 V, 4 groups
- Hi and Lo programmable, two thresholds
- Memory depth 64 M
- Independent pattern sets, selectively executable and re-usable without new download
- Tristate at full speed, RTZ clock formatting
- Forbidden-zone detection
- Real-time compare and results: pass/fail, failed channels, failed pattern
- Timing resolution down to 12.5 ns
- Triggering/synchronisation with analog PXI measurement cards
- Cascading for increased channel count
- Selftest capabilities
- Soft panel support for immediate deployment
- IVI-C driver support

ROHDE&SCHWARZ

V0.4 Ts / 28.02.2007



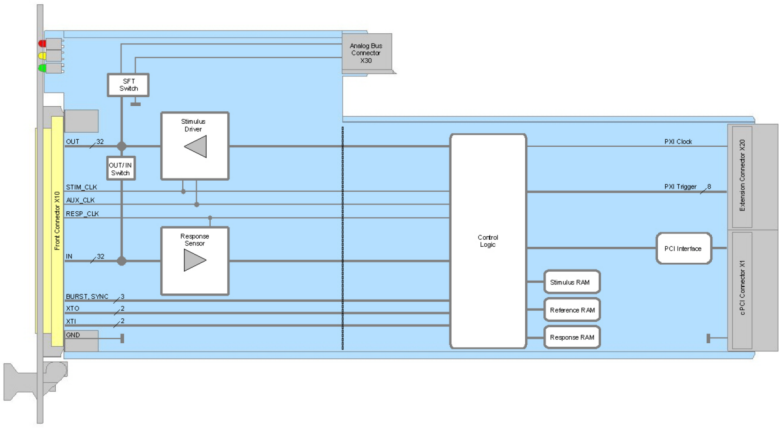
Product introduction

The high-speed digital test module in the R&S CompactTSVP features excellent characteristics in a compact format at a low price. Due to the specifications and the price, the R&S TS-PHDT module can be used both in component and board testing. Its modularity and ability to synchronize with analog modules, e.g. PXI modules, makes mixed signal test possible. For higher channel numbers, several modules can be cascaded.

The R&S TS-PHDT's high pattern rate, timing resolution, and wide level range cover all currently relevant logic families.

Its huge memory capacity of 1.5 GByte makes it possible to create patterns of virtually unlimited length, as they are often generated by simulators. Several pattern sets can be downloaded once and be used again and again, thus eliminating the need for repeated time-consuming reload or download in production. In digital tests, the execution time is not defined by the actual tests but by the download and upload times. In production, an upload of measured data is not necessary at all. During execution, the hardware locally compares the measured values of the pin electronics – also at maximum pattern rate – with the nominal values in real time. Pass/fail, number of errors, failed channels, failed steps, and a short history are available in the error memory immediately after terminating a pattern set. Uploading larger data volumes is only necessary for debugging during program generation.

The stimulus and measurement unit can be synchronized or used independently of each other. The pattern period and trigger delays can be set with a resolution of up to 12.5 ns; response delay for measurement and auxiliary clock with a resolution up to 3 ns. Clock signals for the device under test (DUT) can be directly generated by means of the auxiliary clock (formatting) and thus do not occupy several steps in the pattern memory for generating a pulse (return-to-zero, RTZ).

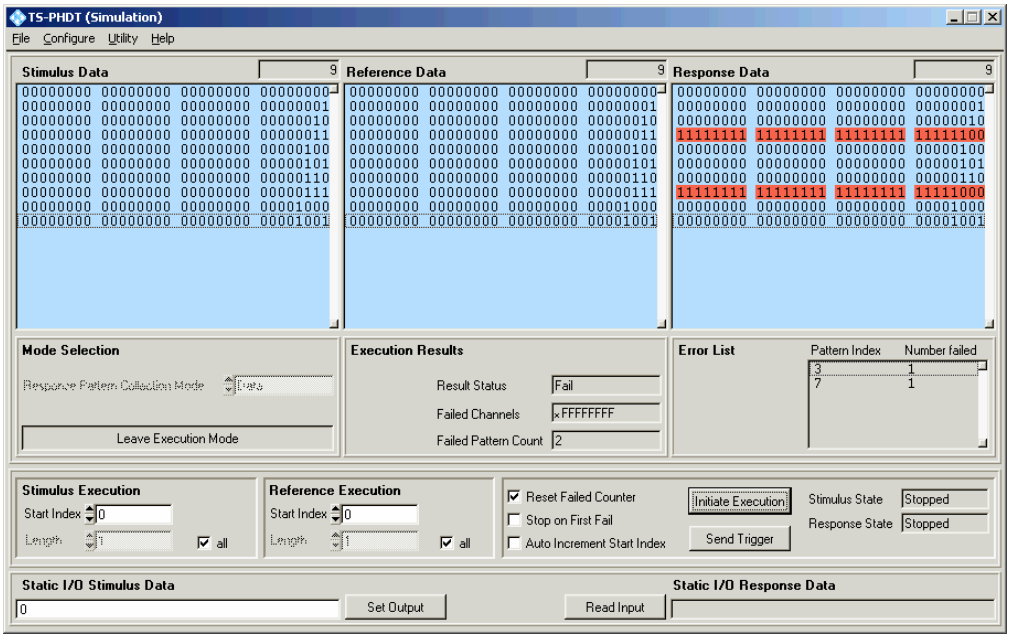


Block diagram of the R&S TS-PHDT module

Software support

An IVI-C driver is available for the functions of the High-Speed Digital Test Module R&S TS-PHDT. The driver is a component of the ROHDE & SCHWARZ GTSL software. All functions are documented extensively in online Help and in the LabWindows/CVI Function Panels.

A Soft Panel is available for the module. The Soft Panel is based on the IVI driver and allows for interactive operation of the module.



Soft panel of the R&S TS-PHDT module

Security by selftest and diagnostic features

A comprehensive dynamic module self test is performed between drivers and sensors and via the analog bus in conjunction with the R&S TS-PSAM module.

Diagnostic LEDs on the module front panel speed up system integration and allow proper operation to be determined at a glance.

Specifications

Application in R&S TSVP platform

R&S CompactTSVP	1 slot required

Interface

Control bus	CompactPCI/PXI
DUT connector (front)	DIN 41612, 96 pins
Tolerances for temperature range	23° ± 5° C
Temperature coefficient outside	± (0.1 x accuracy) / ° C

Data input channels

Channels	32, in 4 ports of 8 channels
Input voltage	-3 V to +12 V, clamping if outside range
Input thresholds	two per port
Range	-2 V to +9 V
Resolution	< 1mV (14 bit DAC)
Accuracy	+/- 100 mV for ≤ 3.3 V/ +-150 mV for > 3.3 V, typ
Programmable per port	Hi and Lo
Detection	Hi, Lo, forbidden zone
Input impedance	1 MΩ // 28 pF typ.
Protection	overvoltage +/- 24 V

Data output channels

Channels	32, in 4 ports of 8 channels
Output voltage	-3 V to +10V
Resolution	< 1mV (14 bit DAC)
Accuracy (static, no load)	+/- 50 mV typ.
Output current	80 mA per channel
Max. current per port	500 mA for ≤ 2.9 V/ 200 mA for > 2.9 V
Current limit accuracy per port	+/- 40 mA typ.
Programmable per port	Hi and Lo, current limit
Rise / fall time (typ)	6 ns (20% to 80% of -3 V to 10 V transition)
Tristate control	each channel at max pattern rate
RTZ clock formatting	static enable for each channel
Output resistance	39 Ohm typ.
Protection	short circuit protected, reverse voltage +/- 24 V at 150 mA

Timing generation

Pattern rate	40 MHz max.

Timing setting ranges

	Resolution	Min	Max	Condition
Pattern period	12.5 ns	25 ns	10 s	
Trigger delay	12.5 ns	0	50 s	
Response delay	3 ns	0	10 s	< pattern period
RTZ delay	3 ns	0	10 s	delay + width < pattern period
RTZ width	3 ns	12.5 ns	10 s	delay + width < pattern period

Triggering	internal, 2 ext, 8 PXI
Synchronisation	between modules
Clock outputs	stim, resp, aux (RTZ)

Memory

Memory depth	64 M pattern for stim, tristate, ref/mask, resp
Pattern comparison	real-time or software
Results in real-time	pass/fail, failed channels, failed pattern count, failed pattern list

General Data

Power consumption	max. +5 V / 6 A, +12 V / 1.1 A, +3.3 V / 1.5 A from cTSVP frame
EMC compliance	compliant with EMC directive 89/336/EEC and EMC standard EN 61326
Safety	CE, EN 61010 Part 1
Mechanical loading	
Vibration test, sinusoidal	5 Hz to 55 Hz: 2 g, MIL-T-28800D, class 5 55 Hz to 150 Hz: 0.5g, MIL-T-28800D, class 5
Vibration test, random	10 Hz to 300 Hz, 1.2 g

Shock test	40g, MIL-STD-810, classes 3 and 5
Temperature loading	
Operating temperature range	+5°C to +40°C
Permissible temperature range	0 to +50°C
Storage temperature range	-40°C to +70°C
Humidity	+40°C, 95% rel. humidity
Dimensions	Module 316 mm x 174 mm x 20 mm,
Weight	0.6 kg (1.3 lb)
Recommended calibration interval	not required

Ordering Information

Designation	Type	Order No.
High-Speed Digital Test Module	R&S TS-PHDT	1157.9704.02
Test Platform R&S CompactTSVP	R&S TS-PCA3	1152.2518.02

Certified Quality System ISO 9001

Certified Environmental System ISO 14001

More information at
www.rohde-schwarz.com
(search term: TS-PSU)

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