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Test pulse generator with low jitter (ETTG-100)

Introduction

Eventech, an European spin-off company from Institute of Electronics and Computer Sciences of Latvia has developed new test pulse generator and is looking for feedback on potential applications, necessary technical improvements and customers for pre-ordering.

Application

Pulse generator is designed for high-precision time analyser testing and other applications related to the need of period generation of time intervals with picosecond jitter.

Functional and parametric capabilities

In the period generation mode generator is a source of periodic pulse signal with low jitter of generated period. Generation is carried out using 2 outputs:

- STOP output has the period range T from 20 ns to 2.6 ms with the 10 ns step;
- START output has the period range M*T, where M is set in the range from 2 to 65536 (from 40 ns to 171.8 s).

Jitter of the generated period depends on its value and is not more than 1.5 ps in the period range from 20 ns to 100 µs. It increases to 4 ps for the period equal to 1 ms up to 6 ps for the period equal to 2.6 ms.

Jitter of generated periods, larger than 2.6 ms, is not specified.

In time interval generation mode generator is a source of start-stop time intervals with low jitter. Time intervals Δ are generated in the range from 20 ns to 2.6 ms with 10 ns step.

The generation period can be set by setting the coefficient M and it is equal to M*Δ.

Jitter of generated time intervals depends on their value and is not more than 2.6 ps in the range from 20 ns to 500 µs. It increases to 4 ps for the interval equal to 1 ms and to 6 ps for the interval equal to 2.6 ms.

In multistop time interval generation mode predetermined number of stop pulses, which is equal to M-1, is generated for every start pulse.

In all modes the temperature instability of generated periods is not more than 0.1 ppm/Cº, for time intervals - not more than 0.2 ppm/Cº.

Additional features

Synchronization is possible based on an external 10 MHz frequency reference. The presence of the external reference signal is indicated. The magnitude of the error of the period and time interval values as well as their temperature instability, when using external reference signal, is defined by parameters of the latter.

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If the external synchronization is not used the value of generated periods or of time intervals could be tuned within ±50 ppm.
Output of the internal clock signal (100 MHz) is available.
Up to 5 parametric generator settings are possible, which are selectable in stand-alone mode by CTRL button.
Generator is controlled by a PC via USB interface.
Control program is running on Windows XP/7/8/10.

Parameters of output pulses

Generator has a modification for negative pulse generation in levels of the standard NIM (ETTG-100_NIM) and a modification for positive pulse generation in levels of the standard LVTTL (ETTG-100_TTL). The outputs of generator are designed to drive only 50 Ohm load; duration of the output pulses is fixed at 10 ns; the duration of the leading and trailing pulse edges is not more than 600 ps.

Physical parameters

Dimensions - 255x170x36 mm
Weight - 0.8 kg
Power is supplied from an external power supply with +7.5 V voltage, 1200 mA current consumption.
Operating conditions – laboratory.

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ETTG-100 specification summary

Output signal type: ETTG-100-NIM ETTG-100-TTL	 Negative NIM pulses (For 50 Ω load: amplitude – 0.8 V, rise time <600 ps; pulse width = 10 ns) Positive TTL/LVTTL pulses (For 50 Ω load: amplitude +2.5V, rise time <600 ps; pulse width = 10 ns)
Outputs (BNC, 50 Ω): STOP START 100 MHz	 Pulse sequence; period from 20 ns up to ~2,6 ms (step = 10 ns) Pulse sequence; period from 40 ns up to ~171,8 s (step = 1 STOP pulses period) Internal clock; adjustable from – 50 up to +50 ppm, if the reference frequency is not used
Input (BNC, 50 Ω): REF 10 MHz	 Reference 10 MHz (level >0.5 V peak-to-peak); If it is present, the Internal clock is locked to it and isn't adjustable
Special modes: Start-Stop mode Locked Internal clock	 Multi-stop mode, no Stop pulse in time of Start pulse 100 MHz Internal clock auto-locked to 10 MHz external reference frequency
Nonvolatile memory	5 settings selectable in stand-alone mode by CTRL button
Jitter of period:	~1.5 ps for periods up to 100 mks ~6 ps for periods up to 2,6 ms
Jitter of time interval:	~2.5 ps time interval up to 100 mks ~6 ps for periods or time interval up to 2,6 ms
temperature instability of period:	~0.1 ppm/Cº in the range 10 Cº – 40 Cº
temperature instability of time interval:	~0.2 ppm/Cº in the range 10 Cº – 40 Cº
Remote programming:	Via USB interface
Application software:	MS-Windows XP/7/8.1/10 based
Hardware dimension, weight:	255x170x36 mm, 0.8 kg
Power supply:	DC +7.5V, 1.2A