Model TD2000 Ultra Fast Timing Discriminator with GHz LE operation

FEATURES

- -2.0 to +3.0V input range
- ±1.25V input threshold range
- GHz operation capability
- 750ps min. output pulse width
- Four outputs
- Fast VETO input
- Shaped output pulse widths <1ns to >350ns
- Unshaped output bandwidth 2.4GHz (3dB)

APPLICATIONS

- Ultra high count rate Single Photon Counting
- LIDAR
- TOF Mass-Spectrometry
- Ultra high count rate Multiscaling

DESCRIPTION

Probably the fastest leading edge discriminator available today. The unshaped outputs can be used at rates in the GHz range (ref.Fig 3).
A fast NIM VETO input provides for inhibiting the shaped outputs.
The fast NIM outputs exhibit fall times of <200ps.
The shaped fast NIM output has a minimum pulse width of typ. 750ps only.
Even the positive output has a fast rise time of approx. 500ps. Thus, pulse widths as low as 2ns can be achieved at full amplitude.

SPECIFICATIONS

General:

Input to unshaped output delay: approx. 1.7ns
Input to shaped output delay: approx. 3.3ns

Inputs:

Signal: BNC, 50 Ω, direct coupled, -2.0 to +3.0V, sensitivity <10mV, slew rate requirement ≥5V/µs

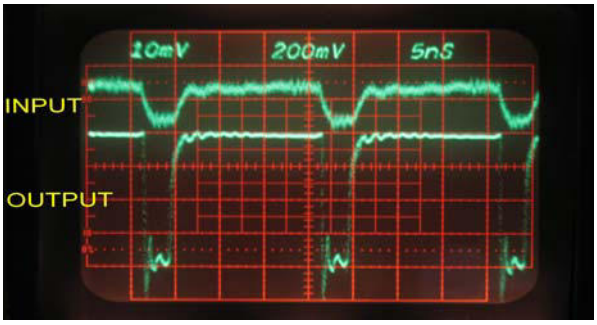

Fig 1: Input sensitivity

Threshold: ±1.25V, 10-turn precision potentiometer, 2mm monitor test point for voltmeters

Veto: BNC, 50Ω, direct coupled, -300mV threshold, fast NIM compatible, slew rate requirement ≥5V/µs

Outputs:

Unshaped: 2x BNC, 50 Ω back-terminated, fast NIM current mode, -16mA into external 50 Ω, inverting & non-inverting, 2.4GHz (3dB) bandwidth

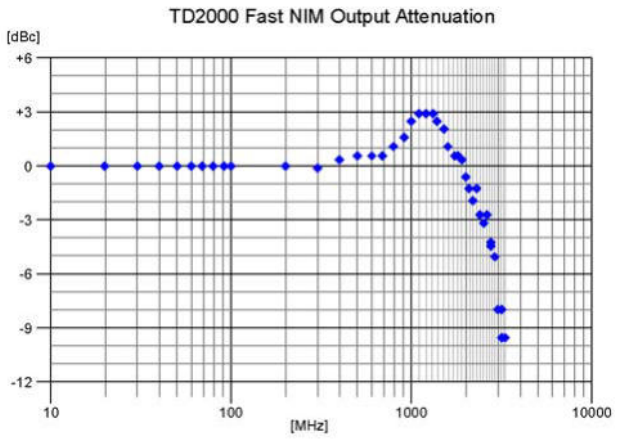

Fig 2: FAST NIM attenuation (dBc)

TD2000 17042007

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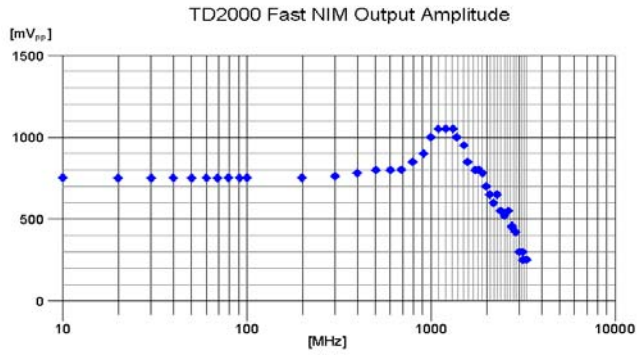

Fig 3:FAST NIM output amplitude

Fig 4 FAST NIM fall time

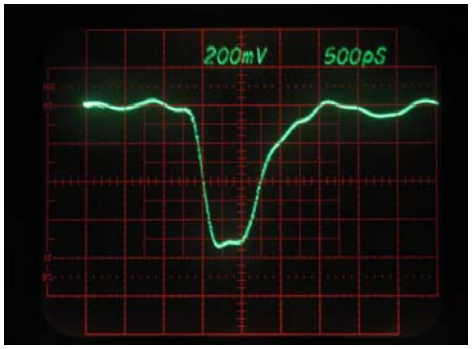

Fig 5: Minimum pulse width

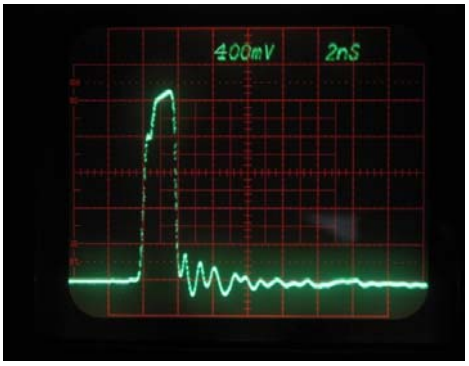

Fig 6: Small positive output pulse

Oscilloscope shots are taken with a 14 GHz sampling head

Shaped: 2x BNC, pulse width 10-turn screwdriver adjustable, <1ns to >350ns, input edge sensitivity rising/falling switch selectable
a) 1x negative fast NIM current mode, 50Ω back-terminated, -16mA into external 50Ω, 400MHz continuous rate
b) 1x positive voltage follower mode,
V_{OL} < 0.5V, V_{OH}>+2.0V into external 50Ω (for widths > 2ns)

Physical:

Case: extruded aluminium sheath Al Mg Si 0.5
Lid: die cast, GD-Al Si 12
Size: 121/153 x 142 x 37 mm
Weight: 500 g

Power Requirements:

Connector: 2.1 mm center pin
Supply Voltage: nominal +12V
voltage range +10 … +18V
Supply Power: 6W
Reverse polarity protected

Absolute maximum ratings:

Supply: 25V (100ms max.)
Signal input: -3V ... +4.0V
EDS rating 1,500V HBM

Accessories:

- External wall power supply (included)
- Precision screwdriver (included)

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