1000BASE-T1 Transient pulse shape definition
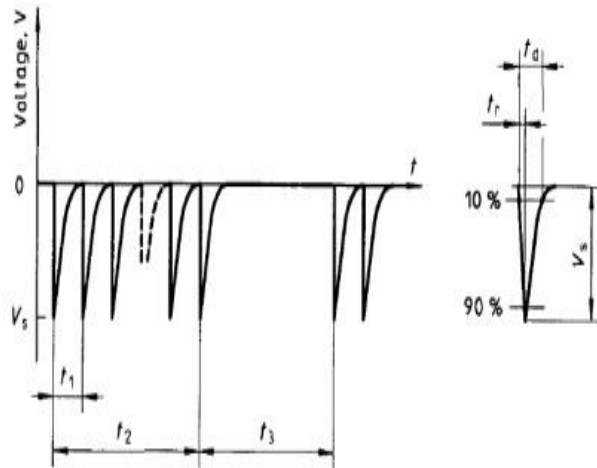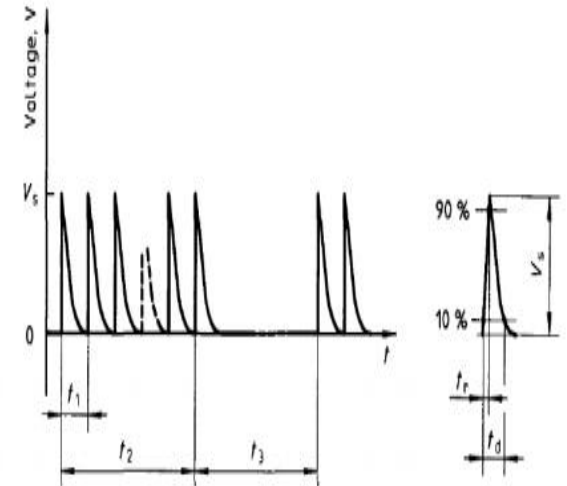
Vijaya G. Ceekala

Texas Instruments

Positive and Negative Test Pulses – ISO 7637-3

**Parameters**

V_s (see table A.1 for 12 V electrical systems or table A.2 for 24 V electrical systems)
R_i = 50 Ω
t_d = 0,1 μs
t_r = 5 ns ± 30 % at V_s = − 50 V, 50 Ω
t_1 = 100 μs
t_2 = 10 ms
t_3 = 90 ms

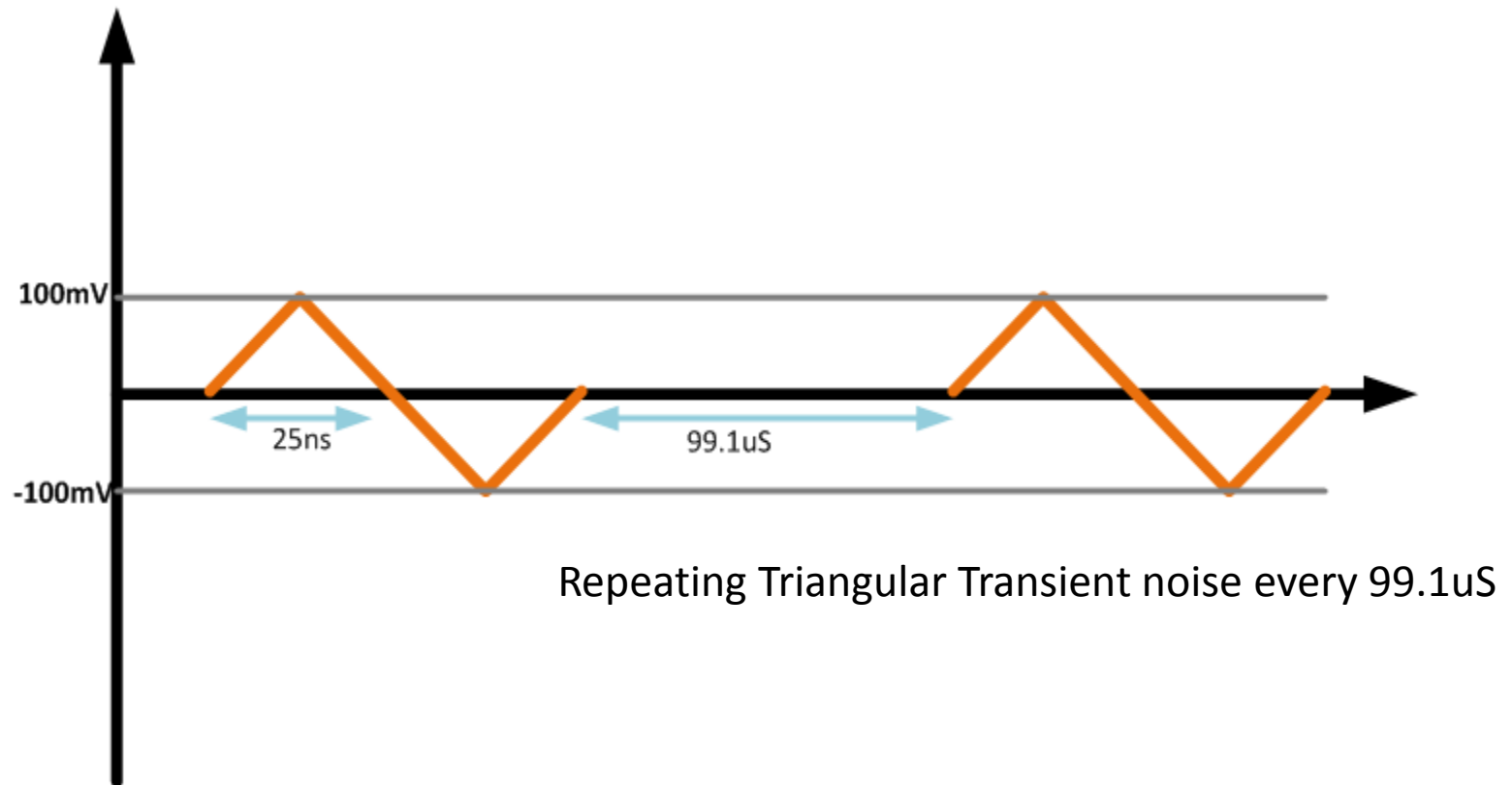**Parameters**

V_s (see table A.1 for 12 V electrical systems or table A.2 for 24 V electrical systems)
R_i = 50 Ω
t_d = 0,1 μs
t_r = 5 ns ± 30 % at V_s = + 50 V, 50 Ω
t_1 = 100 μs
t_2 = 10 ms
t_3 = 90 ms

Simulated Transient Noises – From (Chini_Tazebay_3bp_01a_0114.pdf)
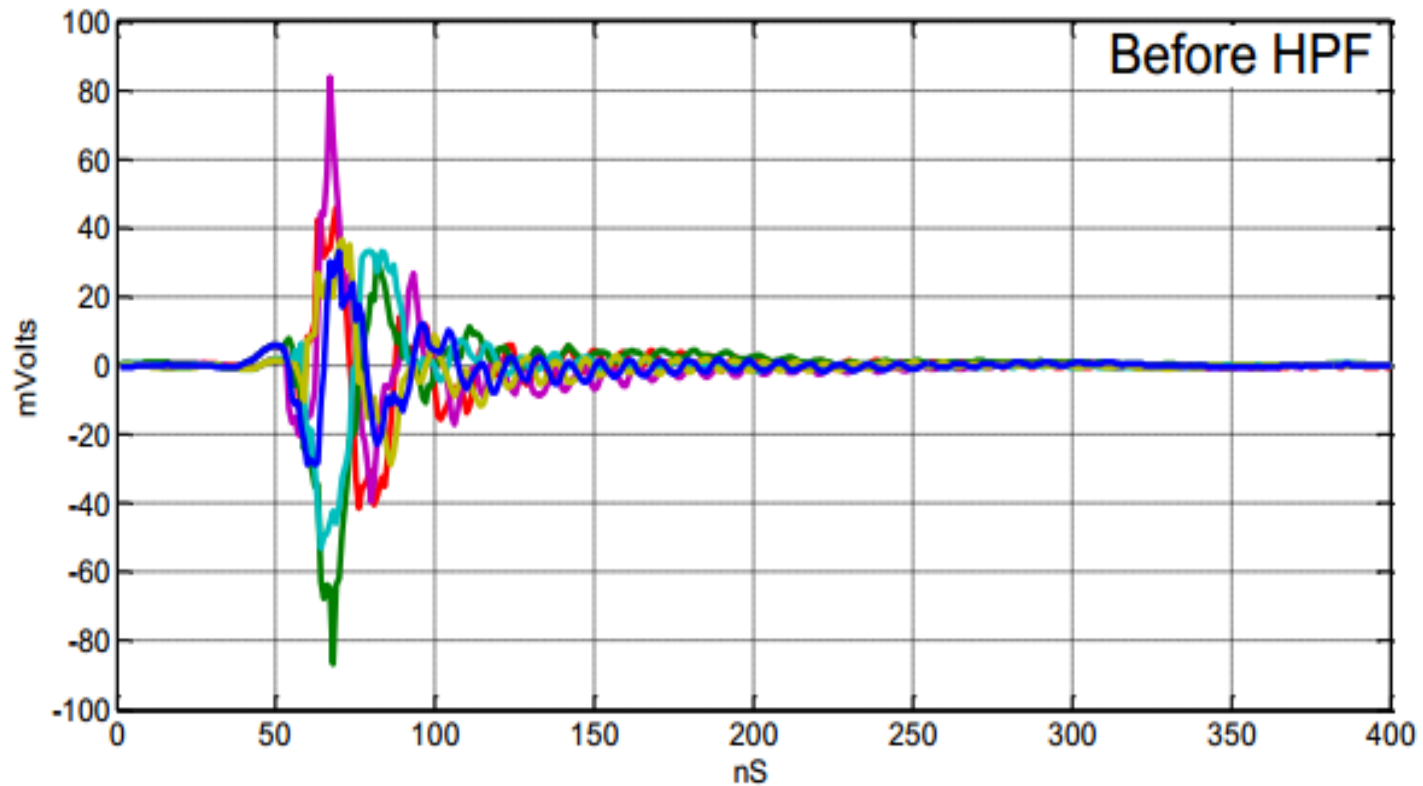
Suggested Transient Test waveform

Repeating Triangular Transient noise every 99.1uS

Transient Pulse modeling methodology (Without a High-pass filter)

- With some cables, as measured by Chini_Tazebay_3bp_01a_0114.pdf, the effect of the transients is seen as a triangular waveform

- This can be modeled by a triangular waveform with 50ns period

- As given by ISO 7637-3, transient test is carried out by periodically applying positive and negative pulses every 100uS

- In a system simulation or modeling environment, when simulating with pseudo-random data patterns, depending on the data pattern being transmitted, the transient waveform may not adversely affect the data integrity.

- Hence the transient waveform needs to be repeated at about 100us time intervals. 99.1uS time interval is recommended