

Burst Test Pulses are faster than CMTI

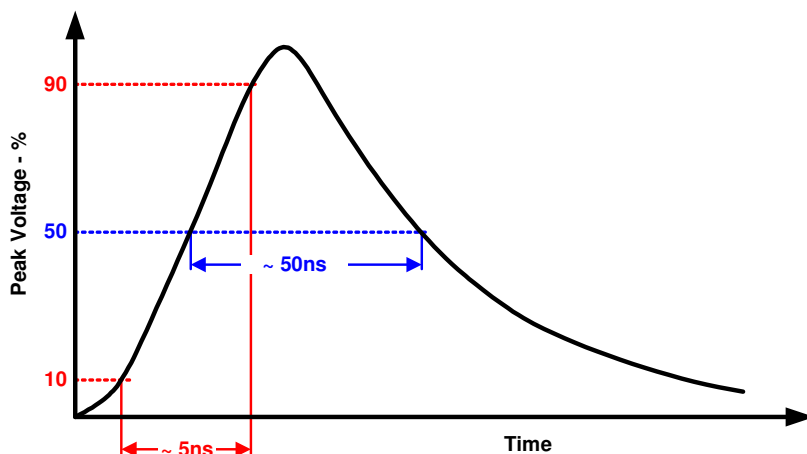
Question: Why do burst test pulses go through **ANY** digital isolators? (*not just TI's*)

Answer: Because their CMTI is too low.

Explanation:

CMTI (Common-Mode Transient Immunity) is a measure of how fast potential differences between GND1 and GND2 can occur without being transferred across the isolation barrier. Minimum values for most isolators are in the range of 25kV/μs, typical values are around 50kV/μs. These values basically represent the Maximum slew rates of the common-mode transient than can be applied without crossing the barrier. Faster transients will pass the barrier causing data errors.

Burst test pulses are faster than that.



Test Level	Peak Voltage / kV	
	Supply Lines	I/O Lines
1	0.5	0.25
2	1	0.5
3	2	1
4	4	2

The left diagram shows the typical waveform of a burst pulse according to IEC61000-4-4 with a rise time of approximately 5ns up to its peak value. Depending on the test level's peak voltage, V_p , (right table), the slew rate, SR, can be approximated by calculating: $SR = V_p/5ns$.

Thus for the lowest level, level 1, with a $V_p = 0.25kV$ the slew rate becomes:

$SR = 0.25kV/5ns = 50 kV/\mu s$, which is well above any isolator's minimum CMTI.

For other test levels multiplying V_p by 200 yields the slew rate in kV/μs.

TK