ANALOG DEVICES

Clause 189
DV/DT and DI/DT

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dV/dt Calculation

See Sept '24 presentation for dV/dt calculation method

paul_02_da_202400916_v1.pdf

Previous presentation used 100mV as the threshold voltage for disturbance to the phy

100mV is too high

Discussions at the Sept. 24 interim in Hamburg, Germany led to the conclusion that -101dBm between 1MHz and 20MHz is a better threshold

This is the alien crosstalk noise threshold

This noise level should lead to a 1dB reduction to SNR at the receiver

-101dBm/Hz over 1MHz – 20MHz = 12.8mVpp

Clause 189 dV / dt and dI/dt limits

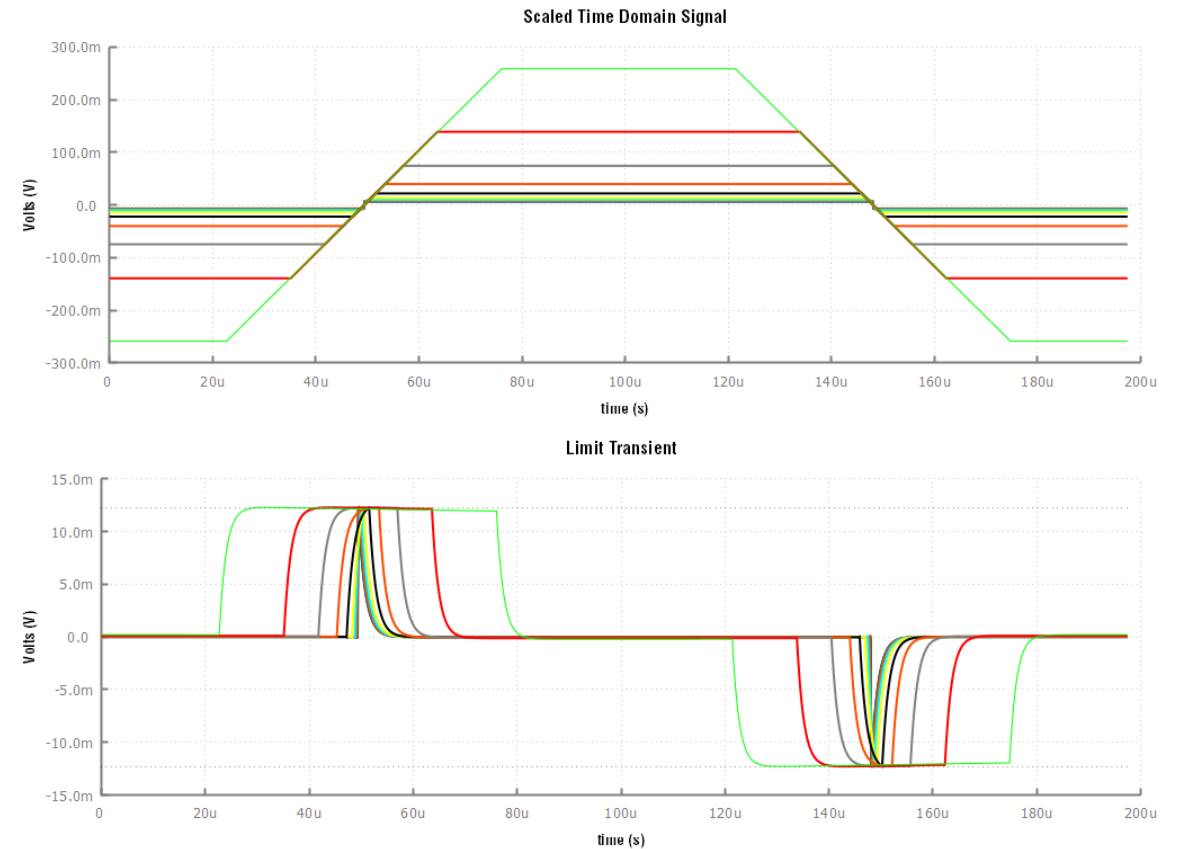12.8mV @ receiver -> 9694V/s = 9.5V/ms

For comment #1 use **9.5V/ms**

dI/dT:

Assume 50Ω input resistance in band of interest

1MHz < fin < 40MHz

(dV/dt) / Zin = (dI/dt)

(9.5V / ms) / 50Ω = 190mA / ms

For comment #2 use **190mA/ms**

Scaled Time Domain Signal

Limit Transient

Clause 104 dV/dt limits (for reference)

Table 104–7—PSE output requirements

Item	Parameter	Symbol	Unit	Min	Max	Class	Type	Additional information
1	DC output voltage during POWER_ON state	$V_{PSE(PON)}$	V	Class $V_{PSE(min)}$	Class $V_{PSE(max)}$	All	All	See 104.4.7.1 and Table 104–1
2	Continuous output current capability in POWER_ON state		mA	P_{Class}/V_{PSE}	—	All	All	See Table 104–1
3	Output slew rate dV/dt		V/ms	—	22	All	A, C	See 104.4.7.3
				—	2	All	E	See 104.4.7.3
				—	40	All	A, C, E	During inrush only
				—	200	All	B, F	See 104.4.7.3

Clause 104 PD dI/dt limits (for reference)

Table 104–11—PD power supply limits

Item	Parameter	Symbol	Unit	Min	Max	PD Type	Additional information
1	Input current dI/dt		A/ms	—	1	A, C	See 104.5.7.4
				—	10	B	
				—	0.1	E	
2	Input voltage dV/dt		V/ms	—	20	A, C	
				—	200	B	
				—	2	E	

Numbers imply a 20Ω input resistance at the PD