

# $\text{SNR}_{\text{ISI}}$

(Clauses 136 and 137)

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# Introduction

- 50GBASE CR and KR  $\text{SNR}_{\text{ISI}}$  limit appears to be not practical, both for test equipment and target designs
- Relates to comment 49

# Test Equipment Measurement Results

Equipment	TXEQ preset	Vf	Pmax	pmax/ Vf	SNR <sub>ISI</sub> [dB]
802.3cd spec limit	Presets 1-3	0.34-0.6		CR: 0.49 KR: 0.75	CR: 36.8 KR: 43
Vendor A	1	0.591	0.578	0.976	38.82
Vendor A	2	0.301	0.437	1.453	39.01
Vendor A	3	0.303	0.442	1.459	38.87
Vendor A + 3dB PCB trace	1	0.6	0.507	0.845	35.09
Vendor A + 3dB PCB trace	2	0.273	0.374	1.37	36.49
Vendor A + 3dB PCB trace	3	0.2632	0.3549	1.028291	35.82
Vendor B	1	0.601	0.553	0.92	32.57

- SNR<sub>ISI</sub> limit close to or above test equipment results
- Results after mated compliance boards will be worse than these

\*Signal timing, linearity and output swing were optimized for the measurement

# Simulation Results – COM Packages

Equipment	TXEQ preset	Vf	Pmax	pmax/ Vf	SNR_ISI [dB]
802.3cd spec limit	Presets 1-3	0.34-0.6		CR: 0.49 KR: 0.75	CR: 36.8 KR: 43
COM Test 1 Package	1	0.601	0.572	0.95	49.22
COM Test 2 Package	1	0.600	0.523	0.87	38.08
COM Test 1 Package	2	0.302	0.429	1.42	49.02
COM Test 2 Package	2	0.302	0.392	1.30	34.78

- SNR\_ISI limit for KR is above long COM package results
- Results after TF will be worse than these – may fail KR limit also for the short package
- Signal timing, linearity and output swing were optimized in simulation – actual transmitters will be worse

# Simulation Results – COM Packages With a Mated Pair

Equipment	TXEQ preset	Vf	Pmax	pmax/ Vf	SNR_ISI [dB]
802.3cd spec limit	Presets 1-3	0.34-0.6		CR: 0.49 KR: 0.75	CR: 36.8 KR: 43
COM Test 1 Package + Mated Pair	1	0.594	0.440	0.74	28.15
COM Test 2 Package + Mated Pair	1	0.594	0.401	0.68	27.57
COM Test 1 Package + Mated Pair	2	0.298	0.328	1.10	27.11
COM Test 2 Package + Mated Pair	2	0.298	0.298	1.00	26.52

- SNR\_ISI limit for CR is above all simulated results
- Signal timing, linearity and output swing were optimized in simulation – actual transmitters will be worse

# Conclusions

- 50GBASE CR and KR  $\text{SNR}_{\text{ISI}}$  limit appears to be not practical, both for test equipment and target designs.
- More work has to be done.