IEEE p1394a

1394a Annex K
Proposed Revisions

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Annex K- 1394-95

- **Goal is to review and improve the test method for the 1394-95 cable assembly in respect to actual physical layer performance.**
  - **Common mode speed signaling risetimes >3ns**
  - **Differential mode data signaling >0.5ns**

Annex K- 1394-95 *(continued)*

- **Review of the Annex K in 1394-95 document yielded the following:**
  - **A test that did not represent the actual performance of the the 1394 BUS.**
    - **Specified frequency sweep from 1 to 500 MHz identifying the common mode signaling function. This was called out as single-ended xtalk test requirement. (Section K.8)**
    - **The impedance aspect requires evaluation of only cable performance. (Section K.3)**
    - **Cable assembly measurements made at 1ns and 2.5ns into cable/connector assembly - well beyond the connector. Connector interface performance was omitted. (Section K.3)**

Proposed Xtalk revision to Annex K- 1394-95

- **Revise the value used for the frequency sweep to reflect equivalent of 3ns risetime with 20ns pulse width.**

- **Fourier analysis was conducted to evaluate power distribution with above pulse signature.**

- **Power sum demonstrates approximately 4 / 5ths of the power available for xtalk coupling to occur below 75 MHz (500 MHz is far too stringent).**

- **Single ended frequency sweep is therefor recommended from 1 to 75 MHz (Section K.8).**

Proposed Impedance addition to Annex K- 1394-95

- Add impedance evaluations at 50, 100 and 150 ps into the cable/connector assembly.

  - Assess A + B pairs in differential mode with 0.5 ns risetime filter.

  - Establish performance target across 100 ps exception window at 110 Ohms +/- 25 Ohms.

  - Given round-trip TDR function actual on-screen evaluation points become 100, 200 and 300 ps.

Action Summary

- Revision details to be added:
  - K.2 - Update test fixture description to include shield to Vg RC network
  - K.3 - Detail TDR method to include differential drive and 0.5ns filter condition
  - K.8 - Provide revision detail to support specific 1 - 75 MHz frequency domain Xtalk sweeps

Analysis Conditions

Test Condition A	
3 ns Risetime	
Risetime	3 ns
Falltime	3 ns
Pulse width	20 ns
Period	40 ns
Duty Cycle	50%
Pulse Voltage at Source	0V to 1 V
Pulse Voltage at Measurement	0V to 0.5 V

Analysis Conditions cont.

Test Condition B	
1.5 ns Risetime	
Risetime	1.5 ns
Falltime	1.5 ns
Pulse width	20 ns
Period	40 ns
Duty Cycle	50%
Pulse Voltage at Source	0V to 1 V
Pulse Voltage at Measurement	0V to 0.5 V

Peak Voltage Distribution

Condition A: 3 ns Risetime		
Harmonic	Frequency (MHz)	Voltage (mV)
fundamental	0	287
1	25	306
2	50	69
3	75	74
4	100	55
5	125	19
6	150	36
7	175	2
8	200	19
9	225	7

Peak Voltage Distribution cont.

Condition B: 1.5 ns Risetime		
Harmonic	Frequency (MHz)	Voltage (mV)
fundamental	0	269
1	25	315
2	50	36
3	75	100
4	100	34
5	125	50
6	150	31
7	175	27
8	200	28
9	225	