1394 Connector and Cable Testing

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Presentation Goals

- **Discuss critical parameters for a cable interconnect in P1394A systems**
- **Present a series of reasonable tests that system integrators can use to validate cable/connector interconnect assemblies**

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Critical areas for cable interconnect

- Differential impedance profile
- Skew
- Differential eye diagram
- Common mode impedance profile
- Common mode crosstalk
- Cable EMI shield effectiveness
-

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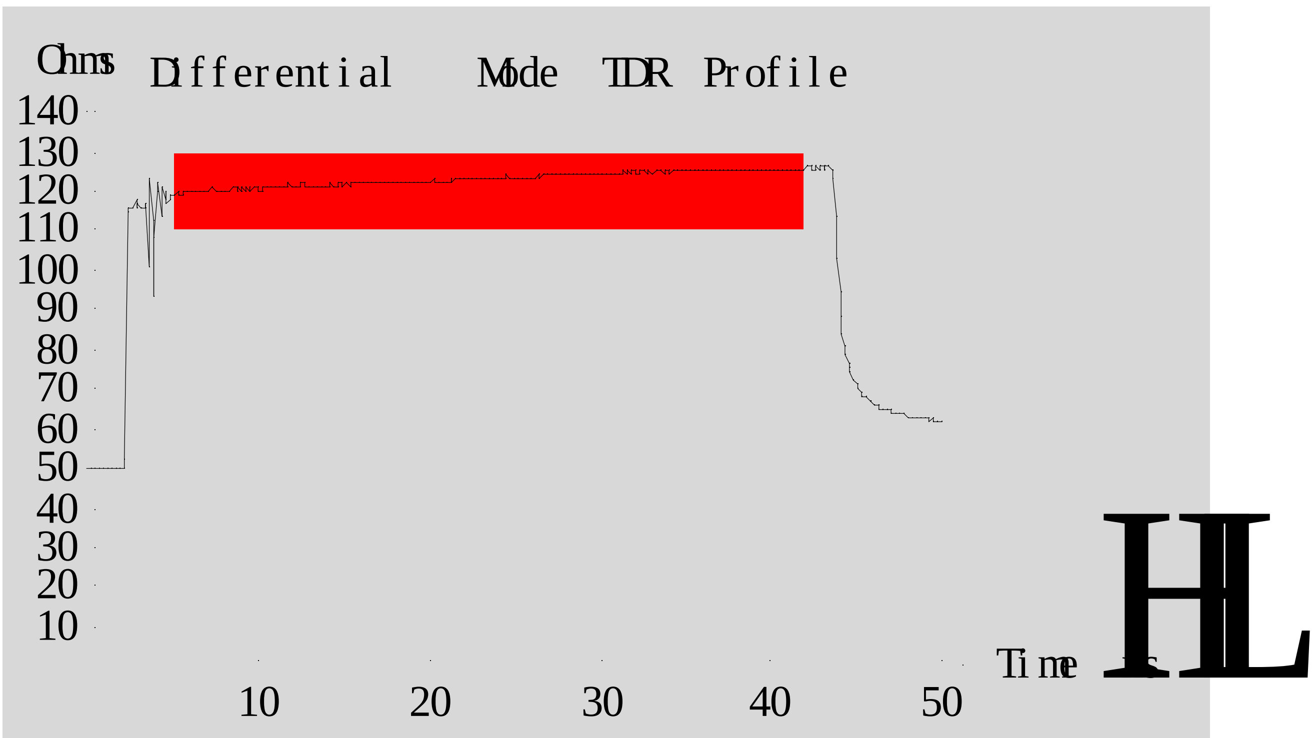
Differential impedance profile

- Differential signals are the primary signaling mechanism
- Variations in differential impedance lead to signal loss and reflections
- TDR studies of differential impedance can detect bad cable terminations



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Skew

- **Both differential pairs must be matched in terms of propagation delays**
- **Recommended procedure**
    - **TBD**
    -

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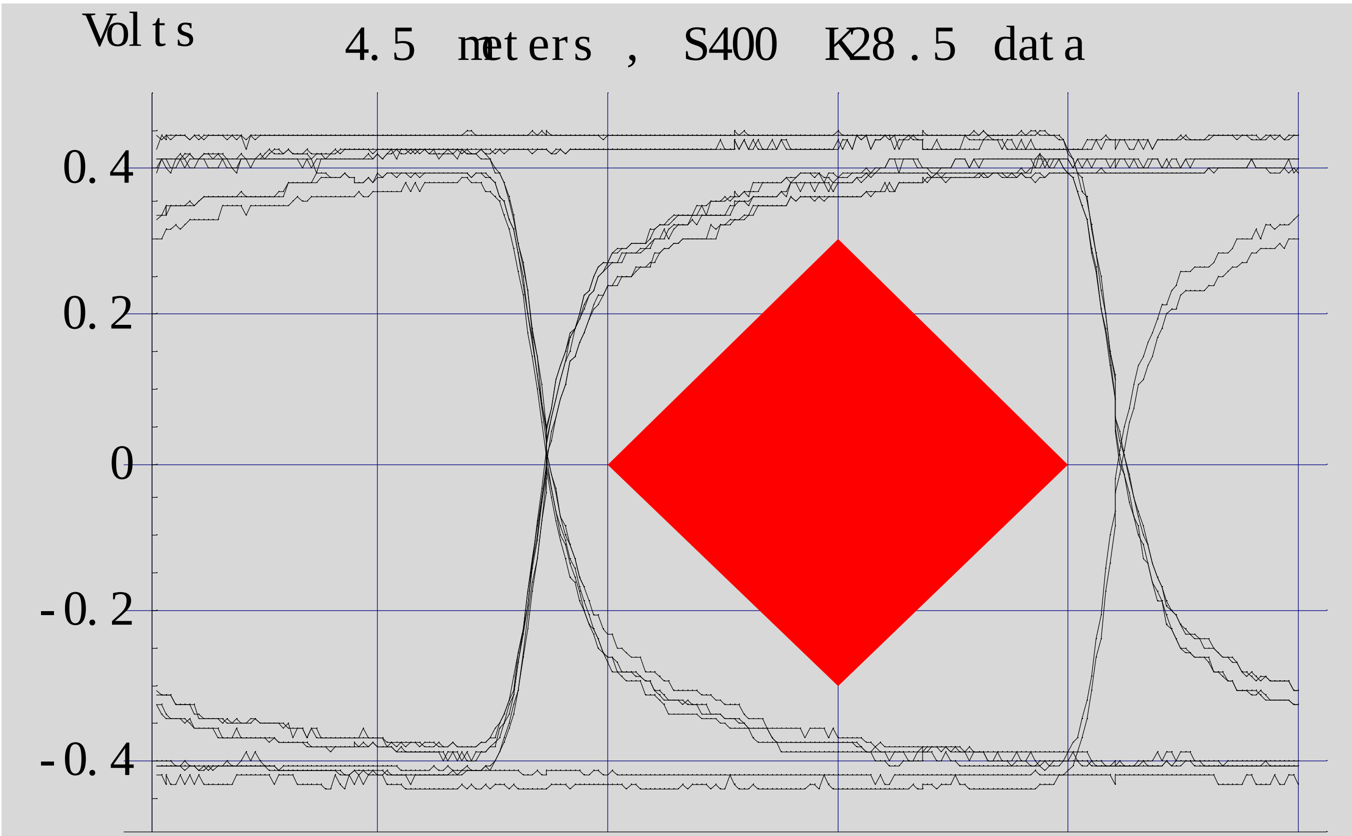
Differential eye diagram

- **The receiver end eye diagram is the fundamental measure of signal quality**



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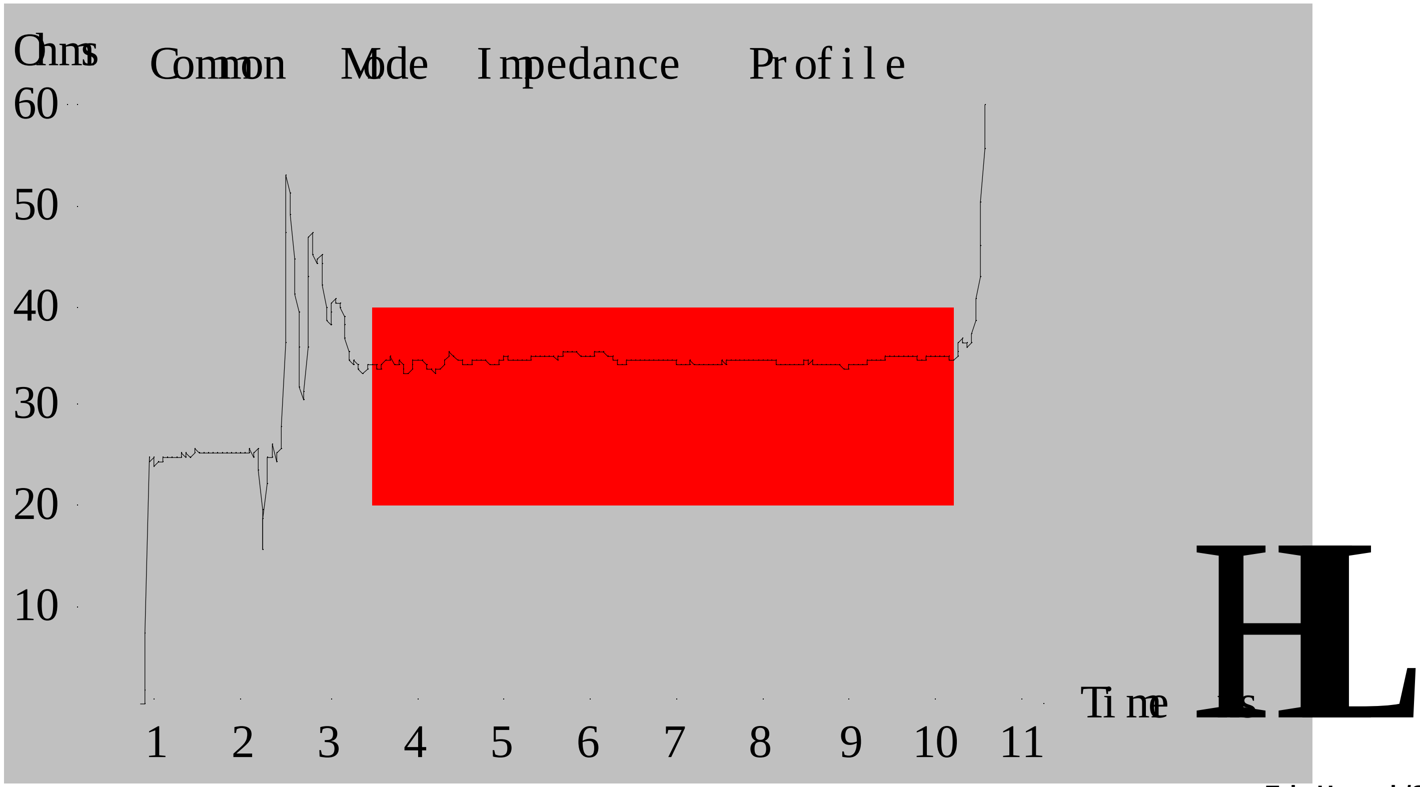
Common mode impedance profile

- Some signals, e.g., speed signaling, are common mode -- the common mode impedance profile must be sufficiently flat to avoid reflections and signal loss
- TDR studies of common mode impedance can detect crimped cables, etc.



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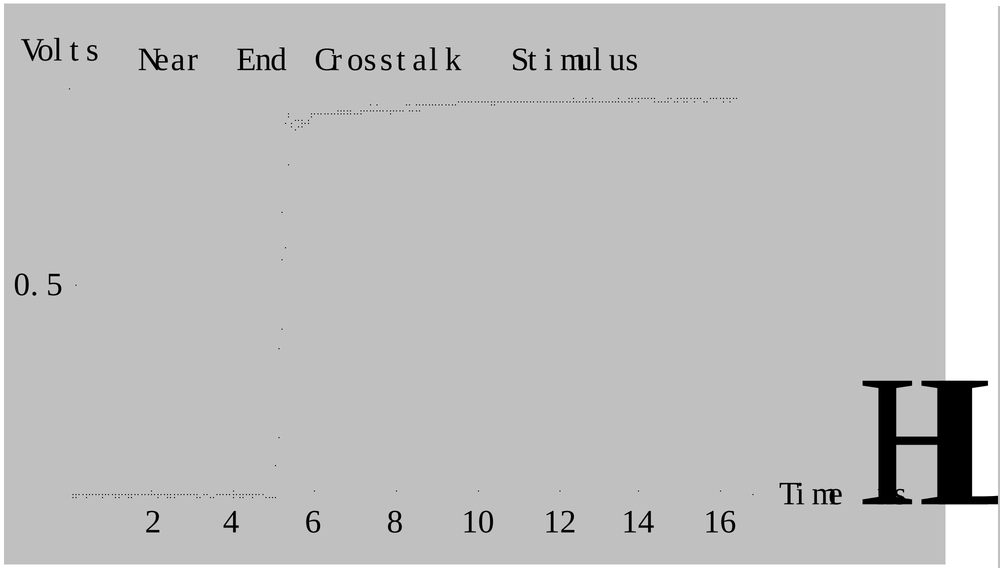
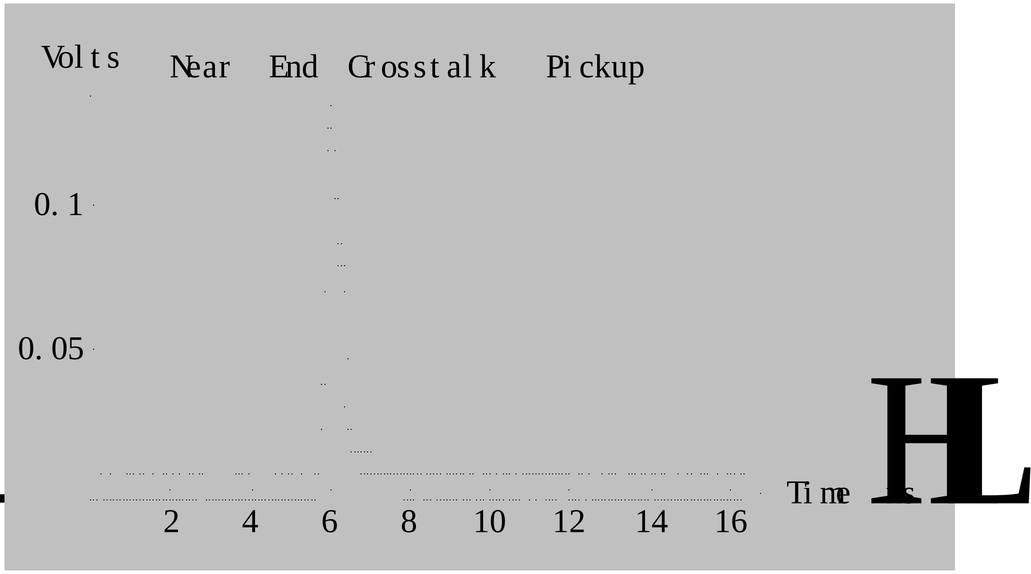
Common mode crosstalk

- Speed signaling at self-ID time can be corrupted by near-end cross talk





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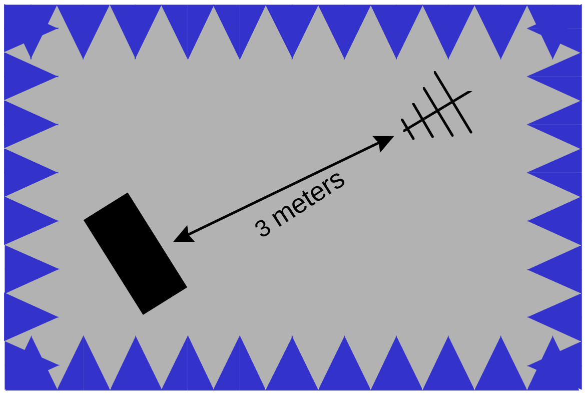
Cable EMI shield effectiveness

◆ Recommended procedure

- **Test cables in 3 meter or equivalent screen room with full differential 1394 voltage applied as single-ended signal to cover maximum skews, terminate in 110 Ohms.**



The following table shows the FCC Class B limits and CISPR-22 Class B Limits. The perenthised numbers show the same limit with the 6dB offset added to compensate for the three to ten meter difference.

FCC Class B Radiated Limits			**CISPR-22 Class B limits**		
Frequency (MHz)	Distance (meters)	Field Strength DBuV/m	Frequency (MHz)	Distance (meters)	Field Strength DBuV/m
30 - 88	3	40	30 - 230	10	30 (36)
88 - 216	3	43.52	230 - 1000	10	37 (43)
216 - 960	3	46.02	N/A	N/A	N/A
960 - 2000	3	53.92	N/A	N/A	N/A

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