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NEAR_END_CROSSTALK_MEASUREMENT

This procedure outlines a method used to perform preliminary near end crosstalk measurements on Madison 4099 SCSI cable. The method uses a fast risetime step to drive a single disturber. All pairs were terminated single ended with an impedance of 133 ohms.

Equipment

1. Hewlett Packard 54120T Digitizing Oscilloscope and TDR.
2. 2 - 6 inch x 5 inch copper PC boards.
3. 50 - 133 ohm +/- 1% termination resistors.
4. 2 - 50 to 132 ohm L type matching pads (to convert 50 ohm test equipment ports to 132 ohms).

Sample Preparation

1. Sample length 20.5 feet.
2. Strip jacket back 3 inches.
3. Fold braided shield back over jacket.
4. Remove 0.5 inches of insulation from conductors.
5. Secure folded back braid to copper board.
6. Solder one conductor of each pair to copper board.
7. Solder the other conductor of each pair to a 133 ohm resistor, the other end of the resistor is soldered to the copper board. (These are the signal conductors).
8. All connections are kept as short as possible.
9. Repeat 2 thru 8 for both ends.

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Measurement

1. Set Normalized risetime to 1 nanosecond.
2. Connect L pads back to back and measure the magnitude of the step in volts (V_{in}).
3. Select a disturbing pair, disconnect signal wire from 133 ohm resistor and connect to L pad.
4. Select a disturbed pair, disconnect signal wire from 133 ohm resistor and connect to L pad.
5. Drive disturbing pair and measure magnitude of crosstalk waveform on disturbed pair (V_{out}).
6. Calculate near end crosstalk as a percentage of the input voltage.

$$\text{NEXT (\%)} = \frac{V_{out}}{V_{in}} \times 100$$

MEASUREMENT RESULTS

<u>Measurement Number</u>	<u>Location of Disturbing Pair</u>	<u>Location of Disturbed Pair</u>	<u>Maximum NEXT (%)</u>
1	Layer 2	Layer 2	3.1
2	Layer 2	Layer 2	3.4
3	Layer 2	Layer 2	2.5
4	Layer 1	Layer 2	3.3
5	Layer 1	Layer 2	3.9
6	Layer 1	Layer 2	3.7
7	Layer 1	Layer 1	4.4
8	Layer 1	Layer 1	4.2
9	Layer 1	Layer 1	3.9
10	Layer 1	Core	3.9
11	Layer 1	Core	4.0
12	Layer 1	Core	2.6
13	Core	Core	4.4
14	Core	Core	4.2

- Notes - All pair combinations are adjacent pairs
- Layer 2 is the layer closest to the shield

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