Analysis of 32AWG, 30AWG, 26AWG copper cables with IEEE802.3 Clause 74 FEC, Clause 91 FEC, and non-FEC conditions

01/2015
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Cable Analysis Methodology

This presentation builds upon the cable assembly methods, measurement, and data presented in matoglu_25GE_01a_1114

For more cable and measurement details please refer to:

COM is computed per IEEE802.3bj Section 92.10.7 with parameters and Test1 & Test 2 specified in Table 93-8. The specification requirement is minimum 3dB

Test 1 and Test 2 differs by device package length \( zp \). COM Test 2 models 30mm package length. COM Test 1 models 12mm device package length

DER is set to:
1e-12 for Non-FEC
1e-8 for Clause 74 FEC
1e-5 for Clause 91 FEC
Cable Analysis Methodology

DER is set to 1e-12 for Non-FEC analysis, 1e-8 for Clause 74 FEC, and 1e-5 for Clause 91 FEC

Starting from the 802.3 CL92 CR4 Host loss of 6.81dB/side at 12.89GHz, the host loss is reduced until the COM>3dB is satisfied.

TP0 to TP5 insertion loss is the measured cable (including MCBs) + 12.52 (6.26*2)
QSFP-4SFP Cu Breakout Cables with FEC91, FEC74, and non-FEC to satisfy 3dB COM (per IEEE802.3 Section 92.10.7)

<table>
<thead>
<tr>
<th>QSFP-4SFP BO Cable</th>
<th>1m 32AWG</th>
<th>1m 30AWG</th>
<th>2m 32AWG</th>
<th>2m 30AWG</th>
<th>2m 26AWG</th>
<th>3m 26AWG</th>
<th>3m 30AWG</th>
<th>4m 26AWG</th>
<th>5m 26AWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>With FEC Clause 91</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>With FEC Clause 74</td>
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<tr>
<td>Without FEC</td>
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</tbody>
</table>

- **With FEC Clause 91**
  - Max8dB total host loss
  - Seeks feasible

- **With FEC Clause 74**
  - Max12dB total host loss
  - Max7.5dB total host loss

- **Without FEC**
  - Max5.5dB total host loss
  - Max7.3dB total host loss
  - Max10.8dB total host loss
  - Max7.3dB total host loss
  - Seems feasible

- **Passes COM spec with 100GBASE-CR4 Host Loss (13.62dB total @ 12.89GHz)**
- **Passes COM spec with a reduction in host channel loss (@ 12.89GHz)**

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