Mechanical Modify of RFI System Level

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The compliance test limits the noise emission level from the type-C USB port for the interoperability between wireless devices (e.g. Wi-Fi, BT, WWAN) and USB.

Applicable to only systems with a Type C connector that supports 5 Gbps and above.

- USB 3.2 Hosts End Product (This includes embedded hosts)
- USB 3.2 Hubs End Product
- DRD (Dual-Rate Data)

DUT Type

- Notebook
- Monitor
- Smart phone
- Hubs end product
Test Issue: Mechanical Interference

- Current fixture design doesn’t fit to all type-C port due to mechanical interference.
Proposed Solutions

• Additional fixture designs optional for compliance test.
  ➢ Recess the outer tube length
  ➢ Cut bottom half outer tube.

• Compliance test results with current fixture and proposed optional fixture are compared:
  ➢ Target to be within +/- 3dB
Experiment: Reduce Test Fixture Cover Length

Modify ME of RFI System Level for Monitor Test

<table>
<thead>
<tr>
<th>Cover Length</th>
<th>Max. Δ</th>
</tr>
</thead>
<tbody>
<tr>
<td>33.5mm</td>
<td>3.77 dB</td>
</tr>
<tr>
<td>40.7mm</td>
<td>2.14 dB</td>
</tr>
<tr>
<td>47.5mm</td>
<td>3.7 dB</td>
</tr>
</tbody>
</table>
Experiment: Reduce Test Fixture Cover Length and Cut Half Cover
Fixture Samples and DUT

**Fixture Samples**

- Original
- Longer Cover
- Shorter Cover

**DUT**

- NB_1
- NB_2
Original VS Longest Cover VS Shortest Cover

Original VS Average (Longest Cover and Shortest Cover)

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Max. △</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original VS Longest Cover VS Shortest Cover</td>
<td>4.748dB @4.99GHz</td>
</tr>
<tr>
<td>Original VS Average (Longest Cover and Shortest Cover)</td>
<td>2.531 dB @4.97GHz</td>
</tr>
</tbody>
</table>
Test Result_Fixture Comparison_NB1_Port 2 (2/3)

- **500 MHz to 1 GHz**
- **1 GHz to 2 GHz**
- **2 GHz to 3 GHz**
- **3 GHz to 4 GHz**
- **5 GHz to 6 GHz**
Test Result_Fixture Comparison_NB1_Port 2 (3/3)

- Full Range
- 500 MHz to 1 GHz
- 1 GHz to 2 GHz
- 2 GHz to 3 GHz
- 3 GHz to 4 GHz
- 5 GHz to 6 GHz
- Full Range

Frequency ranges:
- 500 MHz to 1 GHz
- 1 GHz to 2 GHz
- 2 GHz to 3 GHz
- 3 GHz to 4 GHz
- 5 GHz to 6 GHz
- Full Range
Summary

➢ An Alternative RFI system level compliance test proposed if the original fixture can’t fit the DUT.
  ➢ Two fixtures with 1) longer cover and 2) shorter cover
  ➢ Averaged data should be collected from the two fixtures in order to reduce measurement mismatch comparing to from the original fixture.
➢ Propose that the compliance is met if either one of the original test or the alternative test is passed.
Thank you