

# USB 3.2 ENGINEERING CHANGE NOTICE

**Brief description of the functional changes proposed:**

The change proposed is the addition of a system level RFI (radio frequency interference) limit for systems with USB Type C connector. This applies to hosts, hubs and dual-role devices.

**Benefits as a result of the proposed changes:**

The proposed changes will specify a limit for the RF noise emissions from a USB Type C port. Systems that comply with this requirement will have lower RFI coupled to a wireless radio integrated internally/externally to the system, preventing degraded wireless performance (data throughput, wireless range).

**An assessment of the impact to the existing revision and systems that currently conform to the USB specification:**

No impact

**An analysis of the hardware implications:**

In order to meet the proposed system level RFI limit, Type C connector selection with RFI mitigation features and/or system level design such as chassis ground contact may be required.

**An analysis of the software implications:**

No impact

**An analysis of the compliance testing implications:**

This is a new compliance test. The compliance testing requires the use of the system level RFI test fixture. The measurements are to be performed in an RF shielded chamber and require a spectrum analyzer with a pre-amplifier.

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## Actual Change Requested

### From Text:

Doesn't exist

### To Text:

Section 6.14, Table x-xx1, pp xx-xx

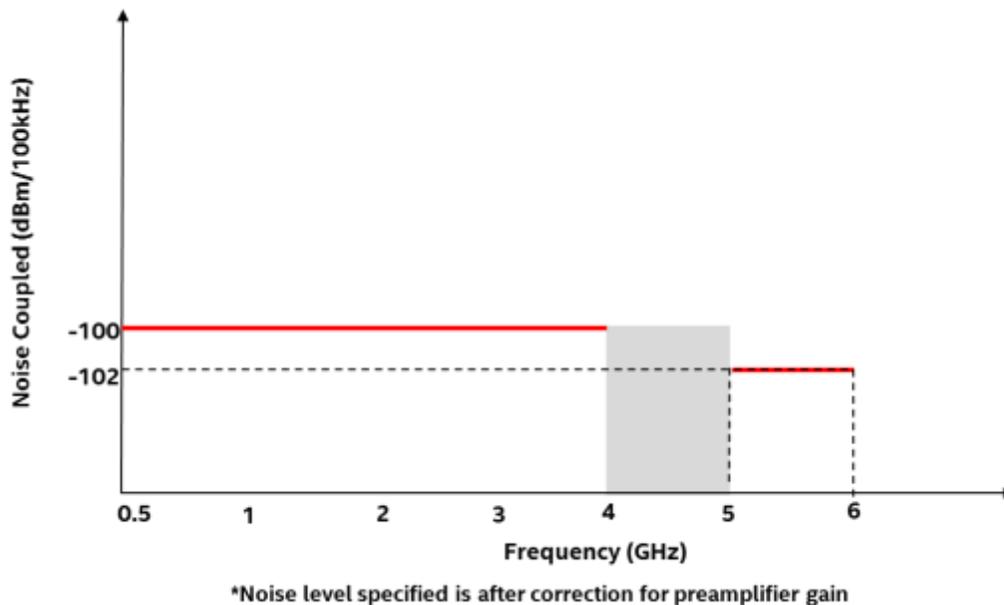
## 6.14 System Radio Frequency Interference (RFI)

### 6.14.1 Overview

The system level RFI test fixture measures the RFI emissions from the USB Type C port using the test fixture shown in Figure 6-42.

All Type C connector(s) on host, hub or dual-role device systems shall pass the system level RFI test for compliance. RFI compliance is not a component level requirement. The compliance criteria for the Type C connector are shown in Figure 6-41.

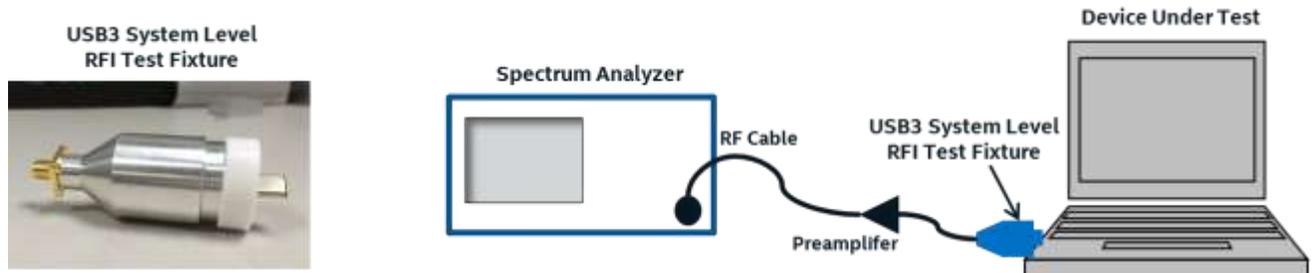
Figure 6-41. System level RFI specification



To perform the measurement the Type C test fixture shall be inserted into the port under test as shown in Figure 6-42. The test setup shall be placed in an RF shielded enclosure. The noise emissions from the Type C port shall be measured on a spectrum analyzer.

Figure 6-42. System level RFI Test Fixture and Test setup

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## Notes:

1. Spectrum Analyzer Settings:
  - a. Frequency Start 500MHz, Stop 6GHz
  - b. Resolution BW 100kHz, Video BW 100kHz
  - c. Average Detector
  - d. 100 trace averages
  - e. Attenuation 0dB
2. System level RFI is not specified between 4 and 5GHz since there are no known radios operating in this range.
3. After the fixture is inserted into the port in a device under test, care should be taken to ensure the planarity of the fixture. If required, support such as a foam block should be provided under the fixture.
4. The fixture is designed to activate compliance test patterns CP0 running at 5 Gbps when the fixture is plugged in. CP0 transmission is forced by the termination in the fixture. Based on that, the specification is designed to meet the RFI requirement when the data rate is 10 Gbps.