

USB4 2.0 ENGINEERING CHANGE NOTICE FORM

Title: Thunderbolt 3 SSC Range Adjustment
Applied to: USB4 Specification Version 2.0

Brief description of the functional changes:

Extends Thunderbolt 3 transmitter SSC frequency range from 35-37KHz to 30-37KHz.
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Benefits as a result of the changes:

Enables single PLL solution for Thunderbolt 3 (currently defined to 35-37KHz) and USB4 (defined to 30-33KHz) without excluding existing designs.
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An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
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None, as TBT3 Rx spec already requires to support 30-37KHz SSC.

An analysis of the hardware implications:
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None.

An analysis of the software implications:
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None.

An analysis of the compliance testing implications:
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None.

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Actual Change

(a). Section 13.1 (Thunderbolt 3 Electrical Layer)

From Text:

13.1 Electrical Layer

When TBT3 Mode is established, an Adapter shall run at a TBT3-Compatible speed.

A Router Assembly shall support TBT3-Compatible Gen 2 Speed (10.3125Gbps). A Router Assembly may also optionally support TBT3-Compatible Gen 3 Speed (20.625Gbps).

A Router Assembly may transmit with either USB4 SSC or TBT3 SSC. A Router Assembly receiver shall tolerate both USB4 SSC and TBT3 SSC.

A Router Assembly shall meet the specifications described in chapter 3, except for the following set of parameters that shall be used instead of the values specified in chapter 3:

Table 13-1. Thunderbolt 3 Parameters

Parameter Name	Min	Max	Units
USB4_SSC_DOWN_SPREAD_RATE_TX	See Table 3-2		KHz
USB4_SSC_PHASE_DEVIATION_TX	See Table 3-2		ns
TBT3_SSC_DOWN_SPREAD_RATE_TX	35	37	KHz
TBT3_SSC_PHASE_DEVIATION_TX	--	18.5	ns
SSC_DOWN_SPREAD_RATE_RX	30	37	KHz
SSC_PHASE_DEVIATION_RX	2.5	22	ns
UI (Gen 2 Speed)	96.9406	96.9988	ps
UI (Gen 3 Speed)	48.4703	48.4994	ps

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To Text:

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USB4_SSC_PHASE_DEVIATION_TX	See Table 3-2		ns
TBT3_SSC_DOWN_SPREAD_RATE_TX	35 30	37	KHz
TBT3_SSC_PHASE_DEVIATION_TX	--	18.5 22	ns
SSC_DOWN_SPREAD_RATE_RX	30	37	KHz
SSC_PHASE_DEVIATION_RX	2.5	22	ns
UI (Gen 2 Speed)	96.9406	96.9988	ps
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