

# USB4 1.0 ENGINEERING CHANGE NOTICE FORM

**Title: Thunderbolt 3 SSC Range Adjustment**  
**Applied to: USB4 Specification Version 1.0**

<b>Brief description of the functional changes:</b>
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Extends Thunderbolt 3 transmitter SSC frequency range from 35-37KHz to 30-37KHz.
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<b>Benefits as a result of the changes:</b>
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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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<b>An assessment of the impact to the existing revision and systems that currently conform to the USB specification:</b>
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None, as TBT3 Rx spec already requires to support 30-37KHz SSC.
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<b>An analysis of the hardware implications:</b>
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None.
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<b>An analysis of the software implications:</b>
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None.
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<b>An analysis of the compliance testing implications:</b>
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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	<del>35</del> 30	37	KHz
TBT3_SSC_PHASE_DEVIATION_TX	--	<del>18.5</del> 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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