

USB4 1.0 ENGINEERING CHANGE NOTICE FORM

Title: Asymmetric TxFFE Change
Applied to: USB4 Specification Version 1.0

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| Brief description of the functional changes: |
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| Adds a timeout for one of the steps in the Asymmetric TxFFE Parameter Negotiation with a Transmitting Primary Partner. |
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| Benefits as a result of the changes: |
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| Fixes TxFFE negotiation with TBT3 cables. |
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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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| Routers and Re-timers adjacent to Type-C connector need to add a timeout to one of the TxFFE steps |
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| An analysis of the hardware implications: |
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| Firmware change |
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| An analysis of the software implications: |
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| None |
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| An analysis of the compliance testing implications: |
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| None |
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Actual Change

(a). Section 13.2.1.4.4.1, Page 515

From Text:

1. The transmitter shall update its transmitter parameters based on the new parameters received in the AT Response. To do this, the transmitter loads one of 16 predefined TxFFE configurations that matches the TxFFE Request field in the Rx Status & TxFFE Request byte.
 - If both Lane Adapters in the Port are enabled and have not yet completed TxFFE negotiation, both transmitters must complete Step 5 before continuing to Step 6. If the other Lane Adapter has not yet completed Step 5, the transmitter shall wait for the other Lane to finish Step 5 before continuing to Step 6.

To Text:

5. The transmitter shall update its transmitter parameters based on the new parameters received in the AT Response. To do this, the transmitter loads one of 16 predefined TxFFE configurations that matches the TxFFE Request field in the Rx Status & TxFFE Request byte.
 - If both Lane Adapters in the Port are enabled and have not yet completed TxFFE negotiation, both transmitters must complete Step 5 before continuing to Step 6. **A Lane Adapter shall not continue to Step 6 until one of the following occurs:**
 - i. The other Lane Adapter completes Step 5.
 - ii. tTxFFETimeout has passed since starting Step 5.

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(b). Table 13-10, Page 520

From Text:

| Parameter | Description | Min | Max | Units |
|-------------|--|-----|-----|-------|
| tLTPhase4 | The amount of time that Broadcast RT Transactions, LT_Gen_2 Transactions, or LT_Gen_3 Transactions are sent after completion of Lane Initialization phase 2. | 25 | ms | |
| tLaneParams | The time interval between transmissions of LT_Gen_2 Transactions, between the transmissions of LT_Gen_3 Transactions, or between the transmissions of Broadcast RT Transactions. | 1 | 5 | ms |

To Text:

| Parameter | Description | Min | Max | Units |
|----------------------|--|-----------|-----|-----------|
| tLTPhase4 | The amount of time that Broadcast RT Transactions, LT_Gen_2 Transactions, or LT_Gen_3 Transactions are sent after completion of Lane Initialization phase 2. | 25 | ms | |
| tLaneParams | The time interval between transmissions of LT_Gen_2 Transactions, between the transmissions of LT_Gen_3 Transactions, or between the transmissions of Broadcast RT Transactions. | 1 | 5 | ms |
| <u>tTxFFETimeout</u> | <u>The amount of time that a Lane Adapter waits for the other Lane Adapter to update its TxFFE parameters before continue negotiation.</u> | <u>80</u> | | <u>ms</u> |