# USB4 2.0 ENGINEERING CHANGE NOTICE FORM

## Title: ALPM Timing
## Applied to: USB4 Specification Version 2.0

| **Brief description of the functional changes:** |
|---|
| Adds clarification that if DP OUT receives back-to-back Sleep then Wake events it must ensure the DP Main Link will be in electrical idle for at least 2us (tEnterLFPS). |

| **Benefits as a result of the changes:** |
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| Ensures the DP OUT will handle B2B events and keep the DP Spec parameters. |

| **An assessment of the impact to the existing revision and systems that currently conform to the USB specification:** |
|---|
| None. |

| **An analysis of the hardware implications:** |
|---|
| None. A DP OUT Adapter will have to handle B2B scenarios while keeping tEnterLFPS timing. |

| **An analysis of the software implications:** |
|---|
| None. |

| **An analysis of the compliance testing implications:** |
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| None. |

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## Actual Change

## (a). 10.5.7.3 Wake Sequence

### 10.5.7.3 Wake Sequence

Upon detecting an LFPS, which is qualified as a wake signal according to the DisplayPort Specification, a DP IN Adapter shall send a DP Link Control Packet of type ALPM with the *S/W* bit set to 0b and the *SR Count* field set to 0h. The DP IN Adapter shall send the DP Link Control Packet within tDPALPMWake after detecting the LFPS.

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Upon reception of an ALPM DP Link Control Packet with the *S/W* bit set to 0b, a DP OUT Adapter shall perform the following wake sequence:

1. If the DP OUT Adapter is in the process of a Sleep sequence, it shall:
    a. Complete the Sleep sequence as defined in Section 10.5.7.2.
    b. Park its transmitters in electrical idle for at least tEnterLFPS (2us), as defined in the DisplayPort specification.
2. Start generating the LFPS followed by ML_PHY_LOCK_LTTPR pattern as the LTTPR that is adjacent to the DPTX generates it, according to DisplayPort Specification. The DP OUT Adapter shall start generating LFPS within tDPALPMWake after receiving the ALPM DP Link Control Packet and the DP Link is in electrical idle.

## (b). Table 10-28 DP Adapter Timing Parameters

**Table 10-28 DP Adapter Timing Parameters**

| Parameter | Description | Min | Max | Units |
|---|---|---|---|---|
| tDPALPMWake | For a DP IN Adapter, the maximum time between detecting LFPS and sending an ALPM DP Link Control Packet.<br>For a DP OUT Adapter, the maximum time between receiving a wake ALPM DP Link Control Packet and starting to start transmitting LFPS after receiving the ALPM DP Link Control Packet and the DP Link is in electrical idle. | | 3 | µs |