

# USB Type-C ENGINEERING CHANGE NOTICE

## Title: Relaxing Ra Requirements

Applied to: USB Type-C Specification Release 2.0, August 2019

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| <b>Brief description of the functional changes proposed:</b> |
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| Change the minimum value of Ra from the current 800Ω to a more flexible limit based on the power consumption allowed for cables. |
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| The Maximum value is not intended to be changed; the threshold voltages are not affected. |
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| <b>Benefits as a result of the proposed changes:</b> |
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| A number of solutions will be available that were not possible with the current rigid limits. These solutions are potentially simpler and cheaper. |
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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. |
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| <b>An analysis of the hardware implications:</b> |
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| New solutions will be possible in addition to existing solutions. No change will be needed. |
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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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| The evaluation of the Ra value may need to change in the test plan though the situation already today is that there is no way to separate the current taken by the eMarker chip for the function of the chip and the current taken by the Ra - in other words all that can reasonably be measured is the sum of the two. |
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## Actual Change Requested

### (a). Table 4-26, Page 236

#### From Text:

Table 4-26 Powered Cable Termination Requirements

|    | Minimum Impedance | Maximum Impedance |
|----|-------------------|-------------------|
| Ra | 800 $\Omega^1$    | 1.2 k $\Omega$    |

Note:

1. The minimum impedance may be less when powering active circuitry.

#### To Text:

Table 4-26 Powered Cable Termination Requirements

|    | Minimum Impedance | Maximum Impedance |
|----|-------------------|-------------------|
| Ra | 800 $\Omega^1$    | 1.2 k $\Omega$    |

Note:

1. The minimum impedance may be less when VCONN is not applied. The current consumed from VCONN shall be as specified in Tables 4-6, 4-7 and 4-8 when the voltage is less than vVconnValid. The voltage across Ra when connected to any valid Rp shall be below the Max voltage in Table 4-36 Voltage on Sink CC pins (Multiple Source Current Advertisements) for vRa.

### (b). Table 4-6, Page 145

#### To Text:

Table 4-6 Cable VCONN Sink Characteristics

Add line in table:

|           |  |       |  |
|-----------|--|-------|--|
| iRaDetect |  | 10 mA | The maximum current drawn from Vconn when the voltage is below vVconnValid<br><br>Note: this current is below the 75mW allowance for the first 500ms at 5.5V |
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## (c). Table 4-7, Page 146

### To Text:

Table 4-7 **VCONN-Powered Accessory (VPA)** Sink Characteristics

Add line in table:

|           |  |       |  |
|-----------|--|-------|--|
| iRaDetect |  | 10 mA | The maximum current drawn from Vconn when the voltage is below vVconnValid<br><br>Note: this current is below the 75mW allowance for the first 500ms at 5.5V |
|-----------|--|-------|--|

Add note to line:

### Power before Alternate Mode Entry

Note: 75mW max allowed for the first 500ms after VCONN applied.

## (d). Table 4-8, Page 147

### To Text:

Table 4-8 **VCONN-Powered USB Device (VPD)** Sink Characteristics

Add line in table:

|           |  |       |  |
|-----------|--|-------|--|
| iRaDetect |  | 10 mA | The maximum current drawn from Vconn when the voltage is below vVconnValid<br><br>Note: this current is below the 75mW allowance for the first 500ms at 5.5V |
|-----------|--|-------|--|

Add note to line:

### Power before USB enumeration

Note: 75mW max allowed for the first 500ms after VCONN applied.