USB Type-C ENGINEERING CHANGE NOTICE

Title: C to A Adapter Assembly
Applied to: Universal Serial Bus Type-C Cable and Connector Specification Release 1.1, April 3, 2015

Brief description of the functional changes:

In order to consider more reasonable cable frequency response requirement for USB2.0, the recent ECN has modified the fmax used to calculate the integrated differential SuperSpeed crosstalk on D+/D- (IDDXT) from 7.5GHz to 1.2GHz for type C to USB3.1 Gen 2 legacy cable assembly and the pass criteria was adjusted to -28.5dB based on the measured vendor cable samples. For consistency, this ECR is to change the fmax for USB type C to USB 3.1 standard-A receptacle adapter assembly. The new pass criteria, -30dB, is proposed to meet USB2.0 noise ingression requirement.

Benefits as a result of the changes:

The fmax for the IDDXT calculation will be consistent between type C to USB3.1 Gen 2 legacy cable assembly and USB type C to USB 3.1 standard-A receptacle adapter assembly. The maximum limit of noise ingression from SuperSpeed to USB2.0 is properly adjusted according to the differential usage scenarios in order to the risk of USB2.0 link impairment.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:

12 cables from 4 vendors were measured and only 1 cable failed to meet the -30dB requirement. There was no question from implementers since the proposed criteria was discussed on May 1st, 2015.
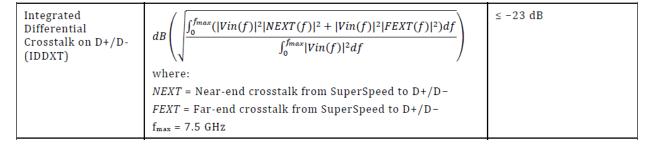

An analysis of the hardware implications:

N/A

An analysis of the software implications:

N/A

An analysis of the compliance testing implications:

The proposal results in changes to the pass criteria in the cable compliance testing tool which processes the measured cable s parameters.

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Actual Change

(a). Section 3.7.5.2, Page 91

From Table 3-30:

Integrated Differential Crosstalk on D+/D- (IDDXT)	$dB\left(\sqrt{\dfrac{\int_0^{fmax}(\lvert Vin(f)\rvert^2\lvert NEXT(f)\rvert^2 + \lvert Vin(f)\rvert^2\lvert FEXT(f)\rvert^2)df}{\int_0^{fmax}\lvert Vin(f)\rvert^2 df}}\right)$ where: $NEXT$ = Near-end crosstalk from SuperSpeed to D+/D− $FEXT$ = Far-end crosstalk from SuperSpeed to D+/D− f_{max} = 7.5 GHz	≤ −23 dB

To Table 3-30:

Integrated Differential Crosstalk on D+/D- (IDDXT)	$dB\left(\sqrt{\dfrac{\int_0^{fmax}(\lvert Vin(f)\rvert^2\lvert NEXT(f)\rvert^2 + \lvert Vin(f)\rvert^2\lvert FEXT(f)\rvert^2)df}{\int_0^{fmax}\lvert Vin(f)\rvert^2 df}}\right)$ where: $NEXT$ = Near-end crosstalk from SuperSpeed to D+/D− $FEXT$ = Far-end crosstalk from SuperSpeed to D+/D− f_{max} = 1.2 GHz	≤ −30 dB