

USB Power Delivery ENGINEERING CHANGE NOTICE FORM

NOTICE: Any Company or Companies submitting a USB Power Delivery ECN proposal must be one of the following: a Promoter or Contributor of the USB 3.0 and 2.0 Specifications who have completed the USB Power Delivery addendum. If a group of Companies is submitting an ECR proposal, each company must be either a Promoter or Contributor of the USB 3.0 and 2.0 Specifications who have completed the USB Power Delivery addendum.

SPECIFICATION REVISIONS AND ADDENDA: At any point in time, there shall only be one current version of the USB PD Specification, termed the production version. At the same time, there may also be proposed revisions to the specification's design which are not yet approved and shall be held confidential as deemed necessary by the USB 3.0 and USB 2.0 Promoters and within the Group of Working Committee(s).

PROCEDURES FOR SUBMITTING PROPOSALS: Both members of the USB Implementers Forum as a whole and members of the USB 3.0 and USB 2.0 Promoters may submit requests to revise the USB PD Specification and design guides. Such a request may be rejected or may result in a USB PD Engineering Change Notice (ECN), which is the official way USB specifications may be changed.

FORMAT OF PROPOSAL: The originator of a request to alter the USB PD Specification may do so by posting this to the USB Power Delivery working group for review. Once the proposal has been reviewed by the working group it will be passed to the USB 3.0 and 2.0 Promoters for approval to publish.

RESUBMISSION AND APPEAL: The originator of a request that was not approved can redraft the original request. Rewritten proposal will be treated as a new proposal and will be evaluated using the procedures described above. The originator of a request that was not approved can also submit an appeal to the USB 3.0 and 2.0 Promoters. The appeal must be made in writing and addressed to the Secretary of the USB Implementers Forum.

ABOUT THE ENGINEERING CHANGE REQUEST FORM:

The Purpose of this Engineering Change Request Form is to expedite the review process of the proposal by providing explanations, background information, and examples of the proposed changes at a high level. This form serves as an executive summary to the actual proposal.

STEPS ON HOW TO SUBMIT A USB PD ENGINEERING CHANGE REQUEST:

- 1) Please fill out the Engineering Change Request Form on the following pages completely:
 - a) Detail the names and contact details for each of the ECR contributors
 - b) Update the ECR Title
 - c) Give a minimum of 2-3 sentences for each description on the form outlining the background to the ECR
- 2) For each section/table/figure to be updated:
 - a) Detail the section number, starting page and figure/table number to be updated as appropriate.
 - b) Detail existing text under "From Text"
 - c) Detail changed text under "To Text"
- 3) Save the file as "USB PD 3.1 V1.4" followed by the ECR Title as per step 1)b)
- 4) Post the ECR in the USB Power Delivery Documents section under "ECR | New ECRs".
 - a) This ECR will then be reviewed by the Power Delivery Working Group.
 - b) Revisions to the ECR originating from the review should be submitted as document revision of the original ECR using "Add new document".

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Country: _____ Zip/Postal Code: _____

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USB Power Delivery ENGINEERING CHANGE NOTICE FORM

Title: Timer for Source to hold Rp SinkTxOk

Applied to: USB Power Delivery Specification Revision 3.1

Version 1.5

Brief description of the functional changes proposed:

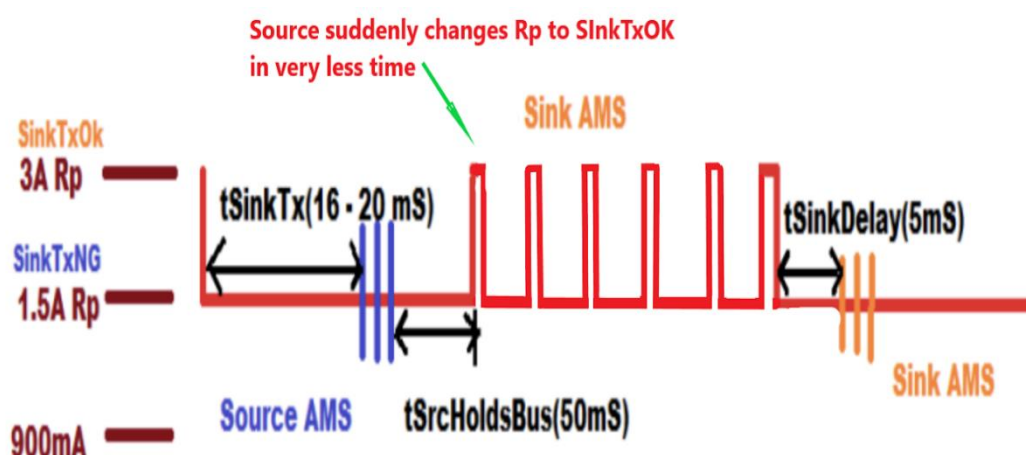
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We have observed a scenario as follows,

The Source is changing the Rp to SinkTxOK for a very short duration (Less than ~ 250μS).

As there is no minimum limit for the Source to hold the SinkTxOK. Source is again changing the Rp to SinkTxNG within very less time, Due to this Sink has no time to initiate the AMS at SinkTxOK state.

If the Source continuously changes the Rp as shown in below image, Sink is unable to initiate an AMS if it fails to recognise the Rp Change for short duration(few tens of μS) and Source is also unable to start an AMS. (After tSinkTx Source can initiate an AMS when the SinkTXNG is asserted. On SinkTXOK state Source shall not initiate the AMS.)



Once the Rp is asserted to SinkTxNg, Source can start an AMS after tSinkTx timer(16 to 20 ms). But when Rp is asserted to SinkTxOk, there is no timer for Rp to be in that state.

So I would recommend introducing a new timer for source to hold SinkTxOk for 5 to 15 ms or any reasonable timing to overcome this corner case.

Table 5-13 Rp values used for Collision Avoidance.

Source Rp	Parameter	Description	Sink operation	Source operation
1.5A@5V	<i>SinkTxNG</i>	Sink Transmit "No Go,"	The Sink shall Not initiate an AMS once <i>tSinkDelay</i> has elapsed after <i>SinkTxNG</i> is asserted.	Source can initiate an AMS <i>tSinkTx</i> after setting Rp to this value.
3A@5V	<i>SinkTxOk</i>	Sink Transmit "Ok"	Sink can initiate an AMS.	Source cannot initiate an AMS while it has this value set.

Benefits as a result of the proposed changes:

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Reduce the risk of interoperability

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

-

An analysis of the hardware implications:

-

An analysis of the software implications:

-

An analysis of the compliance testing implications:

-

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Actual Change Requested

(a). Section x.x.x, Page x, Figure/Table x-x

From Text:

COMMON.CHECK.PD.13 Check Correct Use of Rp

Description: The Tester checks whether the procedures for Collision Avoidance are correctly followed.

Check Applicability: In PD3 mode only, and explicit contract exists.

Perform the following checks on the Atomic Message Sequences: [COMMON.CHECK.PD.13#1]

1. The Source UUT starts an AMS:

When the Source UUT sends the first message to start an AMS, check that SinkTxNG has been asserted for at least tSinkTx min before the start of the first bit of the preamble.

2. An AMS initiated by the Source UUT has ended:

When the last message of an AMS initiated by the Source UUT has been sent, check that SinkTxNG is not asserted for more than tSrcHoldsBus. This delay is measured between the last bit of the EOP of last GoodCRC in the last AMS and the first bit of the preamble of the next AMS. (Refer to Source Port Policy Engine State Diagram in USB PD Specification)

3. The Sink UUT starts an AMS:

When a Sink starts an AMS, one of the following must be true:

- a. SinkTxOk is asserted.
 - b. SinkTxNG has been asserted for less than tSinkDelay.
4. The following AMS are the exception for all the above steps
- a. Hard Reset
 - b. Soft Reset
 - c. Alert

To Text:

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Note: If this check fails, it might be because of the Source UUT asserting SinkTxOK for a very short time duration, and hence it is recommended to verify this check manually in the signal capture that the Source UUT has changed the Rp assertion from SinkTxNG to SinkTxOK between the two AMS where this failure was observed and confirm the failure.

3. The Sink UUT starts an AMS:

When a Sink starts an AMS, one of the following must be true:

- a. SinkTxOk is asserted.
- b. SinkTxNG has been asserted for less than tSinkDelay.

4. The following AMS are the exception for all the above steps

- a. Hard Reset
- b. Soft Reset
- c. Alert