

# USB PD CTS ENGINEERING CHANGE NOTIFICATION FORM

**NOTICE:** Any Company or Companies submitting a USB Power Delivery ECR 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 CTS, 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 CTS Specification. 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 CTS Specification may do so by posting this to the USB Power Delivery Compliance 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 CTS 1.0 R 1" followed by the ECR Title as per step 1)b)
- 4) Post the ECR in the USB PD CTS Documents section under "ECR | New ECRs".
  - a) This ECR will then be reviewed by the Power Delivery Compliance 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".

# USB PD CTS ENGINEERING CHANGE NOTIFICATION FORM

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# USB PD CTS ENGINEERING CHANGE NOTIFICATION FORM

**Title: COMMON.CHECK.PD3.4 Check EPR\_Sink\_Capabilities  
Message**

**Applied to: USB PD CTS Q1, 2026 OR**

<b>Brief description of the functional changes proposed:</b>
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Correction to COMMON.CHECK.PD3.4 to check EPR_Sink_Capabilities instead of Sink_Capabilities
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<b>Benefits as a result of the proposed changes:</b>
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Correctly checks EPR_Sink_Capabilities
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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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None
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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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Tester to update the corresponding tests per the ECR updates.
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<b>An analysis of the Vendor Info File (VIF) implications:</b>
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None
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# USB PD CTS ENGINEERING CHANGE NOTIFICATION FORM

## Actual Change Requested

### COMMON.CHECK.PD3.4 Check EPR\_Sink\_Capabilities Message

#### From Text:

#### COMMON.CHECK.PD3.4 Check EPR\_Sink\_Capabilities Message

Description: The Tester performs additional protocol checks on all EPR *Sink\_Capabilities* Messages sent by the UUT.

Check Applicability: the *Sink\_Capabilities* Message

Perform the following checks on all *Sink\_Capabilities* Messages: [COMMON.CHECK.PD3.4#1]

1. The Tester runs the following field checks on the *Sink\_Capabilities* Message:
  - a. For the first PDO, the Tester checks:
    - i. B31...30 (Fixed Supply) set to 00b.
    - ii. B29 (Dual-Role Power) set to 1b if VIF field PD\_Port\_Type is DRP, Provider/Consumer or Consumer/Provider, otherwise set to 0b.
    - iii. B28: (Higher Capability) matches VIF field Higher\_Capability\_set
    - iv. B27 - (Unconstrained\_Power) matches VIF field Unconstrained\_Power
    - v. B26 (USB Communications Capable) matches VIF field USB\_Comms\_Capable
    - vi. B25 (Dual-Role Data) set to 1b if VIF field DR\_Swap\_To\_UFP\_Supported or DR\_Swap\_To\_DFP\_Supported = YES, otherwise set to 0b if VIF field DR\_Swap\_To\_UFP\_Supported and DR\_Swap\_To\_DFP\_Supported = NO
    - vii. B24...23
      1. PD3 mode (Fast Role Swap required USB Type-C Current) matches VIF field FR\_Swap\_Reqd\_Type\_C\_Current\_As\_Initial\_Source
    - viii. B22...20 (Reserved) set to 000b.
    - ix. B19...10 (Voltage) set to 5V.
    - x. B9...0 (Operational Current) matches VIF field SNK\_PDO\_OP\_CURRENT1
  - b. For each PDO, the Tester checks:
    - i. The Tester checks consistency of Snk\_PDO\_Supply\_TypeN
    - ii. If Fixed Supply PDO:
      1. In PD3, B22...20 (Reserved) are set to zero
      2. The Tester checks consistency of Snk\_PDO\_VoltageN
      3. The Tester checks consistency of Snk\_PDO\_Op\_CurrentN
    - iii. If Variable Supply PDO:
      1. The Tester checks consistency of Snk\_PDO\_Max\_VoltageN
      2. The Tester checks consistency of Snk\_PDO\_Min\_VoltageN
      3. The Tester checks consistency of Snk\_PDO\_Op\_CurrentN
    - iv. If Battery Supply PDO:
      1. The Tester checks consistency of Snk\_PDO\_Max\_VoltageN
      2. The Tester checks consistency of Snk\_PDO\_Min\_VoltageN
      3. The Tester checks consistency of Snk\_PDO\_Op\_PowerN
    - v. If Programmable Power Supply APDO:
      1. B29...28 set to 00b.
      2. B27...25 (Reserved) set to zero.
      3. B16 (Reserved) set to zero.
      4. B7 (Reserved) set to zero.
      5. The Tester checks consistency of Snk\_PDO\_Max\_VoltageN
      6. The Tester checks consistency of Snk\_PDO\_Min\_VoltageN
      7. The Tester checks consistency of Snk\_PDO\_Max\_CurrentN
    - vi. If Adjustable Voltage Supply APDO:
      1. B29...28 set to 01b.
      2. B27...26 (reserved) set to zero.

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3. B16 (Reserved) set to zero.
  4. The Tester checks consistency of Snk\_PDO\_Max\_VoltageN
  5. The Tester checks consistency of Snk\_PDO\_Min\_VoltageN
  6. The Tester checks if the PDP is consistent with “Snk\_PDO\_PDP\_Rating” VIF field.
- c. The Tester compares all PDOs to VIF field PD\_Power\_as\_Sink and check that they meet the requirements of the Power Rules
  - d. The Tester checks PDOs following the first one, are in the correct order: Fixed PDOs in increasing voltage sequence, Battery PDOs in increasing minimum voltage sequence, Variable PDOs in increasing minimum voltage sequence, and finally PPS PDOs in increasing maximum voltage sequence.
  - e. The Tester checks that no Fixed PDO has the same voltage as any other.
  - f. The Tester checks that no Variable PDO has the same voltage range as any other.
  - g. The Tester checks that no Battery PDO has the same voltage range as any other.
  - h. The Tester checks that no PPS/AVS PDO has the same voltage range as any other.

## To Text:

### COMMON.CHECK.PD3.4 Check EPR\_Sink\_Capabilities Message

Description: The Tester performs additional protocol checks on all EPR *Sink\_Capabilities* Messages sent by the UUT.

Check Applicability: the *EPR\_Sink\_Capabilities* Message

Perform the following checks on all *EPR\_Sink\_Capabilities* Messages:

1. Check if the VIF field EPR\_Supported\_as\_Snk is set to yes and Get\_EPR\_Sink\_Capabilities has been sent by the tester. [COMMON.CHECK.PD3.4#1]
2. The Tester checks Extended field = 1 in the Message Header. [COMMON.CHECK.PD3.4#2]  
The Tester checks Data size in the extended header: (SPR PDOs(7) + EPR PDO entries)\*4. The number of EPR PDOs is determined by counting the total number of entries in SnkPdoList and subtracting Num\_Snk\_PDOs VIF Parameter. [COMMON.CHECK.PD3.4#3]
3. For the first PDO, the Tester checks: [COMMON.CHECK.PD3.4#4]
  - a. B31...30 (Fixed Supply) set to 00b.
  - b. B29 (Dual-Role Power) set to 1b if VIF field PD\_Port\_Type is DRP, Provider/Consumer or Consumer/Provider, otherwise set to 0b.
  - c. B28 (Higher Capability) matches VIF field Higher\_Capability\_set.
  - d. B27 (Unconstrained\_Power) matches VIF field Unconstrained\_Power.
  - e. B26 (USB Communications Capable) matches VIF field USB\_Comms\_Capable.
  - f. B25 (Dual-Role Data) set to 1b if VIF field DR\_Swap\_To\_UFP\_Supported or DR\_Swap\_To\_DFP\_Supported = YES, otherwise set to 0b if VIF field DR\_Swap\_To\_UFP\_Supported and DR\_Swap\_To\_DFP\_Supported = NO
  - g. B24...23 (Fast Role Swap required USB Type-C Current) matches VIF field FR\_Swap\_Reqd\_Type\_C\_Current\_As\_Initial\_Source.
  - h. B22...20 (Reserved) set to 000b.
  - i. B19...10 (Voltage) set to 5V.
  - j. B9...0 (Operational Current) matches VIF field SNK\_PDO\_OP\_CURRENT1.
4. Check that the UUT followed all the PDO specific checks defined in COMMON.CHECK.PD.12 for all the SPR PDO in PDO position between 1 and 7. [COMMON.CHECK.PD3.4#5]
5. The Tester checks the EPR PDOs (position 8 to 11) meet the requirements of the Sink power rules [COMMON.CHECK.PD3.4#6]
  - a. Check that the UUT supports only Fixed PDO or EPR AVS APDO in the EPR PDO position (PDO index from 8 to 11).

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- b. If the UUT supports less than 7 SPR PDO's check that the unused SPR PDO's are zero filled in the SPR PDO positions (PDO index from 1 to 7).
- c. Check that the UUT supports no more than one EPR AVS APDO.
- d. The Tester checks PDOs following the first one, are in the correct order: Fixed PDOs in the increasing Voltage sequence.
- e. The tester checks that that no Fixed PDO has the same voltage as any other.
  - i. The Tester checks that no Fixed PDO has the same voltage as any other