

USB PD CTS ENGINEERING CHANGE NOTICE 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 NOTICE FORM

Name: Yoon Lee Email: _____

Company: Apple Mailstop: _____

Address: _____

City: _____ State/Province: _____

Country: _____ Zip/Postal Code: _____

Phone: _____ FAX: _____

Name: _____ Email: _____

Company: _____ Mailstop: _____

Address: _____

City: _____ State/Province: _____

Country: _____ Zip/Postal Code: _____

Phone: _____ FAX: _____

Name: _____ Email: _____

Company: _____ Mailstop: _____

Address: _____

City: _____ State/Province: _____

Country: _____ Zip/Postal Code: _____

Phone: _____ FAX: _____

Name: _____ Email: _____

Company: _____ Mailstop: _____

Address: _____

City: _____ State/Province: _____

Country: _____ Zip/Postal Code: _____

Phone: _____ FAX: _____

USB PD CTS ENGINEERING CHANGE NOTICE FORM

**Title: TEST.PD.VDM.SRC1, TEST.PD.VDM.SNK1 Attention
Response Check Update
Applied to: USB PD CTS Q1, 2026 OR**

Brief description of the functional changes proposed:
--

Update Attention command response check

Benefits as a result of the proposed changes:
--

Correct evaluation of DUT response to Attention command

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

An analysis of the software implications:
--

None

An analysis of the compliance testing implications:
--

Tester to update the corresponding tests per the ECR updates.

An analysis of the Vendor Info File (VIF) implications:
--

None

USB PD CTS ENGINEERING CHANGE NOTICE FORM

USB PD CTS ENGINEERING CHANGE NOTICE FORM

Actual Change Requested

To Text:

TEST.PD.VDM.SRC.1 Discovery Process and Enter Mode

Description: The Tester verifies that the UUT responds appropriately to VDM messages.

Test Specific Tester Behavior: N/A

Test Conditions:

	Consumer Only	Provider Only, C/P, P/C, DRP
<i>Rev2Src</i>		✓
<i>Rev3ChkdSrc</i>		✓

Test Procedures:

- There are 2 possible bring-up procedures:
 - The UUT has VIF field PD_Port_Type set to Consumer/Provider, the Tester runs bring-up procedure with the UUT as a Source COMMON.PROC.BU.7.
 - The UUT has VIF field PD_Port_Type set to anything else, the Tester runs bring-up procedure with the UUT as a Source COMMON.PROC.BU.1.
- The Tester sends *Request* Message with B25 (USB Communication Capable) set to 1b.
- The Tester sends a *Discover Identity* Command to the UUT, using SOP. The Tester checks the response:
 - In PD2 mode, the Tester checks the response as follows: [TEST.PD.VDM.SRC.1#1]
 - The UUT Supports Structured VDM is NO: the check passes if the UUT Ignores the Message within *tVDMSenderResponse* (i.e. if UUT replies with either NAK, ACK, BUSY, Reject, or any AMS will cause check to fail).
 - The UUT Supports Structured VDM is YES: the check fails if the UUT is DFP, and the UUT replies with anything but NAK within *tVDMSenderResponse*.
 - In PD3 mode, the Tester checks the response as follows: [TEST.PD.VDM.SRC.1#2]
 - The check fails if the UUT responds with anything but a *Discover Identity* Response message or *Not_Supported*, and the Tester has resent *Discover Identity* Command *nDiscoverIdentityCount* min after it is in PE_SRC_RDY for *nBusyCount* times.
 - If Supports Structured VDMs is Yes, the check fails if the UUT responds with a “Responder BUSY” message, and the Tester has resent *Discover Identity* Command for *nBusyCount* times every *tVDMBusy* min.
 - The check fails if Supports Structured VDMs is YES and the UUT responds with Not Supported.
 - The check fails if Supports Structured VDMs is NO and the UUT responds with “Responder ACK”, “Responder NAK” or “Responder BUSY”.
 - The check fails if Responds_To_Discov_SOP_DFP is NO and the UUT responds with “Responder ACK”.
 - The check fails if Responds_To_Discov_SOP_DFP is YES and the UUT responds with “Responder NAK”.
- If the UUT sends a “Responder ACK” message, the Tester performs the following check on the “Responder ACK” message: [TEST.PD.VDM.SRC.1#3]
 - ID Header VDO:
 - The check fails if B31 does not match VIF field Data_Capable_as_USB_Host_SOP
 - The check fails if B30 does not match VIF field Data_Capable_as_USB_Device_SOP
 - Check fails if B29..27 if:
 - In PD2 Mode:
 - Field is not set to Undefined if VIF Product_Type_UFP_SOP is PSD

USB PD CTS ENGINEERING CHANGE NOTICE FORM

- ii. Does not match VIF Product_Type_UFP_SOP otherwise.
 - b. In PD3 Mode:
 - Does not match VIF Product_Type_UFP_SOP
 - 4. The check fails if B26 does not match VIF field Modal_Operation_Supported_SOP
 - 5. In PD3, the check fails if B25...23 does not match VIF field Product_Type_DFP_SOP
 - 6. In PD3, the check fails if B22...21 does not match VIF field ID_Header_Connector_Type
 - 7. In PD3, the check fails if B20...16 is not set to zero.
 - 8. In PD2, the check fails if B25...16 is not set to zero.
 - 9. The check fails if B15...0 does not match VIF field USB_VID_SOP
 - ii. The check fails if Cert Stat VDO does not match VIF field XID_SOP
 - iii. The check fails if Product VDO does not match VIF fields PID_SOP and bcdDevice_SOP
4. The Tester sends an *Attention* Command to the UUT.
5. The Tester waits for *tCtsSenderResponse* (see **Error! Reference source not found.**), and the check fails if **Supports Structured VDMs is YES and** the UUT sends any Response message.. [TEST.PD.VDM.SRC.1#4]

TEST.PD.VDM.SNK.1 Discovery Process and Enter Mode

Description: The Tester verifies that the UUT responds correctly to the Discovery Process and the *Enter Mode* Commands.

Test Specific Tester Behavior: N/A

Test Conditions:

	Consumer Only, P/C, C/P, DRP	Provider Only
<i>Rev2Snk</i>	✓	
<i>Rev3ChkdSnk</i>	✓	

Test Procedures:

1. There are 2 possible bring-up procedures:
 - a. The UUT has VIF field PD_Port_Type set to Provider/Consumer, the Tester runs bring-up procedure with the UUT as a Sink COMMON.PROC.BU.8
 - b. The UUT has VIF field PD_Port_Type set to anything else, the Tester runs bring-up procedure with the UUT as a Sink COMMON.PROC.BU.2
2. The Tester sends a *Discover Identity* Command to the UUT, using SOP. The Tester checks the response. [TEST.PD.VDM.SNK.1#1]
 - a. The UUT shall respond with a “Responder NAK, if VIF fields Responds_To_Discov_SOP_UFP = NO and Supports Structured VDMs is Yes. Test ends here.
 - b. The UUT shall respond with either *Not_Supported* (in PD3 mode) or Ignore (in PD2 mode), if Supports Structured VDMs is NO. Test ends here.
 - c. If the UUT interrupts the Discovery Process (by sending anything but a *Discover Identity* Response message), the Tester resends *Discover Identity* Command *tVDMBusy* min after it is in PE_SNK_RDY for *nBusyCount* times. The check fails and the test ends here if the Tester has resent *Discover Identity* Command for *nBusyCount* times.
 - d. The check fails if the UUT responds with a “Responder BUSY” message and the Tester has resent *Discover Identity* Command for *nBusyCount* times every *tVDMBusy* min. Test ends here.
 - e. The check fails if the UUT responds with a “Responder ACK” message and VIF field Responds_To_Discov_SOP_UFP= No. Test ends here.
 - f. The check fails if the UUT does not respond with ‘Responder ACK’ message and VIF field Responds_To_Discov_SOP_UFP=Yes. Test ends here.
3. Perform the following check on “Responder ACK” message: [TEST.PD.VDM.SNK.1#2]
 - a. Number of VDOs:

USB PD CTS ENGINEERING CHANGE NOTICE FORM

- i. The check fails if the number of VDOs in the message does not match the value stated in the [Error! Reference source not found.](#), 11, 12 and 13 below, as appropriate, based on the Product Type(s) found in the message.
 - ii. The check fails if the number of VDOs is 7, and the 6th VDO (Pad) is not all 0's.
 - b. ID Header VDO:
 - i. The check fails if B31 does not match VIF field Data_Capable_as_USB_Host_SOP
 - ii. The check fails if B30 does not match VIF field Data_Capable_as_USB_Device_SOP
 - iii. The check fails if B29...27 if
 - a. In PD2 Mode:
 - i. Field is not set to Undefined if VIF Product_Type_UFP_SOP is PSD
 - ii. Field is set to AMA and VIF Product_Type_UFP_SOP is not set to peripheral.
 - iii. Does not match VIF Product_Type_UFP_SOP otherwise.
 - b. In PD3 Mode:
 - Does not match VIF Product_Type_UFP_SOP
 - iv. The check fails if B26 does not match VIF field Modal_Operation_Supported_SOP
 - v. In PD3 mode, the check fails if B25...23 does not match VIF field Product_Type_DFP_SOP
 - vi. In PD3, the check fails if B22...21 does not match VIF field ID_Header_Connector_Type
 - vii. In PD3 mode, the check fails if B20...16 is not set to zero.
 - viii. In PD2 mode, the check fails if B25...16 is not set to zero.
 - ix. The check fails if B15...0 does not match VIF field USB_VID_SOP
 - c. The check fails if Cert Stat VDO does not match VIF field XID_SOP
 - d. The check fails if Product VDO does not match VIF fields PID_SOP and bcdDevice_SOP
- 4. The Tester sends a *Discover SVIDs* Command to the UUT, using SOP. The Tester checks the response.
[\[TEST.PD.VDM.SNK.1#3\]](#)
 - a. The check fails if the UUT responds with either *Not Supported* or Ignore. The test stops here.
 - b. If the UUT interrupts the Discovery Process (by responding with anything but a *Discover SVIDs* Response message), the Tester resends *Discover SVIDs* Command *tVDMBusy* min after it is in PE_SNK_RDY for *nBusyCount* times. The check fails and the test ends here if the Tester has resent *Discover Identity* Command for *nBusyCount* times.
 - c. If the UUT responds a "Responder BUSY" message, the Tester resends *Discover SVIDs* Command for *nBusyCount* times every *tVDMBusy* min. Once the Tester has repeated *Discover SVIDs* for *nBusyCount* times, the check fails, and test stops here.
 - d. If the UUT responds with a "Responder NAK" message, the Tester checks that VIF field Modal_Operation_Supported_SOP = No.
 - e. If the UUT responds with a "Responder ACK" message, the Tester checks that VIF field Modal_Operation_Supported_SOP = Yes.
- 5. The Tester evaluates the number of SVIDs in the *Discover SVIDs* ACK message and checks the following:
[\[TEST.PD.VDM.SNK.1#4\]](#)
 - a. Each discovered SVID appears in VIF list SVID<X>_SOP. SVID's position in the VDO is checked according to SVID_Fixed_SOP value in VIF.
 - i. If SVID_Fixed_SOP is set to YES, the order of SVIDs in the VDO matches the order of SVID<X>_SOP in VIF.
 - ii. If SVID_Fixed_SOP is set to NO, each SVID in the VDO list can be in any position in the VIF's SVID<X>_SOP list.
 - b. The number of SVIDs discovered lies between Num_SVIDs_min_SOP and Num_SVIDs_max_SOP.
 - c. For each VDO, the Tester checks if B15...0 (SVID n+1) are set to zeros, this marks the last VDO.
 - d. For each VDO, the Tester checks if B31...16 (SVID n) are set to zeros, then B15...0 shall also be zeros, and this marks the last VDO.
 - e. If the *Discover SVIDs* ACK message has 6 VDOs, and B15...0 in VDO 6 is non-zero, then repeat Step-3 until the Tester finds the last VDO.

USB PD CTS ENGINEERING CHANGE NOTICE FORM

6. For each SVID:
 - a. The Tester sends a *Discover Modes* Command to the UUT, using SOP.
 - b. The Tester checks the response: [TEST.PD.VDM.SNK.1#5]
 - i. The check fails if the UUT responds with either *Not_Supported* or Ignore. The test stops here.
 - ii. If the UUT interrupts the Discovery Process (by responding with anything but a *Discover Modes* Response message), the Tester resends *Discover SVIDs* Command *tVDMBusy* min after it is in PE_SNK_RDY for *nBusyCount* times. The check fails and the test ends here if the Tester has resent *Discover Identity* Command for *nBusyCount* times.
 - iii. If the UUT responds a "Responder BUSY" message, the Tester resends *Discover Modes* Command for *nBusyCount* times every *tVDMBusy* min. Once the Tester has repeated *Discover SVIDs* for *nBusyCount* times, the check fails, and test stops here.
 - iv. If the UUT responds with a "Responder NAK" message, the Tester checks that Modal_Operation_Supported_SOP = No.
 - v. If the UUT responds with a "Responder ACK" message, the Tester checks that Modal_Operation_Supported_SOP = Yes.
 - vi. The number of Modes discovered lies between SVID<X>_Num_Modes_Min_SOP and SVID<X>_Num_Modes_Max_SOP.
7. For every Mode in each SVID:
 - a. The Tester sends *Enter Mode* to the UUT, using SOP. If VIF SVID<X>_Mode<Y>_Require_VDO = Yes, The Tester adds VIF SVID<X>_Mode<Y>_Enter_VDO to the VDM.
 - b. The Tester checks the response. [TEST.PD.VDM.SNK.1#6]
 - i. If the UUT responds with "Responder BUSY", the check fails.
 - ii. The check fails if the UUT responds with "Responder NAK" to the corresponding SVID<X>_Mode<Y>_enter_SOP = Yes.
 - iii. If the UUT responds with "Responder ACK" to *Enter Mode*, the Tester then sends an *Exit Mode* Command to the UUT using SOP. The check fails if the UUT does not respond with "Responder ACK" to Exit Mode.
8. The Tester sends an *Attention* Command to the UUT.
9. The Tester waits for *tCtsSenderResponse* (see **Error! Reference source not found.**), and the check fails if Supports Structured VDMs is YES and the UUT sends any Response message. [TEST.PD.VDM.SNK.1#7]