USB Power Delivery ENGINEERING CHANGE NOTICE

Title: Improve VPD Definitions
Applied to: USB Power Delivery Specification Revision 3.0 Version 1.2

Brief description of the functional changes proposed:
Improve the description of a VPD, defining in particular the limitations of what functionality it may have. • Update VPD definition and add CT-VPD definition • Add additional details required for CT-VPD definition. • Add references to VPD in Chapter 5 • Clarify that VPDs are Rev 3 or later • Add current carrying capability to VPD VDO • Added VPD column to message applicability tables Two minor non-VPD corrections changes to the cable Applicability Table.

Benefits as a result of the proposed changes:
Prevent devices being developed that go beyond the intended functionality, and therefore cause incompatibility issues.

An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
Should be none as such devices have not been subject to compliance testing as yet.

An analysis of the hardware implications:
Should be none as such devices have not been subject to compliance testing as yet.

An analysis of the software implications:
Should be none as such devices have not been subject to compliance testing as yet.

An analysis of the compliance testing implications:
Should be none as such devices have not been subject to compliance testing as yet. This definition will assist in future compliance testing as it defines clearly the areas that need testing.

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Actual Change Requested

(a). Section 1.6, Page 45, Table 1-1 Terms and Abbreviations

From Text:

VCONN Powered USB Device (VPD)	A captive cable USB Device that may be powered by either VCONN or VBUS as defined in *[USB Type-C 1.3]*. Note a VPD is only addressable by SOP' Packets.

To Text:

VCONN Powered USB Device (VPD)	A captive cable USB Device that may be powered by either VCONN or VBUS as defined in *[USB Type-C 1.3]*. Note a VPD is only addressable by SOP' Packets. A VPD is a captive cable USB device that may be powered by either VCONN or VBUS and only responds to SOP' messages as defined in the Tables in Section 6.12 (Message Applicability). It only responds to messages sent with a Specification Revision of at least Rev 3.0. A VPD is not allowed to support Alternate Modes. The term VPD refers to either a VPD or a CT-VPD with no charger connected.
VCONN Powered USB Charge Through Device (CT-VPD)	A CT-VPD is a VPD with an additional port for connecting a Source (e.g., a charger) **as** defined in **[USB Type-C 1.3]**. When no charger is connected, a CT-VPD behaves as a VPD. When a charger is connected, no PD communication to the CT-VPD itself is possible as CC is connected to the charger port. Hence all PD communication then is with the charger and the cable with which it is connected.

(b). Section 5.6.1.2.1-3, Page 75
From:

5.6.1.2.1   Start of Packet Sequence (SOP)

SOP is an ordered set. The *SOP* ordered set is defined as: three *Sync-1* K-codes followed by one *Sync-2* K-code (see Table 5-5).

Table 5-5 SOP ordered set

K-code number	K-code in code table
1	Sync-1
2	Sync-1
3	Sync-1
4	*Sync-2*

A Power Delivery Capable Source or Sink *Shall* be able to detect and communicate with packets using *SOP*. If a *Valid SOP* is not detected (see Table 5-3) then the whole transmission *Shall* be *Discarded*.
Sending and receiving of SOP Packets *Shall* be limited to PD Capable Ports on PDUSB Hosts and PDUSB Devices. Cable Plugs *Shall* neither send nor receive SOP Packets. Note that PDUSB Devices, even if they have the physical form of a cable (e.g. AMAs), are still required to respond to SOP Packets.

5.6.1.2.2   Start of Packet Sequence Prime (SOP')

The *SOP'* ordered set is defined as: two *Sync-1* K-codes followed by two *Sync-3* K-codes (see Table 5-6).

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Table 5-6 SOP' ordered set

K-code number	K-code in code table
1	*Sync-1*
2	*Sync-1*
3	*Sync-3*
4	*Sync-3*

A Cable Plug capable of SOP' Communications ***Shall*** only detect and communicate with packets starting with ***SOP'***. A Port needing to communicate with a Cable Plug capable of SOP' Communications, Attached between a Port Pair will be able to communicate using both packets starting with ***SOP'*** to communicate with the Cable Plug and starting with ***SOP*** to communicate with its Port Partner.

For a Cable Plug supporting SOP' Communications, if a ***Valid SOP'*** is not detected (see Table 5-3) then the whole transmission ***Shall*** be ***Discarded***. For a Port supporting SOP' Communications if a ***Valid SOP*** or ***SOP'*** is not detected (see Table 5-3) then the whole transmission ***Shall*** be ***Discarded***. When there is no Explicit Contract or an Implicit Contract in place a Sink ***Shall Not*** send SOP' Packets and ***Shall Discard*** all packets starting with ***SOP'***.

5.6.1.2.3   Start of Packet Sequence Double Prime (SOP'')

The ***SOP''*** ordered set is defined as the following sequence of K-codes: ***Sync-1***, ***Sync-3***, ***Sync-1***, ***Sync-3*** (see Table 5-7).

Table 5-7 SOP'' ordered set

K-code number	K-code in code table
1	*Sync-1*
2	*Sync-3*
3	*Sync-1*
4	*Sync-3*

A Cable Plug capable of SOP'' Communication, ***Shall*** have a SOP' Communication capability in the other Cable Plug. No cable ***Shall*** only support SOP'' Communication. A Cable Plug to which SOP'' Communication is assigned ***Shall*** only detect and communicate with packets starting with ***SOP''*** and ***Shall Discard*** any other packets. A Port needing to communicate with such a Cable Plug, Attached between a Port Pair will be able to communicate using packets starting with ***SOP'*** and ***SOP''*** to communicate with the Cable Plugs and packets starting with ***SOP*** to communicate with its Port Partner. A Port which supports SOP'' Communication ***Shall*** also support SOP' Communication and ***Shall*** co-ordinate SOP* Communication so as to avoid collisions.

For the Cable Plug supporting SOP'' Communication, if a ***Valid SOP''*** is not detected (see Table 5-3) then the whole transmission ***Shall*** be ***Discarded***. For the Port if a ***Valid SOP**** is not detected (see Table 5-3) then the whole transmission ***Shall*** be ***Discarded***.

To:

5.6.1.2.1   Start of Packet Sequence (SOP)

SOP is an ordered set. The ***SOP*** ordered set is defined as: three ***Sync-1*** K-codes followed by one ***Sync-2*** K-code (see Table 5-5).

Table 5-5 SOP ordered set

K-code number	K-code in code table
1	Sync-1
2	Sync-1
3	Sync-1

4	*Sync-2*

A Power Delivery Capable Source or Sink *Shall* be able to detect and communicate with packets using *SOP*. If a *Valid SOP* is not detected (see Table 5-3) then the whole transmission *Shall* be *Discarded*.

Sending and receiving of SOP Packets *Shall* be limited to PD Capable Ports on PDUSB Hosts and PDUSB Devices. Cable Plugs and VPDs *Shall* neither send nor receive SOP Packets. Note that PDUSB Devices, even if they have the physical form of a cable (e.g. AMAs), are still required to respond to SOP Packets.

5.6.1.2.2   Start of Packet Sequence Prime (SOP')

The *SOP'* ordered set is defined as: two *Sync-1* K-codes followed by two *Sync-3* K-codes (see Table 5-6).

Table 5-6 SOP' ordered set

K-code number	K-code in code table
1	*Sync-1*
2	*Sync-1*
3	*Sync-3*
4	*Sync-3*

A VPD *Shall* have SOP' Communication capability. A VPD and a Cable Plug capable of SOP' Communications *Shall* only detect and communicate with packets starting with *SOP'*.

A Port needing to communicate with a Cable Plug capable of SOP' Communications, Attached between a Port Pair will be able to communicate using both packets starting with *SOP'* to communicate with the Cable Plug and starting with *SOP* to communicate with its Port Partner.

For a VPD or a Cable Plug supporting SOP' Communications, if a *Valid SOP'* is not detected (see Table 5-3) then the whole transmission *Shall* be *Discarded*. For a Port supporting SOP' Communications if a *Valid SOP* or *SOP'* is not detected (see Table 5-3) then the whole transmission *Shall* be *Discarded*. When there is no Explicit Contract or an Implicit Contract in place a Sink *Shall Not* send SOP' Packets and *Shall Discard* all packets starting with *SOP'*.

5.6.1.2.3   Start of Packet Sequence Double Prime (SOP'')

The *SOP''* ordered set is defined as the following sequence of K-codes: *Sync-1*, *Sync-3*, *Sync-1*, *Sync-3* (see Table 5-7).

Table 5-7 SOP'' ordered set

K-code number	K-code in code table
1	*Sync-1*
2	*Sync-3*
3	*Sync-1*
4	*Sync-3*

A VPD *Shall Not* have SOP'' Communication capability. A Cable Plug capable of SOP'' Communication, *Shall* have a SOP' Communication capability in the other Cable Plug. No cable *Shall* only support SOP'' Communication. A Cable Plug to which SOP'' Communication is assigned *Shall* only detect and communicate with packets starting with *SOP''* and *Shall Discard* any other packets.

A Port needing to communicate with such a Cable Plug, Attached between a Port Pair will be able to communicate using packets starting with *SOP'* and *SOP''* to communicate with the Cable Plugs and packets starting with *SOP* to communicate with its Port Partner. A Port which supports SOP'' Communication *Shall* also support SOP' Communication and *Shall* co-ordinate SOP* Communication so as to avoid collisions.

For the Cable Plug supporting SOP'' Communication, if a *Valid SOP''* is not detected (see Table 5-3) then the whole transmission *Shall* be *Discarded*. For the Port if a *Valid SOP** is not detected (see Table 5-3) then the whole transmission *Shall* be *Discarded*.

(c). Section 6.2.1.1.5, Page 101
From:

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To ensure interoperability with existing USBPD Products, USBPD Products *Shall* support every PD Specification Revision starting from *[USBPD 2.0]*.

To:

To ensure interoperability with existing USBPD Products, USBPD Products *Shall* support every PD Specification Revision starting from *[USBPD 2.0]* for SOP*; the only exception to this is a VPD which *Shall Ignore* Messages sent with PD Specification Revision 2.0 and earlier.

(d). Section 6.4.4.3.1.7, Page 149

From Text:

The Vconn Powered USB Device (VPD) VDO defined in this section *Shall* be sent when the Product Type is given as Vconn Powered USB Device. Table 6-39 defines the VPD VDO which *Shall* be sent.

For a DFP that supports VPDs, upon discovering that the Product Type is a VPD and that the VPD only supports *[USB 2.0]*, *Shall* issue *Cable Reset* Signaling and *Shall* revert to *[USB 2.0]* operation. Otherwise the Initiator *Shall* follow the Revision requirements as specified in Section 6.2.1.1.5.

Table 6-39 VPD VDO

Bit(s)	Field	Description
B31…28	HW Version	0000b…1111b assigned by the VID owner
B27…24	Firmware Version	0000b…1111b assigned by the VID owner
B23…21	VDO Version	Version Number of the VDO (not this specification Version): • Version 1.0 = 000b Values 001b…111b are *Reserved* and *Shall Not* be used
B20…17	*Reserved*	*Shall* be set to zero.
B16…15	Maximum V$_{BUS}$ Voltage	Maximum Cable V$_{BUS}$ Voltage: 00b – 20V 01b – 30V 10b – 40V 11b – 50V
B14…13	*Reserved*	*Shall* be set to zero.
B12…7	V$_{BUS}$ Impedance	Charge Through Support bit = 1b: Vbus impedance through the VPD in 2 mΩ increments. Values less than 10 mΩ are Reserved and *Shall Not* be used. Charge Through Support bit = 0b: *Reserved, Shall* be set to zero
B6…1	Ground Impedance	Charge Through Support bit = 1b: Ground impedance through the VPD in 1 mΩ increments. Values less than 10 mΩ are *Reserved* and *Shall Not* be used. Charge Through Support bit = 0b: *Reserved, Shall* be set to zero
B0	Charge Through Support	1b – the VPD supports Charge Through 0b – the VPD does not support Charge Through

To Text:

The Vconn Powered USB Device VPD VDO defined in this section *Shall* be sent when the Product Type is given as Vconn Powered USB Device. Table 6-39 defines the VPD VDO that *Shall* be sent.

~~For a DFP that supports VPDs, upon discovering that the Product Type is a VPD and that the VPD only supports *[USB 2.0]*, *Shall* issue *Cable Reset* Signaling and *Shall* revert to *[USB 2.0]* operation. Otherwise the Initiator *Shall* follow the Revision requirements as specified in Section 6.2.1.1.5.~~

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<p align="center">Table 6-39 VPD VDO</p>

Bit(s)	Field	Description
B31...28	HW Version	0000b...1111b assigned by the VID owner
B27...24	Firmware Version	0000b...1111b assigned by the VID owner
B23...21	VDO Version	Version Number of the VDO (not this specification Version): • Version 1.0 = 000b Values 001b...111b are *Reserved* and *Shall Not* be used
B20...17	*Reserved*	*Shall* be set to zero.
B16...15	Maximum V_{BUS} Voltage	Maximum Cable V_{BUS} Voltage: 00b – 20V 01b – 30V 10b – 40V 11b – 50V
B14	Charge Through Current Support	Charge Through Support bit = 1b: 0b - 3A capable; 1b - 5A capable Charge Through Support bit = 0b: *Reserved, Shall* be set to zero
B13	*Reserved*	*Shall* be set to zero.
B12...7	V_{BUS} Impedance	Charge Through Support bit = 1b: Vbus impedance through the VPD in 2 mΩ increments. Values less than 10 mΩ are Reserved and *Shall Not* be used. Charge Through Support bit = 0b: *Reserved, Shall* be set to zero
B6...1	Ground Impedance	Charge Through Support bit = 1b: Ground impedance through the VPD in 1 mΩ increments. Values less than 10 mΩ are *Reserved* and *Shall Not* be used. Charge Through Support bit = 0b: *Reserved, Shall* be set to zero
B0	Charge Through Support	1b – the VPD supports Charge Through 0b – the VPD does not support Charge Through

(e). Section 6.12, Page 228

From Text:

6.12.1 Applicability of Control Messages

Table 6-65 details Control Messages that *Shall*/*Should*/ *Shall Not* be transmitted and received by a Source, Sink or Cable Plug. Requirements for Dual-Role Power Ports and Dual-Role Data Ports *Shall* override any requirements for Source-only or Sink-Only Ports.

<p align="center">Table 6-65 Applicability of Control Messages</p>

Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug
Transmitted Message					
Accept	N	N			N
DR_Swap	O	O		N	NA
FR_Swap	NA	NA	R		NA
Get_Country_Codes	CN[10]/NA	CN[10]/NA			NA
Get_PPS_Status	NA	CN[9]			NA
Get_Sink_Cap	R	NA	N		NA
Get_Sink_Cap_Extended	R	NA	R		NA
Get_Source_Cap	NA	R	N		NA
Get_Source_Cap_Extended	NA	R	R		NA

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Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug
Get_Status	R	R			NA
GoodCRC	N	N			N
GotoMin	CN^1/O	NA			NA
Not_Supported	N	N			N
Ping	O	NA			NA
PR_Swap	NA	NA	N		NA
PS_RDY	N	CN^4/NA	N		NA
Reject	N	NA	O	O	NA
Soft_Reset	N	N			NA
VCONN_Swap	R	R			NA
Wait	CN^2/O	NA	O	O	NA
Received Message					
Accept	N	N	N	N	I
DR_Swap	O/NS	O/NS		N	I
FR_Swap	NS	NS	CN^7/NS		I
Get_Country_Codes	CN^{10}/NS	CN^{10}/NS			I
Get_PPS_Status	CN^9/NS	NS			I
Get_Sink_Cap	NS	N	N		I
Get_Sink_Cap_Extended	NS	CN^{11}/NS	CN^{11}/NS		I
Get_Source_Cap	N	NS	N		I
Get_Source_Cap_Extended	CN^5/NS	NS	CN^5/NS		I
Get_Status	CN^6/NS	CN^6/NS	CN^6/NS		CN^{12}/I
GoodCRC	N	N			N
GotoMin	NS	R^3			I
Not_Supported	N	N			N
Ping	NS	I			I
PR_Swap	NS	NS	N		I
PS_RDY	CN^4/NS	N	N		I
Reject	CN^8/NS	N	N	N	I
Soft_Reset	N	N			N
VCONN_Swap	CN^4/ NS	CN^4/ NS			I
Wait	CN^8/NS	N	N	N	I

Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug

Note 1: **Shall** be supported by a Hub with multiple Downstream Ports. **Should** be supported by a Host with multiple Downstream Ports.

Note 2: **Shall** be supported when transmission of *GotoMin* Messages is supported.

Note 3: **Should** be supported by Sinks which use PD power for charging.

Note 4: **Shall** be supported by any Port that can supply V$_{CONN}$.

Note 5: **Shall** be supported products that support the *Source_Capabilities_Extended* Message.

Note 6: **Shall** be supported by Sources that support the *Alert* Message.

Note 7: **Shall** be supported when the Fast Role Swap signal is supported.

Note 8: **Shall** be supported when *VCONN_Swap* is supported.

Note 9: **Shall** be supported when PPS is supported.

Note 10: **Shall** be supported when required by a country authority.

Note 11: **Shall** be supported by products that support the *Sink_Capabilities_Extended* Message.

Note 12: **Shall** be supported by Active Cables

6.12.2 Applicability of Data Messages

Table 6-66 details Data Messages (except for VDM Commands) that **Shall**/**Should**/ **Shall Not** be transmitted and received by a Source, Sink or Cable Plug. Requirements for Dual-Role Power Ports **Shall** override any requirements for Source-only or Sink-Only Ports.

Table 6-66 Applicability of Data Messages

Message Type	Source	Sink	Dual-Role Power	Cable Plug
Transmitted Message				
Source_Capabilities	N	NA	N	NA
Request	NA	N		NA
Get_Country_Info	CN[5]/O	CN[5]/O		NA
BIST	N[1]	N[1]		NA
Sink_Capabilities	NA	N	N	NA
Battery_Status	CN[2]	CN[2]		NA
Alert	R	R		NA
Received Message				
Source_Capabilities	NS	N	N	I
Request	N	NS		I
Get_Country_Info	CN[5]/NS	CN[5]/NS		I
BIST	N[1]	N[1]		N[1]
Sink_Capabilities	CN[4]	NS	CN[4]	I
Battery_Status	CN[3]/NS	CN[3]/NS		I
Alert	R/NS	R/NS		I

Note 1: For details of which BIST Modes and Messages **Shall** be supported see Section 5.9 and Section 6.4.3.

Note 2: **Shall** be supported by products that contain batteries.

Note 3: **Shall** be supported by products that support the *Get_Battery_Status* Message.

Note 4: **Shall** be supported by products that support the *Get_Sink_Cap* Message.

Note 5: **Shall** be supported when required by a country authority.

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6.12.3 Applicability of Extended Messages

Table 6-67 details Extended Messages (except for Extended VDM Commands) that *Shall*/*Should*/ *Shall Not* be transmitted and received by a Source, Sink or Cable Plug. Requirements for Dual-Role Power Ports *Shall* override any requirements for Source-only or Sink-Only Ports.

Table 6-67 Applicability of Extended Messages

Message Type	Source	Sink	Dual-Role Power	Cable Plug
Transmitted Message				
Battery_Capabilities	CN^1/NA	CN^1/NA		NA
Country_Codes	CN^{10}/NA	CN^{10}/NA		NA
Country_Info	CN^{10}/NA	CN^{10}/NA		NA
Firmware_Update_Request	CN^7/NA	CN^7/NA		NA
Firmware_Update_Response	CN^7/NA	CN^7/NA		CN^7/NA
Get_Battery_Cap	R	R		NA
Get_Battery_Status	R	R		NA
Get_Manufacturer_Info	R	R		NA
Manufacturer_Info	R	R		R
PPS_Status	CN^8/NA	NA		NA
Security_Request	CN^6/NA	CN^6/NA		NA
Security_Response	CN^6/NA	CN^6/NA		CN^6/NA
Sink_Capabilities_Extended	NA	R	R	NA
Source_Capabilities_Extended	R	NA	R	NA
Status	R	R	R	CN^{12}/NA
Received Message				
Battery_Capabilities	CN^4/NS	CN^4/NS		I
Country_Codes	CN^{10}/NS	CN^{10}/NS		I
Country_Info	CN^{10}/NS	CN^{10}/NS		I
Firmware_Update_Request	CN^7/NS	CN^7/NS		CN^7/I
Firmware_Update_Response	CN^7/NS	CN^7/NS		I
Get_Battery_Cap	CN^1/NS	CN^1/NS		I
Get_Battery_Status	CN^1/NS	CN^1/NS		I
Get_Manufacturer_Info	R/NS	R/NS		R
Manufacturer_Info	CN^5/NS	CN^5/NS		I
PPS_Status	NS	CN9/NS		I
Security_Request	CN^6/NS	CN^6/NS		CN^6/I
Security_Response	CN^6/NS	CN^6/NS		I
Sink_Capabilities_Extended	CN^{11}/NS	NS	CN^{11}/NS	I
Source_Capabilities_Extended	NS	CN^2/NS	CN^2/NS	I
Status	CN^3/NS	CN^3/NS		I

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Message Type	Source	Sink	Dual-Role Power	Cable Plug
Note 1: **Shall** be supported by products that contain batteries.				
Note 2: **Shall** be supported by products that can transmit the *Get_Source_Cap_Extended* Message.				
Note 3: **Shall** be supported by products that can transmit the *Get_Status* Message.				
Note 4: **Shall** be supported by products that can transmit the *Get_Battery_Cap* Message.				
Note 5: **Shall** be supported by products that can transmit the *Get_Manufacturer_Info* Message				
Note 6: **Shall** be supported by products that support USB security communication as defined in *[USBTypeCAuthentication 1.0]*				
Note 7: **Shall** be supported by products that support USB firmware update communication as defined in *[USBPDFirmwareUpdate 1.0]*				
Note 8: **Shall** be supported when PPS is supported.				
Note 9: **Shall** be supported by products that can transmit the *Get_PPS_Status*.				
Note 10: **Shall** be supported when required by a country authority.				
Note 11: **Shall** be supported by products that can transmit the *Get_Sink_Cap_Extended* Message.				
Note 12: **Shall** be supported by Active Cables				

6.12.4 Applicability of Structured VDM Commands

Table 6-68 details Structured VDM Commands that **Shall**/**Should**/ **Shall Not** be transmitted and received by a DFP, UFP or Cable Plug. If Structured VDMs are not supported, the DFP or UFP receiving a VDM Command **Shall** send a *Not_Supported* Message in response.

Table 6-68 Applicability of Structured VDM Commands

Command Type	DFP	UFP	Cable Plug
Transmitted Command Request			
Discover Identity	CN[1]/R	R[2]	NA
Discover SVIDs	CN[1]/O	O	NA
Discover Modes	CN[1]/O	O	NA
Enter Mode	CN[1]/NA	NA	NA
Exit Mode	CN[1]/NA	NA	NA
Attention	O	O	NA
Received Command Request/Transmitted Command Response			
Discover Identity	O/NK[3]	CN[1]/R/NK[3]	N
Discover SVIDs	O/NK[3]	CN[1]/NK[3]	CN[1]/NK
Discover Modes	O/NK[3]	CN[1]/NK[3]	CN[1]/NK
Enter Mode	NK[3]	CN[1]/NK[3]	CN[1]/NK
Exit Mode	NK[3]	CN[1]/NK[3]	CN[1]/NK
Attention	O/I[3]	O/I[3]	I
Note 1: **Shall** be supported when Modal Operation is supported.			
Note 2: **May** be transmitted by a UFP/Source during discovery (see Section 6.4.4.3.1 and Section 8.3.3.22.3).			
Note 3: If Structured VDMs are not supported, the DFP or UFP receiving a VDM Command **Shall** send a *Not_Supported* Message in response.			

6.12.4 Applicability of Reset Signaling

Table 6-69 details Reset Signaling that **Shall**/**Should**/ **Shall Not** be transmitted and received by a DFP/UFP or Cable Plug.

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Table 6-69 Applicability of Reset Signaling

Signaling Type	DFP	UFP	Cable Plug
Transmitted Message/Signaling			
Soft_Reset	N	N	NA
Hard Reset	N	N	NA
Cable Reset	CN[1]	CN[1]	NA
Received Message/Signaling			
Soft_Reset	N	N	N
Hard Reset	N	N	N
Cable Reset	DR	DR	N
Note 1: **Shall** be supported when transmission of SOP' Packets are supported and the Port can supply V_{CONN}.			

To Text:

6.12.1 Applicability of Control Messages

Table 6-65 details Control Messages that **Shall**/**Should**/ **Shall Not** be transmitted and received by a Source, Sink, Cable Plug or VPD. Requirements for Dual-Role Power Ports and Dual-Role Data Ports **Shall** override any requirements for Source-only or Sink-Only Ports.

Table 6-65 Applicability of Control Messages

Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug	VPD [13]
Transmitted Message						
Accept	N	N			N	N
DR_Swap	O	O		N	NA	NA
FR_Swap	NA	NA	R		NA	NA
Get_Country_Codes	CN[10]/NA	CN[10]/NA			NA	NA
Get_PPS_Status	NA	CN[9]			NA	NA
Get_Sink_Cap	R	NA	N		NA	NA
Get_Sink_Cap_Extended	R	NA	R		NA	NA
Get_Source_Cap	NA	R	N		NA	NA
Get_Source_Cap_Extended	NA	R	R		NA	NA
Get_Status	R	R			NA	NA
GoodCRC	N	N			N	N
GotoMin	CN[1]/O	NA			NA	NA
Not_Supported	N	N			N[12]/NA	NA
Ping	O	NA			NA	NA
PR_Swap	NA	NA	N		NA	NA
PS_RDY	N	CN[4]/NA	N		NA	NA
Reject	N	NA	O	O	NA	NA
Soft_Reset	N	N			NA	NA
VCONN_Swap	R	R			NA	NA

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Message Type	Source	Sink	Dual-Role Power	Dual-Role Data	Cable Plug	VPD [13]
Wait	CN^2/O	NA	O	O	NA	NA
Received Message						
Accept	N	N	N	N	I	I
DR_Swap	O/NS	O/NS		N	I	I
FR_Swap	NS	NS	CN^7/NS		I	I
Get_Country_Codes	CN^{10}/NS	CN^{10}/NS			I	I
Get_PPS_Status	CN^9/NS	NS			I	I
Get_Sink_Cap	NS	N	N		I	I
Get_Sink_Cap_Extended	NS	CN^{11}/NS	CN^{11}/NS		I	I
Get_Source_Cap	N	NS	N		I	I
Get_Source_Cap_Extended	CN^5/NS	NS	CN^5/NS		I	I
Get_Status	CN^6/NS	CN^6/NS	CN^6/NS		CN^{12}/I	I
GoodCRC	N	N			N	N
GotoMin	NS	R^3			I	I
Not_Supported	N	N			N^{12}/I	I
Ping	NS	I			I	I
PR_Swap	NS	NS	N		I	I
PS_RDY	CN^4/NS	N	N		I	I
Reject	CN^8/NS	N	N	N	I	I
Soft_Reset	N	N			N	N
VCONN_Swap	CN^4/ NS	CN^4/ NS			I	I
Wait	CN^8/NS	N	N	N	I	I

Note 1: ***Shall*** be supported by a Hub with multiple Downstream Ports. ***Should*** be supported by a Host with multiple Downstream Ports.
Note 2: ***Shall*** be supported when transmission of *GotoMin* Messages is supported.
Note 3: ***Should*** be supported by Sinks which use PD power for charging.
Note 4: ***Shall*** be supported by any Port that can supply V_{CONN}.
Note 5: ***Shall*** be supported products that support the *Source_Capabilities_Extended* Message.
Note 6: ***Shall*** be supported by Sources that support the *Alert* Message.
Note 7: ***Shall*** be supported when the Fast Role Swap signal is supported.
Note 8: ***Shall*** be supported when *VCONN_Swap* is supported.
Note 9: ***Shall*** be supported when PPS is supported.
Note 10: ***Shall*** be supported when required by a country authority.
Note 11: ***Shall*** be supported by products that support the *Sink_Capabilities_Extended* Message.
Note 12: ***Shall*** be supported by Active Cables
Note 13: VPD includes CT-VPDs when not attached Connected to a Charger. PD communication with a CT-VPD ***Shall*** only take place when not Connected to a Charger.

6.12.2 Applicability of Data Messages

Table 6-66 details Data Messages (except for VDM Commands) that ***Shall***/***Should***/ ***Shall Not*** be transmitted and received by a Source, Sink, Cable Plug or VPD. Requirements for Dual-Role Power Ports ***Shall*** override any requirements for Source-only or Sink-Only Ports.

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<div align="center">Table 6-66 Applicability of Data Messages</div>

Message Type	Source	Sink	Dual-Role Power	Cable Plug	VPD [6]
Transmitted Message					
Source_Capabilities	N	NA	N	NA	NA
Request	NA	N		NA	NA
Get_Country_Info	CN^5/O	CN^5/O		NA	NA
BIST	N^1	N^1		NA	NA
Sink_Capabilities	NA	N	N	NA	NA
Battery_Status	CN^2	CN^2		NA	NA
Alert	R	R		NA	NA
Received Message					
Source_Capabilities	NS	N	N	I	I
Request	N	NS		I	I
Get_Country_Info	CN^5/NS	CN^5/NS		I	I
BIST	N^1	N^1		N^1	N^1
Sink_Capabilities	CN^4	NS	CN^4	I	I
Battery_Status	CN^3/NS	CN^3/NS		I	I
Alert	R/NS	R/NS		I	I
Note 1: For details of which BIST Modes and Messages **Shall** be supported see Section 5.9 and Section 6.4.3. Note 2: **Shall** be supported by products that contain batteries. Note 3: **Shall** be supported by products that support the *Get_Battery_Status* Message. Note 4: **Shall** be supported by products that support the *Get_Sink_Cap* Message. Note 5: **Shall** be supported when required by a country authority. Note 6: VPD includes CT-VPDs when not Connected to a Charger. PD communication with a CT-VPD **Shall** only take place when not Connected to a Charger.					

6.12.3 Applicability of Extended Messages

Table 6-67 details Extended Messages (except for Extended VDM Commands) that **Shall**/**Should**/ **Shall Not** be transmitted and received by a Source, Sink, Cable Plug or VPD. Requirements for Dual-Role Power Ports **Shall** override any requirements for Source-only or Sink-Only Ports.

<div align="center">Table 6-67 Applicability of Extended Messages</div>

Message Type	Source	Sink	Dual-Role Power	Cable Plug	VPD [13]
Transmitted Message					
Battery_Capabilities	CN^1/NA	CN^1/NA		NA	NA
Country_Codes	CN^{10}/NA	CN^{10}/NA		NA	NA
Country_Info	CN^{10}/NA	CN^{10}/NA		NA	NA
Firmware_Update_Request	CN^7/NA	CN^7/NA		NA	NA
Firmware_Update_Response	CN^7/NA	CN^7/NA		CN^7/NA	NA
Get_Battery_Cap	R	R		NA	NA
Get_Battery_Status	R	R		NA	NA
Get_Manufacturer_Info	R	R		NA	NA
Manufacturer_Info	R	R		R	NA

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Message Type	Source	Sink	Dual-Role Power	Cable Plug	VPD [13]
PPS_Status	CN[8]/NA	NA		NA	NA
Security_Request	CN[6]/NA	CN[6]/NA		NA	NA
Security_Response	CN[6]/NA	CN[6]/NA		CN[6]/NA	NA
Sink_Capabilities_Extended	NA	R	R	NA	NA
Source_Capabilities_Extended	R	NA	R	NA	NA
Status	R	R	R	CN[12]/NA	NA
Received Message					
Battery_Capabilities	CN[4]/NS	CN[4]/NS		I	I
Country_Codes	CN[10]/NS	CN[10]/NS		I	I
Country_Info	CN[10]/NS	CN[10]/NS		I	I
Firmware_Update_Request	CN[7]/NS	CN[7]/NS		CN[7]/I	I
Firmware_Update_Response	CN[7]/NS	CN[7]/NS		I	I
Get_Battery_Cap	CN[1]/NS	CN[1]/NS		I	I
Get_Battery_Status	CN[1]/NS	CN[1]/NS		I	I
Get_Manufacturer_Info	R/NS	R/NS		R	I
Manufacturer_Info	CN[5]/NS	CN[5]/NS		I	I
PPS_Status	NS	CN[9]/NS		I	I
Security_Request	CN[6]/NS	CN[6]/NS		CN[6]/I	I
Security_Response	CN[6]/NS	CN[6]/NS		I	I
Sink_Capabilities_Extended	CN[11]/NS	NS	CN[11]/NS	I	I
Source_Capabilities_Extended	NS	CN[2]/NS	CN[2]/NS	I	I
Status	CN[3]/NS	CN[3]/NS		I	I

Note 1: **Shall** be supported by products that contain batteries.

Note 2: **Shall** be supported by products that can transmit the *Get_Source_Cap_Extended* Message.

Note 3: **Shall** be supported by products that can transmit the *Get_Status* Message.

Note 4: **Shall** be supported by products that can transmit the *Get_Battery_Cap* Message.

Note 5: **Shall** be supported by products that can transmit the *Get_Manufacturer_Info* Message

Note 6: **Shall** be supported by products that support USB security communication as defined in *[USBTypeCAuthentication 1.0]*

Note 7: **Shall** be supported by products that support USB firmware update communication as defined in *[USBPDFirmwareUpdate 1.0]*

Note 8: **Shall** be supported when PPS is supported.

Note 9: **Shall** be supported by products that can transmit the *Get_PPS_Status*.

Note 10: **Shall** be supported when required by a country authority.

Note 11: **Shall** be supported by products that can transmit the *Get_Sink_Cap_Extended* Message.

Note 12: **Shall** be supported by Active Cables

Note 13: VPD includes CT-VPDs when not Connected to a Charger. PD communication with a CT-VPD **Shall** only take place when not Connected to a Charger.

6.12.4 Applicability of Structured VDM Commands

Table 6-68 details Structured VDM Commands that **Shall**/**Should**/ **Shall Not** be transmitted and received by a DFP, UFP, Cable Plug or VPD. If Structured VDMs are not supported, the DFP or UFP receiving a VDM Command **Shall** send a *Not_Supported* Message in response.

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Table 6-68 Applicability of Structured VDM Commands

Command Type	DFP	UFP	Cable Plug	VPD [4]
Transmitted Command Request				
Discover Identity	CN[1]/R	R[2]	NA	NA
Discover SVIDs	CN[1]/O	O	NA	NA
Discover Modes	CN[1]/O	O	NA	NA
Enter Mode	CN[1]/NA	NA	NA	NA
Exit Mode	CN[1]/NA	NA	NA	NA
Attention	O	O	NA	NA
Received Command Request/Transmitted Command Response				
Discover Identity	O/NK[3]	CN[1]/R/NK[3]	N	N
Discover SVIDs	O/NK[3]	CN[1]/NK[3]	CN[1]/NK	NK
Discover Modes	O/NK[3]	CN[1]/NK[3]	CN[1]/NK	NK
Enter Mode	NK[3]	CN[1]/NK[3]	CN[1]/NK	NK
Exit Mode	NK[3]	CN[1]/NK[3]	CN[1]/NK	NK
Attention	O/I[3]	O/I[3]	I	I
Note 1: *Shall* be supported when Modal Operation is supported. Note 2: *May* be transmitted by a UFP/Source during discovery (see Section 6.4.4.3.1 and Section 8.3.3.22.3). Note 3: If Structured VDMs are not supported, the DFP or UFP receiving a VDM Command *Shall* send a *Not_Supported* Message in response. Note 4: VPD includes CT-VPDs when not Connected to a Charger. PD communication with a CT-VPD *Shall* only take place when not Connected to a Charger.				

6.12.5 Applicability of Reset Signaling

Table 6-69 details Reset Signaling that *Shall*/*Should*/ *Shall Not* be transmitted and received by a DFP/UFP, Cable Plug or VPD.

Table 6-69 Applicability of Reset Signaling

Signaling Type	DFP	UFP	Cable Plug	VPD [2]
Transmitted Message/Signaling				
Soft_Reset	N	N	NA	NA
Hard Reset	N	N	NA	NA
Cable Reset	CN[1]	CN[1]	NA	NA
Received Message/Signaling				
Soft_Reset	N	N	N	N
Hard Reset	N	N	N	N
Cable Reset	DR	DR	N	N
Note 1: *Shall* be supported when transmission of SOP' Packets are supported and the Port can supply V_{CONN}. Note 2: VPD includes CT-VPDs when not attachedConnected to a Charger. PD communication with a CT-VPD *Shall* only take place when not attachedConnected to a Charger.				