If the port is a DRP, the port shall transition to Unattached.SNK when the SRC.Open state is detected on either the CC1 or CC2 pin.

4.5.2.2.19 DebugAccessory.SNK

This state appears in Figure 4-13, Figure 4-14, Figure 4-16 and Figure 4-17.

The DebugAccessory.SNK state is used for the Debug Accessory Mode specified in Appendix B.

4.5.2.2.19.1 DebugAccessory.SNK Requirements

This mode is for debug only and shall not be used for communicating with commercial products.

The port shall not drive VBUS or VCONN.

The port shall provide an Rd as specified in Table 4-25 on both the CC1 and CC2 pins and monitor to detect when the state of either is SRC.Open.

If supported, orientation is determined as outlined in Section B.2.6.1.1. The port shall connect any debug signals for Debug Accessory Mode operation only after entry to this state.

4.5.2.2.19.2 Exiting from DebugAccessory.SNK State

The port shall transition to Unattached.SNK when VBUS is no longer present.

4.5.2.2.20 PoweredAccessory State

This state appears in Figure 4-14.

When in the PoweredAccessory state, the port is powering a VCONN–Powered Accessory or VCONN-Powered USB Device.

4.5.2.2.20.1 PoweredAccessory Requirements

If the port needs to determine the orientation of the connector, it shall do so only upon entry to the PoweredAccessory state by detecting which of the CC1 or CC2 pins is connected through the cable (i.e., which CC pin is in the SRC.Rd state).

The SRC.Rd state is detected on only one of the CC1 or CC2 pins. The port shall advertise either 1.5 A or 3.0 A (see Table 4-24) on this CC pin and monitor its state.

The port shall supply VCONN on the unused CC pin within tVconnON-PA of entering the PoweredAccessory state.

The port shall not drive VBUS.

When the port initially enters the PoweredAccessory state it shall operate as a *USB Power Delivery* Source with a DFP data role. In addition, the port shall support at least one of the following:

- Use *USB PD* to establish an explicit contract and then use Structured Vendor Defined Messages (Structured VDMs) to identify a VCONN–Powered Accessory and enter an Alternate Mode.
- Use *USB PD* to query the identity of a VCONN-Powered USB Device (that operates as a cable plug responding to SOP').

4.5.2.2.20.2 Exiting from PoweredAccessory State

The port shall transition to Unattached.SNK when the SRC.Open state is detected on the monitored CC pin.

The port shall transition to Try.SNK if the attached device is not a VCONN–Powered Accessory or VCONN-Powered USB Device. For example, the attached device does not support *USB PD* or does not respond to *USB PD* commands required for a VCONN–Powered Accessory (e.g., Discover SVIDs, Discover Modes, etc.) or is a Sink or DRP attached through a Powered Cable.

The port shall transition to Unsupported.Accessory if the attached device is a VCONN–Powered Accessory but the port has not successfully entered an Alternate Mode within tAMETimeout (see Appendix E).

A port that supports Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.SNK if the connected device identifies itself as a Charge-Through VCONN-Powered USB Device in its Discover Identity Command response. The port may delay this transition in order to perform further SOP' communication.

The port shall cease to supply VCONN within tVCONNOFF of exiting the PoweredAccessory state unless it is transitioning into the CTUnattached.SNK state.

4.5.2.2.21 Unsupported.Accessory State

This state appears in Figure 4-14.

If a VCONN–Powered Accessory does not enter an Alternate Mode, the Unsupported.Accessory state is used to wait until the accessory is unplugged before continuing.

4.5.2.2.21.1 Unsupported.Accessory Requirements

Only one of the CC1 or CC2 pins shall be in the SRC.Rd state. The port shall advertise Default USB Power (see Table 4-24) on this CC pin and monitor its voltage.

The port shall not drive VBUS or VCONN.

A Sink with either VCONN–Powered Accessory or VCONN-Powered USB Device support shall provide user notification that it does not recognize or support the attached accessory or device.

4.5.2.2.21.2 Exiting from Unsupported.Accessory

The port shall transition to Unattached.SNK when the SRC.Open state is detected on the monitored CC pin.

4.5.2.2.22 CTUnattached.VPD State

This state appears in Figure 4-18.

When in the CTUnattached.VPD state, the Charge-Through VCONN-Powered USB Device has detected SNK.Open on its host port for tVPDCTDD, indicating that it is connected to a Charge-Through capable Source, and is independently monitoring its Charge-Through port for the presence of a pass-through Power Source.

This state may also have been entered through detach of a Power Source on the Charge-Through port or detach of a sink from the CTVPD's Charge-through port.

4.5.2.2.22.1 CTUnattached.VPD Requirements

The Charge-Through VCONN-Powered USB Device shall isolate its Host-side port from its Charge-Through port, including CCs and VBUS. The Charge-Through VCONN-Powered USB Device shall ensure that it is powered by VCONN, does not consume more than ICCS (*USB 3.2*) / ICCSH (*USB 2.0*) from VBUS

for monitoring, and is sufficiently isolated from VBUS to tolerate high voltages during Charge-Through operation.

Upon entry into this state, the device shall remove its Rd termination to ground (if present) on the Host-side port CC and provide an Rp termination advertising 3.0 A instead, as specified in Table 4-24. Note that because VBUS is not provided, the Rp termination signals continued connection to the port partner but does not carry with it any current advertisement.

The Charge-Through VCONN-Powered USB Device shall only respond to *USB PD* Discover Identity queries on SOP' on its Host-side port. It shall ensure there is sufficient capacitance on the Host-side port CC to meet cReceiver as defined in *USB PD*.

The Charge-Through VCONN-Powered USB Device shall independently terminate both the Charge-Through port's CC1 and CC2 pins to ground through Rd.

The Charge-Through VCONN-Powered USB Device shall provide a bypass capacitance of CCTB on the Charge-Through Port's VBUS pins.

4.5.2.2.22.2 Exiting from CTUnattached.VPD

The Charge-Through VCONN-Powered USB Device shall transition to CTAttachWait.VPD when a Source connection is detected on the Charge-Through port, as indicated by the SNK.Rp state on exactly one of the Charge-Through port's CC pins.

Debug accessories are not supported on the Charge-Through port.

The Charge-Through VCONN-Powered USB Device shall transition to Unattached.SNK if VCONN falls below vVCONNDisconnect.

The Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.Unsupported within tDRPTransition after the state of both the Charge-Through port's CC1 and CC2 pins is SNK.Open for tDRP – dcSRC.DRP · tDRP, or if directed.

4.5.2.2.23 CTAttachWait.VPD State

This state appears in Figure 4-18.

When in the CTAttachWait.VPD state, the device has detected the SNK.Rp state on exactly one of its Charge-Through port's CC pins and is waiting for VBUS on the Charge-Through port.

4.5.2.2.23.1 CTAttachWait.VPD Requirements

The Charge-Through VCONN-Powered USB Device shall isolate its Host-side port from its Charge-Through port, including CCs and VBUS. The Charge-Through VCONN-Powered USB Device shall ensure that it is powered by VCONN, does not consume more than ICCS (*USB 3.2*) / ICCSH (*USB 2.0*) from VBUS for monitoring, and is sufficiently isolated from VBUS to tolerate high voltages during Charge-Through operation.

The Charge-Through VCONN-Powered USB Device shall maintain its Rp termination advertising 3.0 A on the Host-side port's CC pin, as well as the independent terminations to ground through Rd on the Charge-Through port's CC1 and CC2 pins.

The Charge-Through VCONN-Powered USB Device shall only respond to *USB PD* Discover Identity queries on SOP' on its Host-side port, and complete any active queries prior to exiting this state. It shall ensure there is sufficient capacitance on the Host-side port CC to meet cReceiver as defined in *USB PD*.

4.5.2.2.23.2 Exiting from CTAttachWait.VPD

The Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.VPD when the state of both the Charge-Through port's CC1 and CC2 pins are SNK.Open for at least tPDDebounce.

The Charge-Through VCONN-Powered USB Device shall transition to CTAttached.VPD after the state of only one of the Charge-Through port's CC1 or CC2 pins is SNK.Rp for at least tCCDebounce and VBUS on the Charge-Through port is detected.

Note the Charge-Through Source may initiate *USB PD* communications which will cause brief periods of the SNK.Open state on one of the Charge-Through port's CC pins with the state of the Charge-Through port's other CC pin remaining SNK.Open, but this event will not exceed tPDDebounce.

The Charge-Through VCONN-Powered USB Device shall transition to CTDisabled.VPD if VCONN falls below vVCONNDisconnect.

4.5.2.2.24 CTAttached.VPD State

This state appears in Figure 4-18.

When in the CTAttached.VPD state, the Charge-Through VCONN-Powered USB Device has detected a Power Source on its Charge-Through port and has connected the Charge-Through port's CC and VBUS pins directly to the Host-side port's CC and VBUS pins. Hence all power delivery, negotiation and *USB PD* communication are performed directly between the unit on Host-side port and the Power Source connected to the Charge-Through port.

4.5.2.2.24.1 CTAttached.VPD Requirements

Upon entry to this state, the Charge-Through VCONN-Powered USB Device shall detect which of the Charge-Through port's CC1 or CC2 pins is connected through the cable (i.e., the CC pin that is in the SNK.Rp state). The device shall then immediately, in the following order:

1. Remove or reduce any additional capacitance on the Host-side CC port that was introduced in order to meet cReceiver as defined in *USB PD* to present on CC a value equal to or less than two times the maximum value for cCablePlug_CC.
2. Disable the Rp termination advertising 3.0 A on the host port's CC pin.
3. Passively multiplex the detected Charge-Through port's CC pin through to the host port's CC pin with an impedance of less than RccCON.
4. Disable the Rd on the Charge-Through port's CC1 and CC2 pins.
5. Connect the Charge-Through port's VBUS through to the host port's VBUS.

These steps shall be completed within tVPDDetach minimum of entering this state.

The Charge-Through VCONN-Powered USB Device shall ensure that it is powered by VCONN, does not consume more than ICCS (*USB 3.2*) / ICCSH (*USB 2.0*) from VBUS for monitoring, and is sufficiently isolated from VBUS to tolerate high voltages during Charge-Through operation.

The Charge-Through VCONN-Powered USB Device shall not respond to any *USB PD* communication on any CC pin in this state. Any active queries on SOP' shall have been completed prior to entering this state.

4.5.2.2.24.2 Exiting from CTAttached.VPD

The Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.VPD when VBUS falls below vSinkDisconnect and the state of the passed-through CC pin is SNK.Open for tVPDCTDD.

The Charge-Through VCONN-Powered USB Device shall transition to CTDisabled.VPD if VCONN falls below vVCONNDisconnect.

4.5.2.2.25 CTDisabled.VPD State

This state appears in Figure 4-18.

When in the CTDisabled.VPD state, the Charge-Through VCONN-Powered USB Device has detached on its Host-side port but may still potentially be connected to a Power Source on the Charge-Through port, and is thus ensuring that the VBUS from the Power Source is removed.

4.5.2.2.25.1 CTDisabled.VPD Requirements

The Charge-Through VCONN-Powered USB Device shall isolate its Host-side port from its Charge-Through port, including CCs and VBUS.

The device shall present a high-impedance to ground (above zOPEN) on the Host-side port's CC pin and on the Charge-Through port CC1 and CC2 pins.

The Charge-Through VCONN-Powered USB Device shall ensure that it is powered entirely by VBUS.

4.5.2.2.25.2 Exiting from CTDisabled.VPD

The Charge-Through VCONN-Powered USB Device shall transition to Unattached.SNK after tVPDDisable.

4.5.2.2.26 CTUnattached.SNK State

This state appears in Figure 4-14, Figure 4-16 and Figure 4-17.

When in the CTUnattached.SNK state, the port has detected that it is attached to a Charge-Through VCONN-Powered USB Device and is ready if a Power Source is attached to the Charge-Through VCONN-Powered USB Device.

This state may also have been entered through detach of a Charge-Through Power Source.

4.5.2.2.26.1 CTUnattached.SNK Requirements

Upon entry to this state, the port shall remove its Rp termination (if present) and terminate CC to ground through Rd.

The port shall continue to supply VCONN.

The port shall stop sourcing or sinking VBUS and discharge it.

In *USB PD* Version 2.0, the port shall act as a bus master for the purposes of initiating PD messages.

The port may query the state of the attached VCONN-Powered USB Device by sending SOP' messages on *USB PD* to read the VPD's eMarker.

4.5.2.2.26.2 Exiting from CTUnattached.SNK

The port shall transition to CTAttached.SNK when VBUS is detected. Note that by this point, the VCONN-Powered USB Device has already de-bounced the passed-through CC pin.

The port shall transition to Unattached.SNK if the state of the CC pin is SNK.Open for tVPDDetach after VBUS is vSafe0V.

4.5.2.2.27 CTAttached.SNK State

This state appears in Figure 4-14, Figure 4-16 and Figure 4-17.

When in the CTAttached.SNK state, the port is connected to a Charge-Through VCONN-Powered USB Device, which in turn is passing through the connection to a Power Source.

4.5.2.2.27.1 CTAttached.SNK Requirements

The port shall continue to terminate CC to ground through Rd. Since there is now a Power Source connected through to VBUS and CC, the port shall operate in one of the Sink Power Sub-States shown in Figure 4-19, and remain within the Sink Power Sub-States, until either VBUS is removed or a *USB PD* contract is established with the source.

The port shall not negotiate a voltage on VBUS higher than the maximum voltage specified in the Charge-Through VCONN-Powered USB Device's Discover Identity Command response.

The port shall continue to supply VCONN.

The port shall reject a VCONN swap request.

The port shall not perform *USB BC 1.2* primary detection, as that will interfere with VPD functionality.

In *USB PD* Version 2.0, the port shall act as a bus slave for the purposes of initiating *USB PD* messages, although it remains a DFP for USB data.

The port shall neither initiate nor respond to any SOP' communication.

The port shall meet the Sink Power Sub-State requirements specified in Section 4.5.2.2.29.

The port shall meet the additional maximum current constraints described in Section 4.6.2.5.

The port shall follow the restrictions on *USB PD* messages described in Section 4.10.2.

The port shall alter its advertised capabilities to UFP role/sink only role as described in Section 4.10.2.

4.5.2.2.27.2 Exiting from CTAttached.SNK

A port that is not in the process of a *USB PD* Hard Reset shall transition to CTUnattached.SNK within tSinkDisconnect when VBUS falls below vSinkDisconnect for VBUS operating at or below 5 V or below vSinkDisconnectPD when negotiated by *USB PD* to operate above 5 V.

A port that has entered into *USB PD* communications with the Source and has seen the CC voltage exceed vRd-USB may monitor the CC pin to detect cable disconnect in addition to monitoring VBUS.

A port that is monitoring the CC voltage for disconnect shall transition to CTUnattached.SNK within tSinkDisconnect after the CC voltage remains below vRd-USB for tPDDebounce.

4.5.2.2.28 CTUnattached.Unsupported State

This state appears in Figure 4-18.

When in the CTUnattached.Unsupported state, the Charge-Through VCONN-Powered USB Device has previously detected SNK.Open on its host port for tVPDCTDD, indicating that it is connected to a Charge-Through Capable Source, and is now monitoring its Charge-Through port for the presence of an unsupported sink.

A Charge-Through VCONN-Powered USB Device does not support Sinks, Debug Accessory Mode, or Audio Adapter Accessory Mode.

4.5.2.2.28.1 CTUnattached.Unsupported Requirements

The Charge-Through VCONN-Powered USB Device shall isolate its Host-side port from its Charge-Through port, including CCs and VBUS. The Charge-Through VCONN-Powered USB Device shall ensure that it is powered by VCONN, does not consume more than ICCS (*USB 3.2*) / ICCSH (*USB 2.0*) from VBUS for monitoring, and is sufficiently isolated from VBUS to tolerate high voltages during Charge-Through operation.

Upon entry into this state, the Charge-Through VCONN-Powered USB Device shall maintain its Rp termination advertising 3.0 A on the Host-side port's CC pin, remove its Rd terminations to ground on the Charge-Through port's CC1 and CC2 pins, and provide a Rp termination advertising Default USB Power instead.

The Charge-Through VCONN-Powered USB Device shall only respond to *USB PD* Discover Identity queries on SOP' on its Host-side port. It shall ensure there is sufficient capacitance on the Host-side port CC to meet cReceiver as defined in *USB PD*.

4.5.2.2.28.2 Exiting from CTUnattached.Unsupported

The Charge-Through VCONN-Powered USB Device shall transition to CTAttachWait.Unsupported when a Sink connection is detected on the Charge-Through port, as indicated by the SRC.Rd state on at least one of the Charge-Through port's CC pins or SRC.Ra state on both the CC1 and CC2 pins.

The Charge-Through VCONN-Powered USB Device shall transition to Unattached.SNK if VCONN falls below vVCONNDisconnect.

Otherwise, a Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.VPD within tDRPTransition after dcSRC.DRP · tDRP, or if directed.

4.5.2.2.29 CTAttachWait.Unsupported State

This state appears in Figure 4-18.

The CTAttachWait.Unsupported state is used to ensure that the state of both the Charge-Through Port's CC1 and CC2 pins are stable for at least tCCDebounce.

4.5.2.2.29.1 CTAttachWait.Unsupported Requirements

The requirements for this state are identical to CTUnattached.Unsupported state.

4.5.2.2.29.2 Exiting from CTAttachWait.Unsupported

The Charge-Through VCONN-Powered USB Device shall transition to CTTry.SNK if the state of at least one of the Charge-Through port's CC pins is SRC.Rd, or if the state of both the CC1 and CC2 pins is SRC.Ra for at least tCCDebounce.

The Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.VPD when the state of either the Charge-Through Port's CC1 or CC2 pin is SRC.Open for at least tCCDebounce.

The Charge-Through VCONN-Powered USB Device shall transition to Unattached.SNK if VCONN falls below vVCONNDisconnect.

4.5.2.2.30 CTTry.SNK State

This state appears in Figure 4-18.

When in the CTTry.SNK state, the Charge-Through VCONN-Powered USB Device is querying to determine if the port partner on the Charge-Through port supports the source role.

4.5.2.2.30.1 CTTry.SNK Requirements

The requirements for this state is identical to CTUnattached.VPD state.

4.5.2.2.30.2 Exiting from CTTry.SNK

The Charge-Through VCONN-Powered USB Device shall wait for tDRPTry and only then begin monitoring the Charge-Through port's CC pins for the SNK.Rp state.

The Charge-Through VCONN-Powered USB Device shall then transition to CTAttached.VPD when the SNK.Rp state is detected on the Charge-Through port's CC pins for at least tTryCCDebounce and VBUS is detected on Charge-Through port.

A Charge-Through VCONN-Powered USB Device shall transition to CTAttached.Unsupported if SNK.Rp state is not detected for tDRPTryWait.

Note: The Source may initiate *USB PD* communications which will cause brief periods of the SNK.Open state on both the CC1 and CC2 pins, but this event will not exceed tTryCCDebounce.

The Charge-Through VCONN-Powered USB Device shall transition to Unattached.SNK if VCONN falls below vVCONNDisconnect.

4.5.2.2.31 CTAttached.Unsupported State

This state appears in Figure 4-18.

If the port partner to the Charge-Through VCONN-Powered USB Device's Charge-Through port either does not support the source power role, or failed to negotiate the source role, the CTAttached.Unsupported state is used to wait until that device is unplugged before continuing.

4.5.2.2.31.1 CTAttached.Unsupported Requirements

The Charge-Through VCONN-Powered USB Device shall isolate its Host-side port from its Charge-Through port, including CCs and VBUS. The Charge-Through VCONN-Powered USB Device shall ensure that it is powered by VCONN, does not consume more than ICCS (*USB 3.2*) / ICCSH (*USB 2.0*) from VBUS for monitoring, and is sufficiently isolated from VBUS to tolerate high voltages during Charge-Through operation.

Upon entry into this state, the Charge-Through VCONN-Powered USB Device shall maintain its Rp termination advertising 3.0 A on the Host-side port's CC pin, remove its Rd terminations to ground on the Charge-Through port's CC1 and CC2 pins, and provide a Rp termination advertising Default USB Power instead.

At least one of the CC1 or CC2 pins will be in the SRC.Rd state or both will be in the SRC.Ra state. The Charge-Through port shall advertise Default USB Power (see Table 4-24) on its CC pins and monitor their voltage.

The Charge-Through VCONN-Powered USB Device shall present a USB Billboard Device Class interface indicating that it does not recognize or support the attached accessory or device.

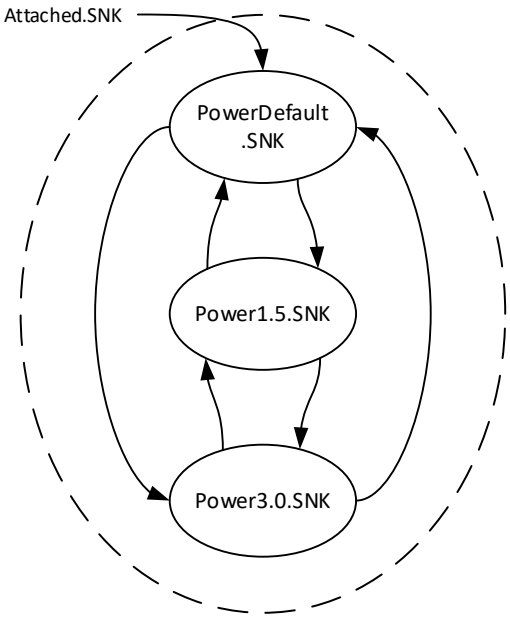
4.5.2.2.31.2 Exiting from CTAttached.Unsupported

The Charge-Through VCONN-Powered USB Device shall transition to CTUnattached.VPD when SRC.Open state is detected on both the Charge-Through port's CC pins or the SRC.Open state is detected on one CC pin and SRC.Ra is detected on the other CC pin.

4.5.2.3 Sink Power Sub-State Requirements

When in the Attached.SNK or CTAttached.SNK states and the Source is supplying default VBUS, the port shall operate in one of the sub-states shown in Figure 4-19. The initial Sink Power Sub-State is PowerDefault.SNK. Subsequently, the Sink Power Sub-State is determined by Source's USB Type-C current advertisement. The port in Attached.SNK shall remain within the Sink Power Sub-States until either VBUS is removed or a *USB PD* contract is established with the Source.

Figure 4-19 Sink Power Sub-States



The Sink is only required to implement Sink Power Sub-State transitions if the Sink wants to consume more than default USB current.

Note that for the CTAttached.SNK state, there are further limitations on maximum current (see Section 4.6.2.5).

4.5.2.3.1 PowerDefault.SNK Sub-State

This sub-state supports Sinks consuming current within the lowest range (default) of Source-supplied current.

4.5.2.3.1.1 PowerDefault.SNK Requirements

The port shall draw no more than the default USB power from VBUS. See Section 4.6.2.1.

If the port wants to consume more than the default USB power, it shall monitor vRd to determine if more current is available from the Source.

4.5.2.3.1.2 Exiting from PowerDefault.SNK

For any change in vRd indicating a change in allowable power, the port shall not transition until the new vRd has been stable for at least tRpValueChange.

For a vRd in the vRd-1.5 range, the port shall transition to the Power1.5.SNK Sub-State.

For a vRd in the vRd-3.0 range, the port shall transition to the Power3.0.SNK Sub-State.

4.5.2.3.2 Power1.5.SNK Sub-State

This sub-state supports Sinks consuming current within the two lower ranges (default and 1.5 A) of Source-supplied current.

4.5.2.3.2.1 Power1.5.SNK Requirements

The port shall draw no more than 1.5 A from VBUS.

The port shall monitor vRd while it is in this sub-state.

4.5.2.3.2.2 Exiting from Power1.5.SNK

For any change in vRd indicating a change in allowable power, the port shall not transition until the new vRd has been stable for at least tRpValueChange.

For a vRd in the vRd-USB range, the port shall transition to the PowerDefault.SNK Sub-State and reduce its power consumption to the new range within tSinkAdj.

For a vRd in the vRd-3.0 range, the port shall transition to the Power3.0.SNK Sub-State.

4.5.2.3.3 Power3.0.SNK Sub-State

This sub-state supports Sinks consuming current within all three ranges (default, 1.5 A and 3.0 A) of Source-supplied current.

4.5.2.3.3.1 Power3.0.SNK Requirements

The port shall draw no more than 3.0 A from VBUS.

The port shall monitor vRd while it is in this sub-state.

4.5.2.3.3.2 Exiting from Power3.0.SNK

For any change in vRd indicating a change in allowable power, the port shall not transition until the new vRd has been stable for at least tRpValueChange.

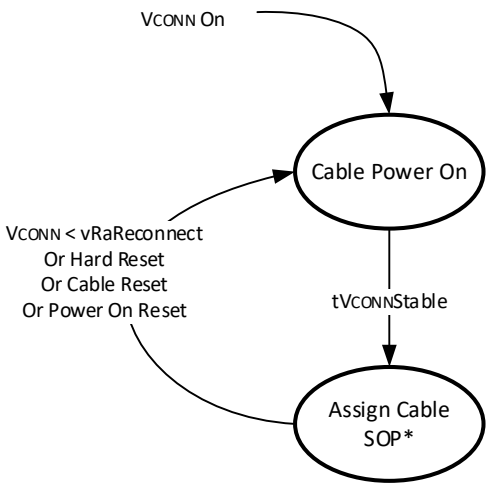
For a vRd in the vRd-USB range, the port shall transition to the PowerDefault.SNK Sub-State and reduce its power consumption to the new range within tSinkAdj.

For a vRd in the vRd-1.5 range, the port shall transition to the Power1.5.SNK Sub-State and reduce its power consumption to the new range within tSinkAdj.

4.5.2.4 Cable State Machine Requirements

Figure 4-20 illustrates the cable eMarker connection state diagram.

Figure 4-20 Cable eMarker State Diagram



4.5.2.4.1 Cable Power On State

This state appears in Figure 4-20. This is the initial power on state for each eMarker in the cable when VCONN is applied.

4.5.2.4.1.1 Cable Power On State Requirements

Each eMarker in the cable shall present Ra when no VCONN is applied.

Each eMarker in the cable shall power on and may continue to present Ra in this state.

The cable shall not respond to SOP' and SOP" commands in this state.

4.5.2.4.1.2 Exiting from Cable Power On State

Each eMarker in a passive or active cable shall transition to Assign Cable SOP* when it has completed its boot process. Each eMarker shall transition to Assign Cable SOP* within tVCONNStable.

4.5.2.4.2 Assign Cable SOP* State

This state appears in Figure 4-20.

Typically, a passive cable has only one eMarker powered at a time. This cable eMarker in a passive cable shall respond to SOP' in this state. If two eMarkers are powered at the same time in a passive cable, then one shall respond to a pre-set SOP' and the other to SOP''.

Each cable eMarker in an active cable shall respond to a pre-set SOP' or SOP''. If only one eMarker exists in the cable, it shall only respond to SOP'.

4.5.2.4.2.1 Assign Cable SOP* State Requirements

Each eMarker in the passive or active cable shall be able to respond to any *USB PD* communication sent to its pre-set SOP' or SOP''. For a passive cable, only one eMarker should be powered at a time and shall respond to SOP' only. If two eMarkers exist in a passive or active cable and are powered at the same time, then only one shall respond to SOP' and the other shall respond to SOP''. The assignment of SOP' and SOP'' is fixed for each eMarker in a cable and shall not be dynamically set when power is applied to VCONN.

Each eMarker in the cable shall weaken or remove Ra if it has not already done so.

Passive cables shall meet the Power for electronically marked passive cables defined in Table 4-6.

Active Cables shall meet the Power for Active cables in Table 4-6.

4.5.2.4.2.2 Exiting from Assign Cable SOP* State

Each eMarker in the cable shall transition to Cable Power On upon sensing VCONN less than vRaReconnect or upon a Power On Reset event.

Each eMarker in the cable shall transition to Cable Power On upon sensing a Hard Reset or Cable Reset.

4.5.2.5 Connection States Summary

Table 4-16 defines the mandatory and optional states for each type of port.