How to debug charger detect issue

1. check point

a) Plot of D+/D-/VBUS/VBATT , can compare the plot to Section of APSD of doc 80-NT390-5;

b) SCH of USBID, D+/D- related from h/w side

c) charger driver log:

echo 'file qpnp-smbcharger.c +p' > /sys/kernel/debug/dynamic_debug/control

[676.819306] SMBCHG: smbchg_external_power_changed: usb type = OTHER current_limit = 2000

[676.819331] SMBCHG: smbchg_set_usb_current_max: USB current_ma = 2000

[676.819389] SMBCHG: smbchg_masked_write_raw: addr = 0x1340 writing 0x3

[676.819484] SMBCHG: smbchg_masked_write_raw: addr = 0x13d0 writing 0xa5

[676.819597] SMBCHG: smbchg_masked_write_raw: addr = 0x13f2 writing 0x19

[676.819640] SMBCHG: smbchg_masked_write_raw: addr = 0x1340 writing 0x3

[676.819658] SMBCHG: smbchg_set_usb_current_max: usb type = 5 current set to 2000 mA

…

[686.325463] SMBCHG: is_hvdcp_present: HVDCP_STS = 0x00

d) Registers dump 0x21000~0x216FF

Power source detection status (IDEV_STS[7:0]):

Indicates the result of BC1.2 detection, i.e. (SDP, DCP, CDP, OCP).

DCD timeout status (APSD_DG_STS[3])

DCD deglitch status (APSD_DG_STS[2]):

USBIN input deglitch time has expired.

Other device DCD deglitch status (APSD_DG_STS[1]):

Other charger has been detected for the deglitch duration.

HVDCP status (HVDCP_STS):

Indicates if an HVDCP has been enabled and detected.

USBIN input status (INPUT_STS[5:3]):

Indicates the voltage range (0V, 5V, Unregulated, 5V-9V, or 9V) of the USBIN input.

e) Try with 3rd charger/cables test, exclude the setup issue.

2 Typical issues and Solutions/WA

a) Slowly insertion issue

Description:

Plug in the DCP charger slowly(over 400ms), recognized as SDP.

Analysis:

The operation is against the BC1.2

Solution:

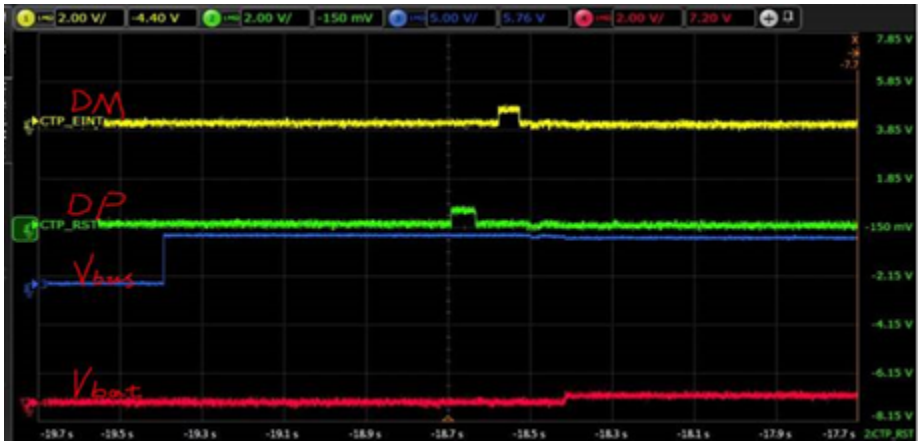
No official solutions.

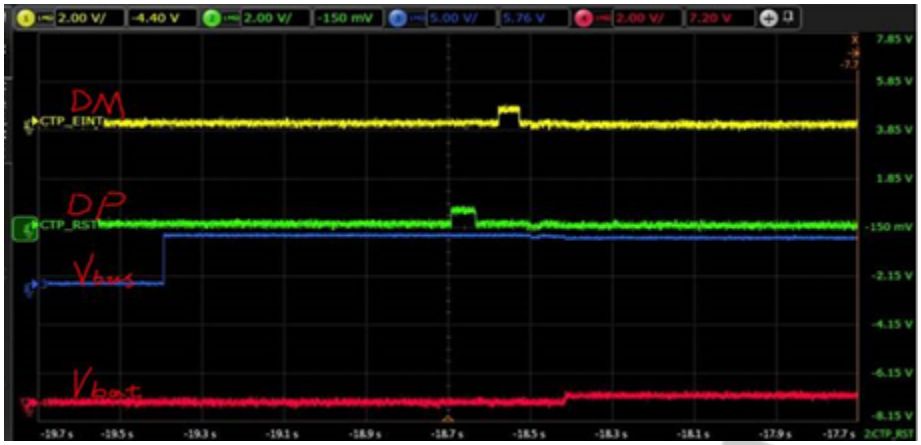
Customers could try with APSD rerun to reduce the probability.

b) [8952] USBID connect issue

Description:

Low battery, plug in SDP, detect as CDP sometimes.





Root Cause:

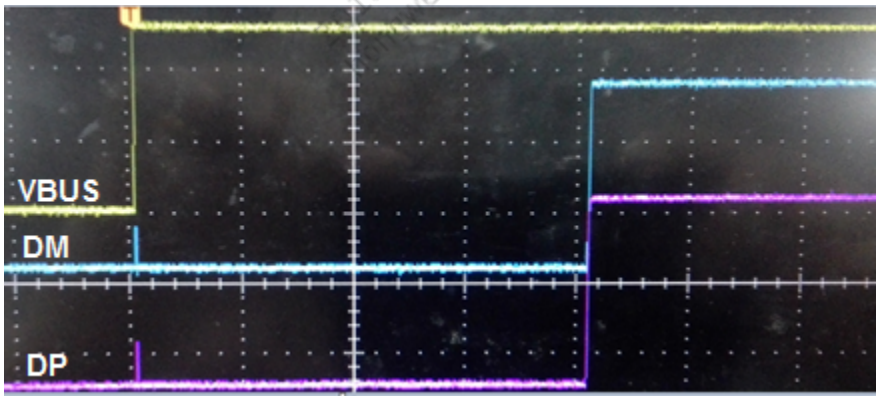
USBID is wrongly connected to both MSM and PMIC side in customers' design.

c) [8953/8996]USB Controller power issue

Description:

the device can't detect USB when the system is in suspend mode.

SDP will be recognized as DCP or DCP detect as other type occasionally. From plot, D+/D- have been pulled up to 3.3V by fault.



Analysis:

ON 8953, QUSB PHY's DVDD is power supply with LDO3. This LDO3 is not always ON i.e. it can be turned OFF.

When this LDO3 is turned OFF, QUSB PHY's configuration is not retained (this is happening on USB cable disconnect and putting system into suspend).

This results into QUSB PHY coming up with unknown state when LDO3 is turned ON which is interfering charger detection (i.e. USB cable connect case)

Solution:

Force L3 always on could be a WA, but will introduce sleep current.

CR1046610. Make sure QUSB PHY is into proper state to avoid interfering USB charger detection .