

What is USB Battery Charging 1.2 (USB BC 1.2)?

TI Precision Labs – USB

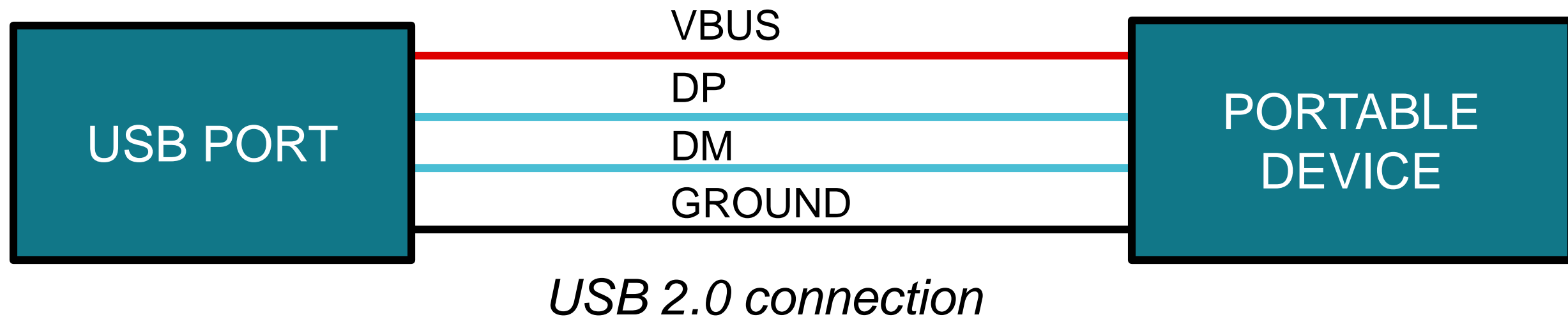
Prepared by Julie Nirchi

Presented by Nicholas Malone

Charging over USB

computer, ac adapter,
car port, etc.

phone, tablet,
handheld electronics



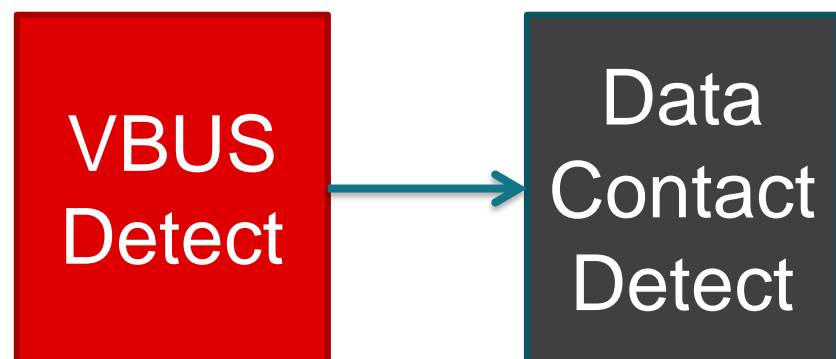
Common USB charging terminology

- **Portable Device (PD)** Device to be charged
- **Standard Downstream Port (SDP)** USB data + current (500 mA for USB 2.0)
- **Charging Downstream Port (CDP)** USB data + 1.5A of current
- **Dedicated Charging Port (DCP)** No data + 1.5A of current

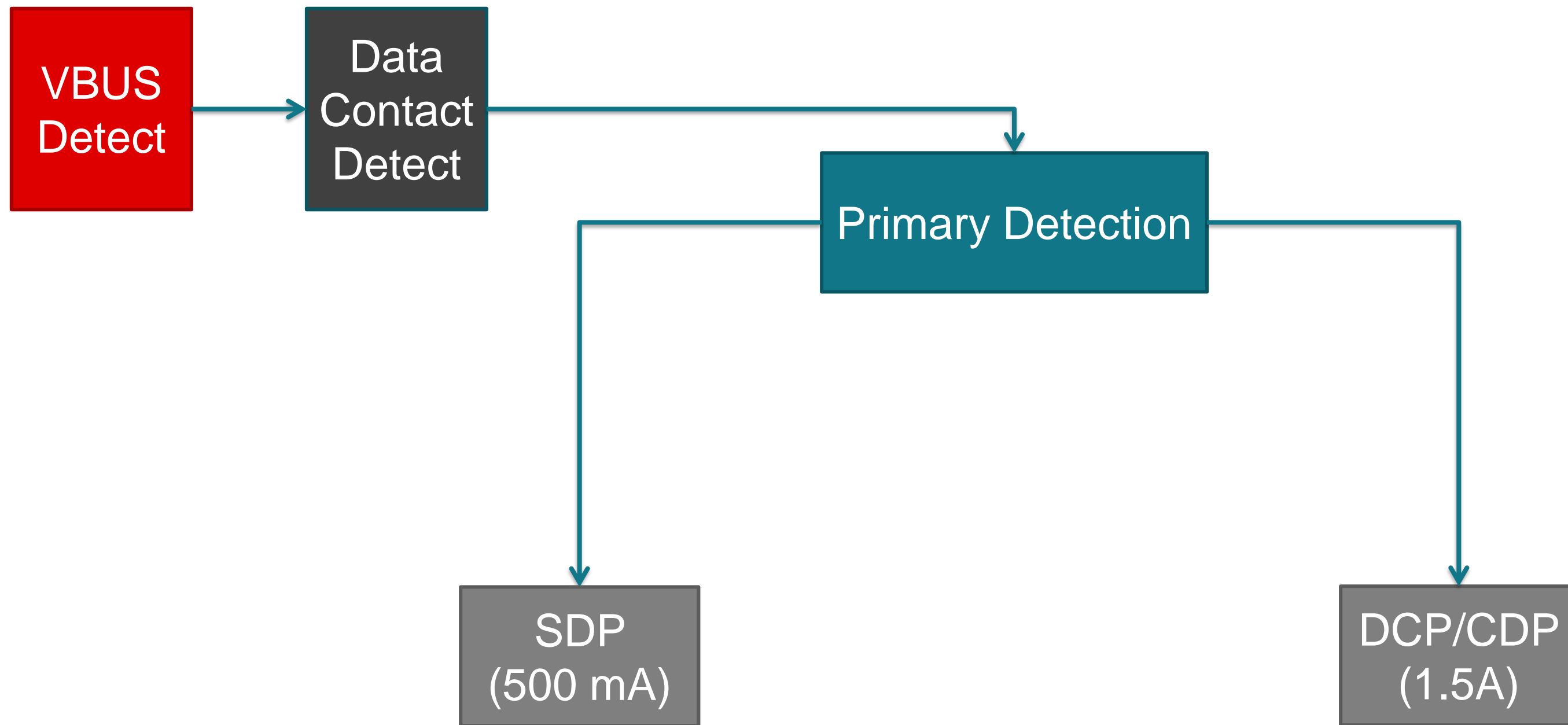
Charger detection by a portable device

VBUS
Detect

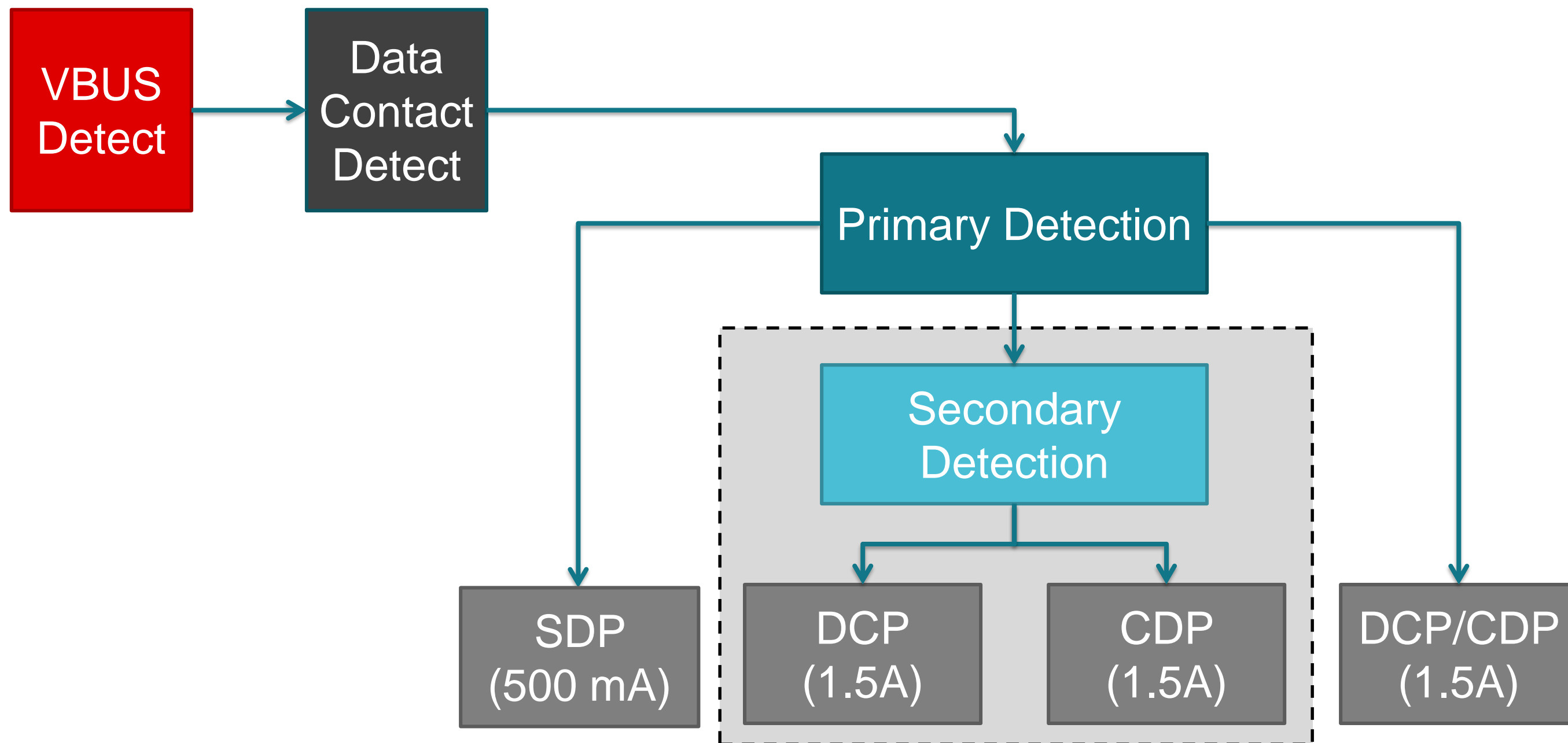
Charger detection by a portable device



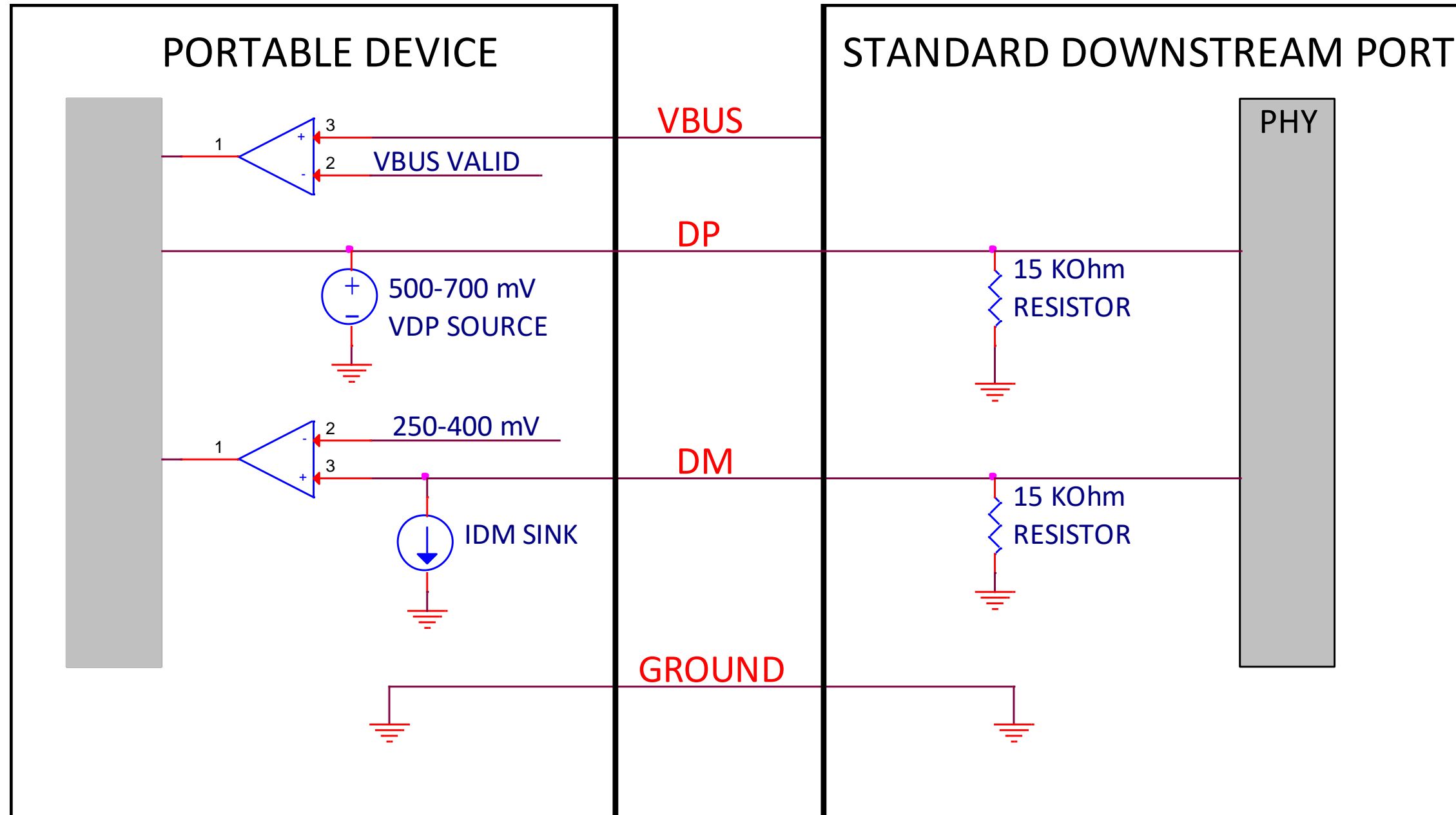
Charger detection by a portable device



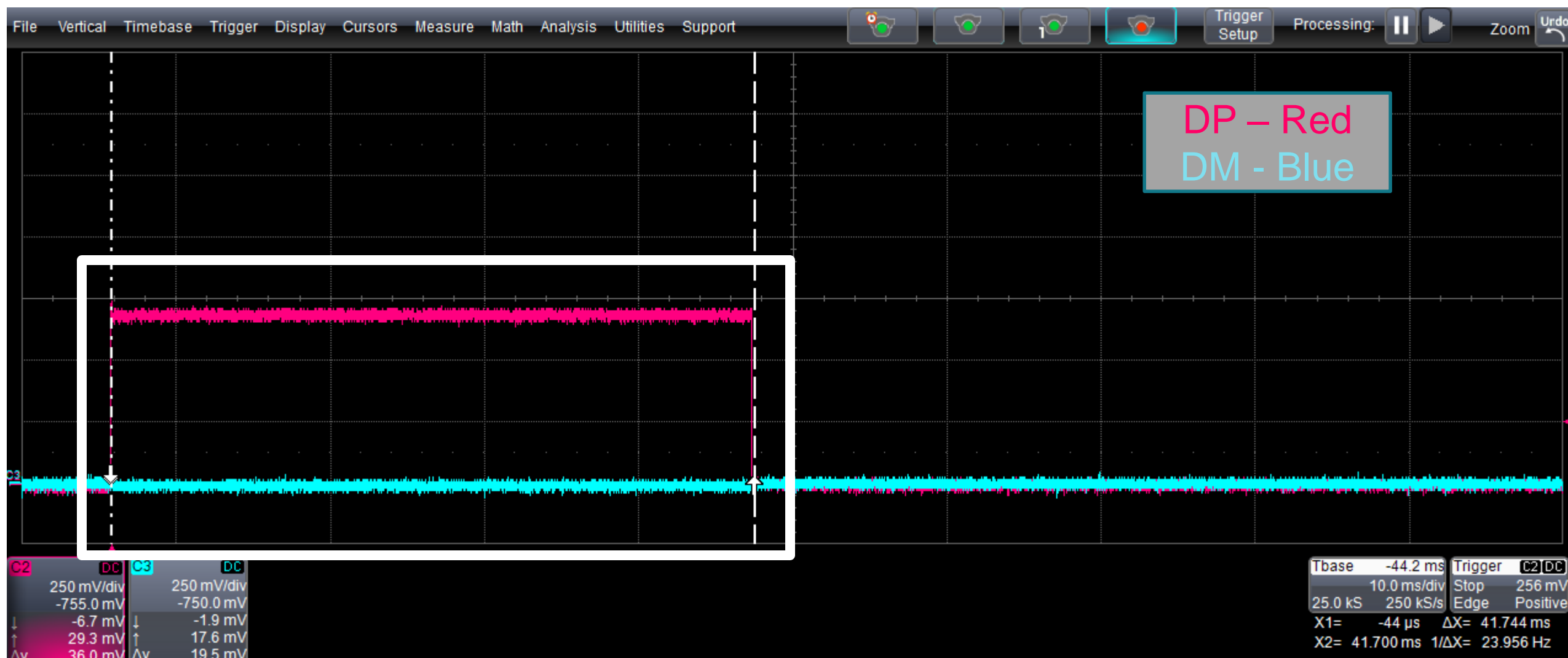
Charger detection by a portable device



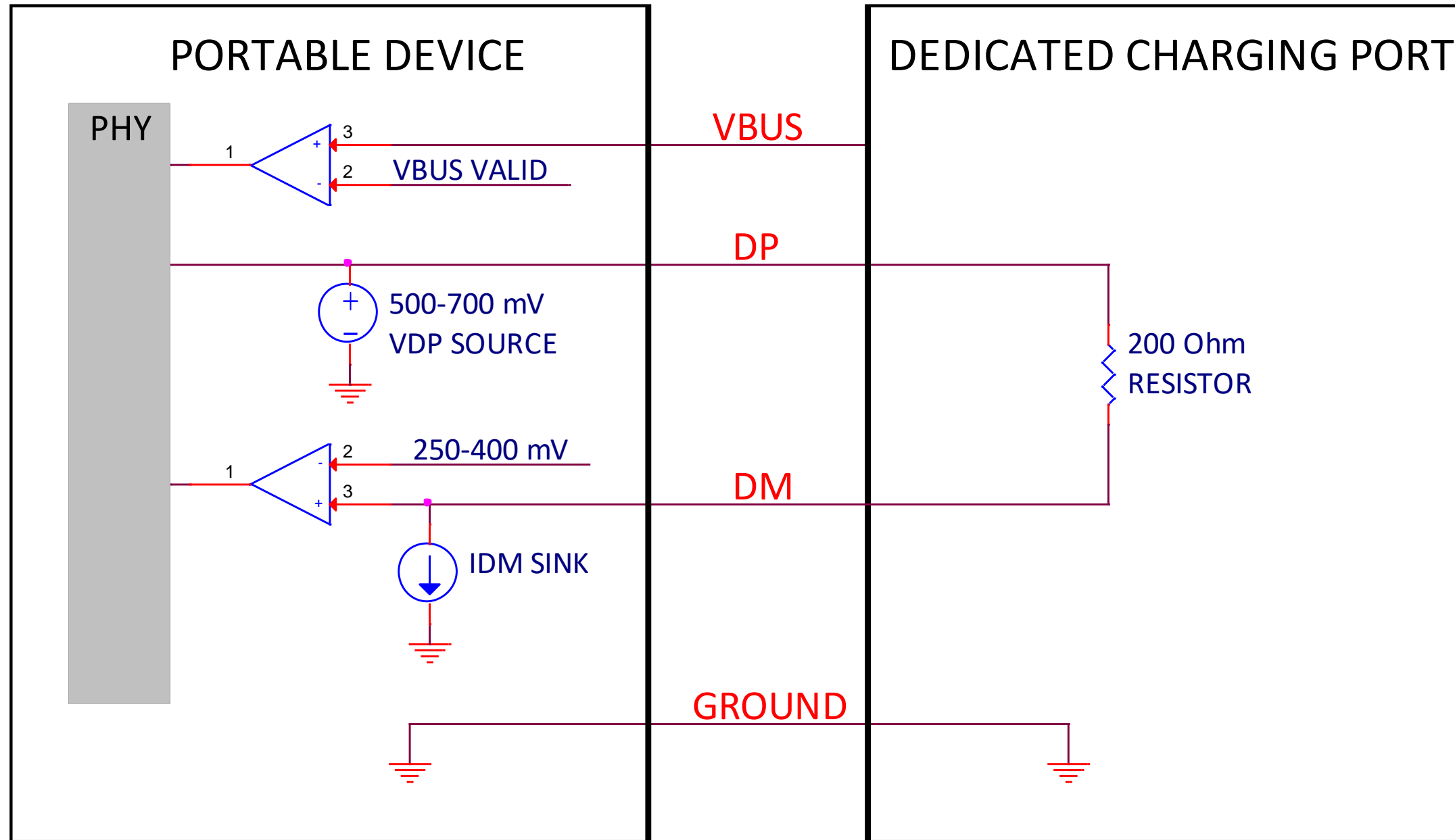
Primary detection: SDP



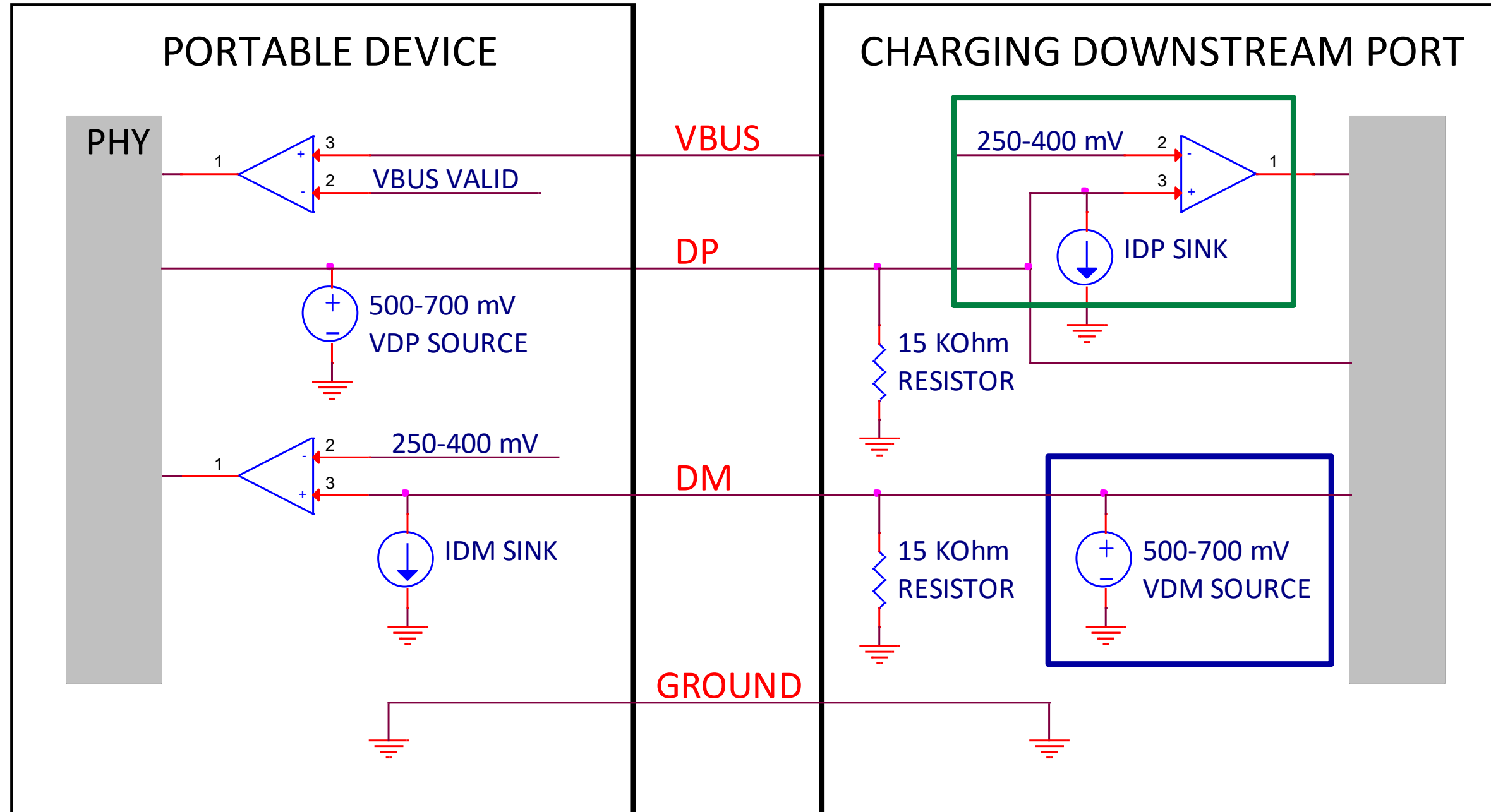
Primary detection: SDP signaling



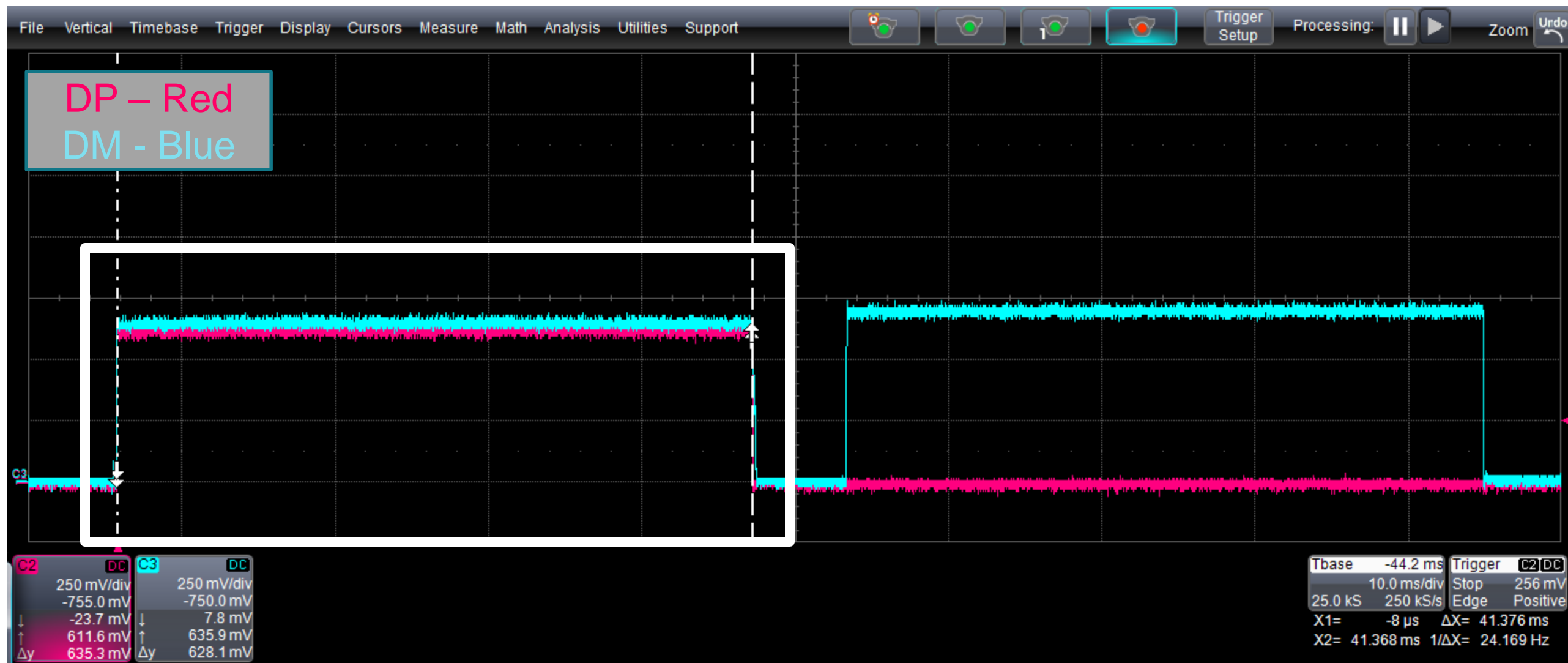
Primary detection: DCP



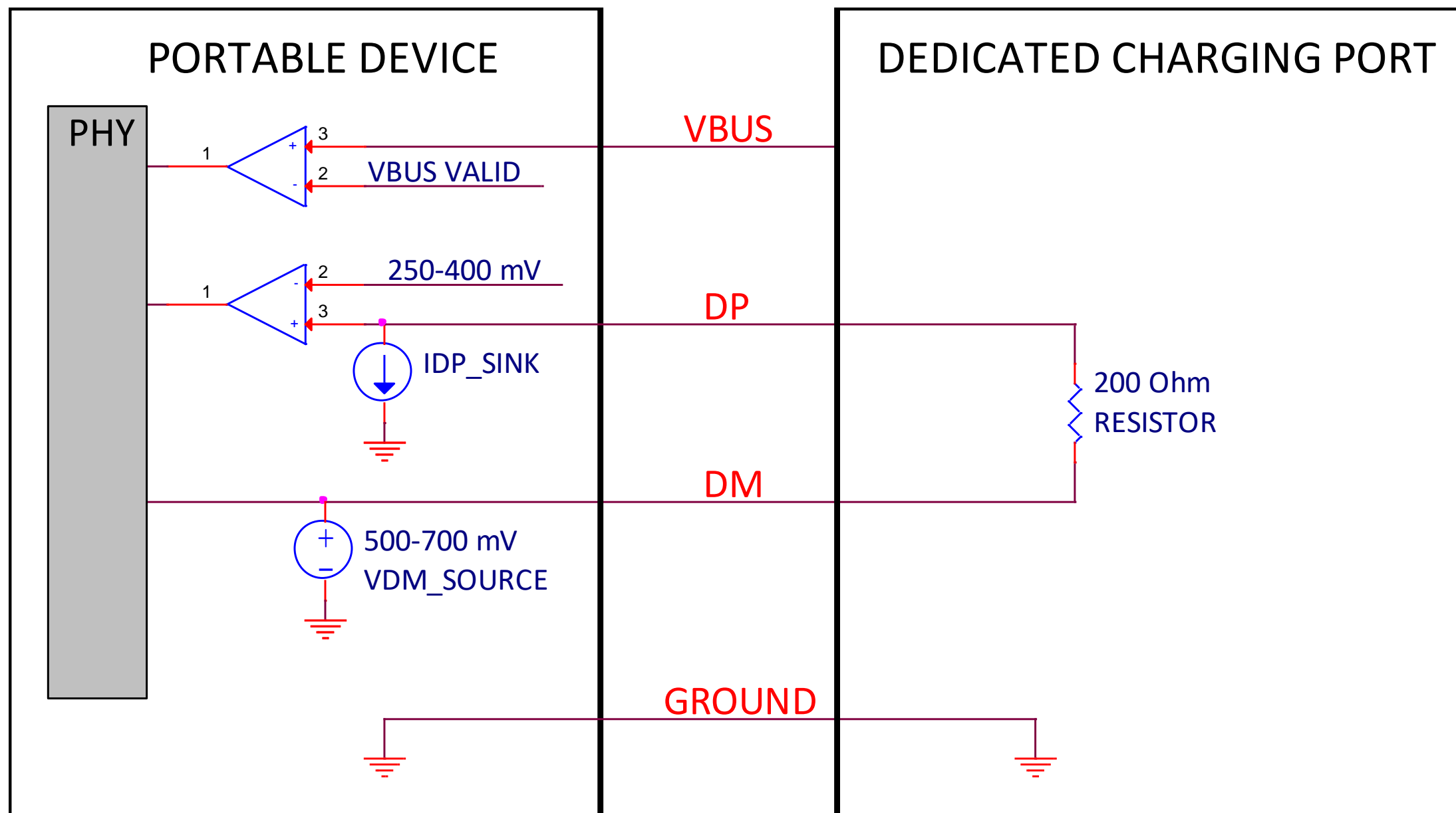
Primary detection: CDP



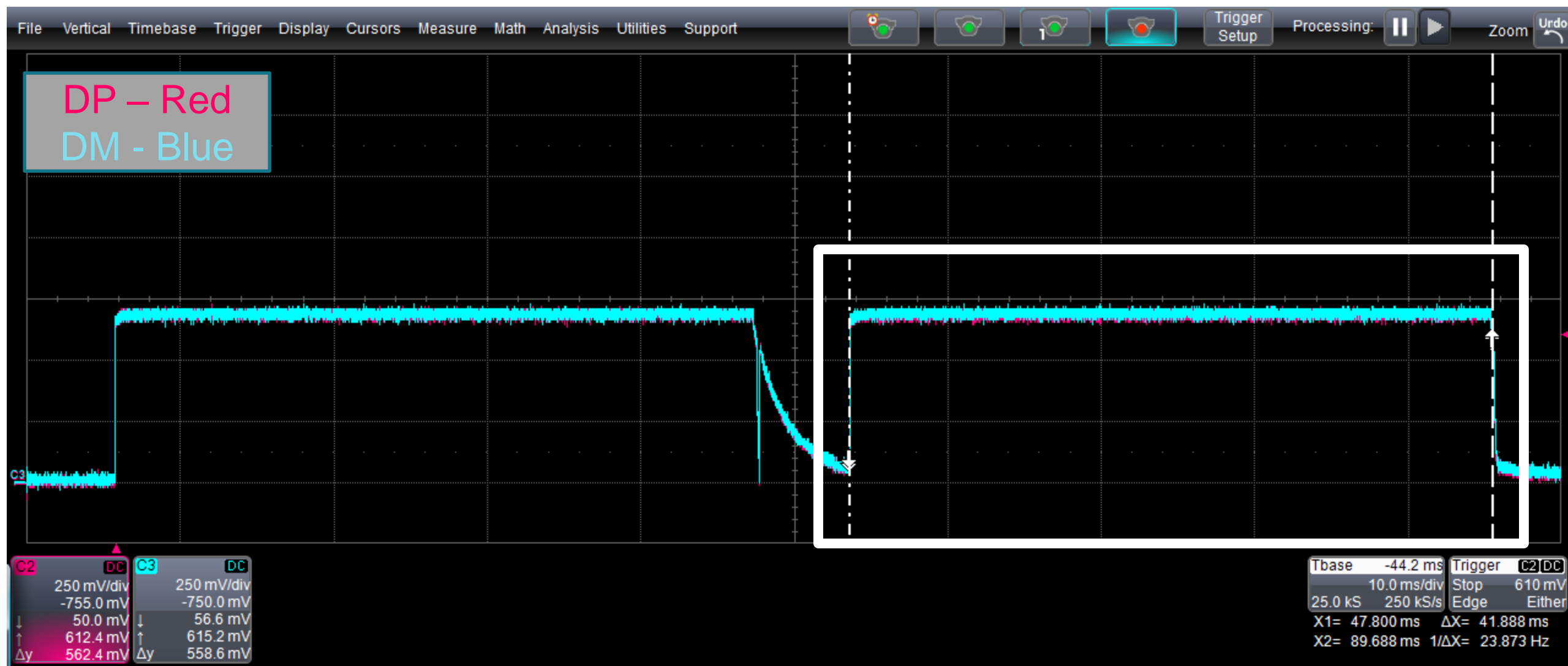
Primary detection: charging port signaling



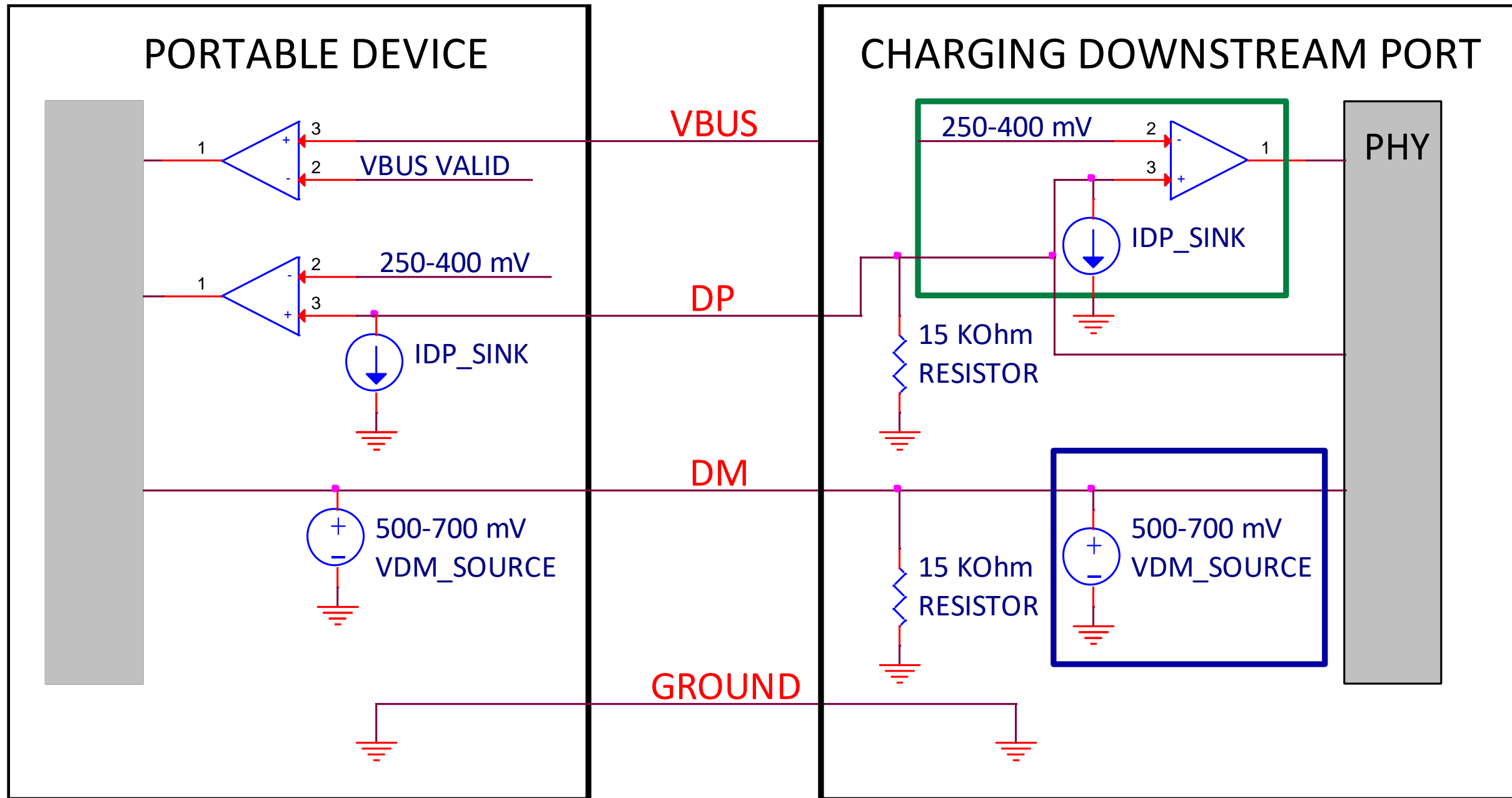
Secondary detection: DCP



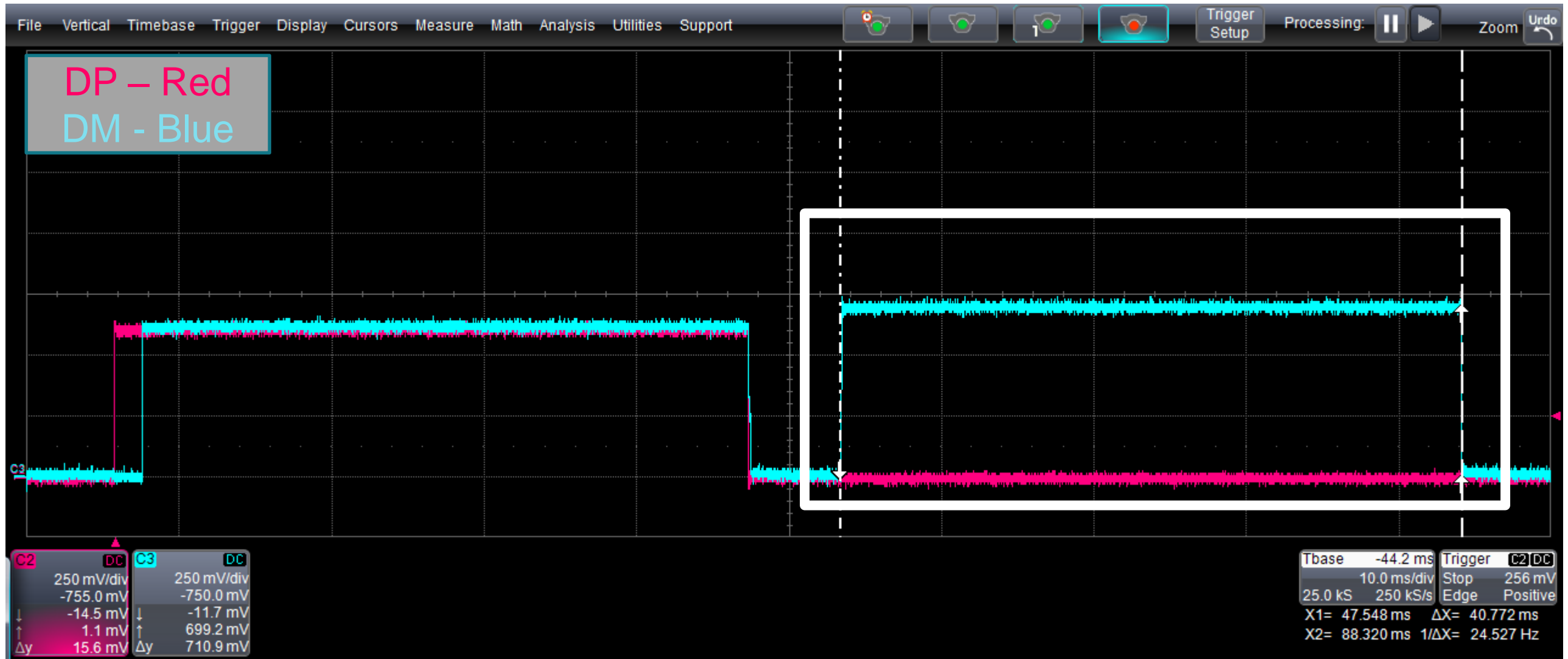
Secondary Detection: DCP signaling



Secondary detection: CDP

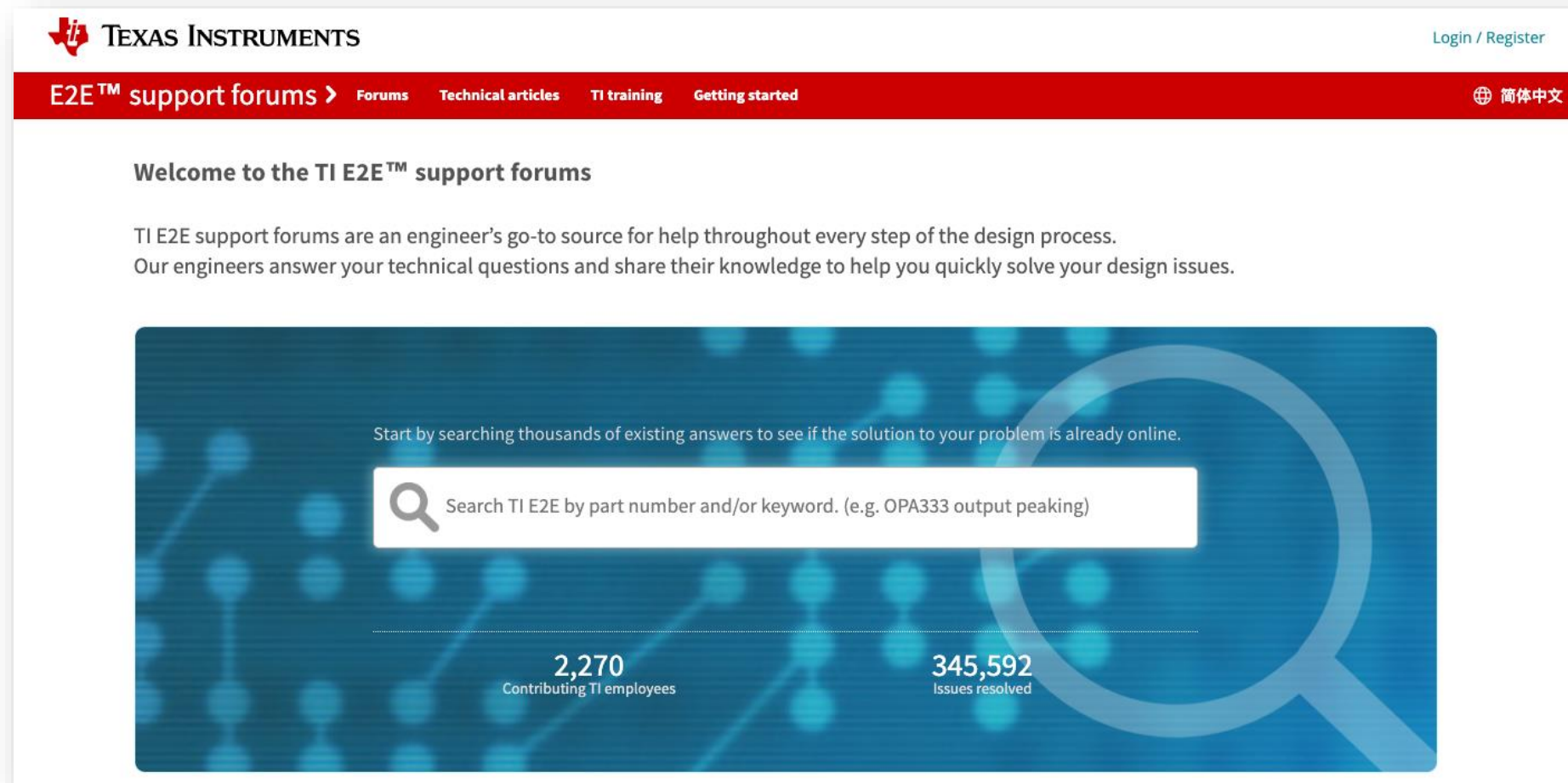


Secondary Detection: CDP signaling



Thank you

- TI Precision Labs – Layout Basics for USB Designs



The screenshot shows the TI E2E support forums homepage. At the top left is the Texas Instruments logo and the text "TEXAS INSTRUMENTS". To the right is a "Login / Register" link. Below this is a red navigation bar with "E2E™ support forums >" followed by links for "Forums", "Technical articles", "TI training", and "Getting started". On the far right of the bar is a globe icon and the text "简体中文".

The main content area features a heading "Welcome to the TI E2E™ support forums" and a paragraph: "TI E2E support forums are an engineer's go-to source for help throughout every step of the design process. Our engineers answer your technical questions and share their knowledge to help you quickly solve your design issues."

Below this is a large blue banner with a network diagram background and a large magnifying glass icon. The banner contains the text: "Start by searching thousands of existing answers to see if the solution to your problem is already online." Below this is a search input field with a magnifying glass icon and the placeholder text: "Search TI E2E by part number and/or keyword. (e.g. OPA333 output peaking)".

At the bottom of the banner, there are two statistics: "2,270 Contributing TI employees" and "345,592 Issues resolved".



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Short quiz

True or false: a portable device can draw up to 1A of current from any USB port?

Short quiz

FALSE

True or false: a portable device can draw up to 1A of current from any USB port?

False. A portable device can draw up to 500 mA from a regular USB 2.0 port and up to 1.5A from a charging port.

Short quiz

True or false: DP and DM are shorted together in a DCP?

Short quiz



True or false: DP and DM are shorted together in a DCP?

True. DP and DM are shorted together through a 200 ohm or smaller resistor in a DCP.

Short quiz

True or false: secondary detection is required on all portable devices?

Short quiz

FALSE

True or false: secondary detection is required on all portable devices?

False. Secondary detection is required only when the portable device is not ready to enumerate within 1 second of detecting VBUS, otherwise it is optional.

Short quiz

True or false: a CDP allows a PD to both charge and enumerate?

Short quiz



True or false: a CDP allows a PD to both charge and enumerate?

True. A CDP allows a PD to draw up to 1.5A of current while enumerated on USB.