

QuadraMAX PPS Test Guide

How to Run PPS Tests

Introduction

This document is a guide to determining when SPT PPS tests are required and how to run them with the QuadraMAX tester. SPT PPS tests include SPT.6 Voltage Step Test and SPT.7 Current Limit Test from the USB Type-C and PD Source Power Requirements Test Specification.

The test procedure incorporates a Total Phase PD Analyzer to capture PD messaging and to visualize the overall Vbus and CC electrical signature for test analysis.

Since the PD 3.0 spec PPS definition is young, testing has not stabilized and manual intervention may be required. When the test procedure indicates that manual intervention is required, please follow up with quadramax@specwerkz.com

Applicability

SPT PPS tests are applicable and required when the VIF for the Port Under Test contains an APDO.

Procedure

- 1) Setup Hardware:
QuadraMAX ⇔ Total Phase PD Analyzer ⇔ Cable ⇔ PUT
Test Operator Computer ⇔ QuadraMAX
Test Operator Computer ⇔ Total Phase PD Analyzer
Shorter cables are better because they introduce less Cable IR Drop.

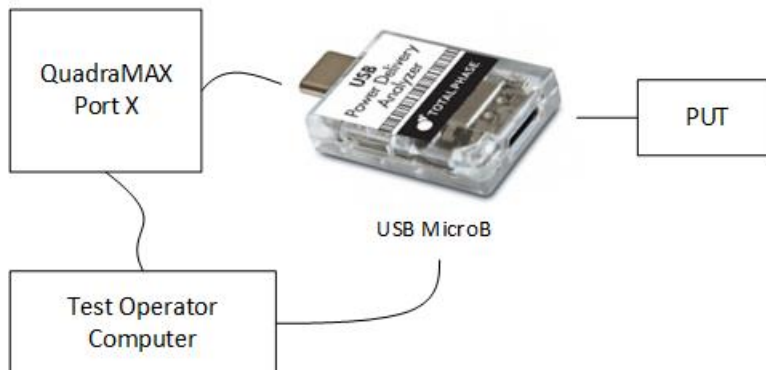


Figure 1: Total Phase PD Analyzer in QuadraMAX PPS Test Setup

2) Setup Software:

- a. Open QuadDraw
- b. Verify Real-Time graphs working (this signifies QuadDraw has a good handle on QuadraMAX device)

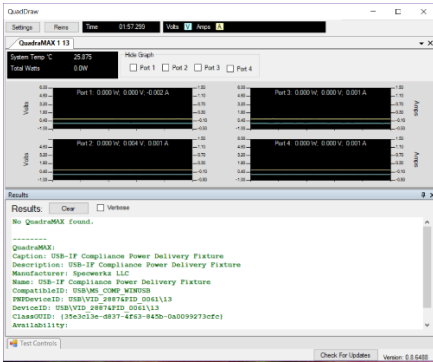


Figure 2: Real-Time Graph Working

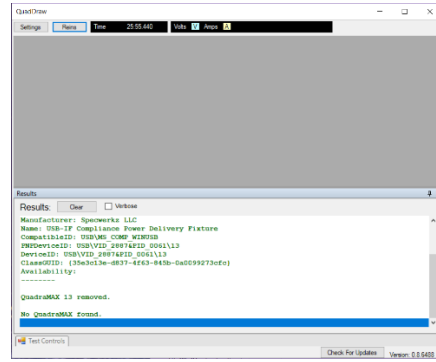


Figure 3: Real-Time Graph Not Working

- c. In the Test Control window, enter Cable IR Drop info for PUT
- d. Check SPT.6 Voltage Step Test and SPT.7 Current Limit Test
- e. Open Total Phase Data Center software
<https://www.totalphase.com/products/data-center/>
- f. Click the "Connect to Analyzer" button and connect to PD Analyzer (this signifies Data Center has a good handle on the PD Analyzer device)

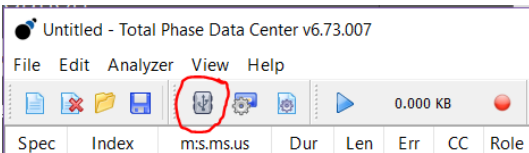


Figure 4: Select "Connect" button

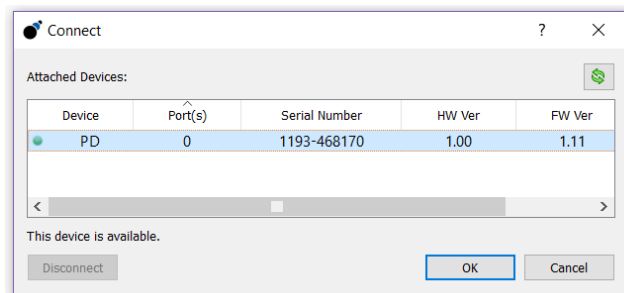


Figure 5: Select PD Analyzer Device and then Select "OK"

3) Start Test:

- a. In QuadDraw Test Control window, hit "Run"
- b. In Total Phase Data Center, hit "Start Capture"

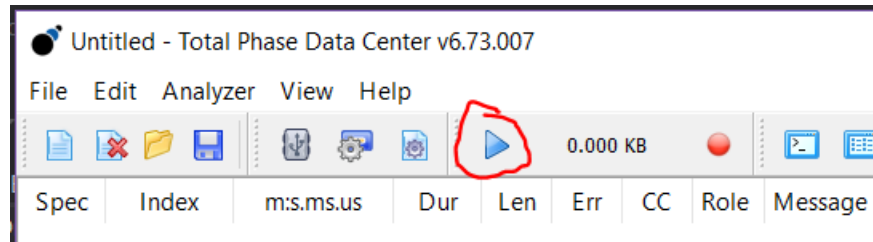


Figure 6: Start Capture

- c. Watch for a flatline in the software graphs. If the PD analyzer graph has flatline for 30 seconds, something is messed up and tests need manual intervention.

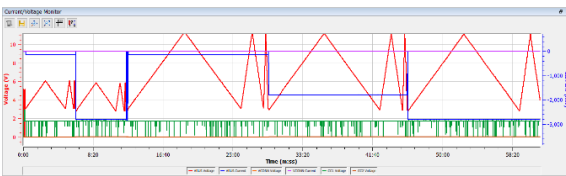


Figure 7: SPT.6 Voltage Step Test Signature

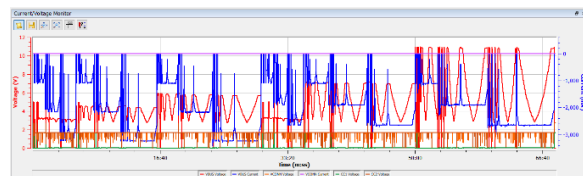


Figure 8: SPT.7 Current Limit Test Signature

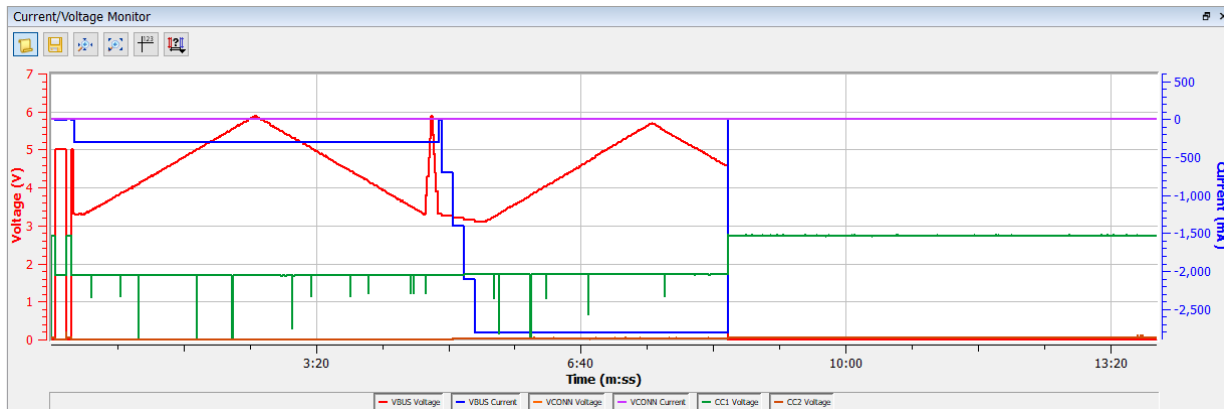


Figure 9: Example "Flatline" Graph Indicating Tests Require Manual Intervention. Test appears to cut out around the 8:30 mark.

- d. When the test run is complete in QuadraMAX, stop capture in Total Phase Data Center and save trace results so we can cross reference later during analysis.

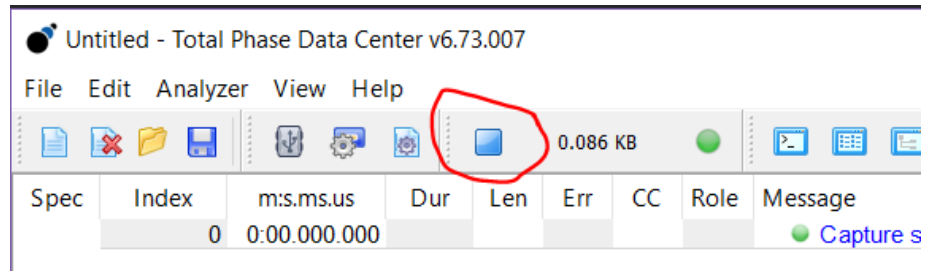
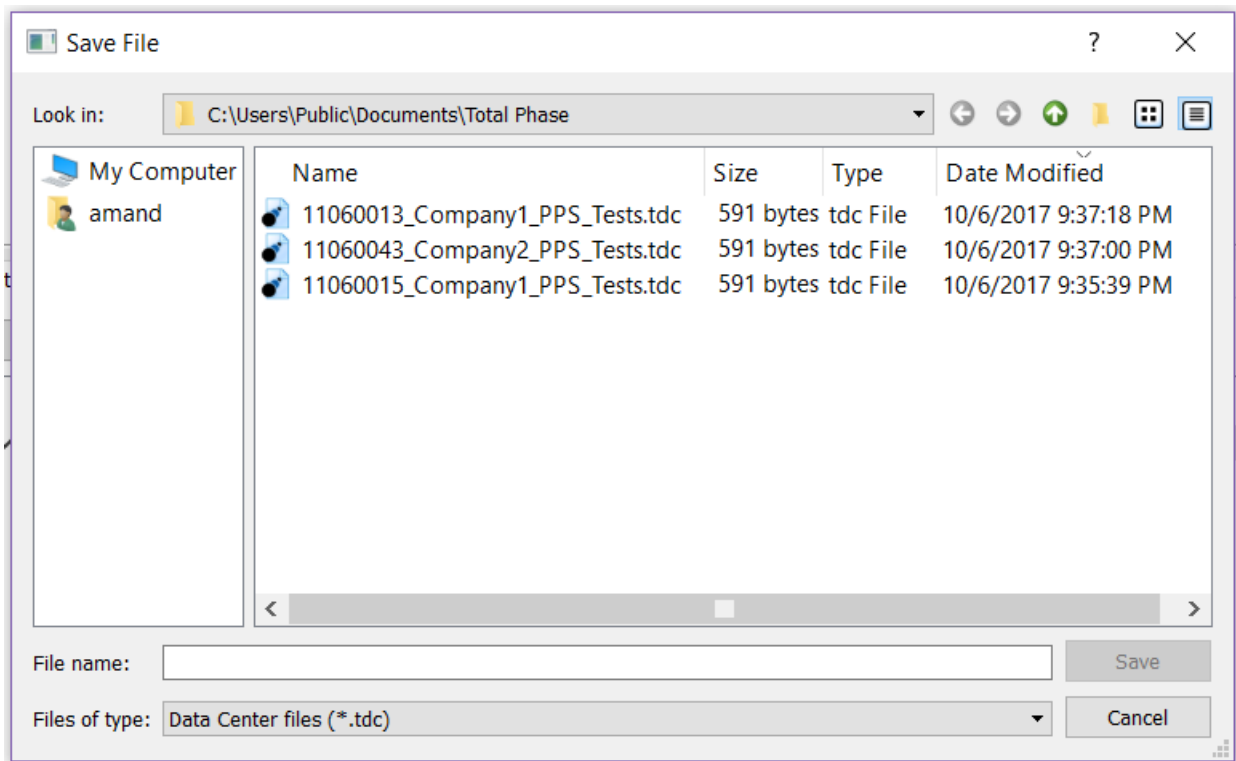
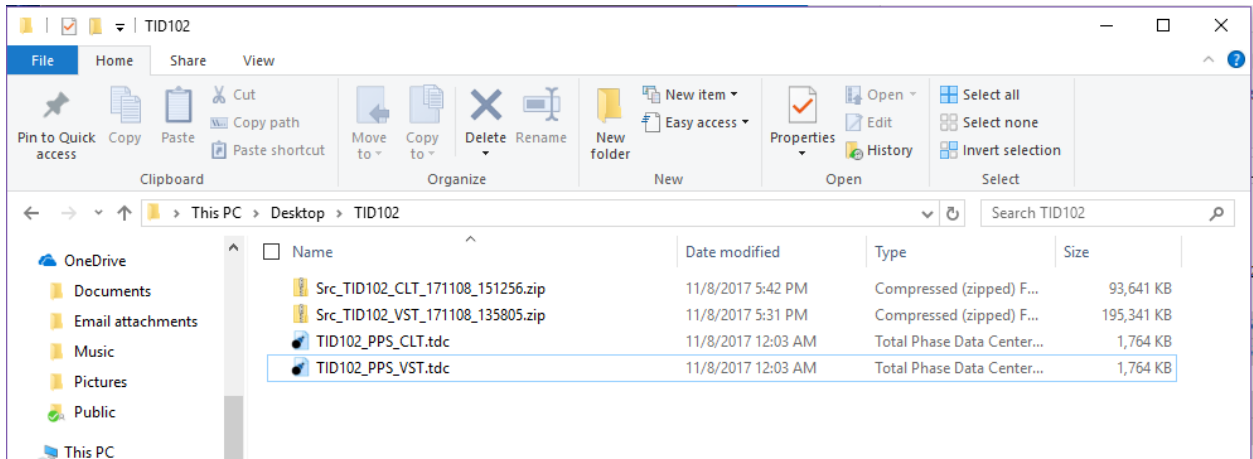


Figure 10: Stop Capture

- e. **Save Results!** Save Total Phase PD Analyzer trace results.
Example directory and file naming scheme: Replace “CompanyX” below with vendor company name or moniker.



- 4) **Send Results.** If you are transferring or sending these results to USB-IF for analysis:
 - a. Create a directory to gather QuadraMAX and Total Phase PD Analyzer results.
Example directory and file naming scheme: Replace “TID102” below with vendor company name or moniker. The Voltage Step Test (VST) and Current Limit Test (CLT) were recorded separately in the example below.



- b. Zip the directory (TID102/ in the example).
- c. Upload the zipped directory to a hosting site.
- d. Send the download link to target recipient(s).