



USB-IF 2.0 Compliance Test Report for Peripheral

Company Name: NXP

VID (Dec): 8137 The VID for the company who apply the USB-IF logo.

Model Name: LPC5536

Product Type: MSC

Report Date: 1/25/2022

Test Result: **PASS**

Tester: Benjamin Tovar-Prince

Authorized Signature: Kayla Seliner

Company Information:

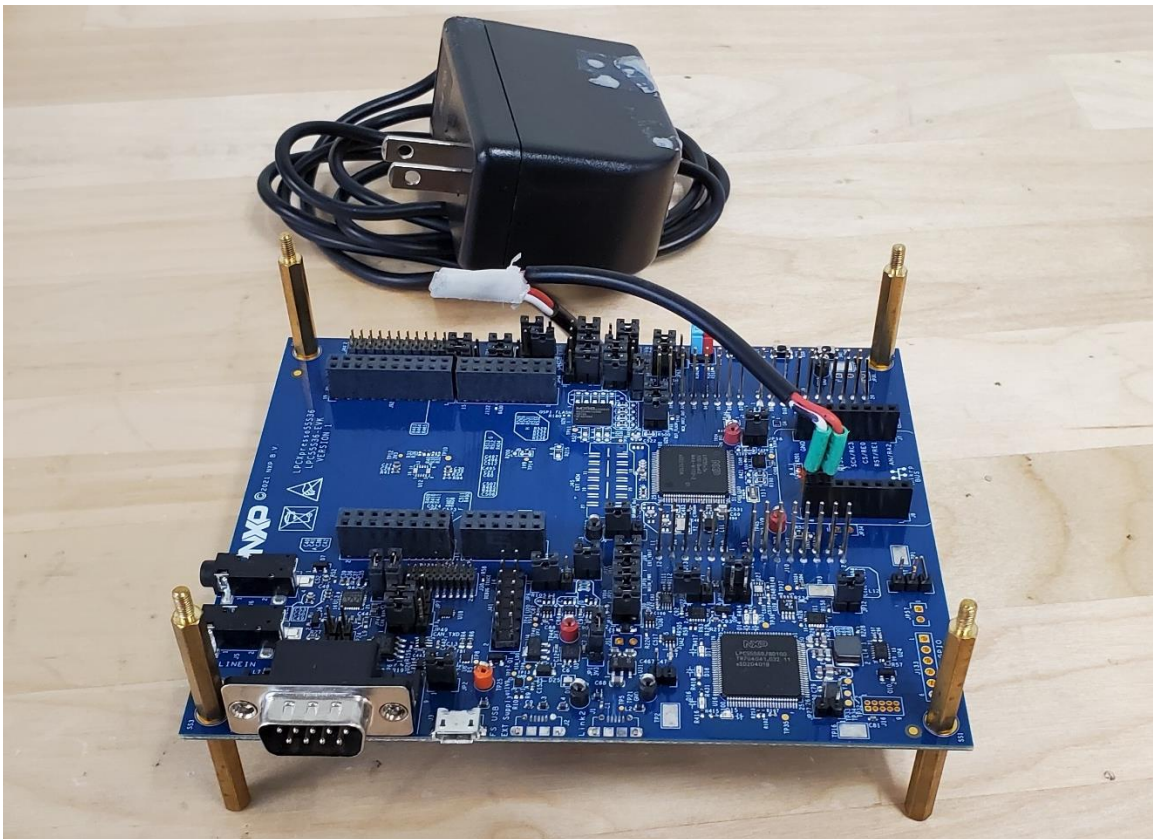
Company

Company Name: NXP Semiconductors
Company Address: 411 E Plumeria Dr. San Jose, CA 95134

Technical Contact

Name: Dezheng "Tom" Tang
Phone Number: N/A
E-Mail: dezheng.tang@nxp.com
FAX Number: N/A

Product Picture:



Overall Test Result Summary

Test Category	Result
Electrical	
Full Speed	Pass
BC 1.2	
Upstream Port	N/A
CV	
USB3CV	Pass
USB20CV	Pass
IOP	
Average Current Draw	Pass
Interoperability Interim Tree	Pass

Full Speed Electrical Compliance Tests

Connector Type: Untethered (Tethered means no standard B or special B connector)

Full Speed Upstream Signal Quality

☒ Pass

☐ Fail

Inrush Current

☒ Pass

☐ Fail

Back Voltage

☒ Pass

☐ Fail

Before Enumeration / After Enumeration

Pin	Voltage (mV)	
D+	0.0	0.0
D-	0.0	0.0
V _{Bus}	0.0	1.6

(All values <= 400mV)

Battery Charging 1.2 Compliance Tests

BC 1.2 Implemented Check

☐ Supported

☒ Not Supported

If the upstream port has BC 1.2 capability, all items of BC 1.2 Portable Device category should be tested under this port for USB-IF certification.

Portable Device (PD)

☐ Pass

☐ Fail

☒ N/A

B-UUT Initial Power-up Test

☐ Pass

☐ Fail

☒ N/A

Data Contact Detect Test – With Current Source

☐ Pass

☐ Fail

☒ N/A

Data Contact Detect Test – No Current Source

☐ Pass

☐ Fail

☒ N/A

DCP Detection Test

☐ Pass

☐ Fail

☒ N/A

CDP Detection Test

☐ Pass

☐ Fail

☒ N/A

SDP Detection Test

☐ Pass

☐ Fail

☒ N/A

ACA-Dock Detection Test

☐ Pass

☐ Fail

☒ N/A

ACA-A Detection Test

☐ Pass

☐ Fail

☒ N/A

ACA-B Detection Test

☐ Pass

☐ Fail

☒ N/A

ACA-C Detection Test

☐ Pass

☐ Fail

☒ N/A

ACA-GND Detection Test

☐ Pass

☐ Fail

☒ N/A

Common Mode Test - Full Speed

☐ Pass

☐ Fail

☒ N/A

Common Mode Test - High Speed

☐ Pass

☐ Fail

☒ N/A

Dead Battery Provision Test

☐ Pass

☐ Fail

☒ N/A

Command Verifier (CV) Compliance Tests

Framework Test Results (USB 3 Gen X CV) ☒ Pass ☐ Fail

All USB peripherals are required to enumerate on a Super Speed host controller (XHCI) and pass all applicable tests within USB 3 Gen X CV. Failures in framework tests in USB 3 Gen X CV will prevent certification.

DELL XPS8700 Platform

Full Speed:

VID: 0x1FC9 PID: 0x0092

Interface: 1 Max Power: 100 mA Remote Wakeup: N/A

Chapter 9 Tests:	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Connector Type Tests:	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
MSC Class Tests:	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
UVC Class Tests:	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A
HID Class Tests:	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A

Framework Test Results (USB 2 CV)

☒ **Pass**

☐ **Fail**

All USB peripherals are required to enumerate on a High Speed host controller (EHCI) and pass all applicable tests within USB 2 CV. Failures in framework tests in USB 2 CV will prevent certification.

StarTech PEX400USB2 (add-in card)

Full Speed:

VID: 0x1FC9

PID: 0x92

Interface: 1 Max Power: 100 mA Remote Wakeup: N/A

Chapter 9 Tests:

☒ **Pass**

☐ **Fail**

MSC Class Tests:

☒ **Pass**

☐ **Fail**

☐ **N/A**

UVC Class Tests:

☐ **Pass**

☐ **Fail**

☒ **N/A**

HID Class Tests:

☐ **Pass**

☐ **Fail**

☒ **N/A**

Average Current Draw Compliance Tests

Full Speed: Low Powered Device

☒ Pass

☐ Fail

Unconfigured Current: 0.18 mA

(<= 100mA)

Configured Current: 0.18 mA

(<= Max Power <= 100mA for Low Power)

(<= Max Power <= 500mA for High Power)

Suspended Current: 190 uA

(<= 2500uA for Self Power Hub or Non Compound Device)

(<= 12500uA for Bus Power Hub or Compound Device)

Power Suspended State Current: 180 uA

(<= 2500uA for not Supporting USB Battery Charging)

(<= 100mA for Supporting USB Battery Charging)

Operating Current: 0.19 mA

(<= Max Power <= 100mA for Low Power)

(<= Max Power <= 100mA for Self Power)

(<= Max Power <= 500mA for High Power)

Interoperability (Interim Tree) Compliance Tests

Interoperability Overall Result

☒ Pass ☐ Fail

DELL XPS8700 Platform

Operating System: Win10

XHCI Host Controller:

Root Port

Enumeration and Driver installation
Check operation of device
Interoperability – Operate all devices
Hot plug test – A Plug
Hot plug test – B Plug
S3 Active Standby Test
Remote Wake-up Test
S3 Active Standby Resume Test
S4 Active Hibernate Test
S4 Active Hibernate Resume Test
Warm Boot Test
Hybrid Boot Test
Cold Boot Test

☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail ☐ N/A
☒ Pass ☐ Fail
☐ Pass ☐ Fail ☒ N/A
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail

Initial Topology (DUT Behind SS5 Hub)

Enumeration
Check operation of device
Interoperability – Operate all devices
Hot plug test – A Plug
Hot plug test – B Plug
S3 Active Standby Test
Remote Wake-up Test
S3 Active Standby Resume Test
S4 Active Hibernate Test
S4 Active Hibernate Resume Test
Warm Boot Test
Hybrid Boot Test
Cold Boot Test

☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail ☐ N/A
☒ Pass ☐ Fail
☐ Pass ☐ Fail ☒ N/A
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail
☒ Pass ☐ Fail

Topology Change 1 (DUT Behind HS5 Hub)

Enumeration

☒ Pass ☐ Fail

Check operation of device

☒ Pass ☐ Fail

Interoperability – Operate all devices

☒ Pass ☐ Fail

Hot plug test – A Plug

☒ Pass ☐ Fail

Hot plug test – B Plug

☒ Pass ☐ Fail ☐ N/A

S3 Active Standby Test

☒ Pass ☐ Fail

Remote Wake-up Test

☐ Pass ☐ Fail ☒ N/A

S3 Active Standby Resume Test

☒ Pass ☐ Fail

S4 Active Hibernate Test

☒ Pass ☐ Fail

S4 Active Hibernate Resume Test

☒ Pass ☐ Fail

Warm Boot Test

☒ Pass ☐ Fail

Hybrid Boot Test

☒ Pass ☐ Fail

Cold Boot Test

☒ Pass ☐ Fail

Topology Change 2 (DUT Behind FS3-1 Hub)

Enumeration

☒ Pass ☐ Fail

Check operation of device

☒ Pass ☐ Fail

Interoperability – Operate all devices

☒ Pass ☐ Fail

Hot plug test – A Plug

☒ Pass ☐ Fail

Hot plug test – B Plug

☒ Pass ☐ Fail ☐ N/A

S3 Active Standby Test

☒ Pass ☐ Fail

Remote Wake-up Test

☐ Pass ☐ Fail ☒ N/A

S3 Active Standby Resume Test

☒ Pass ☐ Fail

S4 Active Hibernate Test

☒ Pass ☐ Fail

S4 Active Hibernate Resume Test

☒ Pass ☐ Fail

Warm Boot Test

☒ Pass ☐ Fail

Hybrid Boot Test

☒ Pass ☐ Fail

Cold Boot Test

☒ Pass ☐ Fail

Interoperability without Driver Verifier:

Run Only if Saw Poor Video or Audio Quality

☒ Pass ☐ Fail ☐ N/A

****Tested without Driver Verifier due to Poor Video Quality**

Host - USB 2.0 Cable - VL811+ Hub - DUT

Enumeration and Driver installation	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Check operation of device	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Interoperability – Operate all devices	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Hot Plug Test – A Plug	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Hot Plug Test – B Plug	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
S3 Active Standby Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Remote Wake-up Test	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A
S3 Active Standby Resume Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
S4 Active Hibernate Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
S4 Active Hibernate Resume Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Warm Boot Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Hybrid Boot Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Cold Boot Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	

Host - USB 2.0 Cable - RTS5423 Hub - DUT

Enumeration and Driver installation	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Check operation of device	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Interoperability – Operate all devices	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Hot Plug Test – A Plug	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Hot Plug Test – B Plug	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input type="checkbox"/> N/A
S3 Active Standby Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Remote Wake-up Test	<input type="checkbox"/> Pass	<input type="checkbox"/> Fail	<input checked="" type="checkbox"/> N/A
S3 Active Standby Resume Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
S4 Active Hibernate Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
S4 Active Hibernate Resume Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Warm Boot Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Hybrid Boot Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	
Cold Boot Test	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	

More Detailed Test Results:

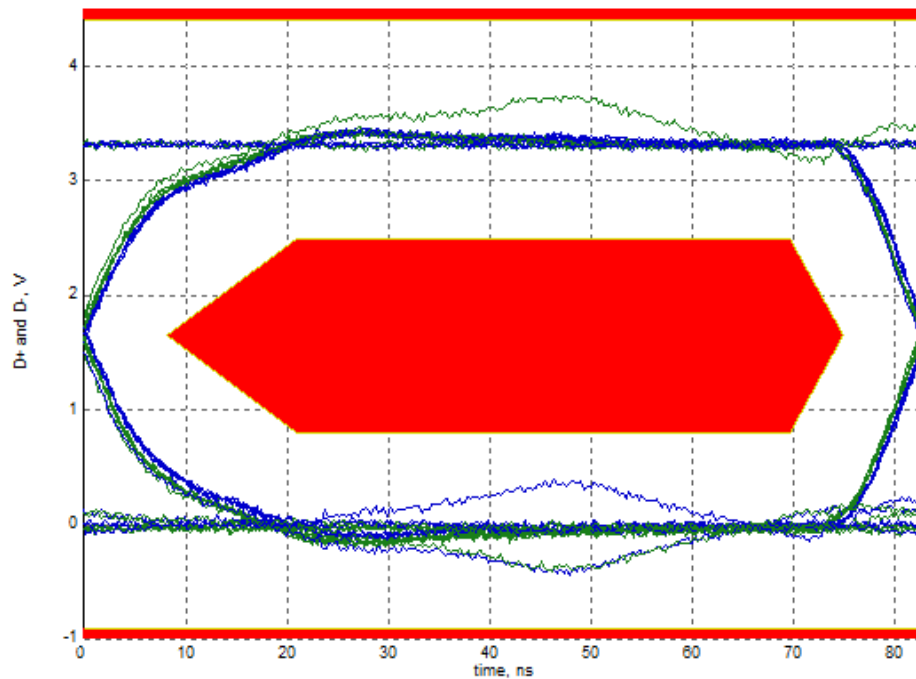
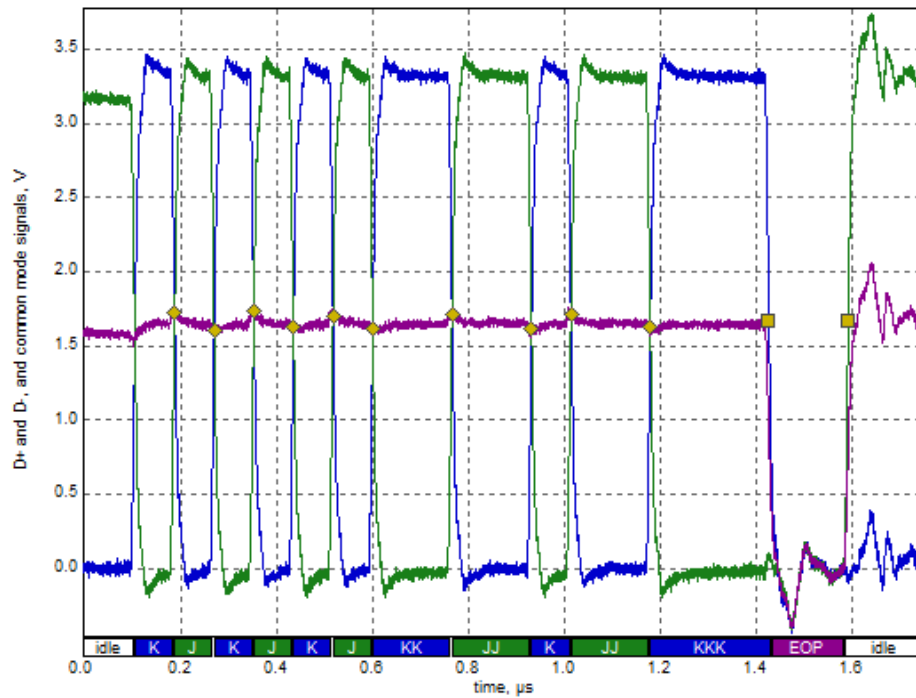
1. Full Speed Upstream Signal Quality: Pass

- Overall result: pass!
- Sync result:
sync passes
- Signal eye:
eye passes
- EOP width: 166.59 ns
EOP width passes
- Measured signaling rate: 12.0062 MHz
signal rate passes
- Edge Monotonicity: 16 mV
Monotonic Edge passes
- Crossover voltage range: 1.61 V to 1.73 V, mean crossover 1.67 V
(first crossover at 1.72 V, 9 other differential crossovers checked)
crossover voltages pass
- Consecutive jitter range: -118.532 ps to 116.945 ps, RMS jitter 76.296 ps
- Paired JK jitter range: -115.144 ps to 128.983 ps, RMS jitter 103.035 ps
- Paired KJ jitter range: -131.107 ps to 151.371 ps, RMS jitter 130.378 ps
jitter passes

Additional Information

- Rising Edge Rate: 210.66 V/us (Equivalent rise time = 12.53 ns)
- Falling Edge Rate: 208.89 V/us (Equivalent fall time = 12.64 ns)
- Edge Rate Match: 0.84% (limit +/-10%)
- Margin Above eye: 0.6967 V
- Margin Below eye: 0.4097 V
- Maximum Voltage: 3.7420 V
- Margin Below Top: 0.6580 V
- Minimum Voltage: -0.4379 V
- Margin Above Bottom: 0.4621 V

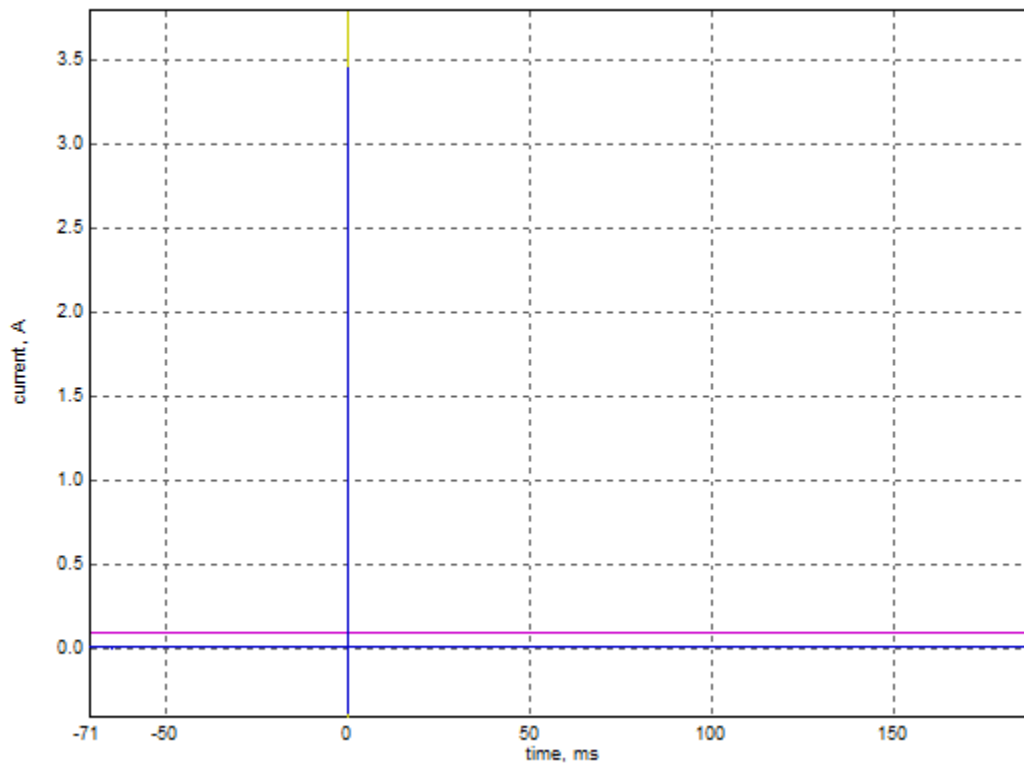
Signal Data and Eye



2. Inrush Current: Pass

- Overall result: pass!
- Inrush at 5.240 V: 14.3643 μC
Inrush passes
- Region 1 Start: -0.00006 ms - End: 0.107 ms = 14.36 μC

Hot Plug (Attach) Current Draw



Testing Procedure Documents:

1. Keysight D9010USBC USB 2.0 Compliance Test Application, Version 4.10.1
2. Universal Serial Bus Implementers Forum Full and Low Speed Electrical and Interoperability Compliance Test Procedure, Version: 1.3
3. USB Battery Charging 1.2 Compliance Plan, Revision: 1.2
4. xHCI Interoperability Test Procedures For Peripherals, Hubs and Hosts (Legacy, USB Type-C and Power Delivery), Version 0.98

Notice: The test results are only valid for the original tested device model.