



COMPLIANCE PROGRAM



TEST REPORT

USB 2.0 Test Report For High Speed Peripheral

Company Name: NXP Semiconductors

VID (Dec or Hex): 0x1FC9 The VID for the company who apply the USB-IF logo.

Model Name: LPC1850

Product Type: MSC

Report Date: 2014/01/29

Test Result: PASS

Tester: Kayla seliner



Legal Disclaimer

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Legacy USB Compliance Tests

Frameworks Test Result (USB20CV): ☒ Pass ☐ Fail

This test primarily covers USB-IF testing of devices and hubs for compliance with the standard commands in Chapters 9 and 11 of the USB 2.0 specification. This specification does not describe the full set of USB-IF tests and assertions for these devices.

VID: 0x1FC9

PID: 0x0082

High Speed Mode:

Chapter 9: ☒ Pass ☐ Fail

Interface: 1 **MAX Power:** 2 mA **Remote Wakeup:** N/A

MSC: ☒ Pass ☐ Fail ☐ N/A

UVC: ☐ Pass ☐ Fail ☒ N/A

HID: ☐ Pass ☐ Fail ☒ N/A

Full Speed Mode:

Chapter 9: ☒ Pass ☐ Fail

Interface: 1 **MAX Power:** 2 mA **Remote Wakeup:** N/A

MSC: ☒ Pass ☐ Fail ☐ N/A

UVC: ☐ Pass ☐ Fail ☒ N/A

HID: ☐ Pass ☐ Fail ☒ N/A



USB Compliance Program Test Report



Frameworks Test Result (USB30CV): ☒ Pass ☐ Fail

All USB peripherals are required to enumerate on a SuperSpeed host controller and pass all applicable tests within USB30CV. Failure framework test in USB30CV will prevent certification.

VID: 0x1FC9

PID: 0x0082

High Speed Mode:

Chapter 9: ☒ Pass ☐ Fail

Interface: 1 **MAX Power:** 2 mA **Remote Wakeup:** N/A

MSC: ☒ Pass ☐ Fail ☐ N/A

UVC: ☐ Pass ☐ Fail ☒ N/A

HID: ☐ Pass ☐ Fail ☒ N/A

Full Speed Mode:

Chapter 9: ☒ Pass ☐ Fail

Interface: 1 **MAX Power:** 2 mA **Remote Wakeup:** N/A

MSC: ☒ Pass ☐ Fail ☐ N/A

UVC: ☐ Pass ☐ Fail ☒ N/A

HID: ☐ Pass ☐ Fail ☒ N/A



Power Current Test Result: ☒ Pass ☐ Fail

High Speed Mode: Low Powered Device

Operating Power: 0 mA

(\leq Max Power \leq 100mA for Low Power)

(\leq Max Power \leq 100mA for Self Power)

(\leq Max Power \leq 500mA for High Power)

Unconfiguration Power: 0 mA

(\leq 100mA)

Configuration Power: 0 mA

(\leq Max Power \leq 100mA for Low Power)

(\leq Max Power \leq 500mA for High Power)

Suspend Mode Power: 81.5 uA

(Remote Wakeup Unsupported Device Only)

(Remote Wakeup Supported Device=> Type "N/A")

(\leq 2500uA for Self Power Hub or Non Compound Device)

(\leq 12500uA for Bus Power Hub or Compound Device)

Suspend Mode Power with Remote Wakeup: N/A uA

Suspend Mode Power without Remote Wakeup: N/A uA

(Remote Wakeup Supported Device Only)

(Remote Wakeup Unsupported Device => Type "N/A")

(\leq 2500uA for Self Power Hub or Non Compound Device)

(\leq 12500uA for Bus Power Hub or Compound Device)

Powered' State Suspend Mode Power: 83.4 uA

(\leq 2500uA for not Supporting USB Battery Charging)

(\leq 100mA for Supporting USB Battery Charging)



Full Speed Mode: Low Powered Device

Operating Power: 0 mA

(\leq Max Power \leq 100mA for Low Power)

(\leq Max Power \leq 100mA for Self Power)

(\leq Max Power \leq 500mA for High Power)

Unconfiguration Power: 0 mA

(\leq 100mA)

Configuration Power: 0 mA

(\leq Max Power \leq 100mA for Low Power)

(\leq Max Power \leq 500mA for High Power)

Suspend Mode Power: 87.4 uA

(Remote Wakeup Unsupported Device Only)

(Remote Wakeup Supported Device=> Type "N/A")

(\leq 2500uA for Self Power Hub or Non Compound Device)

(\leq 12500uA for Bus Power Hub or Compound Device)

Suspend Mode Power with Remote Wakeup: N/A uA

Suspend Mode Power without Remote Wakeup: N/A uA

(Remote Wakeup Supported Device Only)

(Remote Wakeup Unsupported Device => Type "N/A")

(\leq 2500uA for Self Power Hub or Non Compound Device)

(\leq 12500uA for Bus Power Hub or Compound Device)

Powered' State Suspend Mode Power: 87.6 uA

(\leq 2500uA for not Supporting USB Battery Charging)

(\leq 100mA for Supporting USB Battery Charging)



Interoperability Test Overall Result: ☒ Pass

☐ Fail OS: Win 7

EHCI Host Controller:

Enumeration and Driver installation

☒ 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

Warm Boot test

☒ Pass ☐ Fail

Remote Wake-up Test

☐ Pass ☐ Fail ☒ N/A

S3 Active Standby Test

☒ Pass ☐ Fail

S3 Active Standby Resume Test

☒ Pass ☐ Fail

Root Port Test

☒ Pass ☐ Fail

S4 Active Hibernate Test

☒ Pass ☐ Fail

S4 Active Hibernate Resume Test

☒ Pass ☐ Fail

UHCI Host Controller:

Interoperability – Operate all devices

☒ Pass ☐ Fail

System Suspend/Resume Test– Operate DUT

☒ Pass ☐ Fail

Warm Boot Test – Operate DUT

☒ Pass ☐ Fail

OHCI Host Controller:

Interoperability – Operate all devices

☒ Pass ☐ Fail

System Suspend/Resume Test – Operate DUT

☒ Pass ☐ Fail

Warm Boot Test – Operate DUT

☒ Pass ☐ Fail



USB Compliance Program Test Report



Full Speed Signal Quality Test Result: ☒ Pass ☐ Fail

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

Full Speed Upstream Signal Quality: ☒ Pass ☐ Fail

Inrush Current Test: ☒ Pass ☐ Fail

Back Voltage Test Result: (Enumerate before/after) ☒ Pass ☐ Fail

D+: 0.6 mV / 0.6 mV

D- : 0.6 mV / 0.6 mV

V_{Bus}: 2.4 mV / 2.4 mV

(All values <= 400mV)



High Speed USB Compliance Tests

A4.4 Device High-speed Signal Quality

☒ Pass ☐ Fail

These tests measure the ability of transmitters to do valid high speed signaling. High speed signal quality is measured on upstream ports. A high speed scope with differential probes is used. Signaling data is captured with the scope and then translated to an eye pattern. The signal quality eye patterns obtained from the measurements must agree with the transmit eye patterns in the USB 2.0 Specification.

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

EL_2: Transmitter Data Rate:

☒ Pass ☐ Fail

EL_4: Eye Pattern (Template 1):

☐ Pass ☐ Fail ☒ N/A

EL_5: Eye Pattern (Template 2):

☒ Pass ☐ Fail ☐ N/A

EL_6: Rising and Falling Time:

☒ Pass ☐ Fail

EL_7: Monotonic Data Transition:

☒ Pass ☐ Fail

A4.5 Device Packet Parameters

☒ Pass ☐ Fail

This test measures the amount of time it takes hosts and devices to respond. It also verifies device generated SYNCs and EOPs.

EL_21: 32 bit, EL_22 Step1: 160bit, Step2: 163bit, EL_25: 8 bit

(EL_21: 32Bit)

EL_22: 8 to 192 bit

EL_25: 8Bit)

A4.6 Device CHIRP Timing

☒ Pass ☐ Fail

This test examines the basic timings and voltages of both upstream ports during the speed detection protocol. (Device reset from Full Speed)

EL_28: 903.777 us,

(EL_28: 2.5us to 6ms)

EL_29: 2.000 ms,

EL_29: 1ms to 7ms

EL_31: 3.699 us

EL_31: 500us)

A4.7 Device Suspend/Resume/Reset timing

☒ Pass ☐ Fail

This test verifies that a device can be suspended and resumed while operating in high speed and also that the device can be reset from the suspended state.

EL_38: 3.002 ms,

(EL_38: 3ms to 3.125ms)

EL_39: YES,

EL_40: YES

EL_27: 3.903 ms,

(EL_27: 3.1ms to 6ms)

EL_28: 903.746 us

EL_28: 2.5us to 6ms)



A4.8 Device Test J/K, SE0_NAK

☒ **Pass** ☐ **Fail**

The USB-IF no longer requires EL_8: Test_J and Test_K to be performed as a condition for USB Certification. Measurement of EL_9: Test_J, Test_K and SE0 are still a requirement for certification. EL_9 is defined in the USB 2.0 Test Specification and measures the data line voltage when not driven. For detail information please reference as below link:

[High-speed Test_J and Test_K Tests are Removed as Certification Requirements](#)

EL_9

Test Mode	Voltage (mV)
SE0_NAK D+	2.0
SE0_NAK D-	2.1
Test J D-	4.8
Test K D+	4.6

(-10mV to 10mV)

A4.9 Device Receiver Sensitivity

☒ **Pass** ☐ **Fail**

These tests check the receive characteristics of upstream ports

EL_18: YES, EL_17: +153.394, -149.798 mV, EL_16: +146.319, -143.044 mV

(EL_17: $\leq +200\text{mV}$ and $\geq -200\text{mV}$)

EL_16: $\geq +100\text{mV}$ and $\leq -100\text{mV}$)



More Detail Test Result:

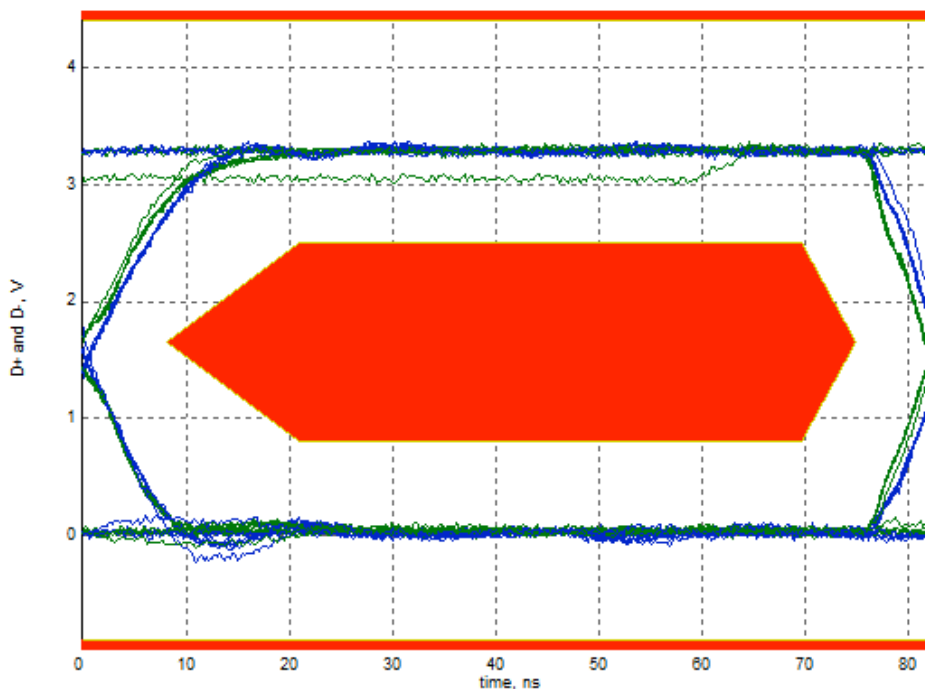
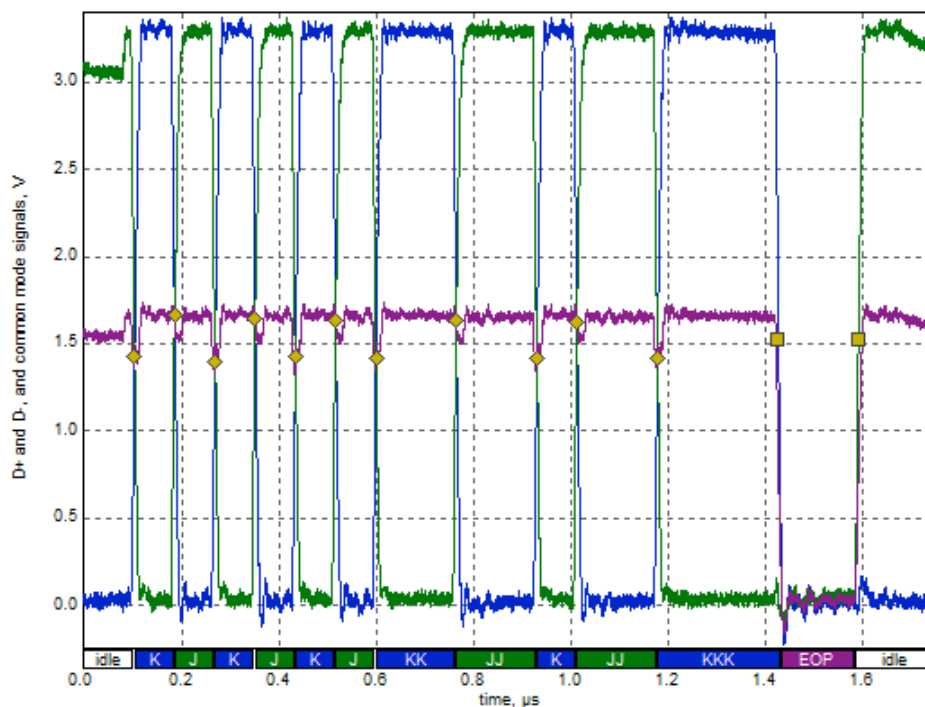
1. Full Speed Upstream Signal Quality: Pass

- Overall result: pass!
- Sync result:
sync passes
- Signal eye:
eye passes
- EOP width: 165.40 ns
EOP width passes
- Measured signaling rate: 11.9991 MHz
signal rate passes
- Edge Monotonicity: 22 mV
Monotonic Edge passes
- Crossover voltage range: 1.40 V to 1.67 V, mean crossover 1.52 V
(first crossover at 1.43 V, 10 other differential crossovers checked)
crossover voltages pass
- Consecutive jitter range: -229.067 ps to 281.306 ps, RMS jitter 189.222 ps
- Paired JK jitter range: -143.893 ps to 112.116 ps, RMS jitter 128.987 ps
- Paired KJ jitter range: -99.865 ps to 74.558 ps, RMS jitter 69.114 ps
jitter passes

Additional Information

- Rising Edge Rate: 189.33 V/us (Equivalent risetime = 13.94 ns)
- Falling Edge Rate: 213.43 V/us (Equivalent falltime = 12.37 ns)
- Edge Rate Match: 11.97% (limit +/-10%)

Signal Data and Eye





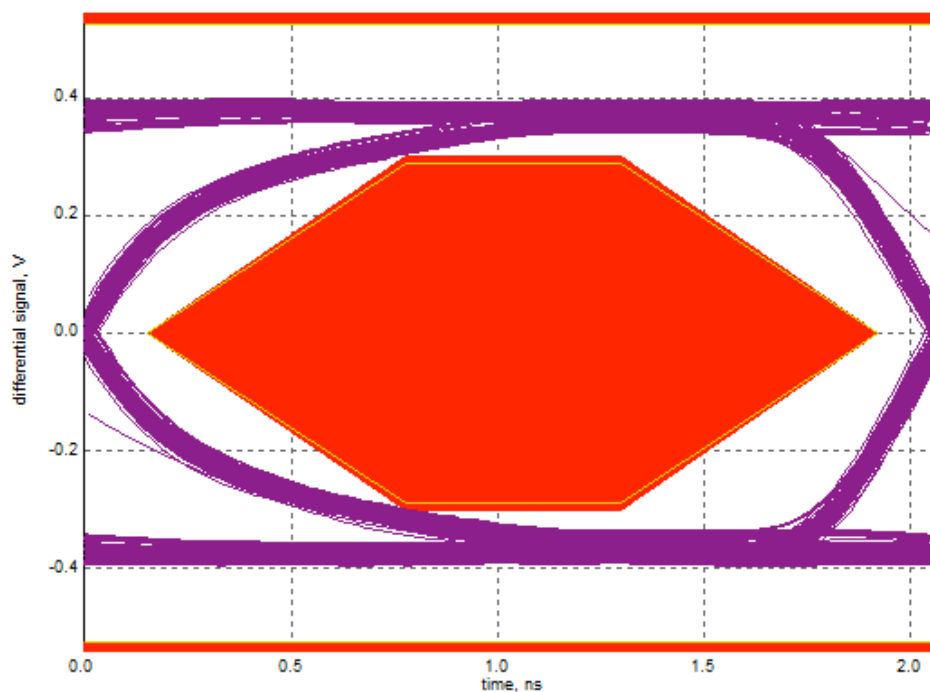
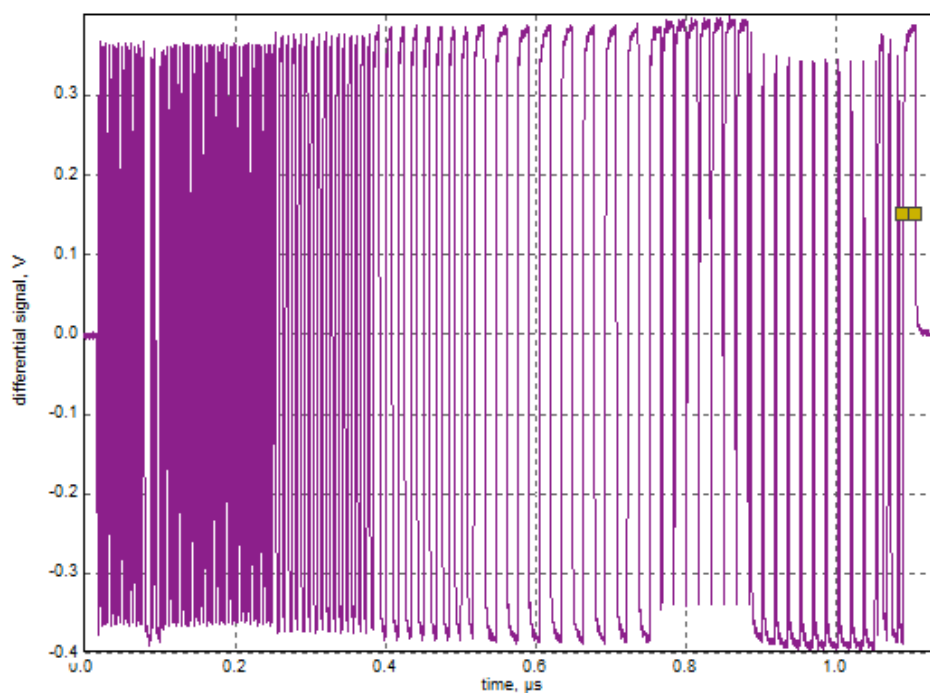
2. High Speed Upstream Signal Quality: Pass

- Overall result: pass!
- Sync result:
sync passes
- Signal eye:
eye passes
- EOP width: 7.92 bits
EOP width passes
- Measured signaling rate: 479.9952 MHz
signal rate passes
- Edge Monotonicity: 0 mV
Monotonic Edge passes
- Rising Edge Rate: 1062.80 V/us (602.18 ps equivalent risetime)
passes
- Falling Edge Rate: 982.28 V/us (651.55 ps equivalent falltime)
passes

Additional Information

- Consecutive jitter range: -41.778 ps to 36.246 ps, RMS jitter 14.024 ps
- Paired JK jitter range: -41.837 ps to 50.098 ps, RMS jitter 16.835 ps
- Paired KJ jitter range: -48.669 ps to 46.766 ps, RMS jitter 23.861 ps

Signal Data and Eye

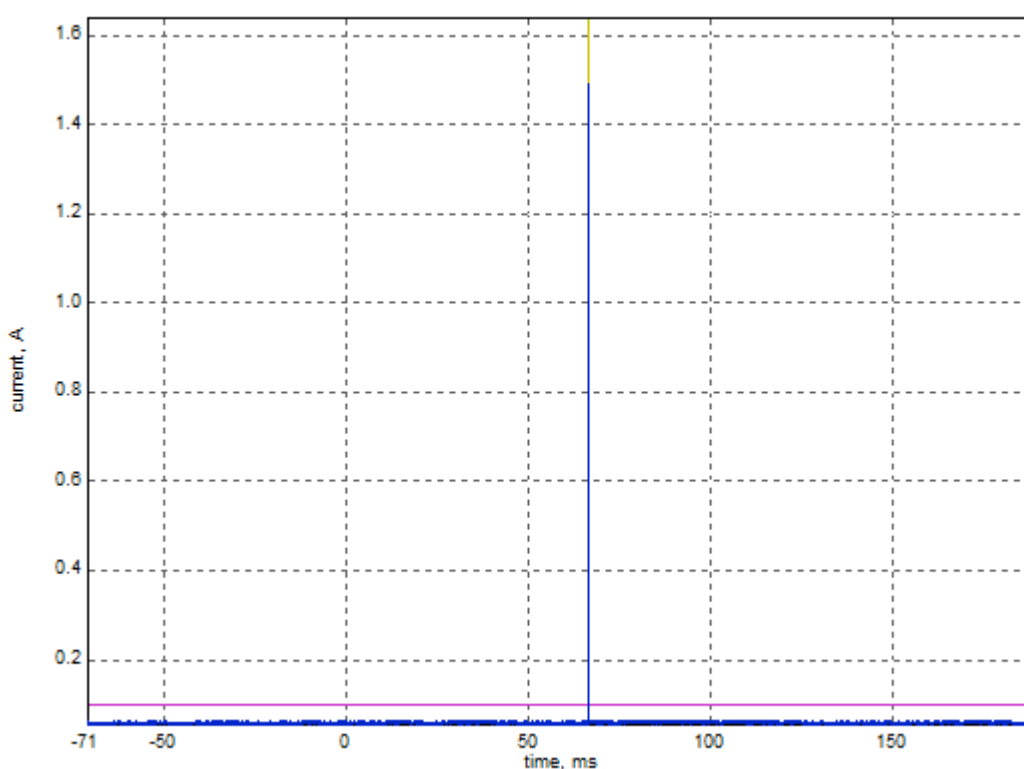




3. Inrush Current: Pass

- Overall result: pass!
- Inrush at 5.000 V: 8.2474 μ C
Inrush passes
- Region 1 Start: 67.19230 ms - End: 67.307 ms = 8.247 μ C

Hot Plug (Attach) Current Draw





Notice: Test result is valid only to the original tested device model. The content of test report may not be copied or re-transmitted (except for the entire report) unless it is prior approved by Allion.

Test Procedure Reference:

1. USB-IF Compliance Update Page---Interoperability Gold Tree Update
<http://compliance.usb.org/resources/GoldSuite%20Test%20Procedure.pdf>
2. Universal Serial Bus Implementers Forum Full and Low Speed Electrical and Interoperability Compliance Test Procedure, version: 1.3
3. Universal Serial Bus Implementers Forum Device High-speed Electrical Test Procedure For Tektronix Test Equipment, version: 1.0
4. Universal Serial Bus Implementers Forum Device High-speed Electrical Test Procedure, version: 1.0