USB 2.0 Hi-Speed Embedded Host Compliance Test Report

USB-IF Compliance Program	
Company Name	Microsemi, SOC Products Group
Product Name	Smartfusion2 EH
Model Number	DVP-102-000304-001-RevC
Product Revision	1
Test Date	September 23 ~ 24, 2013
Test Result	**PASS**

A. Vendor and Product Information

Vendor Information
■ Vendor Name: Microsemi, SOC Products Group ■ Vendor Complete Address: 3850 North First Street, SanJose, CA, 95134, USA ■ Vendor Phone Number: 8007134113 ■ Vendor Contact(s) – Name: Wendy Lockhart Tel: 8007134113 E-mail: ~~xx~~
Product Information
■ Silicon Model Name: ~~SMSC, USB3326C~~ ■ TID(if you know): ~~120000265~~ VID: ~~0x1514~~ PID: ~~n/a~~ ■ Product Category: ~~Development-Embedded Host-High Speed~~ ■ Product Description: ~~Silicon Building Block~~ ~~Comments:~~ ■ Tested OS: ☐ Windows 2000 ☐ Windows XP ☒ Embedded OS
Device Information
■ Number of downstream ports: ~~1~~ ■ Supported Sessions: ☐ ADP ☐ SRP ☒ N/A ■ USB Connector: ☐ Micro AB ☒ Standard A ■ Is there a hub embedded behind one or more downstream ports? ~~No~~ ■ What is the maximum source current rating of the downstream ports? ~~500 mA~~ ■ Are hubs supported? ~~No~~ ■ Is there an upstream port on the Device? ~~No~~ ■ Is a Targeted Peripheral List available? ~~Yes~~ ■ FS supported? ~~No~~ ■ Battery Charging 1.2 supported? ~~No~~
Tested By Joonsi Jung

Overall Test Result: ~~PASS~~

B. Legacy USB Electrical Tests

B.1 Drop/Droop Test Results: ☒ **Pass** ☐ **Fail on Port:** ☐ **N/A**

	$V_{Non-Loaded}$ (V)	V_{Loaded} (V)	V_{Drop} (mV)	V_{Droop} (mV)
Port1	5.160	4.900	260	N/A

Comments: 500 mA Load

B.2 Full-Speed Downstream Signal Quality Test Result:

☒ **Pass** ☐ **Fail on Port:** ☐ **N/A**

Comments:

B.3 Low-Speed Downstream Signal Quality Test Result:

☐ **Pass** ☐ **Fail on Port:** ☒ **N/A**

Comments:

C. Host High-Speed Electrical Tests

C.1 Host High-speed Signal Quality (EL_2, EL_3, EL_6, EL_7)

EL_2 A USB 2.0 high-speed transmitter data rate must be 480 Mb/s ± 0.05%.

Reference documents: *USB 2.0 Specification*, Section 7.1.11

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_3 A USB 2.0 downstream facing port must meet Template 1 transform waveform requirements measured at TP2 (each hub downstream port).

Reference documents: *USB 2.0 Specification*, Section 7.1.2.2

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_6 A USB 2.0 HS driver must have 10% to 90% differential rise and fall times of greater than 500ps.

Reference documents: *USB 2.0 Specification*, Section 7.1.2.2

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_7 A USB 2.0 HS driver must have monotonic data transitions over the vertical openings specified in the appropriate eye pattern template.

Reference documents: *USB 2.0 Specification*, Section 7.1.2.2

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

C.2 Host Controller Packet Parameters (EL_21, EL_22, EL_23, EL_25, EL_55)

EL_21 The SYNC filed for all transmitted packets (not repeated packets) must begin with a 32-bit SYNC field.

Reference documents: *USB 2.0 Specification*, Section 8.2

Results: 66.905 ns

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_25 The EOP for all transmitted packets (except SOFs) must be an 8-bit NRZ byte of 01111111 without bit stuffing. *(**Note**, that a longer EOP is waiverable)*

Reference documents: *USB 2.0 Specification*, Section 7.1.13.2

Results: 16.857 ns

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_23 Host transmitting two packets in a row must have an inter-packet gap of at least 88 bit times and not more than 192 bit times.

Reference documents: *USB 2.0 Specification*, Section 7.1.18.2

Results: 333.307 ns

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_22 When transmitting after receiving a packet, hosts and devices must provide an inter-packet gap of a t least 8 bit times and not more than 192 bit times.

Reference documents: *USB 2.0 Specification*, Section 7.1.18.2

Results: 278.154 ns

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_55 Hosts transmitting SOF packets must provide a 40-bit EOP without bit stuffing where the first symbol of the EOP is a transition from the last data symbol.

Reference documents: *USB 2.0 Specification*, Section 7.1.13.2

Results: 83.549 ns

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

C.3 Host Disconnect Detect (EL_36, EL_37)

EL_37 A USB 2.0 downstream facing port must not detect the high-speed disconnect state when the amplitude of the differential signal at the downstream facing driver's connector is <= 525mV.

Reference documents: *USB 2.0 Specification*, Section 7.1.7.3

☐ **Pass** ☐ Fail on Port: _____ ☒ N/A

Comments:

EL_36 A USB 2.0 downstream facing port must detect the high-speed disconnect state when the amplitude of the differential signal at the downstream facing driver's connector is >= 625mV.

Reference documents: *USB 2.0 Specification*, Section 7.1.7.3

☐ **Pass** ☐ Fail on Port: _____ ☒ N/A

Comments:

C.4 Host CHIRP Timing (EL_33, EL_34, EL_35)

EL_33 Downstream ports start sending and alternating sequence of Chirp K's and Chirp J's within 100us after the device Chirp K stops.

Reference documents: *USB 2.0 Specification*, Section 7.1.7.5

Results: 2.259 us

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_34 Downstream port Chirp K and Chirp J durations must be between 40us and 60us duration.

Reference documents: *USB 2.0 Specification*, Section 7.1.7.5

Results: 50.017/50.013 us

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_35 Downstream ports begin sending SOFs within 500us and not sooner than 100us from transmission of the last Chirp (J or K)

Reference documents: *USB 2.0 Specification*, Section 7.1.7.5

Results: 225.230 us

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

C.5 Host Suspend/Resume Timing (EL_39, EL_41)

EL_39 A device must support the Suspend state.

Reference documents: *USB 2.0 Specification*, Section 7.1.7.6

Results: 3.005 ms

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_41 After resuming a port, the host must begin sending SOFs within 3ms of the start of the idle state.

Reference documents: *USB 2.0 Specification*, Section 7.1.7.7

Results: 101 us

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

C.6 Host Test J/K, SE0_NAK (EL_8, EL_9)

EL_8 When either D+ or D- are driven high, the output voltage must be 400mV ± 10% when terminated with precision 45 Ohm resistors to ground.

Reference documents: *USB 2.0 Specification*, Section 7.1.1.3

Port	1	
Test	D+	D-
J (mV)	-	0
K (mV)	0	-

Overall Results:

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

EL_9 When either D+ or D- are not being driven, the output voltage must be 0V ± 10mV when terminated with precision 45 Ohm resistors to ground.

Reference documents: *USB 2.0 Specification*, Section 7.1.1.3

Port	1	
Test	D+	D-
Results (mV)	0	0

Overall Results:

☒ **Pass** ☐ Fail on Port: _____ ☐ N/A

Comments:

D. PET Test Results: ☒ Pass ☐ Fail

Automated Test Chapter 6

A-UUT Initial Power-up Test	☒ Pass	☐ Fail	☐ N/A
A-UUT VBUS Voltage Test	☒ Pass	☐ Fail	☐ N/A
A-UUT Bypass Capacitance Test	☐ Pass	☐ Fail	☒ N/A
A-UUT SRP Test	☐ Pass	☐ Fail	☒ N/A
A-UUT ADP Test	☐ Pass	☐ Fail	☒ N/A
A-UUT Leakage Test	☐ Pass	☐ Fail	☒ N/A
EH, Capable of ADP and SRP, State Transition Test	☐ Pass	☐ Fail	☒ N/A
EH, Capable of ADP but not SRP, State Transition Test	☐ Pass	☐ Fail	☒ N/A
EH, Capable of SRP but not ADP, State Transition Test	☐ Pass	☐ Fail	☒ N/A
EH with no Session Support State Transition Test	☒ Pass	☐ Fail	☐ N/A
EH, Capable of ADP/SRP, but not HNP, State Transition Test	☐ Pass	☐ Fail	☒ N/A
EH, Capable of ADP but not SRP/HNP, State Transition Test	☐ Pass	☐ Fail	☒ N/A
EH, Capable of SRP but not ADP/HNP, State Transition Test	☐ Pass	☐ Fail	☒ N/A
EH with no Session/HNP Support State Transition Test	☐ Pass	☐ Fail	☒ N/A
A-UUT “Device No Response” for connection timeout	☒ Pass	☐ Fail	☐ N/A
A-UUT “Unsupported Device” Message	☒ Pass	☐ Fail	☐ N/A
EH using Micro-AB “Incorrect Connection”	☐ Pass	☐ Fail	☒ N/A

E. Interoperability Test Results: ☒ Pass ☐ Fail

Manual Test Chapter 7

A-UUT Functionality B-devices	☒ Pass	☐ Fail	☐ N/A
A-UUT Category Functionality B-devices	☒ Pass	☐ Fail	☐ N/A
A-UUT Boot test	☒ Pass	☐ Fail	☐ N/A
A-UUT Legacy Speed Test	☐ Pass	☐ Fail	☒ N/A
A-UUT Concurrent and Independently test	☐ Pass	☐ Fail	☒ N/A
A-UUT Unsupported device Message test	☒ Pass	☐ Fail	☐ N/A
A-UUT Hub Error Message test	☒ Pass	☐ Fail	☐ N/A
A-UUT Hub Functionality test	☐ Pass	☐ Fail	☒ N/A
A-UUT Hub maximum tier test	☐ Pass	☐ Fail	☒ N/A
A-UUT Hub Concurrent and Independent test	☐ Pass	☐ Fail	☒ N/A
A-UUT Bus powered hub power exceeded test	☐ Pass	☐ Fail	☒ N/A
A-UUT Maximum concurrently device exceed message test	☐ Pass	☐ Fail	☒ N/A
A-UUT Standby test	☐ Pass	☐ Fail	☒ N/A
A-UUT Standby Disconnect test	☐ Pass	☐ Fail	☒ N/A
A-UUT Standby Attach test	☐ Pass	☐ Fail	☒ N/A
A-UUT Standby Topology Change test	☐ Pass	☐ Fail	☒ N/A
A-UUT Standby Remote Wakeup test	☐ Pass	☐ Fail	☒ N/A
OTG to OTG test	☐ Pass	☐ Fail	☒ N/A

F. Targeted Peripheral List (TPL) Form

F.1 Host Information:

Enter the following information only once.

Vendor Name:	Microsemi, SOC Products Group			
Product Name:	Smartfusion2 EH			
Product Model:	DVP-102-000304-001-RevC			
Product Revision:	1			
SRP Support:	No			
Downstream Ports:	1			
Signaling Speeds Supported:	☐ Low	☐ Full	☒ High	
Supported Transports:	☒ Control	☒ Bulk	☐ Interrupt	☐ Isochronous
Messaging Interface:	☐ Graphic Screen	☒ Text Screen	☐ Indicator Lights	☐
Max Current Capability:	500 mA			

F.2 Targeted Peripherals Information: Used for Testing

Enter the following information for each supported peripheral.

Vendor Name:	Sandisk		
Product Name:	Cruzer Blade 4GB		
Model:	SDCZ50-004G		
Revision:	0		
Vendor ID:	0x781		
Product ID:	0x5567		
Device Class:	MSC		
SRP Support:	☐ Yes	☒ No	
HNP Support:	☐ Yes	☒ No	
* Maximum Operation Power (mA):	200 mA		
† Maximum USB Signaling Speed:	☐ Low	☐ Full	☒ High

Vendor Name:	Sandisk
Product Name:	Cruzer Blade 8GB
Model:	SDCZ50-008G
Revision:	0
Vendor ID:	0x781
Product ID:	0x5567
Device Class:	MSC

* Obtained from the bMaxPower field of the device's Standard Configuration Descriptor
† Maximum signaling speed when connected to a high-speed host

SRP Support:	☐ Yes	☒ No	
HNP Support:	☐ Yes	☒ No	
‡ Maximum Operation Power (mA):	200 mA		
§ Maximum USB Signaling Speed:	☐ Low	☐ Full	☒ High

Vendor Name:	Sandisk
Product Name:	Cruzer Blade 16GB
Model:	SDCZ50-016G
Revision:	0
Vendor ID:	0x781
Product ID:	0x5567
Device Class:	MSC

SRP Support:	☐ Yes	☒ No	
HNP Support:	☐ Yes	☒ No	
** Maximum Operation Power (mA):	200 mA		
†† Maximum USB Signaling Speed:	☐ Low	☐ Full	☒ High

Vendor Name:	Kingston Technoligy
Product Name:	Data Traveler 4GB
Model:	DTI/4GB
Revision:	0
Vendor ID:	0x951
Product ID:	0x1607
Device Class:	MSC

SRP Support:	☐ Yes	☒ No	
HNP Support:	☐ Yes	☒ No	
‡‡ Maximum Operation Power (mA):	200 mA		
§§ Maximum USB Signaling Speed:	☐ Low	☐ Full	☒ High

Vendor Name:	Kingston Technoligy
Product Name:	Data Traveler 109
Model:	DT109N/8GB
Revision:	0
Vendor ID:	0x930
Product ID:	0x6545
Device Class:	MSC

‡ Obtained from the bMaxPower field of the device's Standard Configuration Descriptor
§ Maximum signaling speed when connected to a high-speed host
** Obtained from the bMaxPower field of the device's Standard Configuration Descriptor
†† Maximum signaling speed when connected to a high-speed host
‡‡ Obtained from the bMaxPower field of the device's Standard Configuration Descriptor
§§ Maximum signaling speed when connected to a high-speed host

SRP Support:	☐ Yes	☒ No	
HNP Support:	☐ Yes	☒ No	
*** Maximum Operation Power (mA):	200 mA		
††† Maximum USB Signaling Speed:	☐ Low	☐ Full	☒ High

Vendor Name:	Transcend		
Product Name:	Jet Flash 300, 4GB		
Model:	TS4GJF30		
Revision:	0		
Vendor ID:	0x8564		
Product ID:	0x1000		
Device Class:	MSC		
SRP Support:	☐ Yes	☒ No	
HNP Support:	☐ Yes	☒ No	
‡‡‡ Maximum Operation Power (mA):	100 mA		
§§§ Maximum USB Signaling Speed:	☐ Low	☐ Full	☒ High

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*** Obtained from the bMaxPower field of the device's Standard Configuration Descriptor
††† Maximum signaling speed when connected to a high-speed host
‡‡‡ Obtained from the bMaxPower field of the device's Standard Configuration Descriptor
§§§ Maximum signaling speed when connected to a high-speed host