



SUBJECT:

Energy Micro AS
EFM32 Giant Gecko Starter Kit

DATE:

30/10/2013



USB 2.0 Full Speed Certification Report

Customer:

Energy Micro AS Corporation
Sandakerveien 118, P.O. Box 4633,
Nydalén, N-0405 Oslo,
Norway

Device:

EFM32 Giant Gecko Starter Kit
TID 10007054

Supplier:

Testronic Labs Belgium nv.
Wetenschapspark 7
B-3590 Diepenbeek



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1. CUSTOMER

Energy Micro AS
Sandakerveien 118, P.O. Box 4633,
Nydalén, N-0405 Oslo,
Norway

2. SUPPLIED HARDWARE AND SOFTWARE

2.1. ASSETS

Description	Manufacturer	Model
Device Under Test	Energy Micro AS	EFM32 Giant Gecko Starter Kit

Comment: The device under test is not supporting Battery Charging 1.2.

2.2. USED MEASUREMENT EQUIPMENT BY TESTRONIC LABS

Description	Manufacturer	Identity	Serial Nr
USB 2.0 Automated Software	Agilent	N5416A	
Digital real-time oscilloscope	Agilent	DSA91304	MY50140172
Probe	Agilent	E2697A	MY43005817
Probe	Agilent	E2697A	MY50091034
Current probe	Tektronix	TCP202	B019512

2.3. TEST TOOLS

Description	Version
USB Electrical Analysis Tool "USBET20"	1.21.02
USB20CV	1.4.10.2
USB30CV	1.1.1.1

2.4. TEST PROCEDURES

Procedure	
Tools(USBET, USBCV)	http://www.usb.org/developers/tools/
Updates	http://compliance.usb.org
Low/Full Speed Test Procedure	http://www.testusb.com/



3. SUMMARY OF THE PERFORMED TESTS

ELECTRICAL LEGACY

Upstream Full Speed Signal Quality	passed
Device Inrush	passed
Bypass capacitor	passed
Device Back Voltage	passed

DEVICE FRAMEWORK USBCV

USB20CV Chapter 9	passed
USB30CV Chapter 9	passed
USBCV PHDC	passed

DEVICE POWER MEASUREMENTS

Power Measurements	passed
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DEVICE GOLDEN TREE

Interoperability	passed
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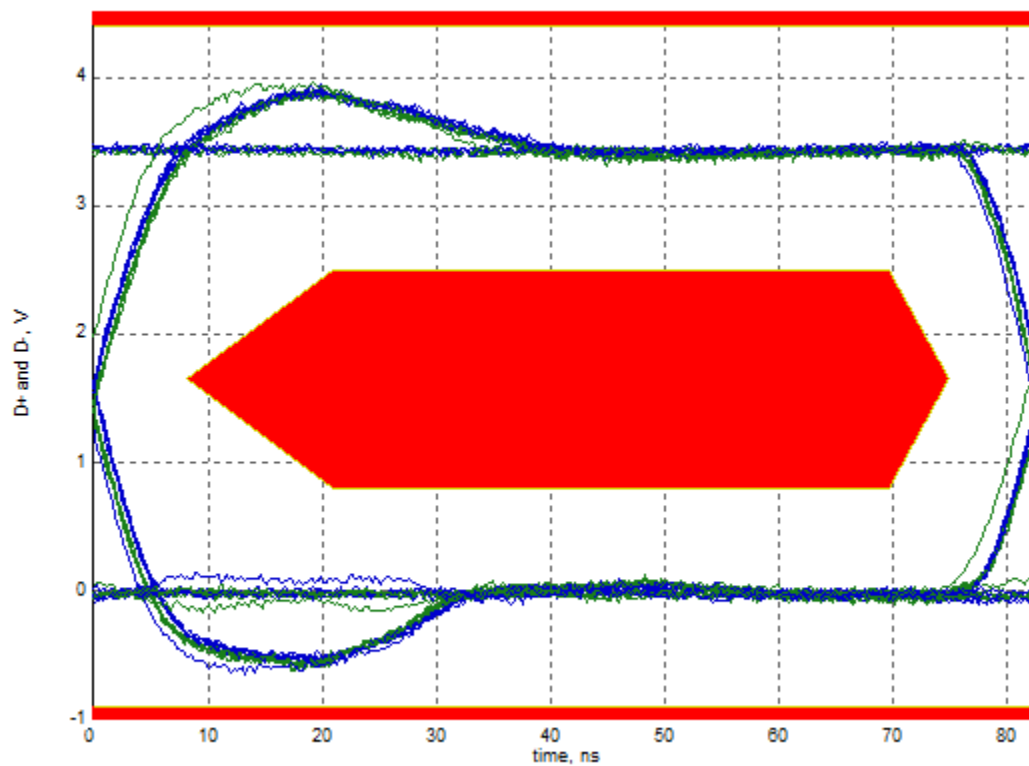


4. RESULTS

4.1. ELECTRICAL LEGACY

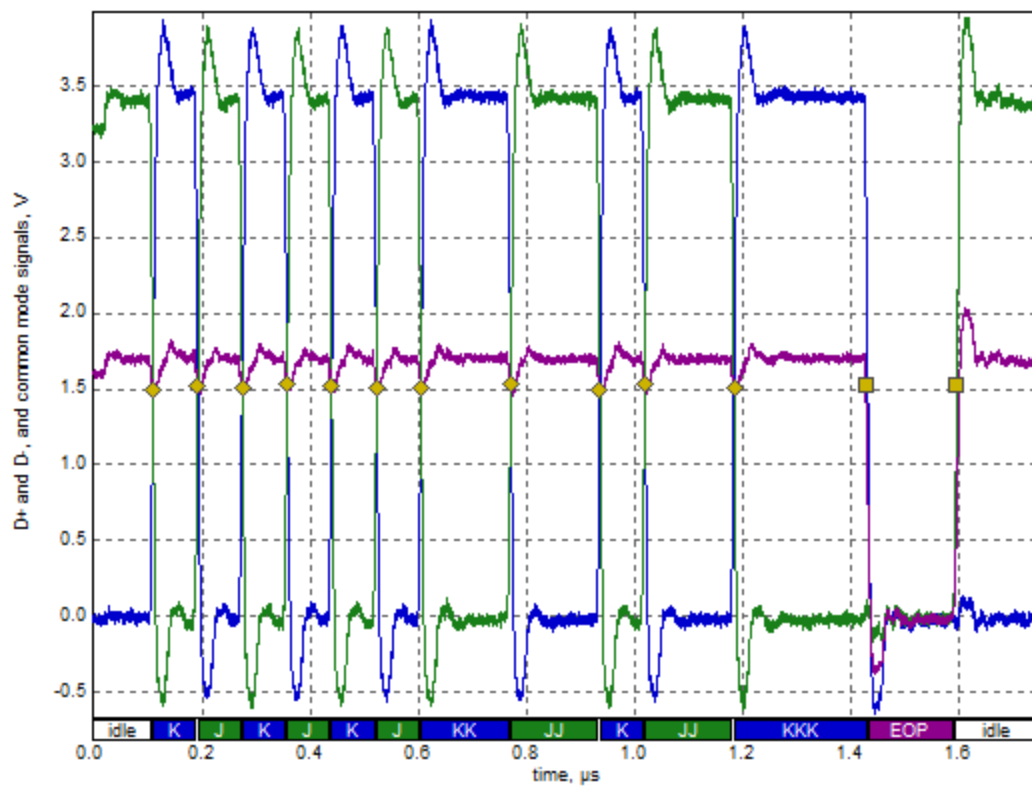
4.1.1. UPSTREAM FULL SPEED SIGNAL QUALITY

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the Full Speed Upstream Signal Quality test.



Signal Eye





Date and Common Mode Voltage



Overall result: pass!

Signal eye:
eye passes

EOP width: 165.90 ns
EOP width passes

Measured signaling rate: 12.0005 MHz
signal rate passes

Edge Monotonicity: 0 mV
Monotonic Edge passes

Crossover voltage range: 1.49 V to 1.54 V, mean crossover 1.51 V
(first crossover at 1.49 V, 10 other differential crossovers checked)
crossover voltages pass

Consecutive jitter range: -291.789 ps to 303.068 ps, RMS jitter 270.087 ps

Paired JK jitter range: -15.003 ps to 15.886 ps, RMS jitter 15.451 ps

Paired KJ jitter range: -48.477 ps to 36.659 ps, RMS jitter 33.346 ps
jitter passes

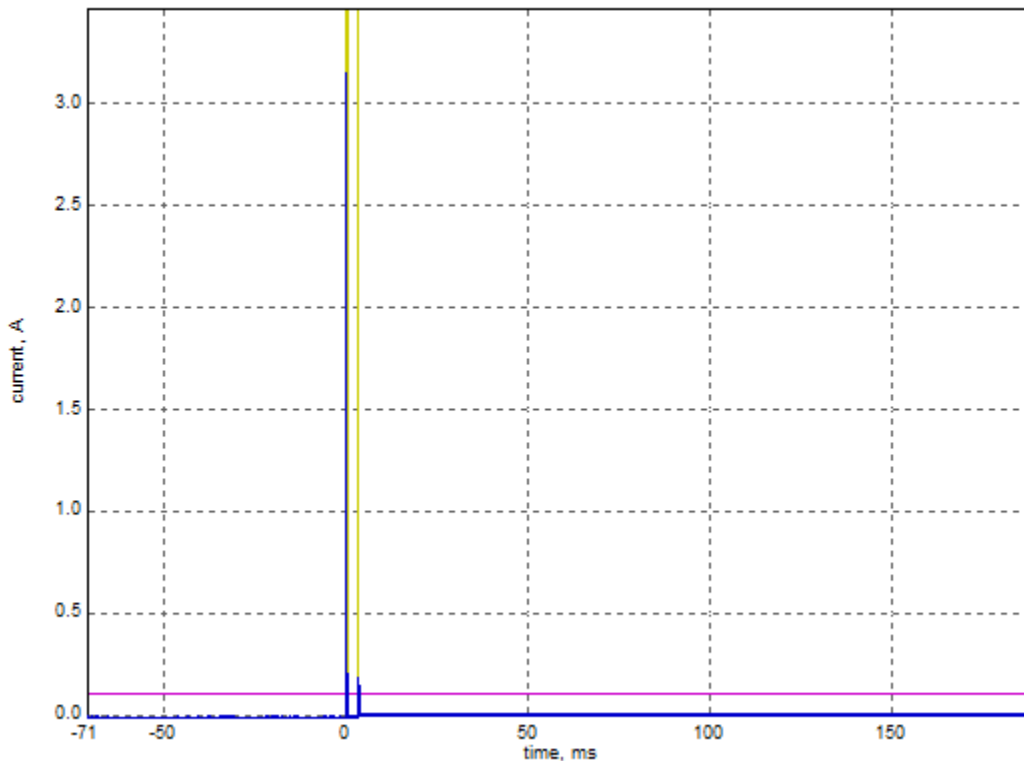
Additional Information

Rising Edge Rate: 317.96 V/us (Equivalent risetime = 8.30 ns)
(minimum 132.00 V/us, maximum 660.00 V/us)
Falling Edge Rate: 356.98 V/us (Equivalent faltime = 7.40 ns)
(minimum 132.00 V/us, maximum 660.00 V/us)
Edge Rate Match: 11.56% (limit +/-10%)



4.1.2. DEVICE INRUSH CURRENT

The measured Inrush current of the Energy Micro AS EFM32 Giant Gecko Starter Kit is 26.81 μC . The USB spec allows up to 10 μF to be hard started, which represents an allowed load of approximately 50 μC . With a measured load of 26.81 μC , the device passed the inrush current test.



Inrush Current

Bypass Capacitance Test

Check that the capacitance is greater than or equal to CRPBmin (1 μF), and less than or equal to CRPB max (10 μF).

- TADP_RISE (1453 us) was in spec (min allowed is 300us).
- TADP_RISE (1453 us) was in spec (max allowed is 2.20ms).

Result = PASS



4.2. DEVICE FRAMEWORK

The following tests were performed using the USB20CV & USB30CV test tool.

4.2.1. USB20CV CHAPTER 9

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the Chapter 9 test of USB20CV.

Description	Full Speed
Vendor ID	2544
Product ID	6
CFG's	1
Interfaces	1
USB Spec.	2.0
Max. Power	100 mA
Result	passed

4.2.2. USB30CV CHAPTER 9

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the USB30CV Chapter 9 test on Intel xHCI.

4.2.3. USBCV PHDC

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the USB20CV & USB30CV PHDC test on Intel xHCI.



4.3. POWER MEASUREMENTS DEVICE MODE

4.3.1. WINDOWS 7 SP1 POWER MEASUREMENT

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the power measurement tests.

Device State	Measurement	Status
Unconfigured State	26.77 mA	passed
Configured State	26.77 mA	passed
Operating State	27.24 mA	passed
Suspended State	530 μ A	passed
Powered State Suspend	529 μ A	passed

4.4. BACK VOLTAGE

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the back voltage tests.

	DC Voltage Before Enumeration	DC Voltage After Enumeration and Removal
Vbus	0 mV	0 mV
D+	0 mV	0 mV
D-	0 mV	0 mV



4.5. GOLD TREE (INTEROPERABILITY)

For more information about the test guides used by Testronic Labs Belgium n.v., please see the procedure that can be found at <http://compliance.usb.org>.

4.5.1. WINDOWS 7 SP1 INTEROPERABILITY

The Energy Micro AS EFM32 Giant Gecko Starter Kit passed the interoperability tests.

Test No.	Test description	Result
1	Enumeration and driver installation test on EHCI	passed
2	Remove External Power Supply	n.a
3	DUT demonstrates correct using default drivers	n.a
4	Update driver	n.a.
5	Install Software	passed
6	Demonstrates functionality with update driver and/or application	passed
7	Interoperability (operates all the devices in Gold Tree)	passed
8	Hot Detach & Reattach	passed
9	Warm boot	passed
10	Inactive S1 Suspend (Remote wake-up test)	n.a.
11	Inactive S1 Resume (Remote wake-up test)	n.a.
12	Active S3 Suspend	passed
13	Active S3 Resume	passed
14	UHCI Root port test	passed
15	Active S4 Suspend(Hibernate)	passed
16	Active S4 Resume(Hibernate)	passed
17	Topology change UHCI	passed
18	Topology change OHCI	passed
19	Topology change XHCI	passed



5. OTHER TESTRONIC LABS SERVICES

Testronic Labs, Your hardware test centre.

Testronic Labs operates as an independent Belgian based test centre for the validation and release of multimedia peripheral equipment and interfaces.

Testronic Labs offers a wide range of testing activities and has become a professional test center for numerous companies all over the world, a test house known for its quality of testing and its dynamic approach.

Thanks to the independence of the test laboratories, Testronic Labs is ideally placed to offer an objective, third party opinion on overall quality of the products in development.

Currently, Testronic Labs experience is located in the following application areas:

Services:

- Alpha Testing
- Beta Testing
- Pre-WHQL Testing
- Compatibility Testing
- Functionality Testing
- Localisation Testing
- Spec Compliance
- Consultancy

Technologies:

- Optical Storage Drives
- Firewire IEEE1394 Certification
- PC, MAC systems and peripherals
- USB
- USB On-The-Go
- Serial-ATA
- Ethernet
- DLNA
- DVB
- PCI-Express
- HDMI, DVI
- Bluetooth
- WIFI
- ...

Tools:

- Ch8ck tool
- Traffic Lab

Please visit our web site at <http://www.testroniclabs.com> for detailed information regarding Testronic Labs testing services.

