



DOC

Declaration Of Conformity

**Product Type**

HDMI to USB Capture

Models

HCP-1080, HCP-1080-A, HCP-1080-B, HCP-1080-C,
HCP-1080-D, HCP-1080-E, HCP-1080-F, HCP-1080-G

Applicant

MultimediaLink Inc.

FCC Designation Number

KR0022

Test Report No.

ETLE180604.0534

Issue Date

June 29, 2018

FCC Rule Part(s)

Part 15 Subpart B

Classification

Class B Personal computers and peripherals

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standard as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2014.

I attest to the accuracy of data and all measurement reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualification of all persons taking them.

Date of issue : 2018. 06. 29

Authorized By : Cho Hyunjoo



MultimediaLink Inc.

812, 19, Ojeongong-eop-gil, Uiwang-si,
Gyeonggi-do, Republic of Korea

Chief Engineer **Hyung Min, Choi**

Date of issue : June 29, 2018



ETL Inc.

114, Gasan digital 2-ro,
Geumcheon-gu, Seoul, 08506, Korea

Electromagnetic Emission

FCC MEASUREMENT REPORT


DECLARATION of CONFORMITY

FCC Part 15 Measurement

PRODUCT : HDMI to USB Capture

MODEL/TYPE NO : HCP-1080 / NONE

MULTIPLE MODEL : HCP-1080-A, HCP-1080-B, HCP-1080-C, HCP-1080-D,
HCP-1080-E, HCP-1080-F, HCP-1080-G

BRAND NAME : 

APPLICANT : MultimediaLink Inc.
812, 19, Ojeongongeoep-gil, Uiwang-si, Gyeonggi-do, Republic of Korea
Attn.: Cho Hyunjoo / CTO

MANUFACTURER : MultimediaLink Inc.
812, 19, Ojeongongeoep-gil, Uiwang-si, Gyeonggi-do, Republic of Korea

FCC CLASSIFICATION : Class B Personal computers and peripherals

RULE PART(S) : FCC Part 15 Subpart B

PROCEDURE : ANSI C63.4-2014

TEST REPORT No. : ETLE180604.0534

DATES OF TEST : June 17, 2018 to June 20, 2018

REPORT ISSUE DATE : June 29, 2018

TEST LABORATORY : ETL Inc. (FCC Designation Number : KR0022)

This HDMI to USB Capture, Model HCP-1080 has been tested in accordance with the measurement procedures specified in ANSI C63.4-2014 at the ETL Test Laboratory and has been shown to be complied with the electromagnetic radiated emission limits specified in FCC Rule Part15 Subpart B:

I attest to the accuracy of data. All measurement herein was performed by me or was made under my supervision and is correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Prepared by: 

Jung Woo, Noh (Test Engineer)

June 29, 2018

Reviewed by: 

Hyung Min, Choi (Chief Engineer)

June 29, 2018

ETL Inc.
114, Gasan digital 2-ro, Geumcheon-gu, Seoul, 08506, Korea
Tel: 82-2-858-0786 Fax: 82-2-858-0788

*The test report merely corresponds to the test sample(s).
This report shall not be reproduced, in whole or in part without the written approval of ETL Inc.*

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FCC MEASUREMENT REPORT

Scope – Measurement and determination of electromagnetic emission(EME) of radio frequency devices including intentional radiators and/or unintentional radiators for compliance with the technical rules and regulations of the U.S Federal Communications Commission(FCC)

General Information

Applicant Name : MultimediaLink Inc.
Address : 812, 19, Ojeongongeop-gil, Uiwang-si,
Gyeonggi-do, Republic of Korea
Attention : Cho Hyunjoo / CTO

- **EUT Type** : HDMI to USB Capture
- **Model Number** : HCP-1080
- **S/N** : NONE
- **FCC Rule Part(s)** : FCC Part 15 Subpart B
- **Test Procedure** : ANSI C63.4-2014
- **FCC Classification** : Class B Personal computers and peripherals
- **Dates of Tests** : June 17, 2018 to June 20, 2018
- **Environmental of Tests** :
Temperature: $(22.7 \pm 0.8) ^\circ\text{C}$
Humidity: $(60 \pm 12) \% \text{ R.H.}$
Atmospheric Pressure: $(100.6 \pm 0.1) \text{ kPa}$
- **Place of Tests** : ETL Inc. Testing Lab. (FCC Designation Number : KR0022)

Radiated Emission test 1;
97-4, Gureomae-gil, Seosin-myeon, Hwaseong-si,
Gyeonggi-do, 18556, Korea

Radiated Emission test 2 and Conducted Emission test;
114, Gasan digital 2-ro, Geumcheon-gu, Seoul, 08506, Korea
- **Test Report No.** : ETLE180604.0534

1. INTRODUCTION

The measurement test for radiated and conducted emission test was conducted at the ETL Inc. The site is constructed in conformance with the requirements of the ANSI C63.4-2014 and CISPR Publication 16. The ETL has site descriptions on file with the FCC for 3 m and 10 m site configurations. Detailed description of test facility was found to be in compliance with FCC Rules according to the ANSI C63.4-2014 and registered to the Federal Communications Commission (FCC Designation Number : KR0022).

The measurement procedure described in American National Standard for Method of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ANSI C63.4-2014) was used in determining radiated and conducted emissions from the MultimediaLink Inc. Model: HCP-1080



2. PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is HDMI to USB Capture (model: HCP-1080).

The model HCP-1080 is basic model that tested.

The multiple models HCP-1080-A, HCP-1080-B, HCP-1080-C, HCP-1080-D, HCP-1080-E, HCP-1080-F and HCP-1080-G are identical to basic model, except for model designation.

2.2 General Specification

Item	Specification
Input/Output Connector	HDMI Connector: STANDARD TYPE
	USB3.0 Connector: Type-A
Key	Reset Button
LEDs	POWER(Green), STATUS(Blue)
Interface	USB3.0 (Max. 5 Gbit/s)
	USB2.0 (Max. 480 Mbit/s)
	HDMI 1.4 (Video: 1080p/60 Hz, Audio: Support)
HDCP Copy Protection	HCP-1080 will not decrypt BD/DVD movies, satellite/cable receivers or other encrypted sources.
OS Support	Windows 7, 8, 10 / Mac OS X / Linux
Power Consumption	Max 2.5 W (5 V DC / 0.5 A @1080p)
Operating Temperature	(20 ± 20) °C
Operating Humidity	(40 ± 40) % R.H.
Storage Temperature	(20 ± 40) °C
Storage Humidity	(45 ± 45) % R.H.
Dimension	112.0 mm (W) x 41.0 mm (D) x 19.6 mm (H)
Accessories	USB 3.0 Cable: Type A to Type A (16 cm)
High Internal Frequency	HDMI Clock → 148 MHz

3. DESCRIPTION OF TESTS

3.1 Conducted Emission Measurement

Conducted emissions measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2014. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω /50 μ H LISN as the input transducer to a Spectrum Analyzer or a Test Receiver. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 9 kHz or for "quasi-peak" within a bandwidth of 9 kHz.

The line-conducted emission test is conducted inside a shielded anechoic chamber room with 1 m x 1.5 m x 0.8 m wooden table which is placed 40 cm away from the vertical wall and 1.5 m away from the side wall of the chamber room. Two LISN are bonded to the shielded room. The EUT is powered from the LISN and the support equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and these supply lines will be connected to the LISN. Non-inductive bundling to a 1 m length shortened all interconnecting cables more than 1 m. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the EMI Test Receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using to set Quasi-Peak mode by manual, after scanned by automatic Peak mode from 0.15 MHz to 30 MHz. The bandwidth of the spectrum analyzer was set to 9 kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission.

Photographs of the worst-case emission can be seen in photographs of conducted emission test setup in Appendix B.

3.2 Radiated Emission Measurement

Radiated emission measurements were made in accordance with section 11, "Measurement of Information Technology Equipment" of ANSI C63.4-2014. The measurements were performed over the frequency range of 30 MHz to 40 GHz (or 5th harmonic of the highest frequency) in using antenna as the input transducer to a spectrum analyzer or a field intensity meter. The measurements below 1 GHz were made with the detector set for "Quasi-peak" within a bandwidth of 120 kHz. The measurements above 1 GHz were made with the detector set for "Peak and Average" within a bandwidth of 1 MHz.

Preliminary measurements were made at 3 m using broadband antennas, and spectrum analyzer to determined the frequency producing the maximum emission in shielded room. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turntable azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30 MHz to 1 000 MHz using Log-Bicon antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used. Final measurements were made open site or SVSWR chamber at 3 m. The test equipment was placed on a styrofoam table. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8 m high nonmetallic 1 m x 1.5 m table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 m to 4 m and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or support equipment and changing the polarity of the antenna, whichever determined the worst-case emission.

Photographs of the worst-case emission can be seen in Photographs of the worst-case emission test setup can be seen in Appendix B.

4. TEST CONDITION

4.1 Test Configuration

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the EUT and the supported equipments were installed to meet FCC requirement and operated in a manner and which tends to maximize its emission level in a typical application.

4.2 EUT operation

The equipment under test was operated during the measurement under following conditions:

- The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on notebook computer monitor. (BurnIn Test program) - Capture mode and Recording mode

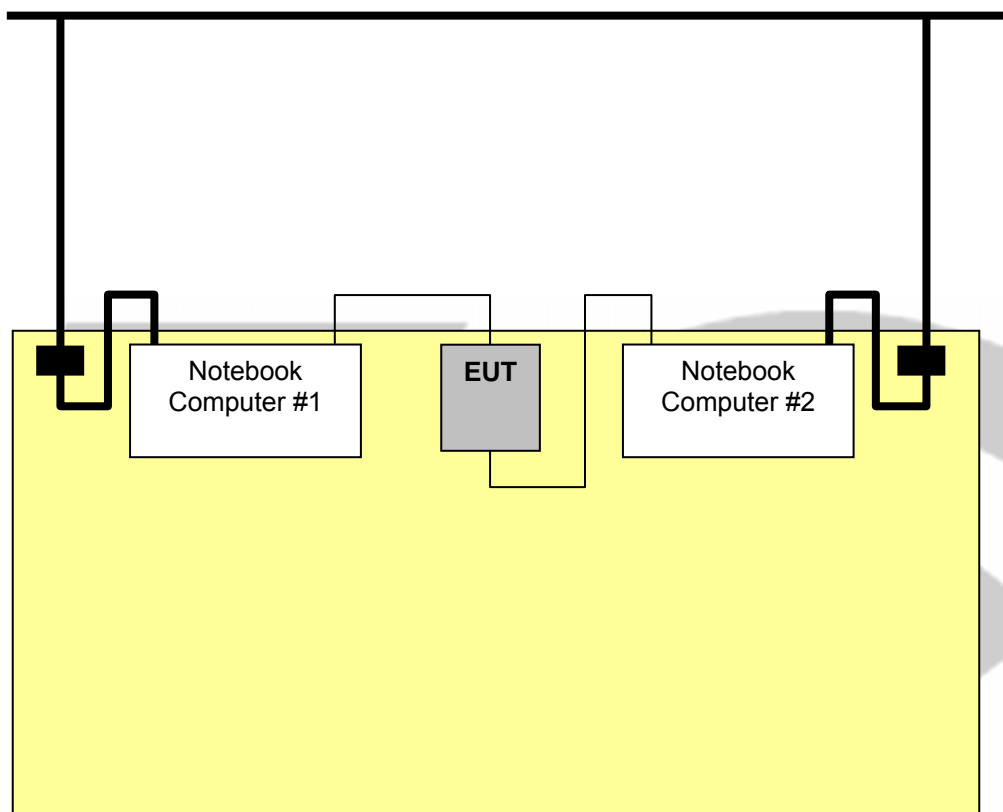
4.3 Support Equipment Used

Description	Model Name	Serial No.	Manufacturer
Notebook Computer #1	NT500R5W	0ULT91IJB00525E	Samsung Electronics Co., Ltd.
Adapter #1 (for Notebook Computer #1)	PA-1400-96	CN60BA4400313A D2VHJAPE553	Liteon Technology Corporation
Notebook Computer #2	LGS53	303QCSF568270	LG Electronics Co., Ltd.
Adapter #2 (for Notebook Computer #2)	PA-1900-14	L9130B10000916	Lite On Technology (Changzhou) Co., Ltd.

4.4 Type of Cables Used

Device from	Device to	Type of Cable(Port)	Length[m]	Type of shield
EUT	Notebook Computer #1	HDMI	1.50	Shielded
EUT	Notebook Computer #2	USB 3.0	0.16	Shielded
Notebook Computer #1	Adapter #1	DC Input	1.20	Shielded
Notebook Computer #2	Adapter #2	DC Input	1.20	Shielded

4.5 The setup drawing(s)



— : Data Line
— : Power Line
■ : Adapter

5. TEST RESULTS

5.1 Summary of Test Results

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum emission of the EUT are reported.

FCC Rule	Measurement Required	Result
15.107(a),(d)	Conducted Emission Measurement	Passed by 6.37 dB *
15.109(a)	Radiated Emission Measurement (Below 1 GHz)	Passed by 6.06 dB
15.109(a)	Radiated Emission Measurement (Above 1 GHz)	Passed by 10.77 dB

* This test was tested at main host computer. (EUT was connected USB port of the host computer.)

The data collected shows that the **MultimediaLink Inc. / HDMI to USB Capture / HCP-1080** complies with technical requirements of above rules part 15.107(a),(d) and 15.109(a) Class B Limits.

The equipment is not modified anything, mechanical or circuits to improve EMI status during a measurement. No EMI suppression device(s) was added and/or modified during testing.

5.2 Conducted Emissions Measurement

EUT	HDMI to USB Capture / HCP-1080 (S/N: N/A)
Limit apply to	FCC Part 15.107(a),(d) Class B
Test Date	June 20, 2018
Environmental of test	(22.8 ± 0.1) °C, (48 ± 0) % R.H., (100.5 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on notebook computer monitor. (BurnIn Test program) - Capture mode and Recording mode
Result	Passed by 6.37 dB

Conducted Emission Test Data

The following data and graph shows the highest levels of conducted emissions on both polarizations of hot and neutral line.

Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 9 kHz)

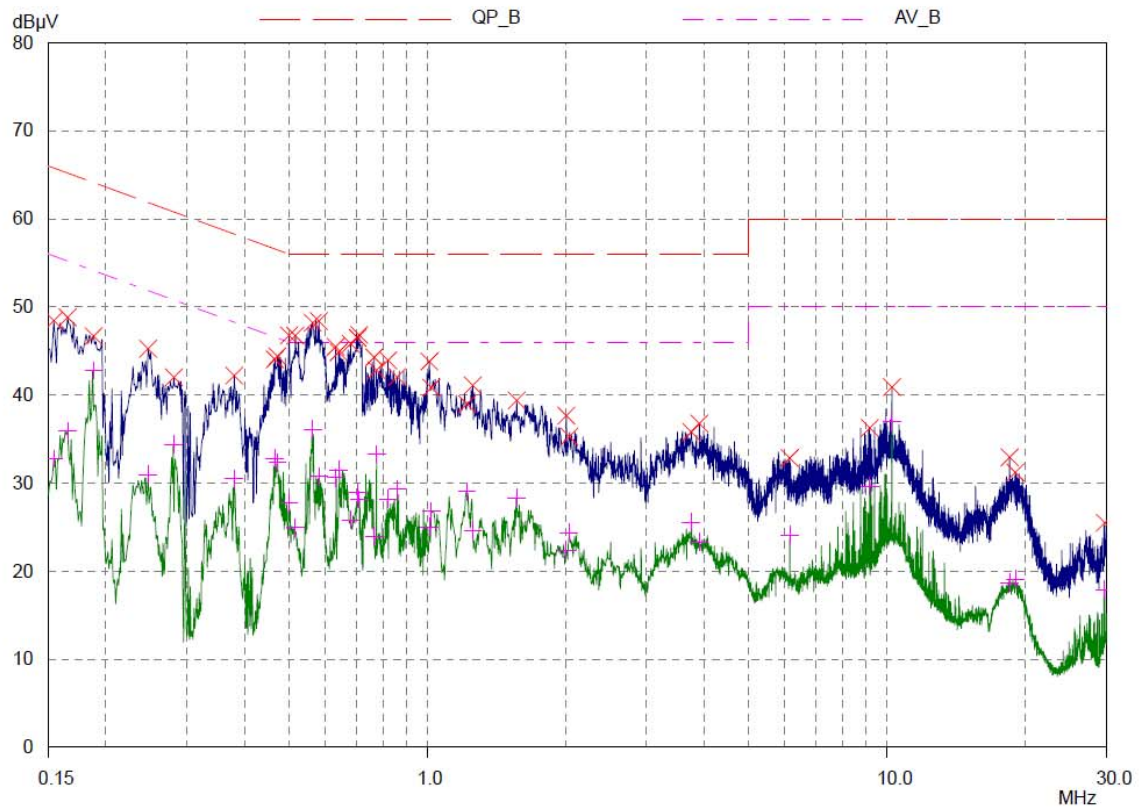
NOTES:

1. Please see the measured data and graph in next page.
2. The Level (Result) value was included the reading, LISN factor and cable loss.
3. Delta (Margin) value = Limit - Level (Result)
4. Measurement were performed at the AC Power Inlet in the frequency band of 150 kHz ~ 30 MHz according to the FCC Part 15.107(a),(d) Class B.
5. If the Quasi-Peak limit is met when using a Peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the Quasi-Peak detector receiver is unnecessary.
6. If the average limit is met when using a Quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

Line: HOT

ETL EMC Laboratory
Conducted Emission Test Result
EUT: ETLE180604.0534
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: HOT

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Peaks:	16
	Acc Margin:	10 dB



ETL EMC Laboratory

Conducted Emission Test Result

EUT: ETLE180604.0534

Manuf:

Op Cond:

Operator:

Test Spec:

Comment: HOT

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Peaks:	16
	Acc Margin:	10 dB

Peak Search Results

Frequency MHz	PK Level dBμV	PK Limit dBμV	PK Delta dB
0.154	48.45	65.78	17.33
0.165	48.81	65.21	16.40
0.188	46.68	64.12	17.44
0.247	45.25	61.86	16.61
0.281	42.01	60.79	18.78
0.38	42.21	58.28	16.07
0.466	44.04	56.58	12.54
0.472	44.41	56.48	12.07
0.5	46.77	56.00	9.23
0.516	46.74	56.00	9.26
0.563	48.19	56.00	7.81
0.581	48.41	56.00	7.59
0.632	45.46	56.00	10.54
0.641	44.86	56.00	11.14
0.681	45.82	56.00	10.18
0.705	46.48	56.00	9.52
0.711	46.83	56.00	9.17
0.766	44.27	56.00	11.73
0.775	42.82	56.00	13.18
0.821	43.93	56.00	12.07
0.86	42.05	56.00	13.95
1.01	43.80	56.00	12.20
1.02	40.83	56.00	15.17
1.22	38.98	56.00	17.02
1.255	41.09	56.00	14.91
1.565	39.38	56.00	16.62
2.005	37.66	56.00	18.34
2.035	35.30	56.00	20.70
3.75	35.79	56.00	20.21
3.905	36.76	56.00	19.24
6.14	32.84	60.00	27.16
9.165	36.26	60.00	23.74
10.24	40.89	60.00	19.11

* limit exceeded

Peak Search Results (continued)

Frequency MHz	PK Level dBμV	PK Limit dBμV	PK Delta dB
18.47	32.91	60.00	27.09
19.01	31.22	60.00	28.78
29.75	25.48	60.00	34.52

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB
0.154	32.76	55.78	23.02
0.165	35.89	55.21	19.32
0.188	42.78	54.12	11.34
0.247	30.96	51.86	20.90
0.281	34.36	50.79	16.43
0.38	30.49	48.28	17.79
0.466	32.83	46.58	13.75
0.472	32.35	46.48	14.13
0.5	27.73	46.00	18.27
0.516	24.93	46.00	21.07
0.563	36.11	46.00	9.89
0.581	30.76	46.00	15.24
0.632	30.62	46.00	15.38
0.641	31.49	46.00	14.51
0.681	25.82	46.00	20.18
0.705	28.88	46.00	17.12
0.711	28.15	46.00	17.85
0.766	23.95	46.00	22.05
0.775	33.29	46.00	12.71
0.821	28.18	46.00	17.82
0.86	29.34	46.00	16.66
1.01	25.01	46.00	20.99
1.02	26.78	46.00	19.22
1.22	29.06	46.00	16.94
1.255	24.60	46.00	21.40
1.565	28.33	46.00	17.67
2.005	22.40	46.00	23.60
2.035	24.37	46.00	21.63
3.75	25.54	46.00	20.46
3.905	23.33	46.00	22.67
6.14	24.08	50.00	25.92
9.165	29.64	50.00	20.36
10.24	36.94	50.00	13.06
18.47	18.66	50.00	31.34
19.01	19.10	50.00	30.90
29.75	17.90	50.00	32.10

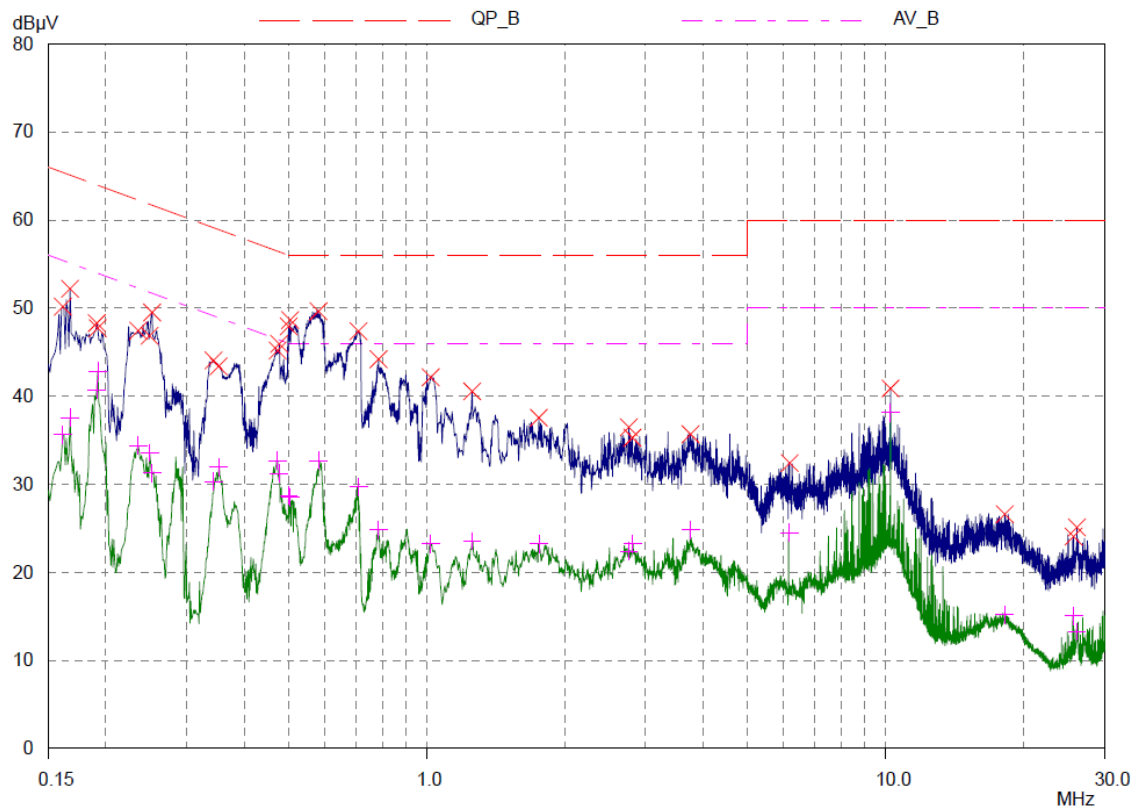
* limit exceeded

Line: Neutral

ETL EMC Laboratory
Conducted Emission Test Result

EUT: ETLE180604.0534
Manuf:
Op Cond:
Operator:
Test Spec:
Comment: N

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Peaks:	16
	Acc Margin:	10 dB



ETL EMC Laboratory

Conducted Emission Test Result

EUT: ETLE180604.0534

Manuf:

Op Cond:

Operator:

Test Spec:

Comment: N

Prescan Measurement:	Detectors:	X PK / + AV
	Meas Time:	see scan settings
	Peaks:	16
	Acc Margin:	10 dB

Peak Search Results

Frequency MHz	PK Level dBμV	PK Limit dBμV	PK Delta dB
0.161	50.16	65.41	15.25
0.167	52.18	65.11	12.93
0.191	48.29	63.99	15.70
0.192	47.73	63.95	16.22
0.235	47.43	62.27	14.84
0.249	46.85	61.79	14.94
0.252	49.50	61.69	12.19
0.343	44.05	59.13	15.08
0.352	43.39	58.92	15.53
0.473	45.19	56.46	11.27
0.477	45.94	56.39	10.45
0.5	47.91	56.00	8.09
0.504	48.64	56.00	7.36
0.581	49.63	56.00	6.37
0.71	47.37	56.00	8.63
0.785	44.20	56.00	11.80
1.02	42.14	56.00	13.86
1.255	40.53	56.00	15.47
1.755	37.54	56.00	18.46
2.755	36.49	56.00	19.51
2.805	35.30	56.00	20.70
3.755	35.68	56.00	20.32
6.175	32.40	60.00	27.60
10.24	40.87	60.00	19.13
18.17	26.60	60.00	33.40
25.66	24.05	60.00	35.95
26.1	25.09	60.00	34.91

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB
0.161	35.65	55.41	19.76

* limit exceeded

Peak Search Results (continued)

Frequency MHz	AV Level dBμV	AV Limit dBμV	AV Delta dB
0.167	37.54	55.11	17.57
0.191	40.72	53.99	13.27
0.192	42.84	53.95	11.11
0.235	34.39	52.27	17.88
0.249	33.55	51.79	18.24
0.252	31.29	51.69	20.40
0.343	30.32	49.13	18.81
0.352	31.95	48.92	16.97
0.473	32.65	46.46	13.81
0.477	31.20	46.39	15.19
0.5	28.73	46.00	17.27
0.504	28.48	46.00	17.52
0.581	32.67	46.00	13.33
0.71	29.73	46.00	16.27
0.785	24.84	46.00	21.16
1.02	23.22	46.00	22.78
1.255	23.54	46.00	22.46
1.755	23.25	46.00	22.75
2.755	22.41	46.00	23.59
2.805	23.25	46.00	22.75
3.755	24.78	46.00	21.22
6.175	24.50	50.00	25.50
10.24	38.13	50.00	11.87
18.17	15.16	50.00	34.84
25.66	15.06	50.00	34.94
26.1	13.24	50.00	36.76

* limit exceeded

5.3 Radiated Emissions Measurement

- Below 1 GHz

EUT	HDMI to USB Capture / HCP-1080 (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 17, 2018
Environmental of test	(22.2 ± 0.3) °C, (69 ± 1) % R.H., (100.7 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on notebook computer monitor. (BurnIn Test program) - Capture mode and Recording mode
Result	Passed by 6.06 dB

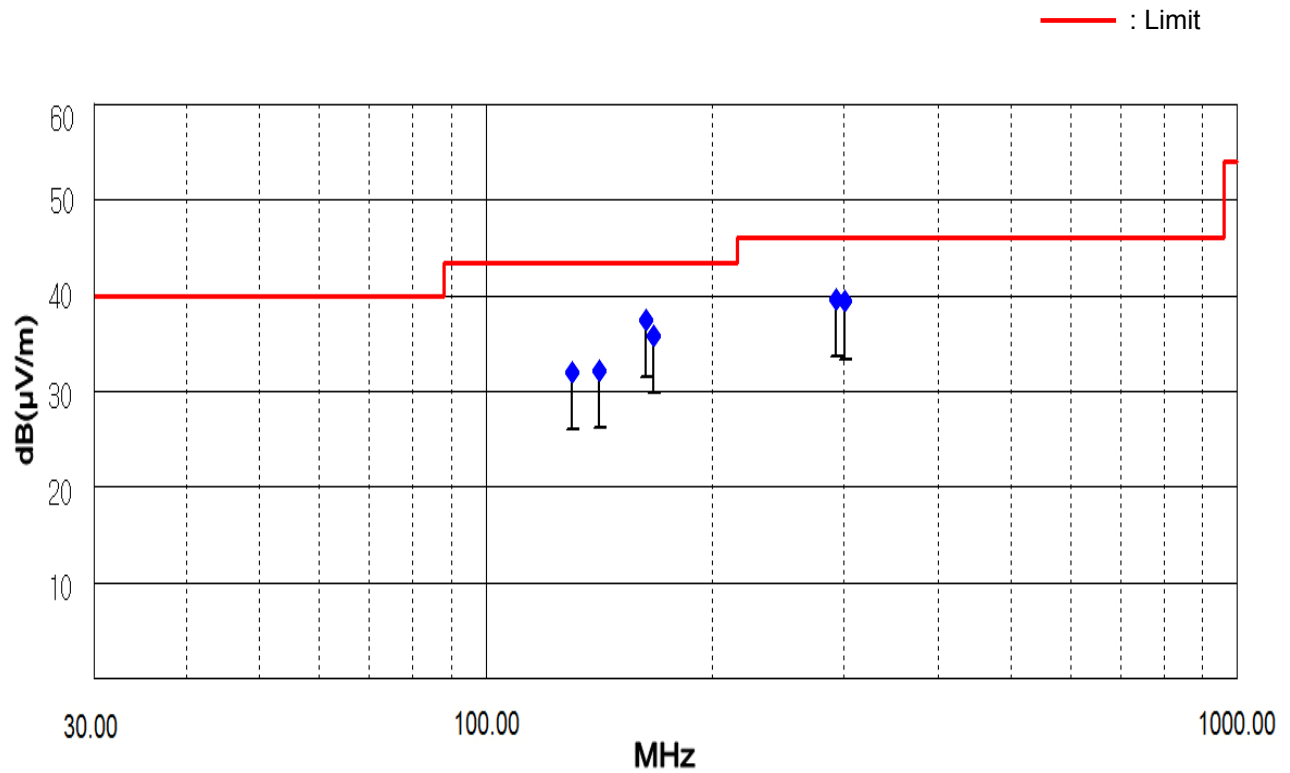
Radiated Emission Test Data

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.
Detector mode: CISPR Quasi-Peak mode (6 dB Bandwidth: 120 kHz)

Frequency [MHz]	Reading [dB(μV)]	Polarization (*H/**V)	Ant. Factor [dB/m]	Cable Loss [dB(μV)]	Height [cm]	Result [dB(μV/m)]	Limit [dB(μV/m)]	Margin [dB]
130.26	55.50	V	8.46	-32.01	100	31.95	43.50	11.55
141.45	56.39	V	7.73	-31.91	100	32.21	43.50	11.29
163.47	60.74	V	8.46	-31.76	105	37.44	43.50	6.06
167.23	58.96	V	8.62	-31.79	105	35.79	43.50	7.71
292.68	57.72	H	13.58	-31.70	110	39.60	46.00	6.40
300.09	57.37	H	13.69	-31.68	105	39.38	46.00	6.62

NOTES:

- * H : Horizontal polarization , ** V : Vertical polarization
- The cable loss value was included the Amp. Gain.
- Result = Reading + Antenna factor + Cable loss
- Margin value = Limit - Result
- The measurement was performed for the frequency range 30 MHz ~ 1 000 MHz according to FCC Part 15.109(a) Class B.



FCC TEST REPORT

- Above 1 GHz

EUT	HDMI to USB Capture / HCP-1080 (S/N: N/A)
Limit apply to	FCC Part 15.109(a) Class B
Test Date	June 17, 2018
Environmental of test	(22.9 ± 0.5) °C, (70 ± 2) % R.H., (100.7 ± 0.0) kPa
Operating Condition	The EUT was connected as user's guide. And during the executed test program for EMI program with "H" pattern display on notebook computer monitor. (BurnIn Test program) - Capture mode and Recording mode
Result	Passed by 10.77 dB

Radiated Emission Test Data

The following data and graph shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

Detector mode: CISPR Peak mode, Average mode

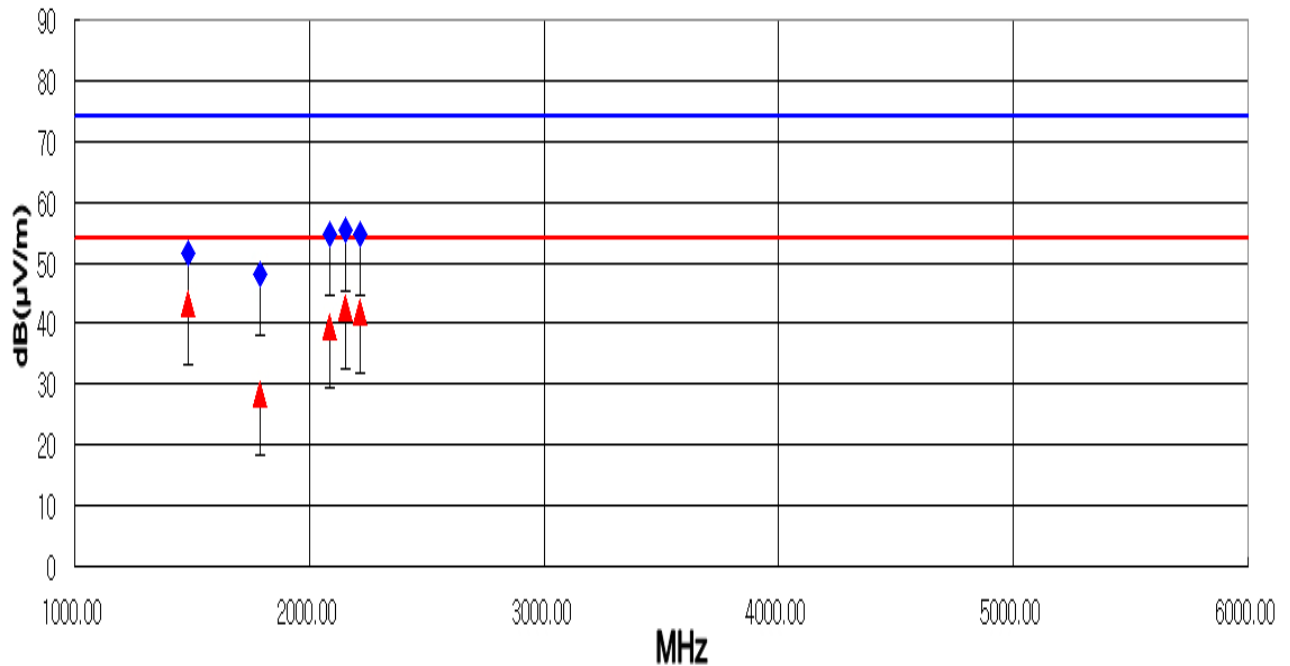
Frequency [MHz]	Reading [dB(μV)]		Polarity (*H/**V)	Height [cm]	Ant. Factor [dB/m]	Cable Loss [dB]	Result [dB(μV/m)]		Limit [dB(μV/m)]		Margin [dB]	
	Peak	Average					Peak	Average	Peak	Average	Peak	Average
1 185.79	59.61	40.34	V	100	25.28	-39.96	44.93	25.66	74.00	54.00	29.07	28.34
1 484.67	65.30	56.85	H	110	25.92	-39.54	51.68	43.23	74.00	54.00	22.32	10.77
1 585.28	70.38	44.29	V	100	26.00	-39.39	56.99	30.90	74.00	54.00	17.01	23.10
1 788.05	61.02	41.36	H	100	26.13	-39.08	48.07	28.41	74.00	54.00	25.93	25.59
2 086.53	67.00	51.52	H	110	26.42	-38.61	54.81	39.33	74.00	54.00	19.19	14.67
2 154.76	67.24	54.52	H	110	26.54	-38.49	55.29	42.57	74.00	54.00	18.71	11.43
2 216.38	66.50	53.47	H	120	26.66	-38.39	54.77	41.74	74.00	54.00	19.23	12.26
3 188.22	60.53	39.02	V	110	28.79	-36.57	52.75	31.24	74.00	54.00	21.25	22.76
4 987.31	57.44	35.29	V	120	31.68	-34.58	54.54	32.39	74.00	54.00	19.46	21.61

NOTES:

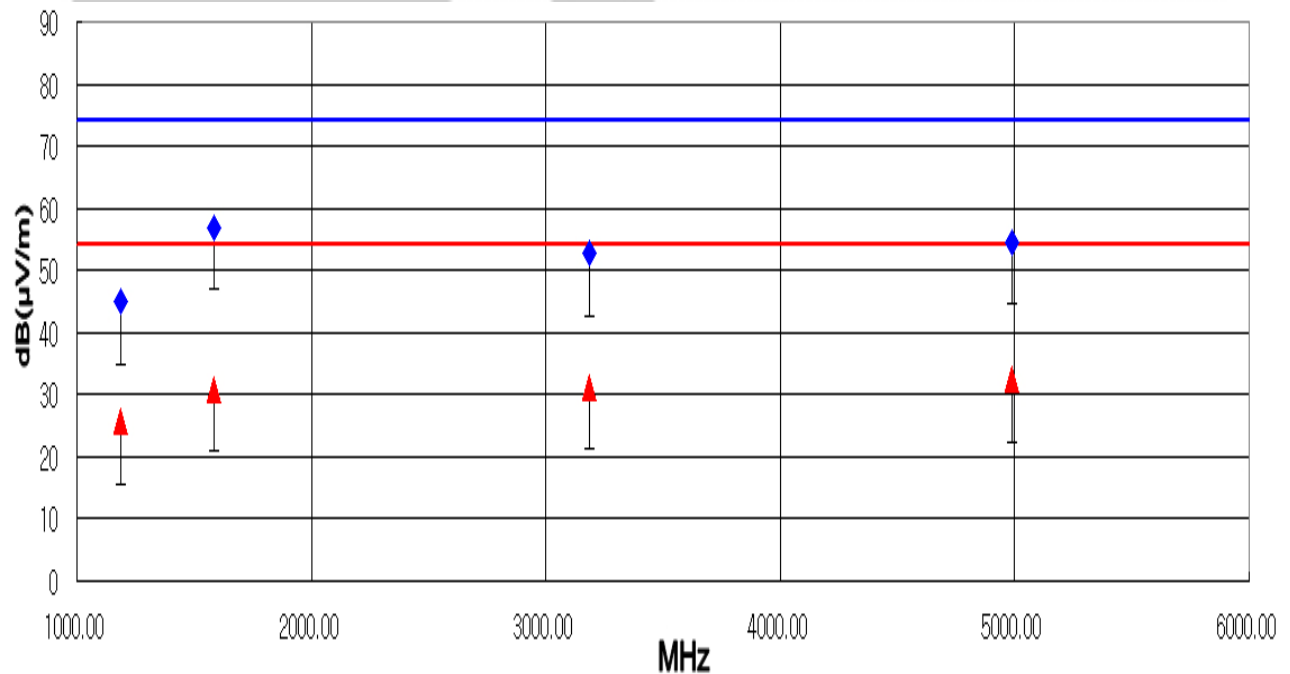
1. * H : Horizontal polarization , ** V : Vertical polarization
2. The cable loss value was included the Amp. Gain.
3. Result = Reading + Antenna factor + Cable loss
4. Margin value = Limit - Result
5. The measurement was performed for the frequency range 1 GHz ~ 6 GHz according to FCC Part 15.109(a) Class B.
6. Upper frequency of measurement range: 5th harmonic of the highest frequency.

Polarization: Horizontal

Limit : — Peak
— Average



Polarization: Vertical



Peak — Average

6. SAMPLE CALCULATION

Sample Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor - Preamplifier Factor

$$dB(\mu V) = 20 \log_{10} (\mu V) : \text{Equation}$$

$$dB(\mu V) = dBm + 107$$

Example : @ 163.47 MHz

$$\text{Class B Limit} = 43.50 \text{ dB}(\mu V/m)$$

$$\text{Reading} = 60.74 \text{ dB}(\mu V)$$

$$\text{Antenna Factor} + (\text{Cable Loss} - \text{Amp. Gain}) = 8.46 + (-31.76) = -23.30 \text{ dB}(\mu V/m)$$

$$\text{Total} = 37.44 \text{ dB}(\mu V/m)$$

$$\text{Margin} = 43.50 - 37.44 = 6.06 \text{ dB}$$

$$= 6.06 \text{ dB below Limit}$$

7. List of test equipments used for measurements

	Test Equipment	Model	Mfg.	Serial No.	Cal. Date	Cal. Due Date
<input checked="" type="checkbox"/>	EMI Test Receiver	ESPI3	R&S	100478	17.08.31	18.08.31
<input checked="" type="checkbox"/>	EMI Test Receiver	ESCS30	R&S	100087	18.03.12	19.03.12
<input checked="" type="checkbox"/>	EMI Test Receiver	ESCI7	R&S	100851	17.08.31	18.08.31
<input checked="" type="checkbox"/>	Two-Line V-Network	ENV216	R&S	102055	18.03.12	19.03.12
<input checked="" type="checkbox"/>	Two-Line V-Network	ENV216	R&S	101715	18.03.12	19.03.12
<input checked="" type="checkbox"/>	Amplifier	BLWA 0310-1	BONN Elektronik	045672	18.01.31	19.01.31
<input checked="" type="checkbox"/>	Horn Antenna	BBHA 9120D	Schwarzbeck	826	18.03.29	20.03.29
<input checked="" type="checkbox"/>	Amplifier	TK-PA18	TESTEK.	120020	17.09.01	18.09.01
<input checked="" type="checkbox"/>	Bi-Log Antenna	VULB9163	Schwarzbeck	01069	17.02.17	19.02.17
<input checked="" type="checkbox"/>	Turn-Table	TT 1.35 SI	SES	-	N/A	N/A
<input checked="" type="checkbox"/>	Antenna Master	AM 4.5	SES	-	N/A	N/A

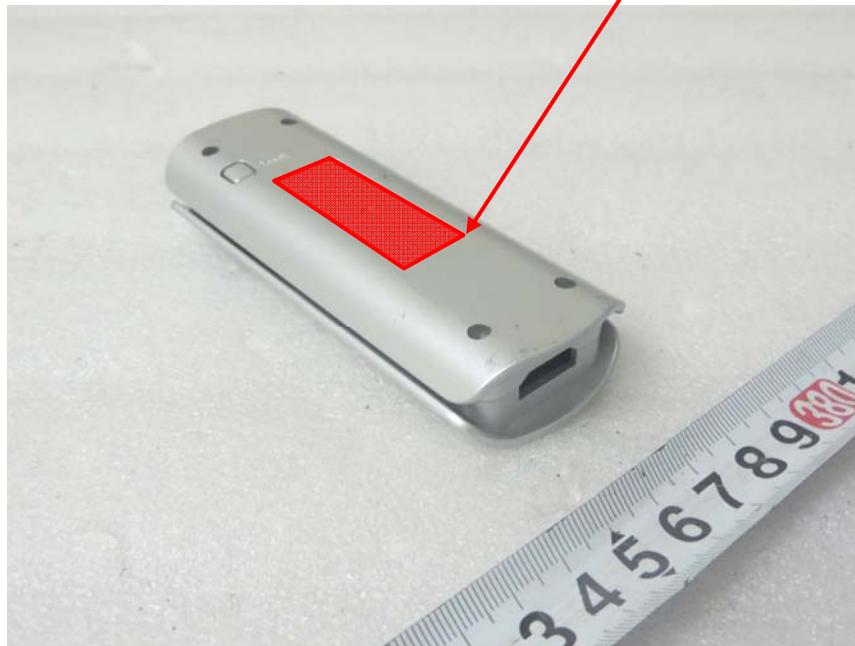
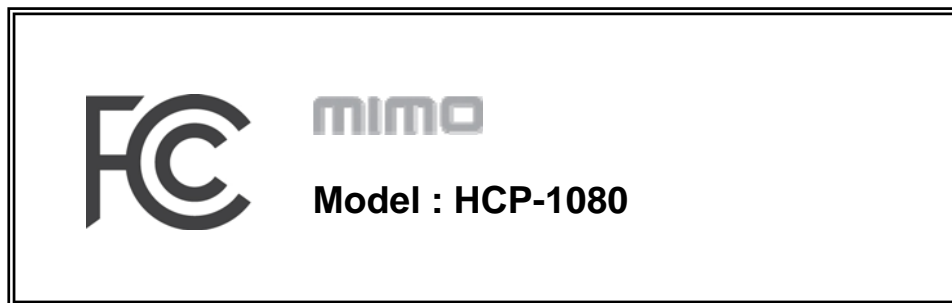
Appendix A. FCC Label and Location

Product Label Sample with FCC Label information

Following is a sample copy of the label that will be placed on the rear cabinet of the product.
The FCC Label and compliance statement are marked in the product label.
The warning statement and Information to the user are described in the user's manual.

Label Location

The label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time purchase.(Labeling requirements per 2.925)



Appendix B. Test Setup Photographs

Conducted Emission Test Setup



Appendix B. Test Setup Photographs

Radiated Emission Test Setup (Below 1 GHz)



Appendix B. Test Setup Photographs

Radiated Emission Test Setup (Above 1 GHz)



Appendix C. External Photographs

Front view of EUT



Rear view of EUT



Appendix C. External Photographs

View of USB port



View of HDMI port



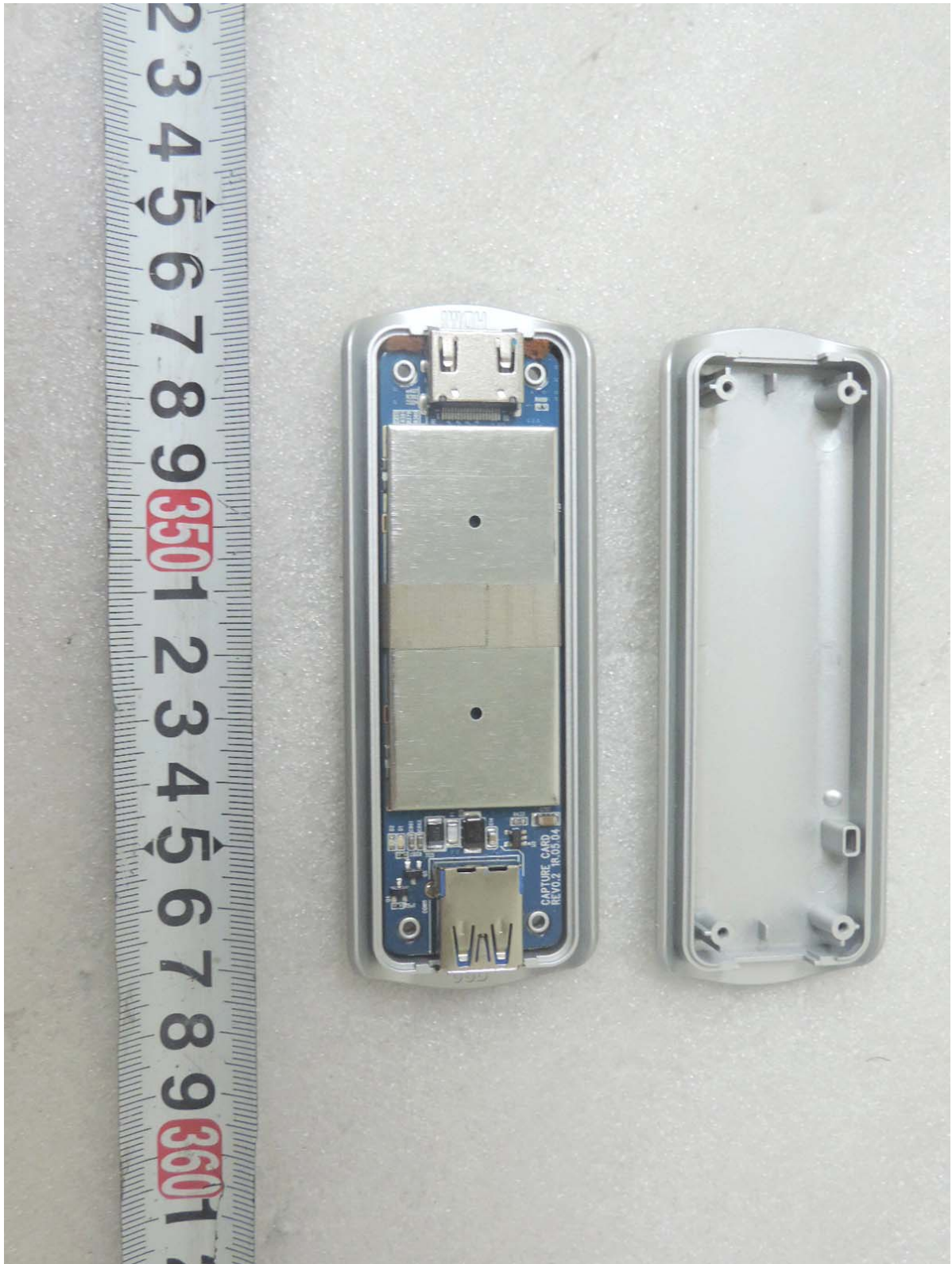
View of reset button



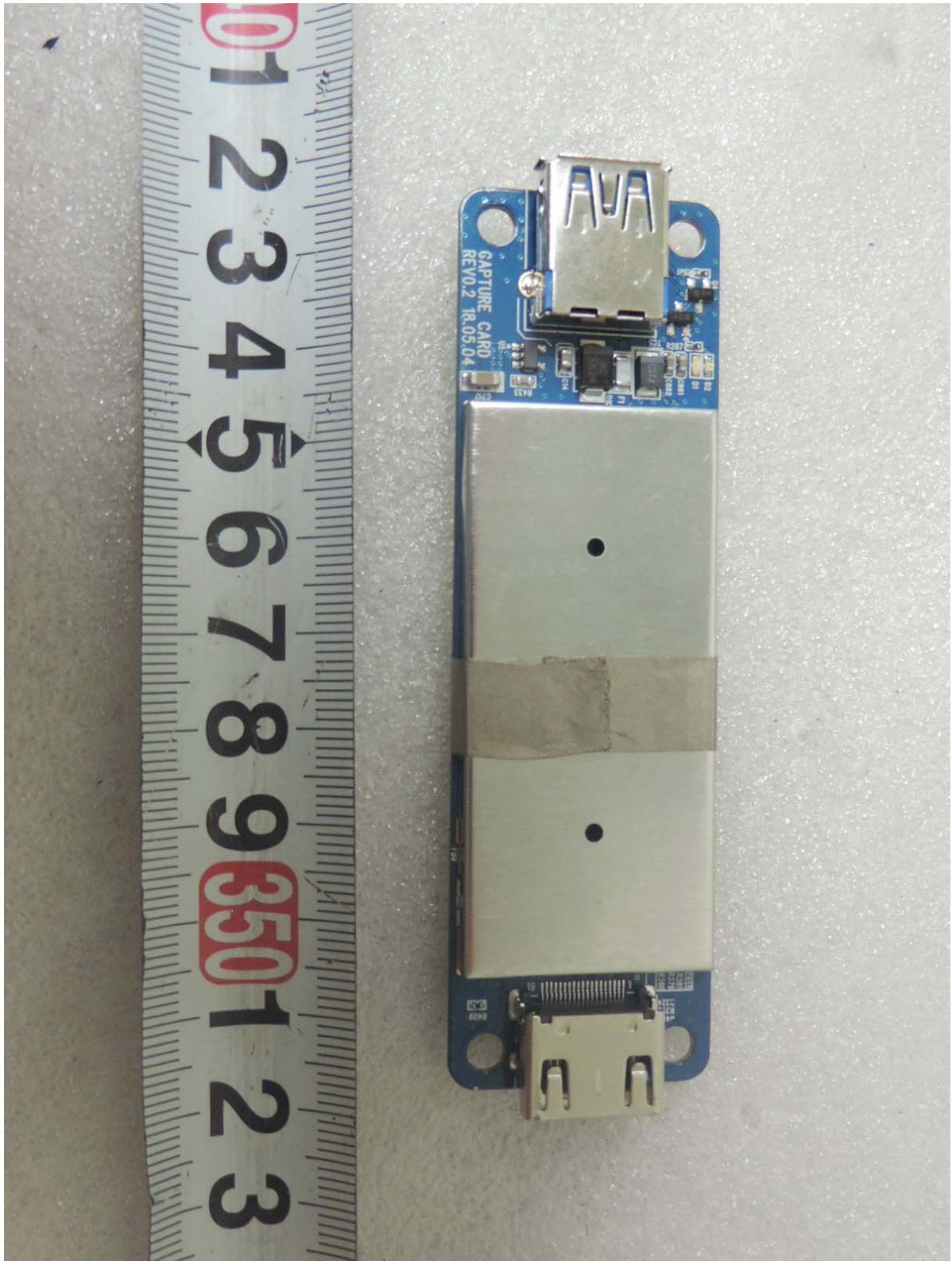
View of USB cable



Inside view of EUT

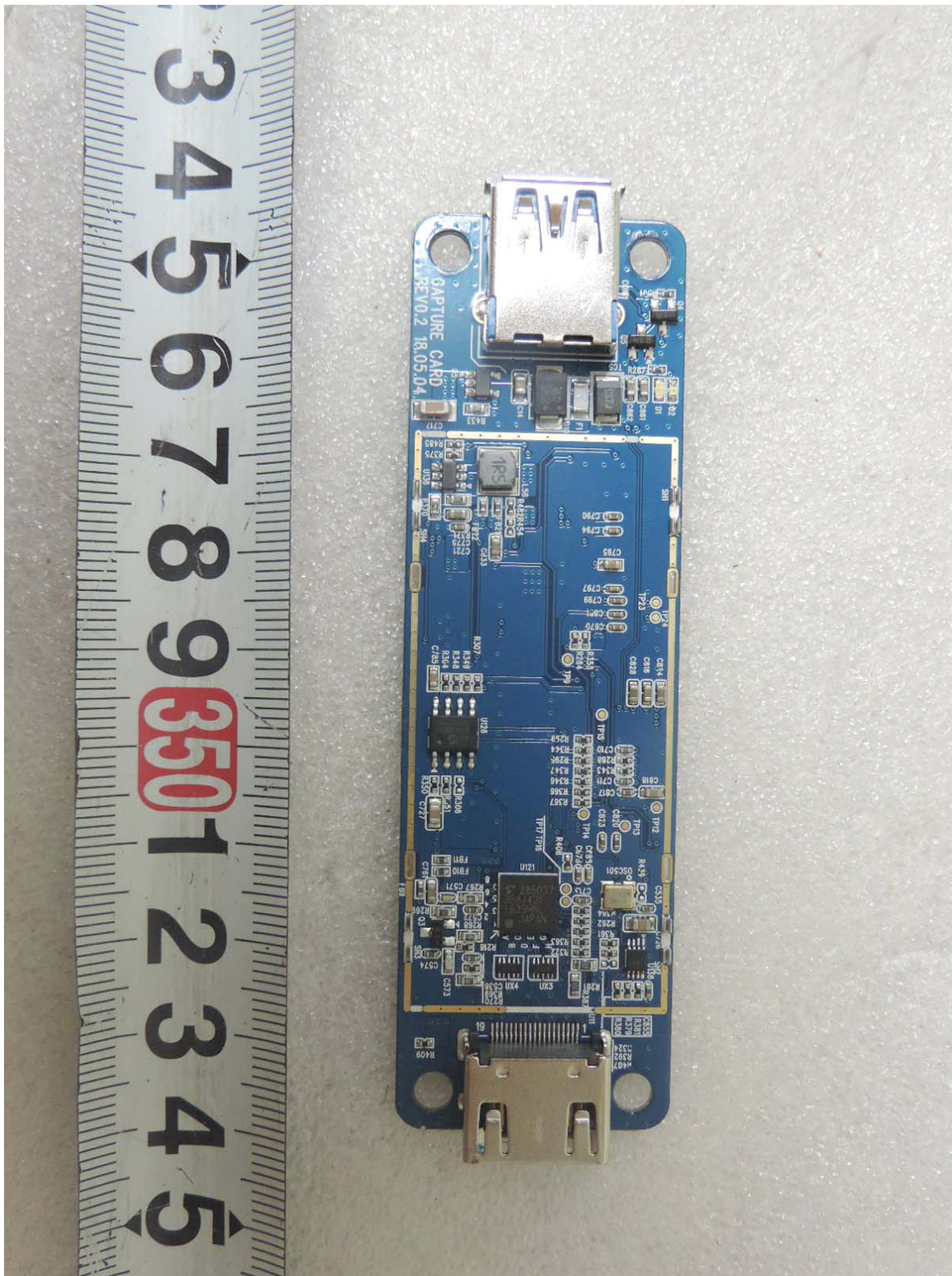


Top side view of main board

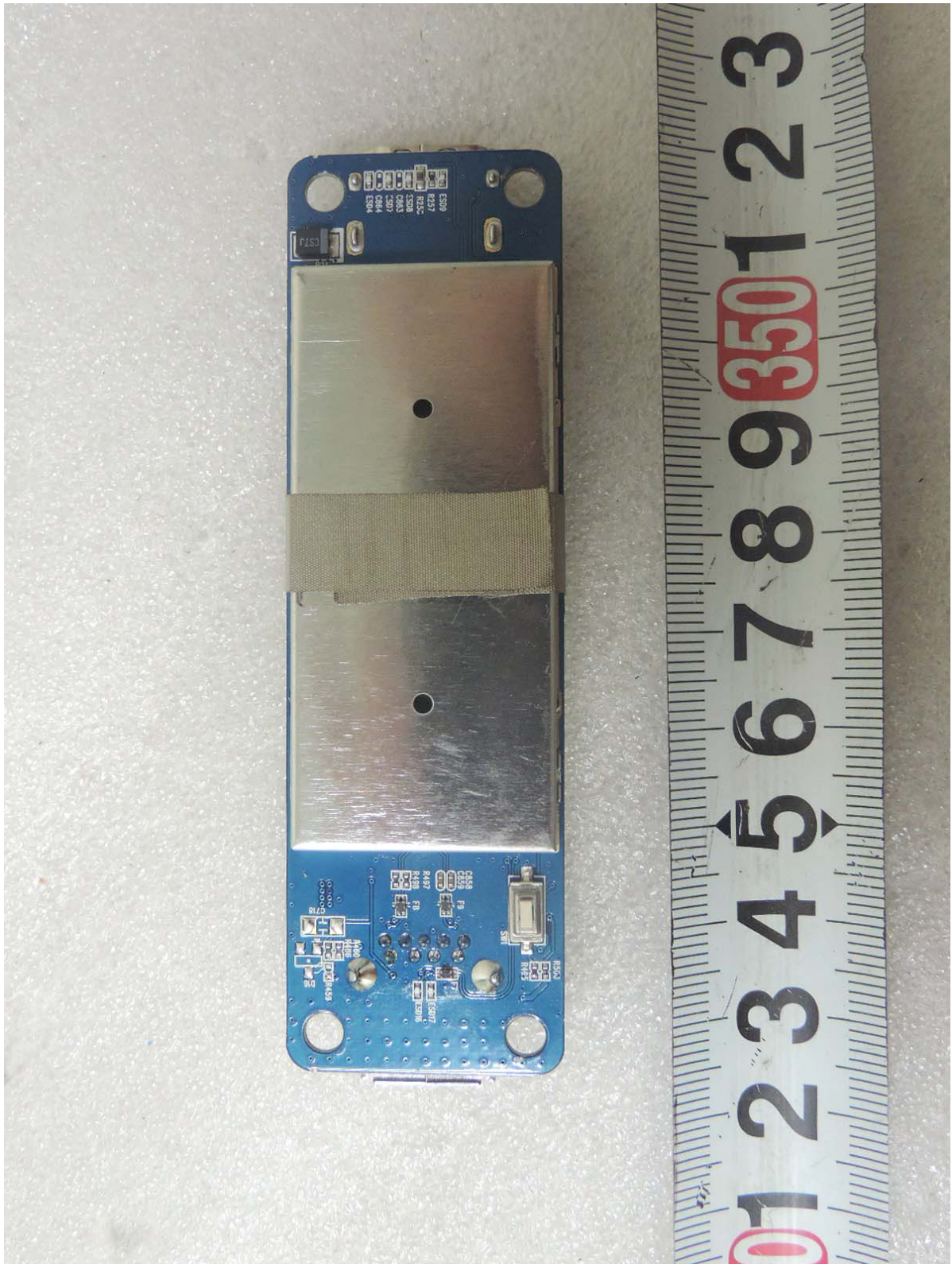


Appendix D. Internal Photographs

Top side view of main board (shield can open)

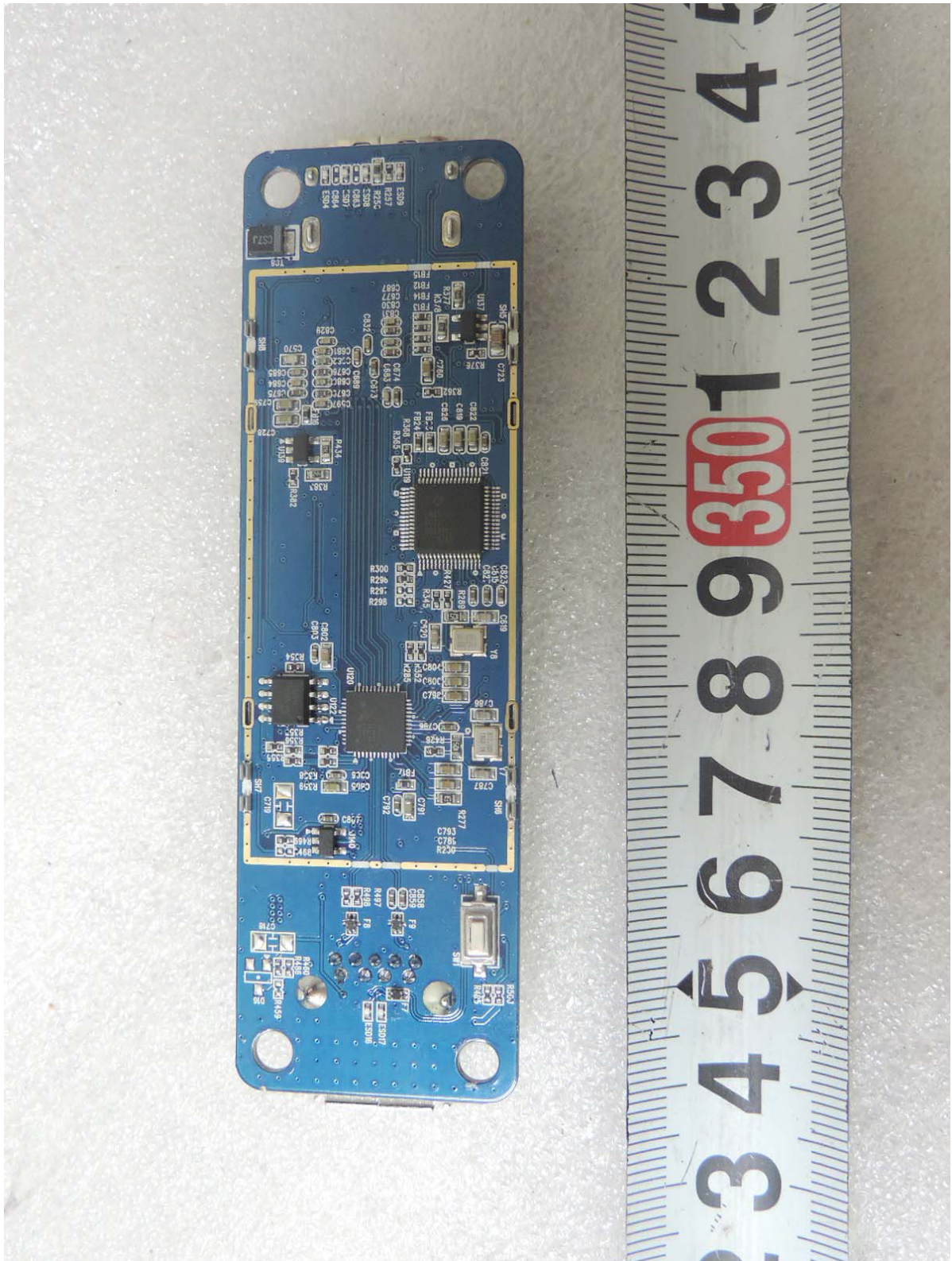


Bottom side view of main board



Appendix D. Internal Photographs

Bottom side view of main board (shield can open)



Appendix E. Block Diagram

