

FCC TEST REPORT

Product : WisePad 2 Plus
Trade mark : BBPOS
Model/Type reference : WisePad 2 Plus
Serial Number : N/A
Report Number : EED32J00012502
FCC ID : 2AB7X-WISEPAD2PLUS
Date of Issue : Mar. 20, 2017
Test Standards : 47 CFR Part 15 Subpart C (2015)
Test result : PASS

Prepared for:

BBPOS International Limited
Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road,
Tsuen Wan, N.T. HK, Hong Kong

Prepared by:

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Date:

Mar. 20, 2017

Check No.: 2457559993



2 Version

Version No.	Date	Description
00	Mar. 20, 2017	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Radiated Emission	47 CFR Part 15 Subpart C Section 15.209; 15.225(a)(b)(c)(d)	ANSI C63.10-2013	PASS

Remark:

The tested sample and the sample information are provided by the client.

Model No.: WisePad 2 Plus, WisePad 2

This test report (Ref. No.: EED32J00012502) is only valid with the original test report (Ref. No.: EED32I00208212).

According to the declaration from the applicant, their RF part, main board, electrical circuit design, layout, components used and internal wiring are identical, only the WisePad 2 Plus is consisted by printer function part, but WisePad 2 is not included.

Therefore in this report AC Power Line Conducted Emission and Radiated Emission were fully retested on model WisePad 2 Plus and shown the data in this report, other tests please refer to original report EED32I00208212.

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5 General Information

5.1 Client Information

Applicant:	BBPOS International Limited
Address of Applicant:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T. HK, Hong Kong
Manufacturer:	BBPOS International Limited
Address of Manufacturer:	Suite 1602, 16/F, Tower 2, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, N.T. HK, Hong Kong

5.2 General Description of EUT

Product Name:	WisePad 2 Plus
Model No.(EUT):	WisePad 2 Plus
Trade Mark:	BBPOS
EUT Supports Radios application	BT 2.1(2402MHz-2480MHz), BT 4.0(2402MHz-2480MHz), NFC(13.56MHz), WIFIB/g/n(HT20)(2412MHz-2472MHz), 2G(850MHz/1900MHz)GPRS
Power Supply:	DC 3.7V by Battery DC 5V by USB port
Battery:	Li-polymer 3.7V, 1300mAh

5.3 Product Specification subjective to this standard

Carrier Frequency:	13.56MHz
Modulation Type:	ASK
Antenna Gain:	0dBi
Sample Type:	Portable production
Antenna Type:	Integral
Test voltage:	AC 120V, 60Hz, DC 3.7V
Sample Received Date:	Jan. 23, 2017
Sample tested Date:	Jan. 23, 2017 to Mar. 20, 2017

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	22°C
Humidity:	53% RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitter mode:	Keep the EUT in transmitting mode (NFC mode) with modulation.

5.5 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Certification	Supplied by
laptop	LENOVO	T3900	FCC DOC	CTI
Mouse	L.Selectron	GL-204	FCC DOC	CTI

5.6 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

5.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 886427

Centre Testing International Group Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 886427.

IC-Registration No.: 7408A

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A .

IC-Registration No.: 7408B

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 & 10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

5.8 Deviation from Standards

None.

5.9 Abnormalities from Standard Conditions

None.

5.10 Other Information Requested by the Customer

None.

5.11 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

6 Equipment List

Conducted disturbance Test					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
Receiver	R&S	ESCI	100009	06-16-2016	06-15-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
LISN	R&S	ENV216	100098	06-16-2016	06-15-2017
LISN	schwarzbeck	NNLK8121	8121-529	06-16-2016	06-15-2017
Voltage Probe	R&S	ESH2-Z3	--	07-09-2014	07-07-2017
Current Probe	R&S	EZ17	100106	06-16-2016	06-15-2017
ISN	TESEQ GmbH	ISN T800	30297	02-23-2017	02-22-2018

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	06-05-2016	06-05-2019
TRILOG Broadband Antenna	SCHWARZBECK	VULB9163	9163-484	05-23-2016	05-22-2017
Microwave Preamplifier	Agilent	8449B	3008A02425	02-16-2017	02-15-2018
Horn Antenna	ETS-LINDGREN	3117	00057407	07-20-2015	07-18-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-16-2016	06-15-2017
Receiver	R&S	ESCI	100435	06-16-2016	06-15-2017
Multi device Controller	maturo	NCD/070/10711 112	---	01-11-2017	01-10-2018
LISN	schwarzbeck	NNBM8125	81251547	06-16-2016	06-15-2017
LISN	schwarzbeck	NNBM8125	81251548	06-16-2016	06-15-2017
Signal Generator	Agilent	E4438C	MY45095744	04-01-2016	03-31-2017
Signal Generator	Keysight	E8257D	MY53401106	04-01-2016	03-31-2017
Temperature/ Humidity Indicator	TAYLOR	1451	1905	04-27-2016	04-26-2017
Communication test set	Agilent	E5515C	GB47050534	04-01-2016	03-31-2017
Cable line	Fulai(7M)	SF106	5219/6A	01-11-2017	01-10-2018
Cable line	Fulai(6M)	SF106	5220/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5216/6A	01-11-2017	01-10-2018
Cable line	Fulai(3M)	SF106	5217/6A	01-11-2017	01-10-2018
Communication test set	R&S	CMW500	152394	04-01-2016	03-31-2017
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-11-2017	01-10-2018

7 Test Result & Measurement Data

7.1 Conducted Emissions

Test Requirement: 47 CFR Part 15C Section 15.207

Test Method: ANSI C63.10-2013

Test Frequency Range: 150kHz to 30MHz

Limit:

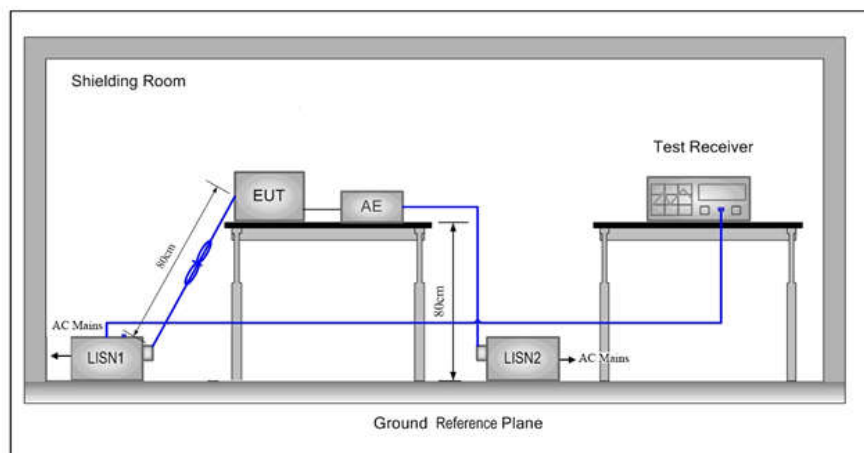
Frequency range (MHz)	Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Procedure:

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2009 on conducted measurement.

Test Setup:



Test Mode: Transmitting mode

Instruments Used: Refer to section 6 for details

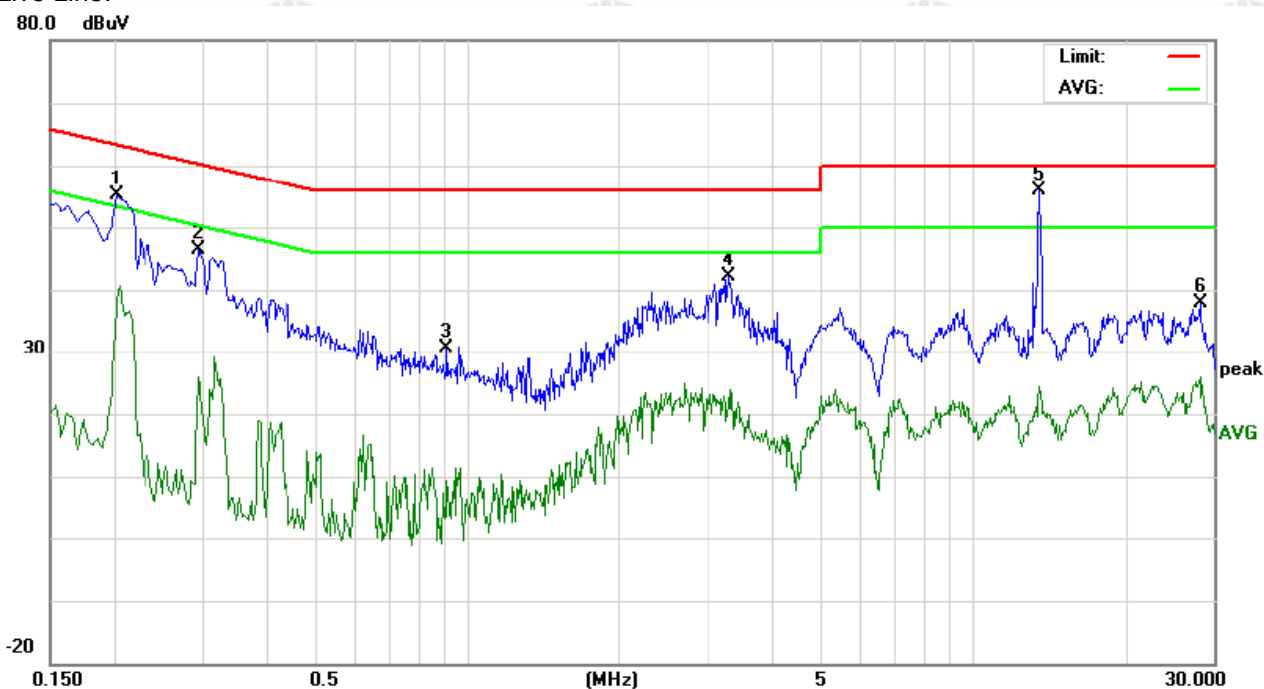
Test Results: Pass

Test Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

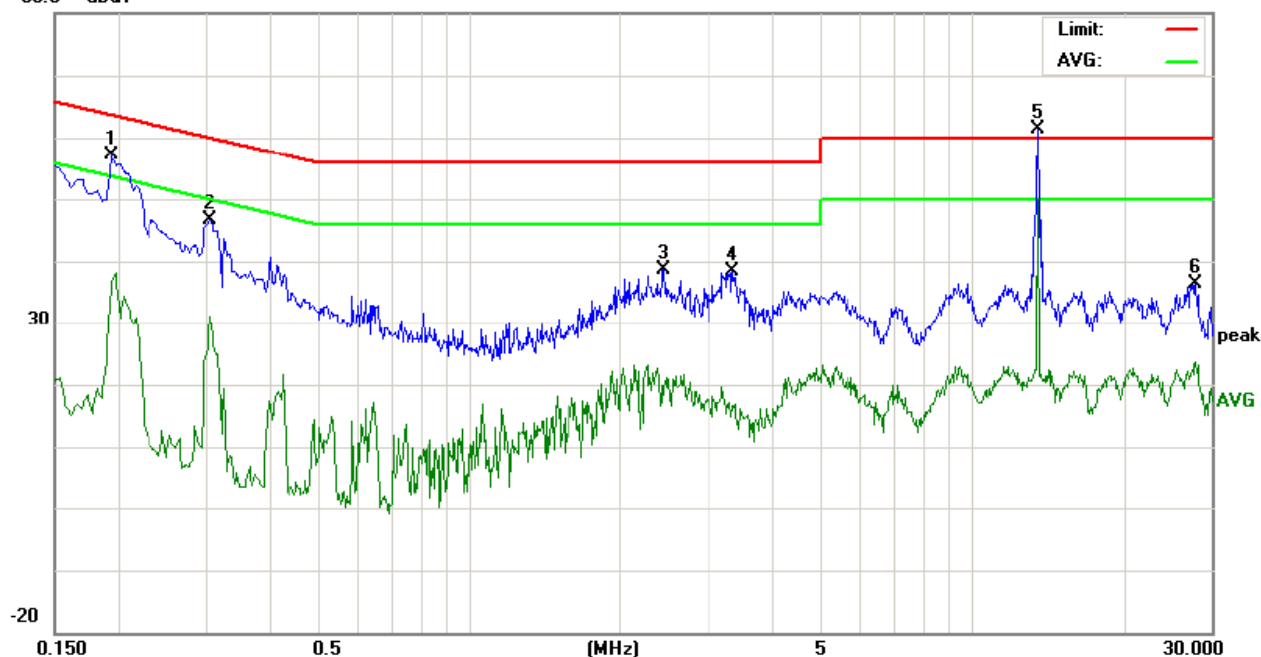
Live Line:



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.2020	45.28		27.52	9.80	55.08		37.32	63.52	53.52	-8.44	-16.20	P	
2	0.2940	36.58		16.17	9.80	46.38		25.97	60.41	50.41	-14.03	-24.44	P	
3	0.9140	21.04		-0.34	9.70	30.74		9.36	56.00	46.00	-25.26	-36.64	P	
4	3.3100	32.20		11.68	10.00	42.20		21.68	56.00	46.00	-13.80	-24.32	P	
5	13.5740													
6	28.1700	28.11		16.13	9.80	37.91		25.93	60.00	50.00	-22.09	-24.07	P	

Neutral Line:

80.0 dBuV



No.	Freq. MHz	Reading_Level (dBuV)			Correct Factor dB	Measurement (dBuV)			Limit (dBuV)		Margin (dB)		P/F	Comment
		Peak	QP	AVG		peak	QP	AVG	QP	AVG	QP	AVG		
1	0.1940	47.32		26.29	9.80	57.12	36.09		63.86	53.86	-6.74	-17.77	P	
2	0.3060	36.88		21.23	9.81	46.69	31.04		60.08	50.08	-13.39	-19.04	P	
3	2.4380	28.54		9.26	10.00	38.54	19.26		56.00	46.00	-17.46	-26.74	P	
4	3.3540	28.38		6.53	10.00	38.38	16.53		56.00	46.00	-17.62	-29.47	P	
5	13.5540													
6	27.9100	26.67		13.93	9.80	36.47	23.73		60.00	50.00	-23.53	-26.27	P	

Notes:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. 13.56MHz is the Fundamental field strength of NFC. According to the 15.207, the limit is not apply.

7.2 Radiated Emissions

Test Requirement: 47 CFR Part 15 Subpart C Section 15.209; 15.225(a)(b)(c)(d)

Test Method: ANSI C63.10-2013

Test Site: 3m (Semi-Anechoic Chamber)

Requirements:

- (a) The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.
- (b) Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.
- (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.
- (d) The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Quasi-peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Quasi-peak	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Quasi-peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Quasi-peak	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Setup:

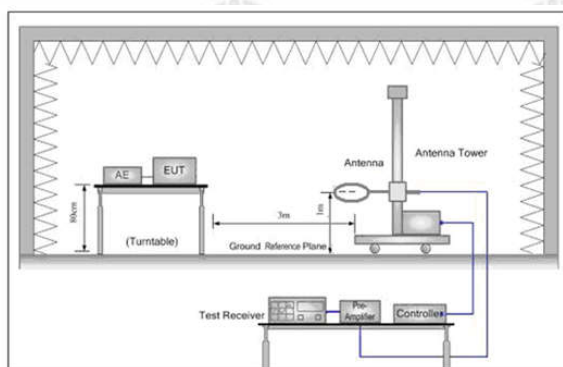


Figure 1. Below 30MHz

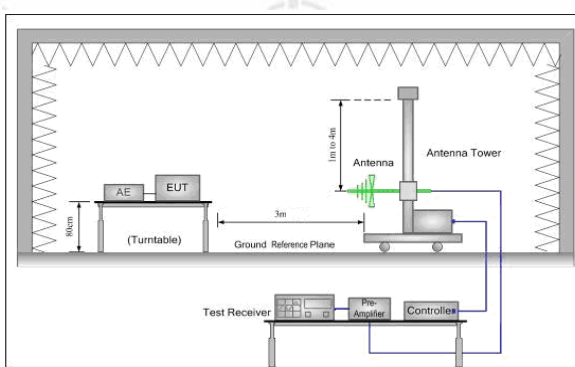


Figure 2. 30MHz to 1GHz

Test Procedure:

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The limit 1.705MHz to 30MHz in clause 4.3 are specified at 30 meters, and measurements were made at 3 meters, the limit is translated to 3 meters by using a formula as follows:
$$\text{Limit}_{3m} = \text{Limit}_{30m} + 40\log(30m/3)$$
8. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

Test Mode:

Transmitting mode

Instruments Used:

Refer to section 6 for details

Test Result:

Pass

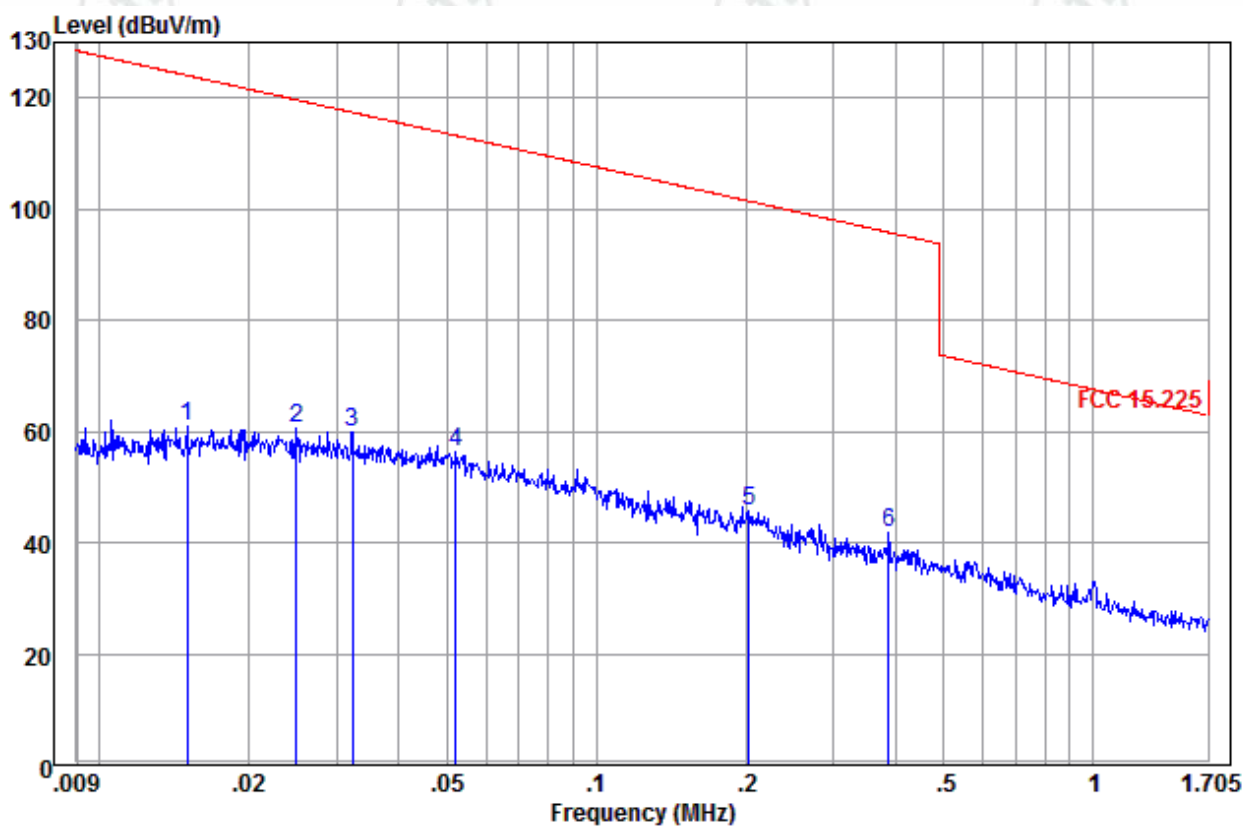
1.705-30MHz

Mode

Test Procedure: For testing performed with the loop antenna, testing was performed in accordance to ANSI C63.4: 2014, section 8.2.1. The center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

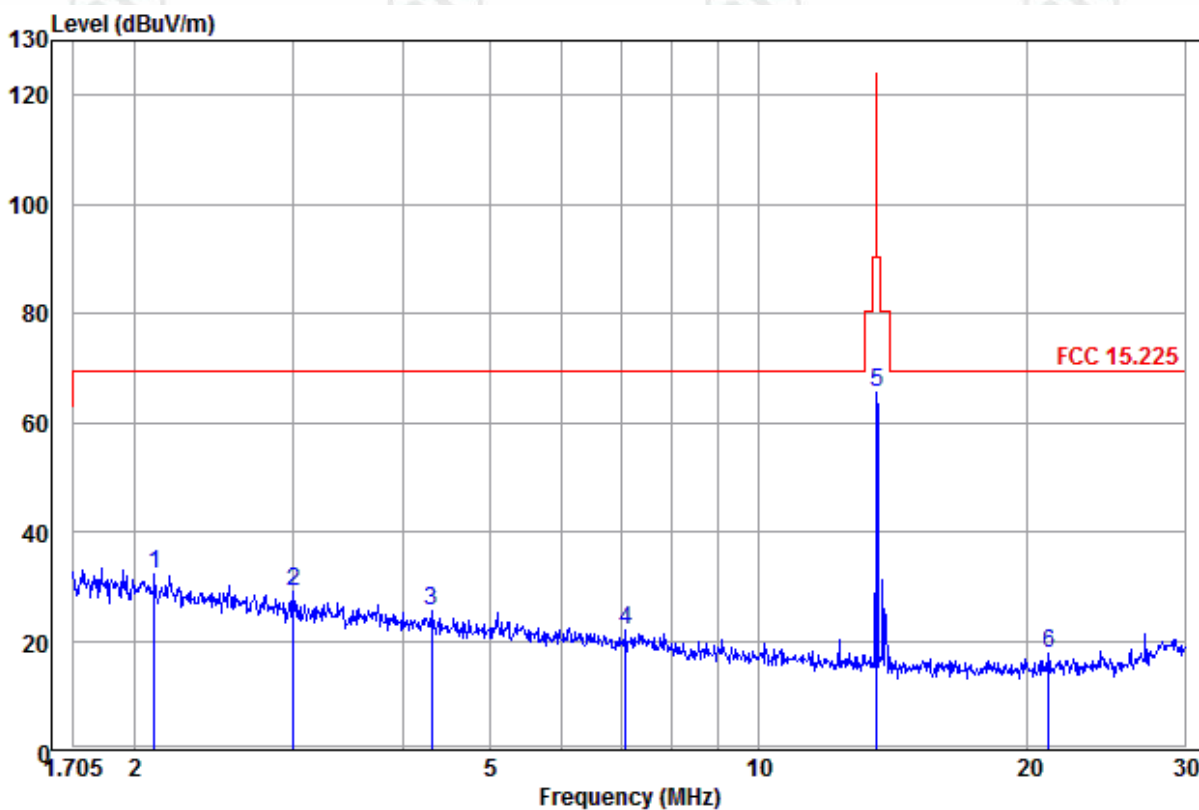
Test data:

9 kHz-1.705MHz



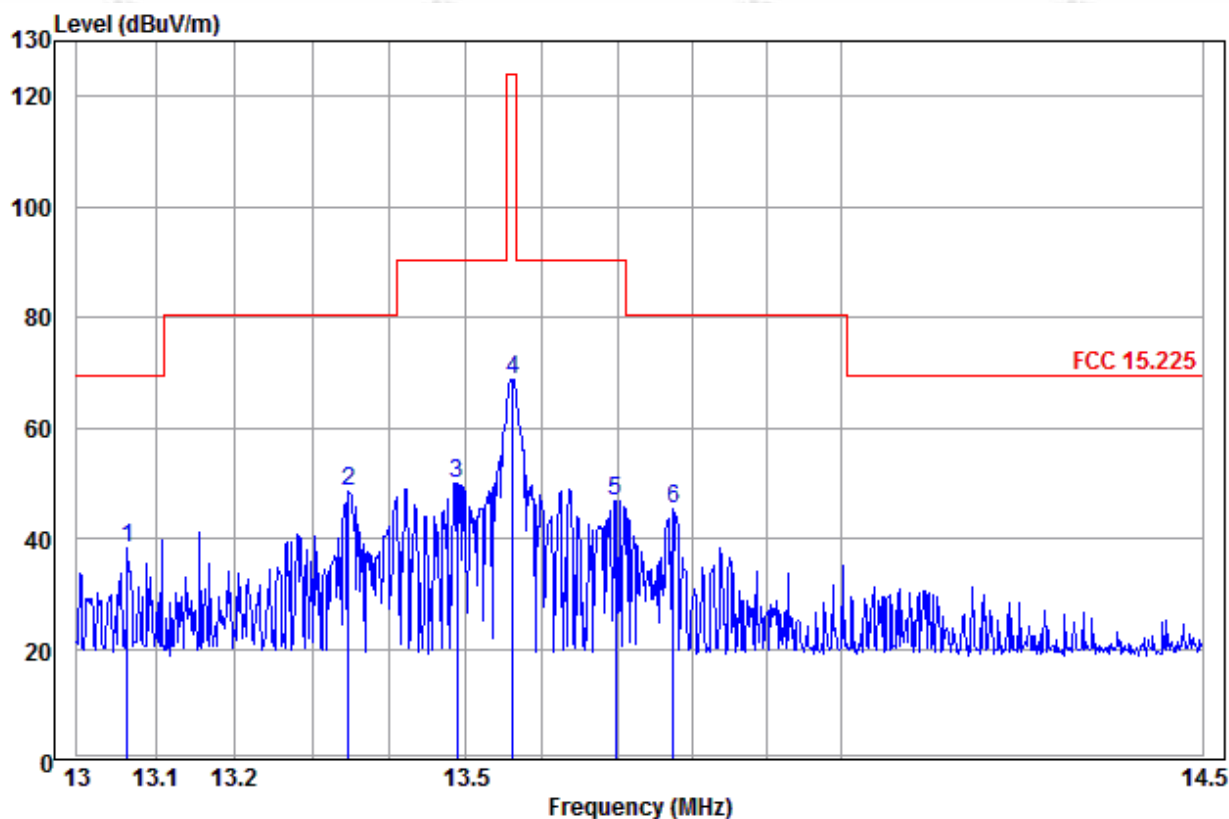
Frequency (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
0.01505	17.49	0.04	43.45	60.98	124.04	-63.06	X	PK
0.02489	15.35	0.05	45.13	60.53	119.67	-59.14	X	PK
0.03236	13.98	0.06	45.99	60.03	117.39	-57.36	X	PK
0.05214	11.68	0.07	44.49	56.24	113.25	-57.01	X	PK
0.20280	11.34	0.11	34.33	45.78	101.46	-55.68	X	PK
0.38857	11.30	0.12	30.50	41.92	95.81	-53.89	X	PK

1.705MHz-30MHz



Frequency (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
2.102	11.41	0.20	20.54	32.15	69.5	-37.35	X	QP
3.008	11.50	0.16	17.32	28.98	69.5	-40.52	X	QP
4.293	11.27	0.18	14.23	25.68	69.5	-43.82	X	QP
7.091	11.05	0.39	10.42	21.86	69.5	-47.64	X	QP
13.556	10.75	0.69	54.17	65.61	123.9	-58.29	X	QP
21.144	9.95	0.84	6.94	17.73	69.5	-51.77	X	QP

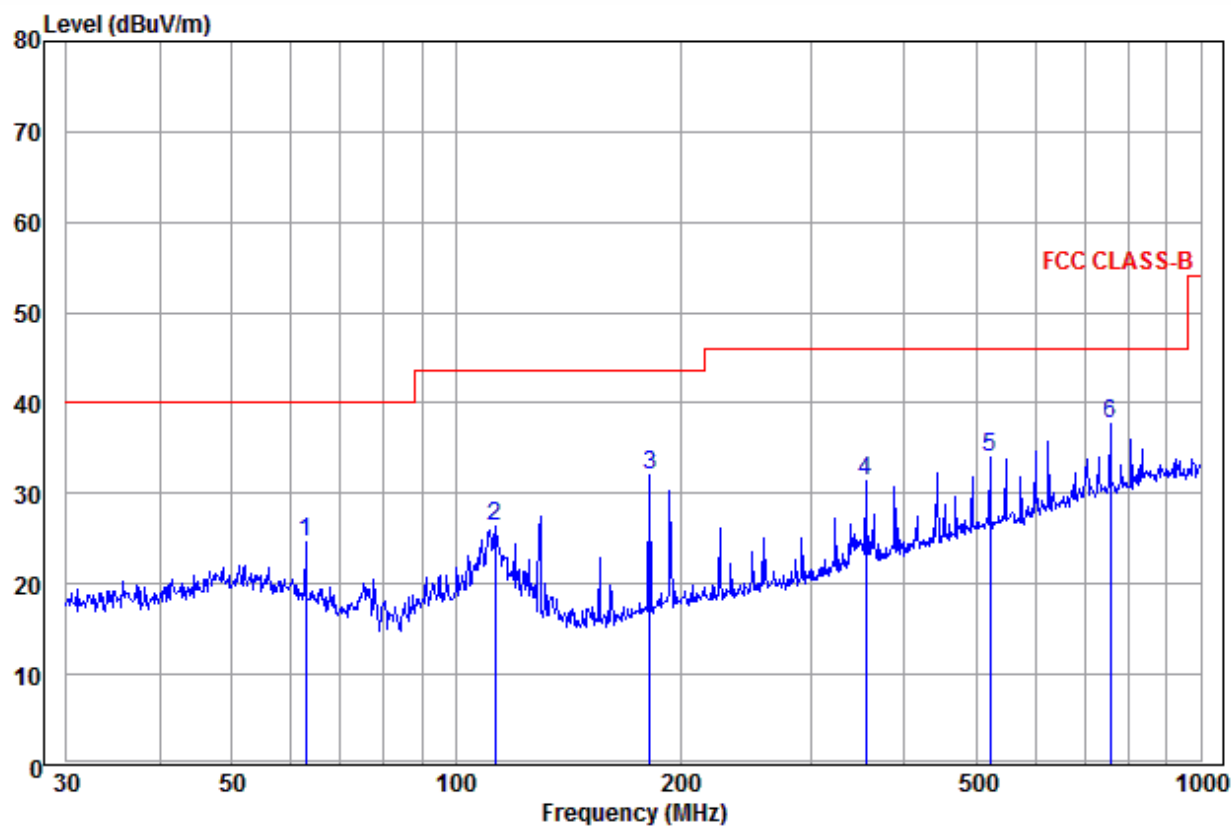
13MHz~14.5MHz



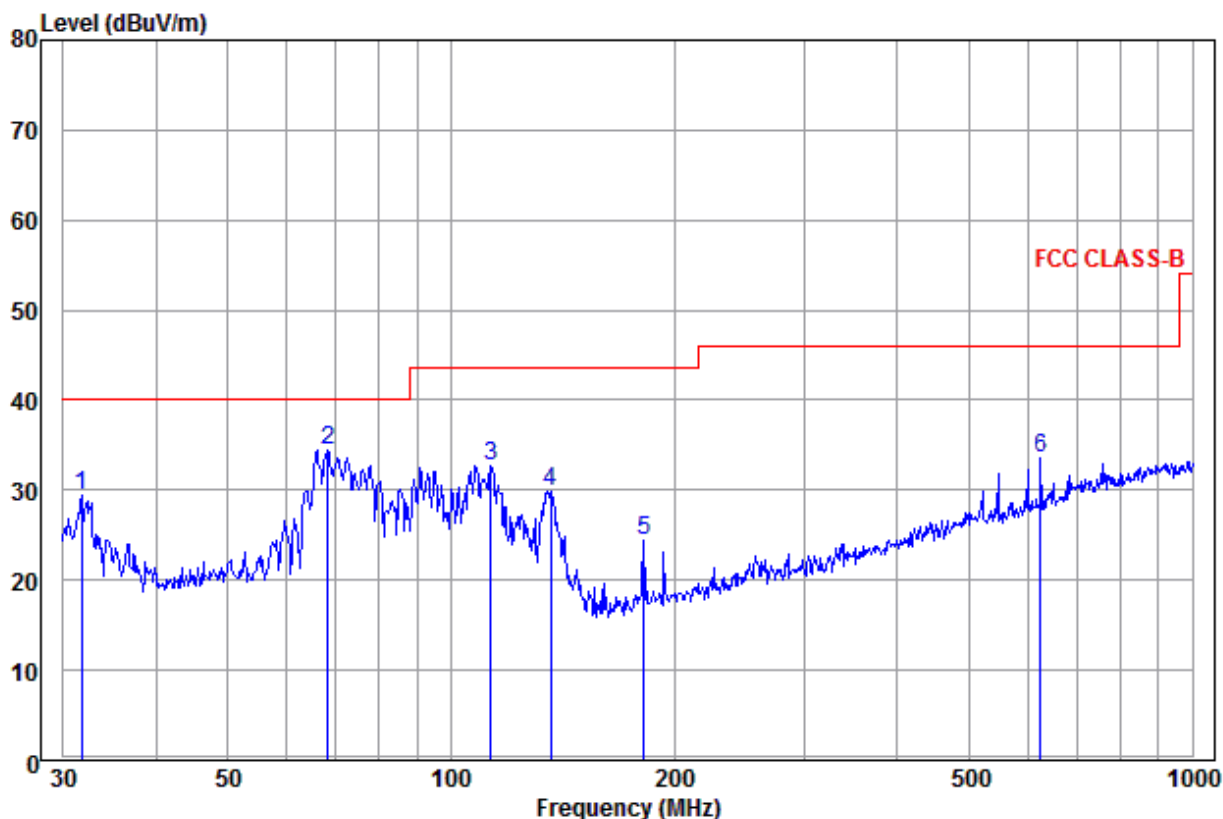
Frequency (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)	Polarization	Remark
13.064	10.77	0.68	26.77	38.22	69.5	-31.28	X	QP
13.347	10.76	0.68	37.02	48.46	80.5	-32.04	X	QP
13.489	10.75	0.68	38.62	50.05	90.4	-40.35	X	QP
13.561	10.75	0.69	57.37	68.81	123.9	-55.09	X	QP
13.698	10.74	0.69	35.48	46.91	90.4	-43.49	X	QP
13.775	10.74	0.69	34.03	45.46	80.5	-35.04	X	QP

Remark: The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case X axis is shown in the report.

30MHz-1000MHz



	Ant Freq	Cable Factor	Cable Loss	Level	Limit	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV/m	dBuV/m	dB		
1	62.871	12.77	1.44	24.64	40.00	-15.36	Horizontal	
2	112.920	12.83	1.57	26.36	43.50	-17.14	Horizontal	
3	181.920	10.84	2.00	32.15	43.50	-11.35	Horizontal	
4	355.427	15.15	2.72	31.47	46.00	-14.53	Horizontal	
5	520.888	18.49	3.16	33.96	46.00	-12.04	Horizontal	
6 pp	755.387	21.21	3.99	37.78	46.00	-8.22	Horizontal	



	Freq	Ant Factor	Cable Loss	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV/m	dBuV/m	dB		
1	31.731	12.83	1.06	29.49	40.00	-10.51	Vertical	
2	68.151	10.99	1.45	34.41	40.00	-5.59	Vertical	
3	113.316	12.75	1.57	32.66	43.50	-10.84	Vertical	
4	136.460	9.81	1.58	29.80	43.50	-13.70	Vertical	
5	181.920	10.84	2.00	24.33	43.50	-19.17	Vertical	
6	625.078	19.30	3.54	33.52	46.00	-12.48	Vertical	

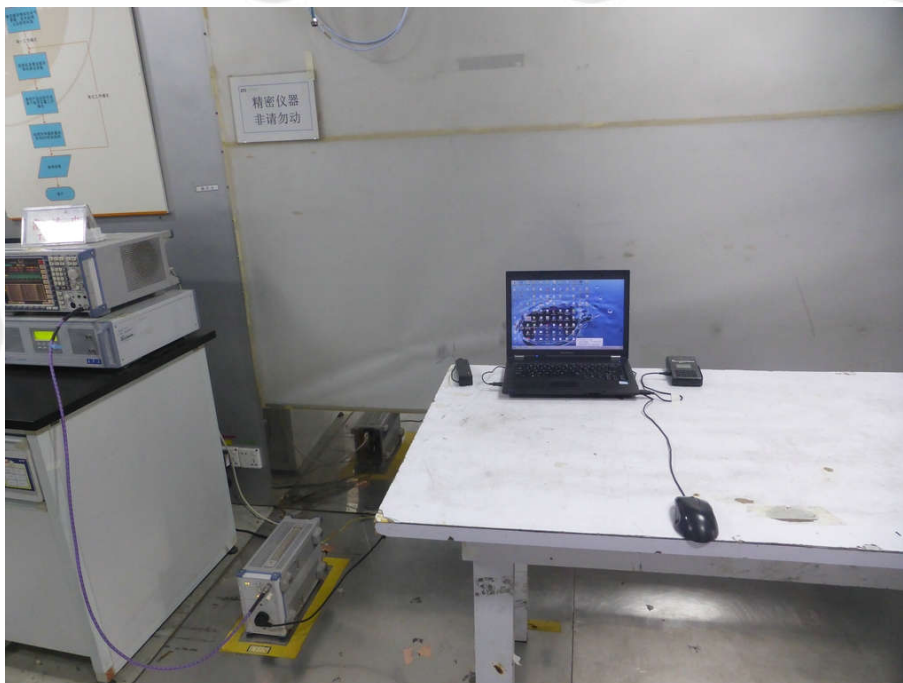
Remark:

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

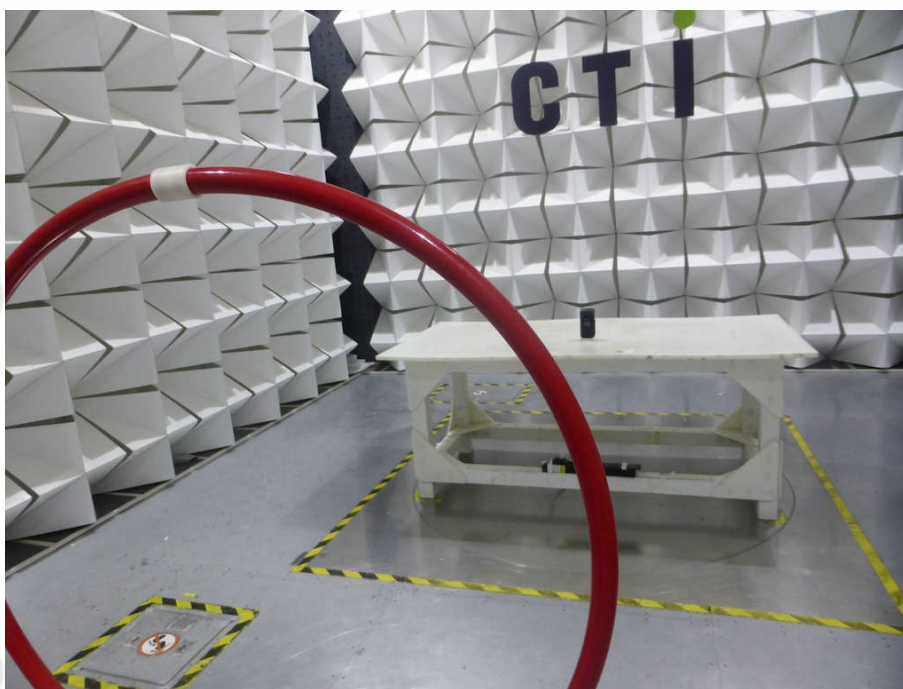
$$\text{Final Test Level} = \text{Receiver Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Preamplifier Factor}$$

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

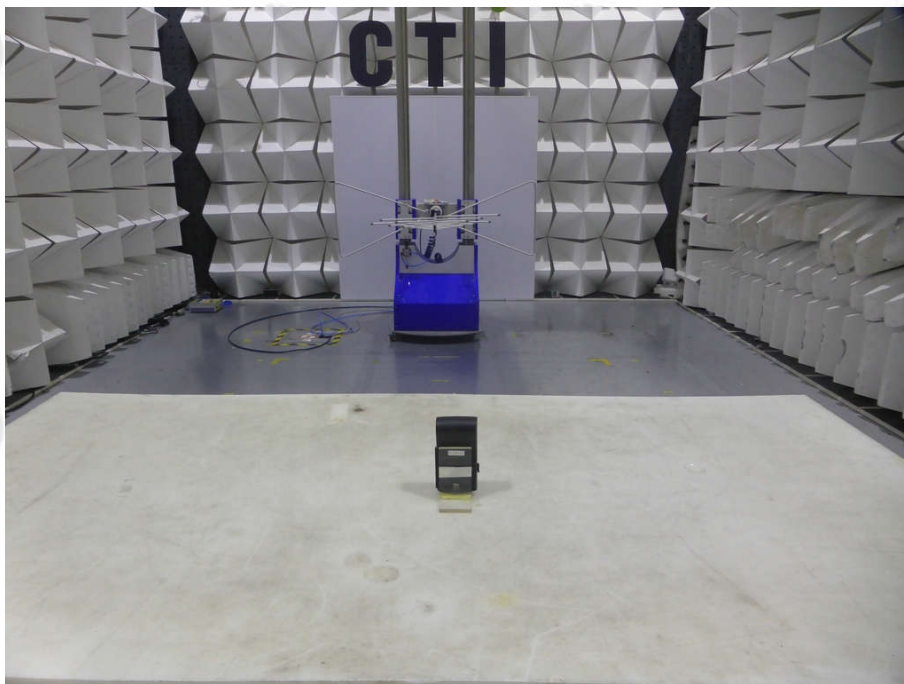
Test Model No.: WisePad 2 Plus



Conducted Emissions



Radiated emission Test Setup (9kHz~30MHz)



Radiated emission Test Setup (30MHz~1000MHz)

APPENDIX 2 PHOTOGRAPHS OF EUT

Test mode No.: WisePad 2 Plus



View of Product-1



View of Product-2



View of Product-3



View of Product-4



View of Product-5



View of Product-6



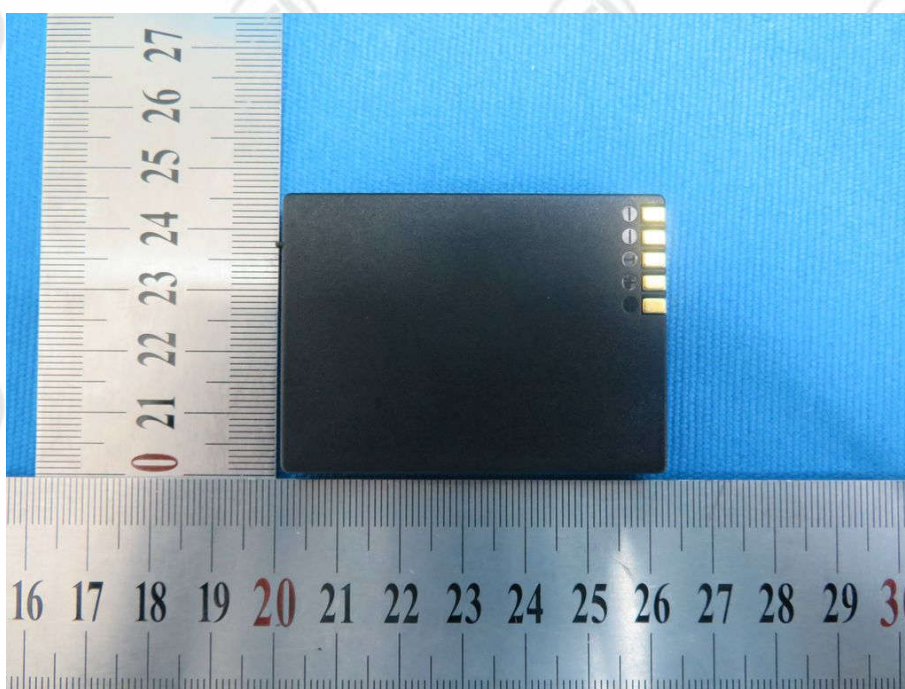
View of Product-7



View of Product-8



View of Product-9



View of Product-10



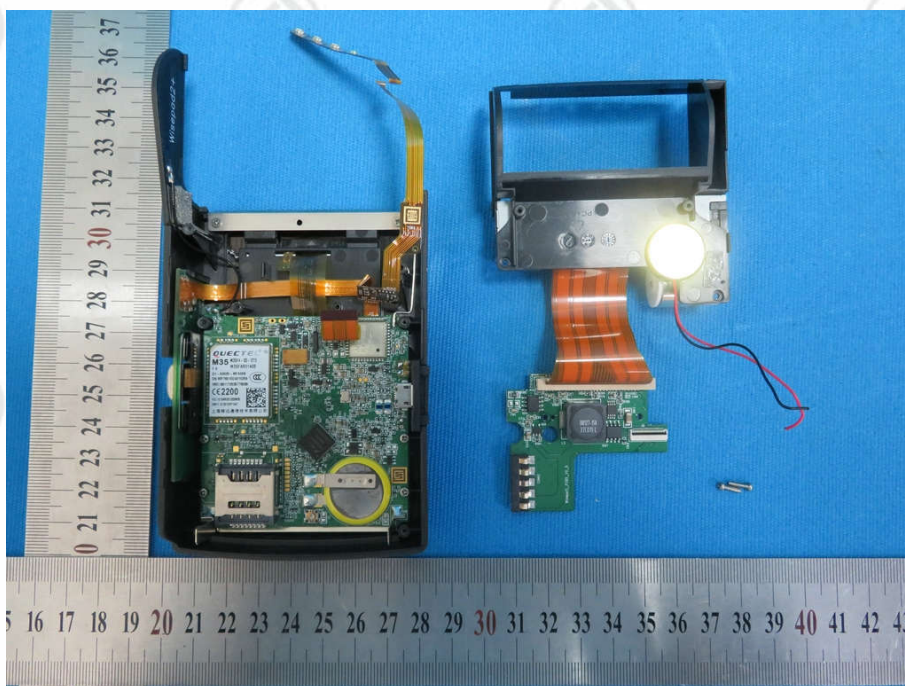
View of Product-11



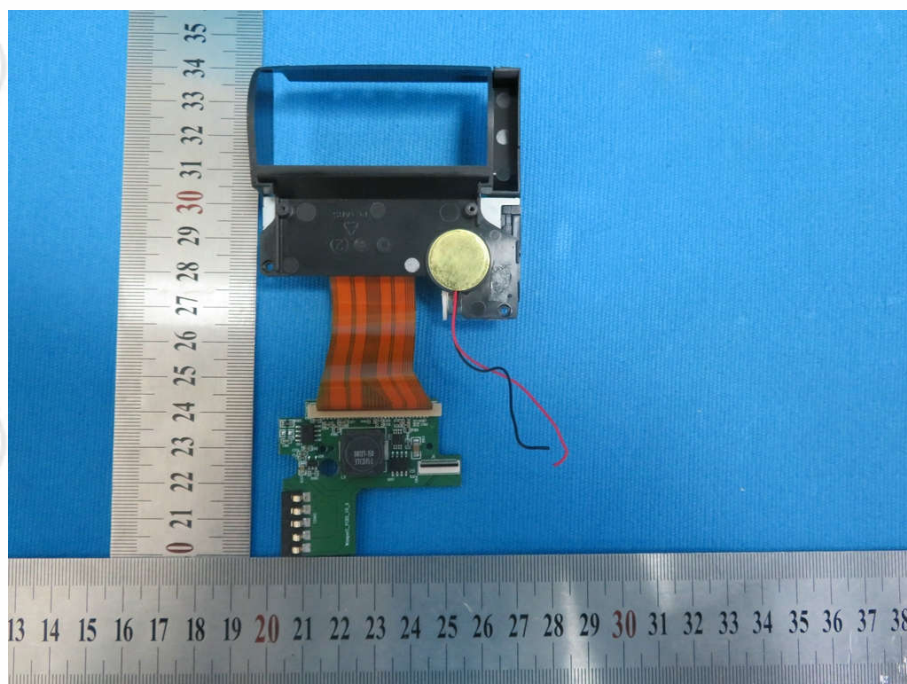
View of Product-12



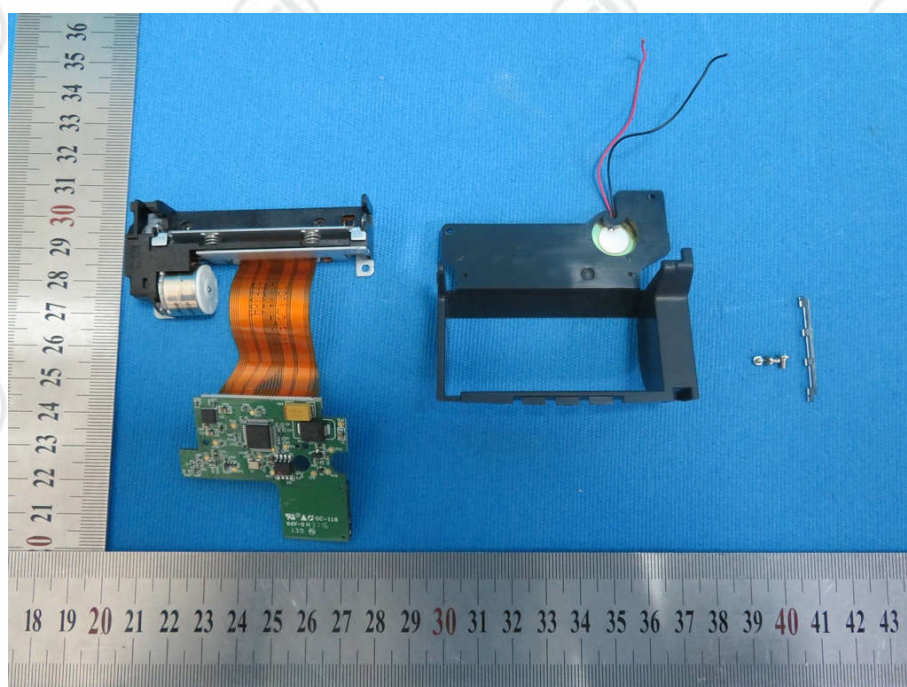
View of Product-13



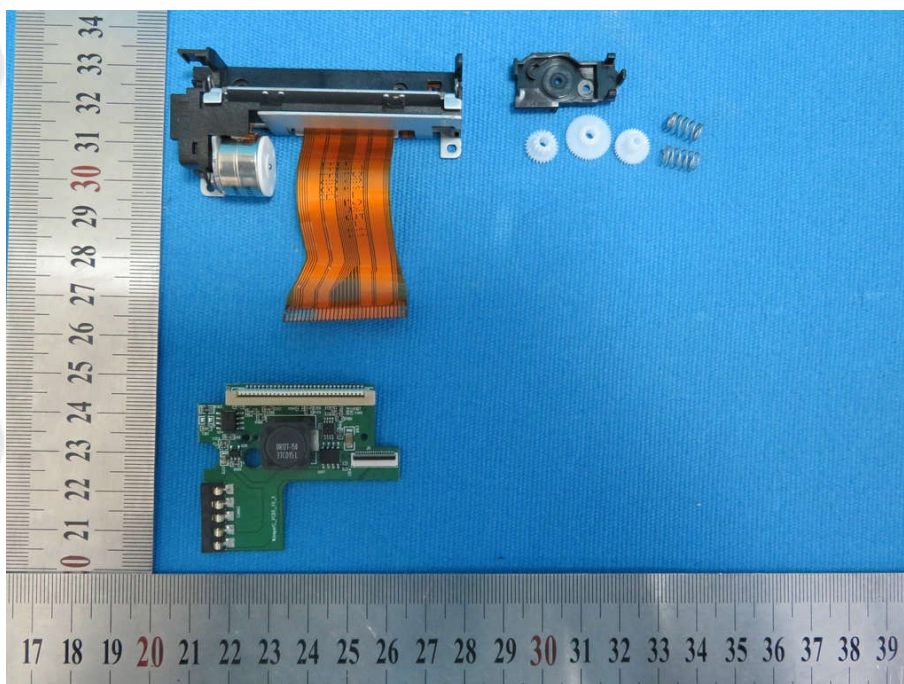
View of Product-14



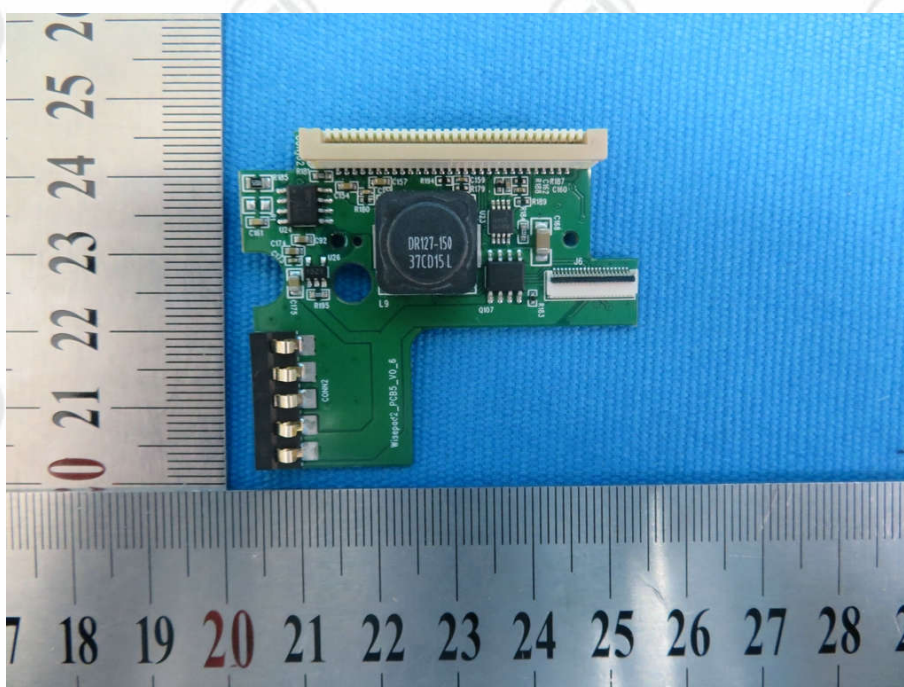
View of Product-15



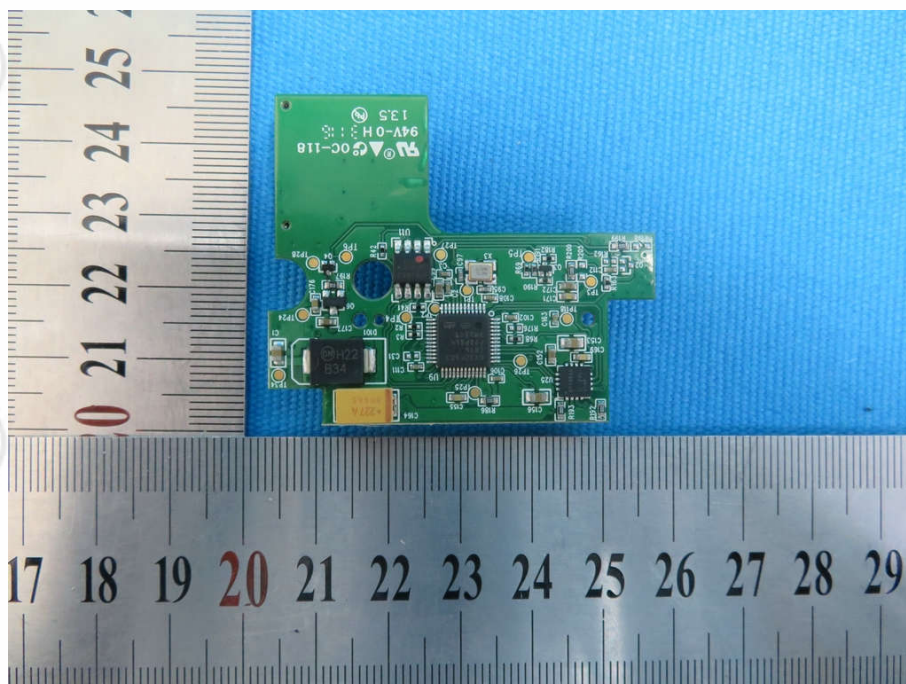
View of Product-16



View of Product-17



View of Product-18



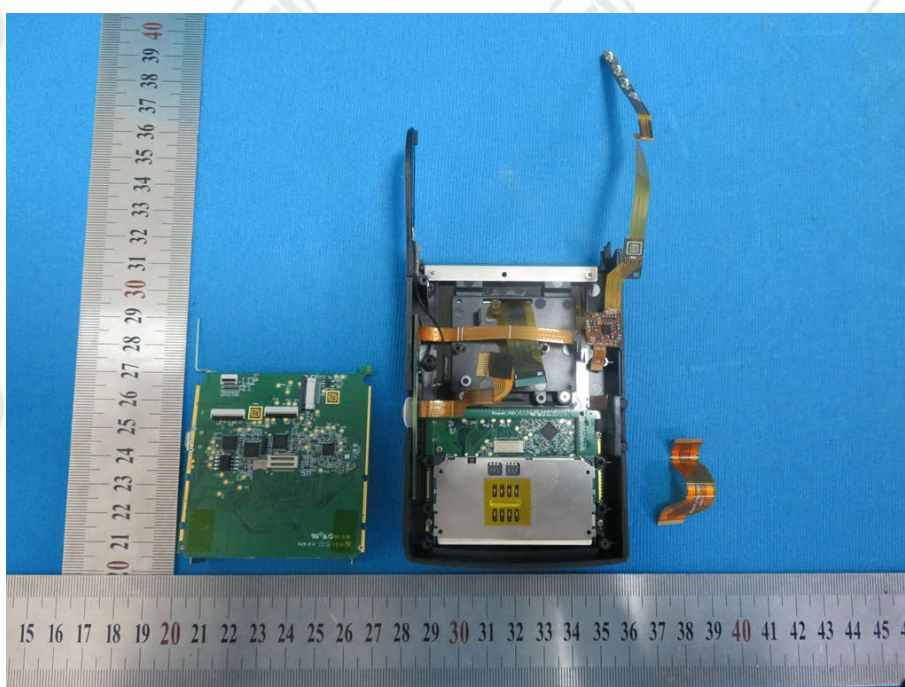
View of Product-19



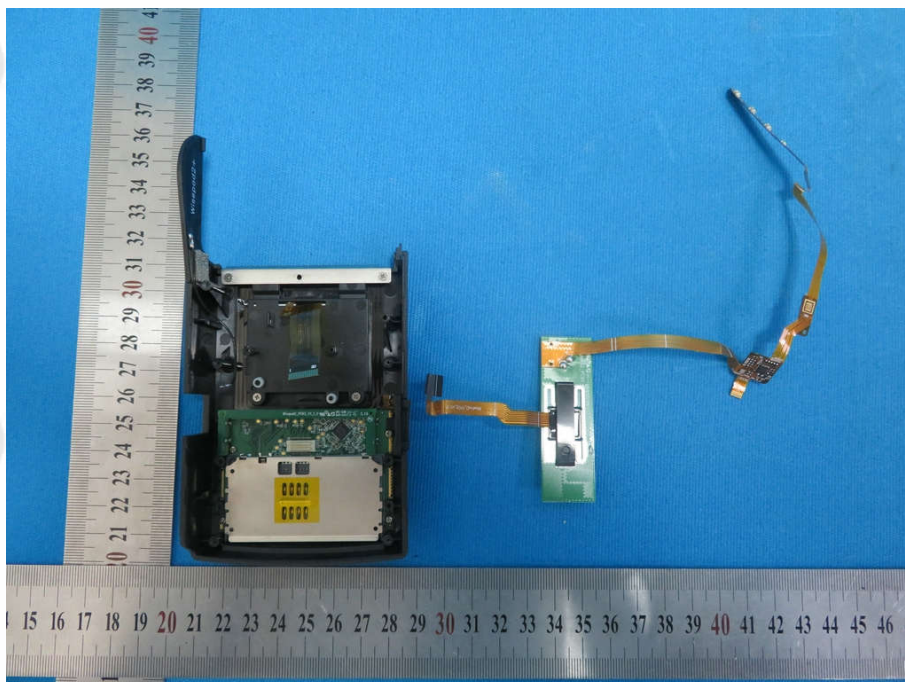
View of Product-20



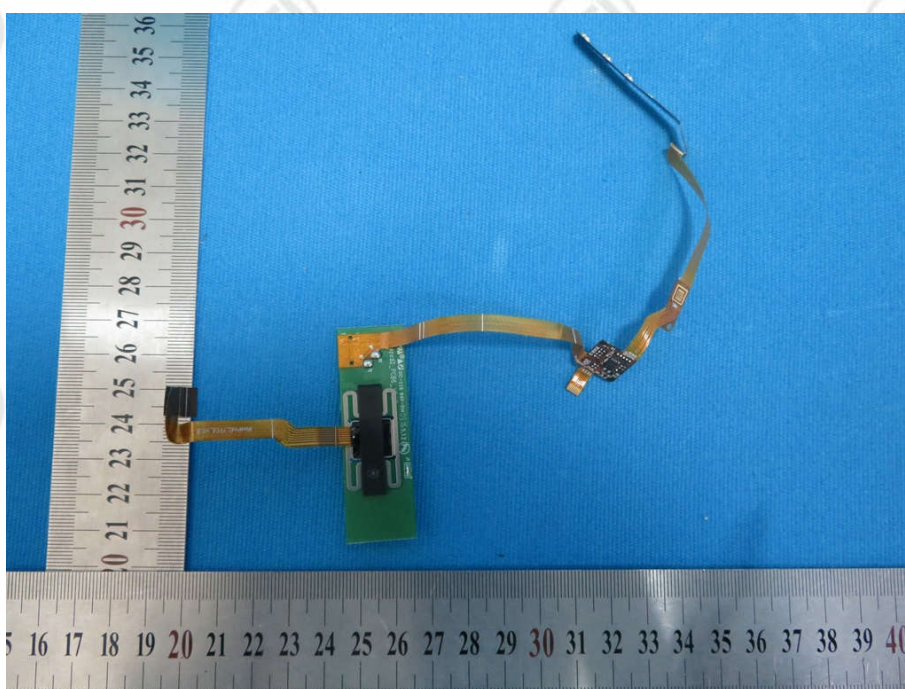
View of Product-21



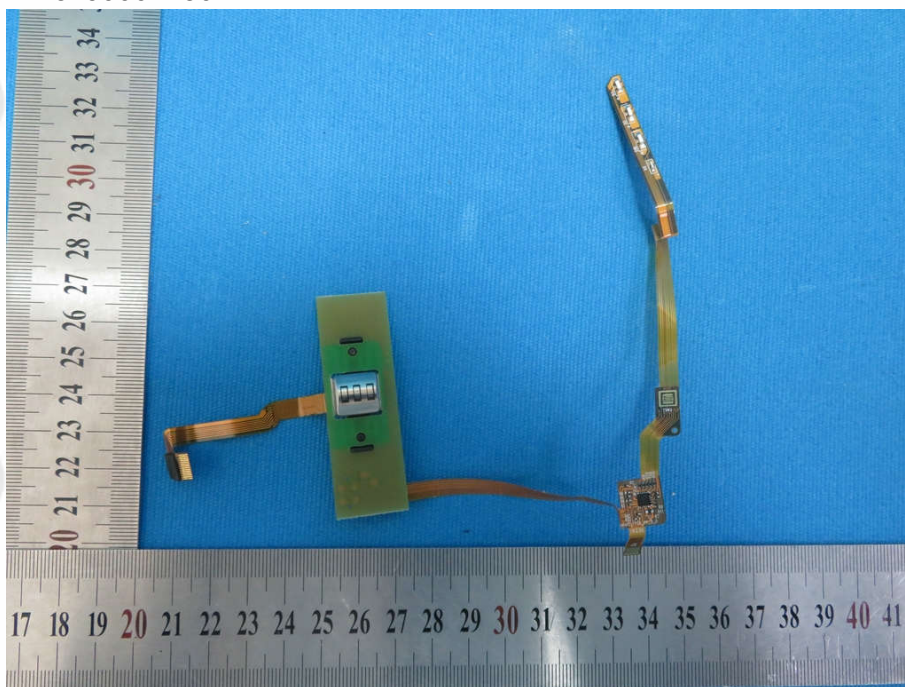
View of Product-22



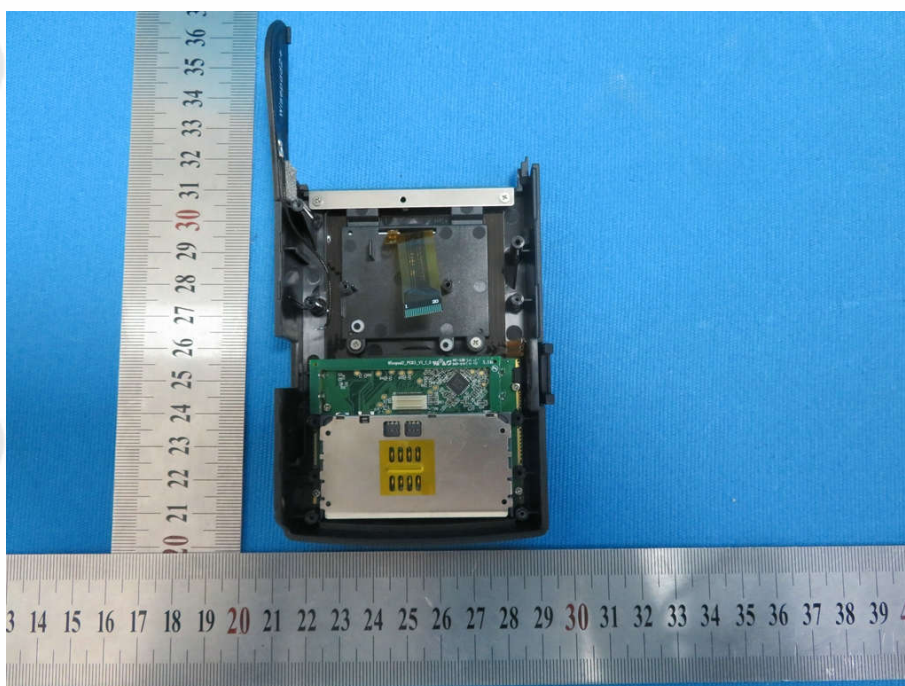
View of Product-23



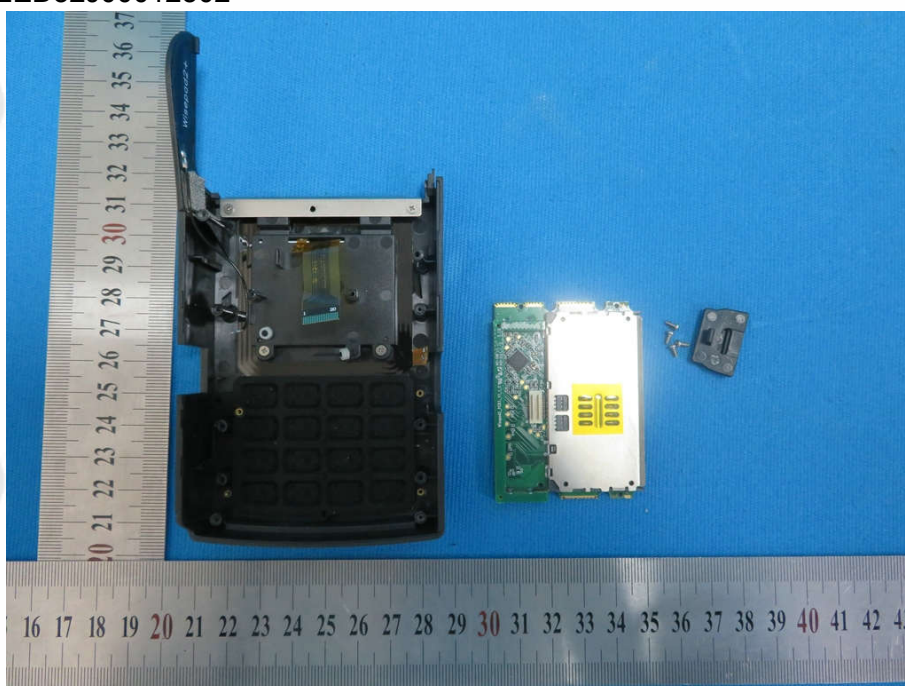
View of Product-24



View of Product-25



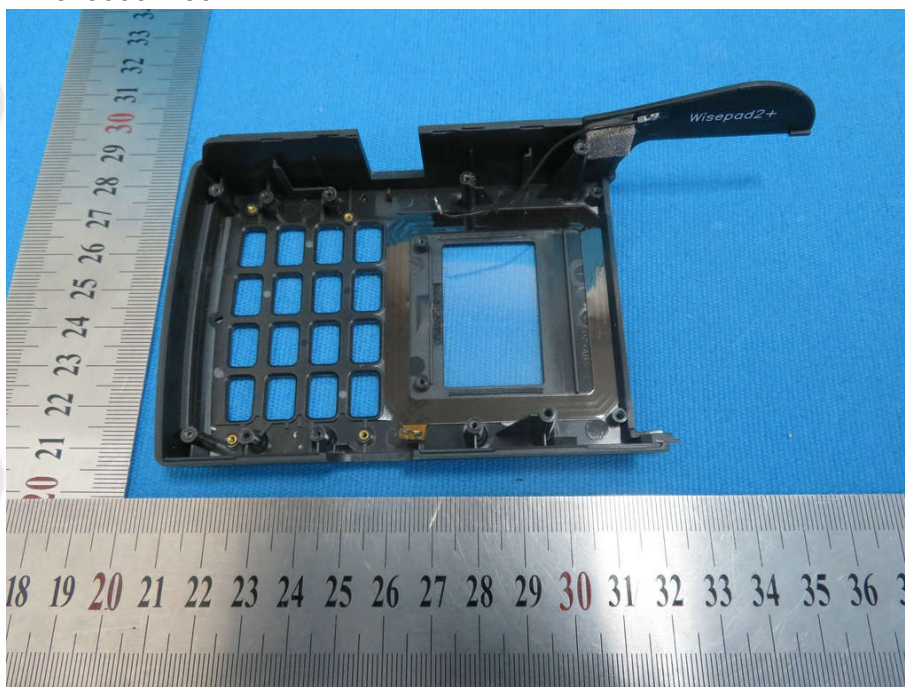
View of Product-26



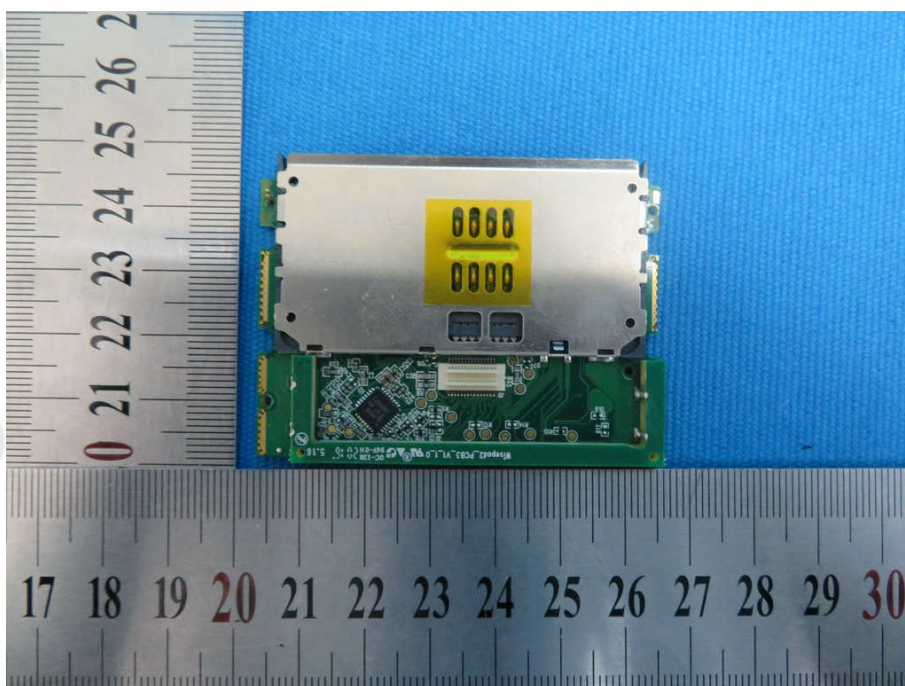
View of Product-27



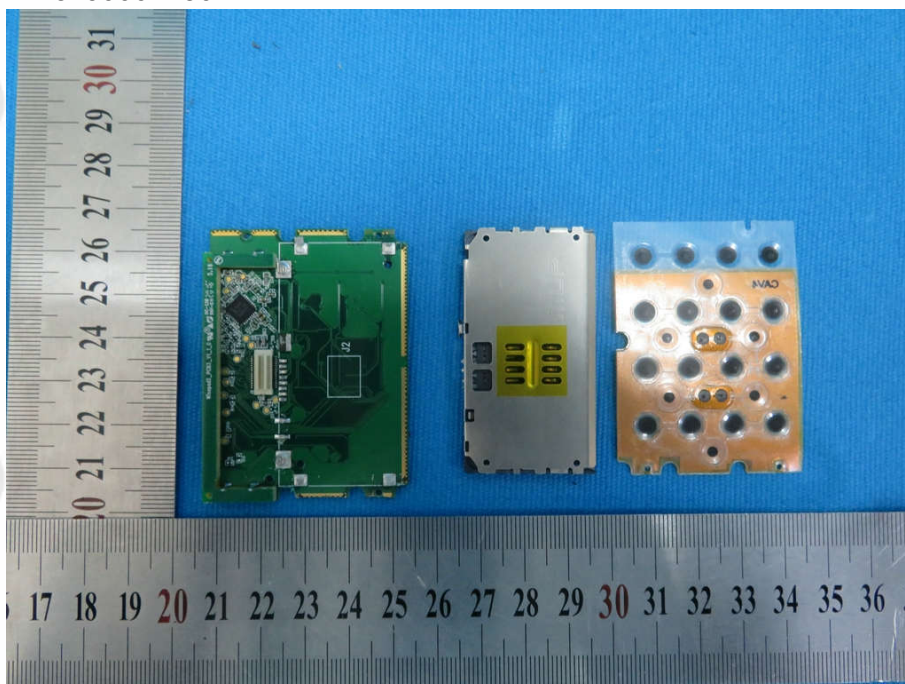
View of Product-28



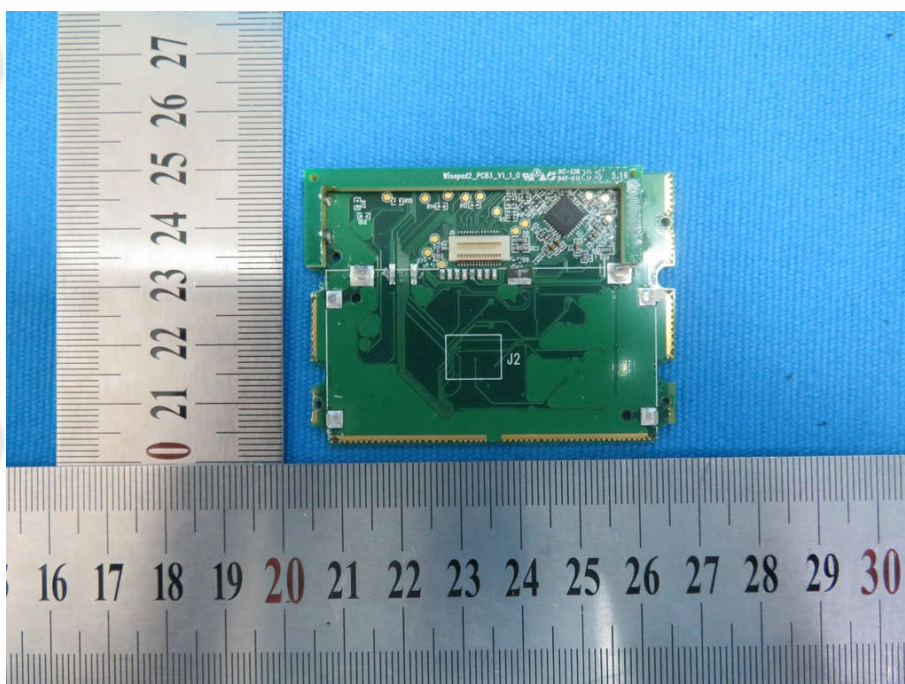
View of Product-29



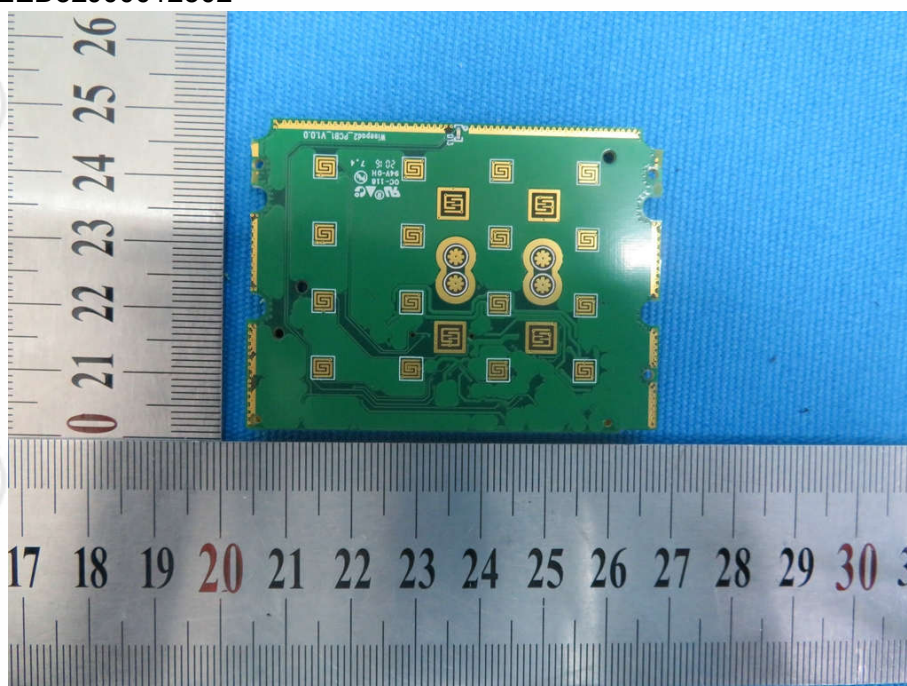
View of Product-30



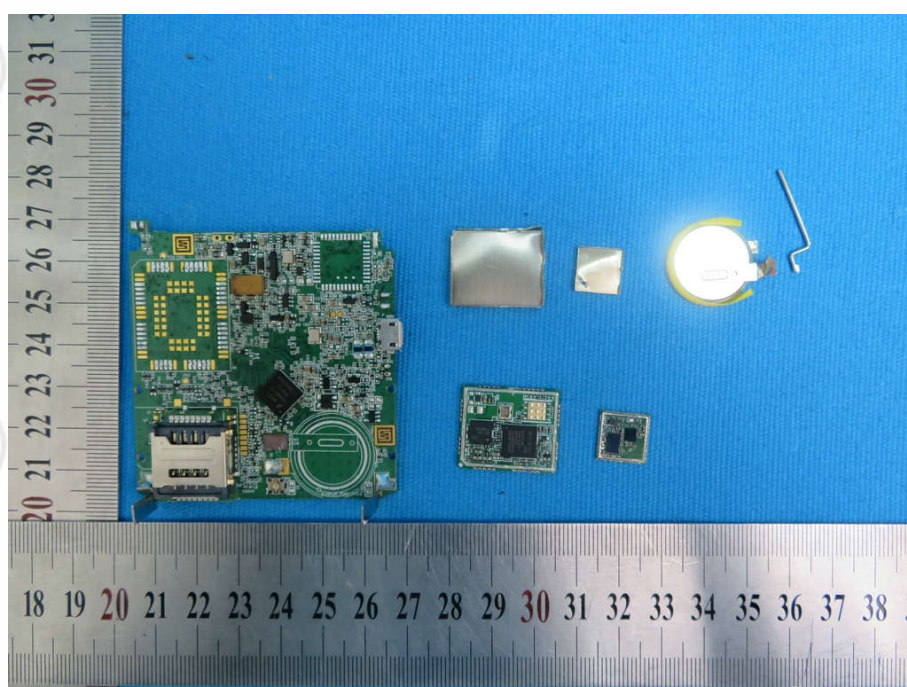
View of Product-31



View of Product-32



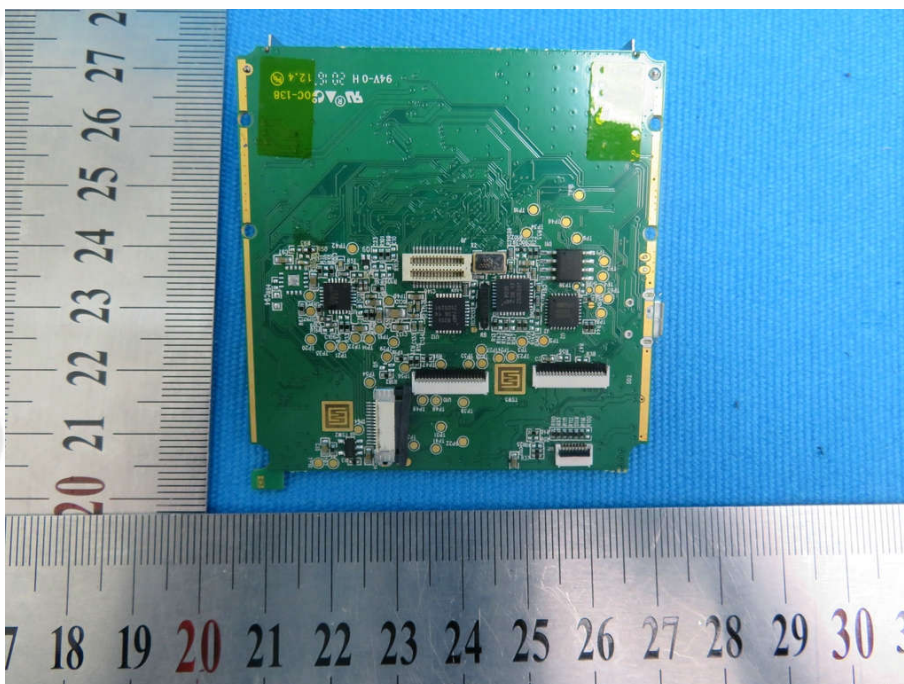
View of Product-33



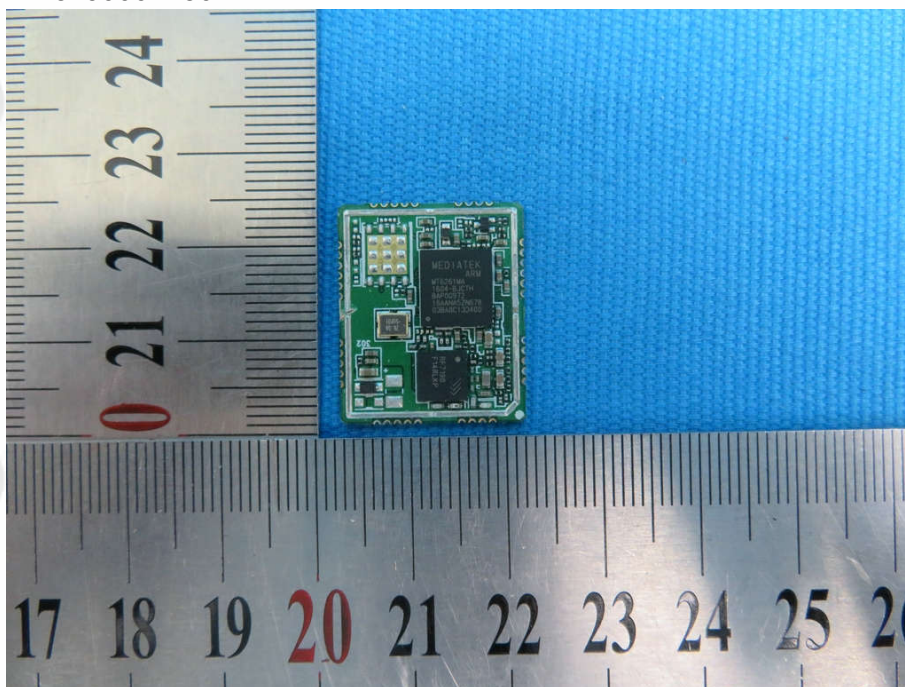
View of Product-34



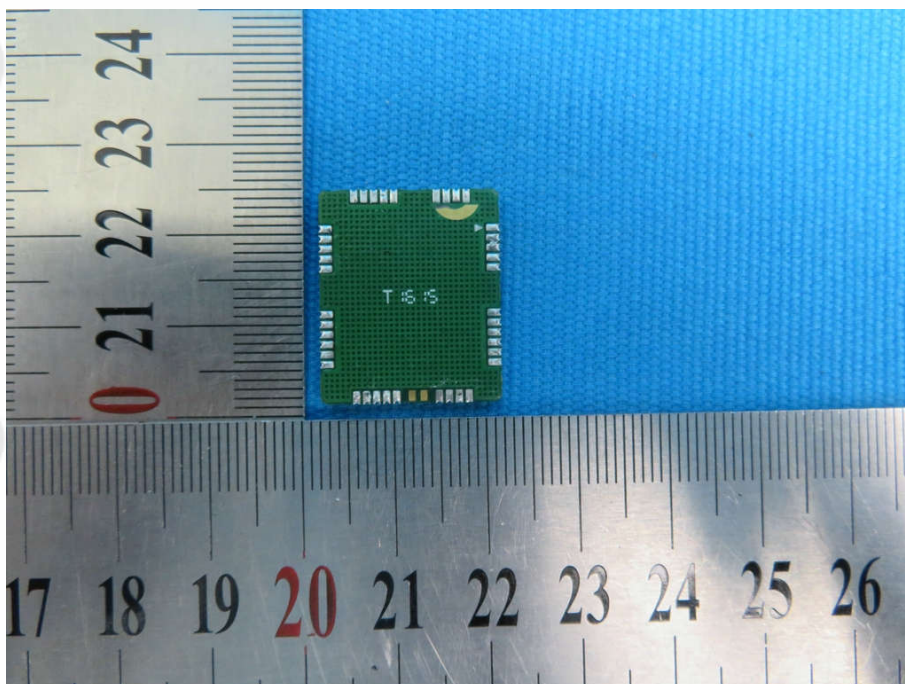
View of Product-35



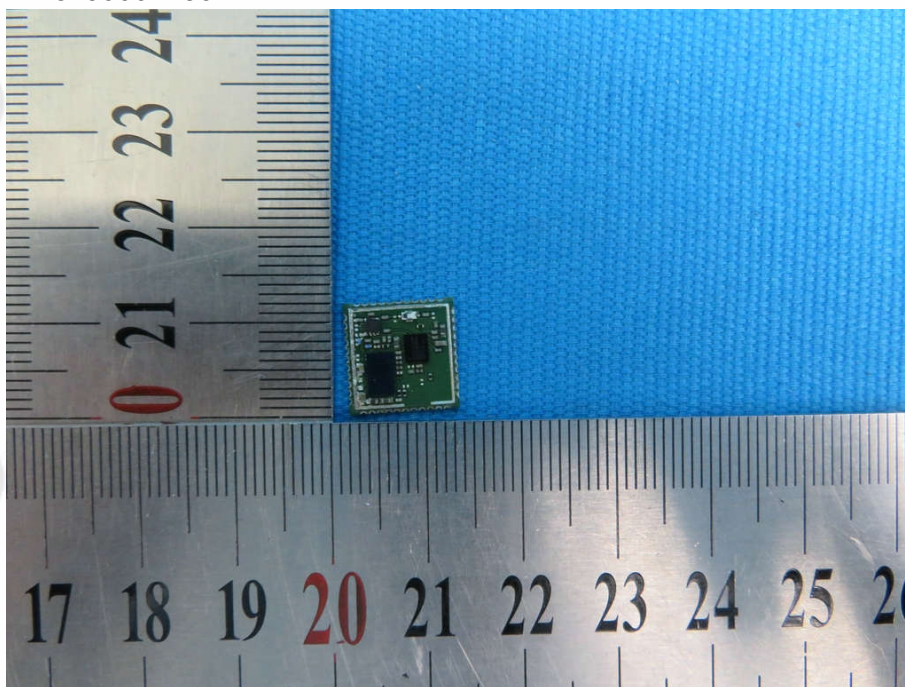
View of Product-36



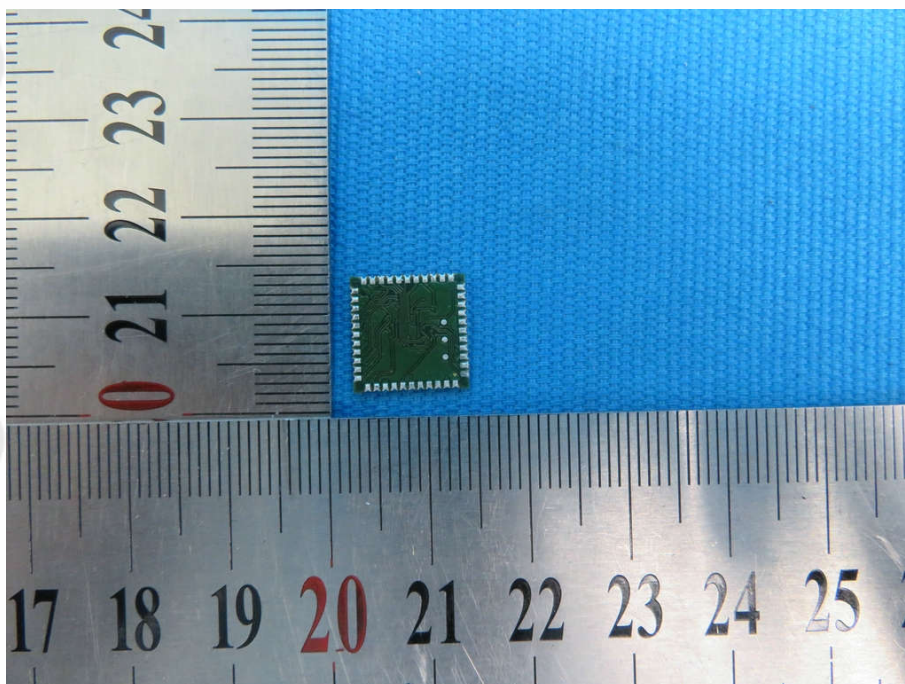
View of Product-37



View of Product-38



View of Product-39



View of Product-40

*** End of Report ***

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