FCC TEST REPORT

Product	:	Smart Indicating System
Trade mark	:	Walk Horizon
Model/Type reference	:	WH-SR1000
Serial Number	:	N/A
Report Number	:	EED32I00332801
FCC ID	:	2AKW8-RL04SR
Date of Issue	:	Mar. 30, 2017
Test Standards	:	47 CFR Part 15 Subpart C (2015)
Test result	:	PASS

Prepared for:

Walk Horizon Technology (Beijing) Co., Ltd.
Room 121, Building B1, Shouxindasha, 5 Jiangtai Road, Chaoyang District, Beijing, 100015, China

Prepared by:

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Tested By:	Tom chen (Test Project)	Compiled by:	Kevin Ian (Project Engineer)
Reviewed by:	Kevin yang (Reviewer)	Approved by:	Sheek Luo (Lab supervisor)
Date:	Mar. 30, 2017		Check No.: 2447644992

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. CTI Report Seal

2 Version

Version No.	Date	Description
00	Mar. 30, 2017	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15 Subpart C Section 15.203	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15 Subpart C Section 15.207	ANSI C63.10-2013	PASS
Field Strength of the Fundamental Signal	47 CFR Part 15 Subpart C Section 15.249 (a)	ANSI C63.10-2013	PASS
Spurious Emissions	47 CFR Part 15 Subpart C Section 15.249 (a)/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15 Subpart C Section 15.249(a)/15.205	ANSI C63.10-2013	PASS
20dB Occupied Bandwidth	47 CFR Part 15 Subpart C Section 15.215 (c)	ANSI C63.10-2013	PASS

Remark:
The tested samples and the sample information are provided by the client.
Test according to ANSI C63.4-2014 & ANSI C63.10-2013.

4 Contents

5 General Information

5.1 Client Information

Applicant:	Walk Horizon Technology (Beijing) Co., Ltd.
Address of Applicant:	Room 121, Building B1, Shouxindasha, 5 Jiangtai Road, Chaoyang District, Beijing, 100015, China
Manufacturer:	Walk Horizon Technology (Beijing) Co., Ltd.
Address of Manufacturer:	Room 121, Building B1, Shouxindasha, 5 Jiangtai Road, Chaoyang District, Beijing, 100015, China
Factory:	Jiangyin SINBON Electronics Co., Ltd
Address of Factory:	No.288, Chengjiang Middle Rd, Jiangyin Economic Development Zone, Jiangsu Province, China.

5.2 General Description of EUT

Product Name:	Smart Indicating System
Model No.(EUT):	WH-SR1000
Trade Mark:	Walk Horizon
EUT Supports Radios application:	TX: 2450MHz, RX: 2440MHz, 2460MHz
Power Supply:	DC 5V by adapter

5.3 Product Specification subjective to this standard

Frequency Range:	2450MHz
Modulation Type:	GFSK
Sample Type:	Fixed production
Hardware Version:	V1.0(manufacturer declare)
Software Version:	V1.0(manufacturer declare)
Antenna Type:	External antenna
Antenna Gain:	3.5dBi
Test voltage:	DC 5V by adapter
Sample Received Date:	Mar. 13, 2017
Sample tested Date:	Mar. 13, 2017 to Mar. 30, 2017

5.4 Test Environment and Mode

Operating Environment:	
Temperature:	24°C
Humidity:	54% RH
Atmospheric Pressure:	1010mbar
Test mode:	
Transmitting mode:	Keep the EUT transmitted the continuous modulation test signal at the specific channel(s)

5.5 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	Supplied by
Power Adapter	Apple	A1443	Client

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-2

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-2 .

IC-Registration No.: 7408B-1

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-1.

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

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber & Accessory Equipment	TDK	SAC-3	TTE20130797	06-01-2016	05-31-2019
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	00057410	06-30-2015	06-28-2018
Horn Antenna	A.H.SYSTEMS	SAS-574	374	06-30-2015	06-28-2018
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
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	FL3CX03WG18NM12-0398-002	TTF20120439	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	003	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA09CL12-0395-001	TTF20120434	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA08CL12-0393-001	TTF20120435	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA04CL12-0396-002	TTF20120436	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA03CL12-0394-001	TTF20120437	01-11-2017	01-10-2018

RF Conducted test					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Spectrum Analyzer	R&S	FSP40	100416	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
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	TTF20120439	01-11-2017	01-10-2018
High-pass filter	MICRO-TRONICS	SPA-F-63029-4	003	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA09C L12-0395-001	TTF20120434	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX01CA08C L12-0393-001	TTF20120435	01-11-2017	01-10-2018
band rejection filter	Sinoscite	FL5CX02CA04C L12-0396-002	TTF20120436	01-11-2017	01-10-2018

Conducted disturbance Test					
Equipment	**Manufacturer**	**Mode 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
LISN	R&S	ENV216	100098	06-16-2016	06-15-2017
LISN	schwarzbeck	NNLK8121	8121-529	06-16-2016	06-15-2017
Current Probe	R&S	EZ17	100106	06-16-2016	06-15-2017
ISN	TESEQ GmbH	ISN T800	30297	02-23-2017	02-22-2018

7 Test results and Measurement Data

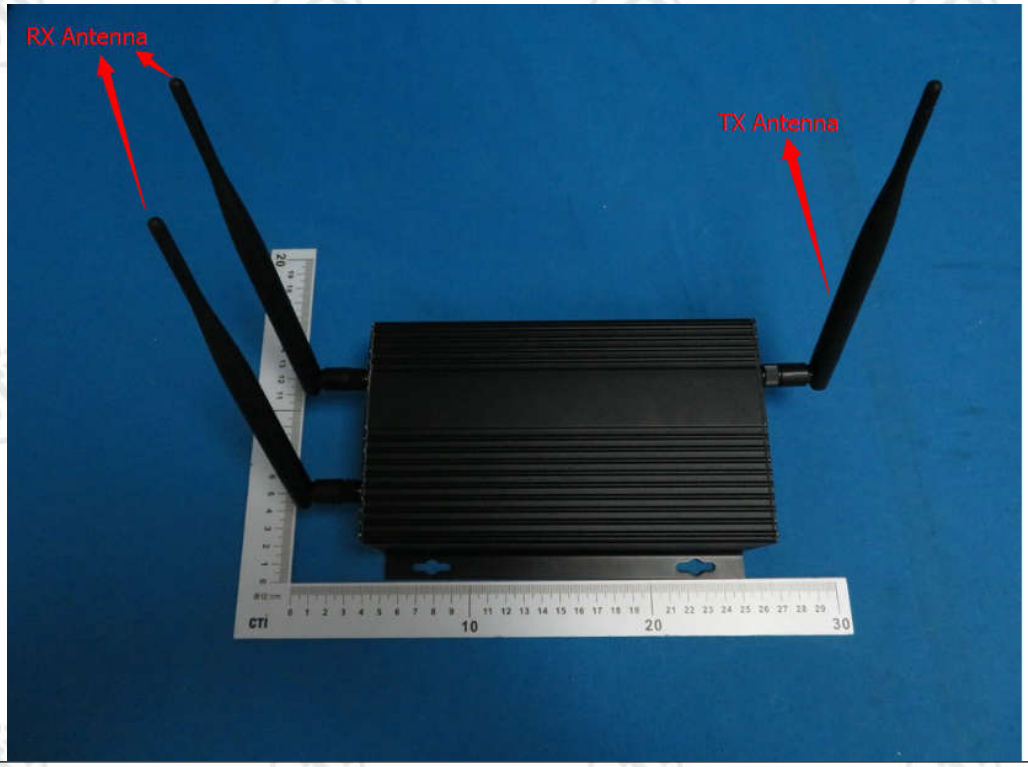
7.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:	

The antenna is External antenna and no consideration of replacement. The best case gain of the antenna is 3.5dBi.



7.2 AC Power Line Conducted Emission

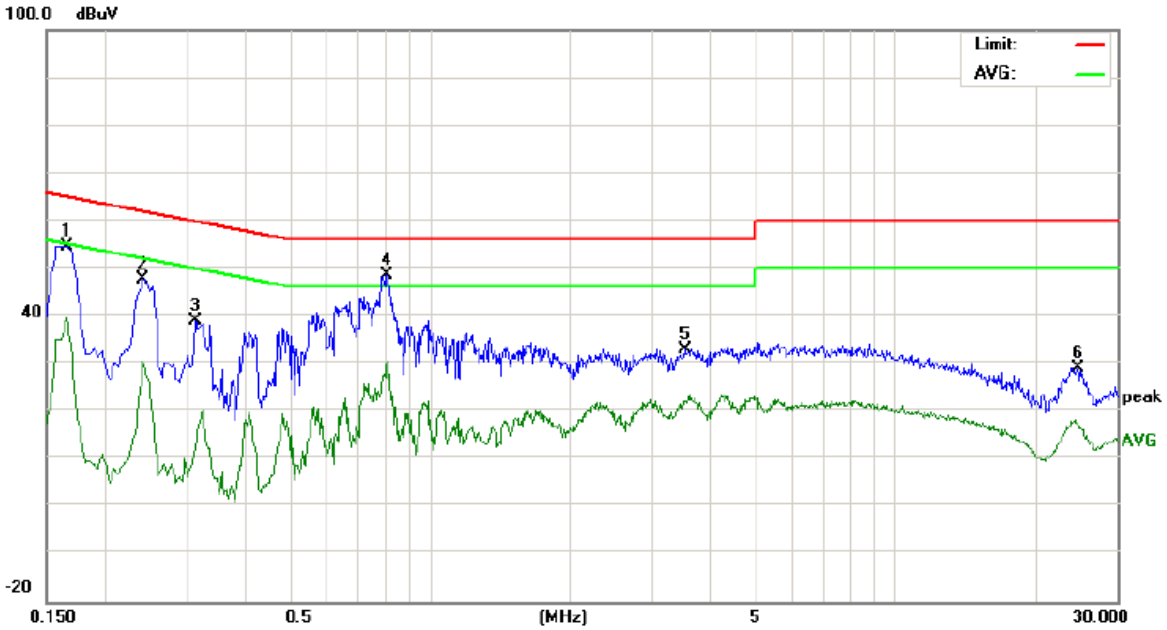
Test Procedure:	Test frequency range :150KHz-30MHz 1)The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all 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 on conducted measurement.
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

* The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.
NOTE : The lower limit is applicable at the transition frequency

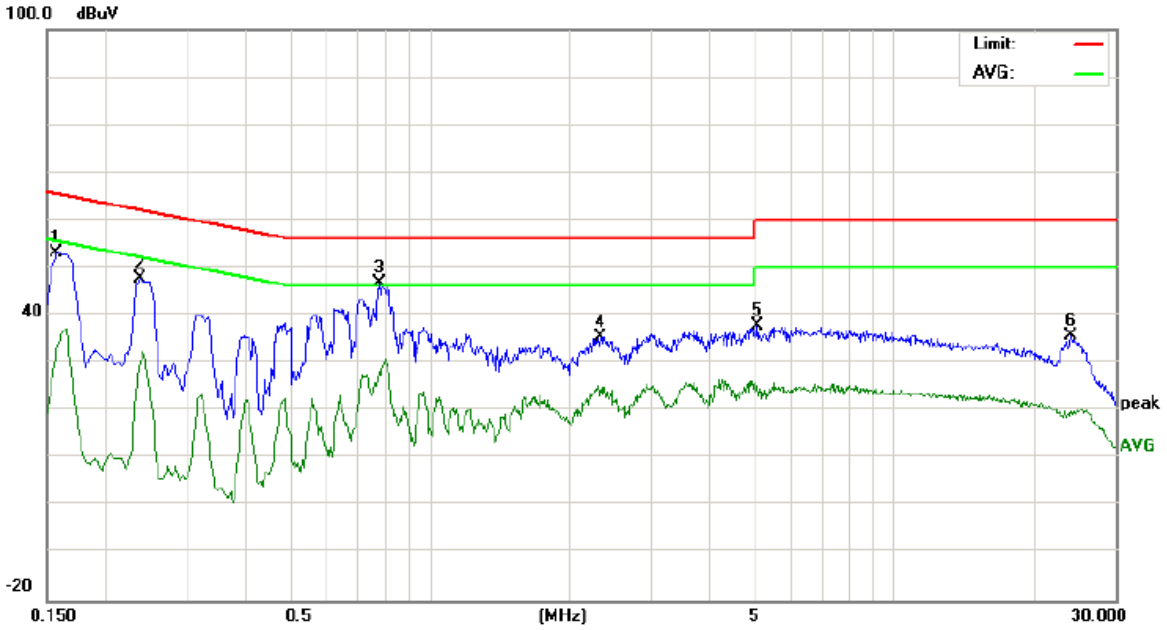
Measurement Data
An initial pre-scan was performed on the live and neutral lines with peak detector.
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Live line:



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1660	44.95		29.70	9.75	54.70		39.45	65.15	55.15	-10.45	-15.70	P	
2	0.2420	37.95		20.85	9.74	47.69		30.59	62.02	52.02	-14.33	-21.43	P	
3	0.3140	29.10		2.80	9.78	38.88		12.58	59.86	49.86	-20.98	-37.28	P	
4	0.8100	38.88		20.66	9.74	48.62		30.40	56.00	46.00	-7.38	-15.60	P	
5	3.5460	23.41		12.41	9.67	33.08		22.08	56.00	46.00	-22.92	-23.92	P	
6	24.7900	18.94		7.13	10.18	29.12		17.31	60.00	50.00	-30.88	-32.69	P	

Neutral line:



No.	Freq.	Reading_Level (dBuV)			Correct Factor	Measurement (dBuV)			Limit (dBuV)		Margin (dB)			
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	QP	AVG	QP	AVG	P/F	Comment
1	0.1580	43.35		22.88	9.76	53.11		32.64	65.56	55.56	-12.45	-22.92	P	
2	0.2380	37.78		20.59	9.74	47.52		30.33	62.16	52.16	-14.64	-21.83	P	
3	0.7820	37.05		18.54	9.74	46.79		28.28	56.00	46.00	-9.21	-17.72	P	
4	2.3420	25.77		14.76	9.71	35.48		24.47	56.00	46.00	-20.52	-21.53	P	
5	5.0939	28.18		15.65	9.62	37.80		25.27	60.00	50.00	-22.20	-24.73	P	
6	24.0300	25.48		9.62	10.18	35.66		19.80	60.00	50.00	-24.34	-30.20	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.

7.3 Radiated Spurious Emission

Test Requirement: 47 CFR Part 15C Section 15.249 and 15.209

Test Method: ANSI C63.10

Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)

Receiver Setup:

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

Test Setup:

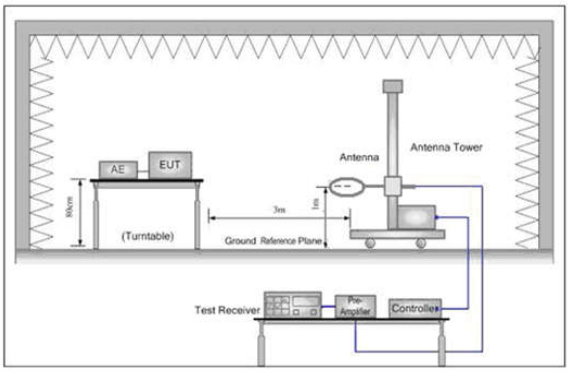


Figure 1. Below 30MHz

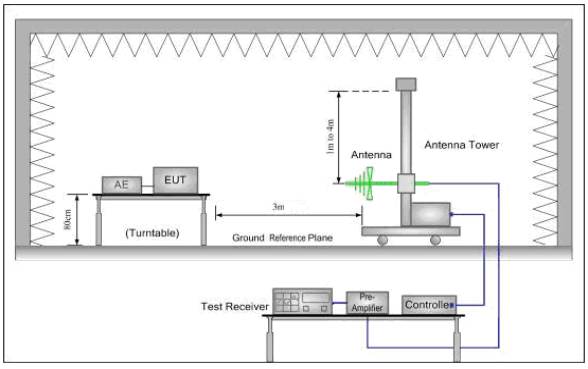


Figure 2. 30MHz to 1GHz

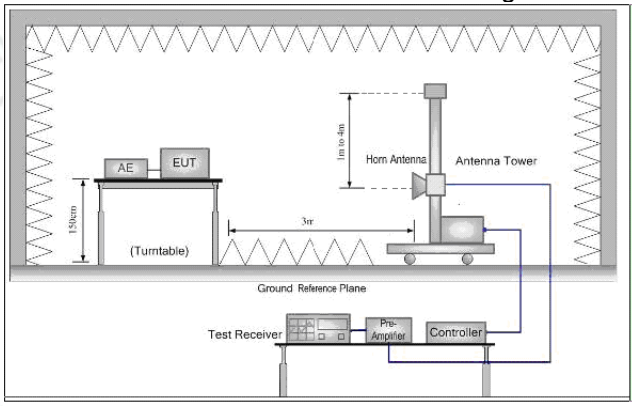


Figure 3. Above 1GHz

Test Procedure:

Below 1GHz test procedure as below:

The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.

The test-receiver system was set to Peak Detect Function and Specified Bandwidth with

Maximum Hold Mode.
If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter).

Test the EUT in the lowest channel , the Highest channel

The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.

Repeat above procedures until all frequencies measured was complete.

Limit: (Spurious Emissions)

Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Limit: (Field strength of the fundamental signal)

Frequency	Limit (dBμV/m @3m)	Remark
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value

Test Mode: Transmitting mode

Instruments Used: Refer to section 6 for details

Test Results: Pass

Measurement Data

Field Strength Of The Fundamental Signal

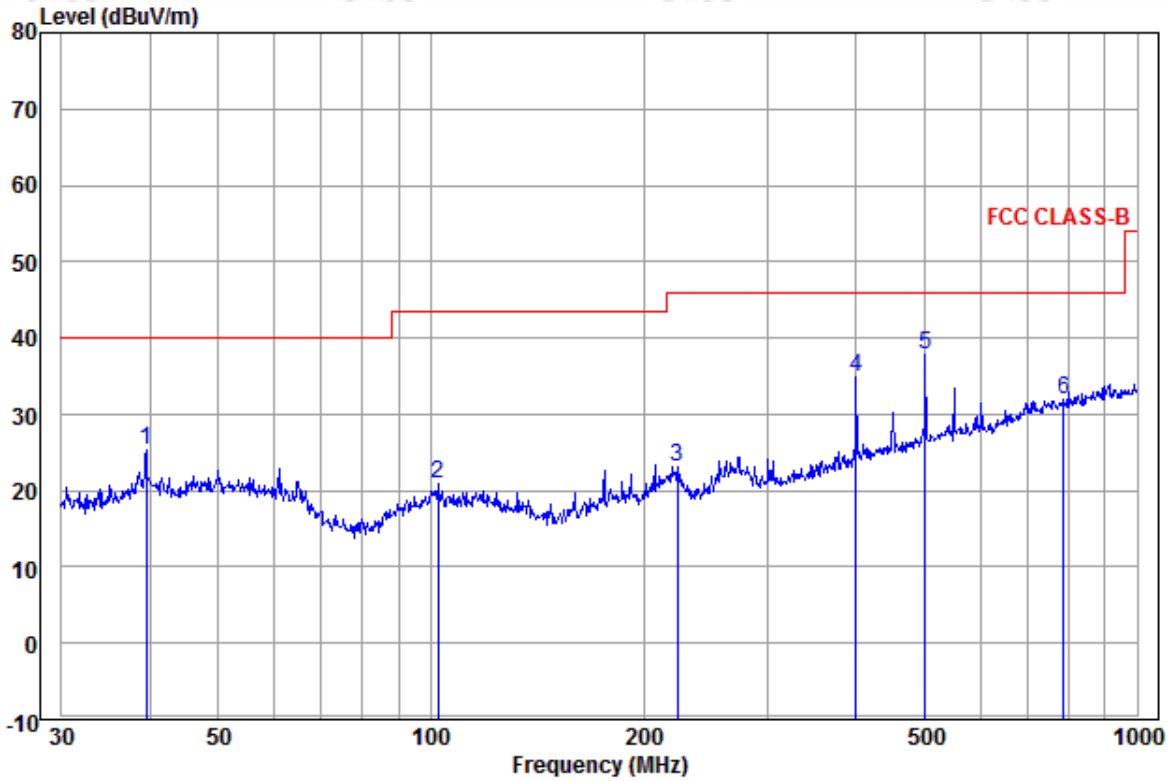
Peak value:

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
2450	32.65	4.43	34.40	86.97	89.65	114	-24.35	Pass	H
2450	32.65	4.42	34.40	87.31	89.98	114	-24.02	Pass	V

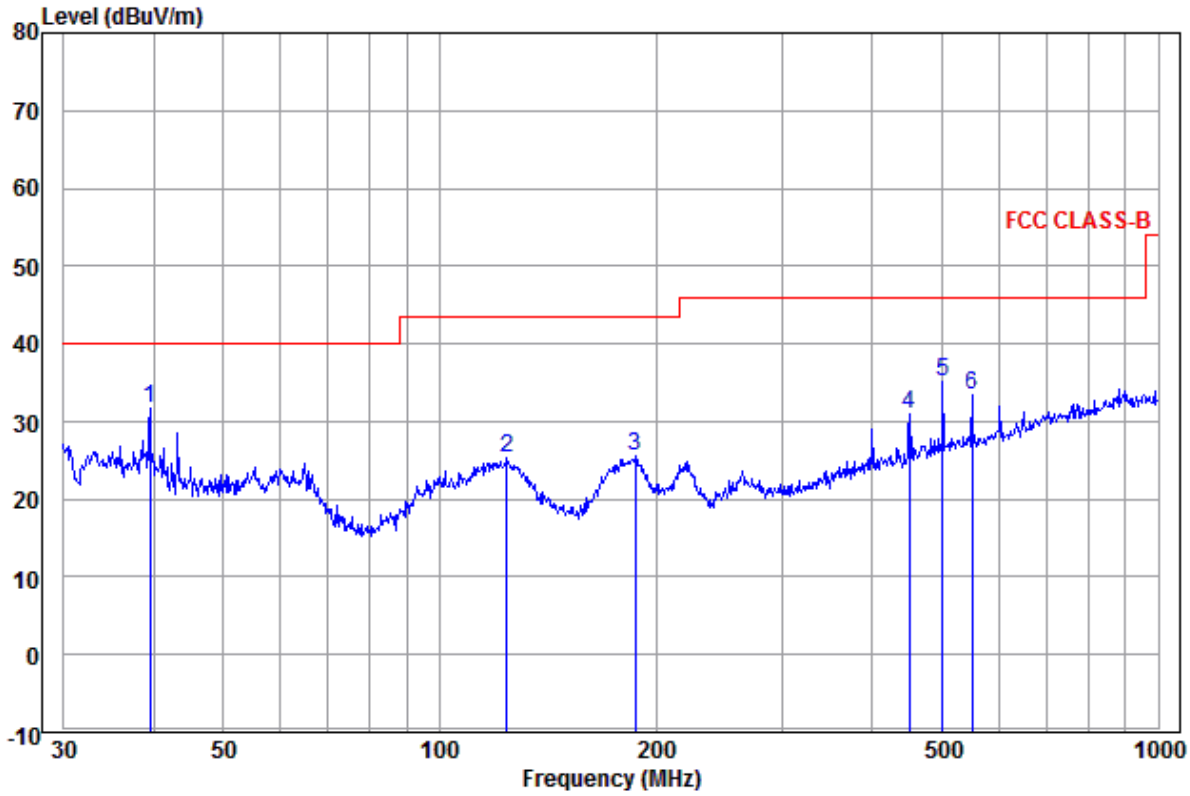
Remark: As shown in this section, for field strength of the fundamental signal measurements, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above. So only the peak measurements were shown in the report.

Spurious Emissions

30MHz~1GHz



	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	39.576	14.14	0.55	10.73	25.42	40.00	-14.58	Horizontal	
2	102.360	13.00	1.57	6.45	21.02	43.50	-22.48	Horizontal	
3	223.733	12.00	2.28	8.94	23.22	46.00	-22.78	Horizontal	
4	400.432	16.31	2.80	15.80	34.91	46.00	-11.09	Horizontal	
5 pp	501.179	18.40	3.13	16.30	37.83	46.00	-8.17	Horizontal	
6	787.851	21.46	3.87	6.63	31.96	46.00	-14.04	Horizontal	



	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1 pp	39.576	14.14	0.55	17.06	31.75	40.00	-8.25	Vertical	
2	124.133	11.33	1.58	12.35	25.26	43.50	-18.24	Vertical	
3	187.096	11.16	2.06	12.23	25.45	43.50	-18.05	Vertical	
4	451.135	17.13	2.99	10.74	30.86	46.00	-15.14	Vertical	
5	501.179	18.40	3.13	13.50	35.03	46.00	-10.97	Vertical	
6	550.948	18.60	3.22	11.50	33.32	46.00	-12.68	Vertical	

Above 1GHz			
Test mode:	Transmitting	Test Frequency :	2450MHz

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Result	Antenna Polaxis
1232.117	30.30	2.55	34.93	41.32	39.24	74	-34.76	Pass	H
2179.145	32.10	3.74	34.34	39.28	40.78	74	-33.22	Pass	H
3168.080	33.45	5.59	34.52	38.03	42.55	74	-31.45	Pass	H
4900.000	34.89	5.08	34.33	34.75	40.39	74	-33.61	Pass	H
7350.000	36.44	6.80	34.90	34.85	43.19	74	-30.81	Pass	H
9800.000	38.09	7.57	35.04	35.95	46.57	74	-27.43	Pass	H
1235.257	30.31	2.56	34.93	37.29	35.23	74	-38.77	Pass	V
1768.619	31.35	3.06	34.46	35.77	35.72	74	-38.28	Pass	V
3104.217	33.51	5.60	34.51	34.73	39.33	74	-34.67	Pass	V
4900.000	34.89	5.08	34.33	31.60	37.24	74	-36.76	Pass	V
7350.000	36.44	6.80	34.90	33.03	41.37	74	-32.63	Pass	V
9800.000	38.09	7.57	35.04	31.75	42.37	74	-31.63	Pass	V

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading - Correct Factor
Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor
Scan from the test data, The average value is lower than limit, and The below the limit need not be reported, so only the peak value had been displayed.

2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

7.4 Emissions Out of Band-edge

Test Requirement: 47 CFR Part 15C Section 15.209 and 15.205
Test Method: ANSI C63.10
Test Site: Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit(Band Edge): Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Frequency	Limit (dBμV/m @3m)	Remark
30MHz-88MHz	40.0	Quasi-peak Value
88MHz-216MHz	43.5	Quasi-peak Value
216MHz-960MHz	46.0	Quasi-peak Value
960MHz-1GHz	54.0	Quasi-peak Value
Above 1GHz	54.0	Average Value
	74.0	Peak Value

Test Setup:

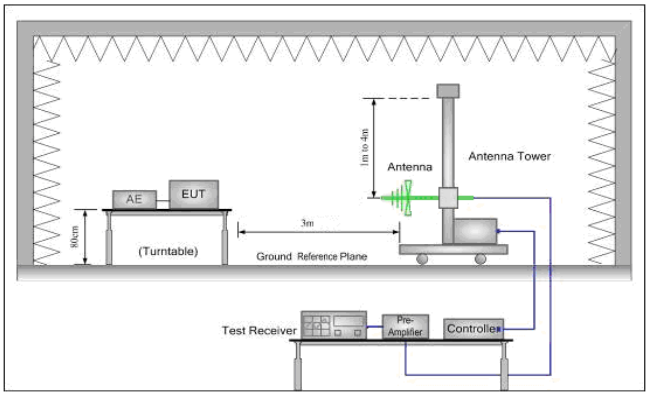


Figure 1. 30MHz to 1GHz

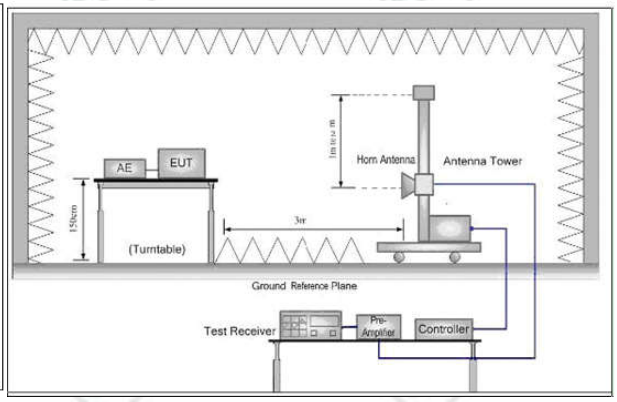


Figure 2. Above 1 GHz

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
h. Test the EUT in the lowest channel , the Highest channel
i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case.
j. Repeat above procedures until all frequencies measured was complete.

Instruments Used: Refer to section 6 for details
Test Mode: Transmitting mode
Test Results: Pass

Test plot as follows:

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Premap Factor (dB)	Read Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)	Antenna Polaxis	Remark
2390.00	32.53	4.28	34.39	56.62	59.04	74	-14.96	H	PK
2390.00	32.53	4.28	34.39	35.17	37.59	54	-16.41	H	AV
2400.00	32.55	4.30	34.39	57.46	59.92	74	-14.08	H	PK
2400.00	32.55	4.30	34.39	34.99	37.45	54	-16.55	H	AV
2390.00	32.53	4.28	34.39	62.62	65.04	74	-8.96	V	PK
2390.00	32.53	4.28	34.39	35.95	38.37	54	-15.63	V	AV
2400.00	32.55	4.30	34.39	63.55	66.01	74	-7.99	V	PK
2400.00	32.55	4.30	34.39	36.01	38.47	54	-15.53	V	AV
2483.50	32.71	4.51	34.41	57.78	60.59	74	-13.41	H	PK
2483.50	32.71	4.51	34.41	35.39	38.20	54	-15.80	H	AV
2483.50	32.71	4.51	34.41	64.08	66.89	74	-7.11	V	PK
2483.50	32.71	4.51	34.41	35.76	38.57	54	-15.43	V	AV

Remark:

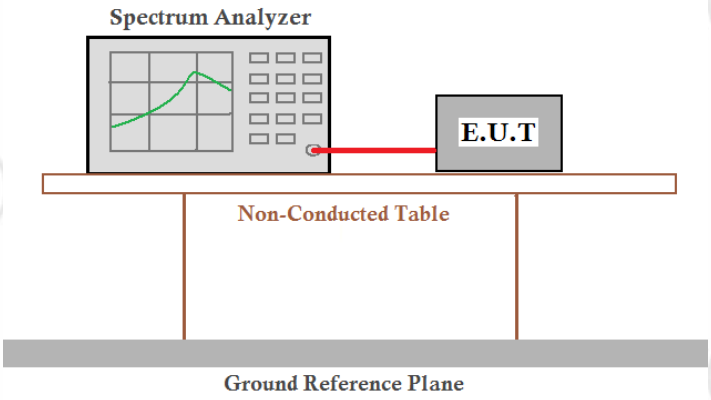
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor– Antenna Factor–Cable Factor

7.5 20dB Bandwidth

Test Requirement: 47 CFR Part 15C Section 15.215
Test Method: ANSI C63.10
Test Setup:

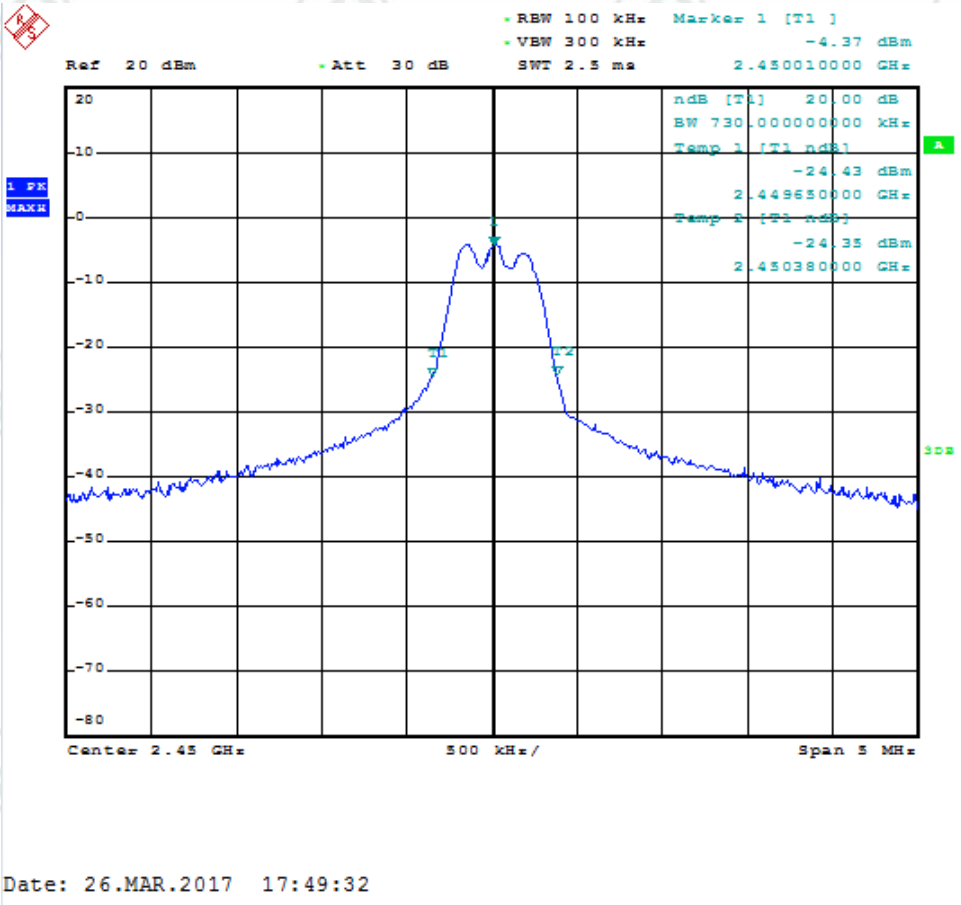


Test Mode: Transmitter mode
Limit: N/A
Instruments Used: Refer to section 6 for details

Test Channel/Frequency	20dB bandwidth (MHz)
2450MHz	0.73

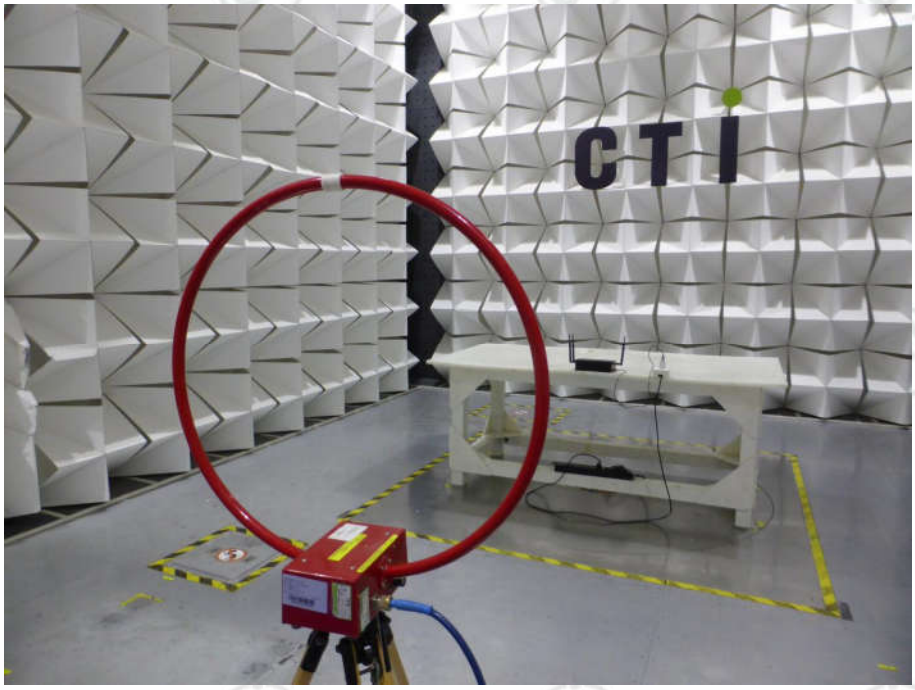
Test plot as follows:

2450Mz



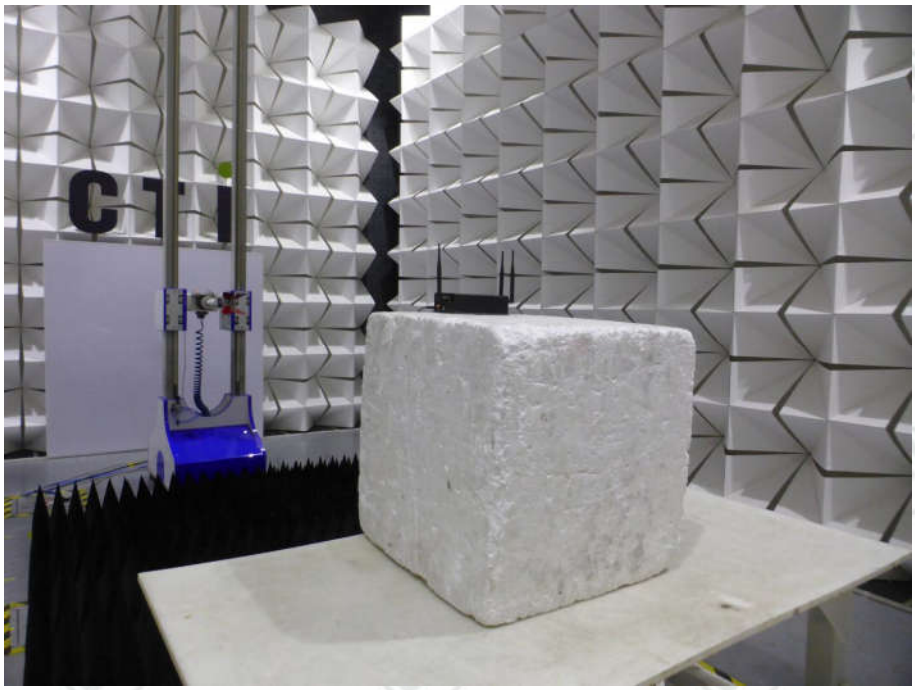
APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Test Model No.: WH-SR1000



Radiated spurious emission Test Setup-1(Below 30MHz)

Radiated spurious emission Test Setup-2(30MHz-1GHz)



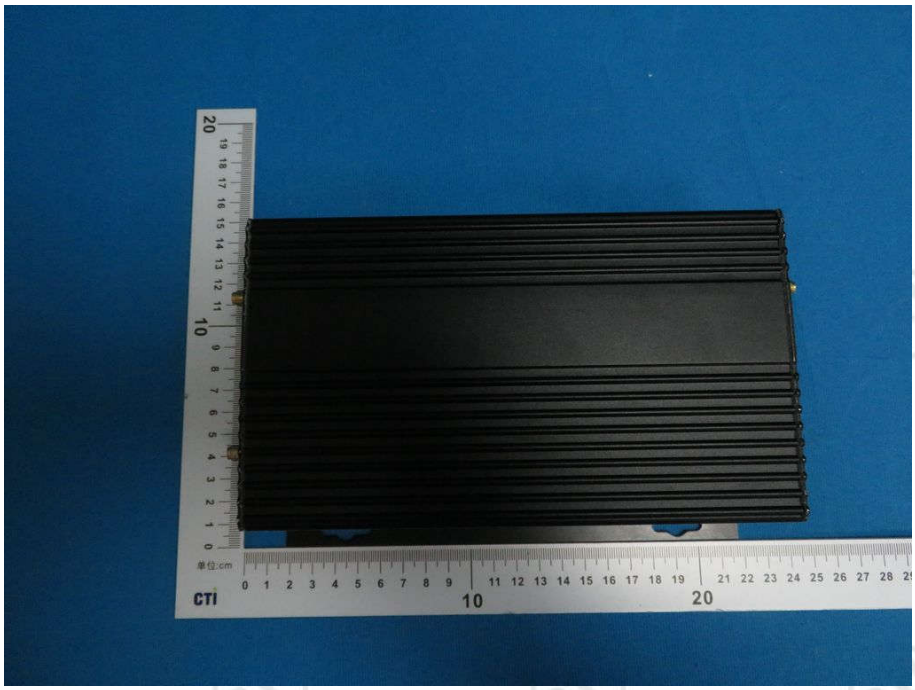
Radiated spurious emission Test Setup-3(Above 1GHz)

Conducted Emissions Test Setup

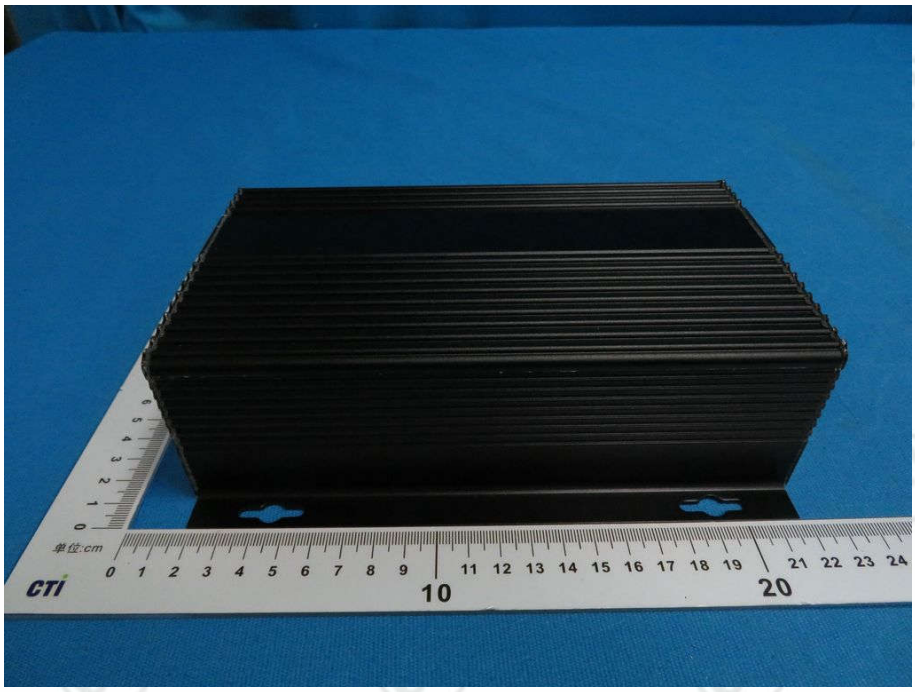
APPENDIX 2 PHOTOGRAPHS OF EUT

Test model No.: WH-SR1000

View of Product-1

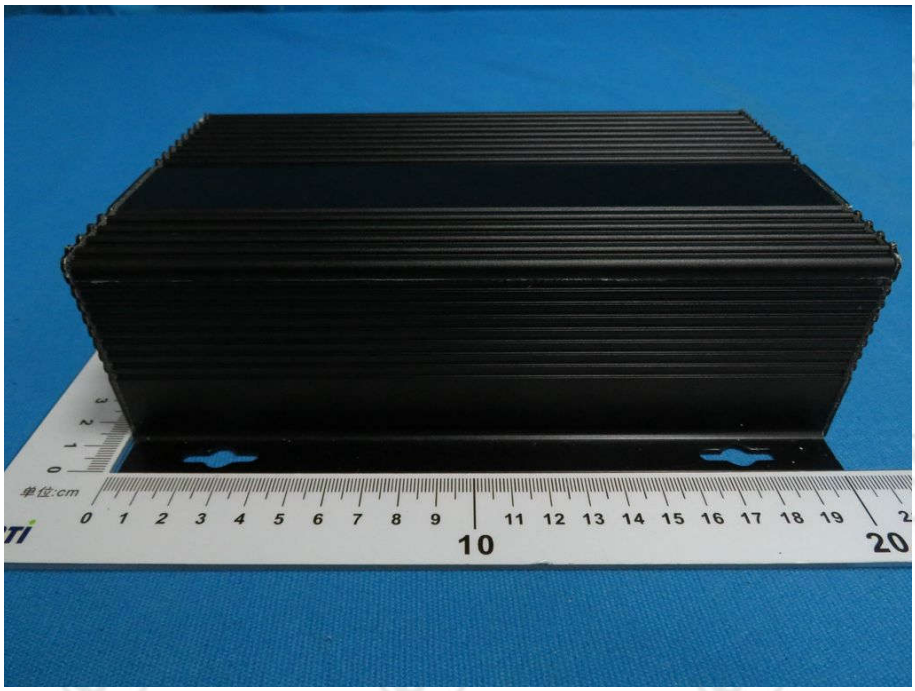


View of Product-2

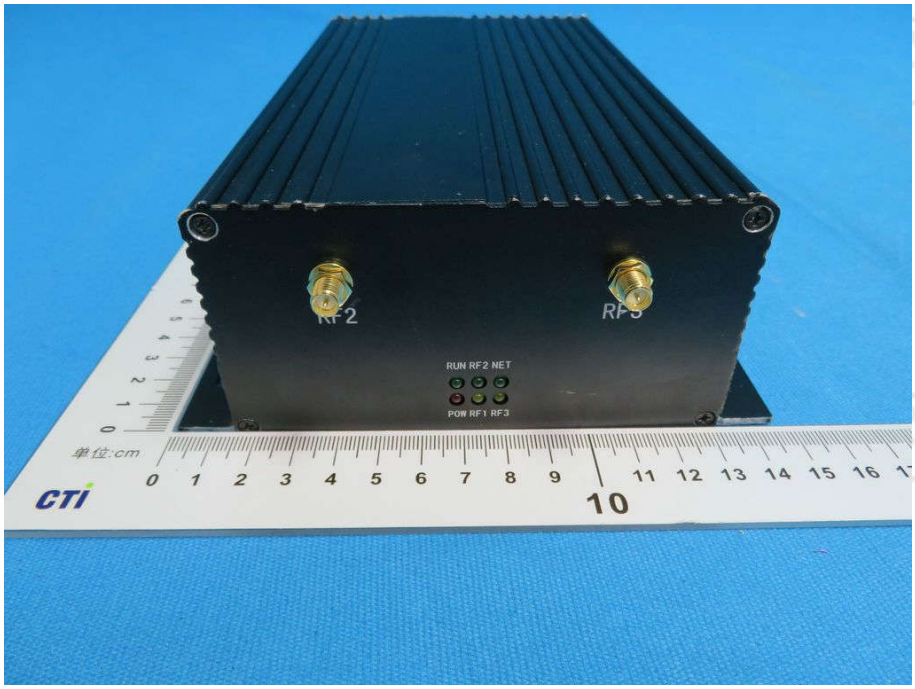


View of Product-3

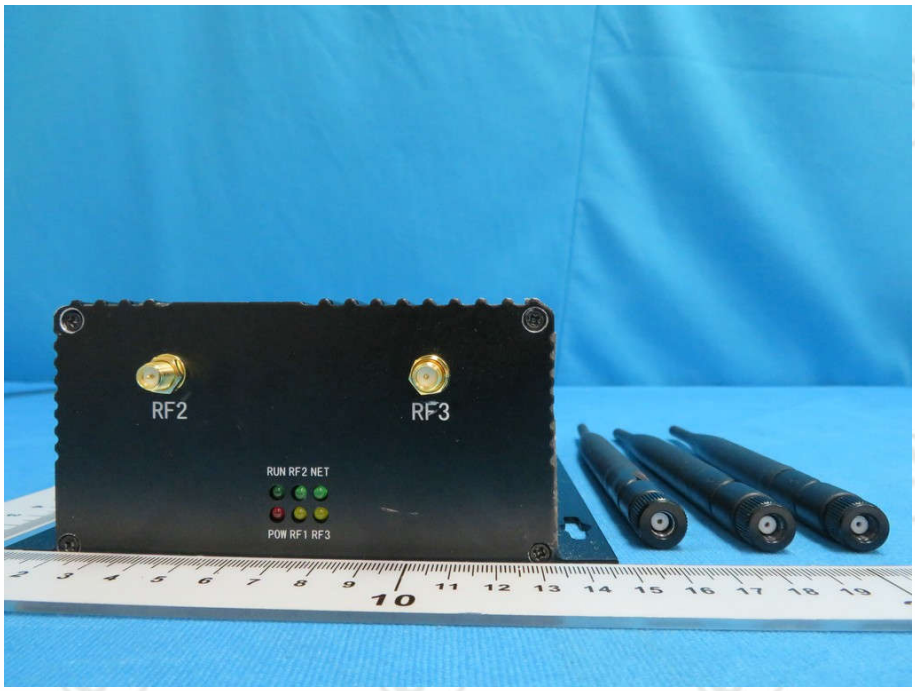
View of Product-4



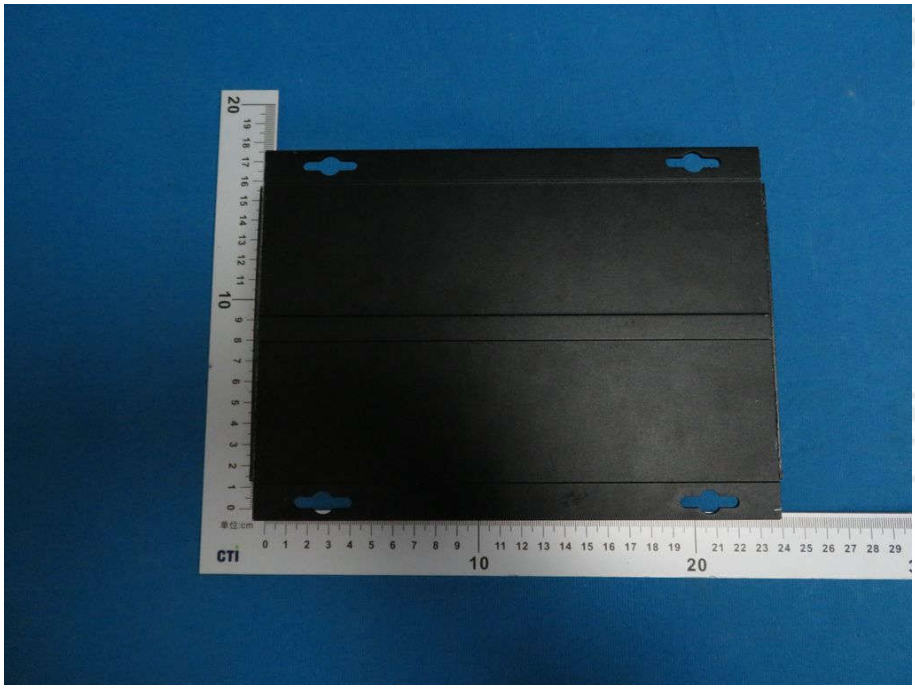
View of Product-5



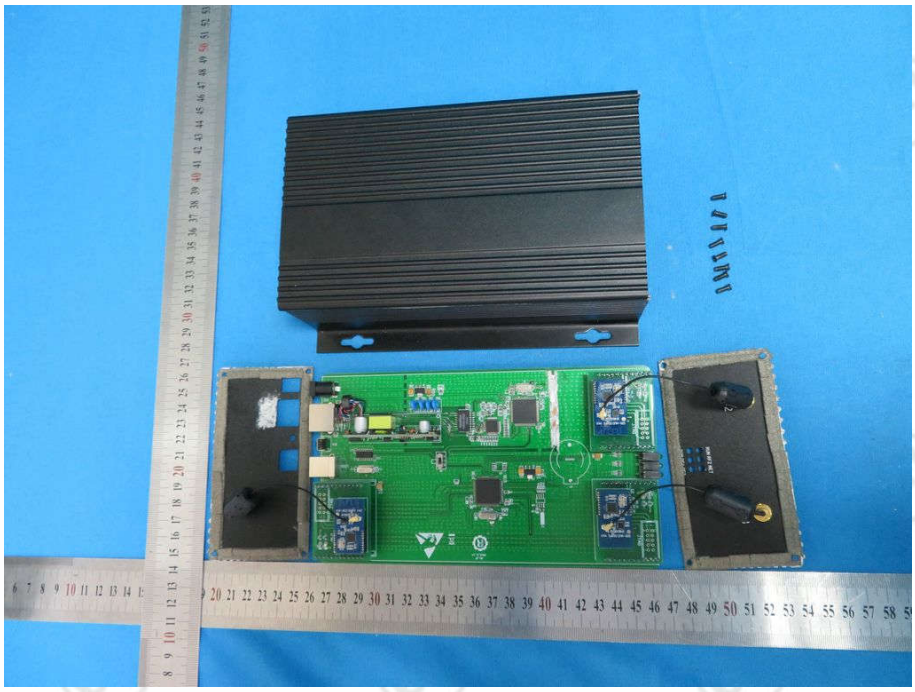
View of Product-6



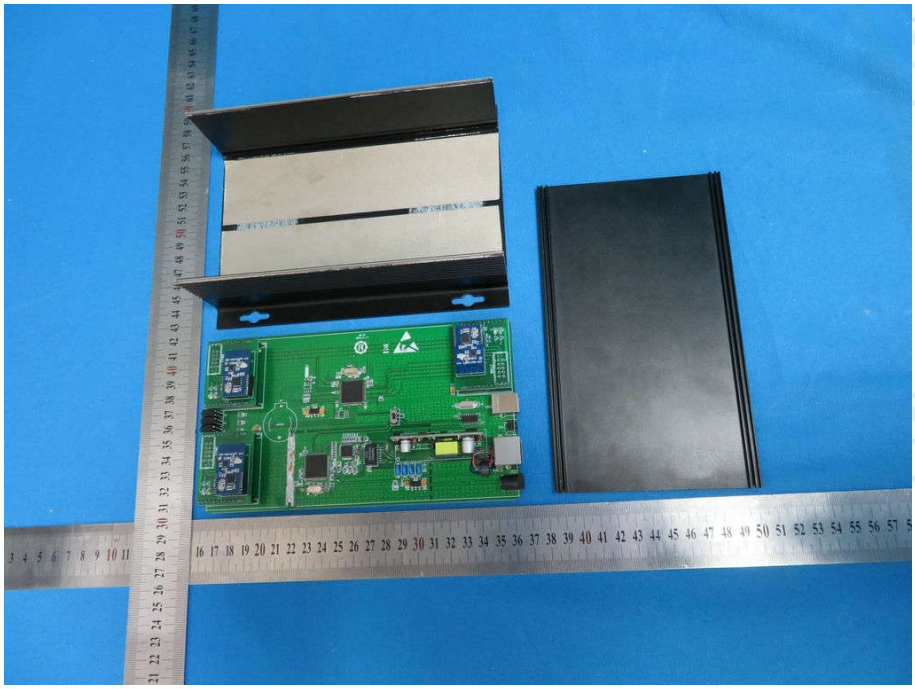
View of Product-7



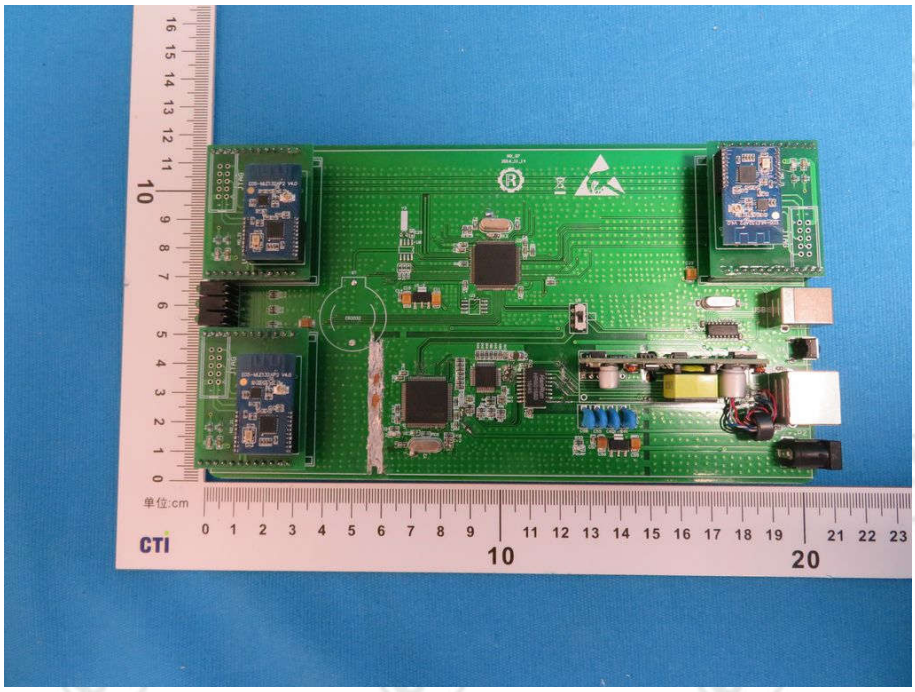
View of Product-8



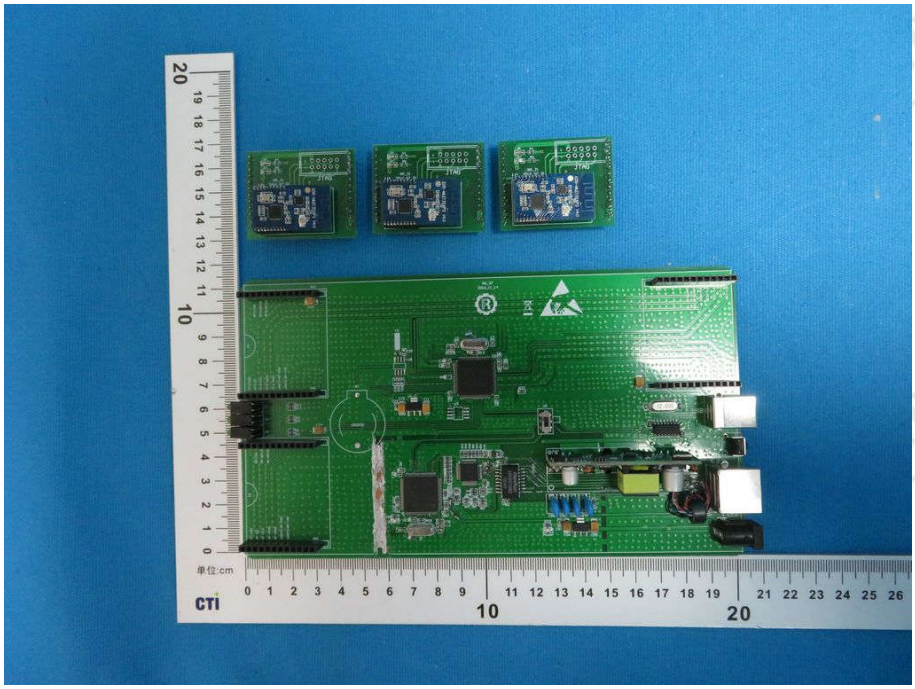
View of Product-9



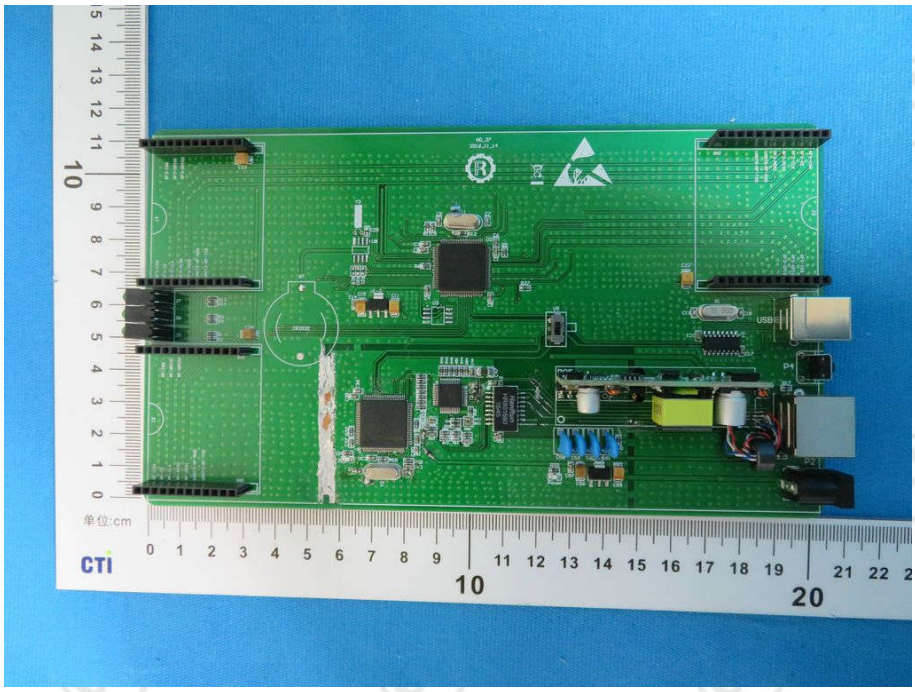
View of Product-10



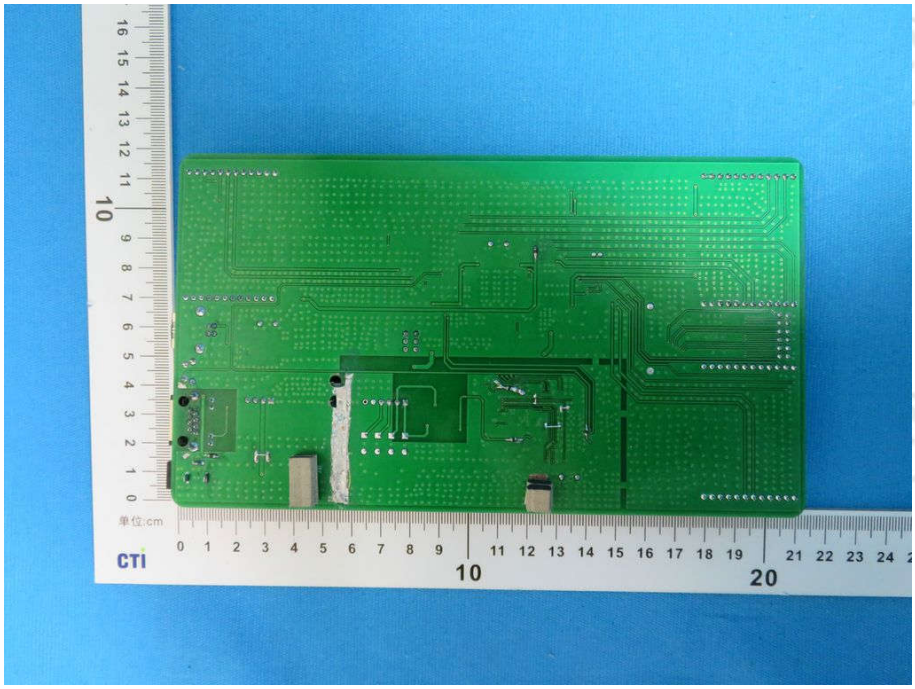
View of Product-11



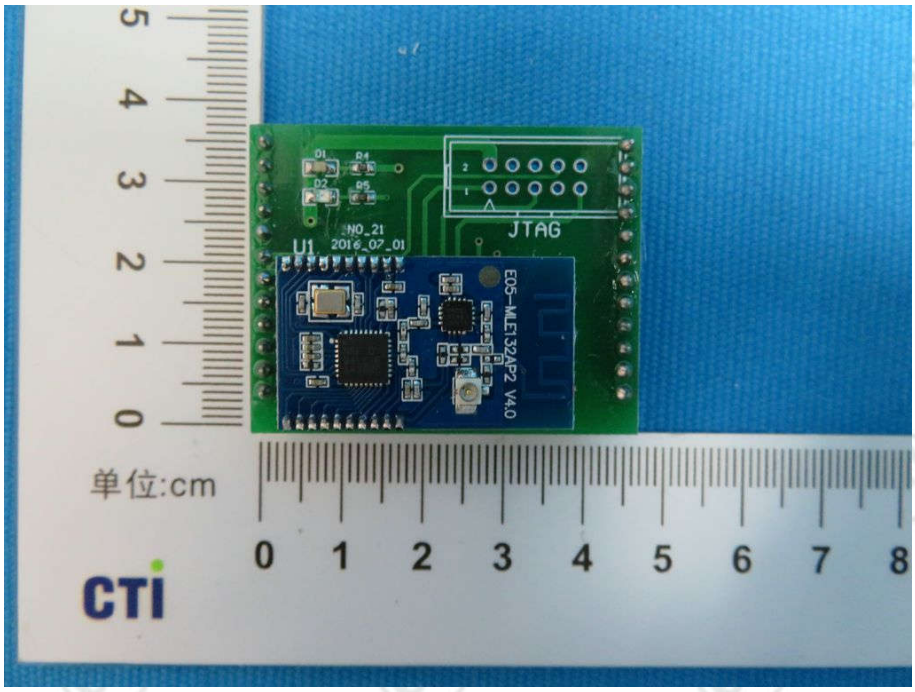
View of Product-12



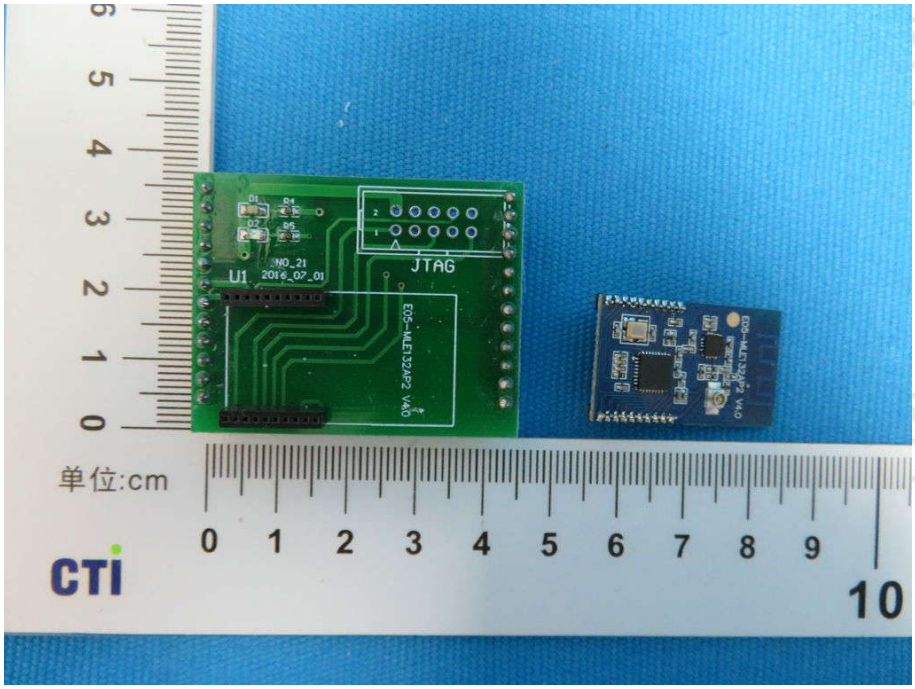
View of Product-13



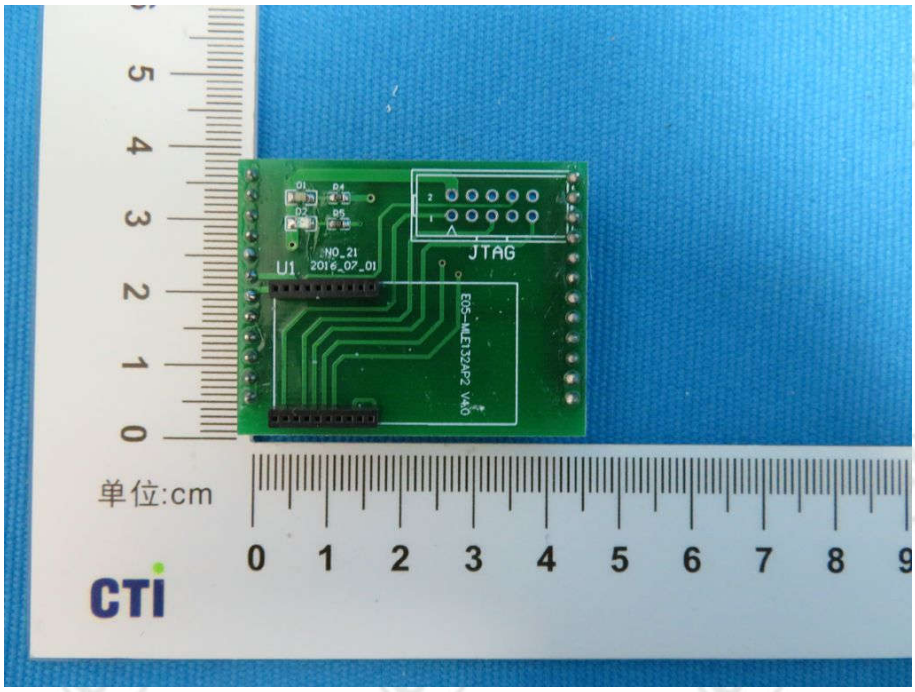
View of Product-14



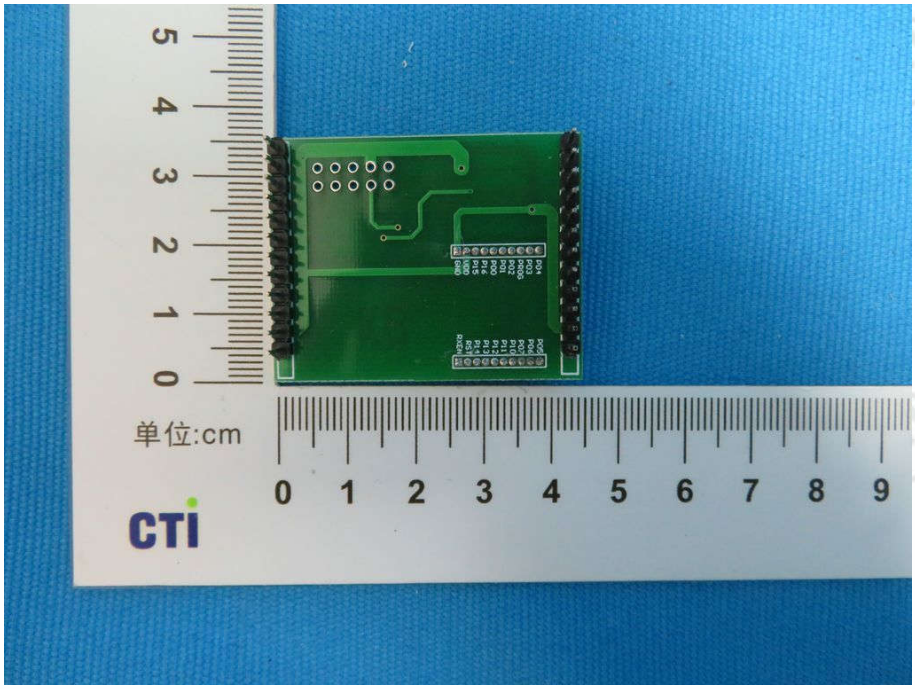
View of Product-15



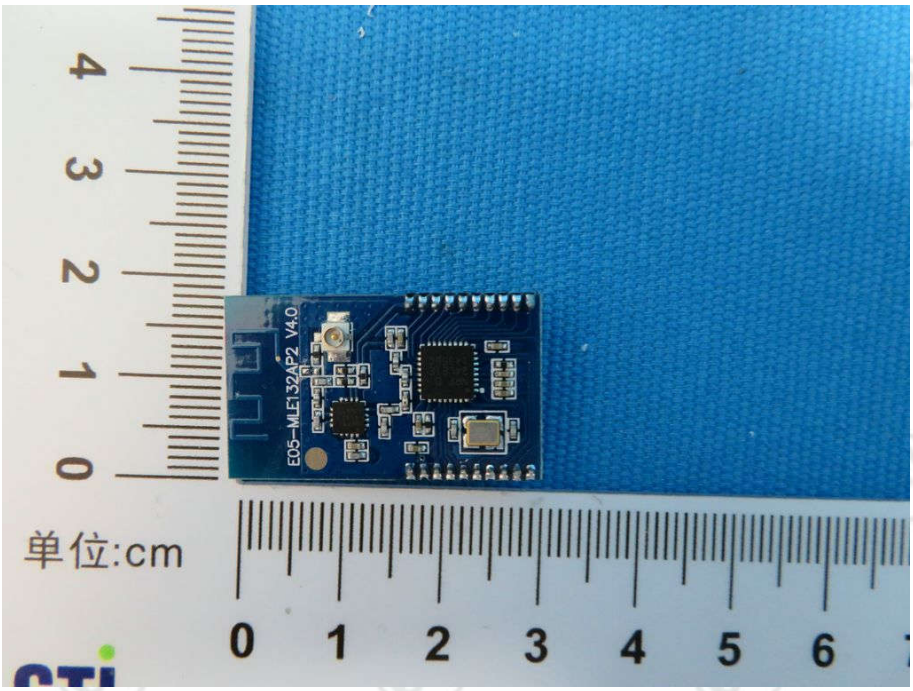
View of Product-16



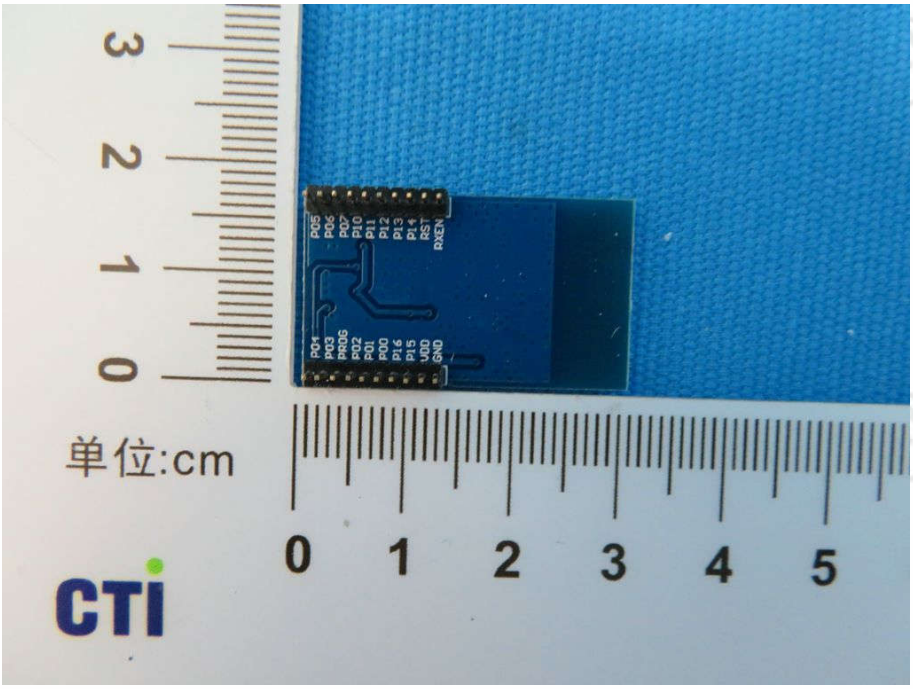
View of Product-17



View of Product-18



View of Product-19



View of Product-20

*** End of Report ***

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