TEST REPORT

Product	:	V-Mark Zigbee HA1.2 Temp tag
Trade mark	:	V-MARK
Model/Type reference	:	VTS03W02
Serial Number	:	N/A
Report Number	:	EED32K00242501
FCC ID	:	2AQ7V-VTSCFDAHATT
Date of Issue	:	Sep. 17, 2018
Test Standards	:	47 CFR Part 15Subpart C
Test result	:	PASS

Prepared for:

V-Mark Enterprises Ltd.
400-601 West Broadway, Vancouver,
British Columbia, Canada

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Tested By:	Tom chen (Test Project)	Compiled by:	Kevin Lan (Project Engineer)
Reviewed by:	Kevin yang (Reviewer)	Approved by:	Sheek Luo (Lab supervisor)
Date:	Sep. 17, 2018		Check No.:1022562054

CENTRE TESTING INTERNATIONAL GROUP CO.,LTD. Report Seal

2 Version

Version No.	Date	Description
00	Sep. 17, 2018	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15Subpart C Section 15.207	ANSI C63.10-2013	N/A
Conducted Peak Output Power	47 CFR Part 15Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15Subpart C Section 15.247 (e)	ANSI C63.10-2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
Radiated Spurious Emissions	47 CFR Part 15Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

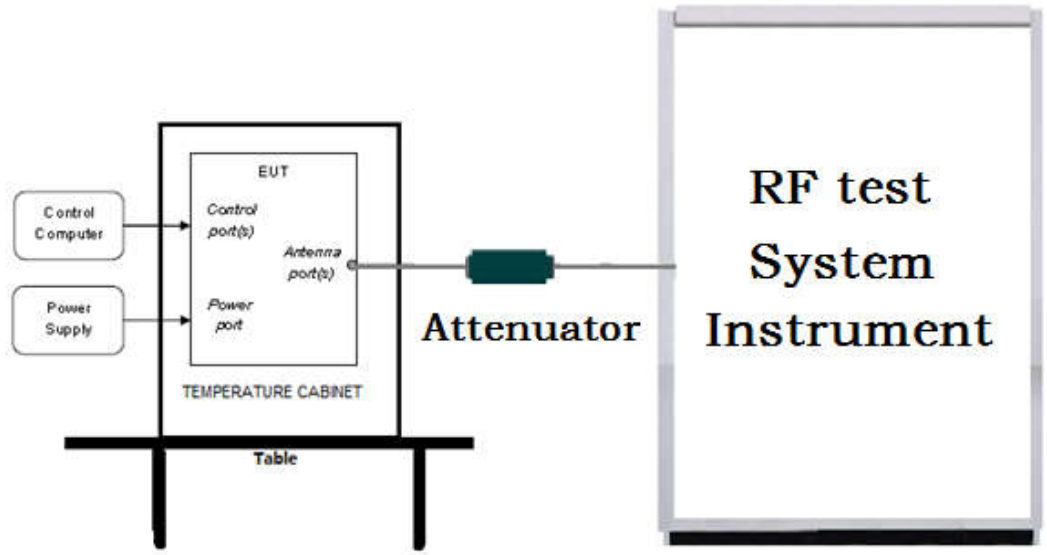
1)Test according to ANSI C63.4-2014 & ANSI C63.10-2013.
2)The tested sample(s) and the sample information are provided by the client.
3)N/A:The device is only battery operated, the test related AC mains is not applicable.

4 Content

5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

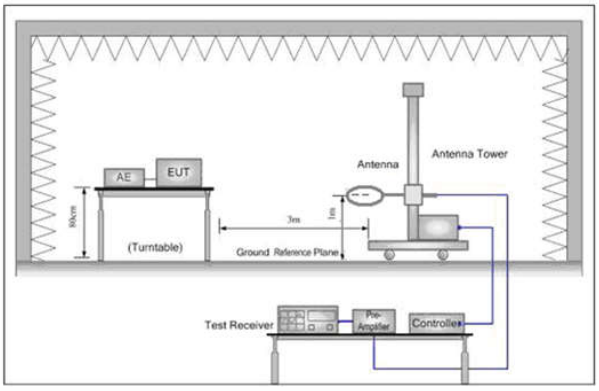


Figure 1. Below 30MHz

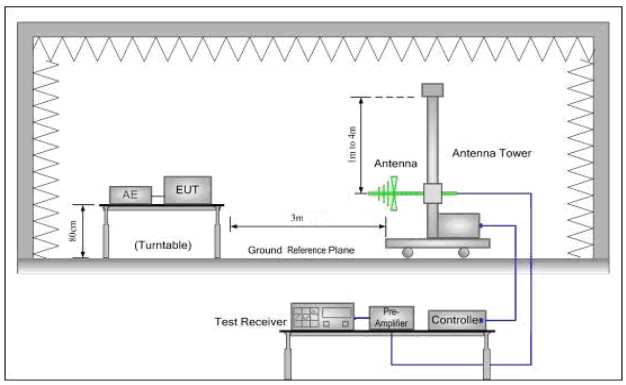


Figure 2. 30MHz to 1GHz

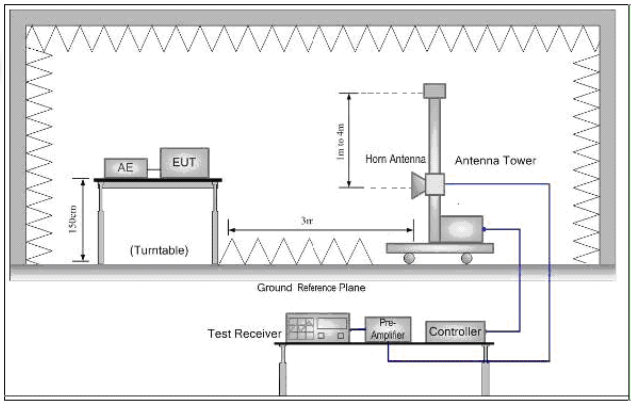


Figure 3. Above 1GHz

5.2 Test Environment

Operating Environment:	
Temperature:	25.3 °C
Humidity:	59 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
OQPSK	2405MHz ~2480 MHz	Channel 1	Channel 9	Channel 16
		2405MHz	2445MHz	2480MHz
TX mode:	The EUT transmitted the continuous signal at the specific channel(s).			

6 General Information

6.1 Client Information

Applicant:	V-Mark Enterprises Ltd.
Address of Applicant:	400-601 West Broadway, Vancouver, British Columbia, Canada
Manufacturer:	Senpu Fishing Tackle Co., Ltd.
Address of Manufacturer:	Floor 2 No 2 Building Fucheng Industrial Park, 82nd Shilian lu, Shiji Town, Panyu District, GuangZhou

6.2 General Description of EUT

Product Name:	V-Mark Zigbee HA1.2 Temp tag
Model No.(EUT):	VTS03W02
Trade mark:	V-MARK
EUT Supports Radios application:	2405MHz to 2480MHz
Power Supply:	Sealed ER14335 lithium-thionyl chloride battery:3.6V,1600mAh
Sample Received Date:	Sep. 04, 2018
Sample tested Date:	Sep. 04, 2018 to Sep. 14, 2018

6.3 Product Specification subjective to this standard

Operation Frequency:	2405MHz to 2480MHz
Modulation Type:	OQPSK
Number of Channel:	16
Sample Type:	Portable production
Test Power Grade:	N/A
Test Software of EUT:	N/A
Firmware version of the sample:	V1.1.7(manufacturer declare)
Hardware version of the sample:	C(manufacturer declare)
Antenna Type and Gain:	Antenna Type:PCB Inverted F Antenna; Antenna Gain:2dBi
Test Voltage:	battery:3.6V,1600mAh

Operation Frequency each of channel			
Channel	Frequency	Channel	Frequency
1	2405MHz	9	2445MHz
2	2410MHz	10	2450MHz
3	2415MHz	11	2455MHz
4	2420MHz	12	2460MHz
5	2425MHz	13	2465MHz
6	2430MHz	14	2470MHz
7	2435MHz	15	2475MHz
8	2440MHz	16	2480MHz

6.4 Description of Support Units

The EUT has been tested independently.

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd
Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China
Telephone: +86 (0) 755 33683668 Fax:+86 (0) 755 33683385
No tests were sub-contracted.
FCC Designation No.: CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 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%

7 Equipment List

RF test system					
Equipment	**Manufacturer**	**Model No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Signal Generator	Keysight	E8257D	MY53401106	03-13-2018	03-12-2019
Spectrum Analyzer	Keysight	N9010A	MY54510339	03-13-2018	03-12-2019
Signal Generator	Keysight	N5182B	MY53051549	11-16-2017	11-15-2018
High-pass filter	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-10-2018	01-09-2019
DC Power	Keysight	E3642A	MY54426035	03-13-2018	03-12-2019
power meter & power sensor	R&S	OSP120	101374	04-11-2018	04-10-2019
RF control unit	JS Tonscend	JS0806-2	2015860006	03-13-2018	03-12-2019
BT&WI-FI Automatic test software	JS Tonscend	JSTS1120-2	---	03-29-2018	03-28-2019
Temperature / Humidity Indicator	Defu	TH128	---	07-02-2018	07-01-2019

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	---	06-04-2016	06-03-2019
Spectrum Analyzer	Agilent	E4443A	MY45300910	11-16-2017	11-15-2018
Receiver	R&S	ESCI	100435	05-25-2018	05-24-2019
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	618	07-30-2018	07-29-2019
Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1869	04-25-2018	04-23-2021
Spectrum Analyzer	R&S	FSP40	100416	05-11-2018	05-10-2019
Preamplifier	JS Tonscend	EMC051845SE	980380	01-19-2018	01-18-2019
Loop Antenna	ETS-LINDGREN	6502	00071730	06-22-2017	06-21-2019
Double ridge horn antenna	A.H.SYSTEMS	SAS-574	6042	06-05-2018	06-04-2021
Pre-amplifier	A.H.SYSTEMS	PAP-1840-60	6041	06-05-2018	06-04-2021
Temperature/ Humidity Indicator	TAYLOR	1451	1905	05-02-2018	05-01-2019
Cable line	Fulai(7M)	SF106	5219/6A	01-10-2018	01-09-2019
Cable line	Fulai(6M)	SF106	5220/6A	01-10-2018	01-09-2019
Cable line	Fulai(3M)	SF106	5216/6A	01-10-2018	01-09-2019
Cable line	Fulai(3M)	SF106	5217/6A	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX01CA09 CL12-0395-001	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX01CA08 CL12-0393-001	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX02CA04 CL12-0396-002	---	01-10-2018	01-09-2019
band rejection filter	Sinoscite	FL5CX02CA03 CL12-0394-001	---	01-10-2018	01-09-2019

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices

Test Results List:

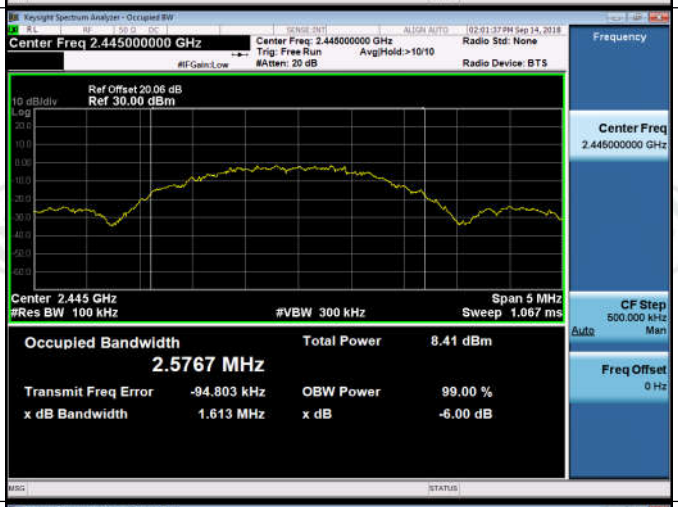
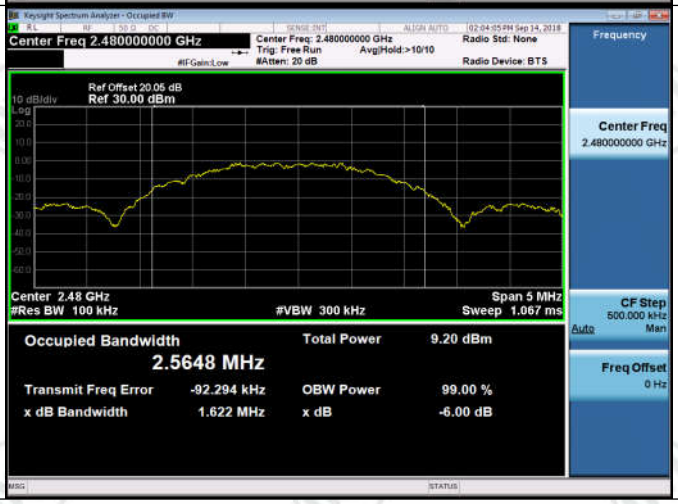
Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix A)
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10	Power Spectral Density	PASS	Appendix E)
Part15C Section 15.203/15.247 (c)	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15C Section 15.207	ANSI C63.10	AC Power Line Conducted Emission	N/A	N/A
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix G)
Part15C Section 15.205/15.209	K ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix H)

Appendix A): 6dB Occupied Bandwidth

Test Result

Mode	Channel	6dB Bandwidth [MHz]	99% OBW[MHz]	Verdict	Remark
OQPSK	LCH	1.647	2.5917	PASS	Peak detector
OQPSK	MCH	1.613	2.5767	PASS	
OQPSK	HCH	1.622	2.5648	PASS	

Test Graphs

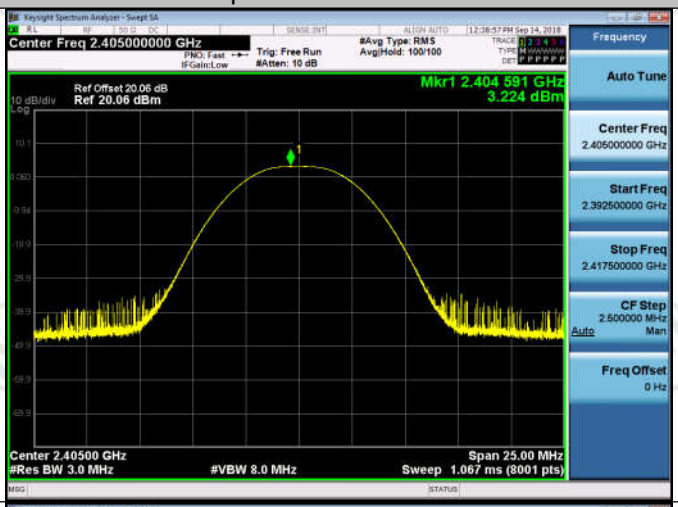
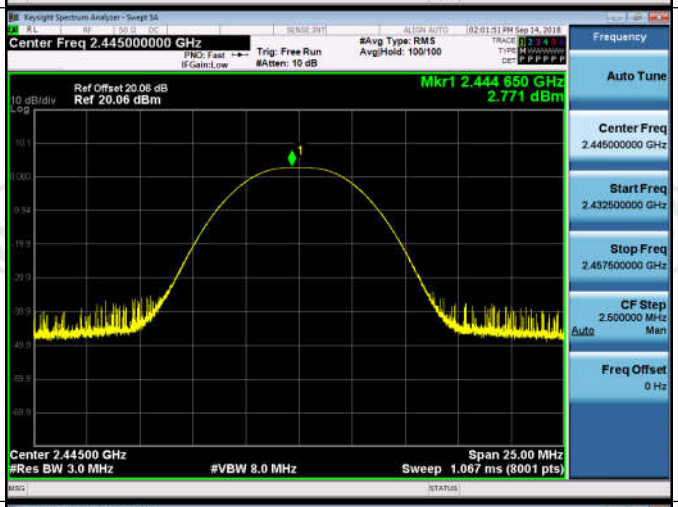
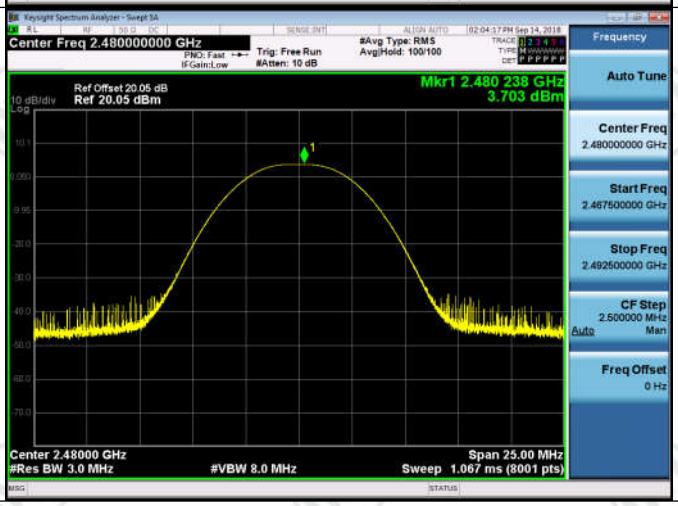
Graphs		
LCH		
MCH		
HCH		

Appendix B): Conducted Peak Output Power

Test Result

Mode	Channel	Conduct Peak Power[dBm]	Verdict
OQPSK	LCH	3.224	PASS
OQPSK	MCH	2.771	PASS
OQPSK	HCH	3.703	PASS

Test Graphs

Graphs		
LCH		
MCH		
HCH		

Appendix C): Band-edge for RF Conducted Emissions

Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
OQPSK	LCH	-1.534	-59.682	-21.53	PASS
OQPSK	HCH	-1.006	-49.955	-21.01	PASS

Test Graphs

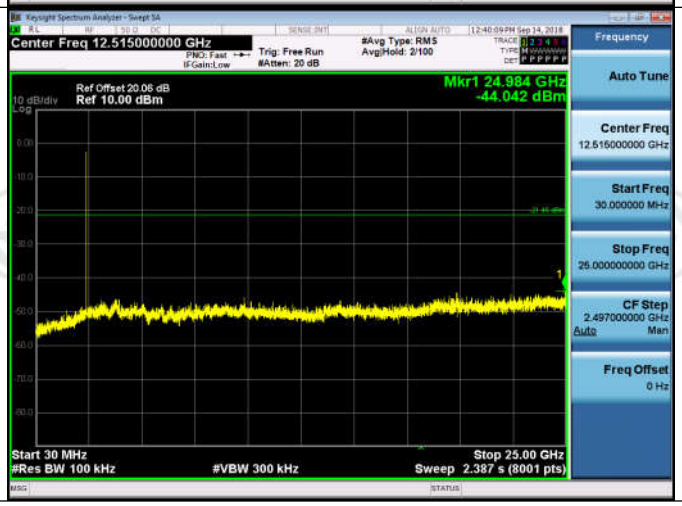
Graphs			
LCH			
HCH			

Appendix D): RF Conducted Spurious Emissions

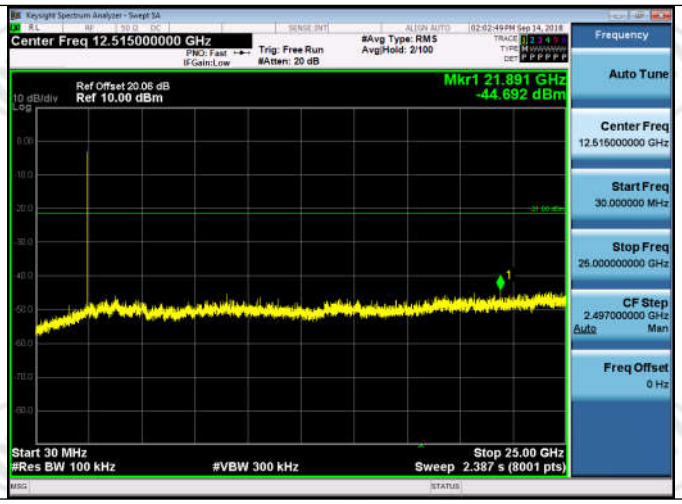
Result Table

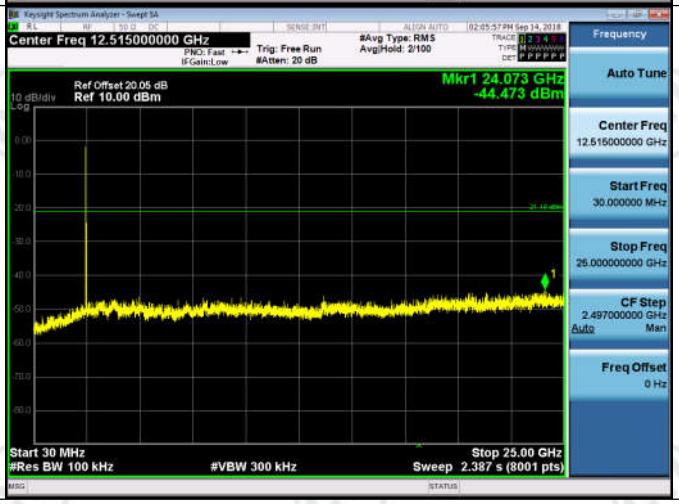
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
OQPSK	LCH	-1.454	<Limit	PASS
OQPSK	MCH	-1.599	<Limit	PASS
OQPSK	HCH	-1.183	<Limit	PASS

Test Graphs

LCH_Graphs		
Pref/LCH		
Puw//LCH		

MCH_Graphs		
Pref/MCH		

Puw/MCH	

HCH_Graphs	
Pref/HCH	
Puw/HCH	

Appendix E): Power Spectral Density

Result Table

Mode	Channel	PSD [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
OQPSK	LCH	-11.649	8	PASS
OQPSK	MCH	-11.506	8	PASS
OQPSK	HCH	-10.586	8	PASS

Test Graphs

Graphs		
LCH		
MCH		
HCH		

Appendix F): Antenna Requirement

15.203 requirement:

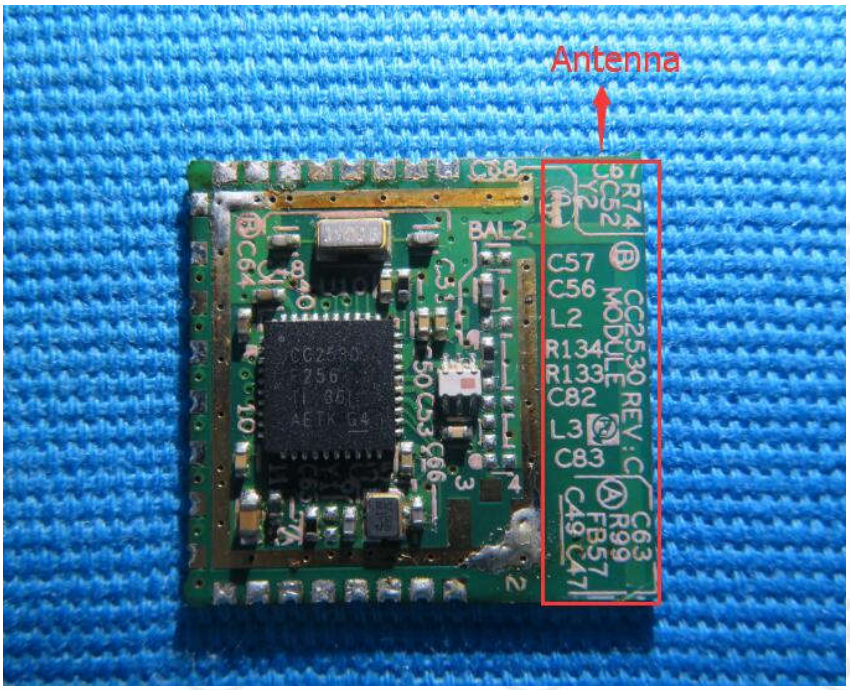
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi.



Appendix G): Restricted bands around fundamental frequency (Radiated)

Receiver Setup:

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

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 and the rotatable 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.

Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel

Above 1GHz test procedure as below:

Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber 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.

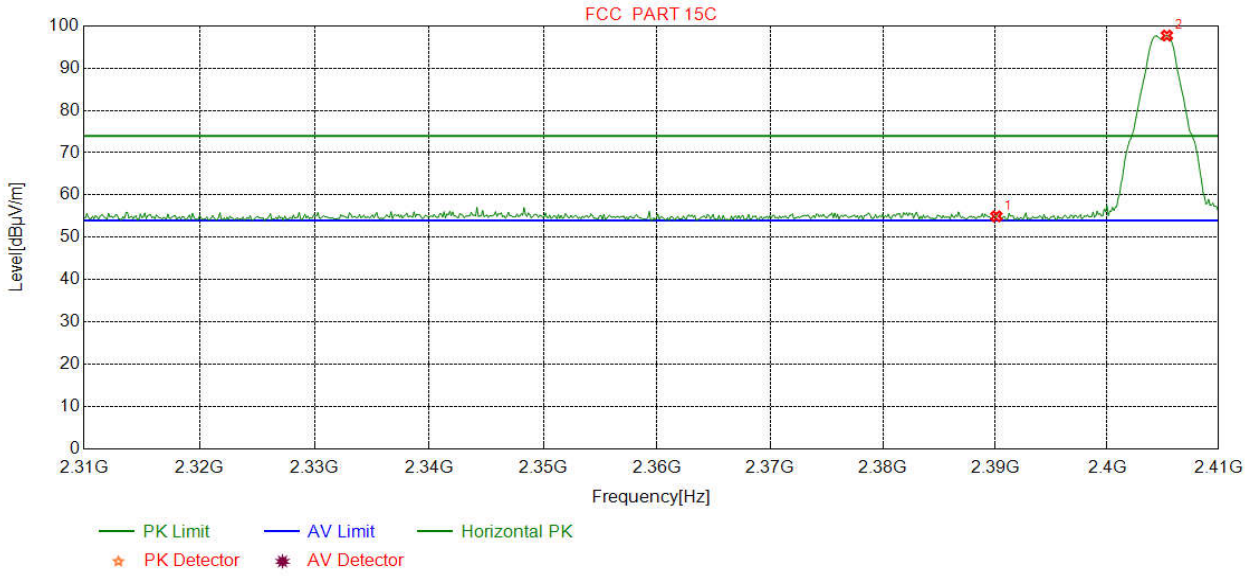
Limit:

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 plot as follows:

Mode:	OQPSK Transmitting	Channel:	2405
Remark:	PK		

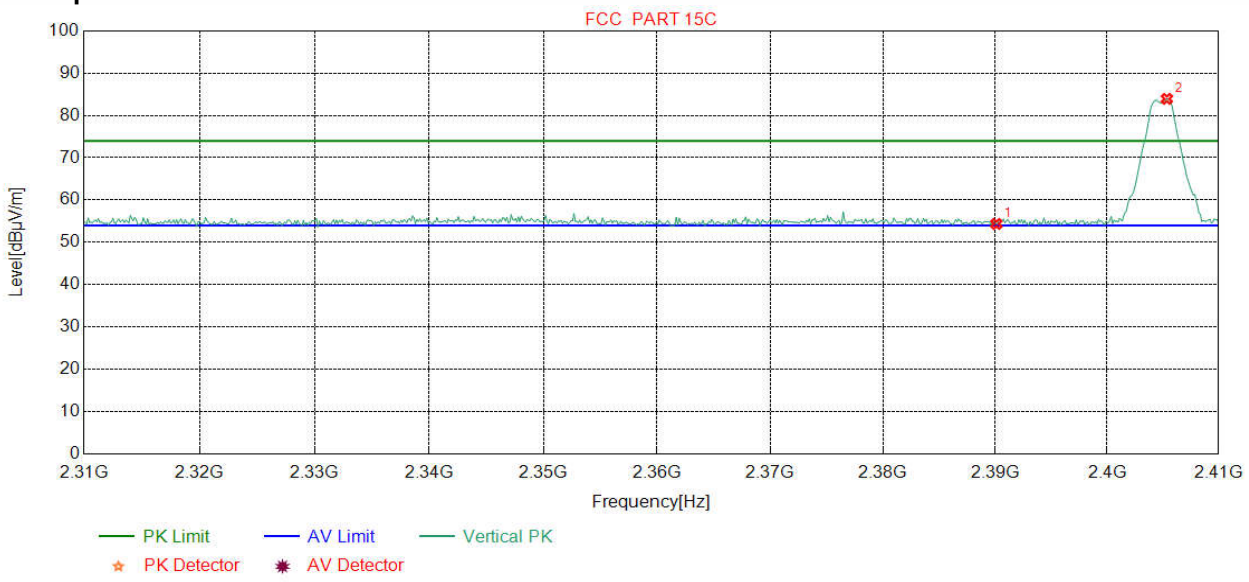
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-36.62	45.95	54.95	74.00	19.05	Pass	Horizontal
2	2405.3692	32.27	13.32	-36.60	88.74	97.73	74.00	-23.73	Pass	Horizontal

Mode:	OQPSK Transmitting	Channel:	2405
Remark:	PK		

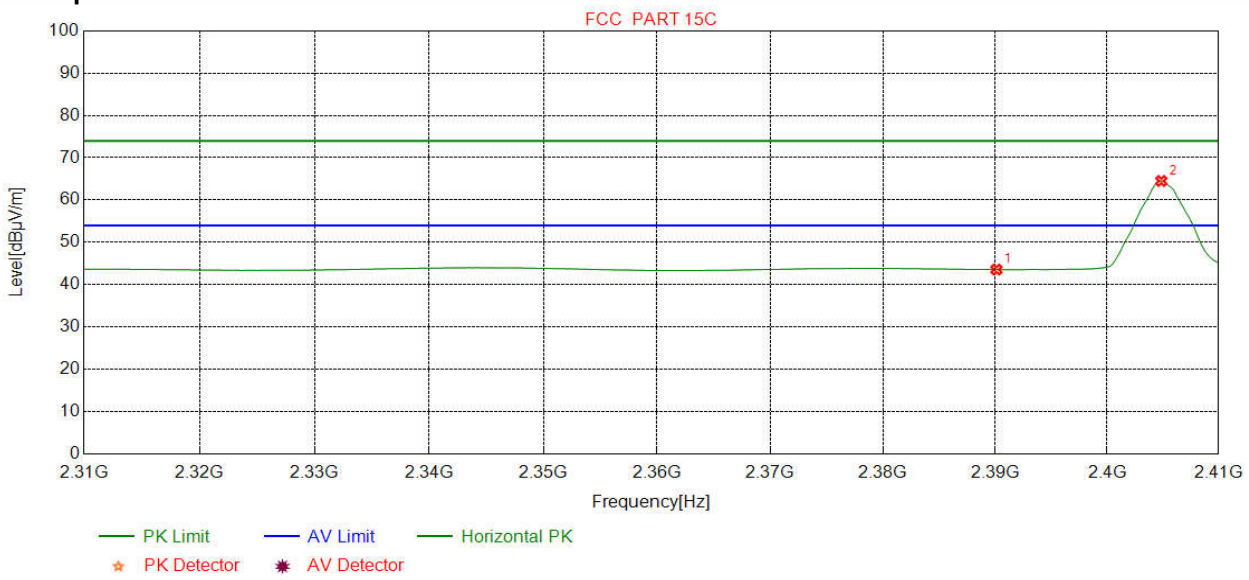
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-36.62	45.35	54.35	74.00	19.65	Pass	Vertical
2	2405.3692	32.27	13.32	-36.60	74.95	83.94	74.00	-9.94	Pass	Vertical

Mode:	OQPSK Transmitting	Channel:	2405
Remark:	AV		

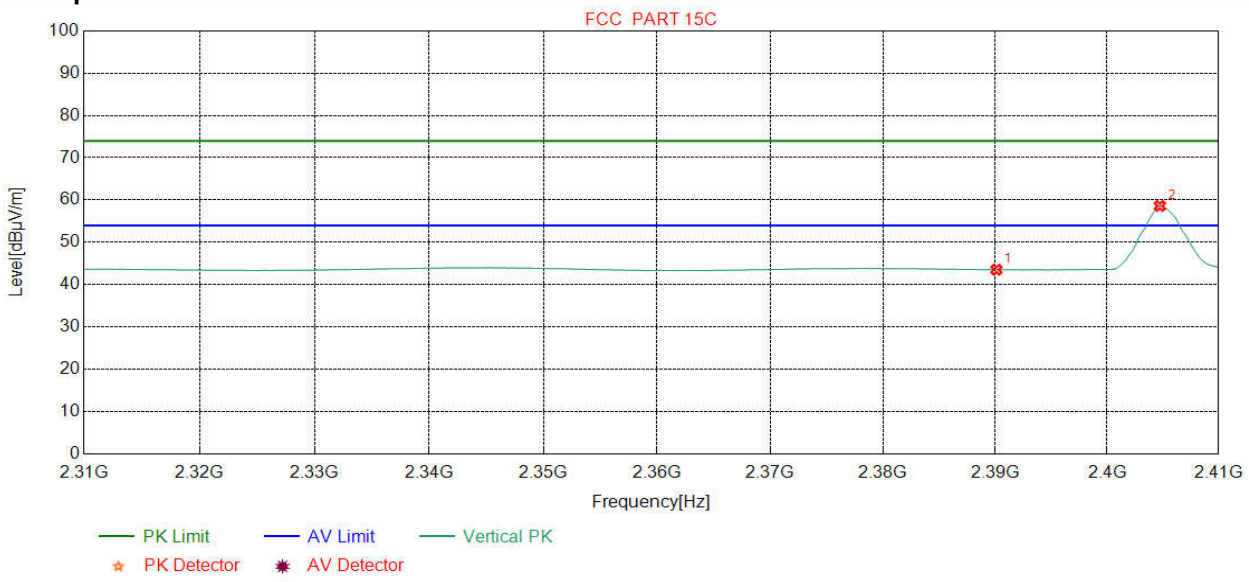
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-36.62	34.54	43.54	54.00	10.46	Pass	Horizontal
2	2404.8686	32.27	13.32	-36.60	55.52	64.51	54.00	-10.51	Pass	Horizontal

Mode:	OQPSK Transmitting	Channel:	2405
Remark:	AV		

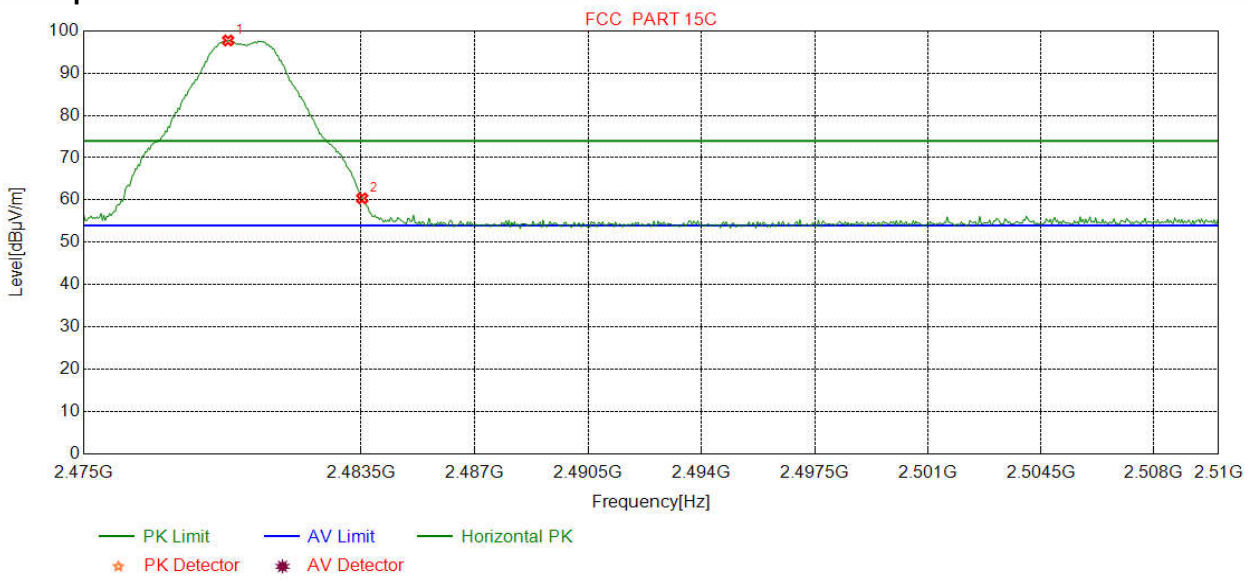
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	2390.0000	32.25	13.37	-36.62	34.51	43.51	54.00	10.49	Pass	Vertical
2	2404.7434	32.27	13.32	-36.60	49.60	58.59	54.00	-4.59	Pass	Vertical

Mode:	OQPSK Transmitting	Channel:	2480
Remark:	PK		

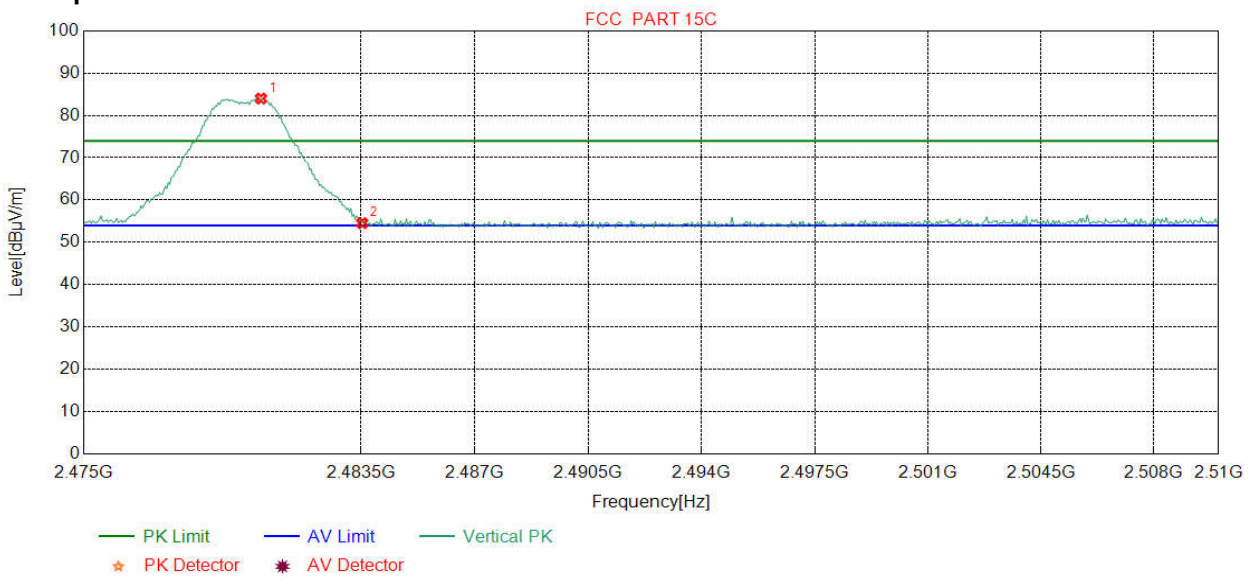
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	2479.4243	32.37	13.39	-36.77	88.76	97.75	74.00	-23.75	Pass	Horizontal
2	2483.5000	32.38	13.38	-36.80	51.43	60.39	74.00	13.61	Pass	Horizontal

Mode:	OQPSK Transmitting	Channel:	2480
Remark:	PK		

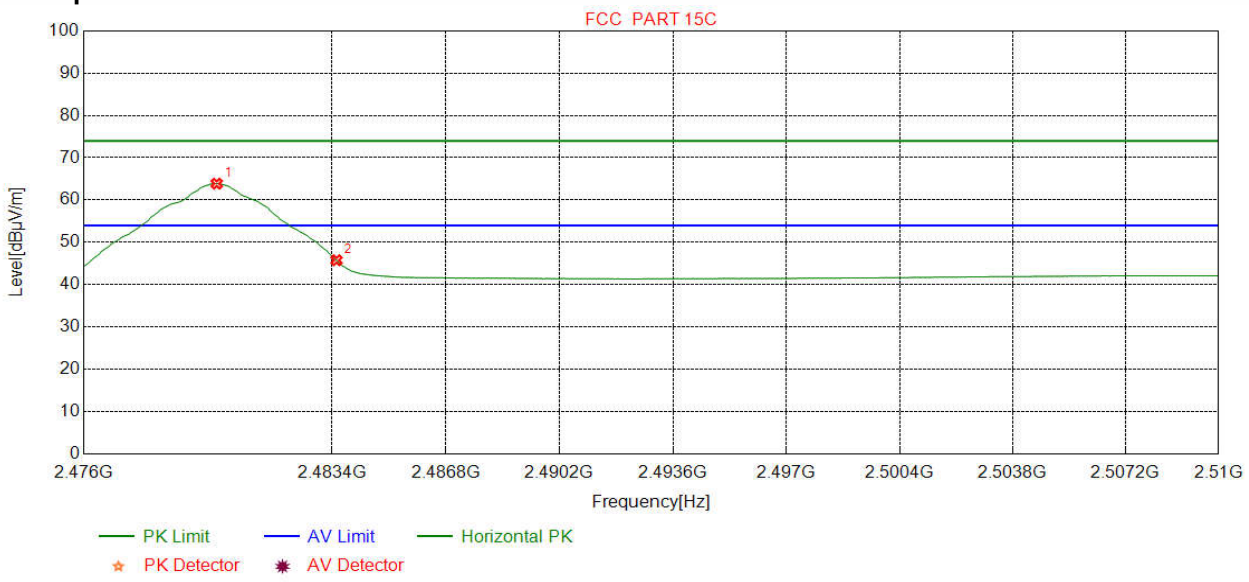
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	2480.4318	32.37	13.39	-36.77	75.02	84.01	74.00	-10.01	Pass	Vertical
2	2483.5000	32.38	13.38	-36.80	45.57	54.53	74.00	19.47	Pass	Vertical

Mode:	OQPSK Transmitting	Channel:	2480
Remark:	AV		

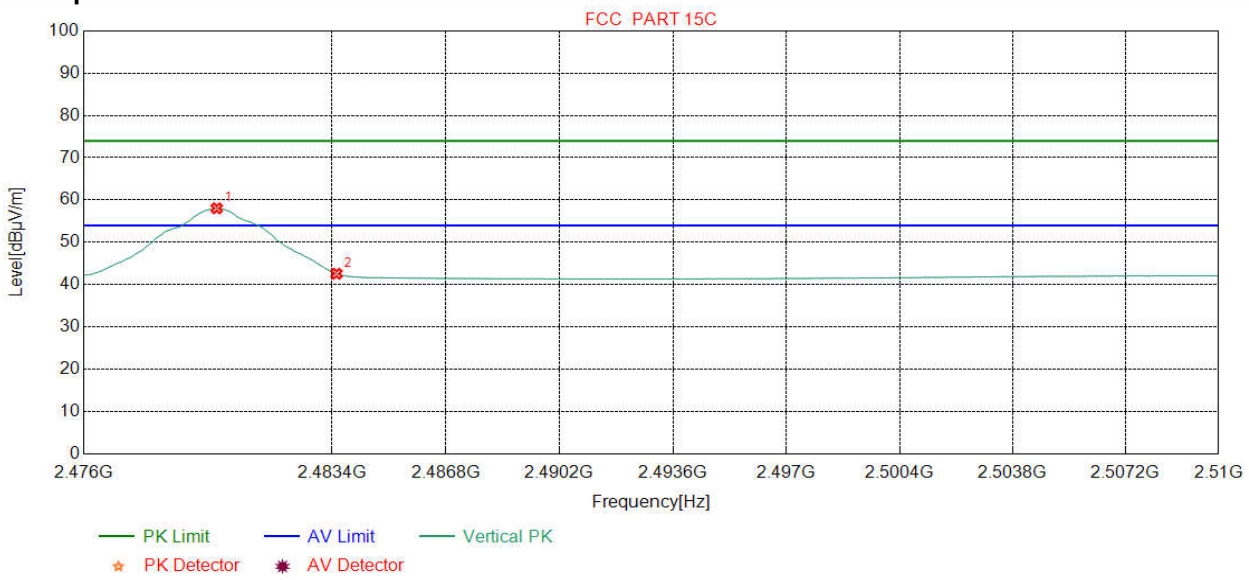
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	2479.9574	32.37	13.39	-36.77	54.88	63.87	54.00	-9.87	Pass	Horizontal
2	2483.5000	32.38	13.38	-36.80	36.79	45.75	54.00	8.25	Pass	Horizontal

Mode:	OQPSK Transmitting	Channel:	2480
Remark:	AV		

Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	2479.9574	32.37	13.39	-36.77	49.05	58.04	54.00	-4.04	Pass	Vertical
2	2483.5000	32.38	13.38	-36.80	33.60	42.56	54.00	11.44	Pass	Vertical

Note:
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

Appendix H): Radiated Spurious Emissions

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 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, whichwas 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 rotatable 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 middle 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:

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

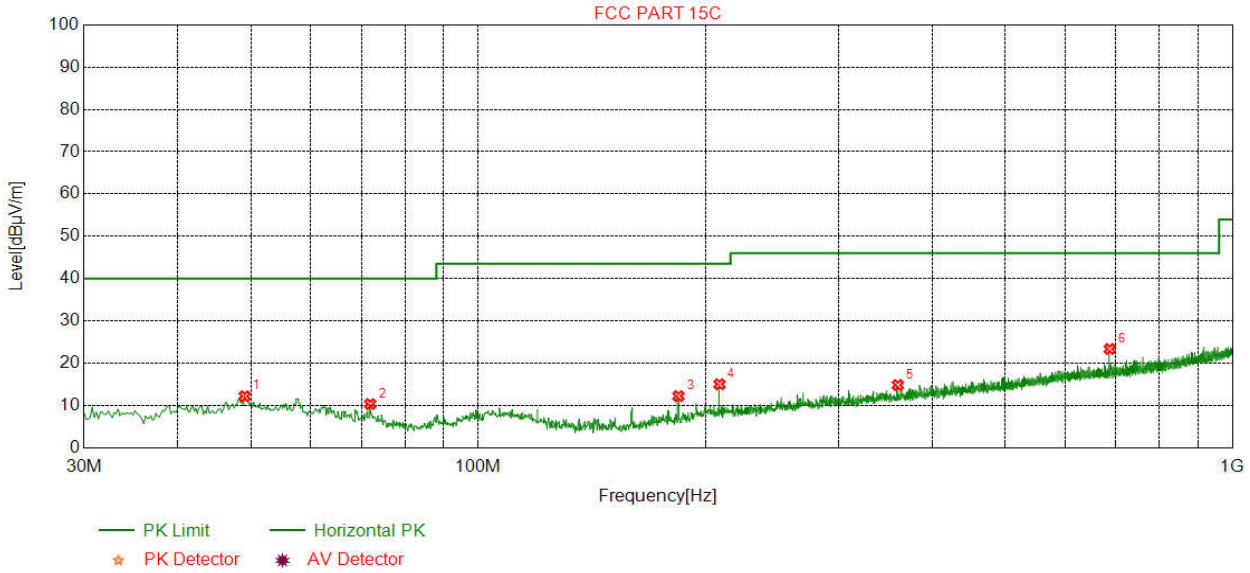
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Radiated Spurious Emissions test Data:

Radiated Emission below 1GHz

Mode:	OQPSK Transmitting	Remark:	QP

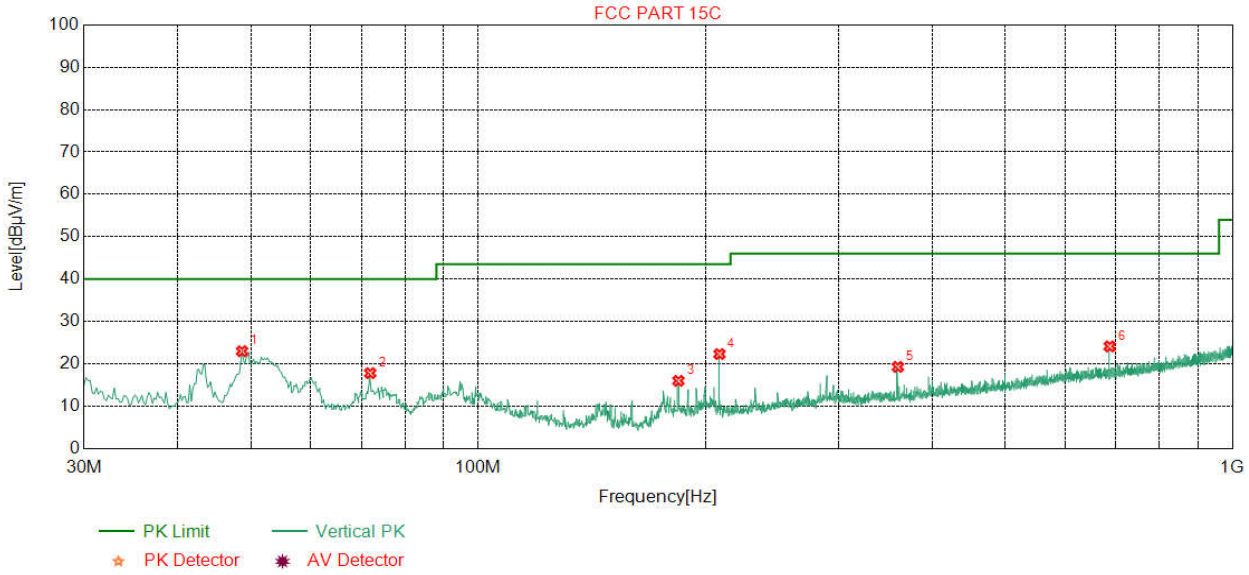
Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBµV]	Level [dBµV/m]	Limit [dBµV/m]	Magin [dB]	Result	Polarity
1	49.0158	13.20	0.79	-32.12	30.28	12.15	40.00	27.85	Pass	Horizontal
2	71.9124	8.64	0.97	-32.05	32.73	10.29	40.00	29.71	Pass	Horizontal
3	184.2609	9.40	1.59	-31.97	33.17	12.19	43.50	31.31	Pass	Horizontal
4	208.9038	11.13	1.71	-31.94	34.10	15.00	43.50	28.50	Pass	Horizontal
5	360.0600	14.52	2.27	-31.84	29.85	14.80	46.00	31.20	Pass	Horizontal
6	687.5975	19.70	3.14	-32.06	32.55	23.33	46.00	22.67	Pass	Horizontal

Mode:	OQPSK Transmitting	Remark:	QP

Test Graph



NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	48.6277	13.20	0.79	-32.12	41.08	22.95	40.00	17.05	Pass	Vertical
2	71.9124	8.64	0.97	-32.05	40.21	17.77	40.00	22.23	Pass	Vertical
3	184.2609	9.40	1.59	-31.97	36.93	15.95	43.50	27.55	Pass	Vertical
4	208.9038	11.13	1.71	-31.94	41.38	22.28	43.50	21.22	Pass	Vertical
5	360.0600	14.52	2.27	-31.84	34.29	19.24	46.00	26.76	Pass	Vertical
6	687.5975	19.70	3.14	-32.06	33.30	24.08	46.00	21.92	Pass	Vertical

Transmitter Emission above 1GHz

Mode:		OQPSK Transmitting			Channel:		2405			
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	2982.3965	33.17	4.50	-36.75	47.90	48.82	74.00	25.18	Pass	Horizontal
2	3509.9760	33.41	4.48	-36.56	46.37	47.70	74.00	26.30	Pass	Horizontal
3	4810.0000	34.50	4.57	-36.14	41.52	44.45	74.00	29.55	Pass	Horizontal
4	6403.0903	35.88	5.32	-36.33	43.26	48.13	74.00	25.87	Pass	Horizontal
5	7215.0000	36.32	5.81	-36.44	44.27	49.96	74.00	24.04	Pass	Horizontal
6	9620.0000	37.65	6.66	-36.84	42.04	49.51	74.00	24.49	Pass	Horizontal

Mode:		OQPSK Transmitting			Channel:		2405			
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	3077.0327	33.23	4.77	-36.84	46.40	47.56	74.00	26.44	Pass	Vertical
2	4810.0000	34.50	4.57	-36.14	40.98	43.91	74.00	30.09	Pass	Vertical
3	5771.2271	35.43	4.96	-36.08	43.57	47.88	74.00	26.12	Pass	Vertical
4	7215.0000	36.32	5.81	-36.44	41.40	47.09	74.00	26.91	Pass	Vertical
5	8547.3297	36.70	6.33	-36.32	43.93	50.64	74.00	23.36	Pass	Vertical
6	9620.0000	37.65	6.66	-36.84	41.62	49.09	74.00	24.91	Pass	Vertical

Mode:		OQPSK Transmitting			Channel:		2445			
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	3321.7822	33.33	4.55	-36.75	46.25	47.38	74.00	26.62	Pass	Horizontal
2	4890.0000	34.50	4.84	-36.11	41.06	44.29	74.00	29.71	Pass	Horizontal
3	6367.9868	35.87	5.41	-36.21	43.33	48.40	74.00	25.60	Pass	Horizontal
4	7335.0000	36.44	5.85	-36.51	40.47	46.25	74.00	27.75	Pass	Horizontal
5	8430.3180	36.57	6.37	-36.35	43.86	50.45	74.00	23.55	Pass	Horizontal
6	9780.0000	37.71	6.63	-36.85	42.55	50.04	74.00	23.96	Pass	Horizontal

Mode:		OQPSK Transmitting			Channel:		2445			
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	3002.9253	33.20	4.92	-36.71	47.11	48.52	74.00	25.48	Pass	Vertical
2	4890.0000	34.50	4.84	-36.11	41.24	44.47	74.00	29.53	Pass	Vertical
3	6391.3891	35.88	5.34	-36.31	43.30	48.21	74.00	25.79	Pass	Vertical
4	7335.0000	36.44	5.85	-36.51	40.48	46.26	74.00	27.74	Pass	Vertical
5	8372.7873	36.55	6.24	-36.49	43.74	50.04	74.00	23.96	Pass	Vertical
6	9780.0000	37.71	6.63	-36.85	42.10	49.59	74.00	24.41	Pass	Vertical

Mode:		OQPSK Transmitting			Channel:		2480			
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	2704.3409	32.73	4.12	-36.72	47.69	47.82	74.00	26.18	Pass	Horizontal
2	4960.0000	34.50	4.82	-36.20	41.32	44.44	74.00	29.56	Pass	Horizontal
3	6544.4794	35.92	5.36	-36.14	42.83	47.97	74.00	26.03	Pass	Horizontal
4	7440.0000	36.54	5.85	-36.34	41.00	47.05	74.00	26.95	Pass	Horizontal
5	8435.1935	36.57	6.38	-36.37	44.00	50.58	74.00	23.42	Pass	Horizontal
6	9920.0000	37.77	6.79	-36.82	40.48	48.22	74.00	25.78	Pass	Horizontal

Mode:		OQPSK Transmitting			Channel:		2480			
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Magin [dB]	Result	Polarity
1	2865.1730	32.98	4.28	-36.83	46.97	47.40	74.00	26.60	Pass	Vertical
2	4646.9397	34.50	4.84	-36.15	43.77	46.96	74.00	27.04	Pass	Vertical
3	4960.0000	34.50	4.82	-36.20	41.07	44.19	74.00	29.81	Pass	Vertical
4	7071.0321	36.17	5.72	-36.21	43.52	49.20	74.00	24.80	Pass	Vertical
5	7440.0000	36.54	5.85	-36.34	40.24	46.29	74.00	27.71	Pass	Vertical
6	9920.0000	37.77	6.79	-36.82	40.24	47.98	74.00	26.02	Pass	Vertical

Note:

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

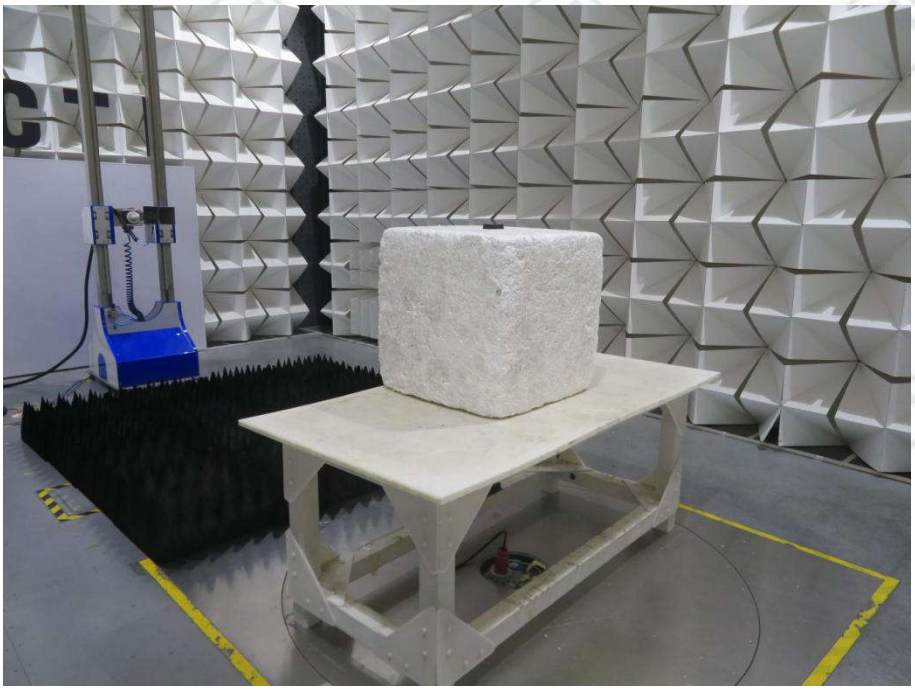
2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

PHOTOGRAPHS OF TEST SETUP

Test model No.:VTS03W02

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

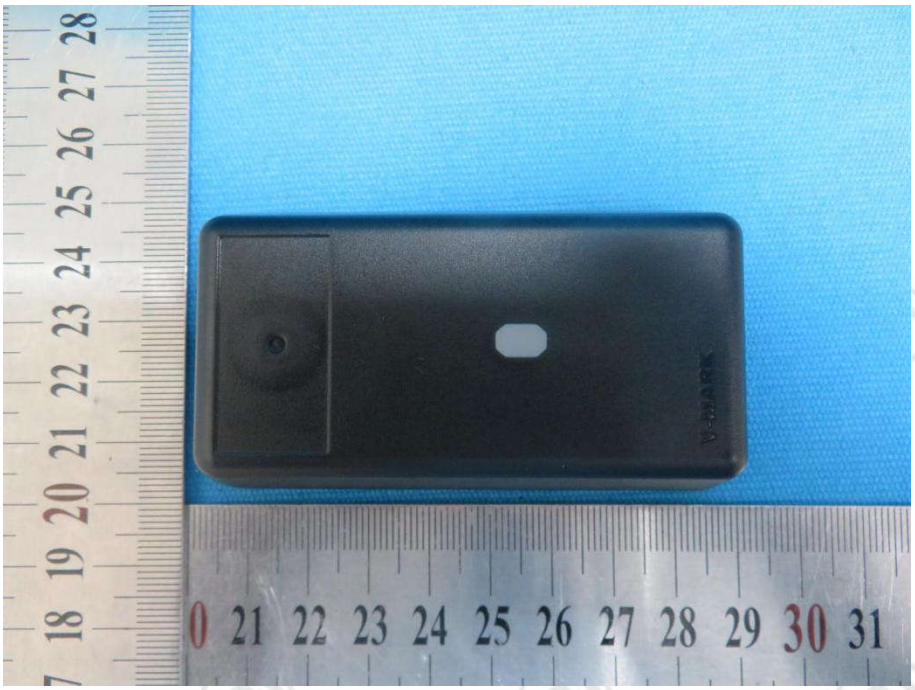
Radiated spurious emission Test Setup-2(30MHz-1GHz)



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

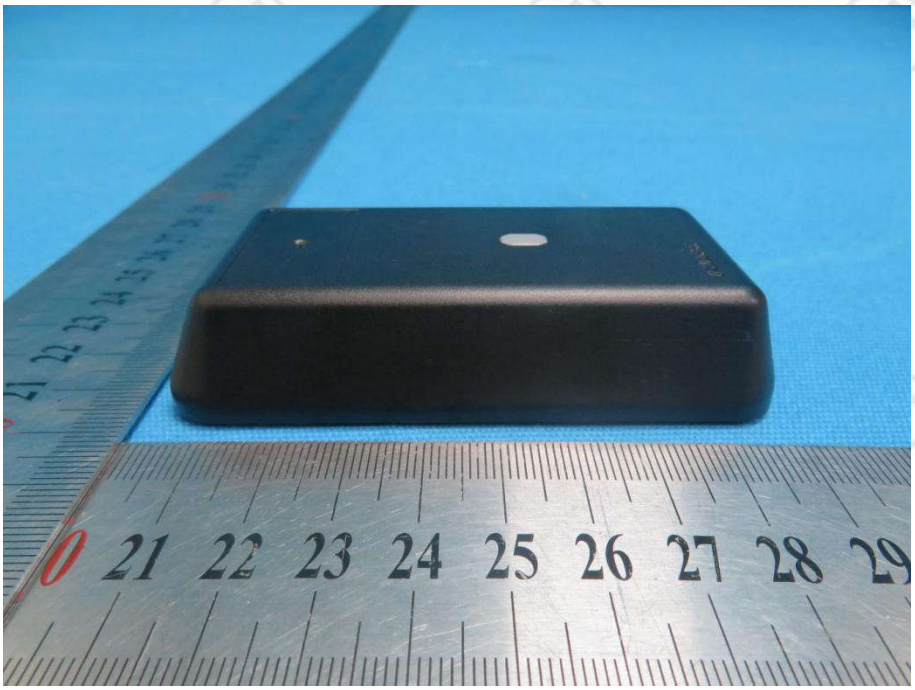
PHOTOGRAPHS OF EUT Constructional Details

Test model No.: VTS03W02

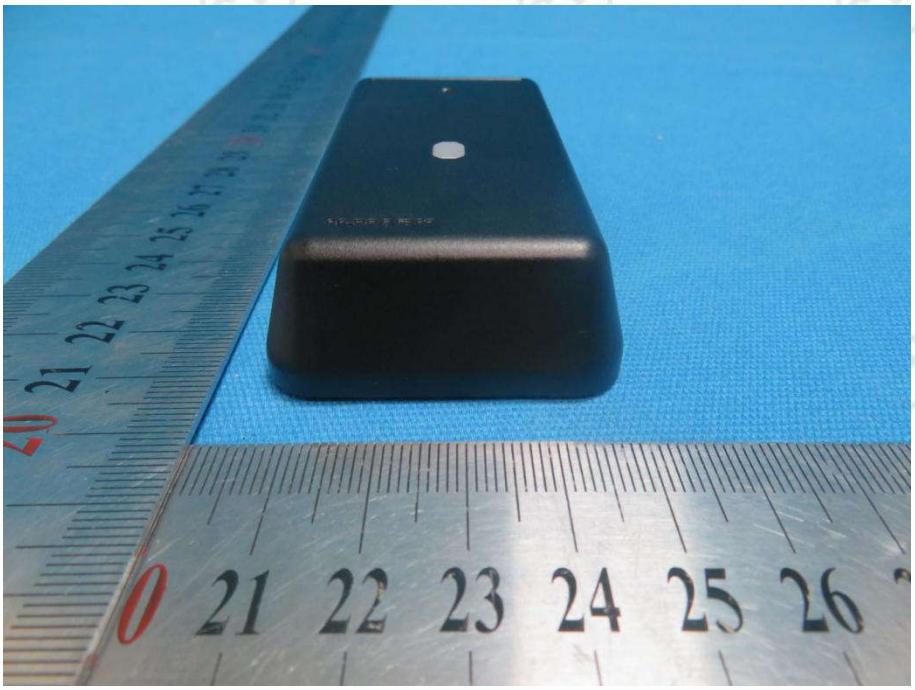


View of Product-1

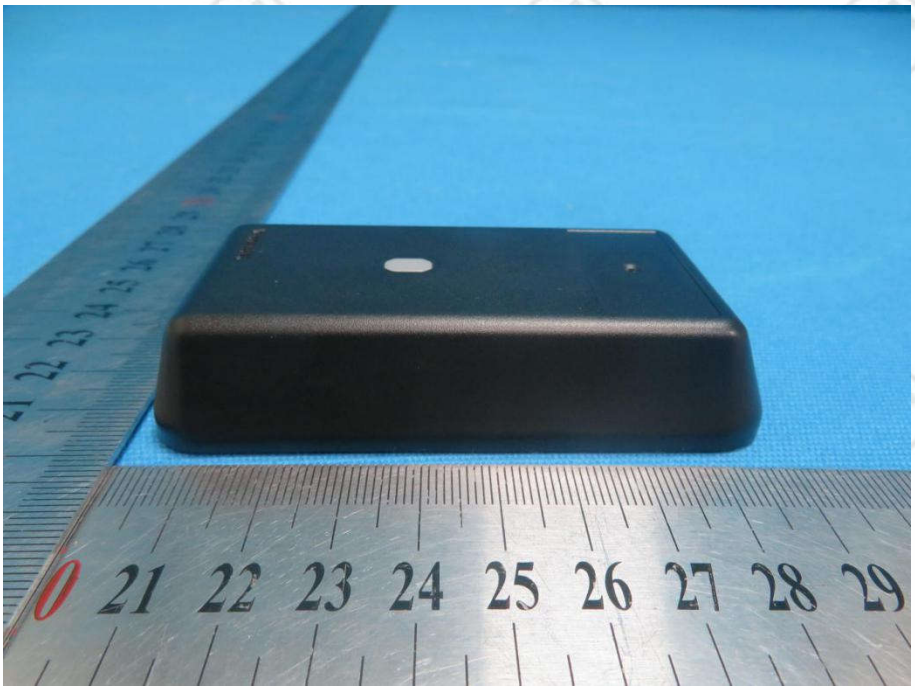
View of Product-2



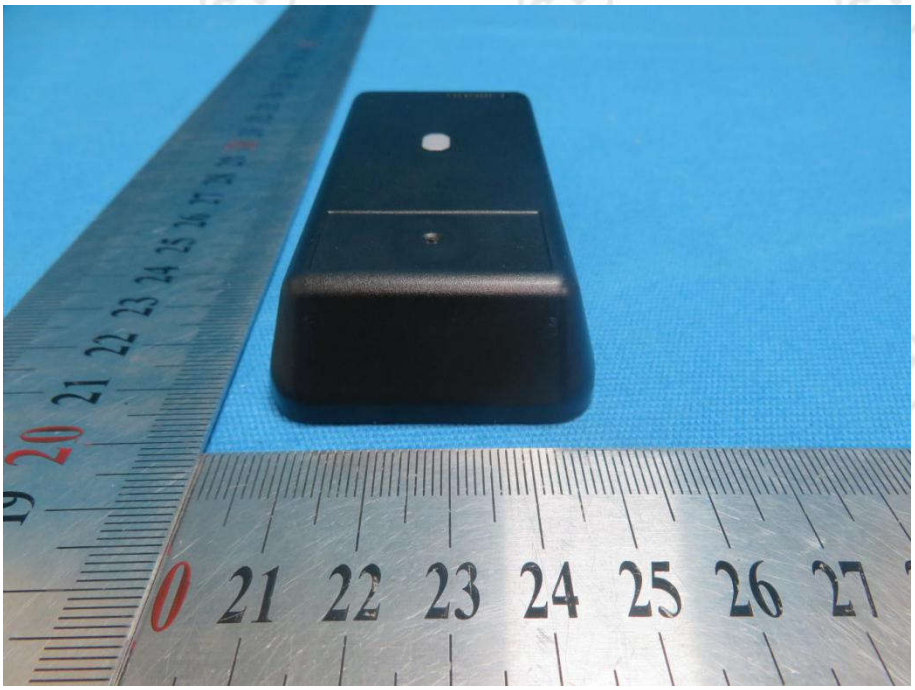
View of Product-3



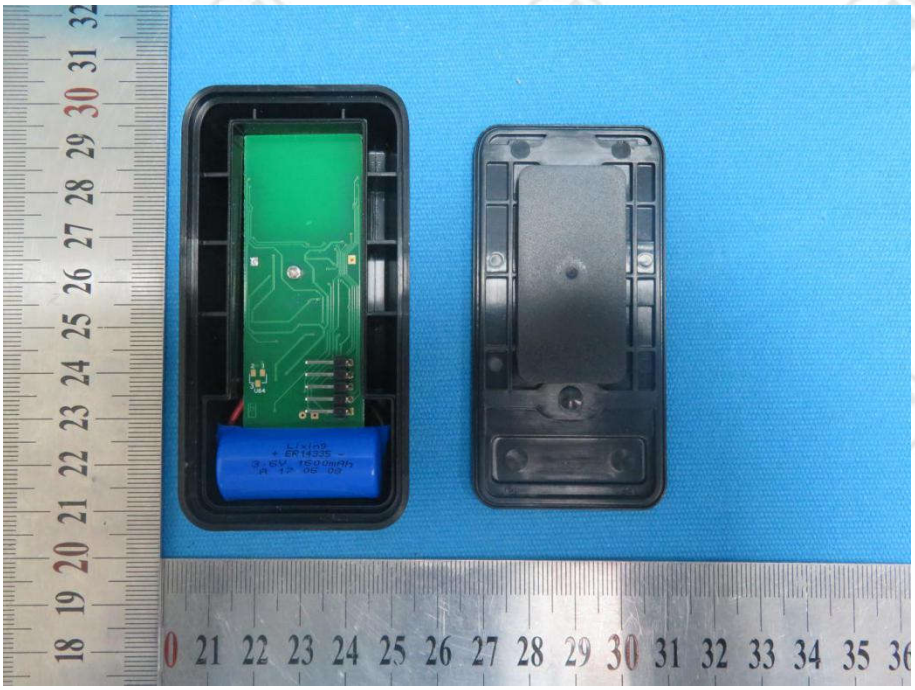
View of Product-4



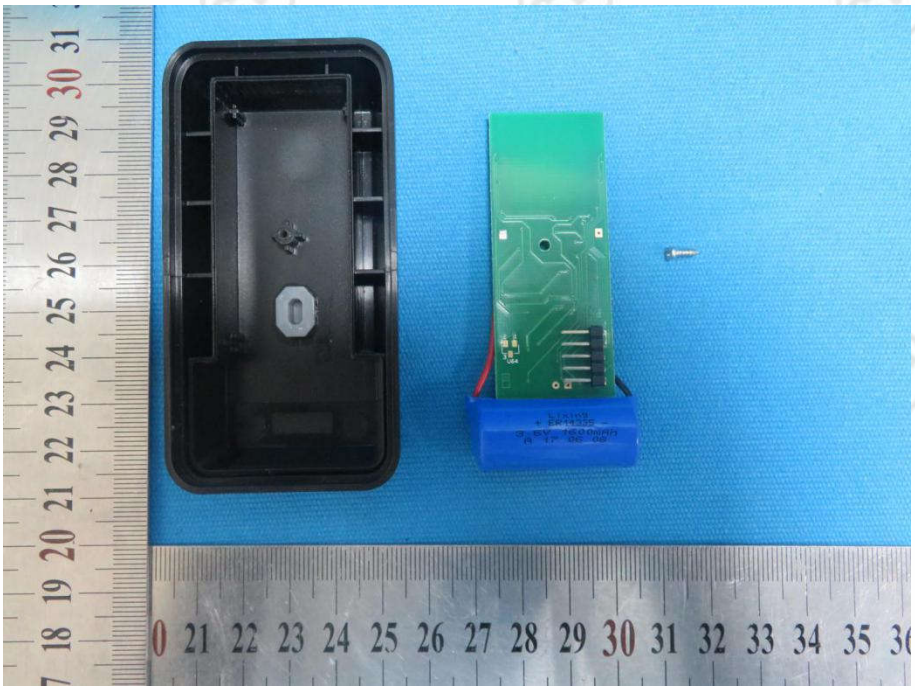
View of Product-5



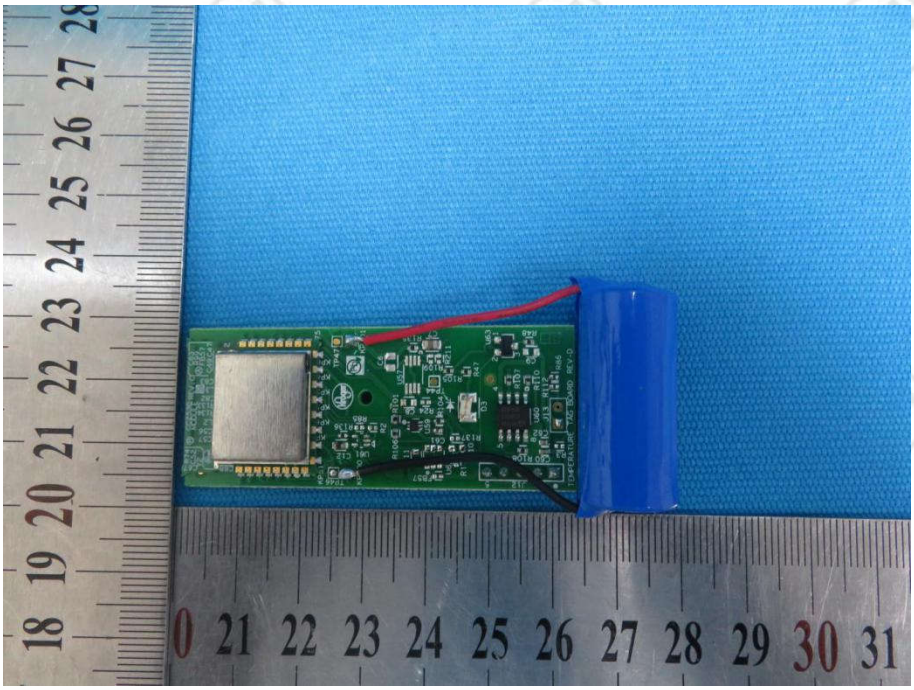
View of Product-6



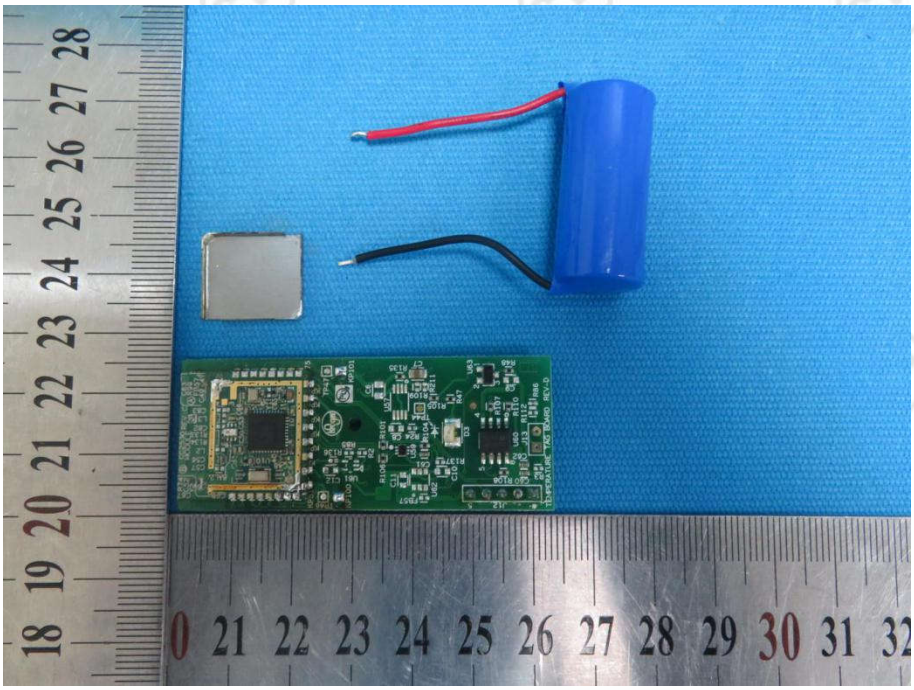
View of Product-7



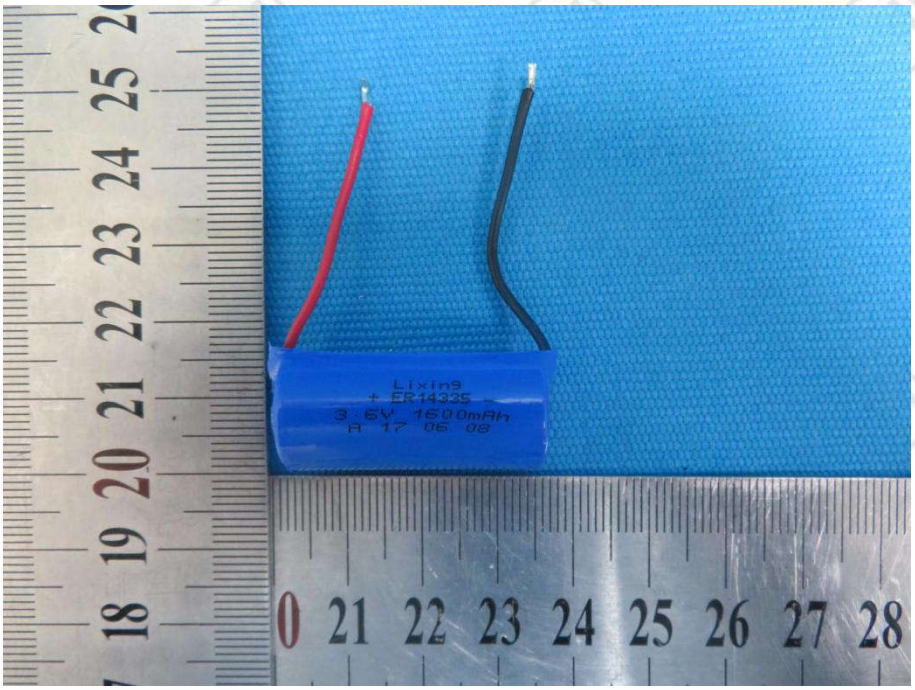
View of Product-8



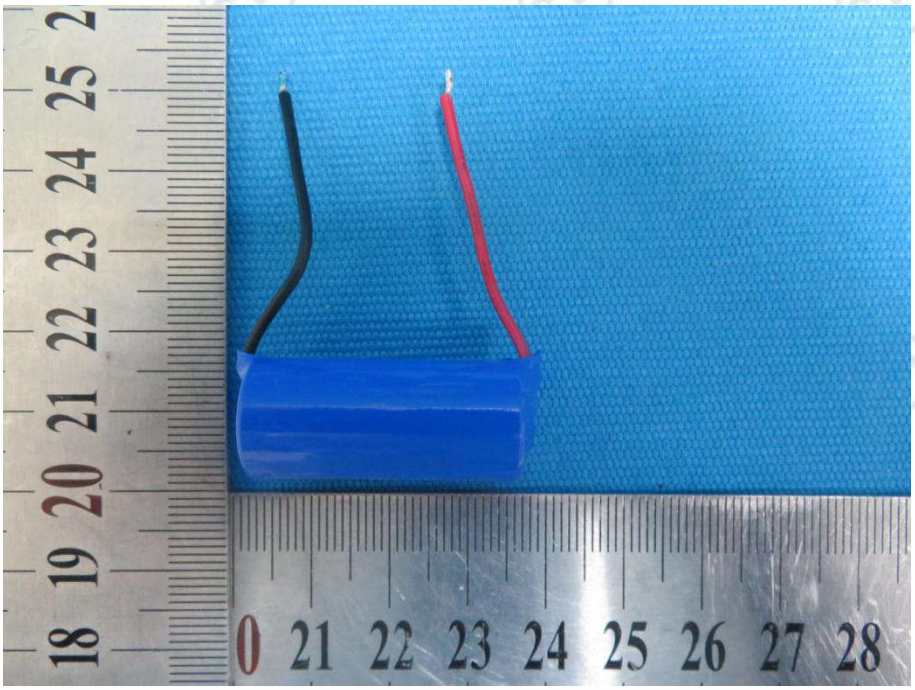
View of Product-9



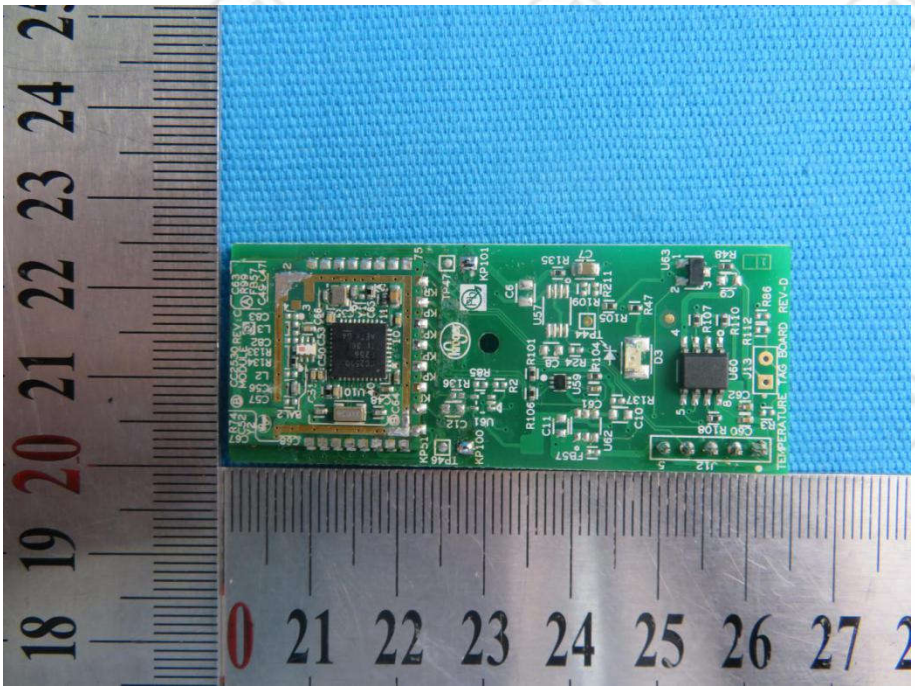
View of Product-10



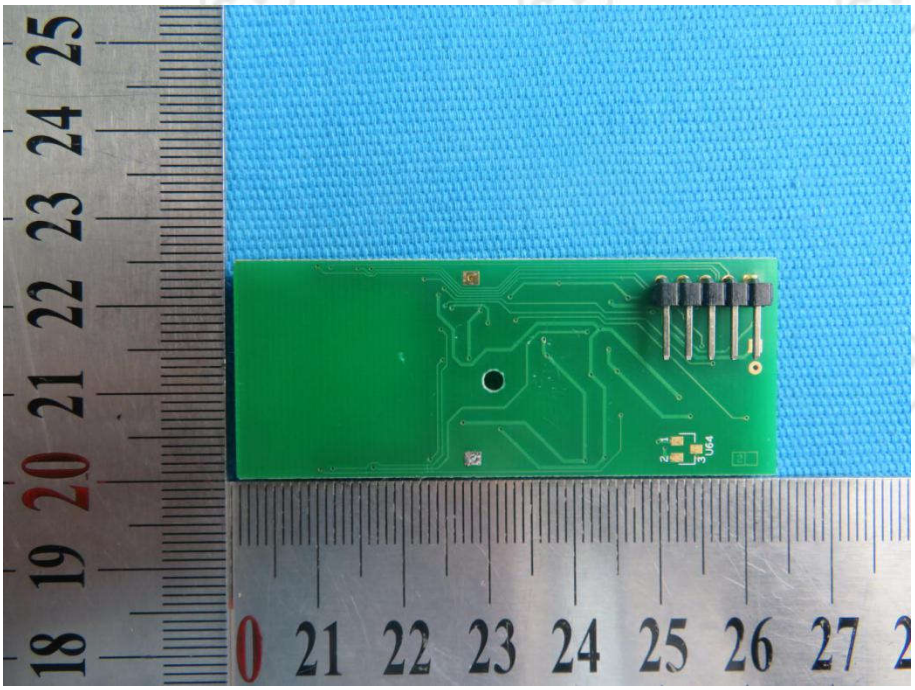
View of Product-11



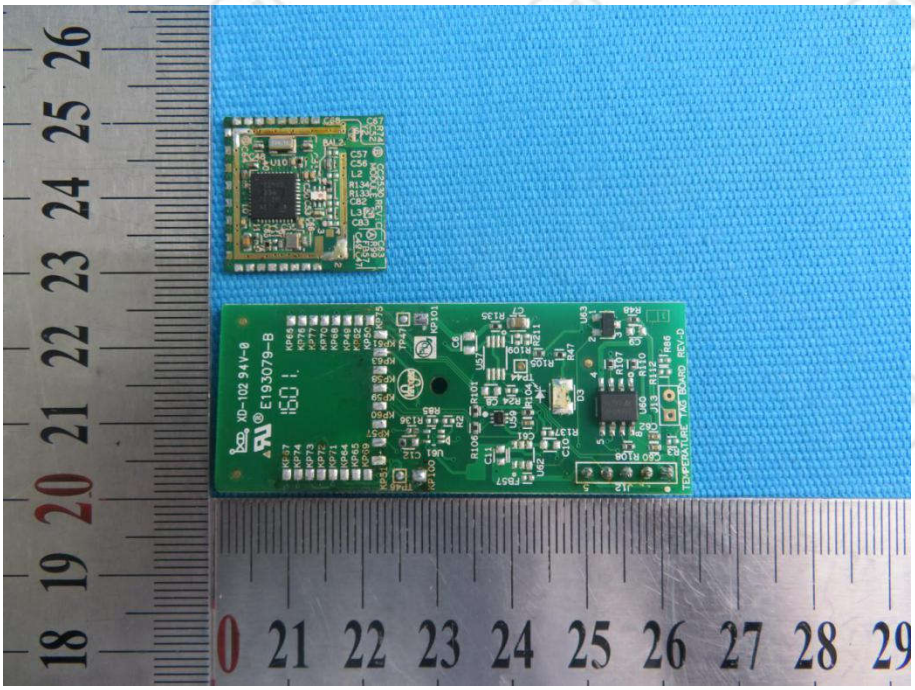
View of Product-12



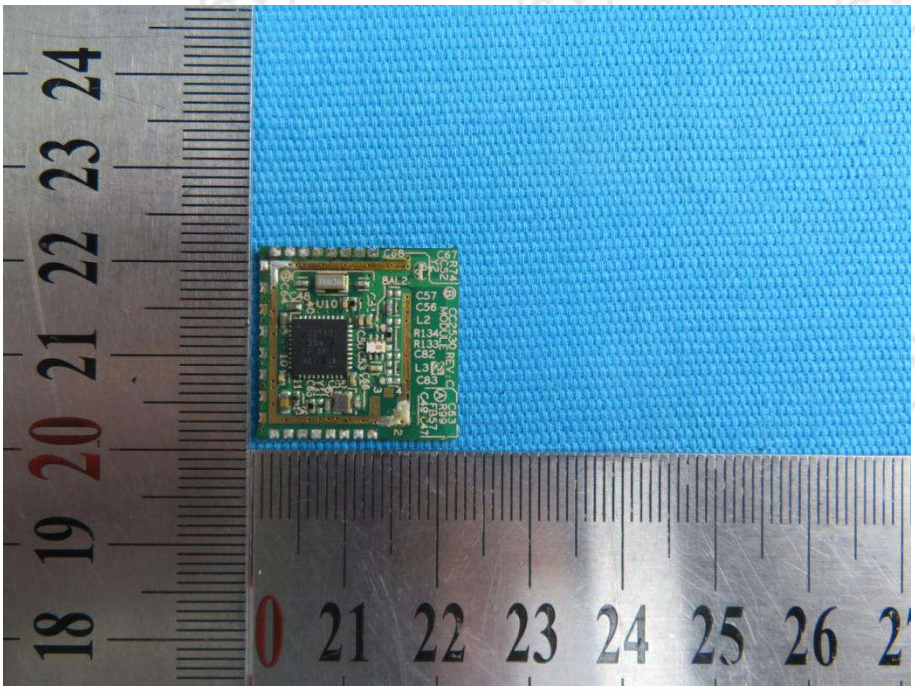
View of Product-13



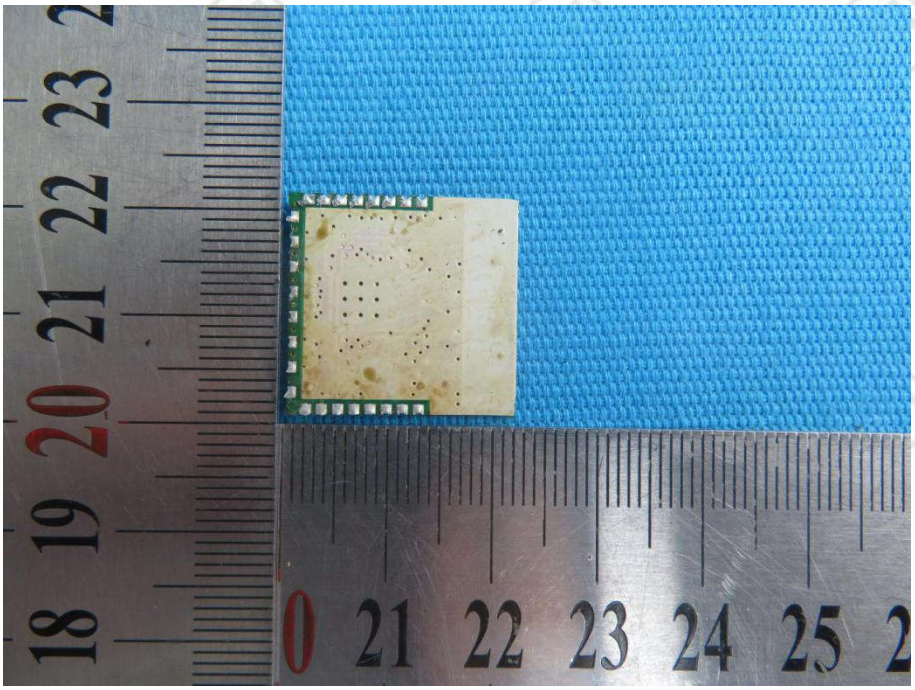
View of Product-14



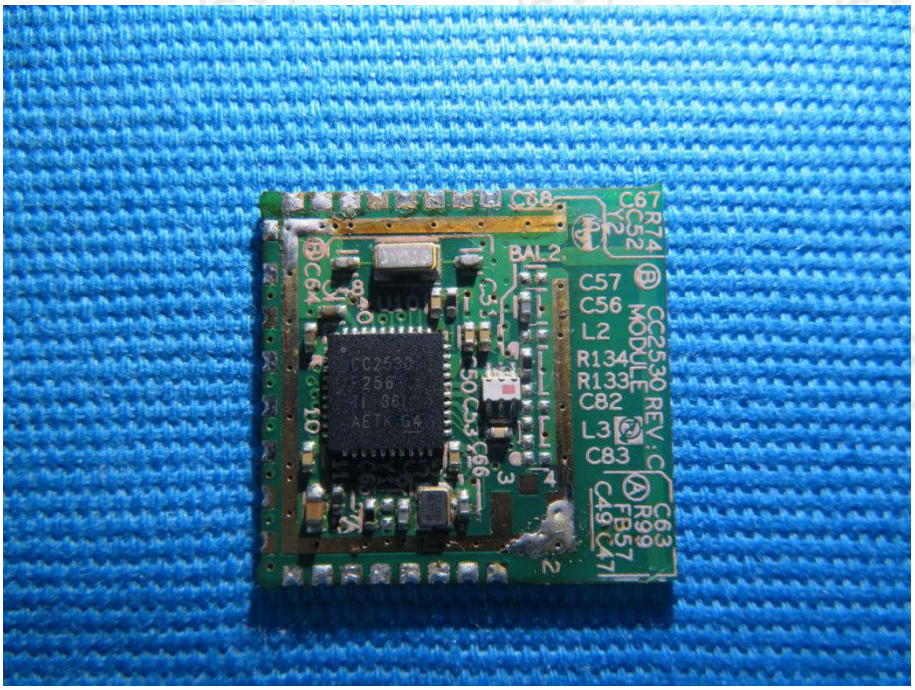
View of Product-15



View of Product-16



View of Product-17



View of Product-18

*** End of Report ***