TEST REPORT

Reference No.	:	WTS19S12083687W
FCC ID	:	2ACQSBMOX1RX
Applicant	:	Guangzhou Si Bao Jian Electronics Co., Ltd.
Address	:	No.7, Nanbei Main Road, Shitan Town, Zengcheng, Guangzhou City, Guangdong Province, 511370, China
Manufacturer	:	Shenzhen Valuelink E-Commerce Co.,Ltd.
Address	:	2207, Building 4, Tian'an Yungu Industrial Park, Bantian Street, Longgang District, Shenzhen, China
Product	:	baby monitor
Model(s)	:	BMO-X1
Standards	:	FCC CFR47 Part 15 Section 15.247
Date of Receipt sample	:	2019-12-04
Date of Test	:	2019-12-04 to 2019-12-12
Date of Issue	:	2019-12-12
Test Result	:	**Pass**

Remarks:
The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

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Compiled by:

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Approved by:

Philo Zhong / Manager

1. Revision History

Test report No.	Date of Receipt sample	Date of Test	Date of Issue	Purpose	Comment	Approved
WTS19S12083687W	2019-12-04	2019-12-04 to 2019-12-12	2019-12-12	original	-	Valid

2. Contents

3. Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	PASS
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separation	15.247(a)(1)	PASS
Number of Hopping Frequency	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS
Note: Pass=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable.		

4. General Information

4.1 General Description of E.U.T

Product:	baby monitor
Model(s):	BMO-X1
Model Differences:	N/A
Frequency Range:	2410.875-2471.625MHz,19 Channels in total
Type of Modulation:	GFSK
Antenna installation:	Integrated antenna
Antenna Gain:	3dBi

4.2 Details of E.U.T

Ratings:	Input: DC 5V, 1A Battery: DC 3.7V 2000mAh 7.4Wh

4.3 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2410.875	2	2414.250	3	2417.625	4	2421.000
5	2424.375	6	2427.750	7	2431.125	8	2434.500
9	2437.875	10	2440.625	11	2441.250	12	2448.000
13	2451.375	14	2454.750	15	2458.125	16	2461.500
17	2464.875	18	2468.250	19	2471.625		

4.4 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectivelyby performing full tests, the worst data were recorded and reported.

Table 1 Tests Carried OutUnderFCC part 15.247

Test mode	Low channel	Middle channel	High channel
Transmitting	2410.875MHz	2441.250MHz	2471.625MHz

5. Equipment Used during Test

5.1 Equipments List

Conducted Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMI Test Receiver	R&S	ESCI	101155	2019-09-17	2020-09-16
2	LISN	SCHWARZBECK	NSLK 8128	8128-289	2019-09-17	2020-09-16
3	Limiter	York	MTS-IMP-136	261115-001-0024	2019-09-17	2020-09-16
4	Cable	LARGE	RF300	-	2019-09-17	2020-09-16
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP30	100091	2019-04-19	2020-04-18
2	Broad-band Horn Antenna(1-18GHz)	SCHWARZBECK	BBHA 9120 D	667	2019-04-19	2020-04-18
3	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	2019-04-19	2020-04-18
4	Coaxial Cable (above 1GHz)	Top	1GHz-18GHz	EW02014-7	2019-04-19	2020-04-18
5	Spectrum Analyzer	R&S	FSP40	100501	2019-09-17	2020-09-16
6	Broad-band Horn Antenna(18-40GHz)	SCHWARZBECK	BBHA 9170	BBHA9170651	2019-09-17	2020-09-16
7	Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	100472	2019-09-17	2020-09-16
8	Cable	Top	18-40GHz	-	2019-09-17	2020-09-16
3m Semi-anechoic Chamber for Radiation Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	2019-04-20	2020-04-19
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	2019-05-24	2020-05-23
3	Active Loop Antenna	Com-power	AL-130R	10160007	2019-04-28	2020-04-27
4	Amplifier	ANRITSU	MH648A	M43381	2019-04-19	2020-04-18
5	Cable	HUBER+SUHNER	CBL2	525178	2019-04-20	2020-04-19
6	Coaxial Cable (below 1GHz)	Top	TYPE16 (13M)	-	2019-09-17	2020-09-16
RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	Spectrum Analyzer	R&S	FSP30	100091	2019-04-19	2020-04-18
2	Coaxial Cable	Top	10Hz-30GHz	-	2019-09-17	2020-09-16

3	Antenna Connector*	Realacc	45RSm	-	2019-09-17	2020-09-16
4	DC Block	Gwave	GDCB-3G-N-SMA	140307001	2019-09-17	2020-09-16

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)

5.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by GUANG ZHOU GRG METROLOGY & TEST CO., LTD. address is No.163, Pingyun Rd. West of Huangpu Ave,Tianhe District, Guangzhou, Guangdong, China.

5.4 Test Facility

FCC Designation No.: CN1201. Test Firm Registration No.: 523476.
ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.

6. Conducted Emission

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.10:2013
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class/Severity:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz
	56 dBμV between 0.5MHz & 5MHz
	60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)

6.1 E.U.T. Operation

Operating Environment **:**

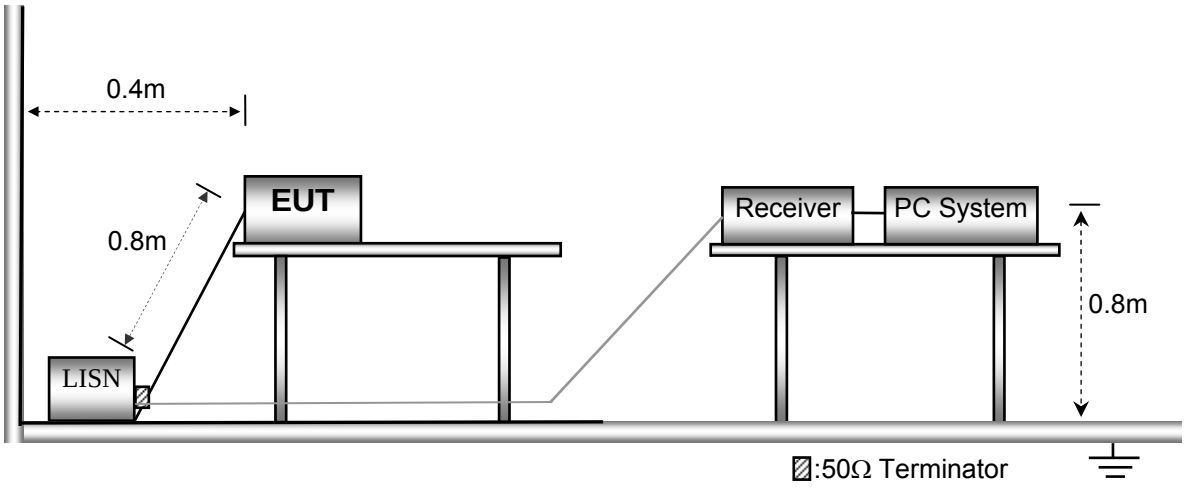
Temperature:	21.5 °C
Humidity:	51.9 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation **:**

The test was performed in Transmitting mode, the test data were shown in the report.

6.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10.



6.3 Measurement Description

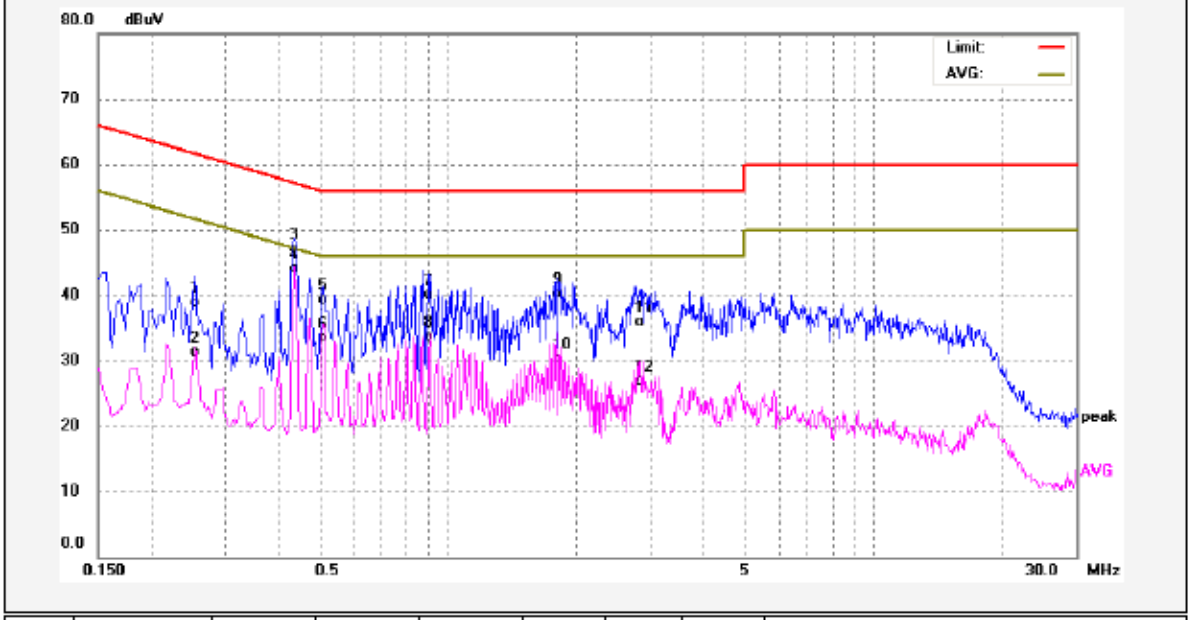
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.4 Conducted Emission Test Result

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

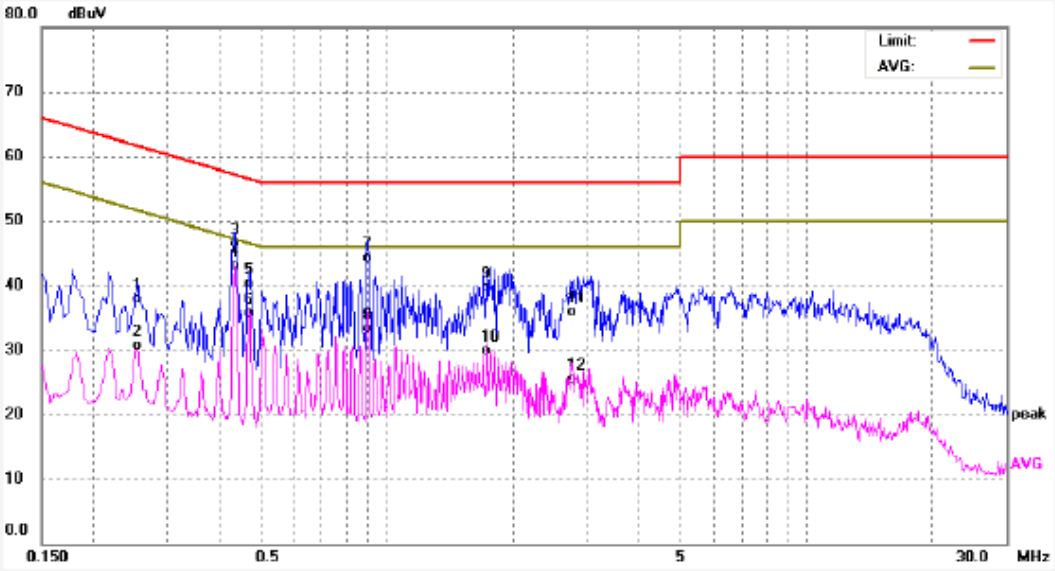
Only the worst case test data were record in the report.

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2540	28.52	10.39	38.91	61.62	-22.71	QP	
2	0.2540	20.83	10.39	31.22	51.62	-20.40	AVG	
3	0.4340	36.73	10.42	47.15	57.18	-10.03	QP	
4	0.4340	33.60	10.42	44.02	47.18	-3.16	AVG	
5	0.5100	28.84	10.43	39.27	56.00	-16.73	QP	
6	0.5100	23.00	10.43	33.43	46.00	-12.57	AVG	
7	0.9060	29.63	10.44	40.07	56.00	-15.93	QP	
8	0.9060	23.19	10.44	33.63	46.00	-12.37	AVG	
9	1.8180	29.68	10.53	40.21	56.00	-15.79	QP	
10	1.8180	19.78	10.53	30.31	46.00	-15.69	AVG	
11	2.8380	25.18	10.68	35.86	56.00	-20.14	QP	
12	2.8380	16.30	10.68	26.98	46.00	-19.02	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2540	27.53	10.39	37.92	61.62	-23.70	QP	
2	0.2540	20.28	10.39	30.67	51.62	-20.95	AVG	
3	0.4340	36.02	10.42	46.44	57.18	-10.74	QP	
4	0.4340	32.71	10.42	43.13	47.18	-4.05	AVG	
5	0.4700	29.85	10.42	40.27	56.51	-16.24	QP	
6	0.4700	25.33	10.42	35.75	46.51	-10.76	AVG	
7	0.9020	33.93	10.44	44.37	56.00	-11.63	QP	
8	0.9020	22.89	10.44	33.33	46.00	-12.67	AVG	
9	1.7300	29.13	10.52	39.65	56.00	-16.35	QP	
10	1.7300	19.33	10.52	29.85	46.00	-16.15	AVG	
11	2.7780	25.19	10.68	35.87	56.00	-20.13	QP	
12	2.7780	14.83	10.68	25.51	46.00	-20.49	AVG	

7. Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: DA 00-705& ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation

Operating Environment**:**

Temperature: 23.5 °C

Humidity: 51.1% RH

Atmospheric Pressure: 101.2kPa

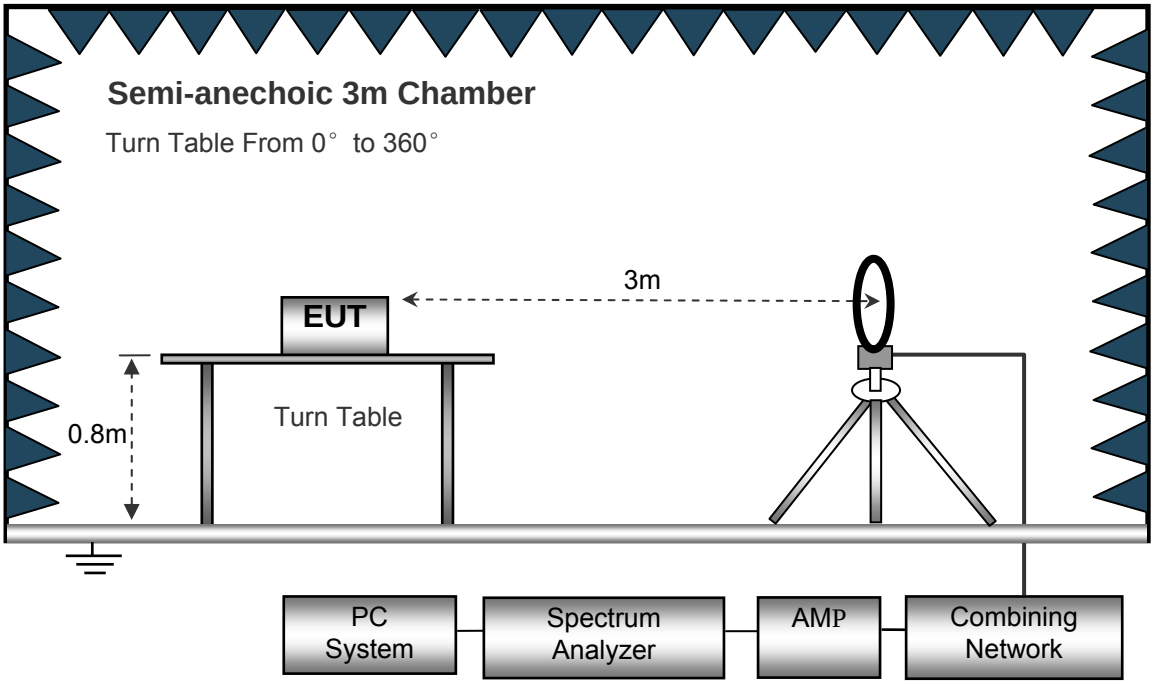
EUT Operation**:**

The test was performed in Transmitting mode, the test data were shown in the report.

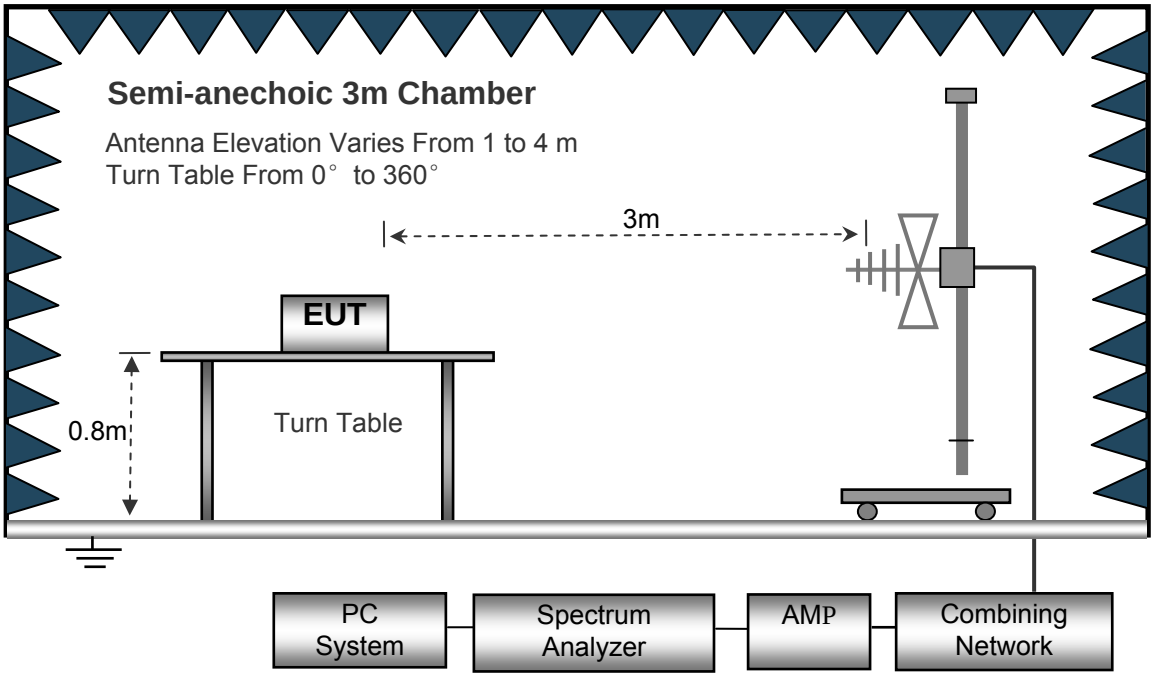
7.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10: 2013.

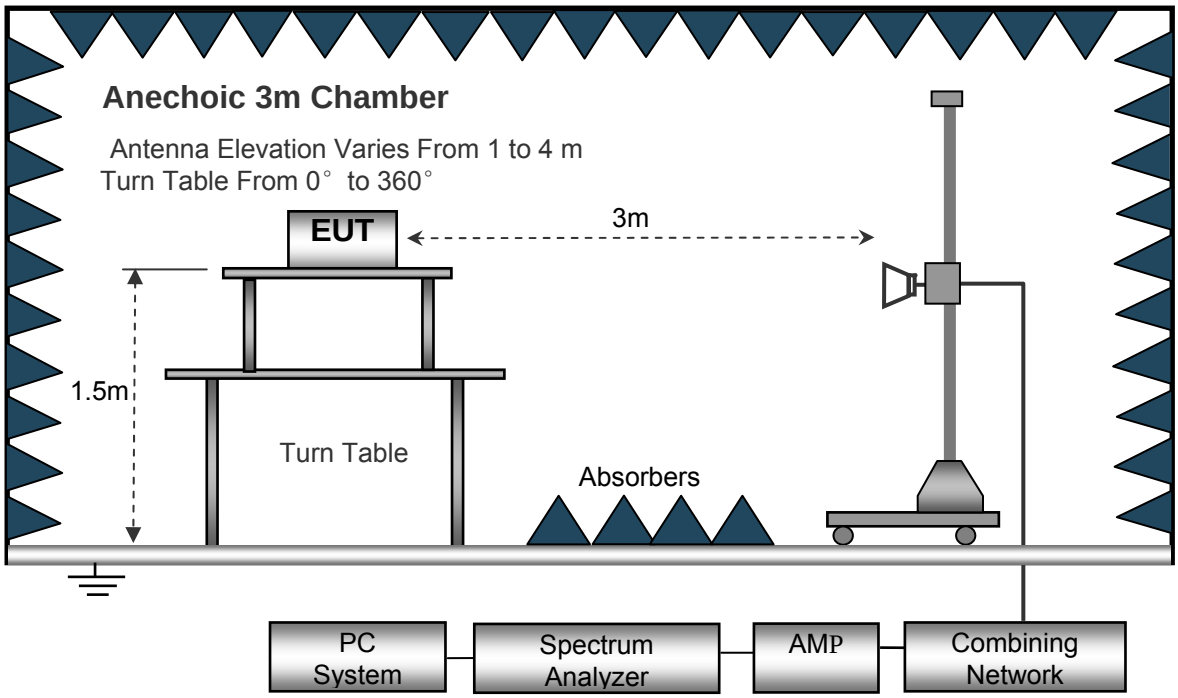
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto
IF Bandwidth..... 10kHz
Video Bandwidth..... 10kHz

Resolution Bandwidth..... 10kHz

30MHz ~ 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 100kHz
Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto
Detector ..... PK
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 3MHz
Detector ..... Ave.
Resolution Bandwidth..... 1MHz
Video Bandwidth..... 10Hz

7.4 Test Procedure

1. The EUT is placed on a turntable. For below 1GHz, the EUT is 0.8m above ground plane; Forabove1GHz, the EUT is 1.5m 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. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up tothe tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
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 radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

7.5 Summary of Test Results

Test Frequency: 9kHz ~ 30MHz

The measurements were more than 20 dB below the limit and not reported.

Test Frequency: 30MHz ~ 7.5GHz

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Low Channel									
486.02	13.67	PK	353	1.3	H	21.09	34.76	45.00	-10.24
486.02	13.10	PK	31	1.9	V	21.09	34.19	45.00	-10.81
4821.75	50.68	PK	262	1.4	V	-1.05	49.63	74.00	-24.37
4821.75	42.89	Ave	262	1.4	V	-1.05	41.84	54.00	-12.16
7232.63	46.95	PK	194	1.7	H	1.34	48.29	74.00	-25.71
7232.63	41.97	Ave	194	1.7	H	1.34	43.31	54.00	-10.69
2313.33	48.54	PK	161	1.4	V	-13.19	35.35	74.00	-38.65
2313.33	38.50	Ave	161	1.4	V	-13.19	25.31	54.00	-28.69
2363.46	48.24	PK	58	1.6	H	-13.15	35.09	74.00	-38.91
2363.46	37.69	Ave	58	1.6	H	-13.15	24.54	54.00	-29.46
2488.38	49.41	PK	328	1.1	V	-13.08	36.33	74.00	-37.67
2488.38	37.35	Ave	328	1.1	V	-13.08	24.27	54.00	-29.73

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
Middle Channel									
486.02	14.88	PK	40	2.0	H	21.09	35.97	45.00	-9.03
486.02	13.71	PK	104	1.5	V	21.09	34.80	45.00	-10.20
4882.50	49.46	PK	352	1.1	V	-0.63	48.83	74.00	-25.17
4882.50	44.24	Ave	352	1.1	V	-0.63	43.61	54.00	-10.39
7323.75	45.24	PK	246	1.7	H	2.21	47.45	74.00	-26.55
7323.75	42.79	Ave	246	1.7	H	2.21	45.00	54.00	-9.00
2310.93	52.17	PK	46	1.3	V	-13.19	38.98	74.00	-35.02
2310.93	38.85	Ave	46	1.3	V	-13.19	25.66	54.00	-28.34
2376.31	50.89	PK	188	1.4	H	-13.14	37.75	74.00	-36.25
2376.31	38.85	Ave	188	1.4	H	-13.14	25.71	54.00	-28.29
2496.99	50.28	PK	151	1.8	V	-13.09	37.19	74.00	-36.81
2496.99	38.95	Ave	151	1.8	V	-13.09	25.86	54.00	-28.14

Frequency	Receiver Reading	Detector	Turn table Angle	RX Antenna		Corrected Factor	Corrected Amplitude	Limit	Margin
				Height	Polar				
(MHz)	(dBμV)	(PK/QP/Ave)	Degree	(m)	(H/V)	(dB)	(dBμV/m)	(dBμV/m)	(dB)
High Channel									
486.02	14.19	PK	49	1.0	H	21.09	35.28	45.00	-9.72
486.02	15.00	PK	337	1.7	V	21.09	36.09	45.00	-8.91
4943.25	50.34	PK	350	1.2	V	-0.25	50.09	74.00	-23.91
4943.25	44.75	Ave	350	1.2	V	-0.25	44.50	54.00	-9.50
7414.88	48.22	PK	239	1.2	H	2.85	51.07	74.00	-22.93
7414.88	41.31	Ave	239	1.2	H	2.85	44.16	54.00	-9.84
2320.76	51.84	PK	345	1.0	V	-13.19	38.65	74.00	-35.35
2320.76	38.19	Ave	345	1.0	V	-13.19	25.00	54.00	-29.00
2362.57	50.03	PK	16	1.7	H	-13.14	36.89	74.00	-37.11
2362.57	36.31	Ave	16	1.7	H	-13.14	23.17	54.00	-30.83
2499.43	48.09	PK	12	1.3	V	-13.09	35.00	74.00	-39.00
2499.43	38.08	Ave	12	1.3	V	-13.09	24.99	54.00	-29.01

Test Frequency: 7.5GHz ~ 25GHz

The measurements were more than 20 dB below the limit and not reported.

8. Band Edge Measurement

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	DA 00-705& ANSI C63.10:2013
Test Limit:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).
Test Mode:	Transmitting and Hopping

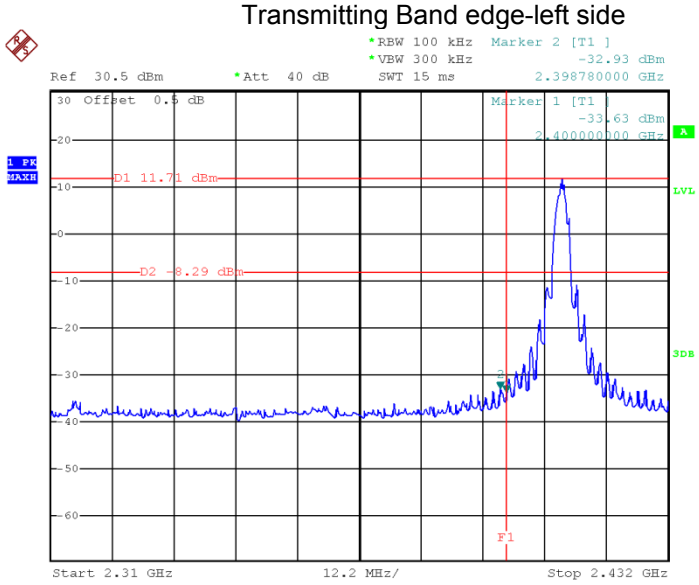
8.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
   Detector function = peak, Trace = max hold

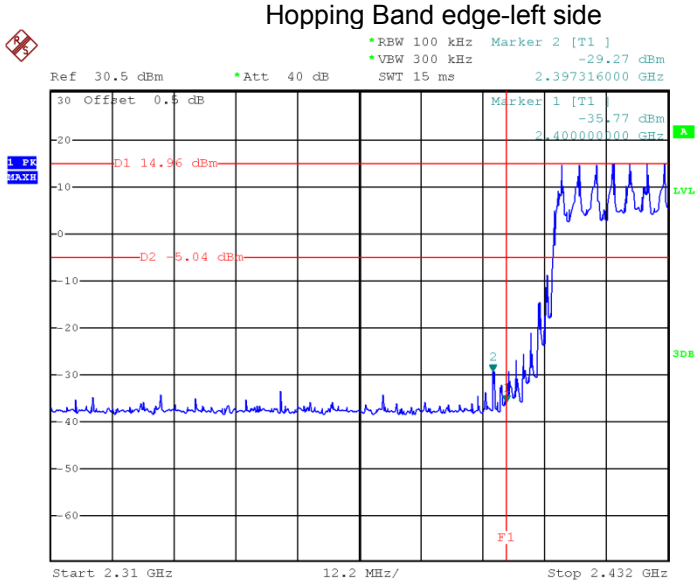
8.2 Test Result

Test plots

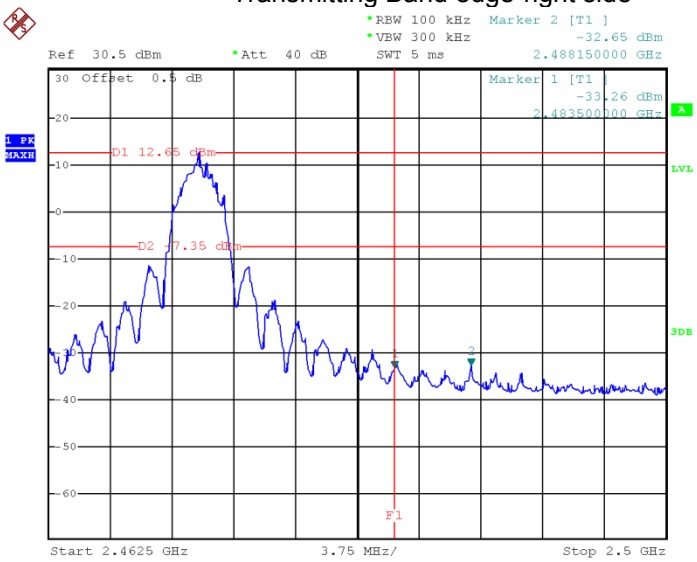
Transmitting Band edge-left side



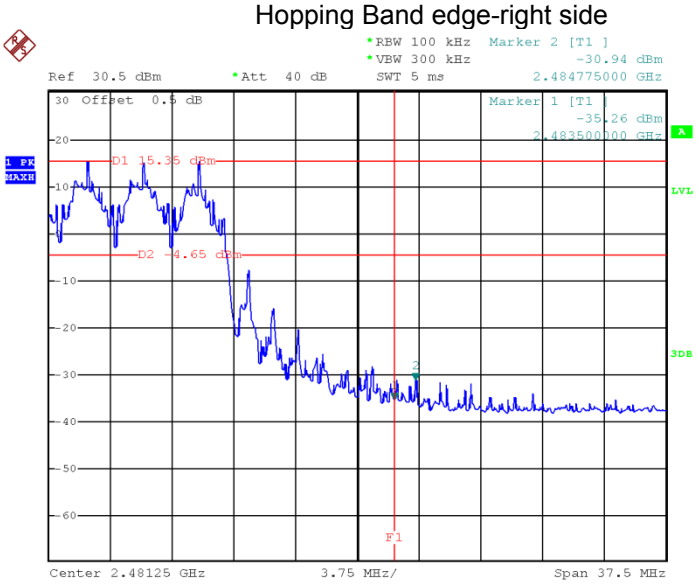
Hopping Band edge-left side



Transmitting Band edge-right side



Hopping Band edge-right side



9. 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705& ANSI C63.10:2013

Test Mode: Test in fixing operating frequency at low, Middle, high channel.

9.1 Test Procedure

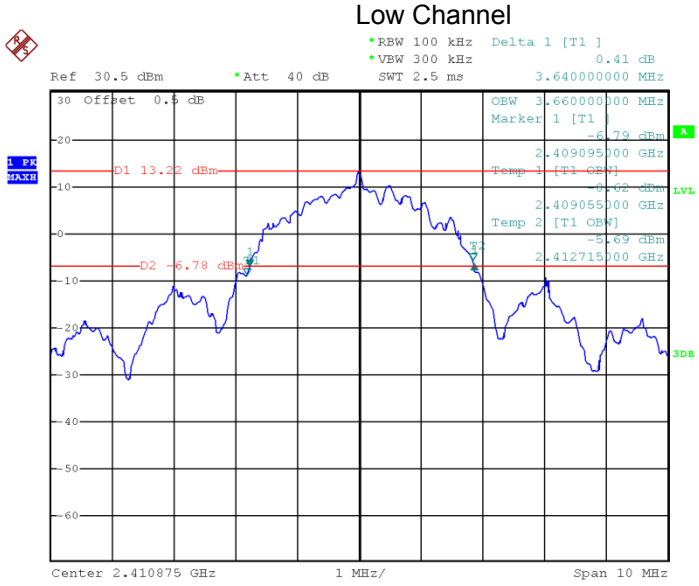
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

9.2 Test Result

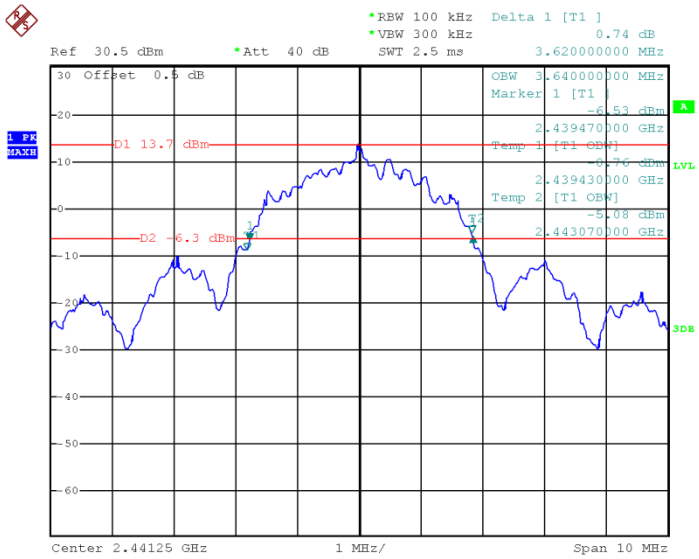
Test Channel	Bandwidth
Low	3.640MHz
Middle	3.620MHz
High	3.640MHz

Testplots

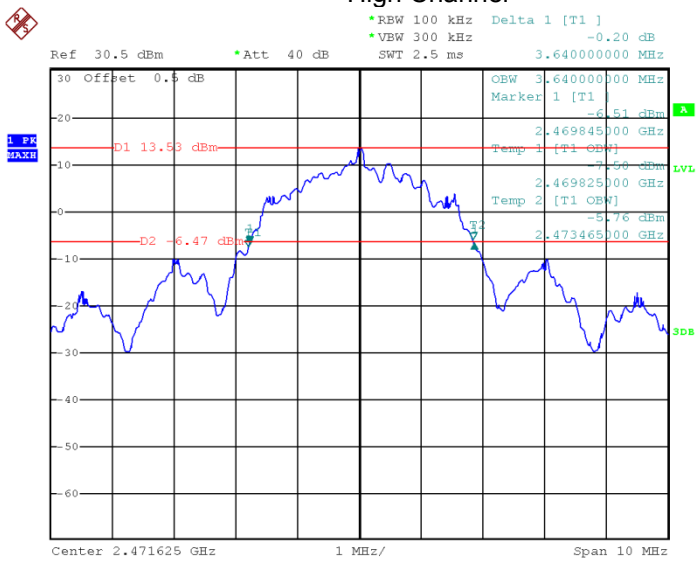
Low Channel



Middle Channel



High Channel



10. Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705& ANSI C63.10:2013

Test Limit: Regulation 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. Forall other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

Refer to the result “Number of Hopping Frequency” of this document. The 0.125watts (20.97 dBm) limit applies.

Test mode: Test in fixing frequency transmitting mode.

10.1 Test Procedure

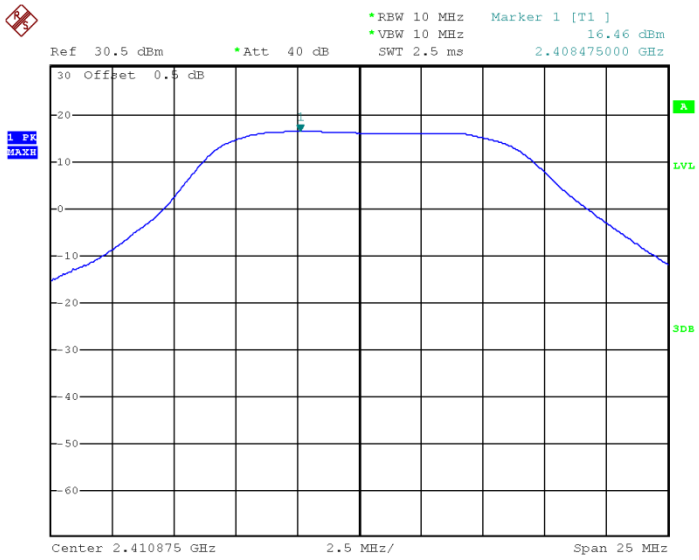
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 10MHz. VBW =10MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

10.2 Test Result

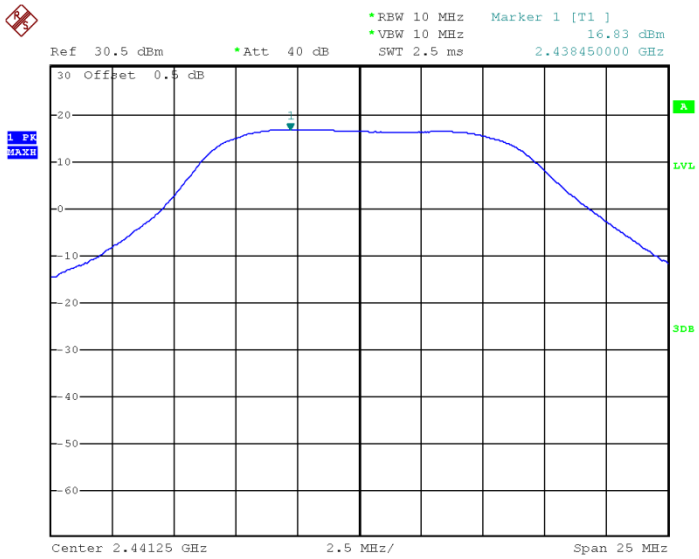
Test Channel	Output Power (dBm)	Limit (dBm)
Low	16.46	20.97
Middle	16.83	20.97
High	16.55	20.97

Testplots

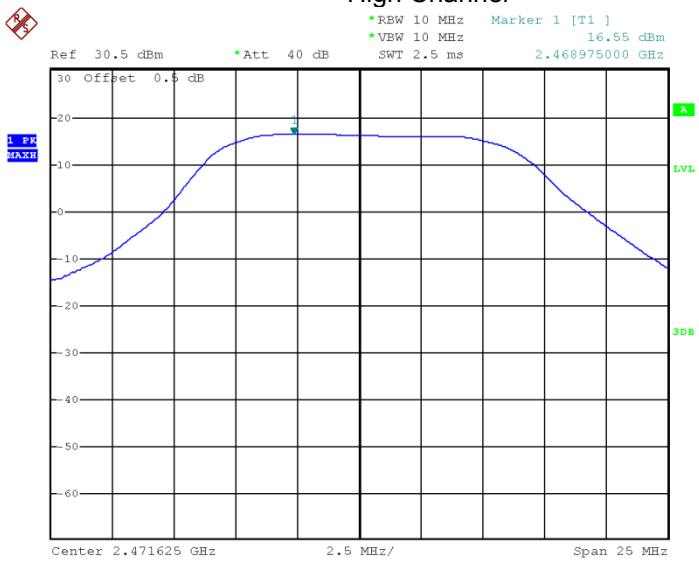
Low Channel



Middle Channel



High Channel



11. Hopping Channel Separation

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705& ANSI C63.10:2013

Test Limit: Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 1W.

Test Mode: Test in hopping transmitting operating mode.

11.1 Test Procedure

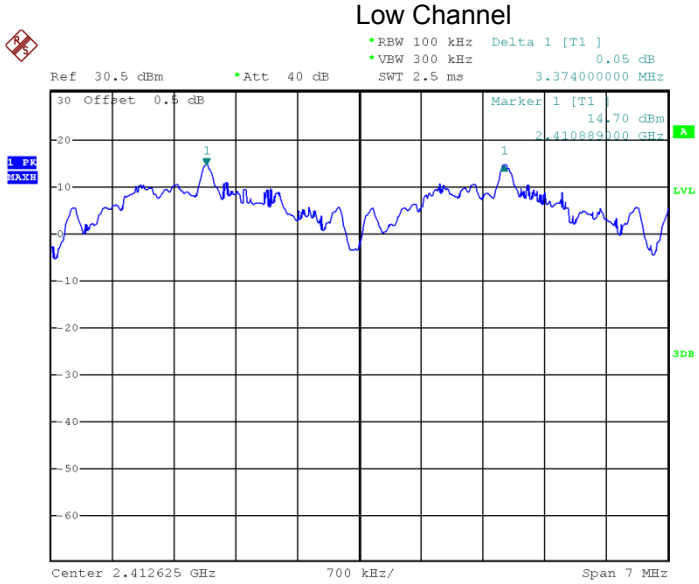
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100KHz. VBW = 300KHz , Span = 7MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

11.2 Test Result

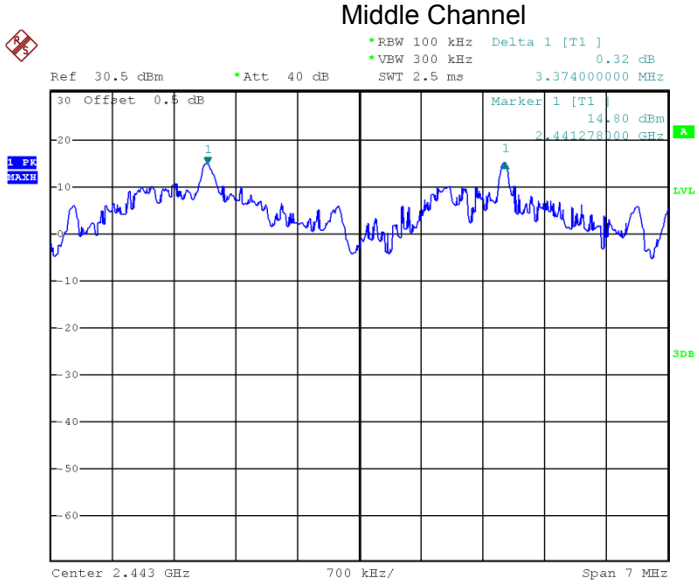
Test Channel	Separation (MHz)	Result
Low	3.374	PASS
Middle	3.374	PASS
High	3.388	PASS

Test plots

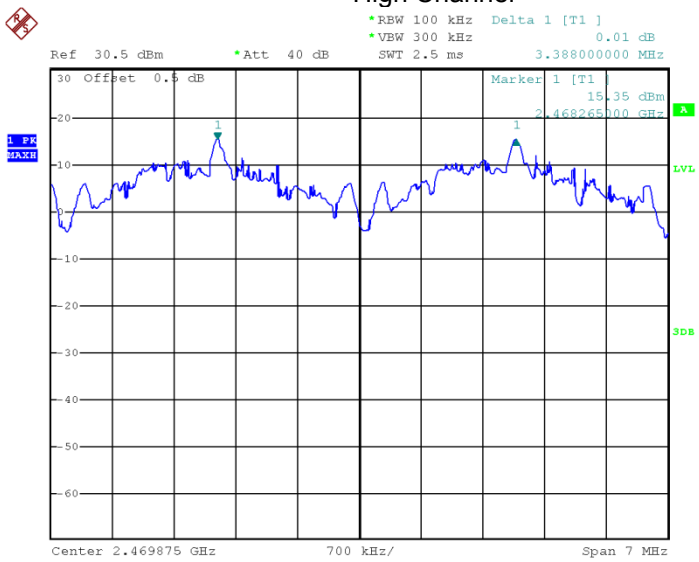
Low Channel



Middle Channel



High Channel



12. Number of Hopping Frequency

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705& ANSI C63.10:2013

Test Limit: Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

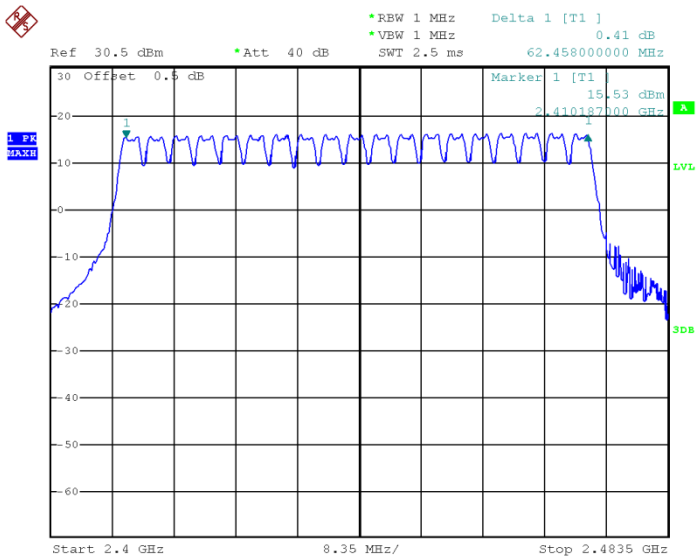
Test Mode: Test in hopping transmitting operating mode.

12.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 1MHz. VBW = 1MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: Start Frequency = 2.4GHz, Stop Frequency = 2.483GHz. Sweep=auto;

12.2 Test Result

Test Plots: 19Channels in total



13. Dwell Time

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705& ANSI C63.10:2013

Test Limit: Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Mode: Test in hopping transmitting operating mode.

13.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.

2. Set spectrum analyzer span = 0. Centreon a hopping channel;

3. Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel.

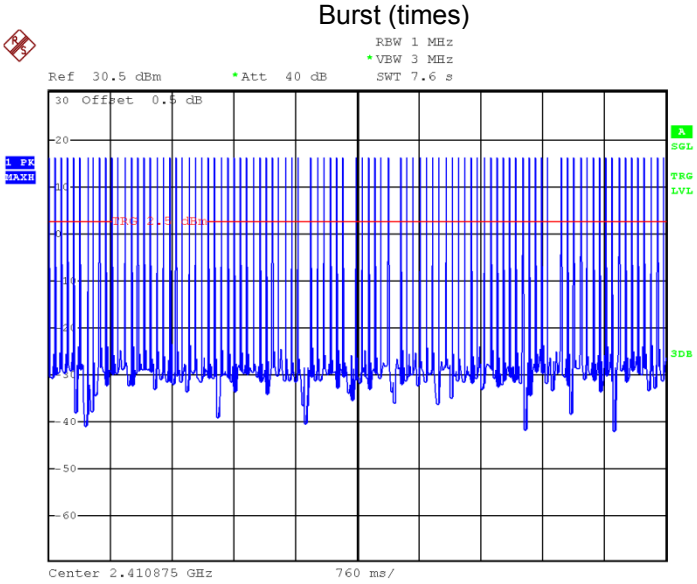
4. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

13.2 Test Result

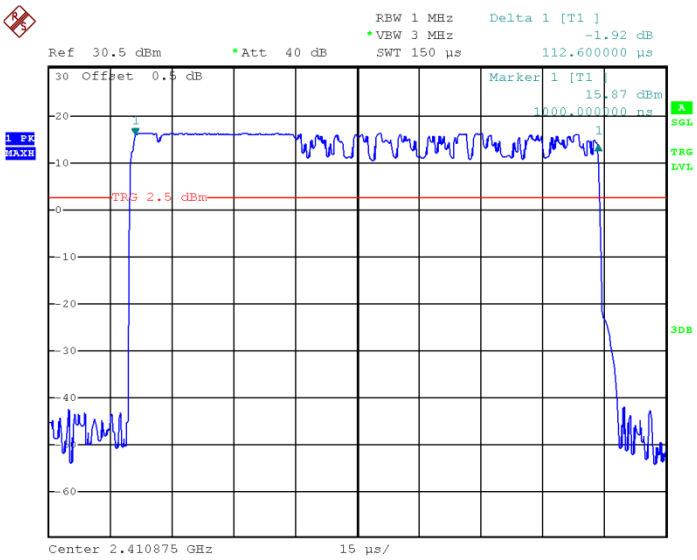
Channel	marker-delta(ms)	Observation Period(s)	Burst (times)	DwellTime(s)	Limits (s)
Low	0.113	7.6	93	0.011	0.4
High	0.112	7.6	85	0.010	0.4
Calculation formula: Dwell time=0.4s*Number ofHoppingFrequency*Burst(Times)* (markerdelta/1000)/ObservationPeriod Remark: Number ofHoppingFrequency=19; ObservationPeriod=7.6s; Low Channel=2410.875MHz; High Channel=2471.625MHz					

Test Plots
Low Channel

Burst (times)

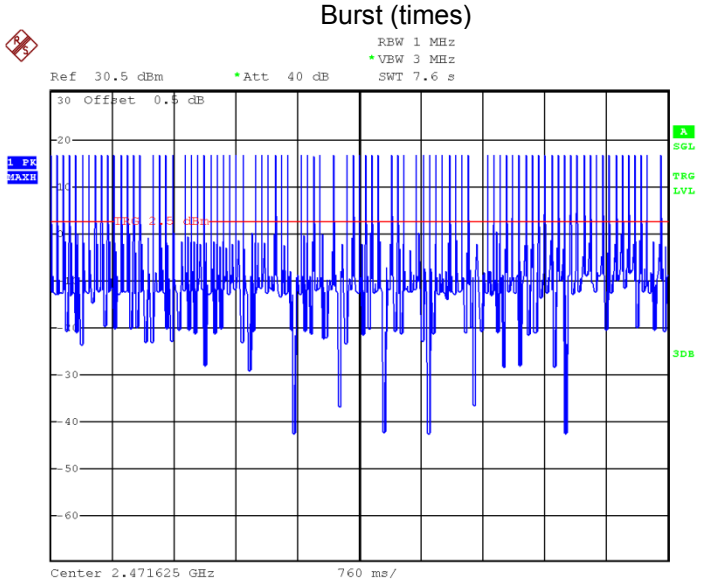


marker-delta

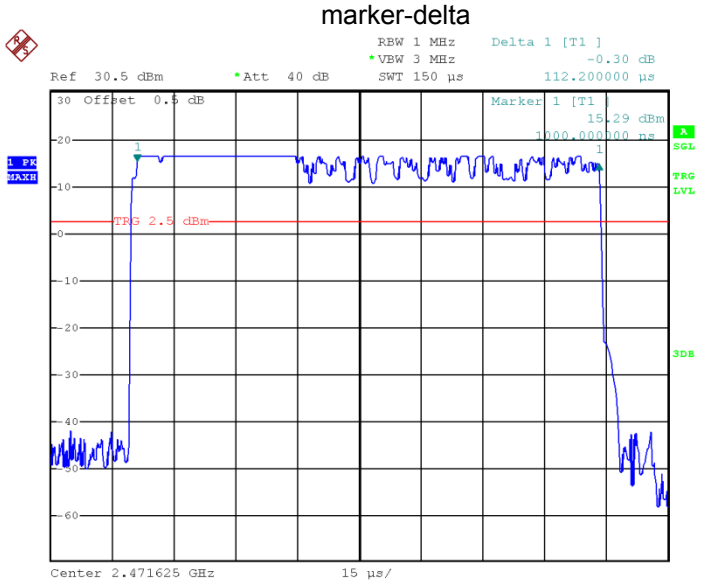


High Channel

Burst (times)

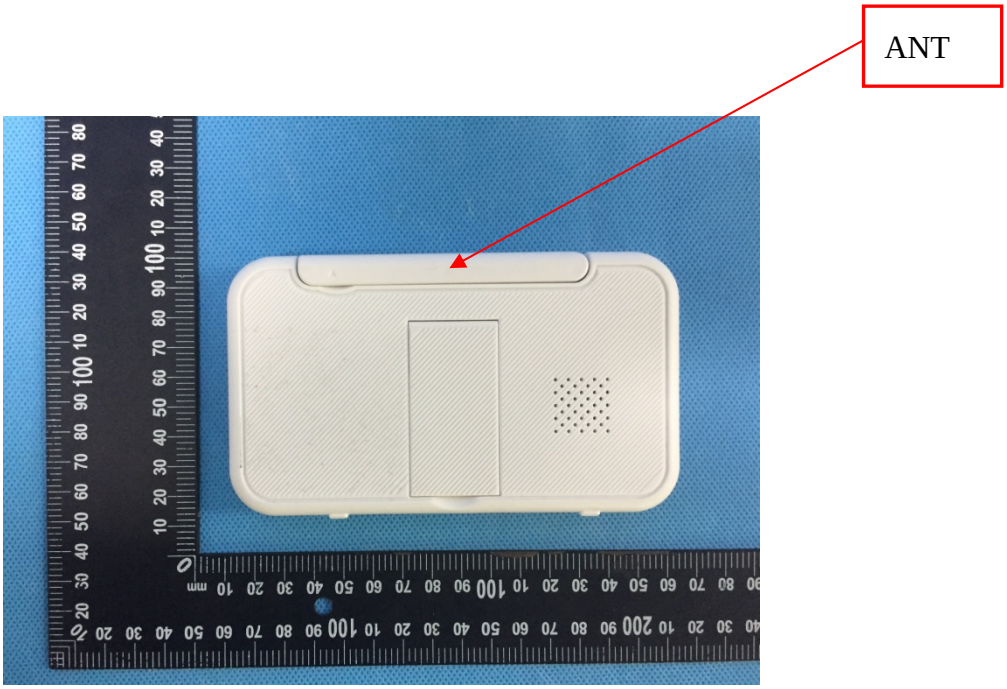


marker-delta



14. Antenna Requirement

According to the FCC Part 15 Paragraph 15.203, 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. This product has a Integrated antenna, fulfil the requirement of this section.



15. RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091

15.1 Requirements

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

15.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

15.3 MPE Calculation Method

P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to
Pd $= P_{out}*G/(4*Pi*R^2)$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

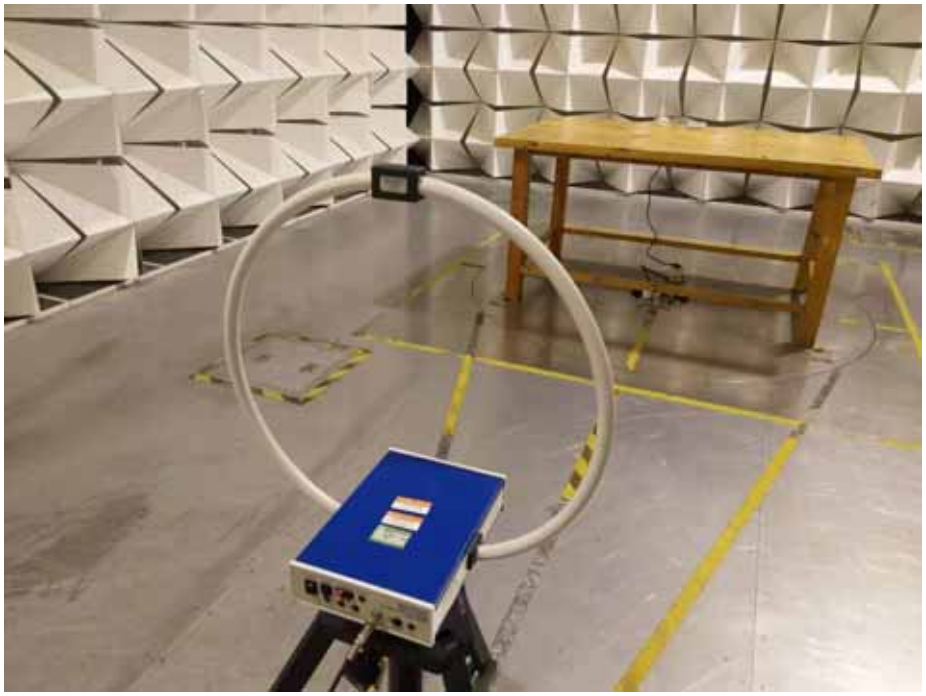
Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
3.00	1.995	16.83	48.19	0.0191	1

Compliance.

16. Photographs – Test Setup

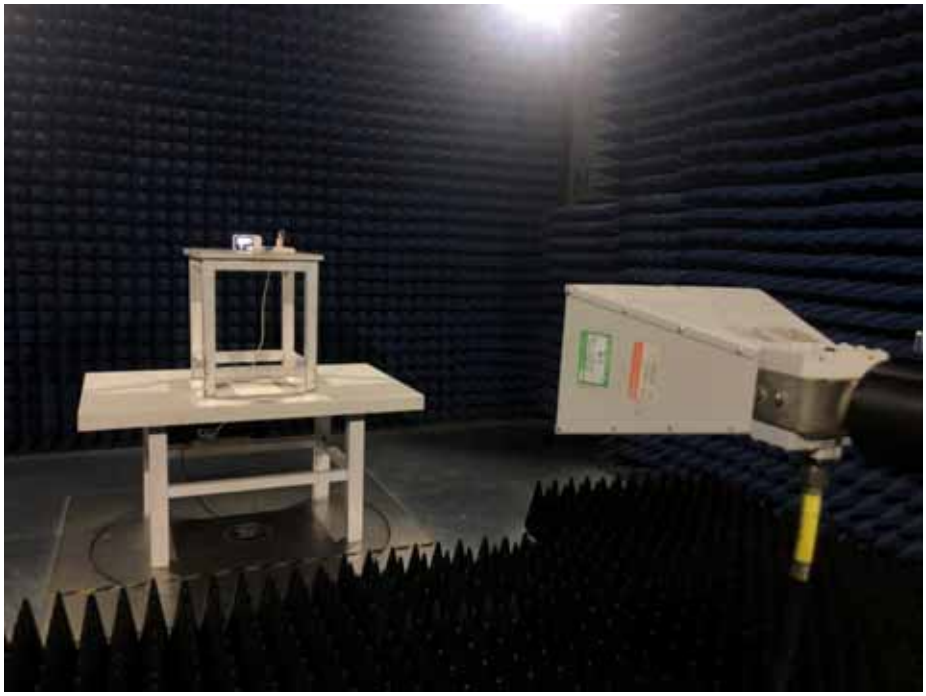
16.1 Photograph – Radiation Spurious Emission Test Setup

Below 30MHz



30MHz-1GHz

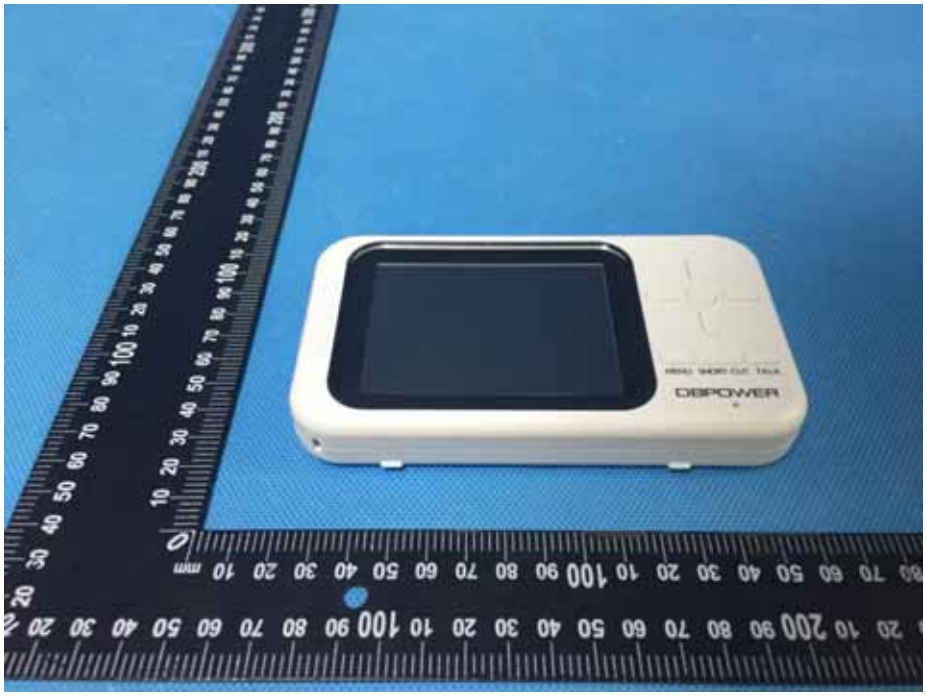
Above 1GHz



16.2 Conducted Emission

17. Photographs - Constructional Details

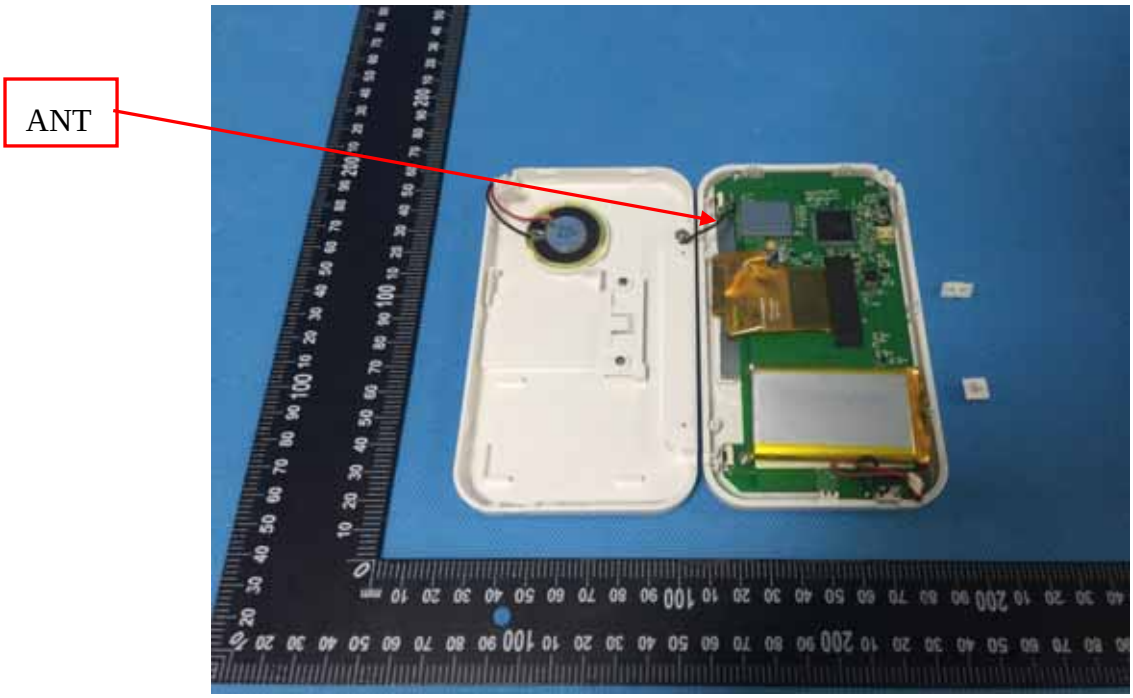
17.1 External Photos

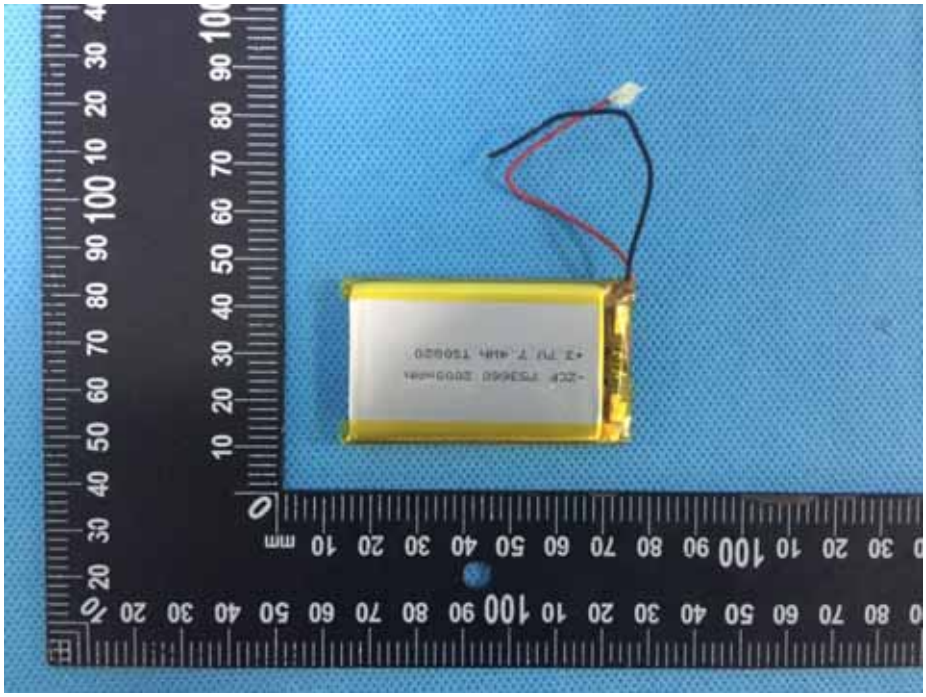

DBPOWER

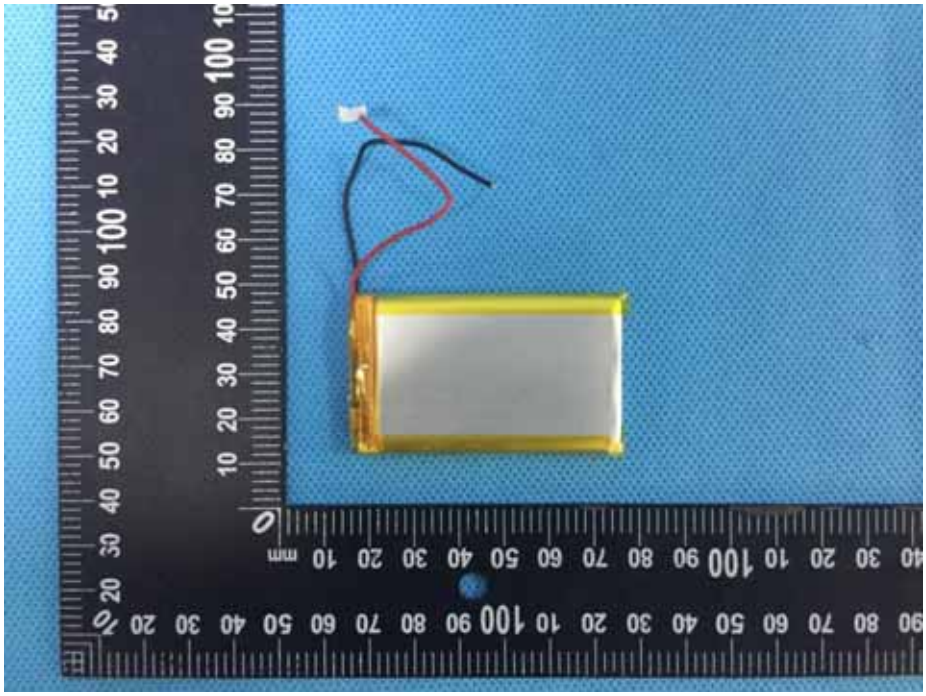

DBPOWER

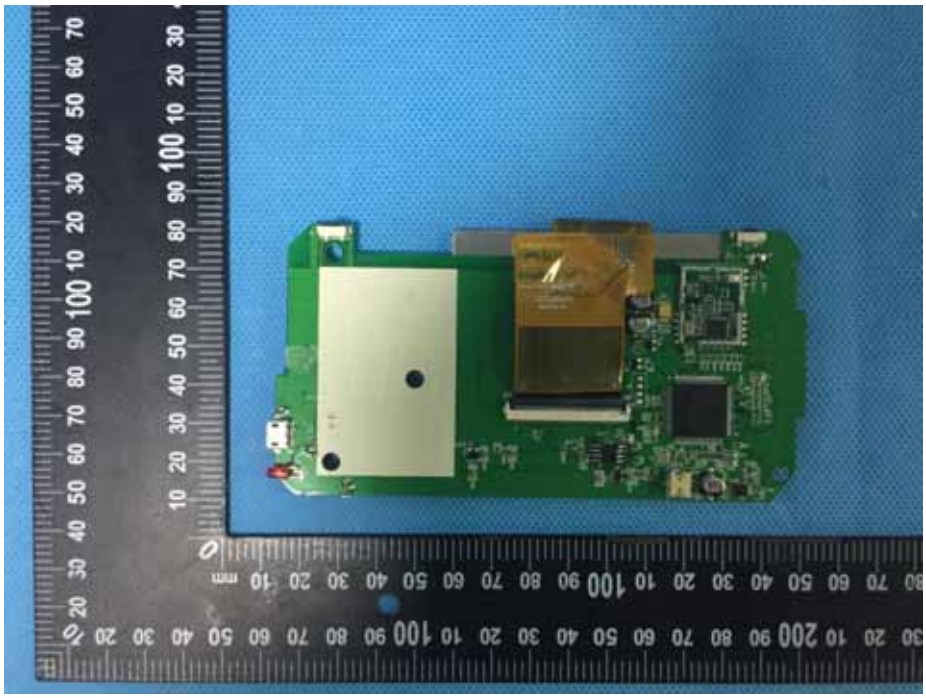

DC/5V

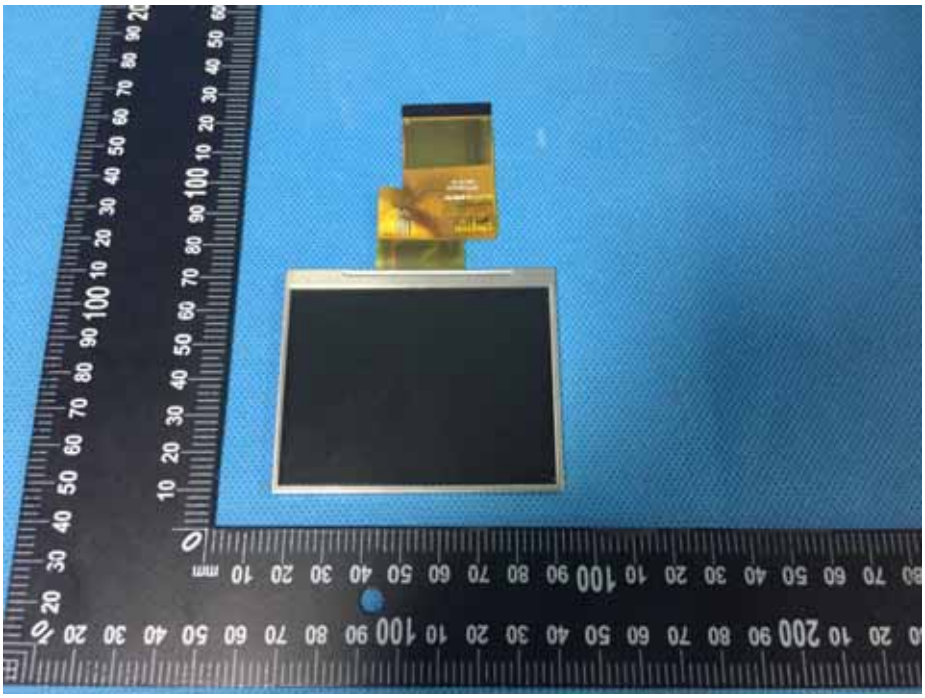
17.2 Internal Photos

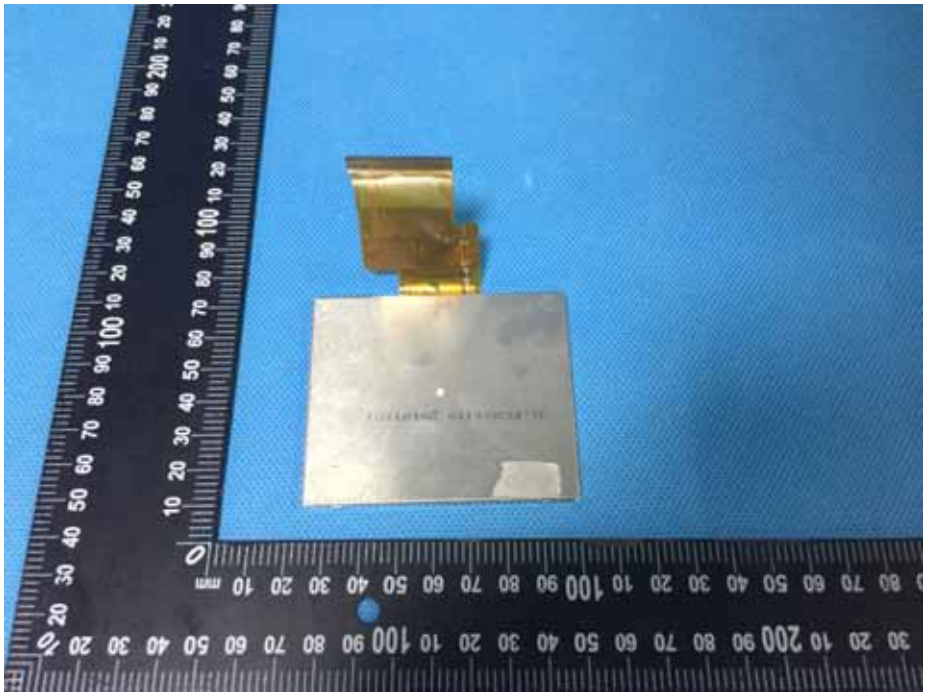


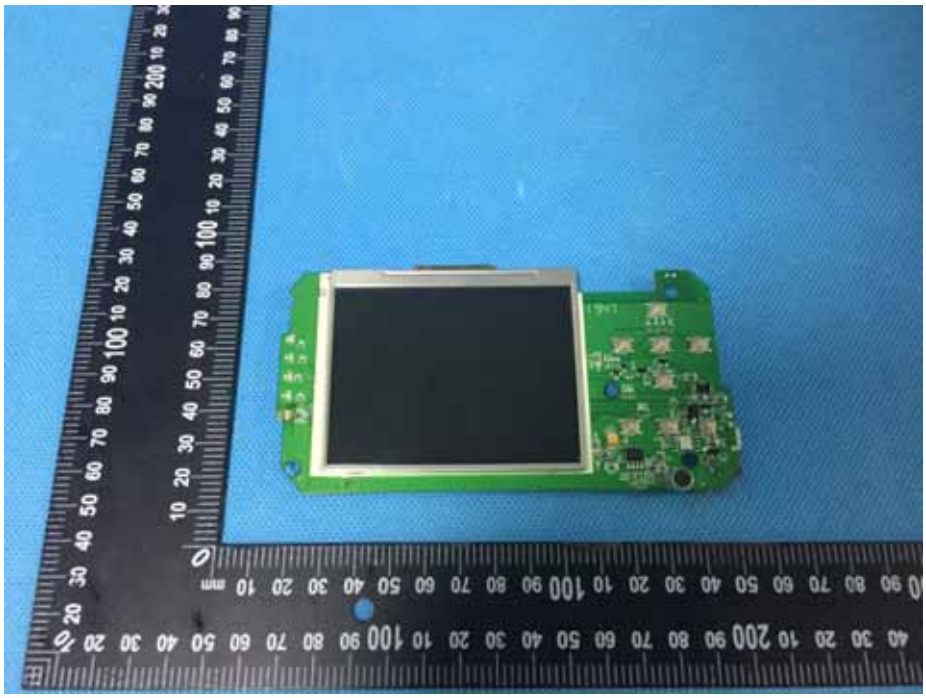


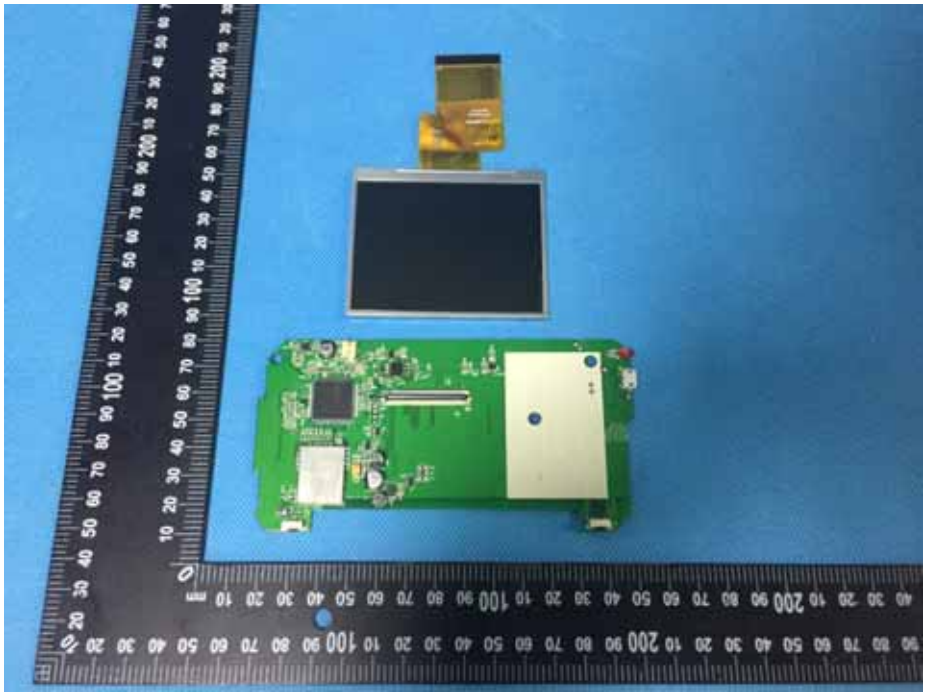


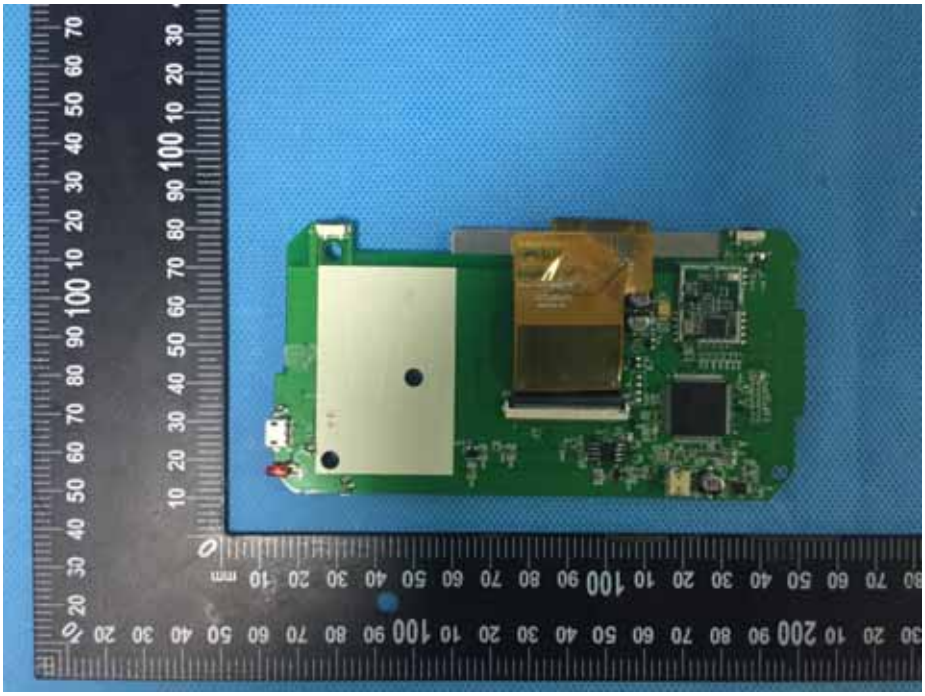


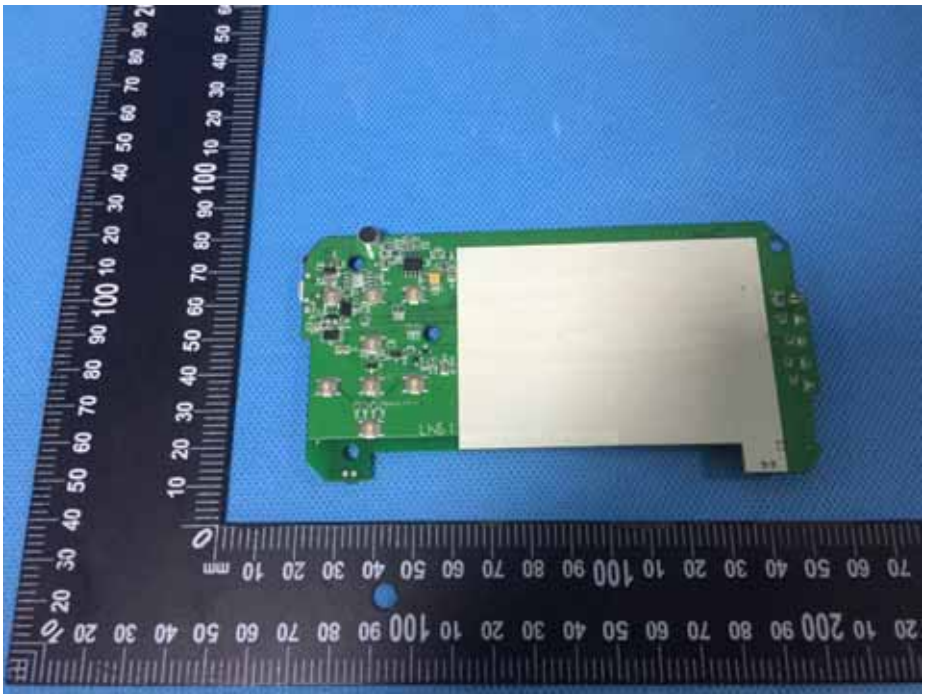


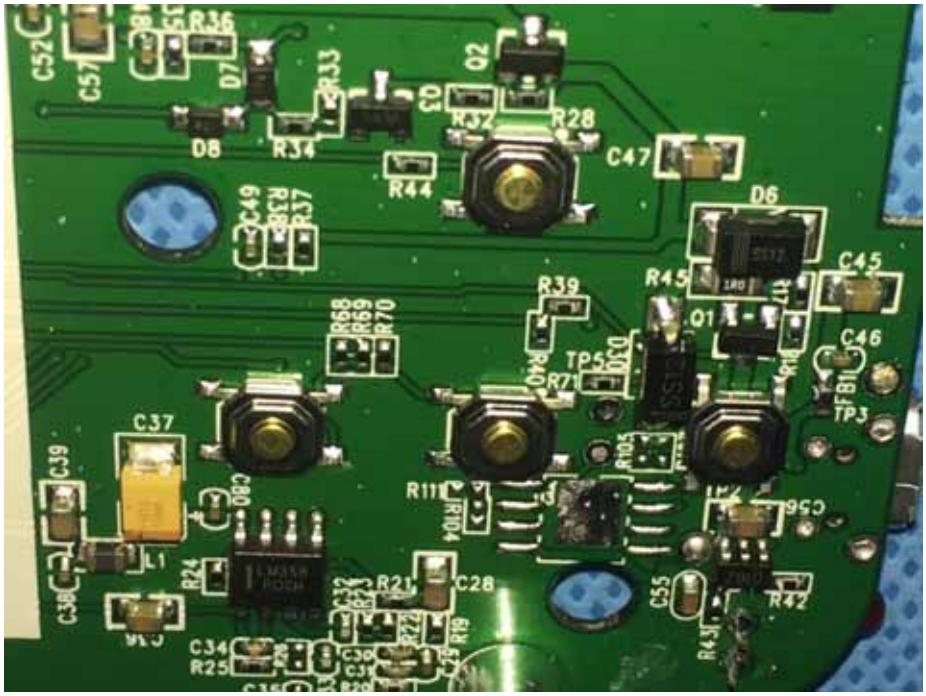




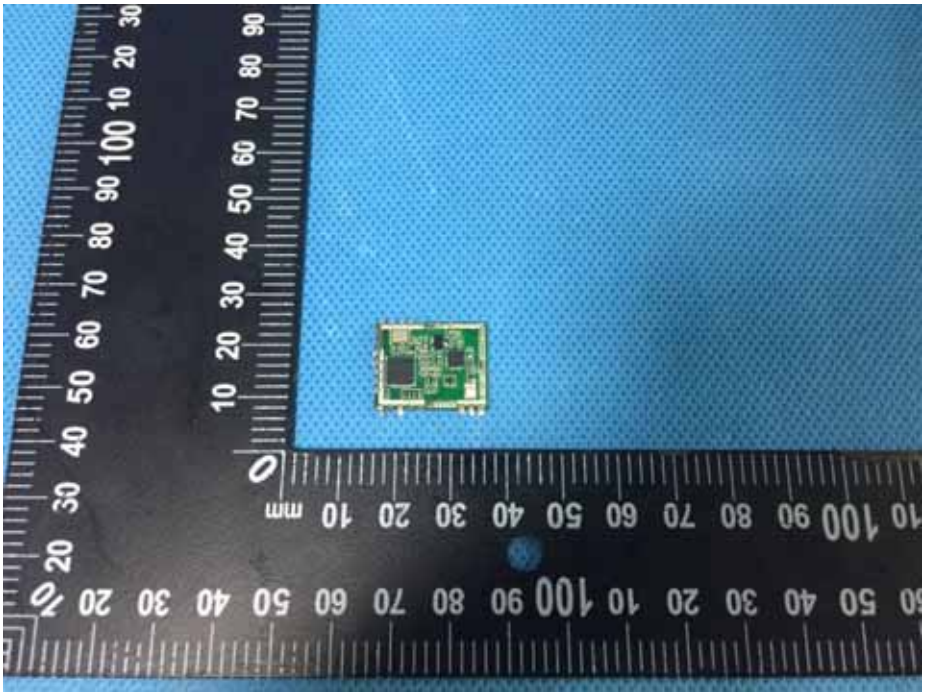


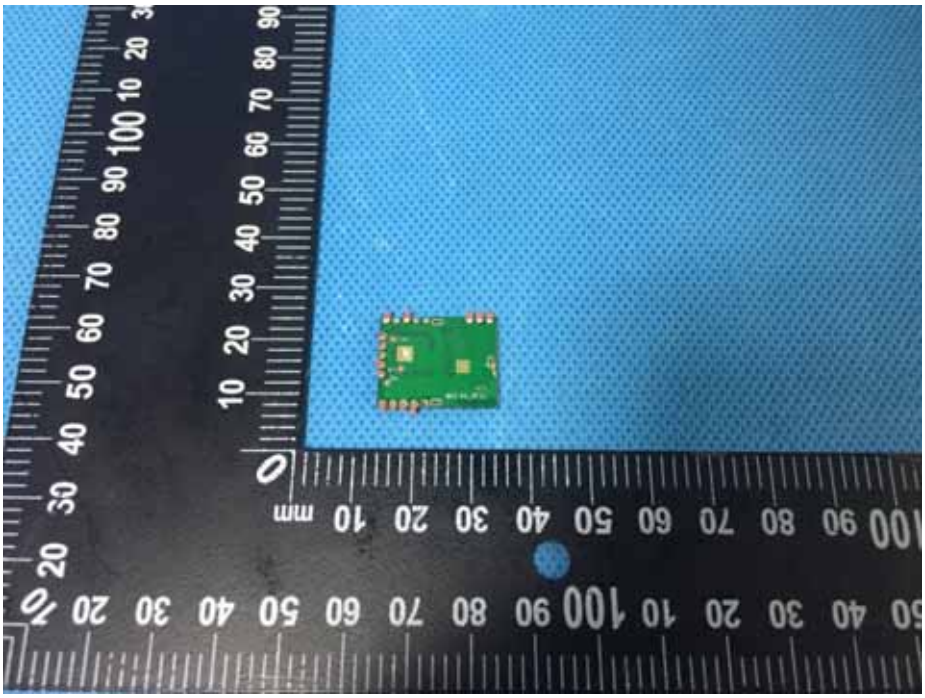


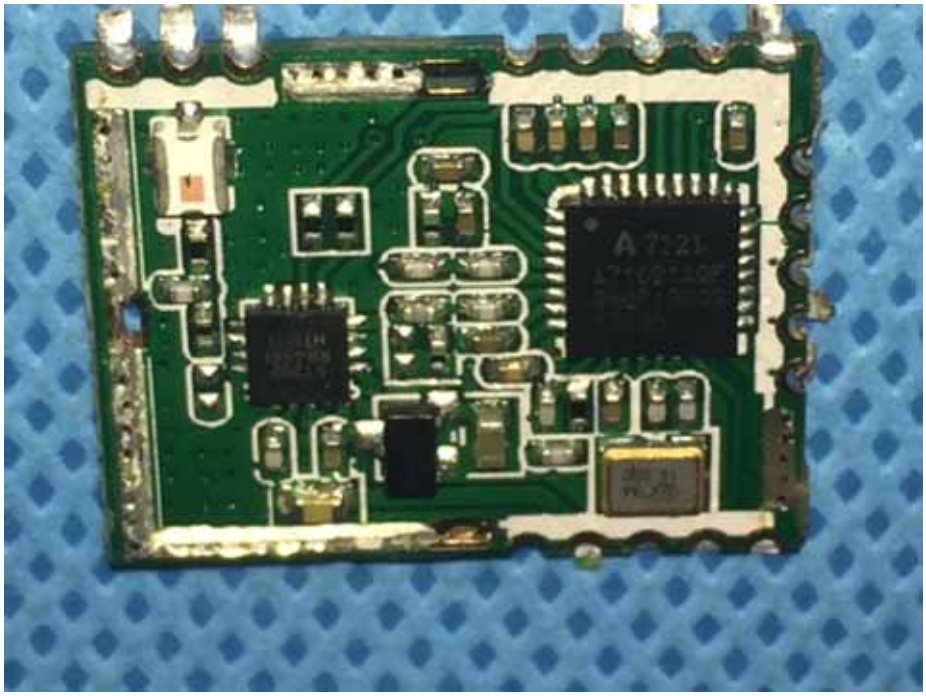


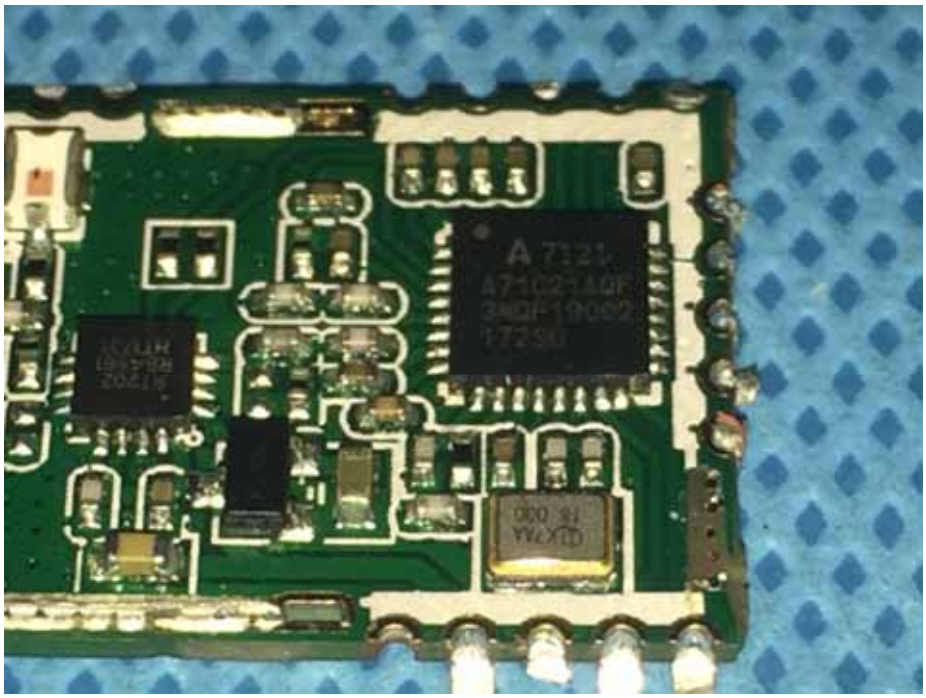

R36
C52
C51
D7
R33
Q2
Q3
R32
R28
D8
R34
C47
R44
C49
R37
D6
C45
R39
R45
Q1
R68
R69
R70
TP5
R40
R71
C46
TP3
C37
C39
R105
R111
R104
L1
R24
C28
R21
C55
R42
C34
R25
C36


R64
C70
C82
C63
Q4
100
10V
RVT
SONIX
SN9313DCFC
C50
R27
C15
C71
R65
R59
R58
R57









====== End of Report ======