TEST REPORT

Reference No.	:	WTF15S0831379-1E
FCC ID	:	2AIBS-2SP8635JK04
Applicant	:	COMET INTERNATIONAL CORPORATION
Address	:	4Fl., No.130, Lane, 254, Huanhe S. Road, Sanchong District, New Taipei City, Taiwan
Manufacturer	:	The same as above
Address	:	The same as above
Product Name	:	BLE SPEAKER LIGHTING
Model No.	:	JK04, COMET01-99, MAGIC01-99, SOUND&LIGHT01-99
Standards	:	FCC CFR47 Part 15 Section 15.247:2016
Date of Receipt sample	:	Aug. 06, 2015
Date of Test	:	Nov. 20, 2016 – Dec. 13, 2016
Date of Issue	:	Mar. 01, 2017
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.

Prepared By:
Waltek Services (Shenzhen) Co., Ltd.
Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China
Tel :+86-755-83551033
Fax:+86-755-83552400

Tested by:

Zero Zhou / Tested Engineer

Approved by:

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.205(a) 15.209(a)	PASS
Conducted Emissions	15.207(a)	PASS
Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3),(4)	PASS
Power Spectral Density	15.247(e)	PASS
Band Edge	15.247(d)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

3 Contents

Page

4 Report Revision History

Report No.	Report Version	Description	Issue Date
WTF15S0831379-1E	NONE	Original	Feb. 27, 2017
WTF15S0831379-1E	Revision1	Identify all ports of device	Mar. 01, 2017

5 General Information

5.1 General Description of E.U.T.

Product Name:	BLE SPEAKER LIGHTING
Model No.:	JK04, COMET01-99, MAGIC01-99, SOUND&LIGHT01-99
Model Difference:	Only model names are different.
Operation Frequency:	2402MHz ~ 2480MHz, 79 channels for EDR, 40 channels for BLE
Type of modulation:	GFSK, Pi/4DQPSK, 8DPSK, GFSK (BLE)
The lowest oscillator:	8 MHz
Antenna installation:	PCB printed antenna
Antenna Gain:	0dBi

5.2 Details of E.U.T.

Technical Data:	DC 3.7V Power by battery or Charging: DC 5V from DC Jack to USB port from PC

5.3 Channel List

BLE mode							
Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
0	2402	1	2404	2	2406	3	2408
4	2410	5	2412	6	2414	7	2416
8	2418	9	2420	10	2422	11	2424
12	2426	13	2428	14	2430	15	2432
16	2434	17	2436	18	2438	19	2440
20	2442	21	2444	22	2446	23	2448
24	2450	25	2452	26	2454	27	2456
28	2458	29	2460	30	2462	31	2464
32	2466	33	2468	34	2470	35	2472
36	2474	37	2476	38	2478	39	2480

5.4 Test Mode

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

Table 1 Tests Carried Out Under FCC part 15.247

Test mode	Low channel	Middle channel	High channel
Transmitting	2402MHz	2440MHz	2480MHz

Table 2 Tests Carried Out Under FCC part 15.207&15.209

Test Item	Test Mode
Conducted Emissions	Communication
Radiated Emissions	Communication

5.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: 7760A-1**

  Waltek Services (Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration 7760A-1, October. 15, 2015.

- **FCC Test Site 1#– Registration No.: 880581**

  Waltek Services(Shenzhen) 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 880581, April 29, 2014.

- **FCC Test Site 2#– Registration No.: 328995**

  Waltek Services(Shenzhen) 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 328995, December 3, 2014.

6 Equipment Used during Test

6.1 Equipments List

Conducted Emissions Test Site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	100947	Sep.12, 2016	Sep.11, 2017
2.	LISN	R&S	ENV216	101215	Sep.12, 2016	Sep.11, 2017
3.	Cable	Top	TYPE16(3.5M)	-	Sep.12, 2016	Sep.11, 2017
Conducted Emissions Test Site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Sep.12, 2016	Sep.11, 2017
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Sep.12, 2016	Sep.11, 2017
3.	Limiter	York	MTS-IMP-136	261115-001-0024	Sep.12, 2016	Sep.11, 2017
4.	Cable	LARGE	RF300	-	Sep.12, 2016	Sep.11, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 1#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1	EMC Analyzer	Agilent	E7405A	MY45114943	Apr.29, 2016	Apr.28, 2017
2	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Oct.17, 2016	Oct.16, 2017
3	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Apr.09, 2016	Apr.08, 2017
4	Coaxial Cable (below 1GHz)	Top	TYPE16(13M)	-	Sep.12, 2016	Sep.11, 2017
5	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9120 D	667	Apr.09, 2016	Apr.08, 2017
6	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	335	Apr.09, 2016	Apr.08, 2017
7	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Apr.13, 2016	Apr.12, 2017
8	Coaxial Cable (above 1GHz)	Top	1GHz-25GHz	EW02014-7	Apr.13, 2016	Apr.12, 2017
3m Semi-anechoic Chamber for Radiation Emissions Test site 2#						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No**	**Last Calibration Date**	**Calibration Due Date**
1	Test Receiver	R&S	ESCI	101296	Apr.13, 2016	Apr.12, 2017
2	Trilog Broadband Antenna	SCHWARZBECK	VULB9160	9160-3325	Apr.09, 2016	Apr.08, 2017
3	Amplifier	Compliance pirection systems inc	PAP-0203	22024	Apr.13, 2016	Apr.12, 2017
4	Cable	HUBER+SUHNER	CBL2	525178	Apr.13, 2016	Apr.12, 2017

RF Conducted Testing						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer (9k~26.5GHz)	Agilent	E7405A	MY45114943	Sep.15,2016	Sep.14,2017
2.	Spectrum Analyzer (9k-6GHz)	R&S	FSL6	100959	Sep.15,2016	Sep.14,2017
3.	Signal Analyzer (9k~26.5GHz)	Agilent	N9010A	MY50520207	Apr. 29, 2016	Apr. 28, 2017

6.2 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)
	± 4.74 dB (Horn antenna 1000M~25000MHz)
Conducted Spurious Emissions test	± 3.64 dB (AC mains 150KHz~30MHz)

6.3 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

7 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)

7.1 E.U.T. Operation

Operating Environment **:**

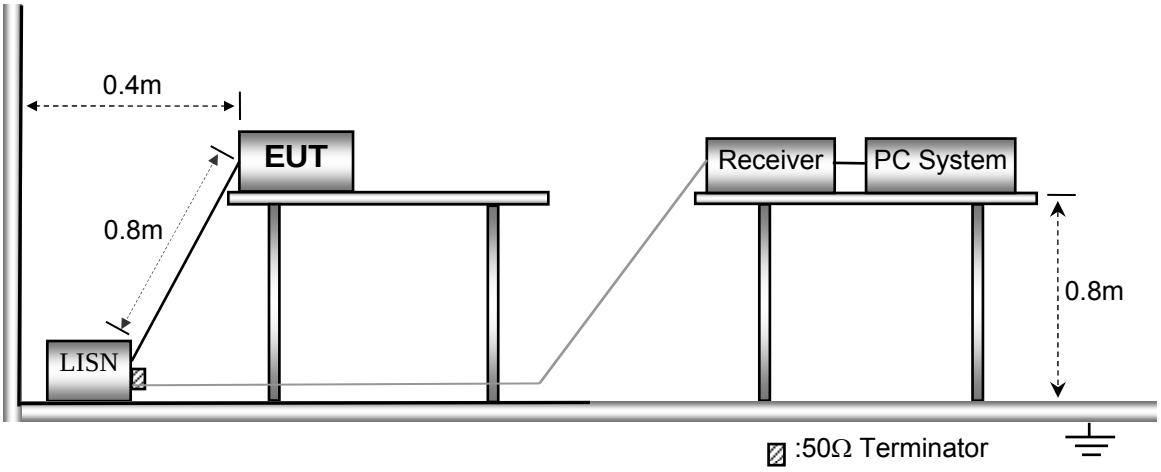
Temperature:	25.5 °C
Humidity:	51 % RH
Atmospheric Pressure:	101.2kPa

EUT Operation **:**

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

7.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.

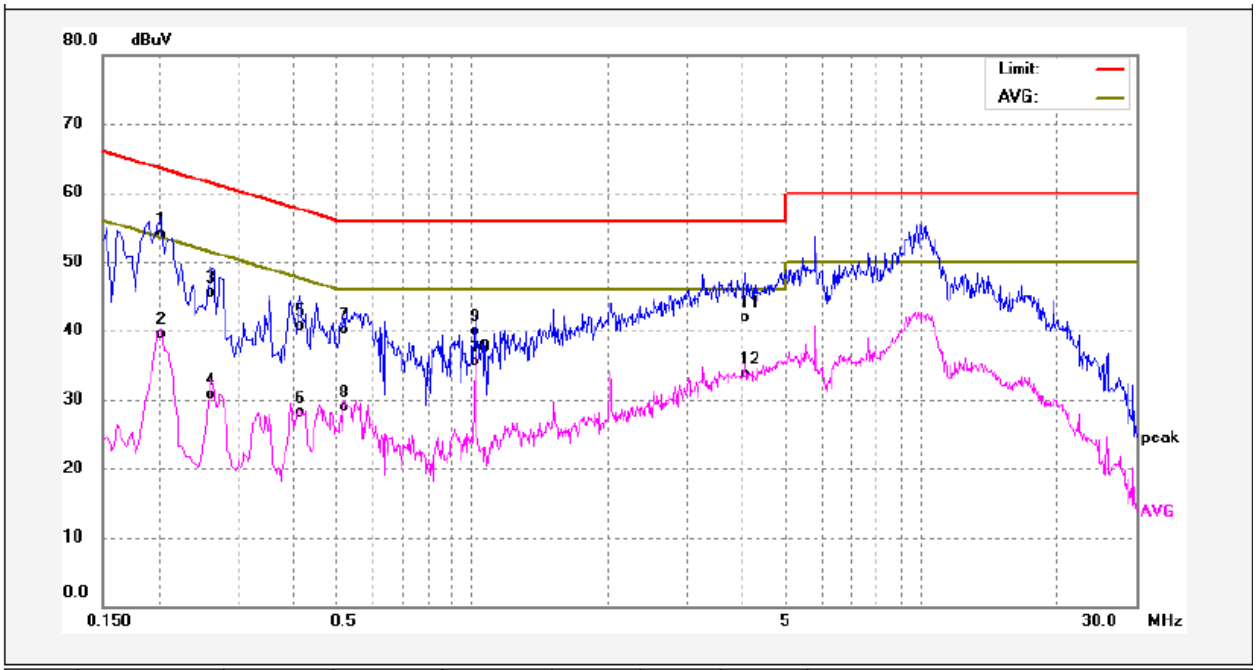


7.3 Measurement Description

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.

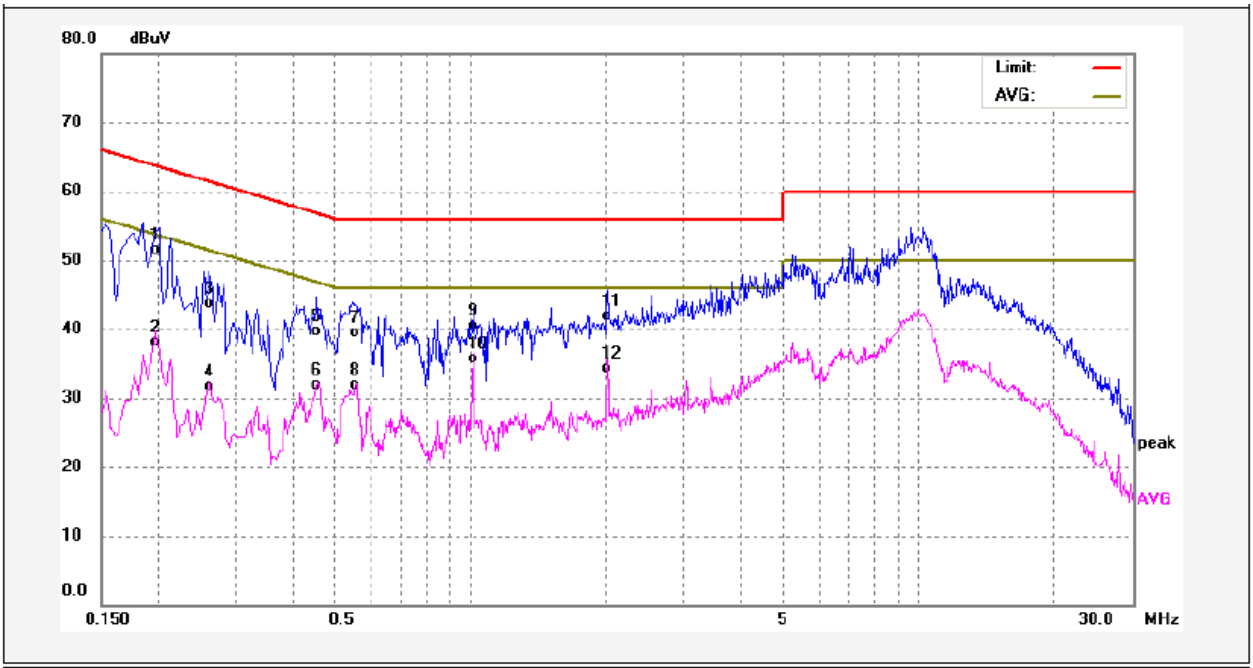
7.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.2020	43.79	10.10	53.89	63.52	-9.63	QP	
2	0.2020	29.45	10.10	39.55	53.52	-13.97	AVG	
3	0.2620	35.33	10.10	45.43	61.36	-15.93	QP	
4	0.2620	20.63	10.10	30.73	51.36	-20.63	AVG	
5	0.4140	30.50	10.11	40.61	57.57	-16.96	QP	
6	0.4140	18.08	10.11	28.19	47.57	-19.38	AVG	
7	0.5260	30.07	10.13	40.20	56.00	-15.80	QP	
8	0.5260	18.86	10.13	28.99	46.00	-17.01	AVG	
9	1.0140	29.71	10.21	39.92	56.00	-16.08	QP	
10	1.0140	25.23	10.21	35.44	46.00	-10.56	AVG	
11	4.0500	31.71	10.23	41.94	56.00	-14.06	QP	
12	4.0500	23.56	10.23	33.79	46.00	-12.21	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1980	41.42	10.10	51.52	63.69	-12.17	QP	
2	0.1980	27.97	10.10	38.07	53.69	-15.62	AVG	
3	0.2620	33.59	10.10	43.69	61.36	-17.67	QP	
4	0.2620	21.51	10.10	31.61	51.36	-19.75	AVG	
5	0.4580	29.65	10.12	39.77	56.73	-16.96	QP	
6	0.4580	21.79	10.12	31.91	46.73	-14.82	AVG	
7	0.5580	29.46	10.13	39.59	56.00	-16.41	QP	
8	0.5580	21.82	10.13	31.95	46.00	-14.05	AVG	
9	1.0140	30.26	10.21	40.47	56.00	-15.53	QP	
10	1.0140	25.53	10.21	35.74	46.00	-10.26	AVG	
11	2.0220	31.68	10.19	41.87	56.00	-14.13	QP	
12	2.0220	24.13	10.19	34.32	46.00	-11.68	AVG	

8 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: 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	$20\log^{(500)}$

8.1 EUT Operation

Operating Environment:

Temperature: 25.5 °C

Humidity: 51 % RH

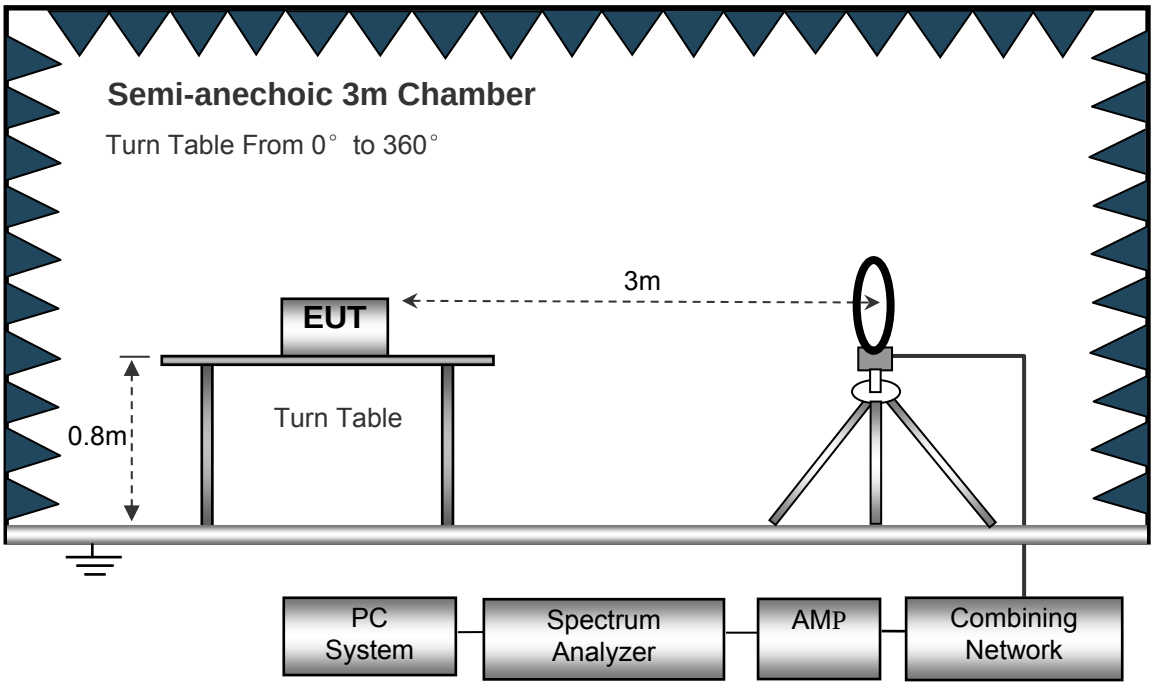
Atmospheric Pressure: 1016 mbar

EUT Operation:

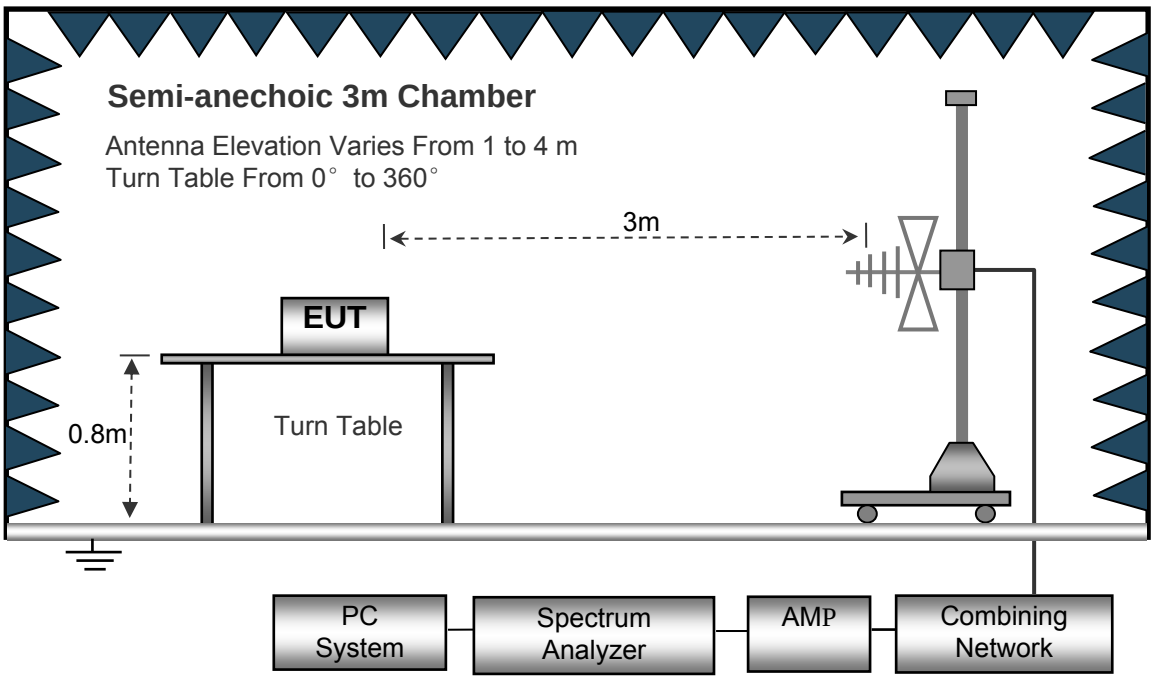
The test was performed in transmitting mode, the test data were shown in the report.

8.2 Test Setup

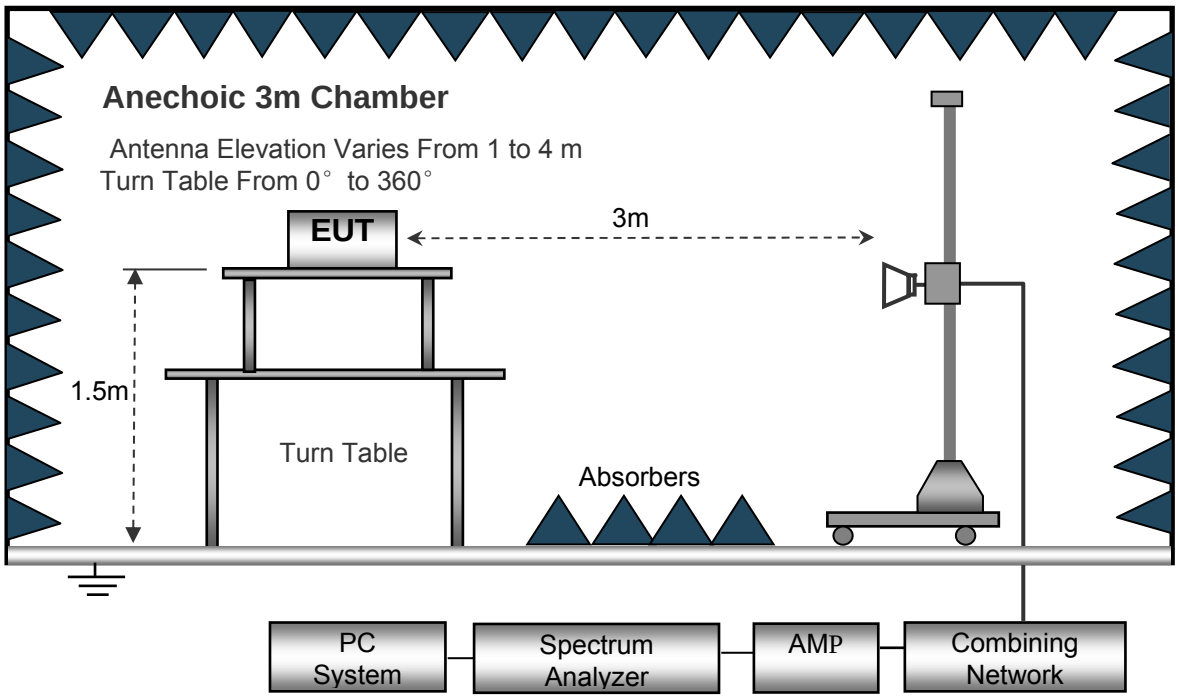
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.10:2013.
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



8.3 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

8.4 Test Procedure

1. The EUT is placed on a turntable, which is above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are performed in X,Y and Z axis positioning(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand),the worst condition was tested putting the eut in X axis,so the worst data were shown as follow.
8. New battery was used during test.

8.5 Summary of Test Results

Test Frequency: 8MHz~30MHz

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

Test Frequency: 30MHz ~ 18GHz

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)
GFSK Low Channel									
176.20	20.81	QP	114	1.5	H	11.01	31.82	43.50	-11.68
176.20	19.39	QP	48	2.0	V	11.01	30.40	43.50	-13.10
4804.00	53.25	PK	78	1.4	V	-0.99	52.26	74.00	-21.74
4804.00	43.09	Ave	78	1.4	V	-0.99	42.10	54.00	-11.90
7206.00	52.65	PK	23	1.6	H	1.52	54.17	74.00	-19.83
7206.00	42.44	Ave	23	1.6	H	1.52	43.96	54.00	-10.04
2336.93	46.58	PK	88	1.4	V	-12.89	33.69	74.00	-40.31
2336.93	38.08	Ave	88	1.4	V	-12.89	25.19	54.00	-28.81
2358.81	43.67	PK	60	1.9	H	-13.00	30.67	74.00	-43.33
2358.81	37.99	Ave	60	1.9	H	-13.00	24.99	54.00	-29.01
2484.50	42.01	PK	195	1.5	V	-12.78	29.23	74.00	-44.77
2484.50	38.41	Ave	195	1.5	V	-12.78	25.63	54.00	-28.37

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)
GFSK Middle Channel									
176.20	20.73	QP	89	1.5	H	10.88	31.61	43.50	-11.89
176.20	18.41	QP	126	1.8	V	11.01	29.42	43.50	-14.08
4882.00	52.02	PK	69	1.9	V	-0.59	51.43	74.00	-22.57
4882.00	43.79	Ave	69	1.9	V	-0.59	43.21	54.00	-10.79
7323.00	52.94	PK	141	1.4	H	2.00	54.94	74.00	-19.06
7323.00	41.87	Ave	141	1.4	H	2.00	43.87	54.00	-10.13
2334.00	45.51	PK	188	1.6	V	-13.20	32.31	74.00	-41.69
2334.00	37.45	Ave	188	1.6	V	-13.20	24.25	54.00	-29.75
2358.84	42.53	PK	297	1.7	H	-13.50	29.03	74.00	-44.97
2358.84	38.16	Ave	297	1.7	H	-13.50	24.66	54.00	-29.34
2497.11	43.45	PK	309	1.7	V	-12.88	30.57	74.00	-43.43
2497.11	37.21	Ave	309	1.7	V	-12.88	24.33	54.00	-29.67

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)
GFSK High Channel									
176.20	20.12	QP	200	1.7	H	10.59	30.71	43.50	-12.79
176.20	18.47	QP	218	1.5	V	11.01	29.48	43.50	-14.02
4960.00	53.08	PK	300	1.3	V	-0.22	52.86	74.00	-21.14
4960.00	43.11	Ave	300	1.3	V	-0.22	42.89	54.00	-11.11
7440.00	53.33	PK	302	1.3	H	2.74	56.07	74.00	-17.93
7440.00	42.68	Ave	302	1.3	H	2.74	45.42	54.00	-8.58
2335.19	46.16	PK	334	1.9	V	-13.11	33.05	74.00	-40.95
2335.19	37.60	Ave	334	1.9	V	-13.11	24.49	54.00	-29.51
2381.98	42.66	PK	52	1.2	H	-13.99	28.67	74.00	-45.33
2381.98	36.77	Ave	52	1.2	H	-13.99	22.78	54.00	-31.22
2496.75	44.34	PK	299	1.3	V	-12.88	31.46	74.00	-42.54
2496.75	37.29	Ave	299	1.3	V	-12.88	24.41	54.00	-29.59

Test Frequency: 18GHz~25GHz

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

9 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) and 15.205(c).
Test Method:	KDB558074 D01 DTS Meas Guidance v03r05
Test Mode:	Transmitting

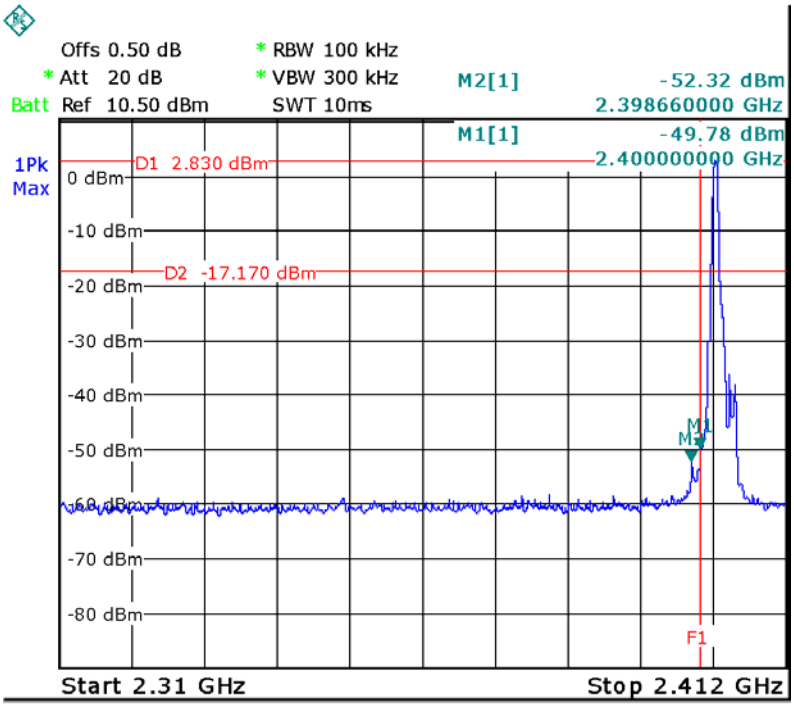
9.1 Test Produce

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto

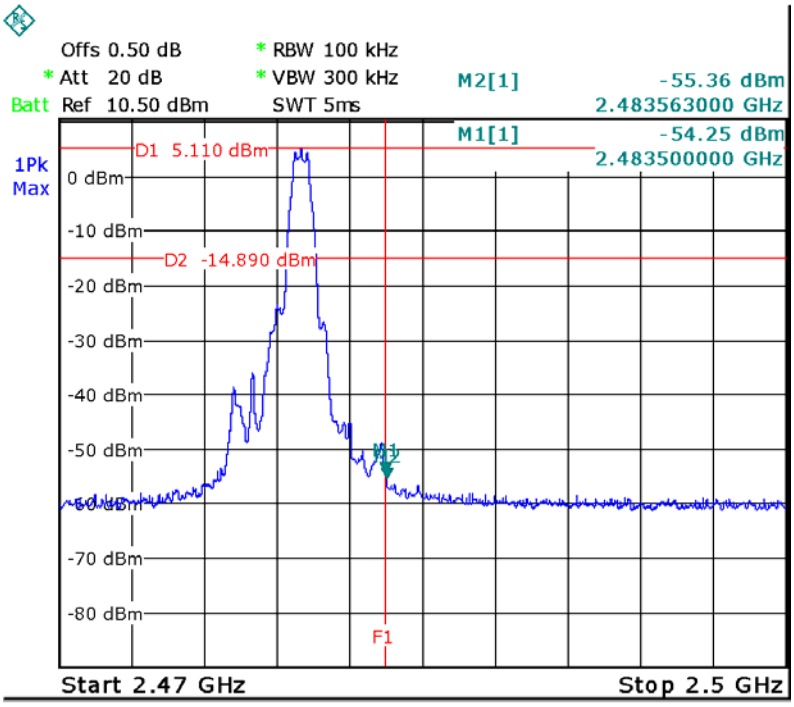
   Detector function = peak, Trace = max hold
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.2 Test Result

Band edge-left side



Band edge-right side



10 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 DTS Meas Guidance v03r05

10.1 Test Procedure

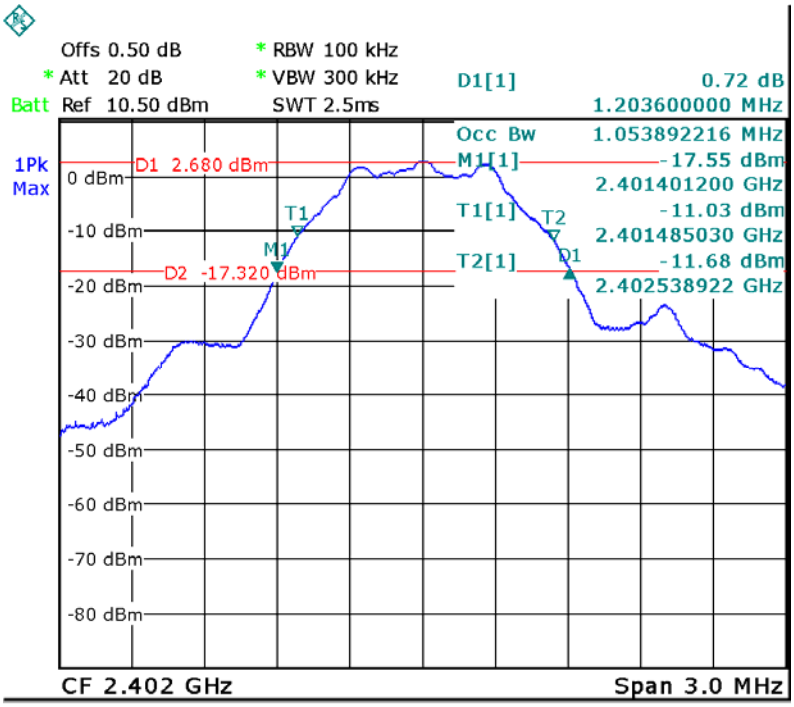
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

10.2 Test Result

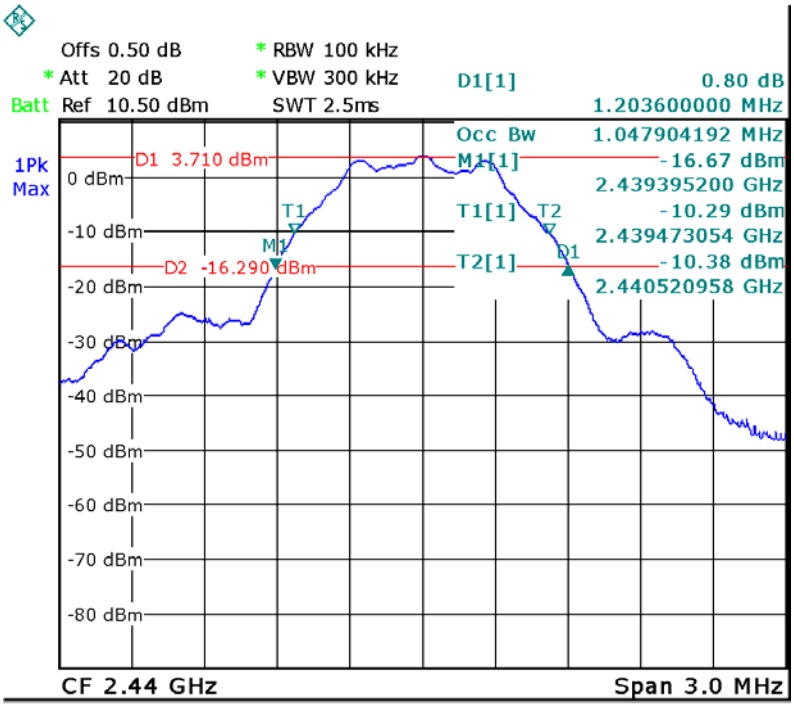
Operation mode	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low channel	1.204	1.054
Middle channel	1.204	1.048
High channel	1.204	1.048

Test result plot as follows:

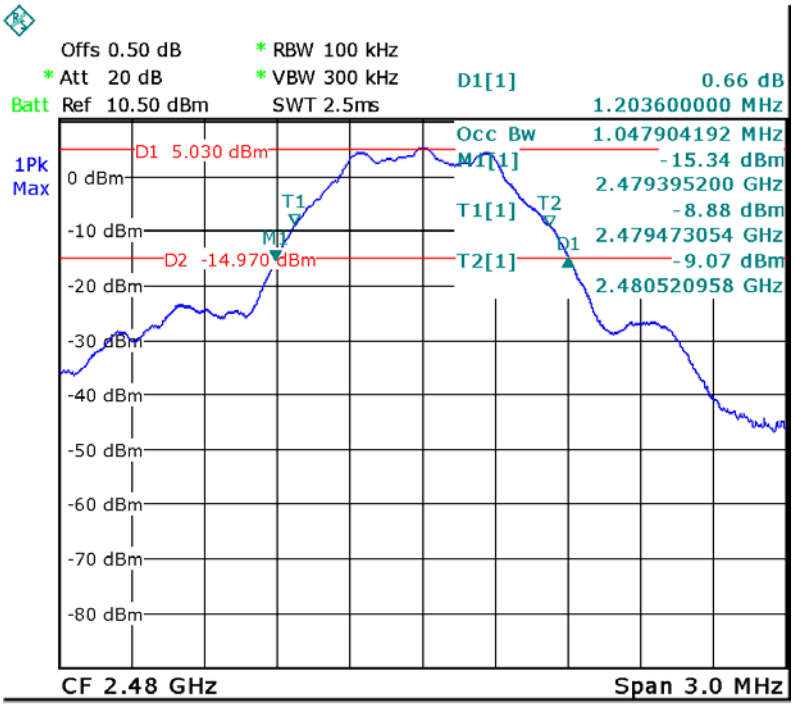
Mode: Low channel



Mode: Middle channel



Mode: High channel



11 Maximum Peak Output Power

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 DTS Meas Guidance v03r05

11.1 Test Procedure

KDB558074 D01 DTS Meas Guidance v03r05 section 8.1.2 Option 2

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

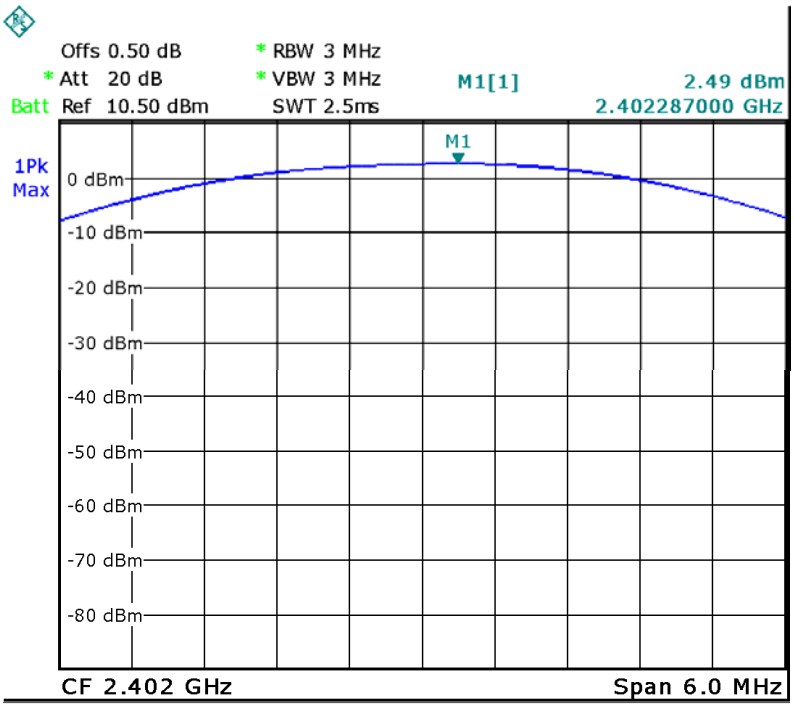
2. Set the spectrum analyzer: RBW = 3MHz. VBW = 3MHz. Sweep = auto; Detector Function = Peak, Set the span to fully encompass the DTS bandwidth.

3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

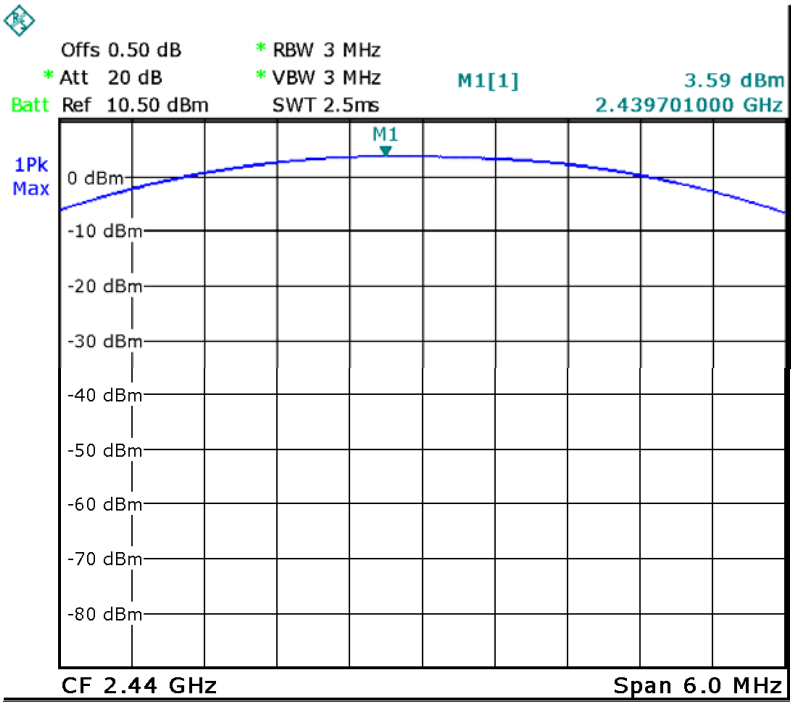
11.2 Test Result

Maximum Peak Output Power (dBm)		
Low channel	Middle channel	High channel
2.49	3.59	5.30
Limit		
1W/30dBm		

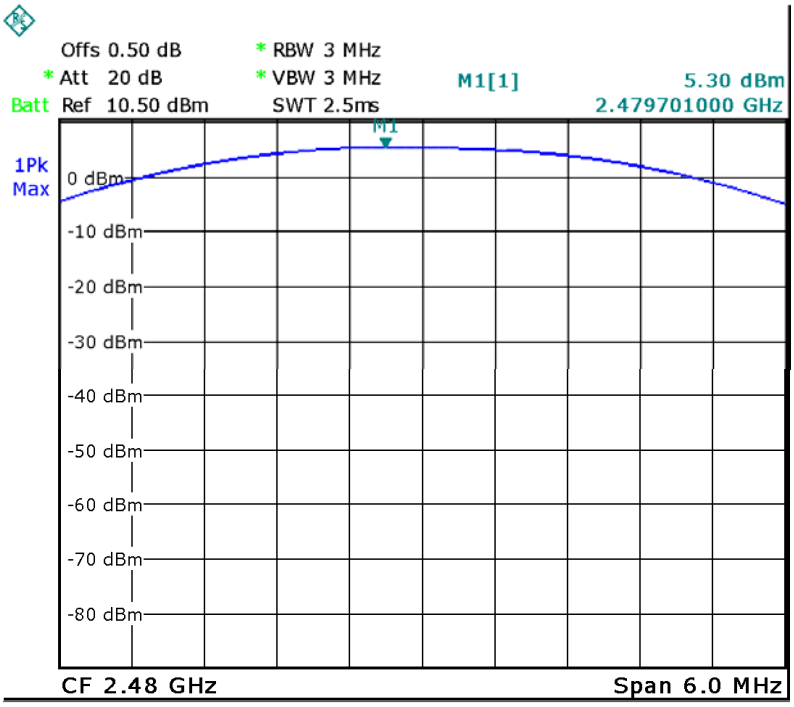
Test mode: Low channel



Test mode :Middle channel



Test mode: High channel



12 Power Spectral density

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: KDB558074 D01 DTS Meas Guidance v03r05

12.1 Test Procedure

KDB558074 D01 DTS Meas Guidance v03r05 section 9.1 Option 1

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

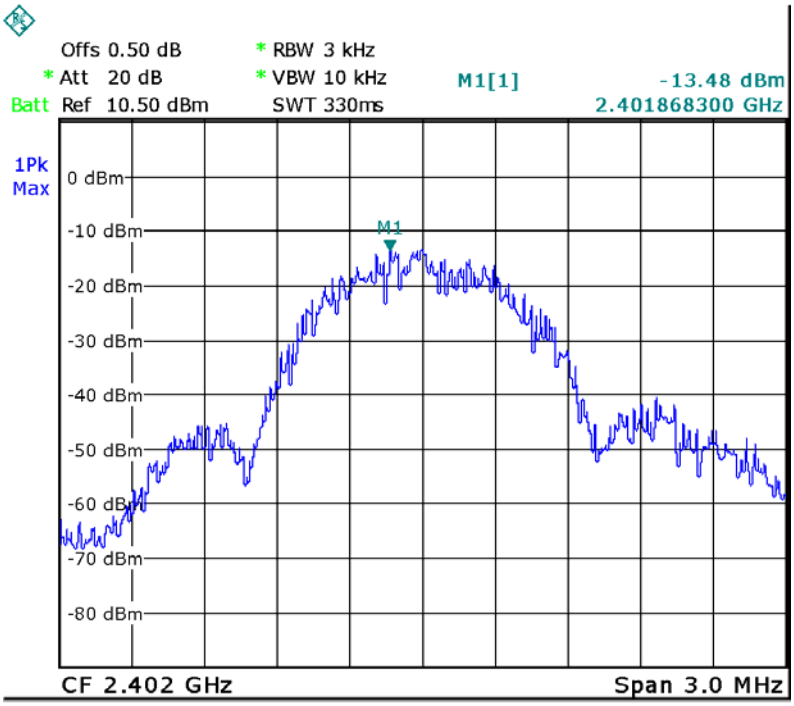
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 10kHz , Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.

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.

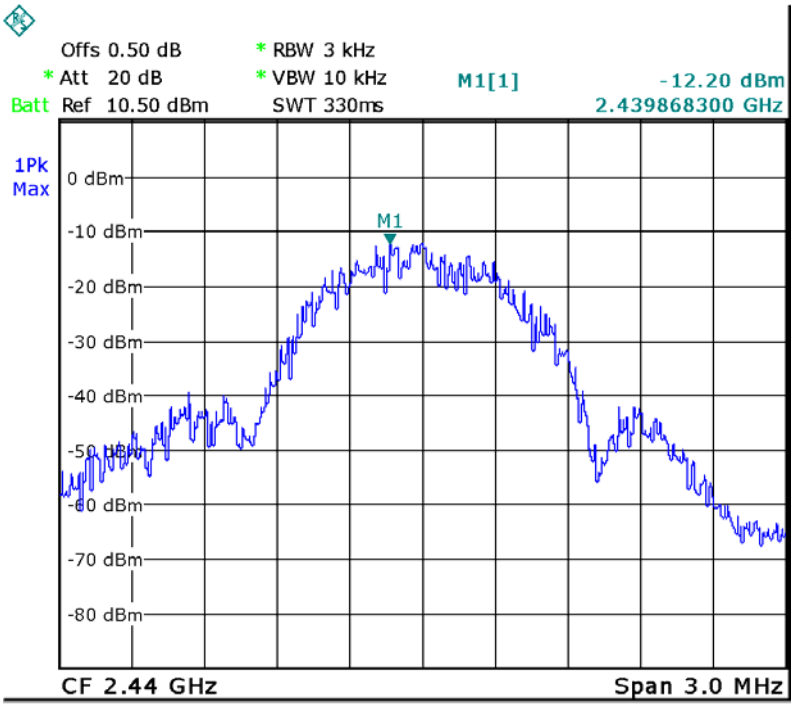
12.2 Test Result

Power Spectral Density		
Low channel	Middle channel	High channel
-13.48	-12.20	-10.92
Limit		
8dBm per 3kHz		

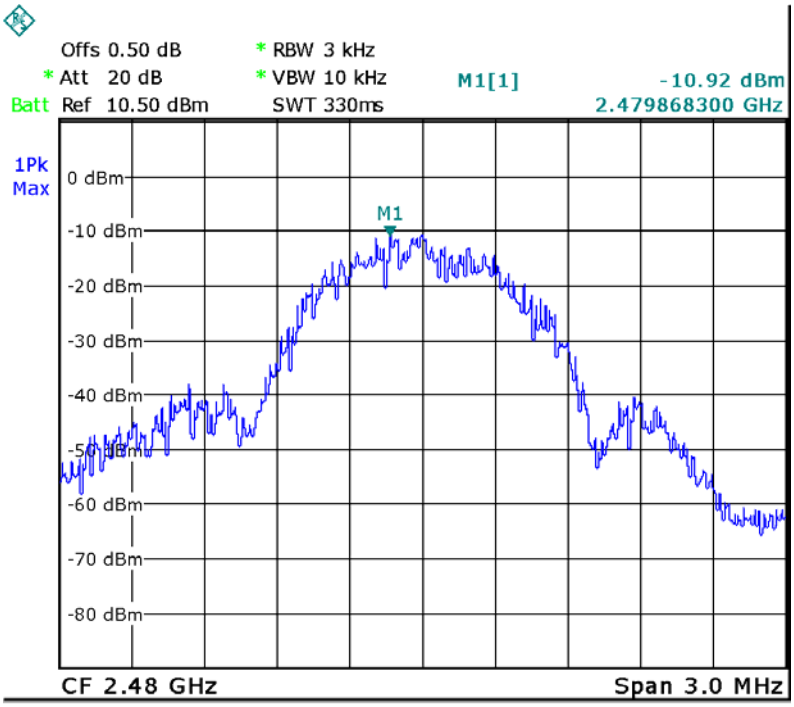
Test mode: Low channel



Test mode: Middle channel



Test mode: High channel



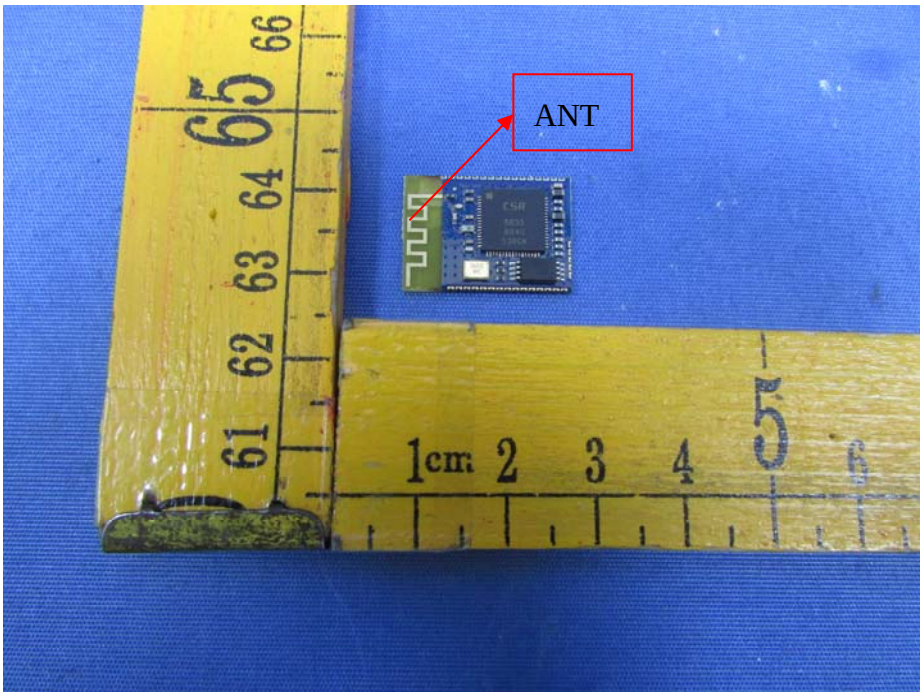
13 Antenna Requirement

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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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.

Result:

The EUT has one PCB printed antenna, the gain is 0dBi. meets the requirements of FCC 15.203.



14 RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091 & KDB 447498 D01 General RF Exposure Guidance v06

14.1 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.

14.2 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

14.3 MPE Calculation Method

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = output power to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

From the peak EUT RF output power, the minimum mobile separation distance, R=20cm, as well as the gain of the used antenna, the RF power density can be obtained

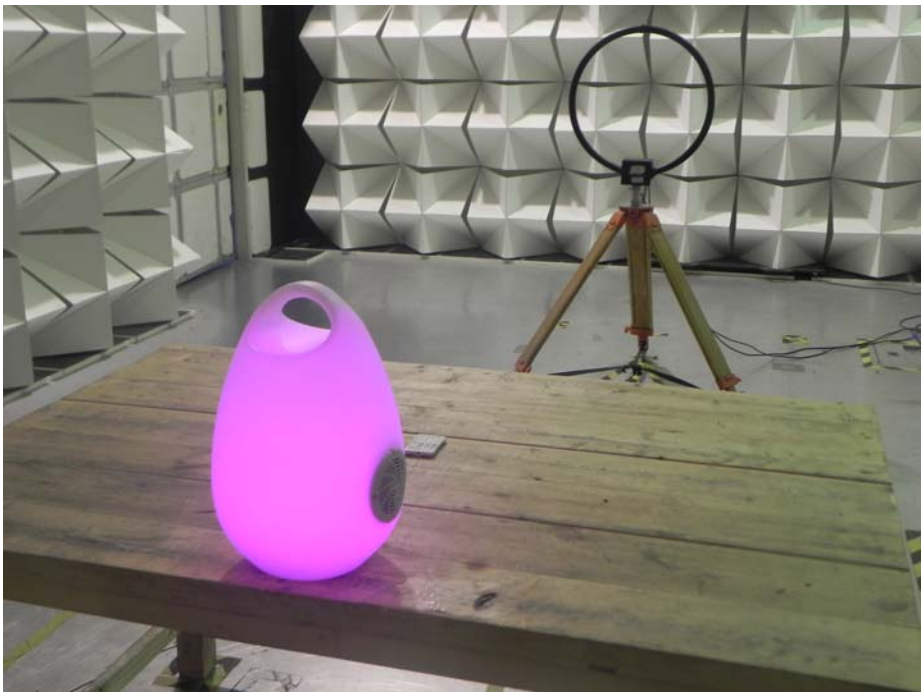
Antenna Gain (numeric)	Antenna Gain (numeric)	Max. Peak Output Power (dBm)	Peak Output Power (mW)	Power Density (mW/cm2)	Limit of Power Density (mW/cm2)
0.00	1.000	5.30	3.39	0.000674	1

15 Photographs –Model JK04 Test Setup

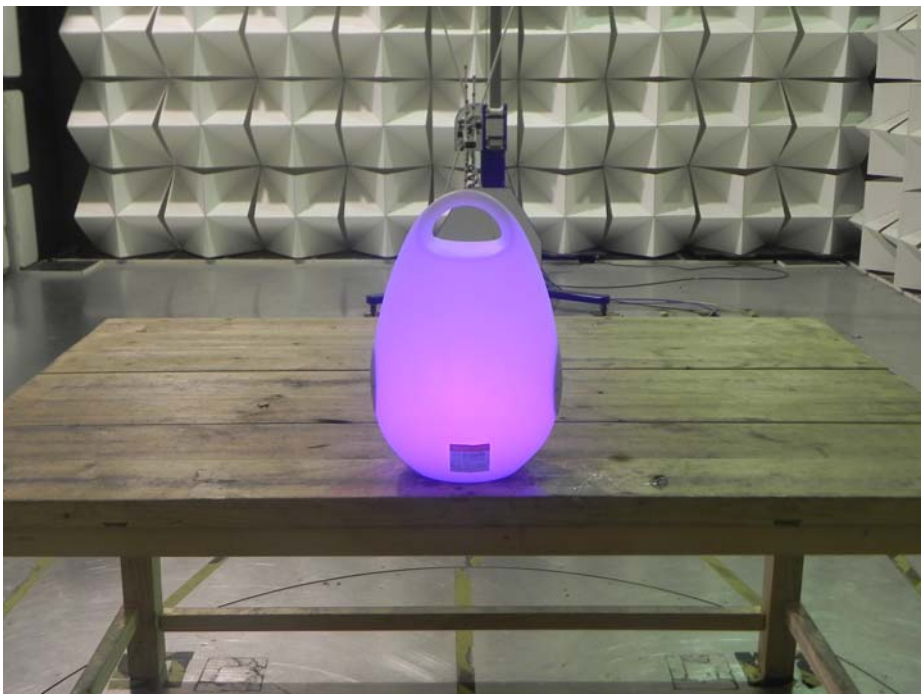
15.1 Photograph – Conducted Emission Test Setup at Test Site 2#

15.2 Photograph – Radiation Spurious Emission Test Setup

Test frequency from 8MHz ~ 30MHz at Test Site 2#



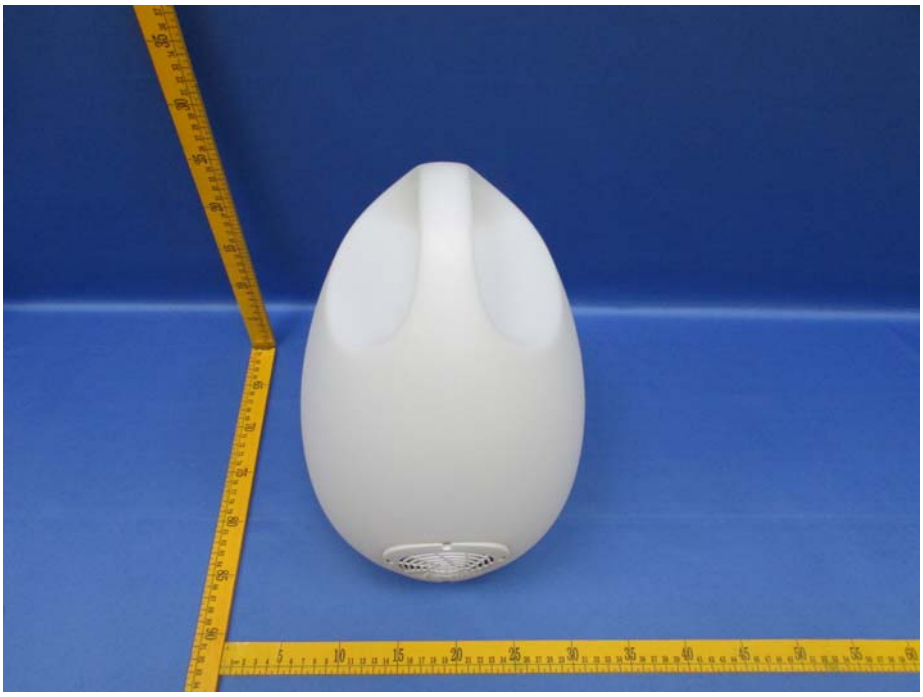
Test frequency from 30MHz to 1GHz at Test Site 2#



Test frequency above 1GHz at Test Site 1#

16 Photographs - Constructional Details

16.1 Model JK04 - External Photos



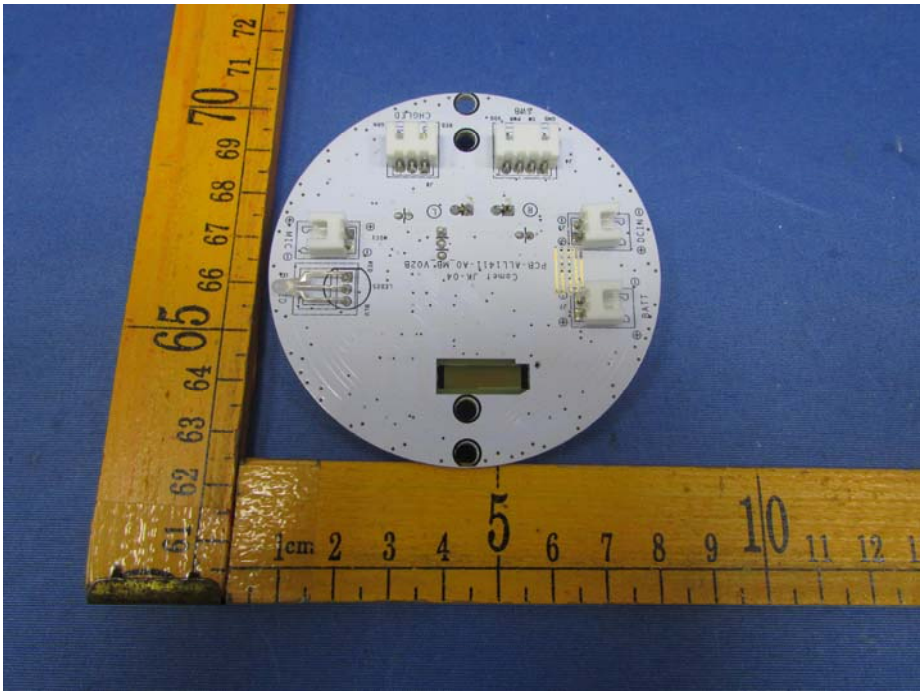

Comet
ON/OFF
MODE
RoHS

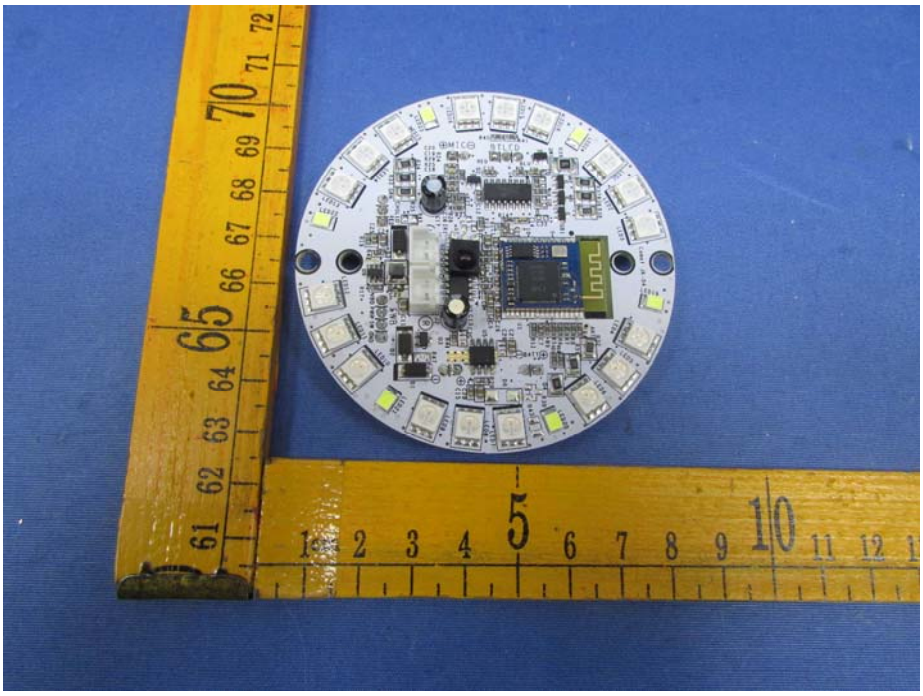

MIC
ON/OFF
Comet

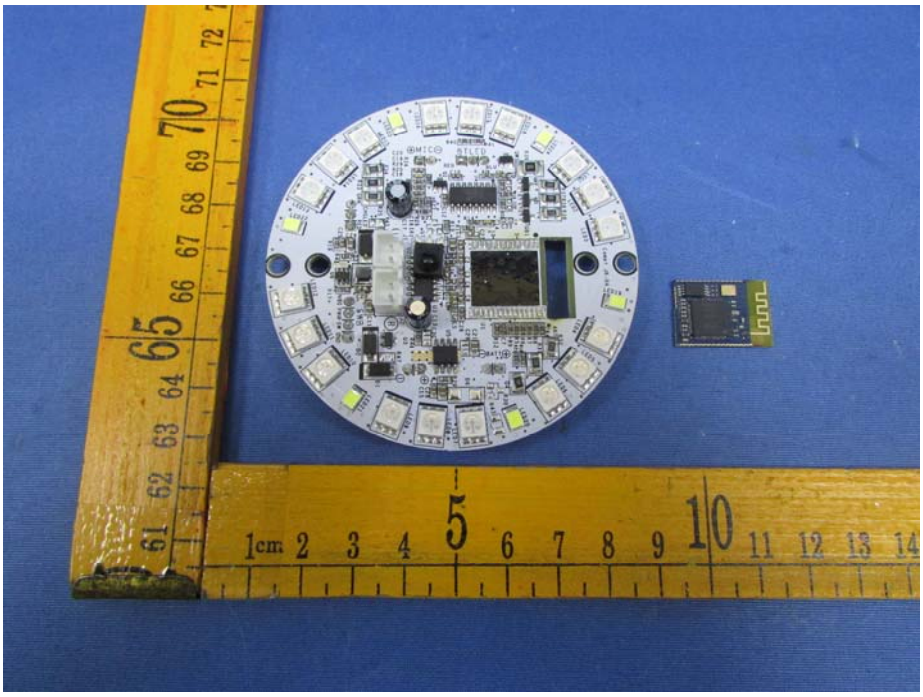

Comet
MODE
POWER DC 5V

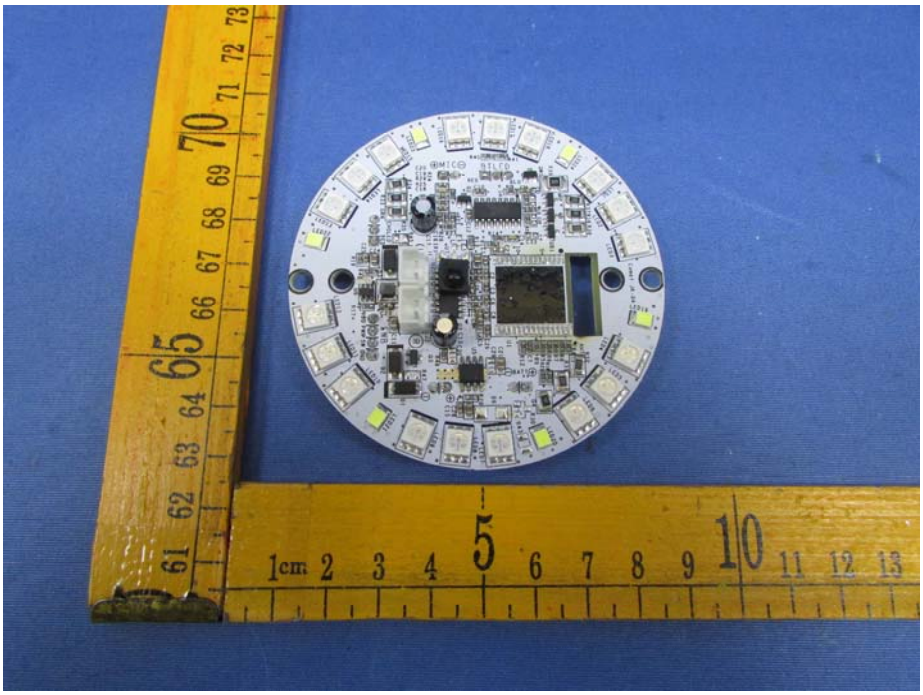

RoHS
DC 5V
Comet

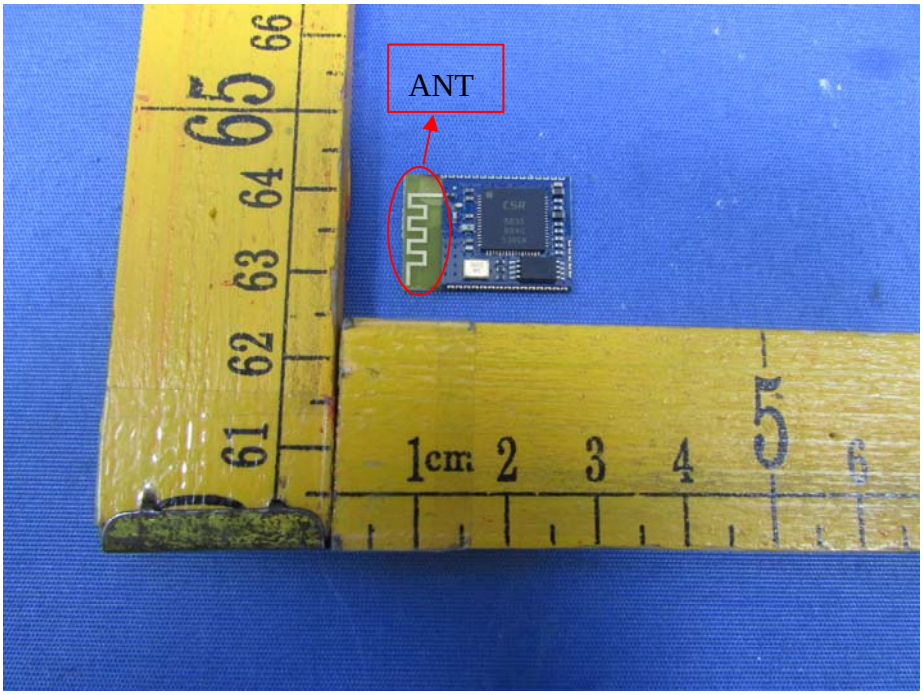
16.2 Model JK04 - Internal Photos



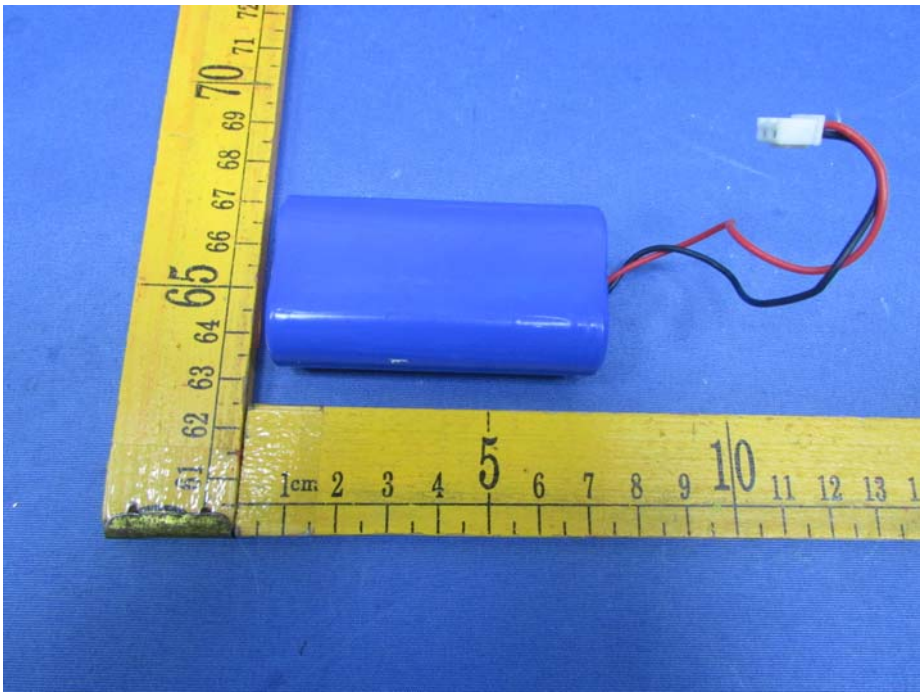


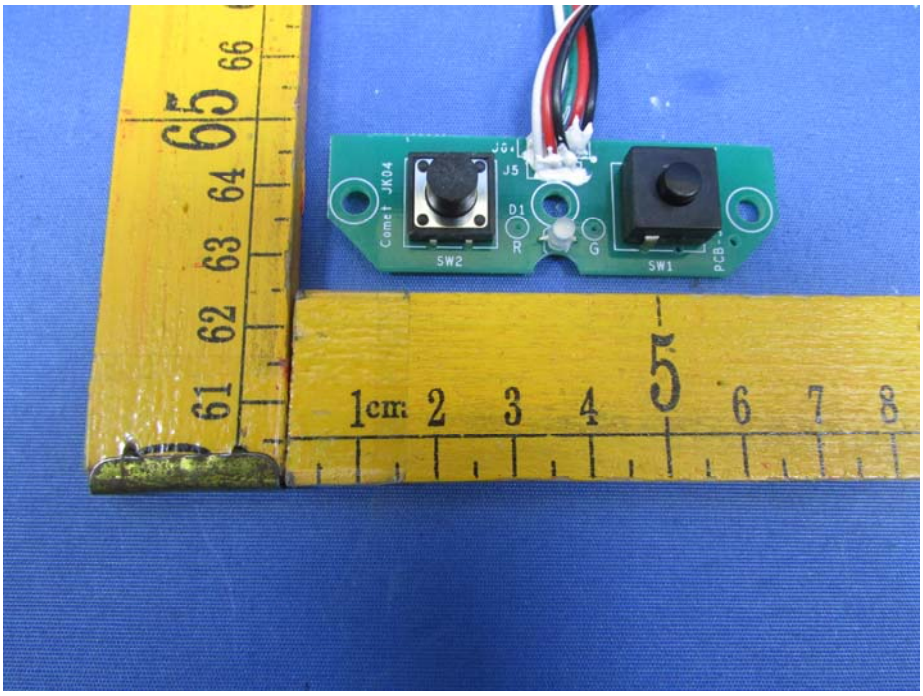


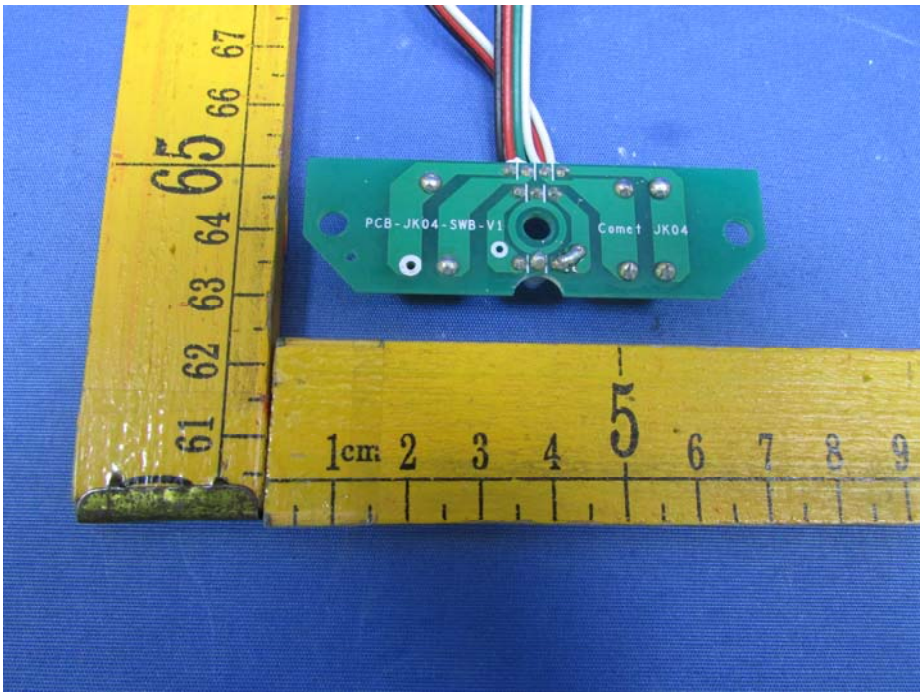



ANT


1cm 2 3 4


1cm 2 3 4 5 6 7 8 9 10 11 12 13





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