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FCC PART 15 SUBPART C TEST REPORT

FCC Part 15.247

Report Reference No.....:	**CTL1604271477-WF02**
Compiled by (position+printed name+signature)..:	File administrators Jacky Chen
Name of the organization performing the tests (position+printed name+signature)..:	Test Engineer Tracy Qi
Approved by (position+printed name+signature)..:	Manager Tracy Qi
Date of issue.....:	July 08, 2016
Test Firm.....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address.....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Applicant's name.....:	**Bright Beacon (Beijing) Technology Co., LTD**
Address.....:	B340, Ming You Industrious Purchasing Center, Xixiang Baoyuan Rd., Bao'an Dis., Shenzhen, China
Test specification:	
Standard .....:	FCC Part 15.247: Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.
Master TRF.....:	Dated 2011-01

Test item description ..... :	CloudBeacon
FCC ID……..:	**2AERL-ZS-0007-3-1**
Trade Mark .....:	CloudBeacon
Model/Type reference.....:	ZS-0007-3-1
Work frequency .....:	2402~2480MHz
Version.....:	V4.0
Type of modulation .....:	GFSK
Antenna Gain .....:	2 dBi
Antenna type .....:	Internal
Result.....:	**Positive**

TEST REPORT

Test Report No. :	CTL1604271477-WF02	July 08, 2016 Date of issue

Equipment under Test	:	CloudBeacon
Model /Type	:	ZS-0007-3-1
Applicant	:	**Bright Beacon (Beijing) Technology Co., LTD**
Address	:	B340, Ming You Industrious Purchasing Center, Xixiang Baoyuan Rd., Bao'an Dis., Shenzhen, China
Manufacturer	:	**Bright Beacon (Beijing) Technology Co., LTD**
Address	:	B340, Ming You Industrious Purchasing Center, Xixiang Baoyuan Rd., Bao'an Dis., Shenzhen, China

Test Result according to the standards on page 5:	**Positive**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

KDB Publication No. KDB 558074 D01 v03r03 Guidance on Measurements for Digital Transmission Systems

ANSI C63.4-2014

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	June 23, 2016
Testing commenced on	:	June 23, 2016
Testing concluded on	:	July 08, 2016

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	●	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		○	Other (specified in blank below)		

2.3. Short description of the Equipment under Test (EUT)

Name of EUT	CloudBeacon
Model Number	ZS-0007-3-1
Antenna Type	Internal
Bluetooth	
Operation frequency	2402MHz-2480MHz
Modulation Type	GFSK
Bluetooth	Supported BT4.0LE
Channel number:	40
Channel separation:	2MHz

Note: This report is only for Bluetooth 4.0LE function.

2.4. EUT operation mode

The EUT has been tested under typical operating condition. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting and receiving mode for testing. There are 40 channels of EUT, and the test carried out at the lowest channel, middle channel and highest channel.

Frequency Range:	2400-2483.5MHz
Channel number:	40 channels
Modulation type:	GFSK
Antenna:	internal

Test Channel	Test Frequency
Low Channel	2402 MHz
Middle Channel	2440 MHz
High Channel	2480 MHz

2.5. EUT configuration

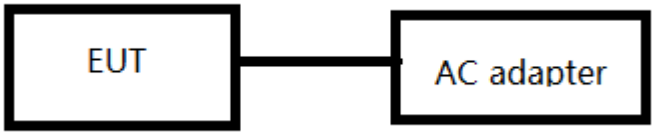
The following peripheral devices and interface cables were connected during the measurement:

○ - supplied by the manufacturer
● - supplied by the lab

○ AC adapter	Manufacturer :	Guandexin
	Model No. :	GDP06BV-0501000-3C
● Notebook PC(FCC DOC Approval)	Manufacturer :	DELL
	Model No. :	PP18L

2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AERL-ZS-0007-3-1** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

2.9. NOTE

1. The EUT have Bluetooth 4.0LE function, The functions of the EUT listed as below:

	Test Standards	Reference Report
BT 4.0LE	FCC Part 15 Subpart C (Section15.247)	CTL1604271477-WF02

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
BT 4.0LE	√	–	–	–

3. The EUT provides one completed transmitter and receiver.

Modulation Mode	TX Function
BT 4.0LE	1TX

2.10. Channel list

Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

2.11. Mode of Operation

1. The EUT has been tested under normal operating condition.
2. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low (2402MHz), mid (2440MHz) and high (2480MHz) with highest data rate are chosen for full testing.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 (2013) and CISPR Publication 22.

3.2. Test Facility

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology 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 970318, December 19, 2013.

3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	Above 1GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.5. Test Description

FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge Compliance of RF Emission	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS
FCC Per 47 CFR 2.1091(b)	MPE Evaluation	PASS

Remark: The measurement uncertainty is not included in the test result.

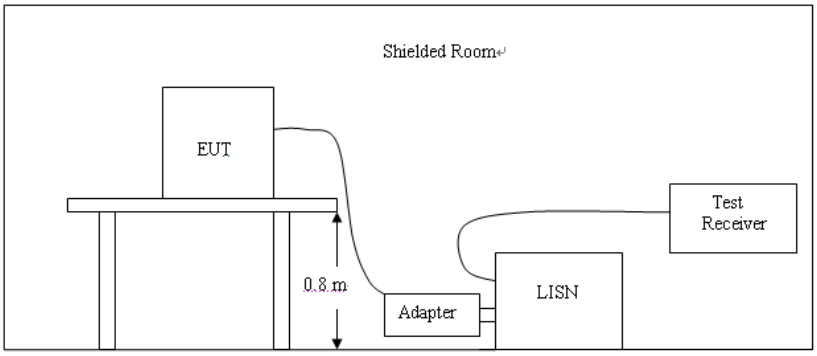
3.6. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
ULTRA-ROADBAND ANTENNA	Sunol Sciences Corp.	JB1	A061713	2016/06/02	2017/06/01
EMI Test Receiver	R&S	ESCI	103710	2016/06/02	2017/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2016/05/21	2017/05/20
Controller	EM Electronics	Controller EM 1000	N/A	2016/05/21	2017/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2016/05/19	2017/05/18
Active Loop Antenna	Daze	ZN30900A	N/A	2016/05/19	2017/05/18
LISN	R&S	ENV216	3560.6550.12	2016/06/02	2017/06/01
LISN	R&S	ESH2-Z5	860014/010	2016/06/02	2017/06/01
ISN	FCC	F-071115-1057-1-09	11229	2016/05/19	2017/05/18
Amplifier	Agilent	8349B	3008A02306	2016/05/19	2017/05/18
Amplifier	Agilent	8447D	2944A10176	2016/05/19	2017/05/18
Transient Limiter	SCHWARZCECK	VTSD 9561F	9666	2016/06/02	2017/06/01
Radio Communication Tester	R&S	CMU200	115419	2016/05/22	2017/05/21
Temperature/Humidity Meter	Gangxing	CTH-608	02	2016/05/20	2017/05/19
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2016/05/20	2017/05/19
Power Meter	Agilent	U2531A	TW53323507	2016/05/21	2017/05/20
Power Sensor	Agilent	U2021XA	MY5365004	2016/05/21	2017/05/20
Climate Chamber	ESPEC	EL-10KA	A20120523	2016/05/20	2017/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2016/05/20	2017/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2016/05/20	2017/05/19
RF Cable	HUBER+SUHNER	RG214	N/A	2016/05/20	2017/05/19

4. TEST CONDITIONS AND RESULTS

4.1. AC Power Conducted Emission

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10-2013.
2 Support equipment, if needed, was placed as per ANSI C63.10-2013
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10-2013
4 The EUT received DC5V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.
Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

AC Power Conducted Emission Limit

For intentional device, according to § 15.207(a) AC Power Conducted Emission Limits is as following：

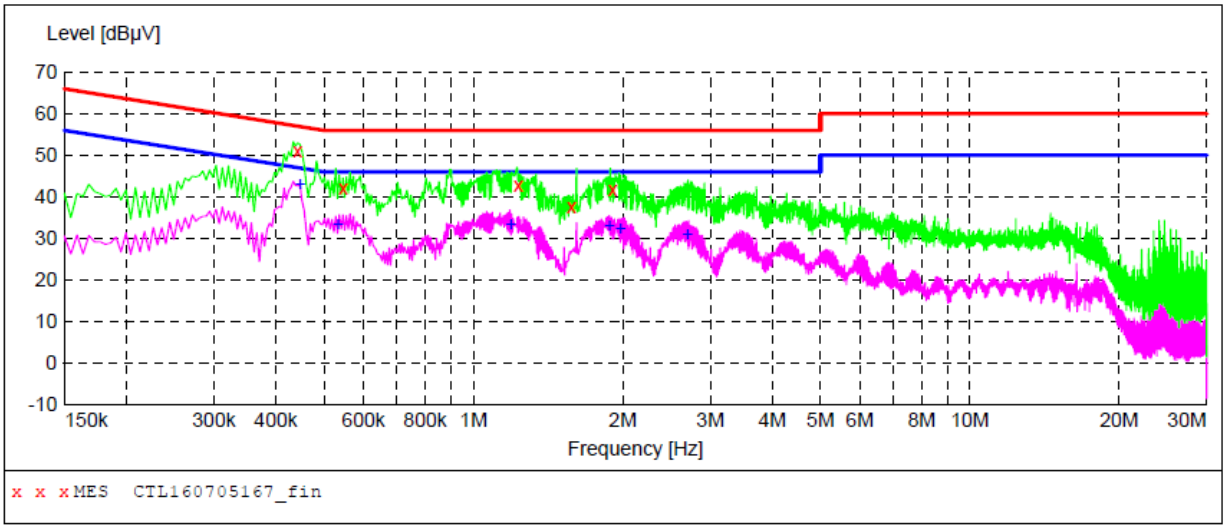
Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

TEST RESULTS

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160705167_fin"

7/5/2016 8:30PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.442501	51.10	10.2	57	5.9	QP	L1	GND
0.546001	42.10	10.2	56	13.9	QP	L1	GND
1.230001	42.60	10.3	56	13.4	QP	L1	GND
1.576501	37.70	10.3	56	18.3	QP	L1	GND
1.905001	41.80	10.3	56	14.2	QP	L1	GND

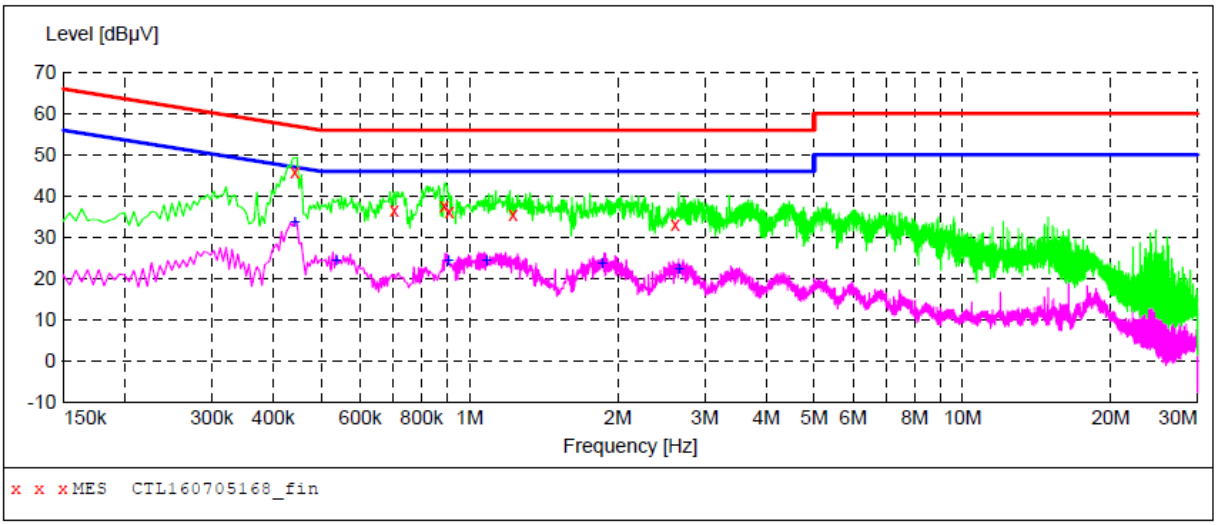
MEASUREMENT RESULT: "CTL160705167_fin2"

7/5/2016 8:30PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.447001	43.00	10.2	47	3.9	AV	L1	GND
0.532501	33.40	10.2	46	12.6	AV	L1	GND
1.189501	33.60	10.3	46	12.4	AV	L1	GND
1.878001	33.20	10.3	46	12.8	AV	L1	GND
1.977001	32.30	10.3	46	13.7	AV	L1	GND
2.697001	31.00	10.4	46	15.0	AV	L1	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160705168_fin"

7/5/2016 8:33PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.442501	45.90	10.2	57	11.1	QP	N	GND
0.703501	36.40	10.2	56	19.6	QP	N	GND
0.888001	37.50	10.2	56	18.5	QP	N	GND
0.910501	36.00	10.2	56	20.0	QP	N	GND
1.225501	35.50	10.3	56	20.5	QP	N	GND
2.616001	33.20	10.4	56	22.8	QP	N	GND

MEASUREMENT RESULT: "CTL160705168_fin2"

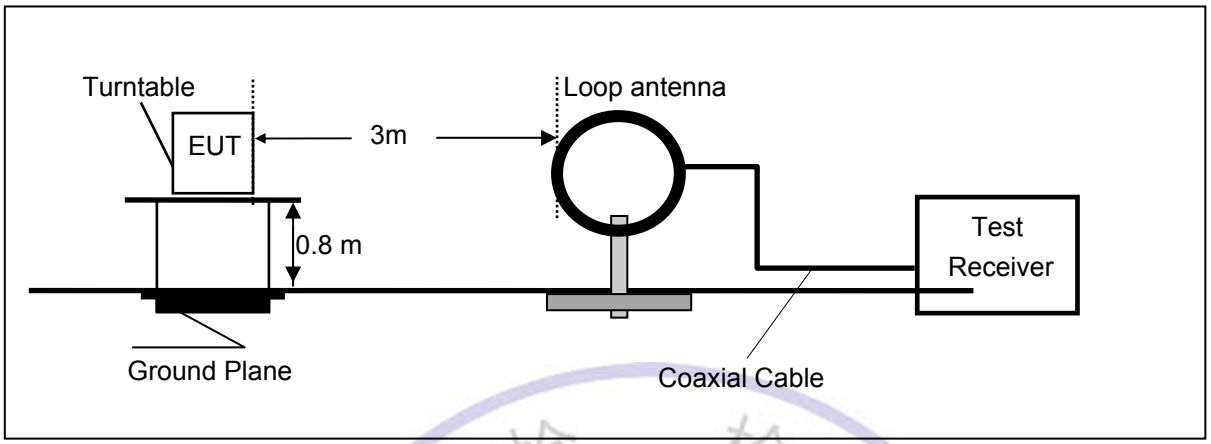
7/5/2016 8:33PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.442501	33.80	10.2	47	13.2	AV	N	GND
0.537001	24.30	10.2	46	21.7	AV	N	GND
0.906001	24.50	10.2	46	21.5	AV	N	GND
1.081501	24.40	10.3	46	21.6	AV	N	GND
1.855501	23.80	10.3	46	22.2	AV	N	GND
2.661001	22.40	10.4	46	23.6	AV	N	GND

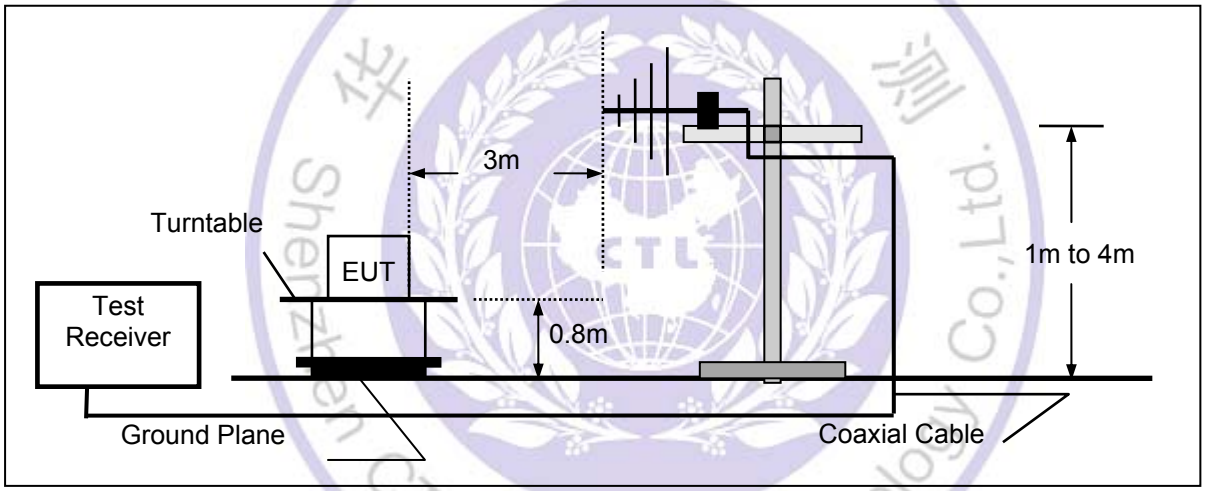
4.2. Radiated Emission and band edge

TEST CONFIGURATION

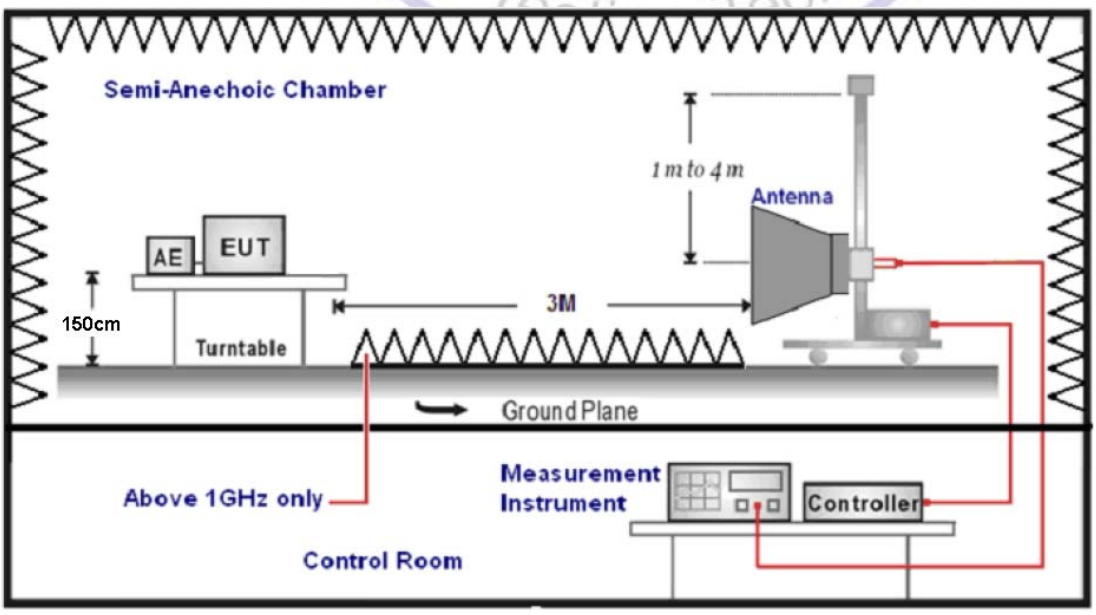
Radiated Emission Test Set-Up
Frequency range 9KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



TEST PROCEDURE

1 The EUT is placed on a turntable, which is 0.8m above ground plane below 1GHz and 1.5m above ground plane above 1GHz.
2 Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. the fundamental frequency is 2400-2483.5MHz, So the radiation emissions frequency range were tested from 9KHz to 25GHz.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL – AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

RADIATION LIMIT

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

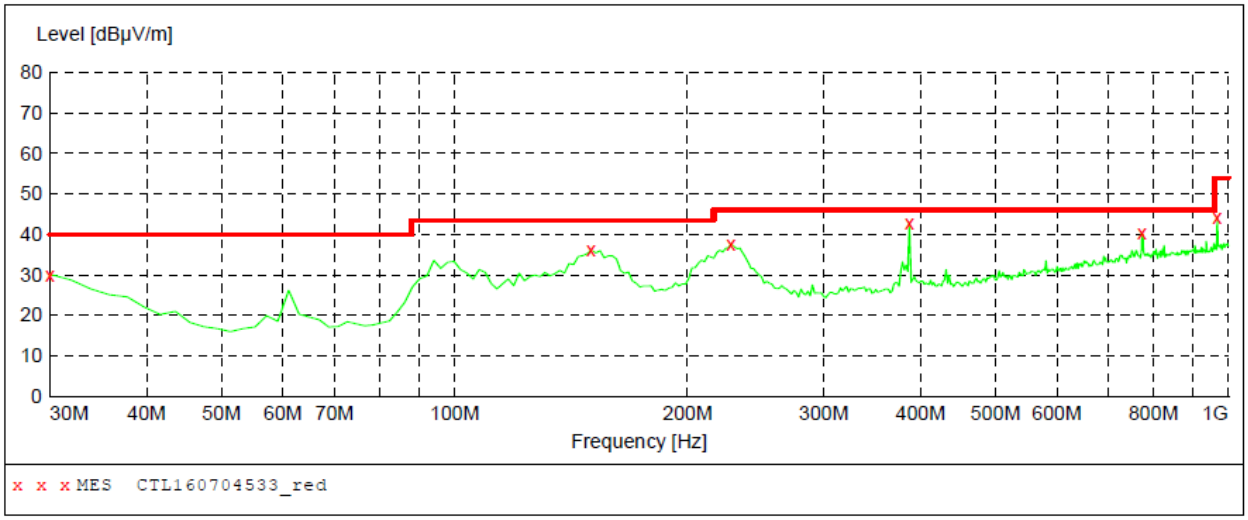
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

TEST RESULTS

Below 1GHz:
The radiated measurement are performed the each test mode and channel (low/mid/high), the datum recorded below is the worst case for all the test mode and channel.

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



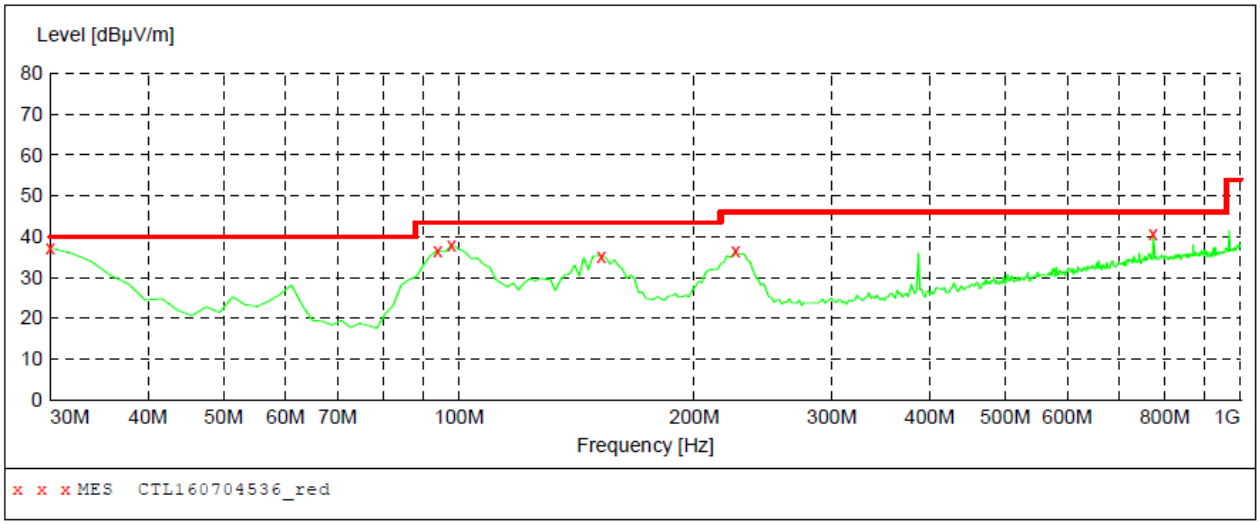
MEASUREMENT RESULT: "CTL160704533_red"

7/4/2016 8:07PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	30.10	20.8	40.0	9.9	---	0.0	0.00	HORIZONTAL
150.280000	36.10	13.8	43.5	7.4	---	0.0	0.00	HORIZONTAL
227.880000	37.60	13.8	46.0	8.4	---	0.0	0.00	HORIZONTAL
386.960000	42.80	17.7	46.0	3.2	---	0.0	0.00	HORIZONTAL
773.020000	40.30	24.4	46.0	5.7	---	0.0	0.00	HORIZONTAL
967.020000	44.30	26.7	53.9	9.6	---	0.0	0.00	HORIZONTAL

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL160704536_red"

7/4/2016 8:13PM

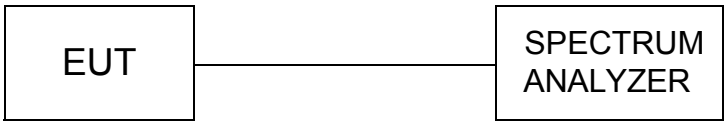
Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	37.20	20.8	40.0	2.8	---	0.0	0.00	VERTICAL
94.020000	36.60	9.9	43.5	6.9	---	0.0	0.00	VERTICAL
97.900000	38.00	10.7	43.5	5.5	---	0.0	0.00	VERTICAL
152.220000	35.30	13.7	43.5	8.2	---	0.0	0.00	VERTICAL
225.940000	36.40	13.9	46.0	9.6	---	0.0	0.00	VERTICAL
773.020000	40.60	24.4	46.0	5.4	---	0.0	0.00	VERTICAL

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
0	V	2402	85.6	29.1	114.7	Fundamental	/	PK
	V	3200	11.7	31.1	42.8	54(note3)	11.2	PK
	V	2390	38.4	32.2	70.6	74	3.4	PK
	V	2390	17.9	32.2	50.1	54	3.9	AV
	V	2400	39.6	32.1	71.7	74	2.3	PK
	V	2400	19.5	32.1	51.6	54	2.4	AV
	V	4804	8.0	42.6	50.6	54(note3)	3.4	PK
	V	7206	18.2	46.5	64.7	74	9.3	PK
	V	7206	2.6	46.5	49.1	54	4.9	AV
	H	24000	11.7	38.9	50.6	54	3.4	PK
19	V	2440	83.2	30.7	113.9	Fundamental	/	PK
	V	3200	12.5	31.1	43.6	54(note3)	10.4	PK
	V	4880	17.8	32.8	50.6	54(note3)	3.4	PK
	V	7320	24.6	46.8	71.4	74	2.6	PK
	V	7320	4.8	46.1	50.9	54	3.1	AV
	H	24000	11.7	38.9	50.6	54	3.4	PK
39	V	2480	84.8	29.5	114.3	Fundamental	/	PK
	V	3200	13.7	31.1	44.8	54(note3)	9.2	PK
	V	2483.5	34.0	30.2	64.2	74	9.8	PK
	V	2483.5	16.0	30.2	46.2	54	7.8	AV
	V	4960	16.6	32.5	49.1	54(note3)	4.9	PK
	V	7440	22.4	46.3	68.7	74	5.3	PK
	V	7440	-0.2	46.3	46.1	54	7.9	AV
	H	24000	11.7	38.9	50.6	54	3.4	PK

Note: 1. Measure Level = Reading Level + Factor.
2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~25GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
Remark: RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value
4. H and V polarity all have been tested ,only worse case is reported.

4.3. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

According to ANSI 63.10 -2013 and KDB 558074 D01 v03r03,The EUT was directly connected to the power meter / spectrum analyzer and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

Use the wideband power meter to test peak power and record the result.

LIMIT

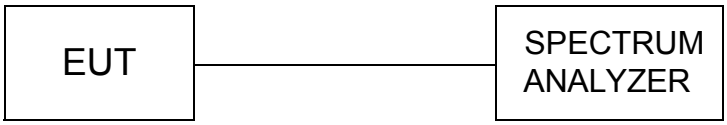
The Maximum Peak Output Power Measurement limit is 30dBm.

TEST RESULTS

Channel No.	Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
0	2402	18.79	30.00	Pass
19	2440	19. 02	30.00	Pass
39	2480	19.14	30.00	Pass

4.4. 6dB Bandwidth

TEST CONFIGURATION



TEST PROCEDURE

1. The testing follows FCC KDB Publication No. 558074 D01 v03r03 (Measurement Guidelines of DTS).
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW. The 6 dB bandwidth must be greater than 500 kHz.
4. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

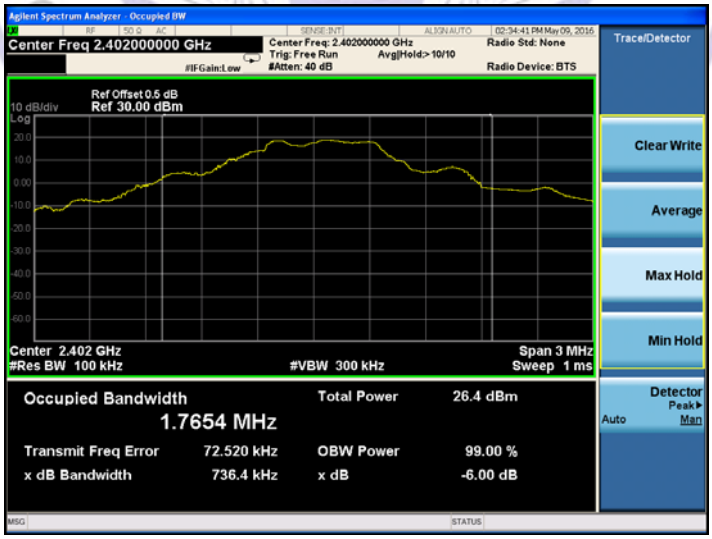
LIMIT

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

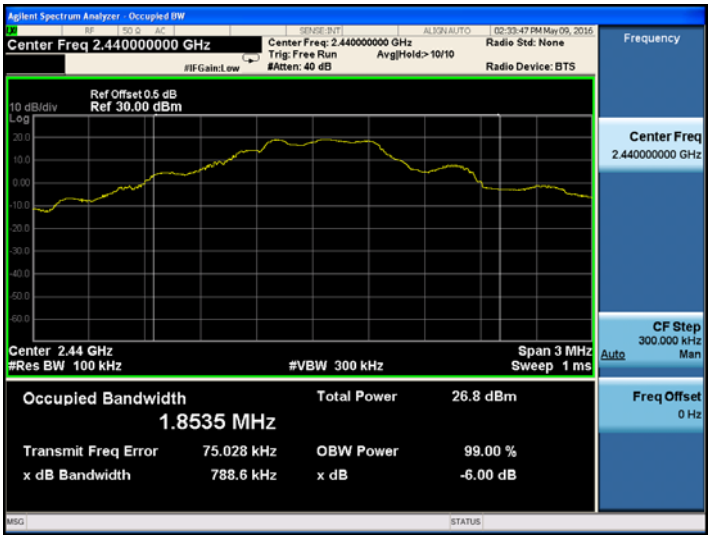
TEST RESULTS

CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (KHz)	LIMIT (KHz)	PASS/FAIL
2402	736.4	500	PASS
2440	788.6	500	PASS
2480	767.1	500	PASS

Low Channel



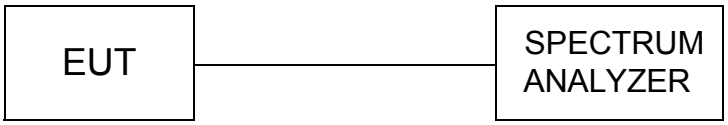
Middle Channel



High Channel

4.5. Power Spectral Density Measurement

TEST CONFIGURATION



TEST PROCEDURE

The EUT was tested according to KDB 558074 D01 v03r03 for compliance to FCC 47CFR 15.247 requirements.

Set RBW= 3 kHz, VBW⩾10KHz, SPAN to 1.5 times greater than the EBW,.

LIMIT

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST RESULTS

Modulation Mode	Channel	Channel Frequency (MHz)	PSD (dBm/3KHz)	Maximum limit (dBm/3KHz)	PASS / FAIL
GFSK	1	2402	4.627	8	PASS
	19	2440	5.036	8	PASS
	39	2480	5.784	8	PASS

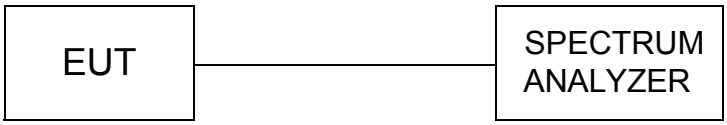
Low channel

Middle channel

High channel

4.6. Spurious RF Conducted Emission and band edge

TEST CONFIGURATION



TEST PROCEDURE

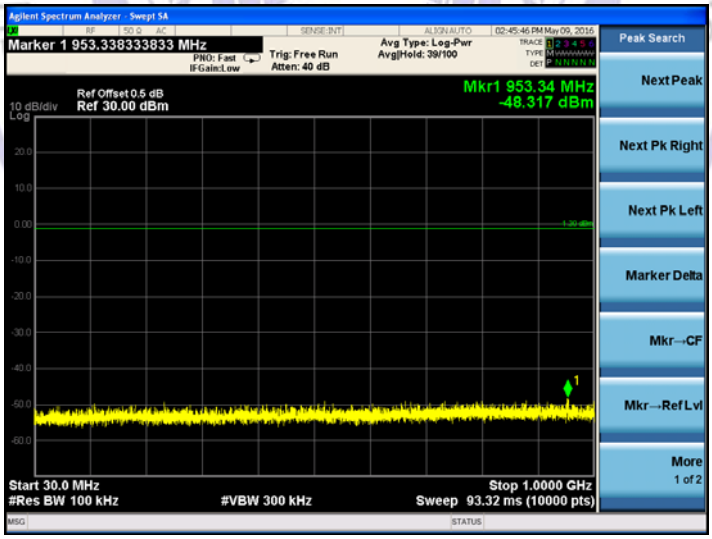
The EUT was tested according to KDB 558074 D01 v03r03 for compliance to FCC 47CFR 15.247 requirements.
The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBM= 300KHz to measure the peak field strength , and measure frequeny range from 30MHz to 26.5GHz.

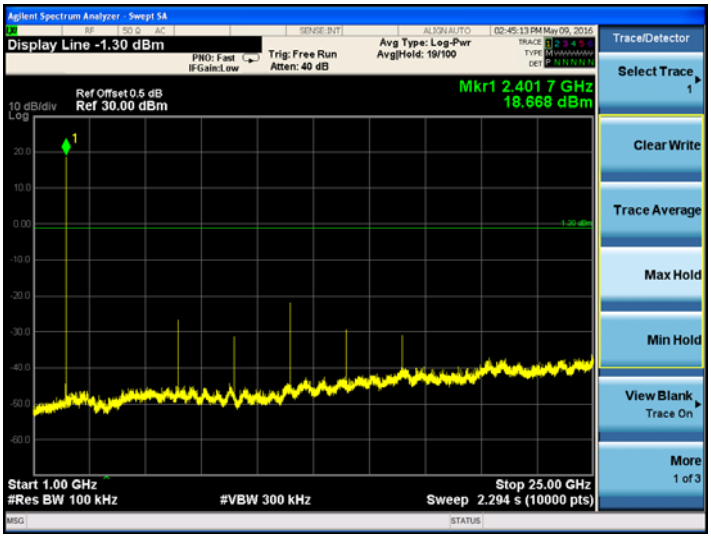
LIMIT

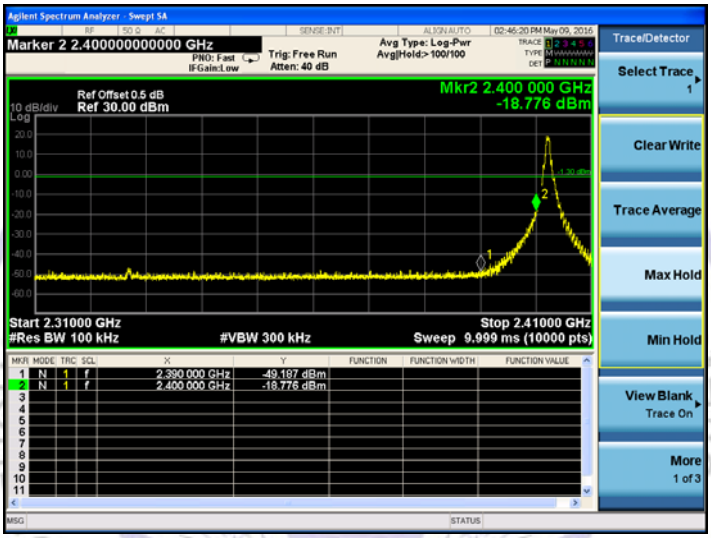
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the 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.

TEST RESULTS

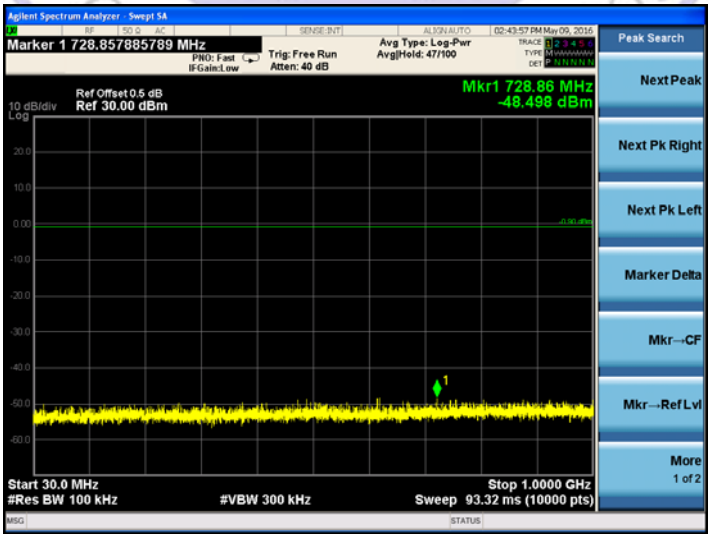
Low channel

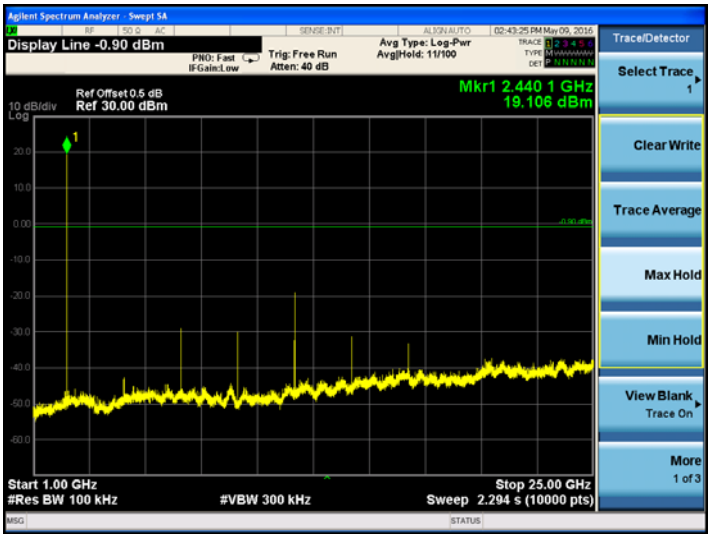




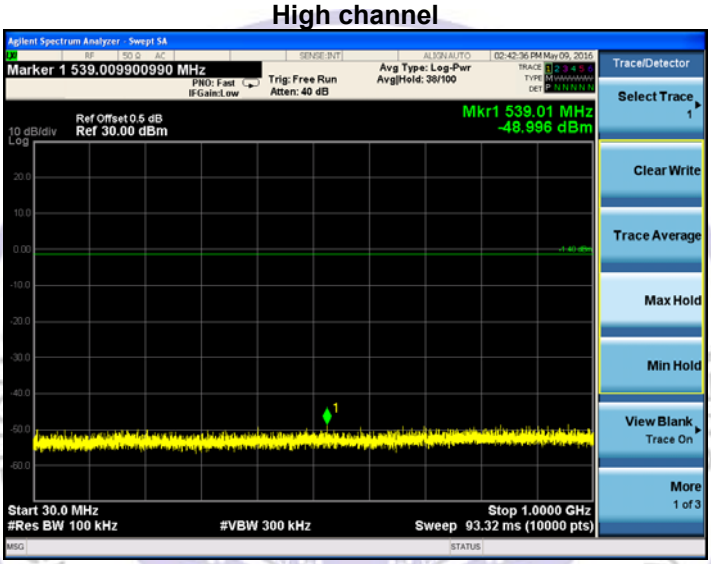


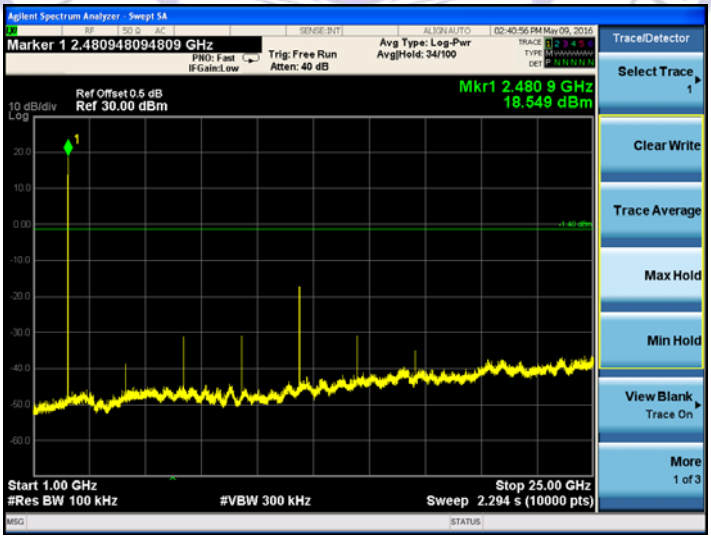
Middle channel

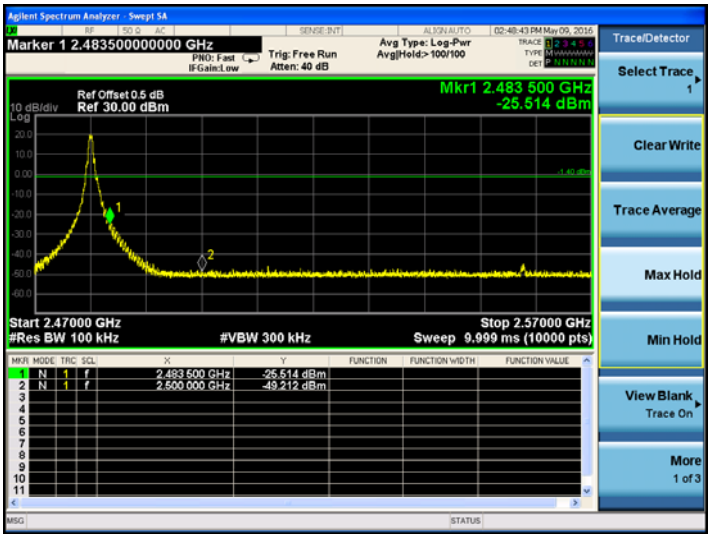




High channel







4.7. Antenna Requirement

Standard Applicable

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.

And according to FCC 47 CFR Section 15.247 (c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

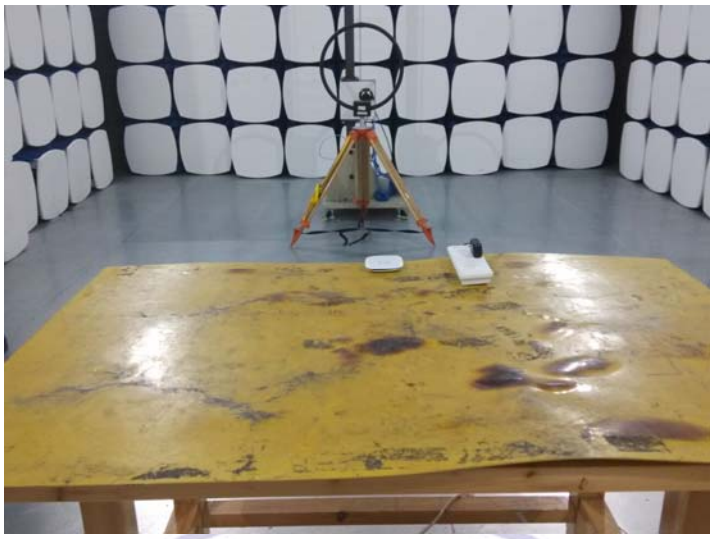
Refer to statement below for compliance.

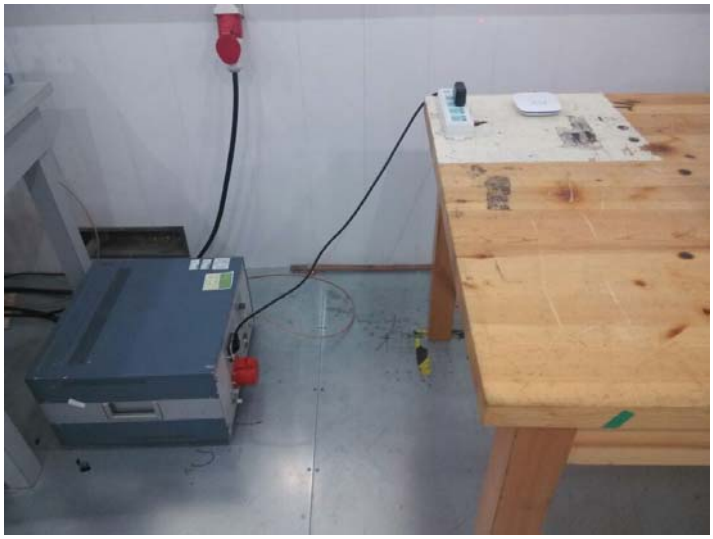
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

Antenna Connected Construction

The antenna used in this product is an internal Antenna, The directional gains of antenna used for transmitting is 2dBi.

5. Test Setup Photos of the EUT

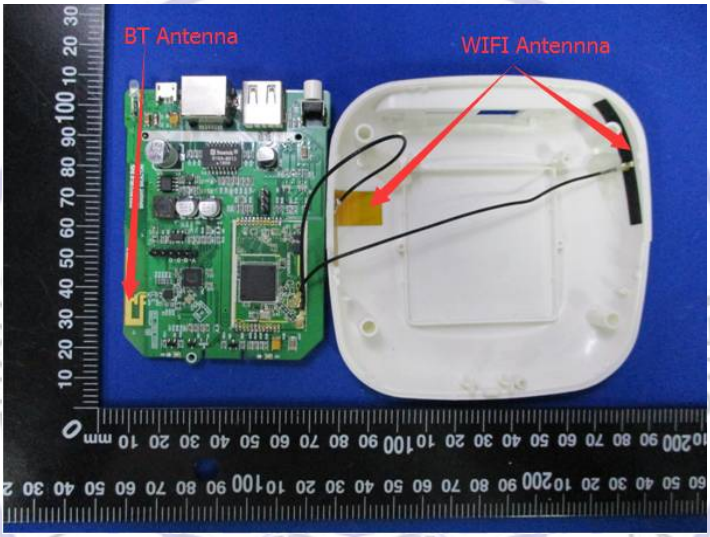


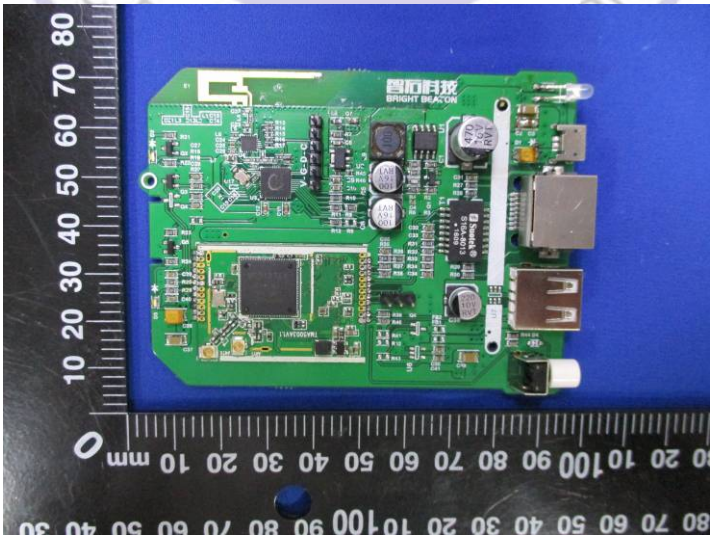


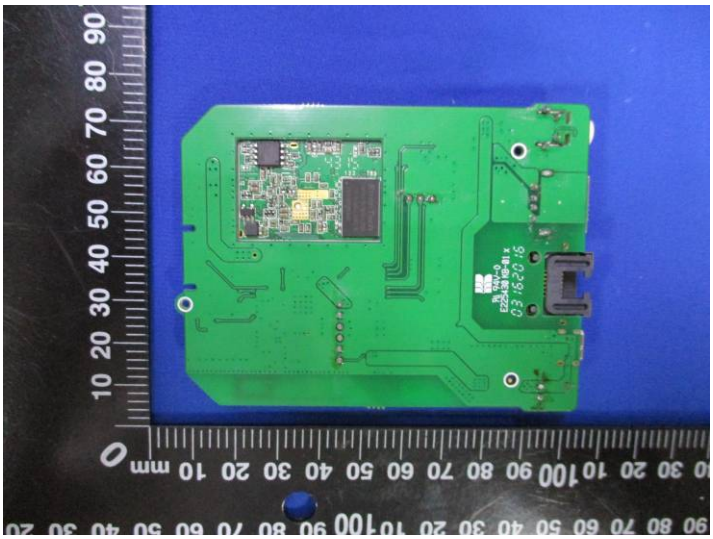
6. External and Internal Photos of the EUT

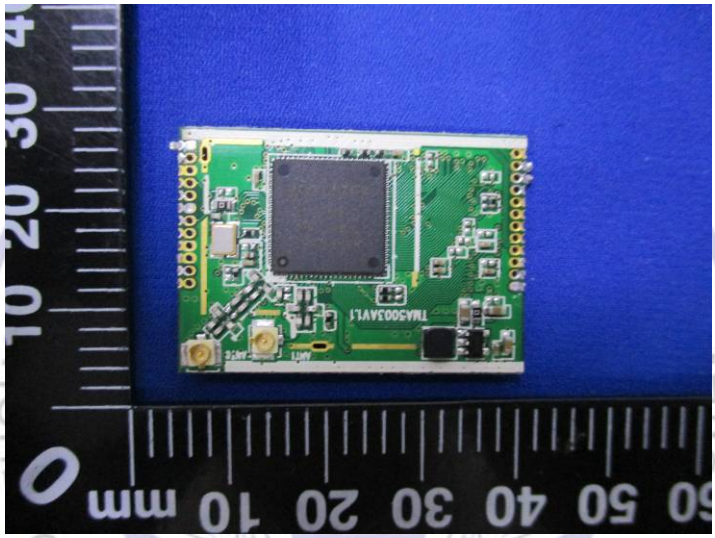
External Photos of EUT

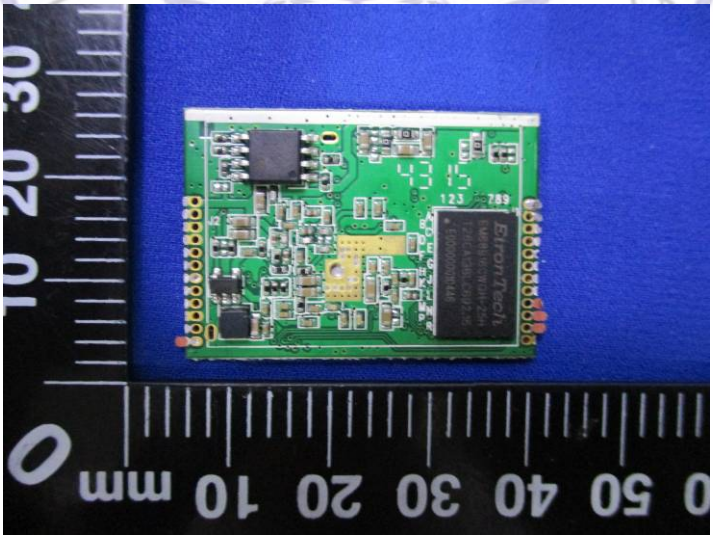
Internal Photos of EUT











.....End of Report.....