FCC TEST REPORT
for
Shenzhen Vsky Industries Co., Ltd.

Bluetooth audio receiver
Model No.: I30

Prepared for	:	Shenzhen Vsky Industries Co., Ltd.
Address	:	2/F, No.4 Building, Hongfa Jiateli Hi-Tech Park, Shiyan Sub-district, Baoan District, Shenzhen, China

Prepared By	:	Shenzhen Anbotek Compliance Laboratory Limited
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Report Number	:	R011411220E
Date of Test	:	Nov. 13~ Dec. 05, 2014
Date of Report	:	Dec. 08, 2014

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TEST REPORT

Applicant	:	Shenzhen Vsky Industries Co., Ltd.
Manufacturer	:	Shenzhen Vsky Industries Co., Ltd.
EUT	:	Bluetooth audio receiver
Model No.	:	I30
Serial No.	:	N.A.
Trade Mark	:	N.A.
Rating	:	DC 5V, 500mA

Measurement Procedure Used:
FCC Part15 Subpart C, Paragraph 15.247

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : Nov. 13~ Dec. 05, 2014

Prepared by : Kebo Zhang
(Tested Engineer / Kebo Zhang)

Reviewer : Amy Ding
(Project Manager / Amy Ding)

Approved & Authorized Signer : Tom Chen
(Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT	:	Bluetooth audio receiver
Model Number	:	I30
Test Power Supply	:	DC 5V Via Adapter AC 120V, 60Hz
Frequency	:	2402~2480MHz
Modulation	:	GFSK
Channel Spacing	:	2MHz
Number of Channels	:	40
Antenna Type	:	PCB Trace Antenna
Antenna Specification	:	PCB Antenna: 8 dBi
Applicant	:	Shenzhen Vsky Industries Co., Ltd.
Address	:	2/F, No.4 Building, Hongfa Jiateli Hi-Tech Park, Shiyan Sub-district, Baoan District, Shenzhen, China
Manufacturer	:	Shenzhen Vsky Industries Co., Ltd.
Address	:	2/F, No.4 Building, Hongfa Jiateli Hi-Tech Park, Shiyan Sub-district, Baoan District, Shenzhen, China
Factory	:	Shenzhen Vsky Industries Co., Ltd.
Address	:	2/F, No.4 Building, Hongfa Jiateli Hi-Tech Park, Shiyan Sub-district, Baoan District, Shenzhen, China
Date of receipt	:	Nov. 13, 2014
Date of Test	:	Nov. 13~ Dec. 05, 2014

1.2. Auxiliary Equipment Used during Test

Adapter	:	Power Supply Model:MX12L3-0502000V Input: AC 100-240V, 50-60Hz, 0.35A Output: DC 5V, 2A CE , FCC
iPod	:	M/N: A1199 S/N: 7J712G0CVQ5 CE , FCC: DOC
5.1CH SUB-WOOFER SYSTEM	:	M/N: A-601W

1.3. Description of Test Facility

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

CNAS - LAB Code: L3503
Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021
Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registed 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 752021, July 10, 2013.

IC-Registration No.: 8058A-1
Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, February 22, 2013.

Test Location
All Emissions tests were performed at
Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.3dB
Conduction Uncertainty	:	Uc = 3.4dB

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4: 2009 and FCC Part 15, Paragraph 15.247.

2.1. Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107, 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15, Paragraph 15.247(b)(1)	Peak Output Power	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(2)	6dB Bandwidth	PASS	Complies
FCC Part 15, Paragraph 15.247(c)	100kHz Bandwidth of Frequency Band Edges	PASS	Complies
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(1)	Frequency Separation	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Number of Hopping Frequency	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Time of Occupancy	-	N/A
FCC Part 15, Paragraph 15.247(c)	Peak Power Density	PASS	Complies

2.2. Description of Test Modes

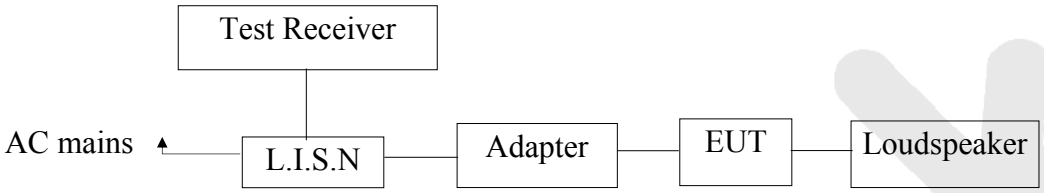
The EUT has been tested under operating condition.
Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel Low(2402MHz), Channel Middle(2440MHz) and Channel High(2480MHz) are chosen for the final testing.

3. Conducted Emission Test

3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μV)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT and simulator as shown as Section 3.1.

3.4.2. Turn on the power of all equipment.

3.4.3. Let the EUT work in test mode (BT Mode, AUX Playing) and measure it.

3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.4-2003 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 3.6.

3.6. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 22, 2014	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 22, 2014	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 22, 2014	1 Year

3.7. Power Line Conducted Emission Measurement Results

PASS.

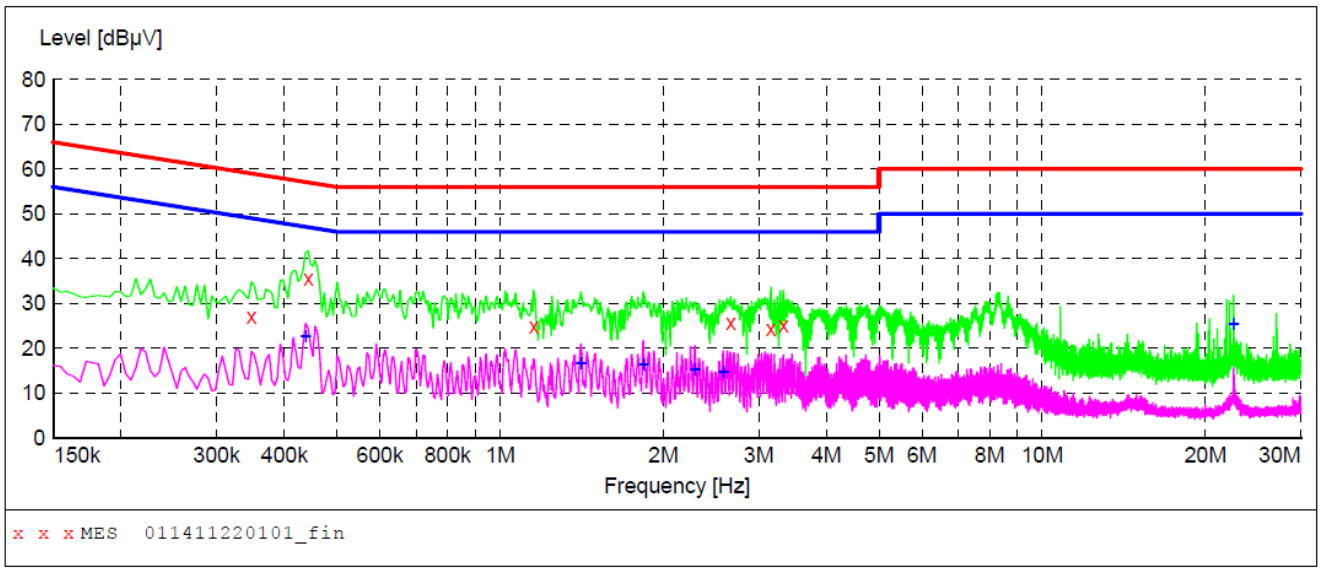
The frequency range from 150KHz to 30 MHz is investigated.

The EUT was tested on (BT Mode, AUX Playing) modes, only the worst data of (BT Mode) is attached in the following pages.

CONDUCTED EMISSION TEST DATA

Test Site:	1# Shielded Room
Operating Condition:	BT Mode
Test Specification:	DC 5V Via Adapter AC 120V, 60Hz
Comment:	Live Line
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "011411220101_fin"

11/18/2014 10:15AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.348000	27.10	20.1	59	31.9	QP	L1	GND
0.442500	35.50	20.1	57	21.5	QP	L1	GND
1.153000	24.80	20.2	56	31.2	QP	L1	GND
2.665000	25.60	20.4	56	30.4	QP	L1	GND
3.160000	24.40	20.4	56	31.6	QP	L1	GND
3.331000	25.10	20.4	56	30.9	QP	L1	GND

MEASUREMENT RESULT: "011411220101_fin2"

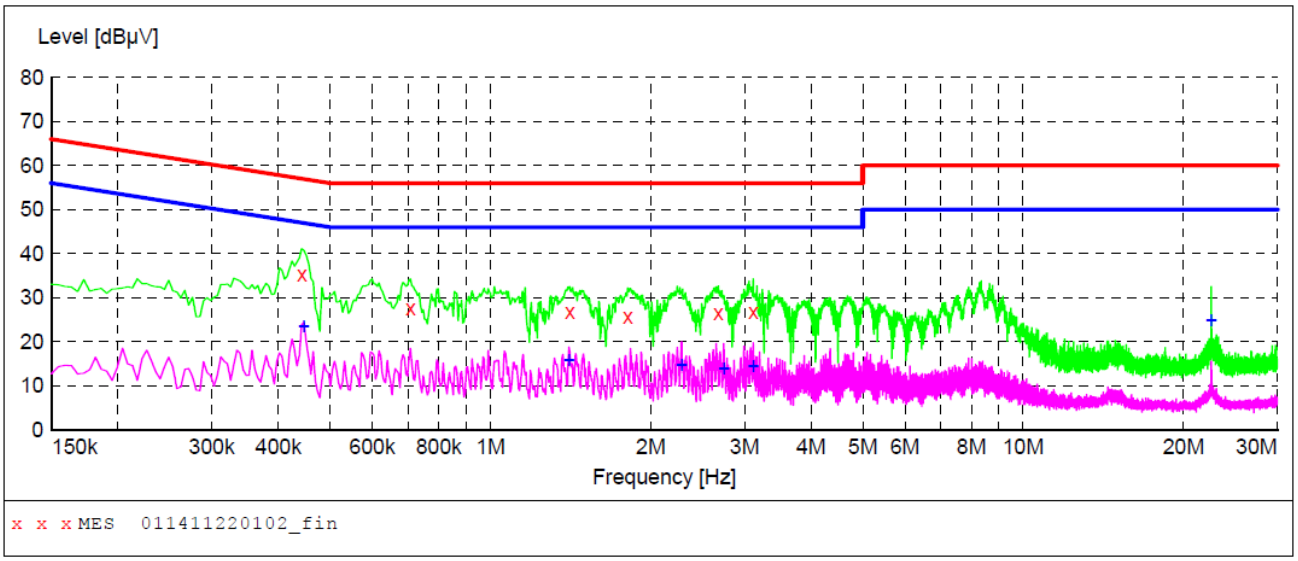
11/18/2014 10:15AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.438000	22.70	20.1	47	24.4	AV	L1	GND
1.409500	16.50	20.2	46	29.5	AV	L1	GND
1.837000	16.40	20.3	46	29.6	AV	L1	GND
2.287000	15.40	20.3	46	30.6	AV	L1	GND
2.579500	14.70	20.4	46	31.3	AV	L1	GND
22.559500	25.30	20.8	50	24.7	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site:	1# Shielded Room
Operating Condition:	BT Mode
Test Specification:	DC 5V Via Adapter AC 120V, 60Hz
Comment:	Neutral Line
	Tem:25℃ Hum:50%

SCAN TABLE: "Voltage(150K~30M)FIN"
Short Description: 150K-30M Disturbance Voltages



MEASUREMENT RESULT: "011411220102_fin"

11/18/2014 10:18AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.442500	35.40	20.1	57	21.6	QP	N	GND
0.708000	27.60	20.1	56	28.4	QP	N	GND
1.409500	26.80	20.2	56	29.2	QP	N	GND
1.810000	25.70	20.3	56	30.3	QP	N	GND
2.678500	26.50	20.4	56	29.5	QP	N	GND
3.115000	26.70	20.4	56	29.3	QP	N	GND

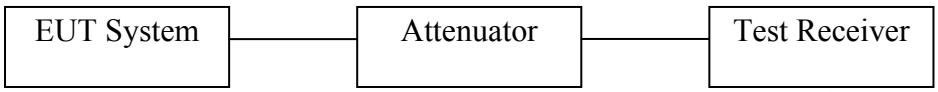
MEASUREMENT RESULT: "011411220102_fin2"

11/18/2014 10:18AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.447000	23.40	20.1	47	23.5	AV	N	GND
1.405000	15.70	20.2	46	30.3	AV	N	GND
2.282500	14.80	20.3	46	31.2	AV	N	GND
2.741500	13.90	20.4	46	32.1	AV	N	GND
3.115000	14.50	20.4	46	31.5	AV	N	GND
22.559500	24.90	20.8	50	25.1	AV	N	GND

4. FCC Part 15.247 Requirements for DSSS & OFDM Modulation

4.1. Test Setup



4.2. 6dB Bandwidth

a. Limit

For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

b. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
   RBW = 100kHz, VBW≥3*RBW =300kHz,
   Detector= Peak
   Trace mode= Max hold.
   Sweep- auto couple.
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

c. Test Setup See 4.1

d. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Aug. 08, 2014	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Aug. 08, 2014	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 22, 2014	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 04, 2014	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 24, 2014	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Aug. 08, 2014	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

e. Test Results

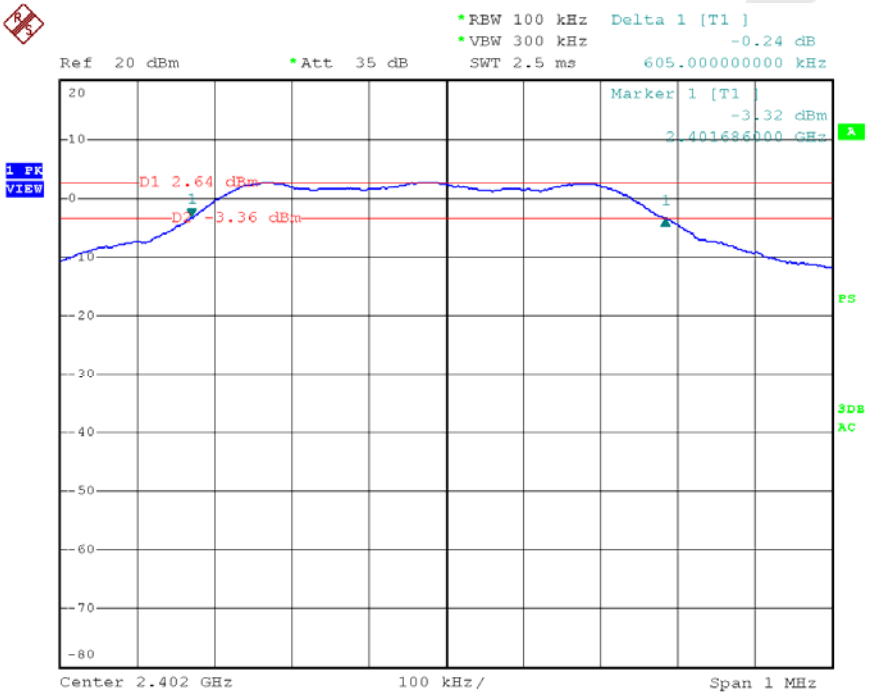
Pass.

f. Test Data

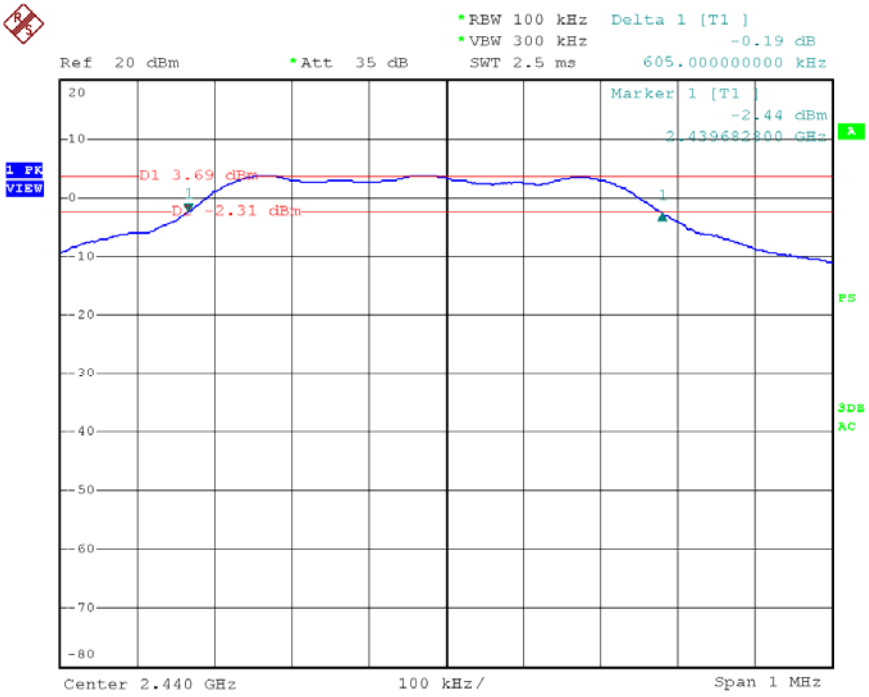
Channel	Frequency (MHz)	Bandwidth (kHz)	Limit (kHz)	Results
Low	2402	605.00		Pass
Mid	2440	605.00	>500	Pass
High	2480	605.00		Pass

Test Plots See the following page.

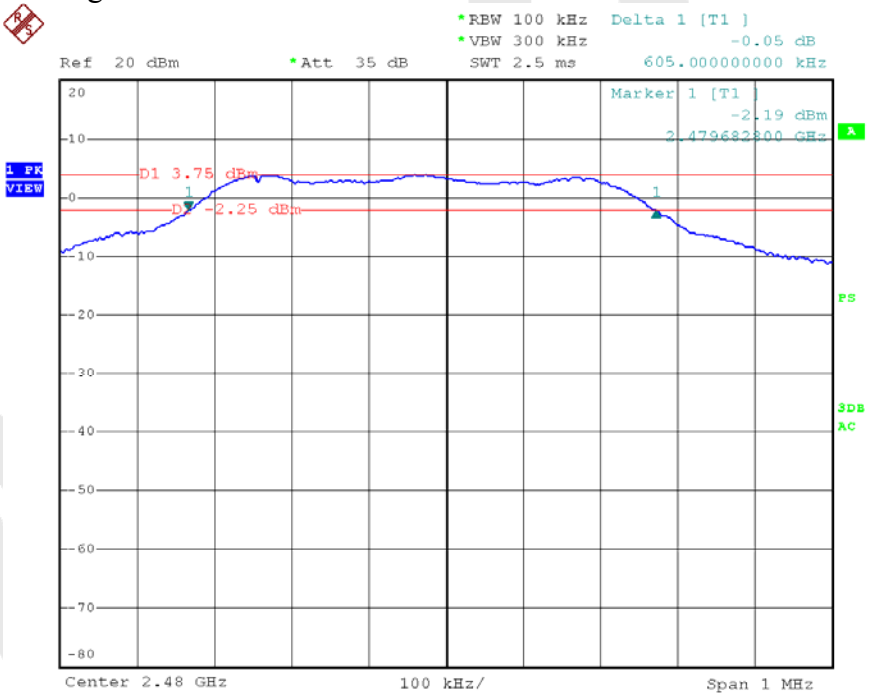
CH Low



CH Mid



CH High



4.3. Maximum Peak output power test

a. Limit

The maximum peak output power of the intentional radiator shall not exceed the following:
1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt (30dBm).
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antenna of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

b. Configuration of Measurement

c. Test Procedure

This test was according the kDB 558074 9.1.2:
1. This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.
2. Set the RBW ≥DTS bandwidth.
3. Set the VBW≥3*RBW.
4. Set the span≥ 3*RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use peak marker function to determine the peak amplitude level.

d. Test Equipment

Same as the equipment listed in 4.2.

e. Test Results

Pass.

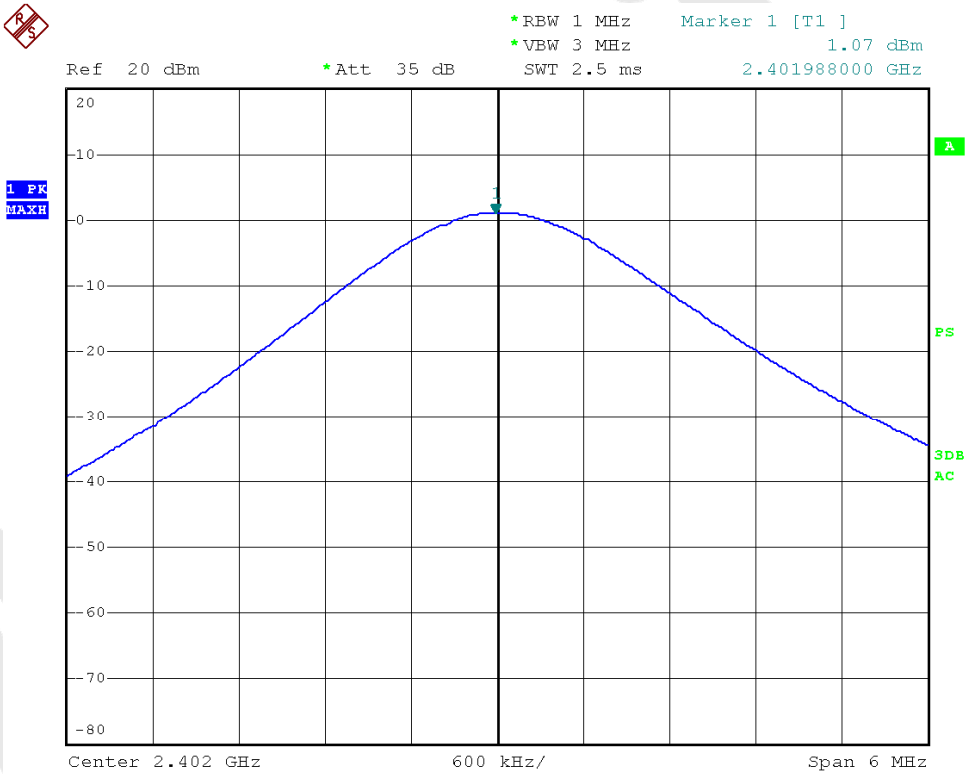
g. Test Data

Channel	Frequency (MHz)	Maximum transmit power (dBm)	Limit		Result
			(dBm)	(watts)	
Low	2402	1.07	28	0.63	Pass
Mid	2440	2.26			Pass
High	2480	2.34			Pass

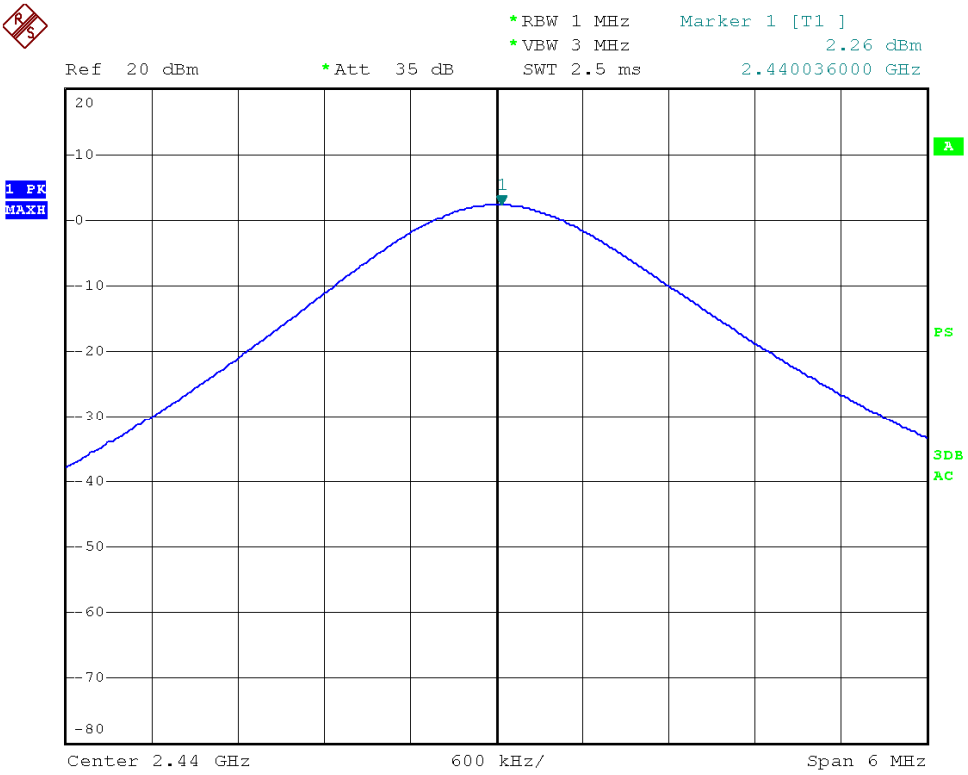
Note:
The antenna gain is 8dBi which is greater than 6dBi, according to the FCC rules, the limit reduced as follows:

Antenna Gain:
8dBi- 6dBi= 2dBi
Limit: 30dBm- 2= 28dBm=0.63W

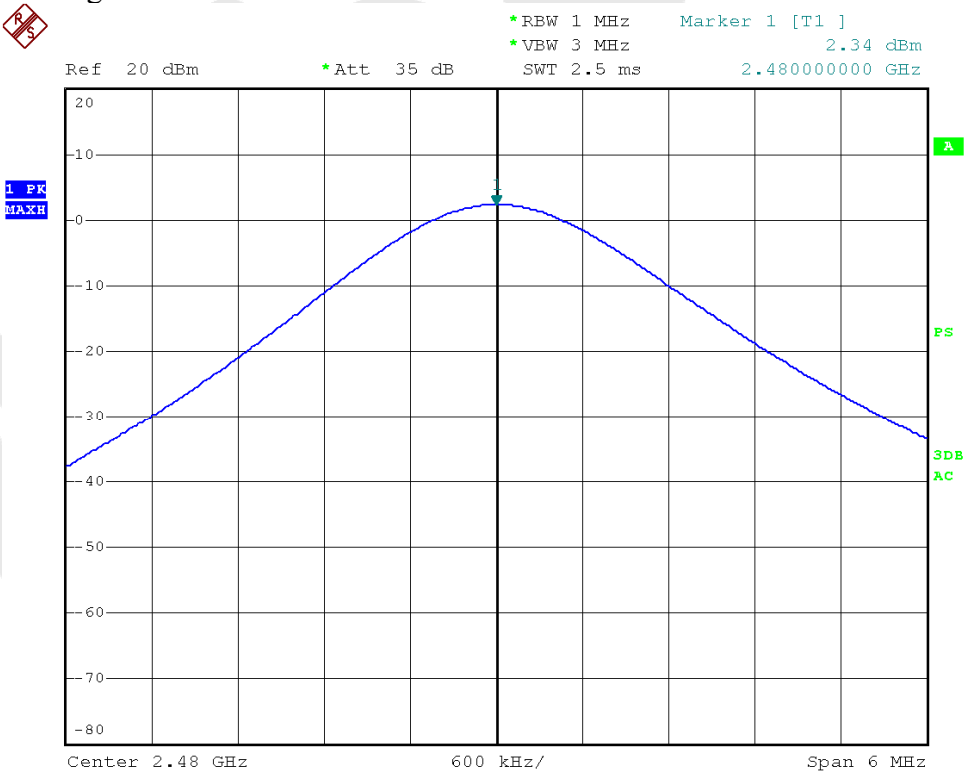
CH Low



CH Mid



CH High



4.4. Band Edges Measurement

a. Limit

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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 in15.209(a).

According to KDB 558074, section 11:

The DTS rules specify that in any 100 kHz bandwidth outside of the authorized frequency band, the power shall be attenuated according to the following conditions:[7]

a) If the maximum peak conducted output power procedure was used to demonstrate compliance as described in 9.1, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (*i.e.*, 20 dBc).

b) If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (*i.e.*, 30 dBc).

c) In either case, attenuation to levels below the 15.209 general radiated emissions limits is not required.[8]

b. Test Procedure

1. Conducted Method:

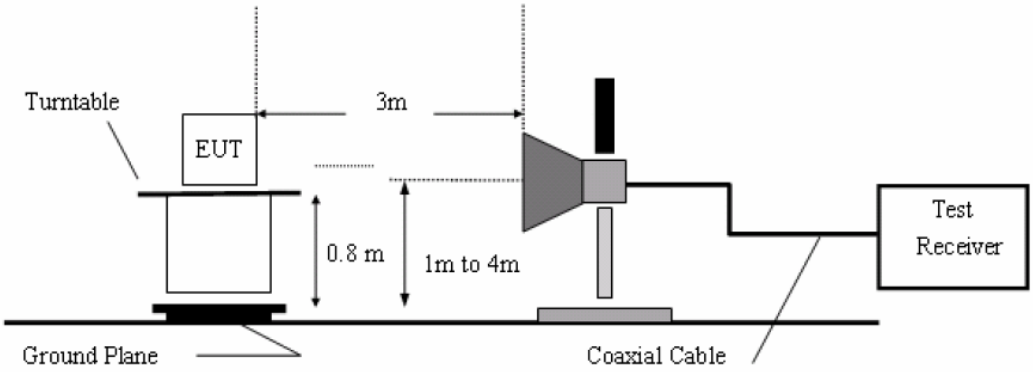
1) Set RBW=100kHz, VBW=300kHz
2) Detector=peak
3) Sweep time= auto
4) Trace mode=max hold.

2. Radiated Method: (If applicable)

1) The EUT is placed on a turntable, which is 0.8m above the ground plane. The EUT is tested in 9*6*6 Chamber.
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 varied from 1m to 4m to find out the highest emission.
4) Set both RBW and VBW of spectrum analyzer to 100kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT. If pass then set Spectrum Analyzer as below:
   For below 1GHz:
   The resolution bandwidth and video bandwidth of test receiver/ spectrum analyzer is 120kHz.
   Detector: **Quasi-Peak**
   For above 1GHz Peak measurement:
   The resolution bandwidth of test receiver/ spectrum analyzer is 1MHz and video bandwidth is 3MHz.
   Detector: **Peak**

For above 1GHz average measurement:
The resolution bandwidth of test receiver/ spectrum analyzer is 1MHz and the video bandwidth is 1kHz.
Detector: **Peak**

5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.



c. Test Equipment

Same as the equipment listed in 4.2.

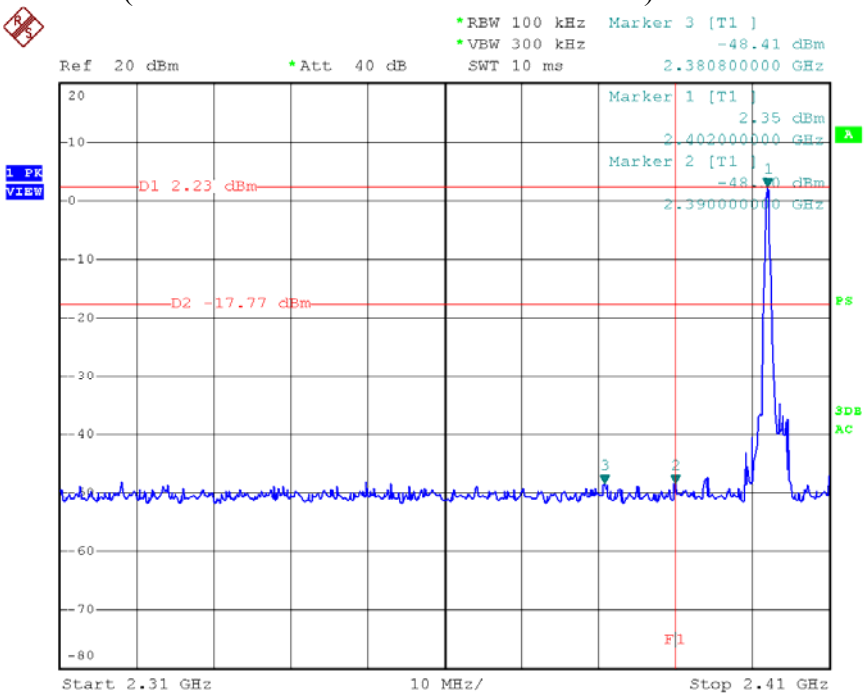
d. Test Results

Pass.

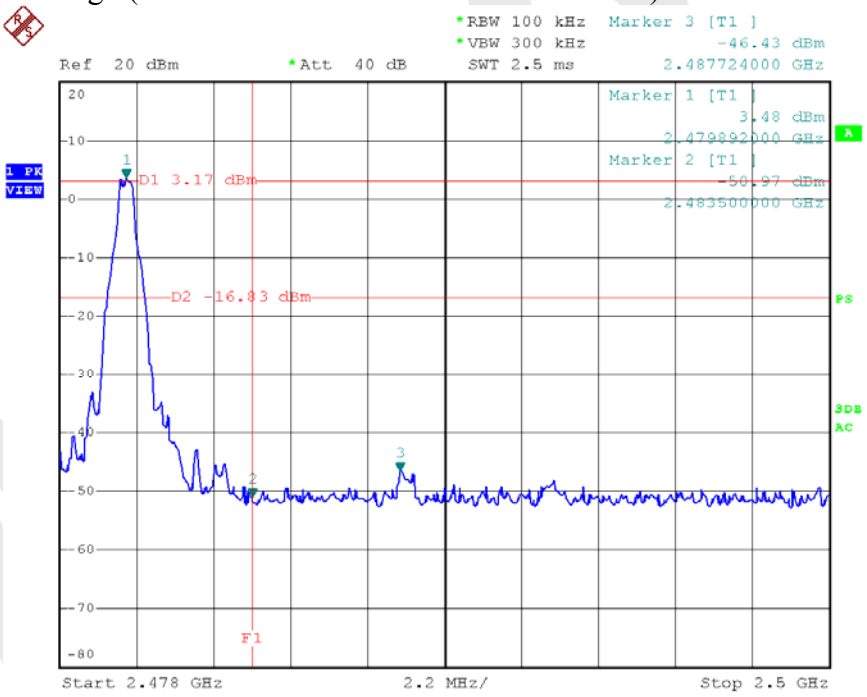
e. Test Plots

See the following page.

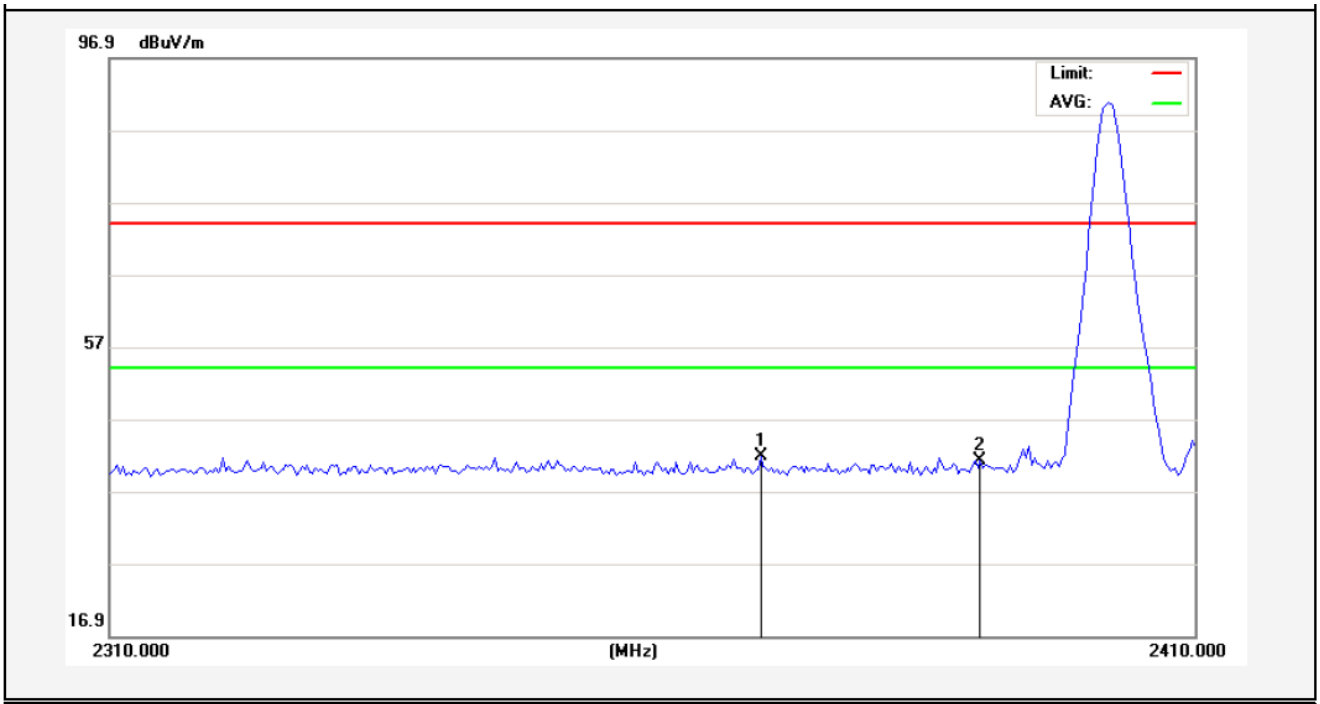
CH Low (The PPSD result in 100kHz is 2.23dBm)



CH High (The PPSD result in 100kHz is 3.17dBm)

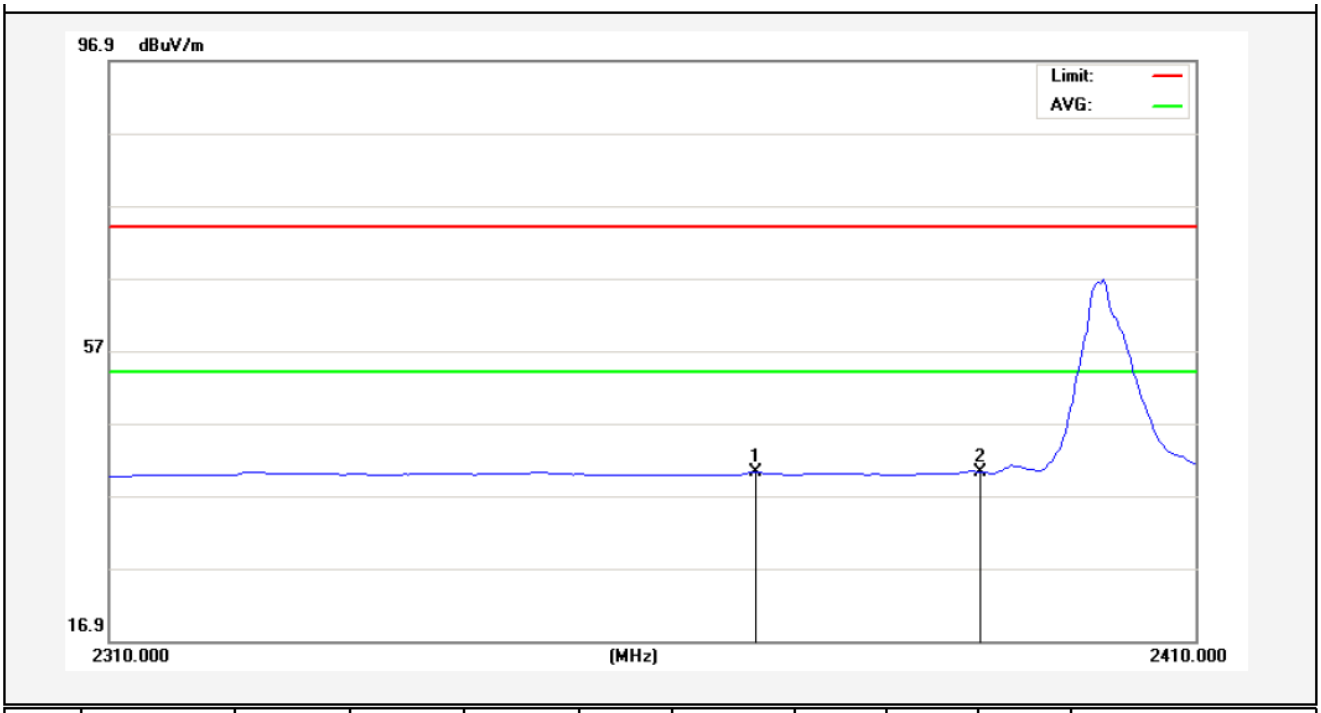


2402MHz
Horizontal-PEAK:



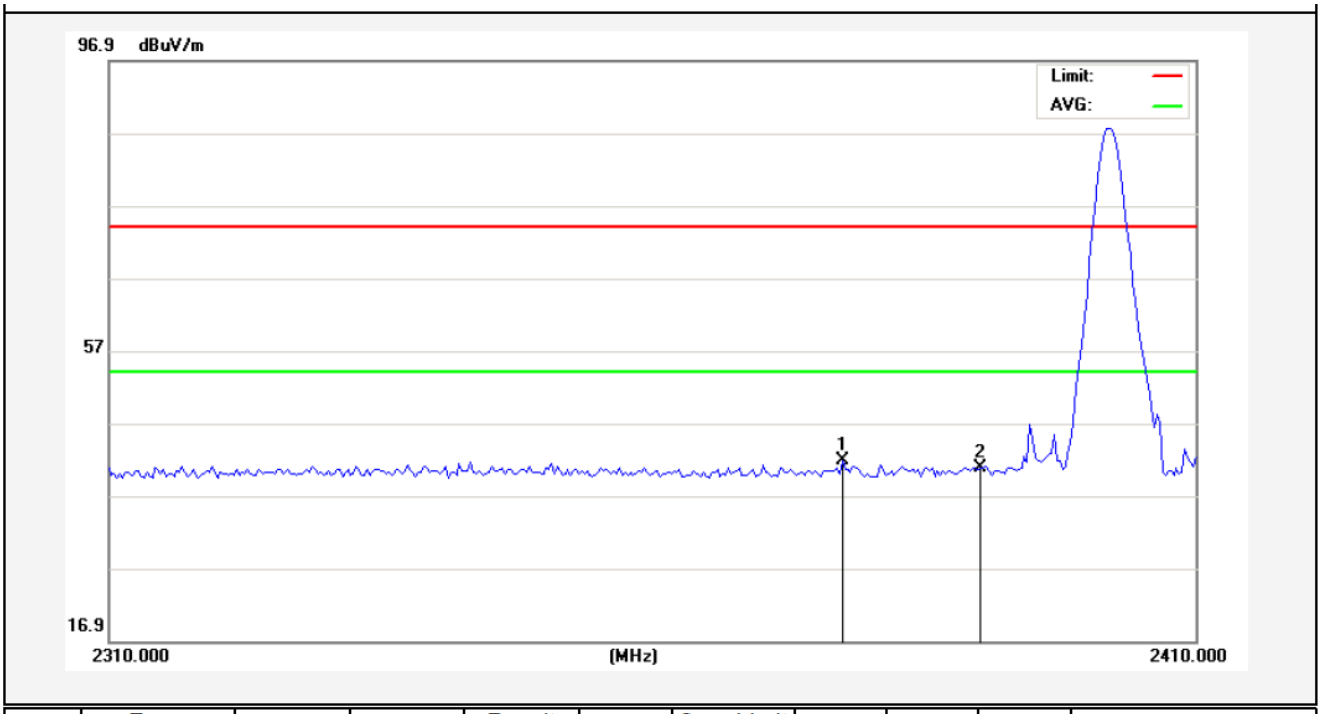
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2369.500	44.34	-2.56	41.78	74.00	-32.22	peak			
2	2390.000	43.70	-2.51	41.19	74.00	-32.81	peak			

Horizontal-AV:



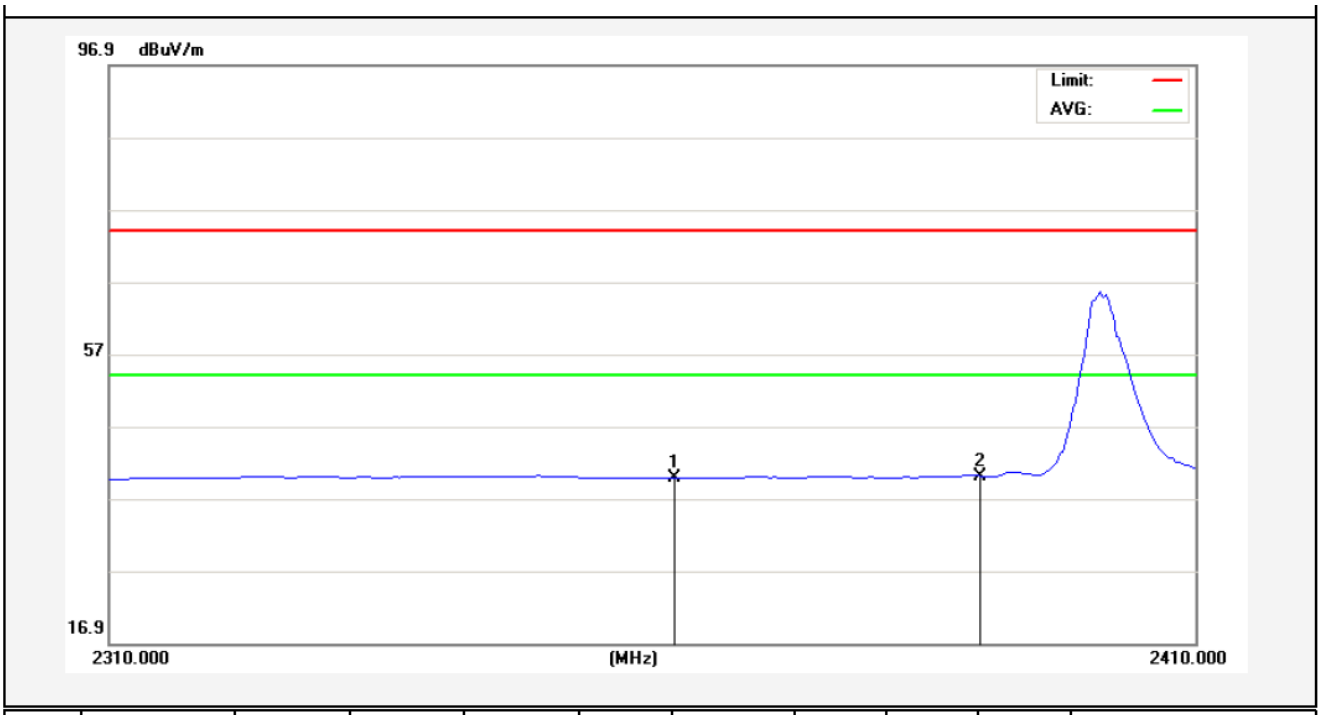
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2369.000	42.78	-2.56	40.22	54.00	-13.78	AVG			
2	2390.000	42.74	-2.51	40.23	54.00	-13.77	AVG			

2402MHz
Vertical-PEAK:



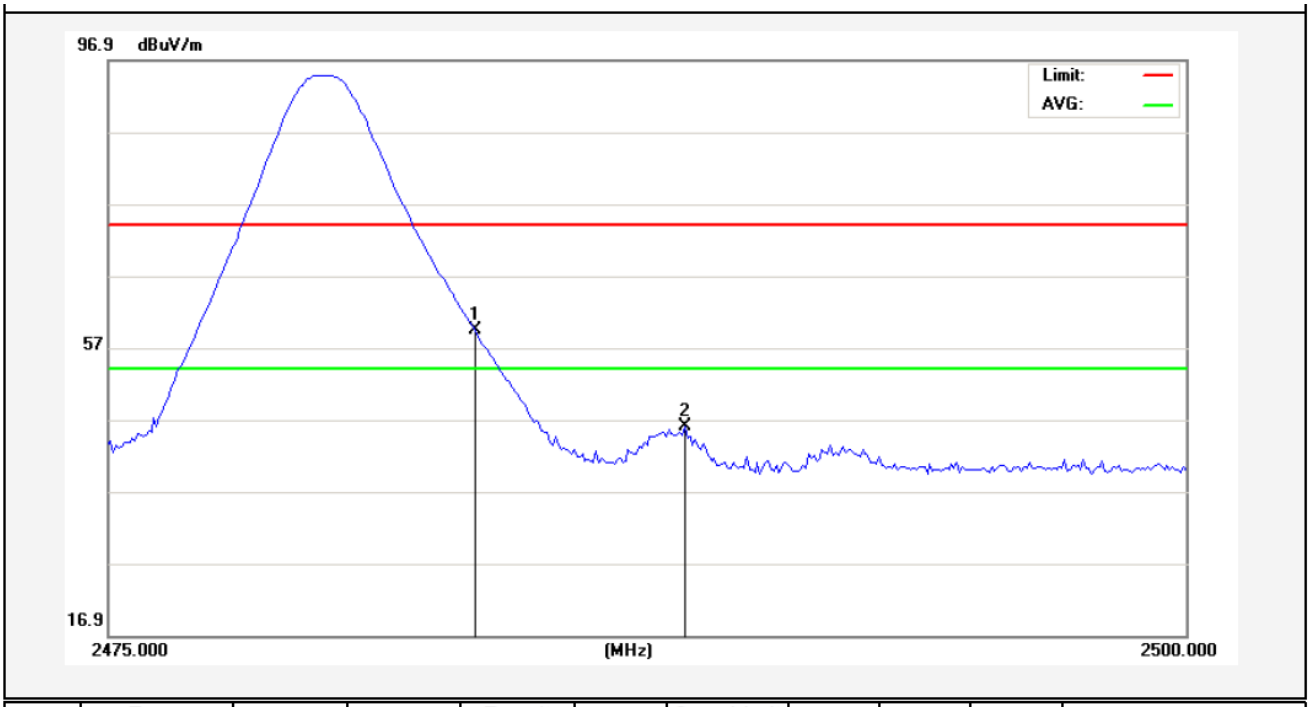
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2377.250	44.39	-2.54	41.85	74.00	-32.15	peak			
2	2390.000	43.24	-2.51	40.73	74.00	-33.27	peak			

Vertical-AV:



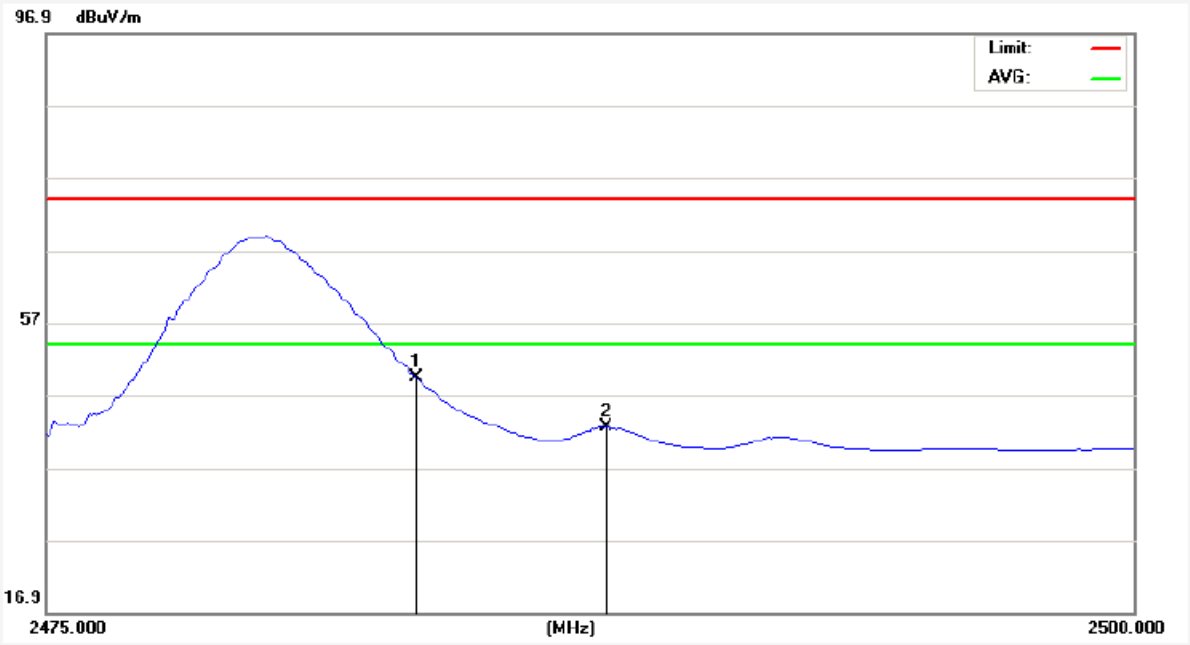
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2361.500	42.43	-2.58	39.85	54.00	-14.15	AVG			
2	2390.000	42.60	-2.51	40.09	54.00	-13.91	AVG			

2480MHz
Horizontal-PEAK:



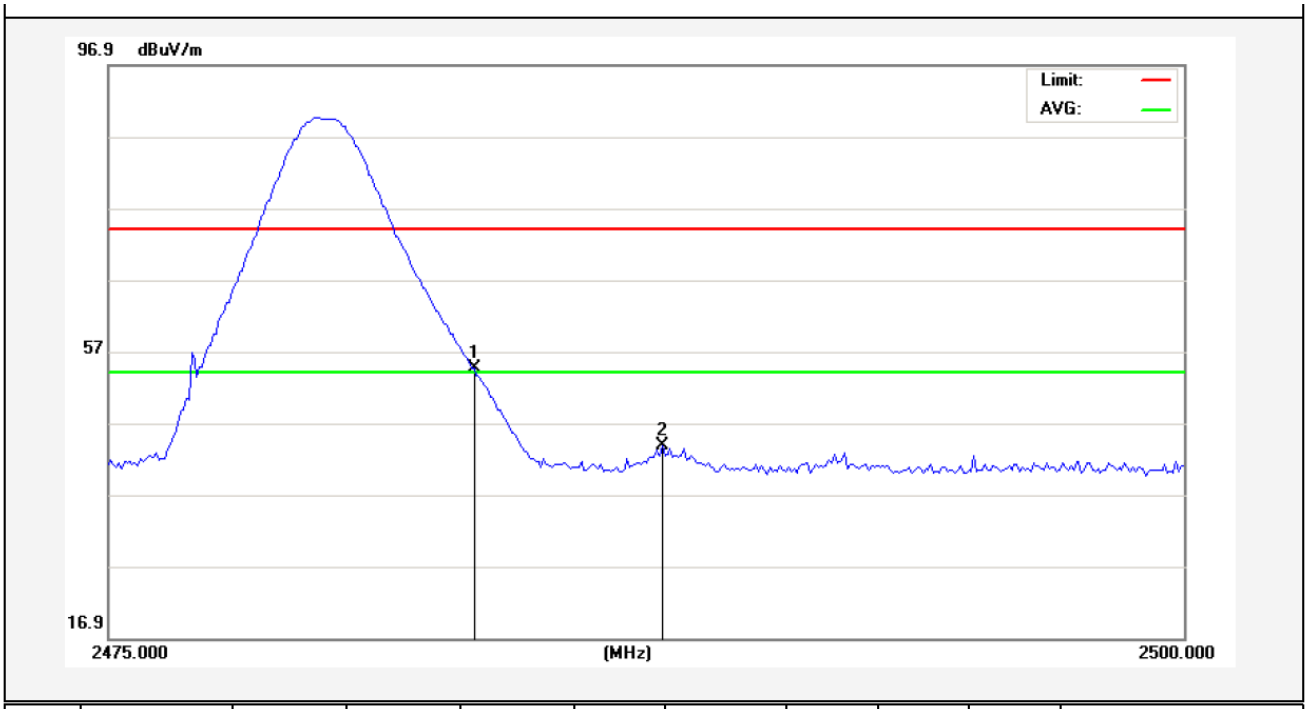
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	61.81	-2.31	59.50	74.00	-14.50	peak			
2	2488.375	48.27	-2.30	45.97	74.00	-28.03	peak			

Horizontal-AV:



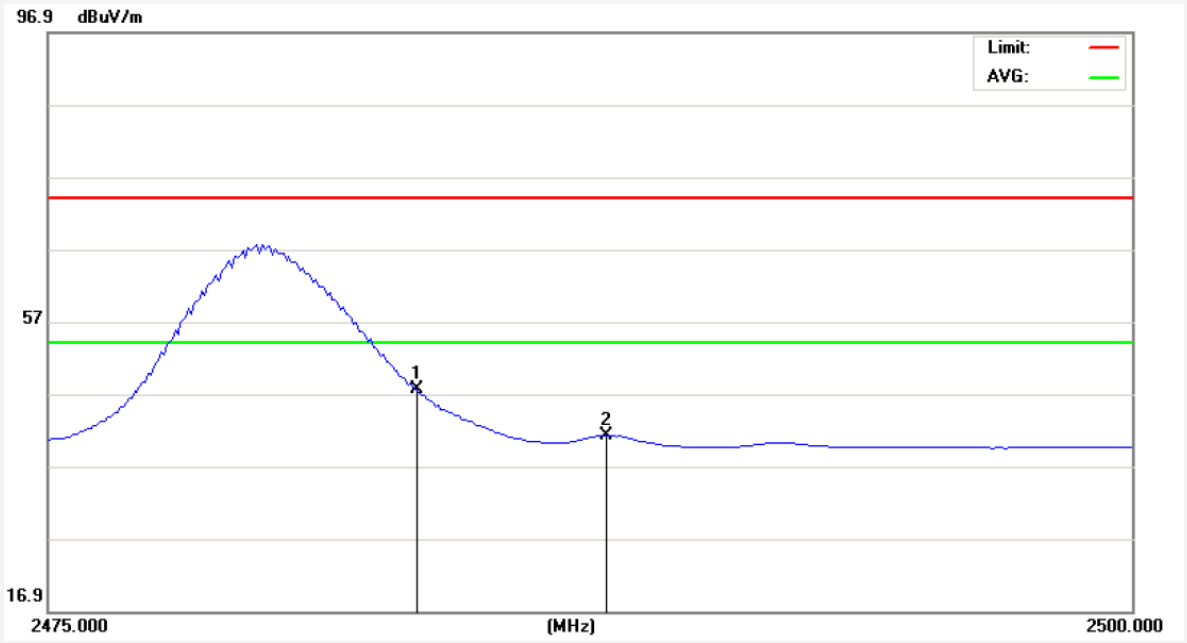
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	51.72	-2.31	49.41	54.00	-4.59	AVG			
2	2487.875	44.90	-2.30	42.60	54.00	-11.40	AVG			

2480MHz
Vertical-PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	56.90	-2.31	54.59	74.00	-19.41	peak			
2	2487.875	46.03	-2.30	43.73	74.00	-30.27	peak			

Vertical-AV:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	49.93	-2.31	47.62	54.00	-6.38	AVG			
2	2487.875	43.58	-2.30	41.28	54.00	-12.72	AVG			

4.5. Peak Power Spectral Density

a. Limit

1. For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
2. The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

b. Test Procedure

1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as: RBW = 3kHz, VBW = 10kHz, Span = 1.5xOBW, Sweep=500s
3. In addition to the second point, re-set the spectrum analyzer as: RBW = 100kHz, VBW = 300kHz, Span = 1.5xOBW, Sweep=500s, the test results are used for conducted bandedge limit.
4. Record the max. reading.
5. Repeat the above procedure until the measurements for all frequencies are completed.

c. Test Equipment

Same as the equipment listed in 4.2.

d. Test Setup

See 3.1

e. Test Results

Pass

f. Test Data

Please refer to the following data.

g. Test Plot See the following pages

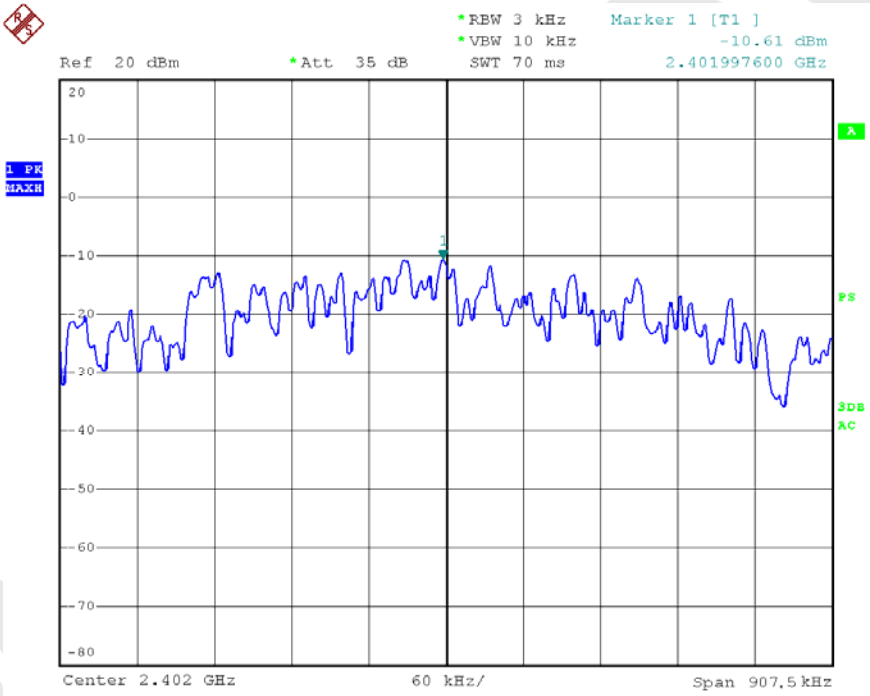
Test Data

Channel	Frequency (MHz)	PPSD (dBm/3KHz)	∑PPSD (dBm/3KHz)	Limit (dBm)	Result
Low	2402	-10.61	-	6.00	Pass
Mid	2440	-9.07	-	6.00	Pass
High	2480	-9.29	-	6.00	Pass

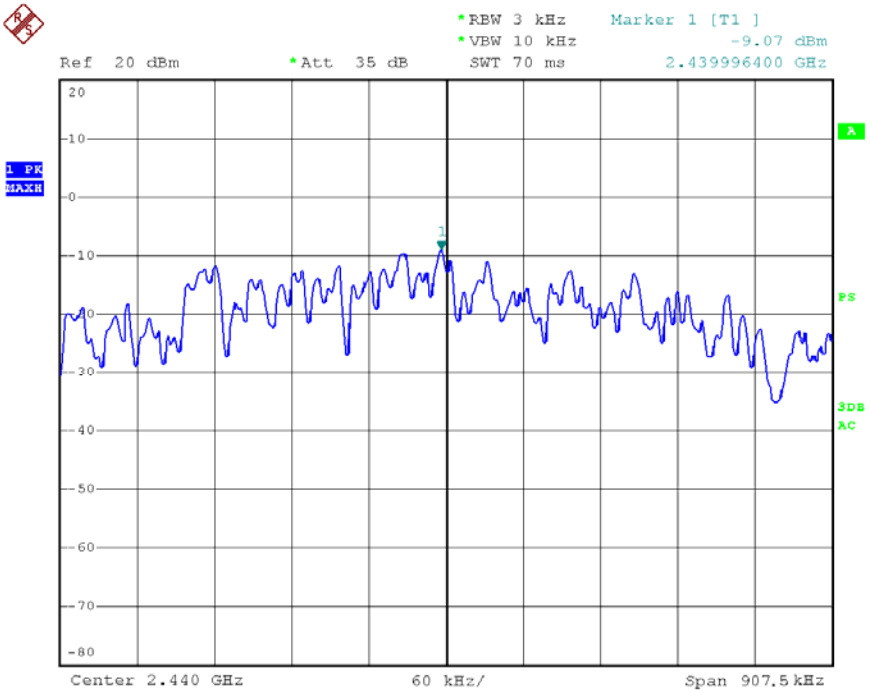
Channel	Frequency (MHz)	PPSD (dBm/100KHz)	∑PPSD (dBm/100KHz)	Result
Low	2402	2.23	-	Pass
Mid	2440	3.28	-	Pass
High	2480	3.17	-	Pass

3KHz

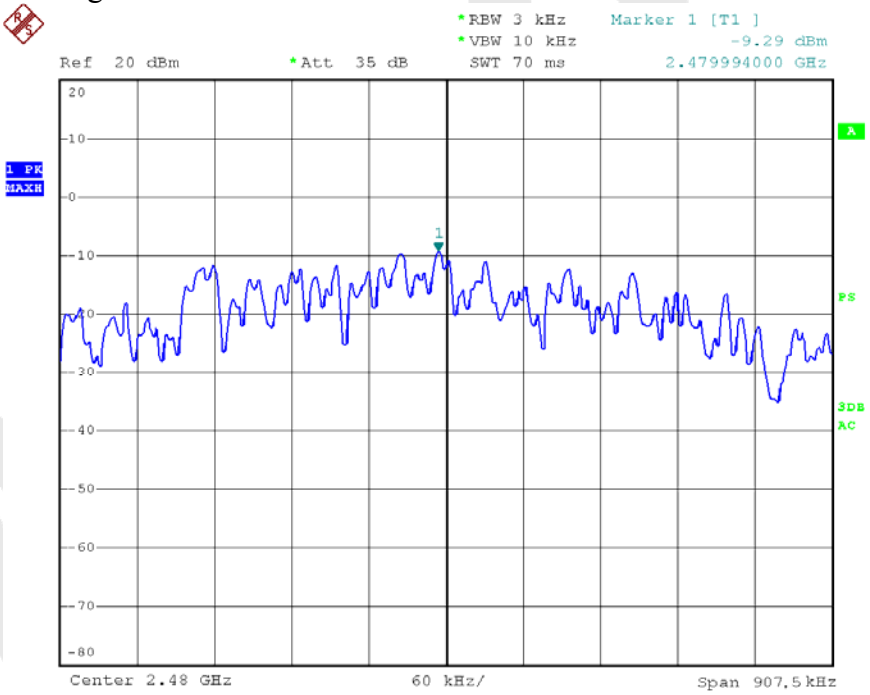
CH Low



CH Mid

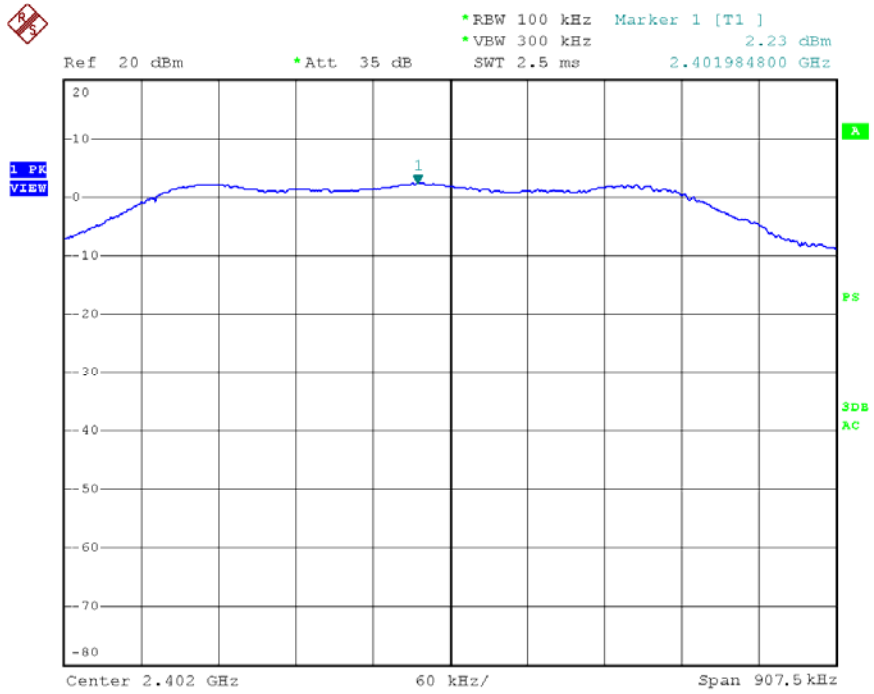


CH High

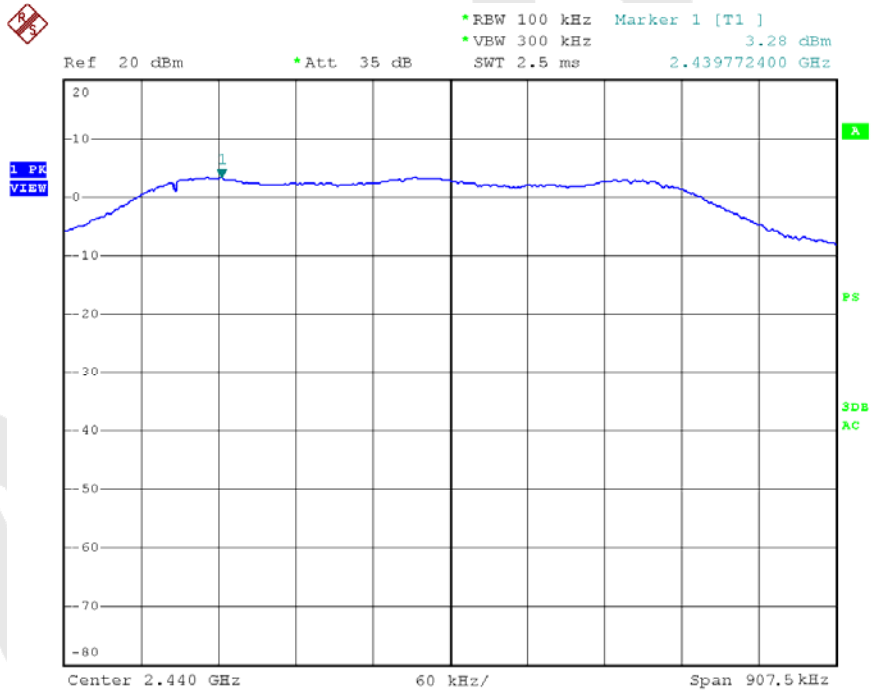


100KHz

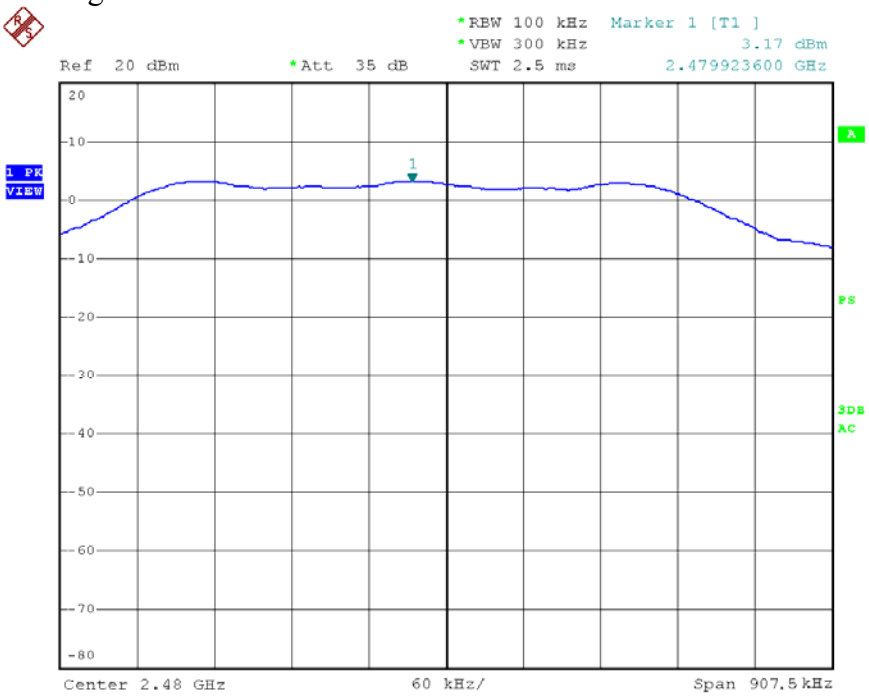
CH Low



CH Mid



CH High


*RBW 100 kHz
Marker 1 [T1]
*VBW 300 kHz
3.17 dBm
Ref 20 dBm
*Att 35 dB
SWT 2.5 ms
2.479923600 GHz
1 PK
VIEW
A
PS
3DB
AC
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
60 kHz/
Span 907.5 kHz

4.6. Radiated Emissions

4.6.1.1. Test Limits (< 30 MHZ)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

4.6.1.2. Test Limits (≥ 30 MHZ)

FIELD STRENGTH of Fundamental: @3M	FIELD STRENGTH of Harmonics	S15.209	
902-928 MHZ		30 - 88 MHz	40 dBuV/m
2.4-2.4835 GHz		88 - 216 MHz	43.5
94 dBμV/m @3m	54 dBμV/m @3m	216 - 960 MHz	46
		ABOVE 960 MHz	54dBuV/m

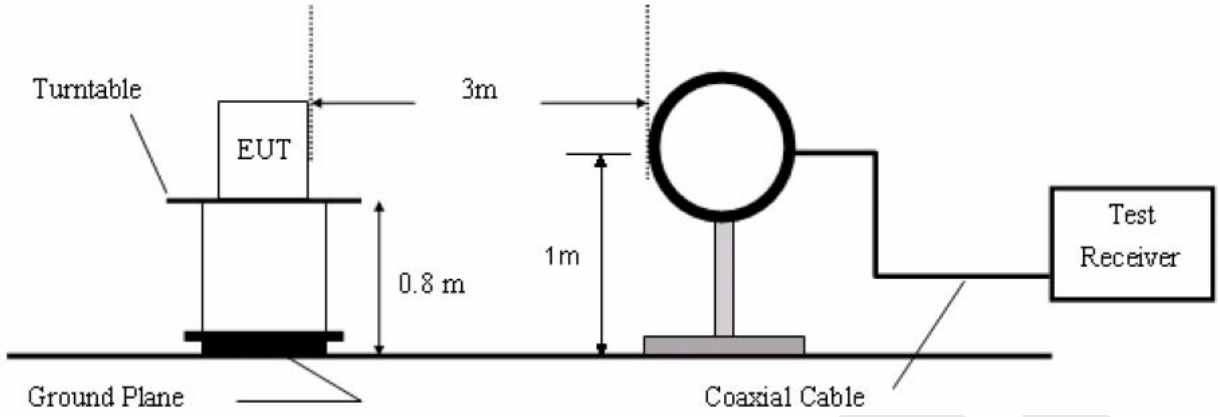
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. 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 Equipment

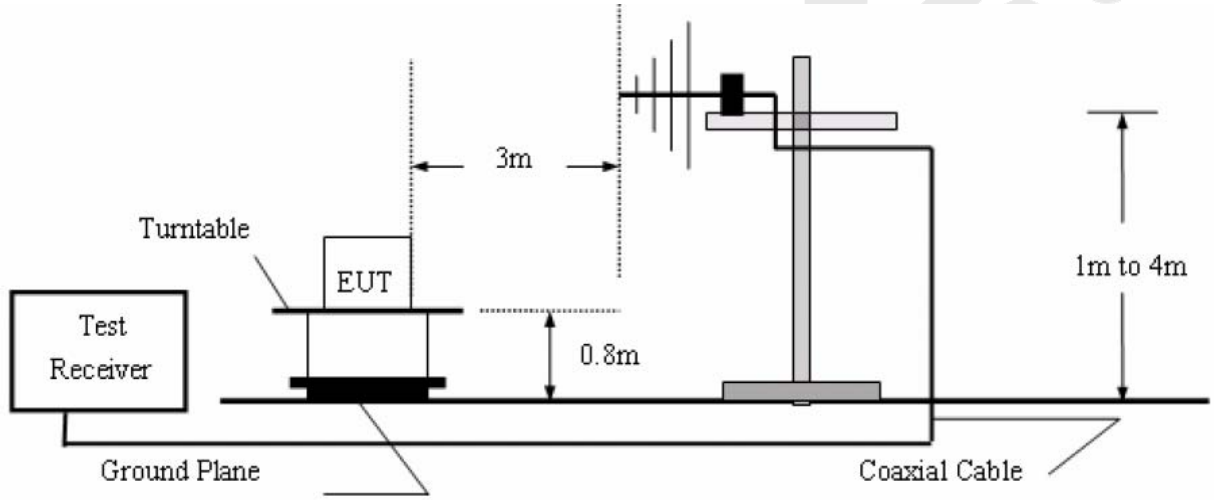
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Aug. 08, 2014	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Aug. 08, 2014	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 22, 2014	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 04, 2014	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 24, 2014	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Aug. 08, 2014	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

4.6.2. Test Configuration:

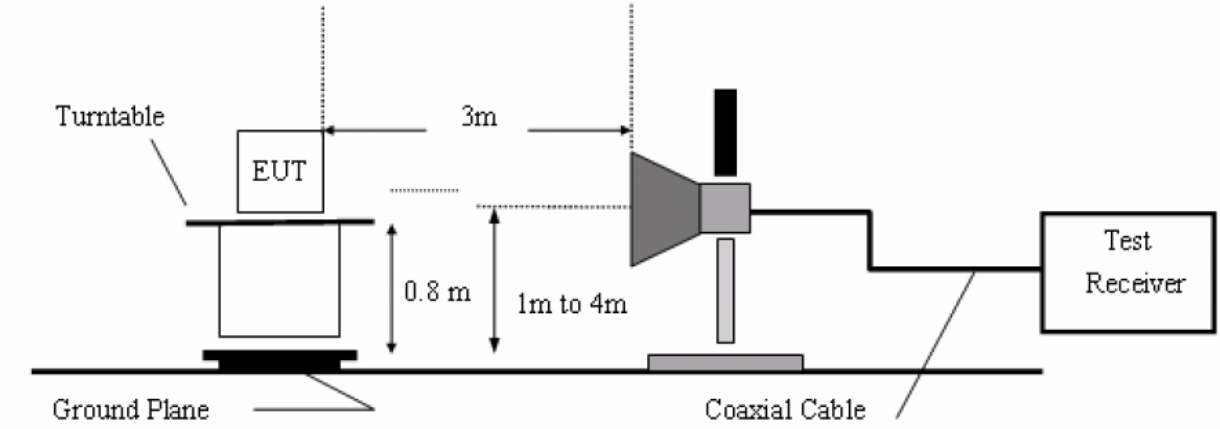
4.6.2.1. 9k to 30MHz emissions:



4.6.2.2. 30M to 1G emissions:



4.6.2.3. 1G to 40G emissions:



4.6.3. Test Procedure

1) The EUT is placed on a turntable, which is 0.8m above the ground plane. The EUT is tested in 9*6*6 Chamber.
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 varied from 1m to 4m to find out the highest emission.
4) Set both RBW and VBW of spectrum analyzer to 100kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT. If pass then set Spectrum Analyzer as below:
For below 1GHz:
The resolution bandwidth and video bandwidth of test receiver/ spectrum analyzer is 120kHz.
Detector: Quasi-Peak
For above 1GHz Peak measurement:
The resolution bandwidth of test receiver/ spectrum analyzer is 1MHz and video bandwidth is 3MHz.
Detector: Peak

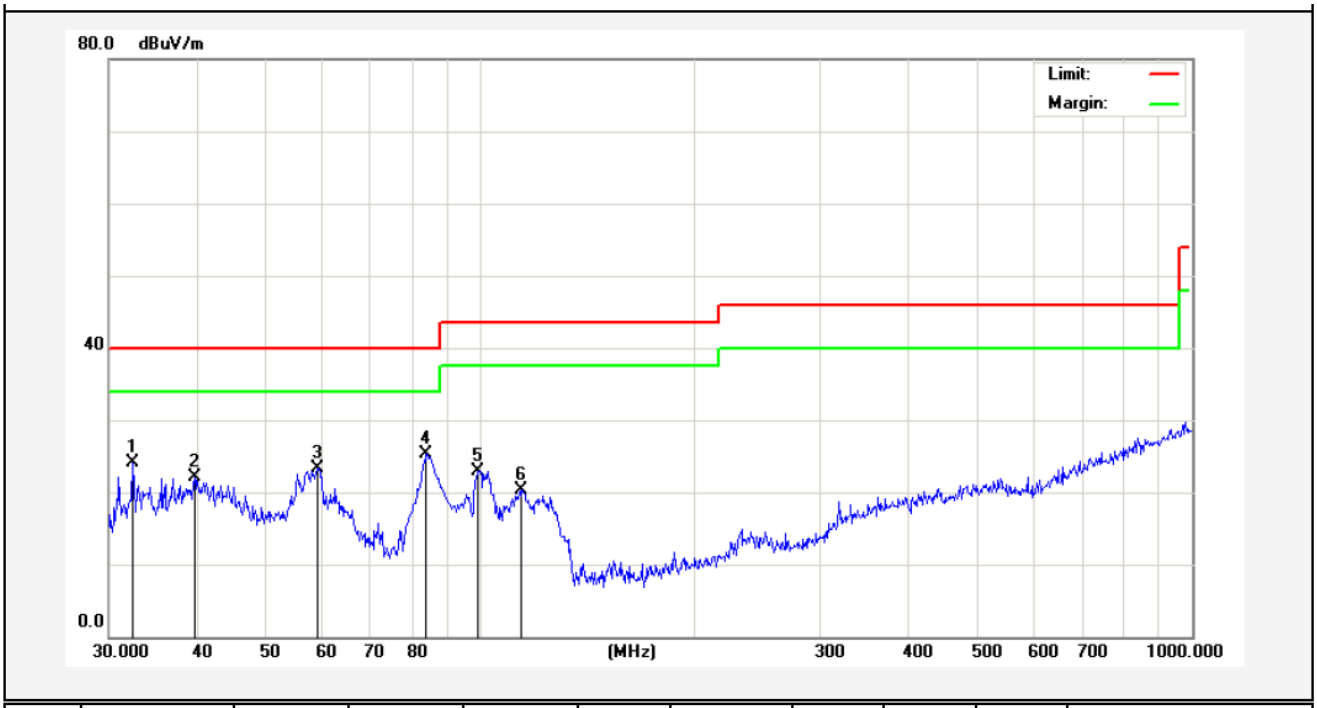
For above 1GHz average measurement:
The resolution bandwidth of test receiver/ spectrum analyzer is 1MHz and the video bandwidth is 1kHz.
Detector: Peak
5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

The test results are listed in Section 4.6.4.

4.6.4. Test Results

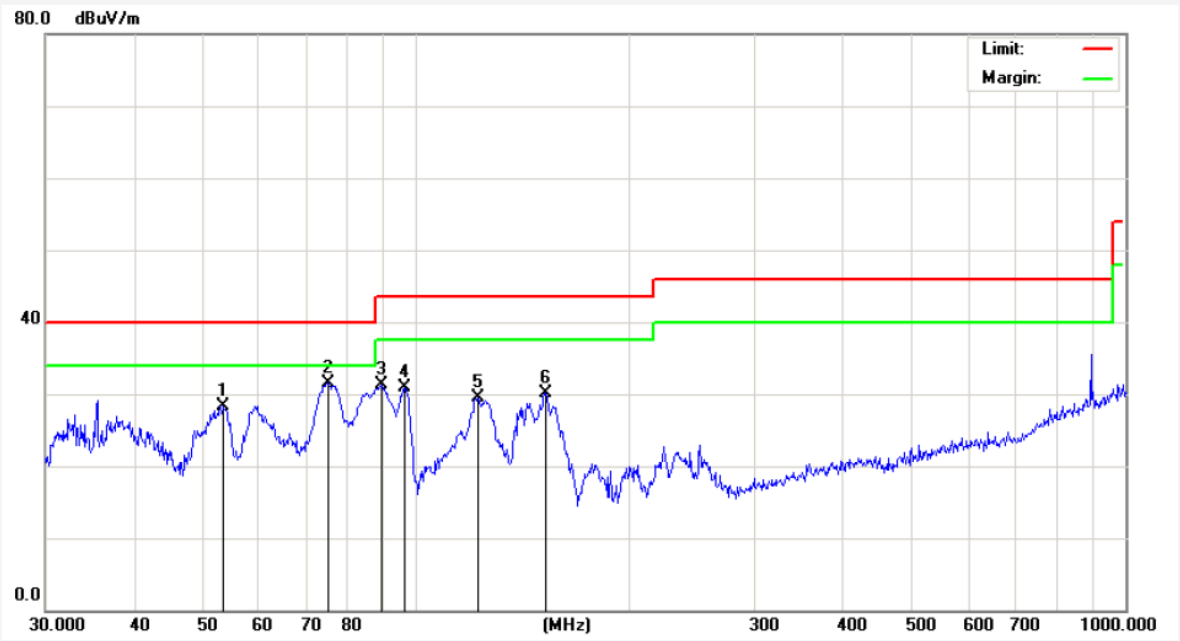
The EUT was tested on (BT Mode, AUX Playing) modes, only the worst data of (BT Mode) are attached in the following pages.

Job No.:	**011411220E**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Test Mode:	**BT Mode**	**Distance:**	**3m**



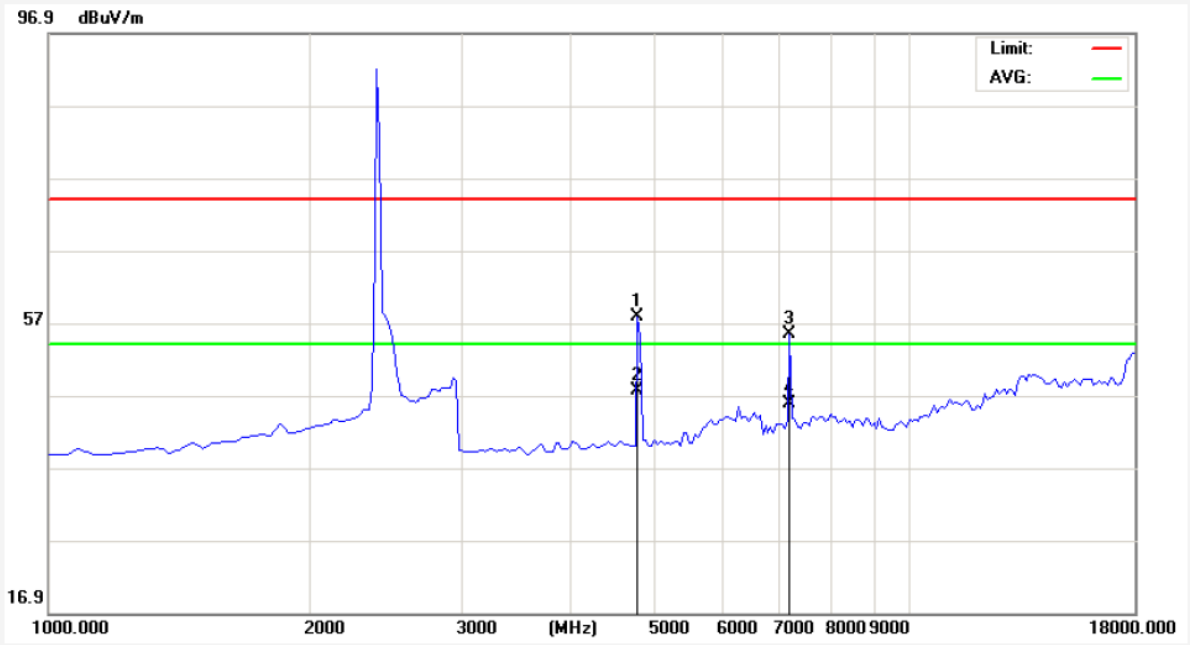
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.4059	39.78	-15.67	24.11	40.00	-15.89	peak			
2	39.5757	32.81	-10.70	22.11	40.00	-17.89	peak			
3	59.0251	38.64	-15.31	23.33	40.00	-16.67	peak			
4	83.8156	45.94	-20.73	25.21	40.00	-14.79	peak			
5	99.1797	43.72	-20.80	22.92	43.50	-20.58	peak			
6	113.7143	41.20	-20.88	20.32	43.50	-23.18	peak			

Job No.:	**011411220E**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Test Mode:	**BT Mode**	**Distance:**	**3m**



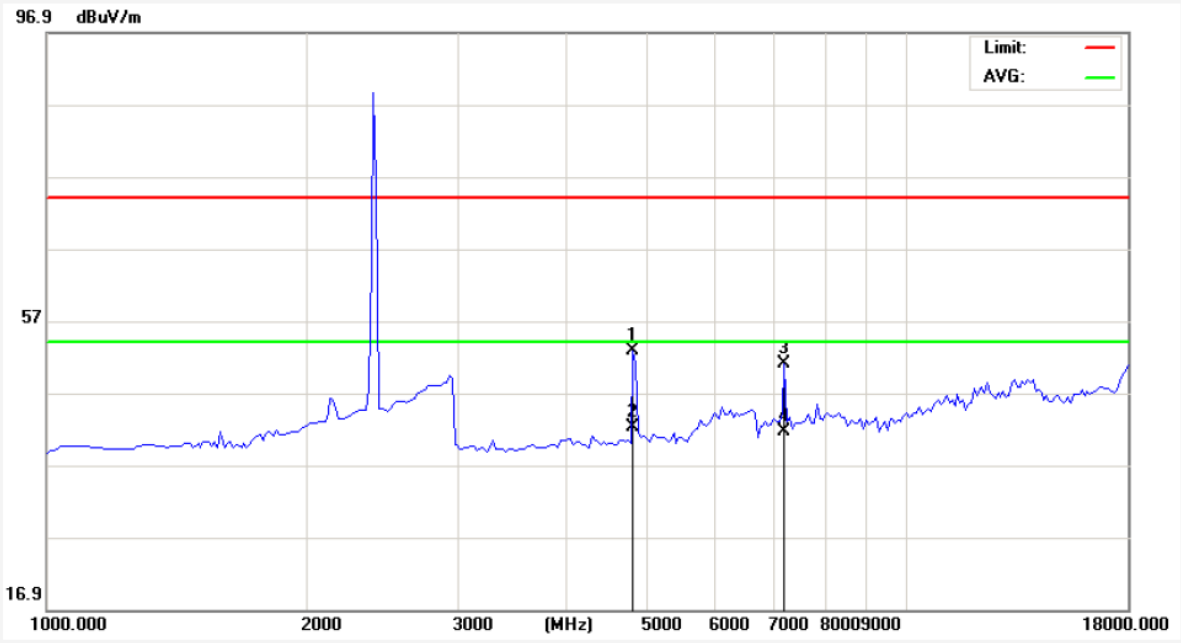
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	53.5052	43.14	-14.82	28.32	40.00	-11.68	peak			
2	75.1822	52.15	-20.57	31.58	40.00	-8.42	peak			
3	89.2764	49.33	-17.95	31.38	43.50	-12.12	peak			
4	96.4362	46.85	-15.95	30.90	43.50	-12.60	peak			
5	121.9755	46.08	-16.62	29.46	43.50	-14.04	peak			
6	152.1297	48.33	-18.24	30.09	43.50	-13.41	peak			

Job No.:	**011411220E**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**2402MHz**	**Distance:**	**3m**



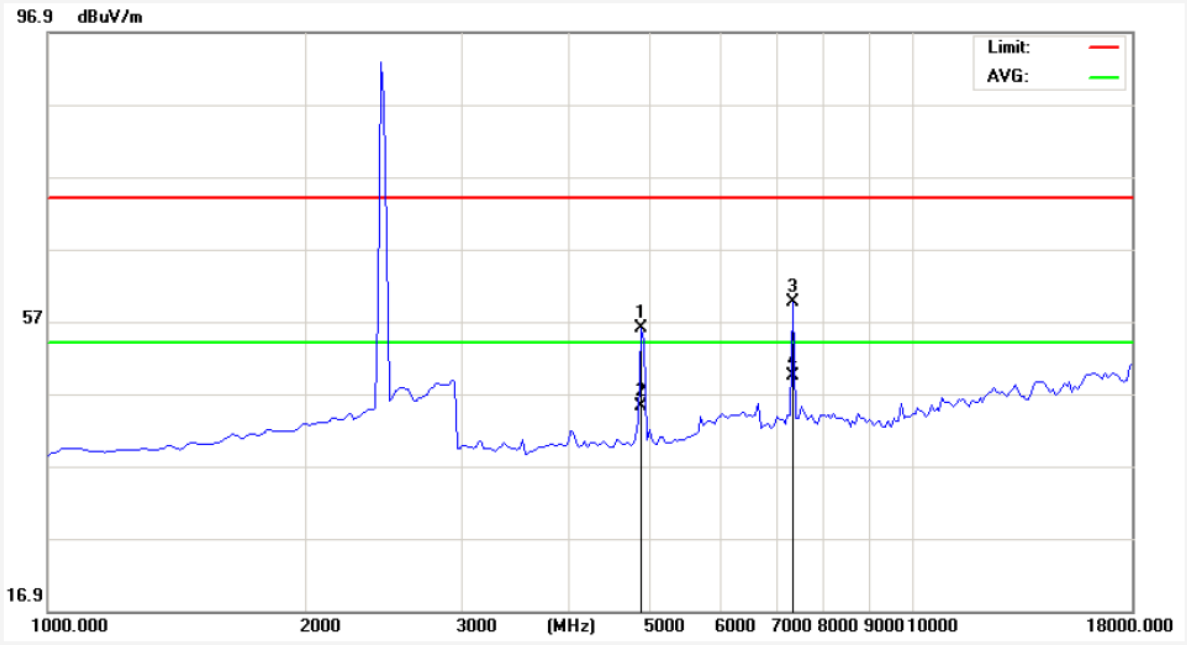
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	54.43	3.34	57.77	74.00	-16.23	peak			
2	4825.000	44.28	3.34	47.62	54.00	-6.38	AVG			
3	7205.000	47.01	8.43	55.44	74.00	-18.56	peak			
4	7205.000	37.42	8.43	45.85	54.00	-8.15	AVG			

Job No.:	**011411220E**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**2402MHz**	**Distance:**	**3m**



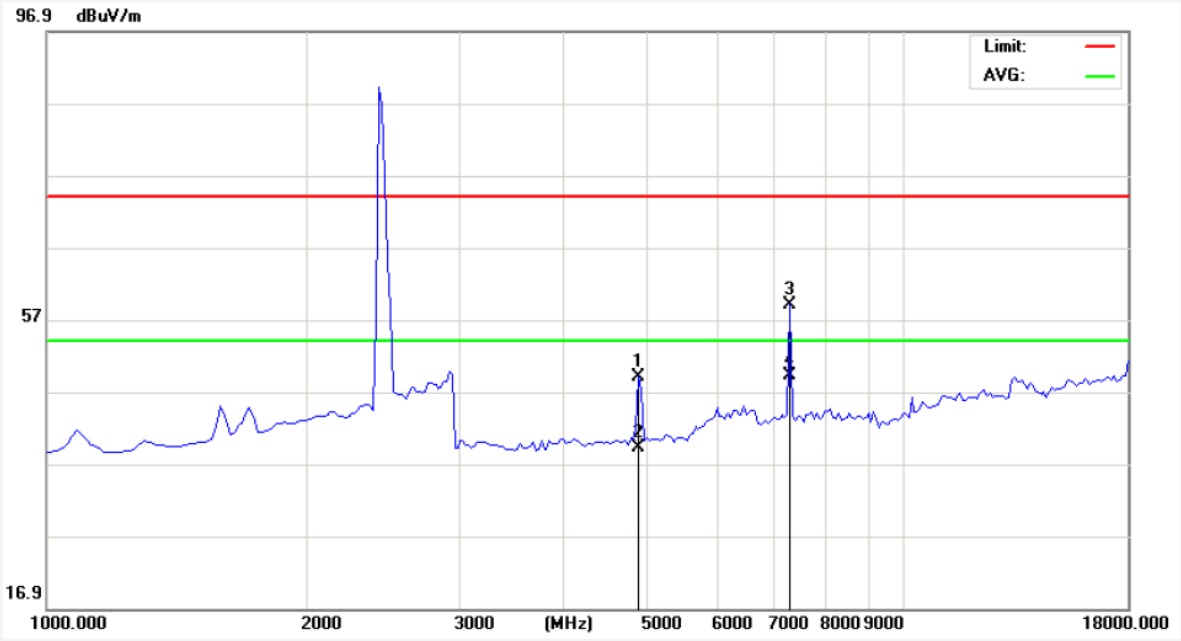
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4825.000	49.39	3.34	52.73	74.00	-21.27	peak			
2	4825.000	38.94	3.34	42.28	54.00	-11.72	AVG			
3	7205.000	42.62	8.43	51.05	74.00	-22.95	peak			
4	7205.000	33.22	8.43	41.65	54.00	-12.35	AVG			

Job No.:	**011411220E**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**2440MHz**	**Distance:**	**3m**



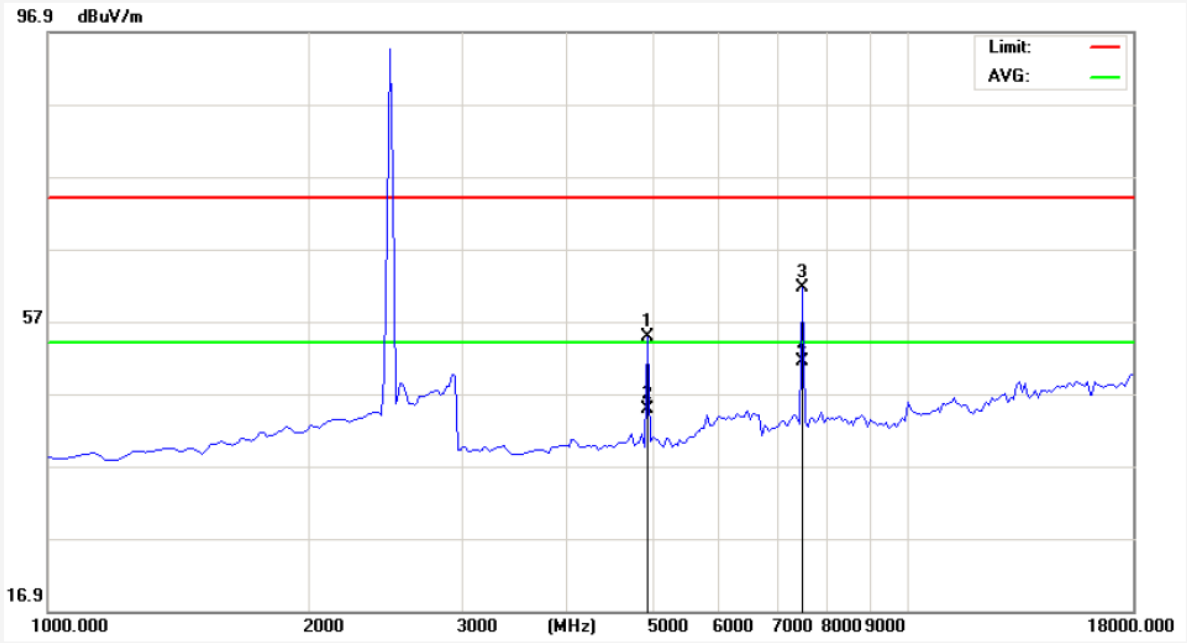
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	52.58	3.41	55.99	74.00	-18.01	peak			
2	4867.500	41.87	3.41	45.28	54.00	-8.72	AVG			
3	7332.500	51.03	8.58	59.61	74.00	-14.39	peak			
4	7332.500	40.89	8.58	49.47	54.00	-4.53	AVG			

Job No.:	**011411220E**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**2440MHz**	**Distance:**	**3m**



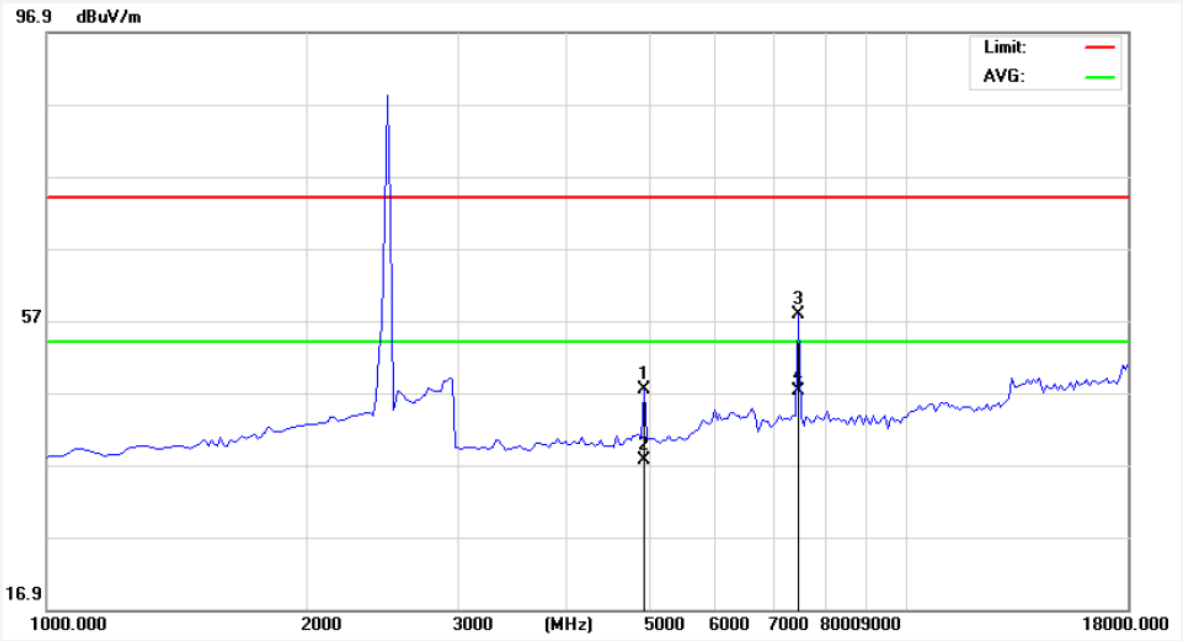
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4867.500	45.69	3.41	49.10	74.00	-24.90	peak			
2	4867.500	35.84	3.41	39.25	54.00	-14.75	AVG			
3	7332.500	50.52	8.58	59.10	74.00	-14.90	peak			
4	7332.500	40.70	8.58	49.28	54.00	-4.72	AVG			

Job No.:	**011411220E**	**Polarization:**	**Horizontal**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**2480MHz**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4952.500	51.28	3.57	54.85	74.00	-19.15	peak			
2	4952.500	41.28	3.57	44.85	54.00	-9.15	AVG			
3	7460.000	52.93	8.73	61.66	74.00	-12.34	peak			
4	7460.000	42.74	8.73	51.47	54.00	-2.53	AVG			

Job No.:	**011411220E**	**Polarization:**	**Vertical**
Standard:	**(RE)FCC PART15 C _3m**	**Power Source:**	**DC 5V Via Adapter AC 120V, 60Hz**
Test item:	**Radiation Test**	**Temp.(C)/Hum.(%RH):**	**24.3(C)/55%RH**
Note:	**2480MHz**	**Distance:**	**3m**



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	4952.500	43.83	3.57	47.40	74.00	-26.60	peak			
2	4952.500	34.02	3.57	37.59	54.00	-16.41	AVG			
3	7460.000	49.08	8.73	57.81	74.00	-16.19	peak			
4	7460.000	38.52	8.73	47.25	54.00	-6.75	AVG			

5. ANTENNA APPLICATION

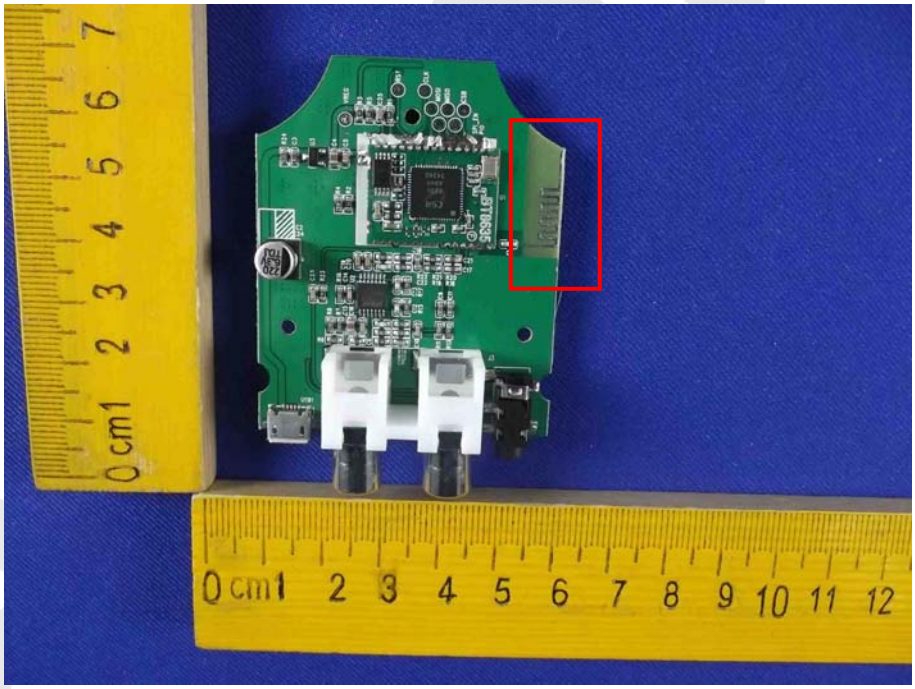
5.1. Antenna requirement

The EUT'S antenna is met the requirement of FCC part 15C 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. 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.

5.2. Result

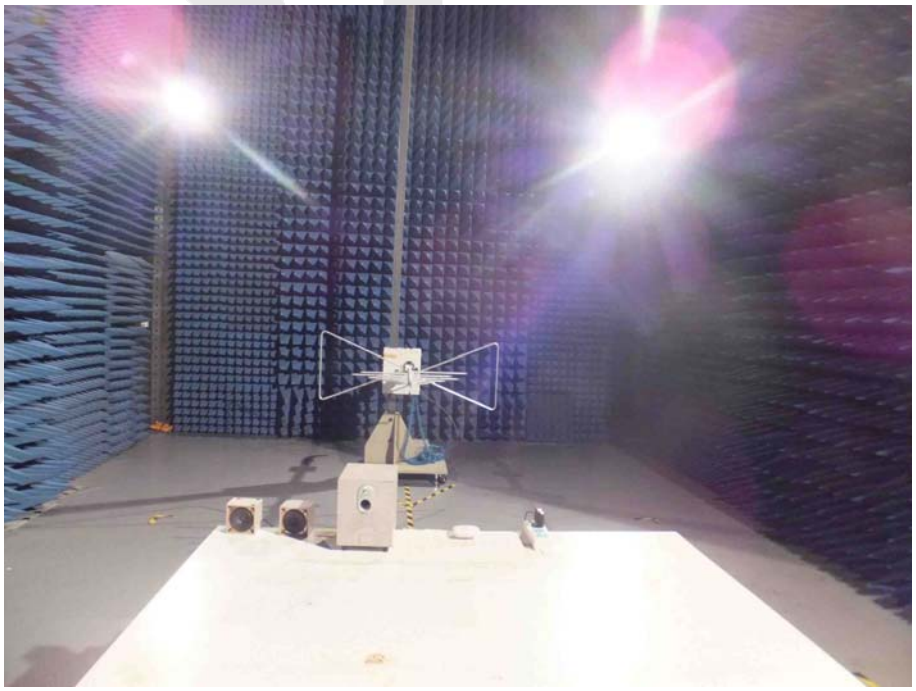
The EUT's antenna used a PCB antenna which is permanently attached, The antenna's gain is 8dBi and meets the requirement.

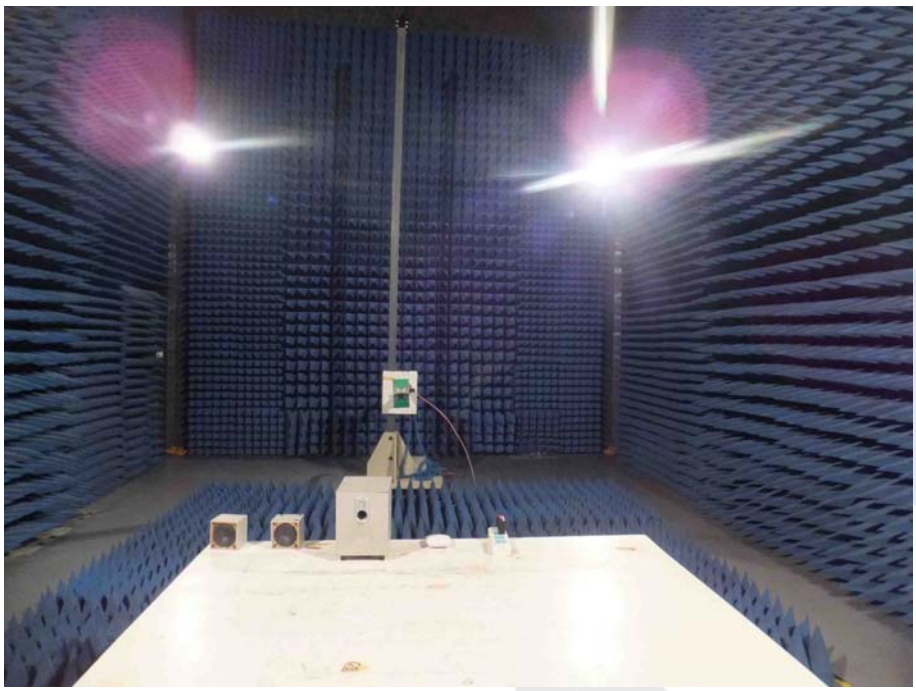


6. PHOTOGRAPH

6.1. Photo of Conducted Emission Measurement

6.2. Photo of Radiation Emission Test





APPENDIX I (EXTERNAL PHOTOS)

Figure 1
The EUT-Overall View

Figure 2
The EUT-Top View

Figure 3
The EUT-Bottom View

Figure 4
The EUT-Front View

Figure 5
The EUT-Back View

Figure 6
The EUT-Left View

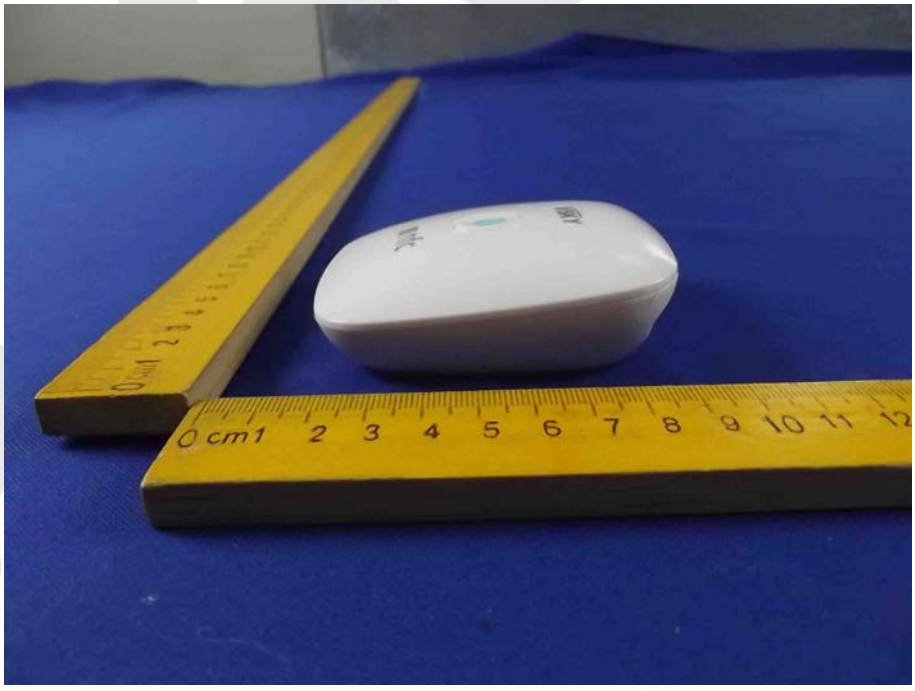


Figure 7
The EUT-Right View

APPENDIX Ⅱ(INTERNAL PHOTOS)

Figure 8
The EUT-Inside View

Figure 9
PCB of the EUT-Front View

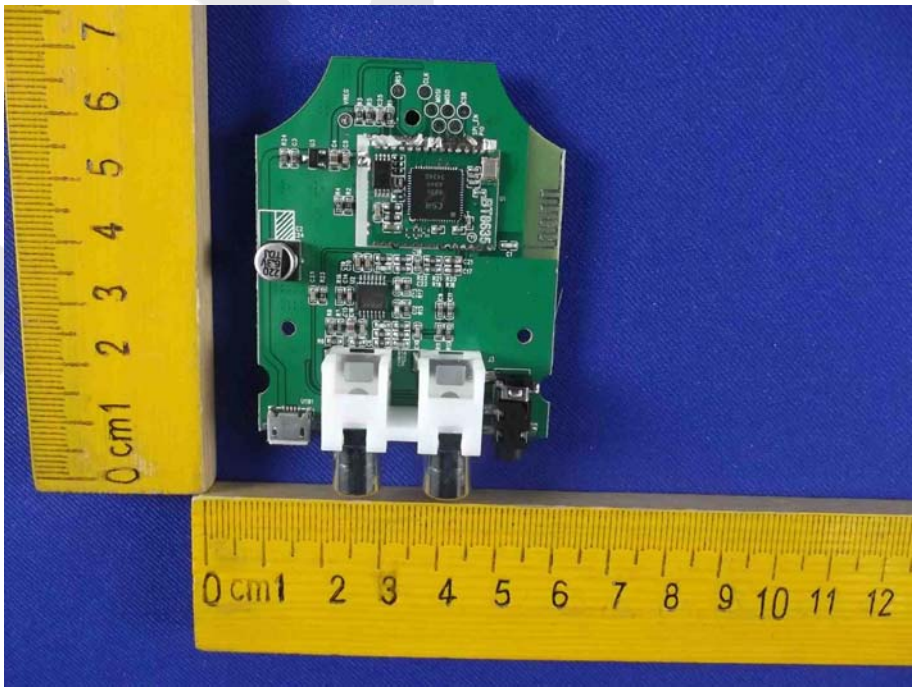


Figure 10
PCB of the EUT-Back View

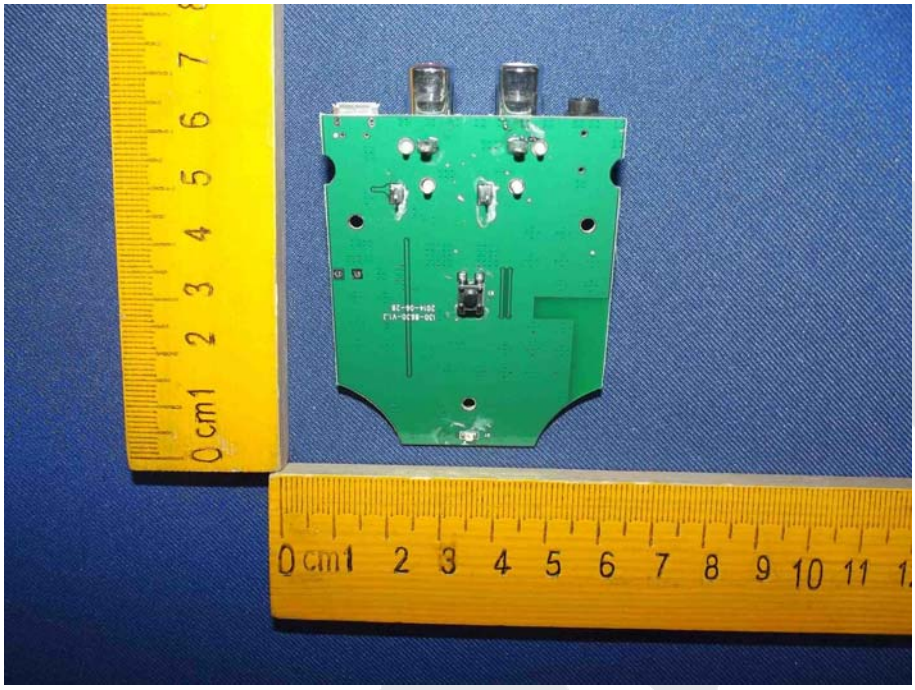


Figure 11
PCB of the EUT-Front View

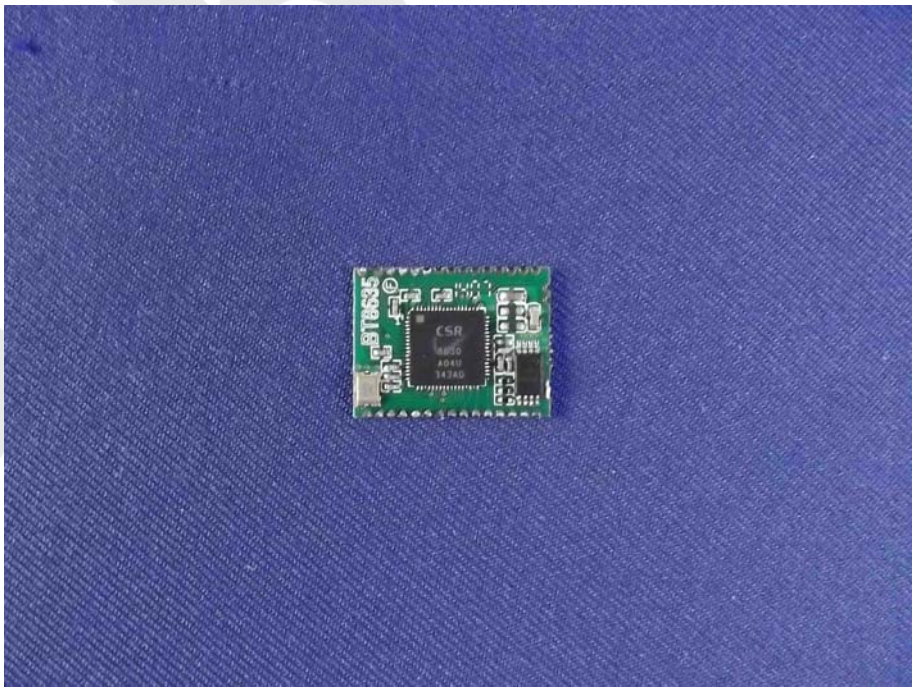


Figure 12
PCB of the EUT-Back View