FCC PART 15 SUBPART C TEST REPORT FCC PART 15.249
&
IC TEST REPORT RSS-210

FCC ID.....:	**2AAVH-CEM960-01D**
IC .....:	**11265A-CEM96001D**
Report Reference No.....:	A1307096018-2
Compiled by (position+printed name+signature)..:	File administrators Lion Cai
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Approved by (position+printed name+signature)..:	Manager Tony Wu
Date of issue.....:	Aug 21, 2013
Representative Laboratory Name .:	**Shenzhen Tian Hai Test Technology Co.,Ltd**
Address .....:	FL.1, No.2 BLDG,Yalian Industrial Zone, Wuhe Road, Bantian street, Longgang District, Shenzhen
Testing Laboratory Name .....:	DTT Services Co.,Ltd
Address .....:	1F,2 Block,Jiaquan Building,Guanlan High-tech Park,Bao'an District, Shenzhen,Guangdong,China. 518110
Applicant's name.....:	**City Ergonomics**
Address .....:	229 Hurst Road, Sidcup Kent DA159AL United Kingdom
Test specification:	
Standard .....:	**47 CFR FCC Part 15 Subpart C - Intentional Radiators** **ANSI C63.10: 2009** **RSS-210 issue-8/RSS-Gen issue 3**
TRF Originator.....:	Shenzhen Tian Hai Test Technology Co.,Ltd
Master TRF.....:	Dated 2012-06

Test item description .....:	DXT Wireless Mouse
Trade Mark .....:	DXT Mouse
Manufacturer .....:	**City Ergonomics**
Model/Type reference.....:	CEM960_01D
Listed Models .....:	/
Operation Frequency.....:	From 2402MHz to 2480MHz
Modulation Type .....:	GFSK
Result.....:	Positive

TEST REPORT

Test Report No. :	A1307096018-2	Aug 21, 2013 Date of issue

Equipment under Test	:	DXT Wireless Mouse
Model /Type	:	CEM960_01D
Listed Models	:	/
Applicant	:	**City Ergonomics**
Address	:	229 Hurst Road, Sidcup Kent DA159AL United Kingdom
Manufacturer		**City Ergonomics**
Address	:	229 Hurst Road, Sidcup Kent DA159AL United Kingdom

Test Result according to the standards on page 4:	**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.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

47 CFR FCC Part 15 Subpart C - Intentional Radiators

ANSI C63.10: 2009 – American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in theRange of 9 kHz to 40GHz

RSS-210 Issue 8 December 2010: Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment

RSS-Gen Issue 3 December 2010: General Requirements and Information for the Certification of Radio Apparatus

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	July 31,2013
Testing commenced on	:	July 31,2013
Testing concluded on	:	Aug 20, 2013

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)		

DC 5.0V from USB

2.3. EUT operation mode

The EUT has been tested under typical operating condition.

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

This submittal(s) (test report) is intended for **FCC ID: 2AAVH-CEM960-01D** and **IC: 11265A-CEM96001D** filing to comply with the FCC Part 15, Subpart C 15.249 Rules and RSS-210 rules.

2.5. Modifications

No modifications were implemented to meet testing criteria.

2.6. Configuration of Tested System

Fig. 2-1 Configuration of Tested System

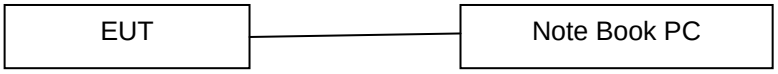


Table 2-1 Equipment Used in Tested System

No.	Equipment	Manufacturer	Model No.	Serial No.	Notes
1	PC	DELL	PP26L	CNG8390Q6X	DOC
2	Printer	HP	Laserjet 6L C3990	Laserjet 6L C3990A	DOC

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

DTT Services Co.,Ltd
1F,2 Block,Jiaquan Building,Guanlan High-tech Park,Bao'an District, Shenzhen,Guangdong,China. 518110

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

3.2. Test Facility

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

IC Registration No.: 9783A

The 3m alternate test site of DTT Services Co.,Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

DTT Services 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 214666, Sep 19, 2011.

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 DTT Services 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 DTT Services Co.,Ltd is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	3.40 dB	(1)
Radiated Emission	1~18GHz	3.40 dB	(1)
Conducted Disturbance	0.15~30MHz	2.30 dB	(1)

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

3.5. Summary of standards and result

FCC PART 15 15.247 & RSS-210 & RSS-Gen			
FCC Part 15.207	RSS-Gen	AC Power Conducted Emission	PASS
FCC Part 15.215(C)	RSS-210 A2.9	20dB Bandwidth	PASS
FCC Part 15.249(a) /15.249(c)	RSS-Gen	Radiated Emissions	PASS
FCC Part 15.249(d)	RSS-210 A2.9	Band Edge Compliance of RF Emission	PASS
FCC Part 15.203/15.249 (b)	RSS-Gen	Antenna Requirement	PASS
N/A	RSs-Gen	Receiver emission	PASS

NOTE: 1) The detailed test rusult please see section 4.
2) The test report merely corresponds to the test sample.
3) It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

3.6. Equipments Used during the Test

Radiated Emissions					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2013-4-9
2	EMI Test Receiver	R&S	ESPI	100097	2013-7-25
3	Spectrum Analyzer	R&S	FSP	100397	2013-11-2
4	Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2013-4-5
5	EMI TEST SOFTWARE	R&S	ESK1	N/A	N/A
6	Horn Antenna	SCHWARZBECK	BBHA9120D	0499	2013-11-27
7	Loop Antenna	Rohde&Schwarz	HFH2-Z2	100020	2013-11-27
8	Horn Antenna	SCHWARZBECK	BBHA9170	25841	2013-11-27
9	EMI TEST SOFTWARE	Audix	E3	N/A	N/A

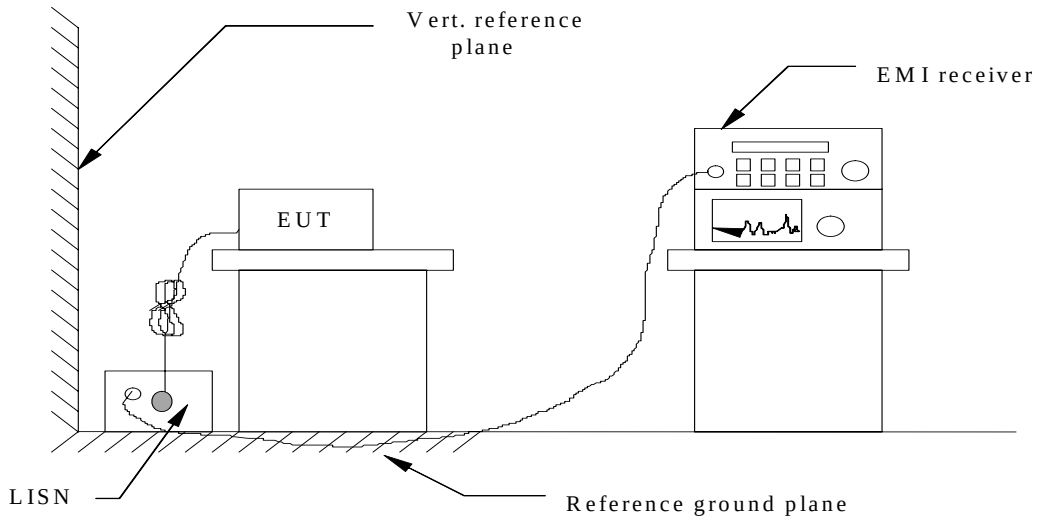
20dB Bandwidth & Deactivation Time & Duty Cycle					
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	R&S	ESPI	100097	2013-7-25
2	Spectrum Analyzer	AGILENT	E4407B	MY44210775	2013-7-25

The calibration interval was one year.

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

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 C63.4-2009.
2 Support equipment, if needed, was placed as per ANSI C63.4-2009.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2009.
4 The EUT 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.

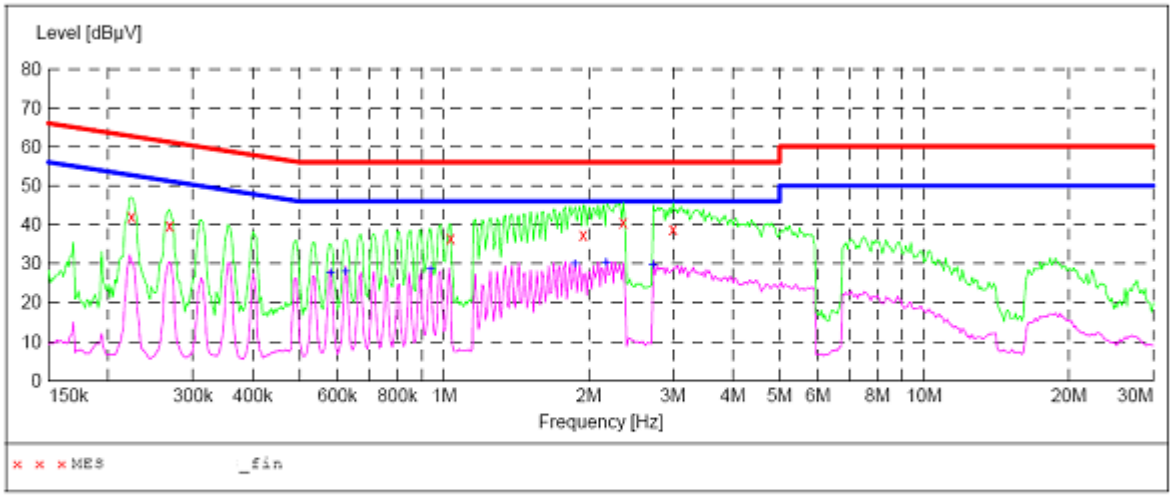
CONDUCTED POWER LINE EMISSION LIMIT

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following：

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	QP	Ave	QP	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

TEST RESULTS

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



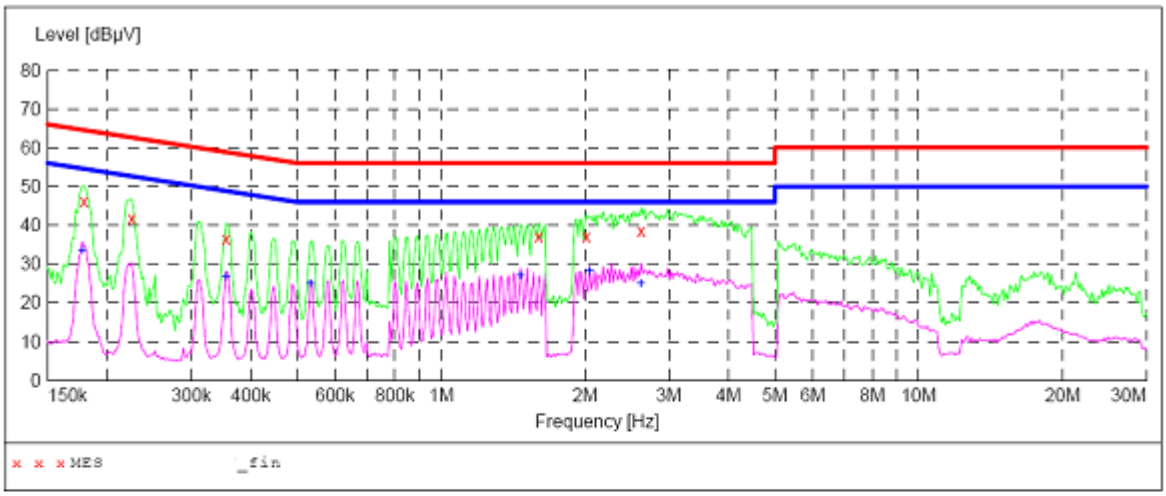
MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.223418	42.20	10.1	63	20.5	QP	N	GND
0.268355	39.90	10.1	61	21.3	QP	N	GND
1.031668	36.70	10.2	56	19.3	QP	N	GND
1.951563	37.40	10.2	56	18.6	QP	N	GND
2.362846	40.70	10.2	56	15.3	QP	N	GND
3.000899	39.00	10.2	56	17.0	QP	N	GND

MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.581275	27.90	10.1	46	18.1	AV	N	GND
0.624491	28.20	10.1	46	17.8	AV	N	GND
0.937591	28.80	10.2	46	17.2	AV	N	GND
1.875340	30.20	10.2	46	15.8	AV	N	GND
2.181876	30.50	10.2	46	15.5	AV	N	GND
2.727250	29.70	10.2	46	16.3	AV	N	GND

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178740	46.30	10.1	65	18.2	QP	L1	GND
0.225205	41.90	10.1	63	20.7	QP	L1	GND
0.354673	36.60	10.1	59	22.3	QP	L1	GND
1.599077	37.30	10.2	56	18.7	QP	L1	GND
2.014767	37.20	10.2	56	18.8	QP	L1	GND
2.620730	38.80	10.2	56	17.2	QP	L1	GND

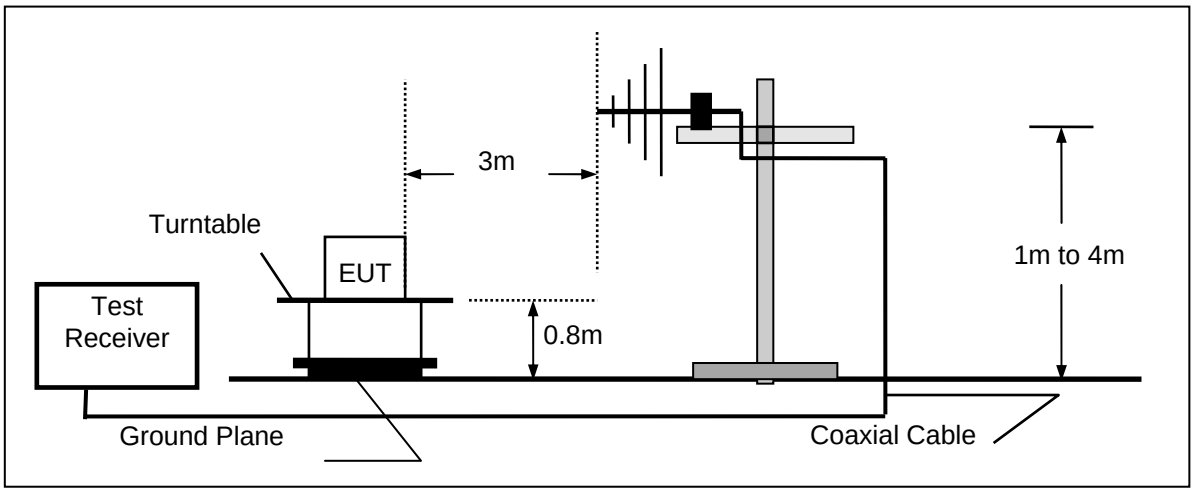
MEASUREMENT RESULT:

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.177322	33.80	10.1	55	20.8	AV	L1	GND
0.354673	26.90	10.1	49	22.0	AV	L1	GND
0.532495	25.30	10.1	46	20.7	AV	L1	GND
1.464885	27.30	10.2	46	18.7	AV	L1	GND
2.047132	28.50	10.2	46	17.5	AV	L1	GND
2.620730	25.30	10.2	46	20.7	AV	L1	GND

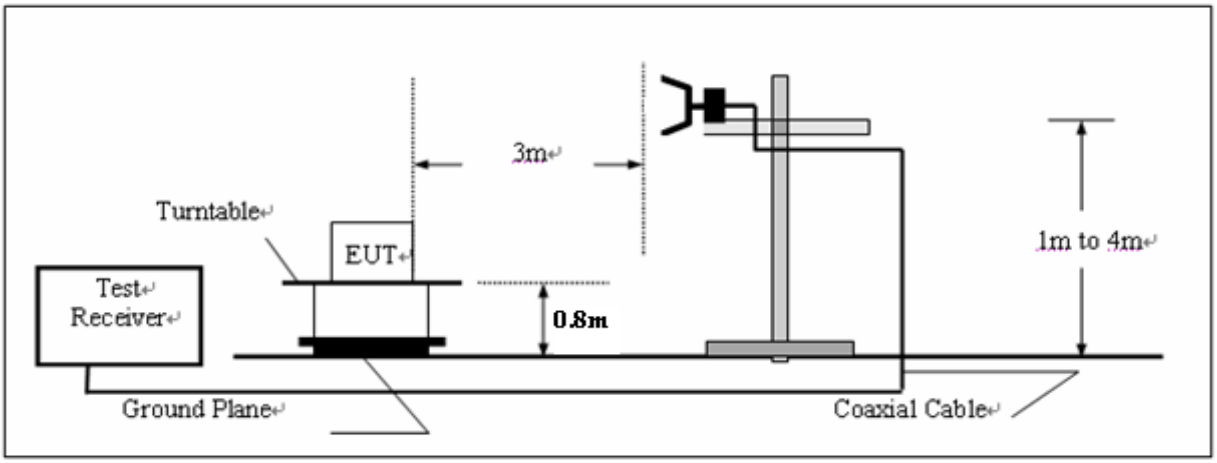
4.2. Radiated Emission Test

TEST CONFIGURATION

a) Radiated Emission Test Set-Up, Frequency below 1000MHz



b) Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m 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 varied from 1m to 4m to find out the highest 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 Highest frequency generated or used in the device or on which the device operates or tunes was 2480MHz and the minimum operation frequency was 34.8KHz,so radiated emissions test frequency 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

according to § 15.209, the field strength of radiated emissions limits comply with the following:

Frequency (MHz)	Field strength (microvolts/meter)	Measure-ment dis-tance (meters)
0.009–0.490	2400/F(kHz)	300
0.490–1.705	24000/F(kHz)	30
1.705–30.0	30	30

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

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

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

As per §15.249 (a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902–928 MHz	50	500
2400–2483.5 MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

As per §15.249 (c), Field strength limits are specified at a distance of 3 meters.

Note:We tested three(High,Middle,Low) channels' Radiated emission and recored worst case data below 1G

TEST RESULTS

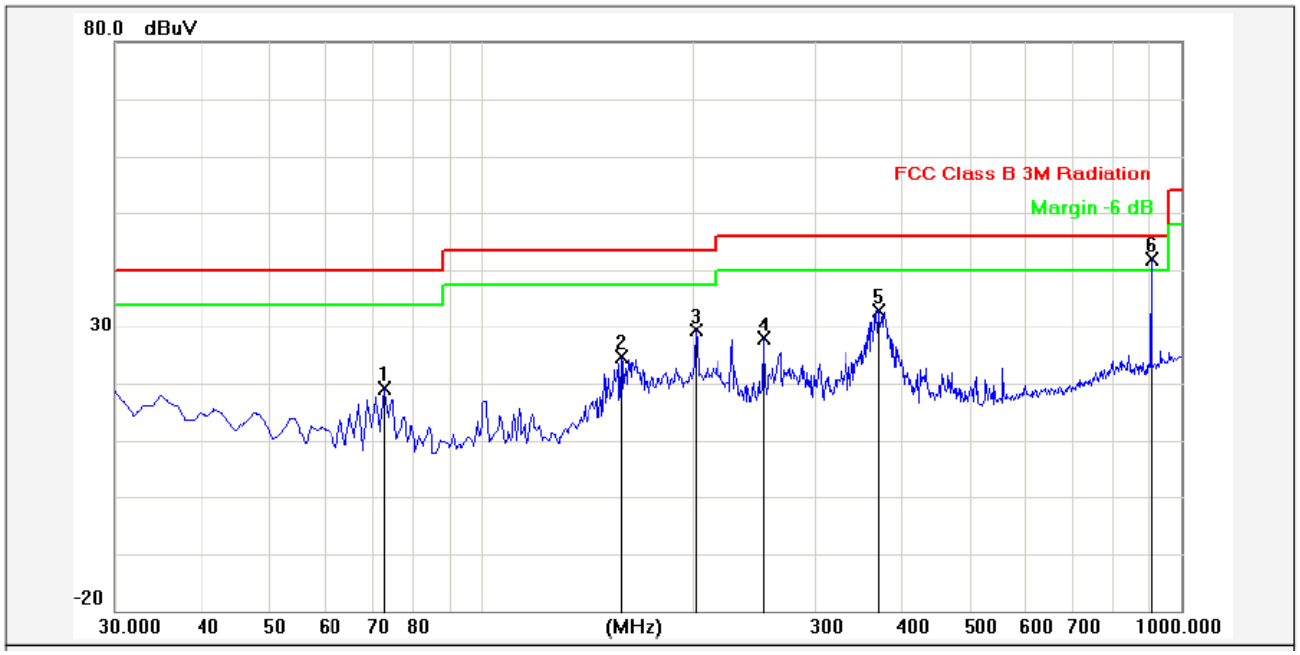
Reark: 1. The radiated emission measurement are for each channel (low, middle, high), and recorded worst case at middle channel.

From 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dBμV/m)@3m	FCC Limit (dBμV/m) @3m	Margin (dB)	Detector	Result
16.00	55.96	69.54	13.58	QP	PASS
21.36	45.78	69.54	23.76	QP	PASS
24.58	41.34	69.54	28.20	QP	PASS

For 30MHz to 1GHz

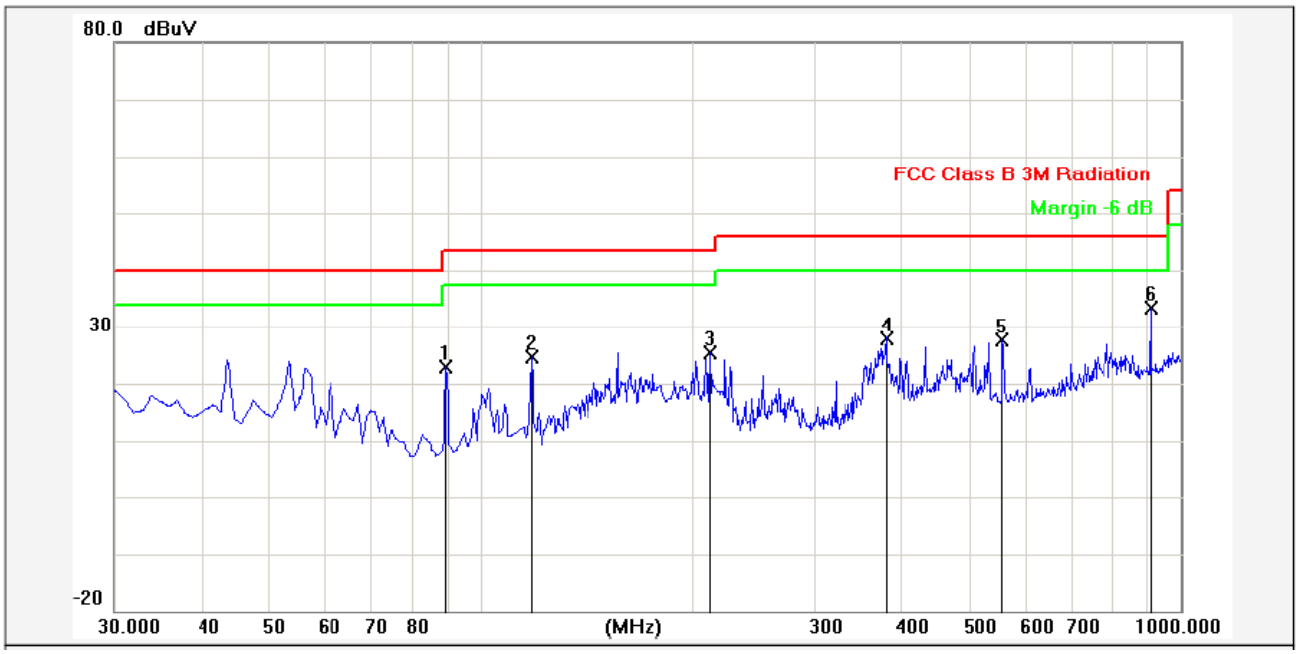
HORIZONTAL



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	72.6800	-21.07	40.27	19.20	40.00	-20.80	QP			P	
2	159.0100	-19.44	44.03	24.59	43.50	-18.91	QP			P	
3	202.6600	-16.82	46.22	29.40	43.50	-14.10	QP			P	
4	253.1000	-16.40	44.23	27.83	46.00	-18.17	QP			P	
5	369.5000	-13.44	46.25	32.81	46.00	-13.19	QP			P	
6	906.8800	-5.93	47.87	41.94	46.00	-4.06	QP			P	

Remark:1.Emission Level= Factor+ Reading.
2.The Emission levels that are 20dB below the official limit are not reported.

VERTICAL



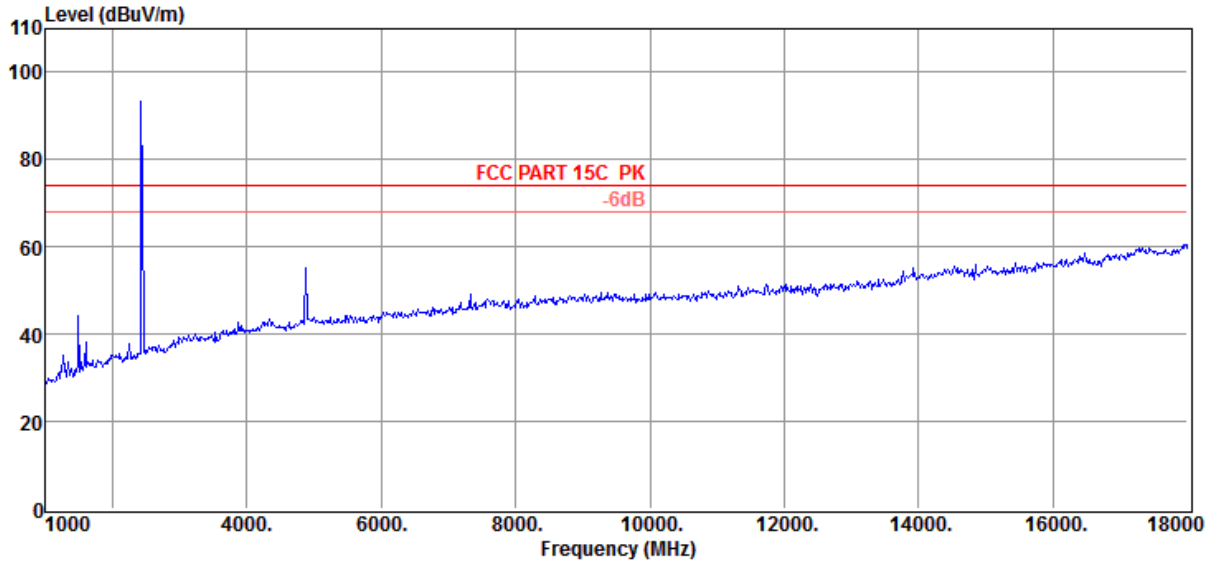
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	89.1700	-18.59	41.40	22.81	43.50	-20.69	QP			P	
2	118.2700	-17.27	41.86	24.59	43.50	-18.91	QP			P	
3	212.3600	-16.75	42.01	25.26	43.50	-18.24	QP			P	
4	381.1400	-13.00	41.00	28.00	46.00	-18.00	QP			P	
5	557.6800	-10.22	37.94	27.72	46.00	-18.28	QP			P	
6	906.8800	-5.93	39.26	33.33	46.00	-12.67	QP			P	

Remark:1.Emission Level= Factor+ Reading.
2.The Emission levels that are 20dB below the official limit are not reported.

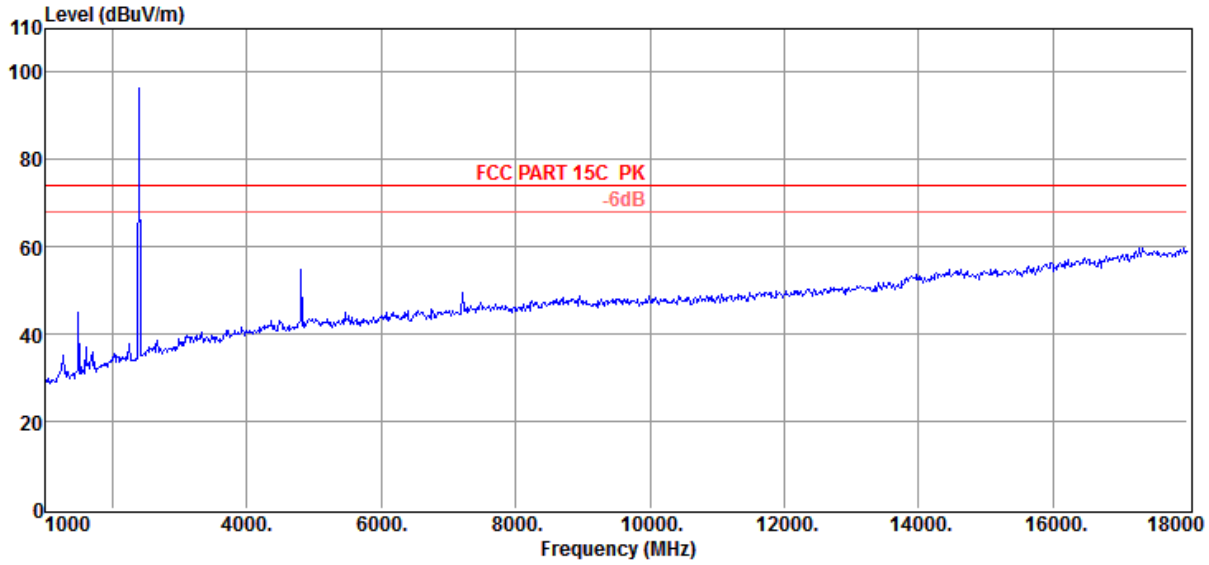
For 1GHz to 25GHz

The frequency spectrum above 1 GHz for Transmitter was investigated. All emission not reported are much lower than the prescribed limits. Set the RBW=1MHz, VBW=3MHz for Peak Detector while the RBW=1MHz,VBW=10Hz for Average Detector,Readings are both peak and average values. The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Low Channel-2402MHz



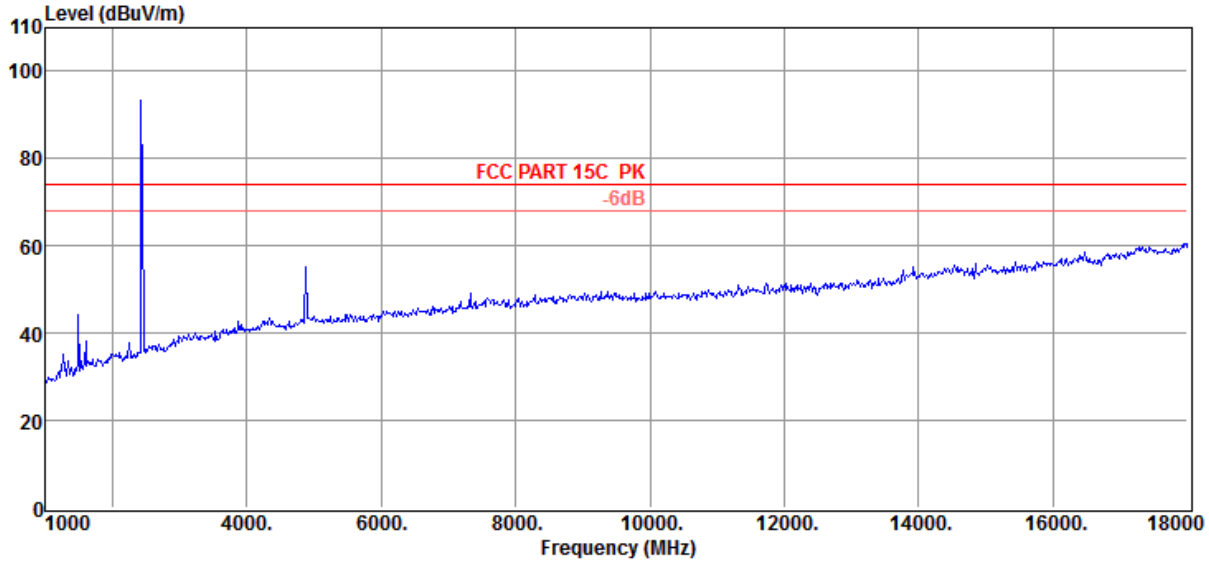
ANTENNA POLARITY & TEST DISTANCE: VERTICAL 3 M											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	*2402.00	90.76	PK	114.00	23.24	1.00	39	98.85	28.93	6.47	43.49
2	4804.00	51.78	PK	74.00	22.22	1.00	332	52.51	34.01	9.32	44.06



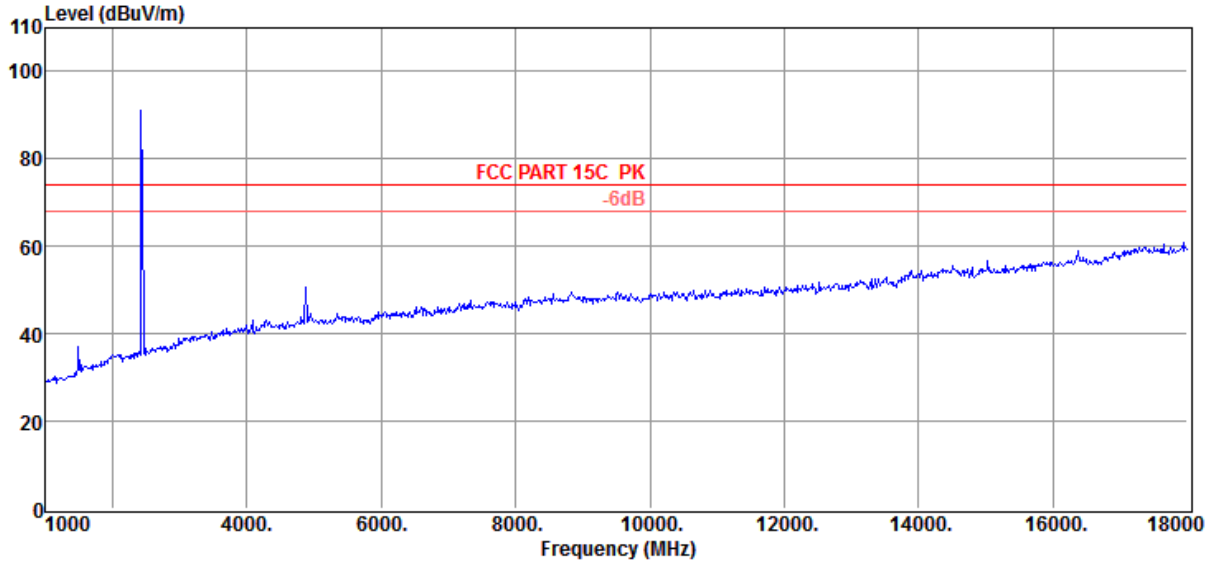
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	*2402.00	97.56	PK	114.00	16.44	1.00	215	105.65	28.93	6.47	43.49
1	*2402.00	86.10	AV	94.00	7.90	1.00	215	94.50	28.93	6.47	43.49
2	4804.00	56.13	PK	74.00	17.87	1.00	136	56.86	34.01	9.32	44.06

2	4804.00	47.88	AV	54.00	6.12	1.00	136	48.61	34.01	9.32	44.06

Middle Channel-2441MHz

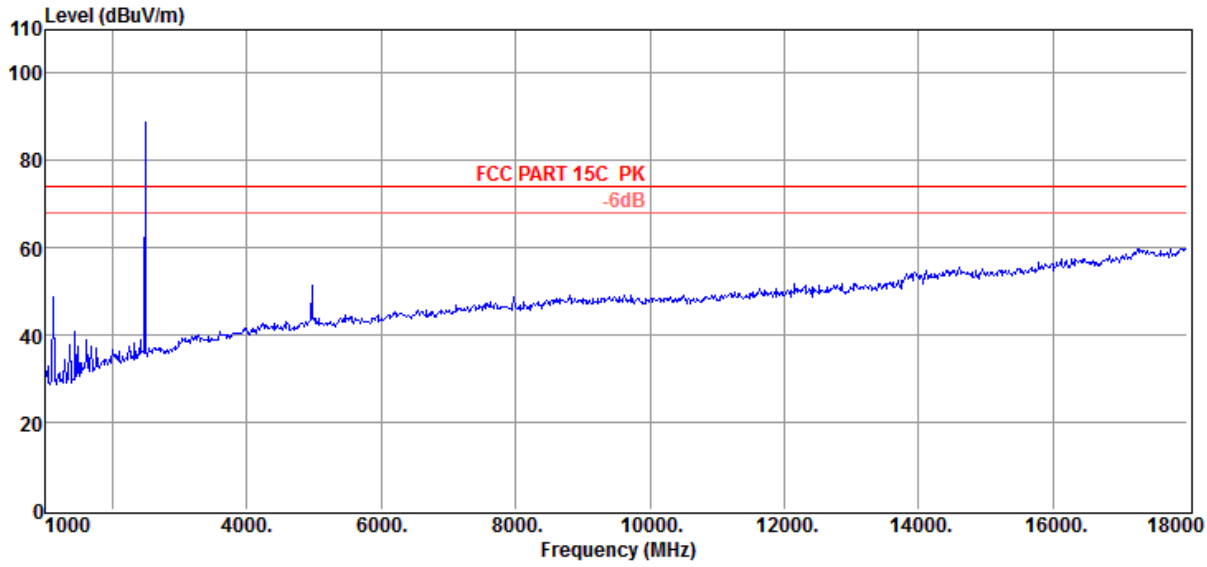


ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	*2441.00	98.86	PK	114.00	15.14	1.00	85	106.79	29.03	6.53	43.49
1	*2441.00	82.41	AV	94.00	11.59	1.00	85	90.34	29.03	6.53	43.49
2	4882.00	56.02	PK	74.00	17.98	1.00	267	56.35	34.29	9.41	44.03
2	4882.00	46.10	AV	54.00	7.90	1.00	267	46.43	34.29	9.41	44.03

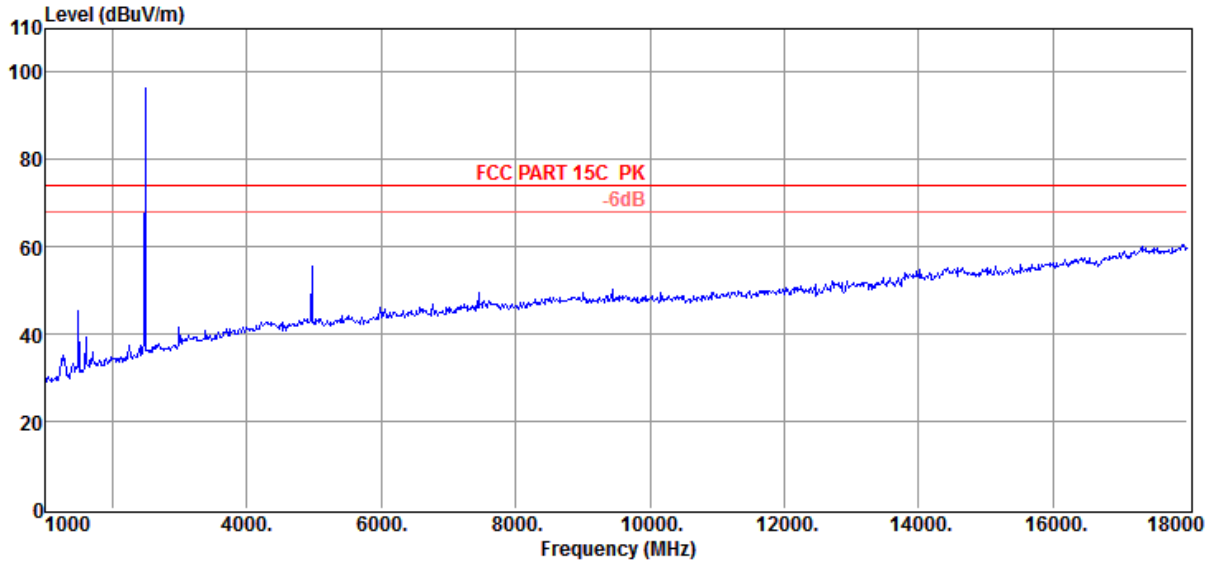


ANTENNA POLARITY & TEST DISTANCE: VERTICAL 3 M											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	*2441.00	91.86	PK	114.00	22.14	1.00	300	99.79	29.03	6.53	43.49
2	4882.00	52.82	PK	74.00	11.18	1.00	85	53.15	34.29	9.41	44.03

High Channel-2480MHz



ANTENNA POLARITY & TEST DISTANCE: VERTICAL 3 M											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	*2480.00	92.20	PK	114.00	21.80	1.00	69	99.95	29.18	6.57	43.50
2	4960.00	52.55	PK	74.00	21.45	1.00	0	52.74	34.34	9.48	44.01



ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)
1	*2480.00	99.05	PK	114.00	14.95	1.00	266	106.80	29.18	6.57	43.50
1	*2480.00	84.20	AV	94.00	9.80	1.00	266	91.95	29.18	6.57	43.50
2	4960.00	55.81	PK	74.00	18.19	1.00	210	56.00	34.34	9.48	44.01
2	4960.00	46.01	AV	54.00	7.99	1.00	210	46.20	34.34	9.48	44.01

REMARKS: 1. Emission level (dBuV/m) =Raw Value (dBuV) + Antenna Factor (dB/m) + Cable Factor (dB) - Pre-amplifier Factor
2. The other emission levels were very low against the limit.
3. Margin value = Limit value- Emission level.
4. The limit value is defined as per 15.249
5. " * " : Fundamental frequency
6. The average measurement was not performed when the peak measured data under the limit of average detection.

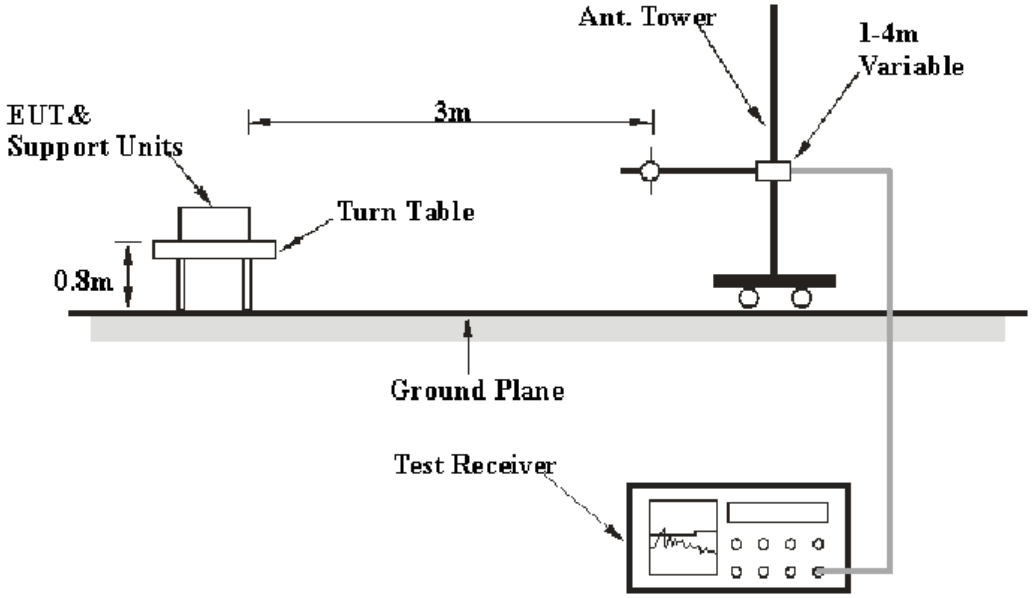
4.3. Out of band emissions

TEST PROCEDURE

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4 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 to 1MHz and VBM to 3MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.

The conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 100 KHz and VBM to 300 KHz, to measure the conducted peak band edge.

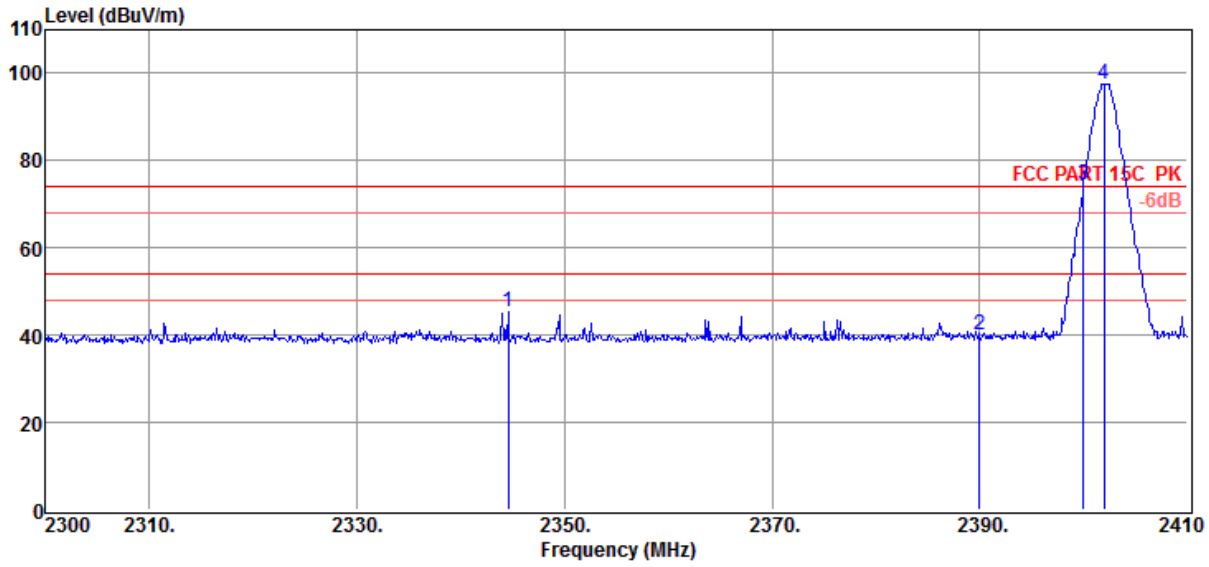
TEST CONFIGURATION



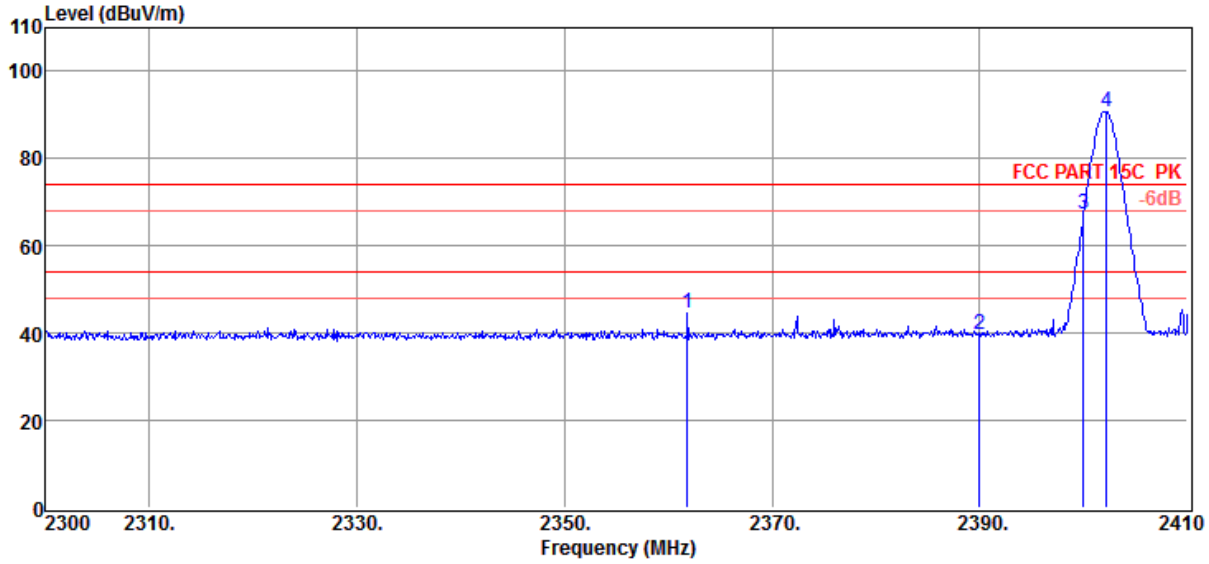
LIMIT

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

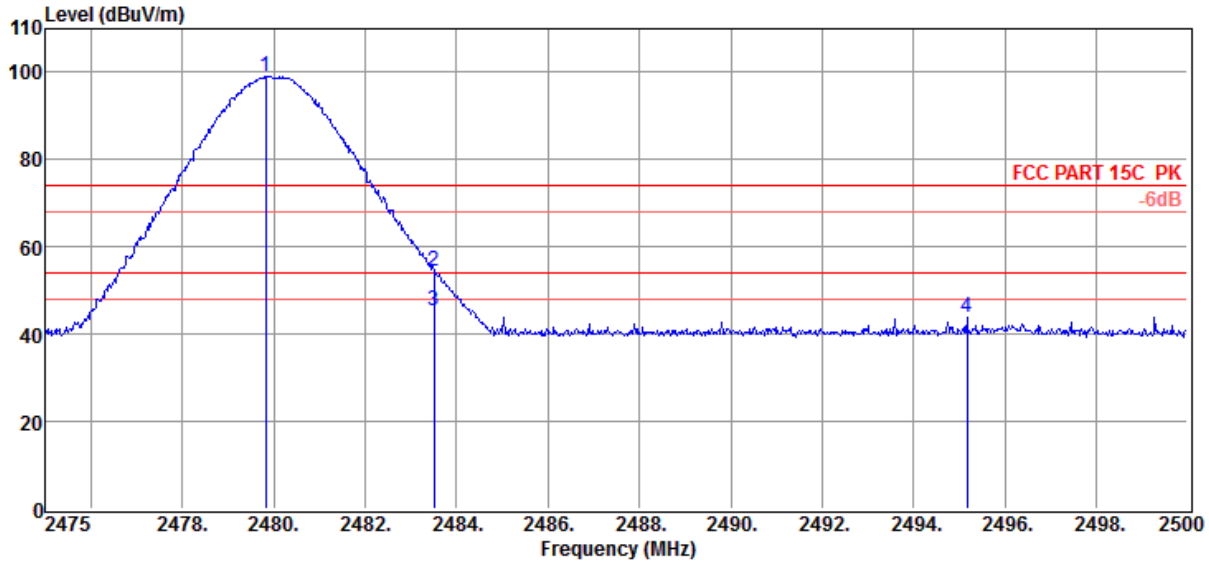
TEST RESULTS



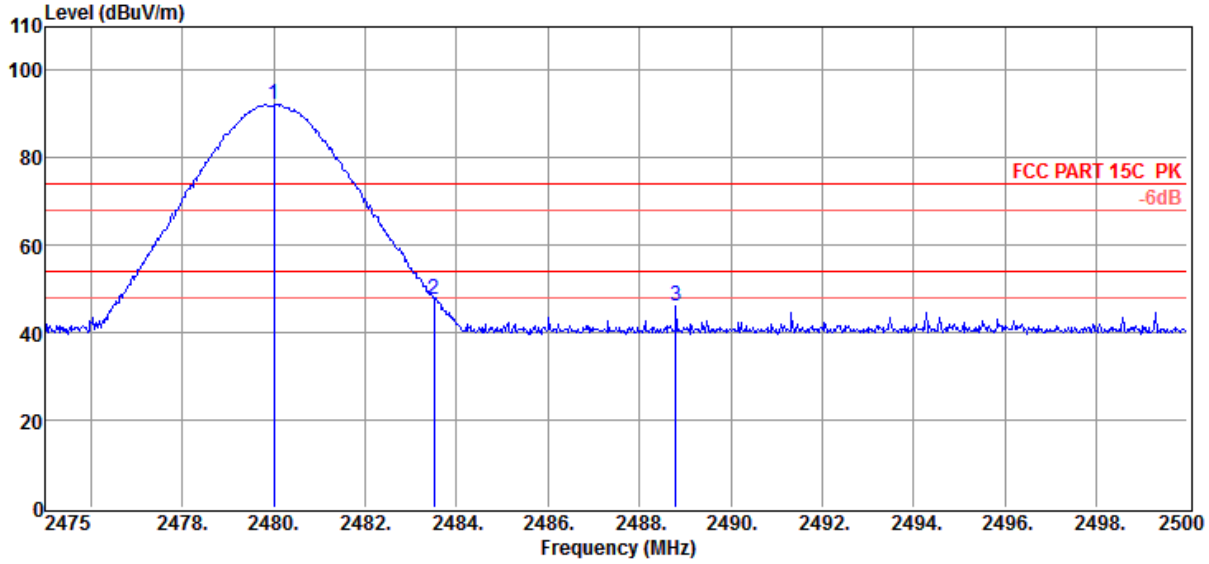
Frequency (MHz)	Corrected Reading (dBµV/m)@3m	FCC Limit (dBµV/m) @3m	Margin (dB)	Detector	Polarization	Results
2390.00	40.25	74.00	33.75	PK	Horizontal	PASS
2400.00	70.35	74.00	3.65	PK	Horizontal	PASS



Frequency (MHz)	Corrected Reading (dBµV/m)@3m	FCC Limit (dBµV/m) @3m	Margin (dB)	Detector	Polarization	Results
2390.00	39.57	74.00	34.43	PK	Vertical	PASS
2400.00	67.32	74.00	6.68	PK	Vertical	PASS



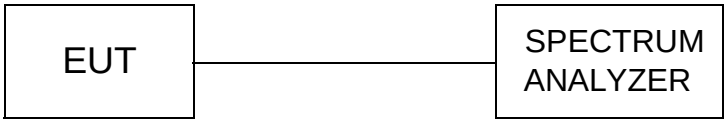
Frequency (MHz)	Corrected Reading (dBµV/m)@3m	FCC Limit (dBµV/m) @3m	Margin (dB)	Detector	Polarization	Results
2483.50	54.61	74.00	19.39	PK	Horizontal	PASS
2483.50	45.51	54.00	8.49	AV	Horizontal	PASS
2500.00	43.69	74.00	30.31	PK	Horizontal	PASS



Frequency (MHz)	Corrected Reading (dBµV/m)@3m	FCC Limit (dBµV/m) @3m	Margin (dB)	Detector	Polarization	Results
2483.50	47.58	74.00	26.42	PK	Vertical	PASS
2500.00	46.00	74.00	28.00	PK	Vertical	PASS

4.4. 20dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

The transmitter output is connected to the spectrum analyzer. The spectrum analyzer center frequency is set to the transmitter frequency. The RBW is set to 100 KHz and VBW is set 300 KHz.

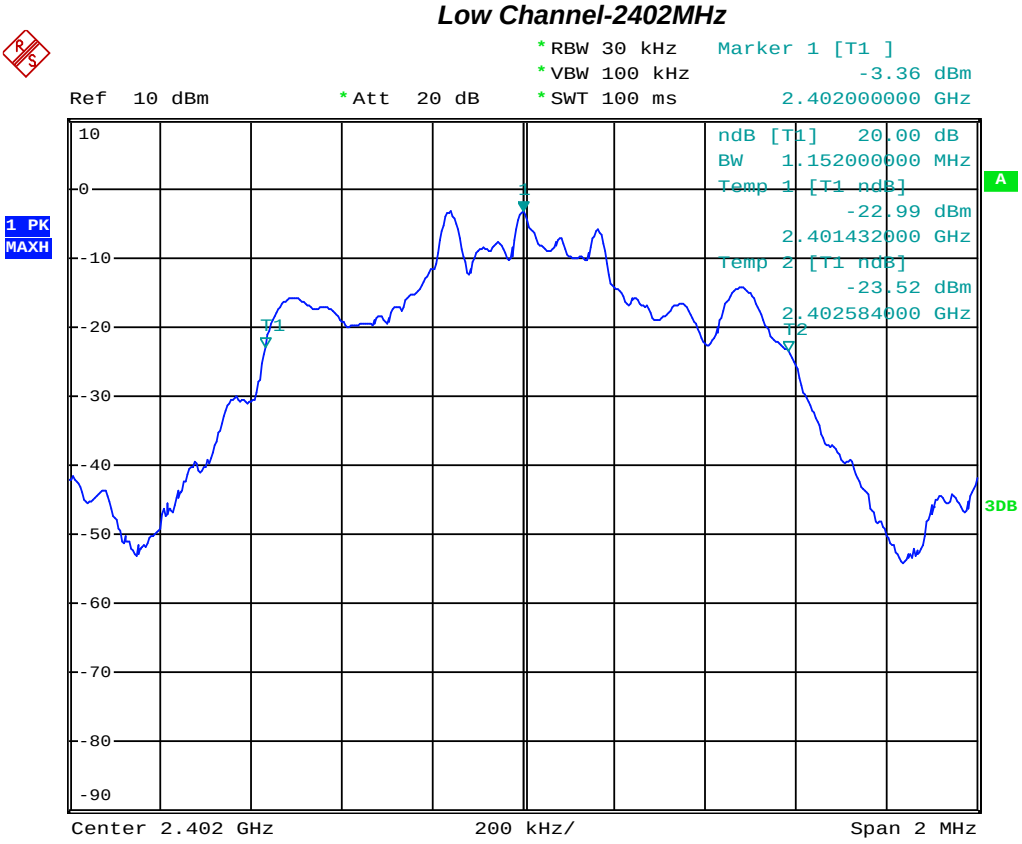
LIMIT

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§ 15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

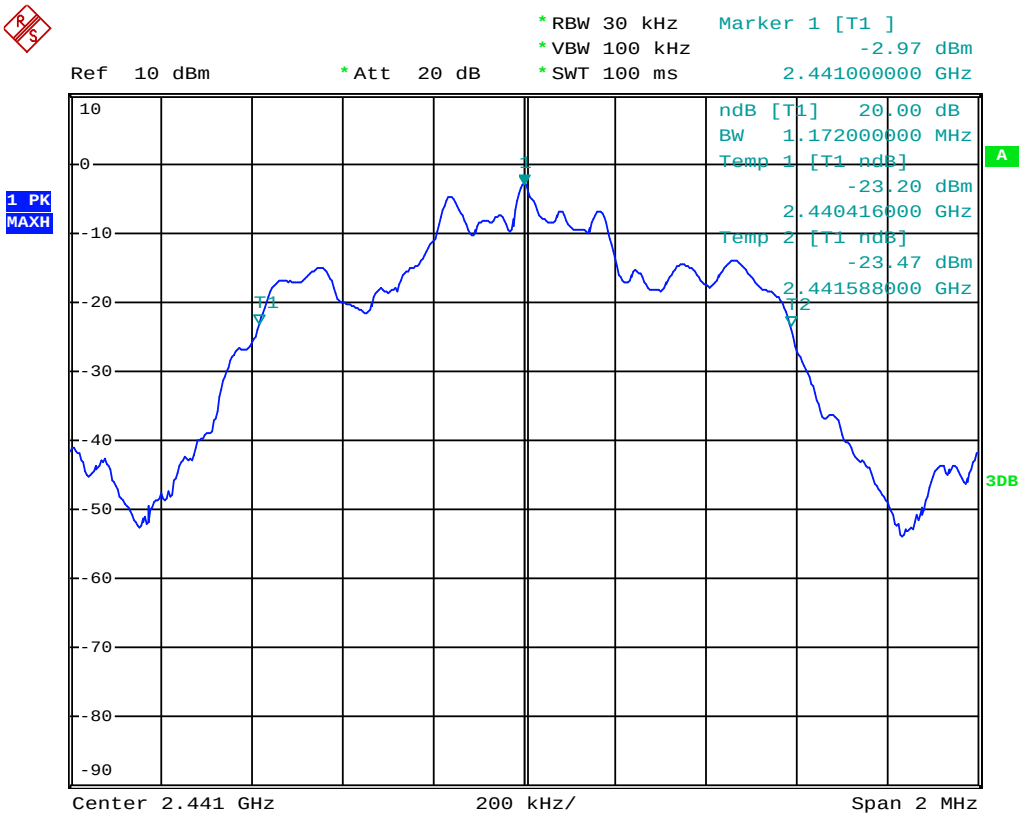
TEST RESULTS

Test Channel	Test Frequency (MHz)	20dB Bandwidth (MHz)	Test Results
Low	2402	1.152	PASS
Middle	2441	1.172	PASS
High	2480	1.160	PASS

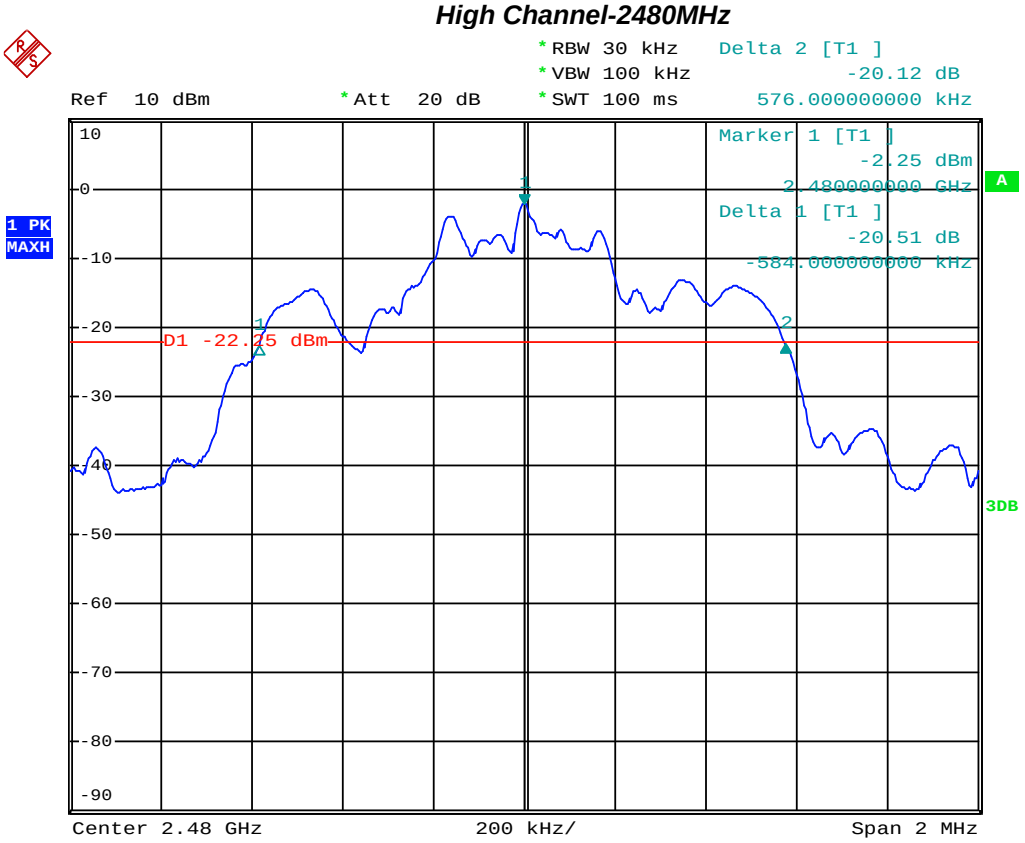
Low Channel-2402MHz



Middle Channel-2441MHz



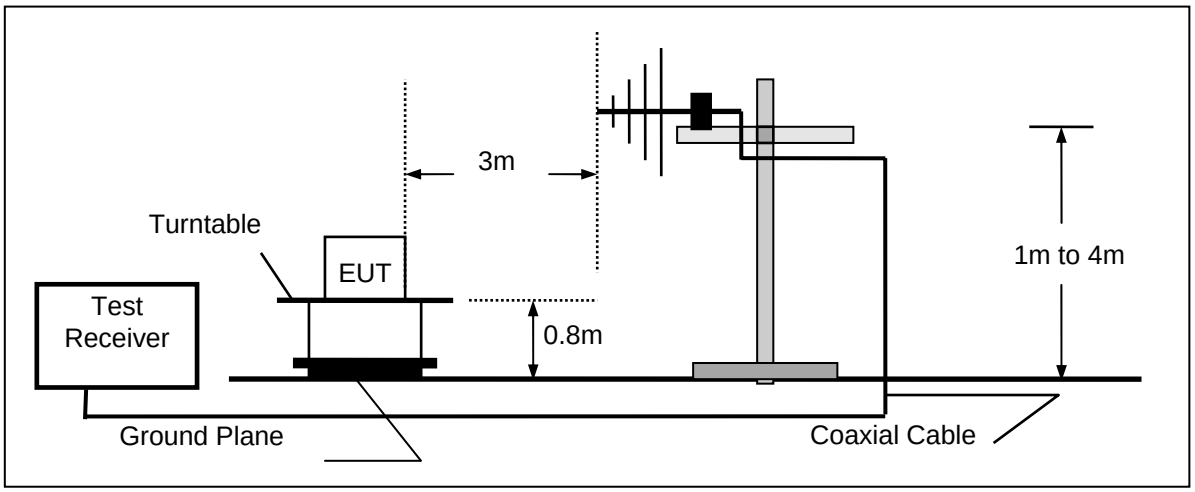
High Channel-2480MHz



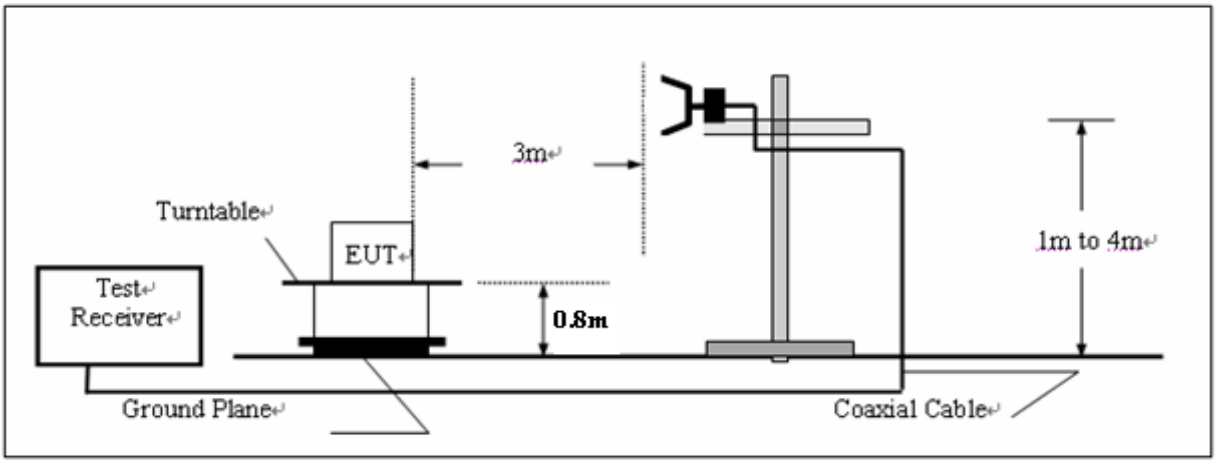
4.5. Receiver Emission *(Not For FCC Review)*

TEST CONFIGURATION

a) Radiated Emission Test Set-Up, Frequency below 1000MHz



b). Radiated Emission Test Set-Up, Frequency above 1000MHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m 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 varied from 1m to 4m to find out the highest 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 Highest frequency generated or used in the device or on which the device operates or tunes was 2480MHz and the minimum operation frequency was 34.8KHz,so radiated emissions test frequency 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 unintentional device, according to § 15.109(a) and RSS-Gen, except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

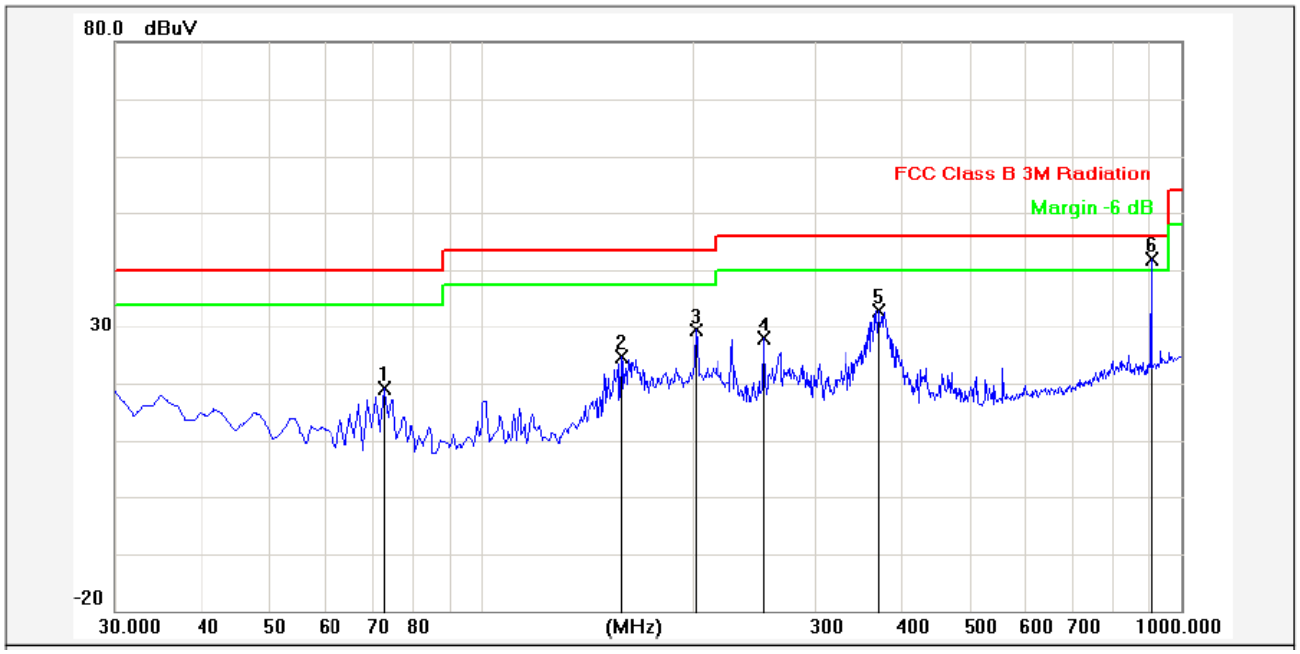
Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (µV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a) and RSS-Gen, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

TEST RESULTS

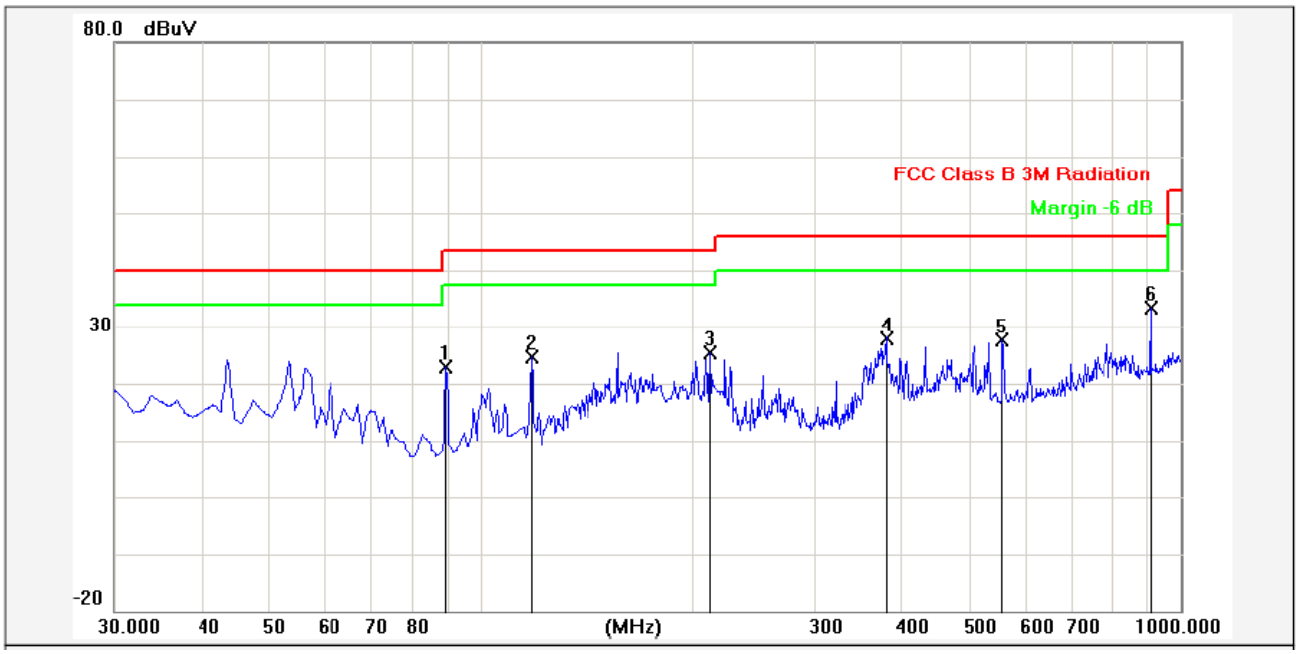
For 30MHz-1GHz

HORIZONTAL



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	72.6800	-21.07	40.27	19.20	40.00	-20.80	QP			P	
2	159.0100	-19.44	44.03	24.59	43.50	-18.91	QP			P	
3	202.6600	-16.82	46.22	29.40	43.50	-14.10	QP			P	
4	253.1000	-16.40	44.23	27.83	46.00	-18.17	QP			P	
5	369.5000	-13.44	46.25	32.81	46.00	-13.19	QP			P	
6	906.8800	-5.93	47.87	41.94	46.00	-4.06	QP			P	

VERTICAL



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	89.1700	-18.59	41.40	22.81	43.50	-20.69	QP			P	
2	118.2700	-17.27	41.86	24.59	43.50	-18.91	QP			P	
3	212.3600	-16.75	42.01	25.26	43.50	-18.24	QP			P	
4	381.1400	-13.00	41.00	28.00	46.00	-18.00	QP			P	
5	557.6800	-10.22	37.94	27.72	46.00	-18.28	QP			P	
6	906.8800	-5.93	39.26	33.33	46.00	-12.67	QP			P	

For 1-25GHz

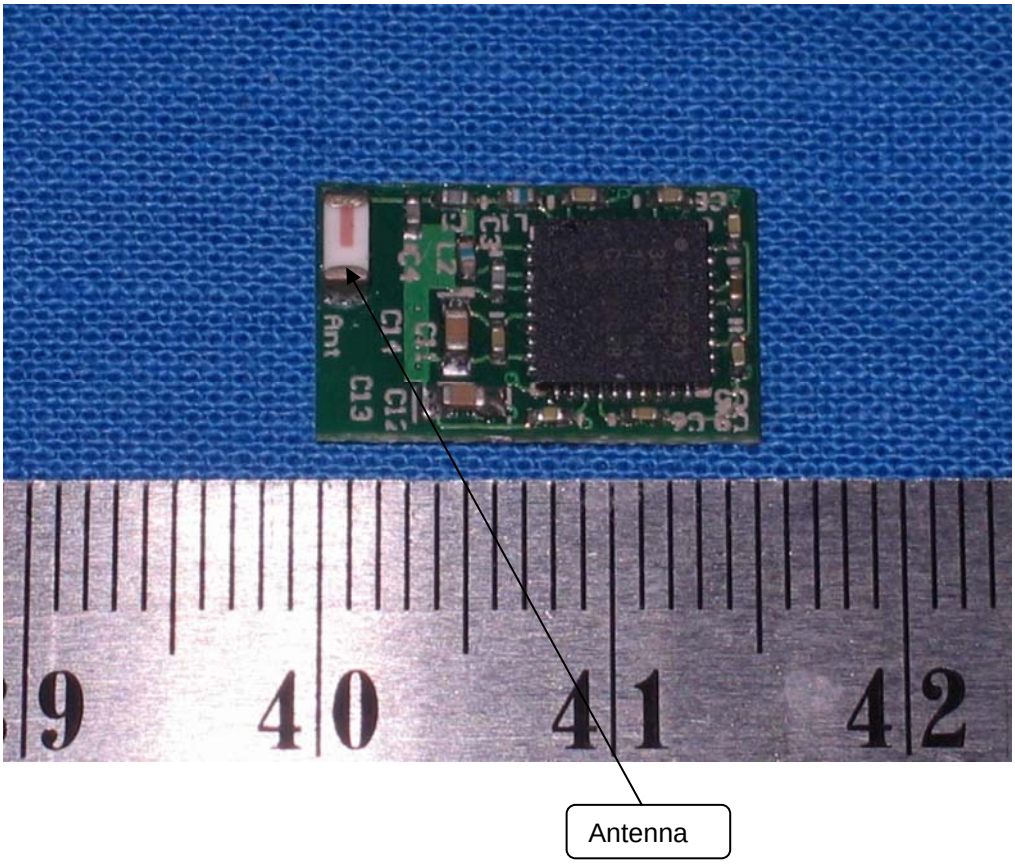
The emission levels are less than 20dB of limit and not record.

4.6. ANTENNA REQUIREMENT

According to FCC Part 15C § 15.203,

a), An intentional radiator shall be de-signed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
b), 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.

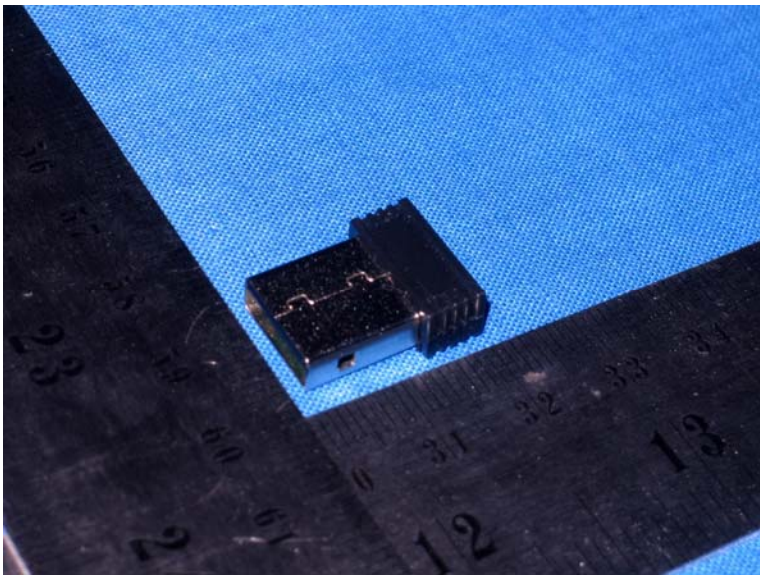
The EUT complied the antenna requirement.，Please refer to the EUT Internal photos.

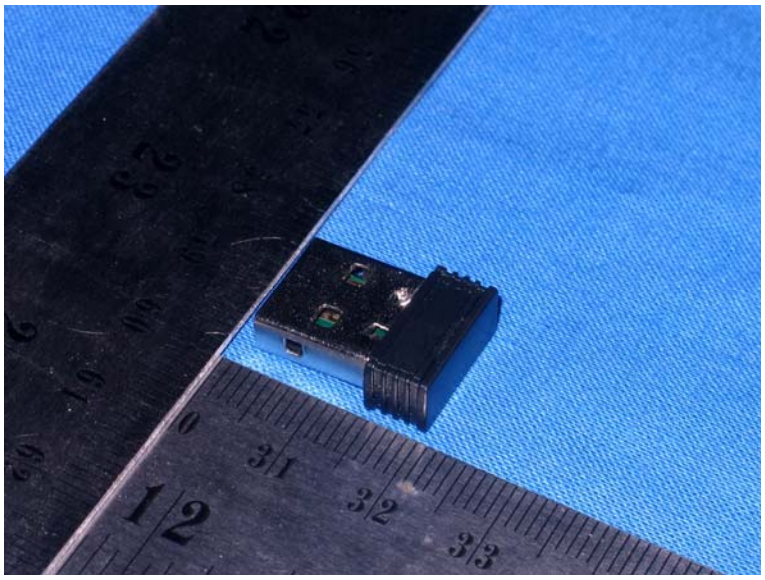


5. Test Setup Photos of the EUT

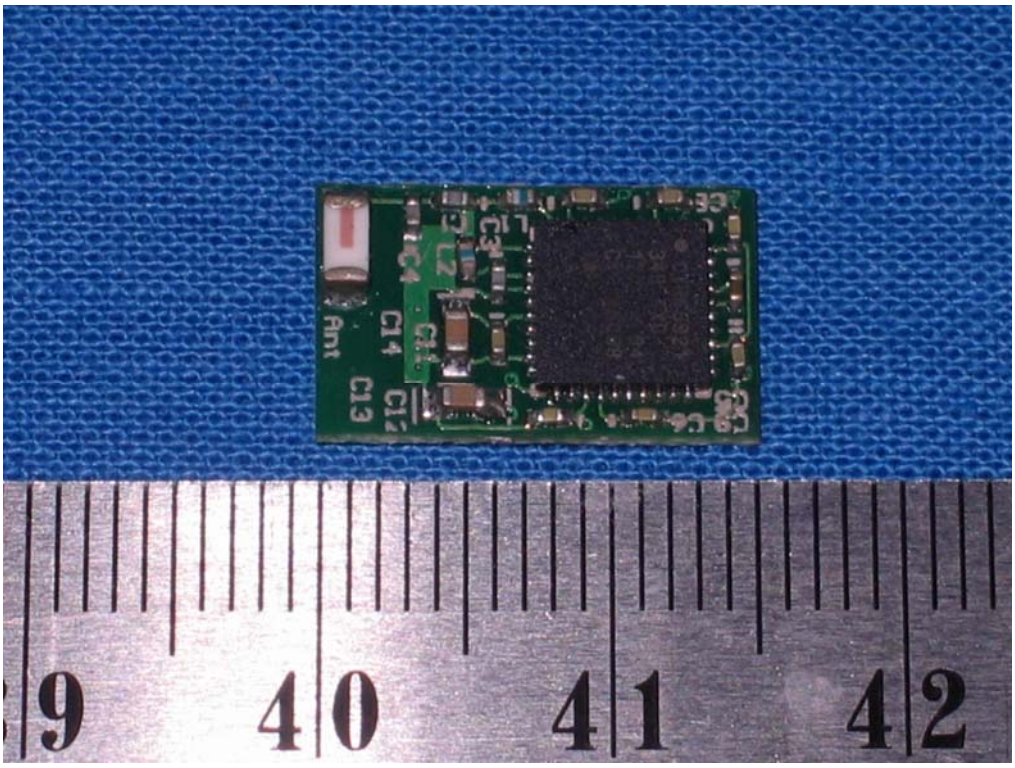
6. External and Internal Photos of the EUT

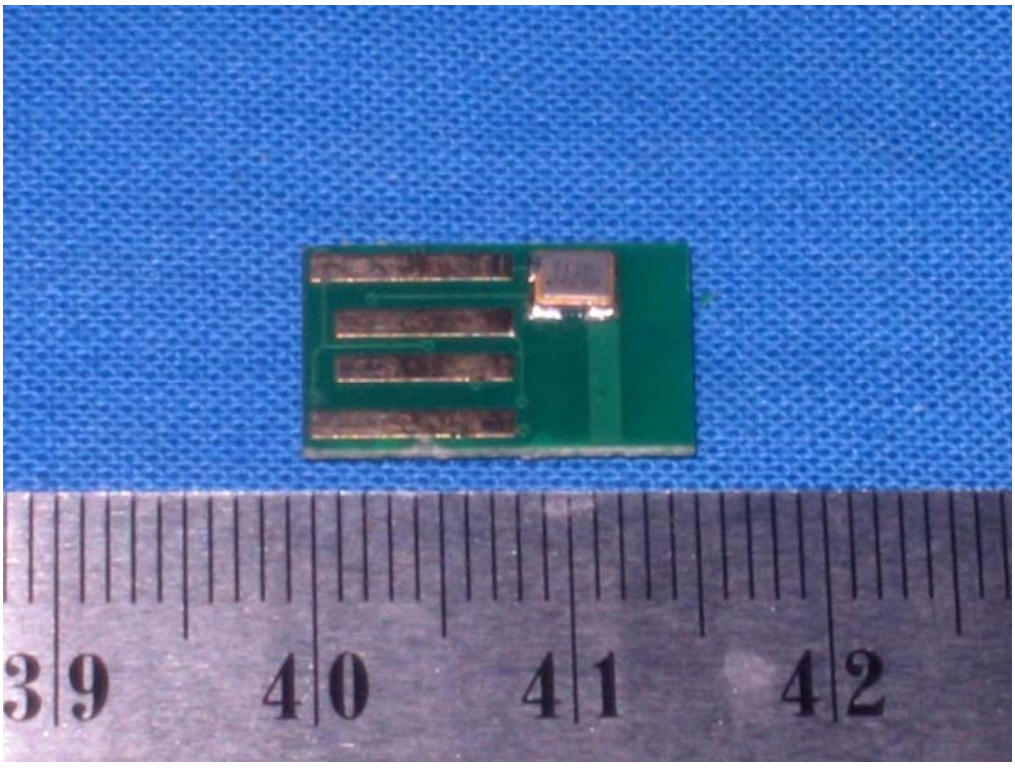
External Photos





Internal Photos





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