



198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology
Development District, Guangzhou, China 510663
Tel: +86 20 82155555 Fax: +86 20 82075059
Email: sgs_internet_operations@sgs.com
FEDERAL COMMUNICATIONS COMMISSION
Registration number: 282399

Report No.: GLEMO09120412301
Page: 1 of 37
FCC ID: ONFC0911A

TEST REPORT

Application No.:	TELE RADIO AB
Applicant:	Datavägen 21, SE-436 32 Askim, Sweden
FCC ID:	ONFC0911A
Equipment Under Test (EUT):	
EUT Name:	TRANSMITTER
Item No.:	T00007-03, T00007-04, T00007-05♣
♣:	Please refer to section 3 of this report which indicates which item was actually tested and which were electrically identical.
Fundamental Carrier Frequency :	2.405GHz to 2.480GHz
Standards:	FCC PART 15 Subpart C: 2009, Section 15.247
Date of Test:	2010-3-23 to 2010-3-26
Date of Issue:	2010-07-09
Test Result :	Pass*

* In the configuration tested, the EUT detailed in this report complied with the standards specified above. Please refer to section 3 of this report for further details.



2010 - July

Stephen Guo
Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at www.sgs.com/terms_and_conditions.htm and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at www.sgs.com/terms_e-document.htm. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.



2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2010-03-29		Original

Authorized for issue by:				
Tested By				2010-3-23 to 2010-3-26 <hr/> Date
Prepared By				2010-03-29 <hr/> Date
Checked By				2010-07-09 <hr/> Date
		Celia Xiang /Project Engineer		
		Celia Xiang /Clerk		
		Jeffrey Chen /Reviewer		



3 Test Summary

RADIO SPECTRUM MATTER (RSM) PART			
Test	Test Requirement	Standard Paragraph	Result
Antenna Requirement	FCC PART 15 :2009	Section 15.247(b)(4)	PASS
6dB Bandwidth	FCC PART 15 :2009	Section 15.247 (a)(2)	PASS
Maximum Peak Output Power	FCC PART 15 :2009	Section 15.247(b)(3)	PASS
Peak Power Spectral Density	FCC PART 15 :2009	Section 15.247(e)	PASS
Conducted Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2009	Section 15.209 &15.247(d)	PASS
Band Edges Measurement	FCC PART 15 :2009	Section 15.247 (d)&15.205	PASS
Radiated Spurious Emission (30MHz to 25GHz)	FCC PART 15 :2009	Section 15.209&15.247(d)	PASS

Remark:

♣Item No.: T00007-03, T00007-04, T00007-05♣

Only the Item **T00007-03** was tested, since the electrical circuit design, PCB layout, Electrical Parts and Figurer are identical to the basic model, Except the keystrokes(T00007-03 has 8 keystrokes; T00007-04 has 6 keystrokes; T00007-05 has 3 keystrokes).



4 Contents

1	COVER PAGE.....	1
2	VERSION	2
3	TEST SUMMARY.....	3
4	CONTENTS.....	4
5	GENERAL INFORMATION.....	5
5.1	Client Information	5
5.2	General Description of E.U.T.	5
5.3	Details of E.U.T.	5
5.4	Description of Support Units	5
5.5	Test Facility	5
5.6	Test Location	6
5.7	Deviation from Standards	6
5.8	Standards Applicable for Testing	6
5.9	Abnormalities from Standard Conditions	6
5.10	Other Information Requested by the Customer	6
6	EQUIPMENT USED DURING TEST.....	7
7	TEST RESULTS.....	8
7.1	E.U.T. test conditions	8
7.2	Antenna Requirement	10
7.3	6dB Bandwidth.....	11
7.4	Maximum Conducted Output Power	14
7.5	Peak Power Spectral Density	17
7.6	Conducted Spurious Emissions	20
7.7	Radiated Spurious Emissions	26
7.8	Radiated Emissions which fall in the restricted bands	32
7.9	Band Edges Requirement	36

5 General Information

5.1 Client Information

Applicant: TELE RADIO AB
Address of Applicant: Datavägen 21, SE-436 32 Askim, Sweden
Manufacturer: TELE RADIO AB
Address of Manufacturer: Datavägen 21, SE-436 32 Askim, Sweden

5.2 General Description of E.U.T.

EUT Name: TRANSMITTER
Item No.: T00007-03, T00007-04, T00007-05
Frequency Range: 2405MHz to 2480MHz
Number of Channels: 16 channels
Type of Modulation: O-QPSK(Offset QPSK), spread spectrum
Antenna Type: ceramic antenna
Antenna Gain: Max 4dBi

5.3 Details of E.U.T.

Power Supply: DC 4.5V (size "AAA" x 3)

5.4 Description of Support Units

The EUT has been tested as an independent.

5.5 Test Facility

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

- **NVLAP – Lab Code: 200611-0**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

- **FCC – Registration No.: 282399**

SGS-CSTC Standards Technical 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 282399, May 31, 2002.



5.6 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory,
198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.

5.7 Deviation from Standards

Biconical and log periodic antennas were used instead of dipole antennas.

5.8 Standards Applicable for Testing

The standard used was FCC PART 15 Subpart C: 2009 section 15.247.

5.9 Abnormalities from Standard Conditions

None.

5.10 Other Information Requested by the Customer

None.



6 Equipment Used during Test

No:	Test Equipment	Manufactory	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal. due Date (dd-mm-yy)
EMC0039	Temperature Chamber	TERCHY	MHG-800RR	0118	14-12-2009	14-12-2010
EMC0009	D.C. Power Supply	Instek	PS-3030	9862036	Check when used	
EMC0007	DMM	Fluke	73	70671122	16-12-2009	16-12-2010
EMC0006	DMM	Fluke	73	70681569	16-12-2009	16-12-2010
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	N/A	N/A
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	10-08-2009	10-08-2010
EMC0502	Biconical Antenna (Rx)	Rohde & Schwarz	HK116	100032	12-08-2009	12-08-2010
EMC0503	Biconical Antenna (Tx)	Rohde & Schwarz	HK116	100033	12-08-2009	12-08-2010
EMC0504	Log-Perd. Dipole Antenna (Rx)	Rohde & Schwarz	HL223	100039	12-08-2009	12-08-2010
EMC0505	Log-Perd. Dipole Antenna (Tx)	Rohde & Schwarz	HL223	100040	12-08-2009	12-08-2010
EMC0517	Horn Antenna (Rx)	Rohde & Schwarz	HF906	100095	15-09-2009	15-09-2010
EMC0519	Bilog Type Antenna	Schaffner Chase	CBL6143	5070	20-12-2009	20-12-2010
EMC0521	1-26.5GHz Pre Amplifier	Agilent	8449B	3008A01649	25-01-2010	25-01-2011
EMC0507	Antenna Mask (Tx)	HD-GmbH	AS620M	620/408	N/A	N/A
EMC0508	Antenna Mask (Rx)	HD-GmbH	MA240	240/619	N/A	N/A
EMC0509	Turntable	HD-GmbH	DT430	N/A	N/A	N/A
EMC0510	Turntable & Antenna Mask Controller	HD-GmbH	HD100	N/A	N/A	N/A
EMC0512	EMI Test Software	Rohde & Schwarz	ES-K1	N/A	N/A	N/A
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	25-01-2010	25-01-2011
EMC0040	Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	05-12-2009	05-12-2010
EMC0516	Signal Generator	Rohde & Schwarz	SMR20	100416	18-07-2010	18-07-2010
EMC0032	Radio Communication Monitor	Rohde & Schwarz	CMS54	100137	2-12-2009	02-12-2010
EMC0904	Power Meter	Rohde & Schwarz	NRVS	825770/074	18-07-2009	18-07-2010
EMC0905	Power Sensor	Rohde & Schwarz	NRV-Z5	825802/013	18-07-2009	18-07-2010
EMC0906	Dual Directional Coupler	Werlatone Inc.	C1795	6634	26-10-2009	26-10-2010
EMC1508	Audio Analyzer	Rohde & Schwarz	UPL	100855	10-09-2009	10-09-2010
EMC1005	Digital Oscilloscope	Tektronix	TDS3012	B015508	18-07-2009	18-07-2010
EMC0523	Active Loop Antenna	EMCO	6502	00042963	17-11-2009	17-11-2010
EMC0077	Temperature, & Humidity	Shanghai Meteorological Instrument factory Co., Ltd.	ZJ1-2B	709151	26-11-2009	26-11-2010



7 Test Results

7.1 E.U.T. test conditions

Power supply: DC 4.5V(New batteries)

Requirements: **15.31(e):** For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

15.32: Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows: Testing shall be in accordance with the procedures specified in Section 15.31 of this part.

Operating Environment:

Temperature: 20.0 -25.0 °C

Humidity: 38-52 % RH

Atmospheric Pressure: 992 -1010 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

Frequency range over which device operates	Number of frequencies	Location in the range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle and 1 near bottom



EUT channels and frequencies list:

Channel	Frequency (MHz)
1	2405
2	2410
3	2415
4	2420
5	2425
6	2430
7	2435
8	2440
9	2445
10	2450
11	2455
12	2460
13	2465
14	2470
15	2475
16	2480

Test frequency is the lowest channel: 1 channel(2405MHz), middle channel: 9 channel(2445MHz) and highest channel: 16 channel(2480MHz)

7.2 Antenna Requirement

7.2.1 Standard requirement

15.203 requirement:

For intentional device. According to 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2.2 EUT Antenna

The antenna is ceramic antenna. The best gain of the antenna is 4.0dBi.



Test result: The unit does meet the FCC requirements.



7.3 6dB Bandwidth

- Test Requirement: FCC Part 15.247(a)(2)
Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
- Test Method: ANSI C63.4:2009 and KDB558074
Remark: KDB558074, DTS test procedure of Oct 2002 KDB558074
- Test Status: Test the EUT in continuous transmitting mode at lowest, middle and highest channels.
- Test Procedure:
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer;
 2. Set the spectrum analyzer: RBW=100KHz. VBW = 300KHz. Sweep = auto; Detector Function = Peak. Trace = Max Hold, Set span to encompass the entire emission bandwidth of the signal.
 3. Mark the peak power frequency and -6dB(upper and lower) power frequency.
 4. Repeat until all the test status are investigated.
 5. Report the worse case.

7.3.1 Measurement Record:

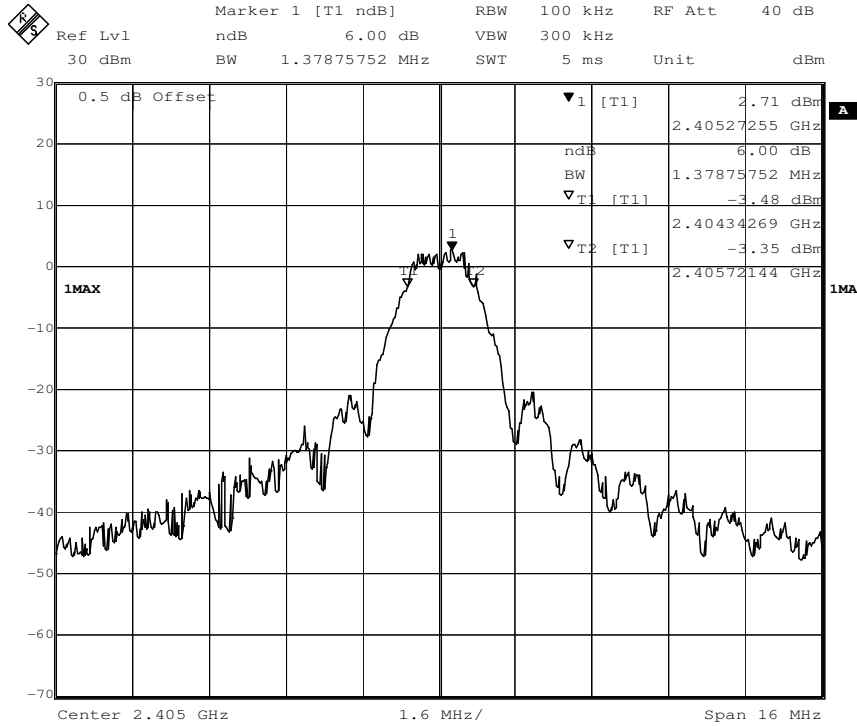
Test Channel	6dB Bandwidth(MHz)	Limit(MHz)
Low	1.379	0.5
Middle	1.218	0.5
High	1.603	0.5

Test result: The unit does meet the FCC requirements.

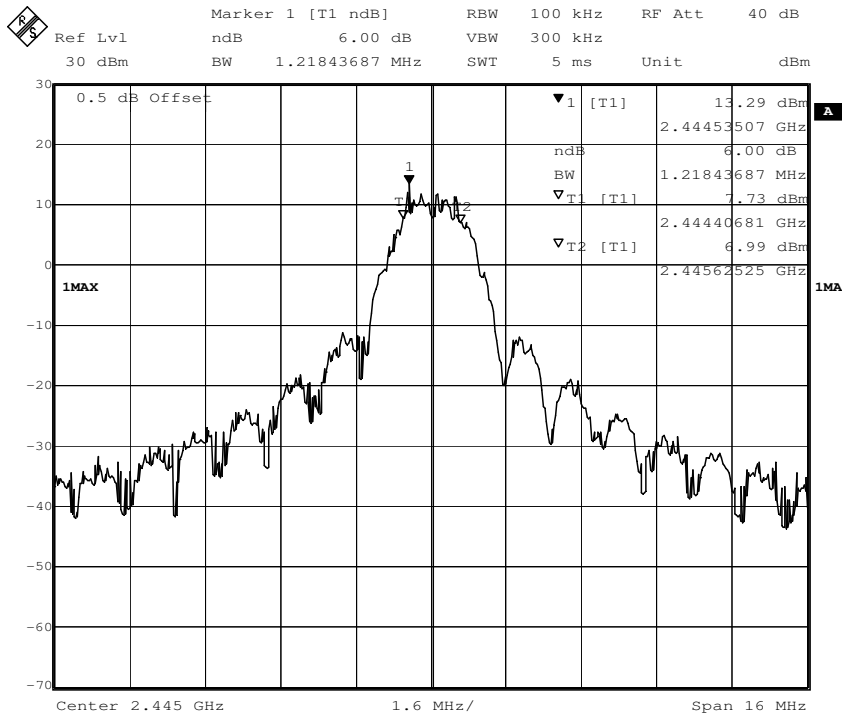
Result plot as follows:



Lowest Channel:

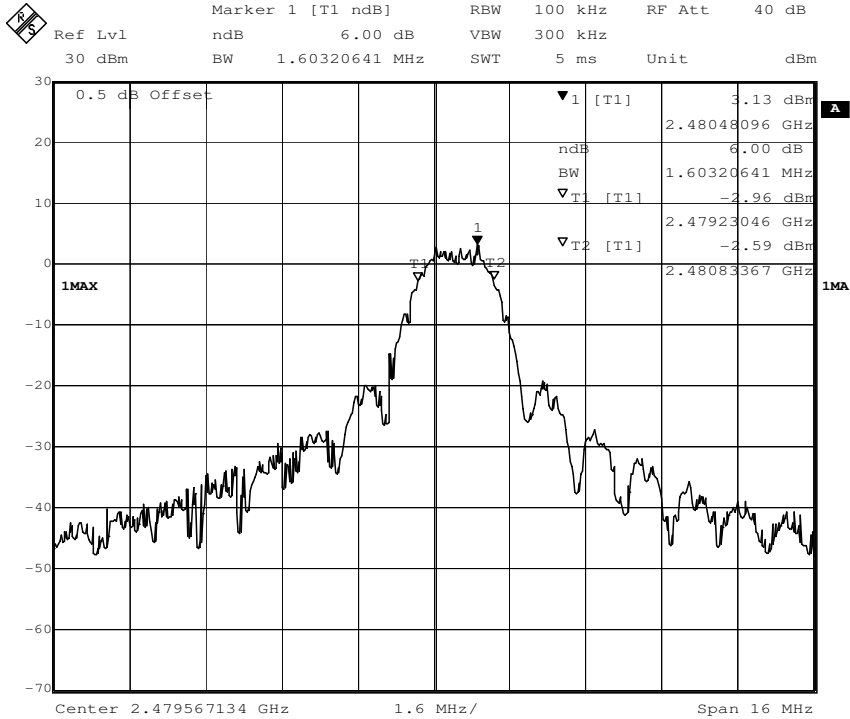


Middle Channel:





Highest Channel:





7.4 Maximum Conducted Output Power

Test Requirement:	FCC Part 15.247(b)(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
Test Method:	ANSI C63.4:2009 and KDB558074. Remark: KDB558074, DTS test procedure of Oct 2002 KDB558074
Test Status:	Test the EUT in continuous transmitting mode at lowest, middle and highest channels.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low attenuation RF cable from the antenna port to the spectrum.
2. Measure the channel power of the test frequency with special test status.
3. Repeat until all the test status are investigated.
4. Report the worse case.



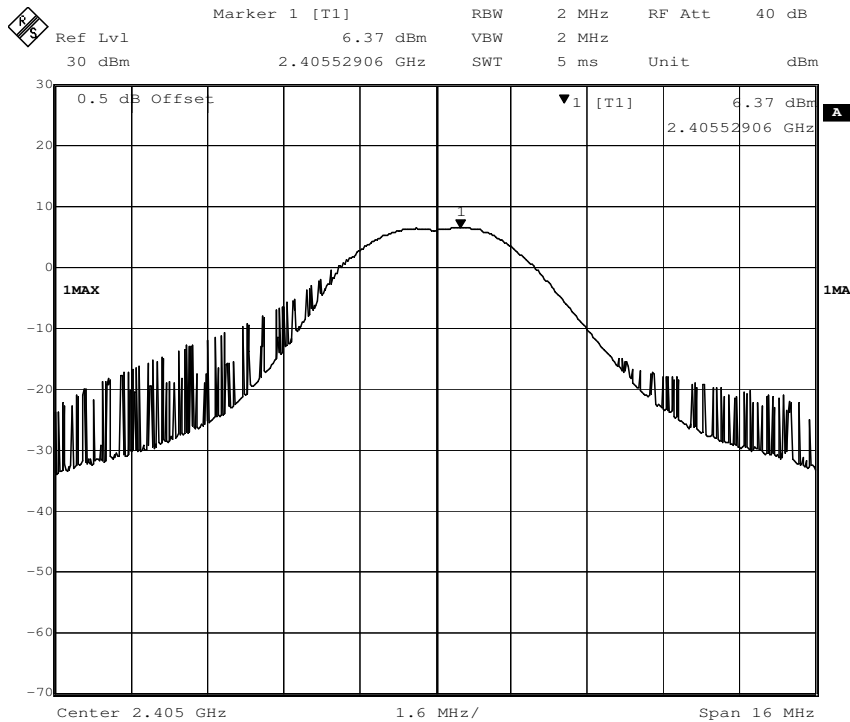
7.4.1 Measurement Record

Test Channel	Power (dBm)	Limit(dBm)
Low	6.37	30
Middle	16.96	30
High	6.97	30

Test result: The unit does meet the FCC requirements.

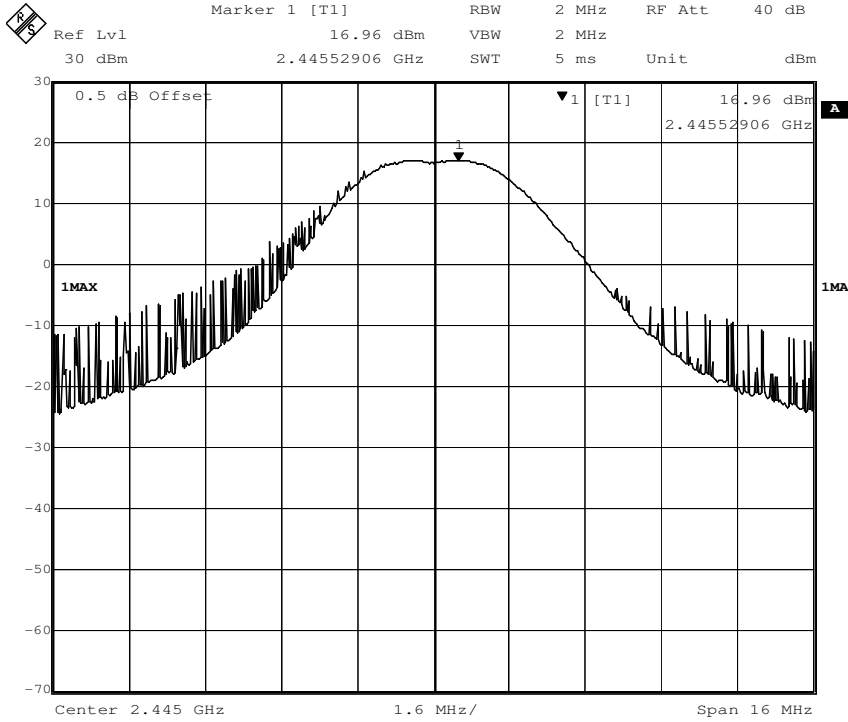
Max power result plots as follows:

Lowest Channel:

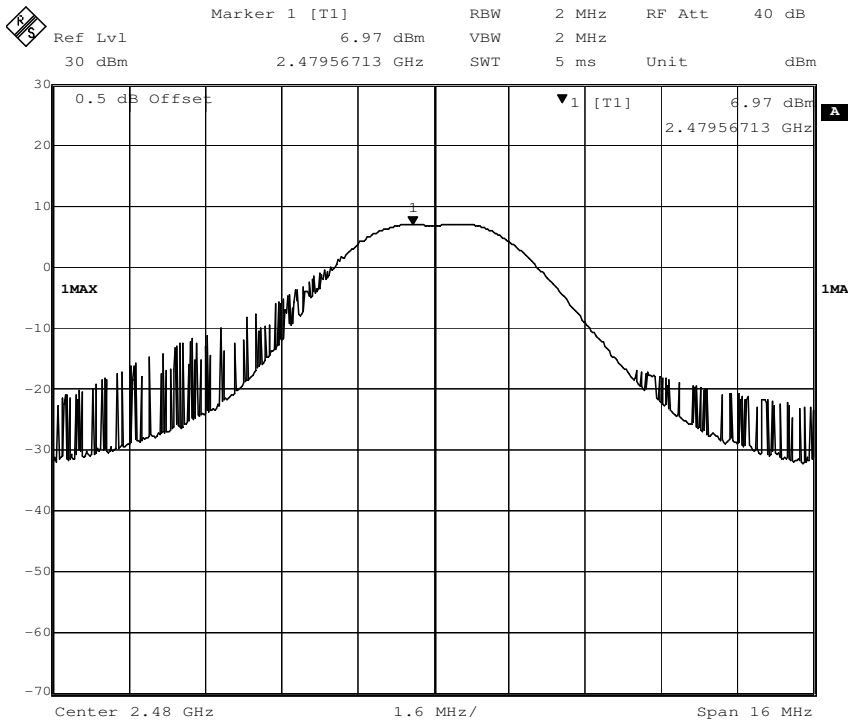




Middle Channel:



Highest Channel:





7.5 Peak Power Spectral Density

Test Requirement: FCC Part 15.247(e)
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.
This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Method: ANSI C63.4:2009 and KDB558074.
Remark: test method is option 1 of (PSD) under KDB558074

Test Status: Test the EUT in continuous transmitting mode at lowest, middle and highest channels.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
2. Set the spectrum analyzer: RBW=3KHz. VBW = 10KHz. sweep= (SPAN/3 kHz); Detector Function = Peak. Trace = Max Hold, Centre = the Peak Power of the signal.
3. Measure the Power Spectral Density of the test frequency with special test status.
4. Repeat until all the test status are investigated.
5. Report the worse case.

7.5.1 Measurement Record

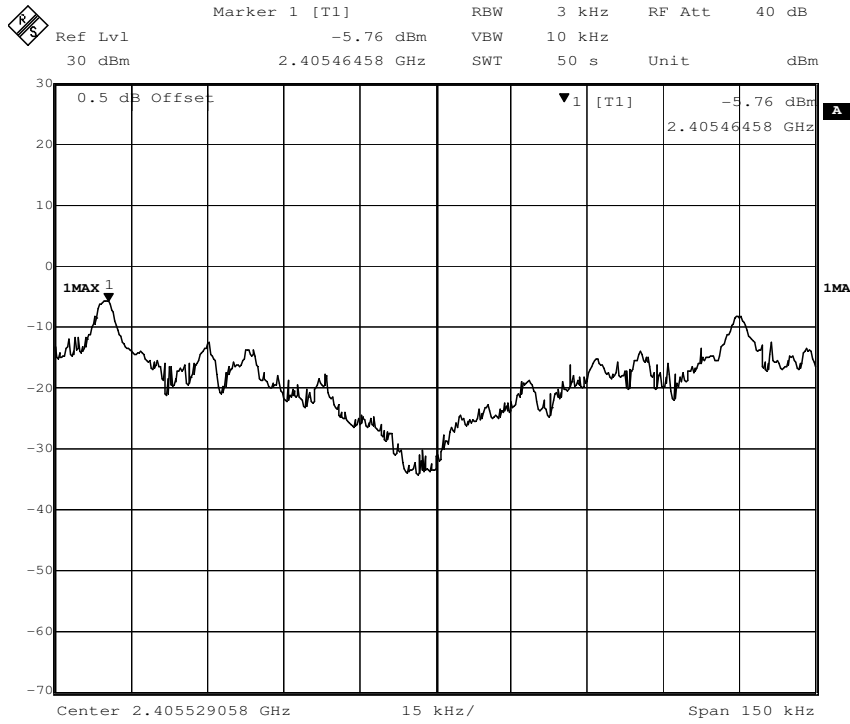
Test Channel	Power Spectral Density	Limit
Low	-5.76dBm/3KHz	8dBm/3KHz
Middle	4.97 dBm/3KHz	8dBm/3KHz
High	-6.48 dBm/3KHz	8dBm/3KHz

Test result: The unit does meet the FCC requirements.

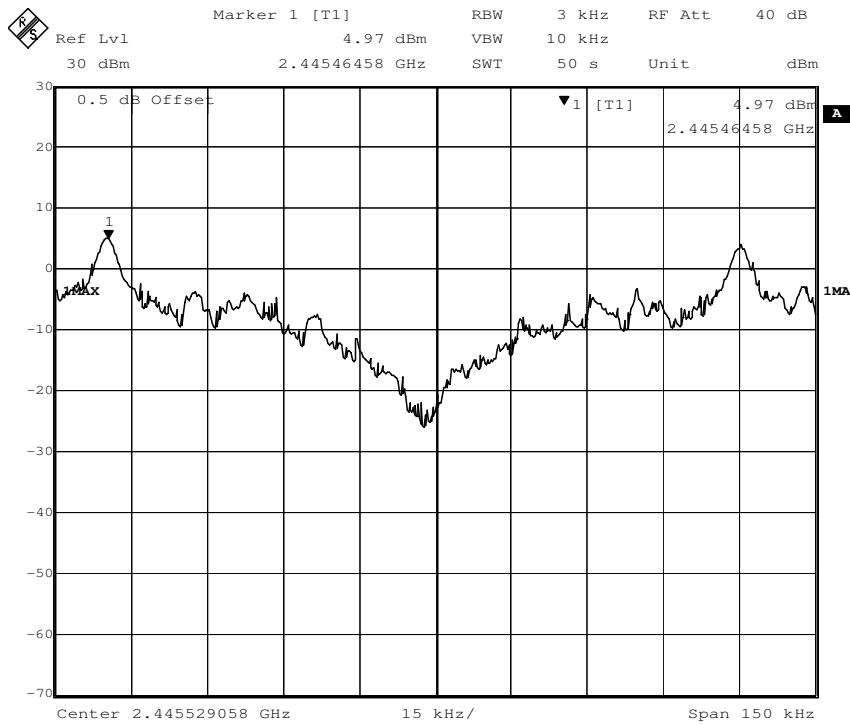
Result plots as follows:



Lowest Channel:

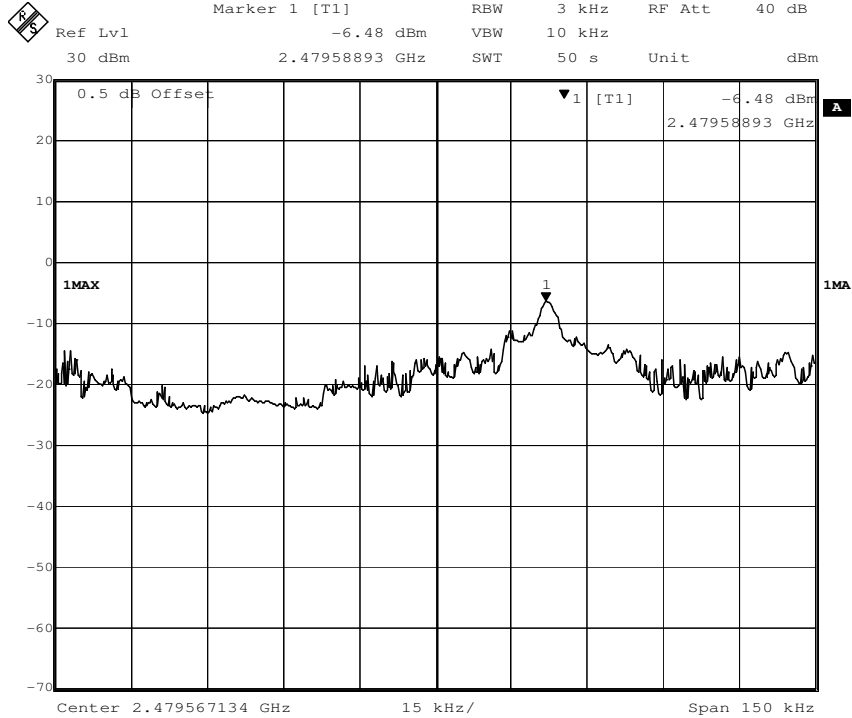


Middle Channel:





Highest Channel:





7.6 Conducted Spurious Emissions

Test Requirement: FCC Part 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Test Method: ANSI C63.4:2009 and KDB558074.

Test Status: Test the EUT in continuous transmitting mode at lowest, middle and highest channels.

Test Procedure:

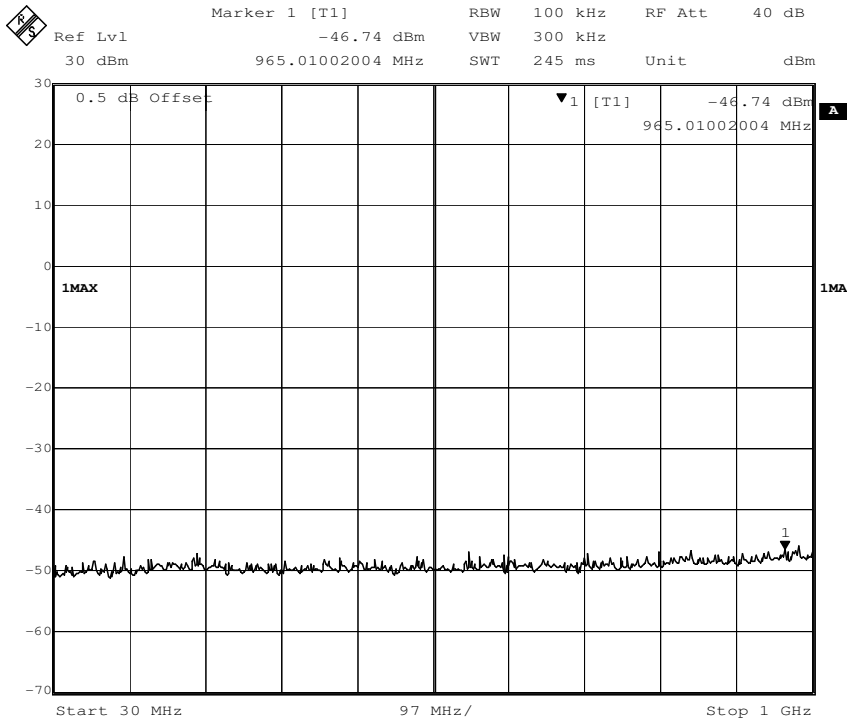
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
2. Set the spectrum analyzer: RBW=100 KHz, VBW = 300KHz. Sweep = auto; Detector Function = Peak. Trace = Max Hold, Scan up through 10th harmonic.
3. Measure the Conducted Spurious Emissions of the test frequency with special test status.
4. Repeat until all the test status are investigated.
5. Report the worse case.

Test result plot as follows:

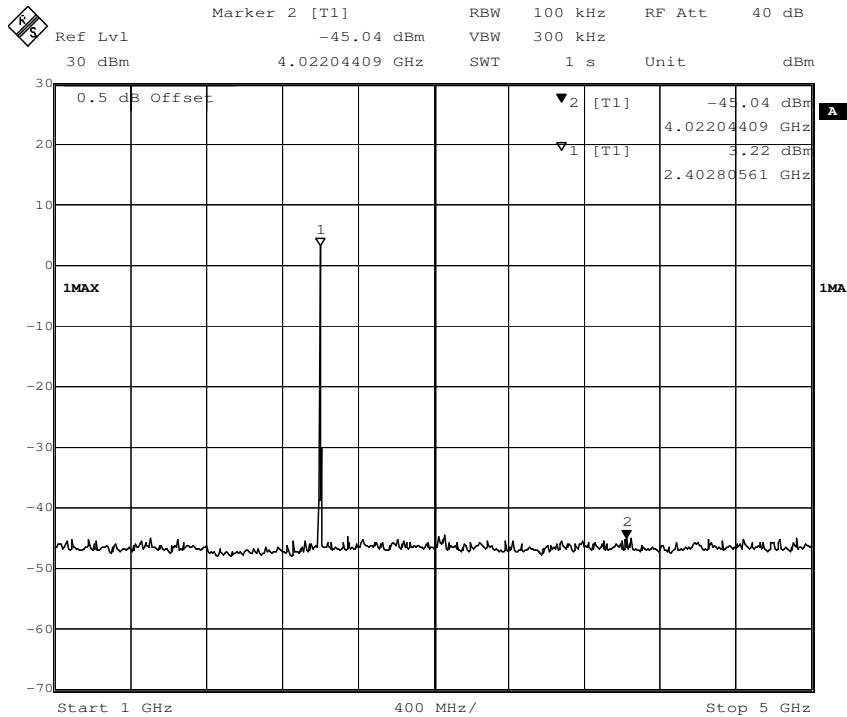


Lowest Channel

30M to 1GHz

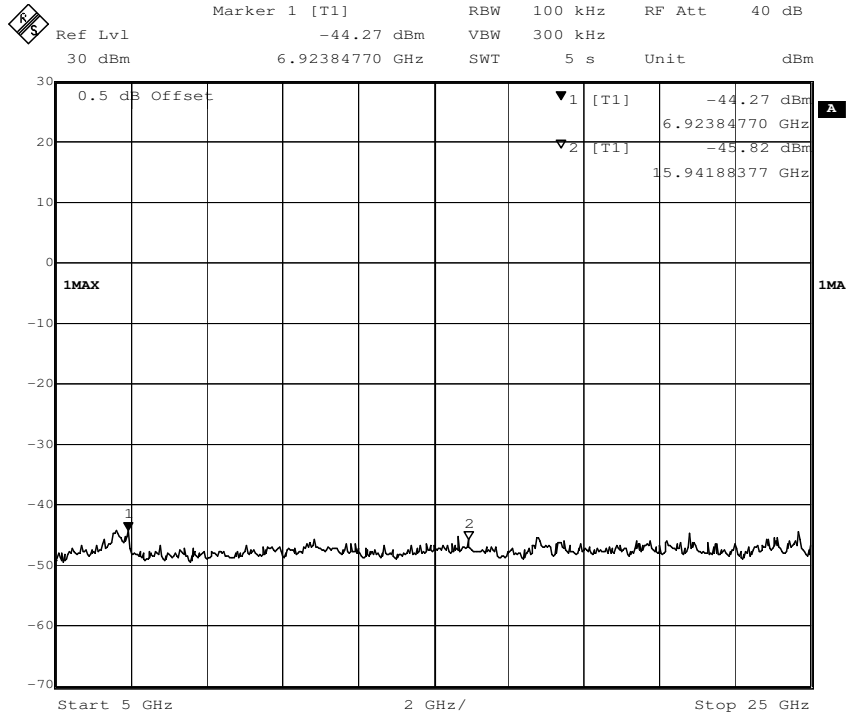


1G to 5GHz



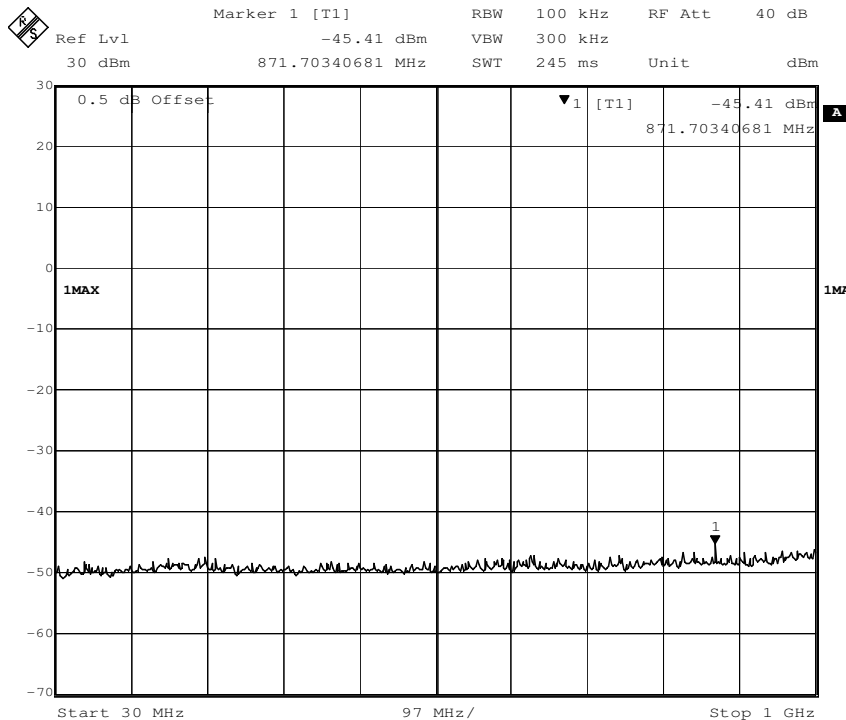


5G to 25GHz



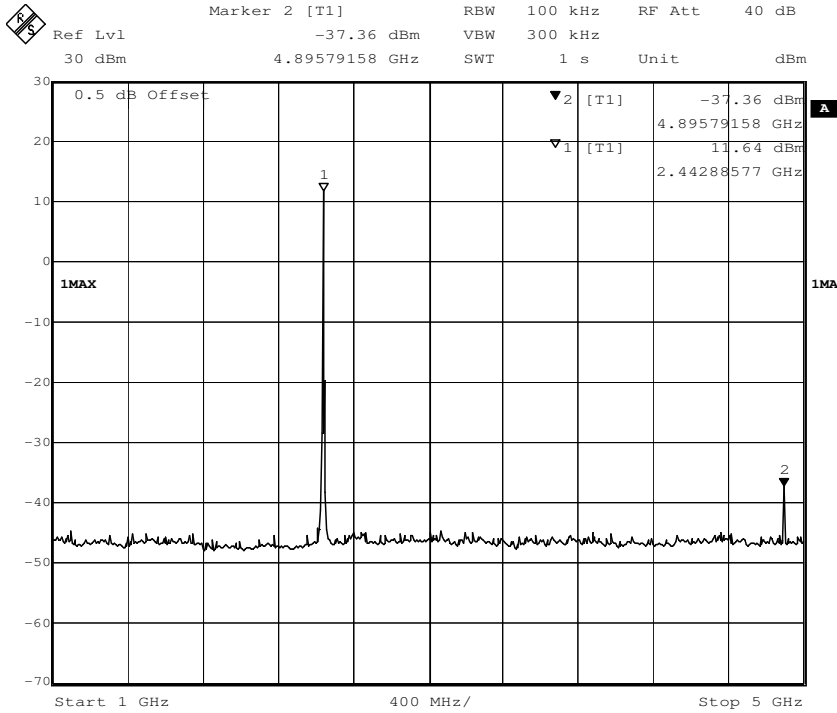
Middle Channel

30MHz to 1GHz

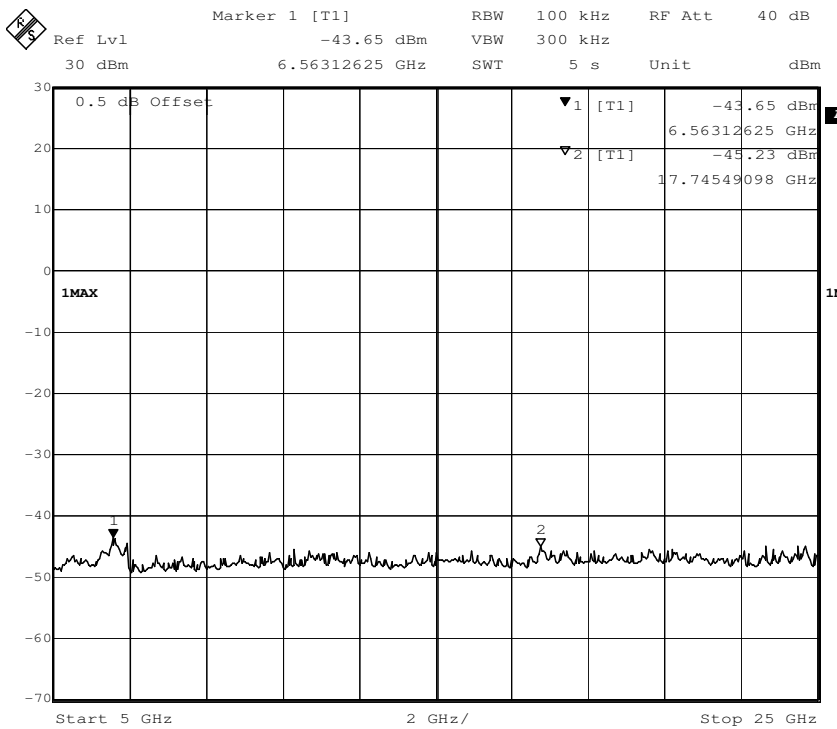




1G to 5GHz



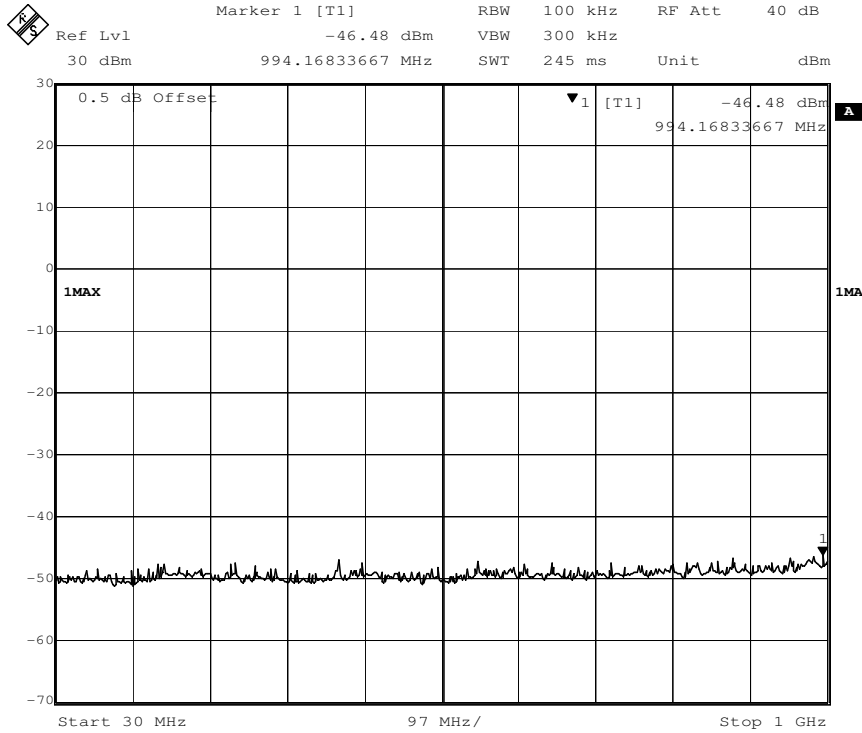
5G to 25GHz



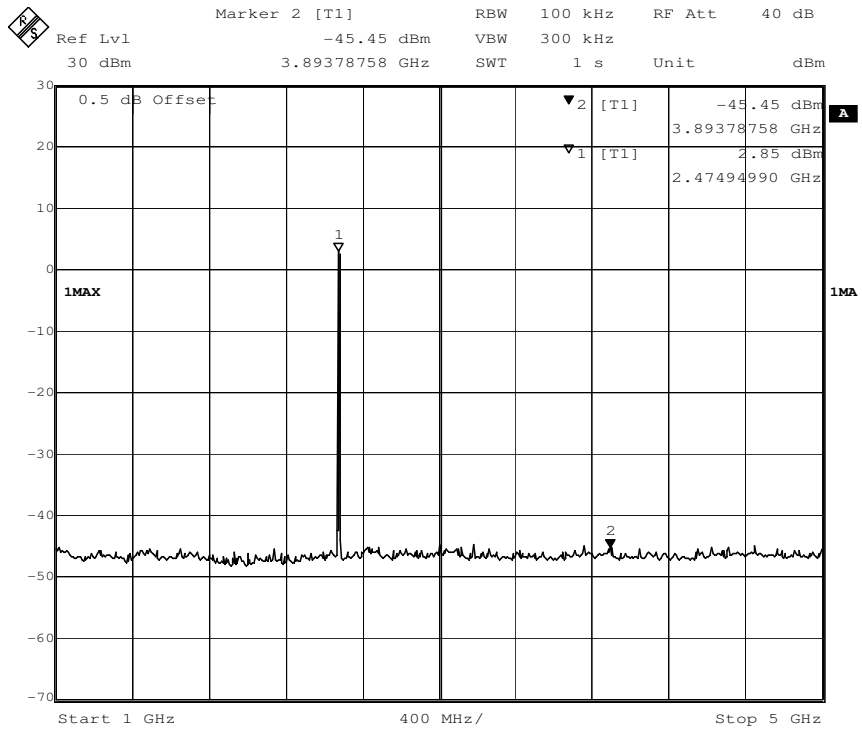


Highest Channel

30MHz to 1GHz

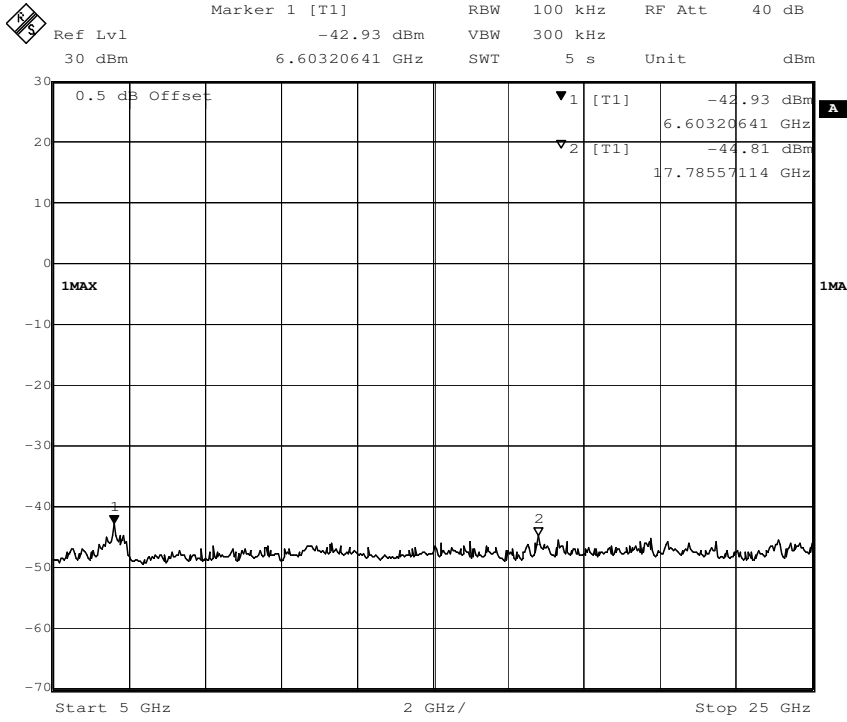


1G to 5GHz





5G to 25GHz





7.7 Radiated Spurious Emissions

Test Requirement:	FCC Part 15.247(d) & 15.209
15.209 Limit:	40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 960MHz 54.0 dB μ V/m above 960MHz
Test Method:	ANSI C63.4:2009 and KDB558074.
Test Status:	Test the EUT in continuous transmitting mode at lowest, middle and highest channels.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)

Test Procedure: The procedure used was ANSI Standard C63.4-2009. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

From 30MHz to 1GHz, read the Quasi-Peak field strength of the emissions with receiver QP detector RBW=120KHz.

Above 1GHz, read the Peak field strength and Average field strength.

Read the Peak field strength through RBW=1MHz, VBW=3MHz in spectrum analyzer setting;

Read the Average field strength through RBW=1MHz, VBW=10Hz in spectrum analyzer setting;

While maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit specified in Section 15.209. If the dwell time per channel of the hopping signal is less than 100 ms, then the average field strength reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the 15.209 limit.

Test Configuration:

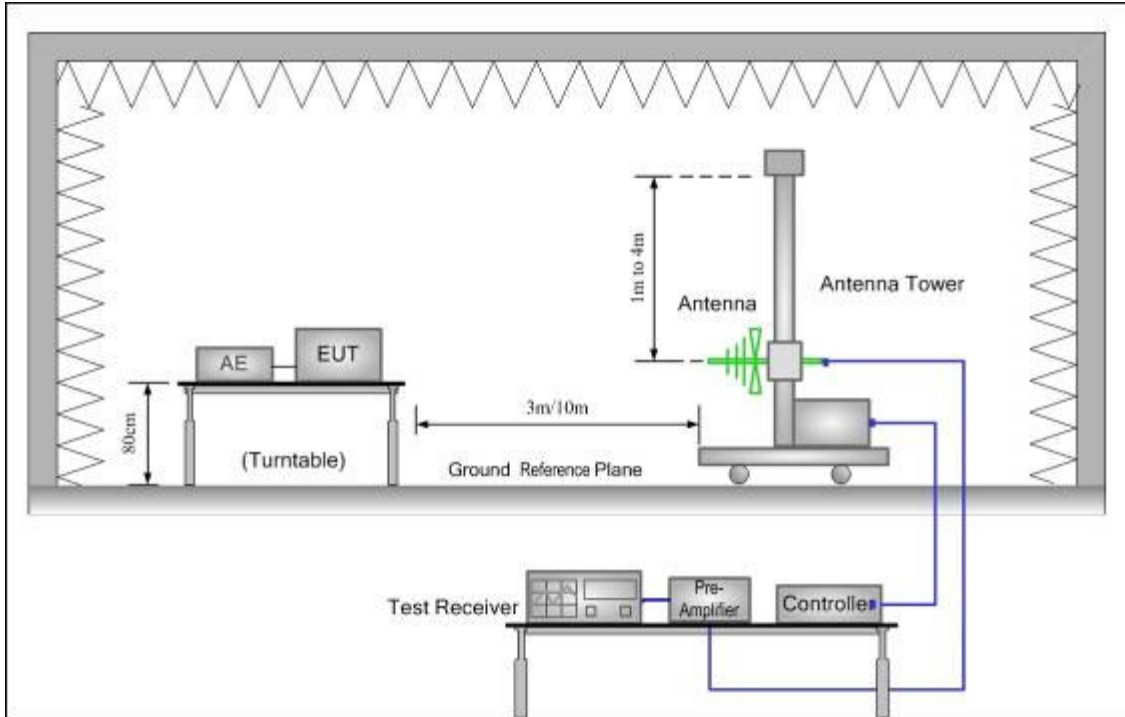


Figure 1. 30MHz to 1GHz radiated emissions test configuration

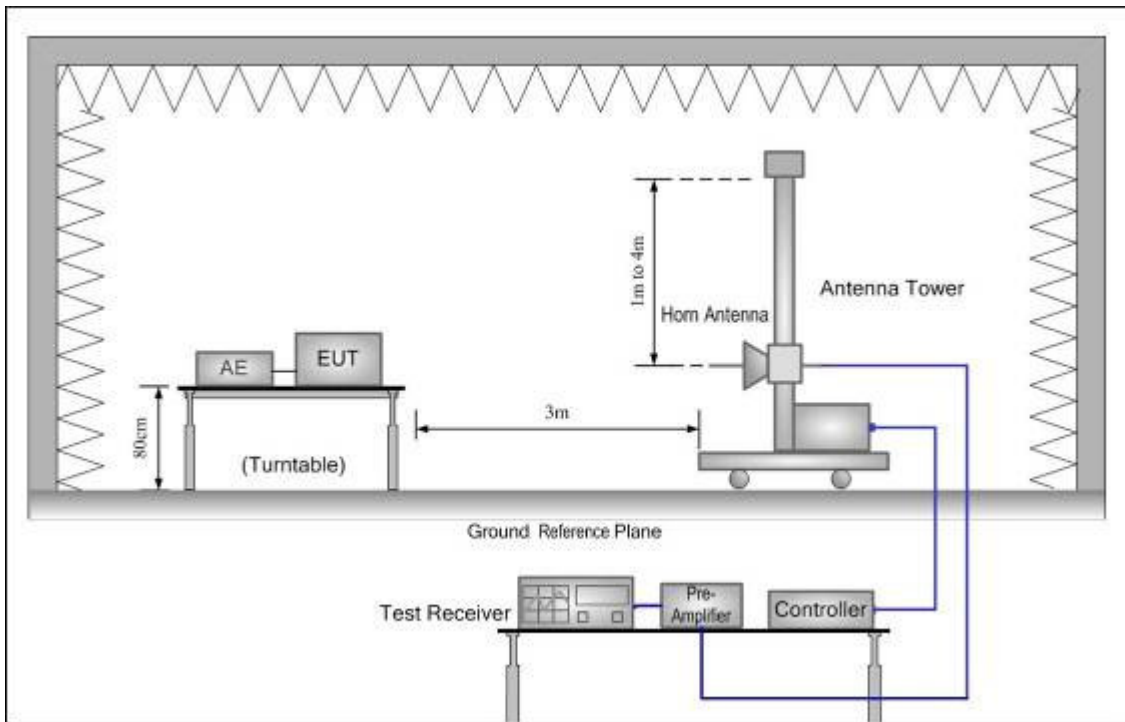


Figure 2. Above 1GHz radiated emissions test configuration



7.7.1 Harmonic and other spurious emissions

7.7.1.1 Test at low Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Reading Level (dBμV)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
94.978	40.77	9.00	0.90	24.50	26.17	43.50	Vertical
131.850	34.47	12.04	1.00	24.40	23.11	43.50	V
199.990	43.2	10.60	1.20	24.20	30.89	43.50	V
133.790	40.04	11.88	1.00	24.40	28.55	43.50	Horizontal
161.920	41.07	10.12	1.10	24.40	27.89	43.50	H
199.990	47.95	10.60	1.20	24.20	35.55	43.50	H

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4810	33.19	6.2	36.3	50.27	53.36	74.00	V
7215	36.08	7.28	36.12	51.88	59.12	74.00	V
9620	36.42	8.80	32.50	46.53	58.72	74.00	V
4810	33.19	6.2	36.3	50.33	53.42	74.00	H
7215	36.08	7.28	36.12	51.63	58.87	74.00	H
9620	36.40	8.80	32.50	45.27	58.00	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4810	33.19	6.2	36.3	35.94	39.03	54.00	V
7215	36.08	7.28	36.12	35.16	42.4	54.00	V
9620	36.42	8.8	32.5	36.07	48.79	54.00	V
4810	33.19	6.2	36.3	39.01	42.1	54.00	H
7215	36.08	7.28	36.12	37.17	44.41	54.00	H
9620	36.4	8.8	32.5	36.77	49.47	54.00	H



7.7.1.2 Test at middle Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
95.960	9.24	0.90	24.50	41.55	27.19	43.50	Vertical
128.940	12.26	1.00	24.40	38.81	27.67	43.50	V
198.780	10.58	1.20	24.22	43.33	30.89	43.50	V
94.990	9.00	0.90	24.50	38.36	23.76	43.50	Horizontal
167.740	10.00	1.20	24.34	43.41	30.27	43.50	H
198.780	10.58	1.20	24.22	45.68	33.24	43.50	H

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4890	33.29	6.27	36.2	57.95	61.31	74.00	V
7335	36.17	7.66	36.16	57.09	64.76	74.00	V
9780	36.4	7.2	32.44	48.59	59.75	74.00	V
4890	33.29	6.27	36.2	58.06	61.42	74.00	H
7335	36.17	7.66	36.16	57.84	65.51	74.00	H
9780	36.4	7.2	32.44	49.77	60.93	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4890	33.29	6.27	36.2	39.46	42.82	54.00	V
7335	36.17	7.66	36.16	38.09	45.76	54.00	V
9780	36.40	7.20	32.44	38.19	49.35	54.00	V
4890	33.29	6.27	36.2	39.47	42.83	54.00	H
7335	36.17	7.66	36.16	39.19	46.86	54.00	H
9780	36.40	7.20	32.44	38.19	49.35	54.00	H



7.7.1.3 Test at high Channel in transmitting status

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
137.670	11.74	1.00	24.40	40.19	28.53	43.50	Vertical
490.750	16.99	2.00	25.40	36.65	30.24	46.00	V
718.700	19.28	2.40	25.399	35.48	31.77	46.00	V
95.925	9.24	0.90	24.50	40.93	26.57	43.50	Horizontal
549.920	18.30	2.10	25.40	33.27	28.27	46.00	H
934.040	20.60	2.70	24.86	35.98	24.42	46.00	H

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4960	33.36	6.2	36.13	49.17	52.6	74.00	V
7440	36.25	7.47	35.95	50.82	58.59	74.00	V
9920	36.50	7.04	32.50	40.16	51.20	74.00	V
4960	33.36	6.2	36.13	49.96	53.39	74.00	H
7440	36.25	7.47	35.95	52.1	59.87	74.00	H
9920	36.50	7.04	32.50	41.53	52.57	74.00	H

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Preamp factor (dB)	Reading Level (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Antenna polarization
4960	33.36	6.2	36.13	39.76	43.19	54.00	V
7440	36.25	7.47	35.95	38.01	45.78	54.00	V
9920	36.5	7.04	32.5	35.74	46.78	54.00	V
4960	33.36	6.2	36.13	39.19	42.62	54.00	H
7440	36.25	7.47	35.95	37.42	45.19	54.00	H
9920	36.5	7.04	32.5	37.46	48.5	54.00	H



Remark:

1). The field strength is calculated by adding the Antenna Factor. Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor –Preamplifier Factor.

2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

4). No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Test result: The unit does meet the FCC requirements.



7.8 Radiated Emissions which fall in the restricted bands

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	ANSI 63.4:2009
Test Status:	Test the EUT in continuous transmitting mode at lowest and highest channels.
Test site:	Measurement Distance: 3m (Semi-Anechoic Chamber)
Limit:	40.0 dB μ V/m between 30MHz & 88MHz; 43.5 dB μ V/m between 88MHz & 216MHz; 46.0 dB μ V/m between 216MHz & 960MHz; 54.0 dB μ V/m above 960MHz.
Detector:	For PK value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz VBW \geq RBW Sweep = auto Detector function = peak Trace = max hold For AV value: RBW = 1 MHz for $f \geq 1$ GHz, 100 kHz for $f < 1$ GHz VBW = 10Hz Sweep = auto Detector function = peak Trace = max hold



Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	
13.36 - 13.41	322 - 335.4		



7.8.1 Measurement Record

Test Result:

1. Low Channel

Vertical:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2336.72	28.42	4.27	37.1	48.4	32.45	43.99	28.04
2373.92	28.51	4.3	36.97	53.65	35.43	49.49	31.27
2385.36	28.51	4.3	36.97	58.35	34.19	54.19	30.03

Horizontal:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2344.4	28.42	4.3	37.1	46.79	42.41	42.41	38.03
2381.52	28.51	4.3	36.97	57.48	43.32	53.32	39.16
2389.28	28.55	4.3	36.9	59.19	42.14	55.14	38.09

2. Middle Channel

Vertical:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2334.16	28.37	4.27	37.07	46.96	35.16	42.53	30.73
2355.6	28.46	4.3	37.03	47.01	36.01	42.74	31.74
2365.92	28.46	4.3	37.03	47.04	35.42	42.77	31.15

Horizontal:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2381.28	28.51	4.3	36.97	50.33	36.07	46.17	31.91
2386.08	28.55	4.3	36.9	51.61	36.44	47.56	32.39
2388.32	28.55	4.3	36.9	51.97	34.16	47.92	30.11



3. High Channel

Vertical:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2483.5	28.78	4.4	37.03	76.22	38.16	72.37	34.31
2484.45	28.78	4.4	37.03	75.25	36.75	71.4	32.9
2487.16	28.78	4.4	37.03	71.44	36.33	67.59	32.48

Horizontal:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss(dB)	Preamp factor(dB)	Peak Reading Level (dBμV)	Average Reading Level (dBμV)	Peak Emission Level (dBμV/m)	Average Emission Level (dBμV/m)
2483.5	28.78	4.4	37.03	74.74	37.15	70.89	33.3
2483.74	28.78	4.4	37.03	75.58	38.01	71.73	34.16
2485.38	28.78	4.4	37.03	73.38	37.15	69.53	33.3

Remark: No any other emission which falls in restricted bands can be detected and be reported.

Test result: The unit does meet the FCC requirements.



7.9 Band Edges Requirement

Test Requirement: FCC Part 15.247(d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

Frequency Band: 2400MHz to 2483.5MHz

Test Method: ANSI C63.4:2009 and KDB558074.

Test Status: Test the EUT in continuous transmitting mode at lowest and highest channels.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum analyzer or power meter.
2. Set RBW=100 kHz, VBW=300KHz, suitable frequency span including 100 kHz bandwidth from band edge.
3. Measure the Conducted Spurious Emissions and Radiated Emissions of the test frequency with special test status.
4. Repeat until all the test status are investigated.
5. Report the worse.

The band edges was measured and recorded Result:

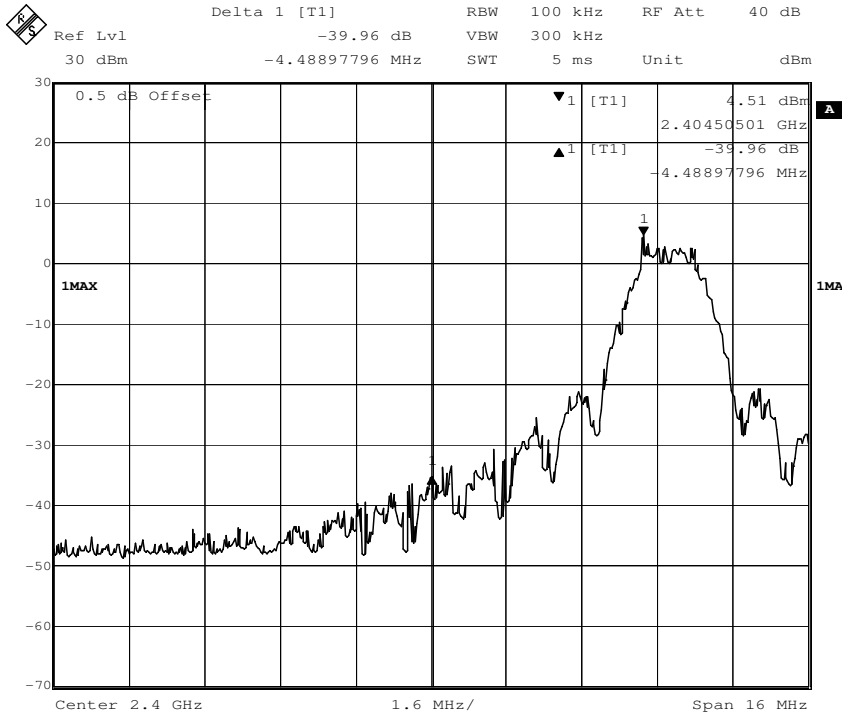
The Lower Edges attenuated more than 20dB.

The Upper Edges attenuated more than 20dB.

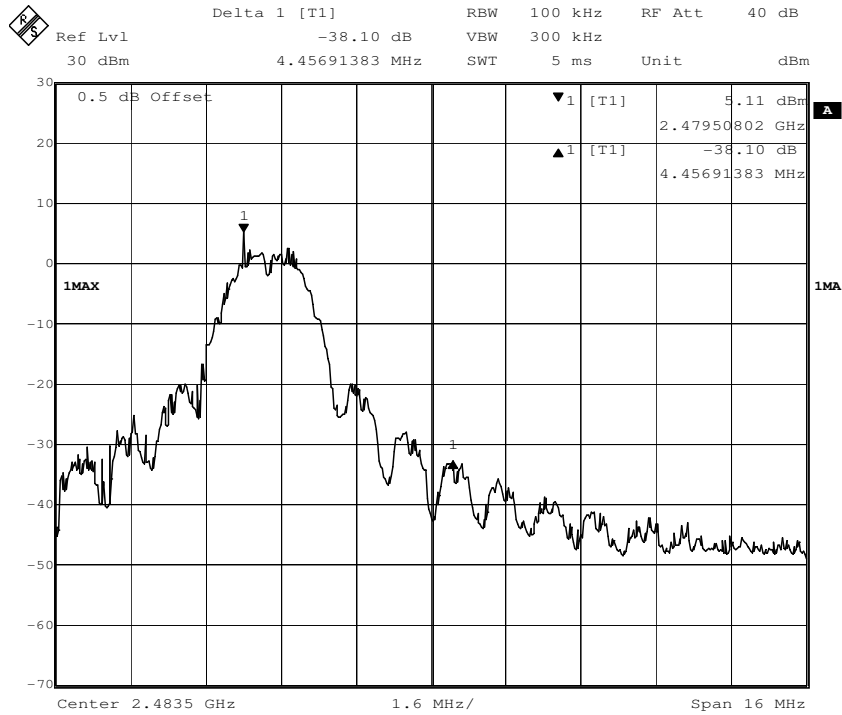
Test result with plots as follows:



Low channel:



Highest Channel:



Test result: The unit does meet the FCC requirements.

--End of Report--