FCC TEST REPORT

FCC ID	: 2AABVBARNVIEWMON
Applicant	: ASA ELECTRONICS
Address	: 2602 MARINA DRIVE ELKHART, IN 46514
Manufacturer	: ASA ELECTRONICS
Address	: 2602 MARINA DRIVE ELKHART, IN 46514

Equipment Under Test (EUT) :

Product Name	: BARNVIEW DIGITAL WIRELESS SURVEILLANCE SYSTEM
Model No.	: BARNVIEWMON
Rules	: FCC CFR47 Part 15 Section 15.247:2010
Date of Test	:May. 15~ June 25, 2013
Date of Issue	:June. 26 2013
Test Result	**: PASS**

Remark:

* The sample described above has been tested to be in compliance with the requirements of ANSI C63.4:2003. The test results have been reviewed and comply with the rules listed above and found to meet their essential requirements.

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District,

Shenzhen 518105, China

Tel: +86-755-83551033 Fax: +86-755-83552400

Compiled by:

Maikou Zhang / Project Engineer

Approved by:

Philo Zhong / Manager

2 Test Summary

Test Items	Test Requirement	Result
Radiated Emissions	15.205(a) 15.209 15.247(d)	PASS
20dB Bandwidth	15.247(a)(1)	PASS
Duty Cycle	15.35	PASS
Band Edge	15.247(d)	PASS
Maximum Peak Output Power	15.247(b)(1)	PASS
Frequency Separated	15.247(a)(1)	PASS
Hopping Channel Number	15.247(a)(1)(iii)	PASS
Dwell time	15.247(a)(1)(iii)	PASS
Antenna Requirement	15.203	PASS
Maximum Permissible Exposure (Exposure of Humans to RF Fields)	1.1307(b)(1)	PASS

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4 General Information

4.1 General Description of E.U.T.

Product Name	: BARNVIEW DIGITAL WIRELESS SURVEILLANCE SYSTEM
Model No.	: BARNVIEWMON
Type of Modulation	: GFSK
Operation Frequency	: 2414.25MHz ~ 2461.5MHz, 15 channels
Antenna Gain	:3dBi & 5dBi(with 3m shielding cable and 9m shielding cable ,This two cables only apply to 5dBi antenna. Cable loss : 3m cable is -1.5632dB, 9m cable is -4.7267dB , the cable use connector of RP SMA with nonstandard whorl).
Oscillator	: Crystal 18MHz for RF module, 24MHz for MCU HP3129, 32.7688KHz for RTC25, LCD driver OSC is 10MHz

4.2 Details of E.U.T.

Technical Data	:Two kind of adapter could be used and the test result carried out by using two adapter were passed, and the data show in the report is the adapter 1's.
Adapter1	: Model:KSAS0060500100VUD INPUT:AC 100-240V, 50/60Hz 0.18A Output: DC5V 1000mA Manufacturer: Ktec
Adapter 2	: Model:CS6D050100FUF INPUT:AC 100-240V, 50/60Hz 200mA Output: DC5V 1.0A Manufacturer: Csec

4.3 Test Facility

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

- **IC – Registration No.: 7760A**

  Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, July 12, 2012.

- **FCC – Registration No.: 880581**

  Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

4.4 Test Location

All the tests were performed at:

Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd.,Songgang Street, Baoan District, Shenzhen, China

4.5 Test Mode

Test Item	Test Mode
Conducted Emissions	transmit (adapter)
Radiated Emissions	transmit (adapter)

4.6 Channel List

Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)	Channel No.	Frequency (MHz)
1	2414.25	2	2417.625	3	2421	4	2424.375
5	2427.75	6	2431.125	7	2434.5	8	2437.875
9	2441.25	10	2444.625	11	2448	12	2451.375
13	2454.75	14	2458.125	15	2461.5	-	-

5 Equipment Used during Test

5.1 Equipments List

Spurious Emissions and Radiated Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMC Analyzer	Agilent	E7405A	MY45114943	Aug. 13,2012	Aug. 13,2013
2.	Active Loop Antenna	Beijing Dazhi	ZN30900A	-	Aug. 13,2012	Aug. 13,2013
3.	Trilog Broadband Antenna	SCHWARZBECK	VULB9163	336	Aug. 13,2012	Aug. 13,2013
4.	Broad-band Horn Antenna	SCHWARZBECK	VULB9163	667	Aug. 13,2012	Aug. 13,2013
5.	Broad-band Horn Antenna	SCHWARZBECK	BBHA 9170	399	Aug. 13,2012	Aug. 13,2013
6.	Broadband Preamplifier	COMPLIANCE DIRECTION	PAP-1G18	2004	Feb .23,2013	Feb .23,2014
7.	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Aug. 13,2012	Aug. 13,2013
8.	10m Coaxial Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Aug. 13,2012	Aug. 13,2013
9.	10m 50 Ohm Coaxial Cable with N-plug	SCHWARZBECK	AK 9513	-	Aug. 13,2012	Aug. 13,2013
10.	Positioning Controller	C&C LAB	CC-C-IF	-	Aug. 13,2012	Aug. 13,2013
11.	Color Monitor	SUNSPO	SP-14C	-	Aug. 13,2012	Aug. 13,2013
Conducted Emissions						
Item	**Equipment**	**Manufacturer**	**Model No.**	**Serial No.**	**Last Calibration Date**	**Calibration Due Date**
1.	EMI Test Receiver	R&S	ESCI	101155	Aug. 13,2012	Aug. 12,2013
2.	LISN	SCHWARZBECK	NSLK 8128	8128-289	Aug. 13,2012	Aug. 12,2013
3.	Cable	LARGE	RF300	EW02014-3	Aug.14,2012	Aug. 13,2013
Associated Equipment						
1	BARNVIEW DIGITAL WIRELESS SURVEILLANCE SYSTEM	ASA ELECTRONICS	BARNVIEWCAM	-	-	-

5.2 Measurement Uncertainty

Parameter	Uncertainty
Radio Frequency	± 1 x 10^{-6}
RF Power	± 1.0 dB
RF Power Density	± 2.2 dB
Radiated Spurious Emissions test	± 5.03 dB (Bilog antenna 30M~1000MHz)
	± 4.74 dB (Horn antenna 1000M~25000MHz)

5.3 Test Equipment Calibration

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

6 Conducted Emission Data

Test Requirement:	FCC CFR 47 Part 15 Section 15.207
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	150kHz to 30MHz
Class:	Class B
Limit:	66-56 dBμV between 0.15MHz & 0.5MHz 56 dBμV between 0.5MHz & 5MHz 60 dBμV between 5MHz & 30MHz
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.5 °C
Humidity: 51 % RH
Atmospheric Pressure: 1012 mbar

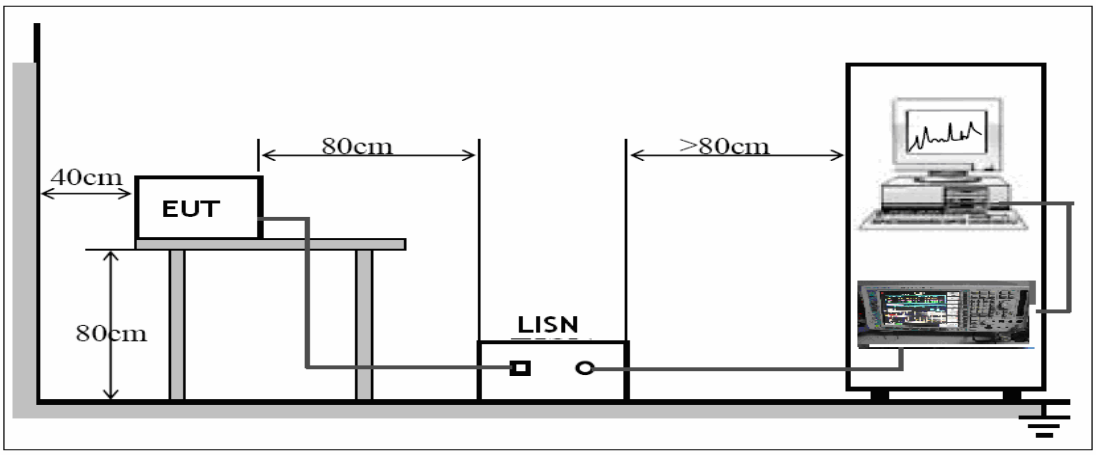
EUT Operation:

The pre-test was performed in transmit mode with 3dBi antenna, 5dBi antenna with 9m cabel. and 3m cable. The test data were shown as follow.

The EUT was tested according to ANSI C63.4:2003. The frequency spectrum from 150kHz to 30MHz was investigated.
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

6.2 EUT Setup

The EUT was placed on the test table in shielding room.

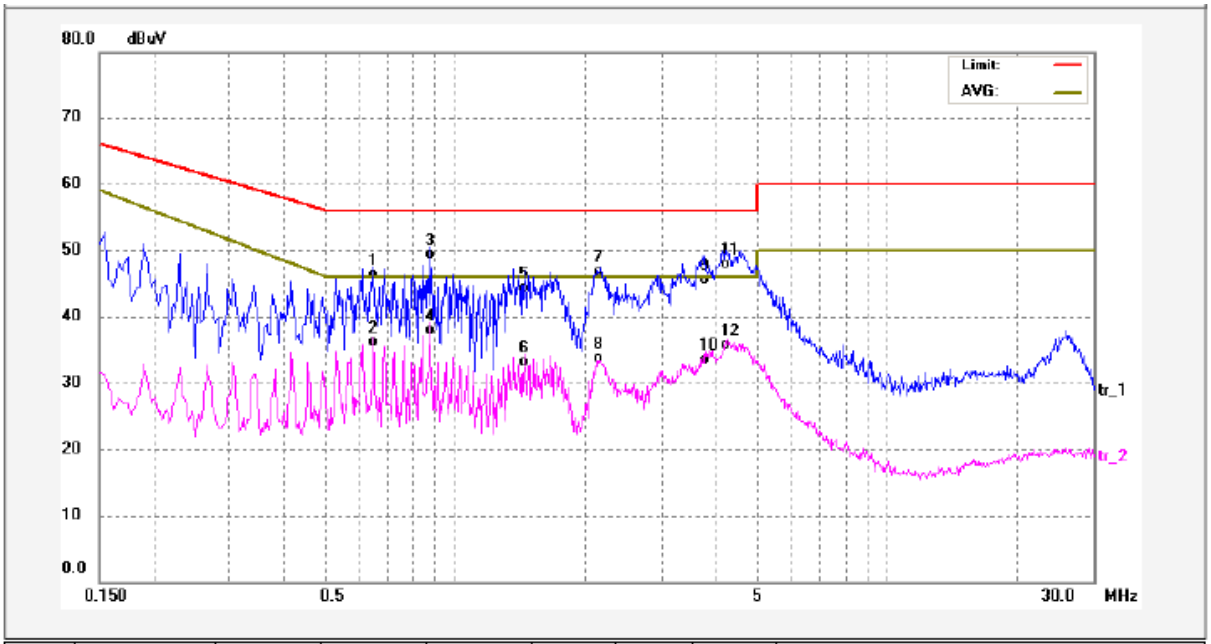


6.3 Conducted Emission Test Result

An initial pre-scan was performed on the live and neutral lines.

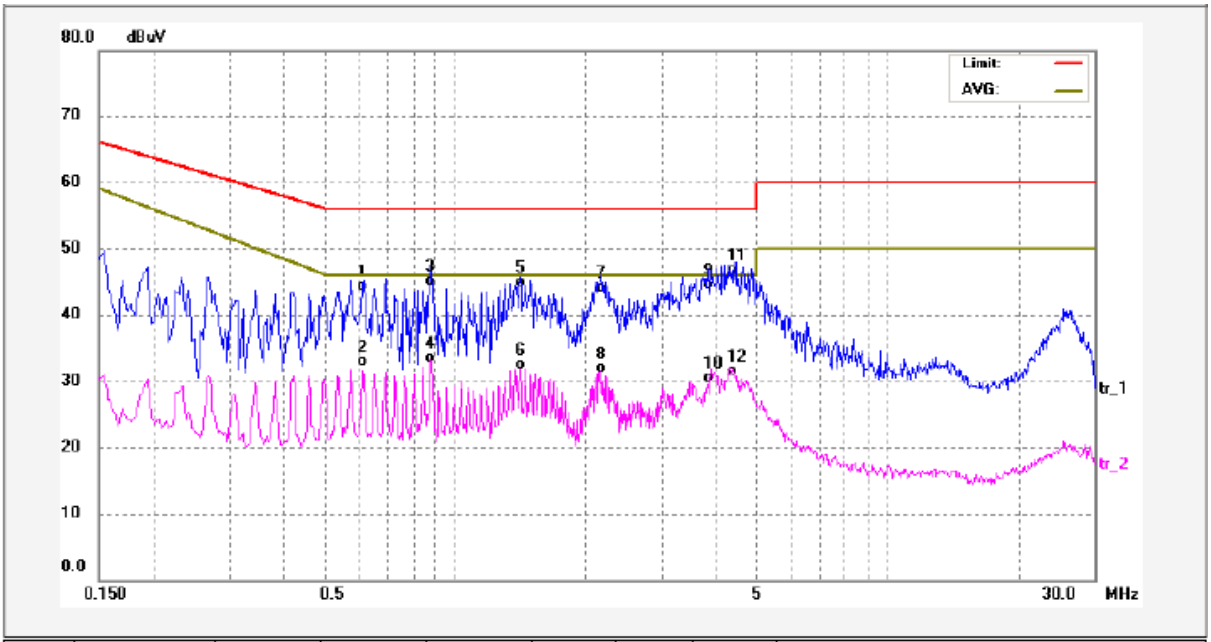
Test mode: transmit mode (5dBi antenna with 9m cable)

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.6460	34.26	11.33	45.59	56.00	-10.41	QP	
2	0.6460	24.06	11.33	35.39	46.00	-10.61	AVG	
3	0.8740	37.21	11.25	48.46	56.00	-7.54	QP	
4	0.8740	25.95	11.25	37.20	46.00	-8.80	AVG	
5	1.4420	32.32	11.19	43.51	56.00	-12.49	QP	
6	1.4420	21.16	11.19	32.35	46.00	-13.65	AVG	
7	2.1700	34.74	11.20	45.94	56.00	-10.06	QP	
8	2.1700	21.73	11.20	32.93	46.00	-13.07	AVG	
9	3.7780	33.49	11.22	44.71	56.00	-11.29	QP	
10	3.7780	21.52	11.22	32.74	46.00	-13.26	AVG	
11	4.2380	35.87	11.23	47.10	56.00	-8.90	QP	
12	4.2380	23.68	11.23	34.91	46.00	-11.09	AVG	

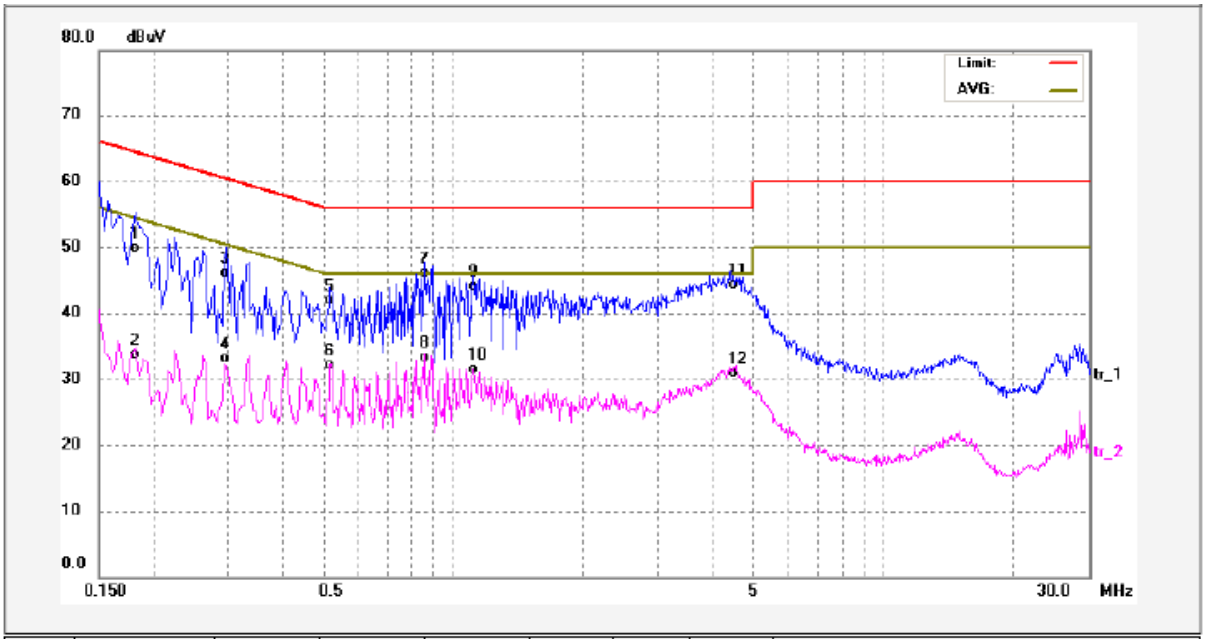
Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.6140	32.26	11.33	43.59	56.00	-12.41	QP	
2	0.6140	20.87	11.33	32.20	46.00	-13.80	AVG	
3	0.8780	32.97	11.24	44.21	56.00	-11.79	QP	
4	0.8780	21.38	11.24	32.62	46.00	-13.38	AVG	
5	1.4180	32.90	11.19	44.09	56.00	-11.91	QP	
6	1.4180	20.47	11.19	31.66	46.00	-14.34	AVG	
7	2.1820	32.02	11.20	43.22	56.00	-12.78	QP	
8	2.1820	19.92	11.20	31.12	46.00	-14.88	AVG	
9	3.8340	32.52	11.22	43.74	56.00	-12.26	QP	
10	3.8340	18.56	11.22	29.78	46.00	-16.22	AVG	
11	4.4140	34.59	11.23	45.82	56.00	-10.18	QP	
12	4.4140	19.45	11.23	30.68	46.00	-15.32	AVG	

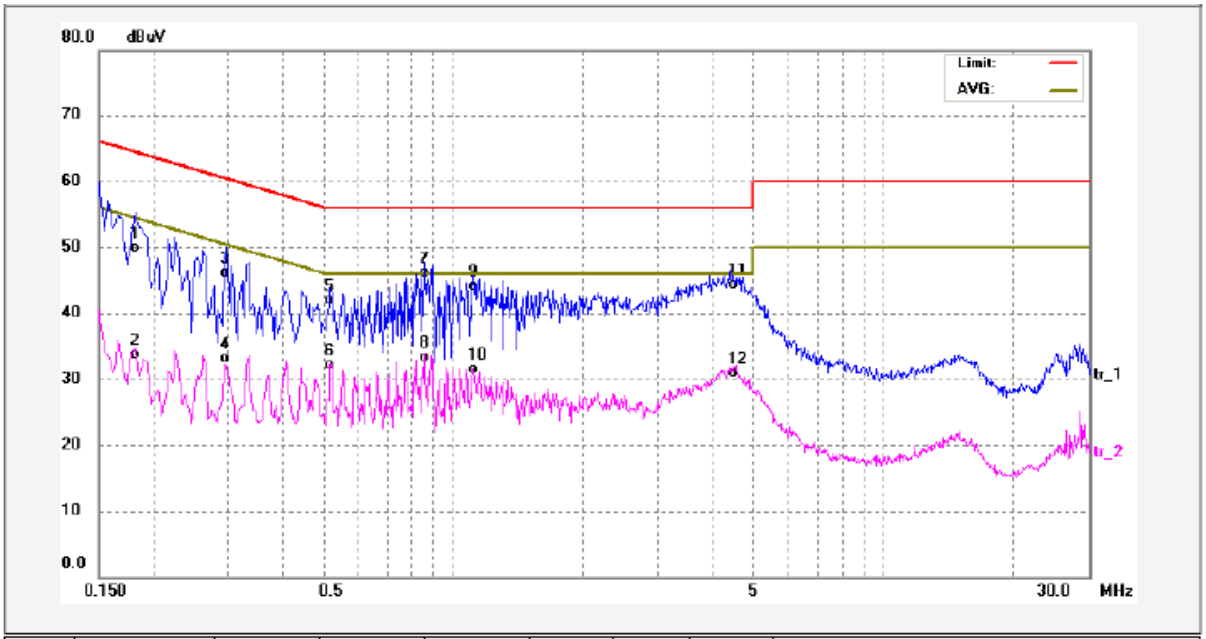
Test mode: transmit mode (5dBi antenna with 3m cable)

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1819	37.94	11.25	49.19	64.39	-15.20	QP	
2	0.1819	21.69	11.25	32.94	54.39	-21.45	AVG	
3	0.2980	33.96	11.30	45.26	60.30	-15.04	QP	
4	0.2980	21.08	11.30	32.38	50.30	-17.92	AVG	
5	0.5180	29.76	11.31	41.07	56.00	-14.93	QP	
6	0.5180	20.06	11.31	31.37	46.00	-14.63	AVG	
7	0.8540	34.00	11.26	45.26	56.00	-10.74	QP	
8	0.8540	21.18	11.26	32.44	46.00	-13.56	AVG	
9	1.1140	32.10	11.18	43.28	56.00	-12.72	QP	
10	1.1140	19.44	11.18	30.62	46.00	-15.38	AVG	
11	4.4180	32.21	11.23	43.44	56.00	-12.56	QP	
12	4.4180	18.86	11.23	30.09	46.00	-15.91	AVG	

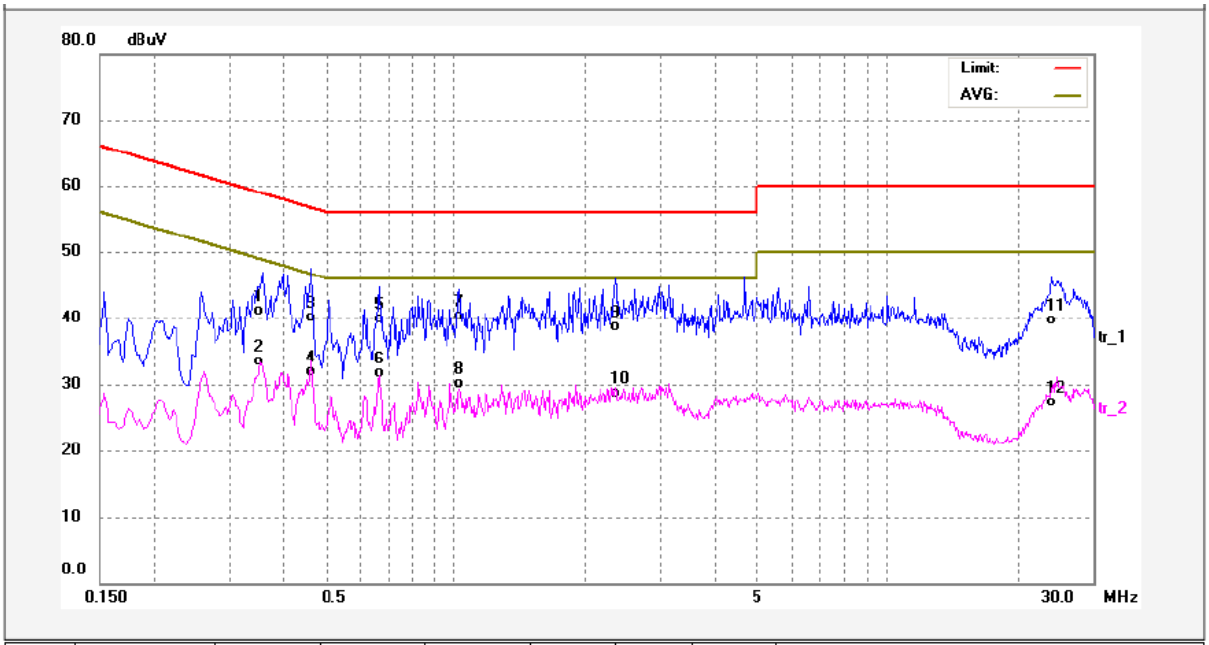
Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1819	37.94	11.25	49.19	64.39	-15.20	QP	
2	0.1819	21.69	11.25	32.94	54.39	-21.45	AVG	
3	0.2980	33.96	11.30	45.26	60.30	-15.04	QP	
4	0.2980	21.08	11.30	32.38	50.30	-17.92	AVG	
5	0.5180	29.76	11.31	41.07	56.00	-14.93	QP	
6	0.5180	20.06	11.31	31.37	46.00	-14.63	AVG	
7	0.8540	34.00	11.26	45.26	56.00	-10.74	QP	
8	0.8540	21.18	11.26	32.44	46.00	-13.56	AVG	
9	1.1140	32.10	11.18	43.28	56.00	-12.72	QP	
10	1.1140	19.44	11.18	30.62	46.00	-15.38	AVG	
11	4.4180	32.21	11.23	43.44	56.00	-12.56	QP	
12	4.4180	18.86	11.23	30.09	46.00	-15.91	AVG	

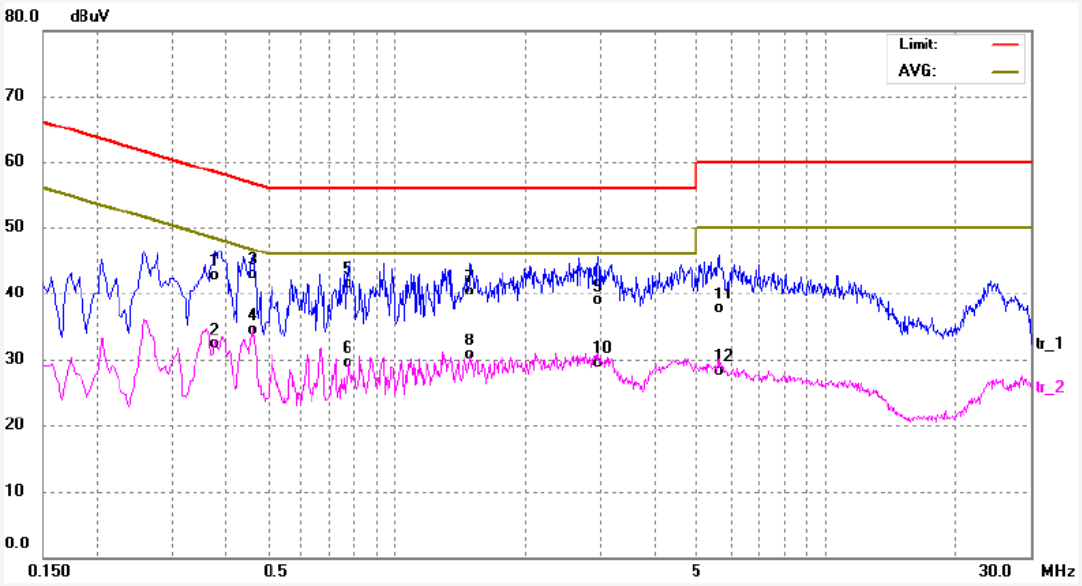
Test mode: transmit mode (3dBi antenna)

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3580	29.06	11.31	40.37	58.77	-18.40	QP	
2	0.3580	21.41	11.31	32.72	48.77	-16.05	AVG	
3	0.4660	27.93	11.31	39.24	56.58	-17.34	QP	
4	0.4660	19.89	11.31	31.20	46.58	-15.38	AVG	
5	0.6700	27.76	11.34	39.10	56.00	-16.90	QP	
6	0.6700	19.47	11.34	30.81	46.00	-15.19	AVG	
7	1.0260	28.32	11.18	39.50	56.00	-16.50	QP	
8	1.0260	18.22	11.18	29.40	46.00	-16.60	AVG	
9	2.3500	26.67	11.20	37.87	56.00	-18.13	QP	
10	2.3500	16.65	11.20	27.85	46.00	-18.15	AVG	
11	24.0540	27.29	11.55	38.84	60.00	-21.16	QP	
12	24.0540	15.02	11.55	26.57	50.00	-23.43	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.3780	30.65	11.31	41.96	58.32	-16.36	QP	
2	0.3780	20.29	11.31	31.60	48.32	-16.72	AVG	
3	0.4660	30.76	11.31	42.07	56.58	-14.51	QP	
4	0.4660	22.37	11.31	33.68	46.58	-12.90	AVG	
5	0.7780	29.31	11.30	40.61	56.00	-15.39	QP	
6	0.7780	17.47	11.30	28.77	46.00	-17.23	AVG	
7	1.4940	28.22	11.19	39.41	56.00	-16.59	QP	
8	1.4940	18.70	11.19	29.89	46.00	-16.11	AVG	
9	2.9500	26.96	11.21	38.17	56.00	-17.83	QP	
10	2.9500	17.49	11.21	28.70	46.00	-17.30	AVG	
11	5.6460	25.72	11.25	36.97	60.00	-23.03	QP	
12	5.6460	16.35	11.25	27.60	50.00	-22.40	AVG	

7 Radiated Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209 & 15.247

Test Method: ANSI C63.4:2003

Test Result: PASS

Frequency Range: 32.7688KHz to 25GHz

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.1 EUT Operation :

Operating Environment:

Temperature: 25.5 °C

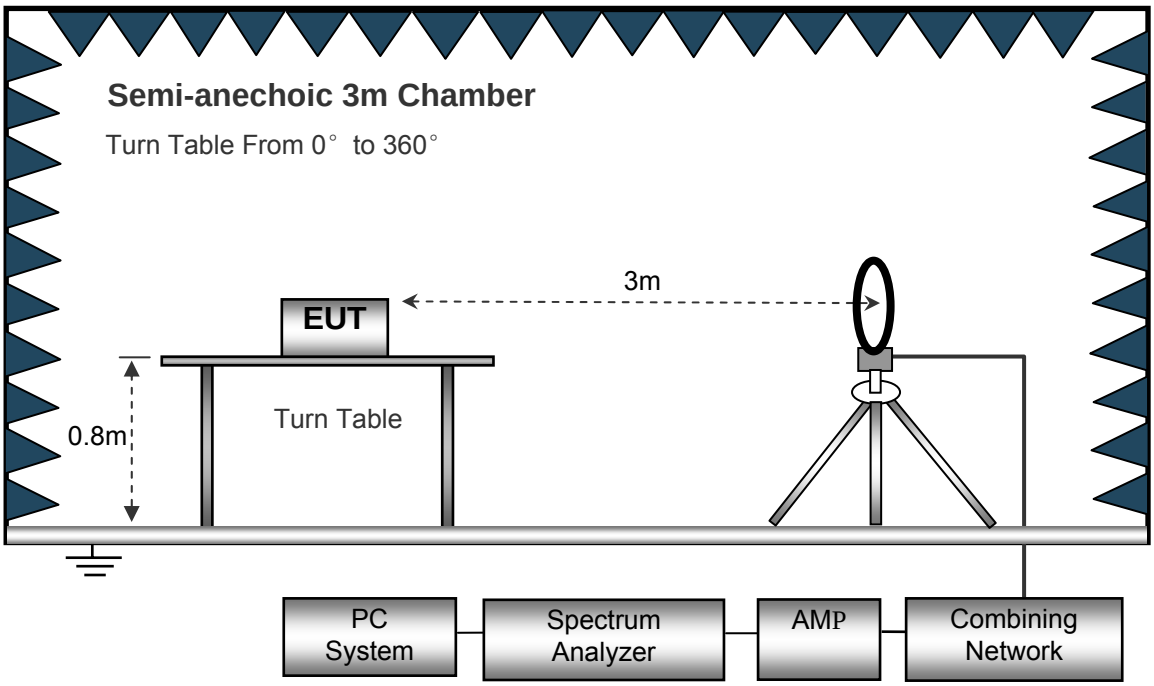
Humidity: 51 % RH

Atmospheric Pressure:1012 mbar

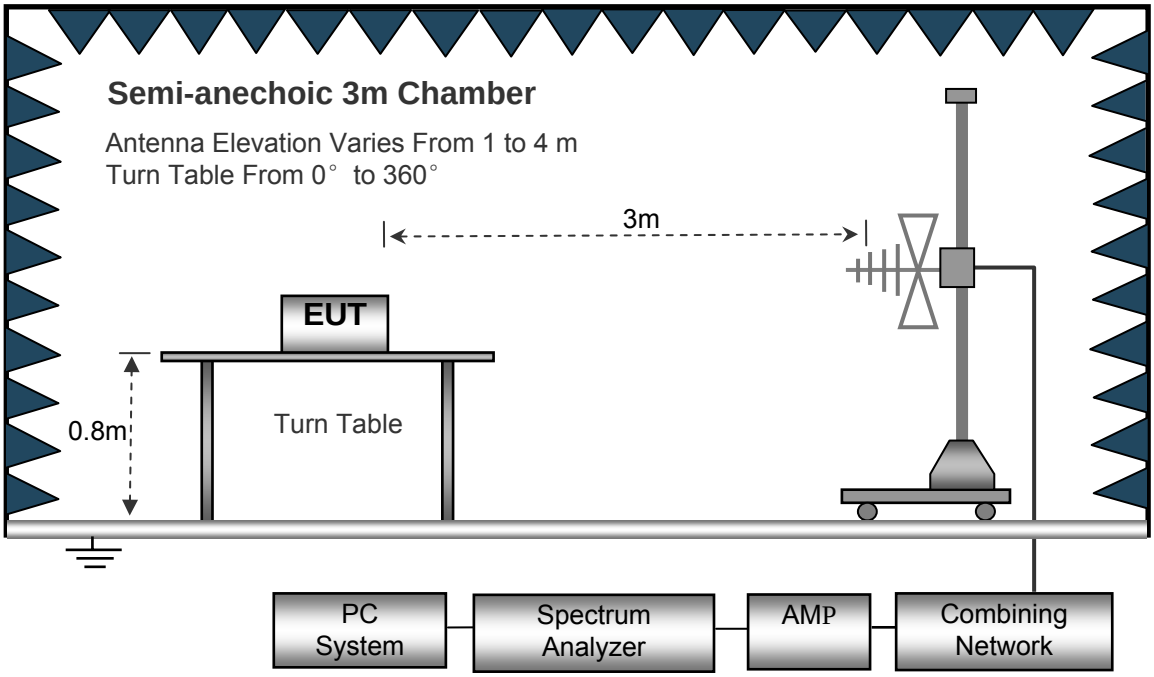
Test mode:The EUT was tested in transmit mode, with 3dBi antenna, 5dBi antenna with 3m cable and 9m cabel. and 5dBi antenna with 9m cable mode data was the worse than with 3m cable, so the worst mode were shown as follow.

7.2 Test Setup

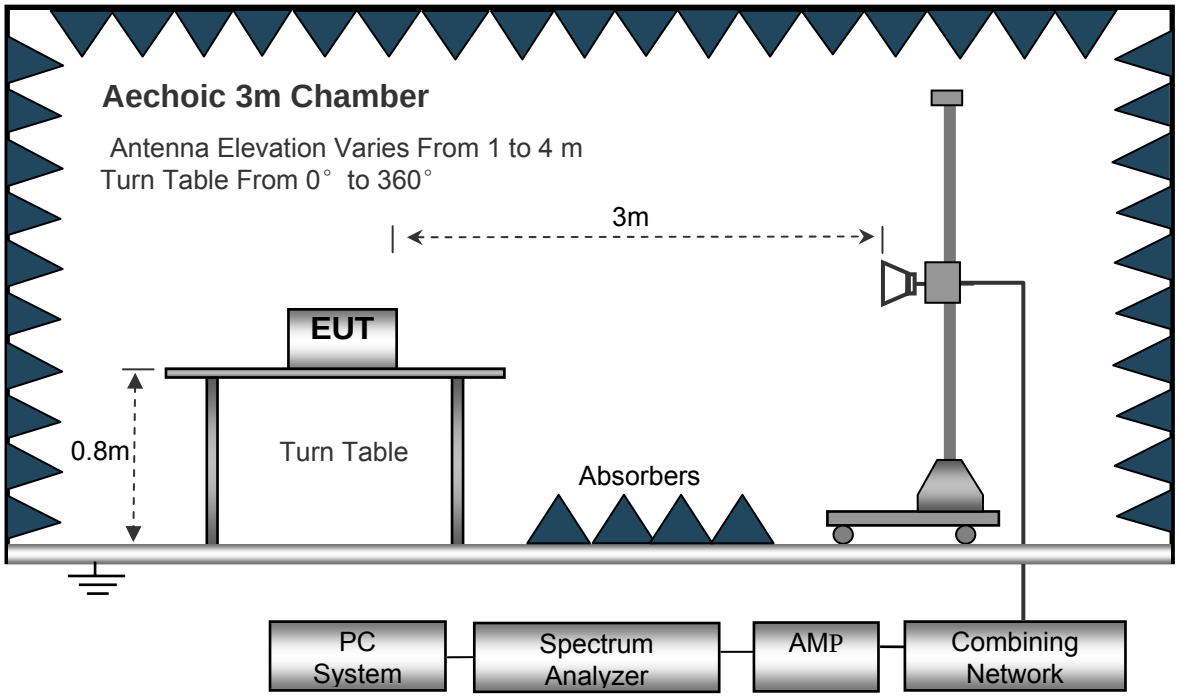
The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4: 2003.
The test setup for emission measurement below 30MHz.



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



The test setup for emission measurement above 1 GHz.



7.3 Spectrum Analyzer Setup

According to FCC Part15 Rules, the system was tested from 32.7688KHz to 25000MHz.

Below 30MHz

Sweep Speed	Auto
IF Bandwidth	10KHz
Video Bandwidth	10KHz
Resolution Bandwidth	10KHz

30MHz ~ 1GHz

Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100KHz

Above 1GHz

Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	3MHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	1MHz

7.4 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 moved from 1m to 4m to find out the maximum emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under X-axes position(X denotes lying on the table).

7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

7.6 Summary of Test Results

Test Frequency :Below 30MHz

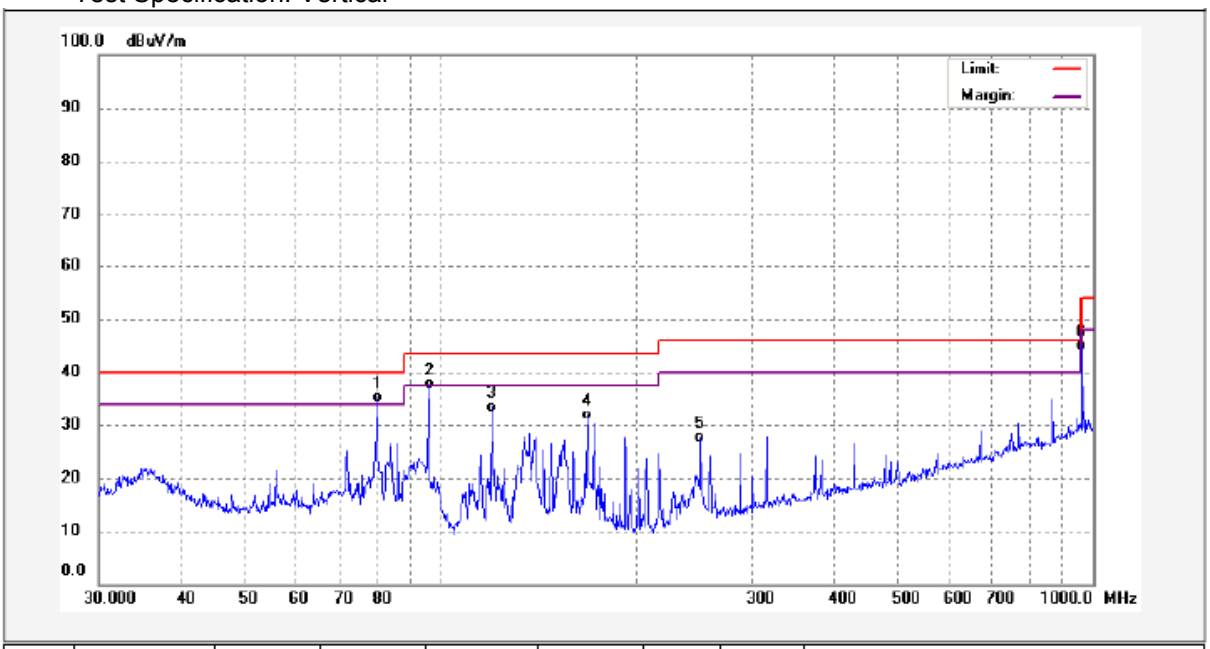
All emissions were more than 20 dB below the limit and therefore not reported.

Test Frequency Range : 30MHz ~ 1000MHz

Remark: the EUT was pretested at the highest, middle and lowest channel, and the worst case was the lowest Channel, so the data show was the lowest channel only.

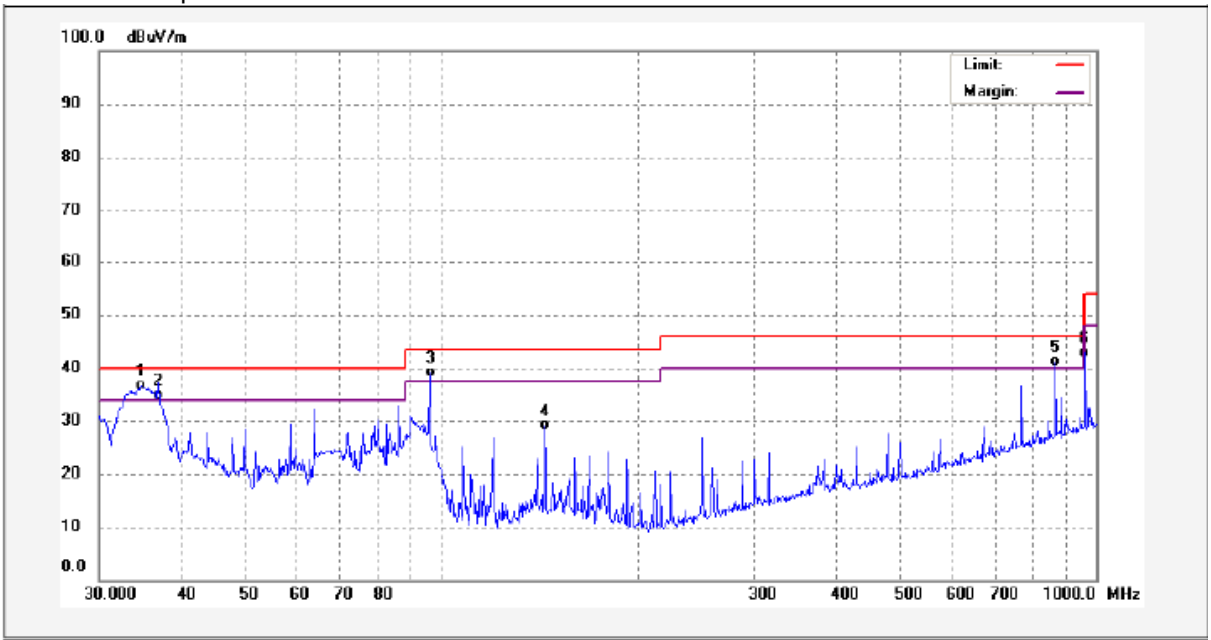
Test Mode: Transmit mode(5dBi antenna with 9m cable)

Test Specification: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	80.0806	60.72	-25.67	35.05	40.00	-4.95	QP	
2	96.0986	62.67	-24.98	37.69	43.50	-5.81	QP	
3	119.8556	56.14	-22.80	33.34	43.50	-10.16	QP	
4	167.8243	52.93	-21.11	31.82	43.50	-11.68	QP	
5	250.3012	49.19	-21.53	27.66	46.00	-18.34	QP	
6	962.1623	49.09	-4.24	44.85	54.00	-9.15	QP	

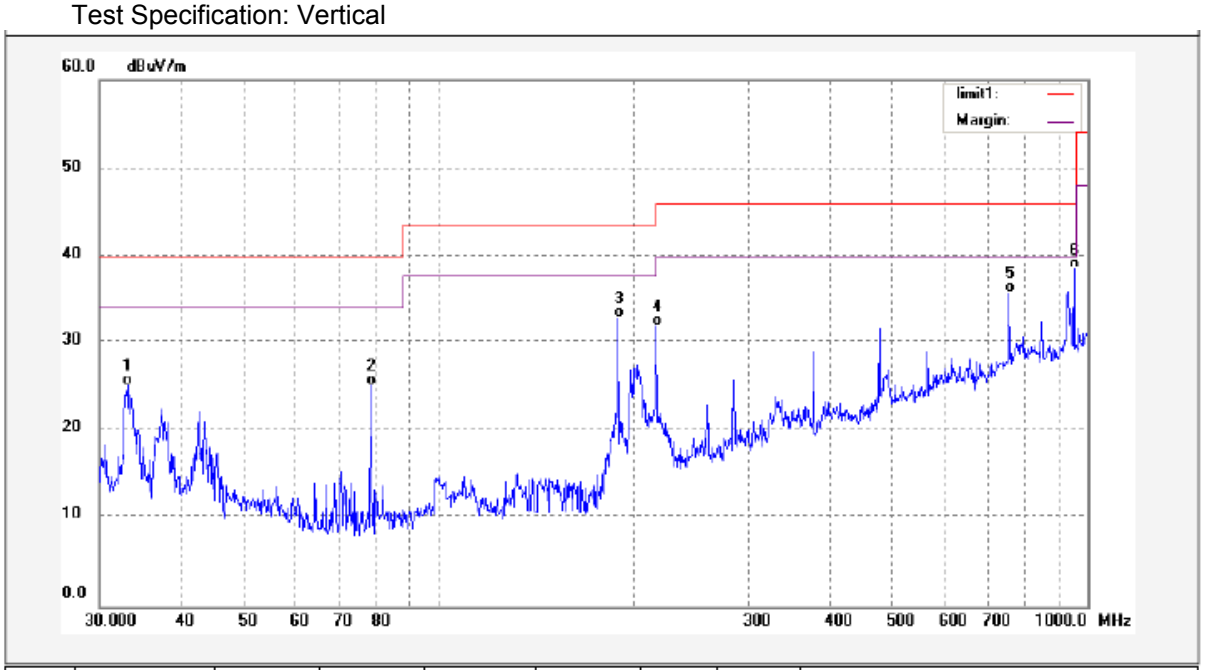
Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	34.7602	56.49	-19.94	36.55	40.00	-3.45	QP	
2	36.8953	55.33	-20.33	35.00	40.00	-5.00	QP	
3	96.0986	63.66	-24.48	39.18	43.50	-4.32	QP	
4	143.8295	50.25	-21.21	29.04	43.50	-14.46	QP	
5	866.0879	47.37	-6.29	41.08	46.00	-4.92	QP	
6	962.1623	47.32	-4.54	42.78	54.00	-11.22	QP	

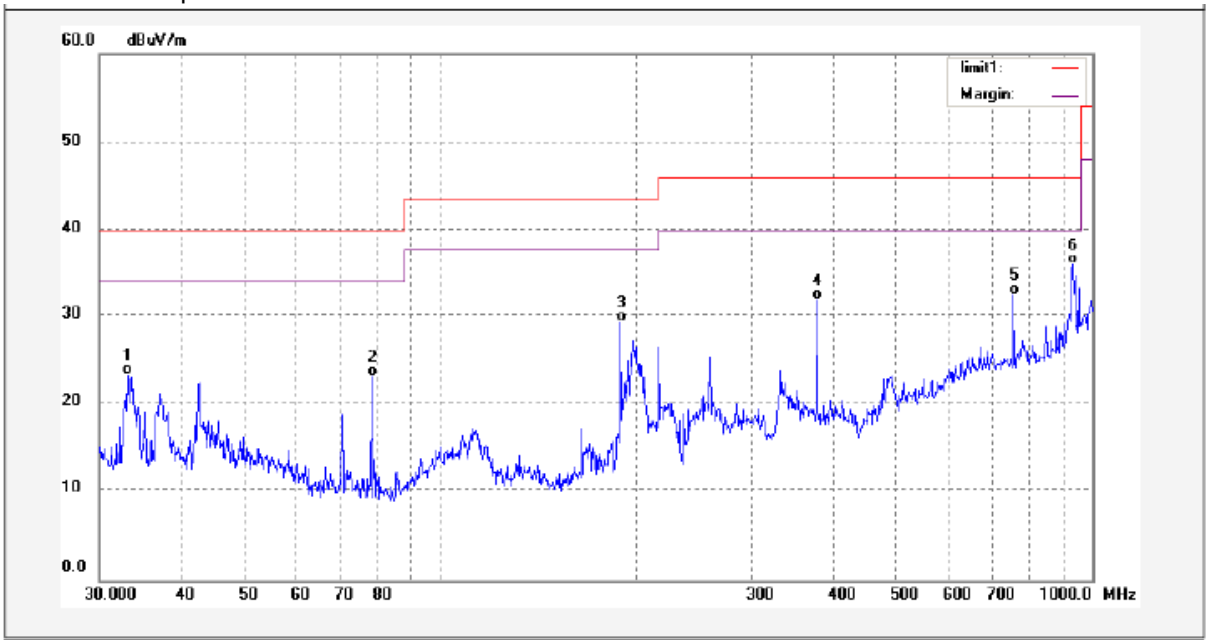
Test Mode:Transmit mode(5dBi antenna with 3m cable)

Test Specification: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.1015	8.59	16.60	25.19	40.00	-14.81	QP	
2	78.5645	15.85	9.21	25.06	40.00	-14.94	QP	
3	189.1076	19.18	13.60	32.78	43.50	-10.72	QP	
4	216.1197	17.22	14.72	31.94	46.00	-14.06	QP	
5	757.6201	8.06	27.50	35.56	46.00	-10.44	QP	
6	955.3509	7.55	30.97	38.52	46.00	-7.48	QP	

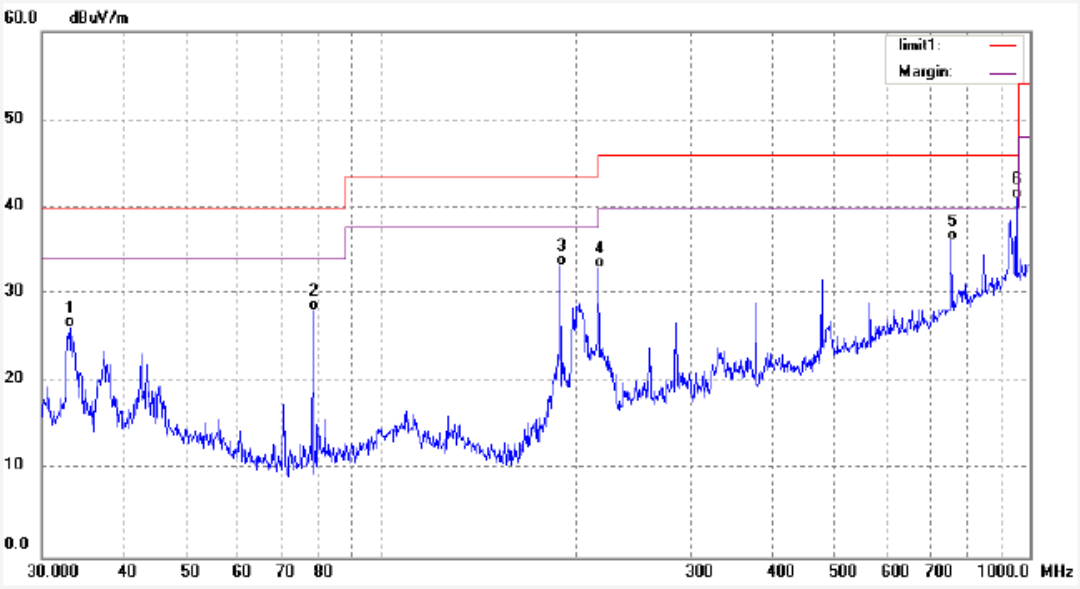
Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.1015	6.79	16.60	23.39	40.00	-16.61	QP	
2	78.5645	14.03	9.21	23.24	40.00	-16.76	QP	
3	189.1076	15.75	13.60	29.35	43.50	-14.15	QP	
4	377.8481	12.37	19.44	31.81	46.00	-14.19	QP	
5	757.6201	4.91	27.50	32.41	46.00	-13.59	QP	
6	935.4214	4.53	31.37	35.90	46.00	-10.10	QP	

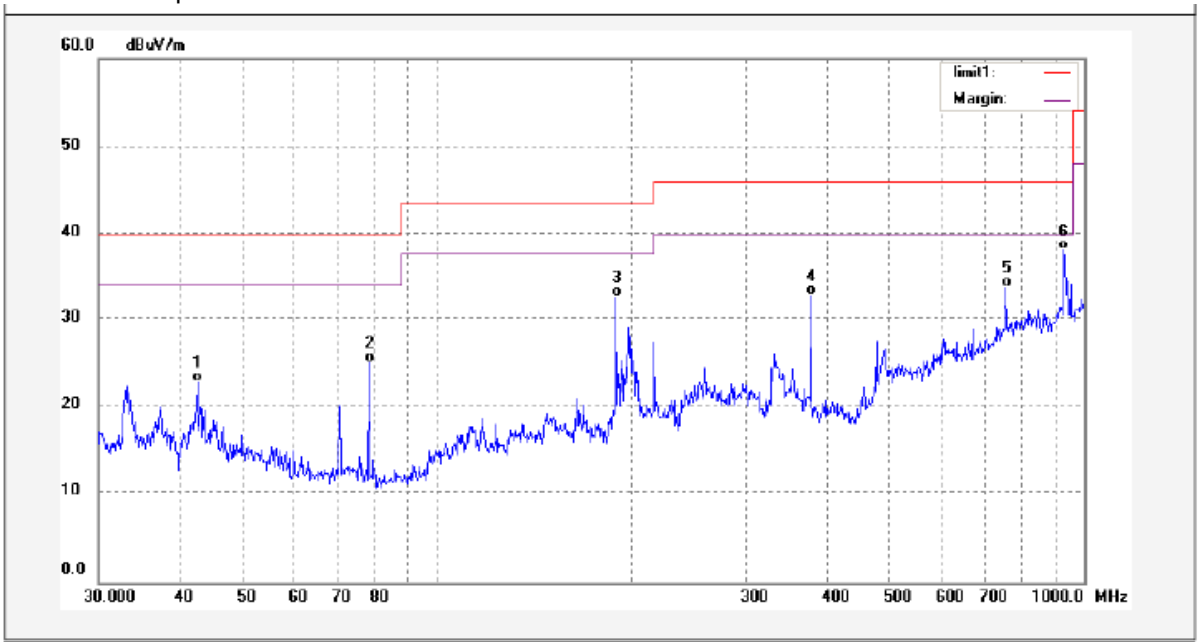
Test Mode: transmit mode(3dBi antenna)

Test Specification: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	33.1015	9.59	16.60	26.19	40.00	-13.81	QP	
2	78.5645	18.85	9.21	28.06	40.00	-11.94	QP	
3	189.1076	19.68	13.60	33.28	43.50	-10.22	QP	
4	216.1197	18.22	14.72	32.94	46.00	-13.06	QP	
5	757.6201	8.56	27.50	36.06	46.00	-9.94	QP	
6	955.3509	10.05	30.97	41.02	46.00	-4.98	QP	

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	42.6299	7.40	15.44	22.84	40.00	-17.16	QP	
2	78.5645	15.98	9.21	25.19	40.00	-14.81	QP	
3	189.1076	19.00	13.60	32.60	43.50	-10.90	QP	
4	377.8481	13.31	19.44	32.75	46.00	-13.25	QP	
5	757.6201	6.20	27.50	33.70	46.00	-12.30	QP	
6	932.1405	6.62	31.36	37.98	46.00	-8.02	QP	

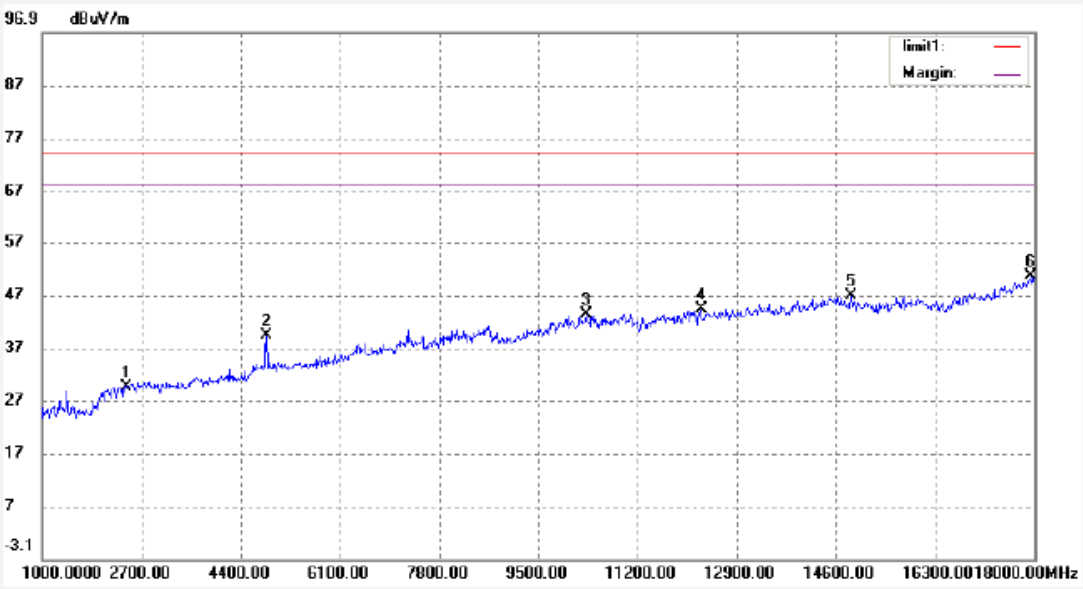
Test Frequency : 1GHz-18GHz (Remark: During testing with the 2.4GHz filter)

Test Mode: recording mode(5dBi antenna with 9m cable)

Test mode: Continuously Transmit

Modulation: Test Channel: 2414.25MHz

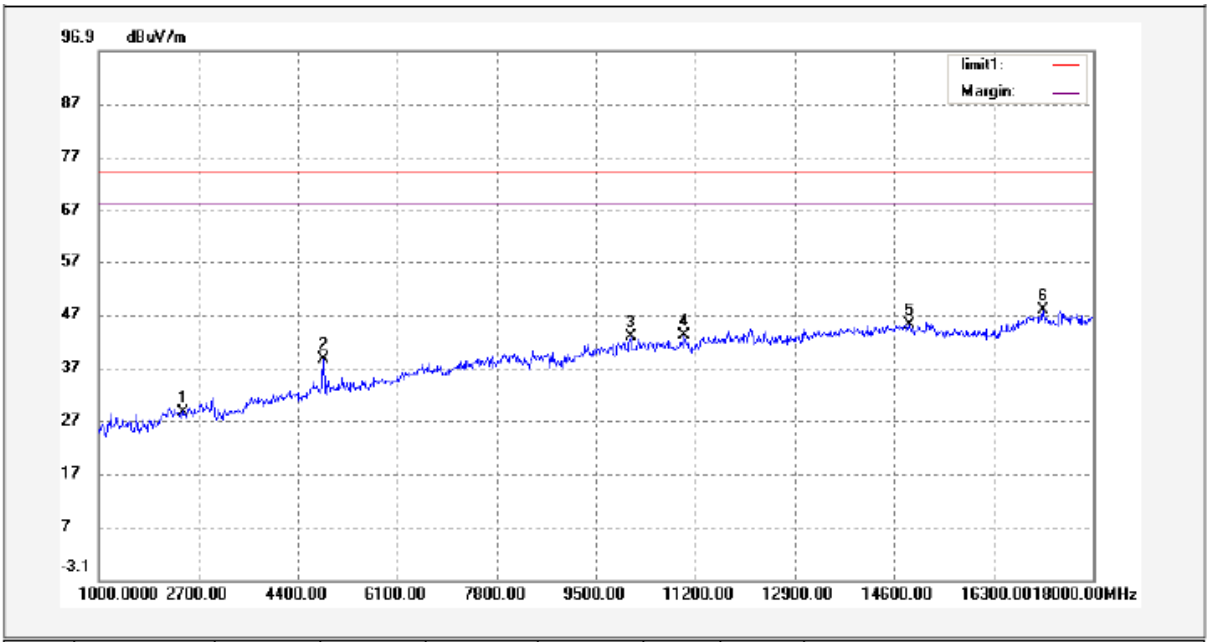
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2414.250	45.13	-15.62	29.51	74.00	-44.49	peak	
2	4828.500	51.11	-11.95	39.16	74.00	-34.84	peak	
3	10316.000	48.04	-4.66	43.38	74.00	-30.62	peak	
4	12288.000	48.92	-4.59	44.33	74.00	-29.67	peak	
5	14855.000	47.14	-0.32	46.82	74.00	-27.18	peak	
6	17949.000	44.20	6.31	50.51	74.00	-23.49	peak	

Remark:the marker 1 is the fundamental

Antenna polarization: Horizontal

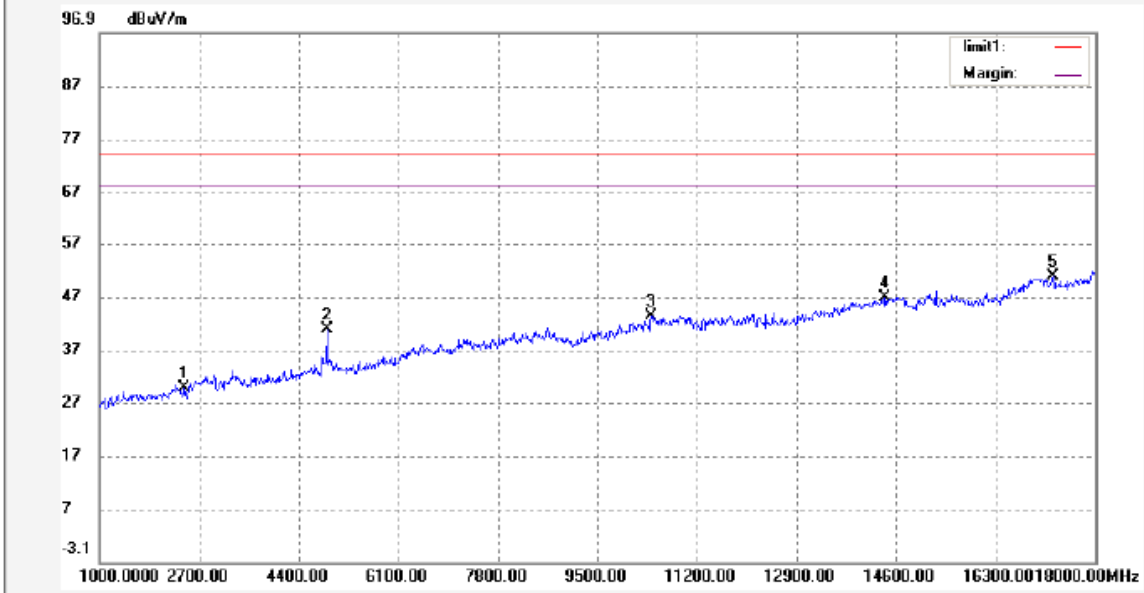


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2414.250	44.27	-15.62	28.65	74.00	-45.35	peak	
2	4828.500	50.38	-11.95	38.43	74.00	-35.57	peak	
3	10095.000	47.86	-5.17	42.69	74.00	-31.31	peak	
4	11013.000	46.56	-3.55	43.01	74.00	-30.99	peak	
5	14855.000	45.32	-0.32	45.00	74.00	-29.00	peak	
6	17150.000	47.05	0.62	47.67	74.00	-26.33	peak	

Remark:the marker 1 is the fundamental

Modulation: Test Channel: 2437.875MHz

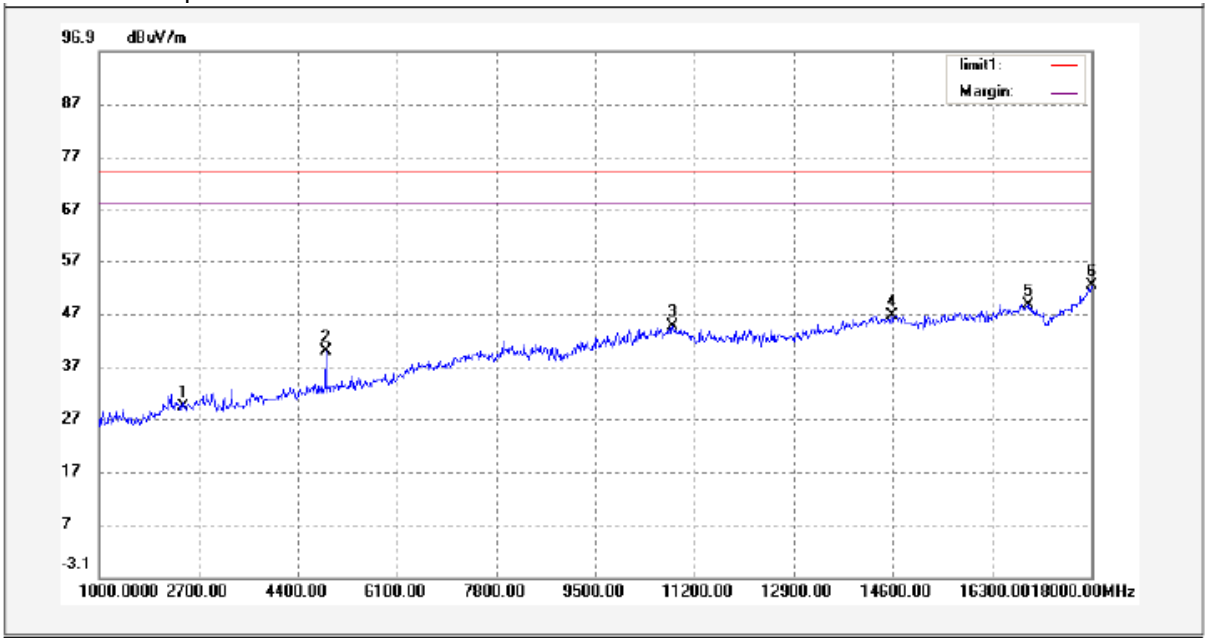
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2436.275	45.52	-15.69	29.83	74.00	-44.17	peak	
2	4875.750	52.70	-11.92	40.78	74.00	-33.22	peak	
3	10418.000	47.77	-4.39	43.38	74.00	-30.62	peak	
4	14413.000	46.39	0.41	46.80	74.00	-27.20	peak	
5	17286.000	49.73	1.05	50.78	74.00	-23.22	peak	

Remark:the marker 1 is the fundamental

Antenna polarization: Horizontal

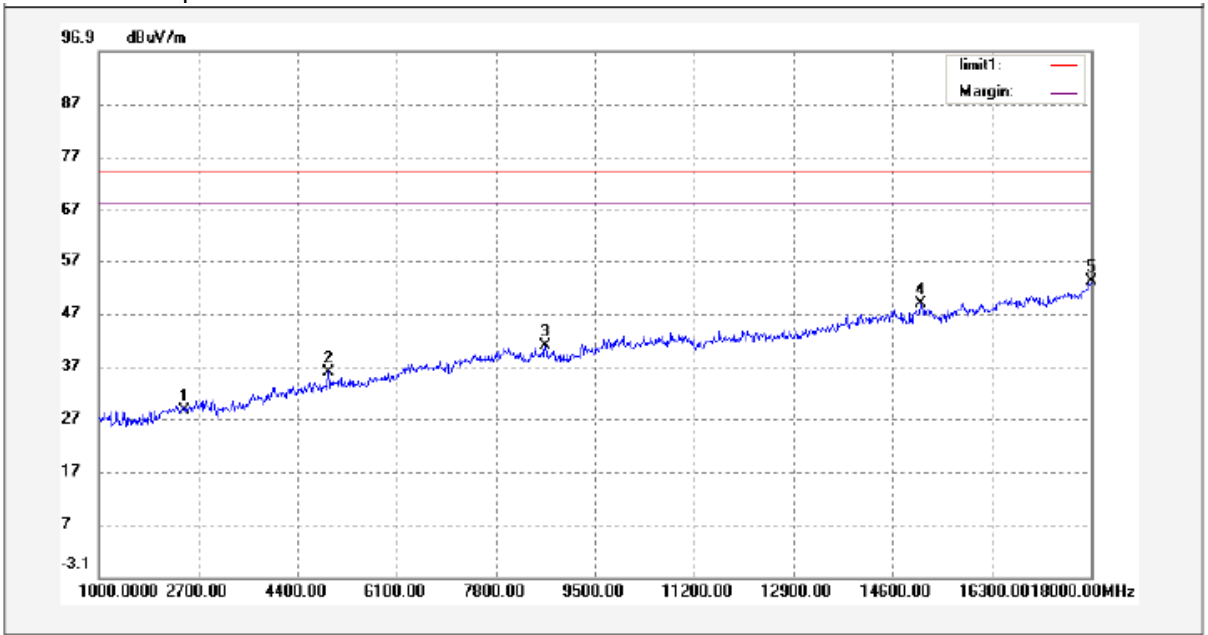


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2436.275	44.98	-15.69	29.29	74.00	-44.71	peak	
2	4875.750	51.80	-11.92	39.88	74.00	-34.12	peak	
3	10826.000	48.36	-3.74	44.62	74.00	-29.38	peak	
4	14583.000	46.12	0.46	46.58	74.00	-27.42	peak	
5	16929.000	48.28	0.24	48.52	74.00	-25.48	peak	
6	18000.000	45.15	7.08	52.23	74.00	-21.77	peak	

Remark:the marker 1 is the fundamental

Modulation: Test Channel: 2461MHz

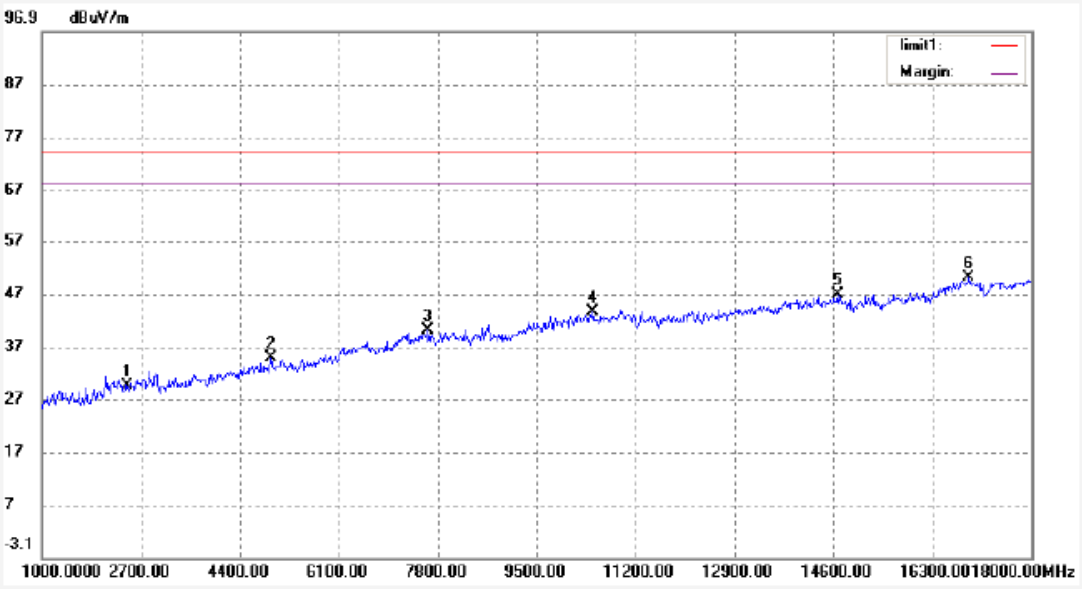
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	44.15	-15.70	28.45	74.00	-45.55	peak	
2	4923.000	47.73	-11.83	35.90	74.00	-38.10	peak	
3	8650.000	47.43	-6.61	40.82	74.00	-33.18	peak	
4	15076.000	50.11	-1.34	48.77	74.00	-25.23	peak	
5	18000.000	45.87	7.08	52.95	74.00	-21.05	peak	

Remark:the marker 1 is the fundamental

Antenna polarization: Horizontal



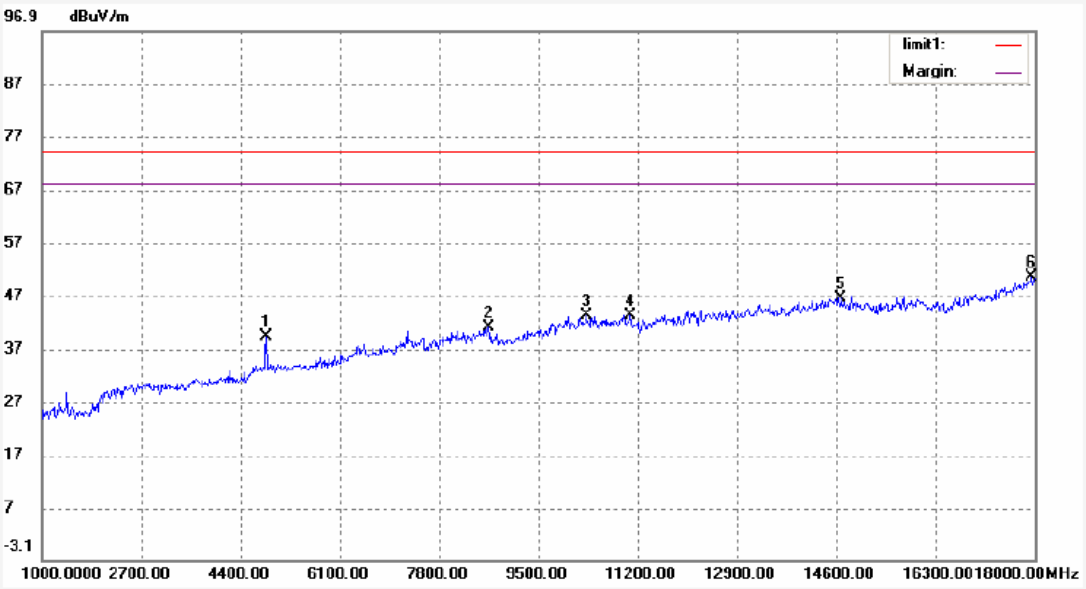
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	45.20	-15.70	29.50	74.00	-44.50	peak	
2	4923.000	46.67	-11.83	34.84	74.00	-39.16	peak	
3	7630.000	47.03	-6.94	40.09	74.00	-33.91	peak	
4	10469.000	47.70	-4.26	43.44	74.00	-30.56	peak	
5	14668.000	46.42	0.33	46.75	74.00	-27.25	peak	
6	16929.000	49.68	0.24	49.92	74.00	-24.08	peak	

Test Mode: recording mode(5dBi antenna with 3m cable)

Test mode: Continuously Transmit

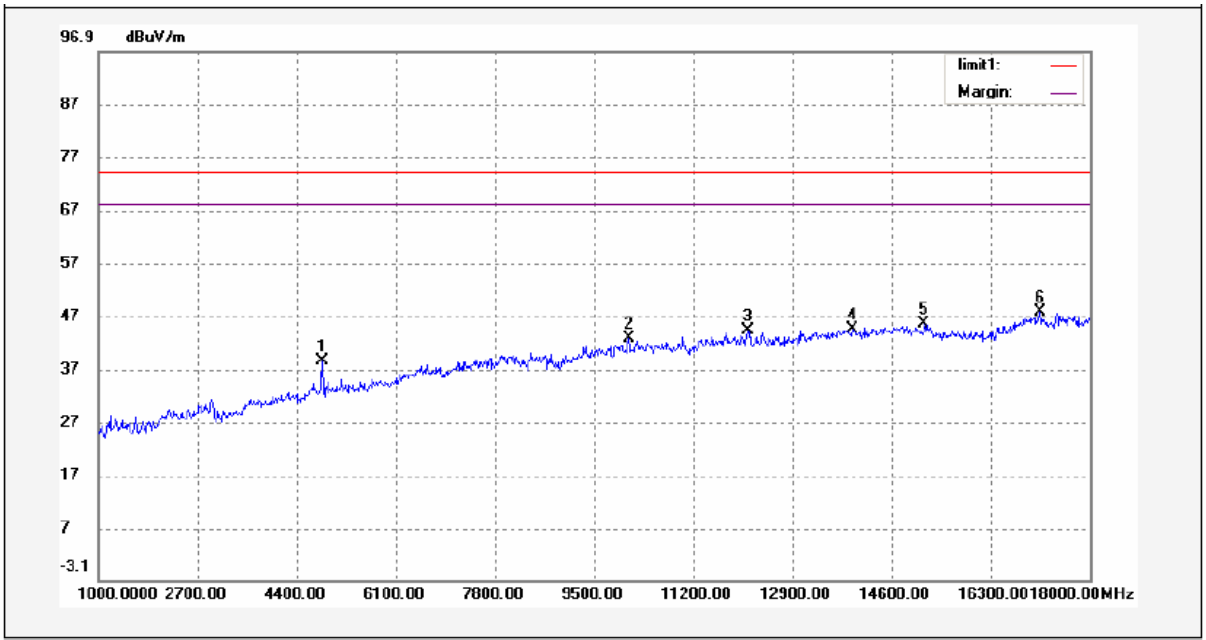
Modulation: Test Channel: 2414.25MHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4842.000	51.11	-11.95	39.16	74.00	-34.84	peak	
2	8650.000	47.59	-6.61	40.98	74.00	-33.02	peak	
3	10316.000	48.04	-4.66	43.38	74.00	-30.62	peak	
4	11081.000	47.13	-3.73	43.40	74.00	-30.60	peak	
5	14685.000	46.27	0.29	46.56	74.00	-27.44	peak	
6	17949.000	44.20	6.31	50.51	74.00	-23.49	peak	

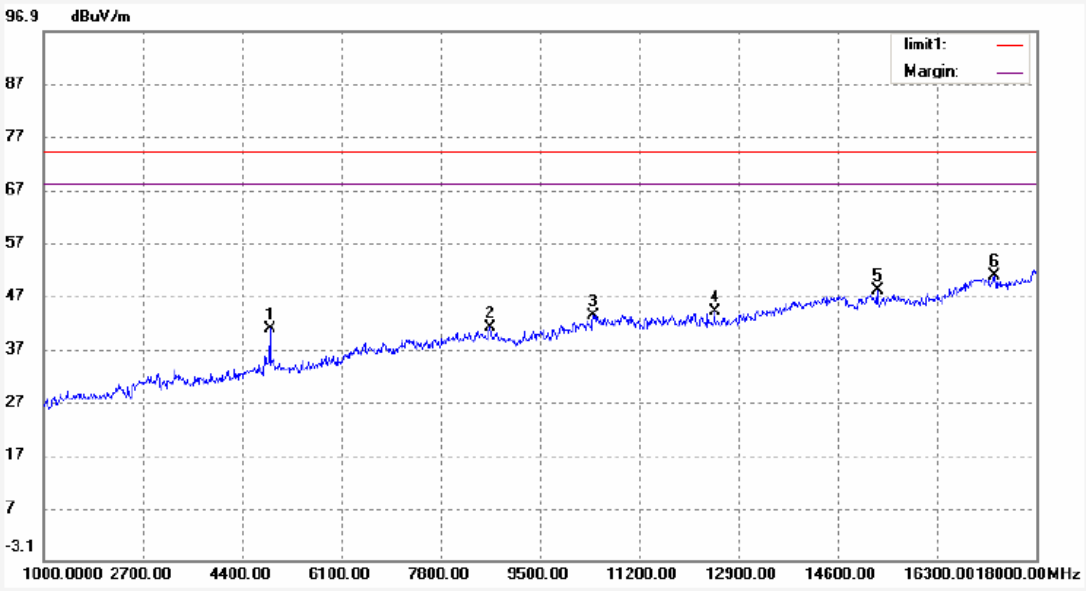
Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4842.000	50.38	-11.95	38.43	74.00	-35.57	peak	
2	10095.000	47.86	-5.17	42.69	74.00	-31.31	peak	
3	12135.000	48.56	-4.39	44.17	74.00	-29.83	peak	
4	13920.000	45.65	-1.05	44.60	74.00	-29.40	peak	
5	15161.000	47.36	-1.73	45.63	74.00	-28.37	peak	
6	17150.000	47.05	0.62	47.67	74.00	-26.33	peak	

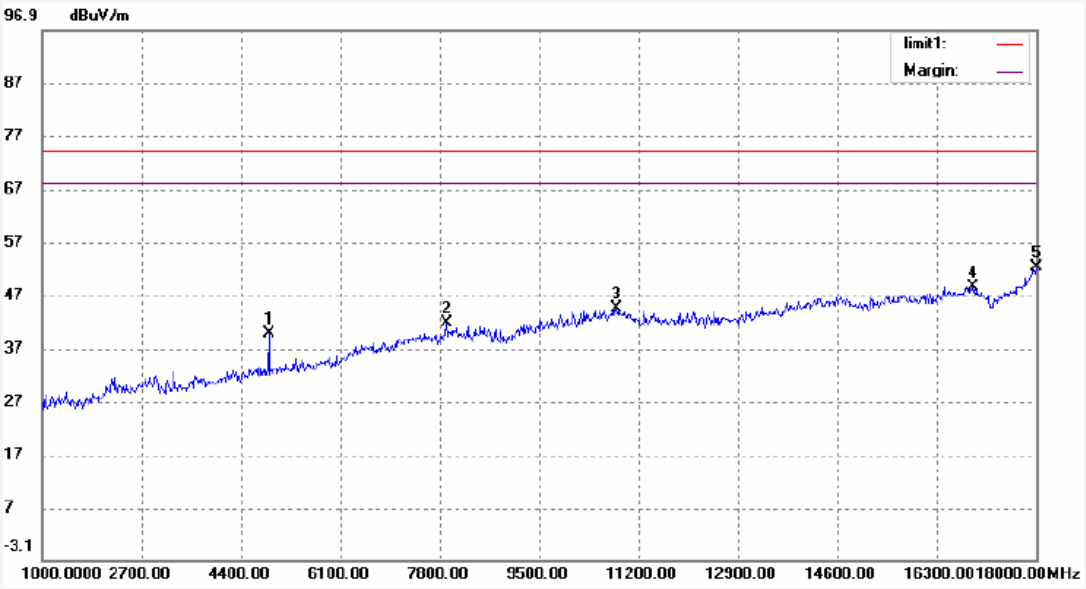
Modulation: Test Channel: 2437.875MHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4876.000	52.70	-11.92	40.78	74.00	-33.22	peak	
2	8650.000	47.63	-6.61	41.02	74.00	-32.98	peak	
3	10418.000	47.77	-4.39	43.38	74.00	-30.62	peak	
4	12492.000	48.81	-4.81	44.00	74.00	-30.00	peak	
5	15280.000	50.35	-2.35	48.00	74.00	-26.00	peak	
6	17286.000	49.73	1.05	50.78	74.00	-23.22	peak	

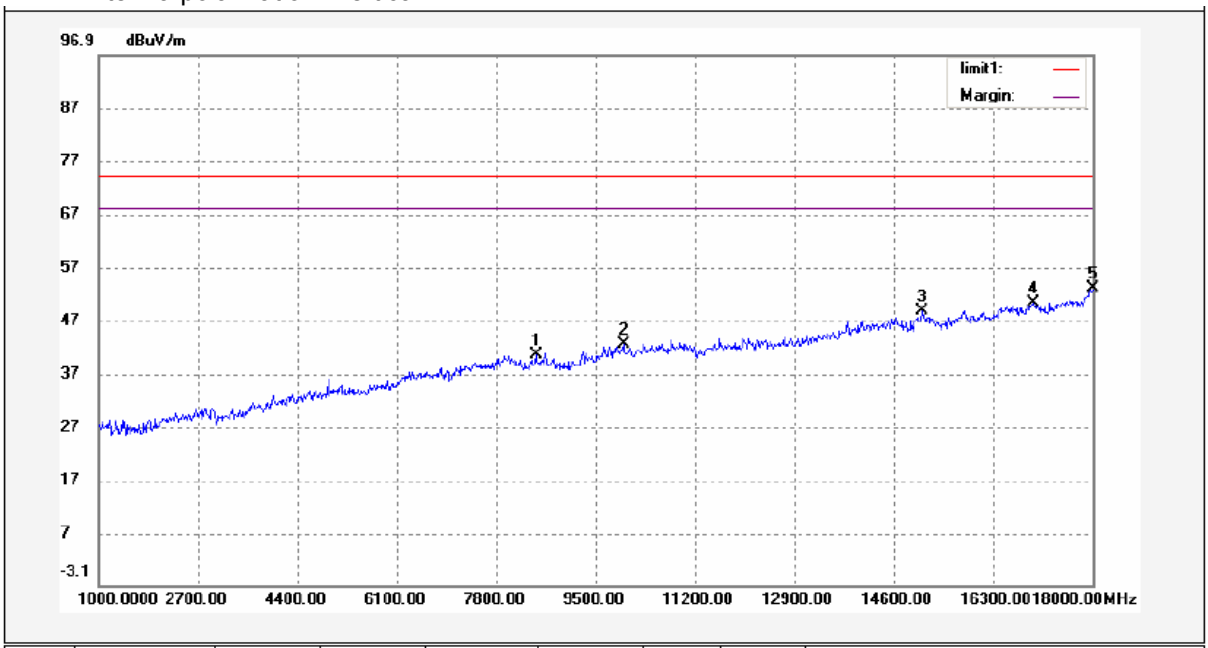
Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	4876.000	51.80	-11.92	39.88	74.00	-34.12	peak	
2	7919.000	47.98	-6.28	41.70	74.00	-32.30	peak	
3	10826.000	48.36	-3.74	44.62	74.00	-29.38	peak	
4	16929.000	48.28	0.24	48.52	74.00	-25.48	peak	
5	18000.000	45.15	7.08	52.23	74.00	-21.77	peak	

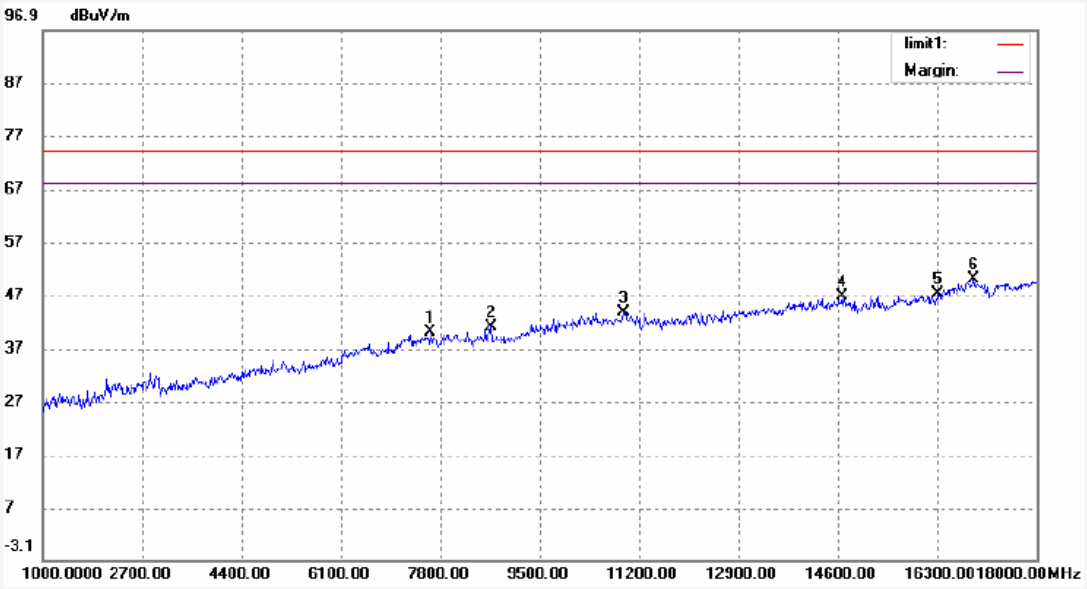
Modulation: Test Channel: 2461MHz

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	8480.000	47.33	-6.92	40.41	74.00	-33.59	peak	
2	9976.000	47.86	-5.22	42.64	74.00	-31.36	peak	
3	15076.000	50.11	-1.34	48.77	74.00	-25.23	peak	
4	16997.000	49.86	0.44	50.30	74.00	-23.70	peak	
5	18000.000	45.87	7.08	52.95	74.00	-21.05	peak	

Antenna polarization: Horizontal



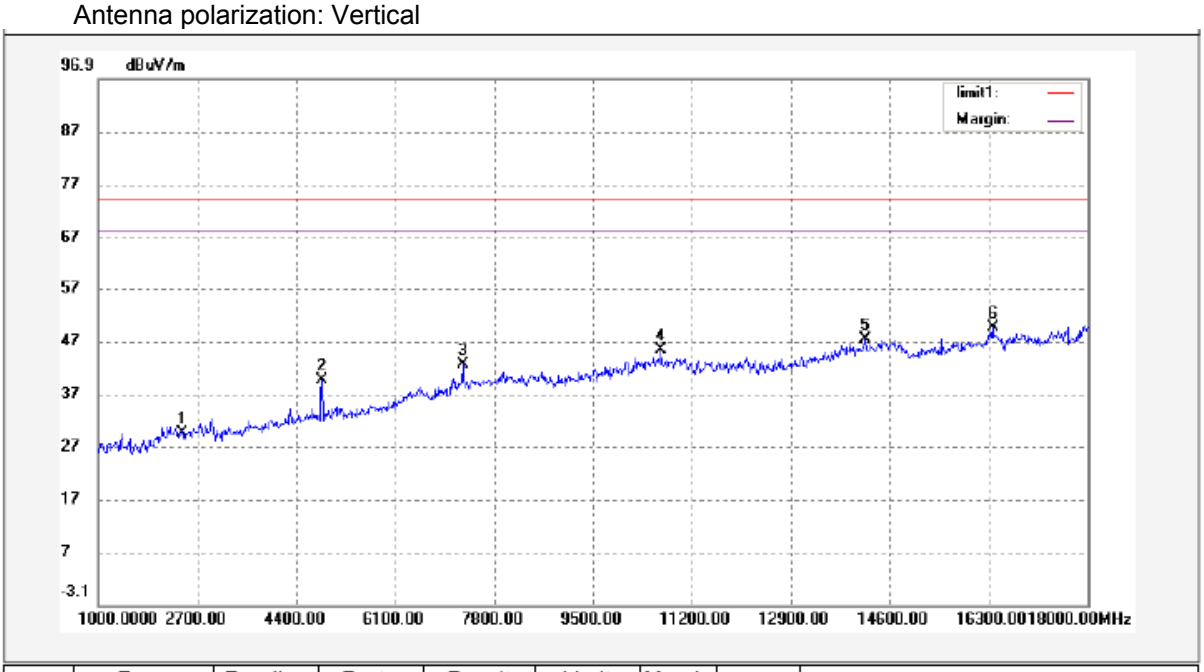
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	7630.000	47.03	-6.94	40.09	74.00	-33.91	peak	
2	8667.000	47.86	-6.88	40.98	74.00	-33.02	peak	
3	10945.000	47.18	-3.48	43.70	74.00	-30.30	peak	
4	14668.000	46.42	0.33	46.75	74.00	-27.25	peak	
5	16317.000	49.90	-2.59	47.31	74.00	-26.69	peak	
6	16929.000	49.68	0.24	49.92	74.00	-24.08	peak	

Test Mode: recording mode(3dBi antenna)

Test mode: Continuously Transmit

Modulation: Test Channel: 2414.25MHz

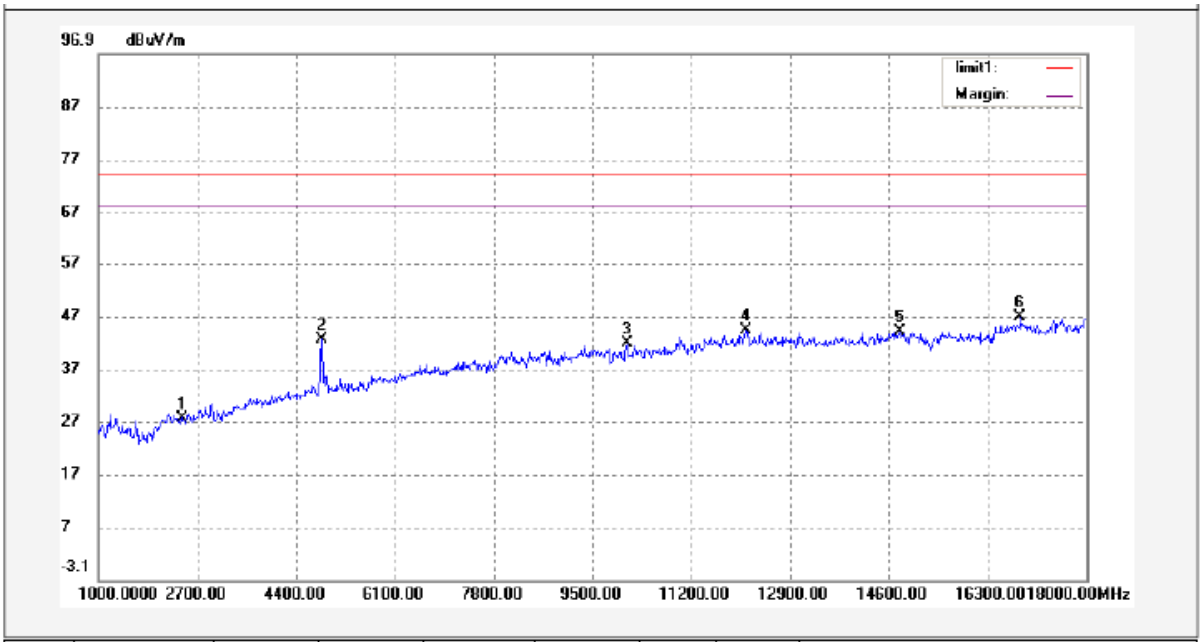
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2414.250	45.19	-15.62	29.57	74.00	-44.43	peak	
2	4828.500	51.37	-11.95	39.42	74.00	-34.58	peak	
3	7242.750	49.76	-7.15	42.61	74.00	-31.39	peak	
4	10673.000	49.52	-4.12	45.40	74.00	-28.60	peak	
5	14175.000	47.38	-0.15	47.23	74.00	-26.77	peak	
6	16368.000	51.82	-2.41	49.41	74.00	-24.59	peak	

Remark:the marker 1 is the fundamental

Antenna polarization: Horizontal

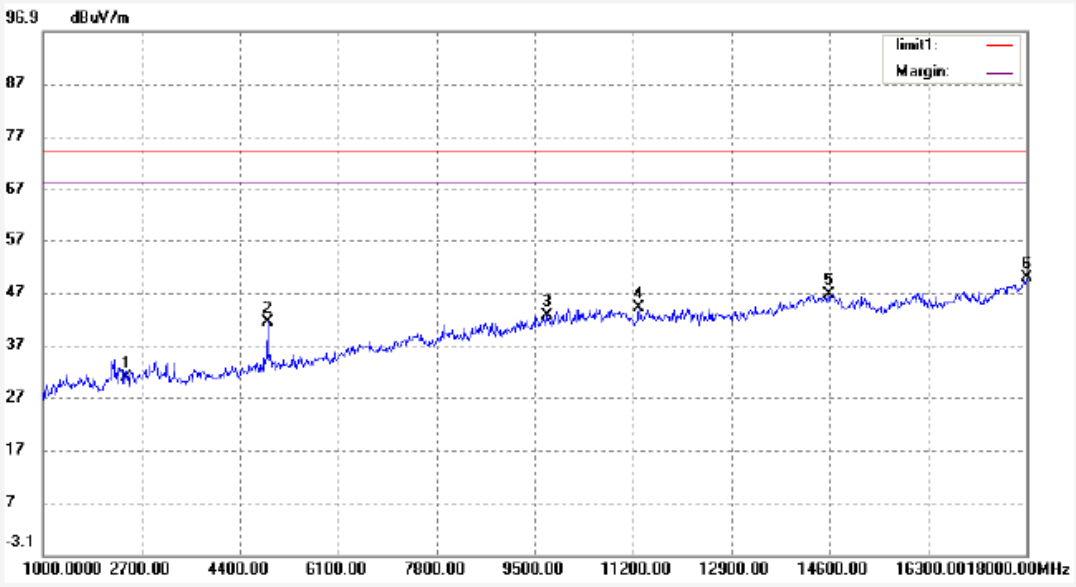


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2414.250	43.27	-15.62	27.65	74.00	-46.35	peak	
2	4828.500	54.38	-11.95	42.43	74.00	-31.57	peak	
3	10095.000	46.86	-5.17	41.69	74.00	-32.31	peak	
4	12135.000	48.56	-4.39	44.17	74.00	-29.83	peak	
5	14787.000	43.99	-0.03	43.96	74.00	-30.04	peak	
6	16861.000	46.83	-0.03	46.80	74.00	-27.20	peak	

Remark:the marker 1 is the fundamental

Modulation: Test Channel: 2437.875MHz

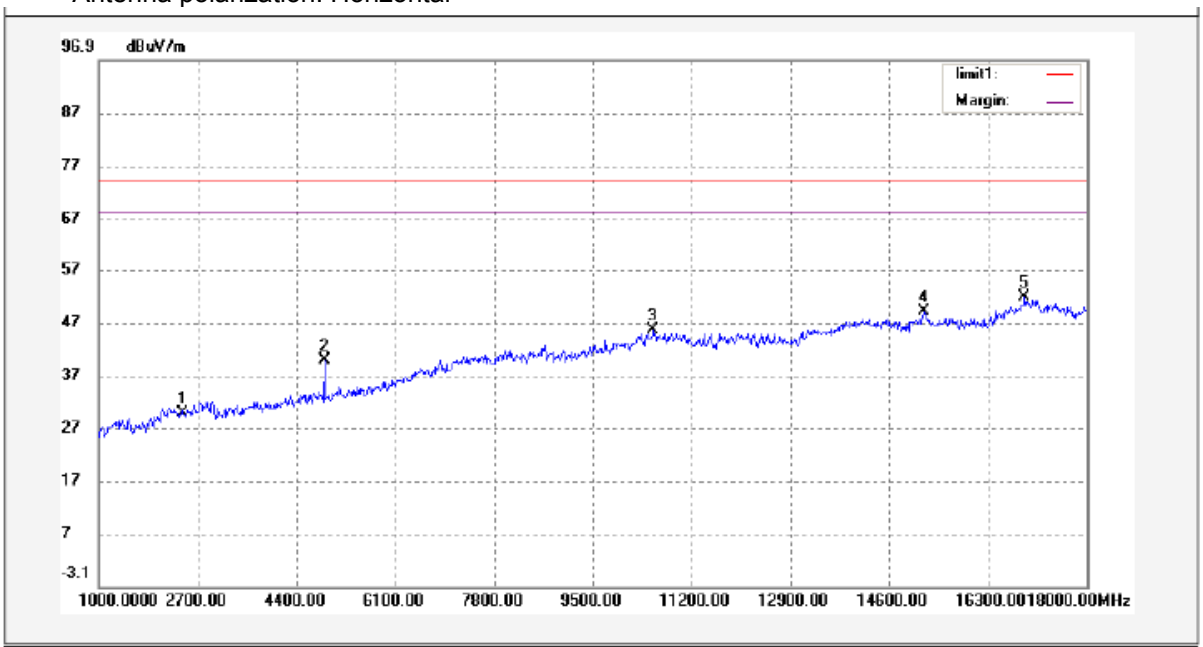
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2436.275	46.48	-15.69	30.79	74.00	-43.21	peak	
2	4875.750	53.30	-11.92	41.38	74.00	-32.62	peak	
3	9704.000	47.91	-5.49	42.42	74.00	-31.58	peak	
4	11302.000	48.01	-4.05	43.96	74.00	-30.04	peak	
5	14583.000	46.12	0.46	46.58	74.00	-27.42	peak	
6	18000.000	42.65	7.08	49.73	74.00	-24.27	peak	

Remark:the marker 1 is the fundamental

Antenna polarization: Horizontal

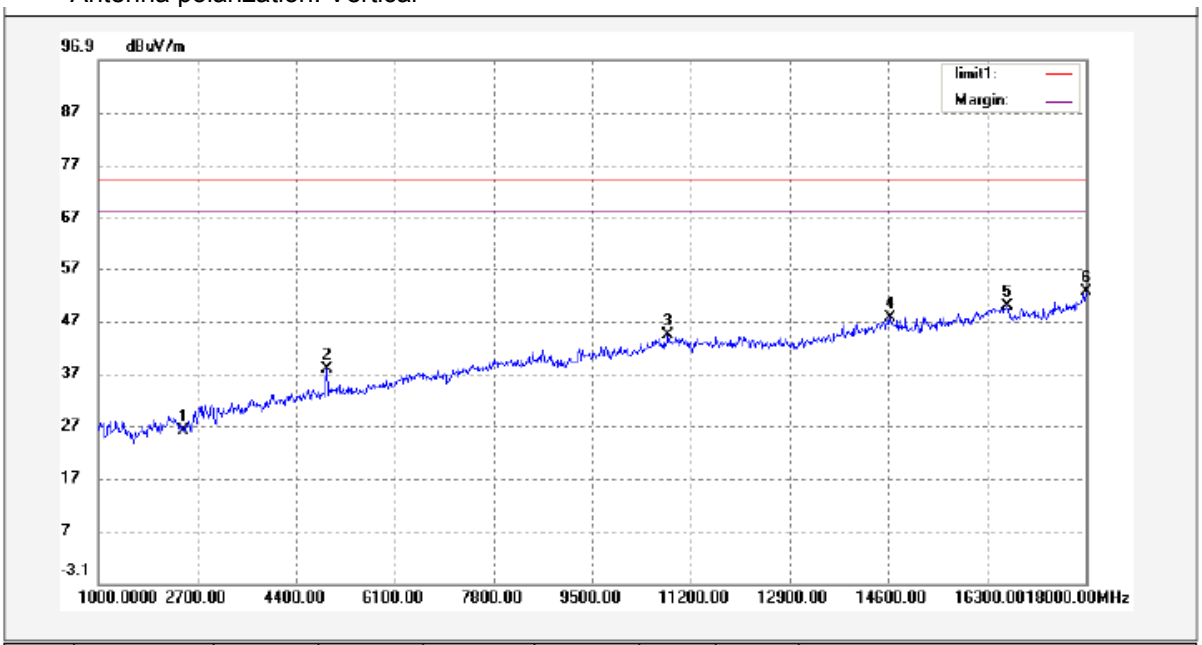


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2437.875	45.47	-15.69	29.78	74.00	-44.22	peak	
2	4875.750	51.62	-11.92	39.70	74.00	-34.30	peak	
3	10537.000	49.76	-4.15	45.61	74.00	-28.39	peak	
4	15195.000	50.97	-1.91	49.06	74.00	-24.94	peak	
5	16929.000	51.59	0.24	51.83	74.00	-22.17	peak	

Remark:the marker 1 is the fundamental

Modulation: Test Channel: 2461MHz

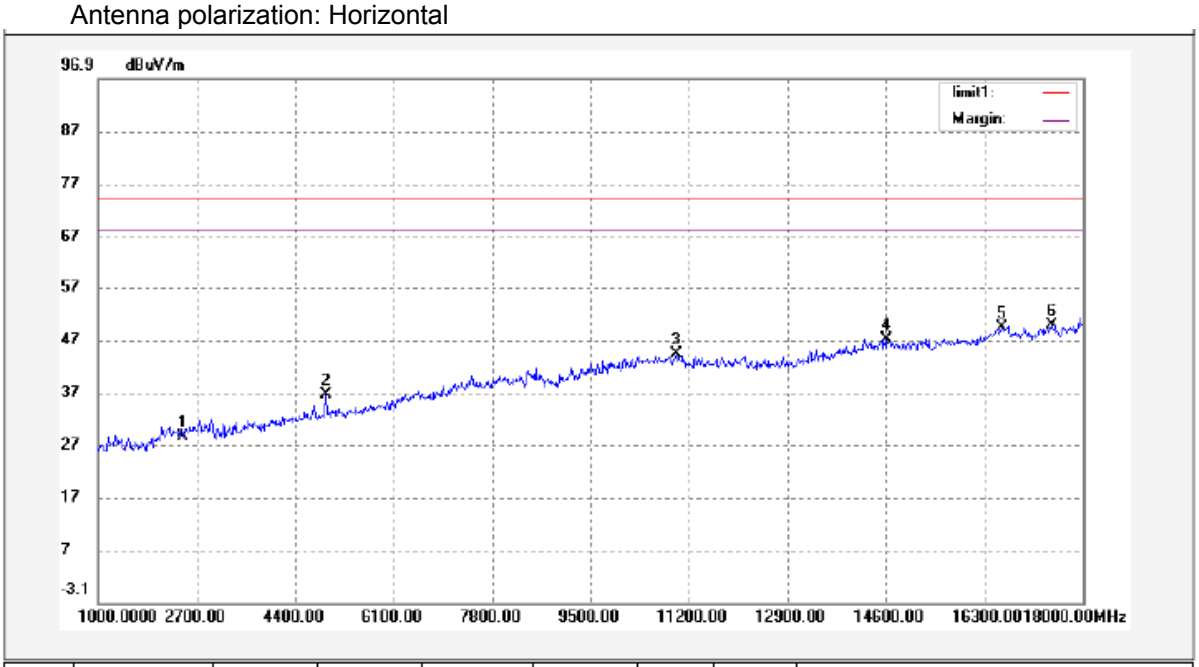
Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	41.65	-15.70	25.95	74.00	-48.05	peak	
2	4923.000	49.73	-11.83	37.90	74.00	-36.10	peak	
3	10809.000	47.97	-3.79	44.18	74.00	-29.82	peak	
4	14634.000	47.21	0.39	47.60	74.00	-26.40	peak	
5	16657.000	50.93	-1.07	49.86	74.00	-24.14	peak	
6	18000.000	45.37	7.08	52.45	74.00	-21.55	peak	

Remark:the marker 1 is the fundamental

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	44.24	-15.70	28.54	74.00	-45.46	peak	
2	4923.000	48.43	-11.83	36.60	74.00	-37.40	peak	
3	10979.000	47.90	-3.50	44.40	74.00	-29.60	peak	
4	14617.000	46.57	0.41	46.98	74.00	-27.02	peak	
5	16606.000	50.64	-1.35	49.29	74.00	-24.71	peak	
6	17473.000	47.61	2.23	49.84	74.00	-24.16	peak	

Remark:the marker 1 is the fundamental

Test Frequency: Above 18GHz(Remark: During testing with the 2.4GHz filter)

The measurements were more than 20 dB below the limit. The channels 2414.25MHz, 2437.875MHz, 2461.5MHz were tested. test Channel 2437.875M MHz data was the worse, so the worst mode were shown as follow.

Test Frequency Range: 18GHz ~ 25GHz

Test Mode:Continuous Transmitting(5dBi antenna with 9m cable)

And the below is the Fundamental and Harmonic

Frequency(MHz)	Detector	Antenna Polarization	EmissionLevel(dBuV/m)	Limit(dBuV/m)	Margin(dB)	AntennaHeight(m)	Turntable Angle(°)
Middle frequency							
19488	PK	Vertical	52.25	74	-21.75	1.2	178
21924	PK	Vertical	53.52	74	-20.48	1.1	228
24360	PK	Vertical	50.02	74	-23.98	1.4	38
19488	PK	Horizontal	40.17	74	-33.83	1.8	138
21924	PK	Horizontal	46.52	74	-27.48	1.3	208
24360	PK	Horizontal	52.07	74	-21.93	1.6	247

Test Mode:Continuous Transmitting(5dBi antenna with 3m cable)

And the below is the Fundamental and Harmonic

Frequency(MHz)	Detector	AntennaPolarization	EmissionLevel(dBuV/m)	Limit(dBuV/m)	Margin(dB)	AntennaHeight(m)	TurntableAngle(°)
Middle frequency							
19488	PK	Vertical	53.08	74	-20.92	1.4	34
21924	PK	Vertical	52.13	74	-21.87	1.6	137
24360	PK	Vertical	50.27	74	-23.73	1.7	168
19488	PK	Horizontal	38.28	74	-35.72	1.3	89
21924	PK	Horizontal	43.64	74	-30.36	1.3	273
24360	PK	Horizontal	48.22	74	-25.78	1.4	35

Test Mode:Continuous Transmitting(3dBi antenna)

And the below is the Fundamental and Harmonic

Frequency(MHz)	Detector	AntennaPolarization	EmissionLevel(dBuV/m)	Limit(dBuV/m)	Margin(dB)	AntennaHeight(m)	TurntableAngle(°)
Middle frequency							
19488	PK	Vertical	53.44	74	-20.56	1.4	220
21924	PK	Vertical	50.27	74	-23.73	1.7	107
24360	PK	Vertical	39.27	74	-34.73	1.3	165
19488	PK	Horizontal	40.21	74	-33.79	1.8	103
21924	PK	Horizontal	39.26	74	-34.74	1.4	123
24360	PK	Horizontal	40.03	74	-33.97	1.8	237

8 Duty Cycle

Test Requirement: FCC Part 15.35

Test Mothed: ANSI C63.4:2003

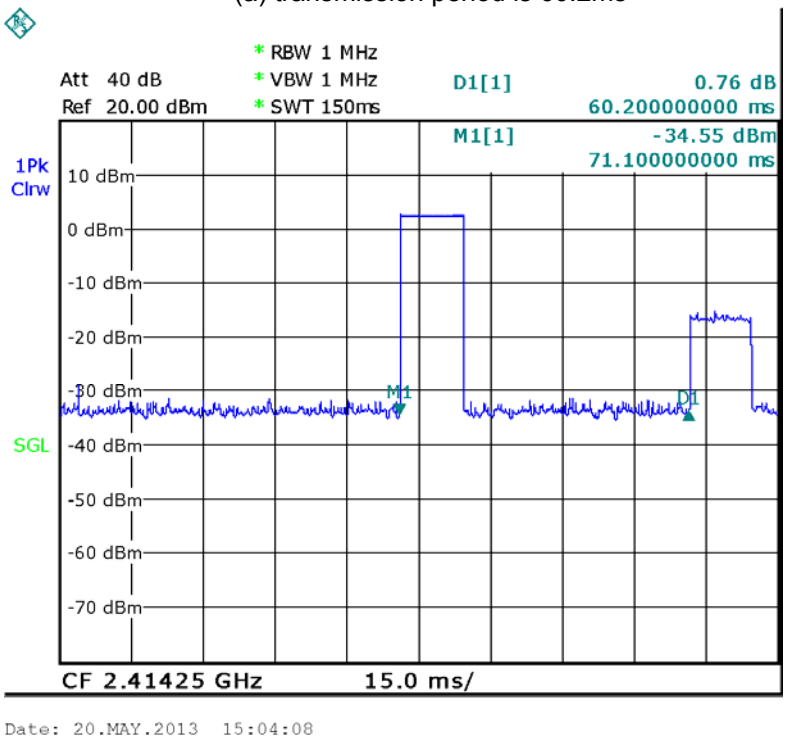
Test Status: TX mode.

8.1 Test Procedure

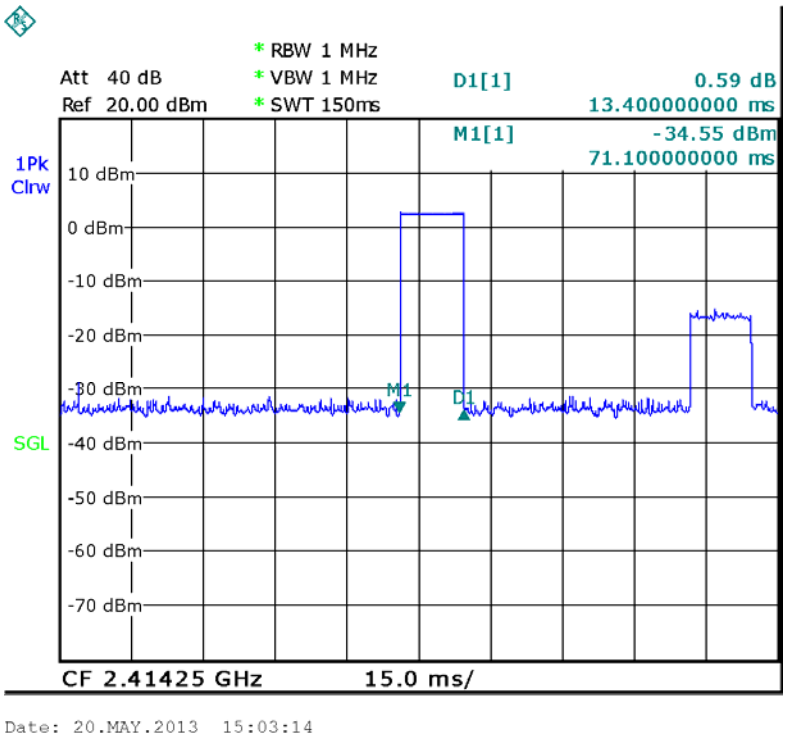
1. The EUT was placed on a turntable which is 0.8m above ground plane
2. Set EUT as normal working mode
3. Set SPA center frequency = fundamental frequency, RBW = 100 kHz, VBW = 100 kHz, Span = 0 Hz, Adjacent sweep time.

8.2 Test Result

(a) transmission period is 60.2ms



(b)Single pulse time is 13.4ms



The EUT is auto. operation for transmitter，it is declared by the manufacturer as a duty cycle ratio of less than 100%.

The EUT's work time : T_{on} =pulse time=13.4 ms

The EUT's work period :$T=T_{ON}+T_{OFF}$= transmission period =60.2 ms

The EUT's duty cycle : $D = T_{on} /T$ = 13.4/60.2*100% =22.26%

Duty Cycle Correction Factor(dB)=20 * Log_{10}(Duty Cycle)=20* Log_{10}(22.26 %)

= -13dB

9 Band Edge Measurement

Test Requirement:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method:	DA 00-705
Measurement Distance:	3m
Limit:	40.0 dBuV/m between 30MHz & 88MHz; 43.5 dBuV/m between 88MHz & 216MHz; 46.0 dBuV/m between 216MHz & 960MHz; 54.0 dBuV/m above 960MHz. 74.0 dBuV/m for peak above 1GHz 54.0 dBuV/m for AVG above 1GHz
Detector:	For Peak value: RBW = 1 MHz for f ≥ 1 GHz VBW ≥ RBW; Sweep = auto Detector function = peak Trace = max hold For AVG value: RBW = 1 MHz for f ≥ 1 GHz VBW = 10Hz; Sweep = auto Detector function = AVG Trace = max hold

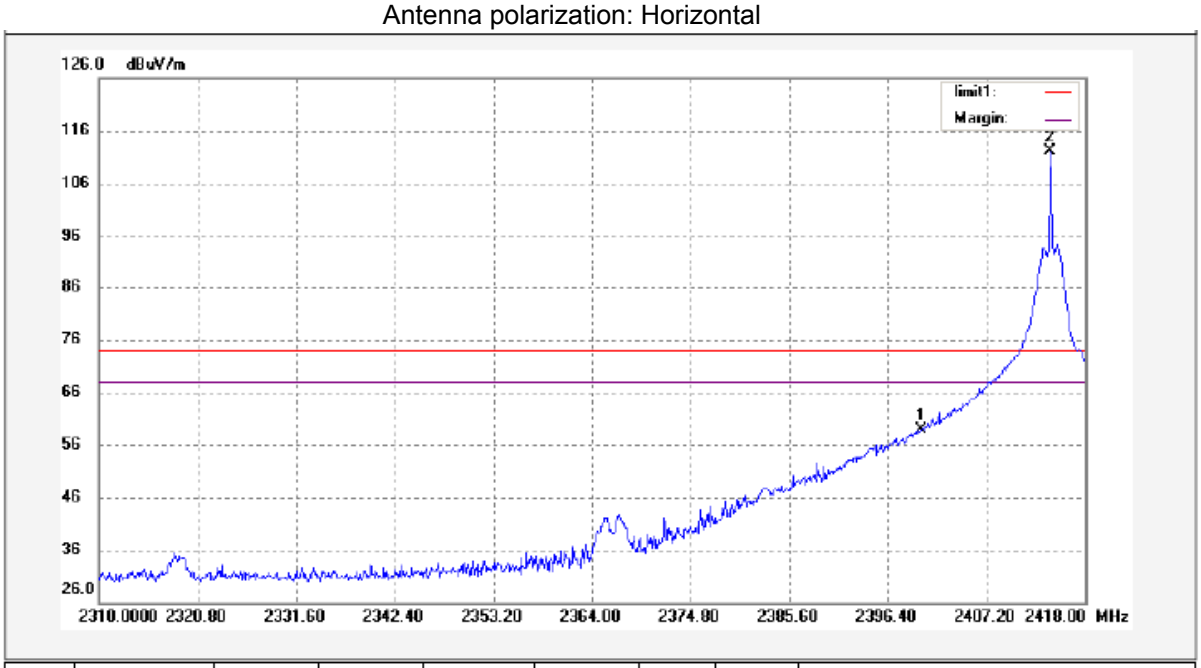
9.1 Test Result(Continuous transmitting)

5dBi antenna with 9m cable:

Low Channel – Peak

Test frequency range:from 2.310 GHz to 2.418GHz

Antenna polarization: Horizontal



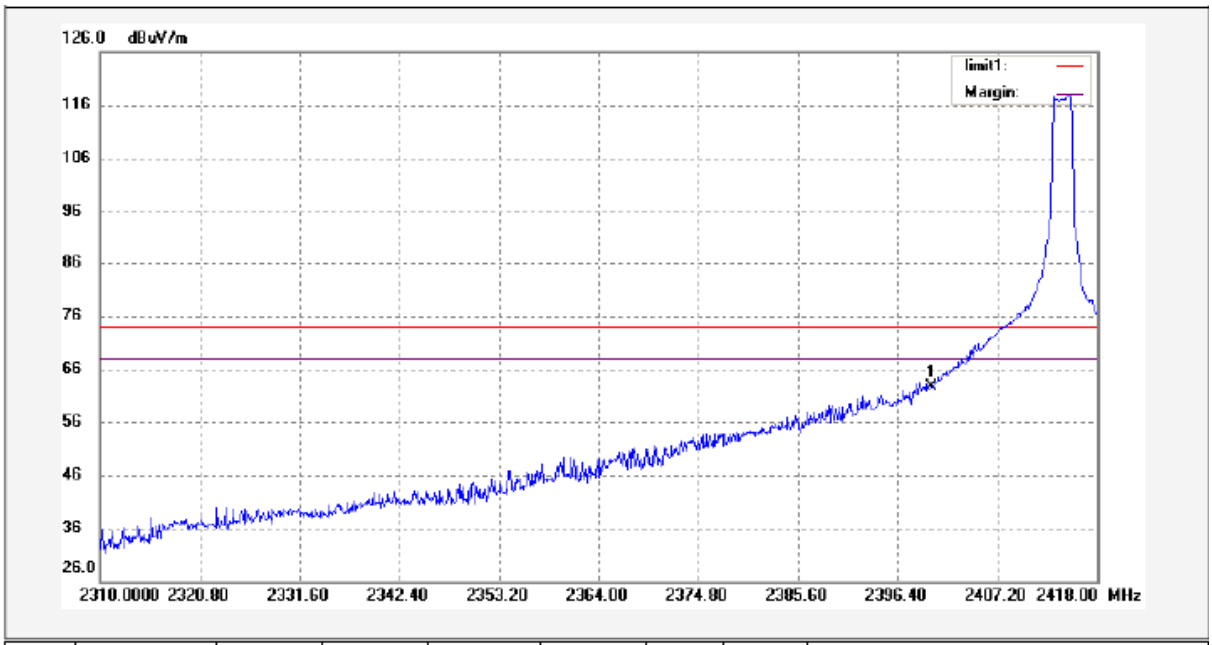
Re

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	74.36	-15.58	58.78	74.00	-15.22	peak	
2	2414.220	127.79	-15.62	112.17	74.00	38.17	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	45.78	54.00	-8.22	AV	
2	2414.000	-13	99.17	54.00	45.17	AV	

Remark:the marker 2 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	78.25	-15.58	62.67	74.00	-11.33	peak	
2	2414.976	133.29	-15.63	117.66	74.00	43.66	peak	

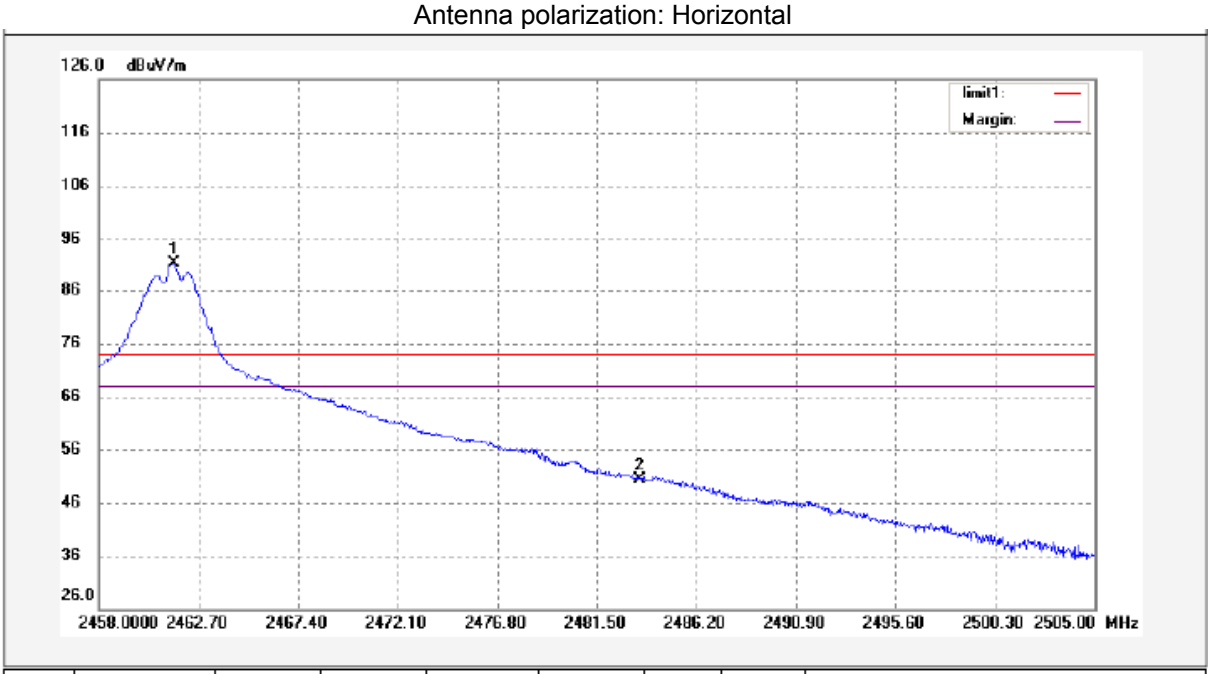
No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	49.67	54.00	-4.33	AV	
2	2414.000	-13	104.66	54.00	50.66	AV	

Remark:the marker 2 is the fundamental

Upper Channel – Peak

Test frequency range:from 2.458 GHz to 2.505 GHz

Antenna polarization: Horizontal

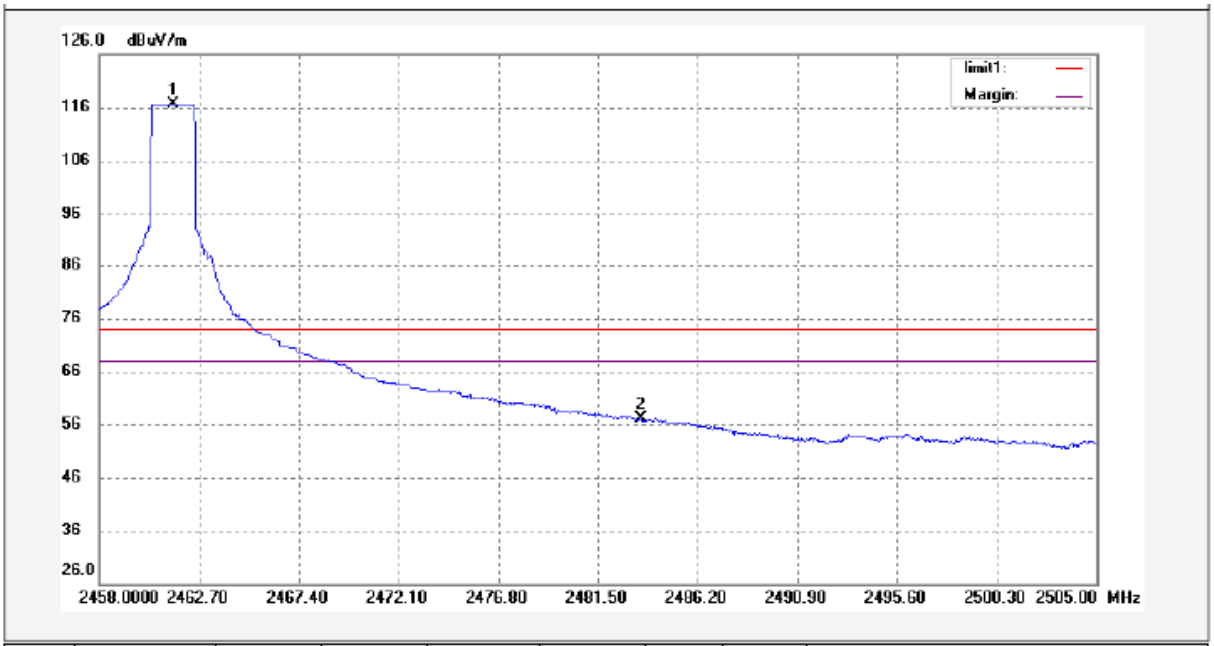


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	106.99	-15.70	91.29	74.00	17.29	peak	
2	2483.500	66.17	-15.67	50.50	74.00	-23.50	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	78.2	54.00	24.2	AV	
2	2483.500	-13	37.5	54.00	-16.5	AV	

Remark:the marker 1 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.478	132.43	-15.70	116.73	74.00	42.73	peak	
2	2483.500	72.68	-15.67	57.01	74.00	-16.99	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	103.73	54.00	49.73	AV	
2	2483.500	-13	44.01	54.00	-9.99	AV	

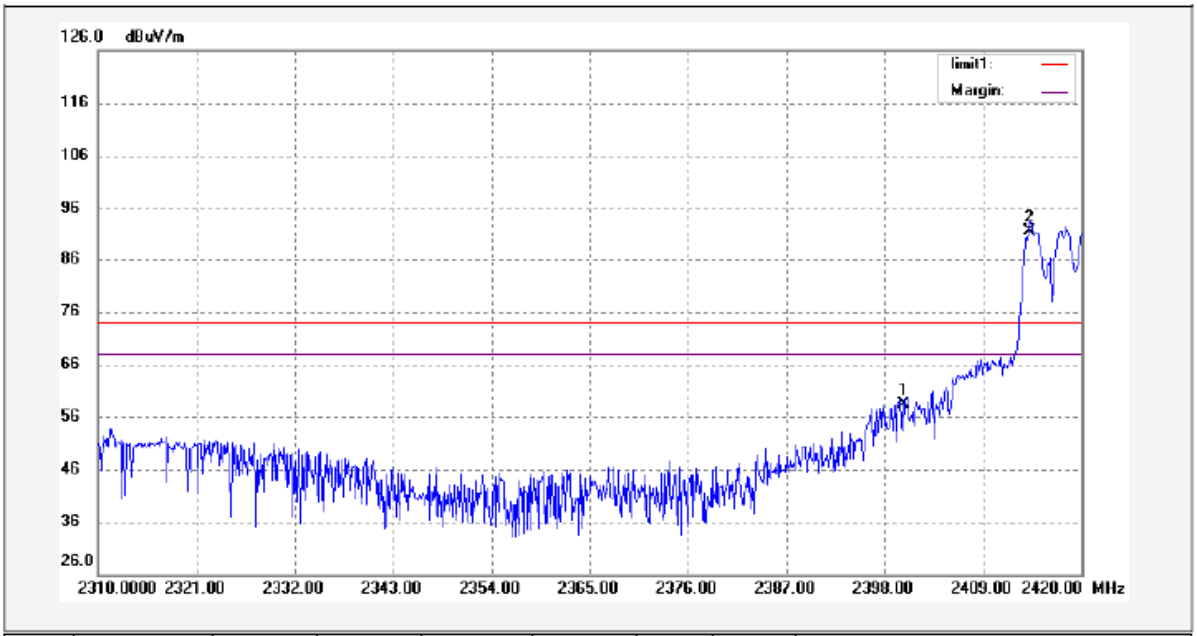
Remark:the marker 1 is the fundamental

9.2 Test Result(Hopping transmitting)

Low Channel – Peak

Test frequency range:from 2.310 GHz to 2.420GHz

Antenna polarization: Horizontal

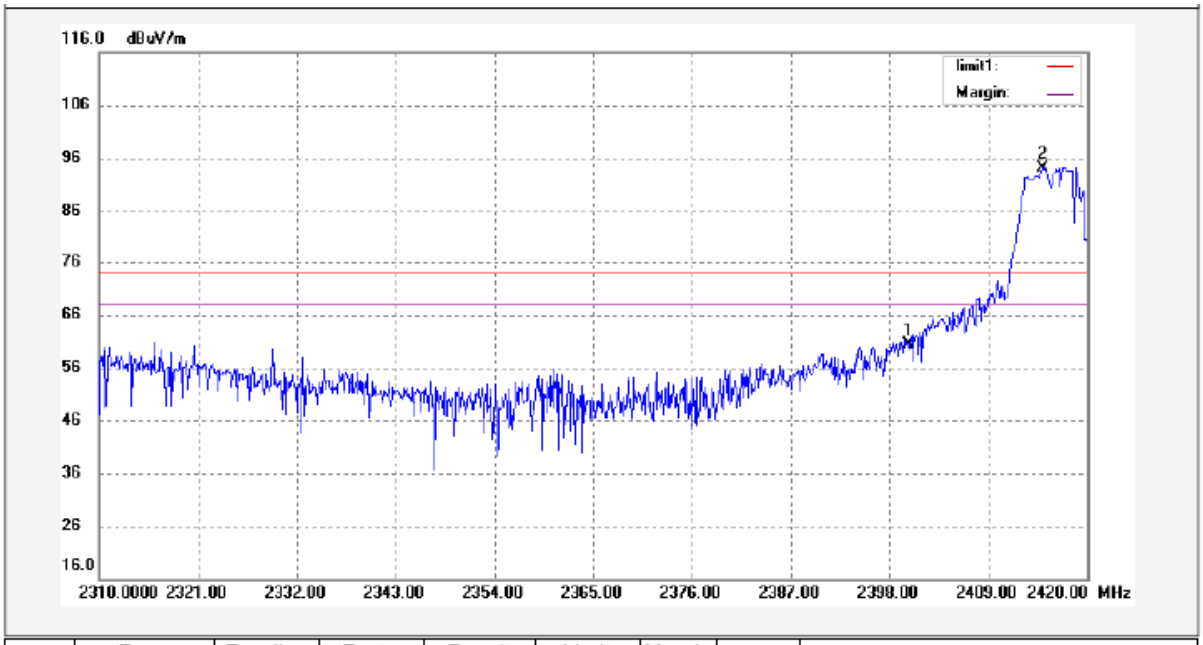


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	74.02	-15.58	58.44	74.00	-15.56	peak	
2	2414.170	107.17	-15.62	91.55	74.00	17.55	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400	-13	47.44	54.00	-8.56	AV	
2	2414	-13	78.55	54.00	24.55	AV	

Remark:the marker 2 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	75.92	-15.58	60.34	74.00	-13.66	peak	
2	2415.050	109.77	-15.63	94.14	74.00	20.14	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400	-13	47.34	54.00	-6.66	AV	
2	2414.17	-13	81.14	54.00	27.14	AV	

Upper Channel – Peak

Test frequency range:from 2.455 GHz to 2.505 GHz

Antenna polarization: Horizontal

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	110.50	-15.70	94.80	74.00	20.80	peak	
2	2483.500	67.19	-15.67	51.52	74.00	-22.48	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	81.8	54.00	27.8	AV	
2	2483.500	-13	38.52	54.00	-15.48	AV	

Remark:the marker 1 is the fundamental

Antenna polarization: Vertical

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.550	111.95	-15.70	96.25	74.00	22.25	peak	
2	2483.500	68.32	-15.67	52.65	74.00	-21.35	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	83.25	54.00	29.25	AV	
2	2483.500	-13	39.65	54.00	-14.35	AV	

Remark:the marker 1 is the fundamental

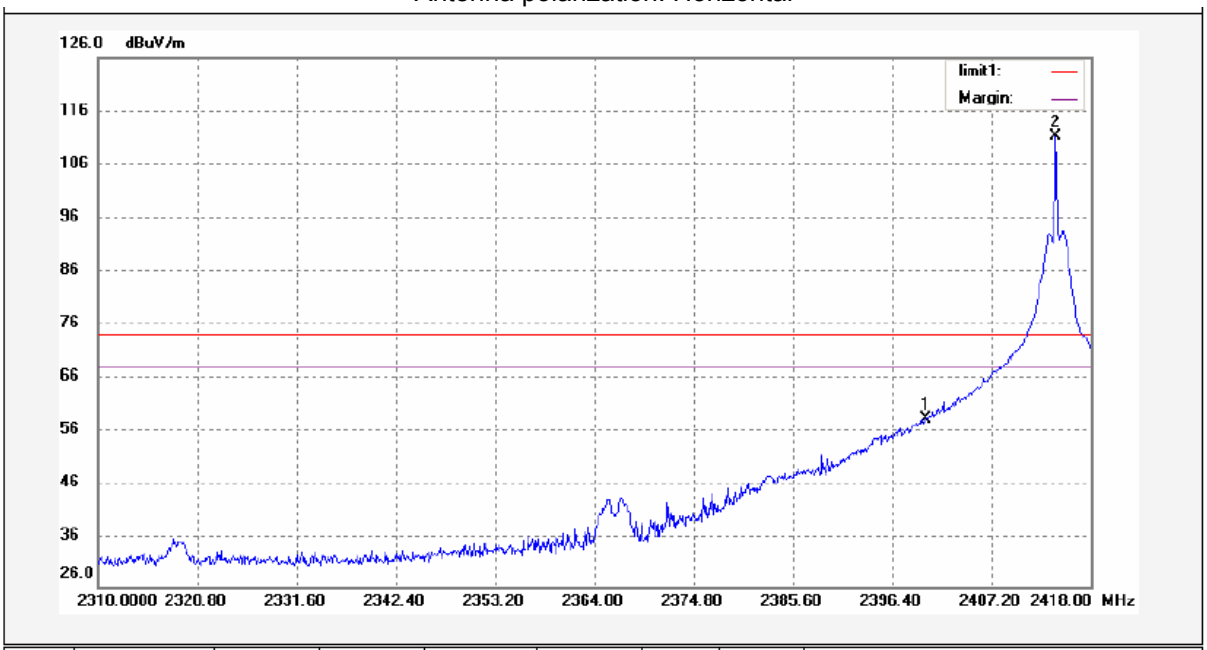
9.3 Test Result(Continuous transmitting)

5dBi antenna with 3m cable:

Low Channel – Peak

Test frequency range:from 2.310 GHz to 2.418GHz

Antenna polarization: Horizontal

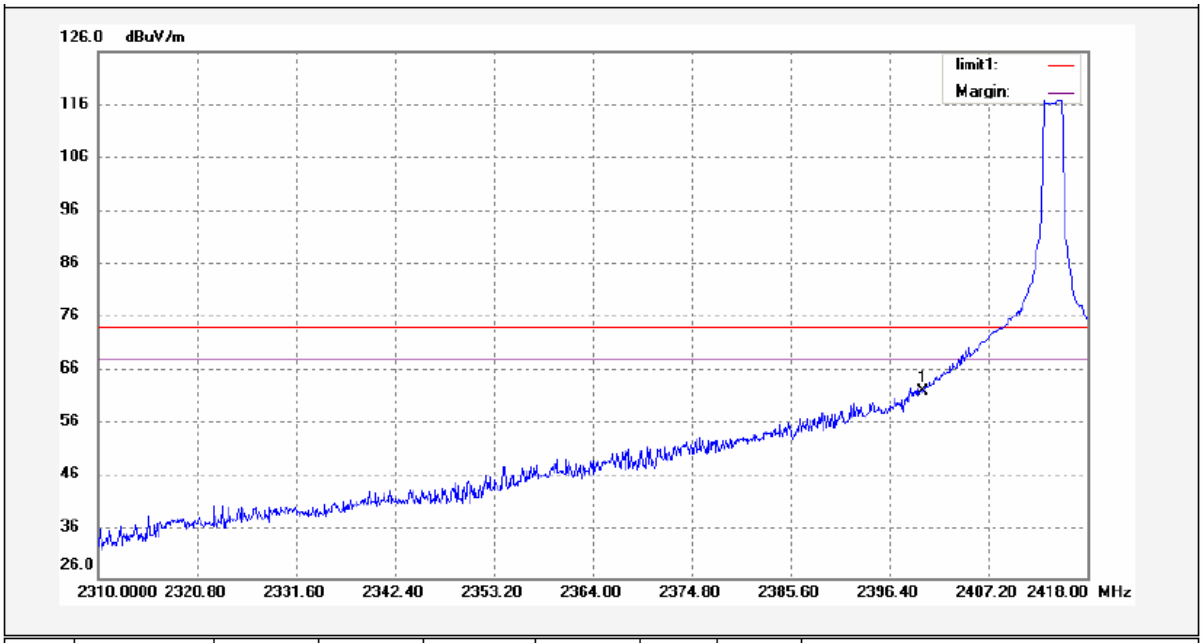


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	73.36	-15.58	57.78	74.00	-16.22	peak	
2	2414.220	126.79	-15.62	111.17	74.00	37.17	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	44.78	54	-9.22	AV	
2	2414.220	-13	98.17	54	44.17	AV	

Remark:the marker 2 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	77.24	-15.58	61.66	74.00	-12.34	peak	
2	2414.976	132.29	-15.63	116.66	74.00	42.66	peak	

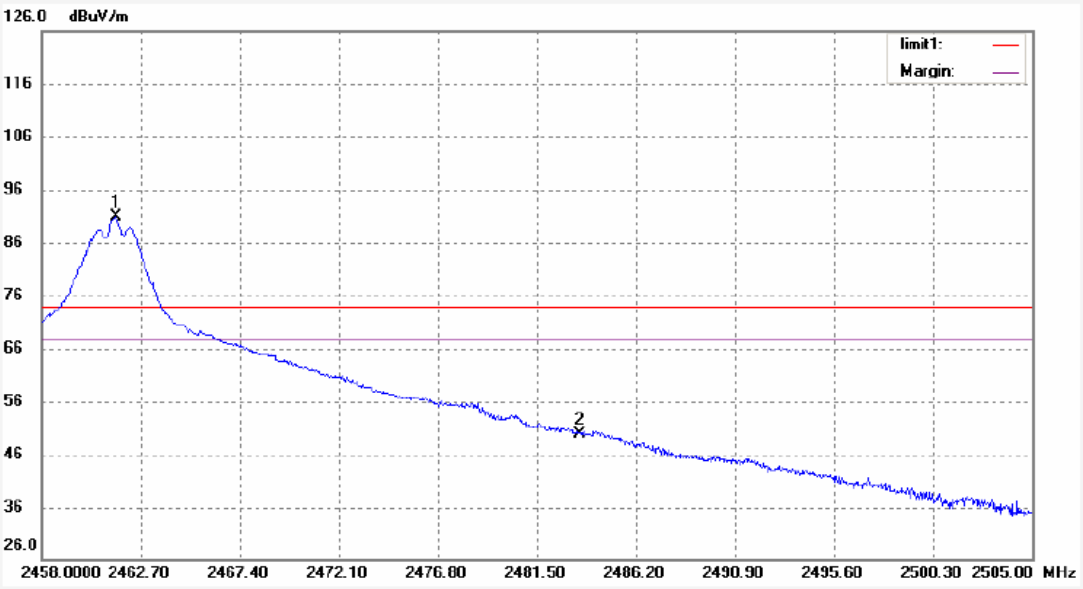
No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	48.66	54	-5.34	AV	
2	2414.976	-13	103.66	54	49.66	AV	

Remark:the marker 2 is the fundamental

Upper Channel – Peak

Test frequency range:from 2.458 GHz to 2.505 GHz

Antenna polarization: Horizontal

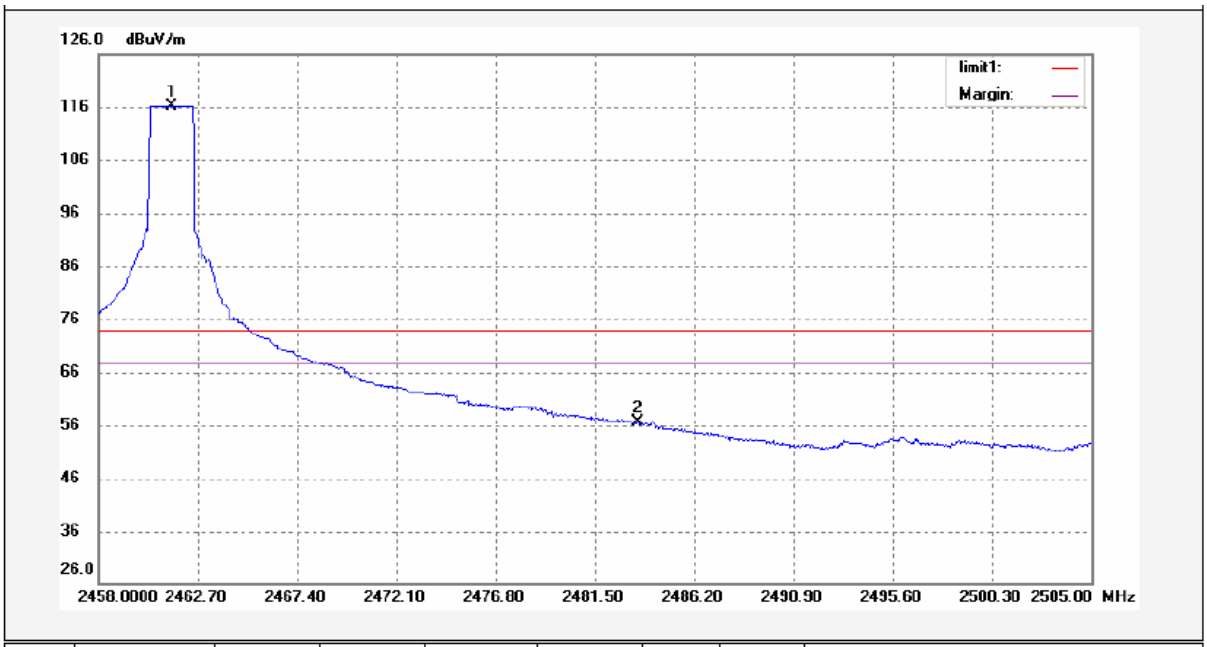


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	106.49	-15.70	90.79	74.00	16.79	peak	
2	2483.500	65.67	-15.67	50.00	74.00	-24.00	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	77.79	54	23.79	AV	
2	2483.500	-13	37	54	-17	AV	

Remark:the marker 1 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.478	131.93	-15.70	116.23	74.00	42.23	peak	
2	2483.500	72.18	-15.67	56.51	74.00	-17.49	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.478	-13	103.23	54	49.23	AV	
2	2483.500	-13	43.51	54	-10.49	AV	

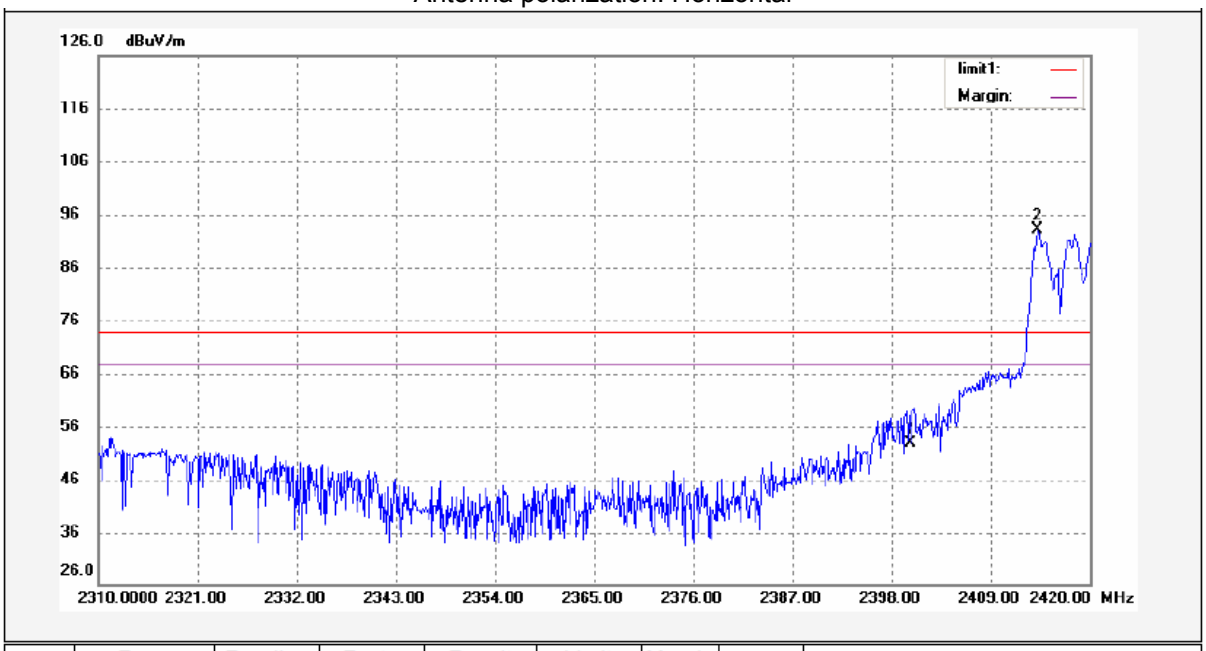
Remark:the marker 1 is the fundamental

9.4 Test Result(Hopping transmitting)

Low Channel – Peak

Test frequency range:from 2.310 GHz to 2.420GHz

Antenna polarization: Horizontal

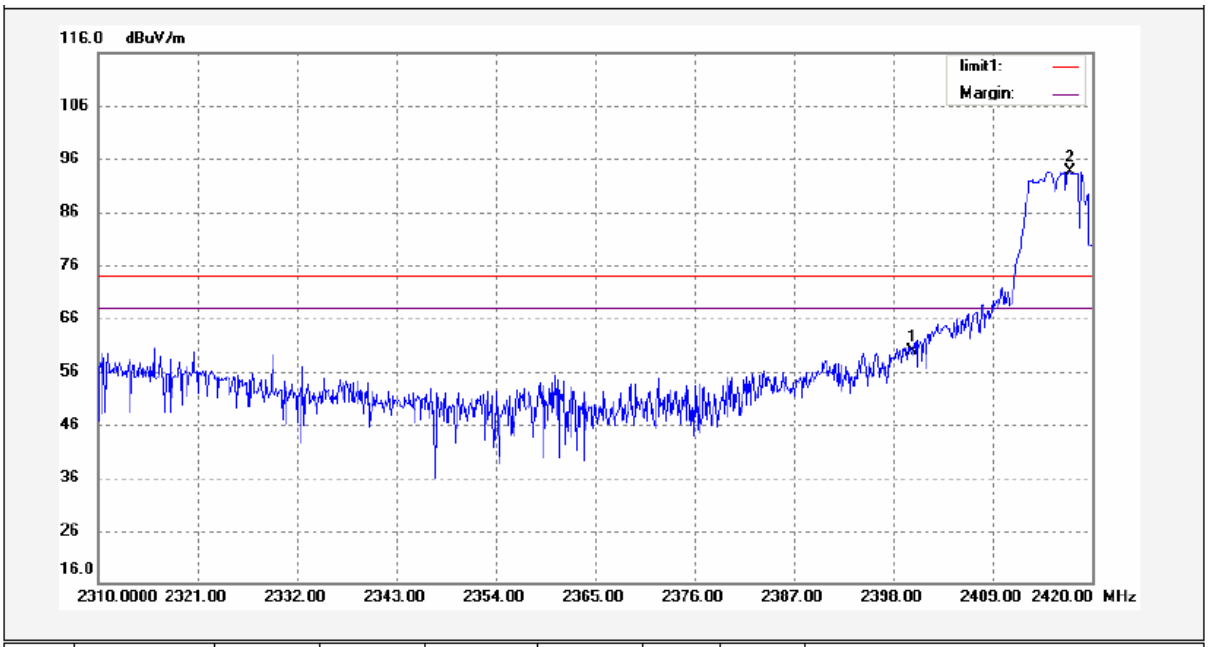


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	68.52	-15.58	52.94	74.00	-21.06	peak	
2	2414.170	108.67	-15.62	93.05	74.00	19.05	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	39.94	54	-14.06	AV	
2	2414.170	-13	80.05	54	26.05	AV	

Remark:the marker 2 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	75.42	-15.58	59.84	74.00	-14.16	peak	
2	2417.580	109.33	-15.63	93.70	74.00	19.70	peak	

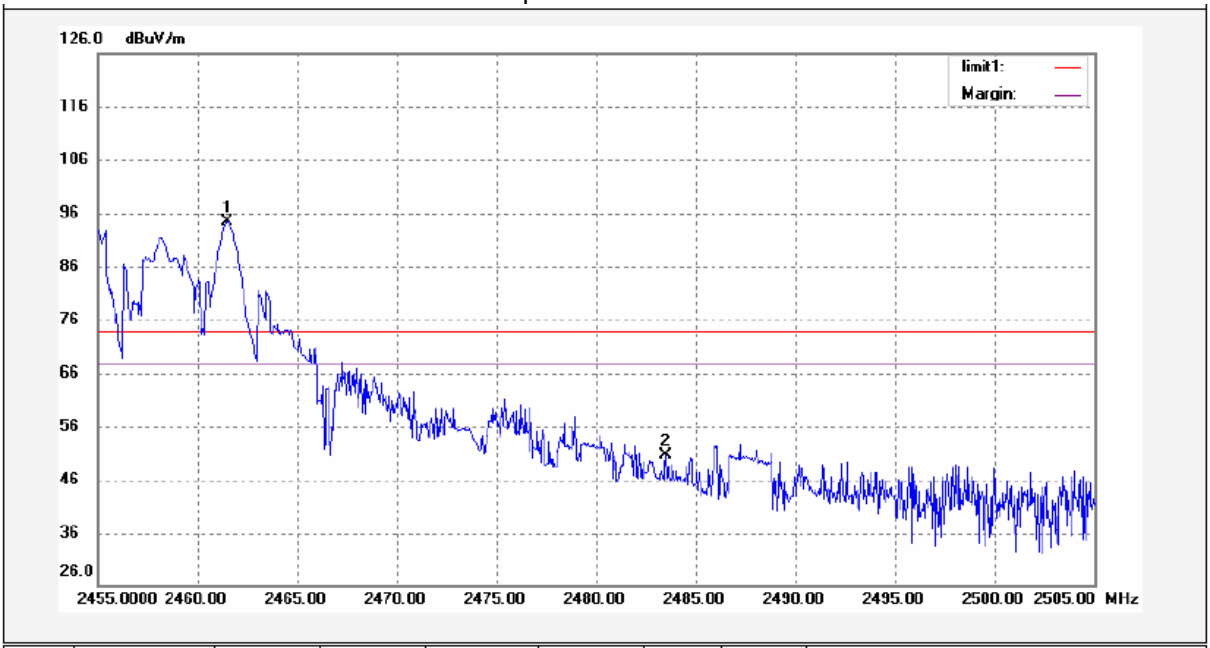
No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	46.84	54	-7.16	AV	
2	2417.580	-13	80.7	54	26.7	AV	

Remark:the marker 2 is the fundamental

Upper Channel – Peak

Test frequency range:from 2.455 GHz to 2.505 GHz

Antenna polarization: Horizontal

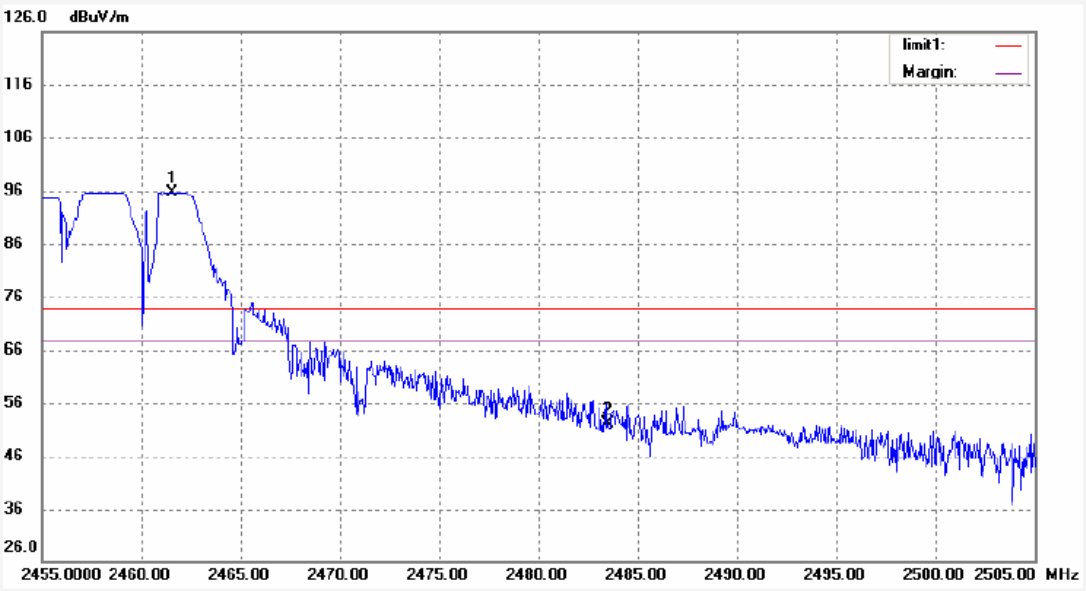


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	110.00	-15.70	94.30	74.00	20.30	peak	
2	2483.500	66.19	-15.67	50.52	74.00	-23.48	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.50	-13	81.3	54	27.3	AV	
2	2483.500	-13	37.52	54	-16.48	AV	

Remark:the marker 1 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.550	111.45	-15.70	95.75	74.00	21.75	peak	
2	2483.500	67.82	-15.67	52.15	74.00	-21.85	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.550	-13	82.75	54	28.75	AV	
2	2483.500	-13	39.15	54	-14.85	AV	

Remark:the marker 1 is the fundamental

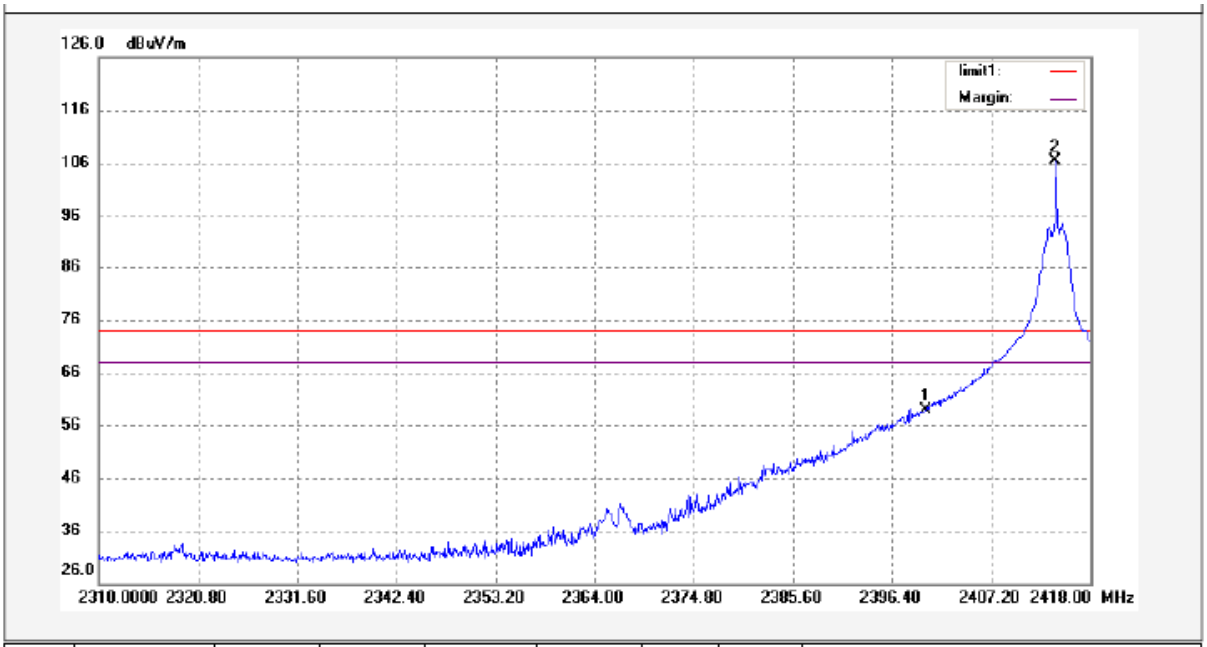
Test Result(Continuous transmitting)

3dBi antenna:

Low Channel – Peak

Test frequency range:from 2.310 GHz to 2.418GHz

Antenna polarization: Horizontal

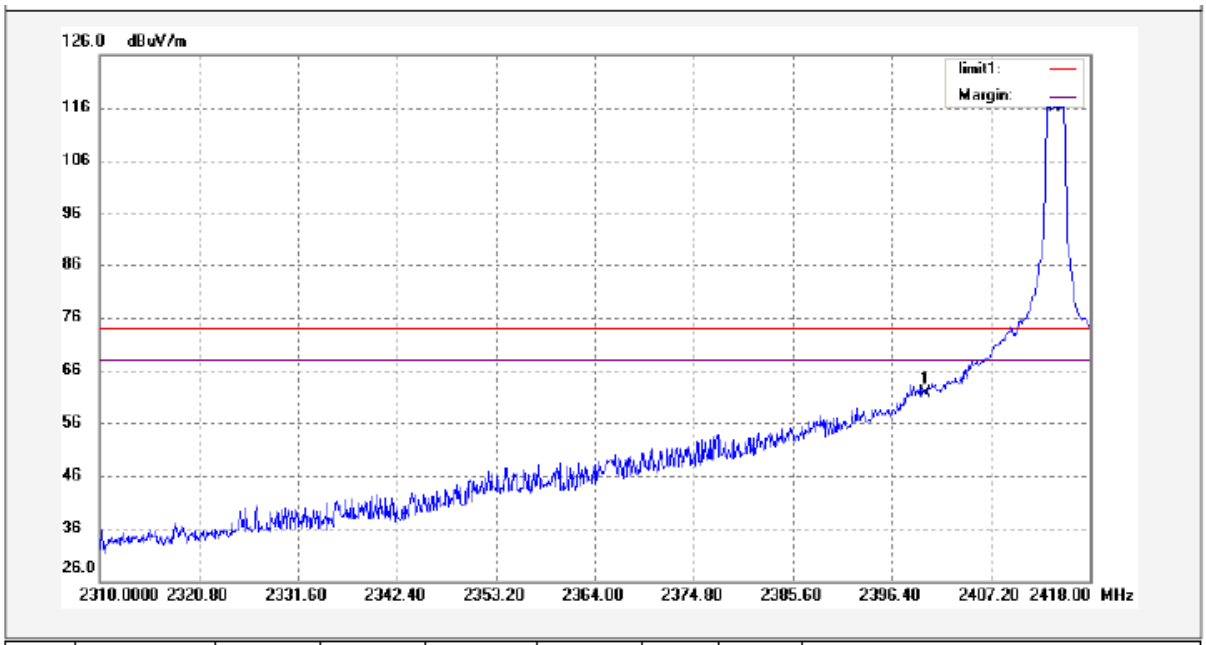


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	74.52	-15.58	58.94	74.00	-15.06	peak	
2	2414.220	122.05	-15.62	106.43	74.00	32.43	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	45.94	54.00	-8.06	AV	
2	2414.000	-13	93.43	54.00	39.43	AV	

Remark:the marker 2 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	77.25	-15.58	61.67	74.00	-12.33	peak	
2	2414.220	131.81	-15.62	116.19	74.00	42.19	peak	

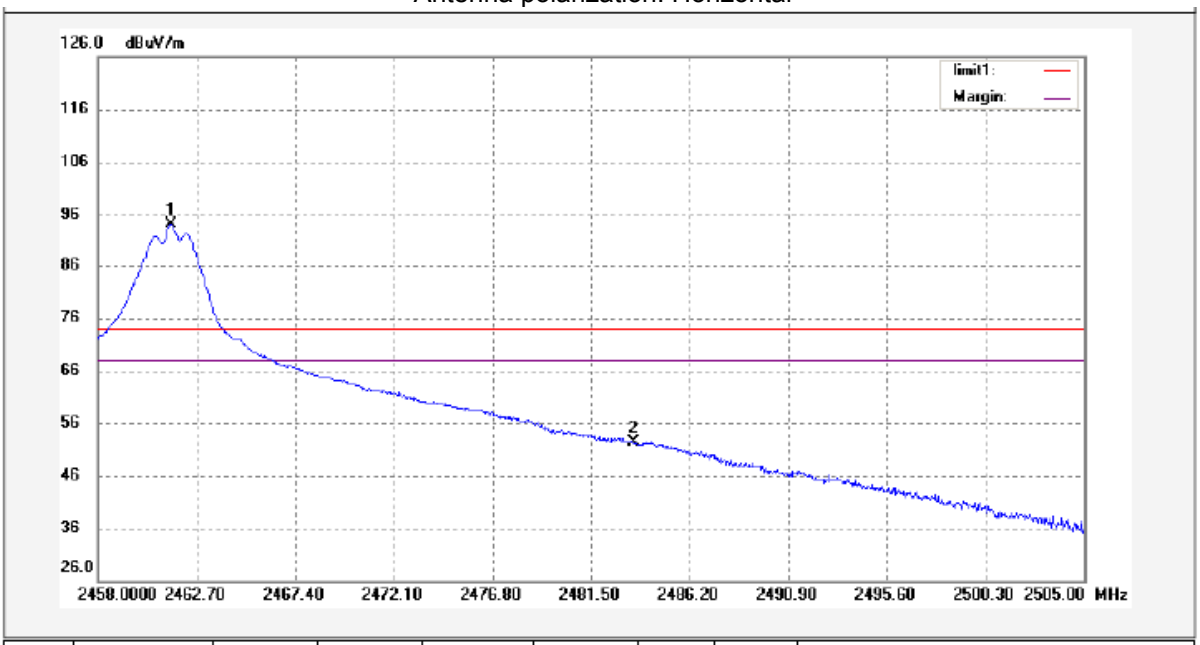
No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	-13	48.67	54.00	-5.33	AV	
2	2414.000	-13	103.19	54.00	49.19	AV	

Remark:the marker 2 is the fundamental

Upper Channel – Peak

Test frequency range:from 2.458 GHz to 2.505 GHz

Antenna polarization: Horizontal

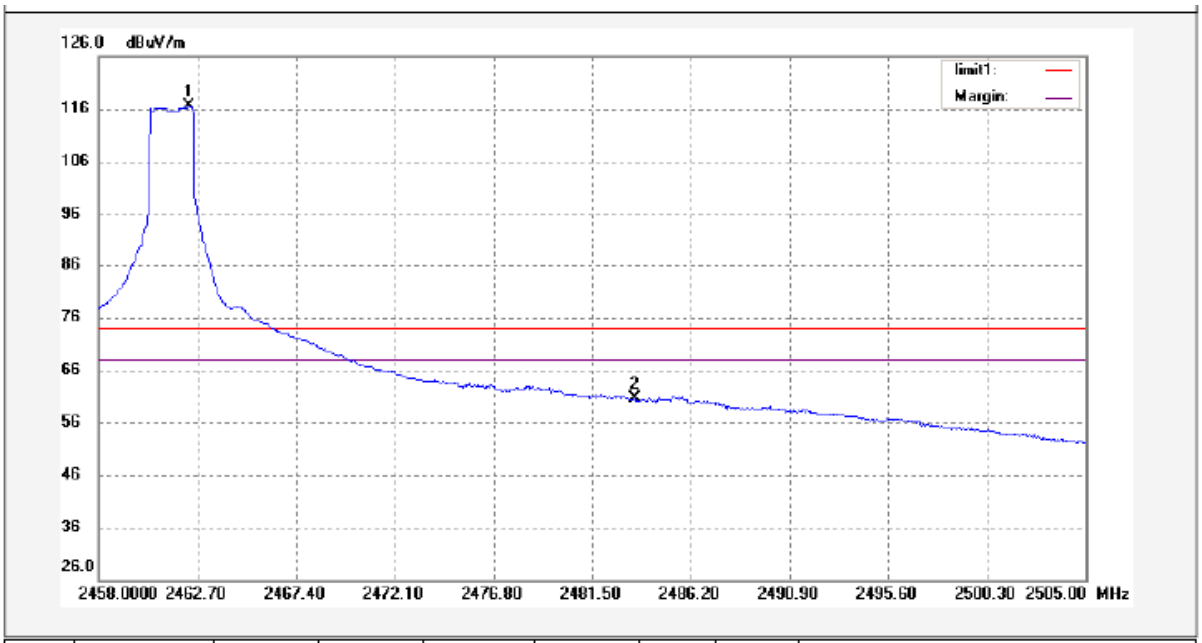


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.478	109.86	-15.70	94.16	74.00	20.16	peak	
2	2483.500	68.08	-15.67	52.41	74.00	-21.59	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	81.16	54.00	27.16	AV	
2	2483.500	-13	39.41	54.00	-14.59	AV	

Remark:the marker 1 is the fundamental

Antenna polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2462.277	132.38	-15.70	116.68	74.00	42.68	peak	
2	2483.500	76.18	-15.67	60.51	74.00	-13.49	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	103.68	54.00	49.68	AV	
2	2483.500	-13	47.51	54.00	-6.49	AV	

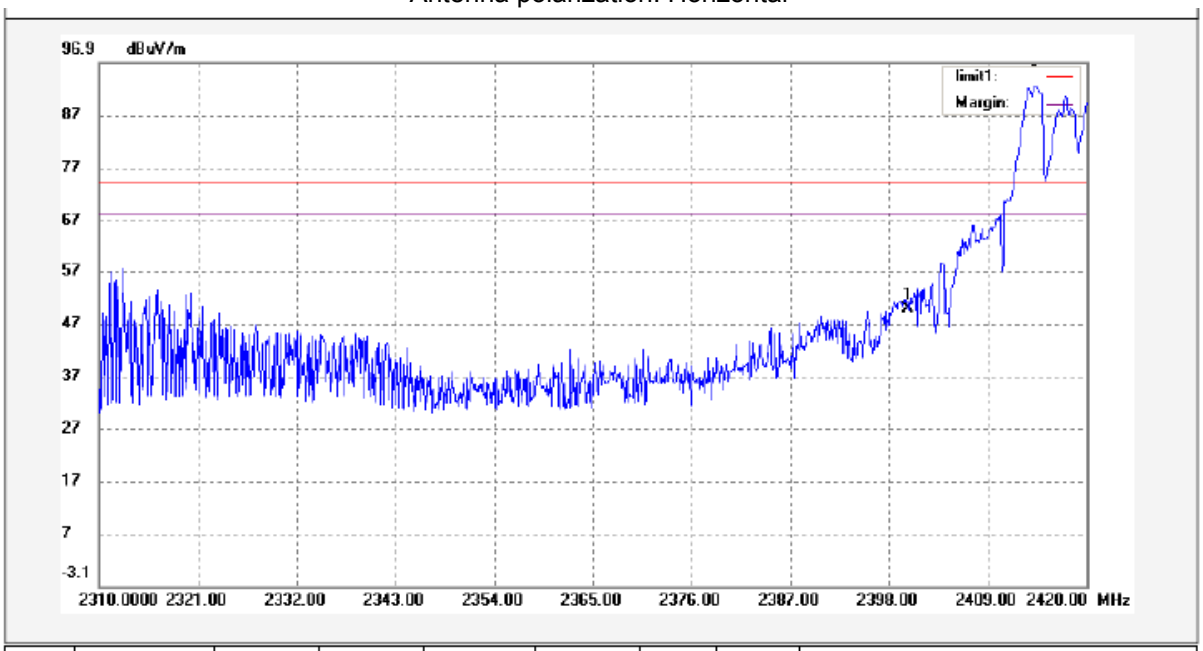
Remark:the marker 1 is the fundamental

9.5 Test Result(Hopping transmitting)

Low Channel – Peak

Test frequency range:from 2.310 GHz to 2.420GHz

Antenna polarization: Horizontal

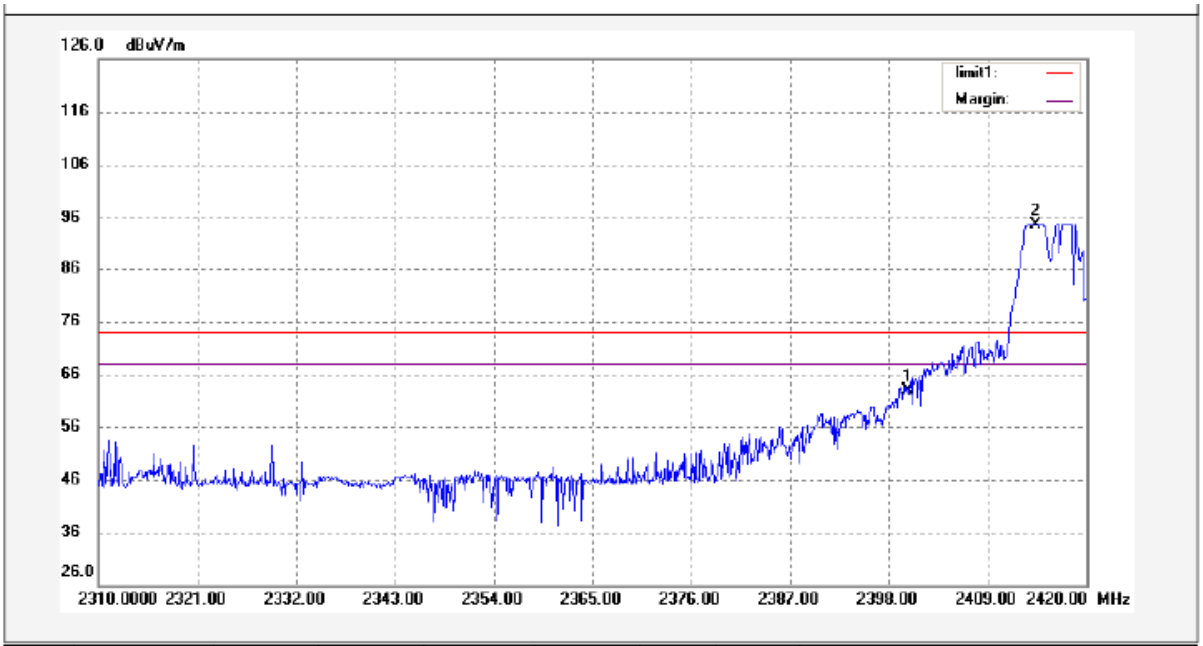


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	65.30	-15.58	49.72	74.00	-24.28	peak	
2	2414.170	108.13	-15.62	92.51	74.00	18.51	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400	-13	36.72	54.00	-17.28	AV	
2	2414	-13	79.51	54.00	25.51	AV	

Remark:the marker 2 is the fundamental

Antenna polarization: Vertical



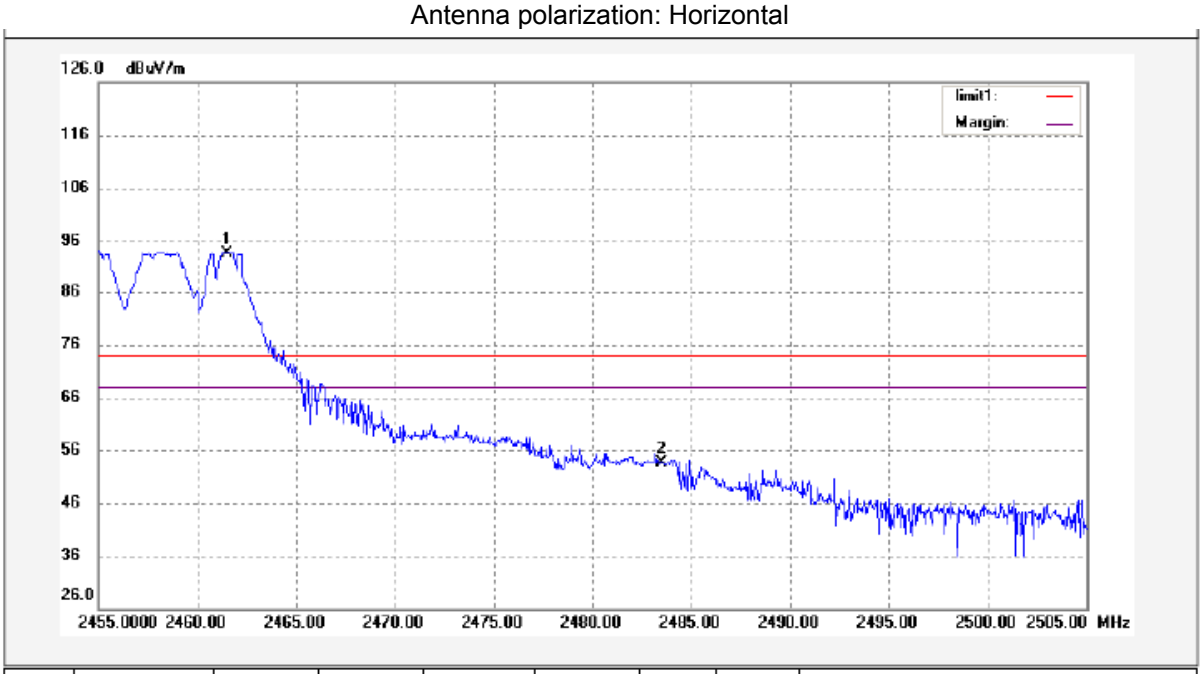
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400.000	76.42	-15.58	60.84	74.00	-13.16	peak	
2	2414.280	110.32	-15.62	94.70	74.00	20.70	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2400	-13	49.84	54.00	-6.16	AV	
2	2414.17	-13	81.7	54.00	27.7	AV	

Upper Channel – Peak

Test frequency range:from 2.455 GHz to 2.505 GHz

Antenna polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.500	109.36	-15.70	93.66	74.00	19.66	peak	
2	2483.500	69.31	-15.67	53.64	74.00	-20.36	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	80.66	54.00	26.66	AV	
2	2483.500	-13	40.64	54.00	-13.36	AV	

Remark:the marker 1 is the fundamental

Antenna polarization: Vertical

No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.550	112.45	-15.70	96.75	74.00	22.75	peak	
2	2483.500	70.32	-15.67	54.65	74.00	-19.35	peak	

No.	Freq. (MHz)	Duty Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	2461.525	-13	83.75	54.00	29.75	AV	
2	2483.500	-13	41.65	54.00	-12.35	AV	

Remark:the marker 1 is the fundamental

10 20 dB Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705

Test Mode: Test in fixing operating frequency at low, Middle, high channel.

10.1 Test Procedure:

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

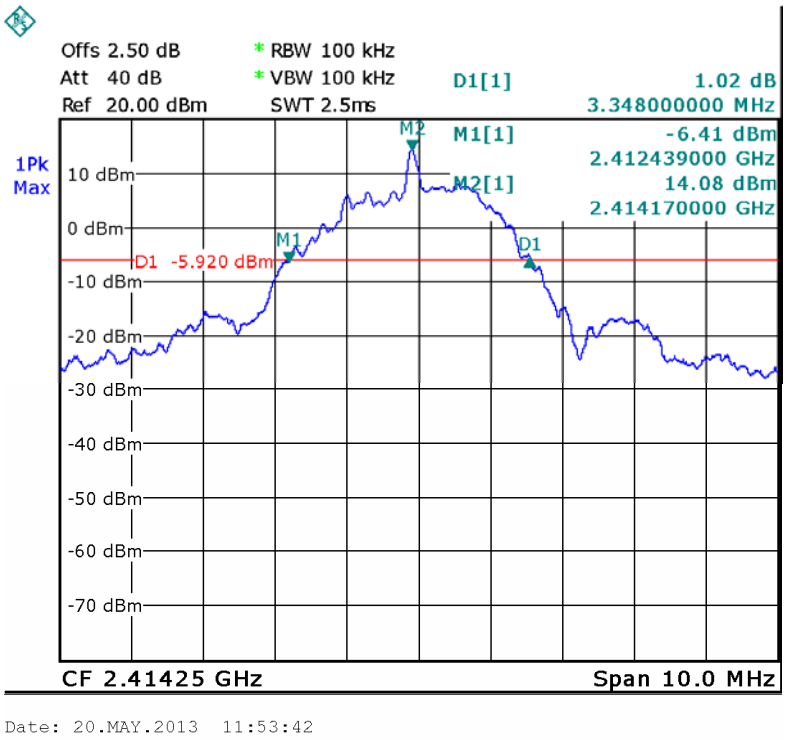
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 100kHz

10.2 Test Result:

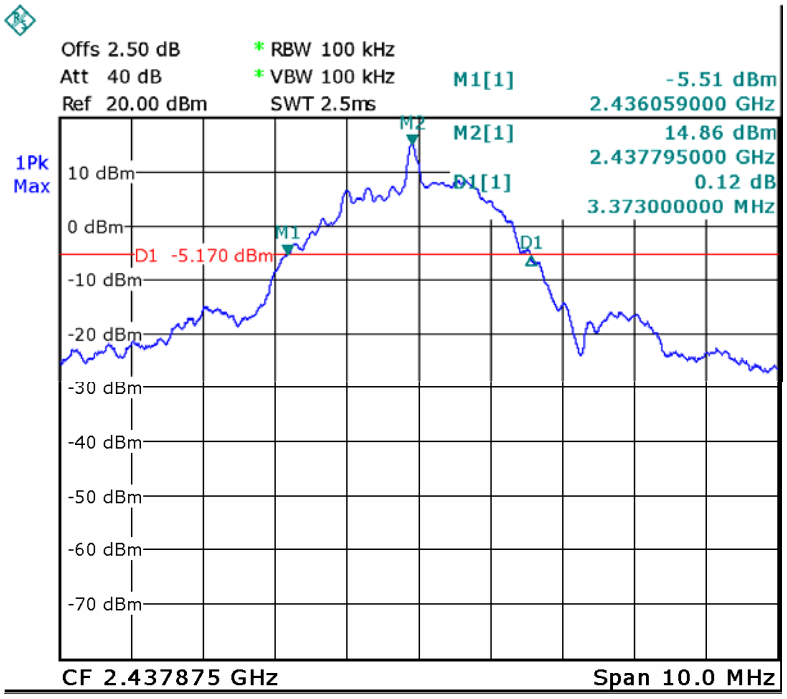
Test Channel	Bandwidth
Low	3.348MHz
Middle	3.373MHz
High	3.393MHz

Test result plot as follows:

Low Channel



Middle Channel



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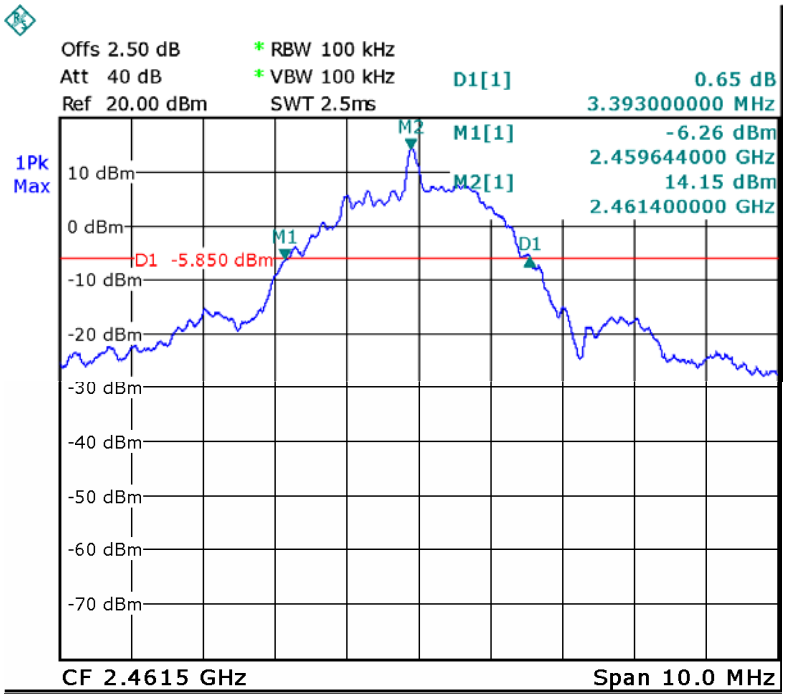
High Channel



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11 Spurious RF Conducted Emissions from out of band

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 Mothed: DA 00-705

Test Status: TX mode

11.1 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set to span from the lowest frequency generated in the device up to and including the tenth harmonic of the highest fundamental frequency.
3. Set RBW = 100kHz and VBW = 300kHz.Sweep =auto.
4. mark the worst point and record.

11.2 Test Result

Test Frequency: Below 30MHz

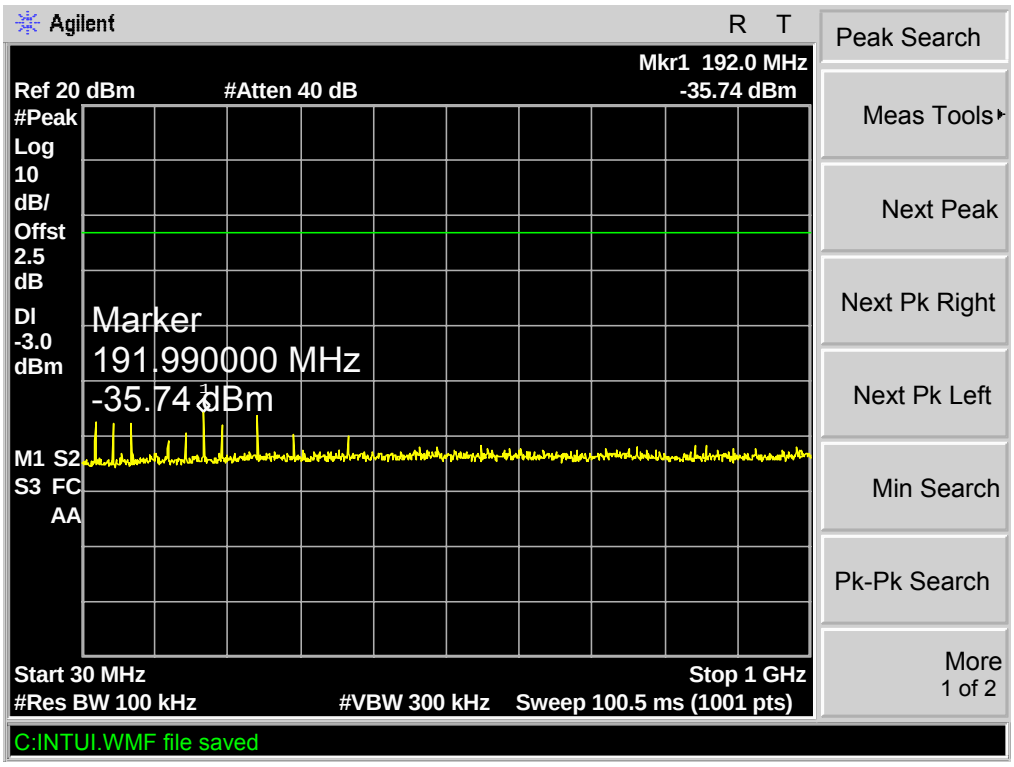
Remark: For emissions below 30MHz,no emission higher than background level, so the data does not show in the report.

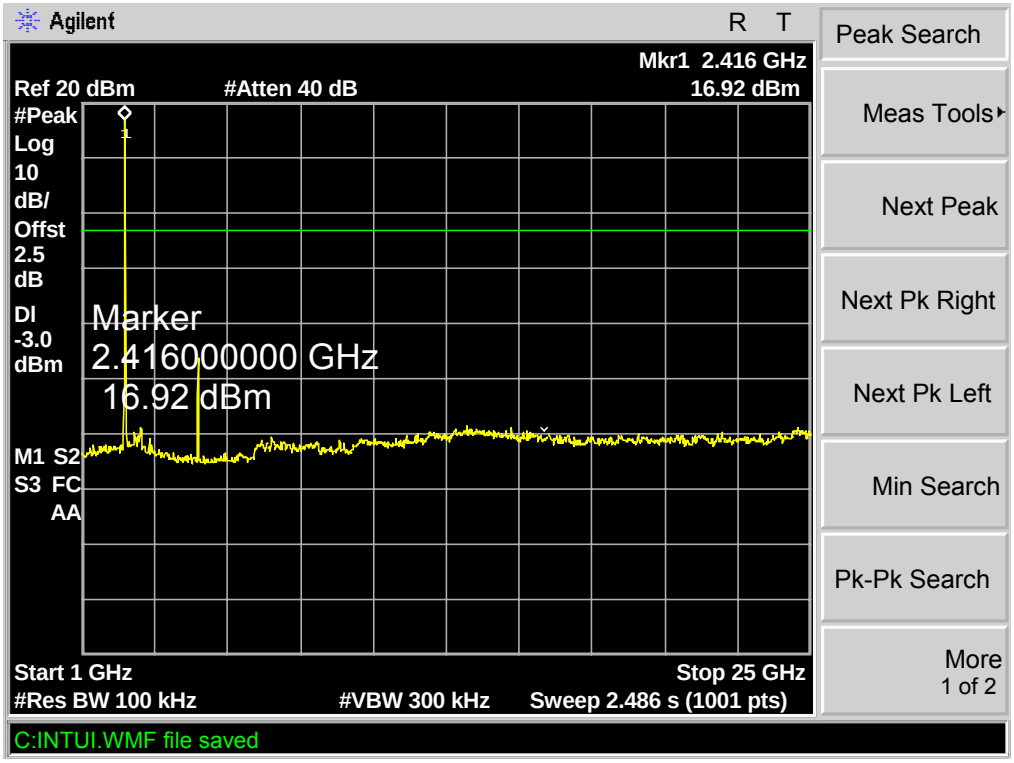
Test Frequency: 30MHz ~ 25GHz

Test result plots shown as follows:

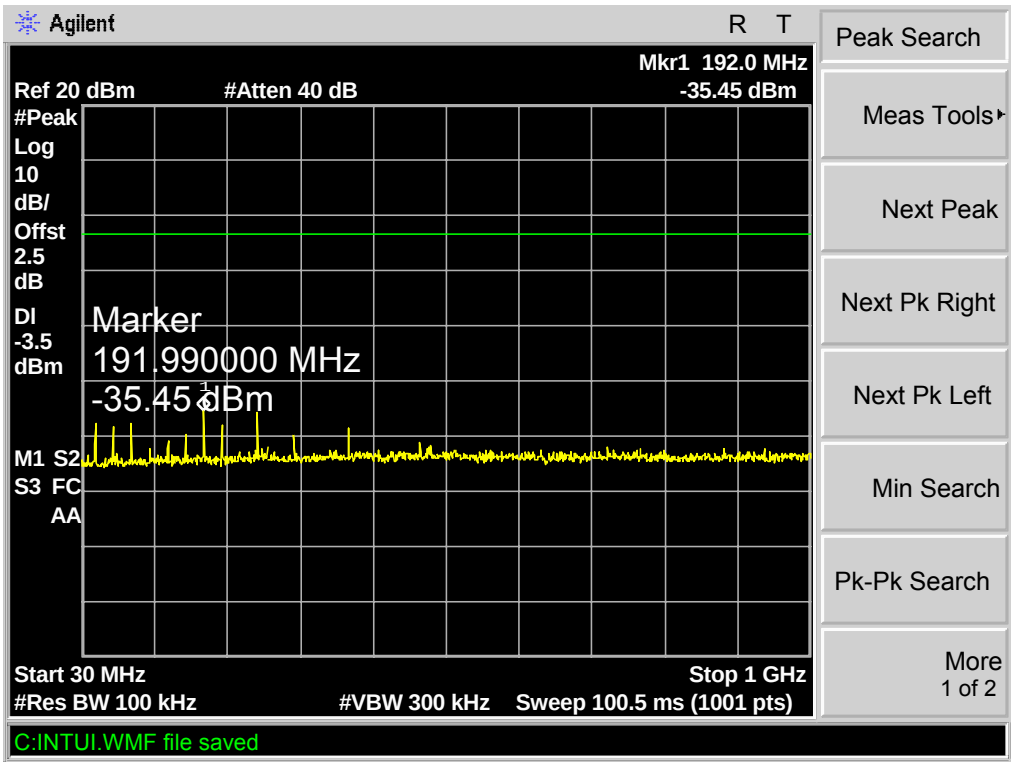
Modulation:GFSK

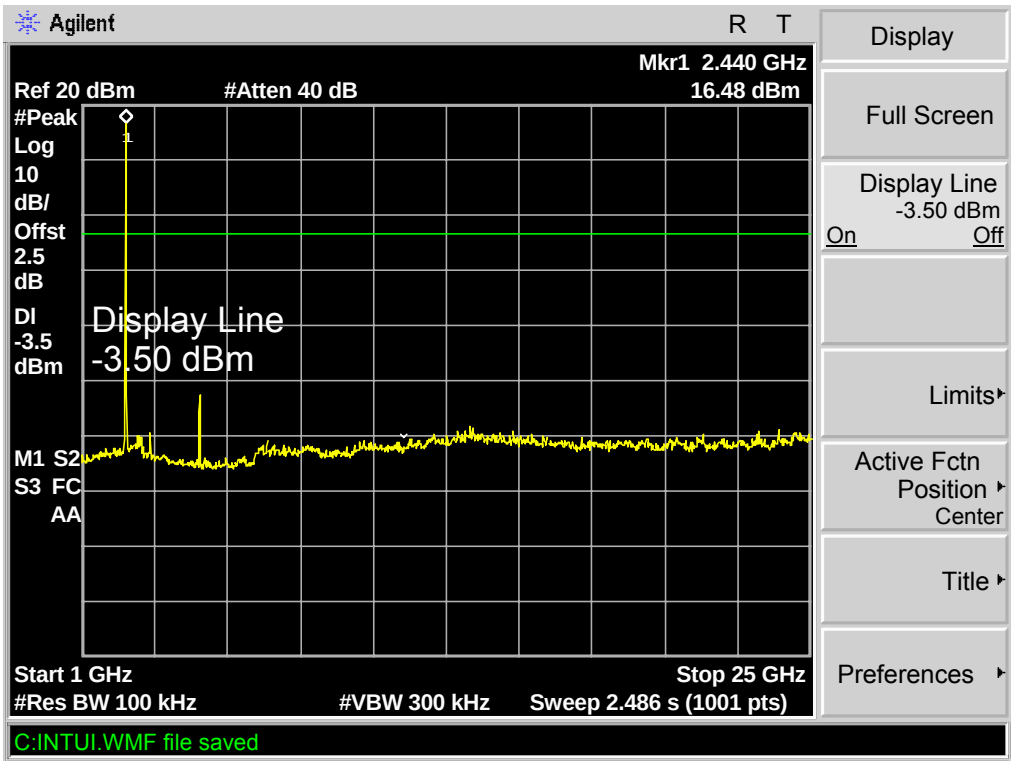
Lower Channel



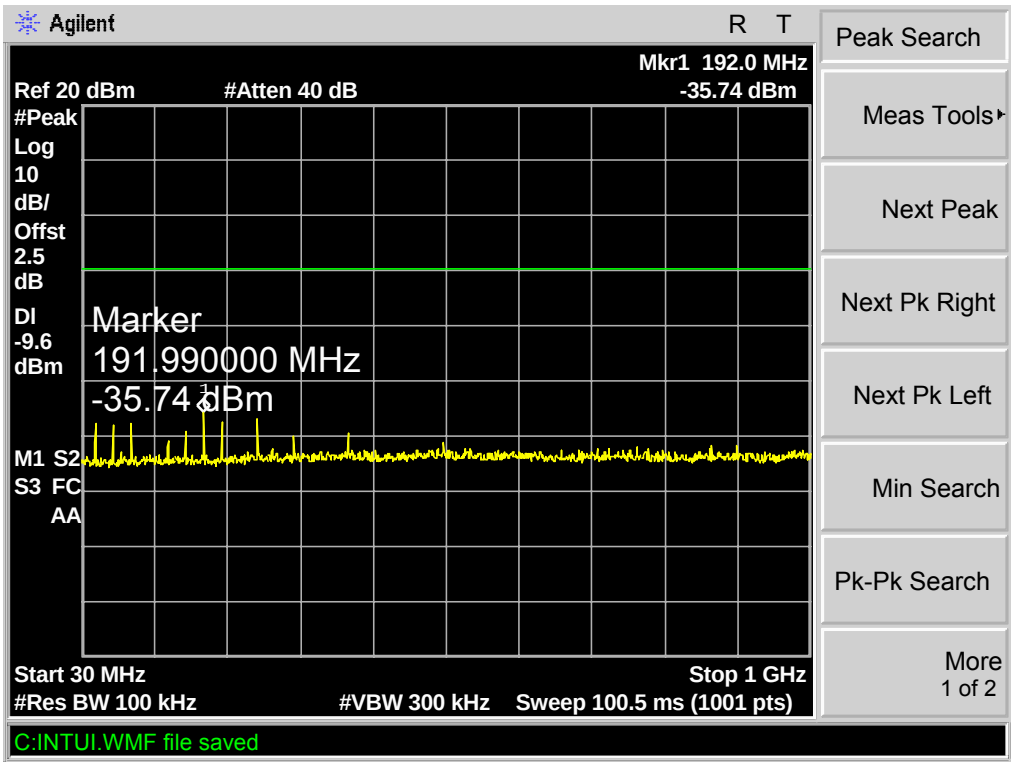


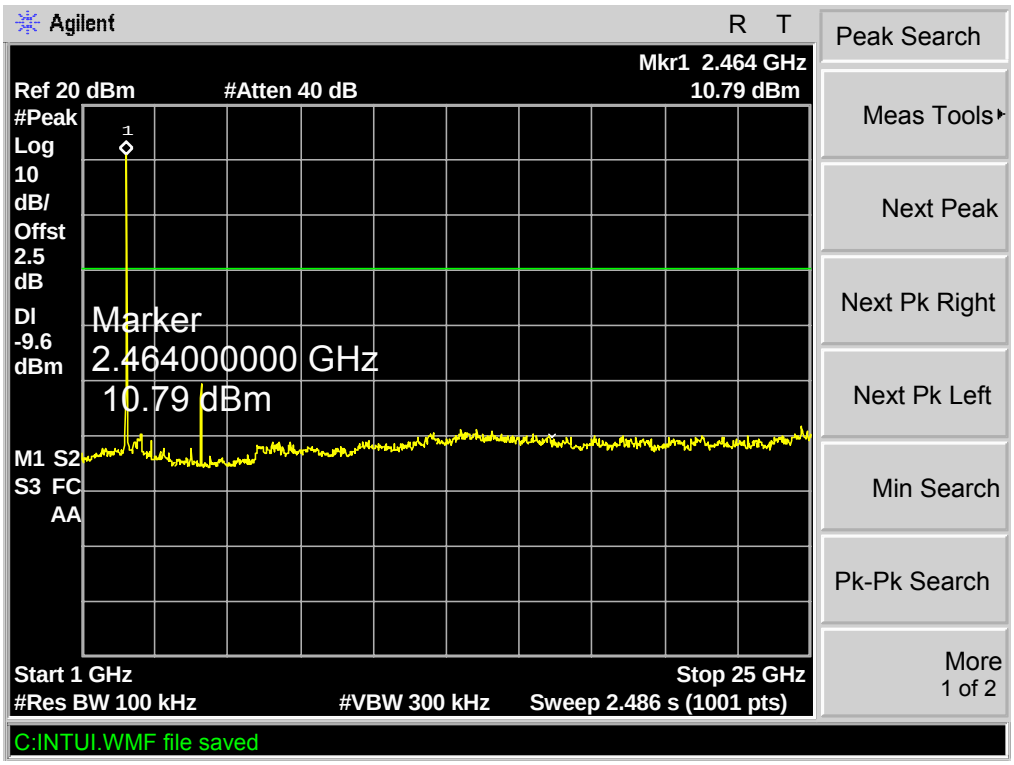
Middle Channel





Upper Channel





12 Maximum Peak Output Power

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	ANSI C63.4:2003
Test Limit:	Regulation 15.247 (b)(1), For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result “Number of Hopping Frequency” of this document. The 0.125watts (20.97 dBm) limit applies.
Test mode:	Test in fixing frequency transmitting mode.

12.1 Test Procedure:

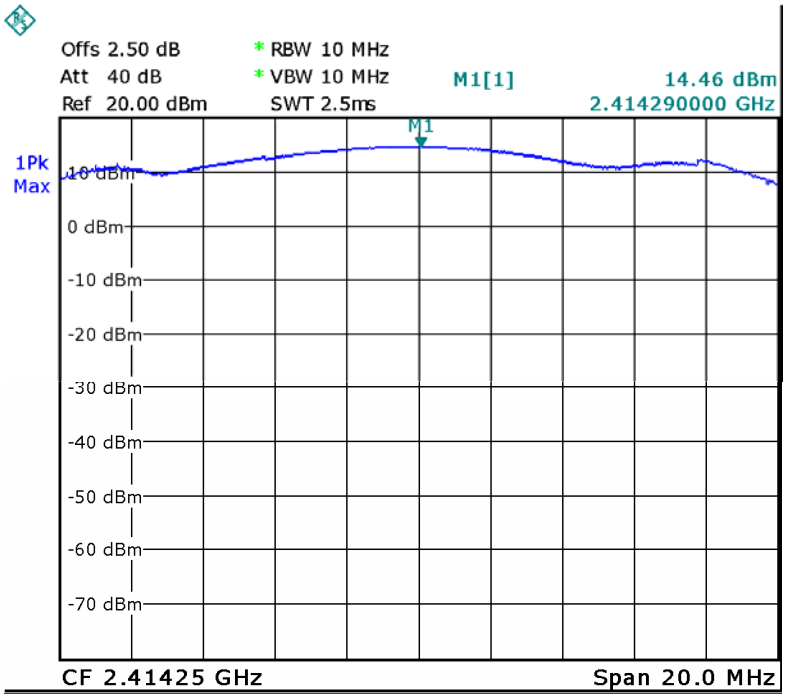
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 10 MHz. VBW = 10 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

12.2 Test Result:

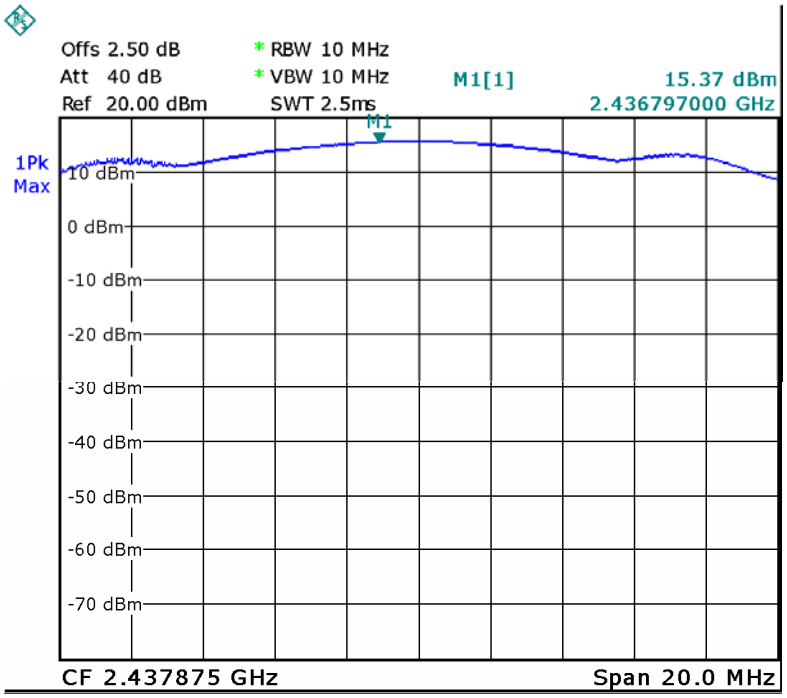
Test Channel	Output Power (dBm)	Limit (dBm)
Low	14.46	20.97
Middle	15.37	20.97
High	14.37	20.97

Test result plot as follows:

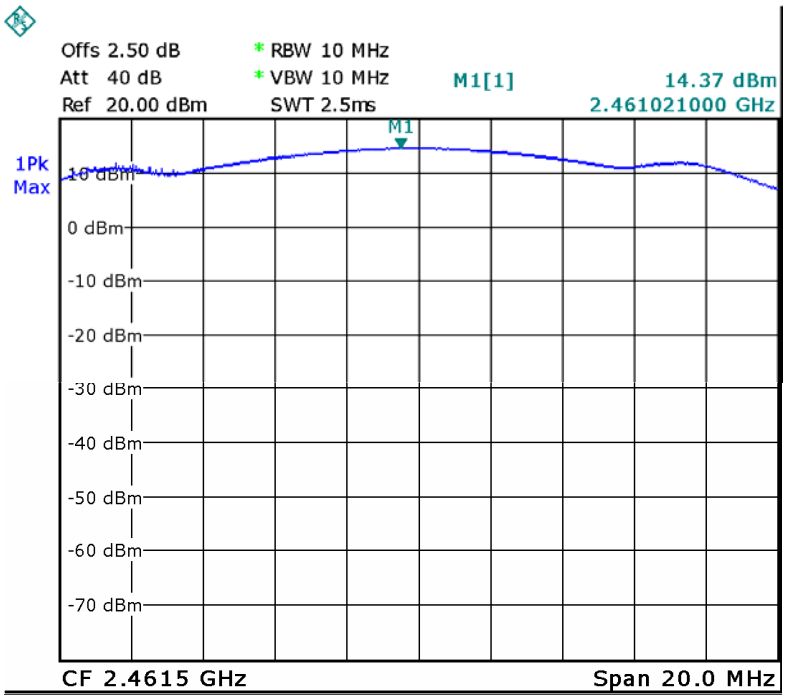
Low Channel



Middle Channel



High Channel



13 Channel Separated

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	DA 00-705
Test Limit:	Regulation 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 1W.
Test Mode:	Test in hopping transmitting operating mode.

13.1 Test Procedure:

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

2. Set the spectrum analyzer: RBW = 30kHz. VBW = 100kHz , Span = 6MHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

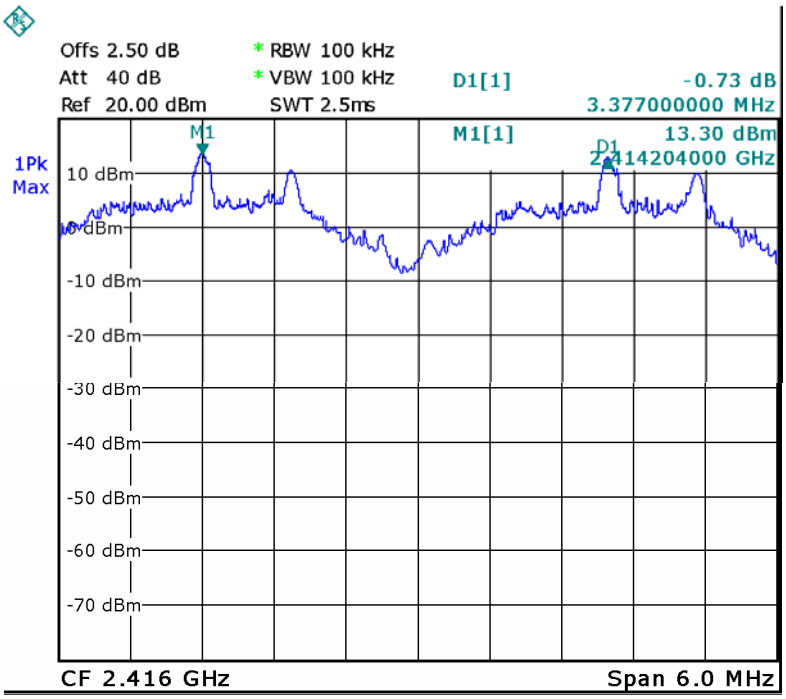
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

13.2 Test Result:

Test Channel	Separation (MHz)	Result
Low	3.377MHz	PASS
Middle	3.377MHz	PASS
High	3.377MHz	PASS

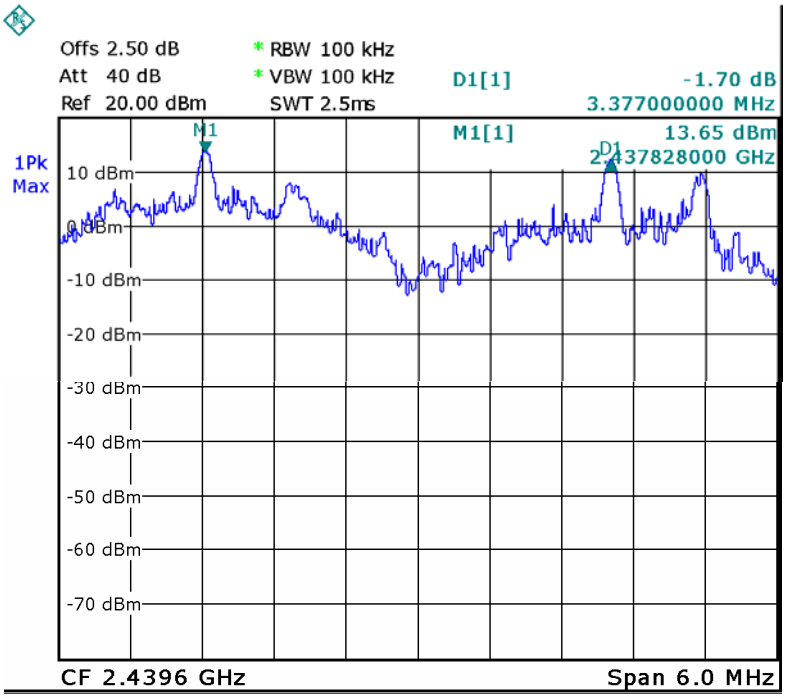
Test result plot as follows:

Low Channel



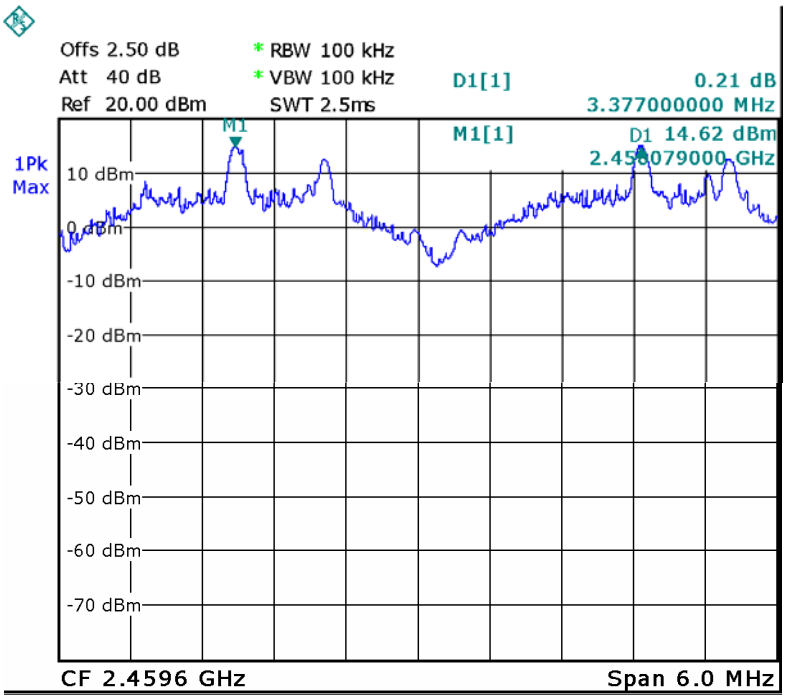
Date: 20.MAY.2013 14:14:16

Middle Channel



Date: 20.MAY.2013 14:16:43

High Channel



Date: 20.MAY.2013 14:23:50

14 Hopping Channel number

Test Requirement:	FCC CFR47 Part 15 Section 15.247
Test Method:	DA 00-705
Test Limit:	Regulation 15.247 (a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Mode:	Test in hopping transmitting operating mode.

14.1 Test Procedure:

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

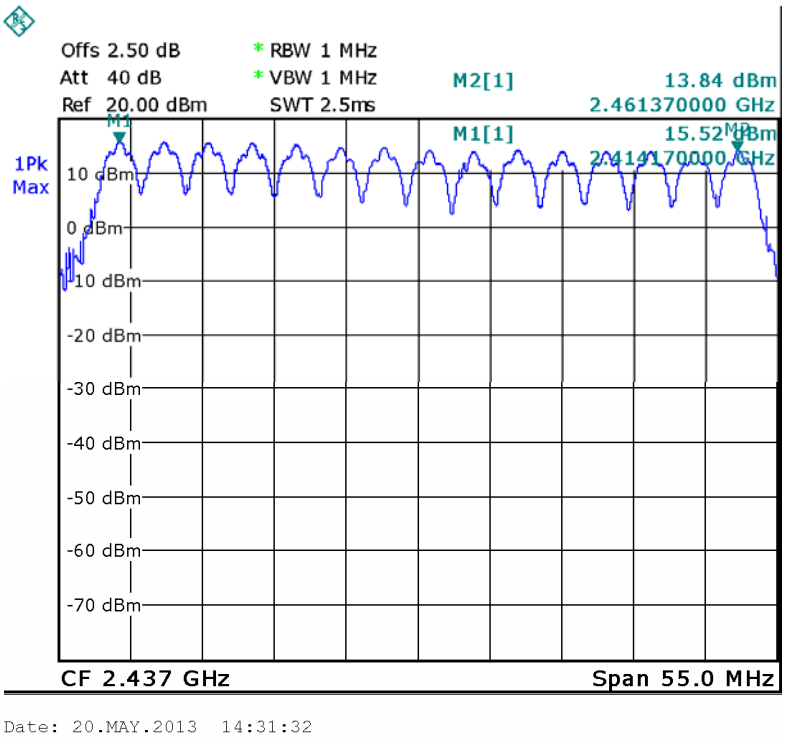
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 100 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.

3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.

4. Set the spectrum analyzer: Center Frequency = 2437MHz, Span = 55MHz. Submit the test result graph.

14.2 Test Result

Total Channels are 15 Channels.



15 Dwell Time

Test Requirement: FCC CFR47 Part 15 Section 15.247

Test Method: DA 00-705

Test Limit: Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

Test Mode: Test in hopping transmitting operating mode.

15.1 Test Procedure:

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

2.Set spectrum analyzer span = 0. centered on a hopping channel;

3.Set RBW = 1MHz and VBW = 1MHz.Sweep = as necessary to capture the entire dwell time per hopping channel.

4.Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

15.2 Test Result

The test period: T= 0.4(s) * 15 = 6 (s)

So, the Dwell Time can be calculated as follows:

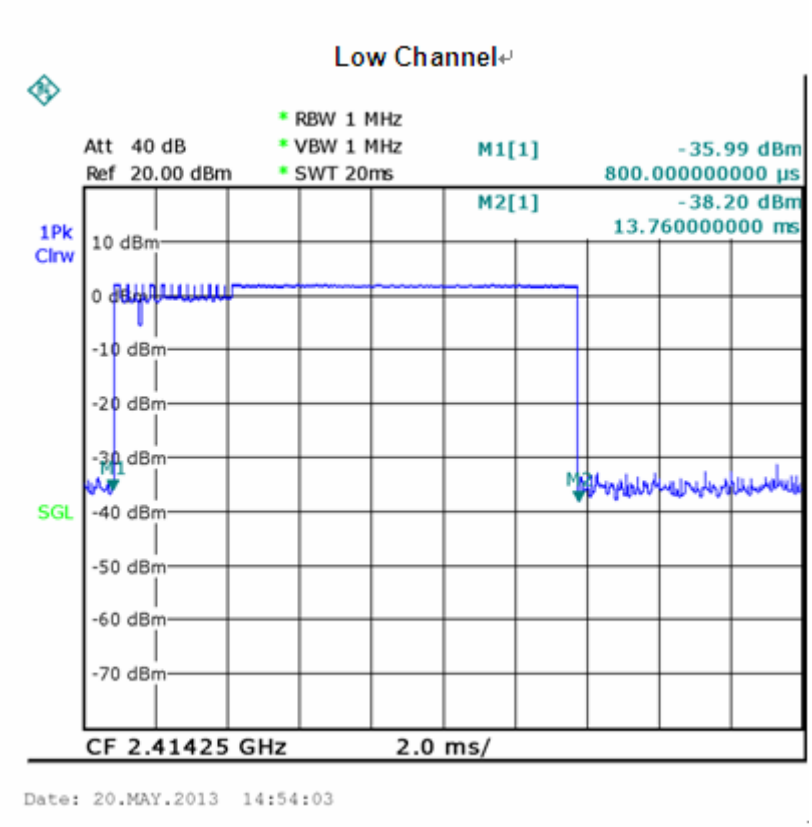
Low channel: slot time=3(times)/1(s)*12.96(ms)*6(s)=0.233(s)

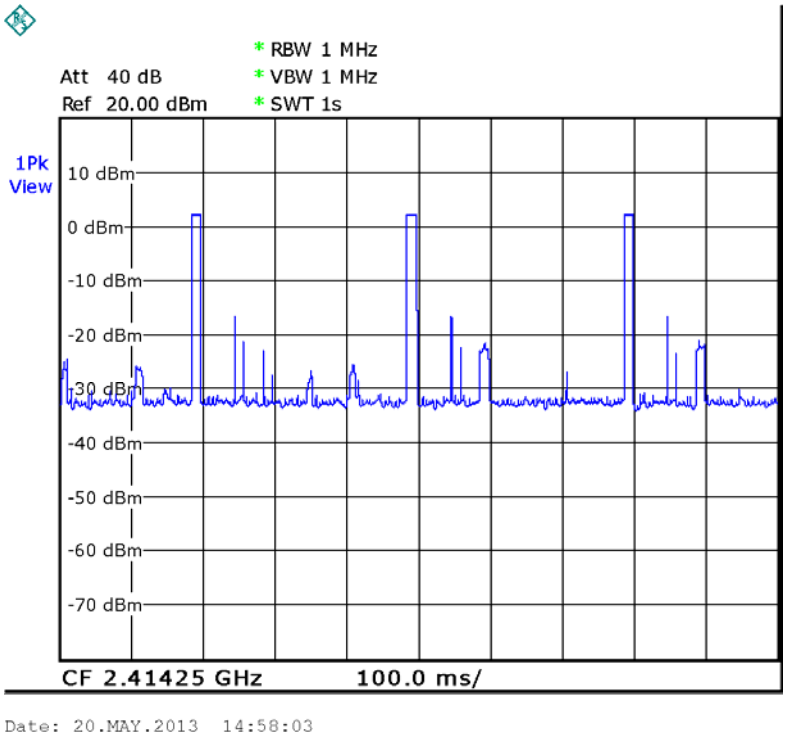
Middle channel: slot time=3(times)/1(s)*12.92(ms)*6(s)=0.233(s)

High channel: slot time=3(times)/1(s)*13.00(ms)*6(s)=0.234(s)

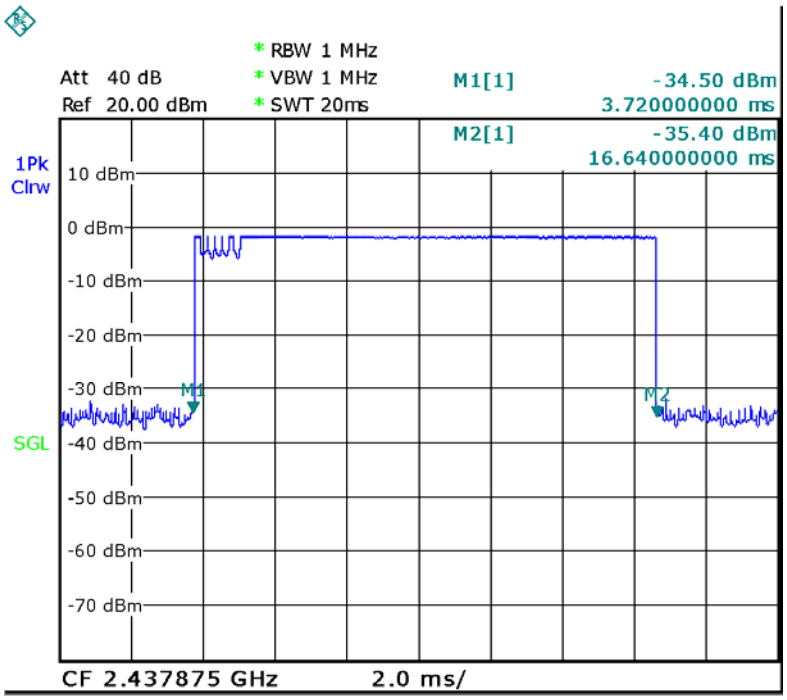
Note : Mkr Delta is once pulse time.

Frequency	Mkr Delta(ms)	Dwell Time(s)	Limits(s)	Result
2414.25 MHz	12.96	0.233	0.400	Pass
2437.85 MHz	12.92	0.233	0.400	Pass
2461.5 MHz	13.00	0.234	0.400	Pass


Low Channel
RBW 1 MHz
Att 40 dB
VBW 1 MHz
Ref 20.00 dBm
SWT 20ms
M1[1]
-35.99 dBm
800.000000000 µs
M2[1]
-38.20 dBm
13.760000000 ms
1Pk
Clrw
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
SGL
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.41425 GHz
2.0 ms/
Date: 20.MAY.2013 14:54:03


RBW 1 MHz
Att 40 dB
VBW 1 MHz
Ref 20.00 dBm
SWT 1s
1Pk
View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.41425 GHz
100.0 ms/
Date: 20.MAY.2013 14:58:03

Middle Channel



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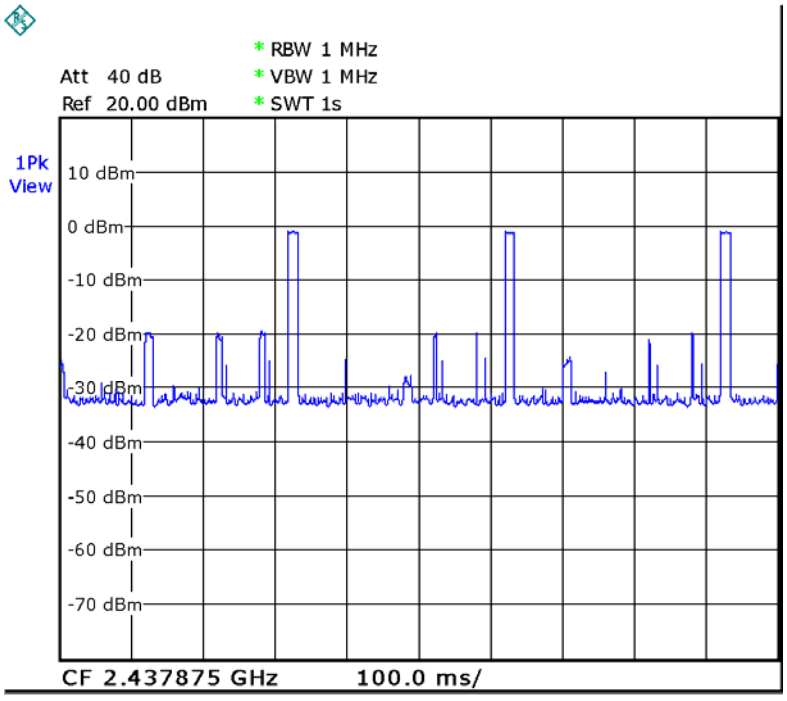

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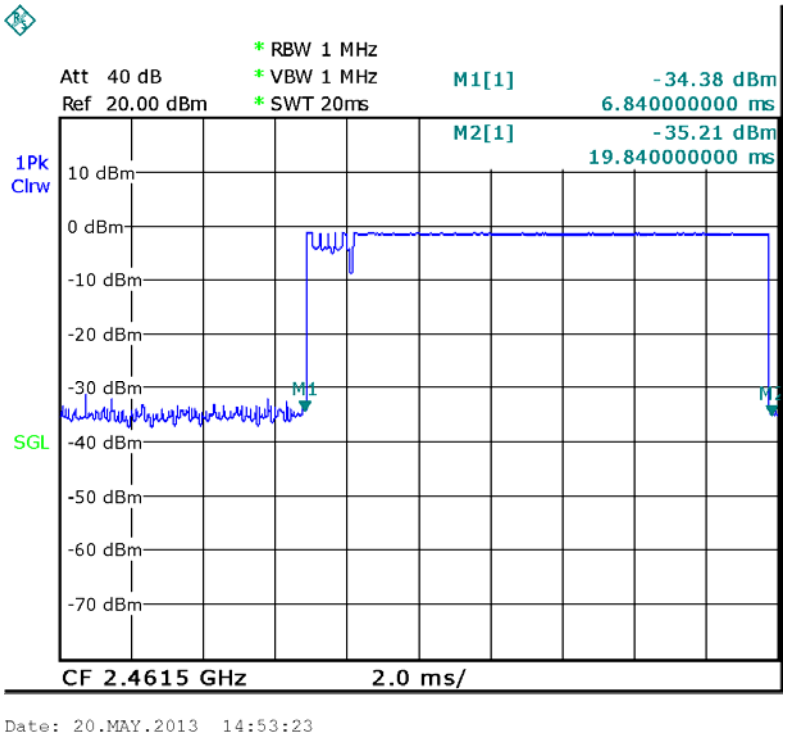
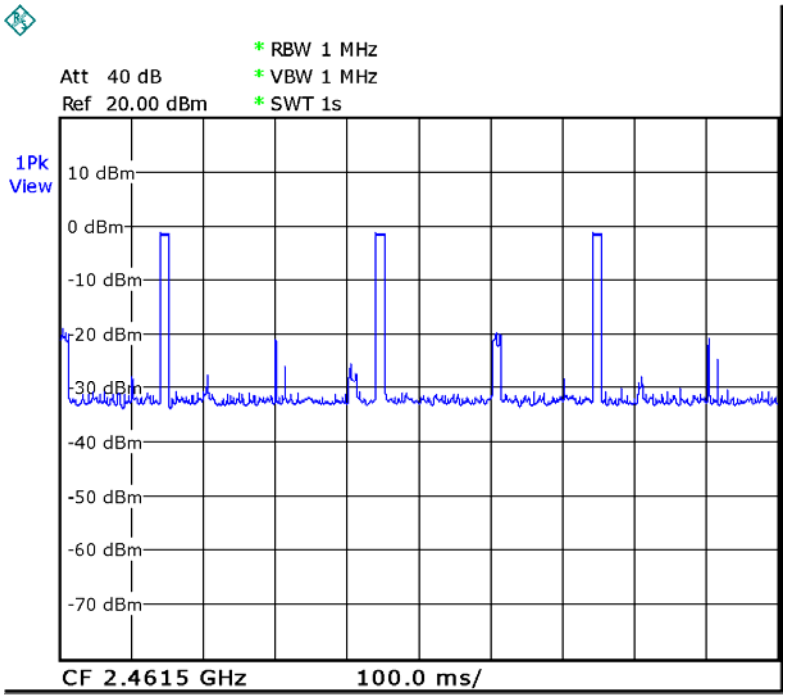
High Channel




* RBW 1 MHz
Att 40 dB
* VBW 1 MHz
Ref 20.00 dBm
* SWT 1s
1Pk
View
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.4615 GHz
100.0 ms/
Date: 20.MAY.2013 14:55:56

16 Antenna Requirement

According to the FCC Part 15 Paragraph 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. This product has a detachable antenna with RP SMA connector (The whorl is nonstandard , it only apply to this model), fulfill the requirement of this section.

17 RF Exposure

Test Requirement: **FCC Part 1.1307**

Test Mode: **The EUT work in test mode(Tx).**

17.1 Requiments:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

17.2 The procedures / limit

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm^2)	Averaging Time $\|E\|^2$,$\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

17.3 MPE Calculation Method

E (V/m) $= \frac{\sqrt{30 \times P \times G \times C}}{d}$ Power Density: *Pd* (W/m²) $= \frac{E^2}{377}$

E = Electric field (V/m)
P = Peak RF output power (W)
G = EUT Antenna numeric gain (numeric)
C = Cable loss (numeric)
d = Separation distance between radiator and human body (m)
The formula can be changed to

$$\boldsymbol{Pd} = \frac{30 \times P \times G \times C}{377 \times d^2}$$

dBm=10lgmW

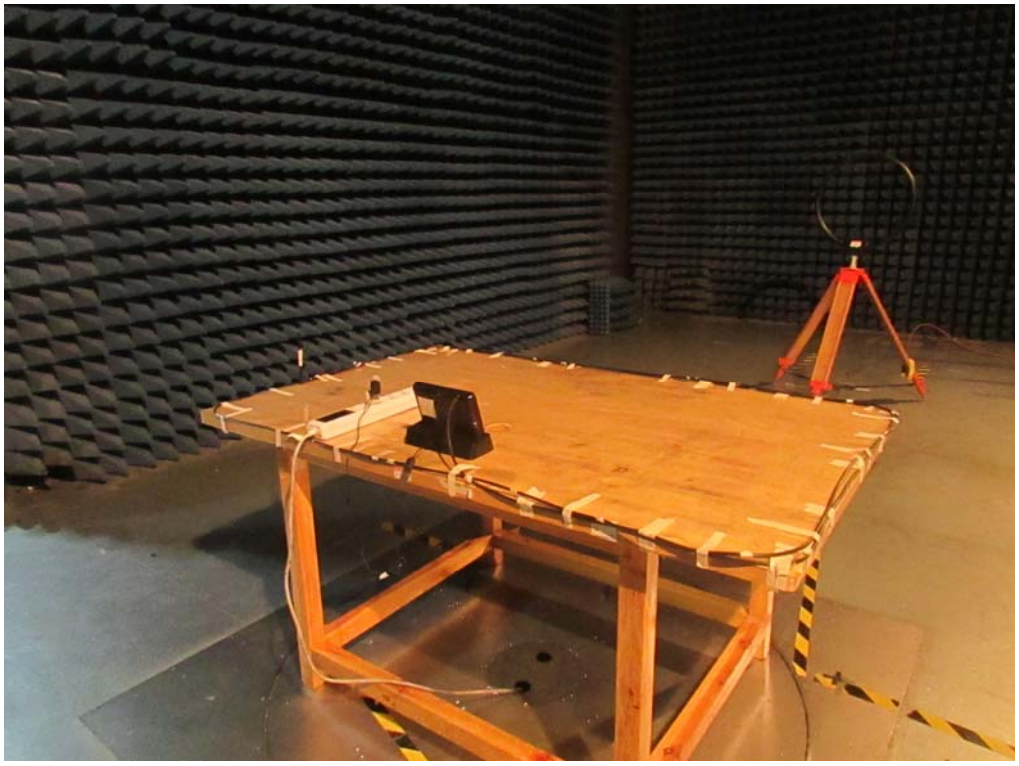
From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

Cable (m)	Peak Output Power (mW)	Antenna Gain (numeric)	Cable loss (numeric)	Power Density (S) (mW/cm^2)	Limit of Power Density (S) (mW/cm^2)
--	34.435	1.995	--	0.0137	1
3	34.435	3.162	0.698	0.0151	1
9	34.435	3.162	0.337	0.0073	1

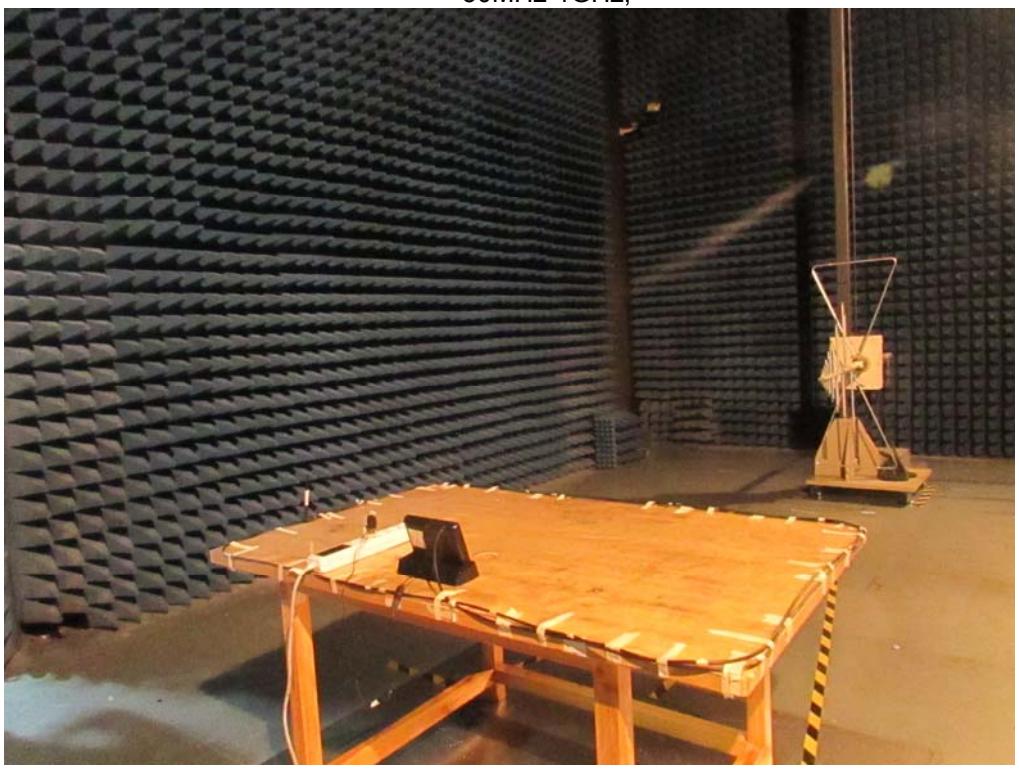
18 Photographs – Test Setup

18.1 Photograph –Conducted Emissions Test Setup

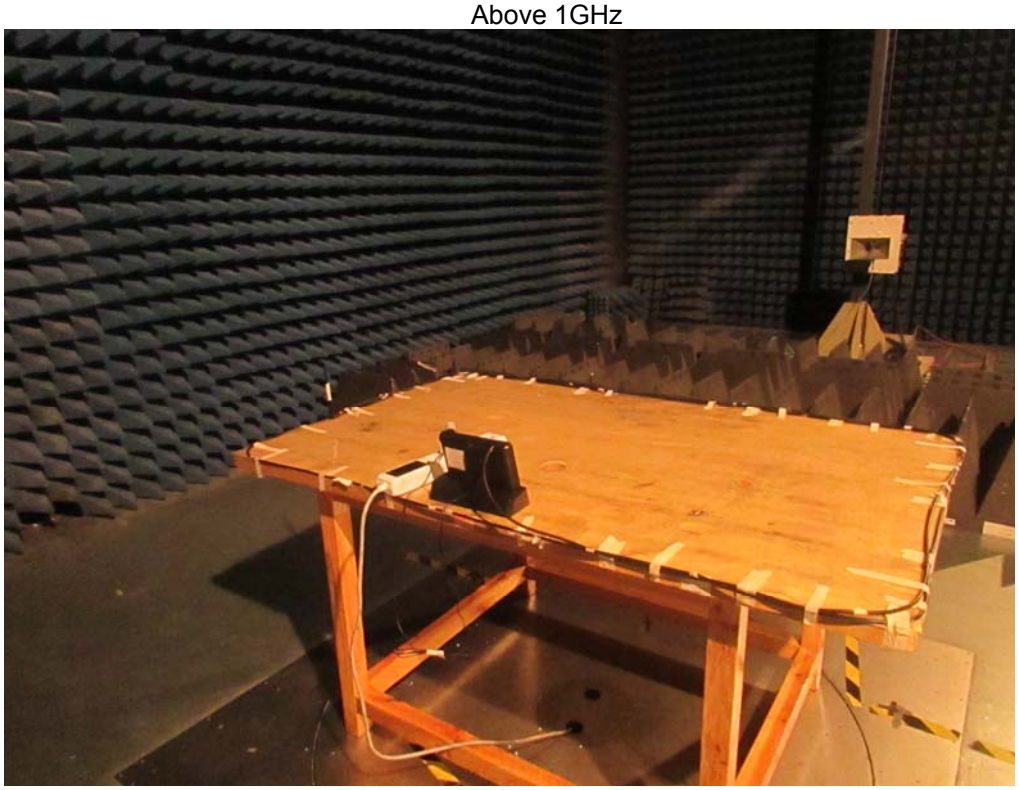
18.2 Photograph –Radiated Emissions Test Setup



30MHz-1GHz,



Above 1GHz



19 Photographs - Constructional Details

19.1 EUT –Appearance View

detail reference to “BARNVIEWMON_External photos”

19.2 EUT –Internal View

detail reference to “BARNVIEWMON_Internal photos”

20 FCC Label

FCC Label Sample for model: BARNVIEWMON

FCC ID: 2AABVBARNVIEWMON

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

FCC Label Location for model: BARNVIEWMON

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

=End of report=