SGS-CSTC Standards Technical Services（Shanghai） Co., Ltd.

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TEST REPORT

Application No. :	SHEM111100153203
Applicant:	Hansong(Nanjing) Technology Ltd.
Equipment Under Test (EUT):	
NOTE: The following sample(s) submitted was/were identified on behalf of the client as	
EUT Name:	Wireless volume master
Brand Name:	SONAB
Model No:	Cloud9 CVM
Fundamental Frequency :	2412-2464 MHz
FCC ID:	XCO-SNBCVM
IC:	7756A- SNBCVM
Standards:	FCC PART 15 SUBPART C, Section 15.247 RSS-210 Issue 8 (December 2010) RSS-Gen Issue 3 (December 2010)
Date of Receipt:	Nov. 23, 2011
Date of Test:	Nov. 24, 2011 to Feb 29, 2011
Date of Issue:	Mar 06, 2011
Test Result :	**PASS ***

* In the configuration tested, the EUT complied with the standards specified above.

E&E Section Head
SGS-CSTC(Shanghai) Co., Ltd.

Zenger Zhang
E&E EMC Engineer
SGS-CSTC(Shanghai) Co., Ltd.

2 Test Summary

TEST ITEM	FCC REFERANCE	IC REFERANCE	Test Procedure	RESULT
Power line conducted emission	15.207	RSS-Gen Issue 8 Clause 7.2.4	ANSI C63.10,2009	Pass
Radiated emission	15.205 & 15.209	RSS-210 Issue 8 Clause 2	ANSI C63.4,2003 KDB 558074	Pass
Channel number of hopping system	15.247(a)(1)(iii)	RSS-210 Issue 8 Annex 8	N/A	NA
Average time of occupancy in any channel	15.247(a)(1)(iii)	RSS-210 Issue 8 Annex 8	NA	NA
Minimum 6dB Bandwidth	15.247(a)(2)	RSS-210 Issue 8 Annex 8	KDB 558074	Pass
Maximum peak output power	15.247(b)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009	Pass
Radiated Emission BandEdge	15.247(c)	---	ANSI C63.4,2003 KDB 558074	Pass
Emission outside the Frequency band	15.247(d)	RSS-210 Issue 8 Annex 8	ANSI C63.4,2003 KDB 558074	Pass
Power spectrum density	15.247(e)	RSS-210 Issue 8 Annex 8	ANSI C63.10,2009	Pass
Occupied bandwidth	---	RSS-Gen Issue 3 Clause 4.6.1	RSS-Gen Issue 3 Clause 4.6.1	Tested

3 Contents

4 General Information

4.1 Client Information

Applicant :	Hansong(Nanjing) Technology Ltd.
Applicant Address:	8th Kangping Road, Jiangning Economy and Technology Development Zone,Nanjing,201106,China
Manufacturer:	Hansong(Nanjing) Technology Ltd.
Manufacturer Address:	8th Kangping Road, Jiangning Economy and Technology Development Zone,Nanjing,201106,China

4.2 Details of E.U.T.

EUT Name:	Wireless volume master
Brand Name:	SONAB
Model No:	Cloud9 CVM
Power Supply:	9.0VDC
AC adaptor:	Manufacturer:CLICK Model: CPS012A090100* INPUT: 100-240V~50/60Hz 0.4A OUTPUT: 9VDC,1.0A
Frequency Band Channels :	2412-2464 MHz Channel Description: Channel of Tranmitter — Frequency(MHz) 1 — 2412 2 — 2438 3 — 2464
Modulation Type:	QPSK
Antenna:	A & B Remark: A and B do not work at same time.

4.3 Description of Support Units

Name	Model No.	Remark
Wireless Loudspeaker	CLS	N/A
Wireless Transmitter	CTX	N/A

4.4 Test Location

Tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
No.588 West Jindu Road, Songjiang District, Shanghai, China. 201612.

Tel: +86 21 6191 5666 Fax: +86 21 6191 5655

4.5 Other Information Requested by the Customer

None.

4.6 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. Date of expiry: 2014-07-26.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683, Expiry Date: 2012-03-17.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A. Expiry Date: 2014-09-20.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3172 and C-3514 respectively. Date of Registration: 2009-11-30. Date of Expiry: 2012-03-17.

5 Test Instruments

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due date
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2011-06-03	2012-06-01
2	Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-679	2011-06-03	2012-06-01
3	Horn Antenna	Rohde & Schwarz	HF906	100284	2011-03-12	2012-03-10
4	ANTENNA	SCHWARZBECK	VULB9168	9168-313	2011-06-03	2012-06-01
5	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2011-10-09	2012-10-08
6	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY—2009P	--	2011-10-15	2012-10-14
7	CLAMP METER	FLUKE	316	86080010	2011-04-22	2012-04-20
8	Thermo-Hygrometer	ZHICHEN	ZC1-2	01050033	2011-10-14	2012-10-13
9	High-low temperature cabinet	Shanghai YuanZhen	GW2050	--	2011-06-17	2012-06-16
11	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT1800.0/2000.0-0.2/40-5SSK	11	2011-06-26	2012-06-25
12	Tunable Notch Filter	Wainwright instruments Gmbh	WRCT800.0/880.0-0.2/40-5SSK	9	2011-06-26	2012-06-25
13	High pass Filter	FSCW	HP 12/2800-5AA2	19A45-02	2011-04-08	2012-04-07
14	Low nosie amplifier	TESEQ	LNA6900	70133	2011-07-05	2012-07-04

15	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2011-06-04	2012-06-03
16	Line impedance stabilization network	SCHWARZBECK	NSLK8127	8127-490	2011-05-07	2012-05-06

6 Test Procedure & Measurement Data

6.1 E.U.T. Operation

Input voltage: 9.0VDC

Operating Environment:

Temperature: 25.0 °C

Humidity: 45 % RH

Atmospheric Pressure: 1010 mbar

EUT Operation: The EUT has been tested under operating condition.

Test program was used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low (2412MHz) mid(2438MHz) high(2464MHz)

6.2 Conducted Emission Test

Test Requirement: FCC Part15 15.207

Test date: Dec. 05, 2011

Standard Applicable According to section 15.207,frequency 150KHz to 30MHz shall not not exceed the limit table as blew.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

*

EUT Setup 1.The conducted emission tests were performed in the test site,using the setup in accordance with the ANSI C63.10-2009.

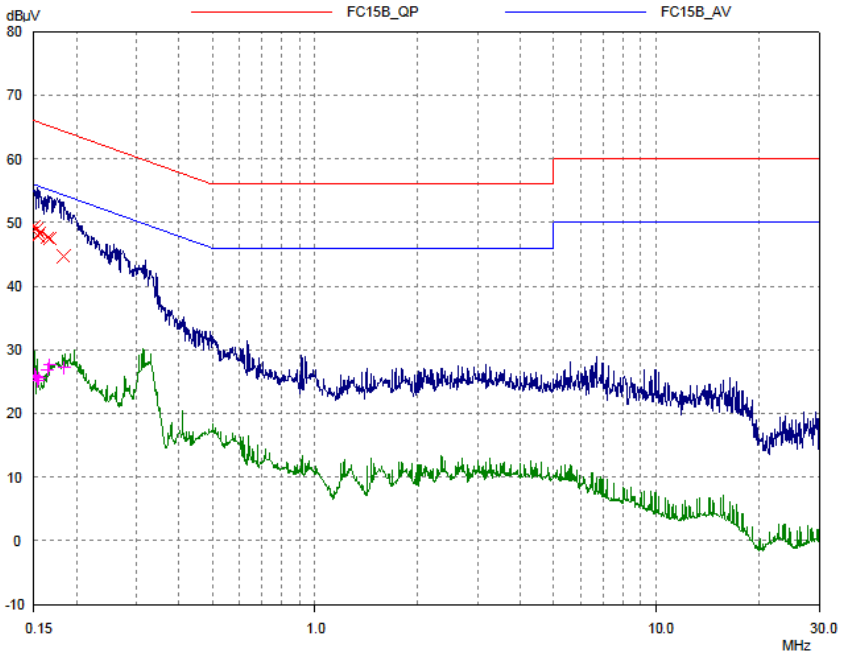
2.EUT is charged with PC.The AC Power adaptor of PC was plug-in LISN.The rear of the EUT and periphearals were placed flushed with the rear of the tabletop.

3.The LISN was connected with 120V AC/60Hz power source.

Measurement Result Operation mode:Normal Link Mode

Note:All test modes have been tested.

L line:

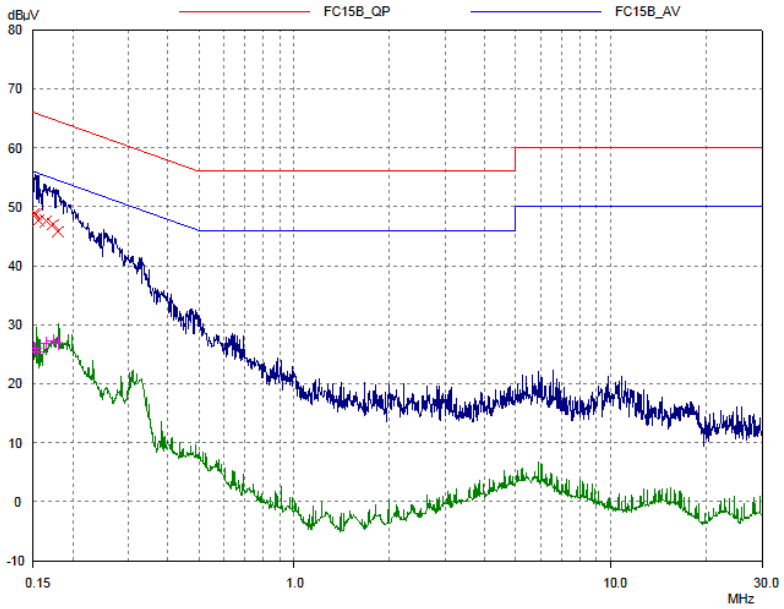


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.1506	49.38	65.97	16.59
0.15241	48.99	65.87	16.88
0.15425	47.91	65.77	17.86
0.15548	48.31	65.70	17.39
0.16442	47.68	65.24	17.56
0.16707	47.50	65.10	17.60
0.18386	44.71	64.31	19.60

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.1506	26.11	55.97	29.86
0.15241	25.74	55.87	30.13
0.15425	25.13	55.77	30.64
0.15548	25.51	55.70	30.19
0.16442	26.86	55.24	28.38
0.16707	27.57	55.10	27.53
0.18386	27.19	54.31	27.12

N Line:



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.1506	48.89	65.97	17.08
0.15241	48.75	65.87	17.12
0.15548	47.71	65.70	17.99
0.16442	47.62	65.24	17.62
0.17387	47.05	64.77	17.72
0.17951	45.79	64.51	18.72

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.1506	26.11	55.97	29.86
0.15241	25.97	55.87	29.90
0.15548	25.32	55.70	30.38
0.16442	26.81	55.24	28.43
0.17387	27.30	54.77	27.47
0.17951	26.78	54.51	27.73

6.3 Spurious Radiated Emission Test

Test Requirement: FCC Part15 247(c)

Test date: Dec 12,2011 and Feb 29, 2012

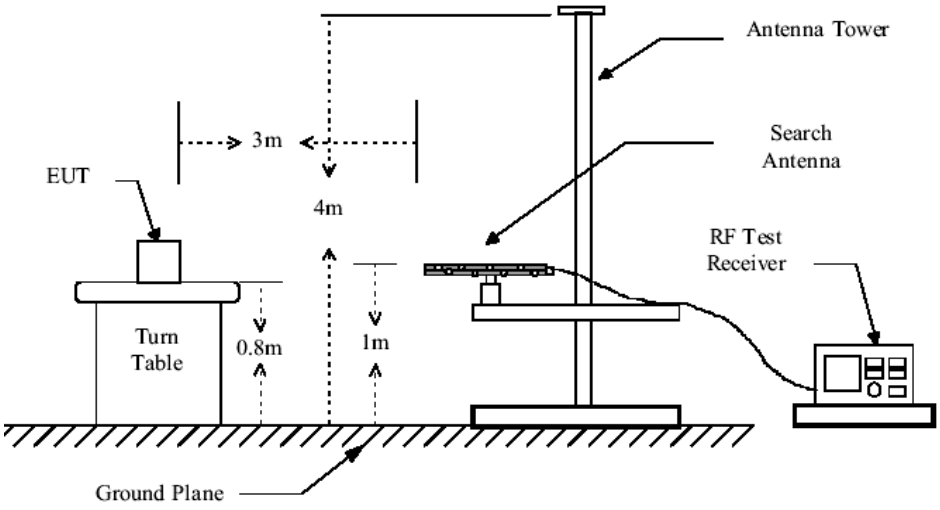
Standard Applicable: According to section 15.247(c),all other emissions outside these bands shall not exceed the general radiated emission limits specified in section15.209(a).And according to section 15.33(a)(1),for an intentional radiator operates below 10GHz,the frequency range of measurements:to the tenth harmonic of the highest fundamental frequency or to 40GHz,which is lower.

Measurement Procedure:

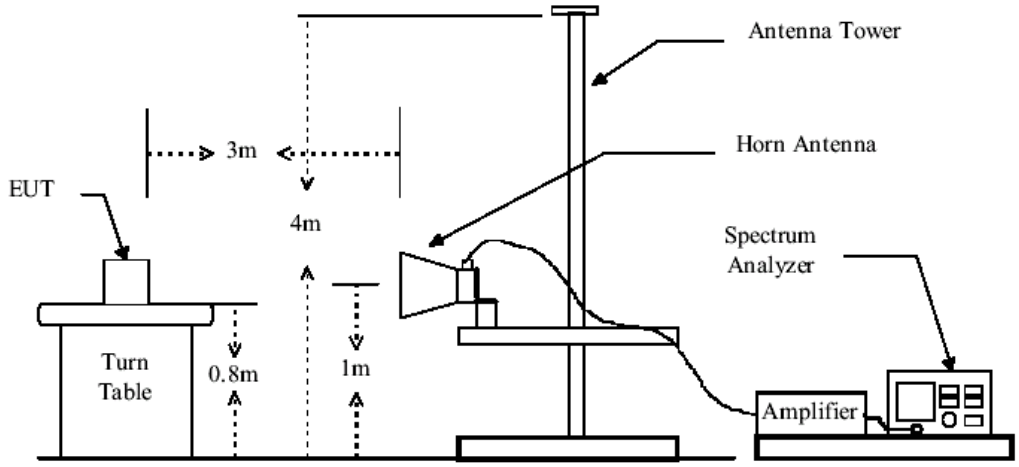
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz - 1000 MHz). 1MHz resolution bandwidth and Peak detector apply (1000 MHz – 25GHz)
Above 1GHz
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO.
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 all frequency measured were complete.

Radiated Test Set-up:

Radiated Emission Test Set-up,Frequency Below 1000MHz



Radiated Emission Test Set-up Frequency Over 1GHz



Low nosie amplifier was used below 1GHz,High pass Filter was used above 1GHz.

Operation Mode: TX Low Mid CH 2412MHz Antenna A

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
440.12	11.5	1.5	24.5	48.92	37.42	46.00	Vertical
233.31	14.5	2.1	24.4	45.50	37.70	46.00	Horizontal

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

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4824.0	31.0	1.2	0.5	43.4	57.48	46.78	74	Vertical
7236.0	35.5	1.7	0.6	43.1	46.38	41.08	74	Vertical
9648.0	37.7	2.1	0.9	43.3	48.85	46.25	74	Vertical
4824.0	31.0	1.2	0.5	43.4	55.22	44.52	74	Horizontal
7236.0	35.5	1.7	0.6	43.1	46.44	41.14	74	Horizontal
9648.0	37.7	2.1	0.9	43.3	44.43	41.83	74	Horizontal

Average Measurement:

Frequency (MHz	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarizatio n
4824.0	31.0	1.2	0.5	43.4	48.97	38.27	54	Vertical
7236.0	35.5	1.7	0.6	43.1	36.42	31.12	54	Vertical
9648.0	37.7	2.1	0.9	43.3	37.80	35.20	54	Vertical
4824.0	31.0	1.2	0.5	43.4	45.98	35.28	54	Horizontal
7236.0	35.5	1.7	0.6	43.1	36.65	31.35	54	Horizontal
9648.0	37.7	2.1	0.9	43.3	35.27	32.67	54	Horizontal

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 +Fiter–Preamplifier Factor

Operation Mode: TX Mid CH 2438MHz Antenna A

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
110.70	11.5	1.5	24.5	49.00	37.50	43.50	Vertical
110.70	14.5	2.1	24.4	45.27	37.47	43.50	Horizontal

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

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarizatio n
4876.0	31.1	1.3	0.5	43.5	52.36	41.76	74	Vertical
7314.0	35.7	1.7	0.6	43.1	46.76	41.66	74	Vertical
9752.0	37.8	2.1	0.9	43.0	47.26	45.06	74	Vertical
4876.0	31.1	1.3	0.5	43.5	56.27	45.67	74	Horizontal
7314.0	35.7	1.7	0.6	43.1	46.73	41.63	74	Horizontal
9752.0	37.8	2.1	0.9	43.0	48.45	46.25	74	Horizontal

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4876.0	31.1	1.3	0.5	43.5	46.10	35.50	54	Vertical
7314.0	35.7	1.7	0.6	43.1	37.24	32.14	54	Vertical
9752.0	37.8	2.1	0.9	43.0	37.34	35.14	54	Vertical
4876.0	31.1	1.3	0.5	43.5	49.32	38.72	54	Horizontal
7314.0	35.7	1.7	0.6	43.1	36.12	31.02	54	Horizontal
9752.0	37.8	2.1	0.9	43.0	37.52	35.32	54	Horizontal

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 +Fiter–Preamplifier Factor

Operation Mode:TX High CH 2464MHz Antenna A

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
110.70	11.5	1.5	24.5	49.51	38.01	43.50	Vertical
110.70	14.5	2.1	24.4	36.37	28.57	43.50	Horizontal

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

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4928.0	31.4	1.4	0.5	43.9	53.06	42.46	74	Vertical
7392.0	35.8	1.7	0.6	43.1	46.57	41.57	74	Vertical
9856.0	38.0	2.2	0.9	42.8	46.22	44.52	74	Vertical
4928.0	31.4	1.4	0.5	43.9	56.92	46.32	74	Horizontal
7392.0	35.8	1.7	0.6	43.1	49.56	44.56	74	Horizontal
9856.0	38.0	2.2	0.9	42.8	46.78	45.08	74	Horizontal

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4928.0	31.4	1.4	0.5	43.9	47.54	36.94	54	Vertical
7392.0	35.8	1.7	0.6	43.1	35.78	30.78	54	Vertical
9856.0	38.0	2.2	0.9	42.8	35.94	34.24	54	Vertical
4928.0	31.4	1.4	0.5	43.9	51.93	41.33	54	Horizontal
7392.0	35.8	1.7	0.6	43.1	37.65	32.65	54	Horizontal
9856.0	38.0	2.2	0.9	42.8	36.48	34.78	54	Horizontal

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

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

Operation Mode: TX Low Mid CH 2412MHz Antenna B

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
387.48	11.5	1.5	24.5	47.88	36.38	46.00	Vertical
211.28	14.5	2.1	24.4	43.07	35.27	43.50	Horizontal

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

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4830.44	31.0	1.2	0.5	43.4	59.18	48.48	74	Vertical
7241.73	35.5	1.7	0.6	43.1	48.68	43.38	74	Vertical
9654.08	37.7	2.1	0.9	43.3	51.85	49.25	74	Vertical
4830.22	31.0	1.2	0.5	43.4	56.92	46.22	74	Horizontal
7241.74	35.5	1.7	0.6	43.1	48.74	43.44	74	Horizontal
9653.64	37.7	2.1	0.9	43.3	47.43	44.83	74	Horizontal

Average Measurement:

Frequency (MHz	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/ m)	Antenna polarization
4831.64	31.0	1.2	0.5	43.4	50.87	40.17	54	Vertical
7243.43	35.5	1.7	0.6	43.1	38.27	32.97	54	Vertical
9656.18	37.7	2.1	0.9	43.3	39.47	36.87	54	Vertical
4831.42	31.0	1.2	0.5	43.4	47.88	37.18	54	Horizontal
7243.44	35.5	1.7	0.6	43.1	38.50	33.20	54	Horizontal
9655.74	37.7	2.1	0.9	43.3	36.94	34.34	54	Horizontal

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 +Fiter–Preamplifier Factor

Operation Mode: TX Mid CH 2438MHz Antenna B

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
165.43	11.5	1.5	24.5	49.12	49.12	43.50	Vertical
178.69	14.5	2.1	24.4	43.34	43.34	43.50	Horizontal

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

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4878.92	31.1	1.3	0.5	43.5	48.924	38.32	74	Vertical
7321.86	35.7	1.7	0.6	43.1	44.384	39.28	74	Vertical
9762.37	37.8	2.1	0.9	43.0	45.534	43.33	74	Vertical
4878.96	31.1	1.3	0.5	43.5	52.443	41.84	74	Horizontal
7321.86	35.7	1.7	0.6	43.1	44.357	39.25	74	Horizontal
9762.38	37.8	2.1	0.9	43.0	46.605	44.40	74	Horizontal

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4880.87	31.1	1.3	0.5	43.5	47.21	36.61	54	Vertical
7321.32	35.7	1.7	0.6	43.1	38.69	33.59	54	Vertical
9761.76	37.8	2.1	0.9	43.0	38.91	36.71	54	Vertical
4880.87	31.1	1.3	0.5	43.5	50.43	39.83	54	Horizontal
7321.32	35.7	1.7	0.6	43.1	37.57	32.47	54	Horizontal
9761.76	37.8	2.1	0.9	43.0	39.09	36.89	54	Horizontal

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 +Fiter–Preamplifier Factor

Operation Mode:TX High CH 2464MHz Antenna B

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
126.39	11.5	1.5	24.5	49.51	36.46	43.50	Vertical
156.82	14.5	2.1	24.4	36.37	31.39	43.50	Horizontal

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

Peak Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4931.40	31.4	1.4	0.5	43.9	53.41	42.81	74	Vertical
7394.35	35.8	1.7	0.6	43.1	46.20	41.20	74	Vertical
9857.52	38.0	2.2	0.9	42.8	45.40	43.70	74	Vertical
4931.79	31.4	1.4	0.5	43.9	57.27	46.67	74	Horizontal
7394.65	35.8	1.7	0.6	43.1	49.19	44.19	74	Horizontal
9857.57	38.0	2.2	0.9	42.8	45.96	44.26	74	Horizontal

Average Measurement:

Frequency (MHz)	Antenna factors (dB/m)	Cable loss (dB)	Filter (dB)	Preamp factor (dB)	Reading Level (dB V)	Emission Level (dB V/m)	Limit (dB V/m)	Antenna polarization
4934.33	31.4	1.4	0.5	43.9	48.78	38.18	54	Vertical
7401.09	35.8	1.7	0.6	43.1	37.06	32.06	54	Vertical
9868.05	38.0	2.2	0.9	42.8	36.64	34.94	54	Vertical
4934.33	31.4	1.4	0.5	43.9	53.17	42.57	54	Horizontal
7401.09	35.8	1.7	0.6	43.1	38.93	33.93	54	Horizontal
9868.05	38.0	2.2	0.9	42.8	37.18	35.48	54	Horizontal

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

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

6.4 6dB Bandwidth

Test Requirement: FCC Part15 247(a)(2)

Test date: Dec 06 11.2011

Standard Applicable: According to section 15.247(a)(2),Systems using digital modulationg techniques may operate in the 902-928MHz,2400-2483.5MHz,and 5725-5850MHz bands.The minimum 6dB bandwidth shall be at least 500KHz.

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW =3* RBW, Span=30/ 50MHz, Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

Measurement Result:

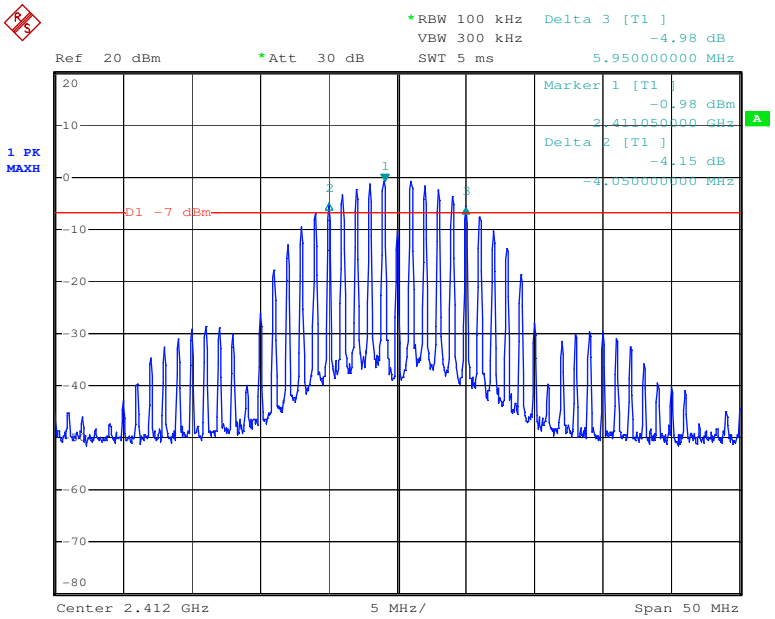
For Antenna A:

CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	10.0	500	PASS
MID	2438	10.1	500	PASS
HIGH	2464	10.0	500	PASS

For Antenna B:

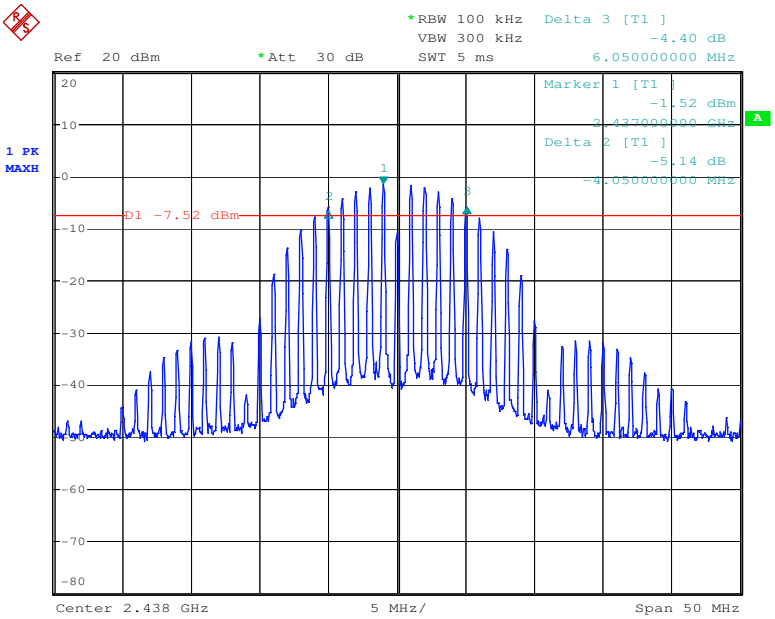
CH	Frequency (MHz)	Bandwidth (MHz)	Limit Bandwidth (KHz)	Result
LOW	2412	10.0	500	PASS
MID	2438	10.0	500	PASS
HIGH	2464	9.9	500	PASS

6dB Band Width Test Data CH-Low 2412MHz For Antenna A



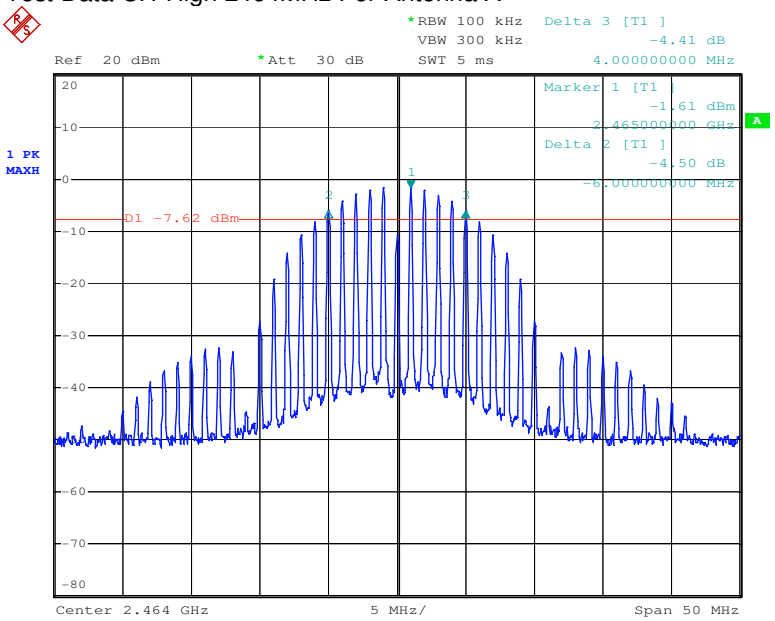
Date: 1.JAN.2000 05:06:07

6dB Band Width Test Data CH-Mid 2438MHz For Antenna A



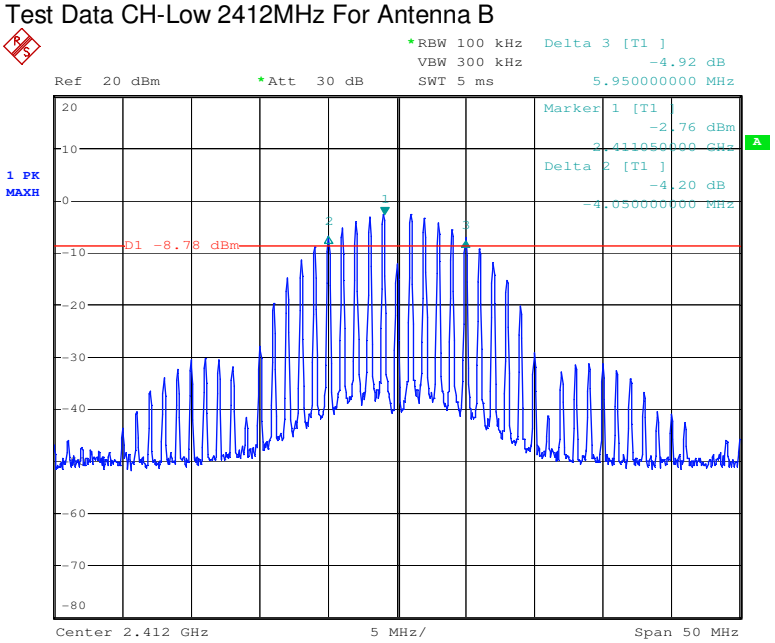
Date: 1.JAN.2000 05:01:42

6dB Band Width Test Data CH-High 2464MHz For Antenna A



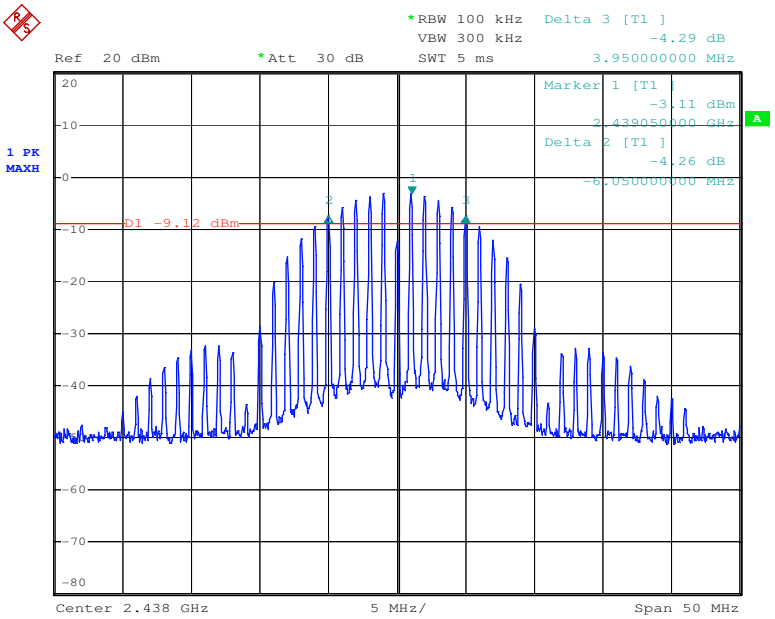
Date: 1.JAN.2000 05:07:33

6dB Band Width Test Data CH-Low 2412MHz For Antenna B



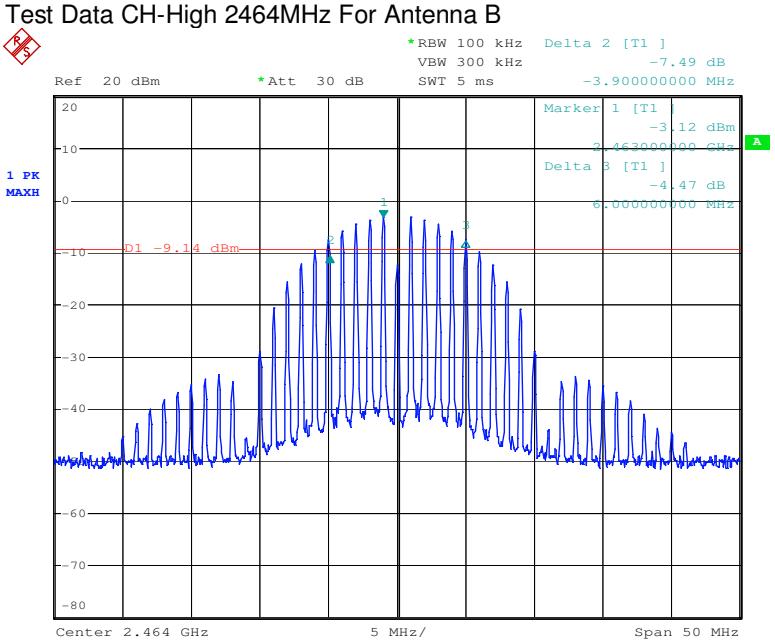
Date: 1.JAN.2000 05:10:30

6dB Band Width Test Data CH-Mid 2438MHz For Antenna B



Date: 1.JAN.2000 05:12:31

6dB Band Width Test Data CH-High 2464MHz For Antenna B



Date: 1.JAN.2000 05:14:14

6.5 Peak Output Power Measurement

Test Requirement: FCC Part 15 15.247(a)(2),(b)

Test date Dec 05, 2011

Standard Applicable: According to section 15.247(a)(2),(b)
(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Measuremet Produre

a) Measure the EUT 6dB bandwith of the emission. reference section 5.3.3 6dB bandwidth results.
b) When the analyzer RBW is not large enough, the analyzer band power function can be used,
c) Set the RBW=1MHz(the anlalyzer maximum available), VBW=3MHz, band limits granter than 26dB bandwidth.
d) Turn averaging off, set sweep to automatic, the span just large enough to capture the emission.
e) Use peak detector on max hold.
Record the measured channel power.

Measurement Result:

For Antenna A

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Correction Factor (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	2.87	0.9	10.00	13.77	30	PASS
MID	2438	1.60	0.9	10.04	12.50	30	PASS
HIGH	2464	1.61	0.9	10.00	12.51	30	PASS

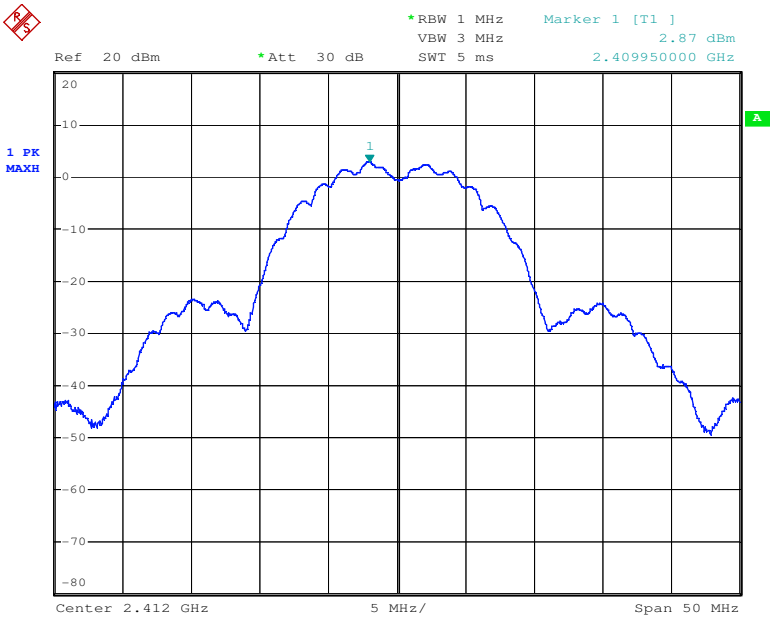
For Antenna B

CH	Frequency (MHz)	Reading Power(dBm)	Cable Loss (dB)	Correction Factor (dB)	Output Power (dBm)	Limit (dBm)	Result
LOW	2412	0.65	0.9	10.00	11.55	30	PASS
MID	2438	0.31	0.9	10.00	11.21	30	PASS
HIGH	2464	0.40	0.9	9.96	11.26	30	PASS

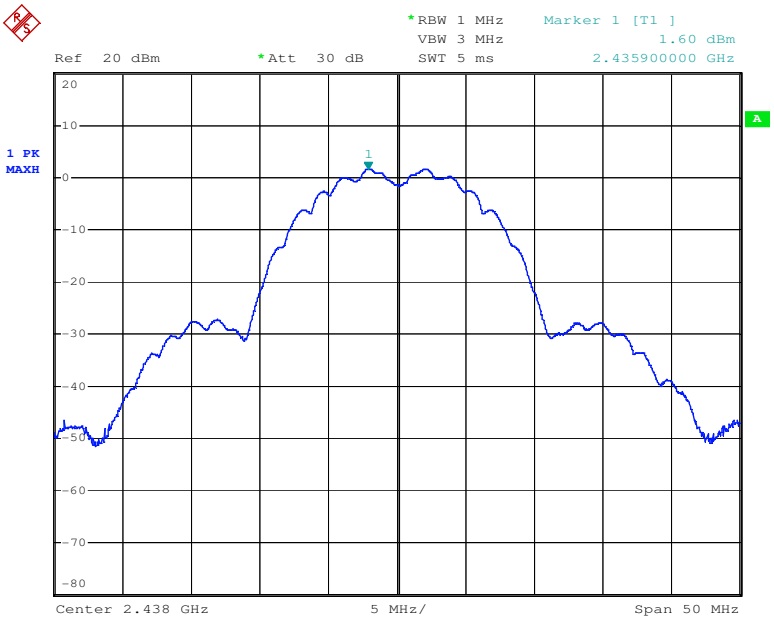
Note: the BW correction factor is 10 log [(6 dB BW of emission)/ (analyzer RBW)].

For Antenna A

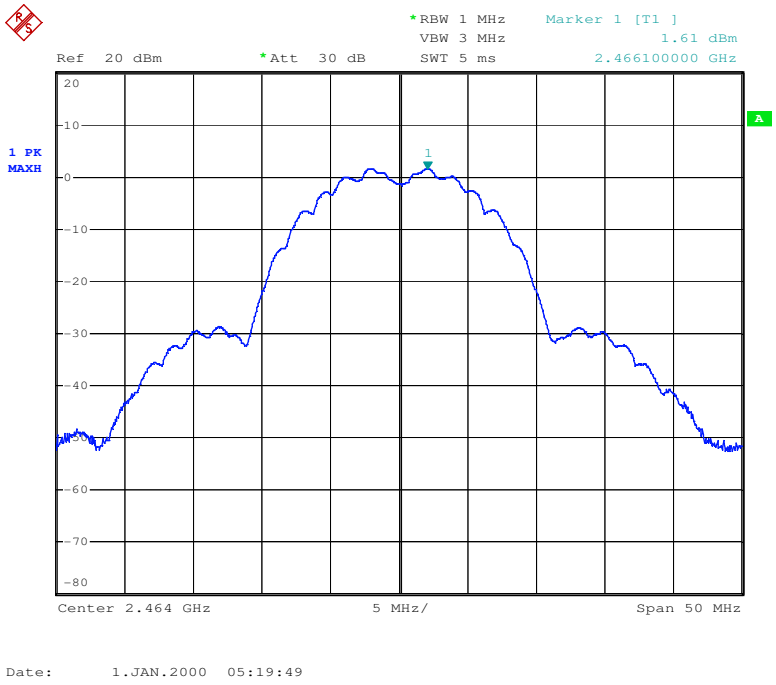
CH Low 2412MHz



CH Mid 2438MHz

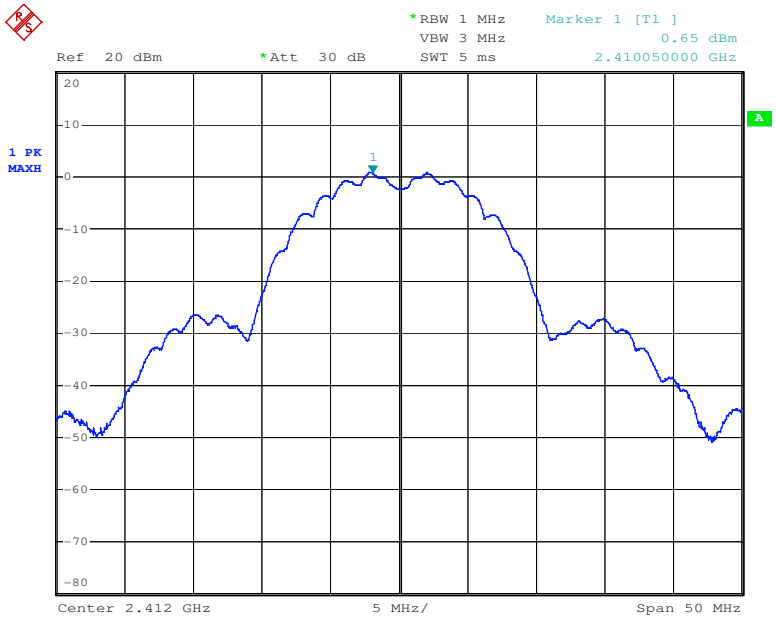


CH High 2464MHz

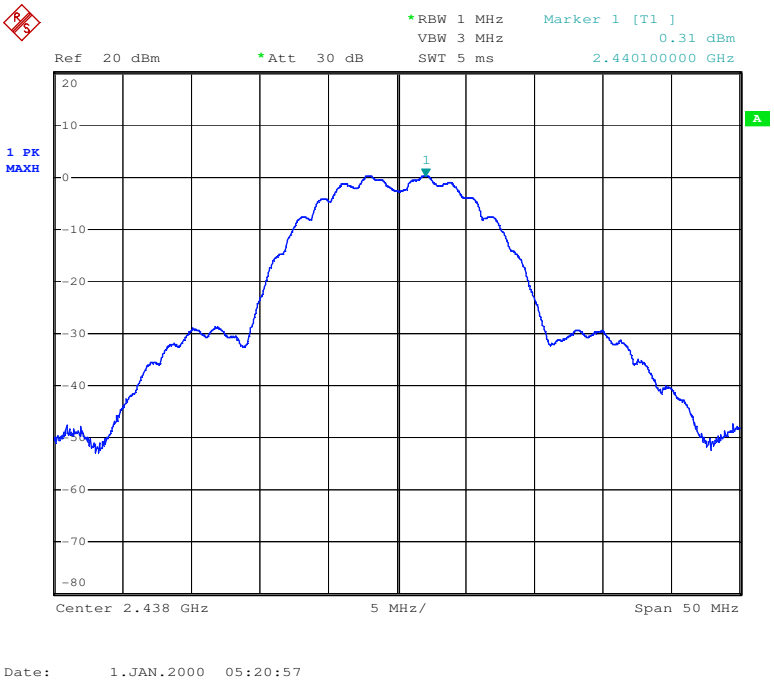


For Antenna B

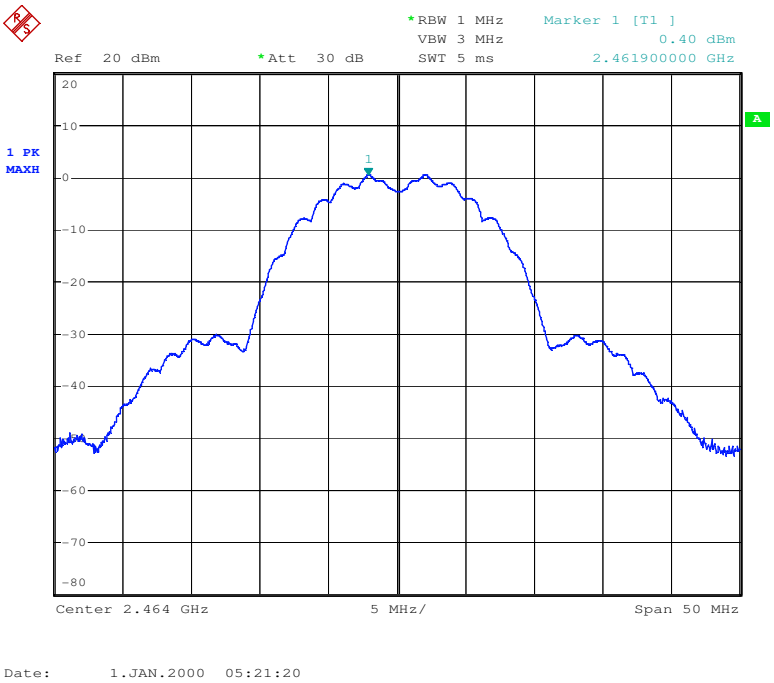
CH Low 2412MHz



CH Mid 2438MHz



CH High 2464MHz



6.6 Radiated Emission Band Edge

Test Requirement: FCC Part15 247(c)

Test date: Dec 01.2011

Standard Applicable: According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

Measurement Distance: 3m (Semi-Anechoic Chamber)

Limit: 40.0 dBμV/m between 30MHz & 88MHz;

43.5 dBμV/m between 88MHz & 216MHz;

46.0 dBμV/m between 216MHz & 960MHz;

AV 54.0 dBμV/m PK 74.0dBμV/m above 960MHz.

Measurement Procedure: The EUT was setup according to ANSI 63.10,2009 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47 CFR 15.247 requirements.The EUT is placed on a turn table which is 0.8 m above ground.The turn table is rotated 360 degrees to determine to the position of the maximum emission level.The EUT was positioned such that the distance from antenna to the EUT was 3 menters.The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level

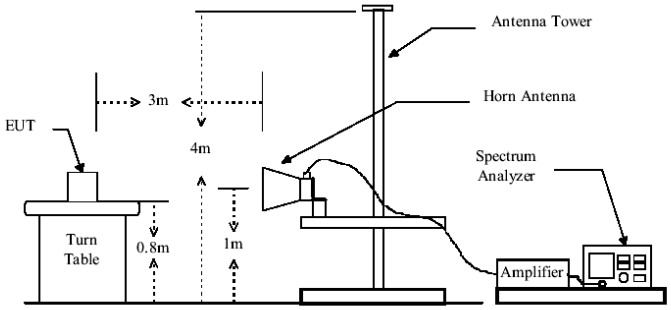
This is repeated for both horizontal and vertical polarization of the antenna.In order to find the maximum emission,all of the interface cables were manipulated according to ANSIC 63.10:2009 on radiated measurement.

Spectrum analyzer parameters setting as shown below:

(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO

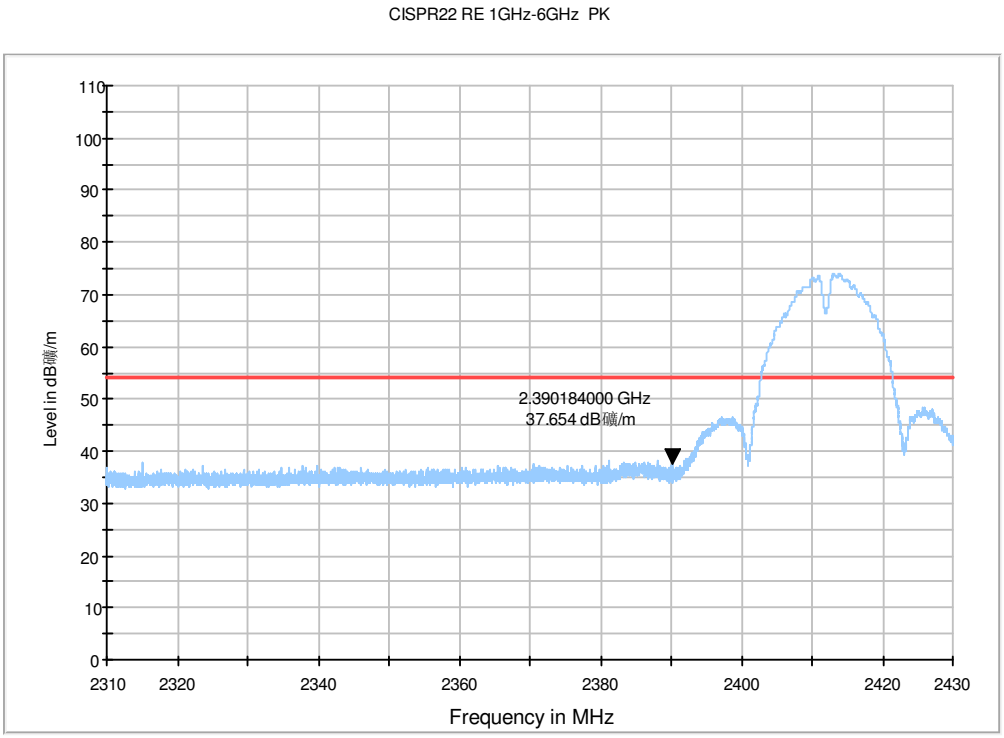
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO

Radiated Emission Test Set-up Frequency Over 1GHz



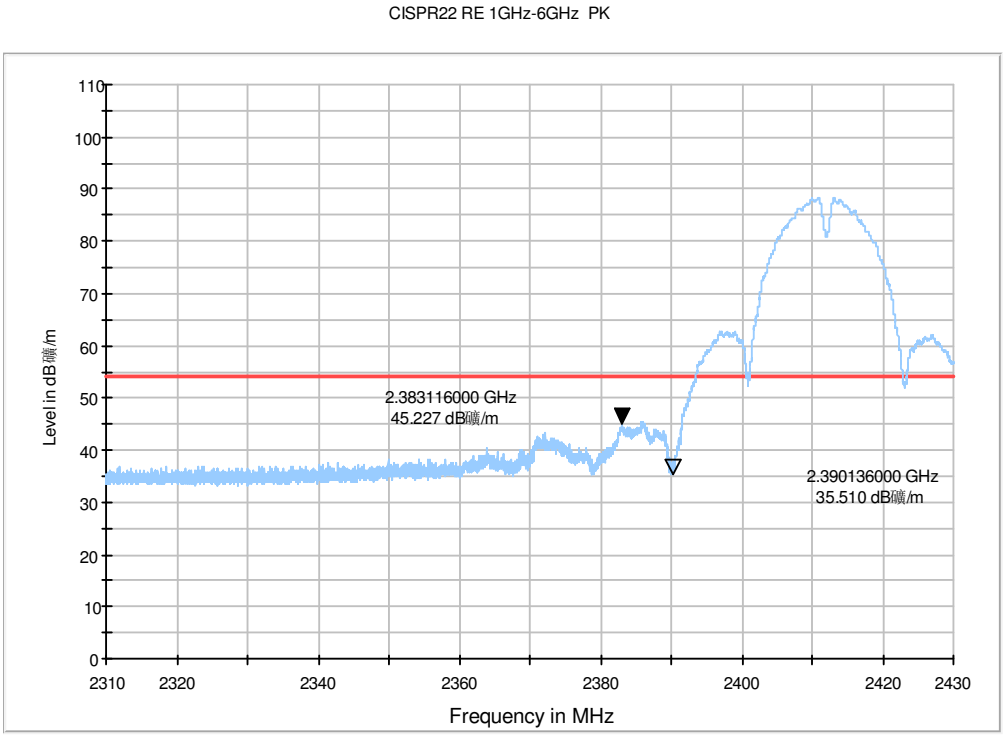
The field strength is calculated by adding the Antenna Factor,Preamplifier Factor&Cable Factor. The basic equation with a sample calculation is as follows:
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

Radiated Bandedge Measurement Result:
CH Low 2412MHz Radiated Bandedge(Horizontal) Antenna A
Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2390.18	48.05	27.28	42.50	4.82	37.65	74.00	36.35

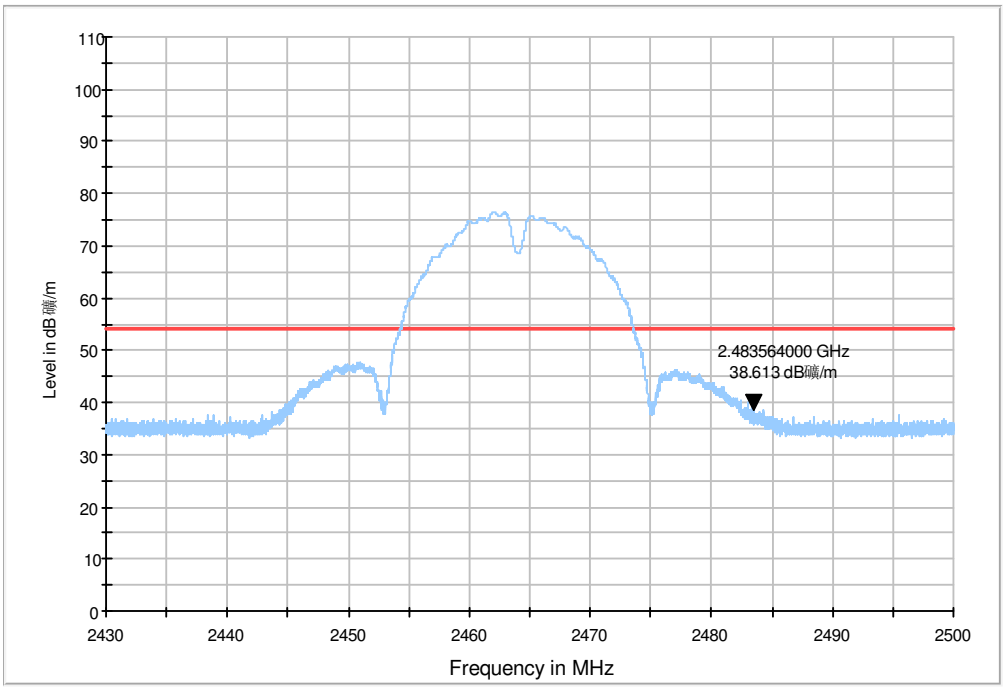
CH Low 2412MHz Radiated Bandedge(Vertical) Antenna A
Vertical, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2383.12	55.63	27.28	42.50	4.82	45.23	74.00	28.77

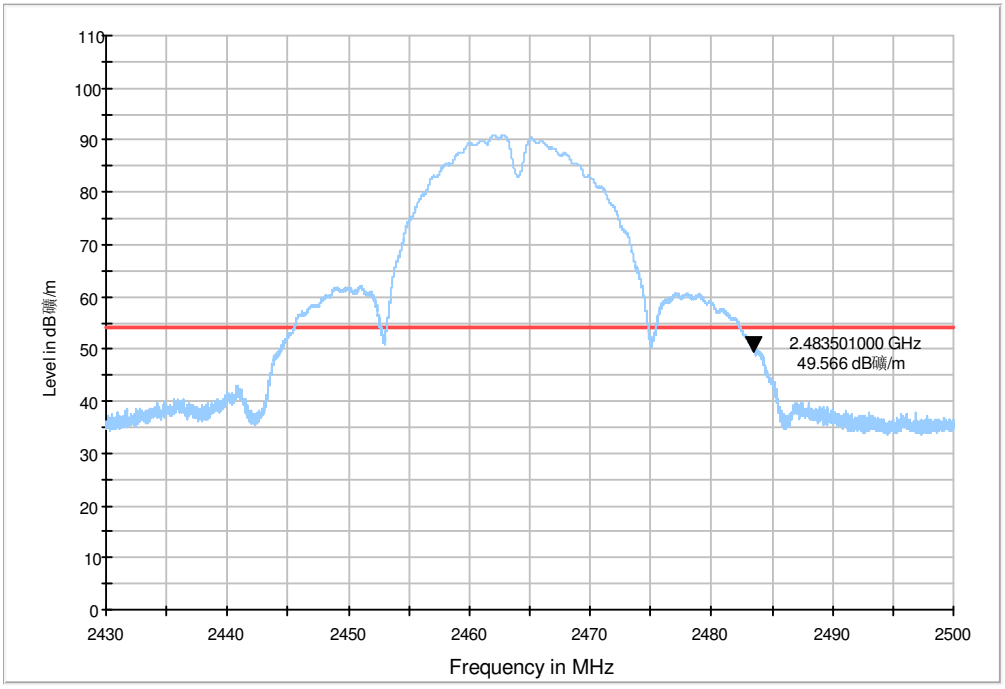
CH High 2464MHz Radiated Bandedge(Horizontal) Antenna A

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.56	48.85	27.48	42.54	4.82	38.61	74.00	35.39

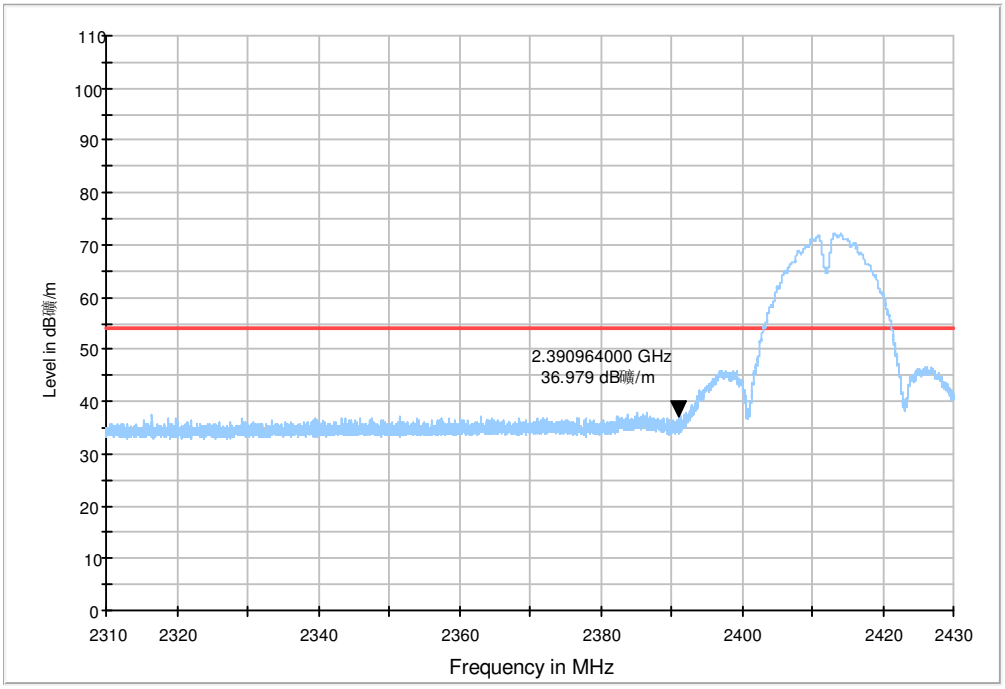
CH High 2464MHz Radiated Bandedge(Vertical) Antenna A
Vertical, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.50	59.81	27.48	42.54	4.82	49.57	74.00	24.43

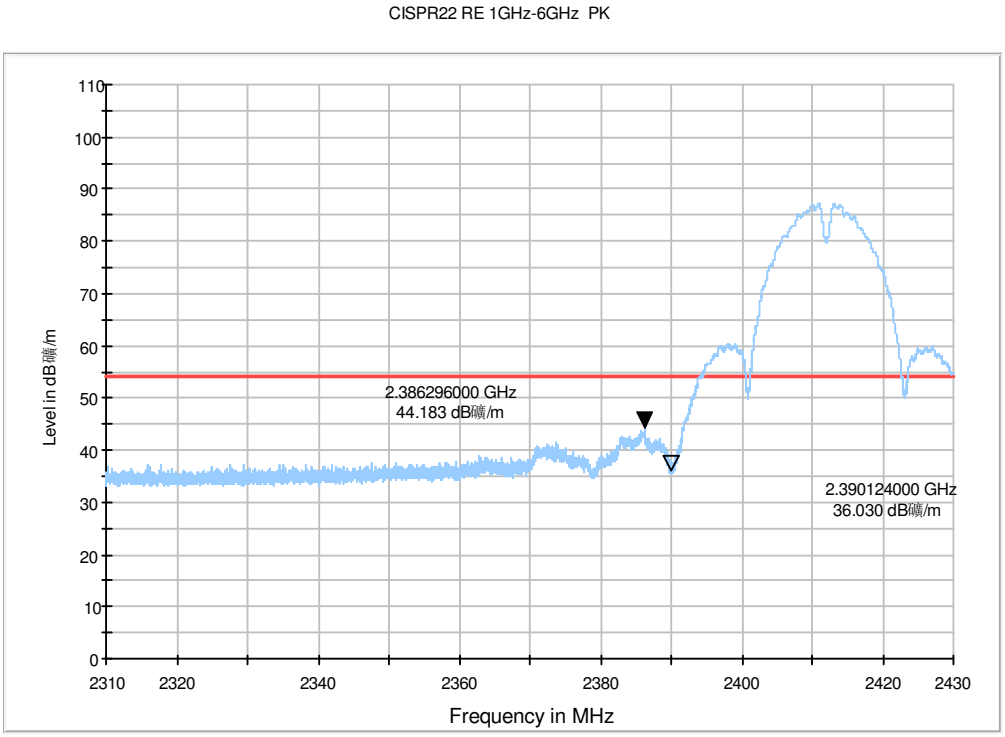
CH Low 2412MHz Radiated Bandedge(Horizontal) Antenna B

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2390.96	47.38	27.28	42.50	4.82	36.98	74.00	37.02

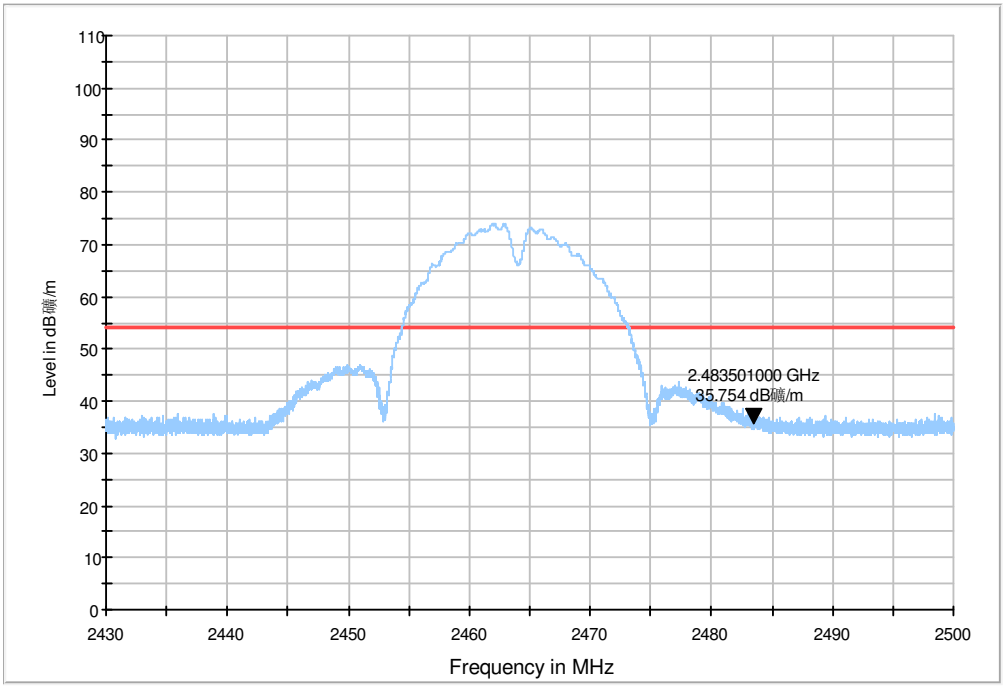
CH Low 2412MHz Radiated Bandedge(Vertical) Antenna B
Vertical, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2386.30	54.58	27.28	42.50	4.82	44.18	74.00	29.82

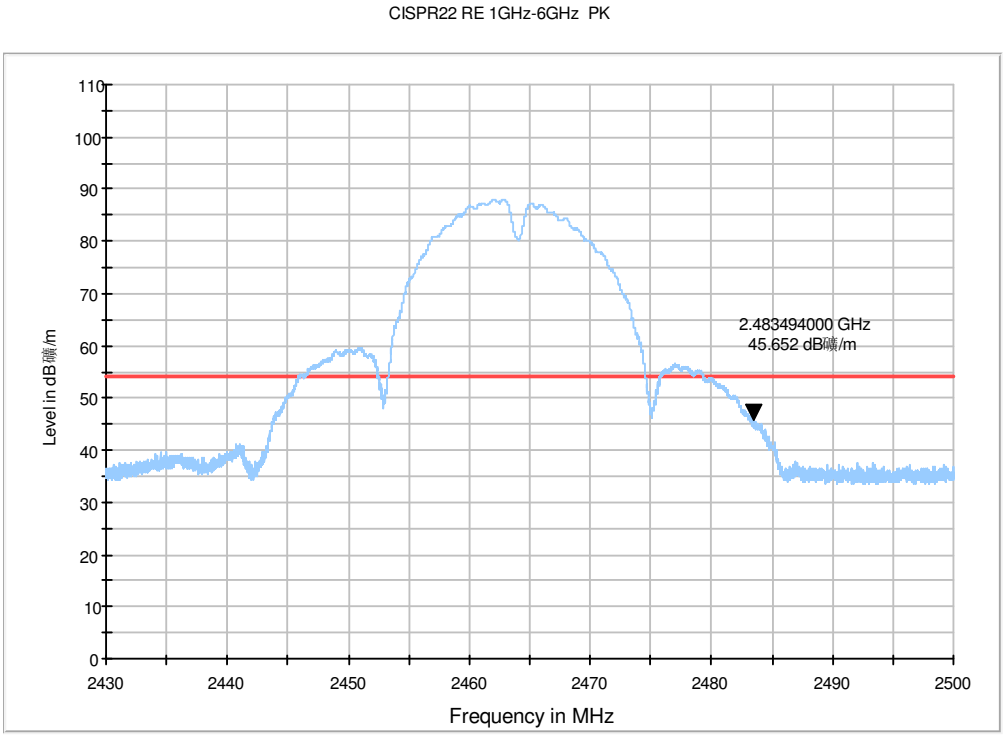
CH High 2464MHz Radiated Bandedge(Horizontal) Antenna B

Horizontal, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.50	45.99	27.48	42.54	4.82	35.75	74.00	38.25

CH High 2464MHz Radiated Bandedge(Vertical) Antenna B
Vertical, Peak Detector:



Frequency (MHz)	Peak Reading (dBuV)	Antenna Factor (dB/m)	PreAmp (dB)	Cable Loss (dB)	Peak Level (dBuV/m)	Peak Limit (dBuV/m)	Margin (dB)
2483.49	55.89	27.48	42.54	4.82	45.65	74.00	28.35

Remark: 1. The Peak Level less than the AV limit, so the AV level is no greater than the AV limit.

2. No any other emission which fall in restricted bands can be detected and be reported.

All frequencies within the “Restricted bands” have been evaluated to compliance. Section 15.205 Restricted bands of operation.

6.7 Conducted Spurious Emission Test

Test Requirement: FCC Part15 247(c)

Test date: Dec 07, 2011

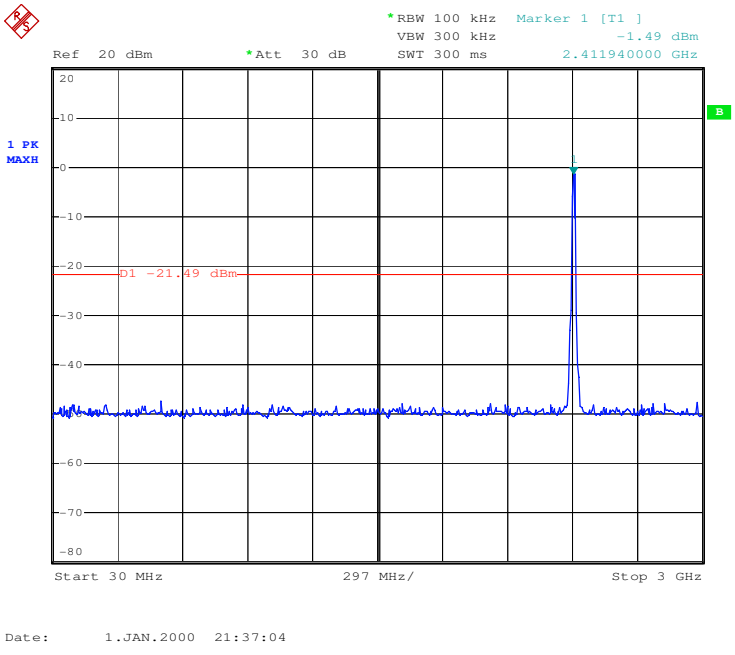
Standard Applicable: According to section 15.247(c),in any 100KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating,the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power,In addition,radiated emissions which fall in the restricted bands,as defined in section 15.205(a),must also comply with the radiated emission limits specified in 15.209(a).

Measurement Procedure:
1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW=100KHz VBW=300KHz, Sweep = auto
6. Repeat above procedures until all frequency measured were complete.

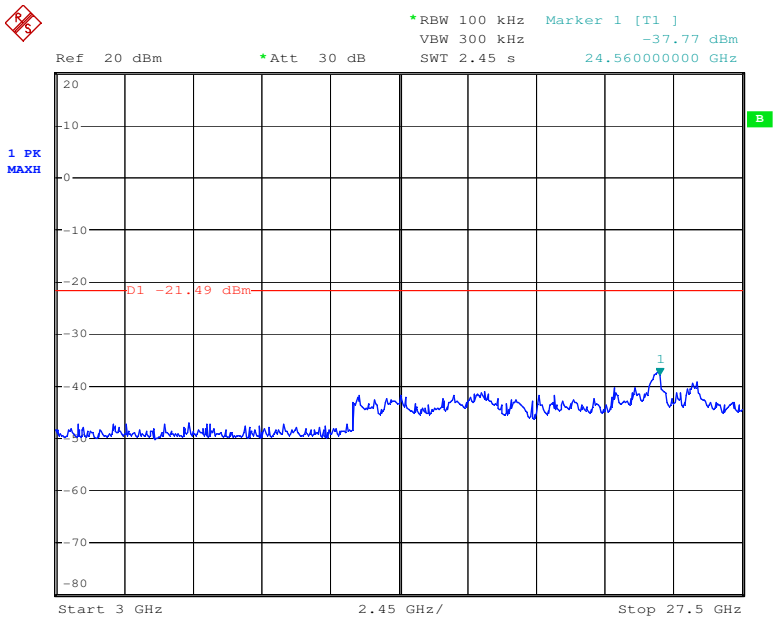
Measurement Result:

Conducted spurious Emission Measurement Result For Antenna A

CH Low 30MHz-3GHz

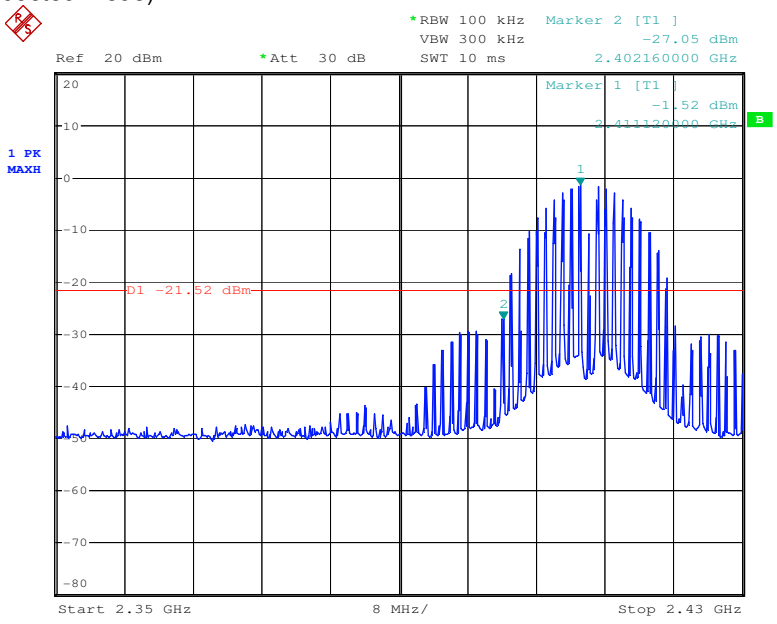


CH Low 3GHz-27.5GHz



Date: 1.JAN.2000 21:38:06

Band Edge (Conducted Mode)



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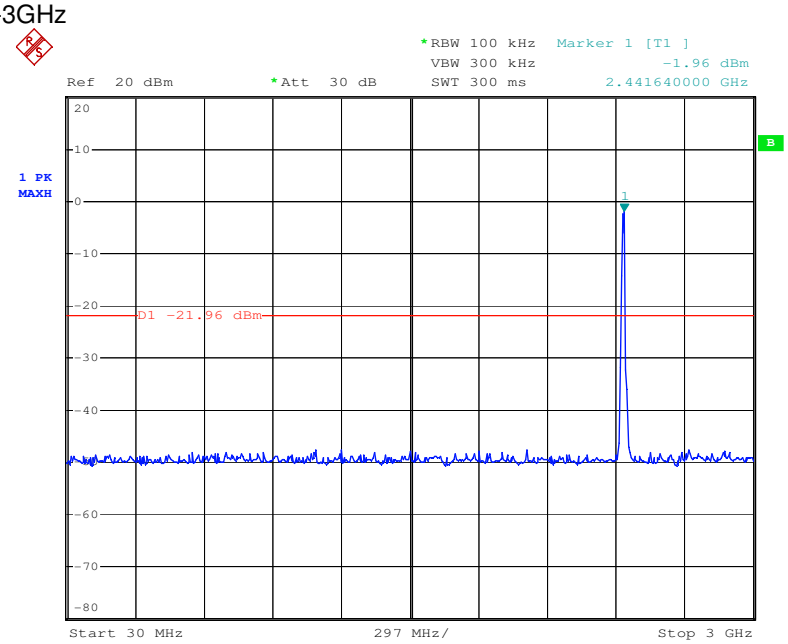
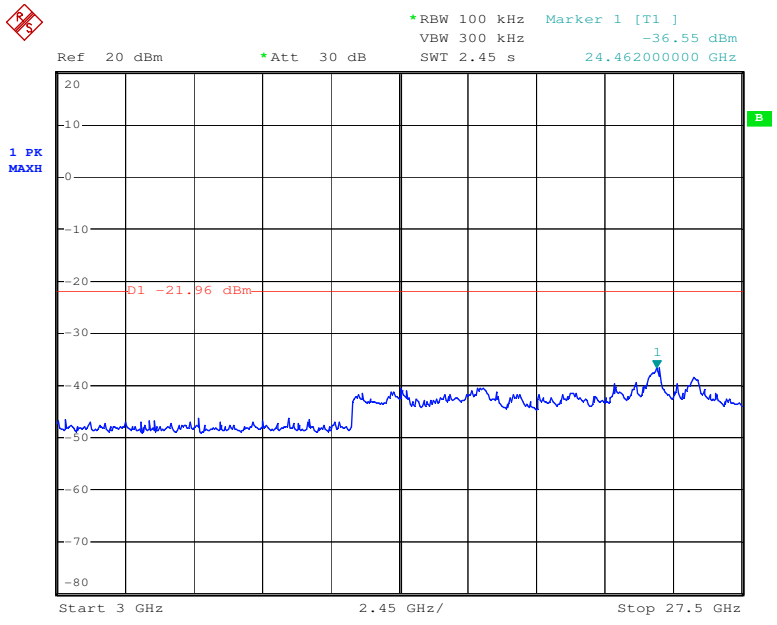
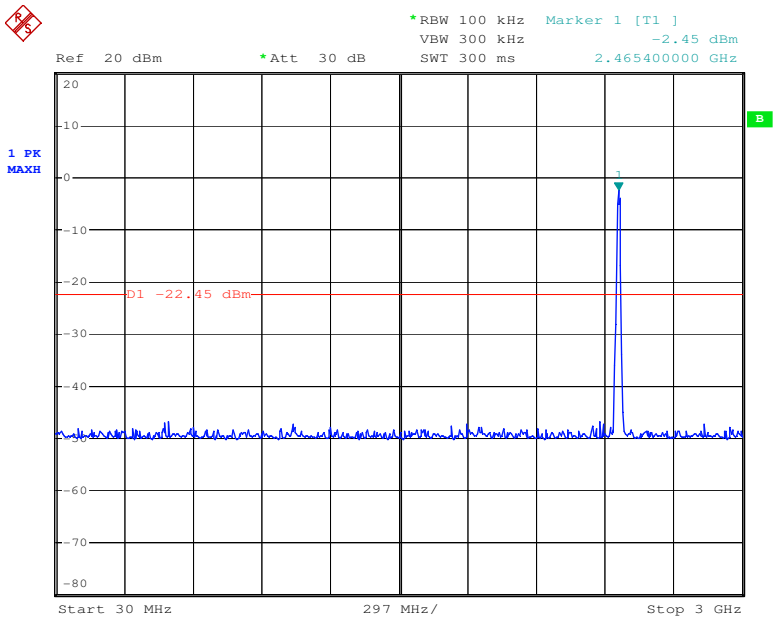
Ch Mid 30MHz-3GHz



Ch Mid 3GHz-27.5GHz

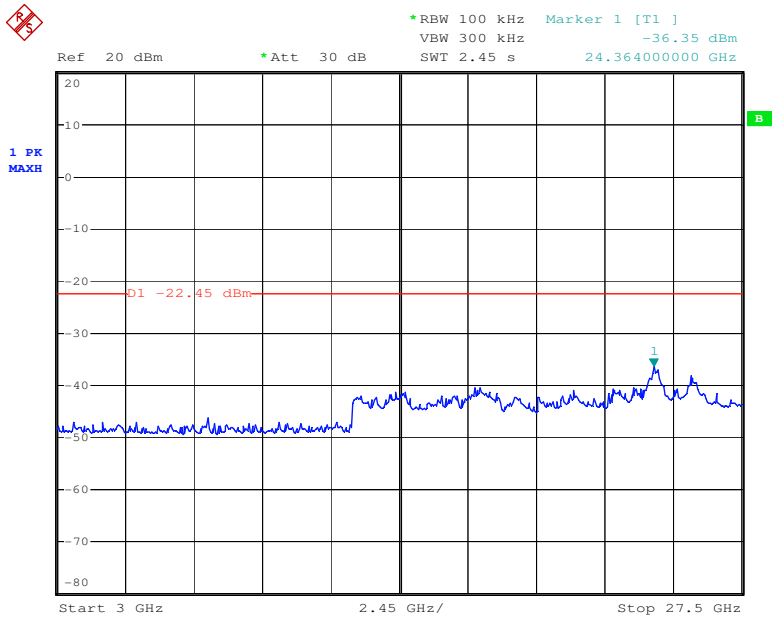


Ch High 30MHz-3GHz



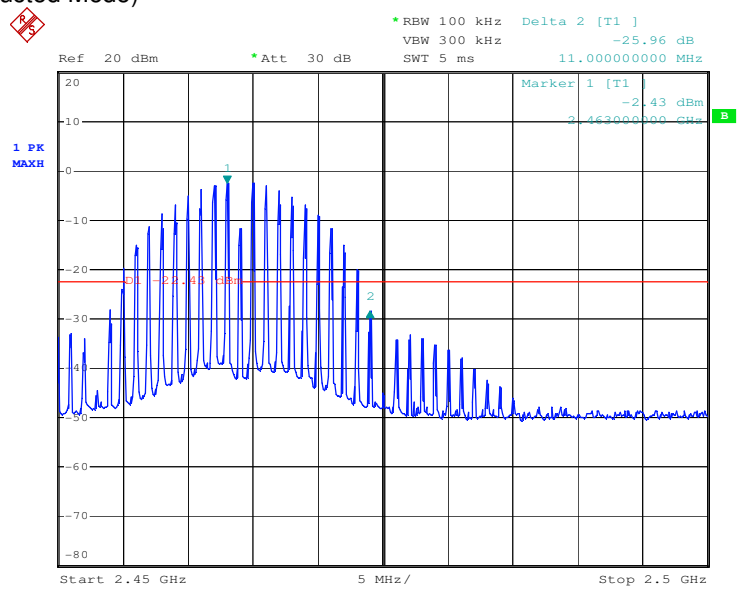
Date: 1.JAN.2000 21:48:30

Ch High 3GHz-27.5GHz

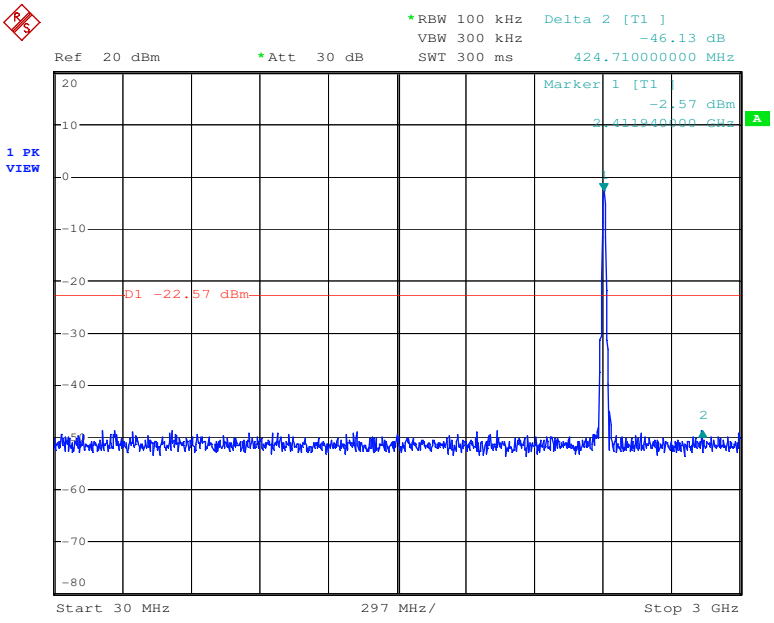


Date: 1.JAN.2000 21:49:42

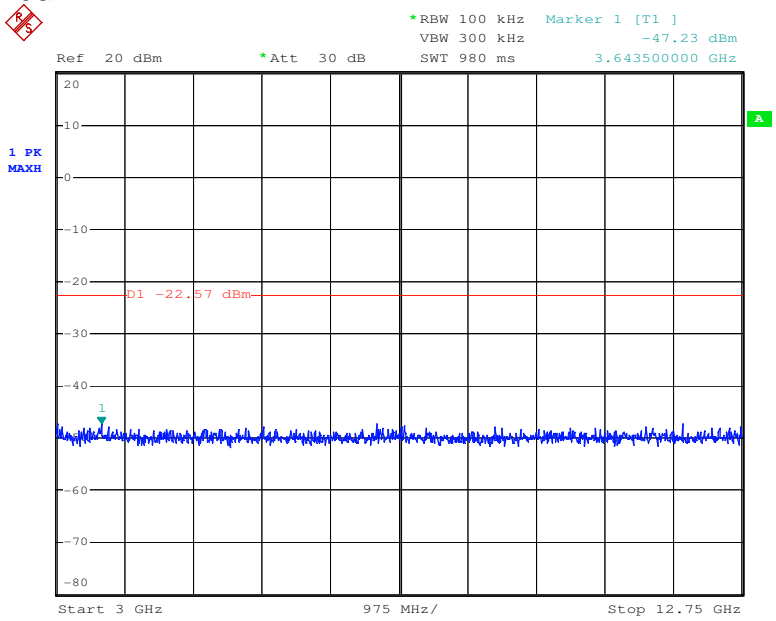
Band Edge (Conducted Mode)



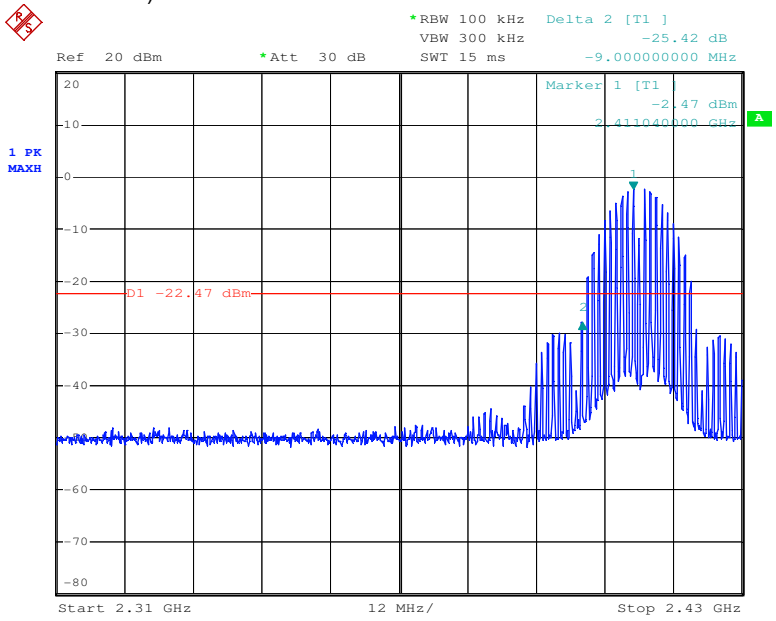
Conducted spurious Emission Measurement Result For Antenna B
CH Low 30MHz-3GHz



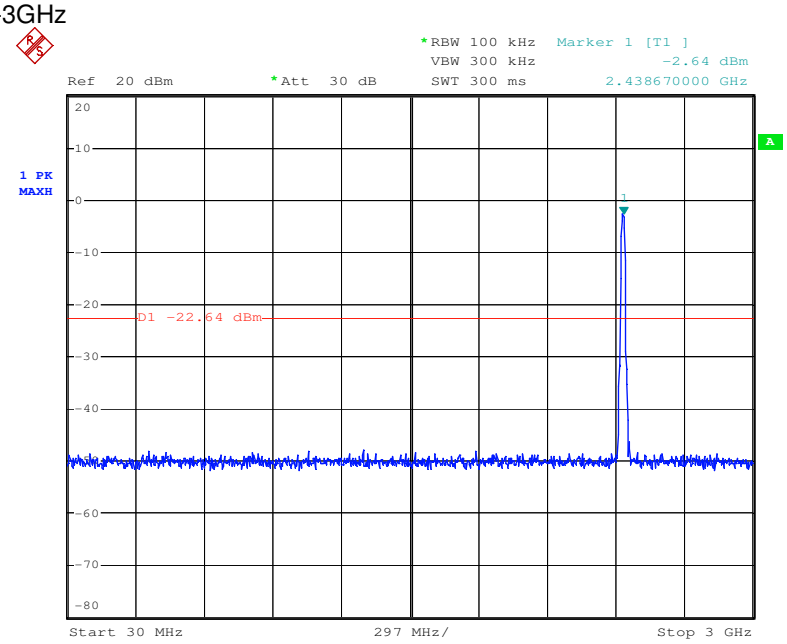
CH Low 3GHz-27.5GHz



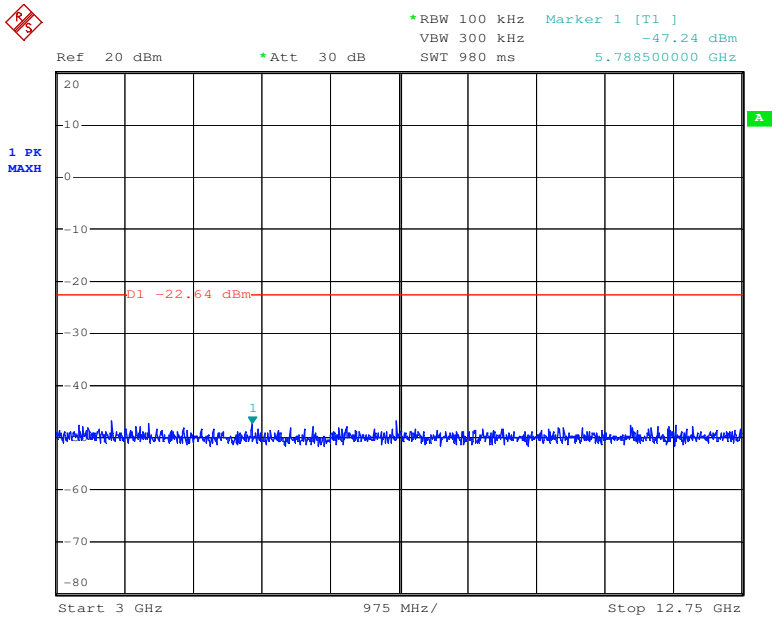
Band Edge (Conducted Mode)



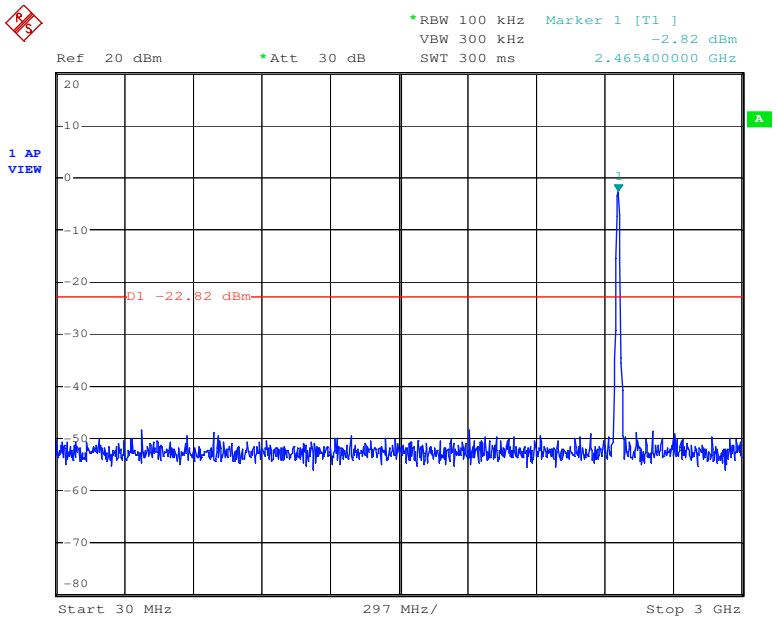
Ch Mid 30MHz-3GHz



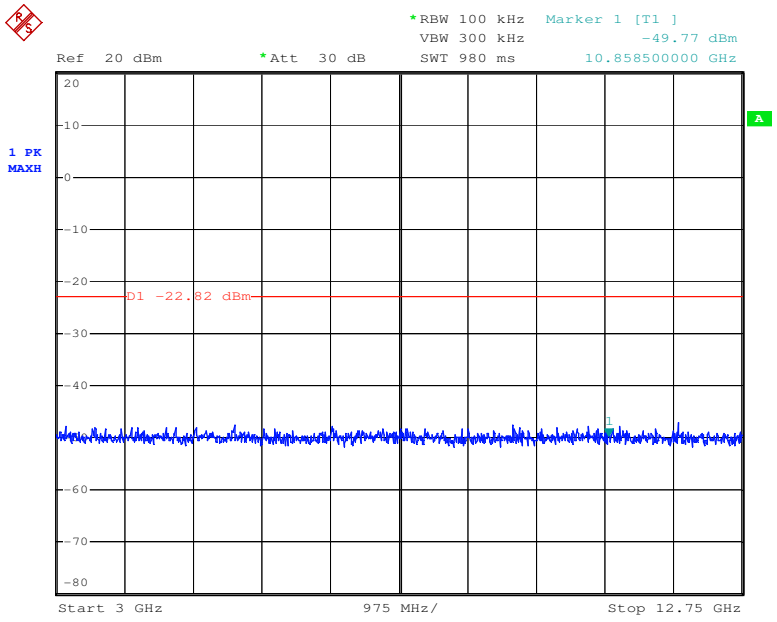
Ch Mid 3GHz-27.5GHz



Ch High 30MHz-3GHz



Ch High 3GHz-27.5GHz



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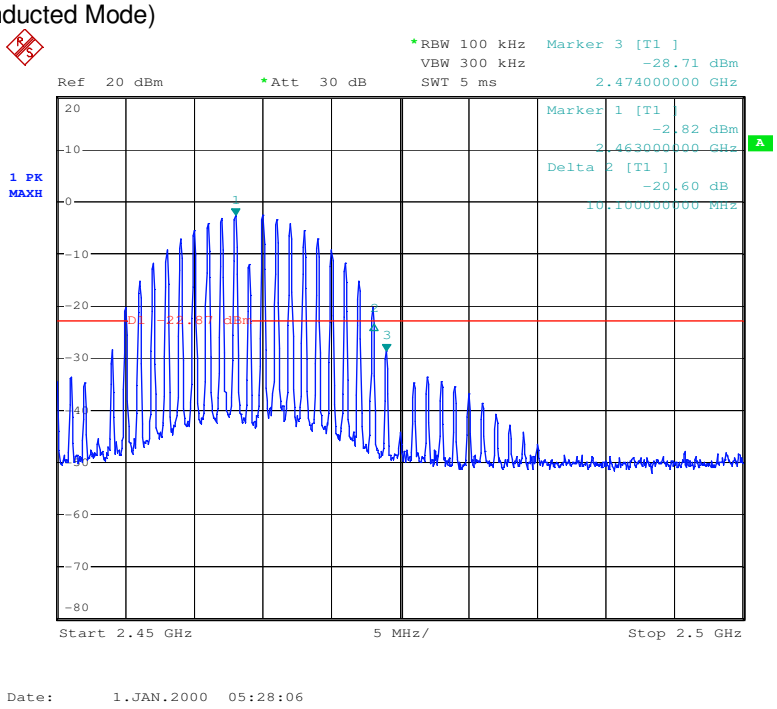
Band Edge (Conducted Mode)



6.8 Peak Power Spectral Density

Test Requirement: FCC Part15 247(e)

Test date: Dec. 06, 2011

Standard Applicable: According to section 15.247(e),For digitally modulated systems,the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dB in any 3KHz band during any time in terval 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 powr spectral density.

Measurement Procedure: The EUT was tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requiremnts. Set RBW=3KHz,Set VBW=10KHz,Span=3MHz,Sweep time=100s,Set detector=Peak detector.

Measurement Result:

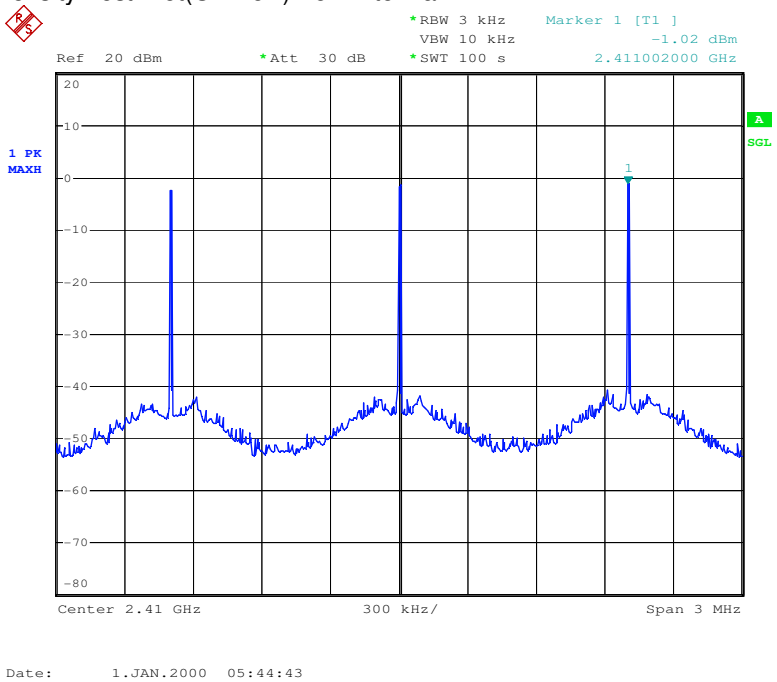
For Antenna A

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-1.02	0.9	-0.12	8	PASS
MID	2438	-1.65	0.9	-0.75	8	PASS
HIGH	2462	-1.62	0.9	-0.72	8	PASS

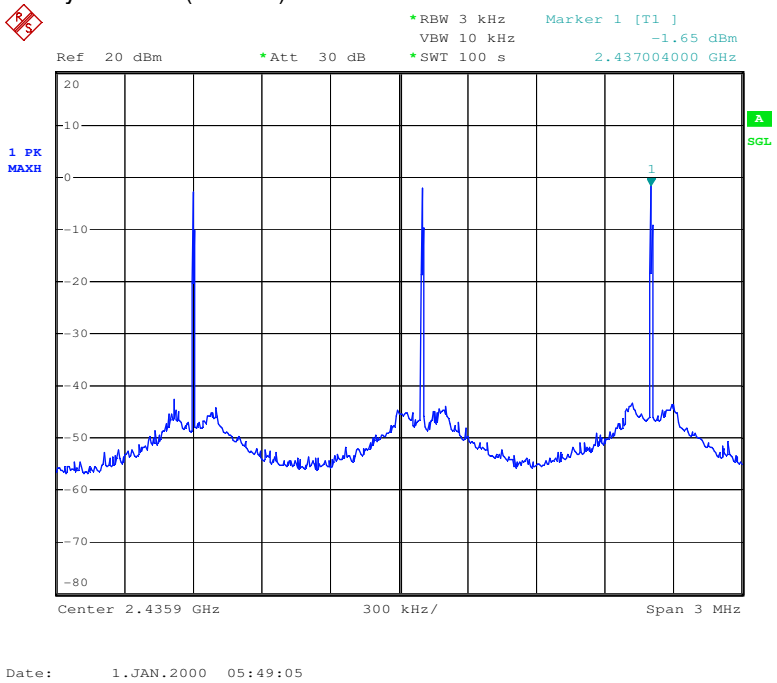
For Antenna B

CH	Frequency (MHz)	Reading (dBm)	Cable Loss (dB)	RF Power Density (dBm)	Limit (dBm)	Result
LOW	2412	-2.47	0.9	-1.57	8	PASS
MID	2438	-2.90	0.9	-2.00	8	PASS
HIGH	2462	-2.77	0.9	-1.87	8	PASS

Power Spectral Density Test Plot(CH-Low) For Antenna A



Power Spectral Density Test Plot(CH-Mid) For Antenna A



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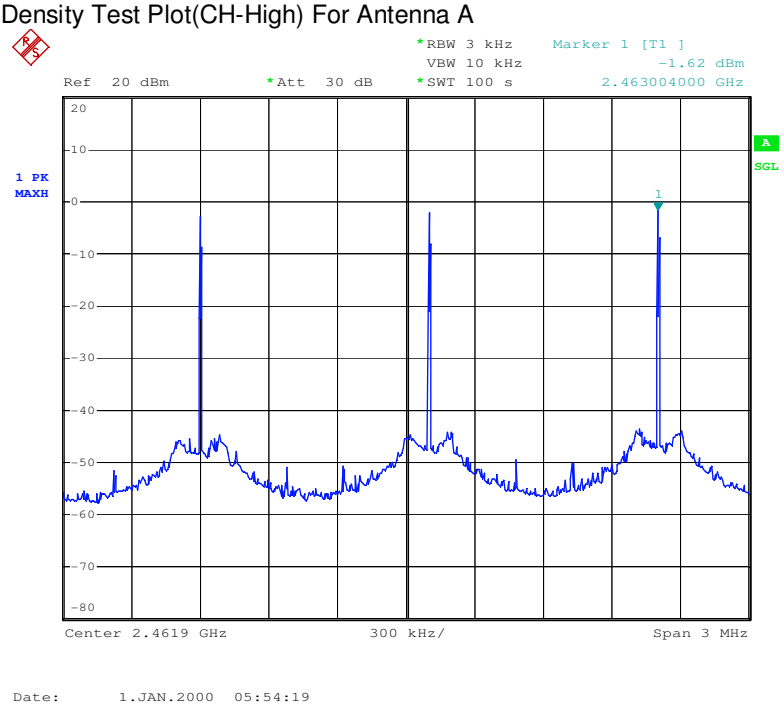
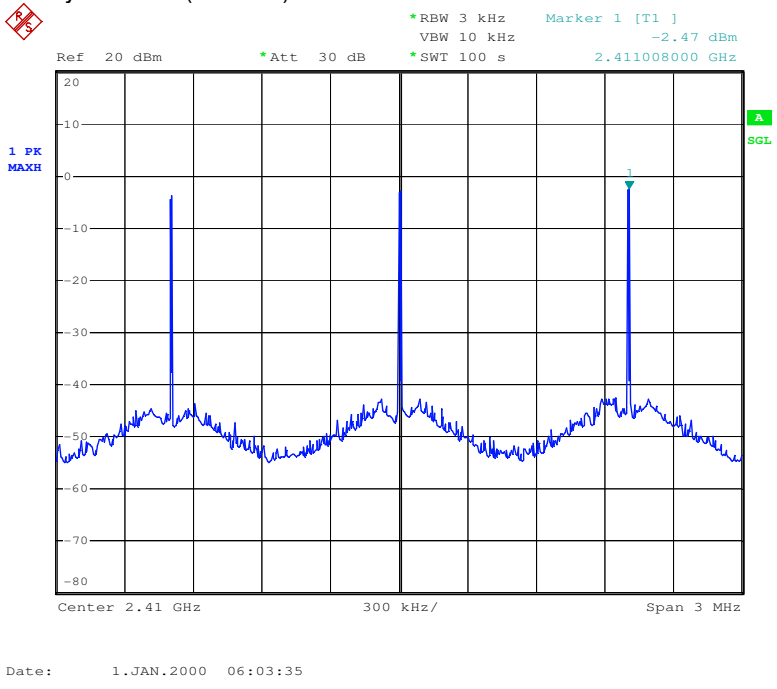
Power Spectral Density Test Plot(CH-High) For Antenna A



Power Spectral Density Test Plot(CH-Low) For Antenna B



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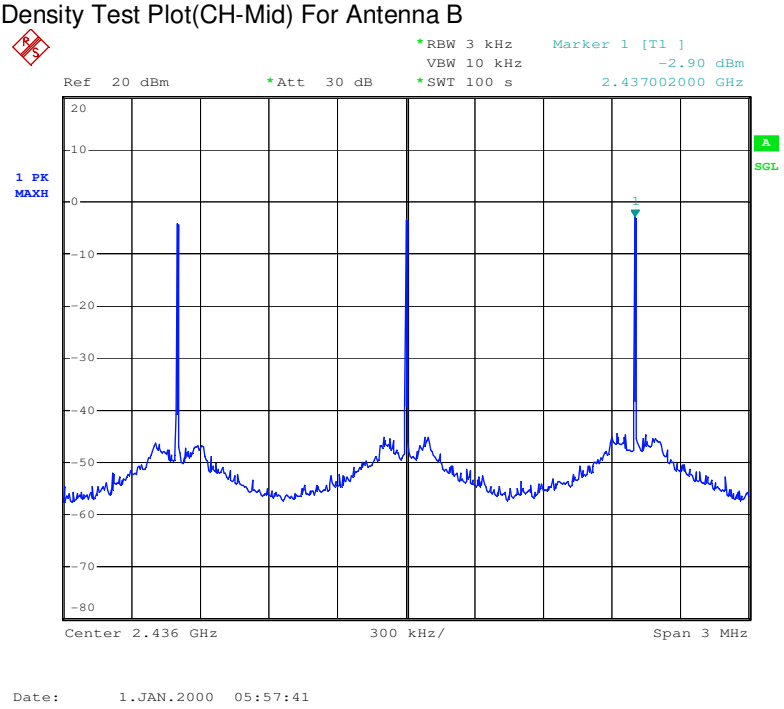
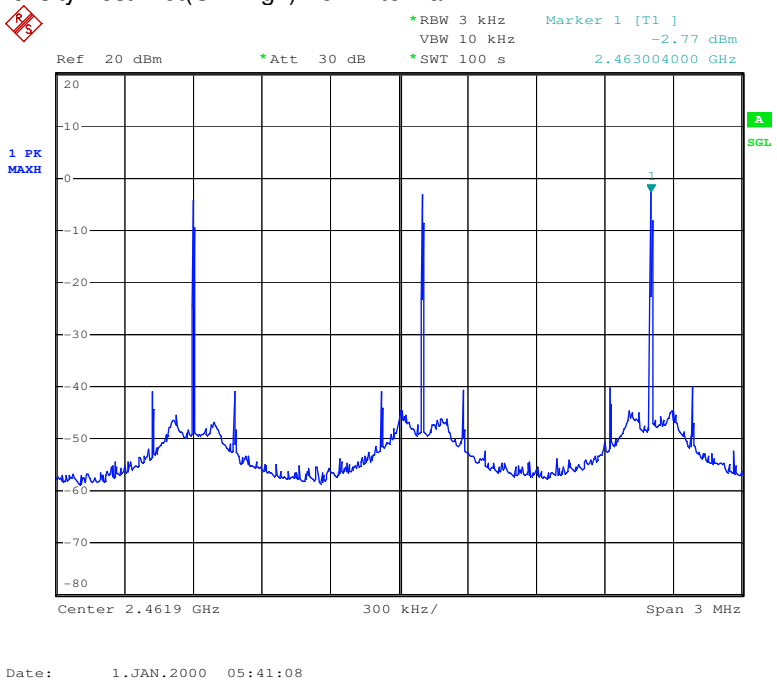
Power Spectral Density Test Plot(CH-Mid) For Antenna B



Power Spectral Density Test Plot(CH-High) For Antenna B



6.9 Occupied Bandwidth Test

Test Requirement: RSS-Gen Issue 3 Clause 4.6.1

Test date: Feb. 29, 2012

Standard Applicable According to the section RSS-Gen Issue 3 Clause 4.6.1

EUT Setup The occupied bandwidth per RSS-Gen Issue 3 Clause 4.6.1 was measured using the Spectrum Analyzer with the resolutions set at 100kHz,the video bandwidth set at 300kHz.

Measurement Result:

For Antenna A

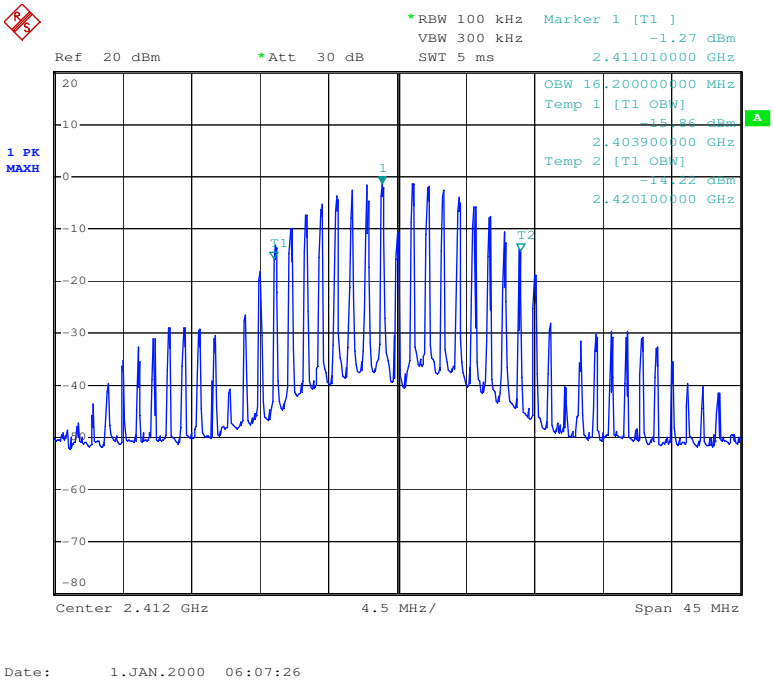
Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.22
MID	2438	16.11
HIGH	2464	16.11

For Antenna B

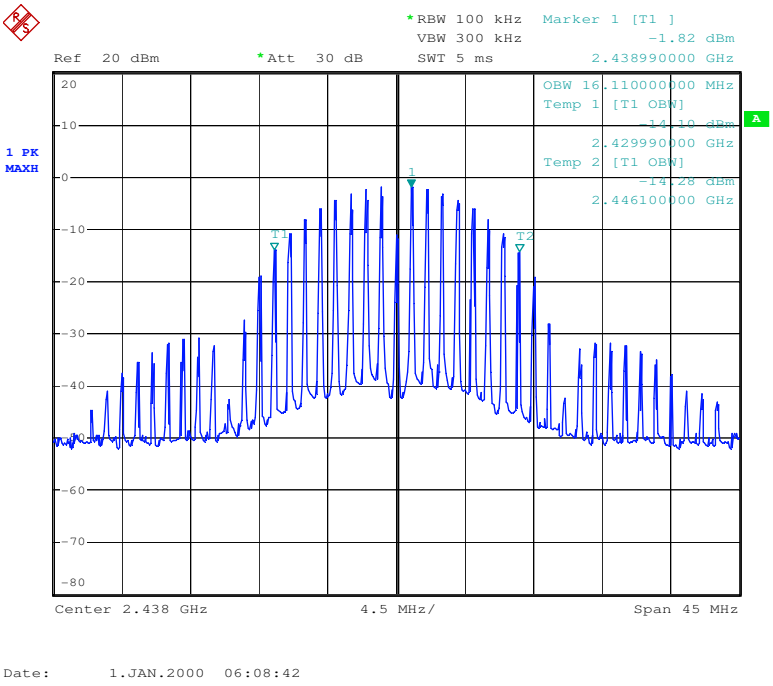
Channel	Frequency (MHz)	Bandwidth (MHz)
LOW	2412	16.22
MID	2438	16.11
HIGH	2464	16.11

For Antenna A

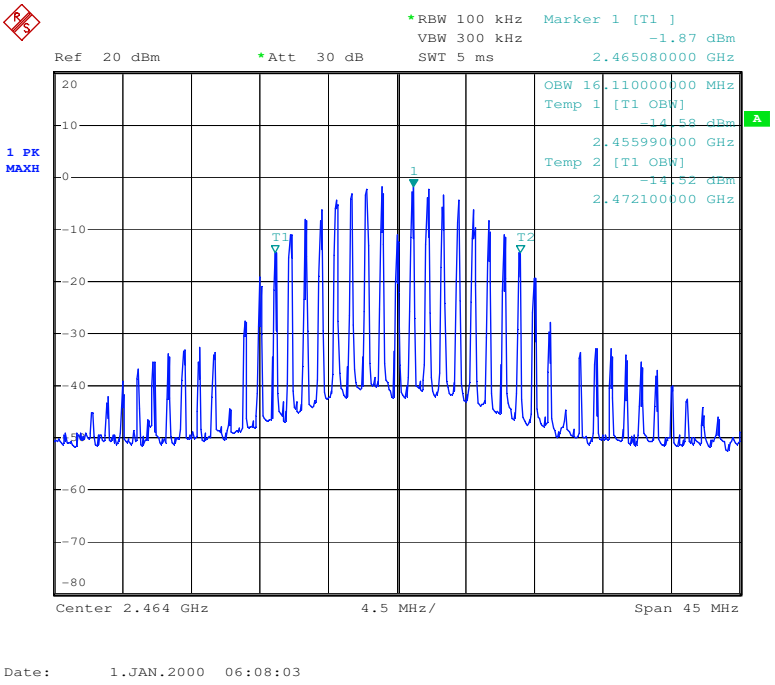
Channel Low 2412MHz



Channel Middle 2438MHz

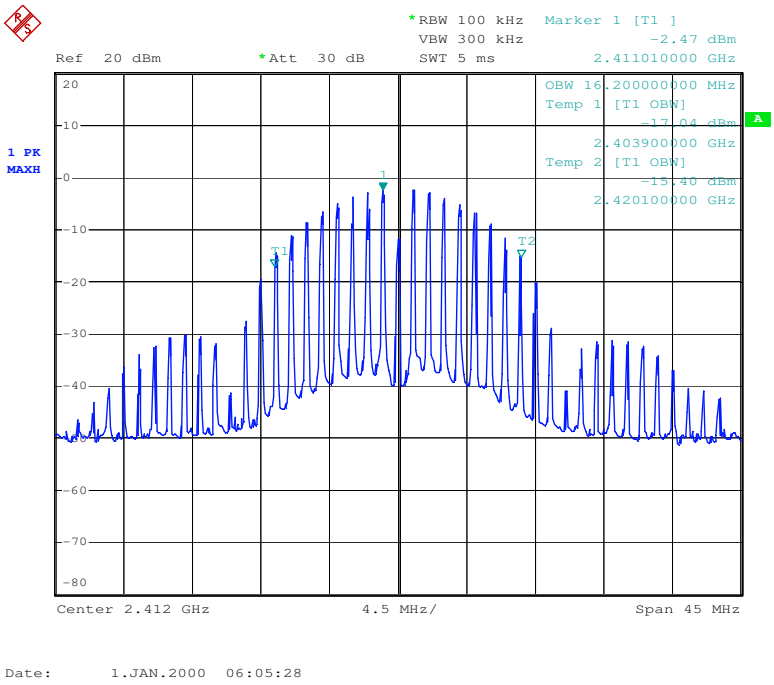


Channel High 2464MHz

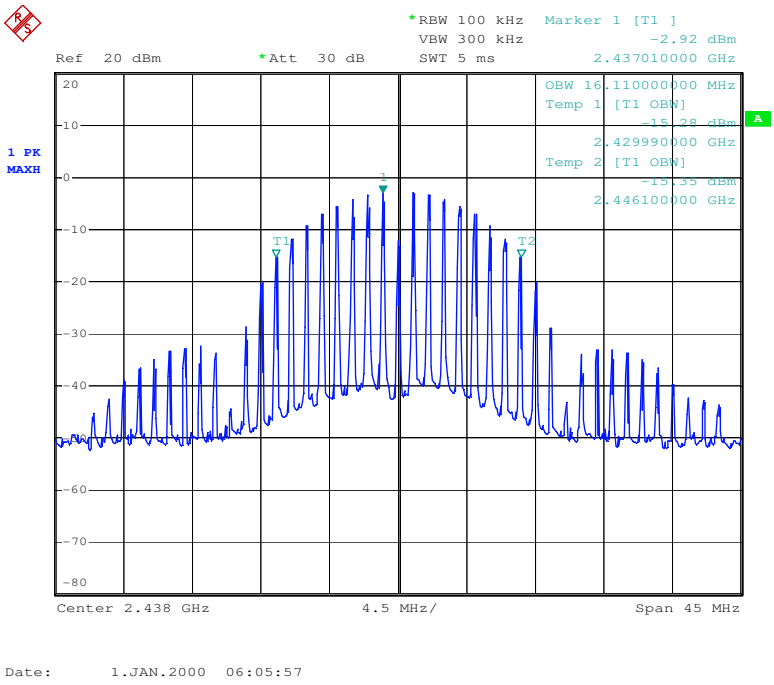


For Antenna B

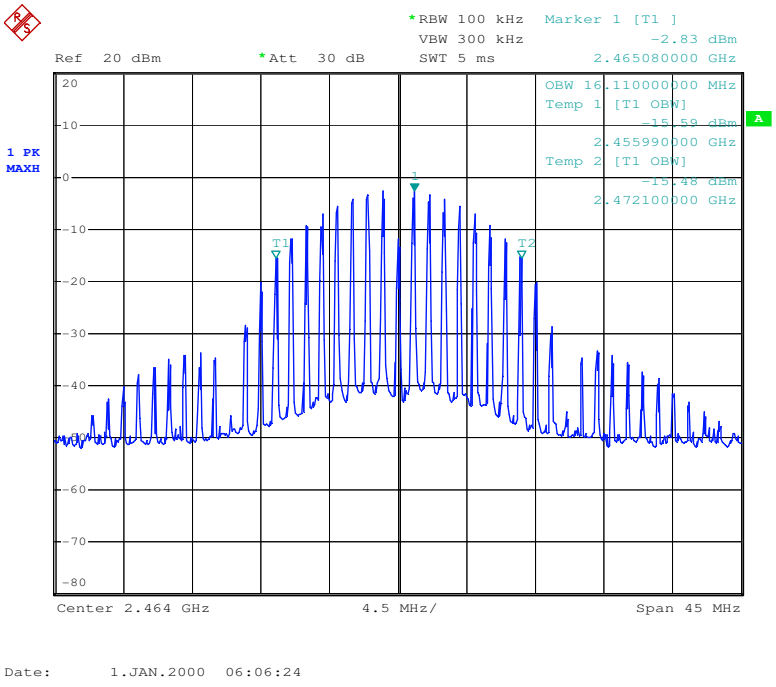
Channel Low 2412MHz



Channel Middle 2438MHz



Channel High 2464MHz



End of Report