



FCC TEST REPORT

According to

FCC Rules and Regulations

Part 15 Subpart C

Applicant	: MEILOON INDUSTRIAL CO., LTD.
Address	: No 77, Lane 1775, Chuen-Ryh RD, Taoyuan City, Taiwan
Equipment	: Powered Speaker with Wireless Subwoofer for iPhone/iPod
Model No.	: i-DS ³
FCC ID	: R48-IDS3RX
Trade Name	: Boston

Laboratory Accreditation



- The test result refers exclusively to the test presented test model / sample.,
- Without written approval of **Cerpass Technology Corp.**, the test report shall not be reproduced except in full.



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CERTIFICATE OF COMPLIANCE

According to

FCC Rules and Regulations

Part 15 Subpart C

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Equipment	: Powered Speaker with Wireless Subwoofer for iPhone/iPod
Model No.	: i-DS ³
FCC ID	: R48-IDS3RX
Trade Name	: Boston

I HEREBY CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4** The equipment was **passed** the test performed according to **FCC Rules and Regulations Part 15 Subpart C (2005)**.

The test was carried out on Dec. 17, 2008 at Cerpass Technology Corp.

Signature

Anson Chou

EMC/RF B.U. Vice General Manager



1. Report of Measurements and Examinations

1.1 List of Measurements and Examinations

FCC Rule	Description of Test	Result
15.203	Antenna Requirement	Pass
15.207	Conducted Emission	Pass
15.209	Radiated Emission	Pass
15.247(a)(1)	Channel Carrier Frequencies Separation	Pass
15.247(a)(1)	20dB Bandwidth Measurement	Pass
15.247(a)(1)	Dwell Time	Pass
15.247(b)	Number of Hopping Channels	Pass
15.247(b)	Peak Output Power Measurement Data	Pass
15.247(d)	Band Edges Measurement Data	Pass
15.247(e)	Power Spectral Density Measurement Data	Pass



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Feature	
• Integrated universal iPhone/iPod dock. Controls and charges all dockable iPhone/iPod models. • 100 Watts total system power for outstanding audio performance. • Dual high performance midrange drivers and dual high performance tweeters. Powerful 6" woofer. • Intuitive, easy to use controls • Remote control puts basic iPod control functions at your finger tips. • Play wirelessly! Wireless subwoofer can be placed anywhere in your room. • BassTrac® audio processing for clean bass at all listening levels. • Play iPod videos on your TV. S-Video and Composite Video Output from all video-capable iPhone/iPod models. • Auxiliary audio input for connecting other audio devices. • Play in Color! Customize your main speaker with optional interchangeable metal grilles.	
Wireless	
Type of Modulation	FHSS
Number of Channels	20 Channels
Frequency Band (s)	2.40-2.485 GHz
Operating Frequency	2.40-2.485 GHz
Data Rate	1.5 Mbps
Output Power	-13.00dBm
Carrier Frequency of each channel	CH 00: 2403.3MHz; CH 19: 2442.2MHz; CH 37: 2479.1MHz
Antenna Type and Gain	Omni Dipole Antenna / 1.53dBi



2.2 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.4.
- The complete test system included Speaker and EUT for RF test.
- An executive program, XDE under WIN XP, which generates a continuous signal by the following frequency to test.
CH 00: 2403.3MHz; CH 19: 2442.2MHz; CH 37: 2479.1MHz.

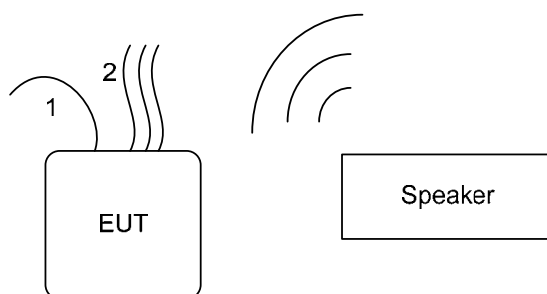
2.3 Description of Test System

Device	Manufacturer	Model No.	Description
Speaker	Boston	i-DS ³	N/A

Use Cable:

Cable	Quantity	Description
S-Video	1	Unshielding, 1.8m
AV	3	Unshielding, 1.8m

2.4 Connection Diagram of Test System



- The S-Video cable is floating.
 - These AV cables (*3) are floating.
- * The EUT keeps to transmit and receive data to speaker by Wireless.



2.5 General Information of Test

Test Site :	CerpPASS Technology Corp. 4F-2, No. 28, Lane 78, Xing-Ai Rd. Nei-hu, Taipei City 114 Taiwan R.O.C.
Test Site Location (OATS1-SD):	No.68-1, Shihbachongsi, shihding Township, Taipei City 223, Taiwan, R.O.C. Registration Number: 632249.
FCC Registration Number :	632249
IC Registration Number :	4934B-1
VCCI Registration Number :	T-338 for Telecommunication Test C-2188 for Conducted emission test R-1902 for Radiated emission test
Test Voltage:	AC 120V
Test in Compliance with:	ANSI C63.4-2003 FCC Part 15 Subpart C
Frequency Range Investigated:	Conducted: from 150kHz to 30MHz Radiation: from 30MHz to 24620MHz
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.

2.6 Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	9 kHz ~ 30 MHz	LINE/NEUTRAL	2.71 dB
Radiated Emission	30 MHz ~ 25GHz	Vertical	4.11 dB
		Horizontal	4.10 dB
20 dB Bandwidth	---	---	7500 Hz
Maximum Peak Output Power	---	---	1.4 dB
100kHz Bandwidth of Frequency Band Edges	---	---	2.2 dB
Power Spectral Density	---	---	2.2 dB

2.7 History of this test report

■ ORIGINAL.

☐ Additional attachment as following record:

[illegible]



3. Antenna Requirements

3.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

3.2 Antenna Construction and Directional Gain

Antenna type: Omni Dipole Antenna

Antenna Gain: 1.53 dBi



4. Test of Conducted Emission

4.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

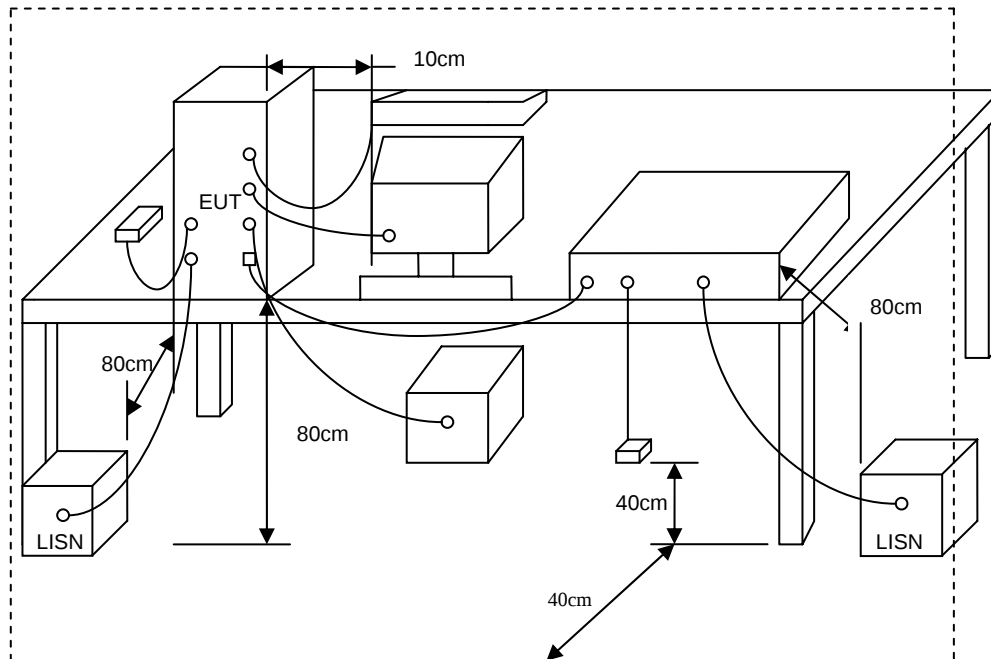
*Decreases with the logarithm of the frequency.

4.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



4.3 Typical Test Setup



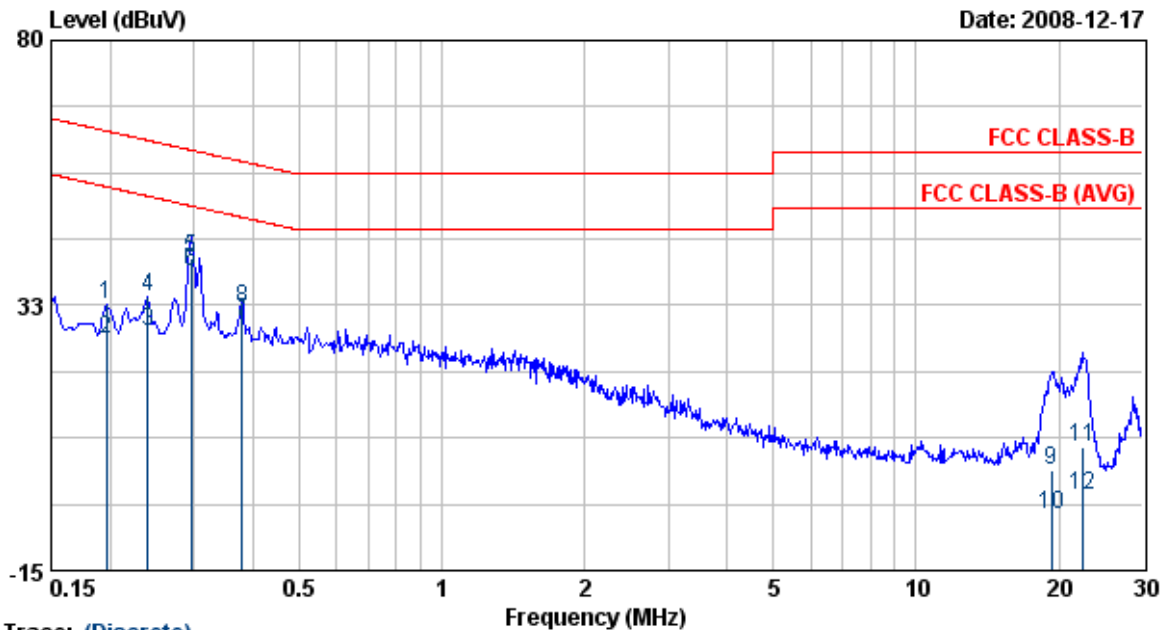
4.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date.
EMI Receiver	R&S	ESCI	100443	2008/09/27	2009/09/26
LISN	MESS TEC	NNB-2/16Z	02/10191	2008/05/14	2009/05/13
LISN	ROLF HEINE	NNB-2/16Z	03/10058	2008/04/19	2009/04/18



4.5 Test Result and Data

Power	: AC 120V	Pol/Phase	: LINE
Test Mode	: CH 00: 2403.3MHz	Temperature	: 25 °C
Memo	:	Humidity	: 60 %

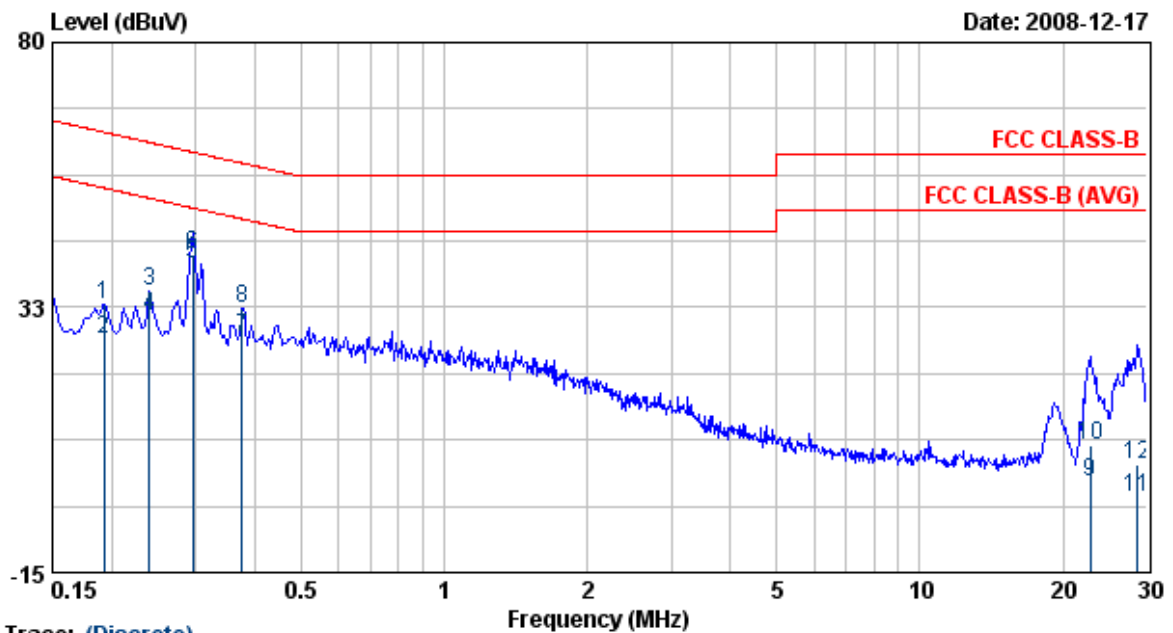


Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark
	MHz	dBuV	dB	dBuV	dBuV	dBuV	
1	0.20	32.54	0.11	32.65	63.76	-31.10	QP
2	0.20	26.43	0.11	26.54	53.76	-27.21	AVERAGE
3	0.24	27.59	0.12	27.70	52.08	-24.38	AVERAGE
4	0.24	33.89	0.12	34.00	62.08	-28.08	QP
5	0.30	40.93	0.12	41.05	60.37	-19.31	QP
6	0.30	38.53	0.12	38.65	50.37	-11.72	AVERAGE
7	0.38	29.35	0.12	29.47	48.30	-18.83	AVERAGE
8	0.38	32.03	0.12	32.15	58.30	-26.15	QP
9	19.33	2.57	0.43	3.00	60.00	-57.00	QP
10	19.33	-5.31	0.43	-4.88	50.00	-54.88	AVERAGE
11	22.42	6.75	0.43	7.18	60.00	-52.82	QP
12	22.42	-2.08	0.43	-1.65	50.00	-51.65	AVERAGE

- Remarks:
1. Level = Read Level + Factor
 2. Factor = LISN(ISN) Factor + Cable Loss
 3. According to technical experiences, all spurious emission of FM mode at channel 0,39,78 are almost the same below 1GHz, so that the channel 0 was chosen as representative in final test.
 4. The data is worst case.



Power	: AC 120V	Pol/Phase	: NEUTRAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 25 °C
Memo	:	Humidity	: 60 %



Trace: (Discrete)

Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark
	MHz	dBuV	dB	dBuV	dBuV	dBuV	
1	0.19	33.00	0.14	33.13	63.93	-30.80	QP
2	0.19	26.59	0.14	26.72	53.93	-27.21	AVERAGE
3	0.24	35.37	0.14	35.50	62.08	-26.58	QP
4	0.24	30.66	0.14	30.80	52.08	-21.28	AVERAGE
5	0.30	40.07	0.14	40.21	50.37	-10.16	AVERAGE
6	0.30	41.88	0.14	42.03	60.37	-18.34	QP
7	0.38	27.03	0.15	27.18	48.39	-21.21	AVERAGE
8	0.38	32.10	0.15	32.25	58.39	-26.14	QP
9	22.78	0.74	0.60	1.34	50.00	-48.66	AVERAGE
10	22.78	7.21	0.60	7.81	60.00	-52.19	QP
11	28.75	-2.10	0.59	-1.51	50.00	-51.51	AVERAGE
12	28.75	3.84	0.59	4.43	60.00	-55.57	QP

Remarks: 1. Level = Read Level + Factor
 2. Factor = LISN(ISN) Factor + Cable Loss
 3. According to technical experiences, all spurious emission of FM mode at channel 0,39,78 are almost the same below 1GHz, so that the channel 0 was chosen as representative in final test.
 4. The data is worst case.

Test engineer: Ben

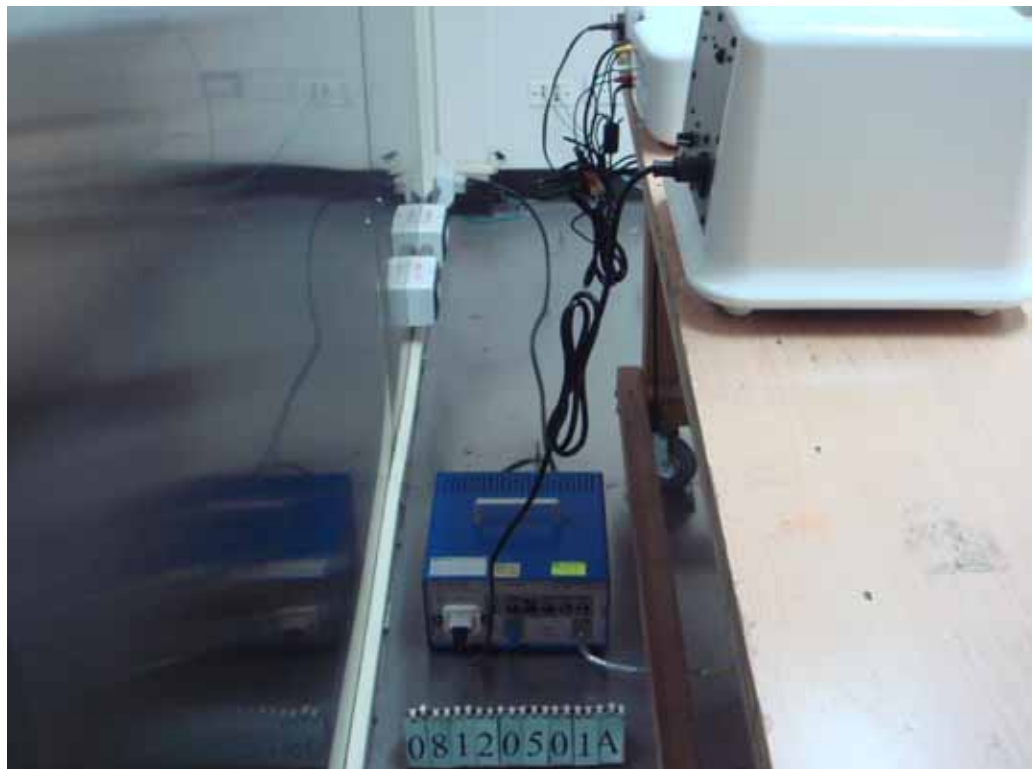


4.6 Test Photographs

Front View



Rear View





5. Test of Radiated Emission

5.1 Test Limit

Radiated emissions from 30 MHz to 25 GHz were measured according to the methods defines in ANSI C63.4-2003. The EUT was placed, 0.8 meter above the ground plane, as shown in section 5.6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions

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

Frequency (MHz)	Distance Meters	Radiated (μ V / M)	Radiated (dB μ V/ M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

Frequency (MHz)	Distance Meters	Radiated (dB μ V/ M)
30-230	10	30
230-1000	10	37

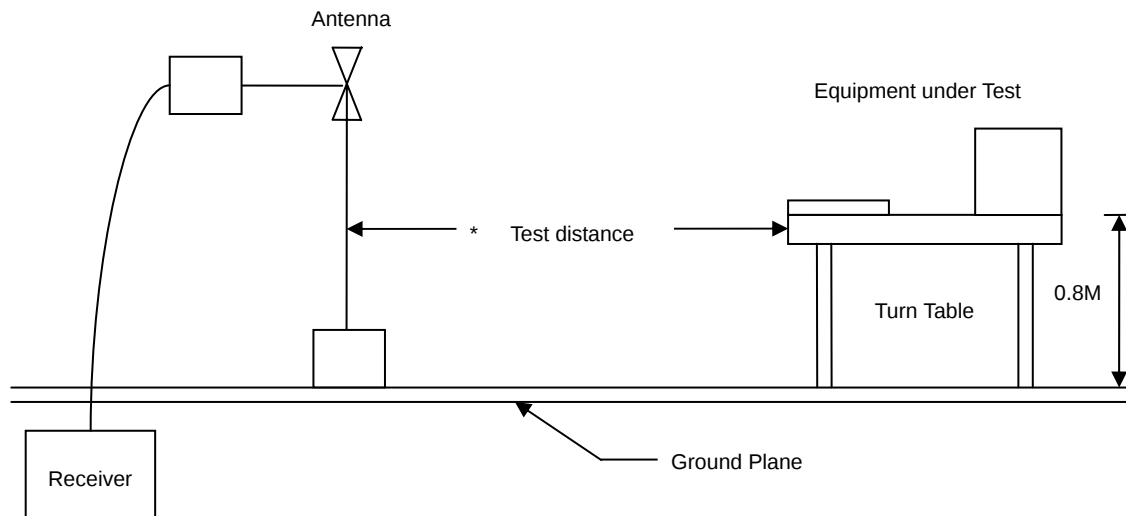


5.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- i. "Cone of radiation" has been considered to be 3dB beam width of the measurement antenna.
- j. During testing, there was no emissions be detected in the third harmonics (4.5-5.15 GHz and 7.25-7.75 GHz).



5.3 Typical Test Setup



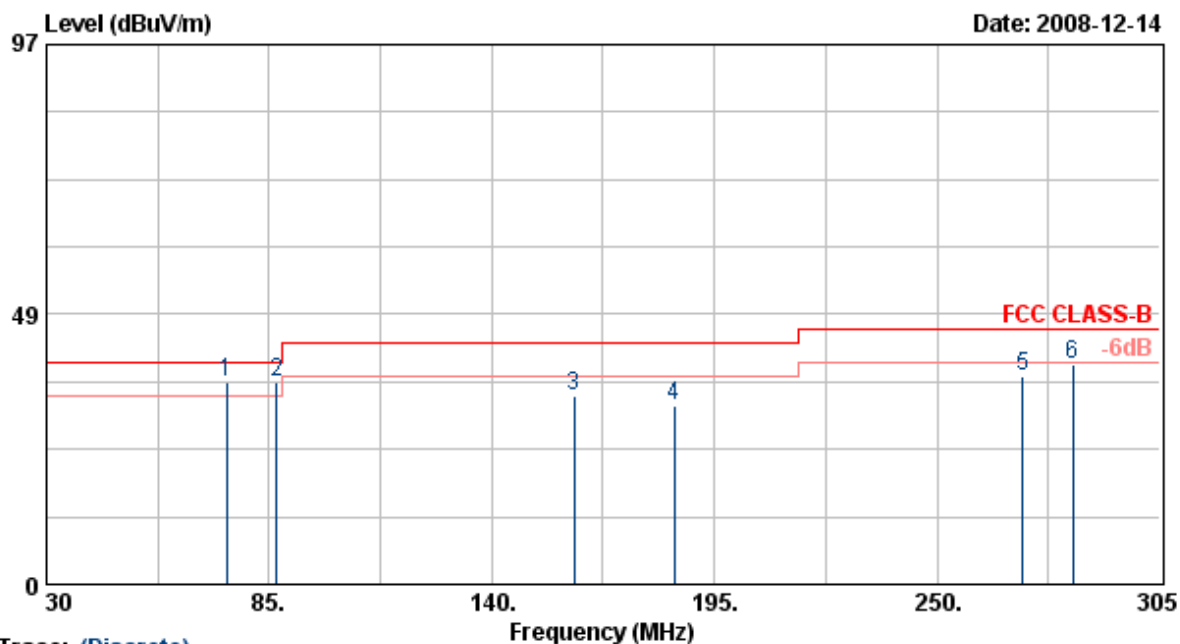
5.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Bilog Antenna	CBL6112B	Schaffner	2840	2008/05/15	2009/05/14
Signal Generator	8648B	HP	3629U00612	2008/10/08	2009/10/07
Amplifier	8447D	Agilent	2944A10593	2008/05/26	2009/05/25
EMI Receiver	8546A	HP	3807A00454	2008/08/07	2009/08/06
RF Filter Section	85460A	HP	3704A00386	2008/08/07	2009/08/06
AC Power Converter	AFC-11005	APC	F103120008	N/A	N/A



5.5 Test Result and Data

Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 20 °C
Memo	:	Humidity	: 65 %



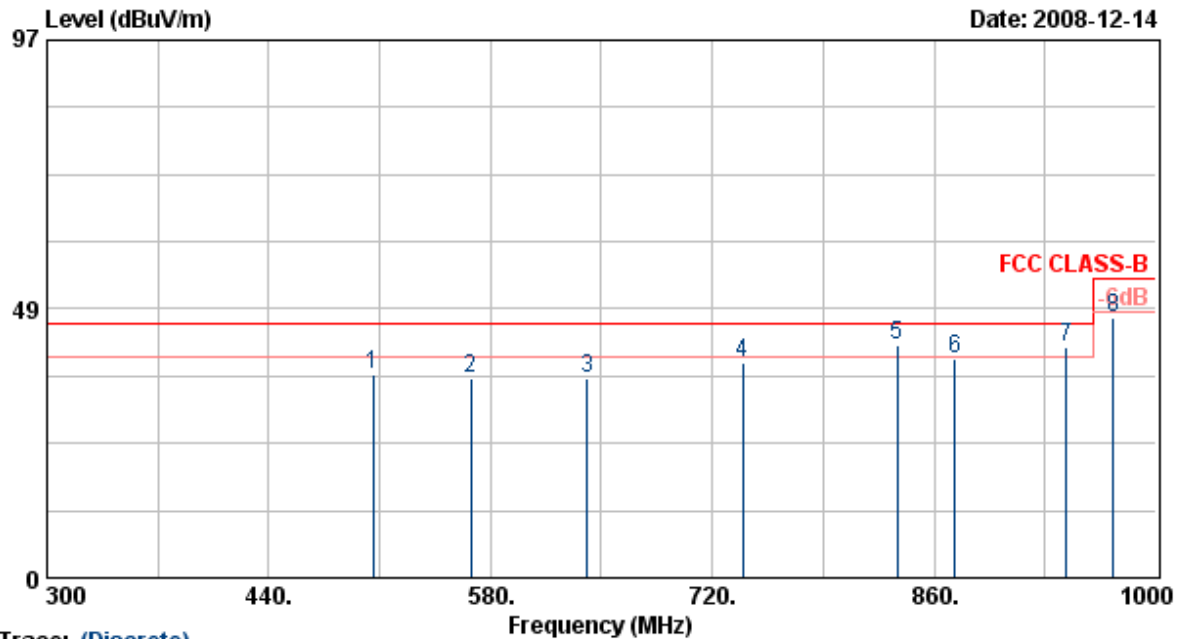
Trace: (Discrete)

Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	74.55	46.89	-10.68	36.21	40.00	-3.79	QP	100	360
2	86.93	47.66	-11.44	36.22	40.00	-3.78	QP	100	360
3	160.35	40.79	-6.90	33.89	43.50	-9.61	Peak	100	360
4	185.10	38.13	-6.17	31.96	43.50	-11.54	Peak	100	360
5	271.18	45.90	-8.68	37.22	46.00	-8.78	Peak	100	360
6	283.55	47.77	-8.24	39.53	46.00	-6.47	Peak	100	360

Remarks: 1. Result = Read Value + Factor
 2. Factor = Antenna Factor + Cable Loss - Amplifier
 3. According to technical experiences, all spurious emission of FM mode at channel 0,39,78 are almost the same below 1GHz, so that the channel 0 was chosen as representative in final test.
 4. The data is worst case.



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 20 °C
Memo	:	Humidity	: 65 %



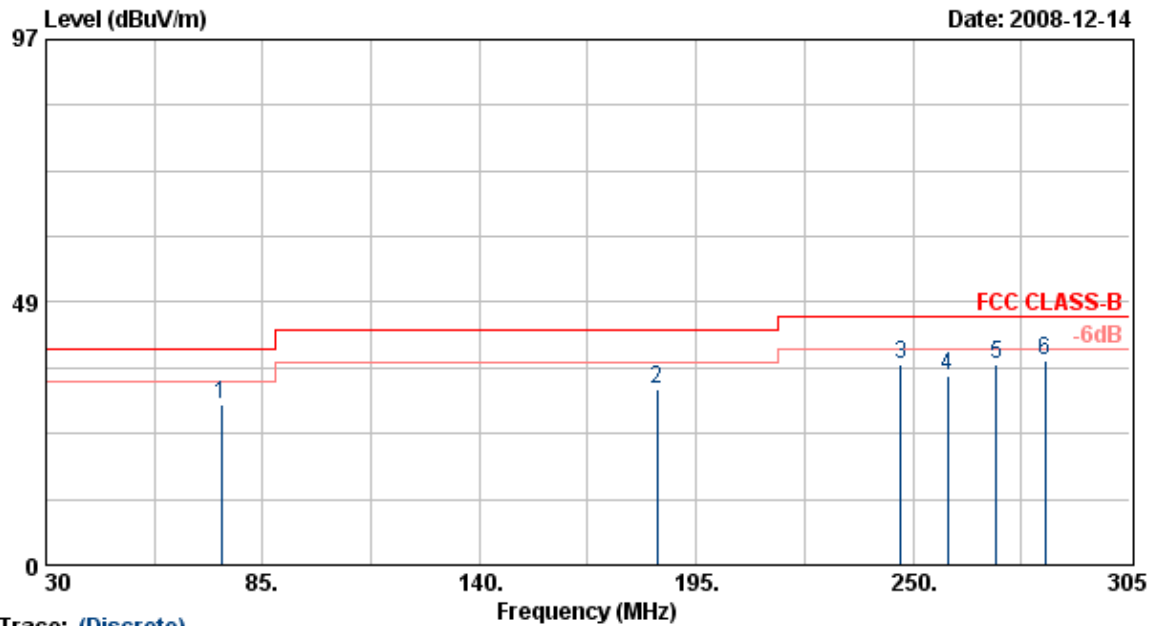
Trace: (Discrete)

Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	505.80	38.58	-1.77	36.81	46.00	-9.19	Peak	150	0
2	567.40	33.43	2.63	36.06	46.00	-9.94	Peak	150	0
3	640.90	32.54	3.59	36.13	46.00	-9.87	Peak	150	0
4	738.90	32.66	6.17	38.83	46.00	-7.17	Peak	150	0
5	836.90	34.29	7.53	41.82	46.00	-4.18	QP	150	0
6	873.30	33.90	5.58	39.48	46.00	-6.52	Peak	150	0
7	943.30	32.41	9.22	41.63	46.00	-4.37	QP	150	0
8	973.40	36.80	9.96	46.76	54.00	-7.24	Peak	150	0

- Remarks:
1. Result = Read Value + Factor
 2. Factor = Antenna Factor + Cable Loss - Amplifier
 3. According to technical experiences, all spurious emission of FM mode at channel 0,39,78 are almost the same below 1GHz, so that the channel 0 was chosen as representative in final test.
 4. The data is worst case.



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 20 °C
Memo	:	Humidity	: 65 %



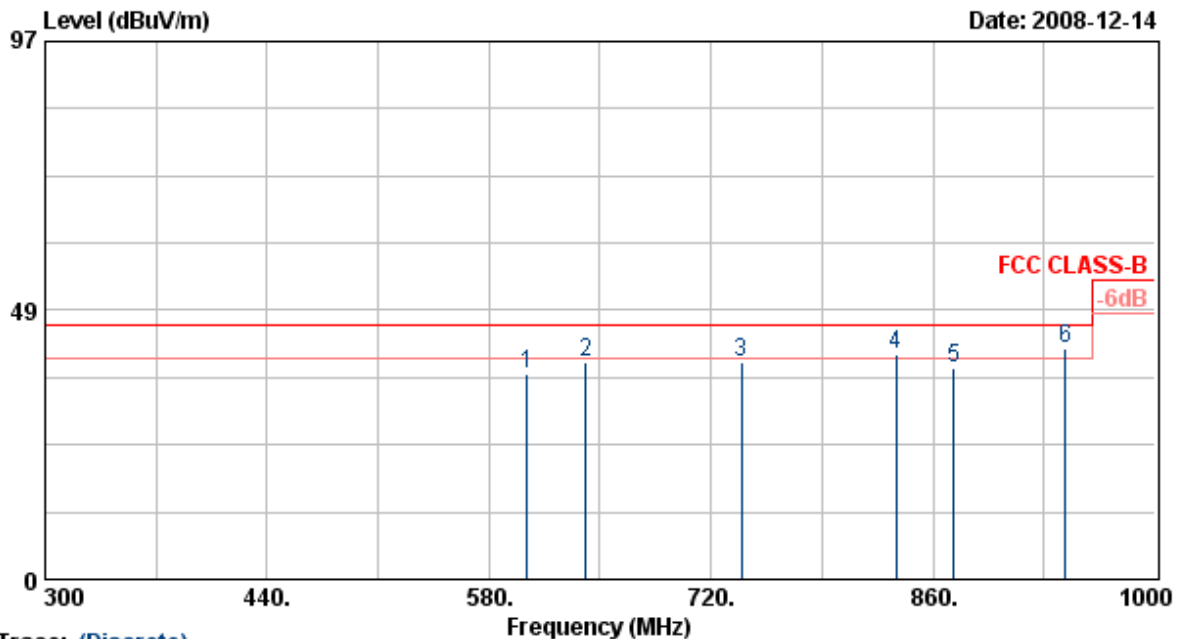
Trace: (Discrete)

Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	74.55	40.17	-10.68	29.49	40.00	-10.51	Peak	150	0
2	185.10	38.66	-6.17	32.49	43.50	-11.01	Peak	150	0
3	246.98	41.45	-4.48	36.97	46.00	-9.03	Peak	150	0
4	258.80	40.85	-6.00	34.85	46.00	-11.15	Peak	150	0
5	271.18	45.70	-8.68	37.02	46.00	-8.98	Peak	150	0
6	283.55	46.05	-8.24	37.81	46.00	-8.19	Peak	150	0

- Remarks:
1. Result = Read Value + Factor
 2. Factor = Antenna Factor + Cable Loss - Amplifier
 3. According to technical experiences, all spurious emission of FM mode at channel 0,39,78 are almost the same below 1GHz, so that the channel 0 was chosen as representative in final test.
 4. The data is worst case.



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 20 °C
Memo	:	Humidity	: 65 %



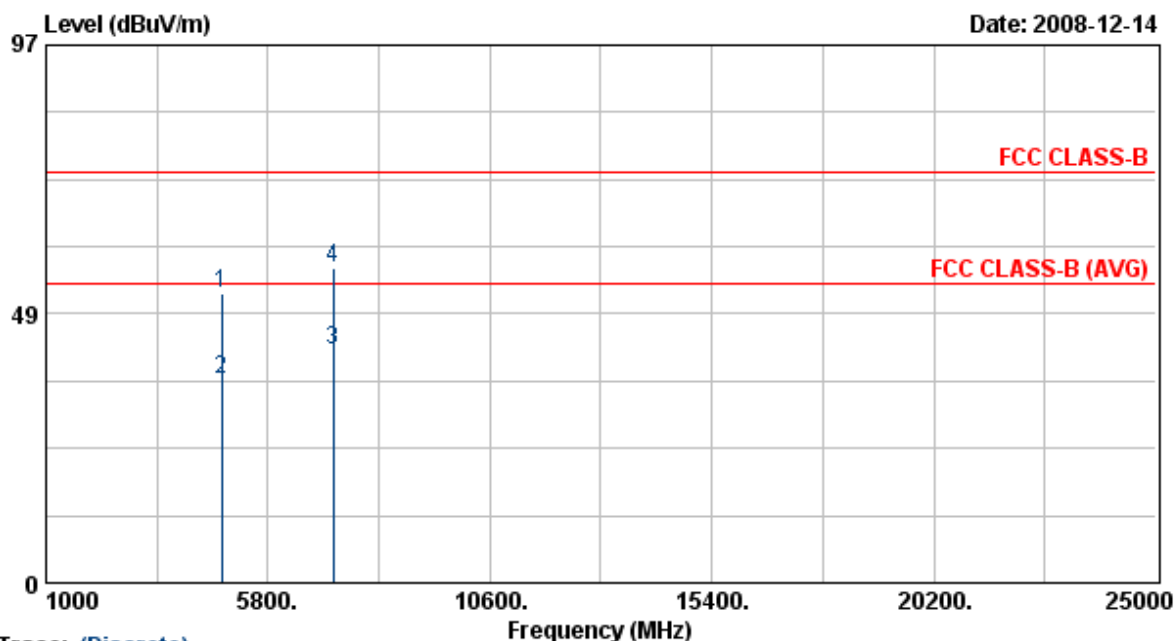
Trace: (Discrete)

Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	603.80	36.65	0.54	37.19	46.00	-8.81	Peak	100	0
2	640.90	35.54	3.59	39.13	46.00	-6.87	Peak	100	0
3	738.90	32.95	6.17	39.12	46.00	-6.88	Peak	100	0
4	836.90	33.04	7.53	40.57	46.00	-5.43	QP	100	0
5	873.30	32.68	5.58	38.26	46.00	-7.74	Peak	100	0
6	943.30	32.50	9.22	41.72	46.00	-4.28	QP	100	0

- Remarks:
1. Result = Read Value + Factor
 2. Factor = Antenna Factor + Cable Loss - Amplifier
 3. According to technical experiences, all spurious emission of FM mode at channel 0,39,78 are almost the same below 1GHz, so that the channel 0 was chosen as representative in final test.
 4. The data is worst case.



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 22 °C
Memo	:	Humidity	: 65 %



Trace: (Discrete)

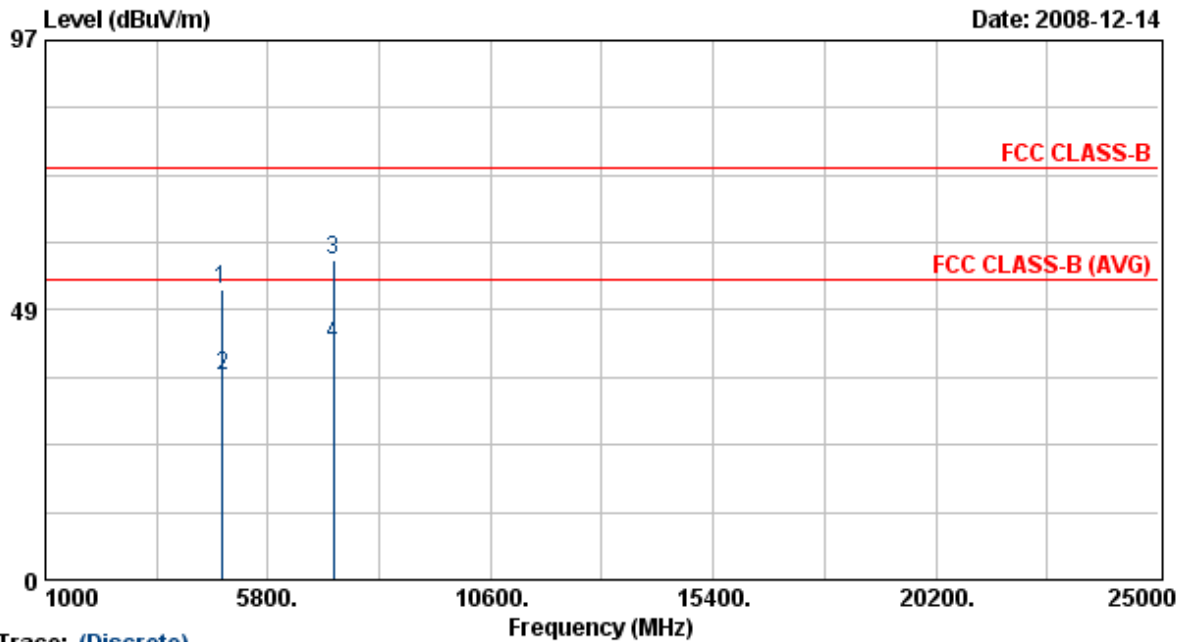
Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	4806.54	44.38	7.75	52.13	74.00	-21.87	Peak	150	360
2	4806.76	28.95	7.75	36.70	54.00	-17.30	Average	150	360
3	7204.90	30.83	11.21	42.04	54.00	-11.96	Average	150	360
4	7208.86	45.66	11.22	56.89	74.00	-17.11	Peak	150	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: CH 00: 2403.3MHz	Temperature	: 22 °C
Memo	:	Humidity	: 65 %



Trace: (Discrete)

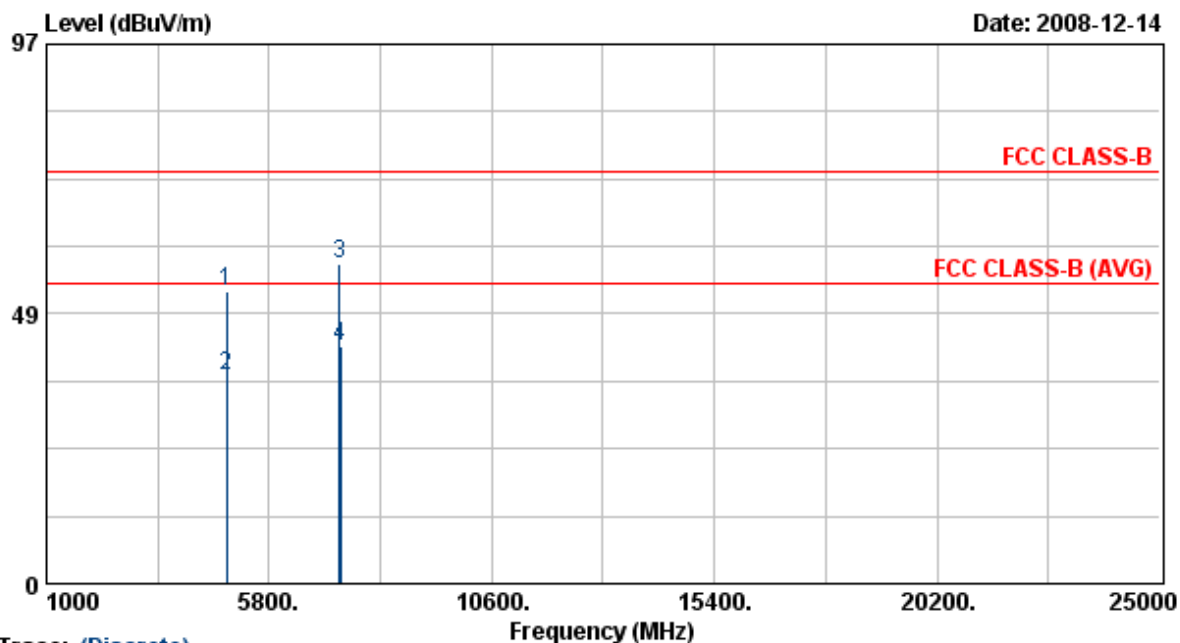
Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	4806.36	44.37	7.75	52.12	74.00	-21.88	Peak	150	155
2	4810.70	28.87	7.76	36.63	54.00	-17.37	Average	150	155
3	7214.00	46.22	11.25	57.46	74.00	-16.54	Peak	150	155
4	7214.04	31.01	11.25	42.26	54.00	-11.74	Average	150	155

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: CH 19: 2442.2MHz	Temperature	: 22 °C
Memo	:	Humidity	: 65 %



Trace: (Discrete)

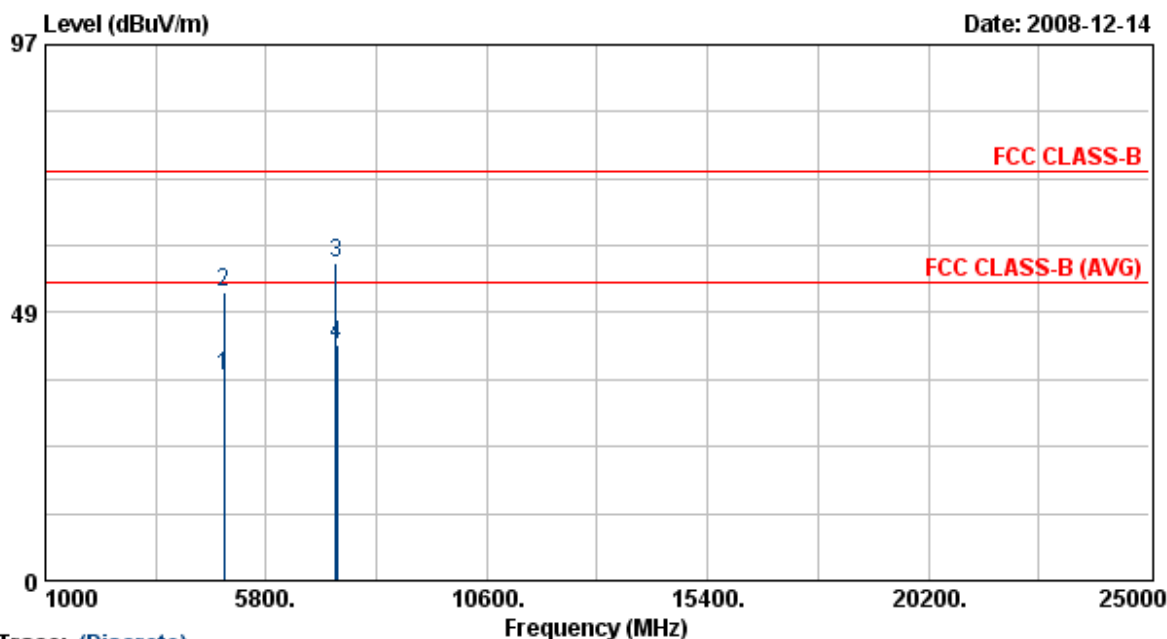
Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	4884.36	44.41	7.98	52.39	74.00	-21.61	Peak	150	0
2	4884.54	29.55	7.98	37.53	54.00	-16.47	Average	150	0
3	7324.50	45.90	11.73	57.63	74.00	-16.37	Peak	150	0
4	7330.08	30.85	11.76	42.61	54.00	-11.39	Average	150	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: CH 19: 2442.2MHz	Temperature	: 22 °C
Memo	:	Humidity	: 65 %



Trace: (Discrete)

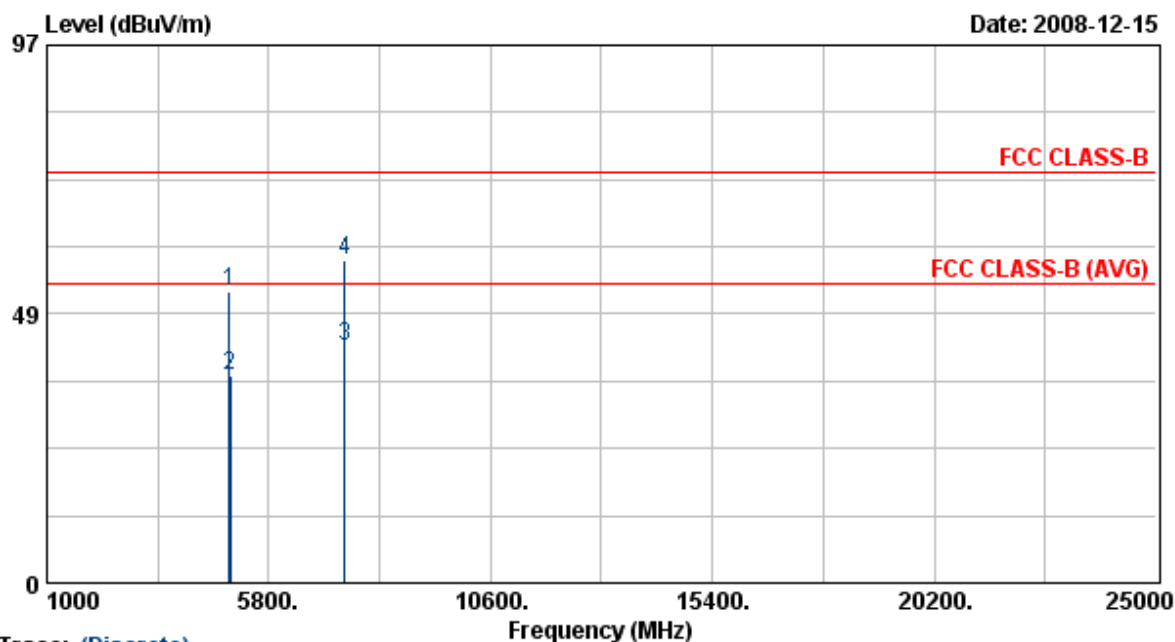
Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	4884.34	29.07	7.98	37.05	54.00	-16.95	Average	150	0
2	4887.26	44.06	7.99	52.05	74.00	-21.95	Peak	150	0
3	7327.00	45.89	11.74	57.63	74.00	-16.37	Peak	150	0
4	7329.88	30.88	11.75	42.63	54.00	-11.37	Average	150	0

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: CH 37: 2479.1MHz	Temperature	: 22 °C
Memo	:	Humidity	: 65 %



Trace: (Discrete)

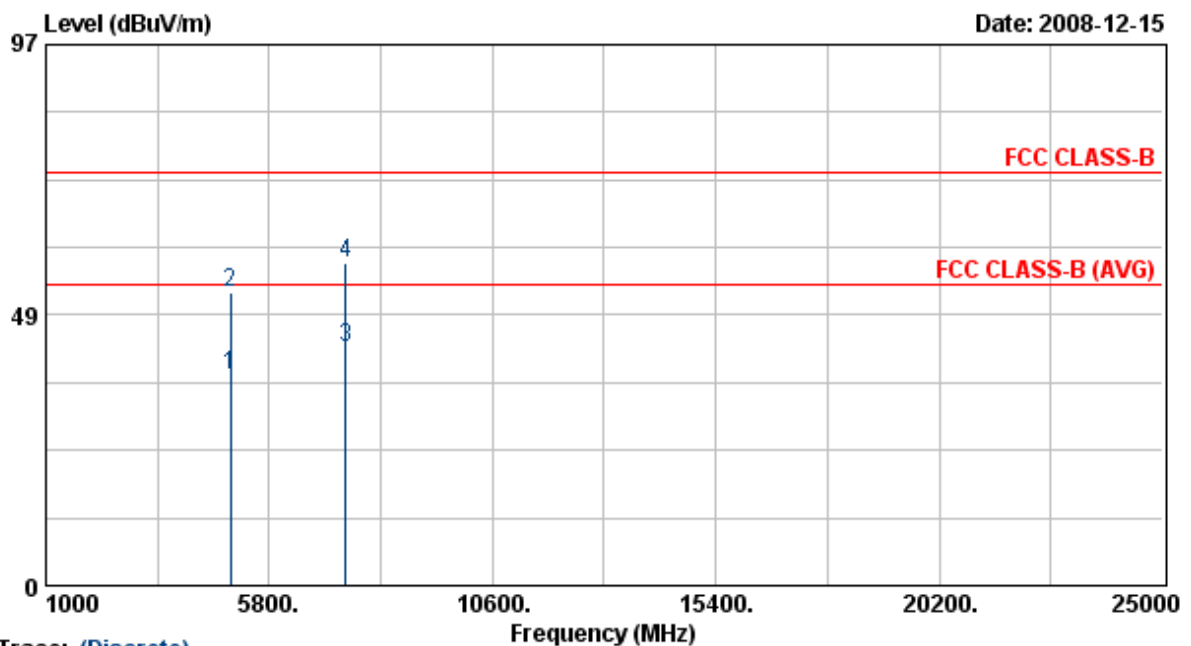
Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	4953.48	44.50	8.19	52.69	74.00	-21.31	Peak	150	290
2	4962.60	29.10	8.22	37.32	54.00	-16.68	Average	150	290
3	7435.68	30.44	12.22	42.66	54.00	-11.34	Average	150	290
4	7439.34	45.79	12.23	58.02	74.00	-15.98	Peak	150	290

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: CH 37: 2479.1MHz	Temperature	: 22 °C
Memo	:	Humidity	: 65 %



Trace: (Discrete)

Item	Freq	Read Value	Factor	Result	Limit	Margin	Remark	Ant Pos	Tab Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB		cm	Deg
1	4958.18	29.52	8.20	37.72	54.00	-16.28	Average	150	360
2	4959.54	44.19	8.21	52.40	74.00	-21.60	Peak	150	360
3	7434.14	30.62	12.21	42.83	54.00	-11.17	Average	150	360
4	7439.70	45.70	12.24	57.93	74.00	-16.07	Peak	150	360

Notes:

1. Result = Read Value + Factor
2. Factor = Antenna Factor + Cable Loss - Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 120KHz and video bandwidth is 300kHz for Peak detection and Quasi-peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
5. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz.
6. The other emissions is too low to be measured.

Test engineer:

Ben



5.6 Test Photographs

Front View



Rear View





6. 20dB Bandwidth Measurement Data

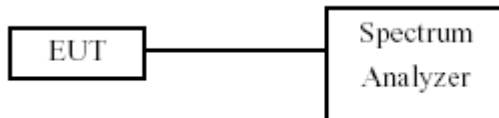
6.1 Test Limit

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 125 mW.

6.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 30 KHz and VBW to 100 KHz.
- The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.

6.3 Test Setup Layout



6.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

6.5 Test Result and Data

Test Date: Dec. 09, 2008

Temperature: 25°C

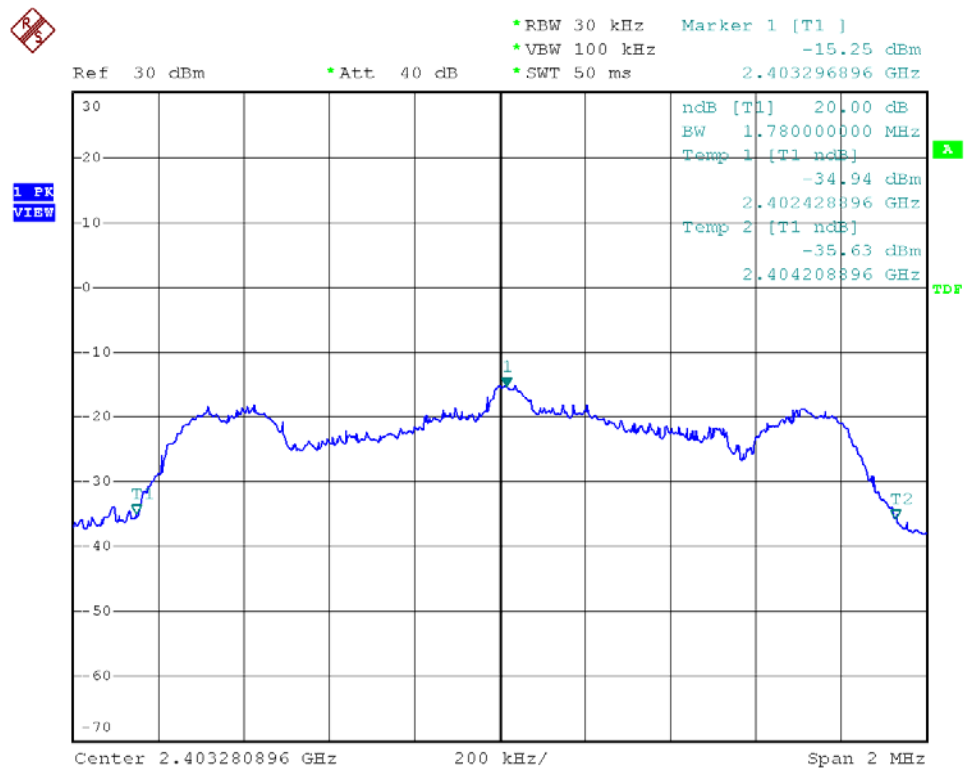
Atmospheric pressure: 1010 hPa

Humidity: 65%

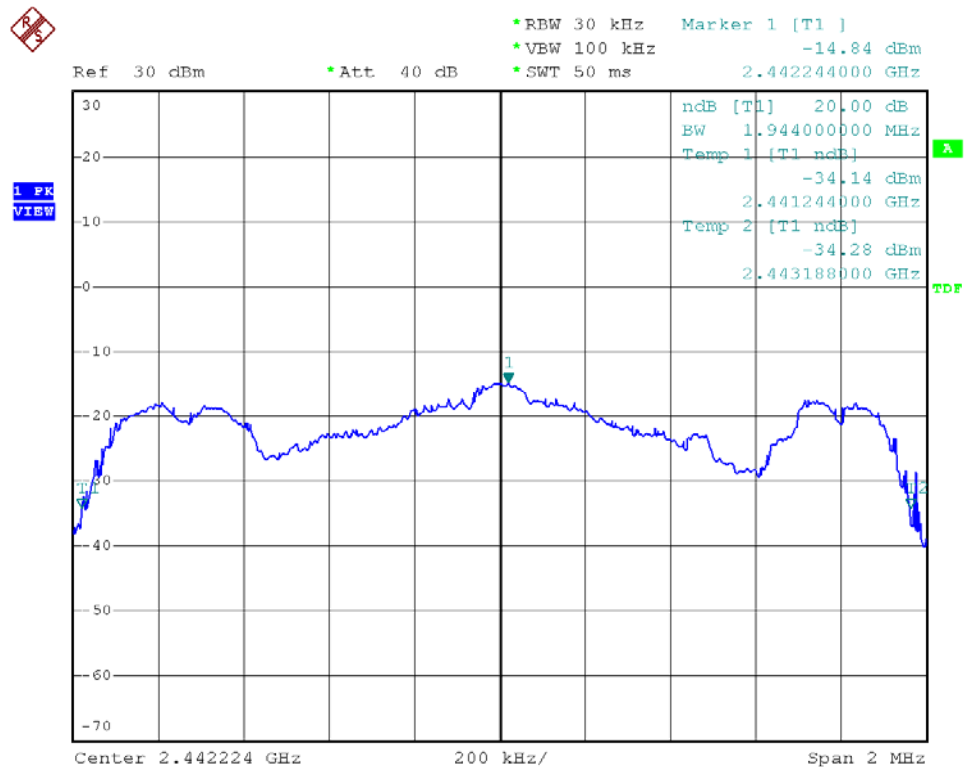
Channel	Frequency (MHz)	20dB Bandwidth (MHz)
00	2403.3	1.780
19	2442.2	1.944
37	2479.1	2.480



Channel: 00

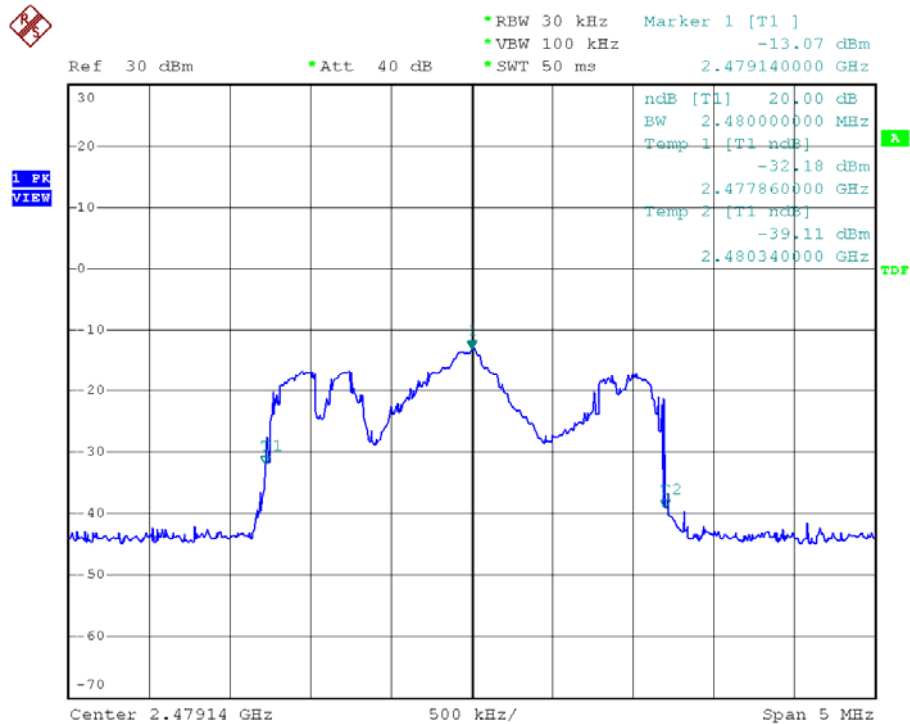


Channel: 19





Channel: 37





7. Frequencies Separation

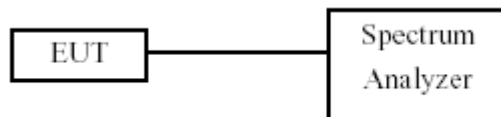
7.1 Test Limit

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.

7.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.
- By using the MaxHold function record the separation of two adjacent channels.
- Measure the frequency difference of these two adjacent channels.

7.3 Test Setup Layout



7.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

7.5 Test Result and Data

Test Date: Dec. 09, 2008

Temperature: 25°C

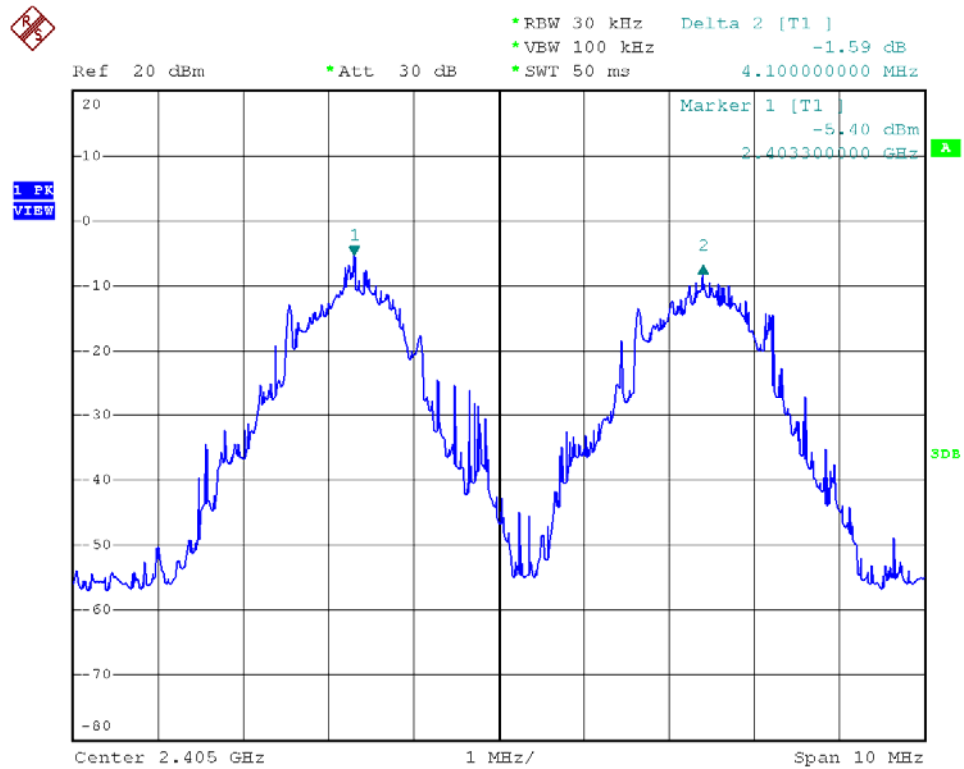
Atmospheric pressure: 1010 hPa

Humidity: 65%

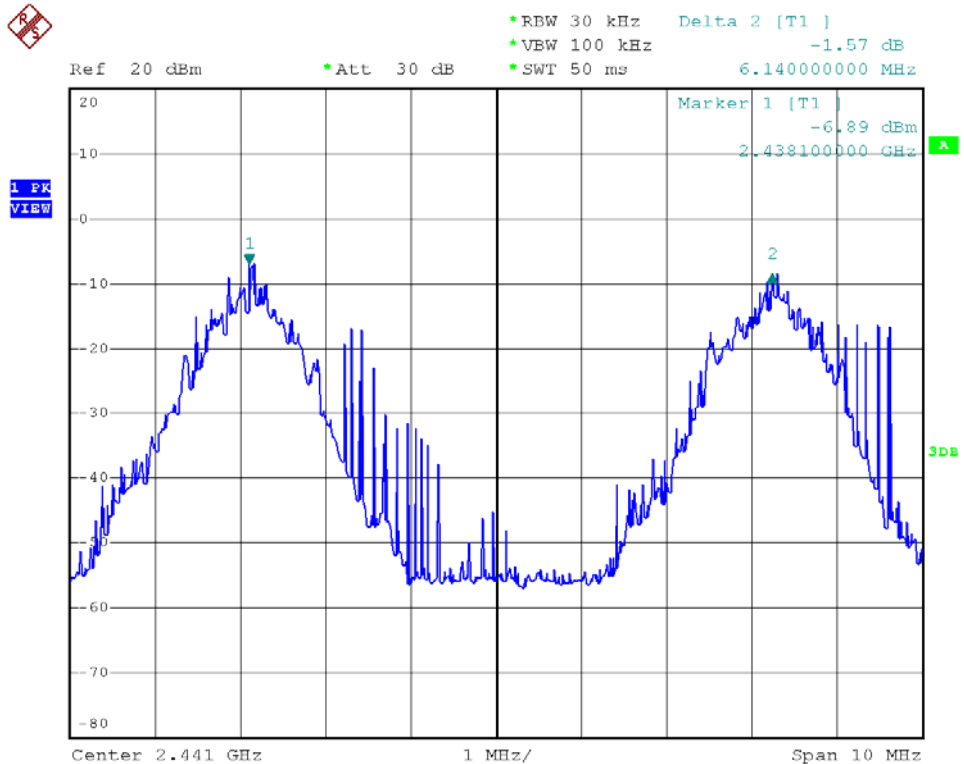
Channel	Frequency (MHz)	Channel Separation (MHz)	Minimum Limit (MHz)
00	2403.3	4.10	1.187
19	2442.2	6.14	1.296
37	2479.1	4.14	1.650



Channel: 00

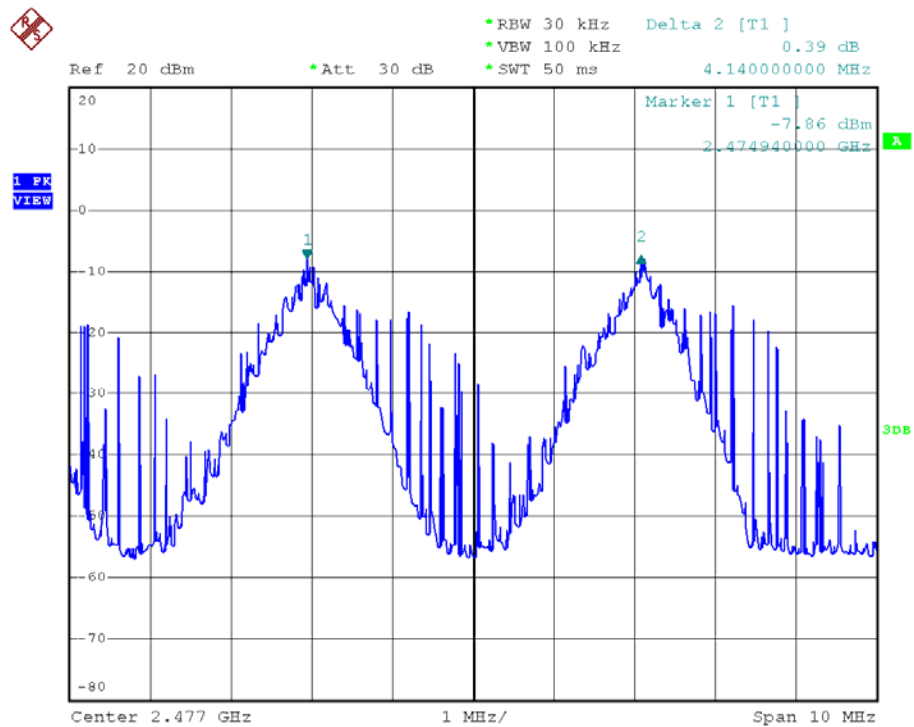


Channel: 19





Channel: 37





8. Dwell Time on each channel

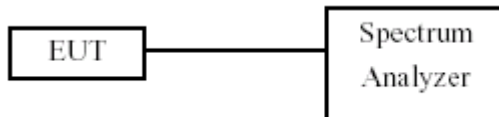
8.1 Test Limit

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.

8.2 Test Procedures

1. The transmitter output was connected to the spectrum analyzer.
2. Adjust the center frequency to measure frequency, then set zero span mode.
3. Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.
4. Measure the time duration of one transmission on the measured frequency.

8.3 Test Setup Layout



8.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

8.5 Test Result and Data

Test Date: Dec. 09, 2008

Temperature: 25°C

Atmospheric pressure: 1010 hPa

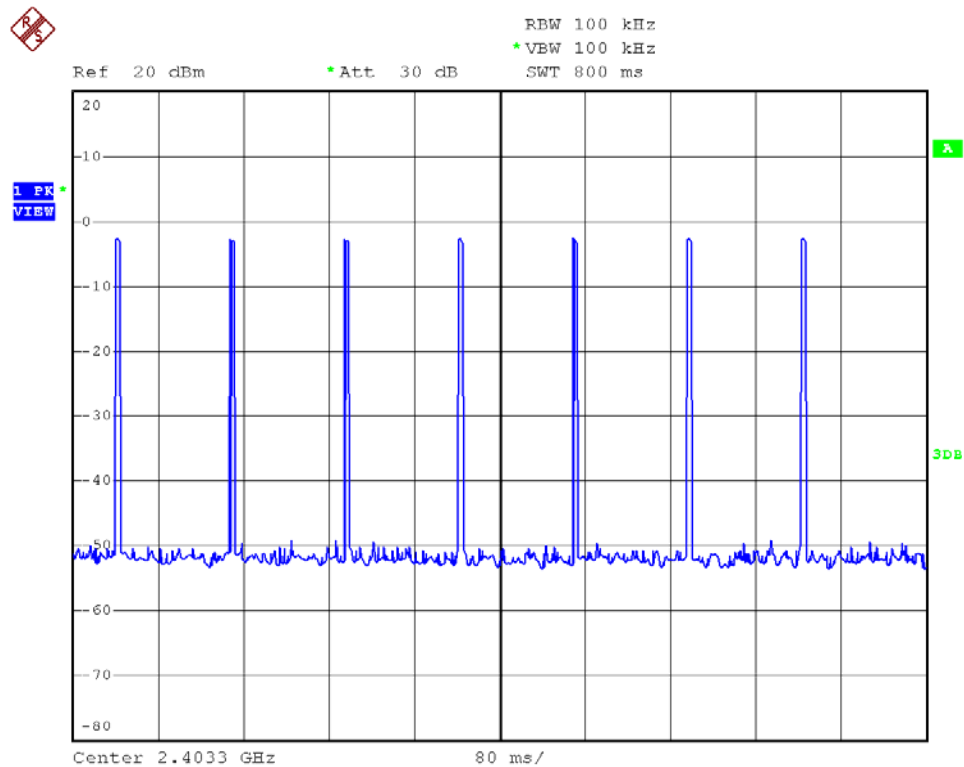
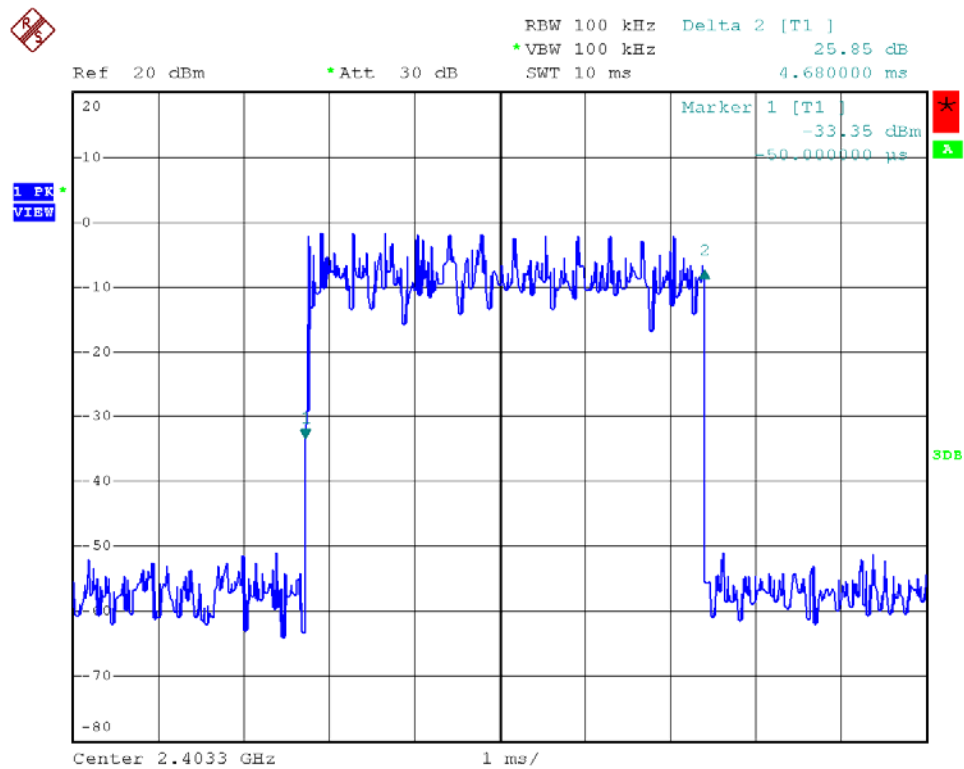
Humidity: 65%

Test Period = 0.4 (second / channel) x 20 Channel = 8 sec

Channel	Frequency (MHz)	Dwell Time (ms)
00	2403.3	327.6
19	2442.2	327.6
37	2479.1	324.8

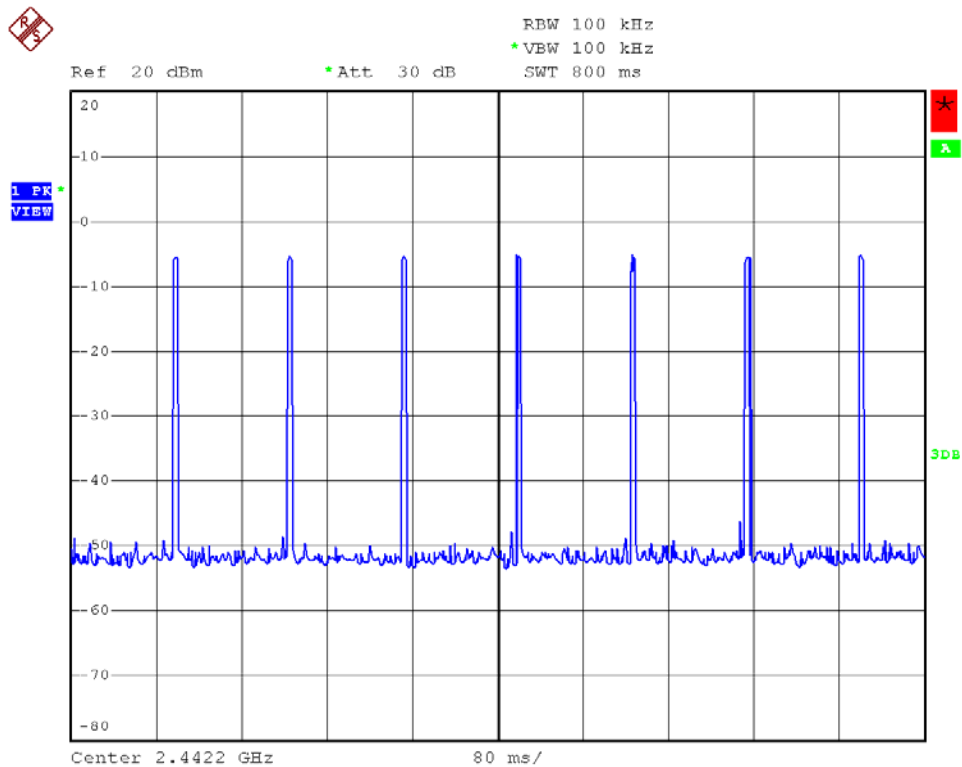
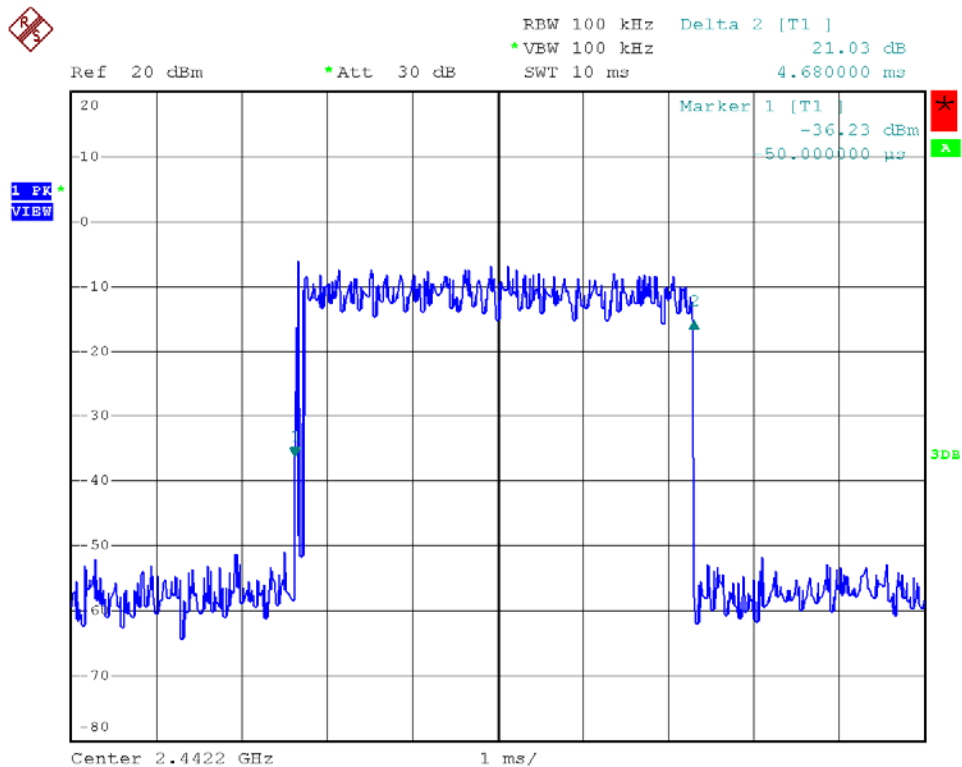


Channel: 00



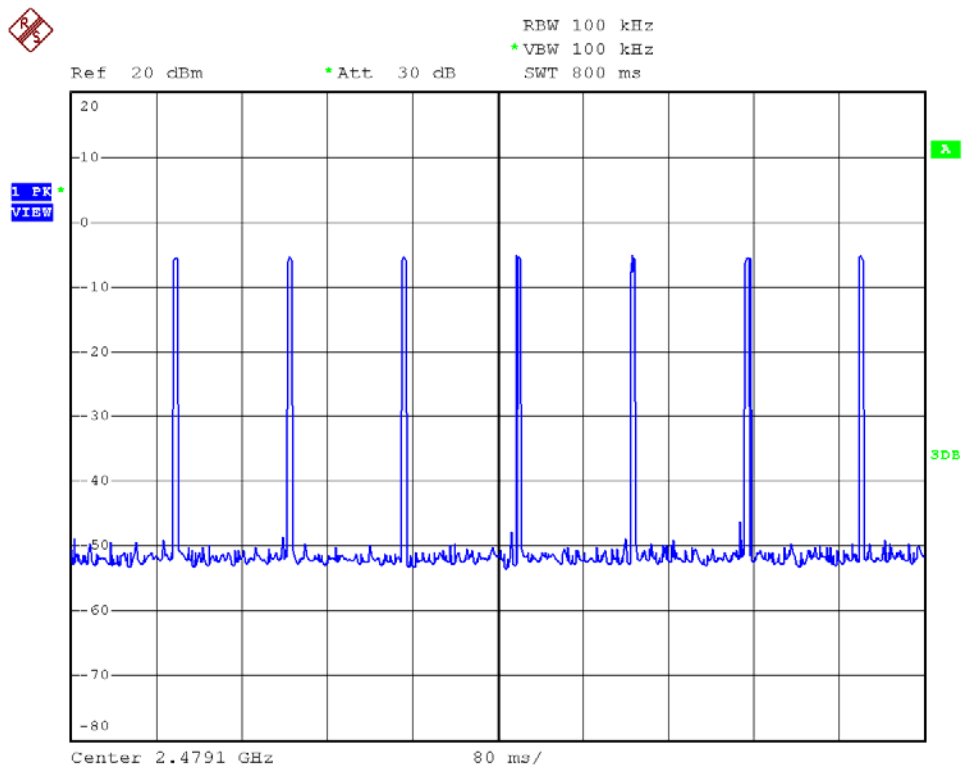
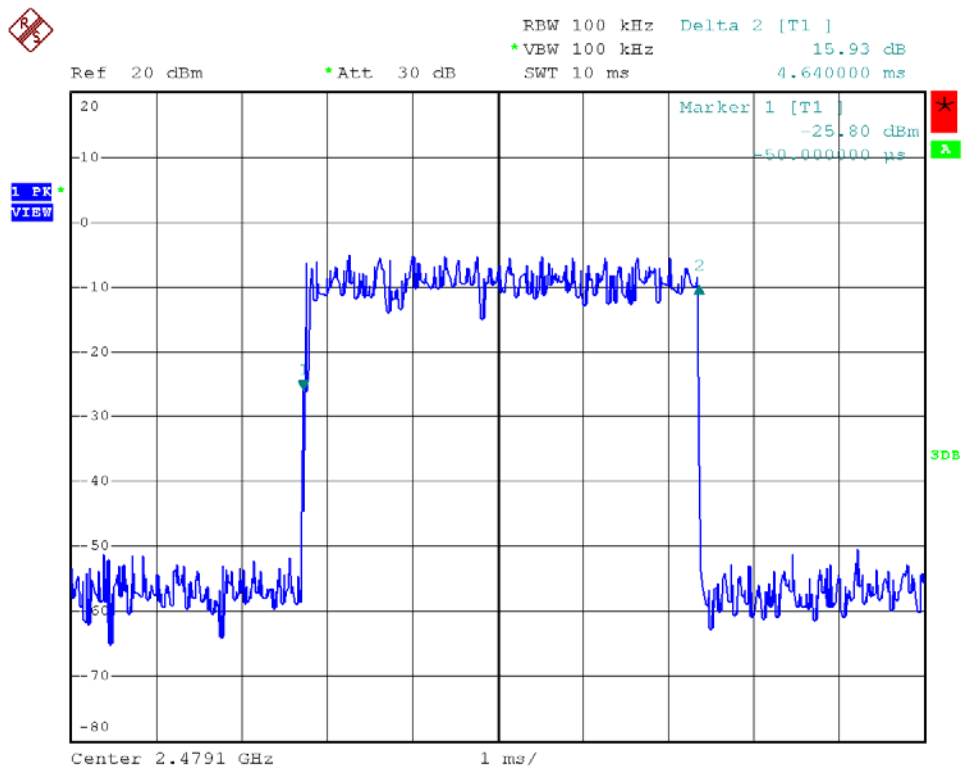


Channel: 19





Channel: 37





9. Number of Hopping Channels

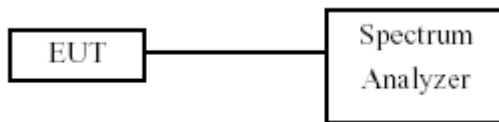
9.1 Test Limit

Frequency hopping systems in the 2400 ~ 2483.5 MHz band shall use at least 15 channels.

9.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100 KHz and VBW to 100 KHz.
- Set the MaxHold function, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been record.

9.3 Test Setup Layout



9.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

9.5 Test Result and Data

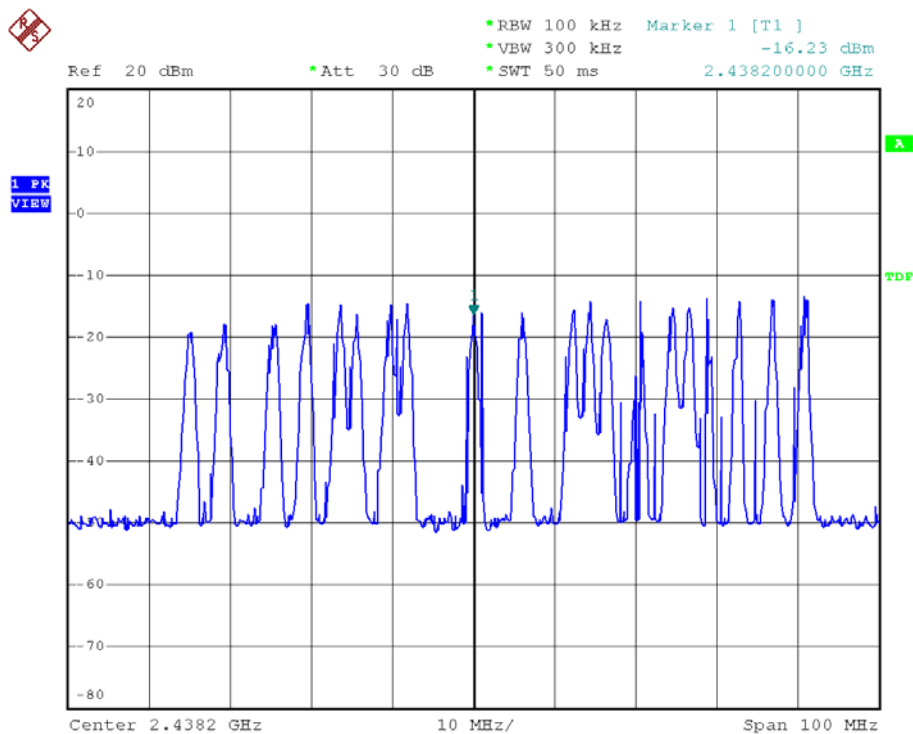
Test Date: Dec. 09, 2008

Temperature: 25°C

Atmospheric pressure: 1010 hPa

Humidity: 65%

Number of hopping channels: 20 Channels





10. Maximum Peak Output Power

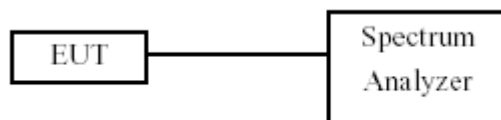
10.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

10.2 Test Procedures

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

10.3 Test Setup Layout



10.4 Measurement Equipment

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

10.5 Test Result and Data

Test Date: Dec. 09, 2008

Temperature: 25°C

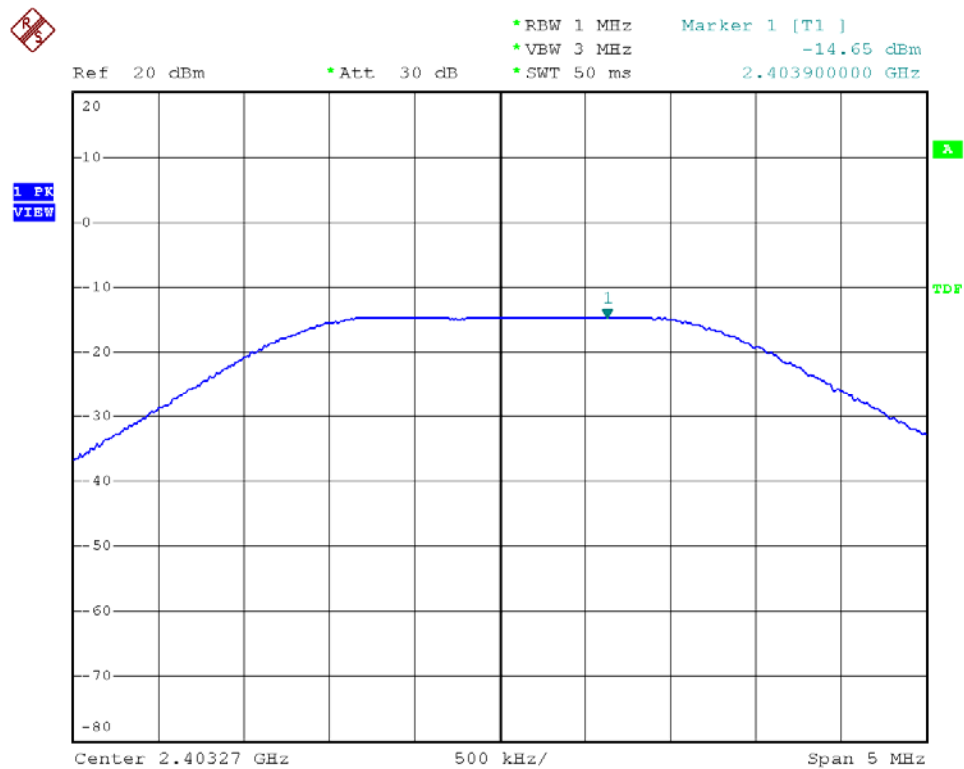
Atmospheric pressure: 1010 hPa

Humidity: 65%

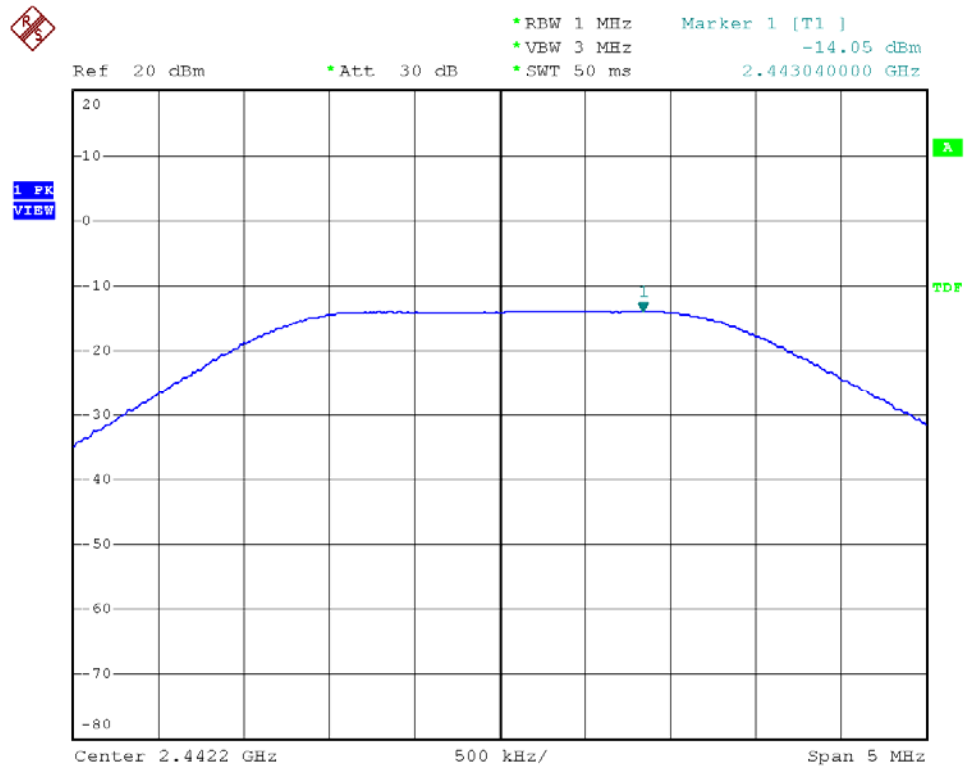
Channel	Frequency (MHz)	Peak Power Output (dBm)	Peak Power Output (mW)
00	2403.3	-14.65	0.03
19	2442.2	-14.05	0.04
37	2479.1	-12.56	0.06



Channel: 00

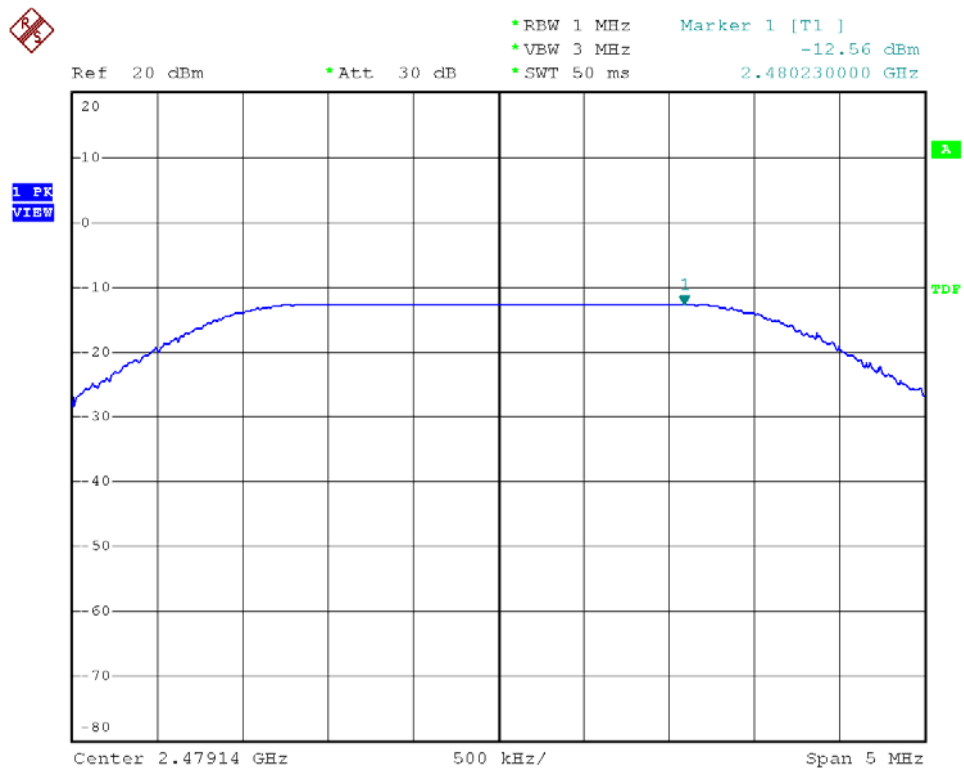


Channel: 19





Channel: 37





11. Power Spectral Density

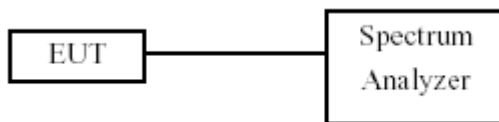
11.1 Test Limit

The Maximum of Power Spectral Density Measurement is 8dBm.

11.2 Test Procedures

1. The transmitter output was connected to spectrum analyzer.
2. The spectrum analyzer's resolution bandwidth were set at 3KHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=span/3KHz.
3. The power spectral density was measured and recorded.
4. The Sweep time is allowed to be longer than span/3KHz for a full response of the mixer in the spectrum analyzer.

11.3 Test Setup Layout



11.4 List of Measuring Equipment Used

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

11.5 Test Result and Data

Test Date: Dec. 09, 2008

Temperature: 25°C

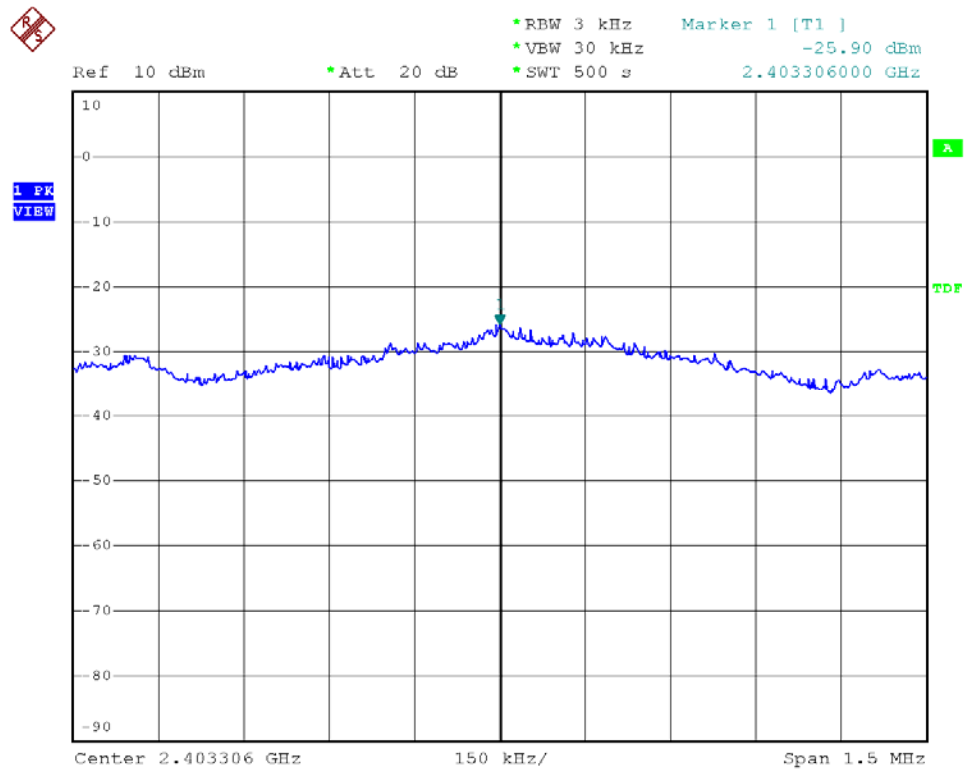
Atmospheric pressure: 1010 hPa

Humidity: 65%

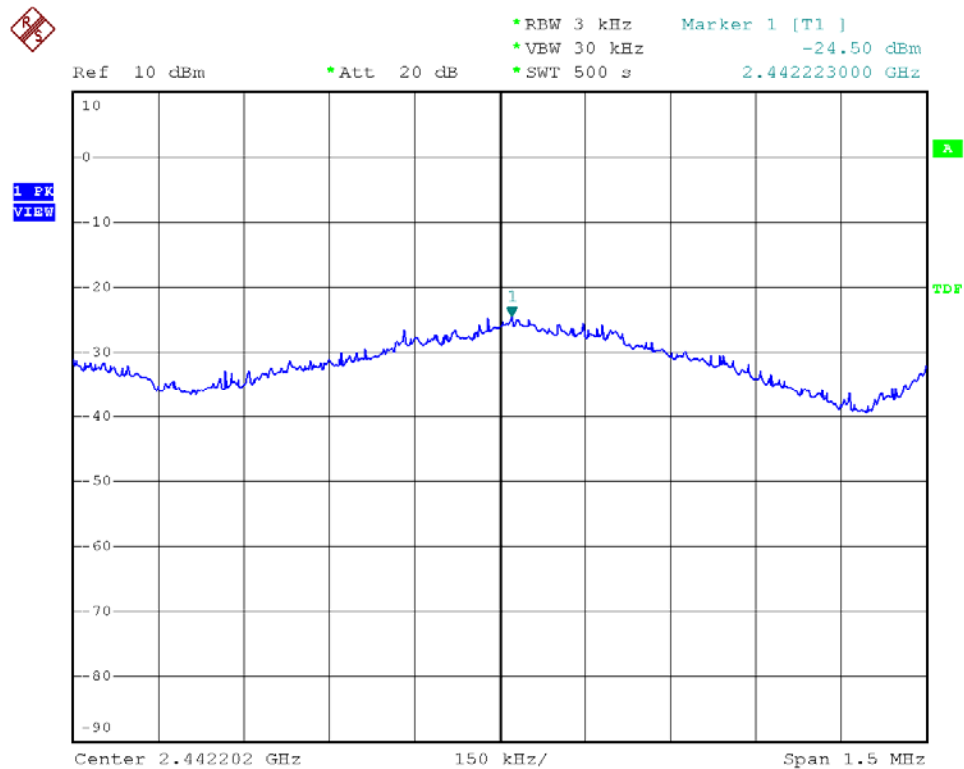
Channel	Frequency (MHz)	Maximum Power Density of 3 kHz Bandwidth (dBm)
00	2403.3	-25.90
19	2442.2	-24.50
37	2479.1	-22.28



Channel: 00

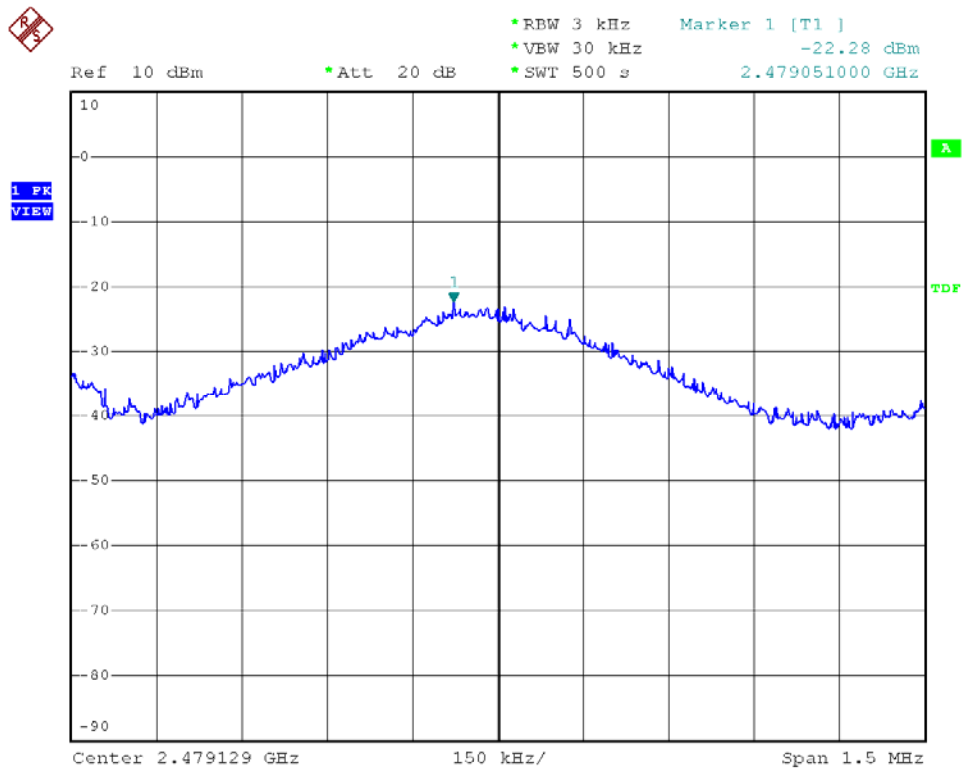


Channel: 19





Channel: 37





12. Band Edges Measurement

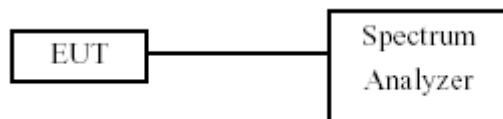
12.1 Test Limit

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

12.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer via a low lose cable.
- Set both RBW and VBW of spectrum analyzer to 100 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- The band edges was measured and recorded.

12.3 Test Setup Layout



12.4 List of Measuring Equipment Used

Instrument/Ancillary	Model No.	Manufacturer	Serial No.	Calibration Date	Valid Date
Spectrum Analyzer	FSP40	R&S	10047	2008/02/22	2009/02/21

12.5 Test Result and Data

Test Date: Dec. 09, 2008

Temperature: 25°C

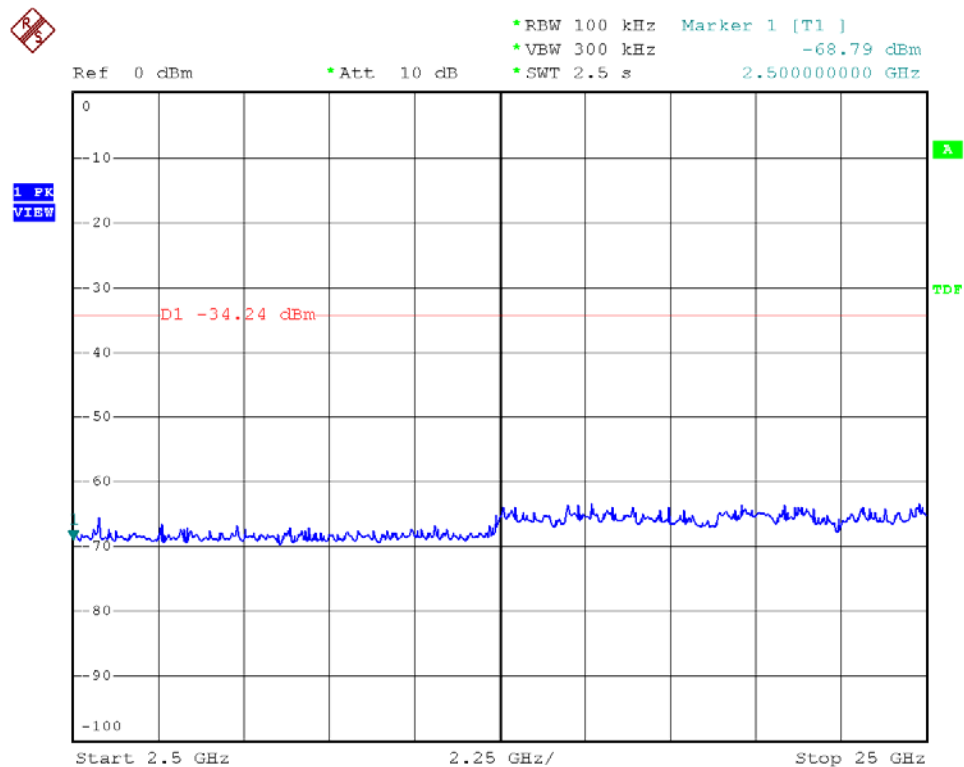
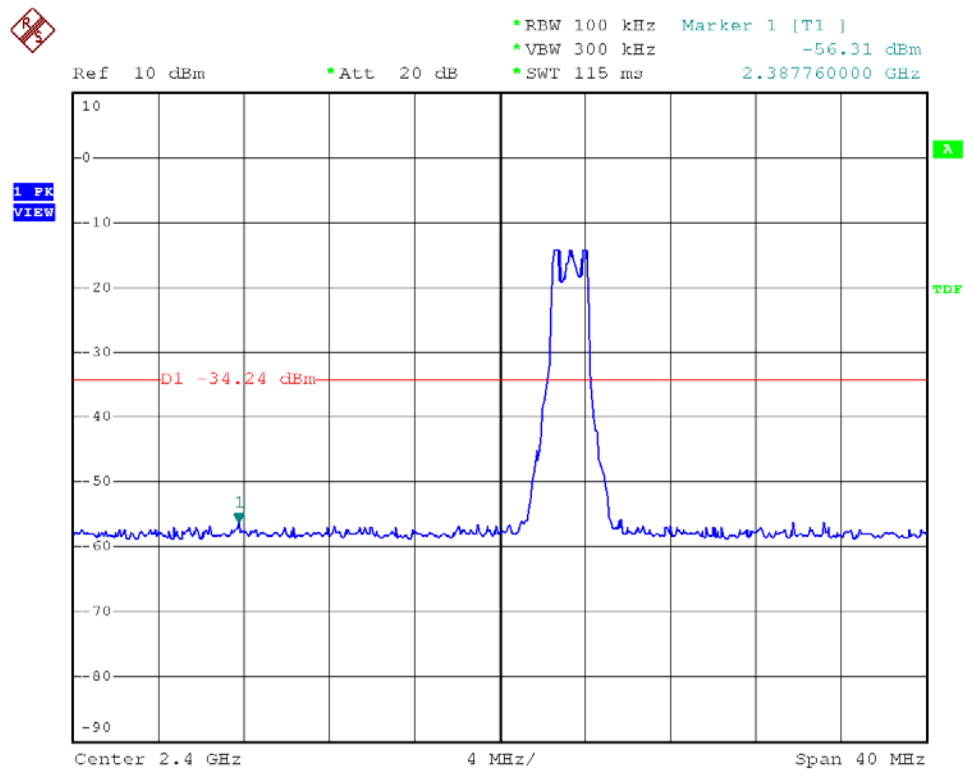
Atmospheric pressure: 1010 hPa

Humidity: 65%

Channel	Frequency (MHz)	maximum value in frequency (MHz)	maximum value (dBm)
00	2403.3	2387.76	-56.31
37	2479.1	2491.02	-56.00

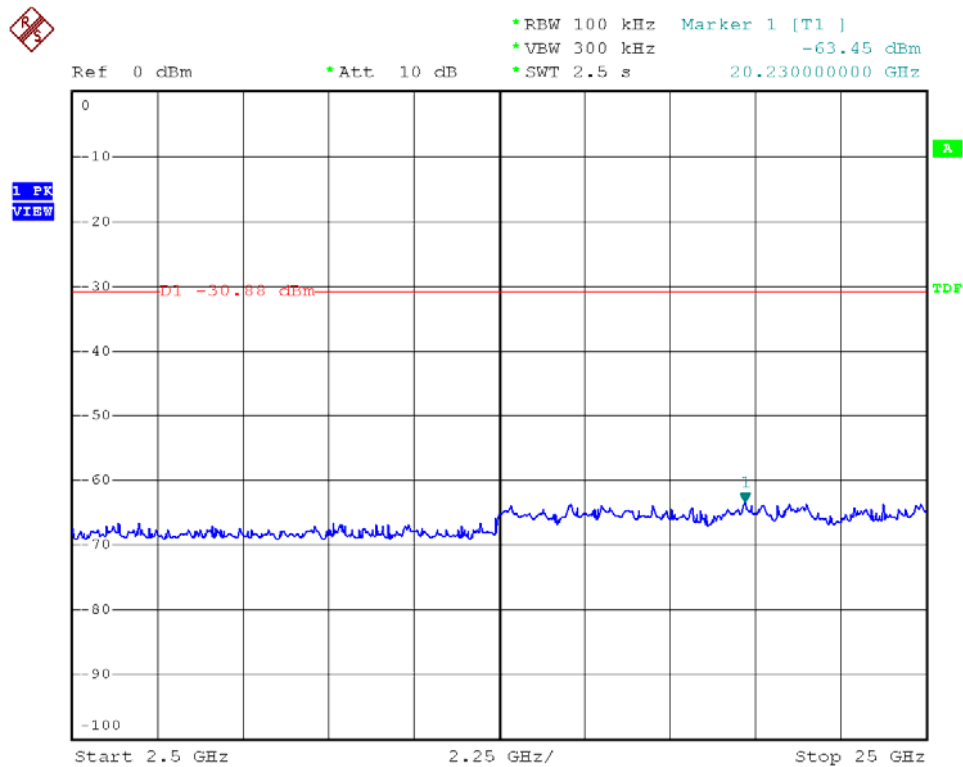
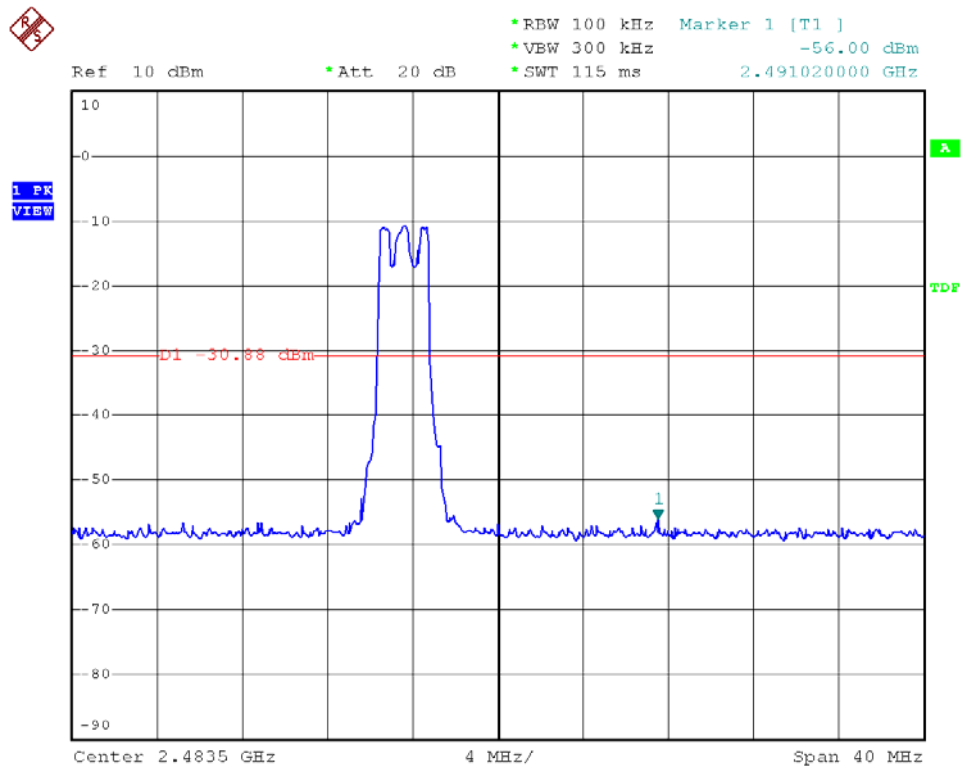


Channel: 00





Channel: 37





12.6 Restrict band emission Measurement Data

Test Date: Dec. 14, 2008

Temperature: 22°C

Atmospheric pressure: 1007 hPa

Humidity: 65%

Channel 00						Fundamental Frequency: 2403.3 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading	Corrected Factor	Result (dBuV/m)	Remark	Limit@3m (dBuV/m)		Margin (dB)	Table (Deg.)	Ant High (m)
						Peak	Ave.			
2385.38	H	58.79	-0.79	58.00	Peak	74	54	-16.00	0	1.50
2387.72	H	45.51	-0.78	44.73	Ave	74	54	-9.27	0	1.50
2378.24	V	58.45	-0.81	57.64	Peak	74	54	-16.36	151	1.50
2385.38	V	45.53	-0.79	44.74	Ave	74	54	-9.26	151	1.50
Channel 37						Fundamental Frequency: 2479.1 MHz				
2483.51	H	69.54	-0.46	69.09	Peak	74	54	-4.91	350	1.50
2483.51	H	51.45	-0.46	51.00	Ave	74	54	-3.00	350	1.50
2492.55	V	58.13	-0.43	57.70	Peak	74	54	-16.30	308	1.50
2483.51	V	45.70	-0.46	45.24	Ave	74	54	-8.76	308	1.50

Notes:

1. Result = Meter Reading + Factor
2. Factor = Antenna Factor + Cable Loss – Amplifier
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average detection at frequency above 1GHz



13. Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.250
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

13.1 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device:

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