FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	**900MHz WLAN mini-PCI card**
Model No.	:	**MaxR-900**
Brand Name	:	**Arada**
Filing Type	:	**New Application**
Applicant	:	**Arada Systems, Inc.** 4633 Old Ironsides Drive, Suite 415 Santa Clara, CA 95054
FCC ID	:	**XZB-MAXR900**
Manufacturer	:	**Arada Systems, Inc.** 4633 Old Ironsides Drive, Suite 415 Santa Clara, CA 95054
Received Date	:	Dec. 31, 2010
Final Test Date	:	Jan. 06, 2011

Statement

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.

Testing Laboratory
1190

SPORTON International Inc.

No. 52 Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Table of Contents

1. SUMMARY OF THE TEST RESULT 2

2. GENERAL INFORMATION 3

2.1. Product Details 3
2.2. Table for Filed Antenna 3
2.3. Table for Test Modes 3
2.4. Table for Testing Locations 4
2.5. Table for Supporting Units 4
2.6. Table for Parameters of Test Software Setting 4
2.7. EUT Operation during Test 4
2.8. Test Configurations 5

3. TEST RESULT 7

3.1. AC Power Line Conducted Emissions Measurement 7
3.2. Maximum Peak Output Power Measurement 11
3.3. Power Spectral Density Measurement 13
3.4. 6dB Spectrum Bandwidth Measurement 25
3.5. Radiated Emissions Measurement 37
3.6. Band Edge Emissions Measurement 79
3.7. Antenna Requirements 92

4. LIST OF MEASURING EQUIPMENTS 93

5. TEST LOCATION 95

6. TAF CERTIFICATE OF ACCREDITATION 96

APPENDIX A. MAXIMUM PERMISSIBLE EXPOSURE ..... A1 ~ A3

APPENDIX B. TEST PHOTOS ..... B1 ~ B7

APPENDIX C. PHOTOGRAPHS OF EUT ..... C1 ~ C12

History of This Test Report

Original Issue Date: Jan. 17, 2011
Report No.: FR0D2437

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.247

Equipment	:	**900MHz WLAN mini-PCI card**
Model No.	:	**MaxR-900**
Brand Name	:	**Arada**
Applicant	:	**Arada Systems, Inc.** 4633 Old Ironsides Drive, Suite 415 Santa Clara, CA 95054

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Dec. 31, 2010 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Wayne Hsu Vice Manager

SPORTON International Inc.

No. 52 Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
3.1	15.207	AC Power Line Conducted Emissions	Complies	13.07 dB
3.2	15.247(b)(3)	Maximum Peak Output Power	Complies	0.20 dB
3.3	15.247(e)	Power Spectral Density	Complies	12.98 dB
3.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
3.5	15.247(d)	Radiated Emissions	Complies	3.13 dB
3.6	15.247(d)	Band Edge Emissions	Complies	-
3.7	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Maximum Peak Output Power	±0.8dB	Confidence levels of 95%
Power Spectral Density	±0.5dB	Confidence levels of 95%
6dB Spectrum Bandwidth	$\pm 8.5\times 10^{-8}$	Confidence levels of 95%
Radiated Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Radiated / Band Edge Emissions (1GHz~18GHz)	±1.9dB	Confidence levels of 95%
Radiated Emissions (18GHz~40GHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7℃	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1. Product Details

Only the radio detail is shown in the table below. For more detailed features description, please refer to the manufacturer's specifications or user's manual.

Items	Description
Power Type	From host
Data Modulation	DSSS (DBPSK / DQPSK / CCK); OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	DSSS (1/ 2/ 5.5/11); OFDM (6/9/12/18/24/36/48/54)
Frequency Range	902 ~ 928MHz
Channel Number	5M : 4 ; 10M : 4 ; 20M : 2
Channel Band Width (99%)	5M: 4.17 MHz ; 10M: 8.24 MHz ; 20M : 16.48 MHz
Conducted Output Power	5M : 23.64 dBm ; 10M : 23.80 dBm ; 20M : 23.59 dBm

2.2. Table for Filed Antenna

Ant.	Antenna Type	Connector	Gain (dBi)
1	Patch antenna	I-PEX	12.00

2.3. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode		Data Rate	Channel
AC Power Line Conducted Emissions	Normal Mode		-	-
Peak Output Power Power Spectral Density 6dB Spectrum Bandwidth	5M	DSSS	2.75 Mbps	907 MHz / 912 MHz / 922 MHz
		OFDM	1.5Mbps	
	10M	DSSS	5.5 Mbps	907 MHz / 912 MHz / 922 MHz
		OFDM	3 Mbps	
	20M	DSSS	11 Mbps	912 MHz / 917 MHz
		OFDM	6 Mbps	
Radiated Emissions 9kHz~1GHz	5M	OFDM	1.5Mbps	912 MHz
	10M	OFDM	3 Mbps	912 MHz
	20M	OFDM	6 Mbps	912 MHz
Radiated Emissions Above 1GHz	5M	DSSS	2.75 Mbps	907 MHz / 912 MHz / 922 MHz
		OFDM	1.5Mbps	
	10M	DSSS	5.5 Mbps	907 MHz / 912 MHz / 922 MHz
		OFDM	3 Mbps	
	20M	DSSS	11 Mbps	912 MHz / 917 MHz
		OFDM	6 Mbps	
Fundamental Emissions Band Edge Emissions	5M	DSSS	2.75 Mbps	907 MHz / 922 MHz
		OFDM	1.5Mbps	
	10M	DSSS	5.5 Mbps	907 MHz / 922 MHz
		OFDM	3 Mbps	
	20M	DSSS	11 Mbps	912 MHz / 917 MHz
		OFDM	6 Mbps	

2.4. Table for Testing Locations

Test Site No.	Site Category	Location
CO04-HY	Conduction	Hwa Ya
TH01-HY	OVEN Room	Hwa Ya
03CH02-HY	SAC	Hwa Ya

Semi Anechoic Chamber (SAC).

2.5. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	D505	N/A

2.6. Table for Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.

Test Software Version	Art		
Frequency	907 MHz	912 MHz	922 MHz
5M DSSS	11.5	11.5	11.5
5M OFDM	5	5	6.5
10M DSSS	13	13	12.5
10M OFDM	5	5	7

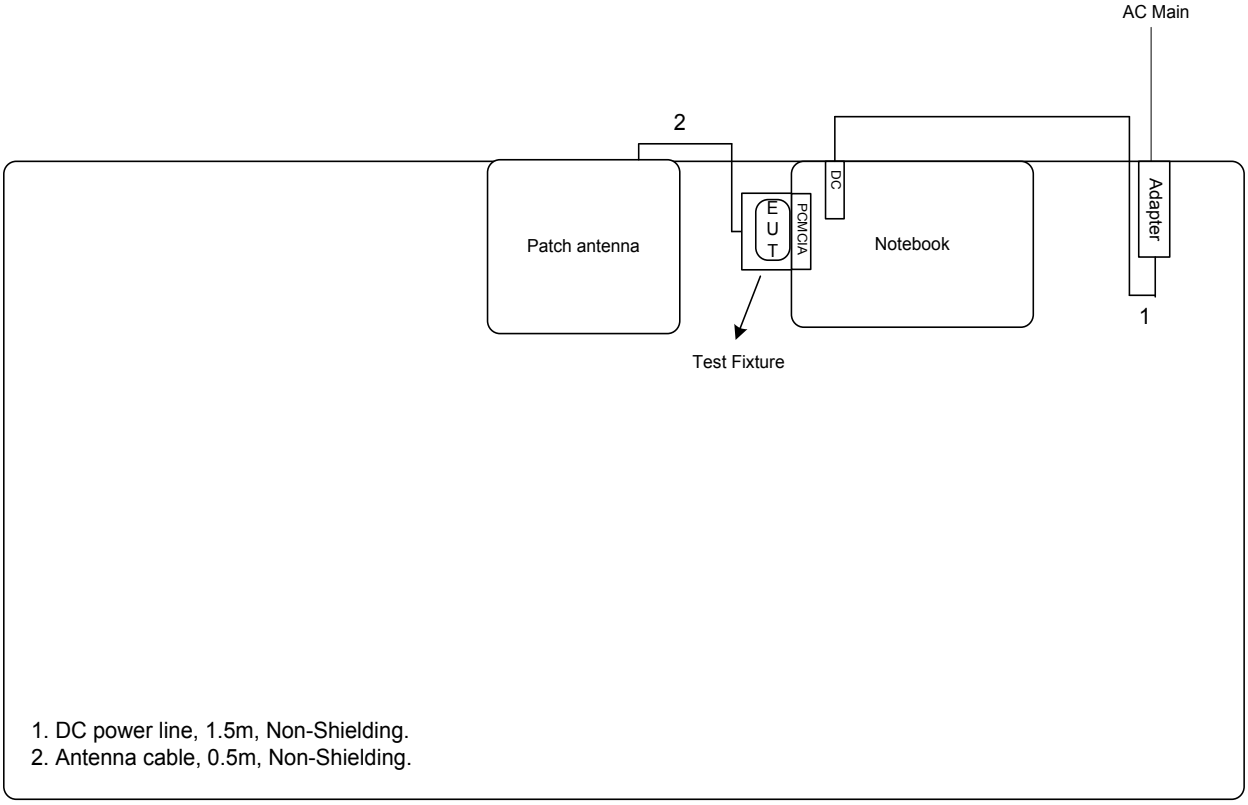
Test Software Version	Art	
Frequency	912 MHz	917 MHz
20M DSSS	11.5	11.5
20M OFDM	5	5

2.7. EUT Operation during Test

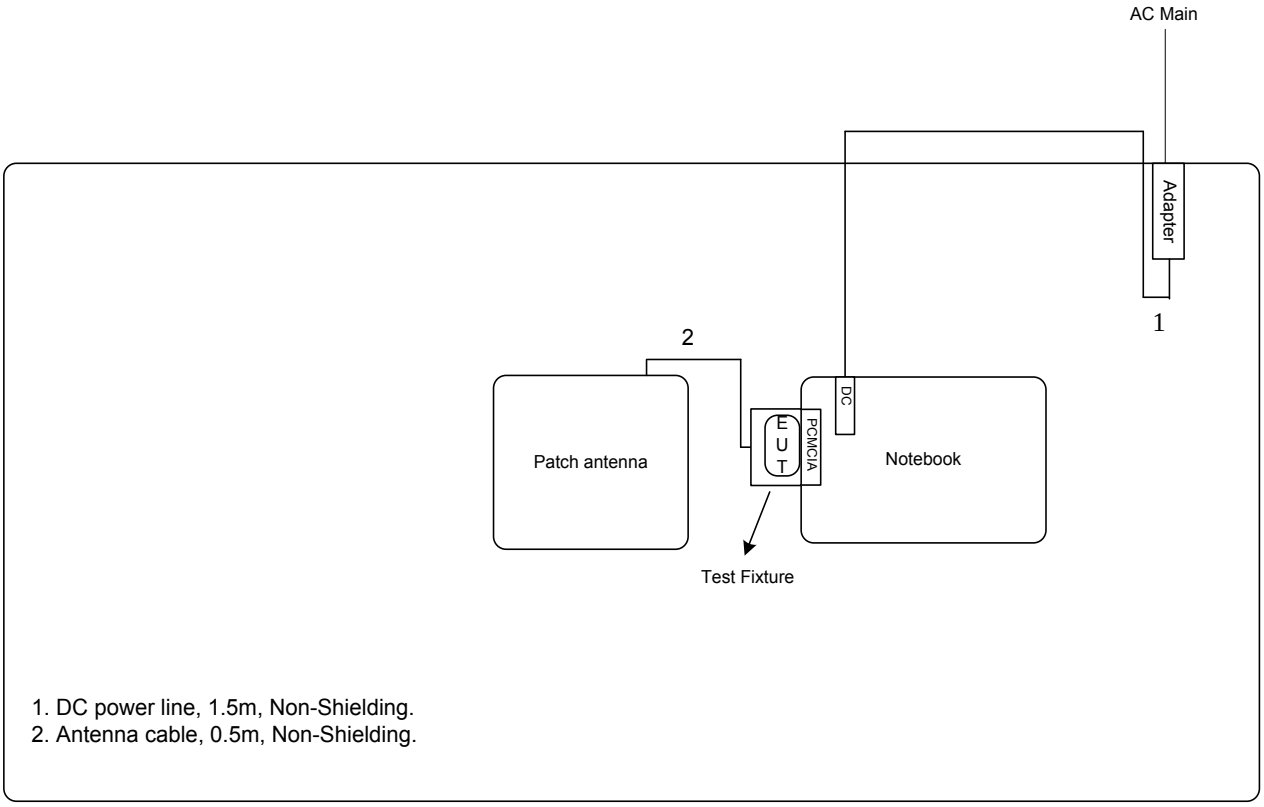
An executive program, EMCTEST.EXE under WIN XP, which generates a complete line of continuously repeating “ H “ pattern was used as the test software.
The program was executed as follows :
Turn on the power of all equipment.
The NB reads the test program from the hard disk drive and runs it.
The NB sends “ H “ messages to the panel, and the panel displays “ H “ patterns on the screen.
At the same time, the following programs were executed:
-Executed "Art " to link EUT to keep transmitting signals at fixed frequency.

2.8. Test Configurations

Radiation Emissions Test Configuration
For radiated emissions 9kHz~1GHz



For radiated emissions above 1GHz



3. TEST RESULT

3.1. AC Power Line Conducted Emissions Measurement

3.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Class B

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

3.1.2. Measuring Instruments and Setting

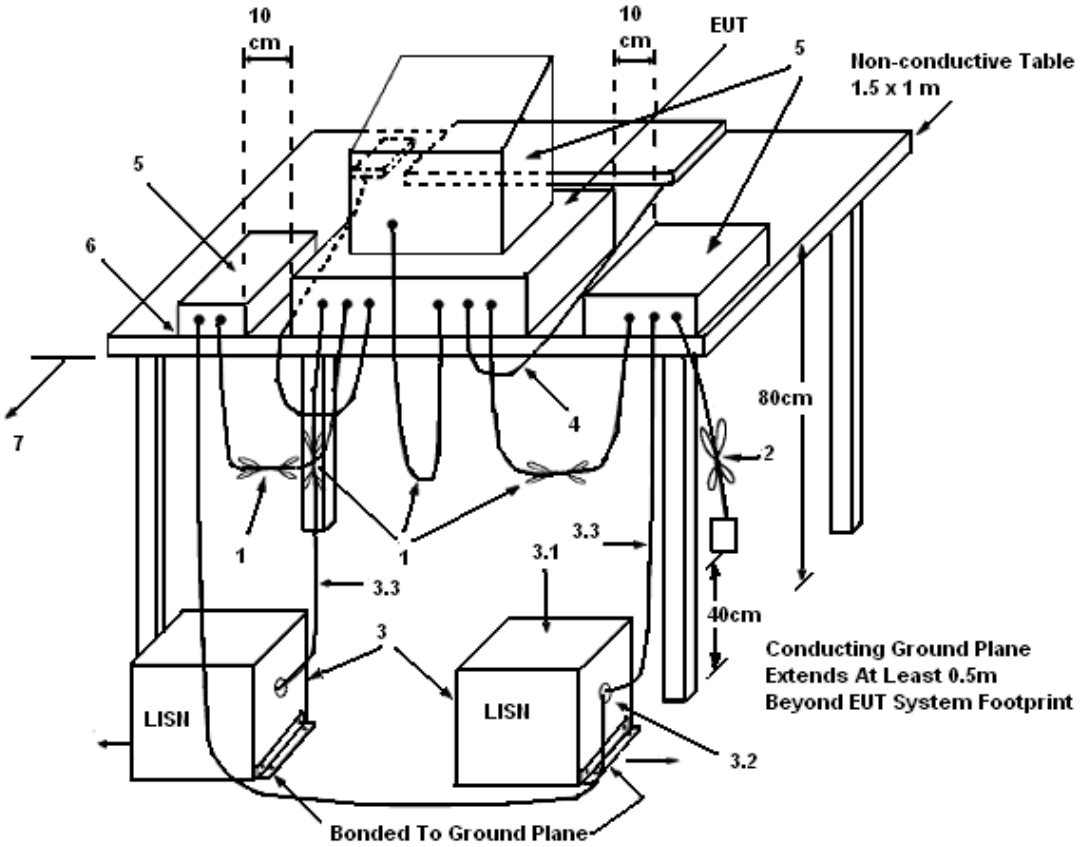
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

3.1.3. Test Procedures

1. The EUT warm up about 15 minutes then start test.
2. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. The measurement has to be done between each power line and ground at the power terminal.

3.1.4. Test Setup Layout



LEGEND:
(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.
(3.1) All other equipment powered from additional LISN(s).
(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
(3.3) LISN at least 80 cm from nearest part of EUT chassis.
(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
(5) Non-EUT components of EUT system being tested.
(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5. Test Deviation

There is no deviation with the original standard.

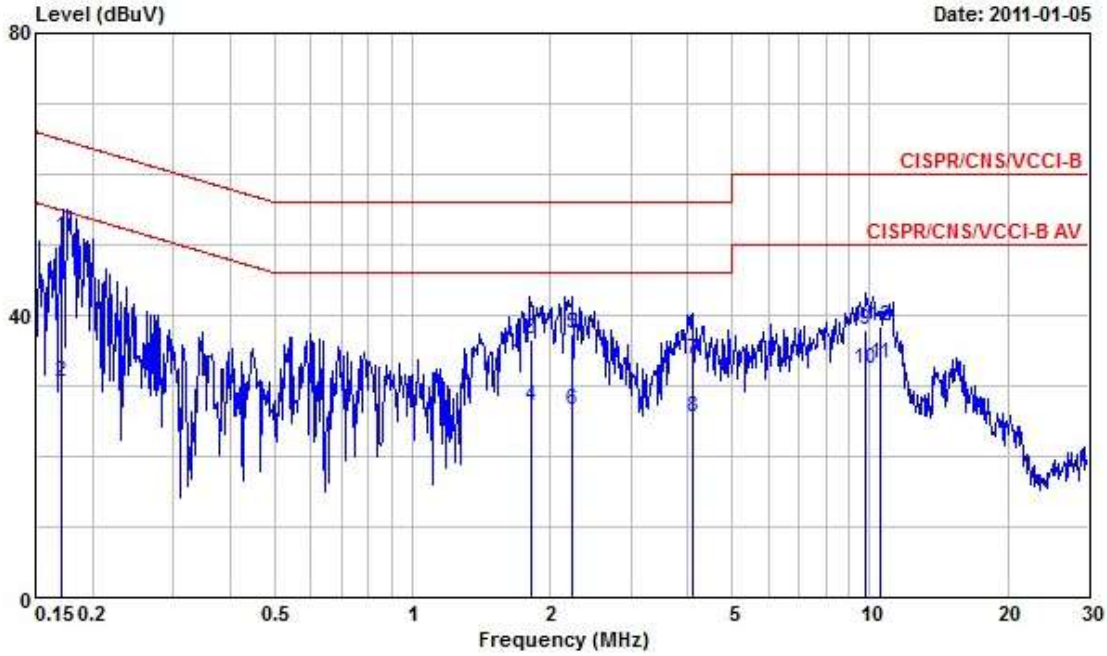
3.1.6. EUT Operation during Test

The EUT was placed on the test table and programmed in normal function.

3.1.7. Results of AC Power Line Conducted Emissions Measurement

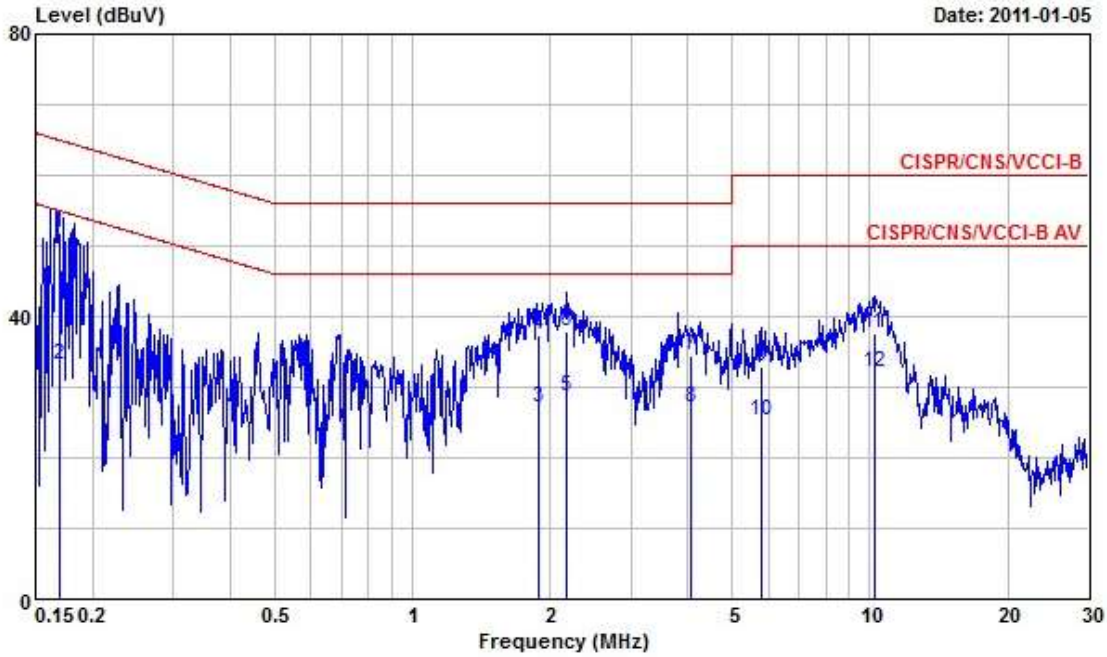
Final Test date	Jan. 05, 2011	Test Site No.	CO04-HY
Temperature	21.2℃	Humidity	51.9%
Test Engineer	Jason	Configuration	Normal Mode

Line



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1714690	51.07	-13.82	64.89	50.91	0.08	0.08	QP
2	0.1714690	30.62	-24.27	54.89	30.46	0.08	0.08	Average
3	1.810	36.46	-19.54	56.00	36.23	0.13	0.10	QP
4	1.810	27.21	-18.79	46.00	26.98	0.13	0.10	Average
5	2.240	37.38	-18.62	56.00	37.15	0.13	0.10	QP
6	2.240	26.46	-19.54	46.00	26.23	0.13	0.10	Average
7	4.090	33.70	-22.30	56.00	33.44	0.16	0.10	QP
8	4.090	25.58	-20.42	46.00	25.32	0.16	0.10	Average
9	9.810	37.85	-22.15	60.00	37.48	0.27	0.10	QP
10	9.810	32.43	-17.57	50.00	32.06	0.27	0.10	Average
11	10.545	33.05	-16.95	50.00	32.65	0.28	0.12	Average
12	10.545	38.35	-21.65	60.00	37.95	0.28	0.12	QP

Neutral



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	@0.1700500	51.89	-13.07	64.96	51.73	0.08	0.08	QP
2	0.1700500	33.05	-21.91	54.96	32.89	0.08	0.08	Average
3	1.880	27.05	-18.95	46.00	26.84	0.11	0.10	Average
4	1.880	37.46	-18.54	56.00	37.25	0.11	0.10	QP
5	2.170	28.73	-17.27	46.00	28.52	0.11	0.10	Average
6	2.170	37.88	-18.12	56.00	37.67	0.11	0.10	QP
7	4.070	34.60	-21.40	56.00	34.35	0.15	0.10	QP
8	4.070	27.02	-18.98	46.00	26.77	0.15	0.10	Average
9	5.800	32.90	-27.10	60.00	32.61	0.19	0.10	QP
10	5.800	25.34	-24.66	50.00	25.05	0.19	0.10	Average
11	10.230	37.69	-22.31	60.00	37.32	0.26	0.11	QP
12	10.230	32.20	-17.80	50.00	31.83	0.26	0.11	Average

Note:
Level = Read Level + LISN Factor + Cable Loss.

3.2. Maximum Peak Output Power Measurement

3.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-multipoint antenna reduction operation, the limit has to be reduced by 1dB for every dB that the directional gain of the antenna exceeds 6dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

3.2.2. Measuring Instruments and Setting

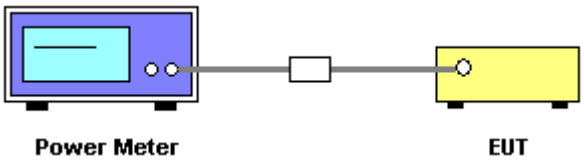
Please refer to section 4 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Filter No.	Auto
Measurement time	0.135 s ~ 26 s
Used Peak Sensor	MA2411B

3.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

3.2.4. Test Setup Layout



3.2.5. Test Deviation

There is no deviation with the original standard.

3.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7. Test Result of Maximum Peak Output Power

Final Test Date	Dec. 31, 2011	**Test Site No.**	TH01-HY
Temperature	21℃	**Humidity**	60%
Test Engineer	Cain	**Configuration**	5M / 10M / 20M

5M (2.75 Mbps)

Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
907 MHz	22.58	24.00	**Complies**
912 MHz	22.87	24.00	**Complies**
922 MHz	22.75	24.00	**Complies**

5M (1.5 Mbps)

Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
907 MHz	23.38	24.00	**Complies**
912 MHz	23.42	24.00	**Complies**
922 MHz	23.64	24.00	**Complies**

10M (5.5 Mbps)

Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
907 MHz	23.69	24.00	**Complies**
912 MHz	23.80	24.00	**Complies**
922 MHz	23.33	24.00	**Complies**

10M (3Mbps)

Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
907 MHz	23.34	24.00	**Complies**
912 MHz	23.67	24.00	**Complies**
922 MHz	23.54	24.00	**Complies**

20M (11 Mbps)

Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
912 MHz	23.38	24.00	**Complies**
917 MHz	23.50	24.00	**Complies**

20M (6Mbps)

Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
912 MHz	23.31	24.00	**Complies**
917 MHz	23.59	24.00	**Complies**

3.3. Power Spectral Density Measurement

3.3.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

3.3.2. Measuring Instruments and Setting

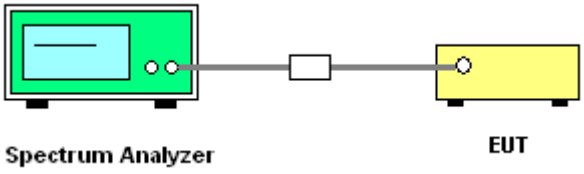
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	1.5MHz
RB	3 kHz
VB	30 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	500s

3.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Set RBW of spectrum analyzer to 3 kHz and VBW to 30 kHz. Set Detector to Peak, Trace to Max Hold.
3. Mark the frequency with maximum peak power as the center of the display of the spectrum.
4. Set the span to 1.5MHz and the sweep time to 500s and record the maximum peak value.

3.3.4. Test Setup Layout



3.3.5. Test Deviation

There is no deviation with the original standard.

3.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.3.7. Test Result of Power Spectral Density

Final Test Date	Dec. 31, 2011	**Test Site No.**	TH01-HY
Temperature	21℃	**Humidity**	60%
Test Engineer	Cain	**Configuration**	5M / 10M / 20M

5M (2.75 Mbps)

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
907 MHz	0.78	2.00	**Complies**
912 MHz	1.50	2.00	**Complies**
922 MHz	0.74	2.00	**Complies**

5M (1.5 Mbps)

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
907 MHz	-3.94	2.00	**Complies**
912 MHz	-5.24	2.00	**Complies**
922 MHz	-3.75	2.00	**Complies**

10M (5.5 Mbps)

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
907 MHz	0.27	2.00	**Complies**
912 MHz	1.01	2.00	**Complies**
922 MHz	1.20	2.00	**Complies**

10M (3 Mbps)

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
907 MHz	-7.04	2.00	**Complies**
912 MHz	-8.28	2.00	**Complies**
922 MHz	-7.05	2.00	**Complies**

20M (11 Mbps)

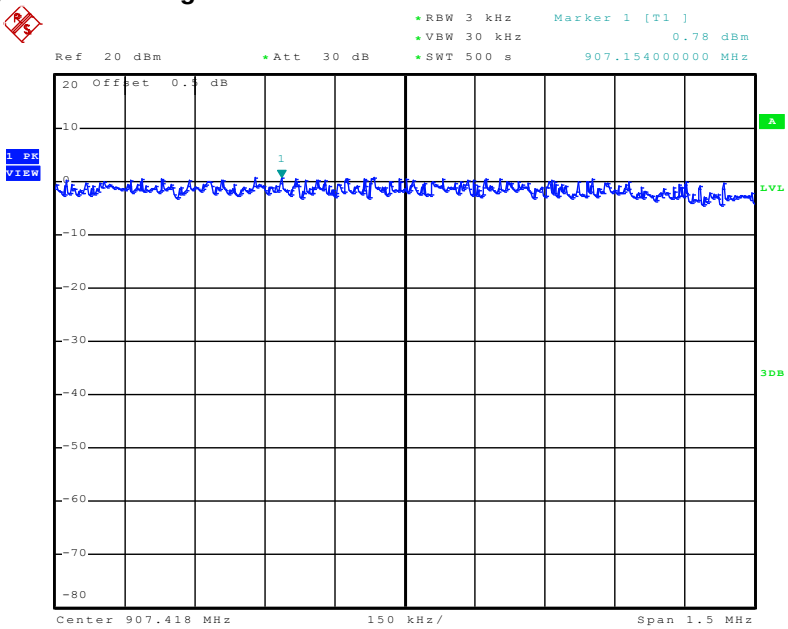
Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
912 MHz	-1.05	2.00	**Complies**
917 MHz	-0.10	2.00	**Complies**

20M (6 Mbps)

Frequency	Power Density (dBm)	Max. Limit (dBm)	Result
912 MHz	-11.97	2.00	**Complies**
917 MHz	-10.47	2.00	**Complies**

5M (2.75 Mbps)

Power Density Plot on Configuration 907 MHz



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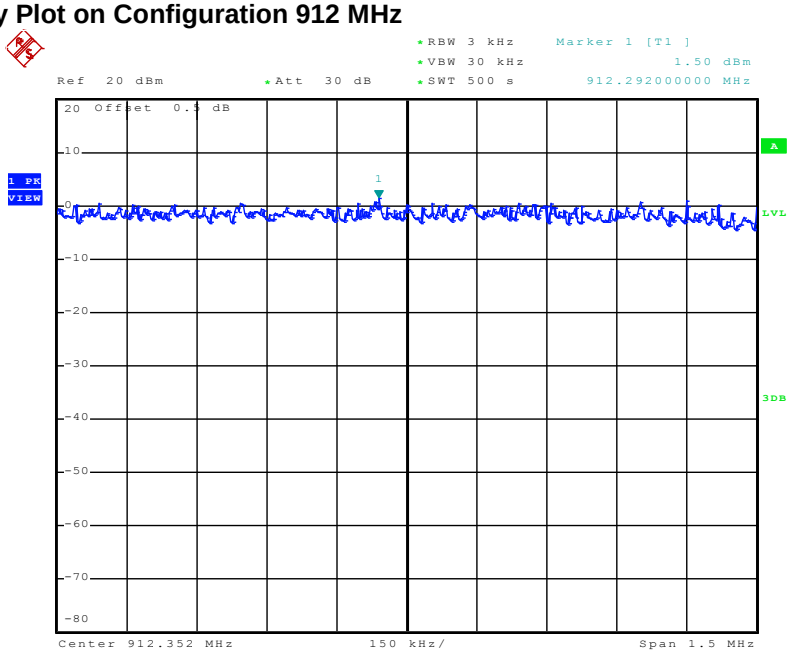
Power Density Plot on Configuration 912 MHz



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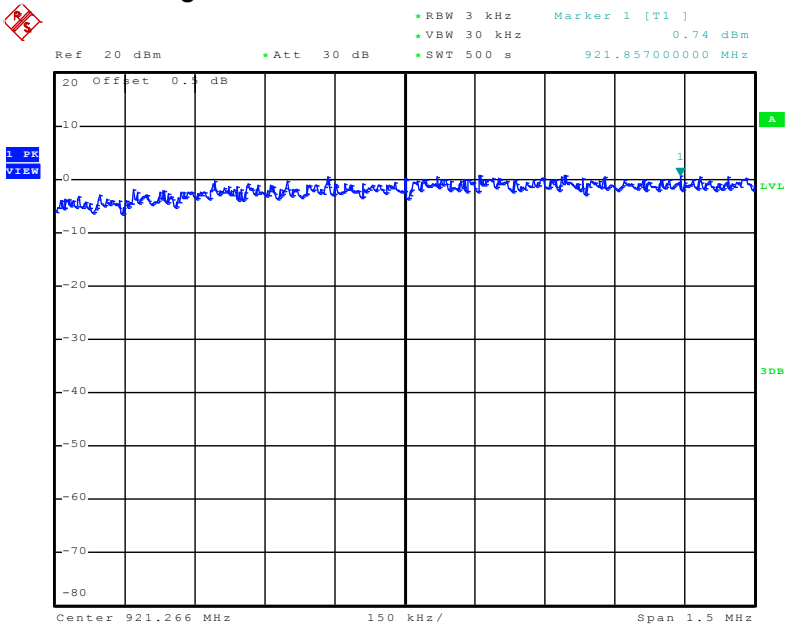
Power Density Plot on Configuration 922 MHz



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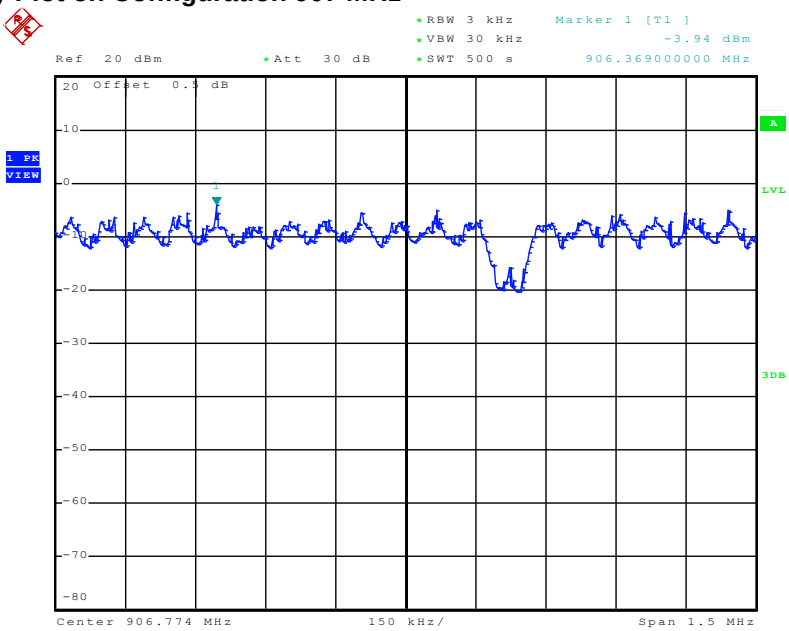
5M (1.5 Mbps)

Power Density Plot on Configuration 907 MHz



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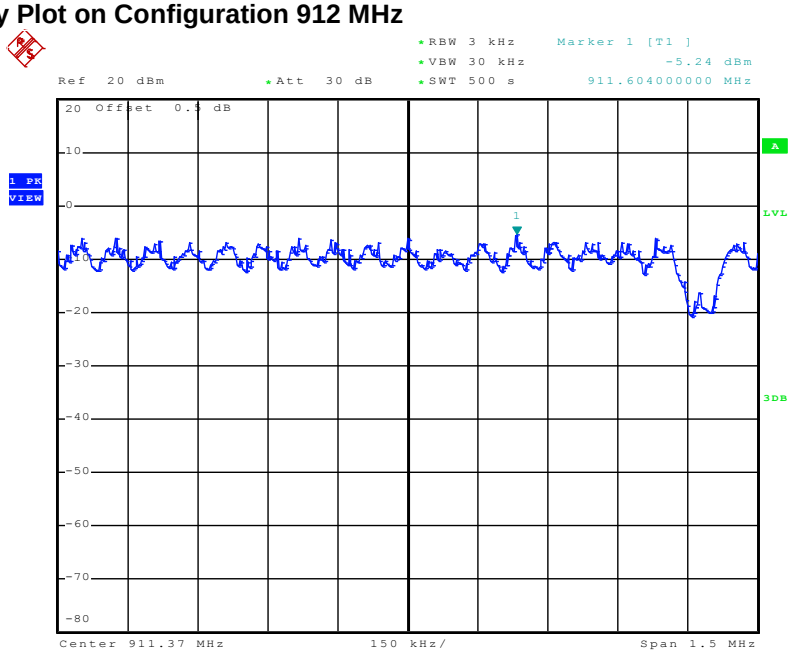
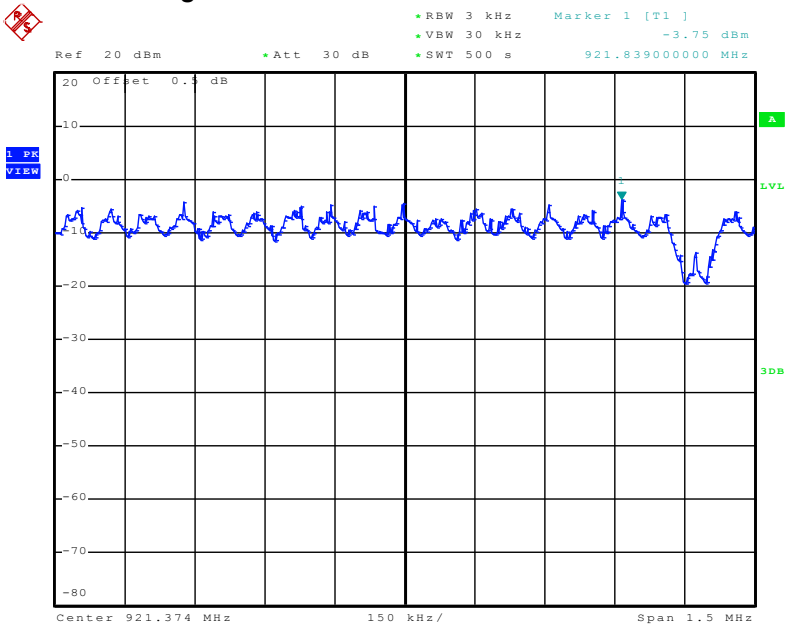
Power Density Plot on Configuration 912 MHz



Date: 31.DEC.2010 15:07:04

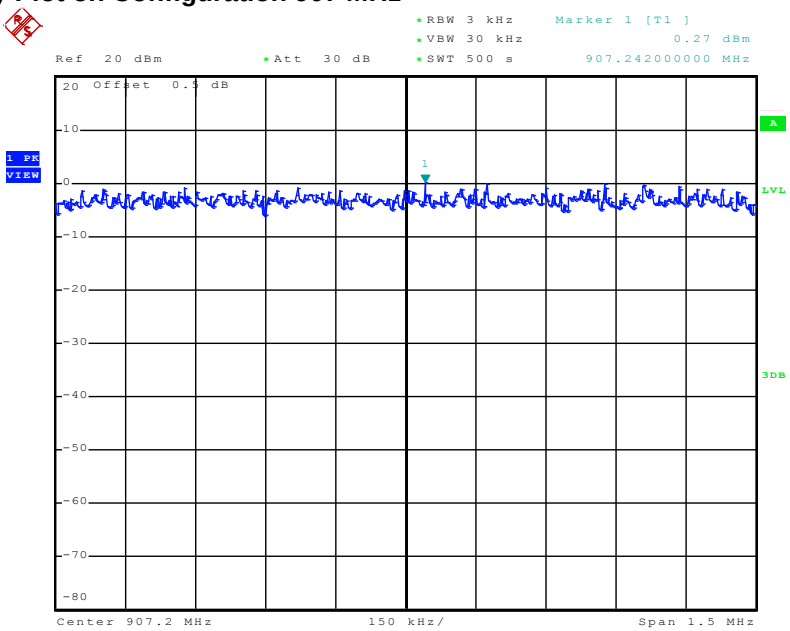
Power Density Plot on Configuration 922 MHz



Date: 31.DEC.2010 15:12:19

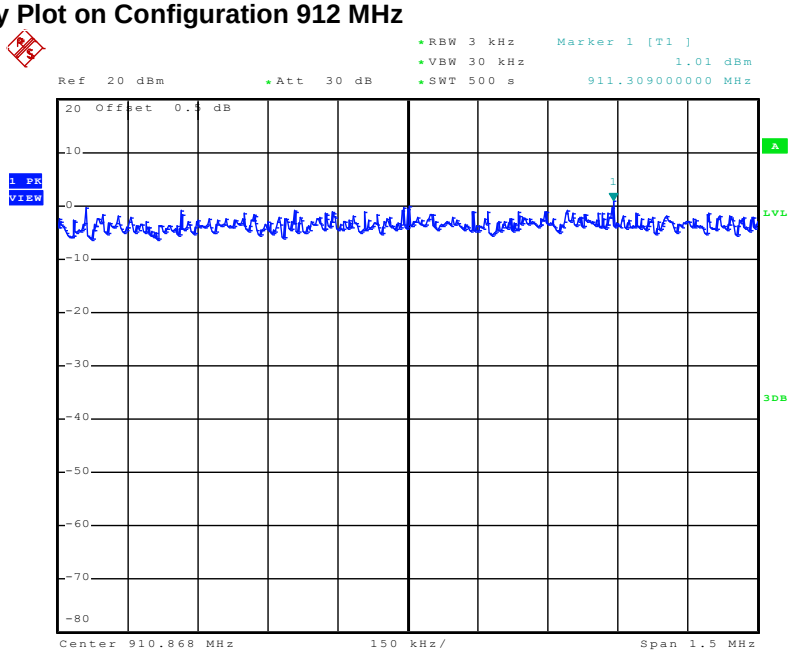
10M (5.5 Mbps)

Power Density Plot on Configuration 907 MHz



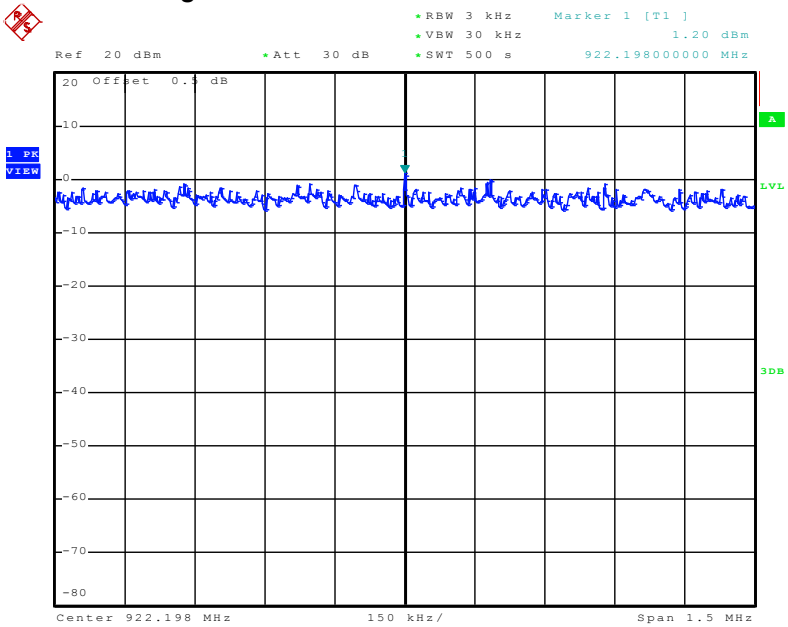
Date: 31.DEC.2010 13:46:16

Power Density Plot on Configuration 912 MHz



Date: 31.DEC.2010 13:51:12

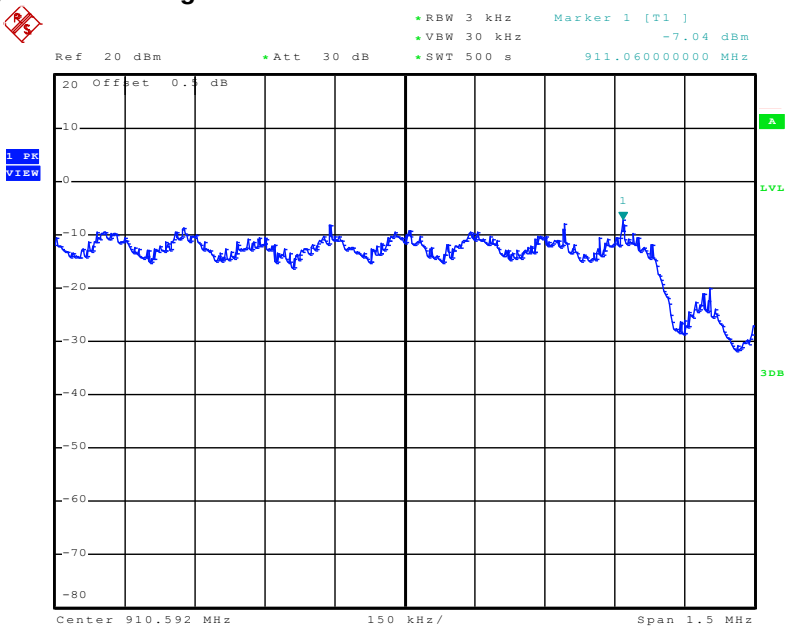
Power Density Plot on Configuration 922 MHz



Date: 31.DEC.2010 14:01:16

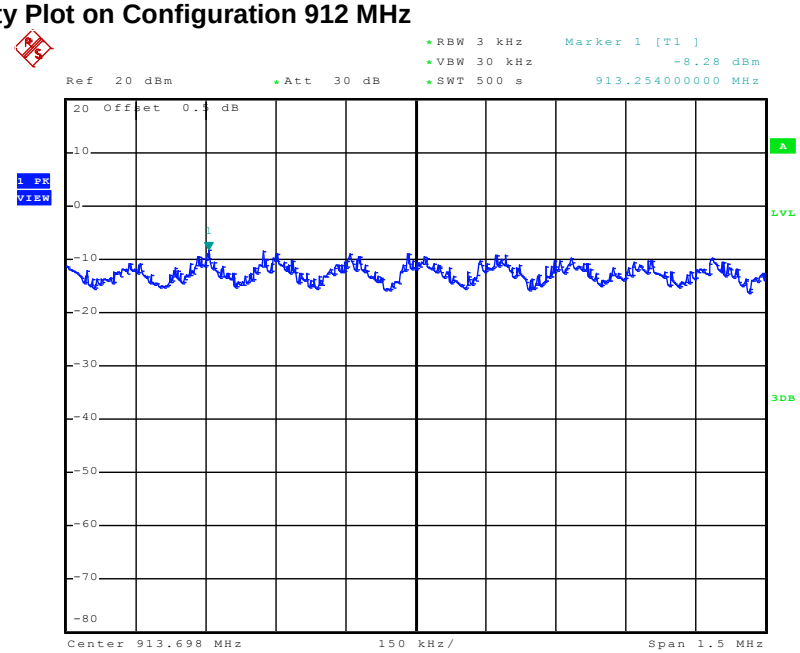
10M (3 Mbps)

Power Density Plot on Configuration 907 MHz



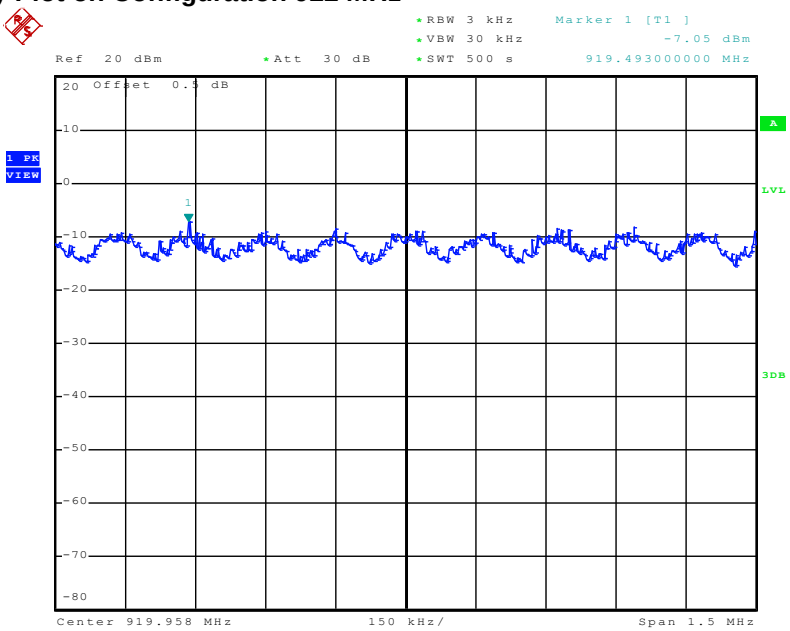
Date: 31.DEC.2010 13:33:37

Power Density Plot on Configuration 912 MHz



Date: 31.DEC.2010 13:35:37

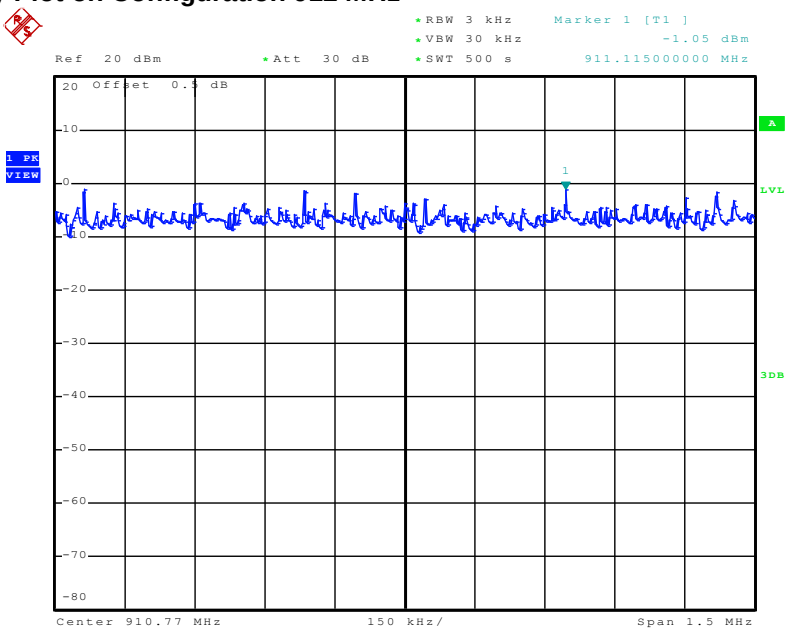
Power Density Plot on Configuration 922 MHz



Date: 31.DEC.2010 13:39:45

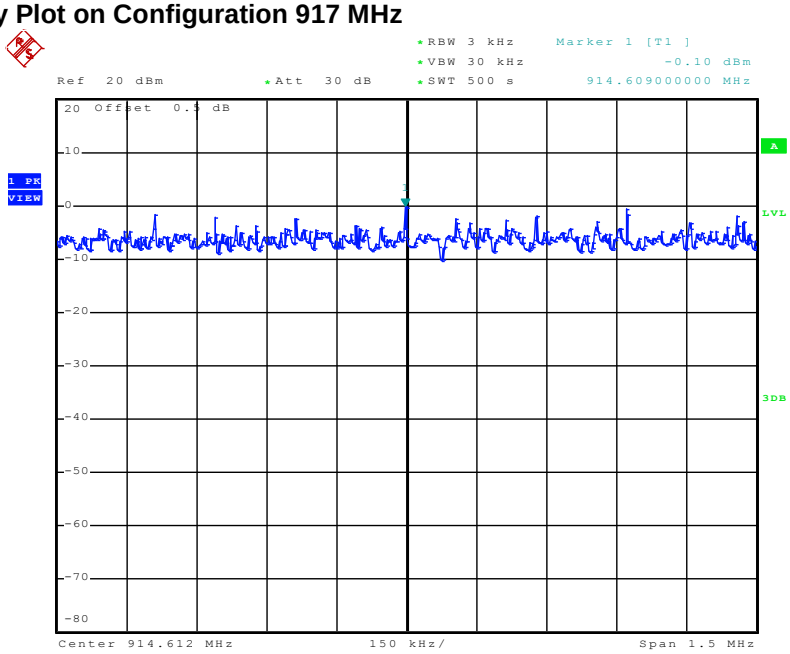
20M (11 Mbps)

Power Density Plot on Configuration 912 MHz



Date: 31.DEC.2010 12:59:51

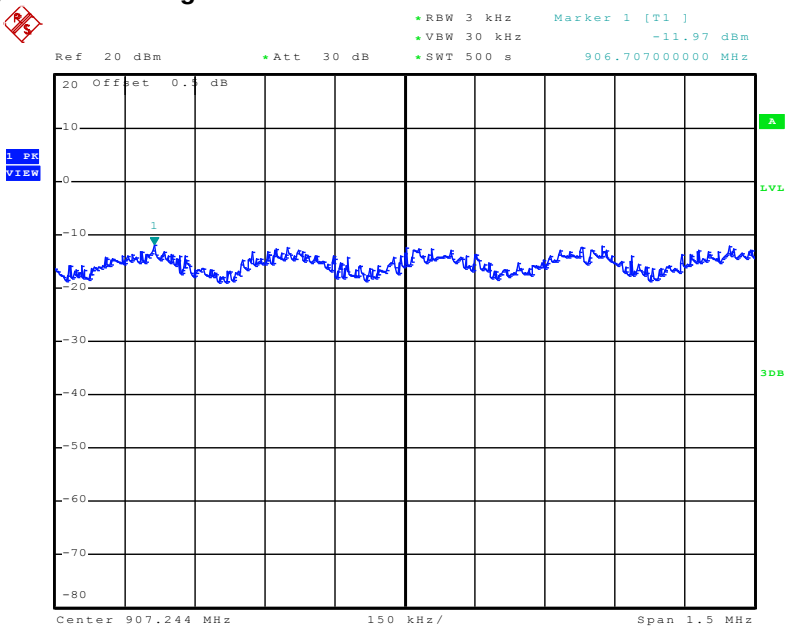
Power Density Plot on Configuration 917 MHz



Date: 31.DEC.2010 13:10:48

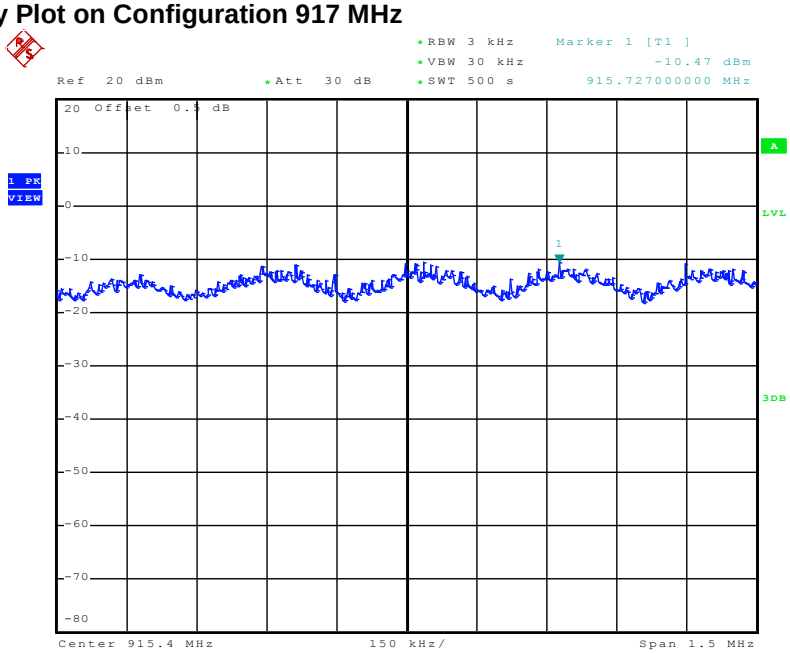
20M (6 Mbps)

Power Density Plot on Configuration 912 MHz



Date: 31.DEC.2010 13:20:24

Power Density Plot on Configuration 917 MHz



Date: 31.DEC.2010 13:28:02

3.4. 6dB Spectrum Bandwidth Measurement

3.4.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

3.4.2. Measuring Instruments and Setting

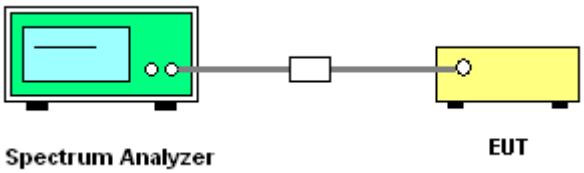
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RB	100 kHz
VB	100 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 100 kHz and the video bandwidth of 100 kHz were used.
3. Measured the spectrum width with power higher than 6dB below carrier.

3.4.4. Test Setup Layout



3.4.5. Test Deviation

There is no deviation with the original standard.

3.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.4.7. Test Result of 6dB Spectrum Bandwidth

Final Test Date	Dec. 31, 2011	**Test Site No.**	TH01-HY
Temperature	21℃	**Humidity**	60%
Test Engineer	Cain	**Configuration**	5M / 10M / 20M

5M (2.75 Mbps)

Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
907 MHz	3.13	3.89	500	Complies
912 MHz	3.13	3.90	500	Complies
922 MHz	3.11	3.88	500	Complies

5M (1.5 Mbps)

Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
907 MHz	4.16	4.16	500	**Complies**
912 MHz	4.17	4.17	500	**Complies**
922 MHz	4.17	4.16	500	**Complies**

10M (5.5 Mbps)

Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
907 MHz	5.98	7.70	500	Complies
912 MHz	5.98	7.76	500	Complies
922 MHz	5.84	7.70	500	Complies

10M (3 Mbps)

Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
907 MHz	8.26	8.22	500	Complies
912 MHz	8.26	8.24	500	Complies
922 MHz	8.24	8.22	500	Complies

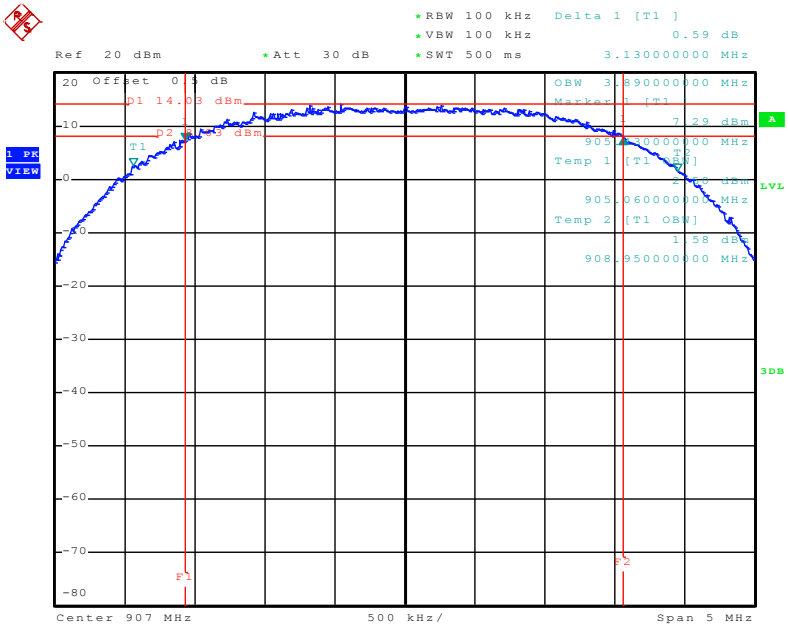
20M (11 Mbps)

Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
912 MHz	11.36	15.12	500	Complies
917 MHz	11.36	15.08	500	Complies

20M (6 Mbps)

Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
912 MHz	16.40	16.48	500	Complies
917 MHz	16.16	16.44	500	Complies

5M (2.75 Mbps)
6 dB Bandwidth Plot on 907 MHz



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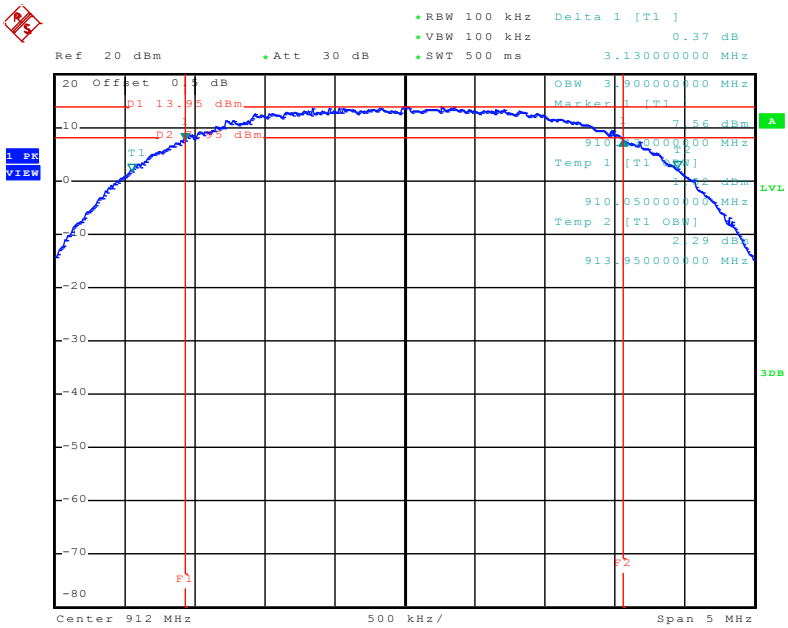
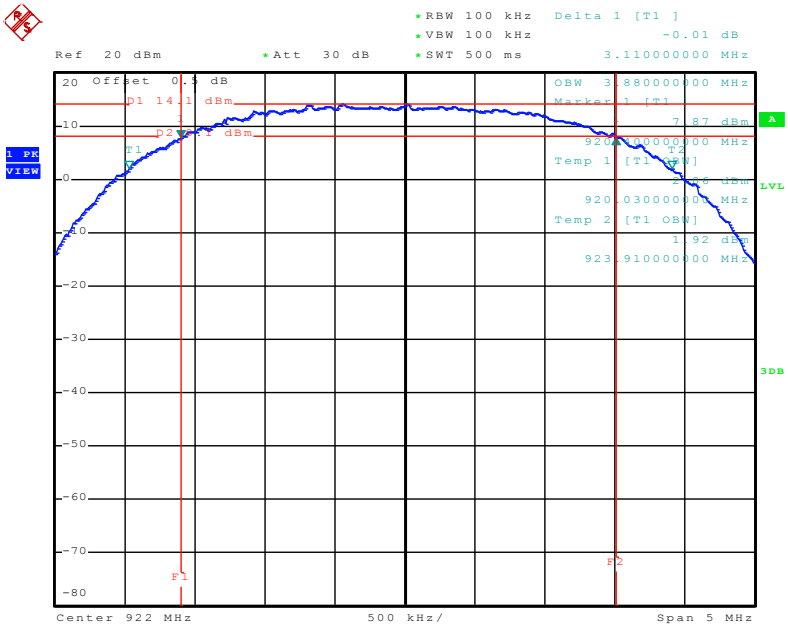
6 dB Bandwidth Plot on 912 MHz



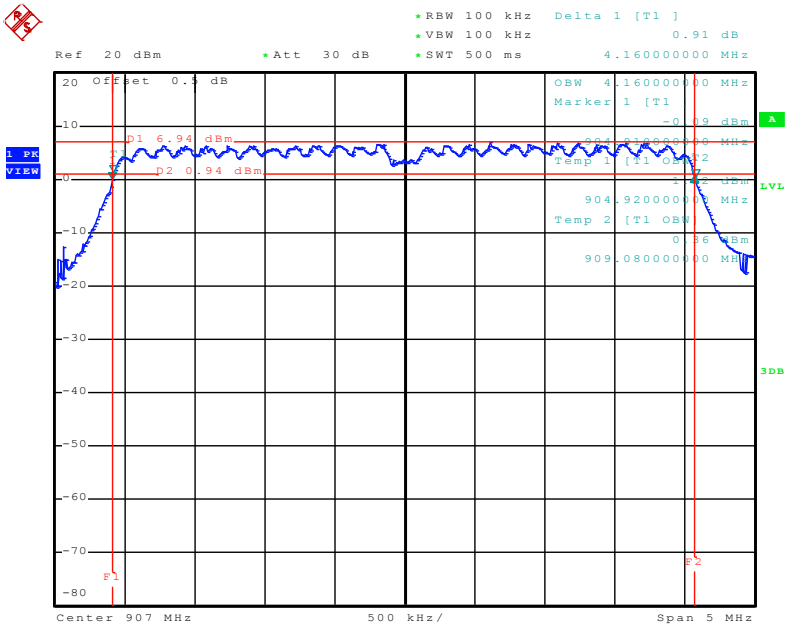
Date: 31.DEC.2010 14:17:45

6 dB Bandwidth Plot on 922 MHz



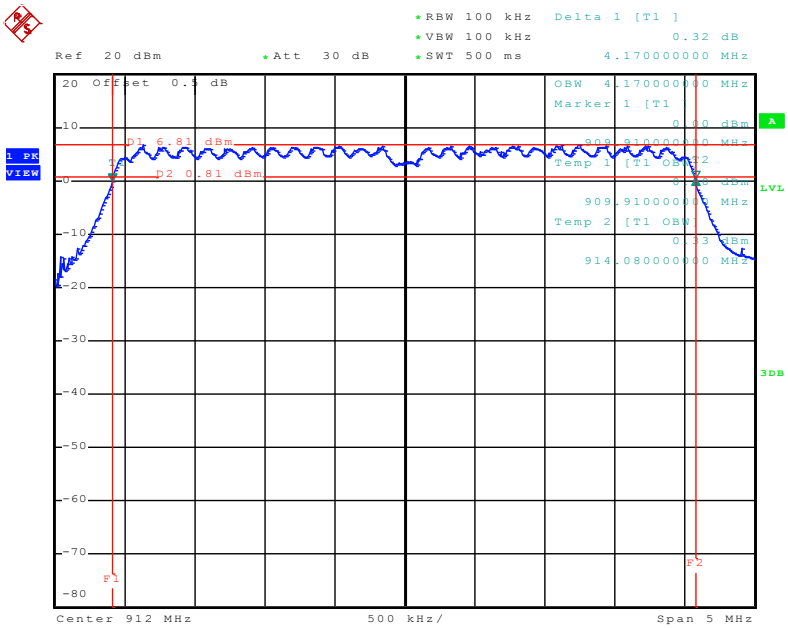
Date: 31.DEC.2010 14:56:40

5M (1.5 Mbps)
6 dB Bandwidth Plot on 907 MHz



Date: 31.DEC.2010 15:02:33

6 dB Bandwidth Plot on 912 MHz



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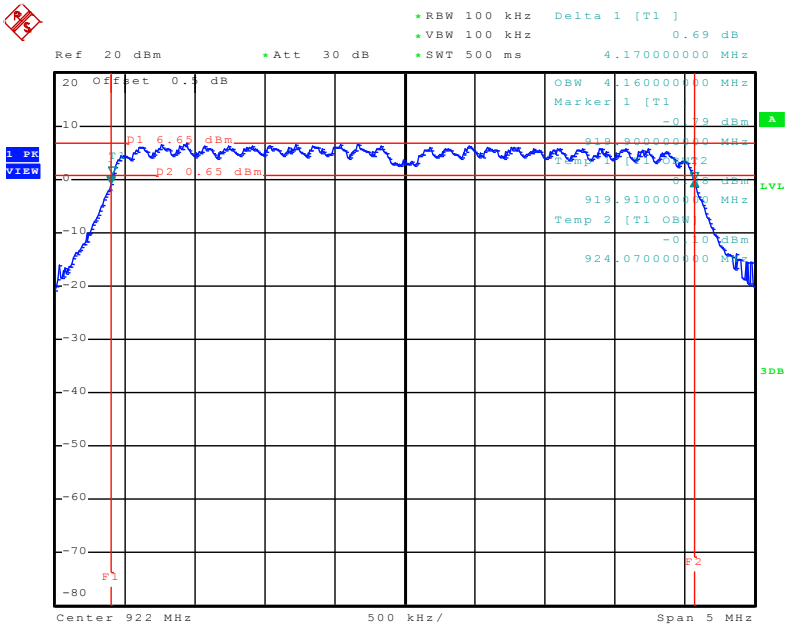
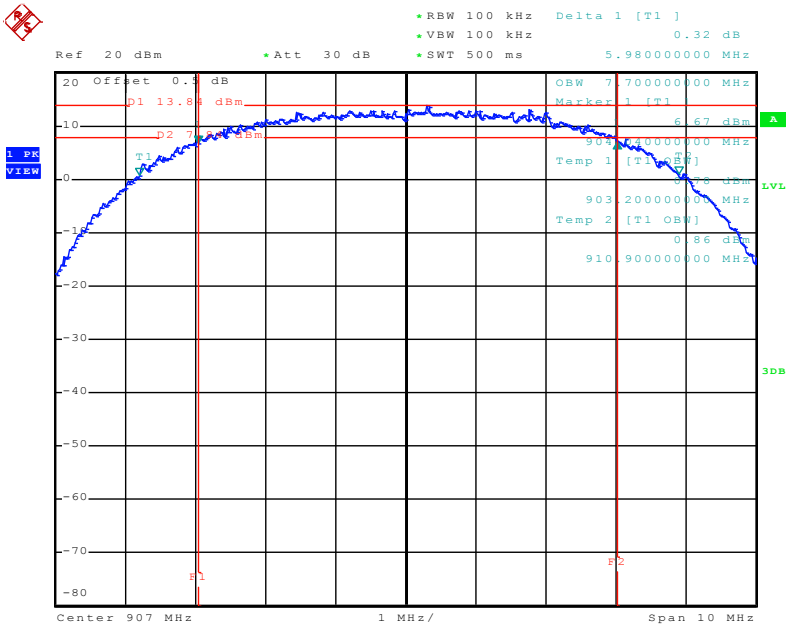
6 dB Bandwidth Plot on 922 MHz



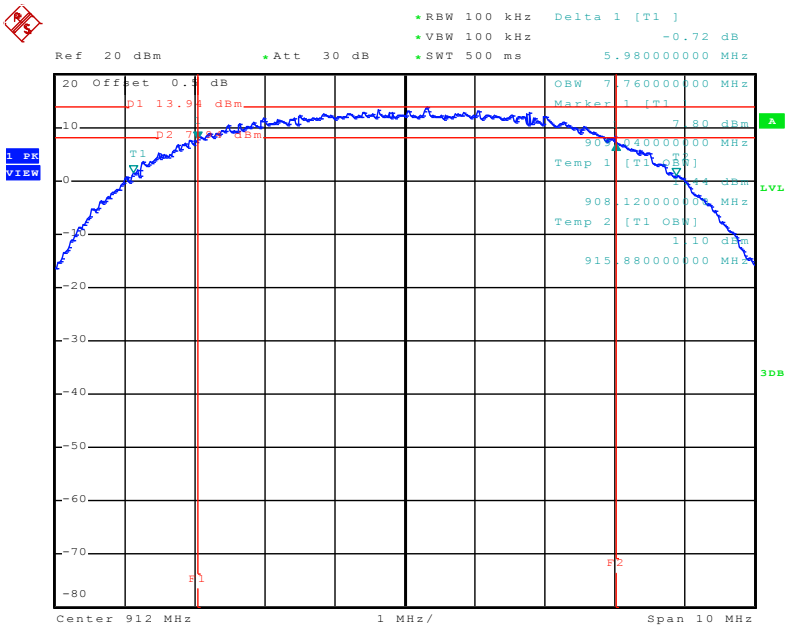
Date: 31.DEC.2010 15:10:02

10M (5.5 Mbps)
6 dB Bandwidth Plot on 907 MHz



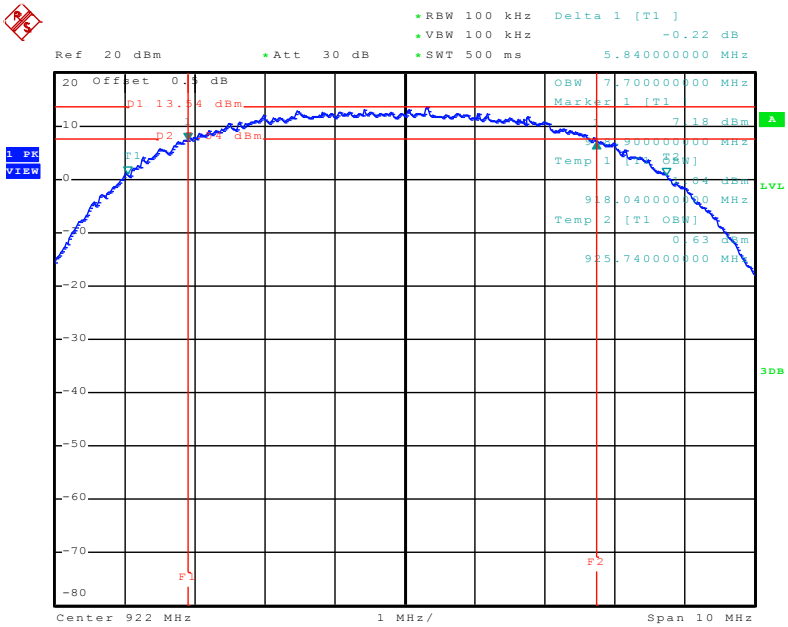
Date: 31.DEC.2010 13:44:36

6 dB Bandwidth Plot on 912 MHz



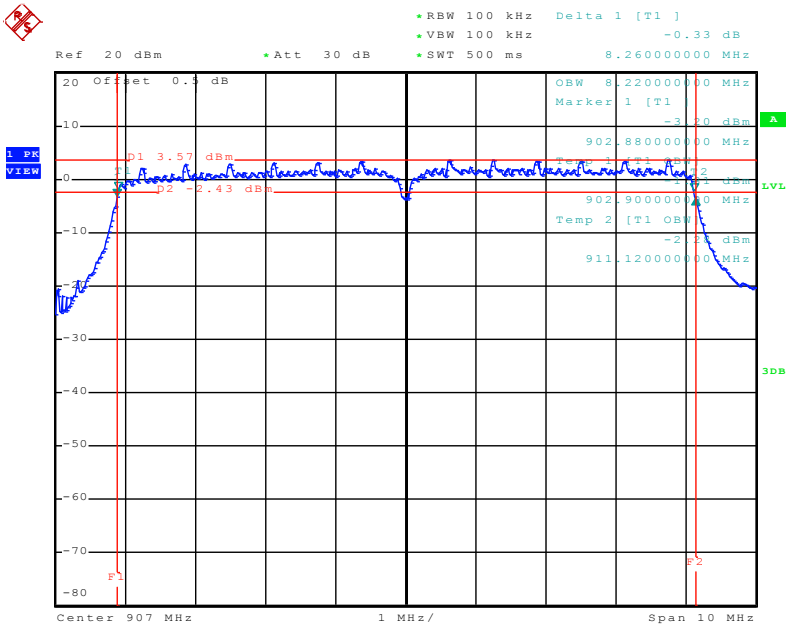
Date: 31.DEC.2010 13:50:13

6 dB Bandwidth Plot on 922 MHz



Date: 31.DEC.2010 14:03:46

10M (3 Mbps)
6 dB Bandwidth Plot on 907 MHz



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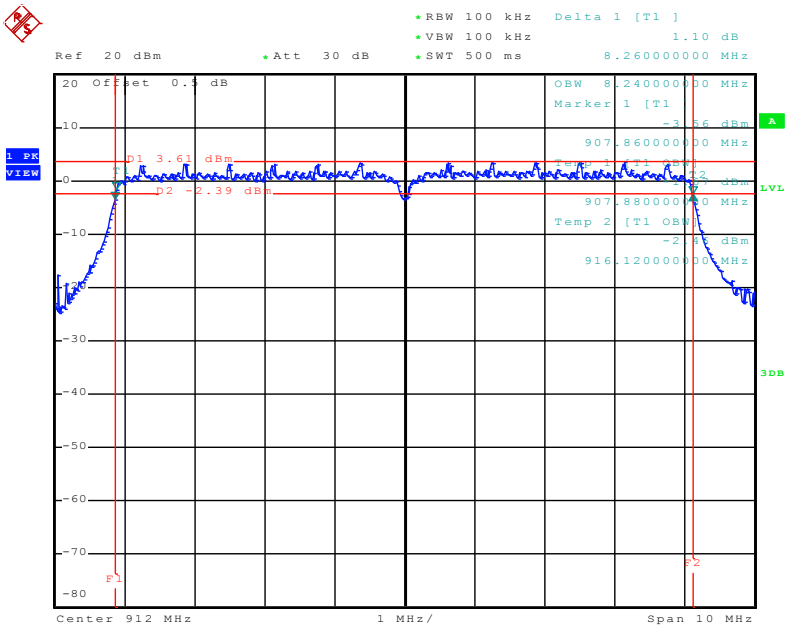
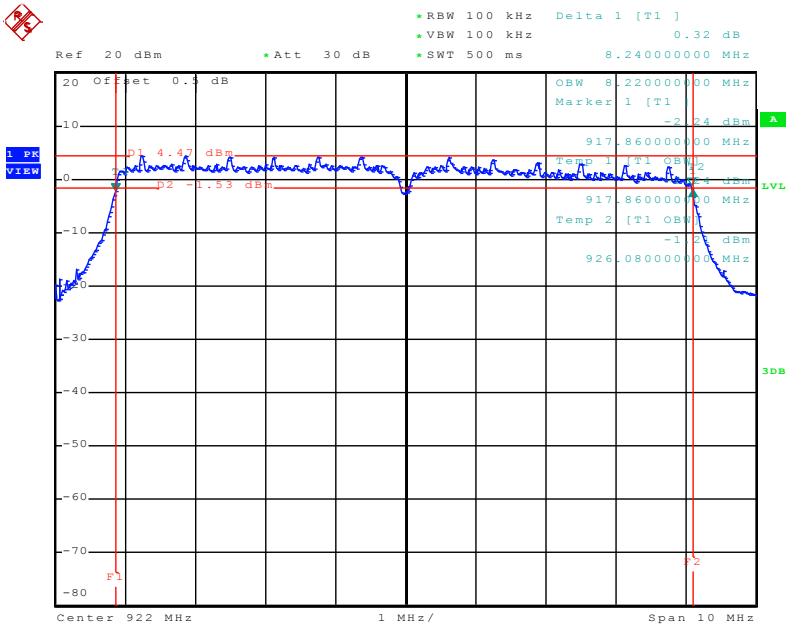
6 dB Bandwidth Plot on 912 MHz



Date: 31.DEC.2010 13:34:51

6 dB Bandwidth Plot on 922 MHz



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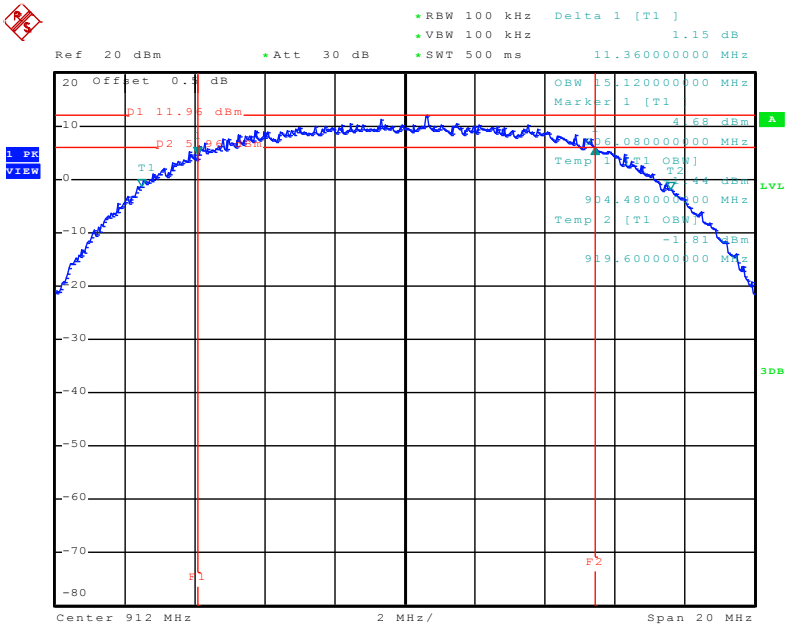
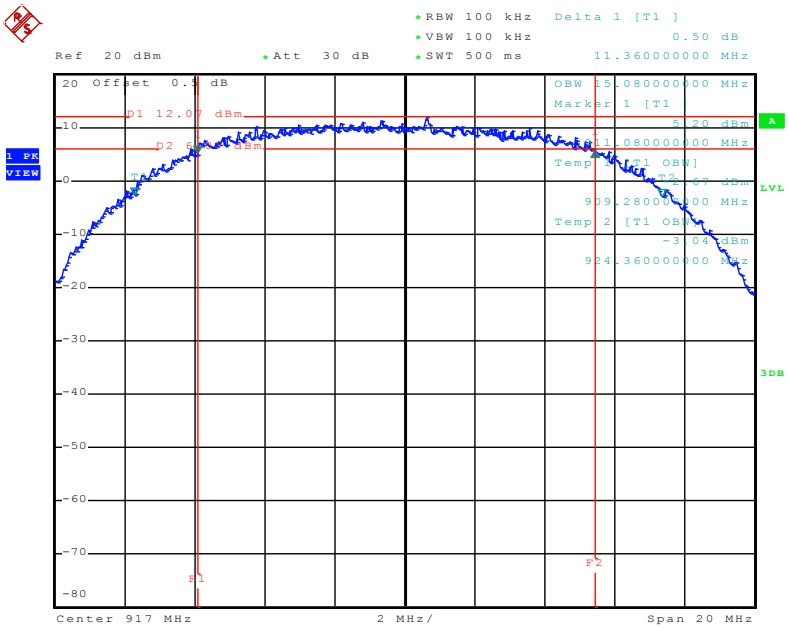
20M (11 Mbps)
6 dB Bandwidth Plot on 912 MHz



Date: 31.DEC.2010 13:06:46

6 dB Bandwidth Plot on 917 MHz



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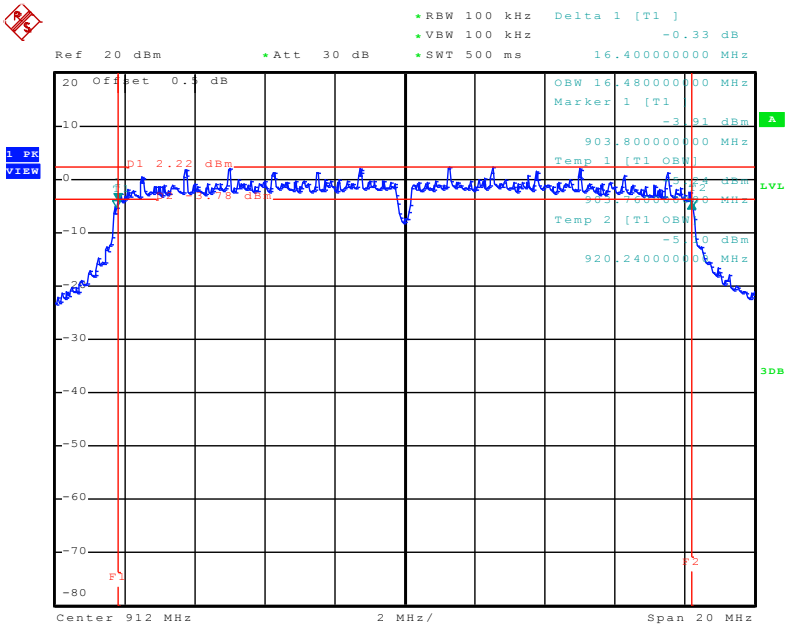
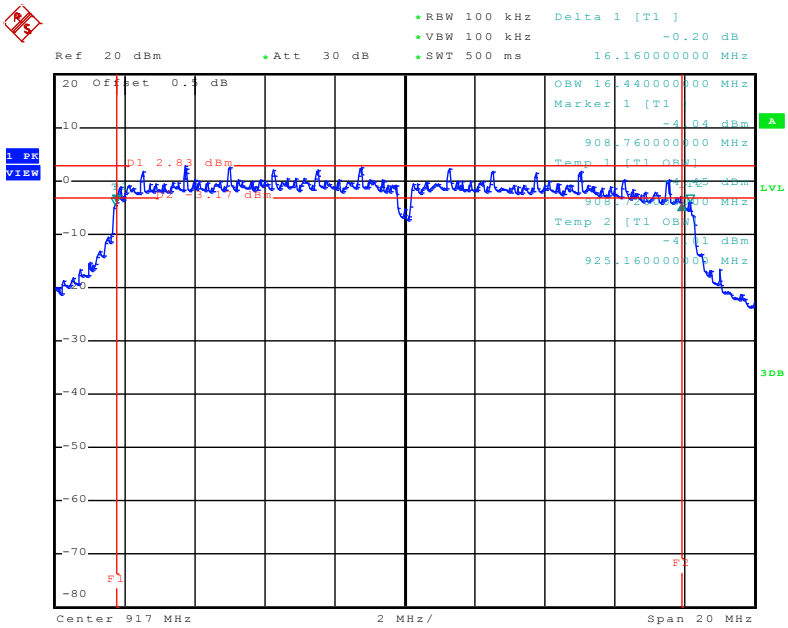
20M (6 Mbps)
6 dB Bandwidth Plot on 912 MHz



Date: 31.DEC.2010 13:21:39

6 dB Bandwidth Plot on 917 MHz



Date: 31.DEC.2010 13:26:42

3.5. Radiated Emissions Measurement

3.5.1. Limit

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a)..

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.5.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	1MHz / 1MHz for Peak

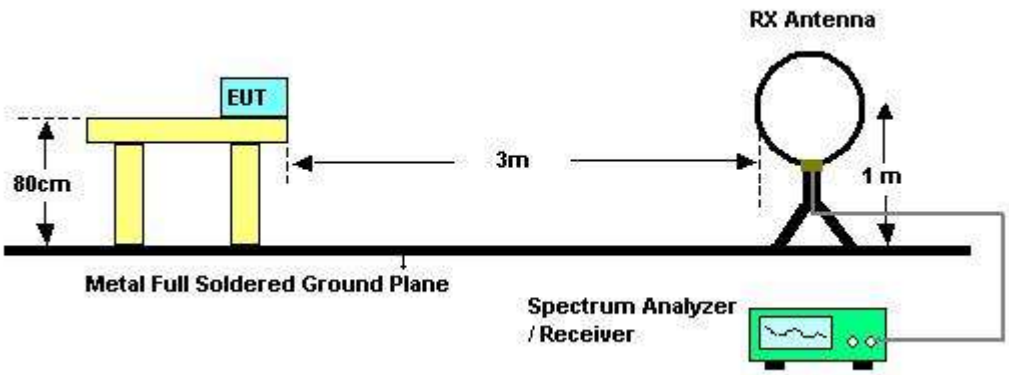
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.5.3. Test Procedures

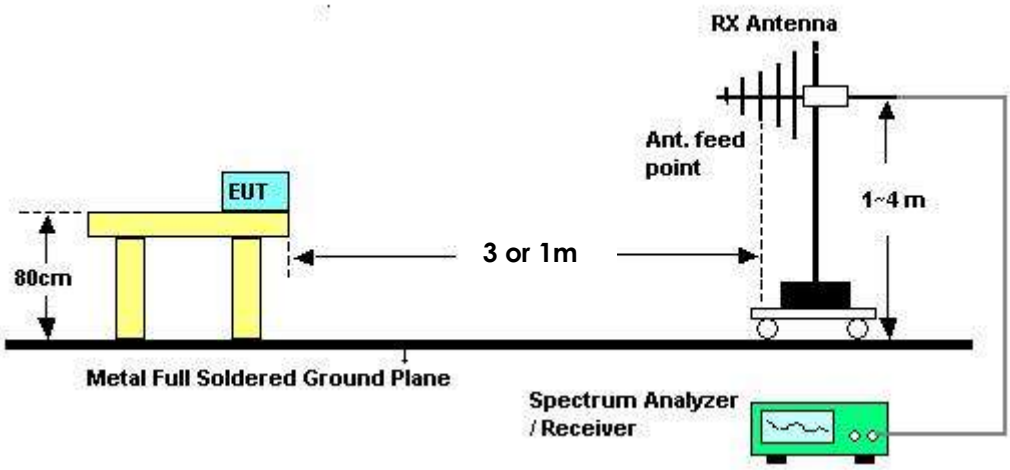
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average 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 for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions 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.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.5.4. Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



Above 10 GHz shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade form 3m to 1m.
Distance extrapolation factor = 20 log (specific distance [3m] / test distance [1m]) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor [9.54 dB].

3.5.5. Test Deviation

There is no deviation with the original standard.

3.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.5.7. Results of Radiated Emissions (9kHz~30MHz)

Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel		

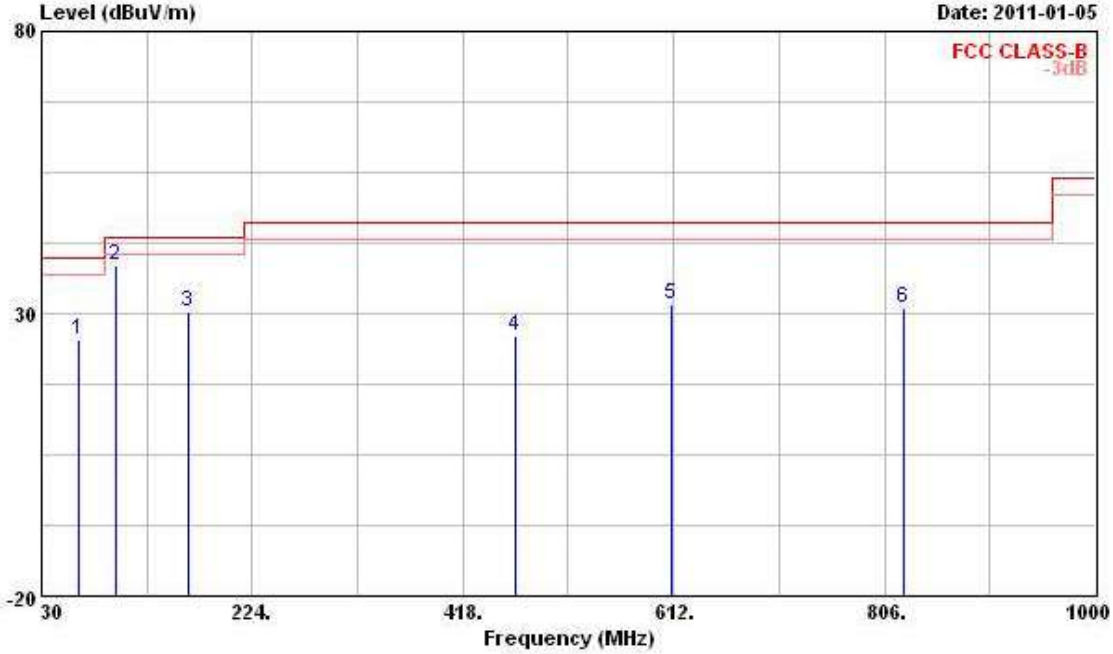
Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:
The amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
Limit line = specific limits (dBuV) + distance extrapolation factor.

3.5.8. Results of Radiated Emissions (30MHz~1GHz)

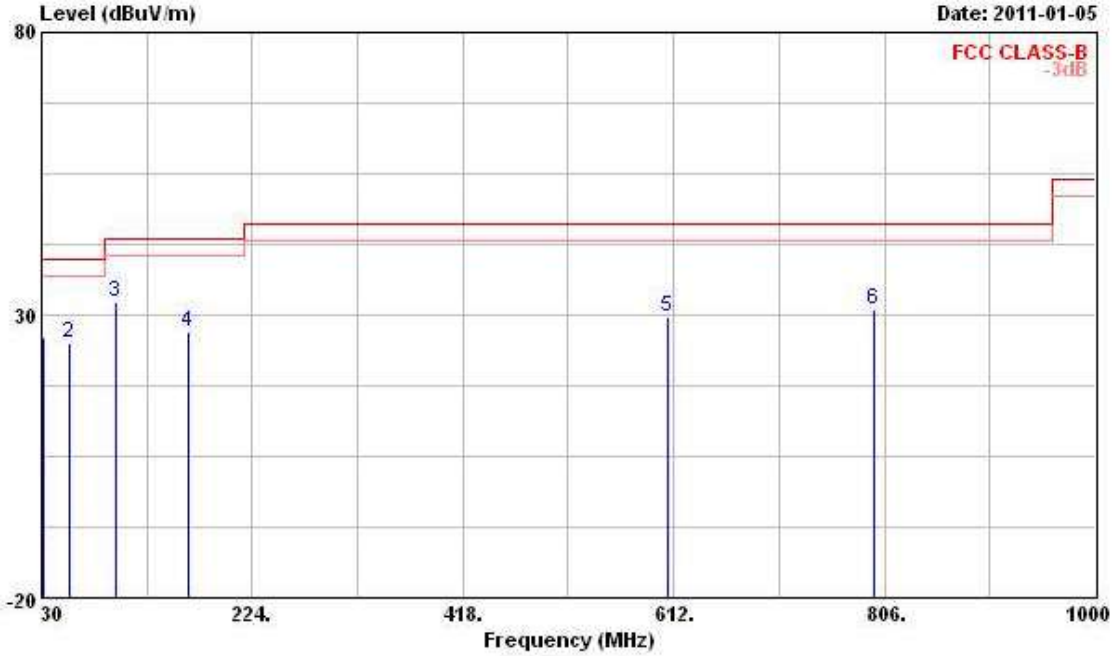
Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M OFDM-912MHz

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	63.950	25.42	-14.58	40.00	44.92	6.98	1.28	27.76	Peak
2 @	98.870	38.66	-4.84	43.50	53.65	11.01	1.60	27.60	Peak
3	164.830	30.24	-13.26	43.50	45.13	10.34	2.11	27.34	Peak
4	466.500	25.99	-20.01	46.00	33.80	16.61	3.59	28.01	Peak
5	610.060	31.79	-14.21	46.00	35.83	20.05	4.06	28.15	Peak
6	824.430	31.06	-14.94	46.00	33.65	20.21	4.82	27.62	Peak

Vertical

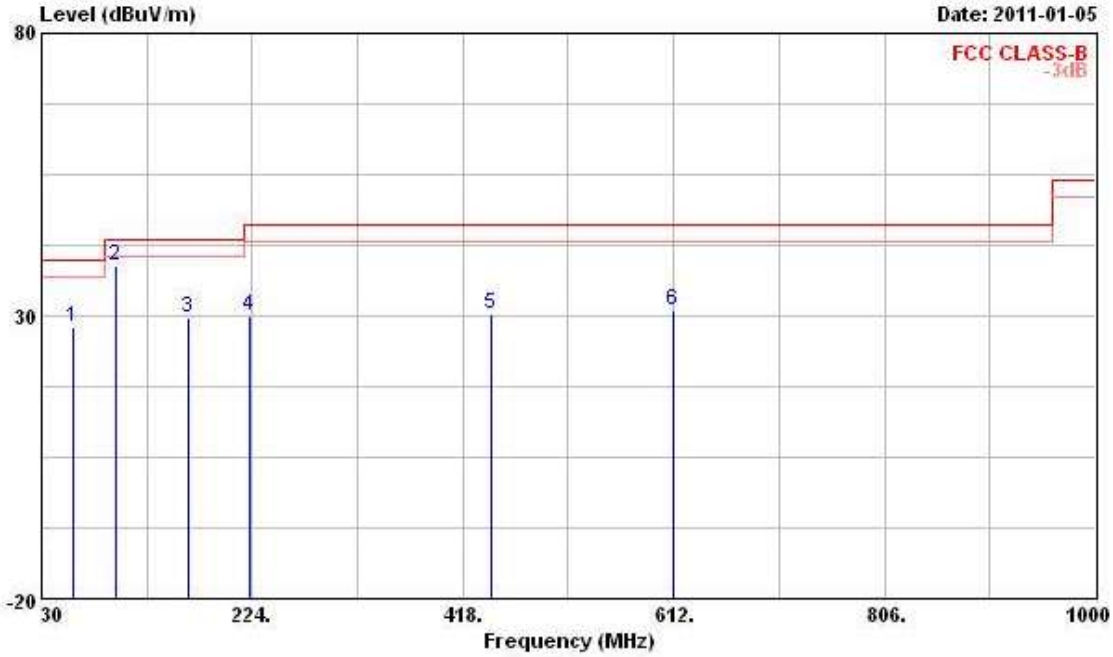


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	31.940	26.10	-13.90	40.00	37.70	15.48	0.78	27.86	Peak
2	56.190	25.20	-14.80	40.00	43.71	8.05	1.19	27.75	Peak
3 @	98.870	32.44	-11.06	43.50	47.43	11.01	1.60	27.60	Peak
4	164.830	27.16	-16.34	43.50	42.05	10.34	2.11	27.34	Peak
5	606.180	29.53	-16.47	46.00	33.55	20.10	4.04	28.16	Peak
6	797.270	30.91	-15.09	46.00	33.65	20.23	4.76	27.73	Peak

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

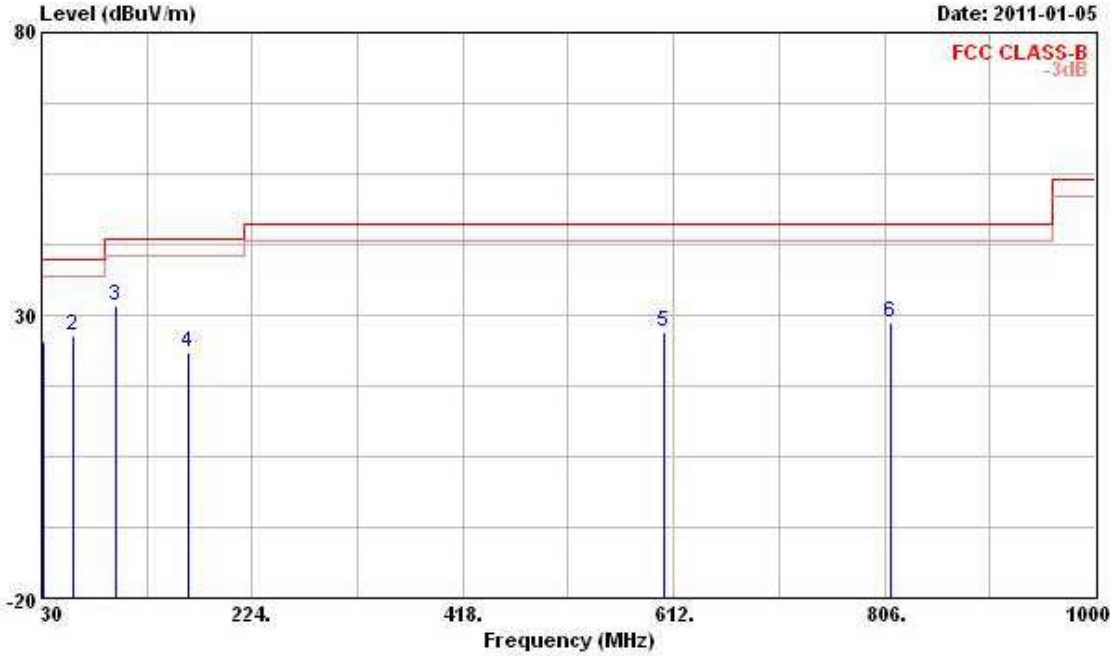
Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M OFDM-912MHz

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	59.100	27.95	-12.05	40.00	47.09	7.38	1.24	27.76	Peak
2 @	98.870	38.74	-4.76	43.50	53.73	11.01	1.60	27.60	Peak
3	164.830	29.72	-13.78	43.50	44.61	10.34	2.11	27.34	Peak
4	222.060	30.11	-15.89	46.00	42.50	12.08	2.48	26.95	Peak
5	444.190	30.17	-15.83	46.00	38.43	16.16	3.47	27.89	Peak
6	611.030	31.03	-14.97	46.00	35.07	20.04	4.07	28.15	Peak

Vertical

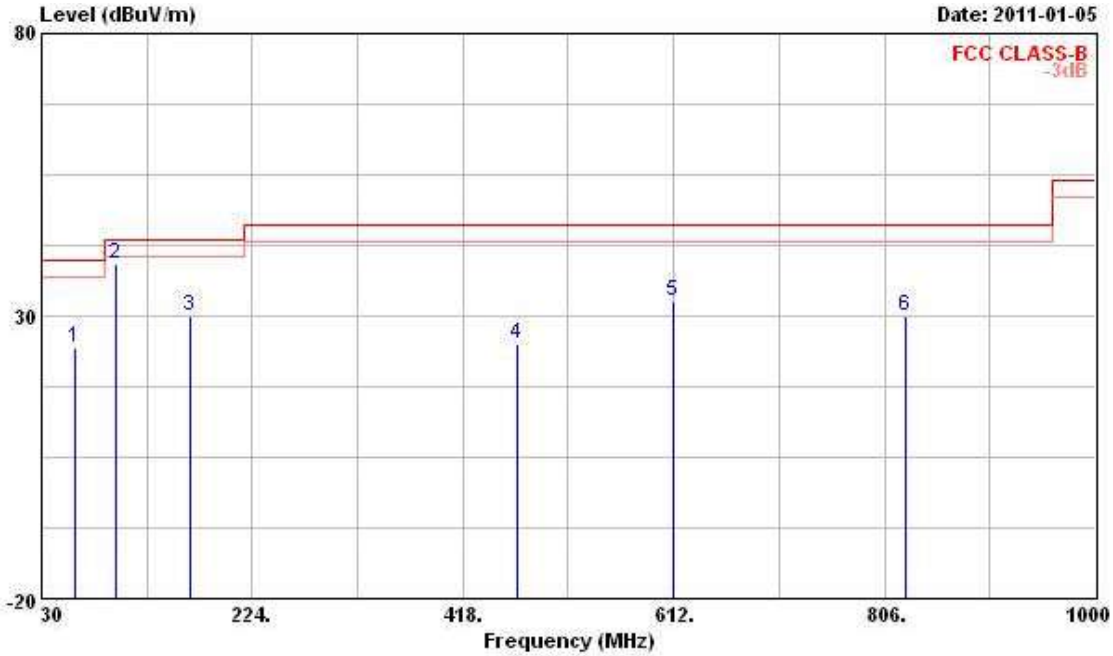


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	31.940	25.50	-14.50	40.00	37.10	15.48	0.78	27.86	Peak
2	59.100	26.52	-13.48	40.00	45.66	7.38	1.24	27.76	Peak
3	98.870	31.78	-11.72	43.50	46.77	11.01	1.60	27.60	Peak
4	164.830	23.38	-20.12	43.50	38.27	10.34	2.11	27.34	Peak
5	603.270	27.03	-18.97	46.00	31.02	20.14	4.03	28.16	Peak
6	811.820	28.59	-17.41	46.00	31.24	20.24	4.79	27.68	Peak

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

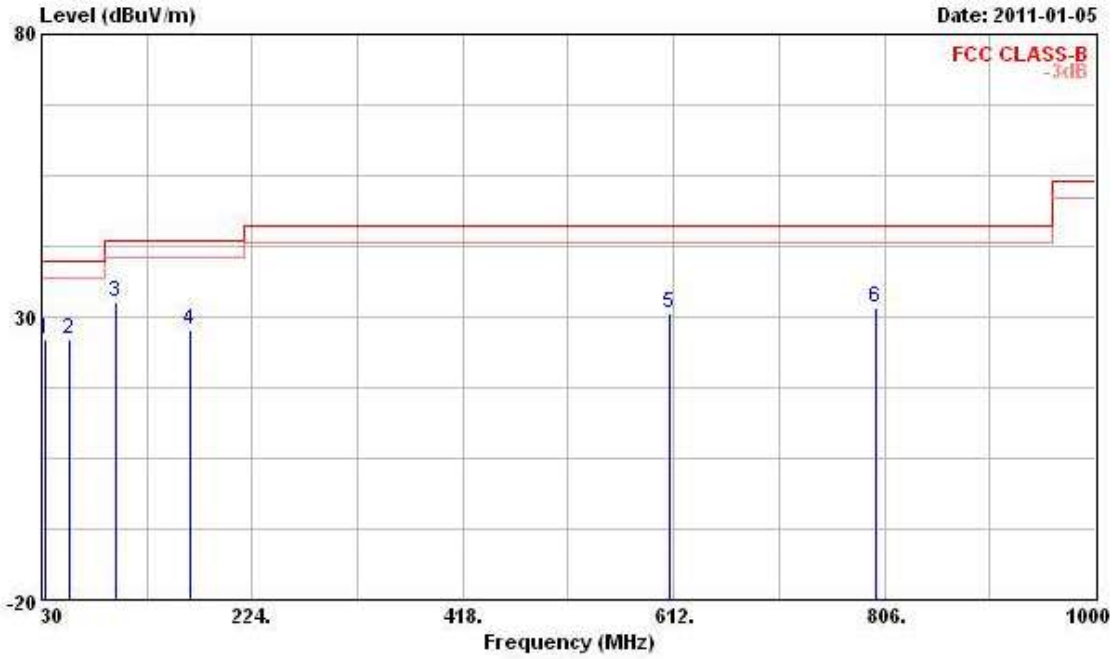
Final Test Date	Jan. 05, 2011	Test Site No.	03CH02-HY
Temperature	20℃	Humidity	54%
Test Engineer	Daniel	Configurations	20M OFDM-912MHz

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	60.980	24.56	-15.44	40.00	43.94	7.12	1.26	27.76	Peak
2 @	99.120	39.22	-4.28	43.50	54.21	11.01	1.60	27.60	Peak
3	166.320	29.94	-13.56	43.50	44.89	10.26	2.12	27.33	Peak
4	467.520	25.05	-20.95	46.00	32.84	16.63	3.60	28.02	Peak
5	612.380	32.62	-13.38	46.00	36.68	20.02	4.07	28.15	Peak
6	826.020	29.89	-16.11	46.00	32.48	20.21	4.82	27.62	Peak

Vertical



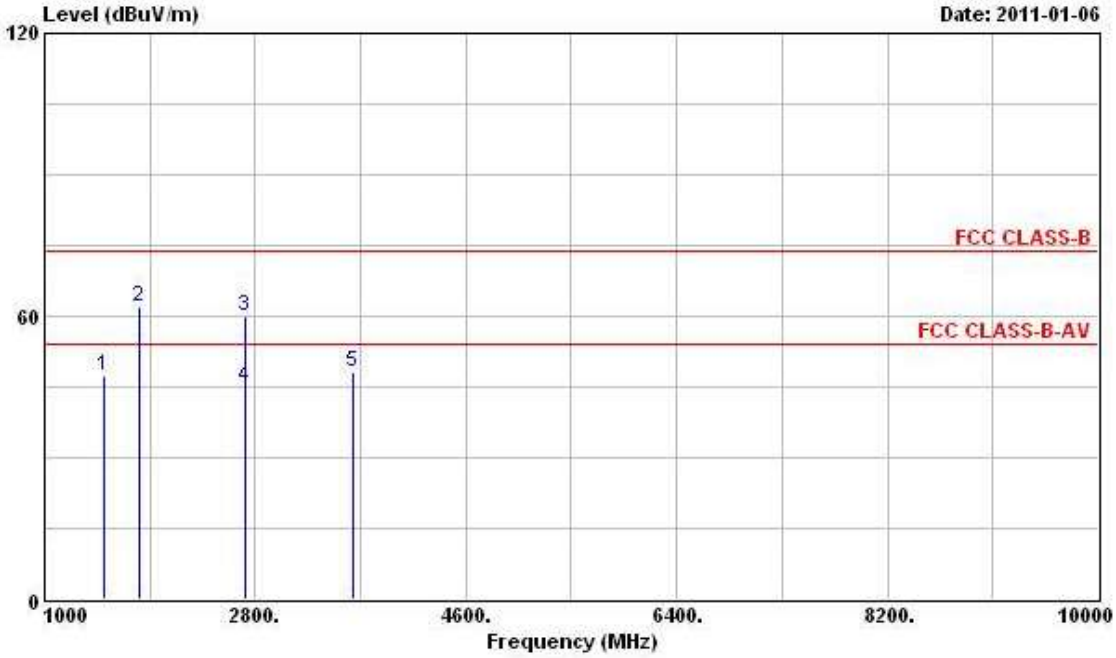
		Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1		32.860	26.17	-13.83	40.00	38.11	15.11	0.81	27.86	Peak
2		55.440	26.18	-13.82	40.00	44.47	8.27	1.19	27.75	Peak
3	@	98.320	32.58	-10.92	43.50	47.75	10.84	1.60	27.61	Peak
4		166.680	27.83	-15.67	43.50	42.78	10.26	2.12	27.33	Peak
5		608.120	30.62	-15.38	46.00	34.65	20.08	4.05	28.16	Peak
6		798.540	31.76	-14.24	46.00	34.48	20.24	4.77	27.73	Peak

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M DSSS-907MHz

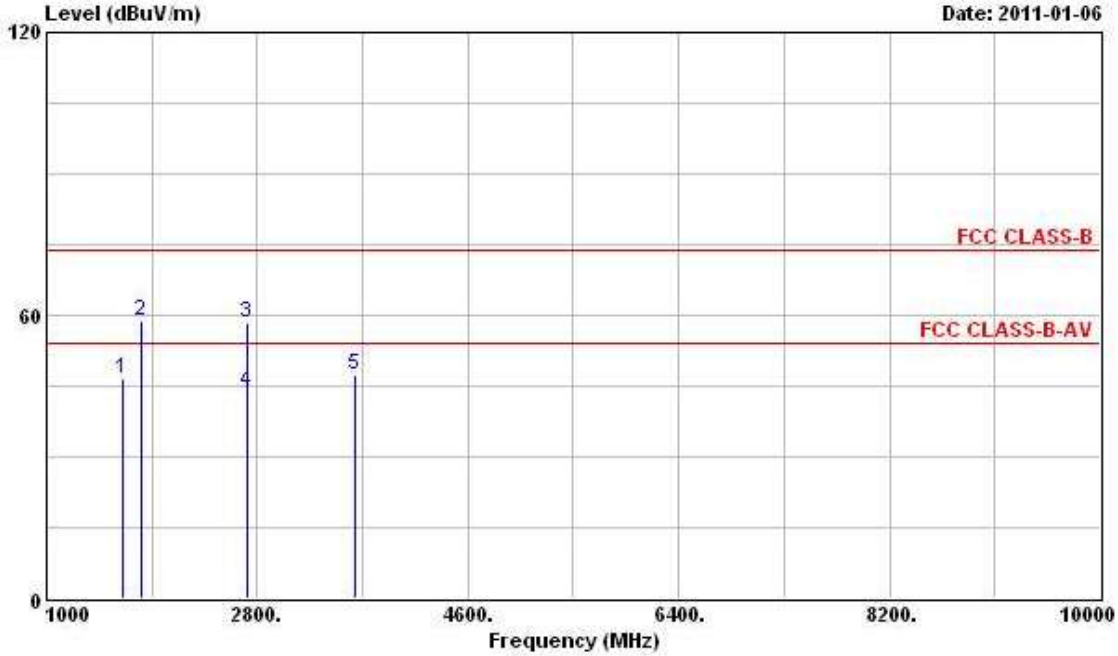
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	47.28	-6.72	54.00	51.71	27.59	2.30	34.32	PK
2	1814.000	62.14			64.23	29.21	2.56	33.86	Peak
3	2721.000	60.00	-14.00	74.00	58.22	32.72	3.24	34.18	Peak
4	2721.000	44.82	-9.18	54.00	43.04	32.72	3.24	34.18	Average
5	3628.000	48.20	-5.80	54.00	45.26	33.68	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

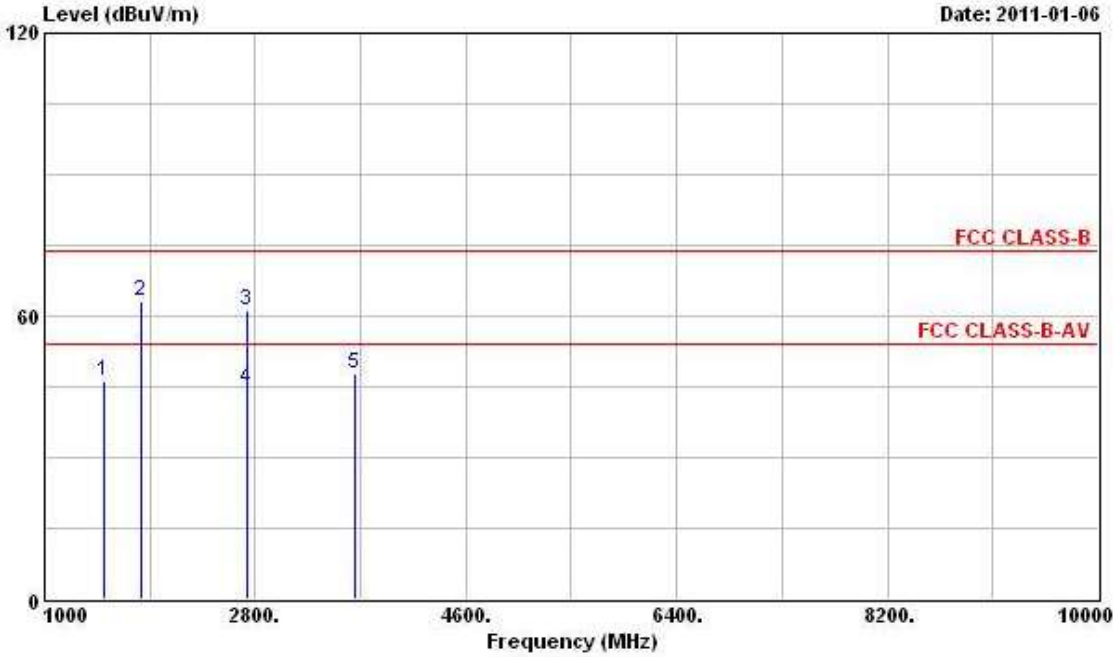


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1657.000	46.53			49.19	29.00	2.43	34.09	Peak
2	1814.000	58.78			60.36	29.72	2.56	33.86	Peak
3	2721.000	58.28	-15.72	74.00	56.47	32.75	3.24	34.18	Peak
4	2721.000	43.65	-10.35	54.00	41.84	32.75	3.24	34.18	Average
5	3628.000	47.28	-6.72	54.00	44.47	33.55	3.92	34.66	PK

Note: The items 1 and 2 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M DSSS-912MHz

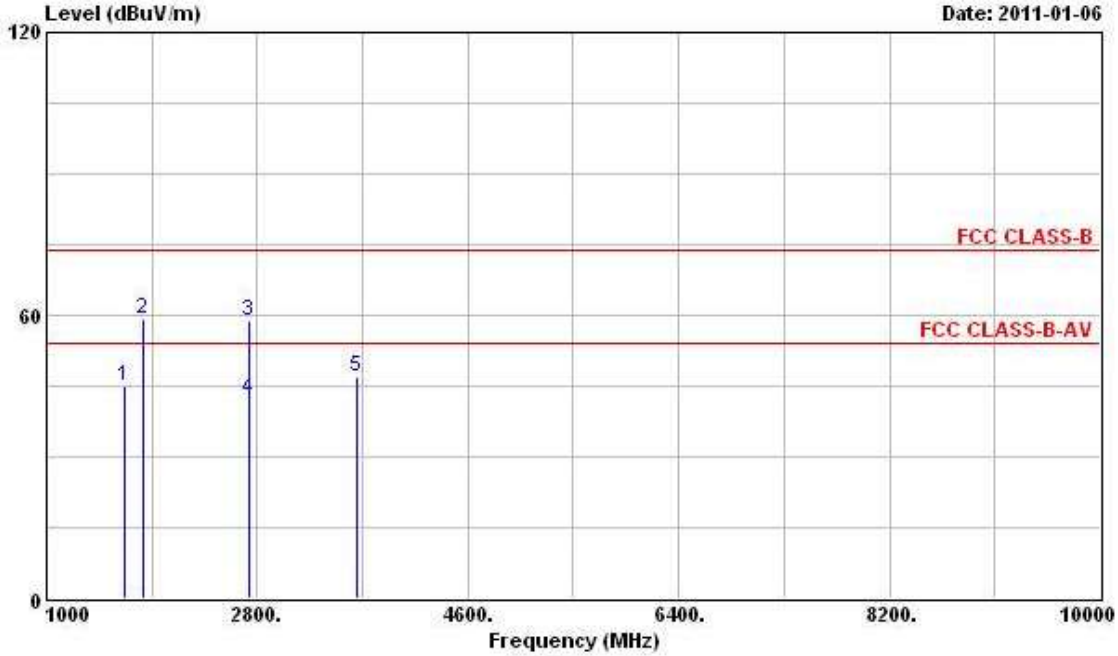
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	46.38	-7.62	54.00	50.81	27.59	2.30	34.32	PK
2	1824.000	63.04			65.13	29.21	2.56	33.86	Peak
3	2736.000	61.01	-12.99	74.00	59.16	32.76	3.26	34.17	Peak
4	2736.000	44.60	-9.40	54.00	42.75	32.76	3.26	34.17	Average
5	3648.000	47.57	-6.43	54.00	44.57	33.71	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

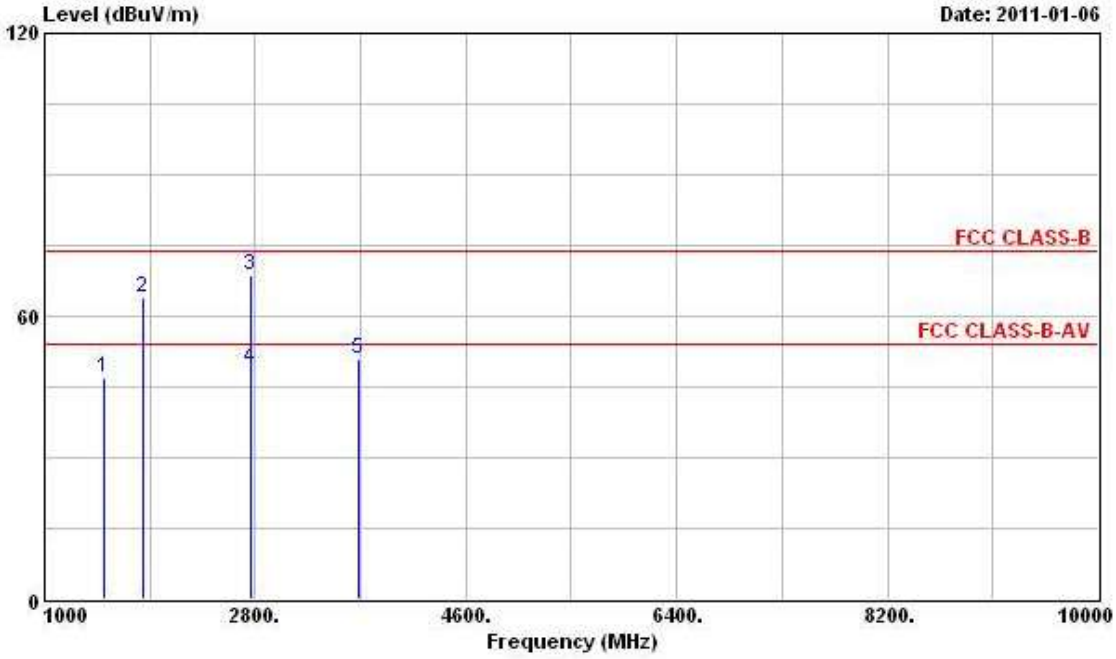


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	44.91	-9.09	54.00	47.57	29.00	2.43	34.09	PK
2	1824.000	59.16			60.74	29.72	2.56	33.86	Peak
3	2736.000	58.76	-15.24	74.00	56.90	32.77	3.26	34.17	Peak
4	2736.000	42.21	-11.79	54.00	40.35	32.77	3.26	34.17	Average
5	3648.000	46.82	-7.18	54.00	43.95	33.58	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M DSSS-922MHz

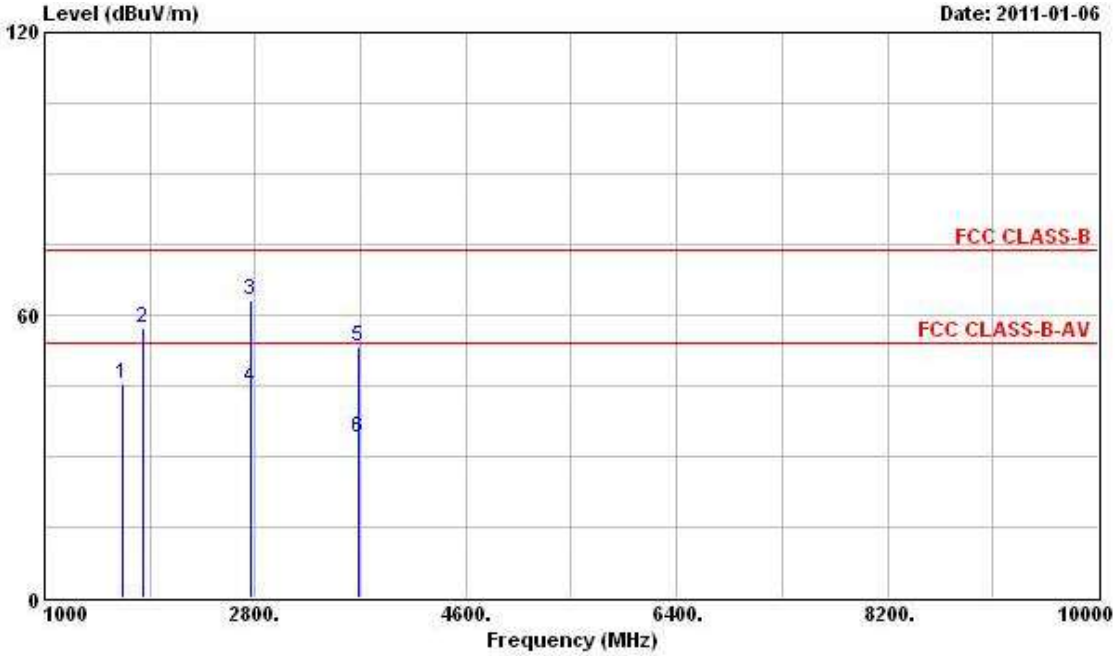
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	47.05	-6.95	54.00	51.48	27.59	2.30	34.32	PK
2	1844.000	64.02	----	-----	65.86	29.39	2.59	33.82	Peak
3	2760.000	68.77	-5.23	74.00	66.82	32.84	3.26	34.15	Peak
4	2760.000	48.79	-5.21	54.00	46.84	32.84	3.26	34.15	Average
5 @	3688.000	50.85	-3.15	54.00	47.74	33.78	3.97	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

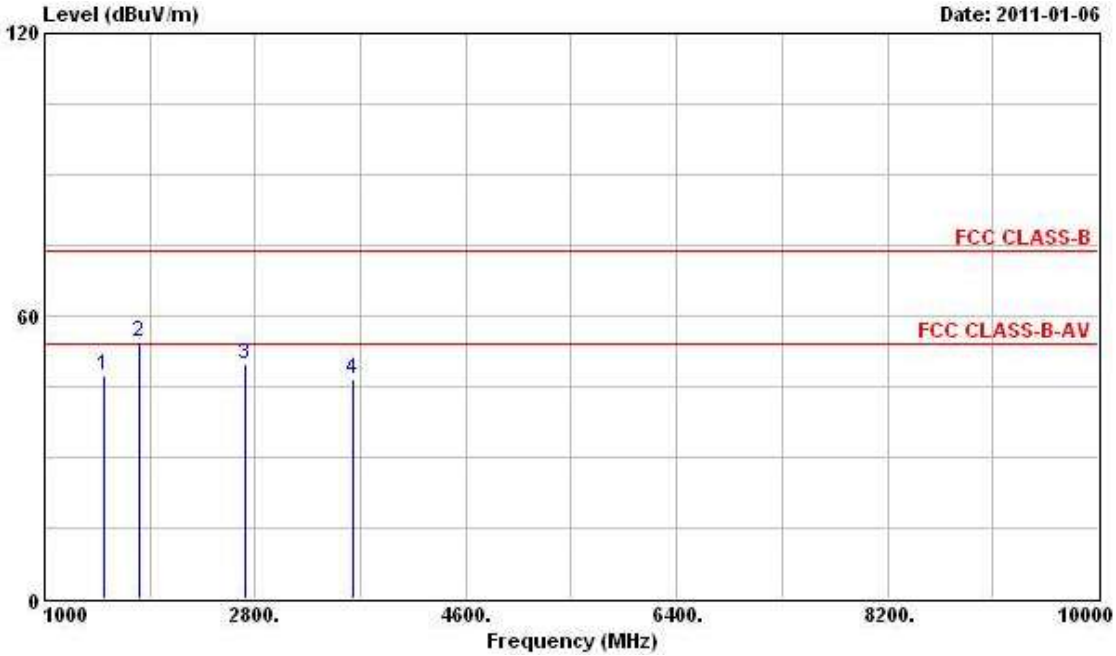


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.30	-8.70	54.00	47.96	29.00	2.43	34.09	PK
2	1844.000	57.08			58.43	29.88	2.59	33.82	Peak
3	2760.000	63.06	-10.94	74.00	61.12	32.83	3.26	34.15	Peak
4	2760.000	44.58	-9.42	54.00	42.64	32.83	3.26	34.15	Average
5	3688.000	53.42	-20.58	74.00	50.45	33.64	3.97	34.64	Peak
6	3688.000	34.03	-19.97	54.00	31.06	33.64	3.97	34.64	Average

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M OFDM-907MHz

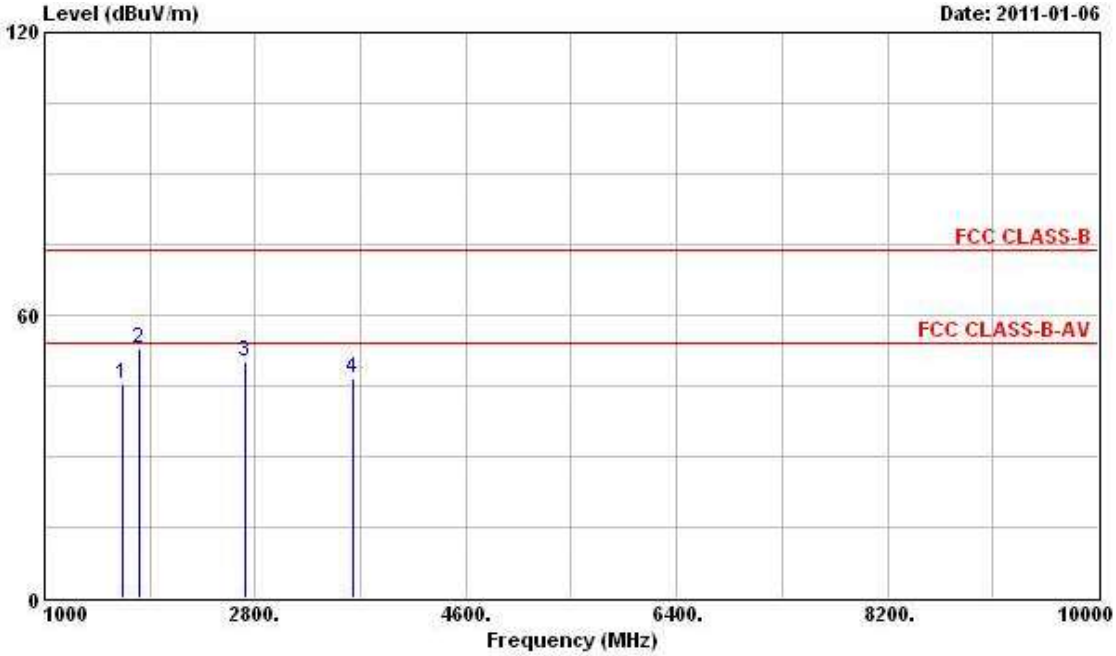
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	47.20	-6.80	54.00	51.63	27.59	2.30	34.32	PK
2	1814.000	54.45			56.54	29.21	2.56	33.86	Peak
3 @	2721.000	49.78	-4.22	54.00	48.00	32.72	3.24	34.18	PK
4	3628.000	46.68	-7.32	54.00	43.74	33.68	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

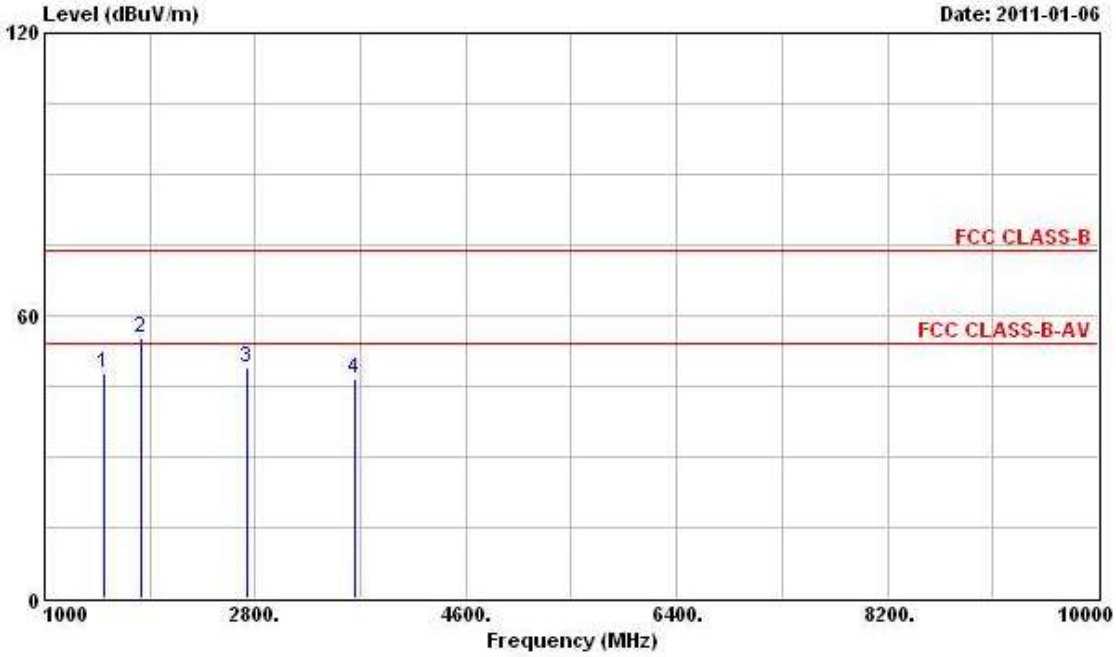


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.28	-8.72	54.00	47.94	29.00	2.43	34.09	PK
2	1814.000	53.03			54.61	29.72	2.56	33.86	Peak
3 @	2721.000	50.17	-3.83	54.00	48.36	32.75	3.24	34.18	PK
4	3628.000	46.76	-7.24	54.00	43.95	33.55	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M OFDM-912MHz

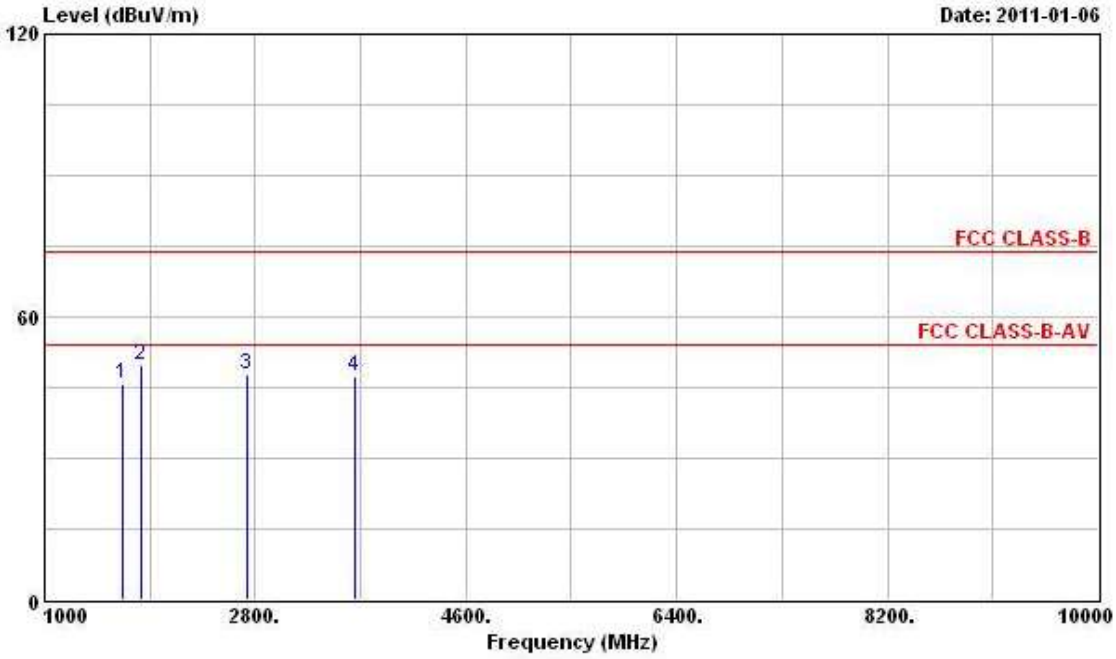
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	47.93	-6.07	54.00	52.36	27.59	2.30	34.32	PK
2	1824.000	55.16			57.25	29.21	2.56	33.86	Peak
3	2736.000	49.09	-4.91	54.00	47.24	32.76	3.26	34.17	PK
4	3648.000	46.51	-7.49	54.00	43.51	33.71	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

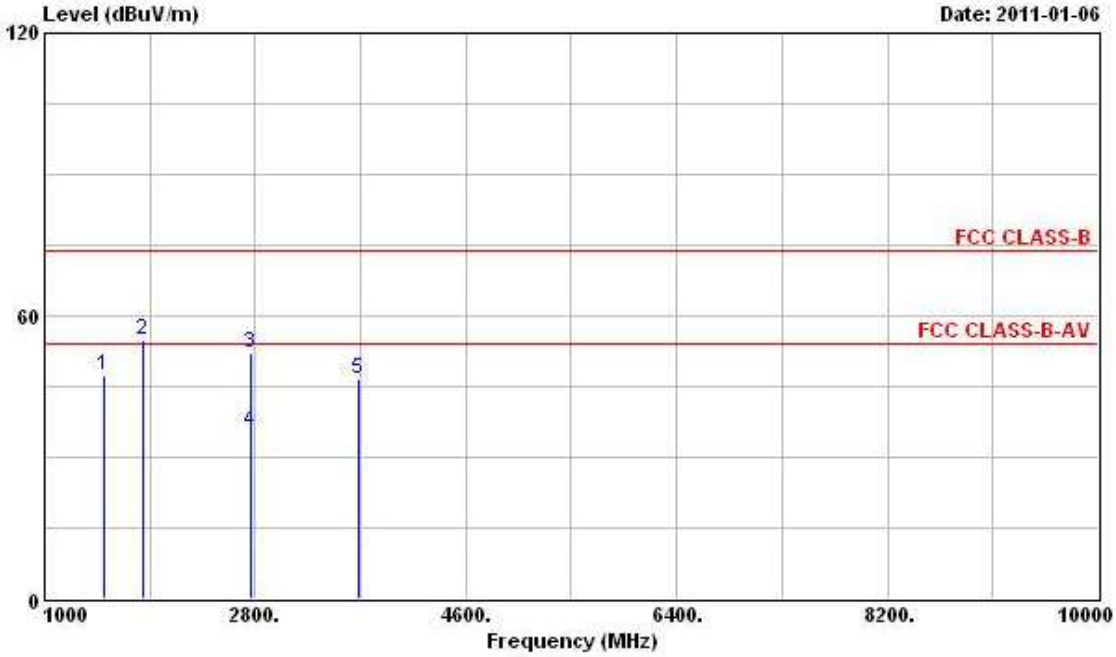


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.95	-8.05	54.00	48.61	29.00	2.43	34.09	PK
2	1822.000	49.71			51.29	29.72	2.56	33.86	Peak
3	2736.000	47.95	-6.05	54.00	46.09	32.77	3.26	34.17	PK
4	3648.000	47.33	-6.67	54.00	44.46	33.58	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M OFDM-922MHz

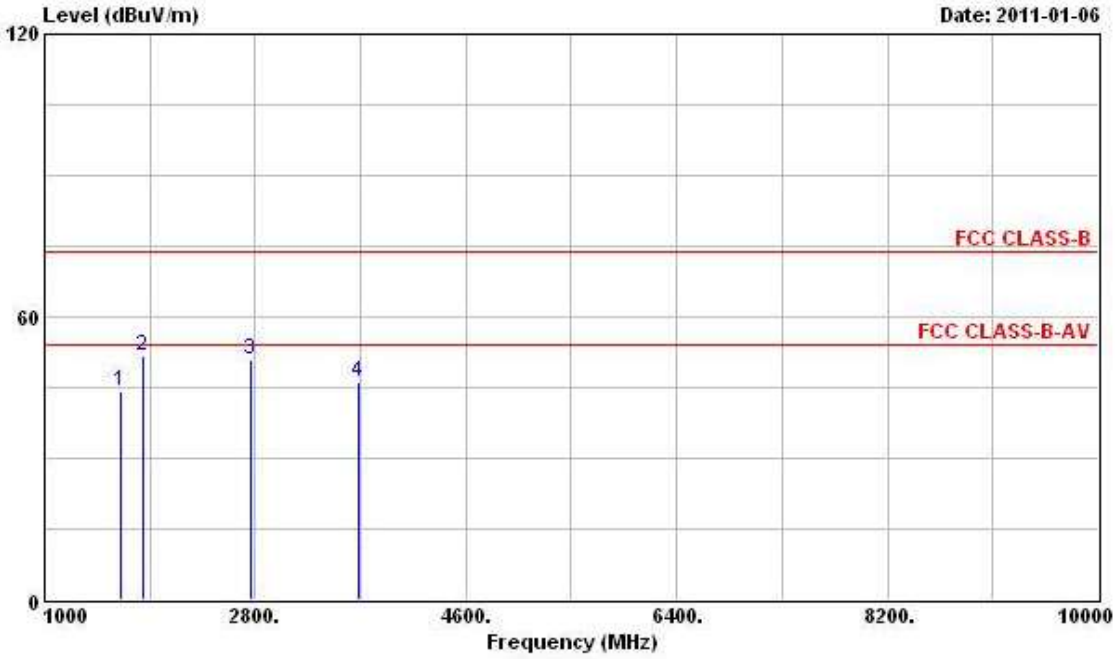
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	47.53	-6.47	54.00	51.96	27.59	2.30	34.32	PK
2	1844.000	54.69			56.53	29.39	2.59	33.82	Peak
3	2766.000	52.16	-21.84	74.00	50.21	32.84	3.26	34.15	Peak
4	2766.000	35.50	-18.50	54.00	33.55	32.84	3.26	34.15	Average
5	3688.000	46.71	-7.29	54.00	43.60	33.78	3.97	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

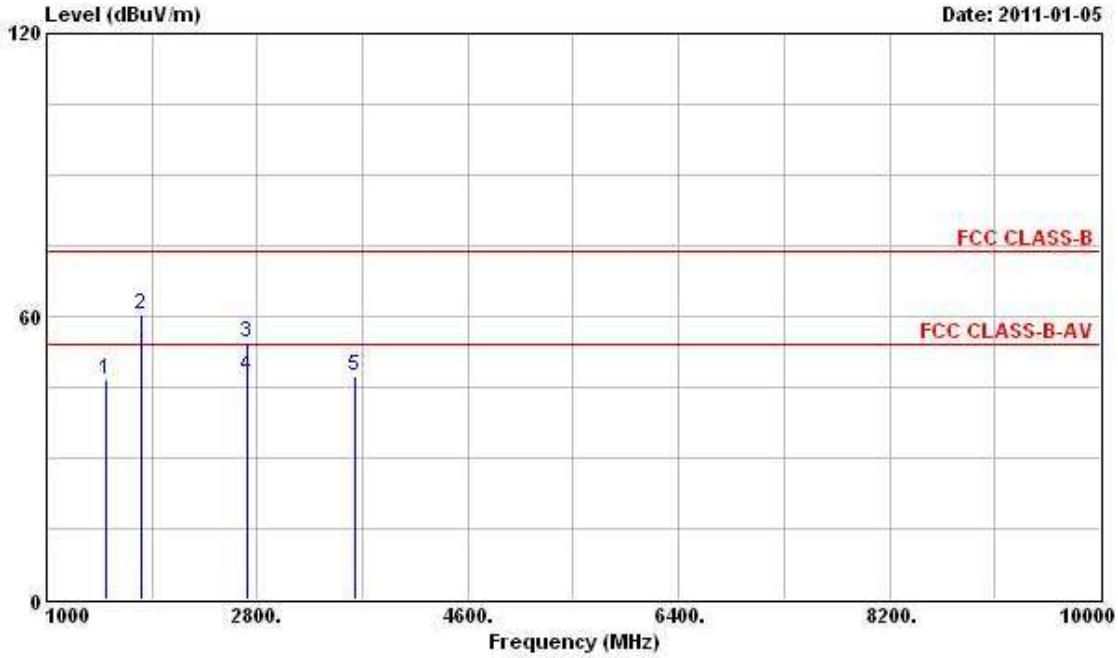


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1657.000	44.28			46.94	29.00	2.43	34.09	Peak
2	1844.000	51.52			52.87	29.88	2.59	33.82	Peak
3 @	2760.000	50.87	-3.13	54.00	48.93	32.83	3.26	34.15	PK
4	3688.000	46.38	-7.62	54.00	43.41	33.64	3.97	34.64	PK

Note: The items 1 and 2 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M DSSS-907MHz

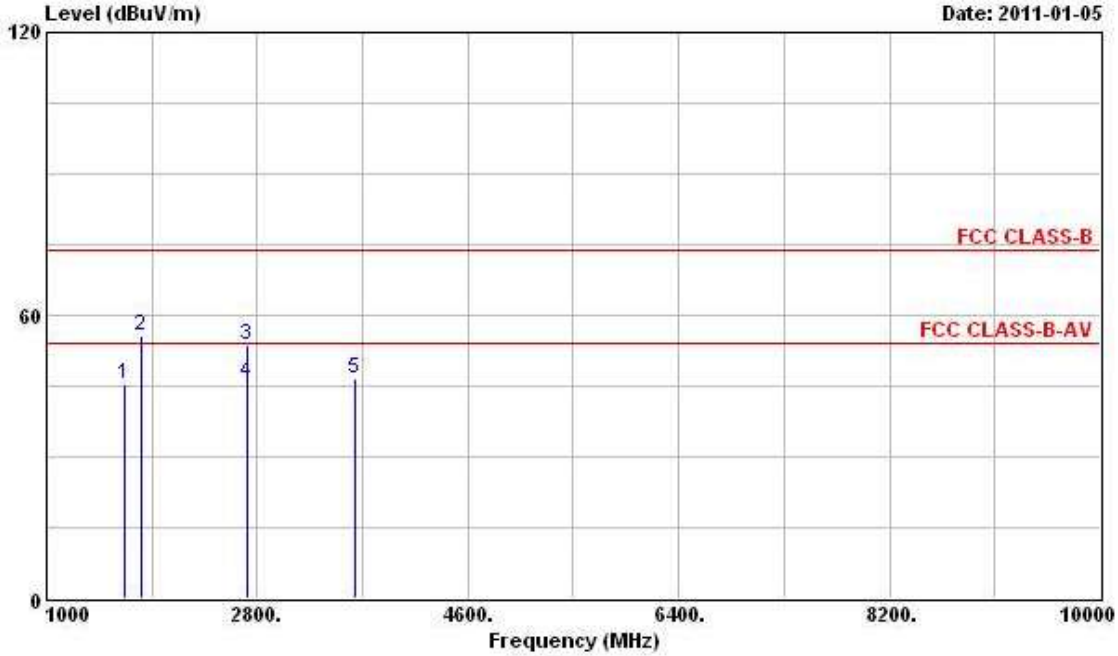
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	46.73	-7.27	54.00	51.16	27.59	2.30	34.32	PK
2	1810.000	60.22			62.31	29.21	2.56	33.86	Peak
3	2722.000	54.45	-19.55	74.00	52.66	32.72	3.24	34.17	Peak
4	2722.000	47.55	-6.45	54.00	45.76	32.72	3.24	34.17	Average
5	3628.000	47.18	-6.82	54.00	44.24	33.68	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

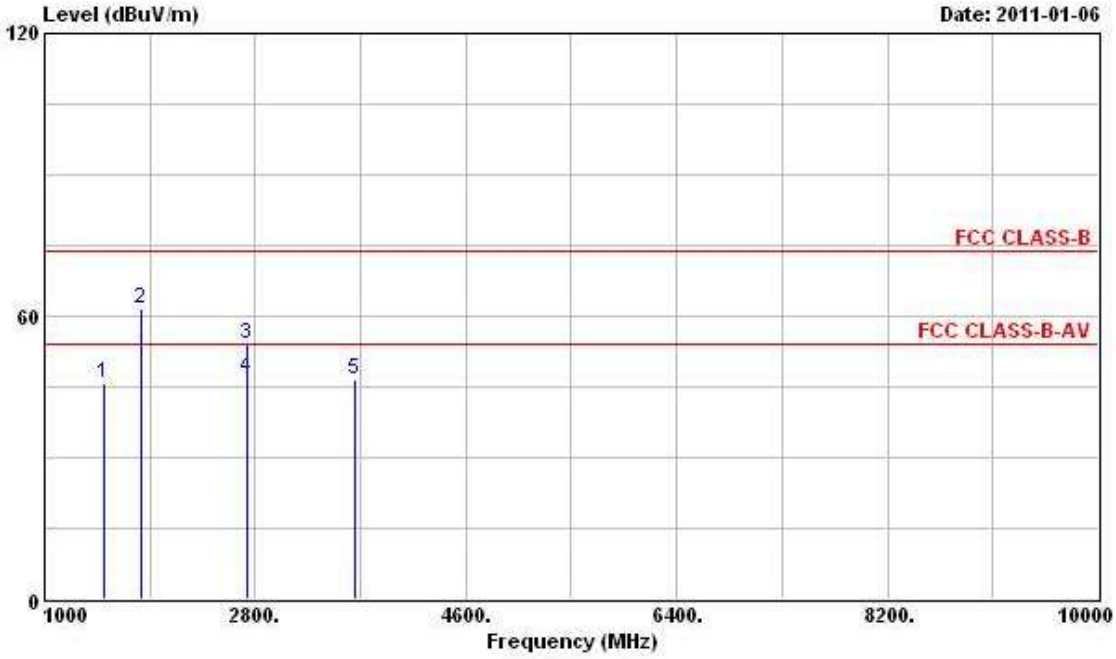


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.52	-8.48	54.00	48.18	29.00	2.43	34.09	PK
2	1814.000	55.58			57.16	29.72	2.56	33.86	Peak
3	2721.000	53.60	-20.40	74.00	51.79	32.75	3.24	34.18	Peak
4	2721.000	45.86	-8.14	54.00	44.05	32.75	3.24	34.18	Average
5	3628.000	46.59	-7.41	54.00	43.78	33.55	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M DSSS-912MHz

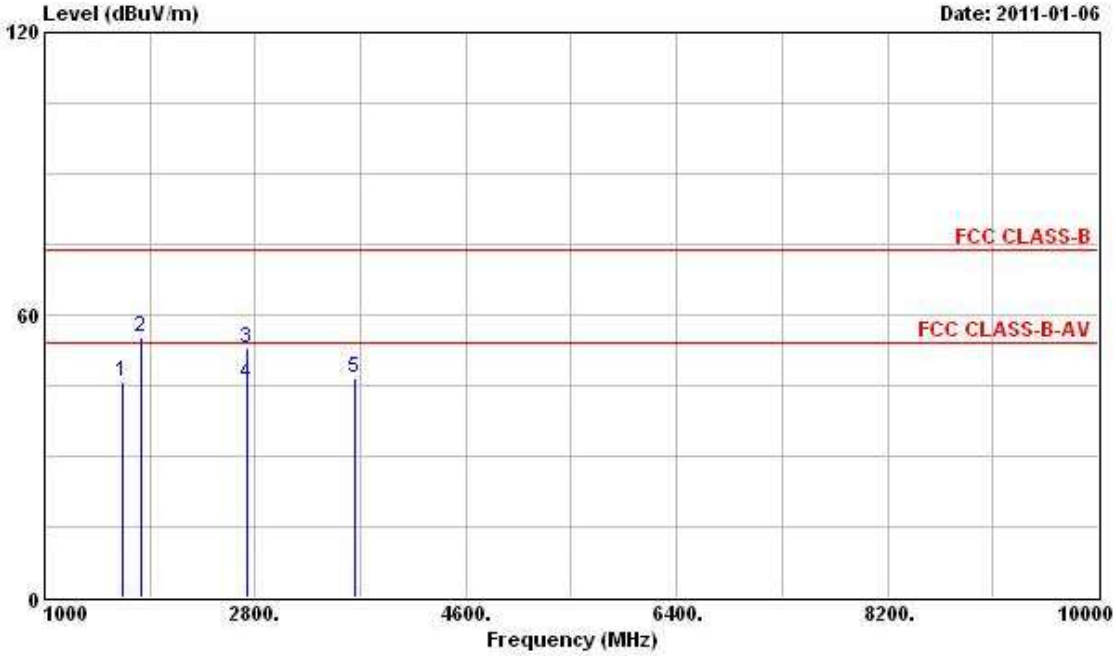
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	45.80	-8.20	54.00	50.23	27.59	2.30	34.32	PK
2	1824.000	61.58			63.67	29.21	2.56	33.86	Peak
3	2736.000	54.07	-19.93	74.00	52.22	32.76	3.26	34.17	Peak
4	2736.000	47.05	-6.95	54.00	45.20	32.76	3.26	34.17	Average
5	3648.000	46.73	-7.27	54.00	43.73	33.71	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

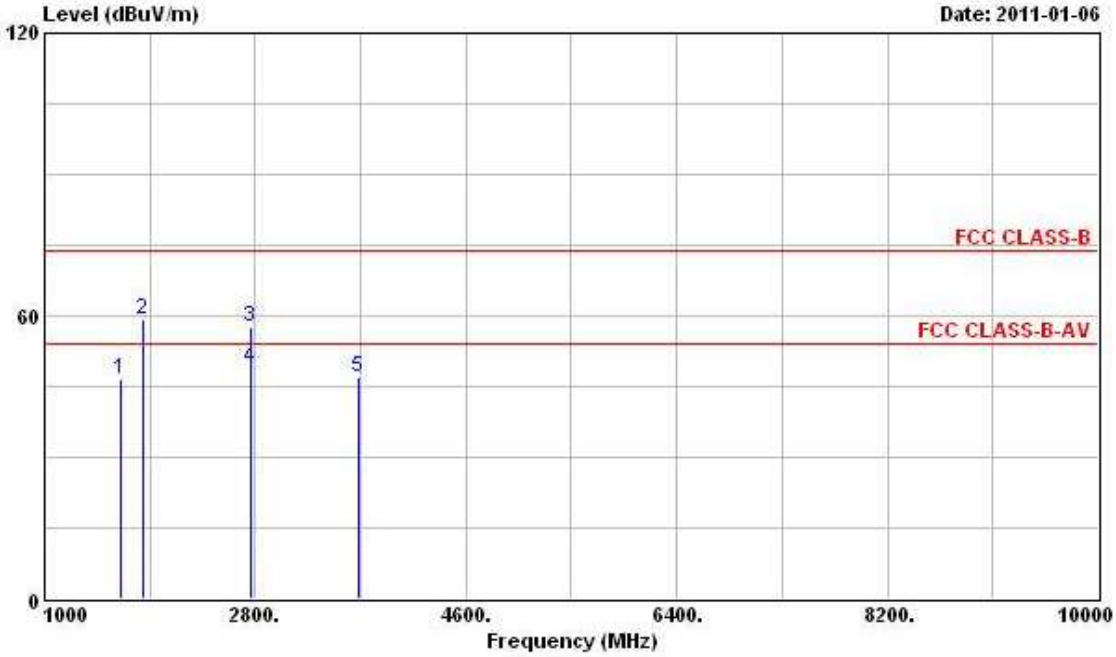


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.83			48.49	29.00	2.43	34.09	PK
2	1822.000	55.17			56.75	29.72	2.56	33.86	Peak
3	2736.000	52.77	-21.23	74.00	50.91	32.77	3.26	34.17	Peak
4	2736.000	45.32	-8.68	54.00	43.46	32.77	3.26	34.17	Average
5	3648.000	46.43	-27.57	74.00	43.56	33.58	3.94	34.65	PK

Note: The items 1 and 2 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M DSSS-922MHz

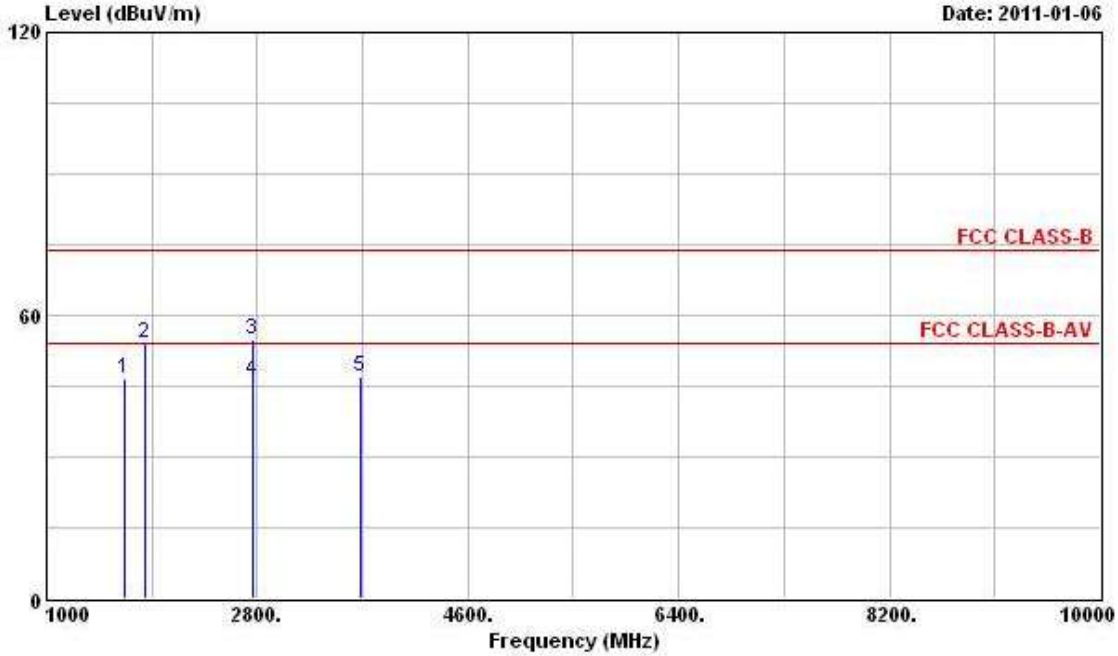
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1657.000	46.70			49.96	28.40	2.43	34.09	Peak
2	1844.000	59.34			61.18	29.39	2.59	33.82	Peak
3	2760.000	57.82	-16.18	74.00	55.87	32.84	3.26	34.15	Peak
4	2760.000	49.11	-4.89	54.00	47.16	32.84	3.26	34.15	Average
5	3688.000	47.11	-6.89	54.00	44.00	33.78	3.97	34.64	PK

Note: The items 1 and 2 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

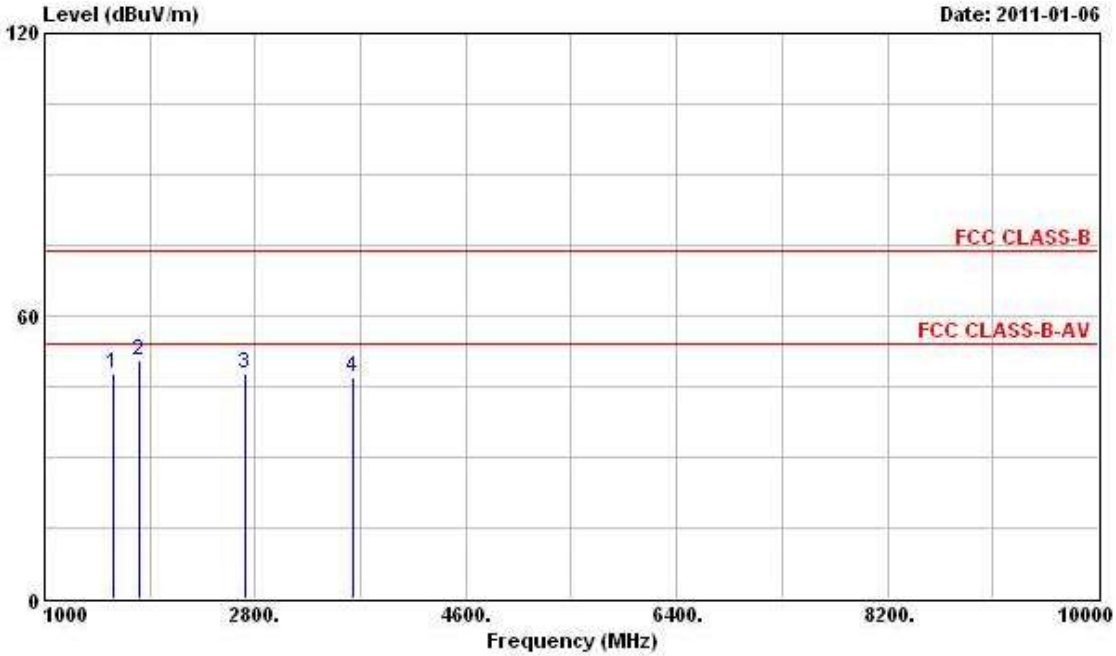


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	46.50	-7.50	54.00	49.16	29.00	2.43	34.09	PK
2	1844.000	54.05			55.40	29.88	2.59	33.82	Peak
3	2760.000	54.72	-19.28	74.00	52.78	32.83	3.26	34.15	Peak
4	2760.000	46.36	-7.64	54.00	44.42	32.83	3.26	34.15	Average
5	3688.000	47.10	-6.90	54.00	44.13	33.64	3.97	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M OFDM-907MHz

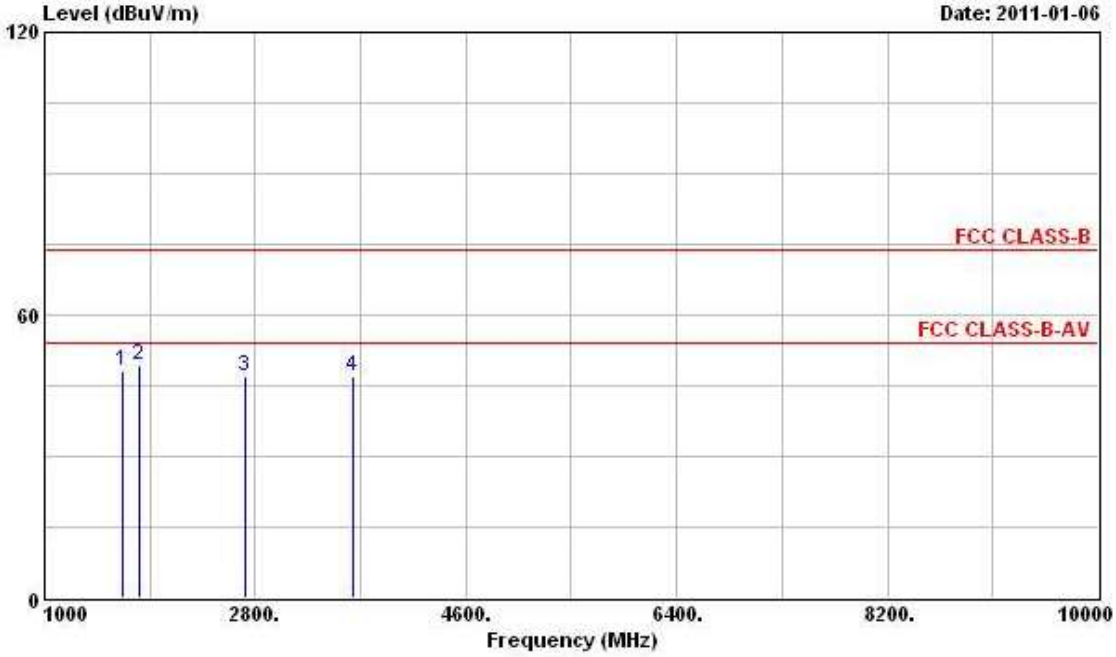
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1594.000	47.62	-6.38	54.00	51.42	28.04	2.36	34.20	PK
2	1814.000	50.69			52.78	29.21	2.56	33.86	Peak
3	2721.000	47.72	-6.28	54.00	45.94	32.72	3.24	34.18	PK
4	3628.000	47.08	-6.92	54.00	44.14	33.68	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

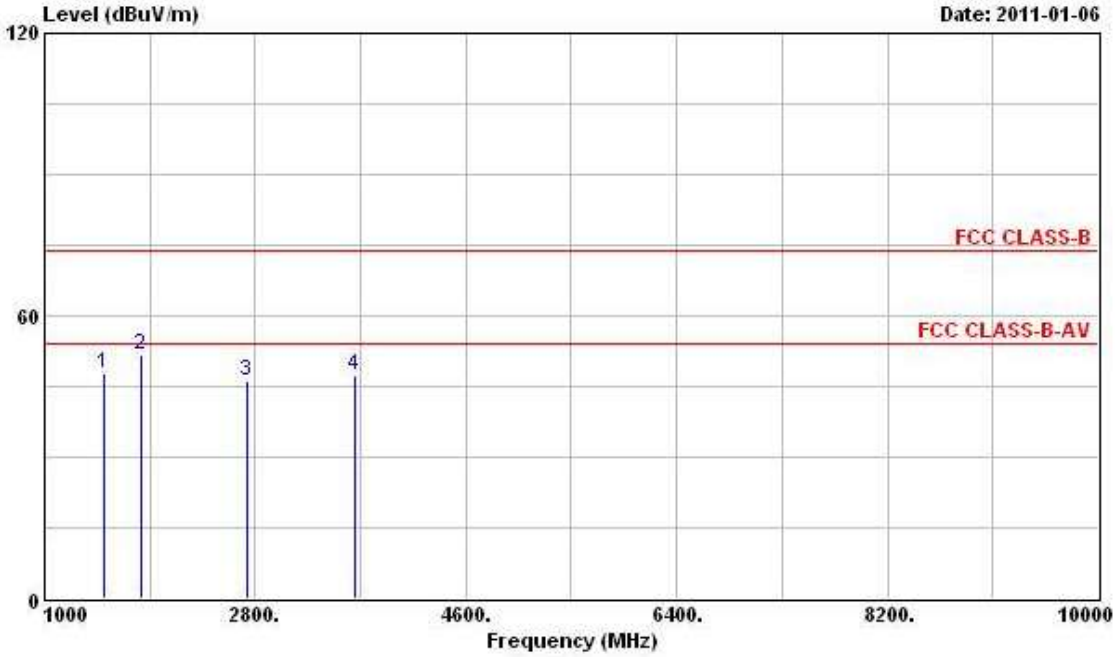


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	48.12	-5.88	54.00	50.78	29.00	2.43	34.09	PK
2	1814.000	49.39			50.97	29.72	2.56	33.86	Peak
3	2721.000	47.00	-7.00	54.00	45.19	32.75	3.24	34.18	PK
4	3628.000	47.09	-6.91	54.00	44.28	33.55	3.92	34.66	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M OFDM-912MHz

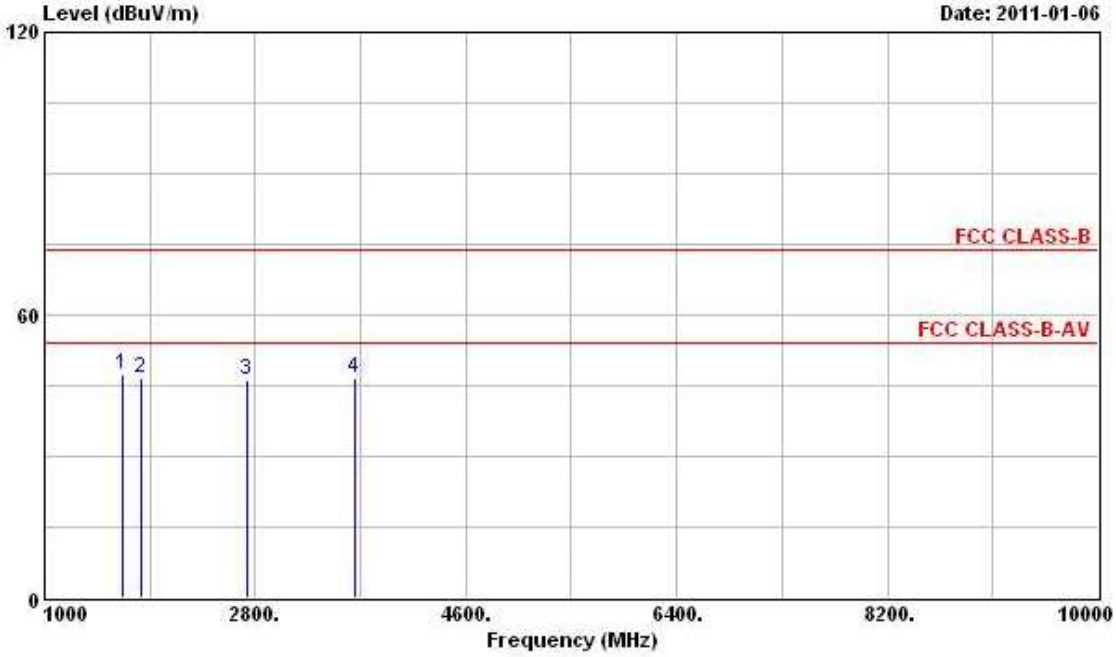
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	47.63	-6.37	54.00	52.06	27.59	2.30	34.32	PK
2	1824.000	51.87			53.96	29.21	2.56	33.86	Peak
3	2736.000	46.26	-7.74	54.00	44.41	32.76	3.26	34.17	PK
4	3648.000	47.18	-6.82	54.00	44.18	33.71	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

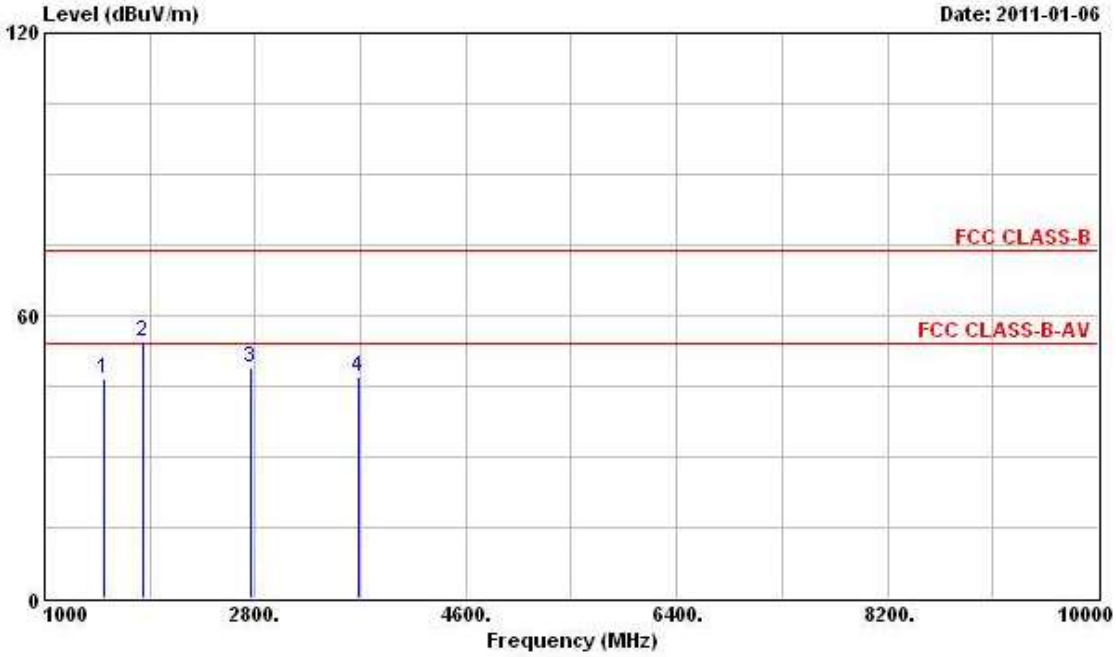


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	47.51	-6.49	54.00	50.17	29.00	2.43	34.09	PK
2	1824.000	46.76			48.34	29.72	2.56	33.86	Peak
3	2736.000	46.01	-7.99	54.00	44.15	32.77	3.26	34.17	PK
4	3648.000	46.43	-7.57	54.00	43.56	33.58	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 06, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M OFDM-922MHz

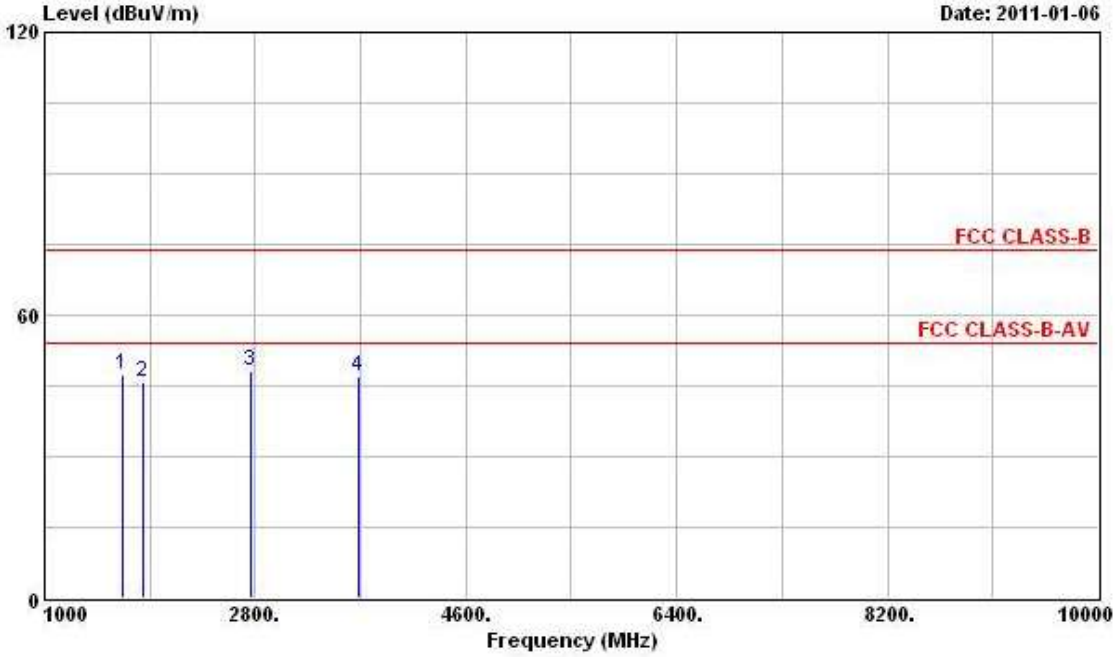
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	46.43	-7.57	54.00	50.86	27.59	2.30	34.32	PK
2	1844.000	54.31			56.15	29.39	2.59	33.82	Peak
3	2760.000	49.13	-4.87	54.00	47.18	32.84	3.26	34.15	PK
4	3688.000	47.04	-6.96	54.00	43.93	33.78	3.97	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

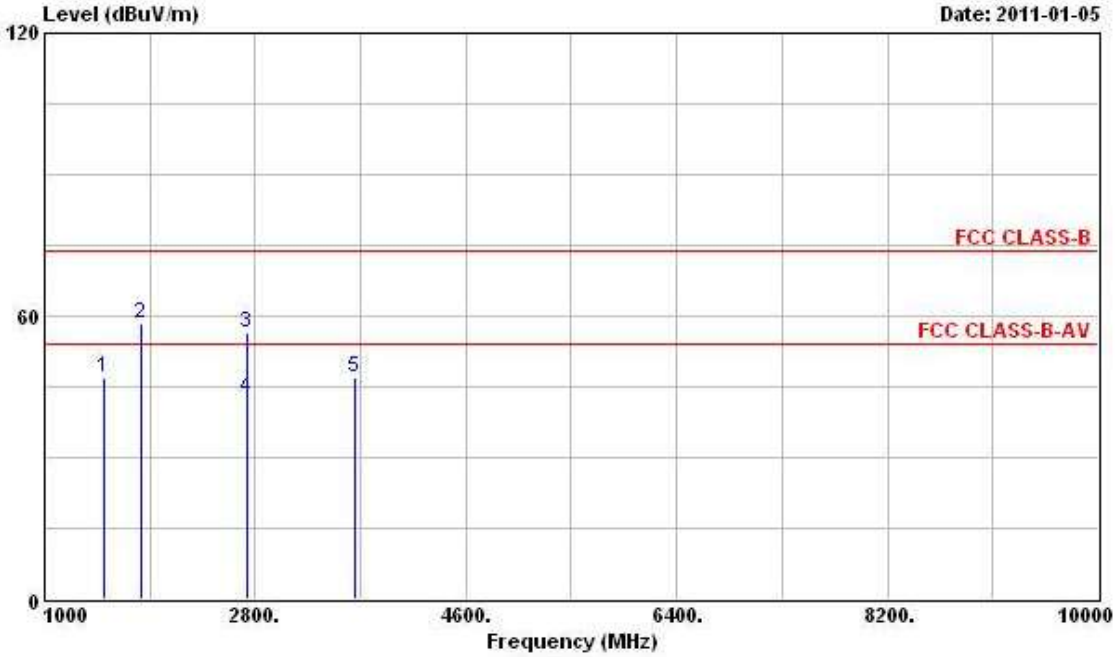


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	47.23	-6.77	54.00	49.89	29.00	2.43	34.09	PK
2	1844.000	45.76			47.11	29.88	2.59	33.82	Peak
3	2760.000	48.00	-6.00	54.00	46.06	32.83	3.26	34.15	PK
4	3688.000	47.01	-6.99	54.00	44.04	33.64	3.97	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	20M DSSS-912MHz

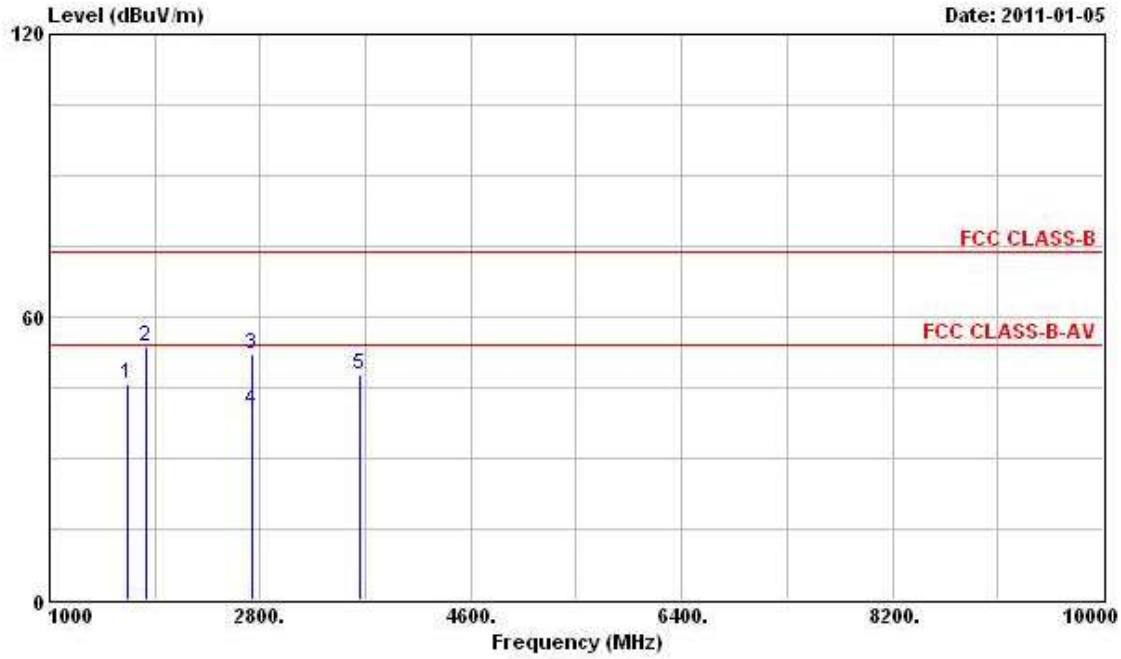
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	46.84	-7.16	54.00	51.27	27.59	2.30	34.32	PK
2	1824.000	58.47			60.56	29.21	2.56	33.86	Peak
3	2736.000	56.48	-17.52	74.00	54.63	32.76	3.26	34.17	Peak
4	2736.000	42.49	-11.51	54.00	40.64	32.76	3.26	34.17	Average
5	3648.000	46.88	-7.12	54.00	43.88	33.71	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

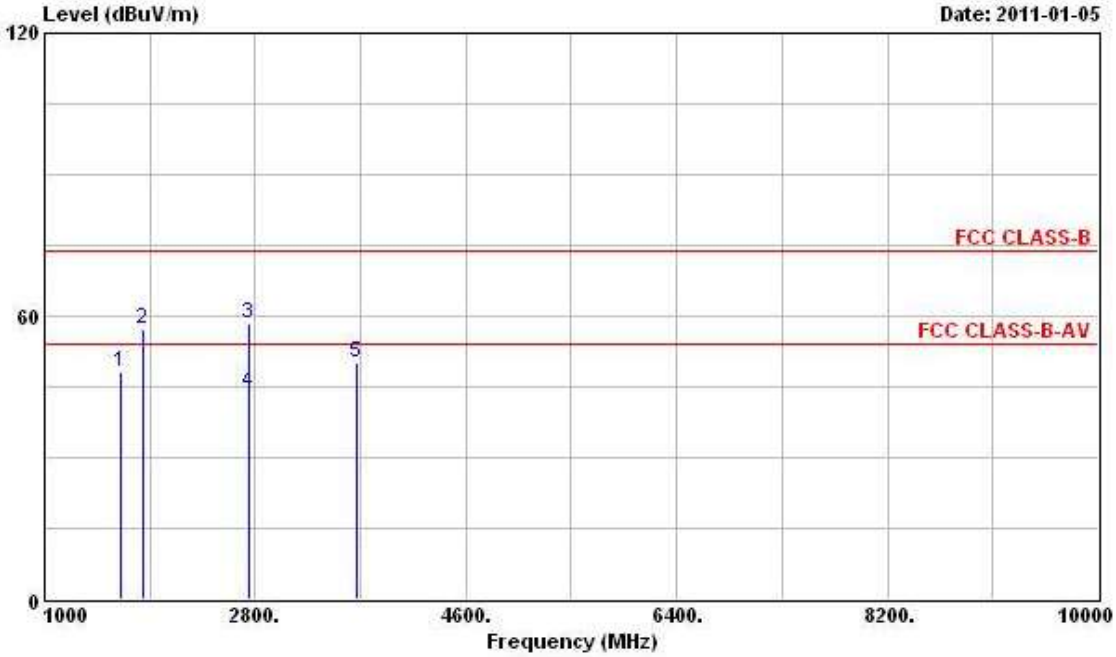


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.81			48.47	29.00	2.43	34.09	Peak
2	1824.000	53.71			55.29	29.72	2.56	33.86	Peak
3	2736.000	52.28	-21.72	74.00	50.42	32.77	3.26	34.17	Peak
4	2736.000	40.12	-13.88	54.00	38.26	32.77	3.26	34.17	Average
5	3648.000	47.57	-6.43	54.00	44.70	33.58	3.94	34.65	PK

Note: The items 1 and 2 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	20M DSSS-917MHz

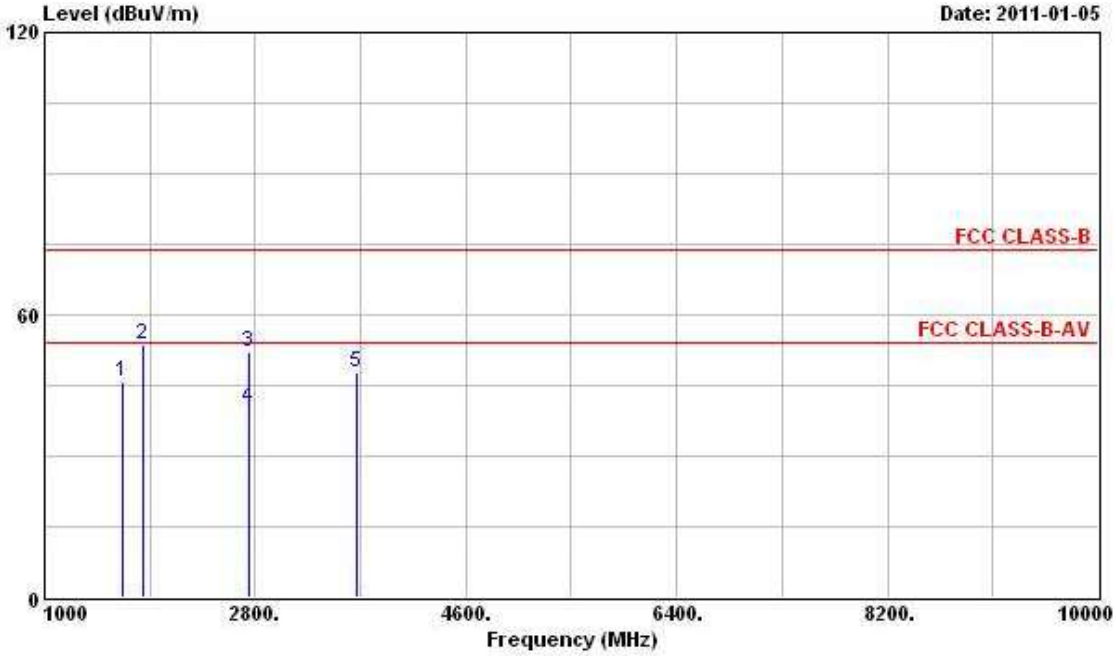
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1657.000	48.22			51.48	28.40	2.43	34.09	Peak
2	1834.000	57.14			59.10	29.30	2.56	33.82	Peak
3	2751.000	58.46	-15.54	74.00	56.55	32.80	3.26	34.15	Peak
4	2751.000	44.00	-10.00	54.00	42.09	32.80	3.26	34.15	Average
5 @	3668.000	50.06	-3.94	54.00	47.02	33.74	3.94	34.64	PK

Note: The items 1 and 2 are on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

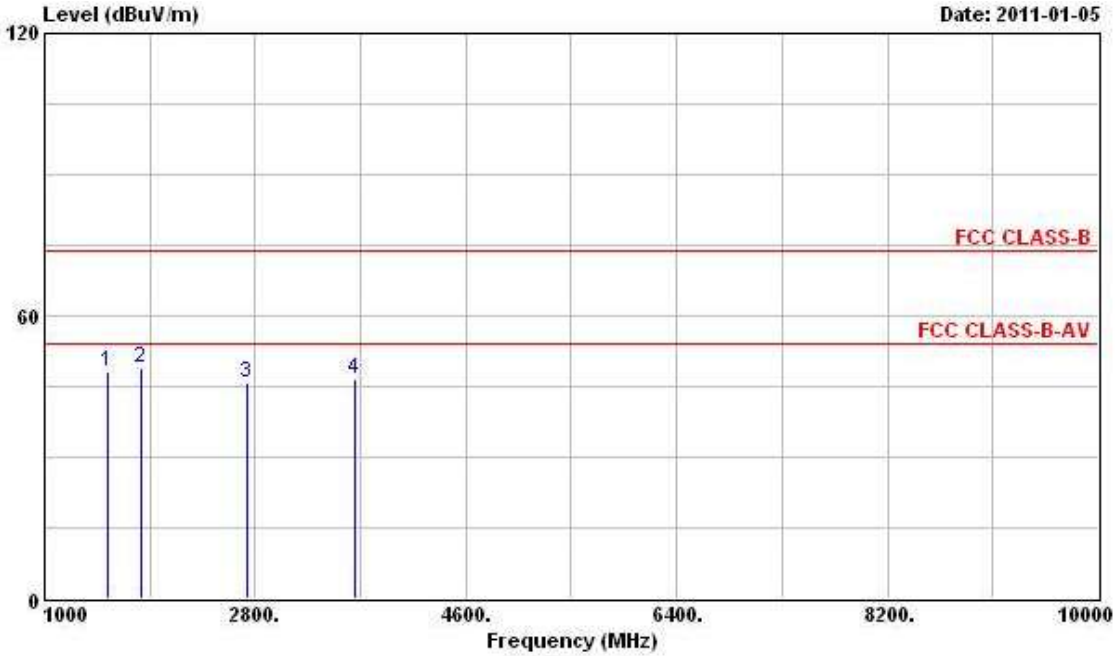


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.96	-8.04	54.00	48.62	29.00	2.43	34.09	PK
2	1834.000	53.50			54.96	29.80	2.56	33.82	Peak
3	2751.000	52.13	-21.87	74.00	50.22	32.80	3.26	34.15	Peak
4	2751.000	40.30	-13.70	54.00	38.39	32.80	3.26	34.15	Average
5	3668.000	47.71	-6.29	54.00	44.80	33.61	3.94	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	20M OFDM-912MHz

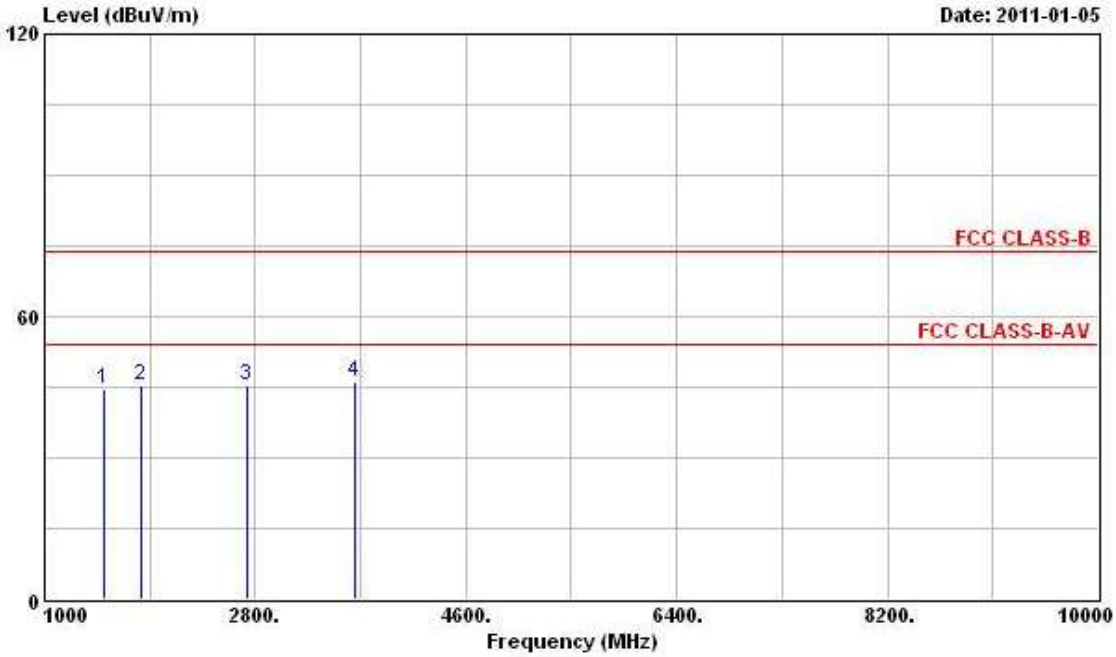
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1537.000	48.24	-5.76	54.00	52.42	27.77	2.33	34.28	PK
2	1824.000	49.02			51.11	29.21	2.56	33.86	Peak
3	2736.000	45.75	-8.25	54.00	43.90	32.76	3.26	34.17	PK
4	3648.000	46.57	-7.43	54.00	43.57	33.71	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical

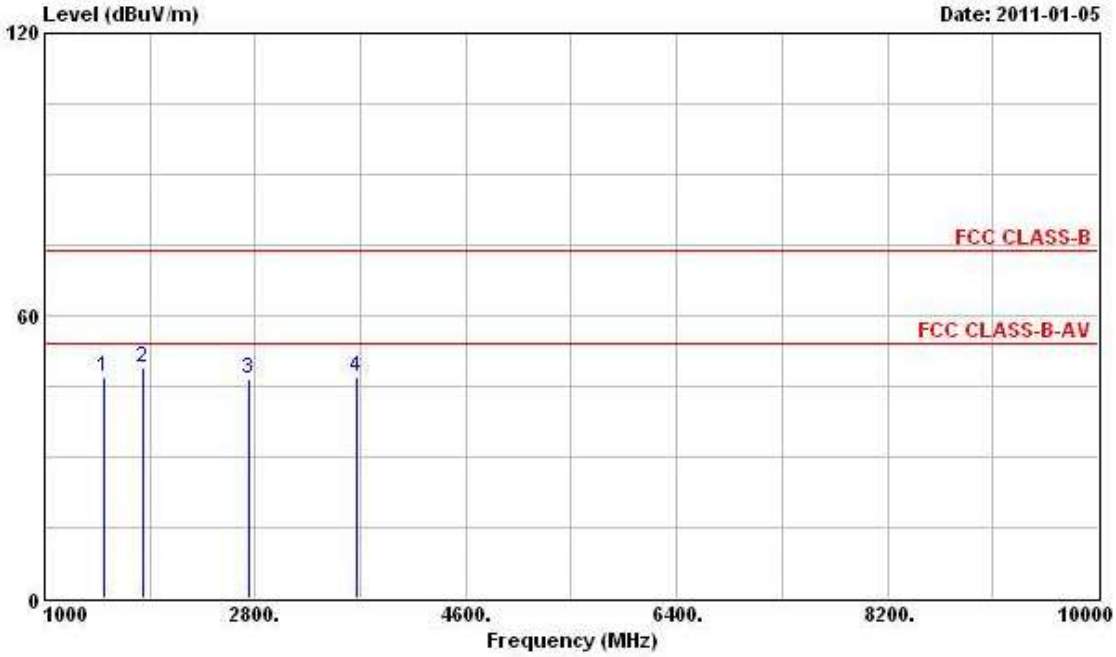


	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	44.42	-9.58	54.00	48.16	28.28	2.30	34.32	PK
2	1824.000	45.29			46.87	29.72	2.56	33.86	Peak
3	2736.000	45.41	-8.59	54.00	43.55	32.77	3.26	34.17	PK
4	3648.000	46.17	-7.83	54.00	43.30	33.58	3.94	34.65	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Final Test Date	Jan. 05, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	20M OFDM-917MHz

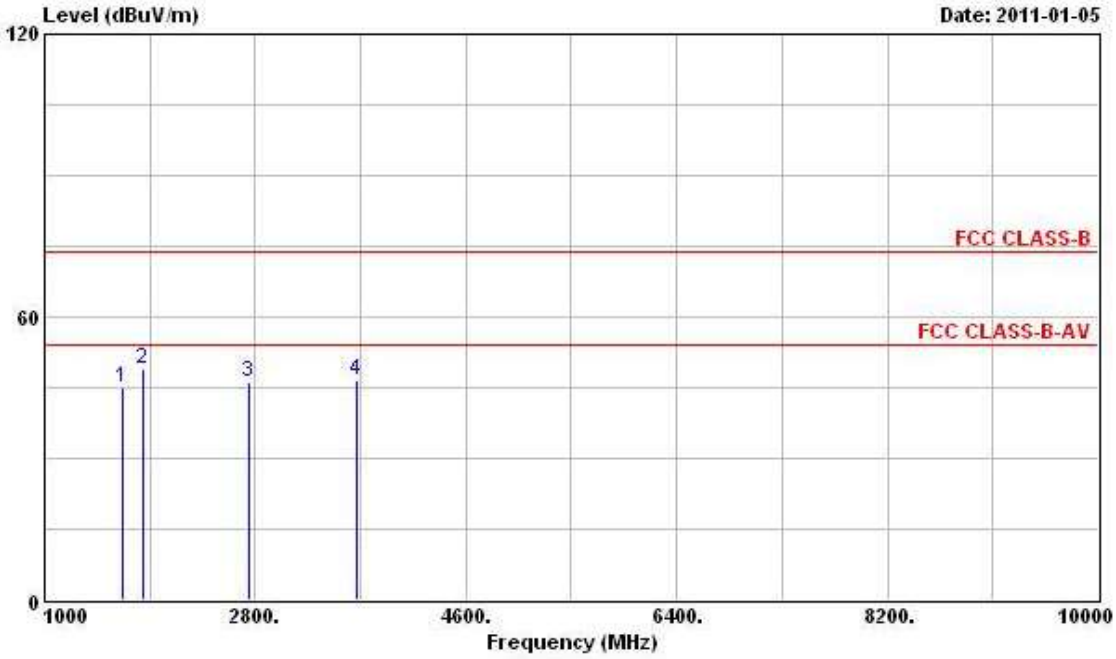
Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1513.000	46.92	-7.08	54.00	51.35	27.59	2.30	34.32	PK
2	1834.000	48.80			50.76	29.30	2.56	33.82	Peak
3	2751.000	46.58	-7.42	54.00	44.67	32.80	3.26	34.15	PK
4	3668.000	47.16	-6.84	54.00	44.12	33.74	3.94	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1	1666.000	45.10	-8.90	54.00	47.76	29.00	2.43	34.09	PK
2	1834.000	48.80			50.26	29.80	2.56	33.82	Peak
3	2751.000	46.17	-7.83	54.00	44.26	32.80	3.26	34.15	PK
4	3668.000	46.51	-7.49	54.00	43.60	33.61	3.94	34.64	PK

Note: The item 2 is on un-restricted band, so the limit is -20dB for the field strength of the fundamental emissions (see section 3.7.7).

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Emission level (dBuV/m) = 20 log Emission level (uV/m).
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.6. Band Edge Emissions Measurement

3.6.1. Limit

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 2.7 the restricted bands must also comply with the radiated emission limit specified in section 2.8..

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.6.2. Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RB / VB (Emission in restricted band)	1MHz / 1MHz for Peak, 1 MHz / 10Hz for Average
RB / VB (Emission in non-restricted band)	100 KHz /100 KHz for Peak

3.6.3. Test Procedures

1. The test procedure is the same as section 3.5.3.; only the frequency range investigated is limited to 100MHz around band edges.
2. In case the emission is fail due to the used RB/VB is too wide, marker-delta method of FCC Public Notice DA00-705 will be followed.

3.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 3.5.4..

3.6.5. Test Deviation

There is no deviation with the original standard.

3.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.6.7. Test Result of Band Edge and Fundamental Emissions

Final Test Date	Jan. 01, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	5M

DSSS
907MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	902.000	82.96			57.87	20.08	5.01	0.00	Peak
2 @	905.560	118.83			93.64	20.17	5.02	0.00	Peak

Note:
Item 1 is on un-restricted band, so the limit is -20dB for the item 2 field strength of the fundamental emissions.

922MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	920.440	119.12			93.49	20.53	5.10	0.00	Peak
2 @	928.120	76.60			50.74	20.73	5.13	0.00	Peak

Note:
Item 2 is on un-restricted band, so the limit is -20dB for the item 1 field strength of the fundamental emissions.

OFDM
907MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	901.960	73.58			48.49	20.08	5.01	0.00	Peak
2 @	906.100	112.45			87.22	20.20	5.03	0.00	Peak

Note:
Item 1 is on un-restricted band, so the limit is -20dB for the item 2 field strength of the fundamental emissions.

922MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	921.220	112.17			86.51	20.56	5.10	0.00	Peak
2 @	928.120	67.01			41.15	20.73	5.13	0.00	Peak

Note:
Item 2 is on un-restricted band, so the limit is -20dB for the item 1 field strength of the fundamental emissions.

Final Test Date	Jan. 01, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M

DSSS

907MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	902.000	90.05			64.96	20.08	5.01	0.00	Peak
2 @	907.000	120.21			94.96	20.22	5.03	0.00	Peak

Note:
Item 1 is on un-restricted band, so the limit is -20dB for the item 2 field strength of the fundamental emissions.

922MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	922.360	119.89			94.21	20.58	5.10	0.00	Peak
2 @	928.180	83.27			57.41	20.73	5.13	0.00	Peak

Note:
Item 2 is on un-restricted band, so the limit is -20dB for the item 1 field strength of the fundamental emissions.

OFDM
907MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	901.900	80.95			55.86	20.08	5.01	0.00	Peak
2 @	910.120	109.99			84.65	20.29	5.05	0.00	Peak

Note:
Item 1 is on un-restricted band, so the limit is -20dB for the item 2 field strength of the fundamental emissions.

922MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	918.820	111.04			85.44	20.51	5.09	0.00	Peak
2 @	928.420	80.41			54.53	20.75	5.13	0.00	Peak

Note:
Item 2 is on un-restricted band, so the limit is -20dB for the item 1 field strength of the fundamental emissions.

Final Test Date	Jan. 01, 2011	**Test Site No.**	03CH02-HY
Temperature	20℃	**Humidity**	54%
Test Engineer	Daniel	**Configurations**	10M

DSSS

912MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	902.000	86.69			61.60	20.08	5.01	0.00	Peak
2 @	910.700	117.99			92.65	20.29	5.05	0.00	Peak

Note:
Item 1 is on un-restricted band, so the limit is -20dB for the item 2 field strength of the fundamental emissions.

917MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	916.300	117.60			92.08	20.44	5.08	0.00	Peak
2 @	929.500	79.88			53.97	20.77	5.14	0.00	Peak

Note:
Item 2 is on un-restricted band, so the limit is -20dB for the item 1 field strength of the fundamental emissions.

OFDM
912MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	902.000	83.71			58.62	20.08	5.01	0.00	Peak
2 @	914.600	108.92			83.46	20.39	5.07	0.00	Peak

Note:
Item 1 is on un-restricted band, so the limit is -20dB for the item 2 field strength of the fundamental emissions.

917MHz

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	
1 @	911.900	108.59			83.20	20.34	5.05	0.00	Peak
2 @	928.000	78.24			52.38	20.73	5.13	0.00	Peak

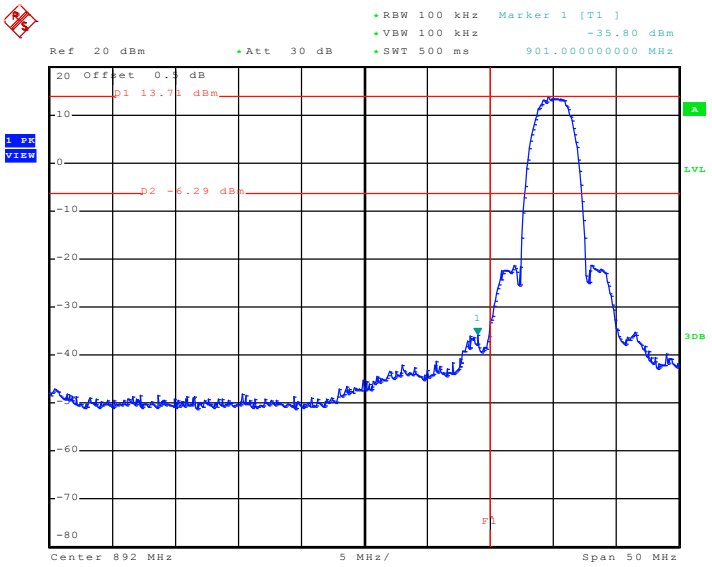
Note:
Item 2 is on un-restricted band, so the limit is -20dB for the item 1 field strength of the fundamental emissions.

For Emission not in Restricted Band

Final Test Date	Dec. 31, 2011	**Test Site No.**	TH01-HY
Temperature	21℃	**Humidity**	60%
Test Engineer	Cain	**Configuration**	5M / 10M / 20M

5M (2.75 Mbps)

Low Band Edge Plot on 907 MHz



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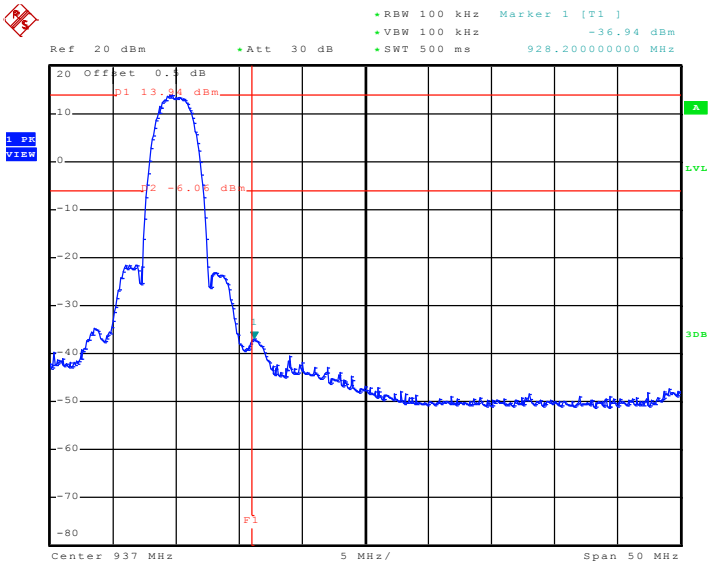
High Band Edge Plot on 922 MHz



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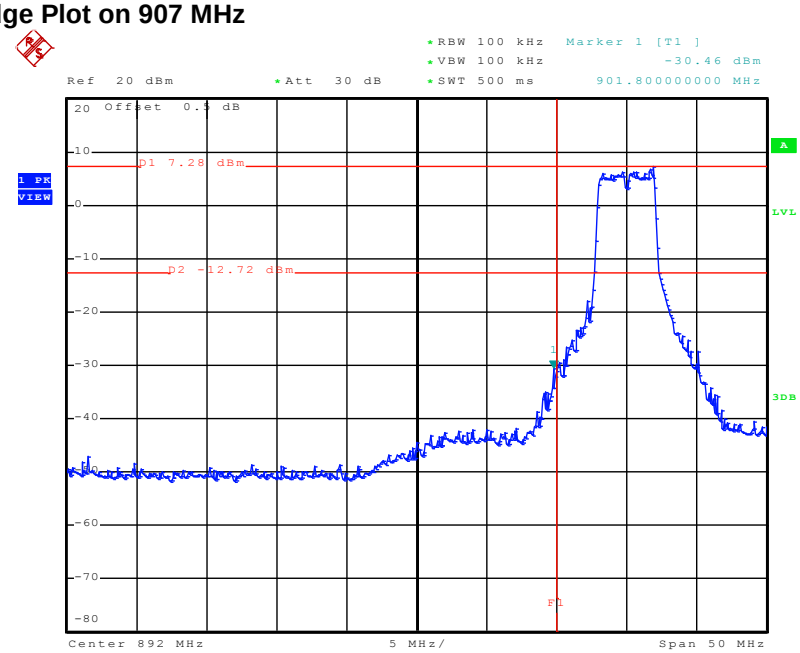
5M (1.5 Mbps)

Low Band Edge Plot on 907 MHz



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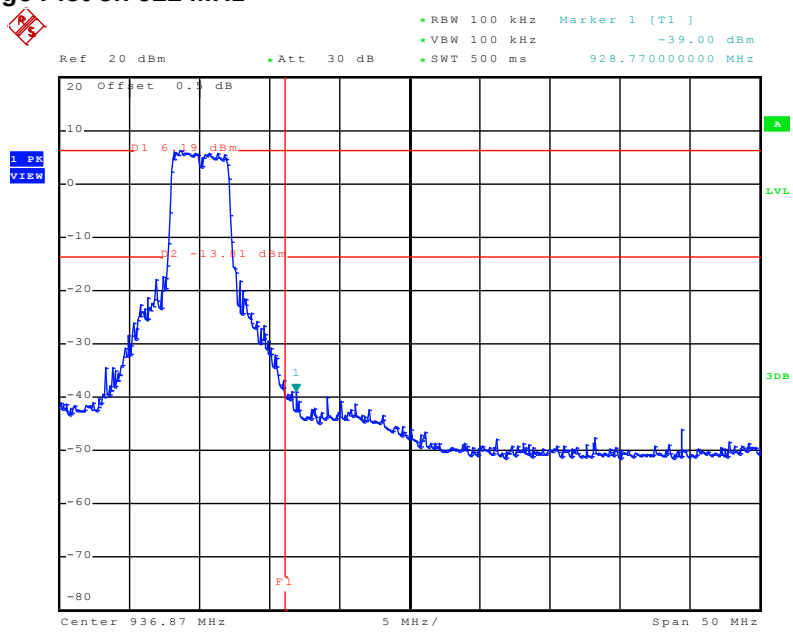
High Band Edge Plot on 922 MHz



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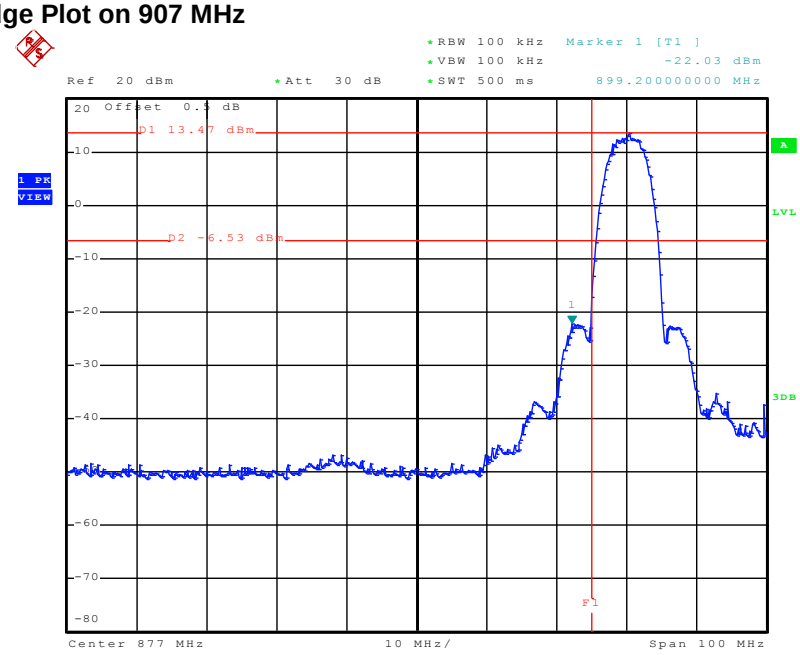
10M (5.5 Mbps)

Low Band Edge Plot on 907 MHz



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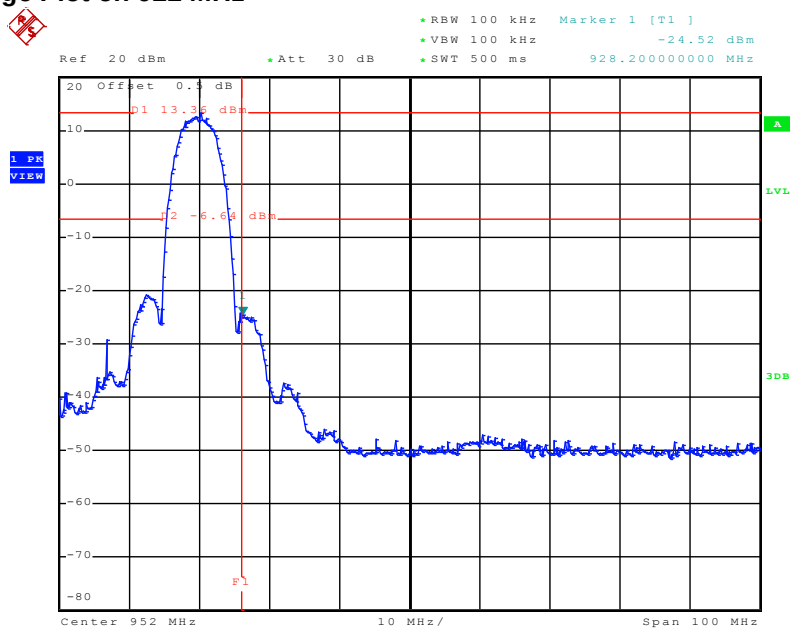
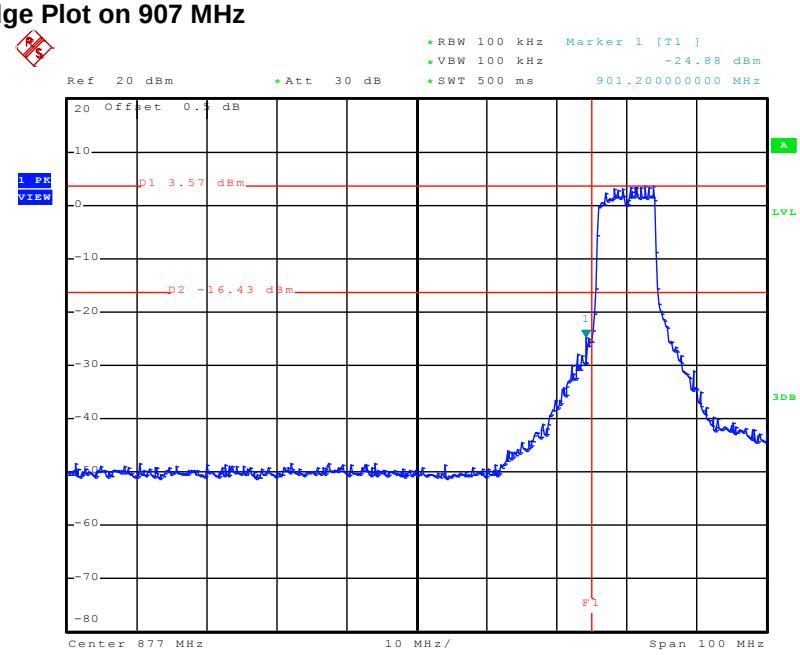
High Band Edge Plot on 922 MHz



Date: 31.DEC.2010 14:04:46

10**M (3 Mbps)**

Low Band Edge Plot on 907 MHz



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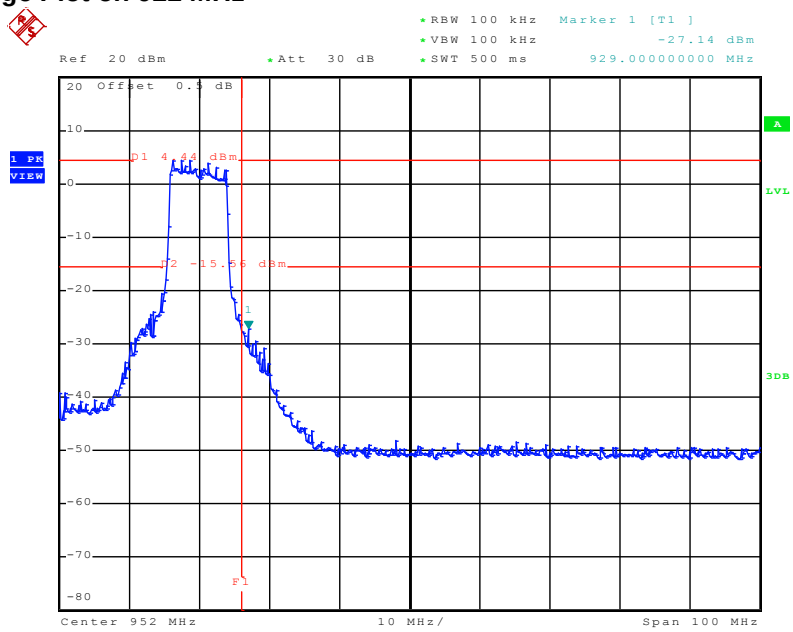
High Band Edge Plot on 922 MHz



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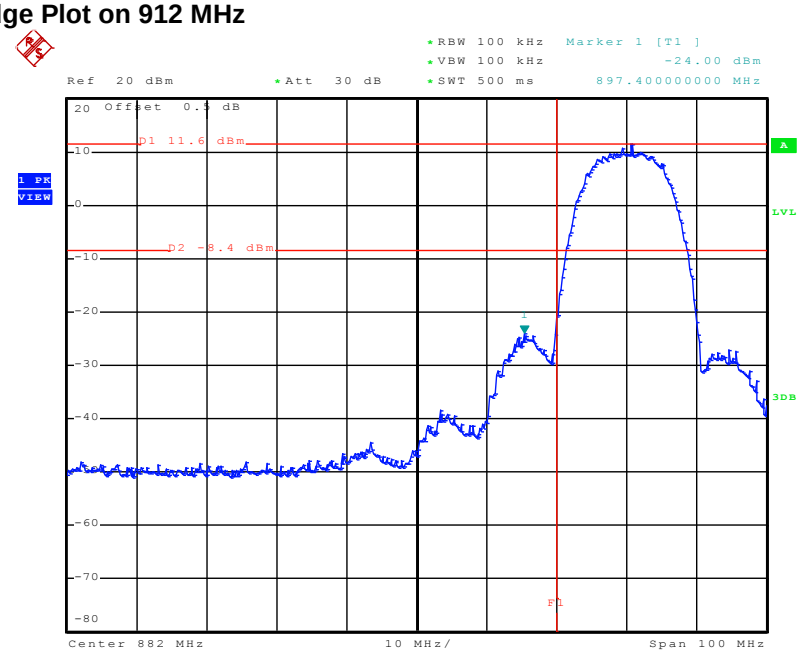
20M (11 Mbps)

Low Band Edge Plot on 912 MHz



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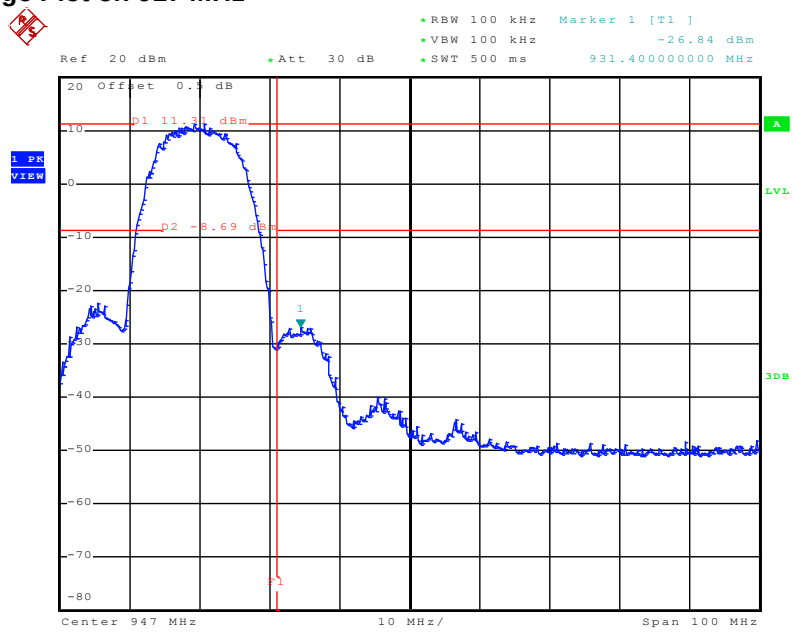
High Band Edge Plot on 917 MHz



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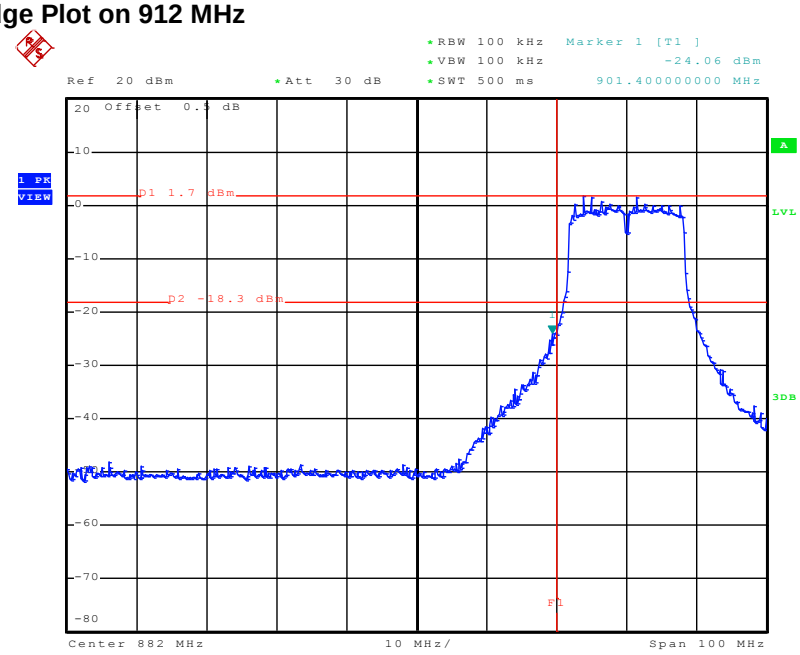
20M (11 Mbps)

Low Band Edge Plot on 912 MHz



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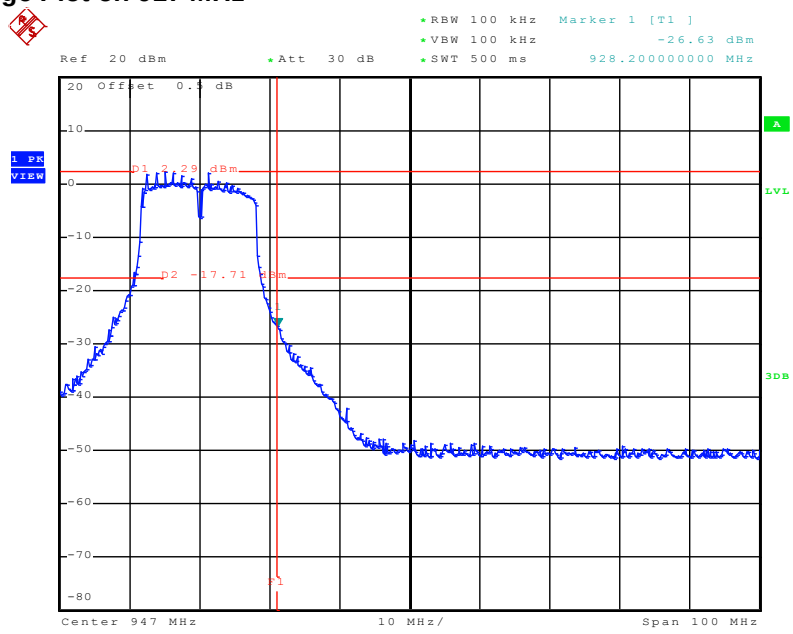
High Band Edge Plot on 917 MHz



Date: 31.DEC.2010 13:24:00

3.7. Antenna Requirements

3.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

3.7.2. Antenna Connector Construction

Please refer FCC 15.247 section 15.203. The antenna specification is not subject to the requirement of FCC 15.247 section 2.2..

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9kHz – 2.75GHz	Apr. 06, 2010	Conduction (CO04-HY)
LISN	MessTec	NNB-2/16Z	99041	9kHz – 30MHz	Mar. 23, 2010	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9kHz – 30MHz	Apr. 29, 2010	Conduction (CO04-HY)
RF Cable-CON	UTIFLEX	3102-26886-4	CB049	9kHz – 30MHz	Apr. 20, 2010	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSU26.5	100015	20Hz ~ 26.5GHz	Nov. 19, 2010	Conducted (TH01-HY)
DC Power Source	G.W.	GPC-6030D	C671845	DC 1V ~ 60V	Apr. 16, 2010	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Oct. 22, 2010	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 02, 2010	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 02, 2010	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Mar. 30, 2010	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	Dec. 03, 2010	Conducted (TH01-HY)
Power Meter	Anritsu	ML2495A	0949003	300MHz~40GHz	Dec. 03, 2010	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jul. 26, 2010*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz - 40GHz	Feb. 02, 2010	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz - 1 GHz 3m	May 01, 2010	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz – 1.3 GHz	Jul. 23, 2010	Radiation (03CH02-HY)
Amplifier	Agilent	8449B	3008A02373	1GHz – 26.5 GHz	Jul. 23, 2010	Radiation (03CH02-HY)
Horn Antenna	ETS-LINDGREN	3117	00091920	1GHz~18GHz	Nov. 11, 2010	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30MHz ~ 1GHz	Feb. 26, 2010	Radiation (03CH02-HY)
RF Cable-HIGH	SUHNER	SUCOFLEX106	03CH02-HY	1GHz~40GHz	Feb. 26, 2010	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz - 2 GHz	Oct. 16, 2010	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 29, 2010*	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is two year.

5. TEST LOCATION

SHIJR	ADD	:	6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C.
	TEL	:	886-2-2696-2468
	FAX	:	886-2-2696-2255
HWA YA	ADD	:	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
	TEL	:	886-3-327-3456
	FAX	:	886-3-318-0055
LINKOU	ADD	:	No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C
	TEL	:	886-2-2601-1640
	FAX	:	886-2-2601-1695
DUNGHU	ADD	:	No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C.
	TEL	:	886-2-2631-4739
	FAX	:	886-2-2631-9740
JUNGHE	ADD	:	7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C.
	TEL	:	886-2-8227-2020
	FAX	:	886-2-8227-2626
NEIHU	ADD	:	4Fl., No. 339, Hsin Hu 2nd Rd., Taipei 114, Taiwan, R.O.C.
	TEL	:	886-2-2794-8886
	FAX	:	886-2-2794-9777
JHUBEI	ADD	:	No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
	TEL	:	886-3-656-9065
	FAX	:	886-3-656-9085

6. TAF CERTIFICATE OF ACCREDITATION

TAF

Certificate No. : L1190-100529

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.
EMC & Wireless Communications Laboratory
No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

is accredited in respect of laboratory

Accreditation Criteria	:	ISO/IEC 17025:2005
Accreditation Number	:	1190
Originally Accredited	:	December 15, 2003
Effective Period	:	January 10, 2010 to January 09, 2013
Accredited Scope	:	Testing Field, see described in the Appendix
Specific Accreditation Program	:	Accreditation Program for Designated Testing Laboratory for Commodities Inspection Accreditation Program for Telecommunication Equipment Testing Laboratory Accreditation Program for BSMI Mutual Recognition Arrangment with Foreign Authorities

Jay-San Chen

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : May 29, 2010

P1, total 23 pages

The Appendix forms an integral part of this Certificate, which shall be invalid when use without the Appendix