

FCC Part 15 Subpart C Requirement Measurement and Test Report


For

HONGKONG GULANG MODEL TECHNOLOGIES CO., LTD

Block 4, Fengmen Industrial Park, Egongling Village, Pinghu Town,
Longgang, Shenzhen, China

FCC ID: W8RK-6X

March 24, 2009

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: Radio Control System
Test Engineer:	Eric Yang
Report Number:	SE09C-036F
Test Date:	March 20, 2009
Reviewed By:	
Prepared By:	S&E Technologies Laboratory Ltd Room 407, Block A Shennan Garden, Hi-Tech Industrial Park, Shenzhen 518057, P.R. China. Tel: 86-755-26636573, 26630631 Fax: 86-755-26630557

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of S&E Technologies Laboratory Ltd.

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1-Test Result Certification

Applicant: HONGKONG GULANG MODEL TECHNOLOGIES CO., LTD
Block 4, Fengmen Industrial Park, Egongling Village,
Pinghu Town, Longgang, Shenzhen, China

Equipment Under Test: Radio Control System

Trade Name: KDS

Model: K-6X

Type of Modulation: FHSS

Number of Channels: 76

Channel Separation: 1MHz

Operation Frequency: 2403 ~2478MHz

Antenna Designation: Non-user replaceable (fixed)

Battery Voltage: DC12.0V [1.5V*8 "AA" Ni-MH battery]

Date of Test: March 20-21, 2009

Applicable Standards	
Standard	Test Result
FCC 47 CFR Part 15 Subpart C, §15.247	No non-compliance noted

We hereby certify that:

The above equipment was tested at Guangdong Galanz Enterprise Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15C: 2007, §15.247.

The test results of this report relate only to the tested sample identified in this report.

2- EUT Description

Product	Radio Control System
Trade Name	KDS
Model Number	K-6X
Model Difference	N/A
Type of Modulation:	FHSS
Number of Channels:	76
Channel Separation:	1MHz
Power Supply	12.0V DC power from [1.5V*8 "AA" Ni-MH battery]
Frequency Range	2403 ~2478 MHz
Antenna Designation	Non-user replaceable (fixed)

Remark: This submittal(s) test report is intended for FCC ID: W8RK-6X filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules.

3-Test System

3.1 Test Mode

The compliance test was performed under test modes:

Mode 1: Transmitting at 2403MHz without hopping.

Mode 2: Transmitting at 2440MHz without hopping.

Mode 3: Transmitting at 2478MHz without hopping.

Mode 4: Transmitting with hopping.

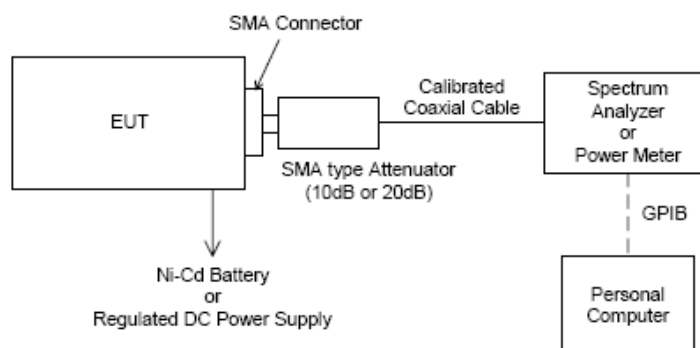
The EUT is designed both of horizontally placed and vertically place. In radiated emission measurement, each condition was conducted.

As a result, the emission that produce the maximum operation under were reported.

- a) Carrier Frequency Separation measurement ---Mode 4
- b) Number of Hopping Frequencies measurement --- Mode 4
- c) Time of Occupancy measurement --- Mode 4
- d) Peak Output Power measurement --- Mode 1, Mode 2, Mode 3
- e) Band Edge of RF Conducted measurement --- Mode 4
- f) Radiated Emission measurement --- Mode 1, Mode 2, Mode 3
- g) 20dB Bandwidth measurement --- Mode 1, Mode 2, Mode 3

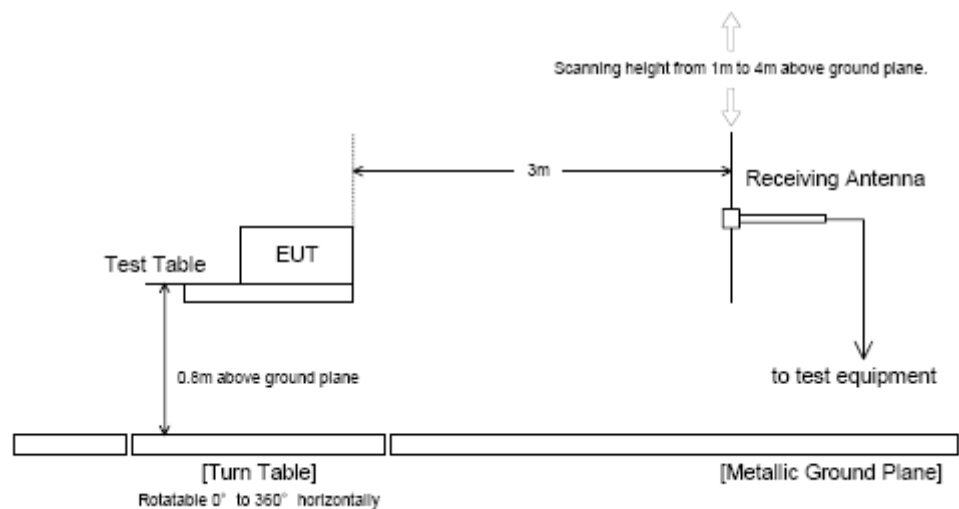
3.2 Test Setup Diagram

- . Carrier Frequency Separation
- . Number of Hopping Frequencies
- . Time of Occupancy (Dwell Time)
- . Peak Output Power
- . Band Edge of RF Conducted Emission
- . 20dB Bandwidth

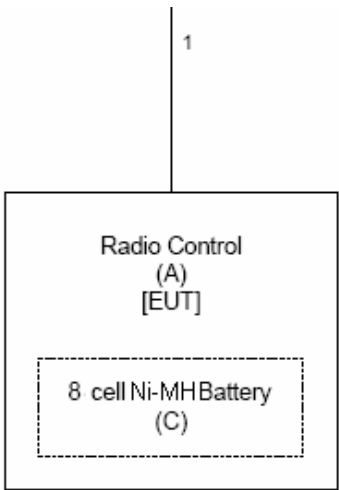


Note: Regulated DC power supply is not used in this report.

. Radiated Emisison



3.3 Block Diagram of EUT System



3.4 List of Cables

No	Cable Name	Shielded (Y/N)	Length (m)	Note	Remark
1	Antenna	Y	0.1		

4- Test Equipment and Calibration

Equipment type	Manufacturer	Model	Serial Number	Calibration Due
Biconilog Antenna	ETS	3142C	00042672	2009/09/26
Receiver	SCHAFFNER	SMR4503	11725	2009/07/08
Spectrum Analyzer	R/S	FSP30	100755	2009/11/26
Double-Ridged-Wave-guide Horn Antenna	ETS	3115	6587	2009/08/02
Amplifier	Agilent	83017A	MY39500438	2009/11/26

5- Laboratory Accreditations and Measurement Uncertainty

5.1 Laboratory Accreditation

CNAS-Lab Cert. No.L 2244

Guangdong Galanz Enterprise Co. Ltd, EMC Laboratory has been accredited by CNAS for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 1999 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing. Valid time is from June 08, 2007 to September 29, 2010

FCC-Registration No.: 580210

Guangdong Galanz Enterprise Co. Ltd, EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files. Registration 580210, Renewal date December 07, 2009.

5.2 Measurement Uncertainty

of $\pm 3 \times 10^{-9}$ for Carrier Frequency Separation Measurement
of $\pm 3 \times 10^{-9}$ for Number of Hopping Frequencies Measurement
of $\pm 3 \times 10^{-9}$ for 20dB Bandwidth Measurement
of $\pm 3 \times 10^{-9}$ for Time of Occupancy (Dwell time) Measurement
of ± 0.8 dB for Peak Output Power Measurement
of ± 0.8 dB for Band Edge RF Conducted Measurement
of ± 0.8 dB for Spurious RF Conducted Emission Measurement
of ± 0.8 dB for Power Density
of ± 4.8 dB for Radiated Emissions
of ± 2.3 dB for Conducted Emissions

6- Technical Requirements and Results

6.1 Carrier Frequency Separation Measurement

Applicable Standard:

According to §15.247(a)(1), frequency hopping systems shall have hopping channel carrier frequencies separated by minimum of 25KHz or the 20dB bandwidth of the hopping channel, whichever is greater.

Test Procedure:

1. Connect the EUT RF output port to spectrum analyzer via calibrated coaxial cable and suitable attenuator (if necessary).
2. Activates the EUT System and execute the software prepared for test, if necessary.
3. To find out the maximum emission condition, the transmitting data rate of EUT is set to maximum data rate.
4. The Spectrums are scanned and allow the trace stabilized.
5. The separation between the peaks of the peaks of adjacent channel were measured by using delta-maker function of the spectrum analyzer

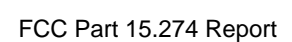
Spectrum analyzer setup condition :

Frequency Span : 2MHz
Resolution bandwidth : 100kHz
Video bandwidth : \geq RBW
Sweep : Auto
Detector function : Peak
Trace Mode : Max Hold

Test Result:

Temperature:	22 °C
Humidity:	45%
EUT Operation:	Data Transmission (hopping)
Test Date:	March 20, 2009

Carrier Frequency Separation [MHz]	[MHz] Limit
1.2084	> 0.025
Note: Test plots see next page figure 1.	



6.2 Number of Hopping Frequencies Measurement

Applicable Standard:

According to §15.247(a)(1)(iii), frequency hopping systems operating in the 2400MHz-2483.5 MHz bands shall use at least 15 hopping frequencies.

Test Procedure:

1. Connect the EUT RF output port to spectrum analyzer via calibrated coaxial cable and suitable attenuator (if necessary).
2. Activates the EUT System and executes the software prepared for test, if necessary.
3. To find out the maximum emission condition, the transmitting data rate of EUT is set to maximum data rate.
4. The spectrums are scanned and allow the trace to stabilize.
5. The number of hopping frequencies were counted on the spectrum analyzer and recorded.

Spectrum analyzer setup condition :

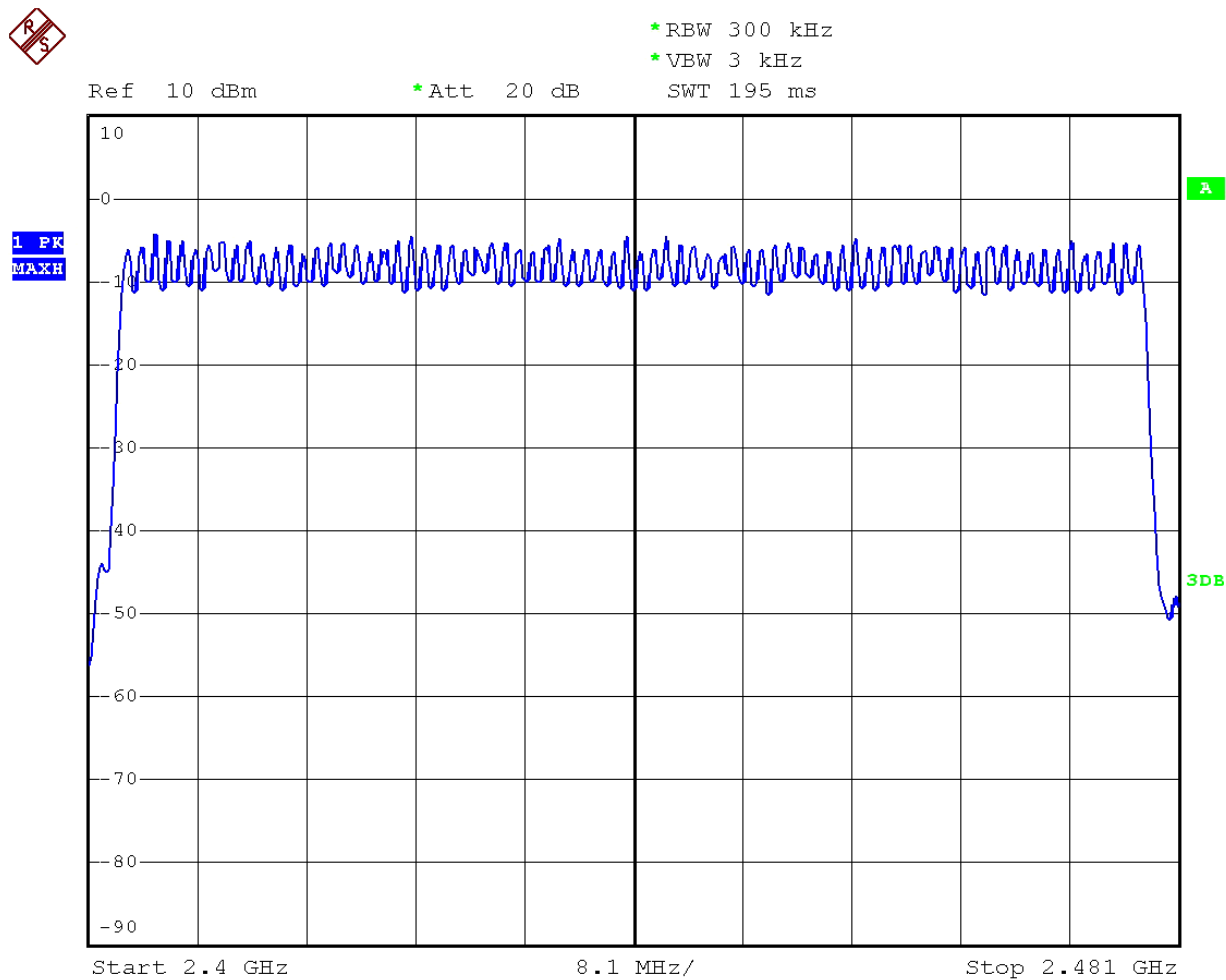
Frequency Span : 81MHz
Resolution bandwidth : 300KHz
Sweep : Auto
Detector function : Peak
Trace Mode : Max Hold

Test Result:

Temperature:	22 °C
Humidity:	45%
EUT Operation:	Data Transmission (hopping)
Test Date:	March 20, 2009

Number of Hopping Frequencies	[MHz] Limit
76	> 15
Note: Test plots see next page figure 2.	

Figure 2: Number of Hopping Frequencies



6.3 Time of Occupy (Dwell Time) Measurement

Applicable Standard:

According to §15.247(a)(1)(iii), for frequency hopping systems operating in the 2400MHz-2483.5 MHz, the average time of occupancy on any frequency shall not greater than 0.4 s within period of 0.4 seconds multiplied by the number of hopping channel employed.

Test Procedure:

1. Connect the EUT RF output port to spectrum analyzer via calibrated coaxial cable and suitable attenuator (if necessary).
2. Activates the EUT System and execute the software prepared for test, if necessary.
3. To find out the maximum emission condition, the transmitting data rate of EUT is set to maximum data rate.
4. The span of spectrum analyzer was set to zero (sweep time 30msec). The occupied time at center on a hopping frequency was observed and recorded as "Ton".
5. The spectrums are scanned by using the spectrum analyzer (*1). And the numbers of occupied channel per Nsec (period of 0.4 seconds multiplied by the number of hopping channels employed) were counted by using the delta-marker function of spectrum analyzer and recorded as "N".
6. The dwell time was calculated by $Ton \times N$.

Spectrum analyzer setup condition:

Frequency Span : Zero span

Resolution bandwidth : 10KHz

Video bandwidth : \geq RBW

Sweep : as necessary to capture the entire dwell time per hopping channel.

Detector function : Peak

Trace Mode : Max Hold

Test Result:

Temperature:	22 °C
Humidity:	45%
EUT Operation:	Data Transmission (hopping)
Test Date:	March 20, 2009

[ms]Dwell Time	[ms] Limit
1.4145ms x 248 = 350.796	< 400
Note: Test plots see next page figures 3, 4 and 5.	

Figure 3: Duration of one transmission

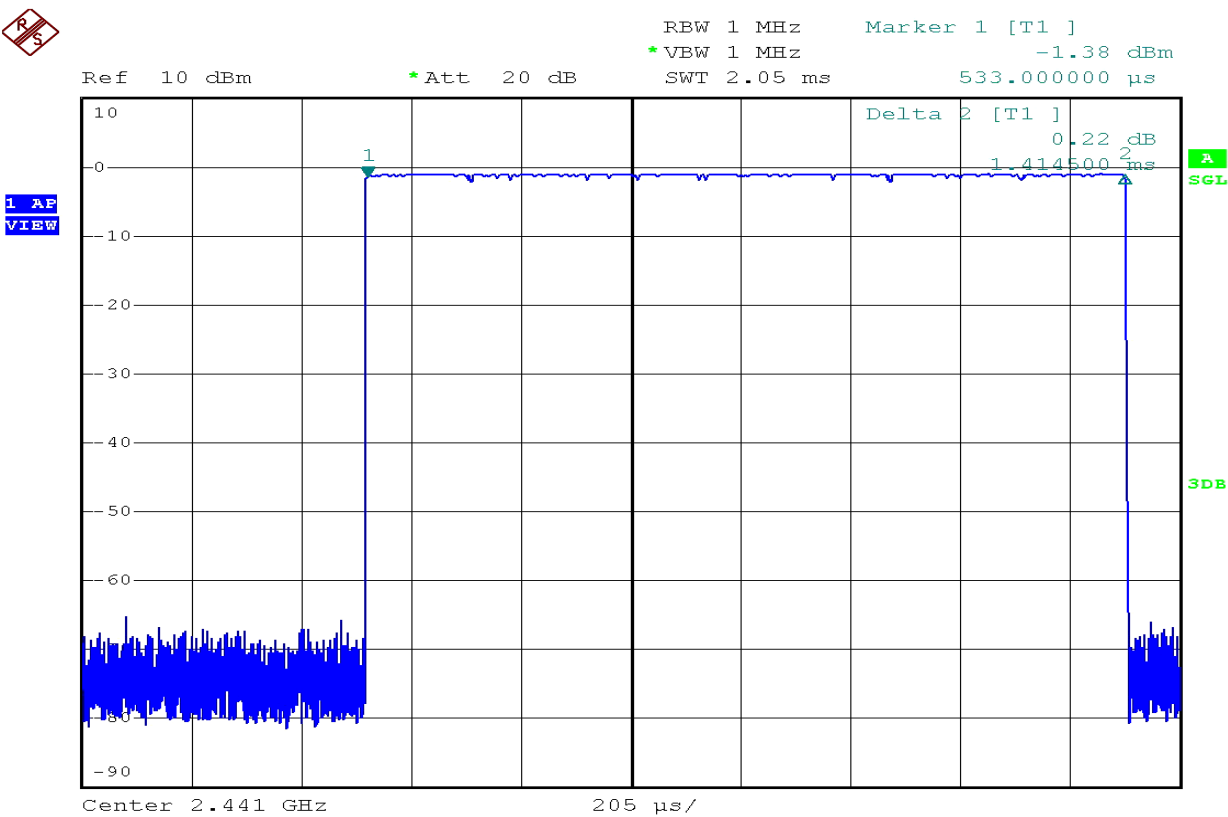


Figure 4: Number of Transmission at 3.8 s

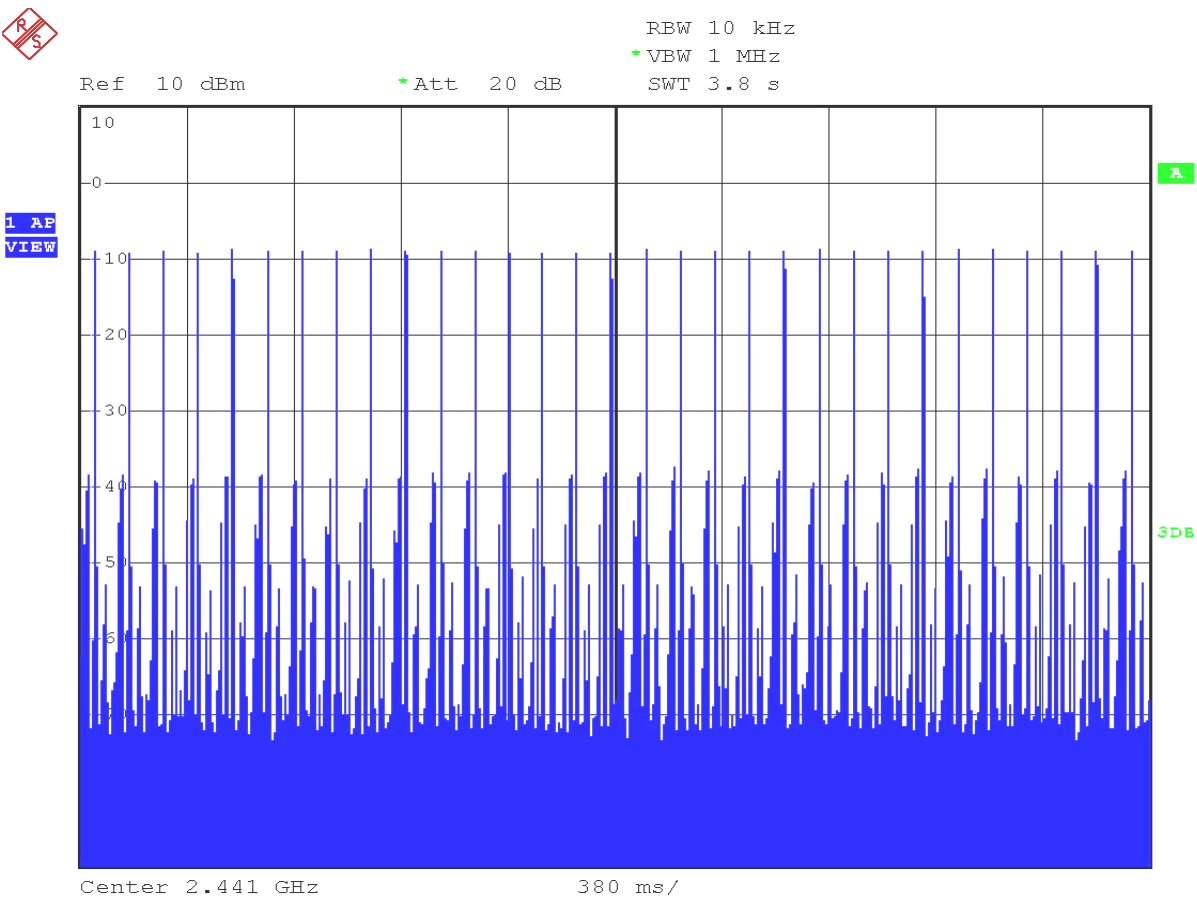
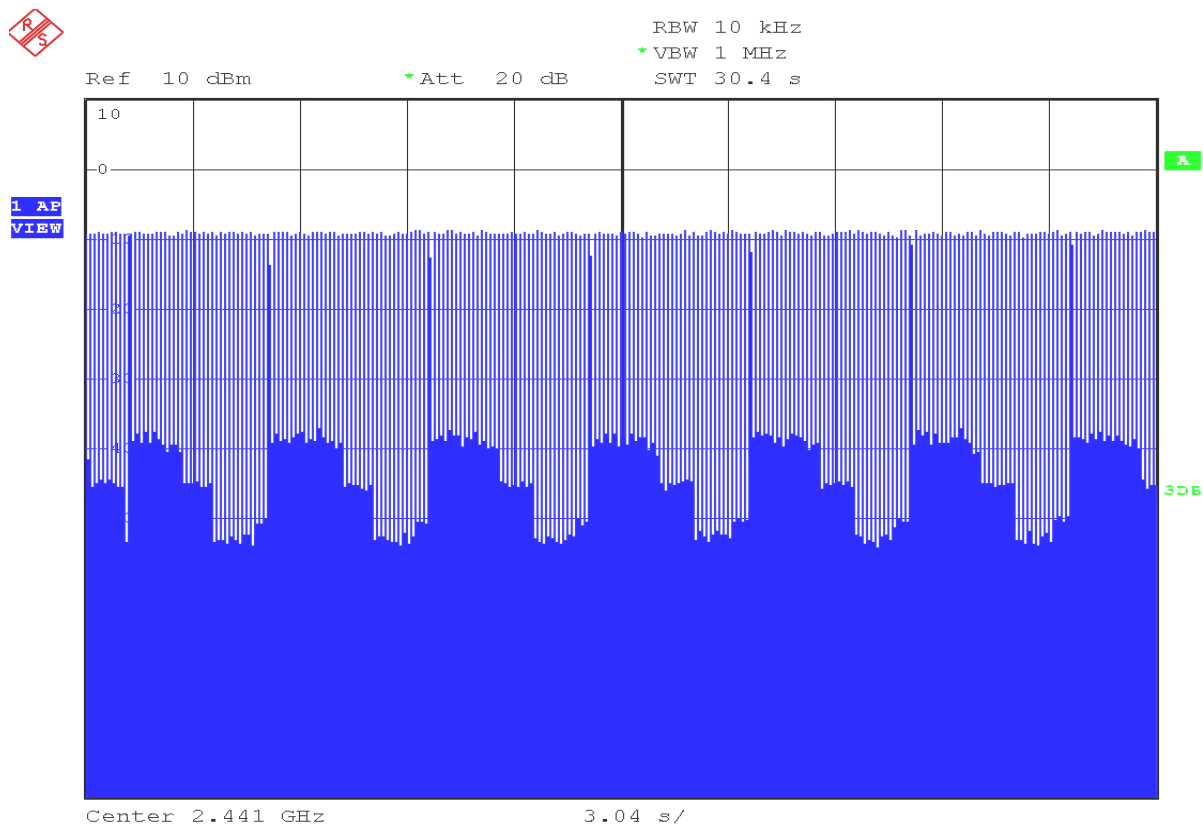


Figure 5: Number of Transmission at 30.4 s



6.4 Peak Output Power Measurement

Applicable Standard:

According to §15.247(b), for frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1Watt. for all other frequency hopping systems in the 2400 – 2483.5MHz band: 0.125 Watts.

Test Procedure:

1. Connect the EUT RF output port to spectrum analyzer via calibrated coaxial cable and suitable attenuator (if necessary).
2. Activates the EUT System and executes the software prepared for test, if necessary.
3. To find out the worst case, the transmitting data rate of EUT is varied with the different modes of operation. The final test condition is recorded in this report.
4. The spectrums are scanned and allow the trace to stabilize.
5. The peak output power was determined by using the marker-data function of spectrum analyzer or peak type power meter.

Spectrum Analyzer Set Up Conditions

Frequency Span : above 20dB bandwidth of the emission being measured

Resolution bandwidth : 3MHz

Video bandwidth : \geq RBW

Sweep : Auto

Detector function : Peak

Trace Mode : Max Hold

Test Result:

Temperature:	22 °C
Humidity:	45%
EUT Operation:	Data Transmission (without hopping)
Test Date:	March 20, 2009

Frequency	Factor	Reading	Power	Limit	Margin
[MHz]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
2403	5.20	-0.68	4.52	20.97	16.45
2441	5.20	-0.62	4.58	20.97	16.39
2478	5.20	-0.69	4.51	20.97	16.46

Note: Test plots see next page figures 6, 7 and 8

Figure 6: Peak Output Power-low channel

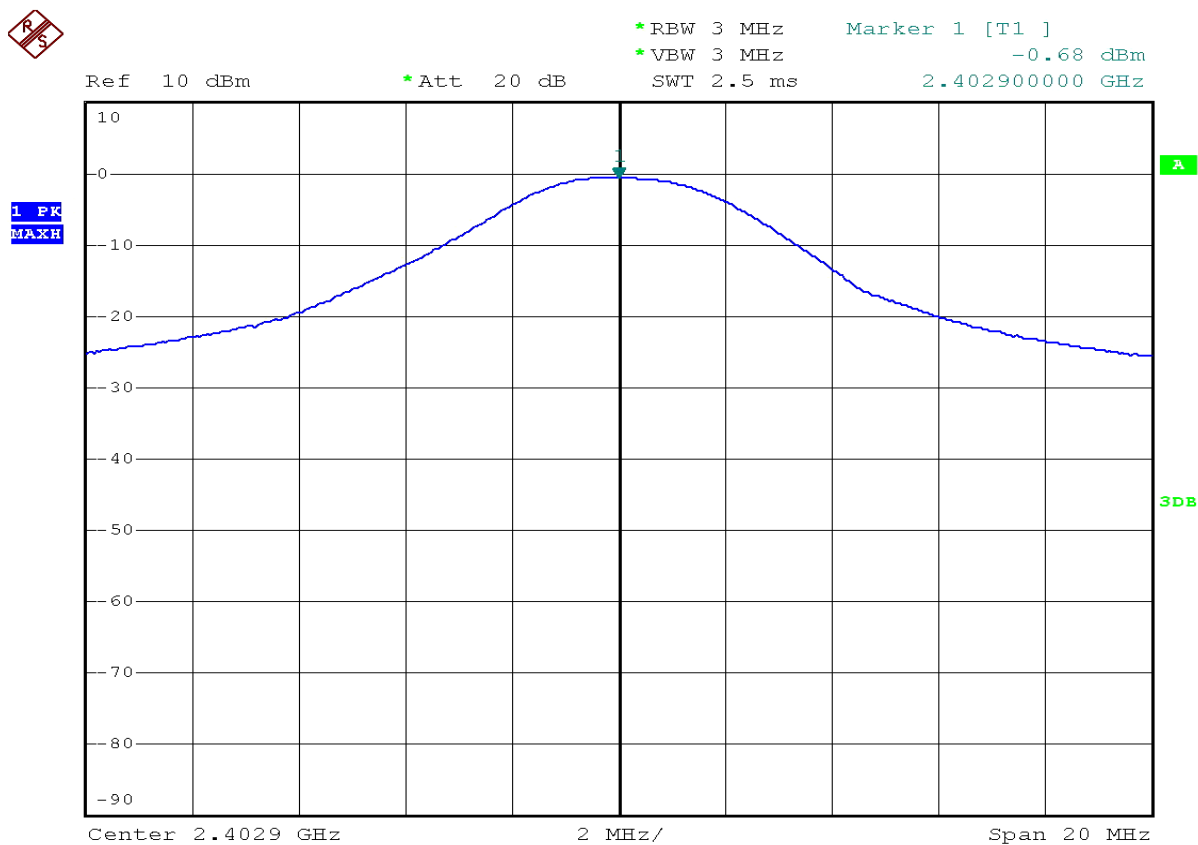


Figure 7: Peak Output Power-mid channel

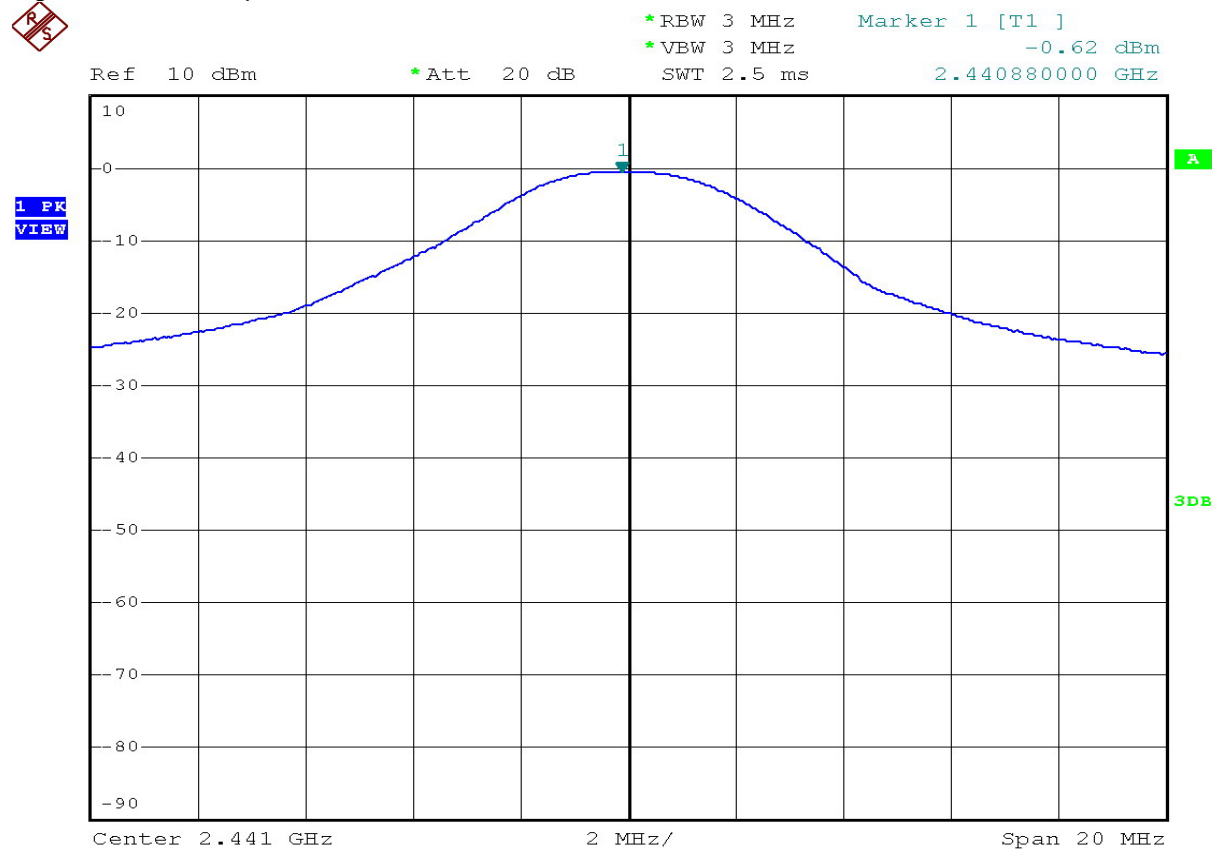
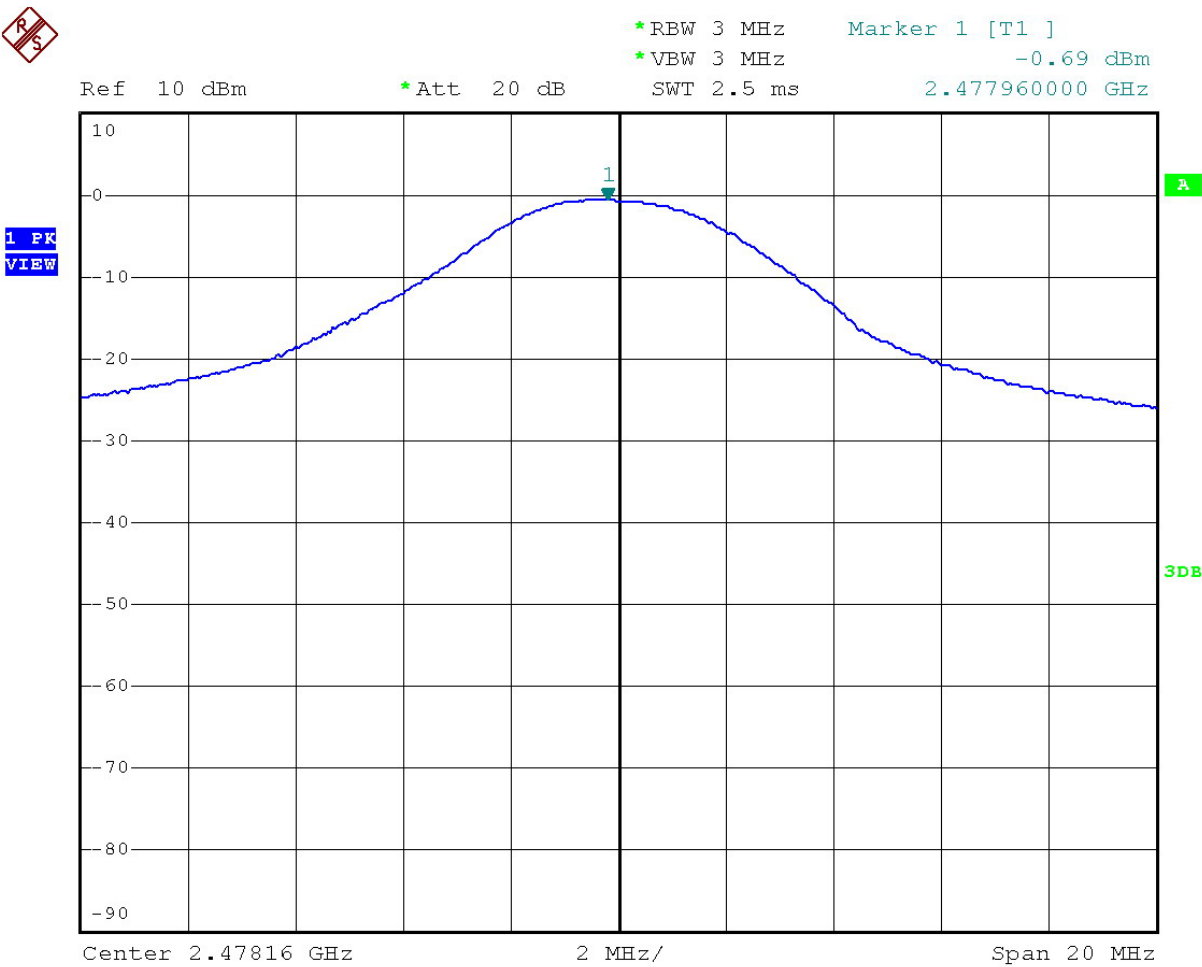


Figure 8: Peak Output Power-high channel



6.5 Band Edge of Conducted Emission

Applicable Standard:

According to §15.247(d), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum 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, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Test Procedure:

1. Connect the EUT RF output port to the spectrum analyzer via calibrated coaxial cable and suitable attenuator (if necessary).
2. Activates the EUT System and executes the software prepared for test, if necessary.
3. To find out the maximum emission condition, the transmitting data rate of EUT is set to maximum data rate.
4. The spectrum are scanned.
5. The emission at the band edge or the highest modulation product outside of band were measured by using the marker function of spectrum analyzer (*1).
6. The peak of the in-band emission were measured by using the marker to peak function of spectrum analyzer.
7. Above measurement were repeated at other side band edge.

Frequency Span : Wide enough to capture the peak level of emission on the band edge

Resolution bandwidth : 100kHz

Video bandwidth : \geq RBW

Sweep : Auto

Detector function : Peak

Trace Mode : Max Hold

Temperature:	22 °C
Humidity:	45%
EUT Operation:	Data Transmission (without hopping)
Test Date:	March 20, 2009

The unit does meet the requirement, see the next page figures 9 and 10.

Figure 9: Band Edge - low frequency side

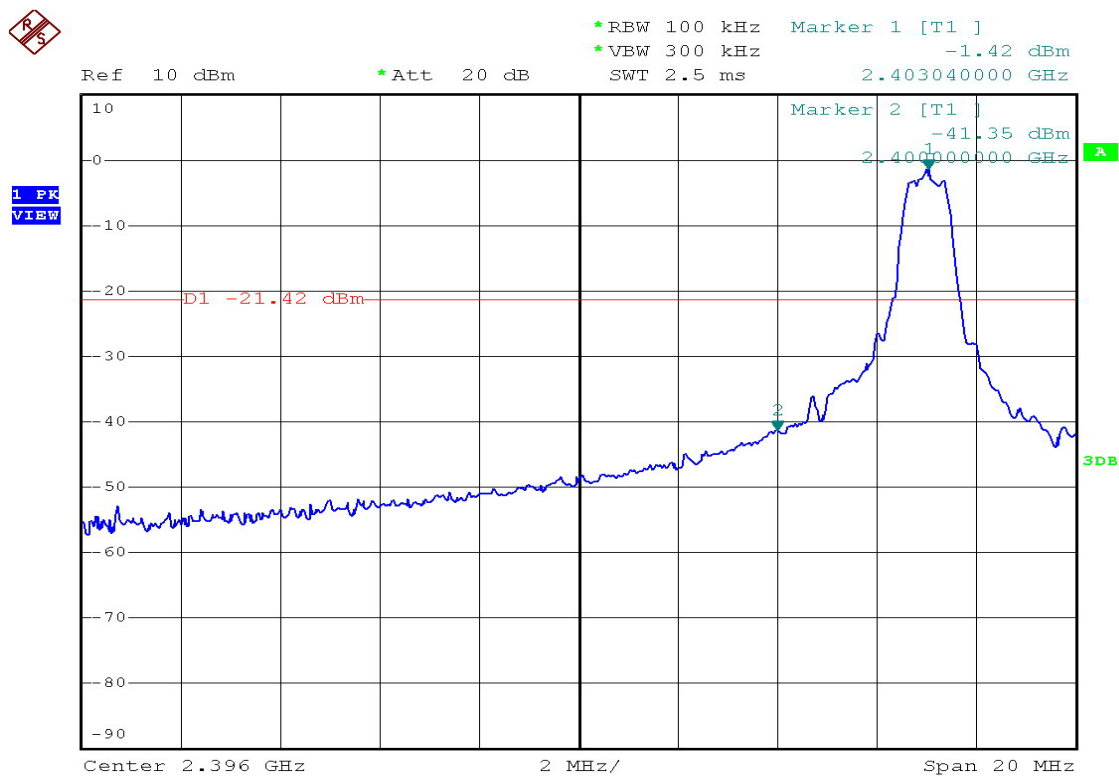
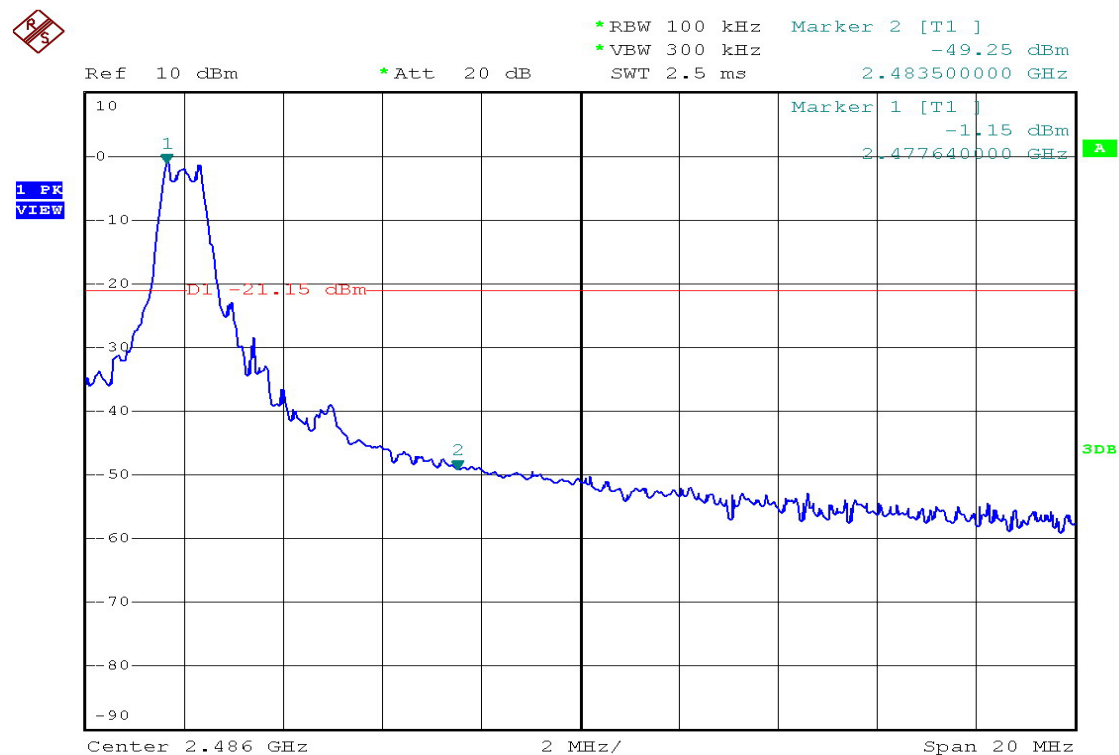


Figure 10: Band Edge – high frequency side



6.6 Spurious Radiated Emission Measurement

Applicable Standard:

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

Test Procedure:

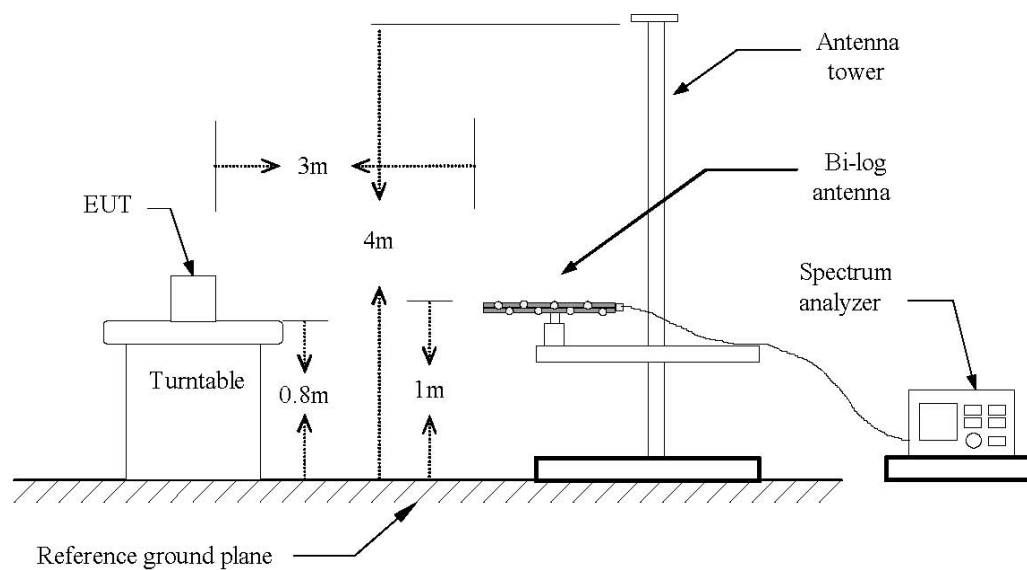
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until all frequency measured were complete.

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

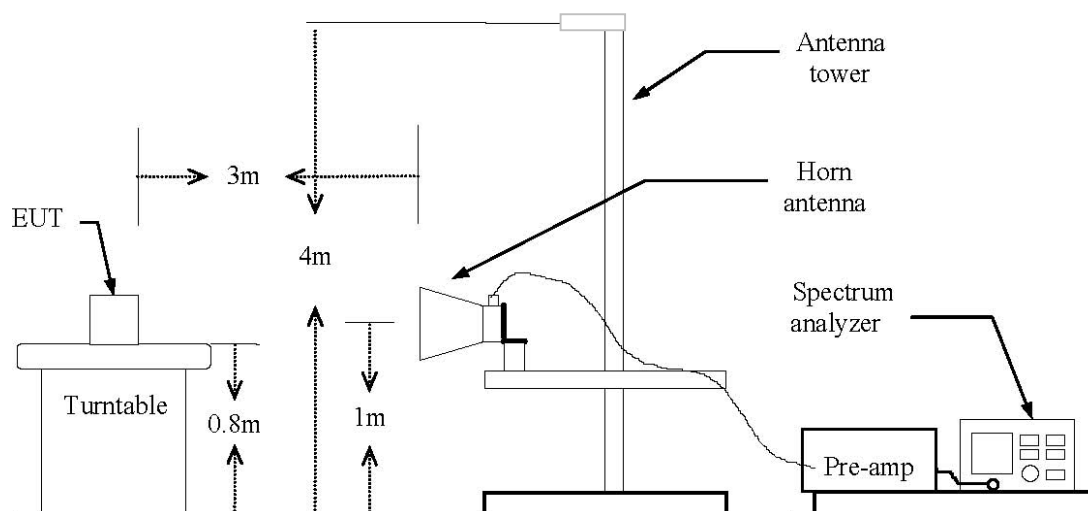
$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

Test Configuration Below 1 GHz:



Test Configuration Above 1 GHz:



Test Results:

Temperature:	24°C
Humidity:	45%
EUT Operation:	Data Transmission (without hopping)
Test Date:	March 20, 2009

Spurious Emission In the Frequency Rang Below 1GHz:

Fc= 2403MHz Transmitting Operation

Freq. (MHz)	Ant.Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
35.36	H	Peak	7.2	12.4	19.6	40.0	-20.4
628.00	H	Peak	17.4	19.3	36.7	46.0	-9.3
744.00	H	Peak	11.0	21.3	32.3	46.0	-13.7
170.00	V	Peak	27.2	11.4	38.6	43.5	-4.9
416.00	V	Peak	19.2	17.4	36.6	46.0	-9.4
600.00	V	Peak	13.5	19.3	32.8	46.0	-13.2

Fc= 2440MHz Transmitting Operation

Freq. (MHz)	Ant.Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
30.72	H	Peak	7.1	12.6	19.7	40.0	-20.3
174.00	H	Peak	21.4	11.4	32.8	43.5	-10.7
600.00	H	Peak	13.2	19.3	32.5	46.0	-13.5
37.92	V	Peak	5.4	12.4	17.8	40.0	-22.2
174.00	V	Peak	27.4	11.4	38.8	43.5	-4.7
600.00	V	Peak	19.3	19.3	38.6	46.0	-7.4

Fc= 2478MHz Transmitting Operation

Freq. (MHz)	Ant.Pol. (H/V)	Detector Mode (PK/QP)	Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)
33.36	H	Peak	8.3	11.2	19.5	40.0	-20.5
210.00	H	Peak	19.6	8.8	28.4	43.5	-15.1
656.00	H	Peak	12.3	20.2	32.5	46.0	-13.5
37.04	V	Peak	4.7	12.4	17.1	40.0	-22.9
174.00	V	Peak	27.1	11.4	38.5	43.5	-5.0
600.00	V	Peak	15.1	19.3	34.4	46.0	-11.6

Note: For spurious emission measurement, the compliance tests were performed both of horizontally placed and vertically placed in EUT(X position, Y position, Z position). As a result, the data of operation mode that produce the maximum emission were reported. The other emissions are more than 20dB below the limit.

Spurious Emission In the Frequency Rang above 1GHz:

Fc= 2403MHz Transmitting Operation- Horizontal

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
				Peak (dBuV/m)	AV (dBuV/m)			
4806.00	44.49	-	2.68	47.17	-	74.00	54.00	-26.83
7209.00	49.91	-	3.68	53.59	-	74.00	54.00	-20.41
9612.00	-	-	-	-	-	-	-	-
12015.00	-	-	-	-	-	-	-	-
14418.00	-	-	-	-	-	-	-	-
16821.00	-	-	-	-	-	-	-	-
19224.00	-	-	-	-	-	-	-	-
21627.00	-	-	-	-	-	-	-	-
24030.00	-	-	-	-	-	-	-	-

Fc= 2403MHz Transmitting Operation- Vertical

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
				Peak (dBuV/m)	AV (dBuV/m)			
4806.00	44.84	-	2.68	47.52	-	74.00	54.00	-26.48
7209.00	48.67	-	3.68	52.35	-	74.00	54.00	-21.65
9623.00	-	-	-	-	-	-	-	-
12009.00	-	-	-	-	-	-	-	-
14432.00	-	-	-	-	-	-	-	-
16831.00	-	-	-	-	-	-	-	-
19229.00	-	-	-	-	-	-	-	-
21623.00	-	-	-	-	-	-	-	-
24017.00	-	-	-	-	-	-	-	-

Note: Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The other emissions are more than 20dB below the limit.

Fc= 2440MHz Transmitting Operation- Horizontal

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
				Peak (dBuV/m)	AV (dBuV/m)			
4880.00	44.64	-	2.70	47.34	-	74.00	54.00	-26.66
7320.00	49.89	-	3.70	53.59	-	74.00	54.00	-20.41
9768.00	-	-	-	-	-	-	-	-
12210.00	-	-	-	-	-	-	-	-
14652.00	-	-	-	-	-	-	-	-
17094.00	-	-	-	-	-	-	-	-
19536.00	-	-	-	-	-	-	-	-
21978.00	-	-	-	-	-	-	-	-
24420.00	-	-	-	-	-	-	-	-

Fc= 2440MHz Transmitting Operation- Vertical

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
				Peak (dBuV/m)	AV (dBuV/m)			
4880.00	46.22	-	2.70	47.34	-	74.00	54.00	-26.66
7320.00	50.54	-	3.70	53.59	-	74.00	54.00	-20.41
9768.00	-	-	-	-	-	-	-	-
12210.00	-	-	-	-	-	-	-	-
14652.00	-	-	-	-	-	-	-	-
17094.00	-	-	-	-	-	-	-	-
19536.00	-	-	-	-	-	-	-	-
21978.00	-	-	-	-	-	-	-	-
24420.00	-	-	-	-	-	-	-	-
24420.00	-	-	-	-	-	-	-	-

Note: Data of measurement within this frequency range shown "---" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The other emissions are more than 20dB below the limit.

Fc= 2478MHz Transmitting Operation- Horizontal

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
				Peak (dBuV/m)	AV (dBuV/m)			
4956.00	49.78	-	2.70	52.48	-	74.00	54.00	-21.52
7437.00	55.01	-	3.90	58.91	-	74.00	54.00	-15.09
9860.00	-	-	-	-	-	-	-	-
12325.00	-	-	-	-	-	-	-	-
14870.00	-	-	-	-	-	-	-	-
17355.00	-	-	-	-	-	-	-	-
19850.00	-	-	-	-	-	-	-	-
22289.00	-	-	-	-	-	-	-	-
24750.00	-	-	-	-	-	-	-	-

Fc= 2478MHz Transmitting Operation- Vertical

Freq. (MHz)	Peak Reading (dBuV)	AV Reading (dBuV)	Ant./CL/ Amp.CF (dB)	Actual FS		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin
				Peak (dBuV/m)	AV (dBuV/m)			
4956.00	45.66	-	2.70	48.36	-	74.00	54.00	-25.64
7437.00	50.67	-	3.90	54.57	-	74.00	54.00	-19.43
9860.00	-	-	-	-	-	-	-	-
12325.00	-	-	-	-	-	-	-	-
14870.00	-	-	-	-	-	-	-	-
17355.00	-	-	-	-	-	-	-	-
19850.00	-	-	-	-	-	-	-	-
22289.00	-	-	-	-	-	-	-	-
24750.00	-	-	-	-	-	-	-	-
4956.00	-	-	-	-	-	-	-	-

Note: Data of measurement within this frequency range shown “---” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The other emissions are more than 20dB below the limit.

6.7 20dB Bandwidth Measurement

Standard Applicable:

For frequency hopping spread spectrum systems, FCC Part 15.247 requires the 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.

Occupied bandwidth was performed by connecting the output of the EUT to the input of a spectrum analyzer.

Test Procedure:

Use the following spectrum analyzer settings:

Span = 2MHz

Resolution Bandwidth = 30KHz

Video Bandwidth = 100KHz

Sweep = auto

Detector function = peak

Trace = max hold

Test Results:

Temperature:	24°C
Humidity:	49%
EUT Operation:	Data Transmission (without hopping)
Test Date:	March 20, 2009

Frequency (MHz)	20dB Bandwidth (MHz)
2403	1.10
2441	1.09
2478	1.12
Note: Test plots see next page figures 11,12 and 13.	

Figure 11- 20dB bandwidth Measurement (fc=2403MHz)

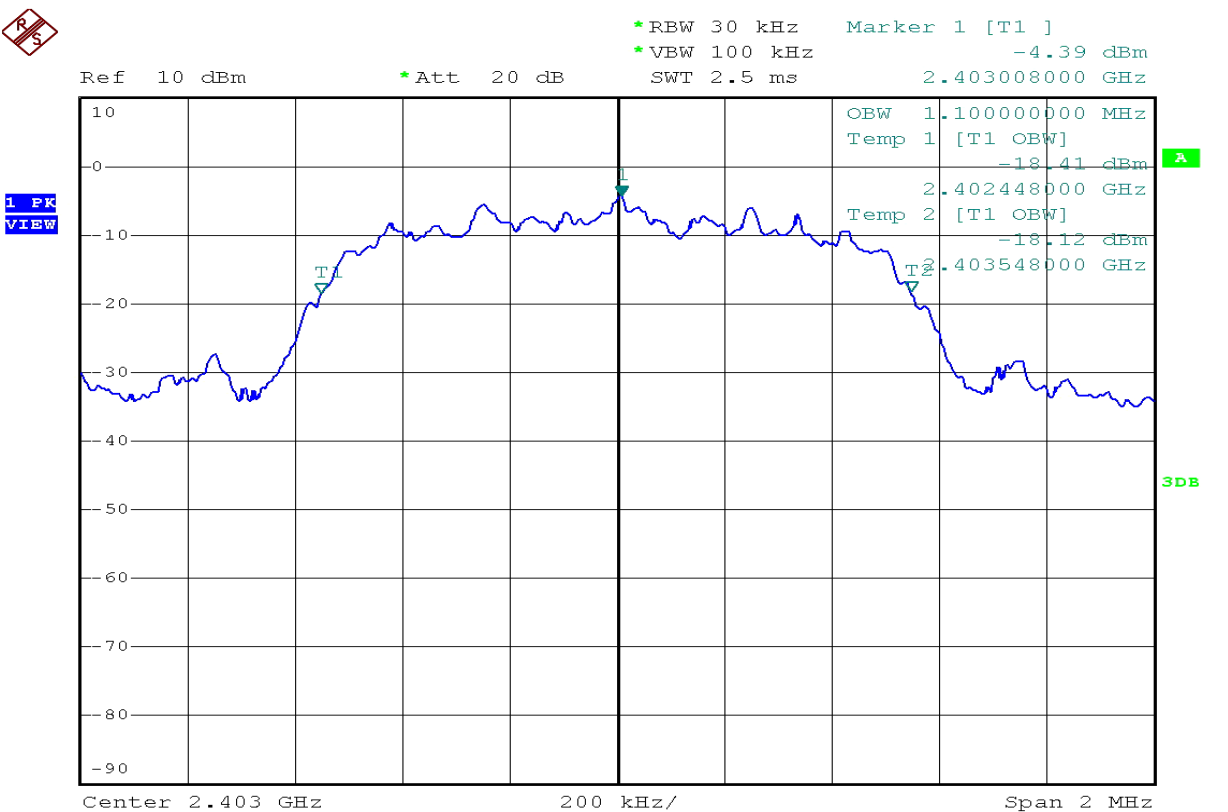


Figure 12- 20dB bandwidth Measurement (fc=2441MHz)

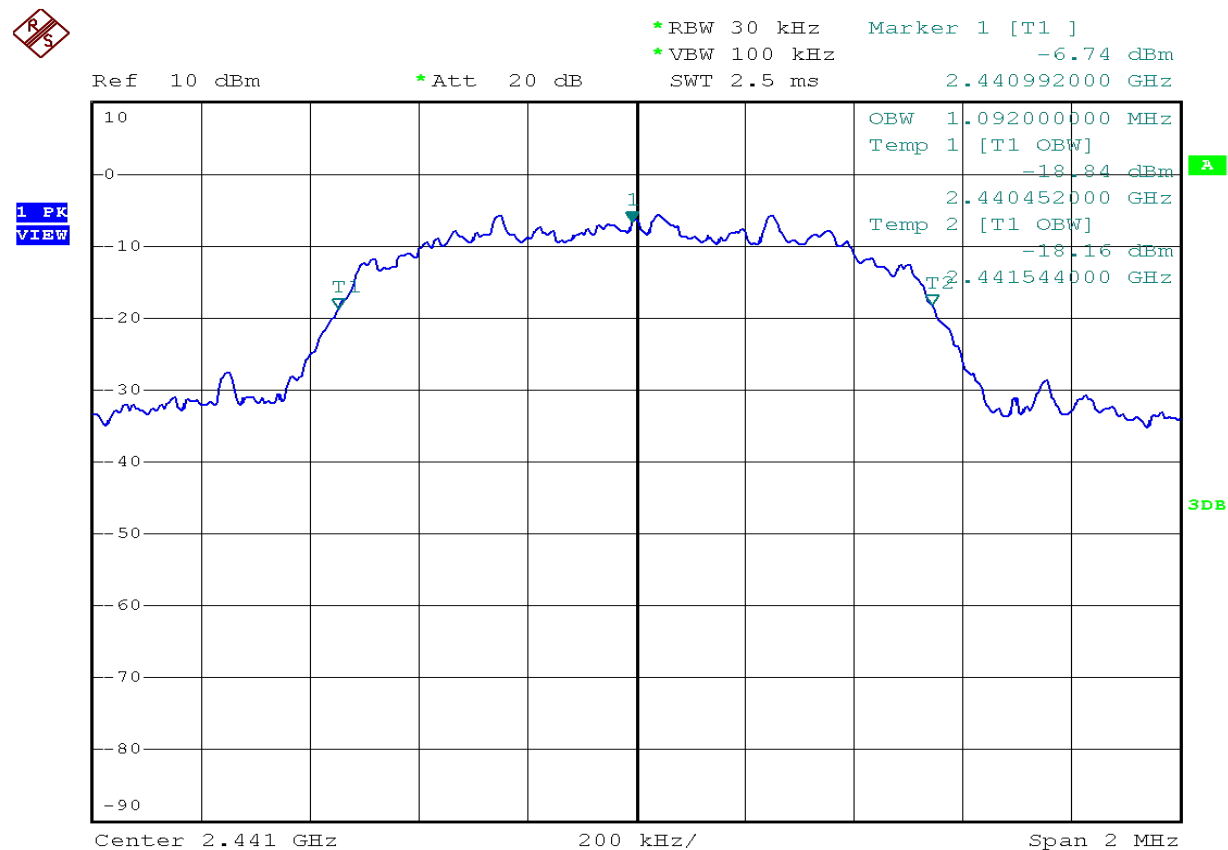
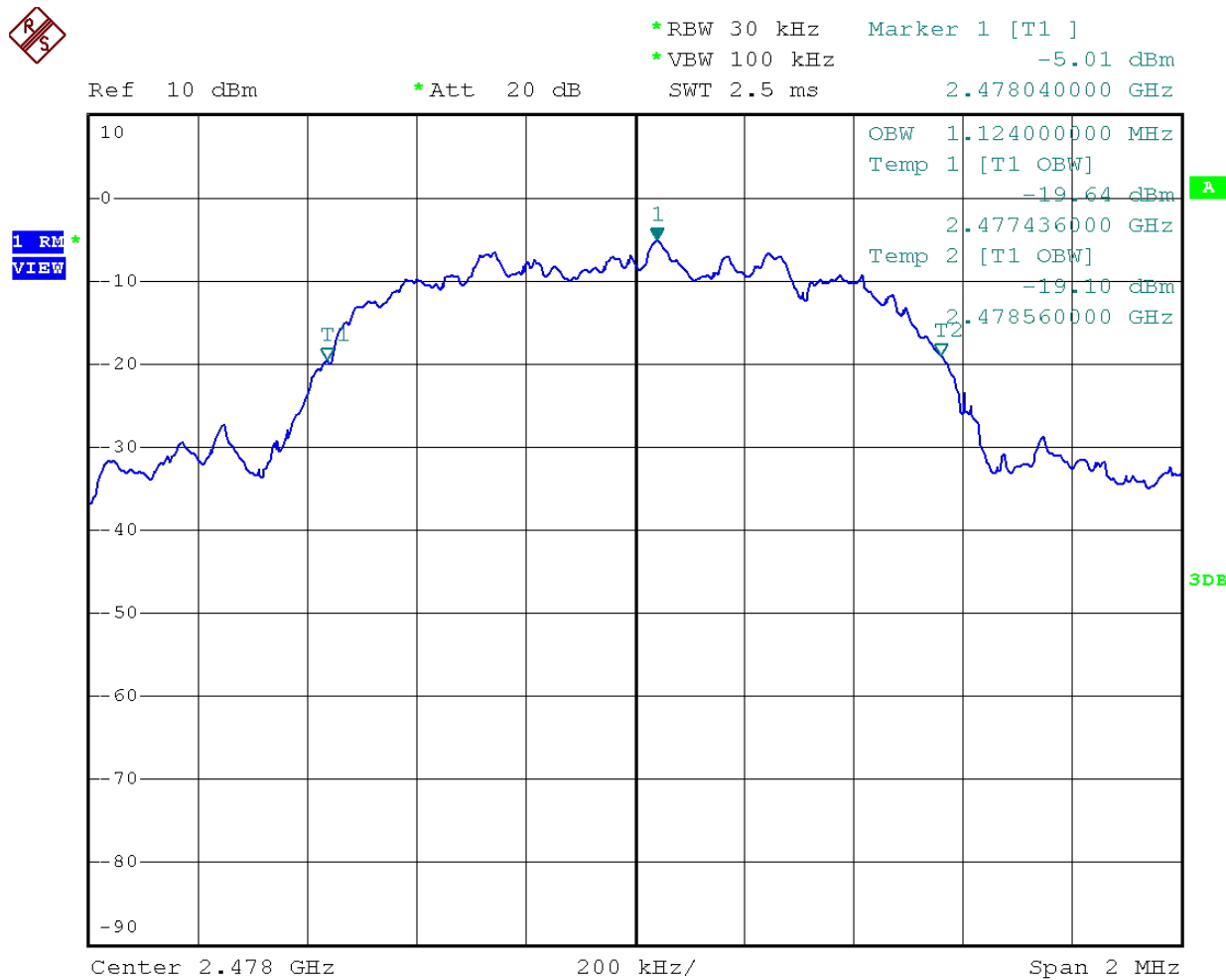


Figure 13- 20dB bandwidth Measurement (fc=2478MHz)



6.8 RF Exposure

Standard Applicable

According to 1.1307 (b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a portable device.

Measurement Result:

This is a portable device and the max peak output power is 4.58 dBm = (2.87mW). Lower than low threshold 60/f GHz mW = (24.21 mW), d <2.5 cm general population category.

The SAR/MPE measurement is not necessary.

6.9 Antenna Requirement

Standard Applicable

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than furnished by the responsible party shall be used with the device. And according to §15.246(1), 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 6 dBi.

Antenna Construction:

The directional gains of antenna used for transmitting is 1.3~1.5 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

The unit does meet the requirement.