FCC Test Report

for

Evoluent Vertical Mouse 3 Wireless – Right Hand

Trade Name	**:**	**Evoluent**
Model Number	**:**	**VM3W-R**
FCC ID	**:**	**TUQ0360WR**
Report Number	**:**	**RF-H180-0712-108**
Date of Receipt	**:**	**Dec. 13, 2007**
Date of Report	**:**	**Feb. 5, 2008**

Prepared for

K-WELL INTERNATIONAL CORP.

10F, NO. 57, Sec. 4, Jhonghsiao E. Rd., Da-An Dist., Taipei City, Taiwan.

Prepared by

Central Research Technology Co.

EMC Test Laboratory

11, Lane41, Fushuen St., Jungshan Chiu, Taipei, Taiwan, 104, R.O.C.

Certification of Compliance

Equipment under Test	:	**Evoluent Vertical Mouse 3 Wireless – Right Hand**
Model No.	:	**VM3W-R**
FCC ID	:	**TUQ0360WR**
Manufacturer	:	**K-WELL INTERNATIONAL CORP.**
Applicant	:	**K-WELL INTERNATIONAL CORP.**
Address	:	**10F, NO. 57, Sec. 4, Jhonghsiao E. Rd., Da-An Dist., Taipei City, Taiwan.**
Applicable Standards	:	**47 CFR part 15, Subpart C**
Date of Testing	:	**Feb. 4, 2008**
Deviation	:	**N/A**
Condition of Test Sample	:	**Prototype**

We, **Central Research Technology Co**., hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen , **DATE :** Feb. 5, 2008
(Cathy Chen/Technical Manager)

APPROVED BY : J. Y. Shih , **DATE :** Feb. 5, 2008
(Tsun-Yu Shih/Laboratory Head)

Contents

1. General Description 4

1.1 General Description of EUT 4

1.2 Test Methodology 4

1.3 Applied standards 5

1.4 The Support Units 8

1.5 Layout of the Setup 8

1.6 Test Capability 9

1.7 Measurement Uncertainly 11

2. Field strength of Fundamental 12

2.1 Limits for Field strength of Fundamental 12

2.2 Test Instruments 13

2.3 Test Procedures 14

2.4 Test Configurations 15

2.5 Test Results 16

3. Radiated Emission Measurement 21

3.1 Limit for Radiated Emission Measurement 21

3.2 Test Instruments 22

3.3 Test Procedures 23

3.4 Test Configuration 24

3.5 Test Results 25

Attachment 1 – Photographs of the Test Configurations

Attachment 2 – External Photographs of EUT

Attachment 3 – Internal Photographs of EUT

1. General Description

1.1 General Description of EUT

Equipment Under Test	:	Evoluent Vertical Mouse 3 Wireless – Right Hand
Model No.	:	VM3W-R
Power in	:	3.0Vdc
Test Voltage	:	3.0Vdc (1.5Vdc Battery*2)
Manufacturer	:	K-WELL INTERNATIONAL CORP.
Channel Numbers	:	3
Frequency Range	:	2403MHz~2478MHz
Fundamental Frequency	:	2403, 2453, 2478 MHz
Function Modulation	:	FSK
Function Description	:	

The EUT is used to transmit control command only. Please refer to the user's manual for the details.

1.2 Test Methodology

For this E.U.T., the radiated emissions measurement performed according to the procedures illustrated in ANSI C63.4:2003 and other required were illustrated in separate sections of this test report for detail.

1.3 Applied standards

(1) Field strength of Fundamental

According to 15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	**Field Strength of Fundamental (mV/m)**	**Field Strength of Harmonics (uV/m)**
902 – 928 MHz	50	500
2400 – 2483.5 MHz	50	500
5725 – 5875 MHz	50	500
24.0 – 24.25 GHz	250	2500

(2) Radiation emission

According to 15.249(d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

(3) Radiated emission limits, general requirements.

According to 15.209, except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	**Field Strength (uV/m)**	**Measurement Distance (m)**
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

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

(4) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
[2]1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(2)
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

(5) Conducted Limit

For intentional device, according to §15.207(a) line conduction emission limit is as below table.

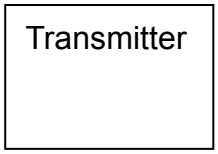
Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

1.4 The Support Units

No.	Unit	Model No./ Serial No.	Teade Name	PowerCode	Supported by lab.
NA	*	*	*	*	*

1.5 Layout of the Setup



Connecting Cables :

No.	Cable	Length	Shielded	Ferrite Core	Shielded Backshell	Supported by lab.	Note
N/A	*	*	*	*	*	*	*

Justification:

For both conducted and radiated emission below 1GHz, the system was configured for typical fashion as a customer could normal use it.

For radiated emission, measurement of radiated emission from digital circuit is performed with normal transmitting.

1.6 Test Capability

Test Facility

The test facility used for evaluating the conformance of the EUT with each standard in the present report meets what required in CISPR16-1-4, CISPR16-2-3 and ANSI C63.4.

Test Room	Type of Test Room	Descriptions
☐ TR1	10m semi-anechoic chamber (23m×14m×9m)	Complying with the NSA requirements in documents CISPR 22 and ANSI C63.4. For the radiated emission measurement.
☐ TR10	3m semi-anechoic chamber (9m × 6m × 6m)	
☑ TR11	3m semi-anechoic chamber (9m × 6m × 6m)	
☐ TR4	Shielding Room (5m×3m×3m)	For the RF conducted emission measurement.
☐ TR5	Shielding Room (8m×5m×4m)	For the conducted emission measurement.

Test Laboratory Competence Information

Central Research Technology Co. has been accredited/filed/authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	R.O.C. (Taiwan)	TAF	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033, SL2-IS-E-0033, SL2-R1/R2-E-0033, SL2-A1-E-0033	ISO/IEC 17025
Site Filing Document	USA	FCC	474046, TW1021	Test facility list & NSA Data
	Canada	IC	4699A-1,-2,-3	Test facility list & NSA Data
	Japan	VCCI	R-1527,C-1609,T-131	Test facility list & NSA Data
Authorization Certificate	Germany	TUV	10021687-2007	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.7 Measurement Uncertainly

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor k = 2. The values are less than U_{cispr} in table 1 of CISPR 16-4-2 and which are shown as below.

Test Item	Measurement Uncertainty	
Radiated Emission: (30MHz~200MHz)	Horizontal: 3.3dB；Vertical: 3.4dB	
Radiated Emission: (200MHz~1GHz)	Horizontal: 3.7dB；Vertical: 3.7dB	
Radiated Emission: (above 1GHz)	Horizontal: 4.4dB；Vertical: 4.4dB	
Line Conducted Emission	ESH2-Z5	4.3 dB
	ENV 4200	4.5 dB

2. Field strength of Fundamental

Result: PASS

2.1 Limits for Field strength of Fundamental

Fundamental Frequency	Peak	Average
☐ 902 – 928 MHz	500mV/m (**114dBuV/m**)	50mV/m (**94dBuV/m**)
☑ 2400 – 2483.5 MHz	500 mV/m (**114dBuV/m**)	50 mV/m (**94dBuV/m**)
☐ 5725 – 5875 MHz	500 mV/m (**114dBuV/m**)	50 mV/m (**94dBuV/m**)
☐ 24.0 – 24.25 GHz	2500 mV/m (**128dBuV/m**)	250 mV/m (**108dBuV/m**)

2.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Spectrum	R&S	FSP 7/ 100106	Aug 5,, 2007	Aug 5, 2008
Horn Antenna	EMCO	3117/ 57408	Feb. 12, 2007	Feb. 12, 2008
Pre-Amplifier	MITEQ	JS4-00101800-28-5A/742229	July 31, 2007	July 31, 2008
TR11 Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	July 1, 2007	July 1, 2008

Note：

1. The calibrations are traceable to NML/ROC.
2. NCR: No Calibration Required

Instrument Setting

RBW	VBW	Detector	Trace	Comment
1MHz	3MHz	Peak	Maxhold	

Climatic Condition

Ambient Temperature：27°C ; Relative Humidity ：68%

2.3 Test Procedures

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

c. If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT was set 3m away from the interference receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine higher emission level and record it.

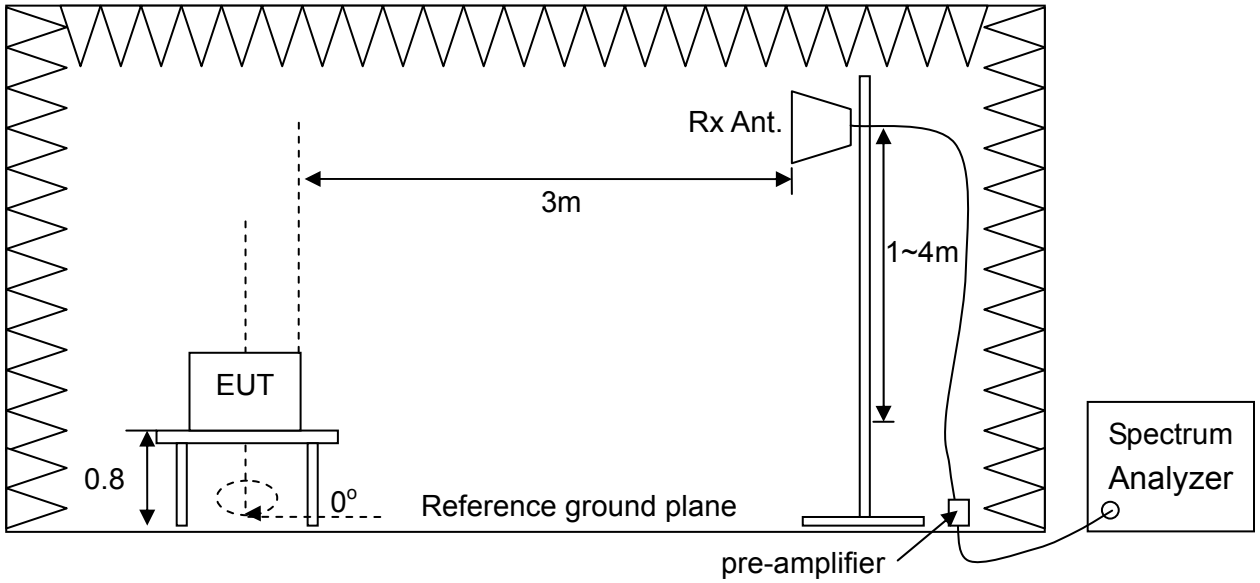
g. Then measure frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. Set the spectrum detector to be Peak or Average to find out the maximum level occurred.

i. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.

j. Change the receiving antenna to another polarization to measure radiated emission by following step e. to i. again.

2.4 Test Configurations



2.5 Test Results

Test Mode **: Transmitter**

Test Distance **:** 3m **Tester** **:** Bill

Frequency (MHz)	Polarization	Reading Data (dBuV)		Correction Factor (dB/m)	Output Field Strength (dBμV/m)		Limit (dBμV/m)		Margin (dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
2403	V	87.63	68.13	4.76	92.40	72.90	113.98	93.98	21.58	21.08
	H	90.05	70.55	4.76	94.81	75.31	113.98	93.98	19.17	18.67
2453	V	88.33	68.83	4.90	93.23	73.73	113.98	93.98	20.75	20.25
	H	91.06	71.56	4.90	95.96	76.46	113.98	93.98	18.02	17.52
2478	V	85.79	66.29	4.85	90.64	71.14	113.98	93.98	23.34	22.84
	H	89.03	69.53	4.85	93.89	74.39	113.98	93.98	20.09	19.59

Note：

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Output Field Strength (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Output Field Strength
4. The average value of fundamental frequency is:

   Average = Peak value + 20log(Duty cycle)

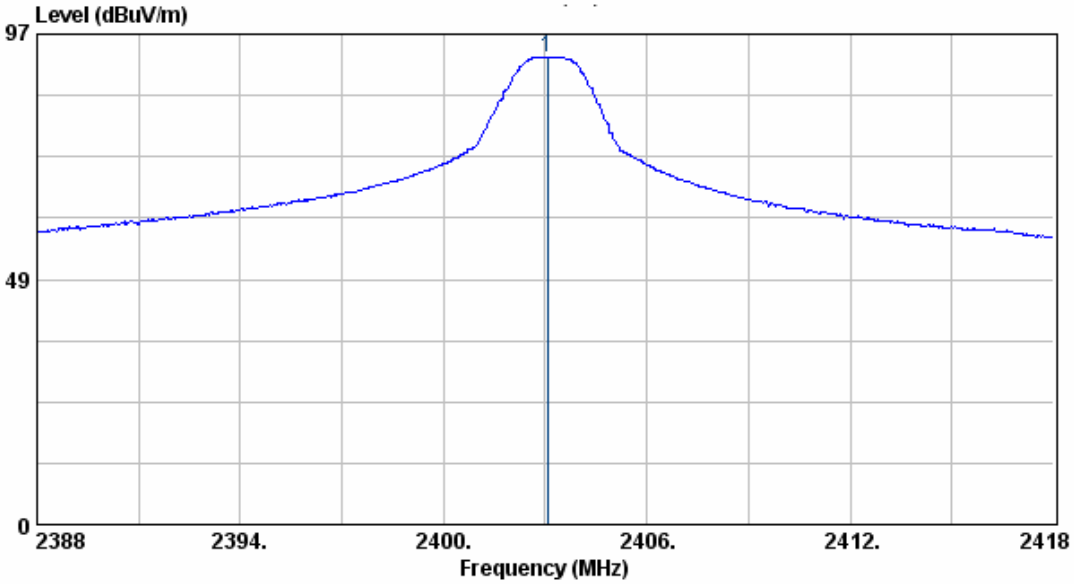
   Where the duty factor is calculated from following formula:

   $20\log(\text{Duty Cycle}) = 20\log\frac{0.35}{2.96+0.35} = -19.5\text{dB}$

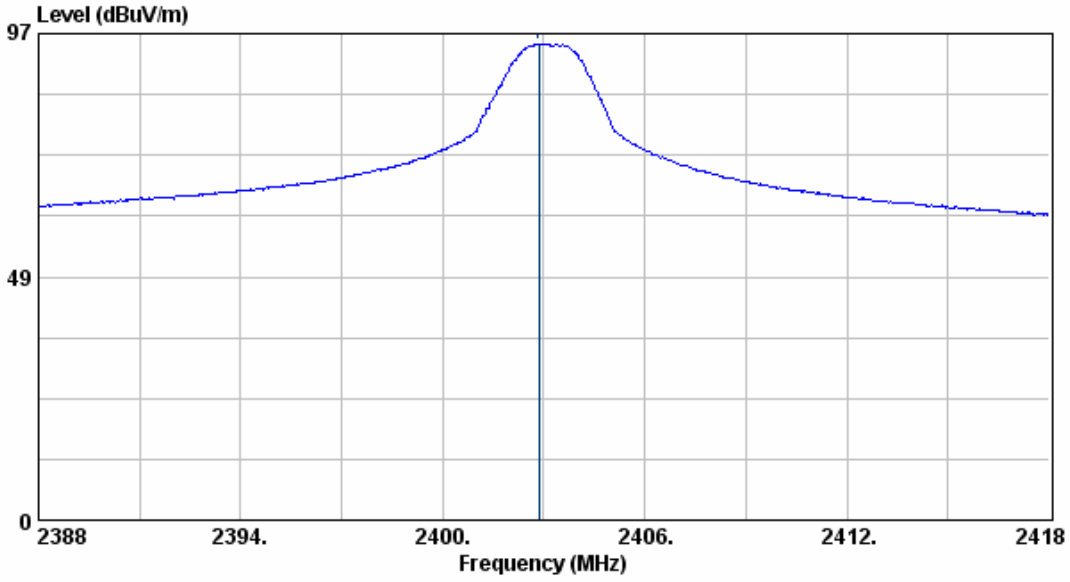
   please see page 20 for plotted duty cycle.

2403MHz

Vertical Polarization

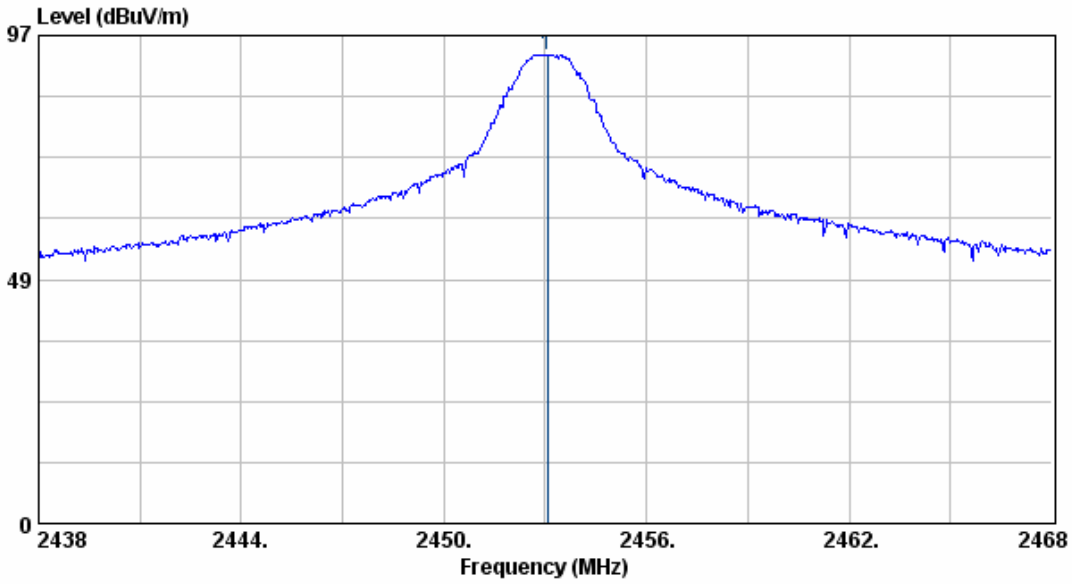


Horizontal Polarization

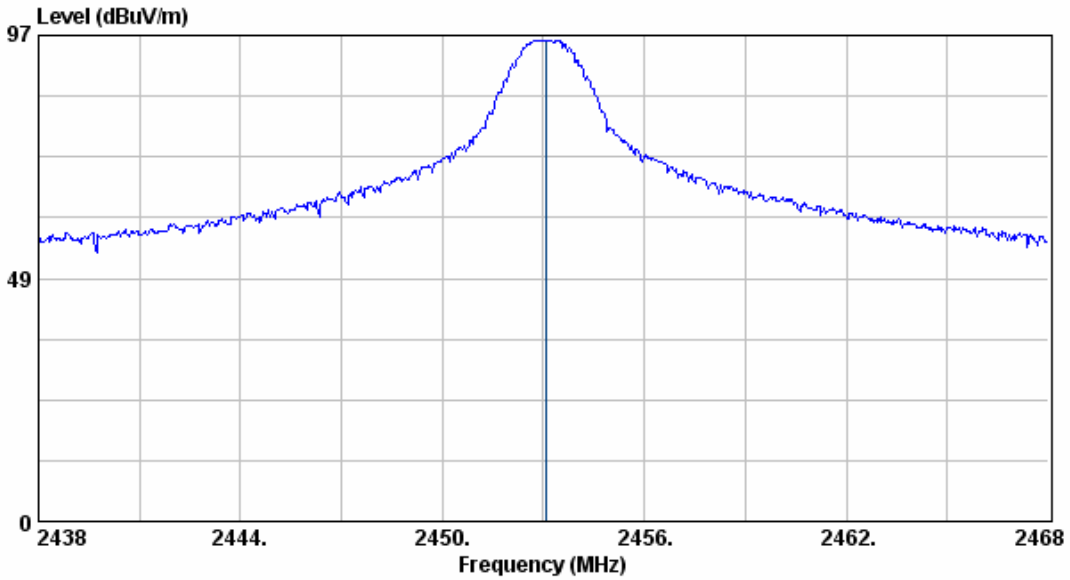


2453MHz

Vertical Polarization

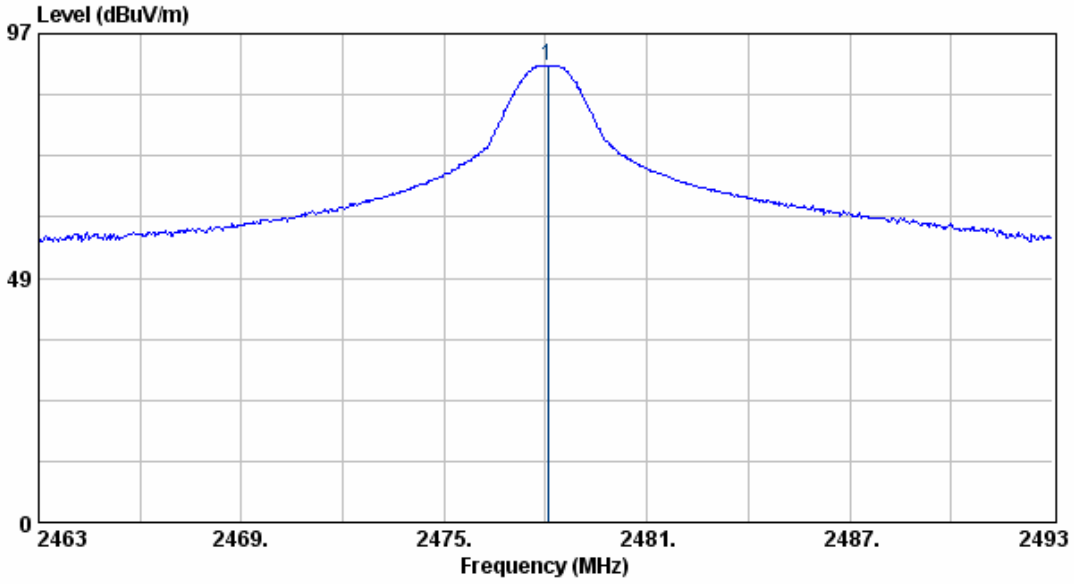


Horizontal Polarization

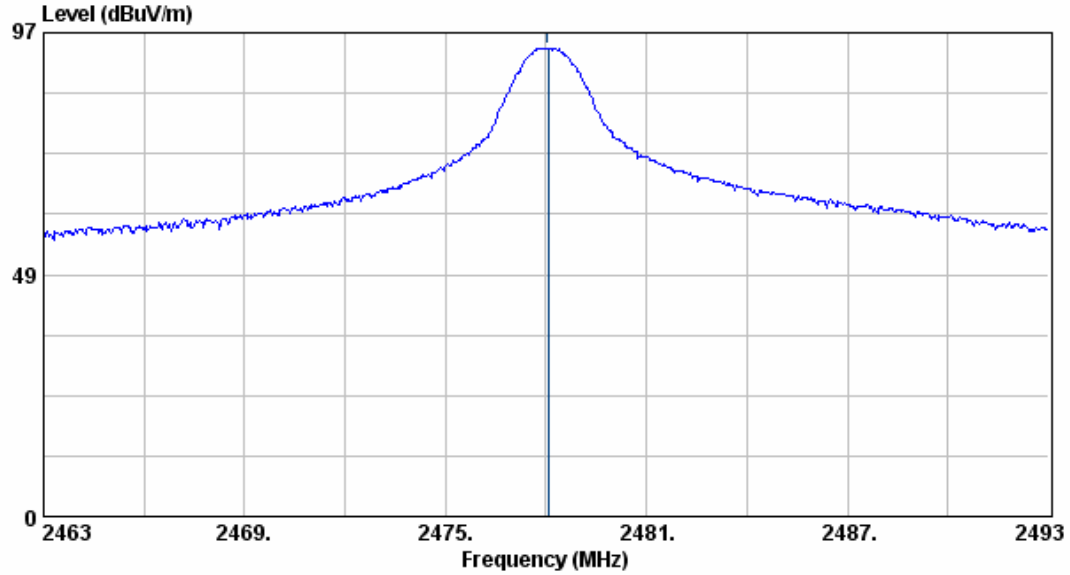


2478MHz

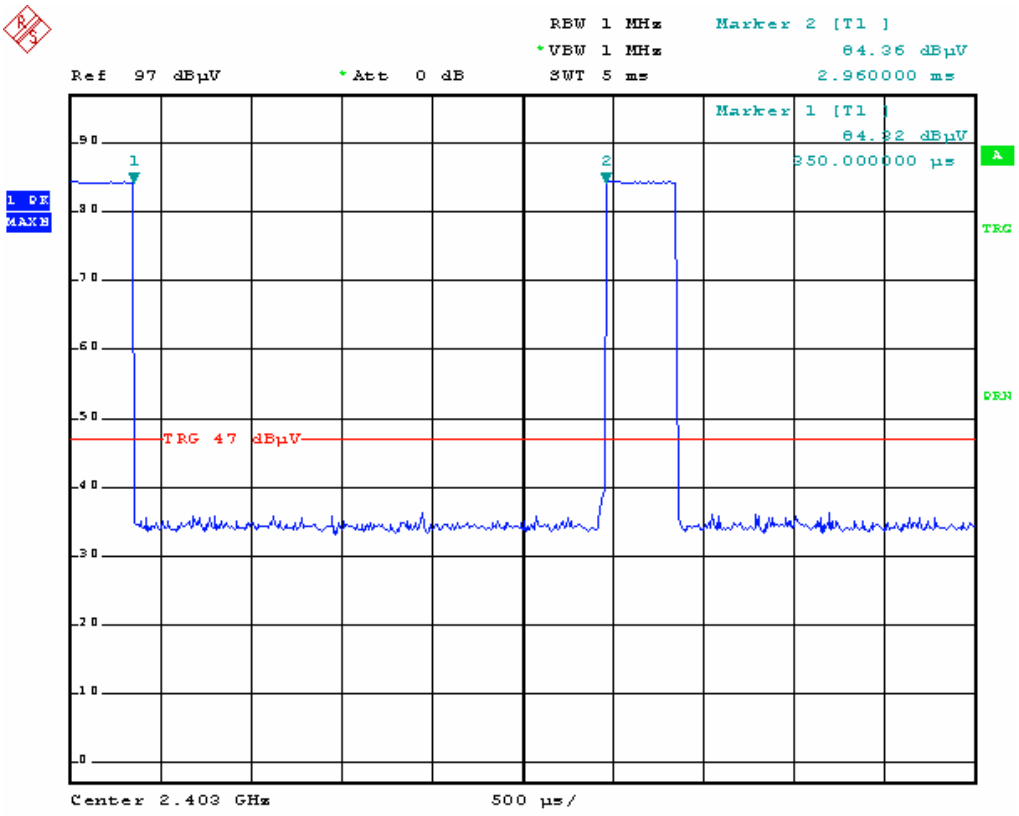
Vertical Polarization



Horizontal Polarization



Duty Cycle


RBW 1 MHz
VBW 1 MHz
SWT 5 ms
Marker 2 [T1]
84.36 dBµV
2.960000 ms
Ref 97 dBµV
Att 0 dB
Marker 1 [T1]
84.32 dBµV
350.000000 µs
1 PK
MAXH
A
TRG
PEN
TRG 47 dBµV
Center 2.403 GHz
500 µs/

3. Radiated Emission Measurement

Result: PASS

3.1 Limit for Radiated Emission Measurement

Limit for Harmonics Radiation Emission Measurement

Fundamental Frequency	Field Strength of Harmonics
☐ 902 – 928 MHz	500 uV/m (54dBuV/m)
☑ 2400 – 2483.5 MHz	500 uV/m (54dBuV/m)
☐ 5725 – 5875 MHz	500 uV/m (54dBuV/m)
☐ 24.0 – 24.25 GHz	2500 uV/m(68dBuV/m)

Limit for Other Emissions except Harmonics

Frequency (MHz)	Quasi-peak (dBμV/m)	
30 to 88	40	
88 to 216	43.5	
216 to 960	46	
960 to 1000	54	
Frequency (MHz)	**Peak (dBμV/m)**	**Average (dBμV/m)**
Above 1000	74	54

Note 1- The lower limit shall apply at the transition frequency.
Note 2- Additional provisions may be required for cases where interference occurs.

3.2 Test Instruments

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESCS 30/ 836858/020	July 28, 2007	July 28, 2008
Spectrum	R&S	FSP 7/ 100106	Aug 5, 2007	Aug 5, 2008
Broadband Antenna	EMCO	HL-562/ 830547/010	Dec. 11, 2007	Dec. 11, 2008
Horn Antenna	EMCO	3117/ 57408	Feb. 12, 2007	Feb. 12, 2008
Pre-Amplifier	MITEQ	JS4-00101800-28-5A/742229	July 31, 2007	July 31, 2008
Pre-Amplifier	Mini Circuit	ZKL-2/ 001	Sept. 6, 2007	March 6, 2008
Pre-Amplifier	Mini Circuit	ZKL-2/ 002	Sept. 6, 2007	March 6, 2008
TR11 Semi - anechoic Chamber	ETS. LINDGREN	TR11/ 906-A	July 1, 2007	July 1, 2008

Note：

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required

Instrument Setting

RBW	VBW	Detector	Trace	Comment
120kHz	N/A	Quasi-Peak	Maxhold	Below 1GHz
1MHz	1MHz	Peak	Maxhold	Above 1GHz Peak
1MHz	10Hz	Peak	Maxhold	Above 1GHz Average

Climatic Condition

Ambient Temperature：27°C ; Relative Humidity ：68%

3.3 Test Procedures

a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.

b. A software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

c. If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.

d. The EUT was set 3m away from the interference receiving antenna.

e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.

f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.

g. Then measure each frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.

h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred.

i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any.

j. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.

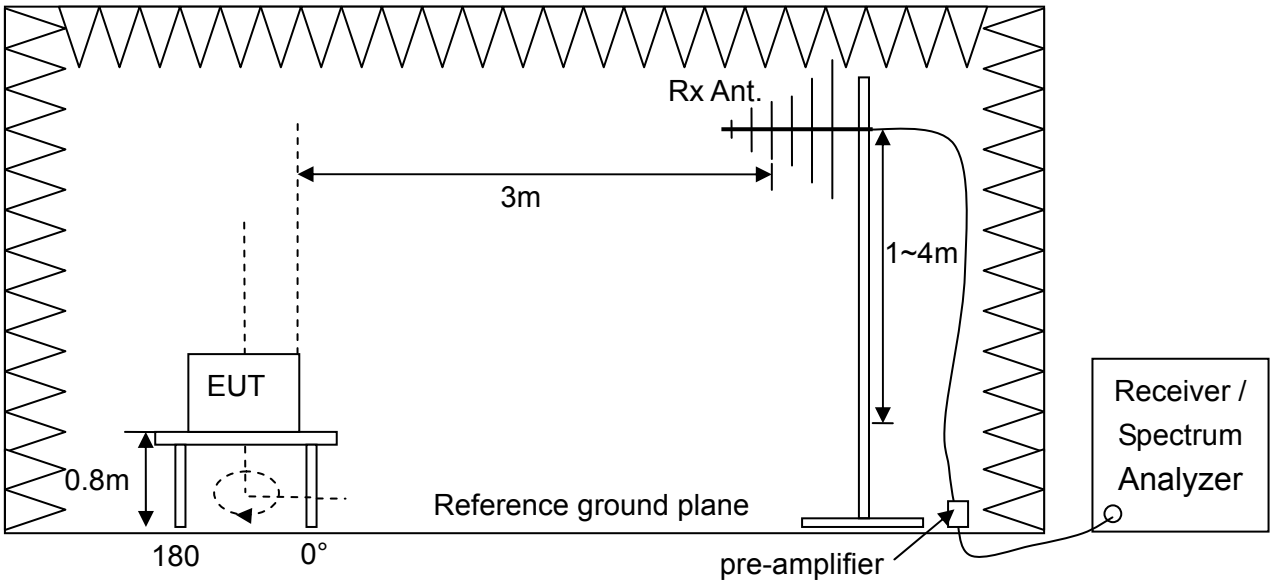
k. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.

l. If the peak emission level below 1000MHz measured from step f. is 4dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.

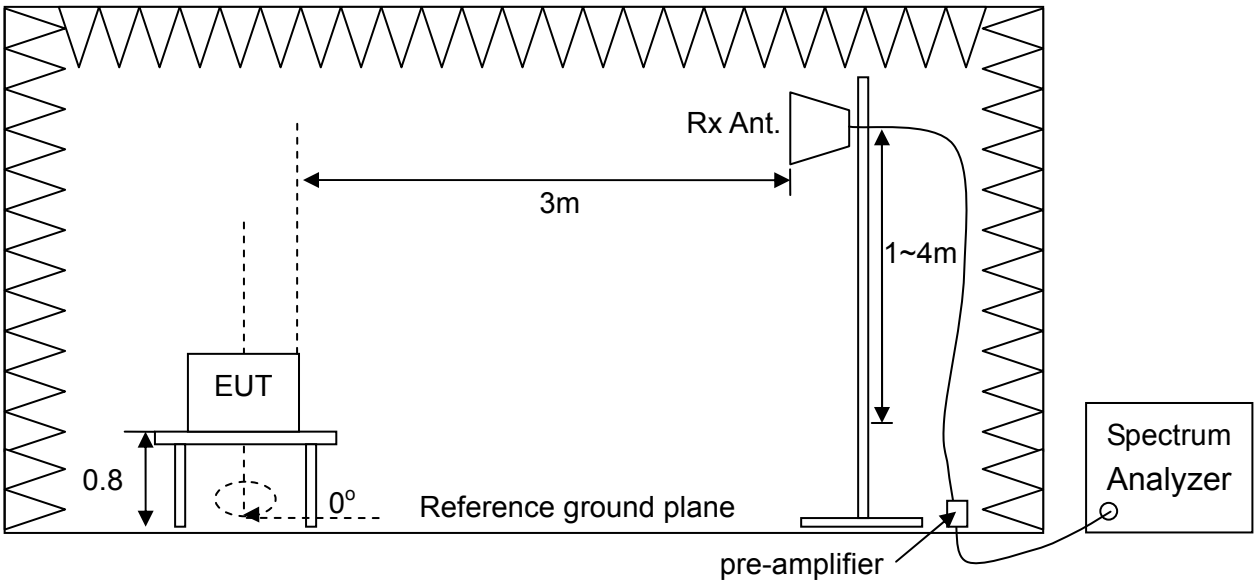
m. If the peak emission level above 1000MHz measured from step f. is 20dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate A.V. value will be measured and presented.

3.4 Test Configuration

Radiated Emission Measurement below 1000MHz



Radiated Emission Measurement above 1000MHz



3.5 Test Results

Band Edge

Test Mode **: Transmitter**

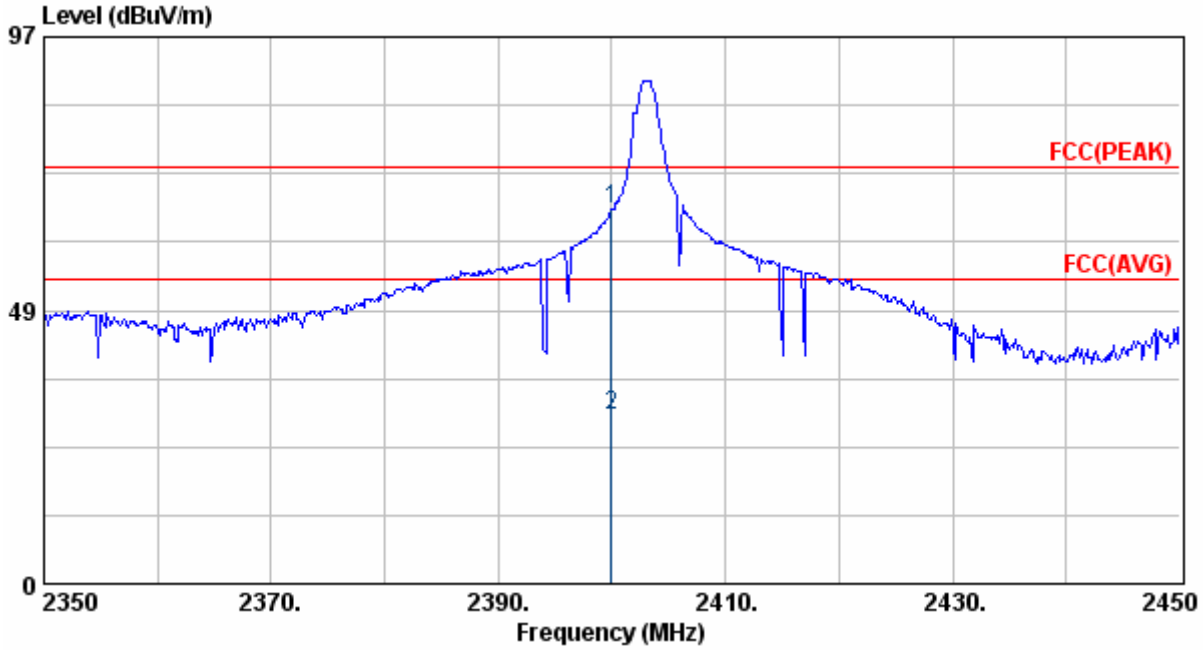
Test Distance **:** 3m **Tester** **:** Bill

Test Range	Polarization	Frequency (MHz)	Reading Data (dBuV)		Correction Factor (dB/m)	Emission (dBuV/m)		Limit (dBuV/m)		Margin (dB)	
			PK.	AV.		PK.	AV.	PK.	AV.	PK.	AV.
Lowest	V	2400.00	61.53	25.08	4.75	66.29	29.84	74	54	7.71	24.16
	H	2400.00	64.41	25.61	4.75	69.17	30.37	74	54	4.83	23.63
Highest	V	2483.50	61.48	22.90	4.84	66.32	27.75	74	54	7.68	26.25
	H	2483.50	59.45	23.82	4.84	64.29	28.66	74	54	9.71	25.34

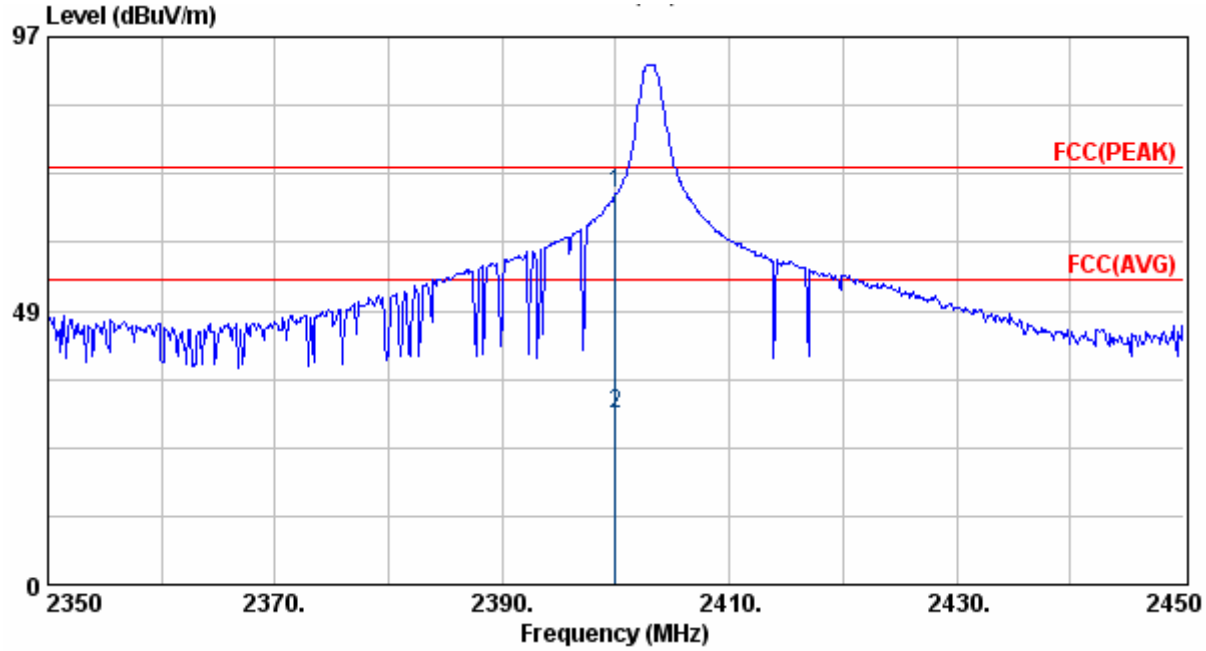
Note:

1. Correction Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier
2. Emission Level (dBuV/m) = Reading Data + Correction Factor
3. Margin (dB) = Limit – Emission Level
4. "*": The emission is too low to be measured.

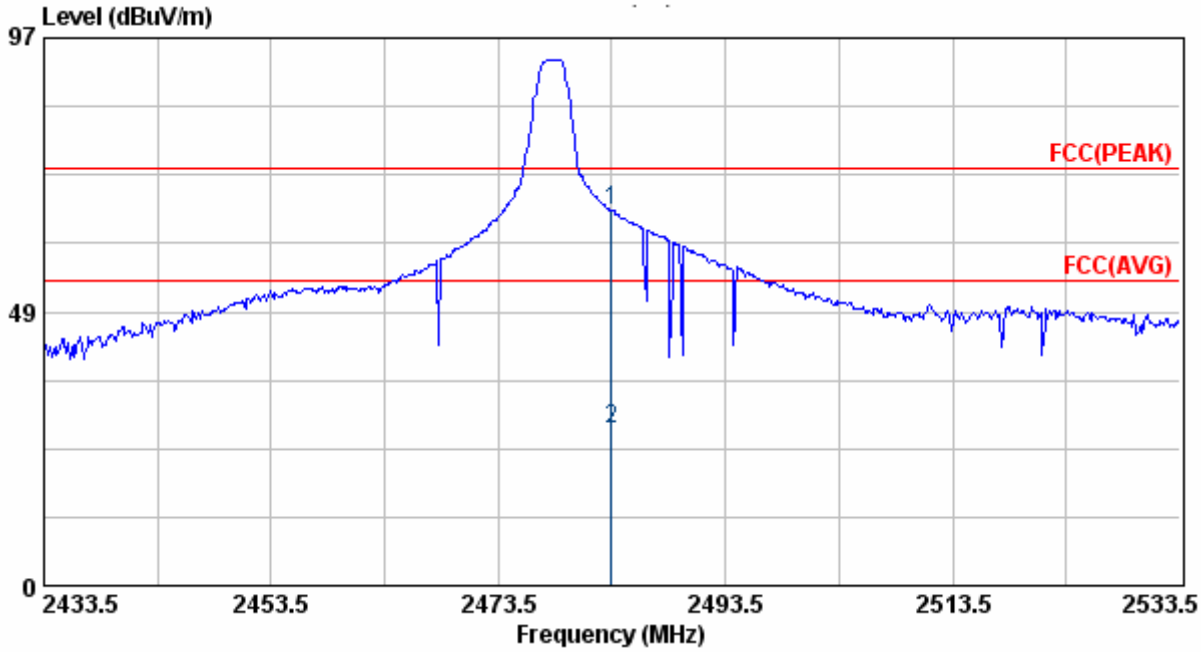
Lowest Channel, Vertical



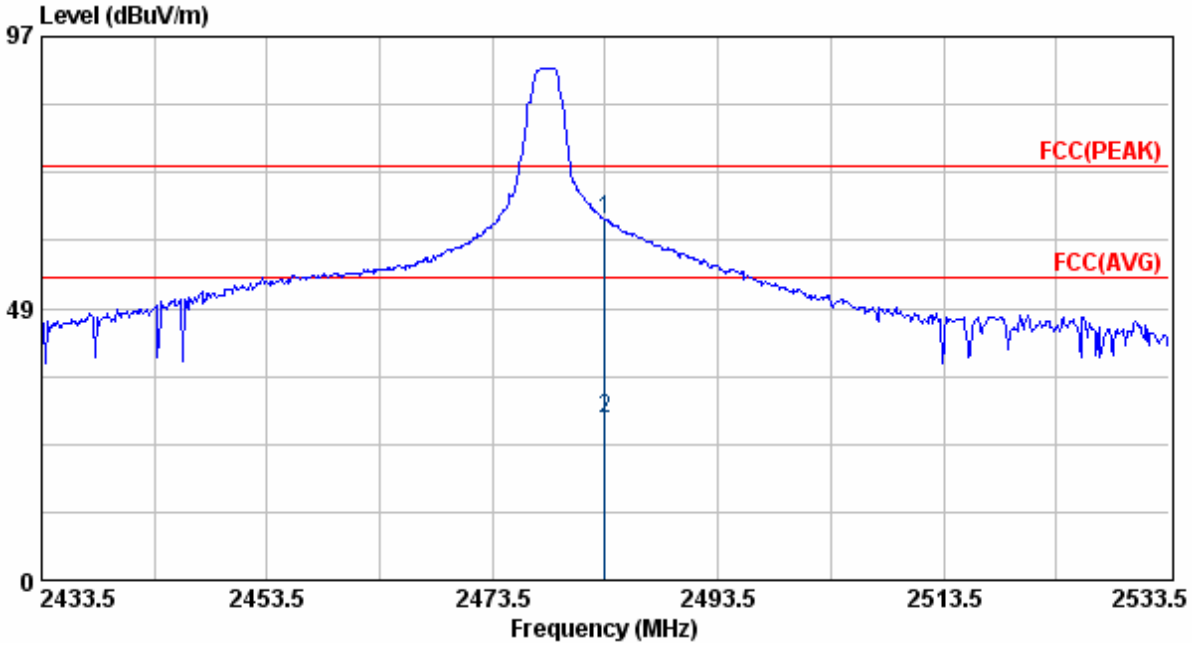
Lowest Channel, Horizontal



Highest Channel, Vertical



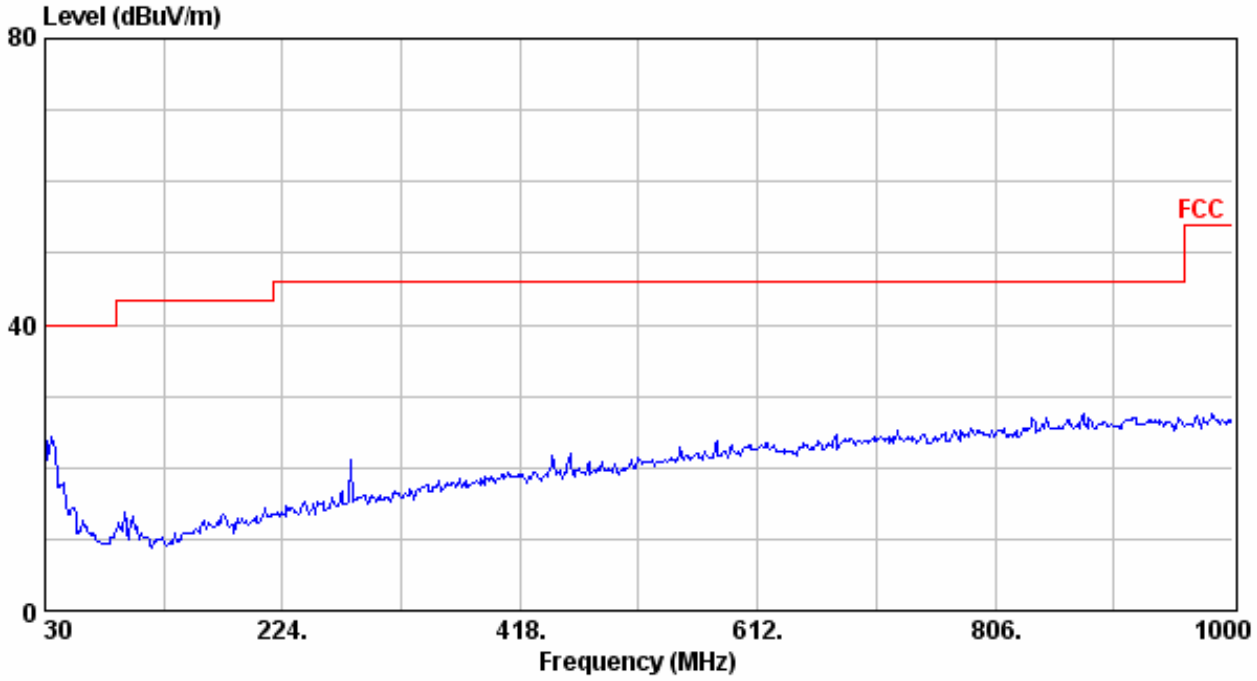
Highest Channel, Horizontal



Radiated Emission Measurement

Below 1000MHz

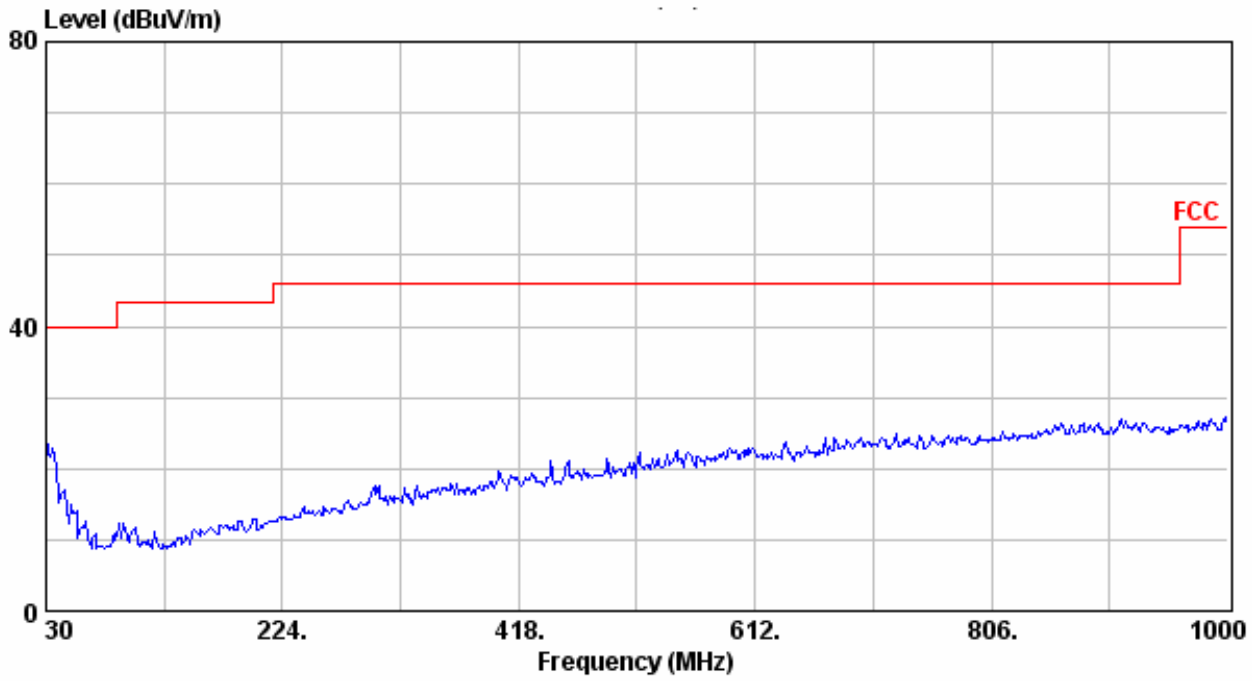
Test Mode	:	**2403MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	30MHz~1000MHz



Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.
3. Q.P is abbreviation of quasi-peak.

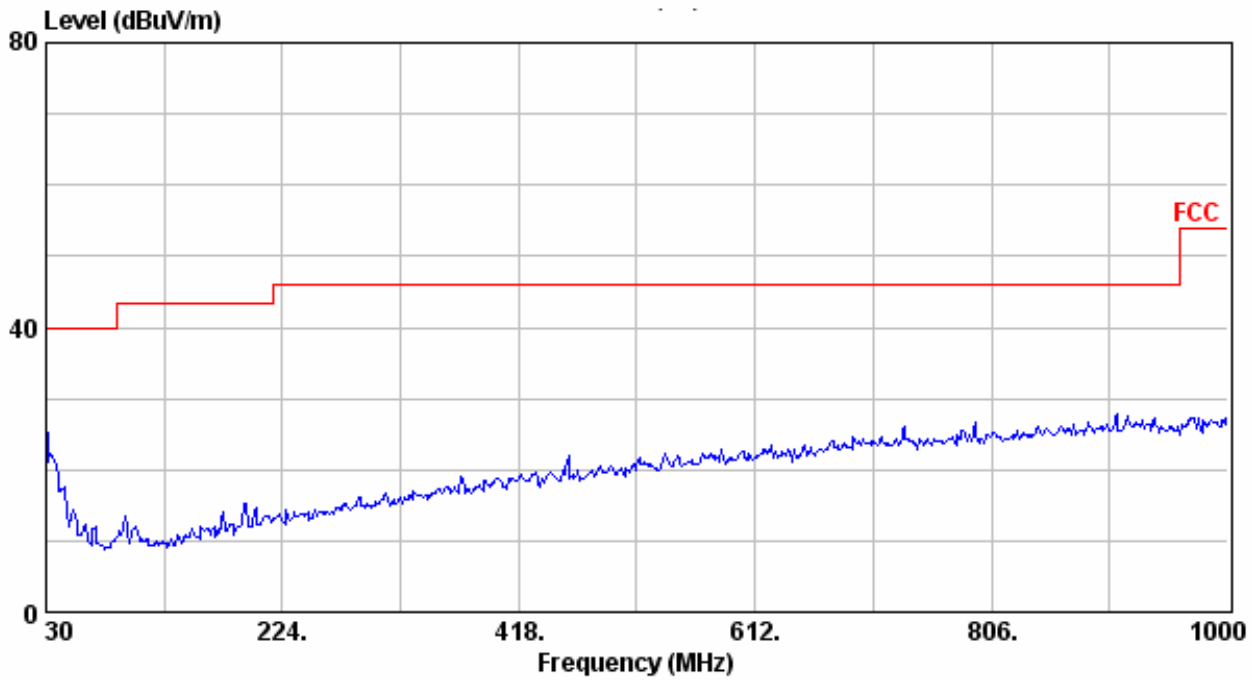
Test Mode	:	**2403MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	30MHz~1000MHz



Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.
3. Q.P is abbreviation of quasi-peak.

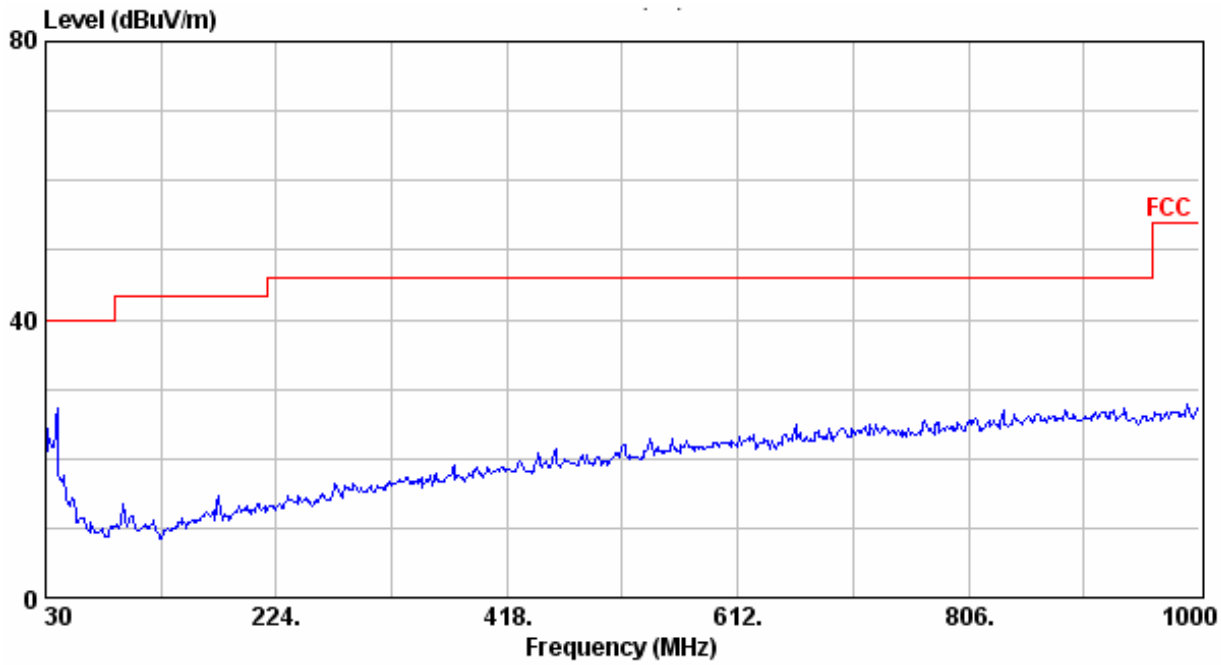
Test Mode	:	**2453MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	30MHz~1000MHz



Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.
3. Q.P is abbreviation of quasi-peak.

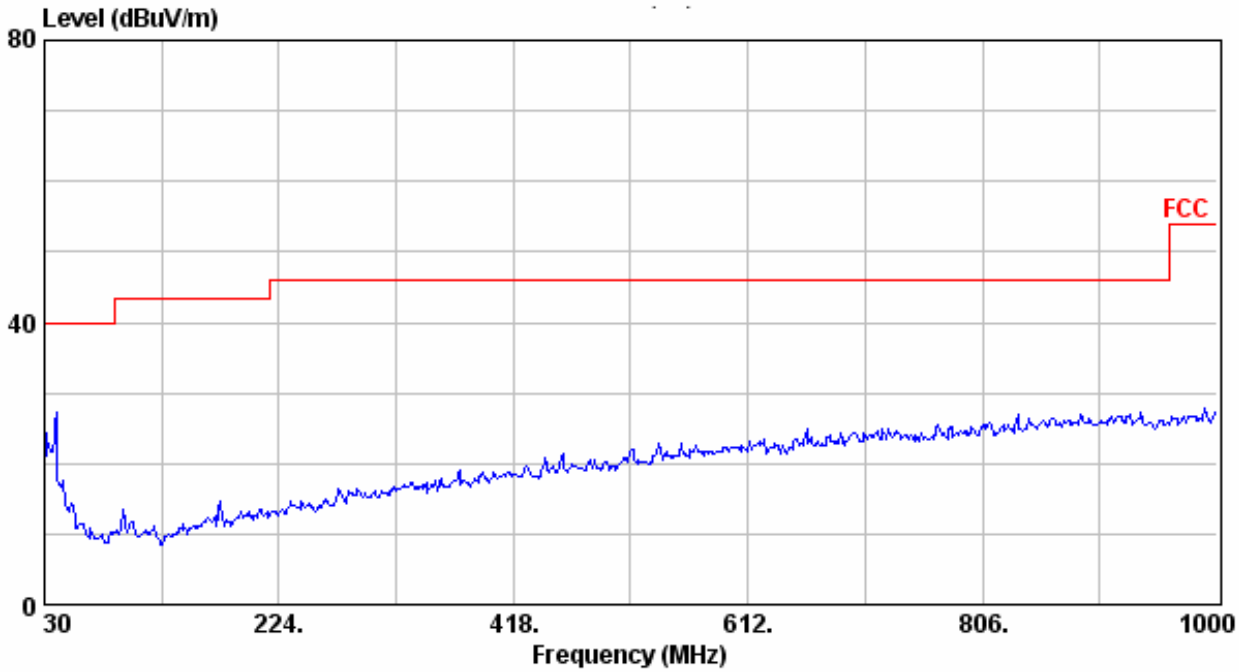
Test Mode	:	**2453MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	30MHz~1000MHz



Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.
3. Q.P is abbreviation of quasi-peak.

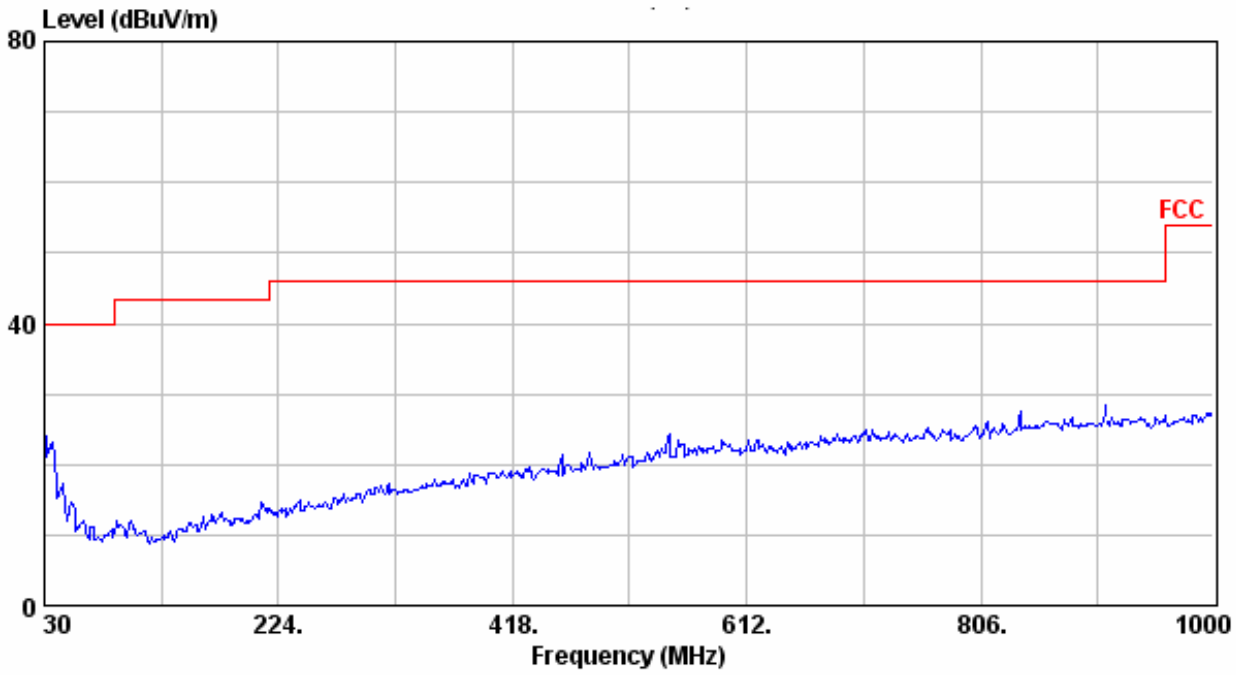
Test Mode	:	**2478MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	30MHz~1000MHz



Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.
3. Q.P is abbreviation of quasi-peak.

Test Mode	:	**2478MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	30MHz~1000MHz

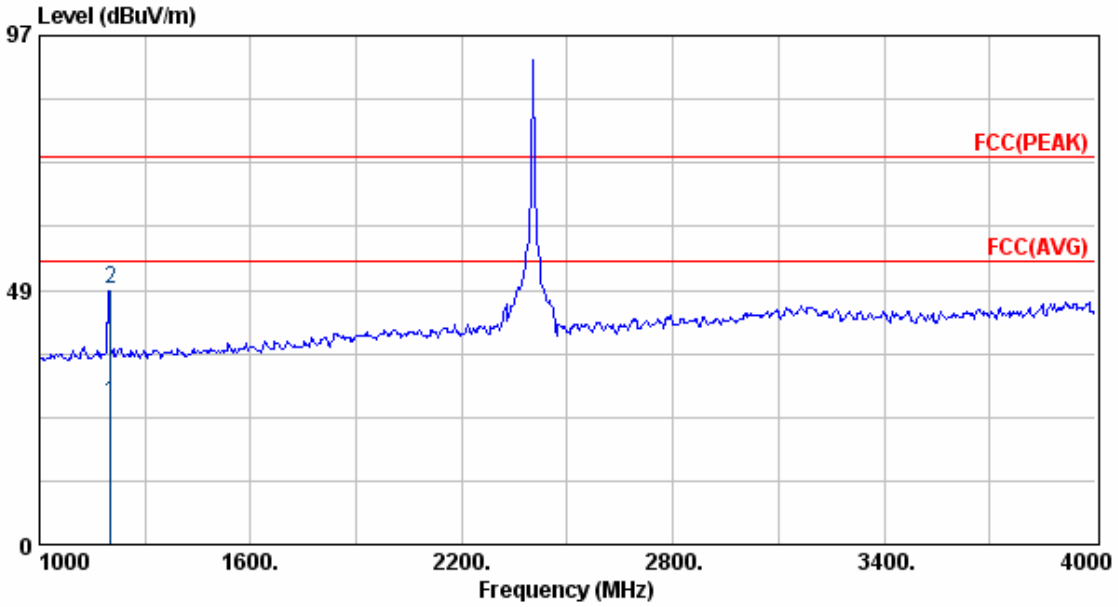


Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.
3. Q.P is abbreviation of quasi-peak.

Above 1000MHz

Test Mode	:	**2403MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	1GHz ~ 4GHz

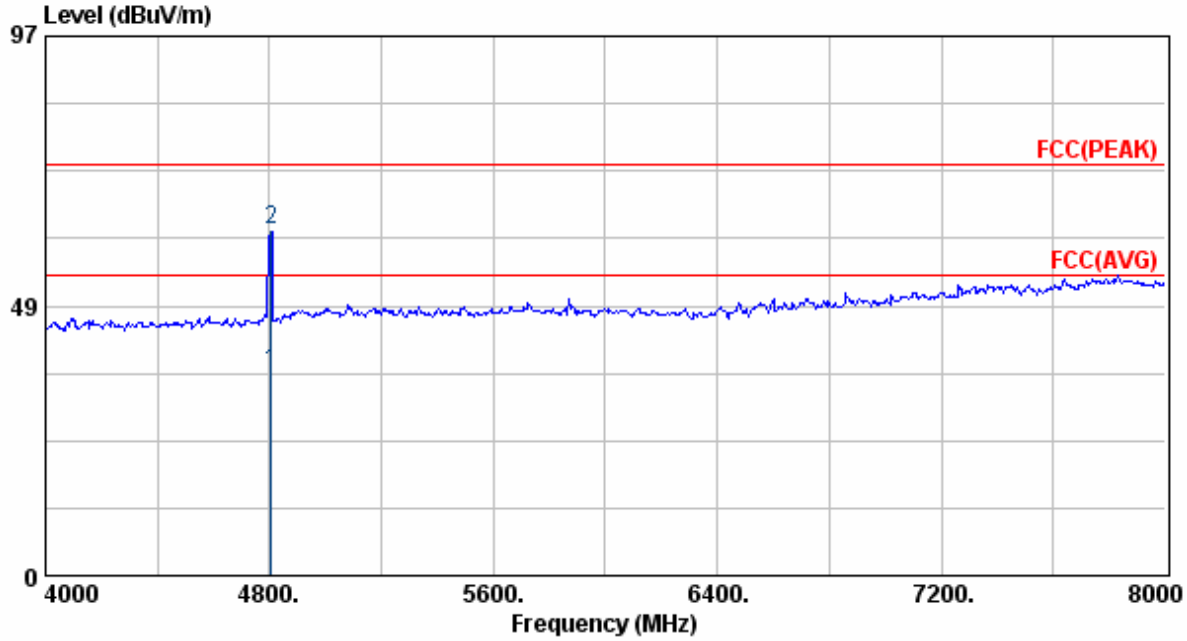


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	1201.51	27.02	-0.45	27.48	54.00	-26.98	---	---	VERTICAL	Average
2	1201.60	48.79	-0.45	49.25	74.00	-25.21	---	---	VERTICAL	

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

Test Mode	:	**2403MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	4GHz ~ 8GHz



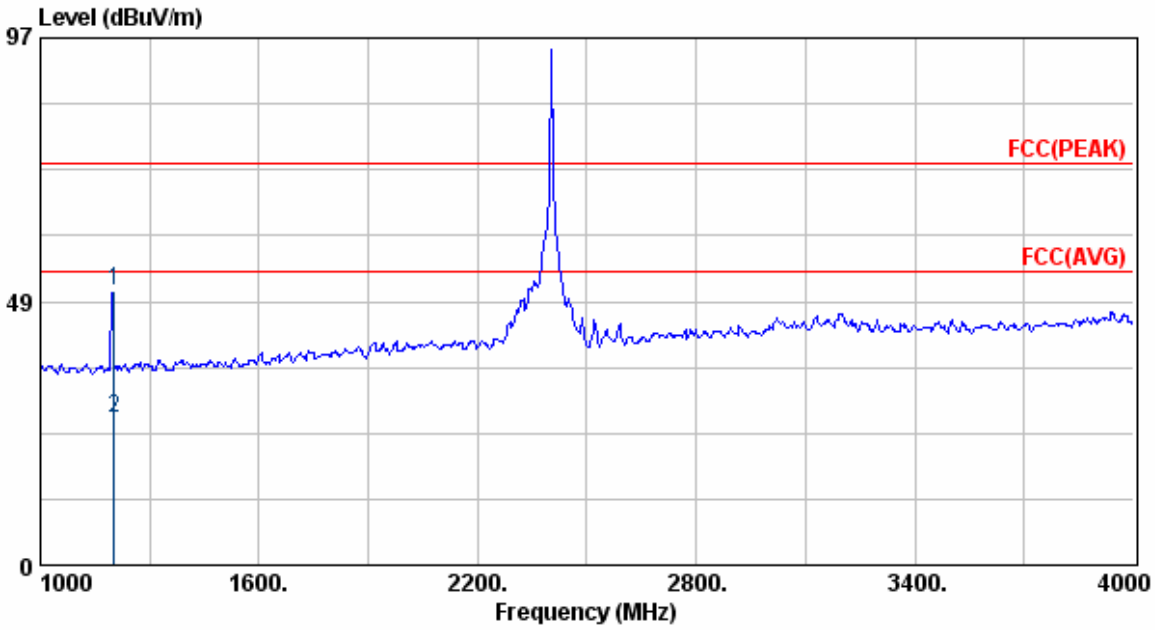
	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	4805.87	36.74	9.69	27.05	54.00	-17.26	---	---	VERTICAL	Average
2 !	4805.90	62.09	9.69	52.40	74.00	-11.91	---	---	VERTICAL	Peak

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

No signal can be detected from 8GHz to 25GHz, so the graphs are omitted above 8GHz.

Test Mode	:	**2403MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	1GHz ~ 4GHz

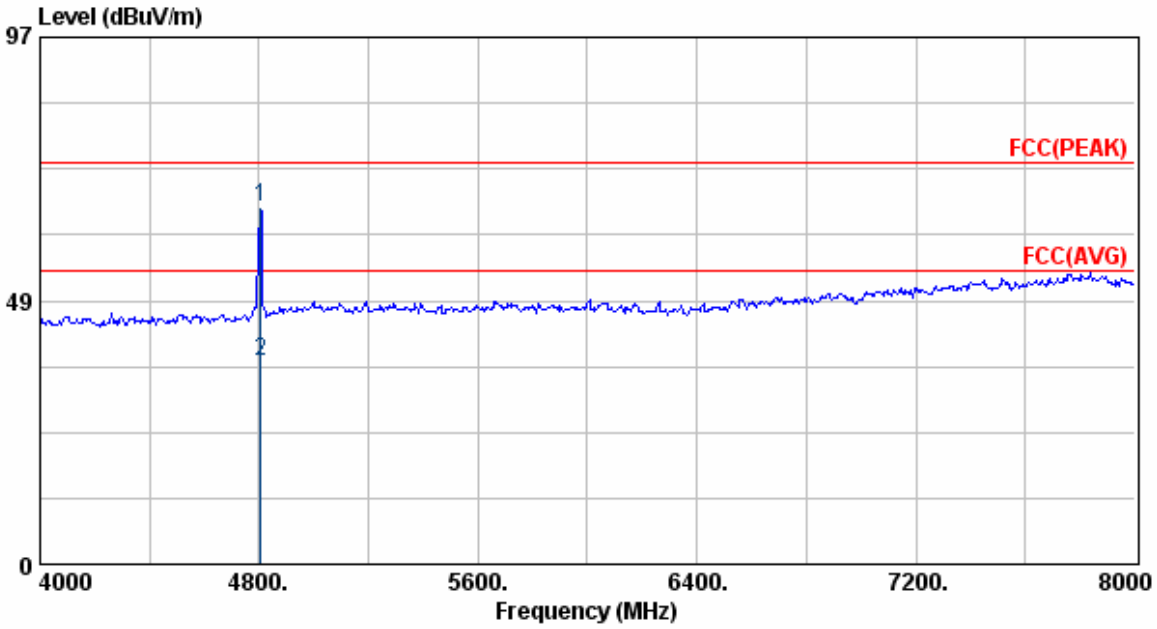


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	1201.49	50.55	-0.45	51.01	74.00	-23.45	---	---	HORIZONTAL	Peak
2	1201.49	27.11	-0.45	27.57	54.00	-26.89	---	---	HORIZONTAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

Test Mode	:	**2403MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	4GHz ~ 8GHz



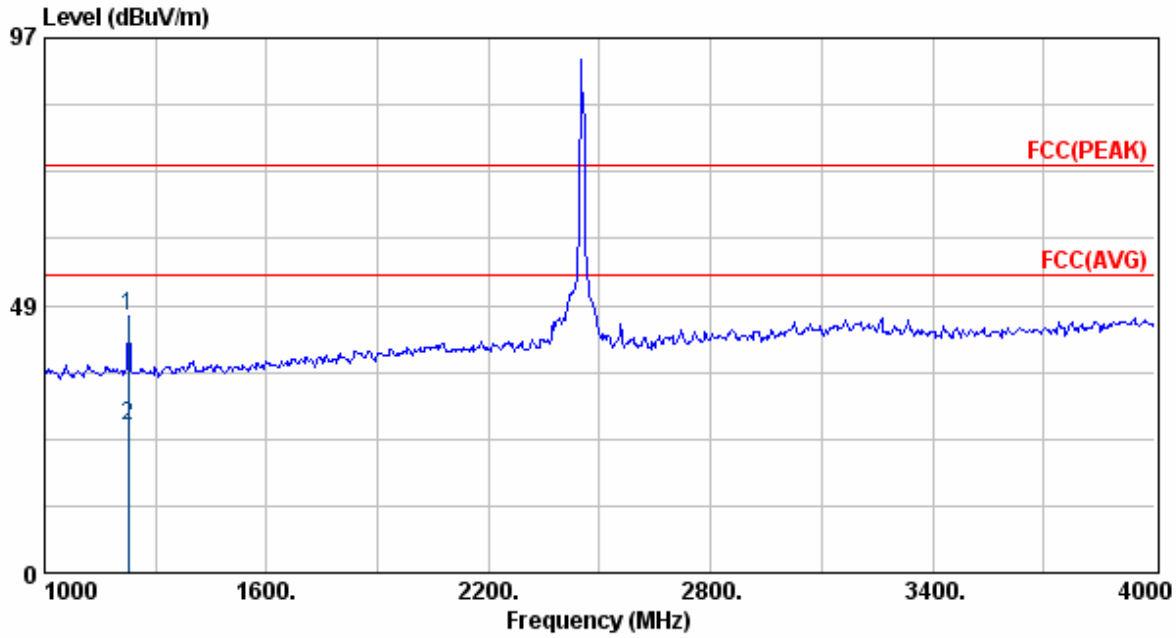
	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	4805.90	65.72	9.69	56.03	74.00	-8.28	---	---	HORIZONTAL	Peak
2 !	4805.95	37.22	9.69	27.54	54.00	-16.78	---	---	HORIZONTAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

No signal can be detected from 8GHz to 25GHz, so the graphs are omitted above 8GHz.

Test Mode	:	**2453MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	1GHz ~ 4GHz

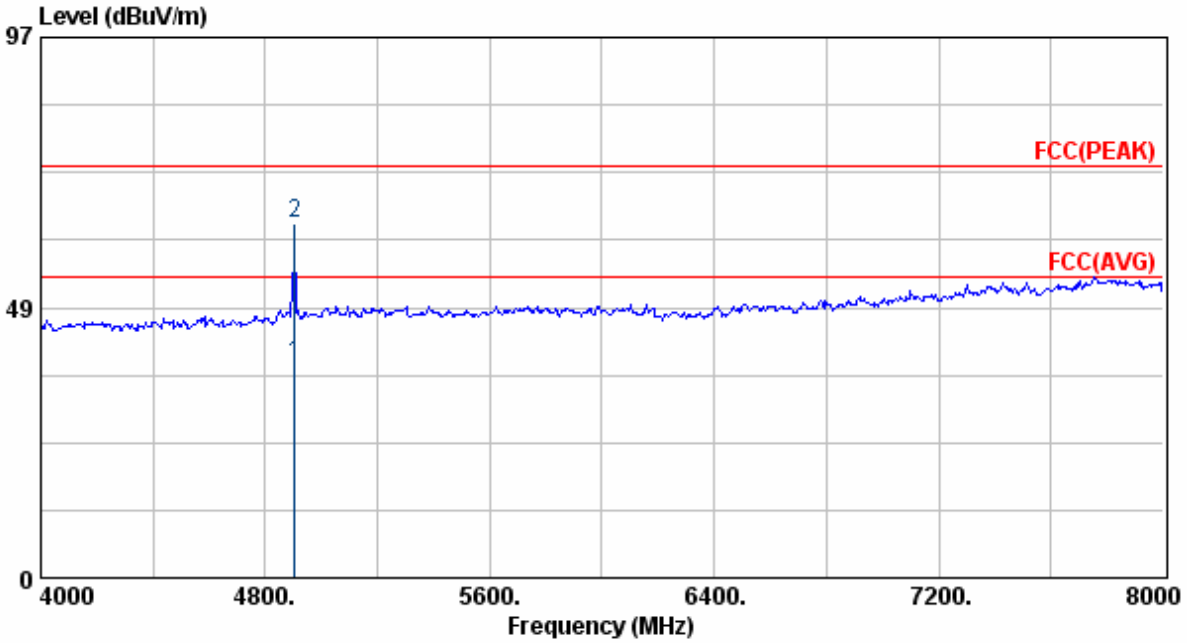


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	1225.00	46.66	-0.52	47.18	74.00	-27.34	---	---	VERTICAL	Peak
2	1226.50	26.74	-0.52	27.26	54.00	-27.26	---	---	VERTICAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

Test Mode	:	**2453MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	4GHz ~ 8GHz



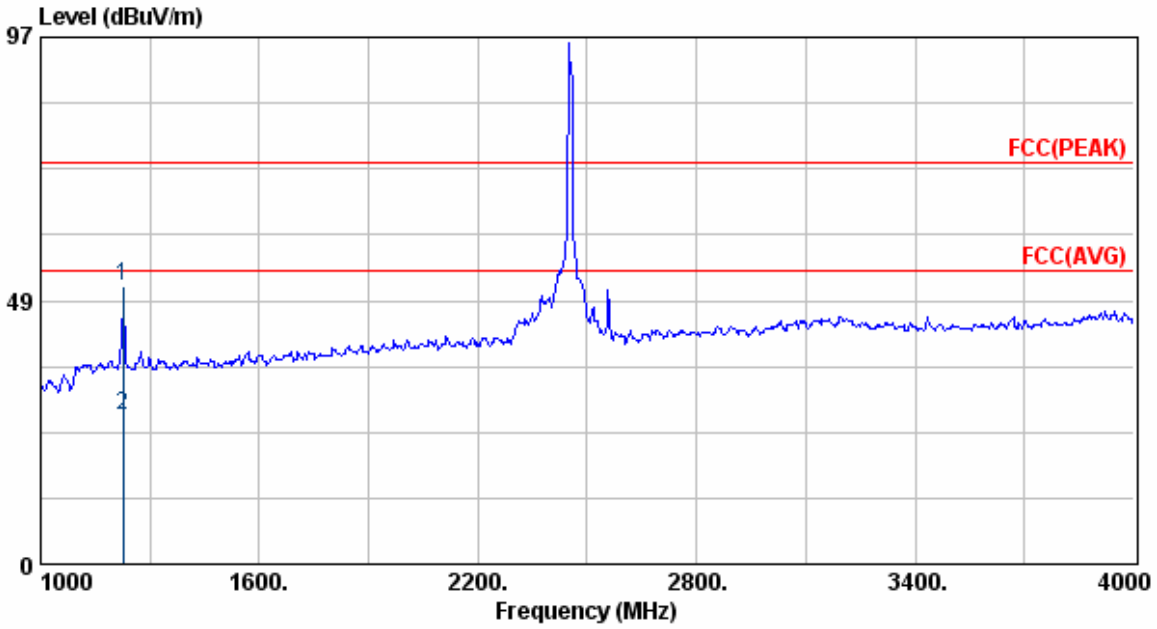
	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	4906.19	38.26	10.28	27.98	54.00	-15.74	---	---	VERTICAL	Average
2 !	4906.22	63.57	10.28	53.29	74.00	-10.43	---	---	VERTICAL	Peak

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

No signal can be detected from 8GHz to 25GHz, so the graphs are omitted above 8GHz.

Test Mode	:	**2453MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	1GHz ~ 4GHz

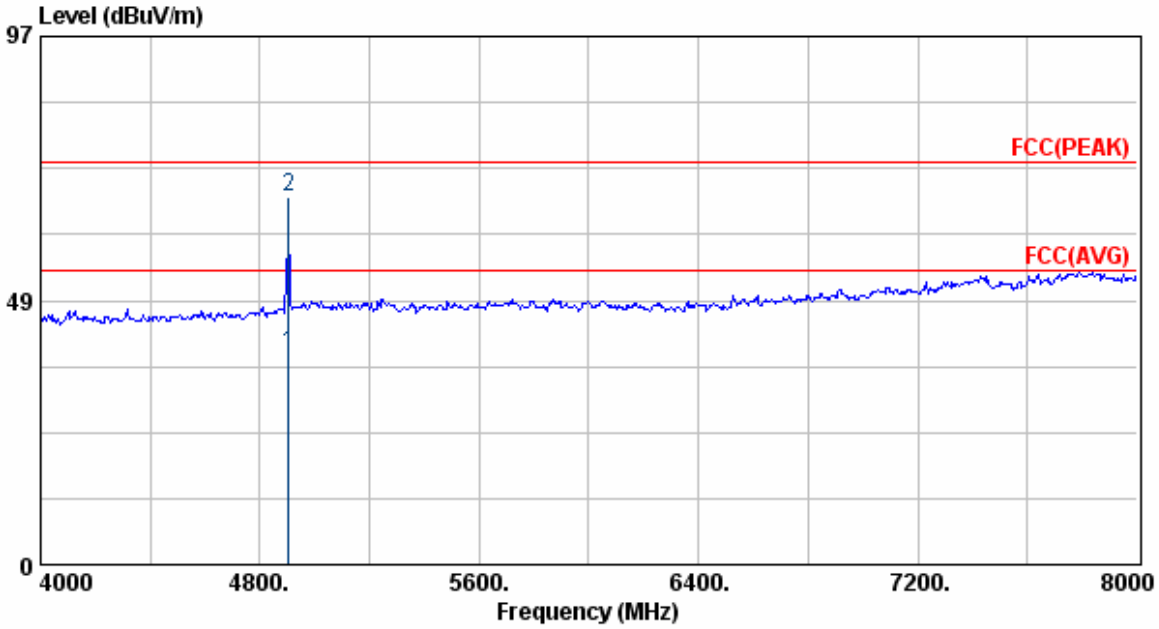


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	1226.47	51.01	-0.52	51.53	74.00	-22.99	---	---	HORIZONTAL	Peak
2	1226.47	27.38	-0.52	27.90	54.00	-26.62	---	---	HORIZONTAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

Test Mode	:	**2453MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	4GHz ~ 8GHz



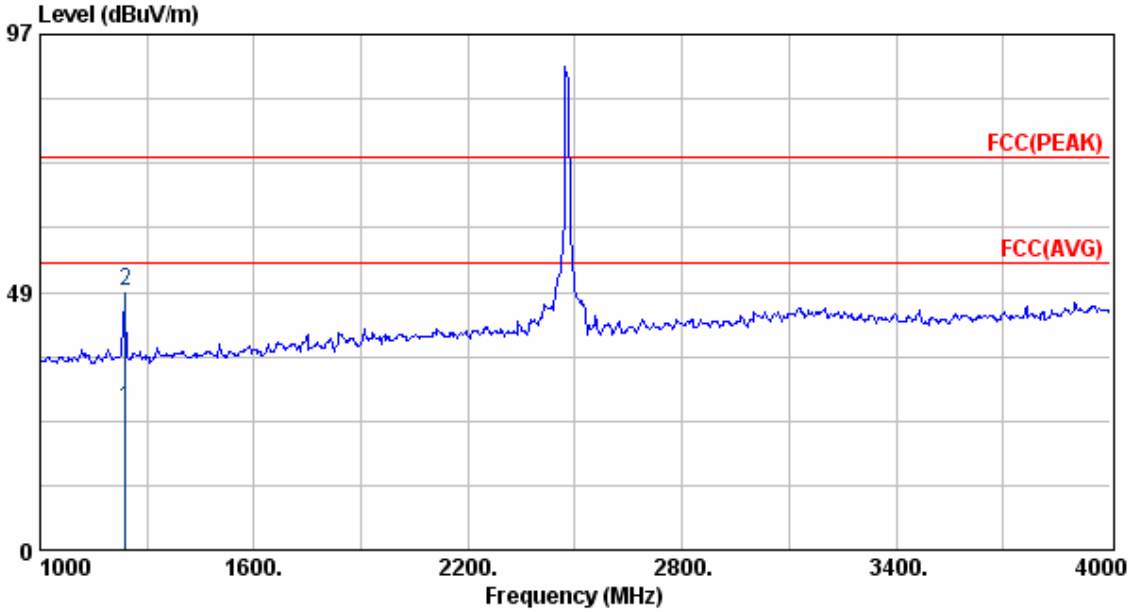
	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	4906.01	38.74	10.28	28.45	54.00	-15.26	---	---	HORIZONTAL	Average
2 !	4906.22	67.41	10.28	57.13	74.00	-6.59	---	---	HORIZONTAL	Peak

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

No signal can be detected from 8GHz to 25GHz, so the graphs are omitted above 8GHz.

Test Mode	:	**2478MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	1GHz ~ 4GHz

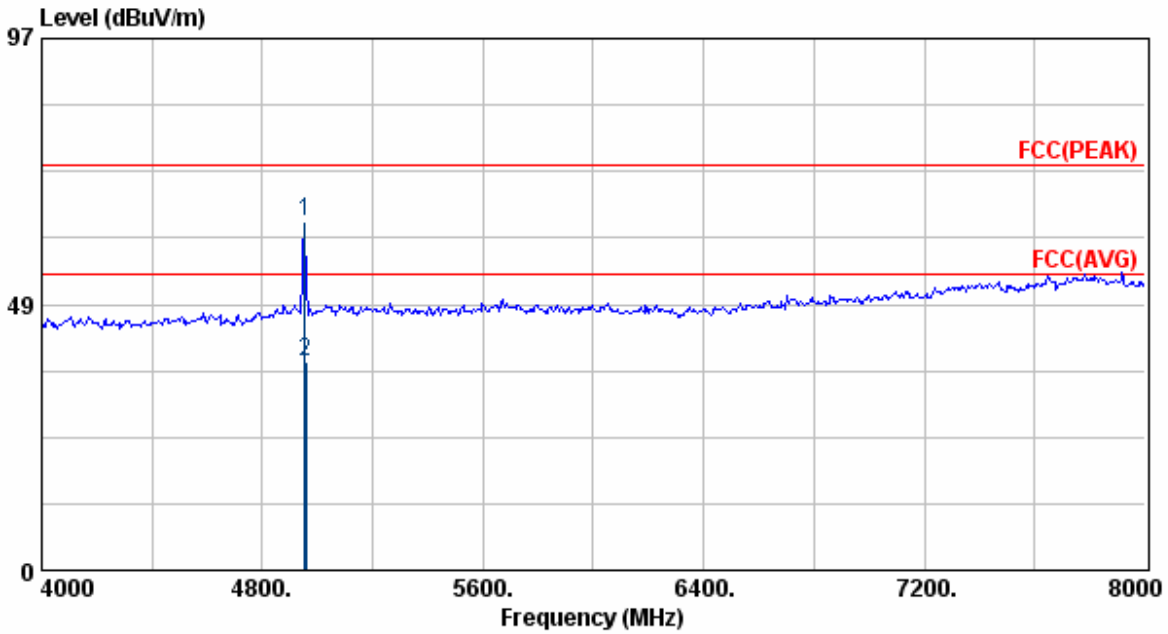


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	1238.97	26.51	-0.55	27.06	54.00	-27.49	---	---	VERTICAL	Average
2	1239.42	48.50	-0.55	49.06	74.00	-25.50	---	---	VERTICAL	Peak

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

Test Mode	:	**2478MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Vertical	**Frequency Range**	:	4GHz ~ 8GHz



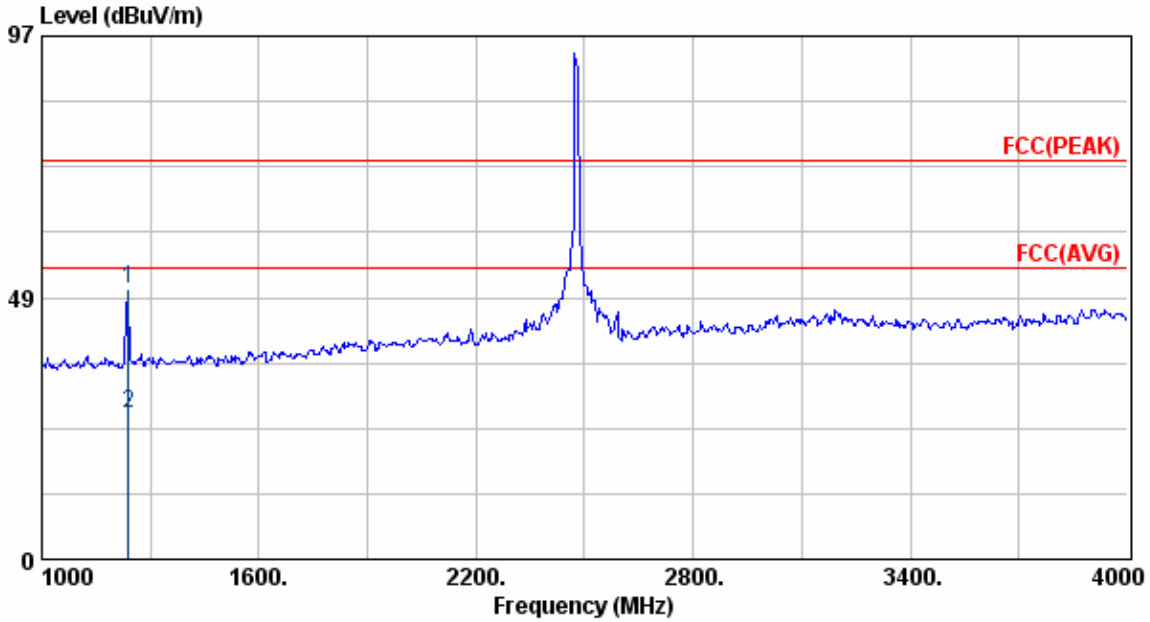
	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	4955.80	63.69	10.31	53.39	74.00	-10.31	---	---	VERTICAL	Peak
2 !	4955.93	37.98	10.31	27.67	54.00	-16.02	---	---	VERTICAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

No signal can be detected from 8GHz to 25GHz, so the graphs are omitted above 8GHz.

Test Mode	:	**2478MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	1GHz ~ 4GHz

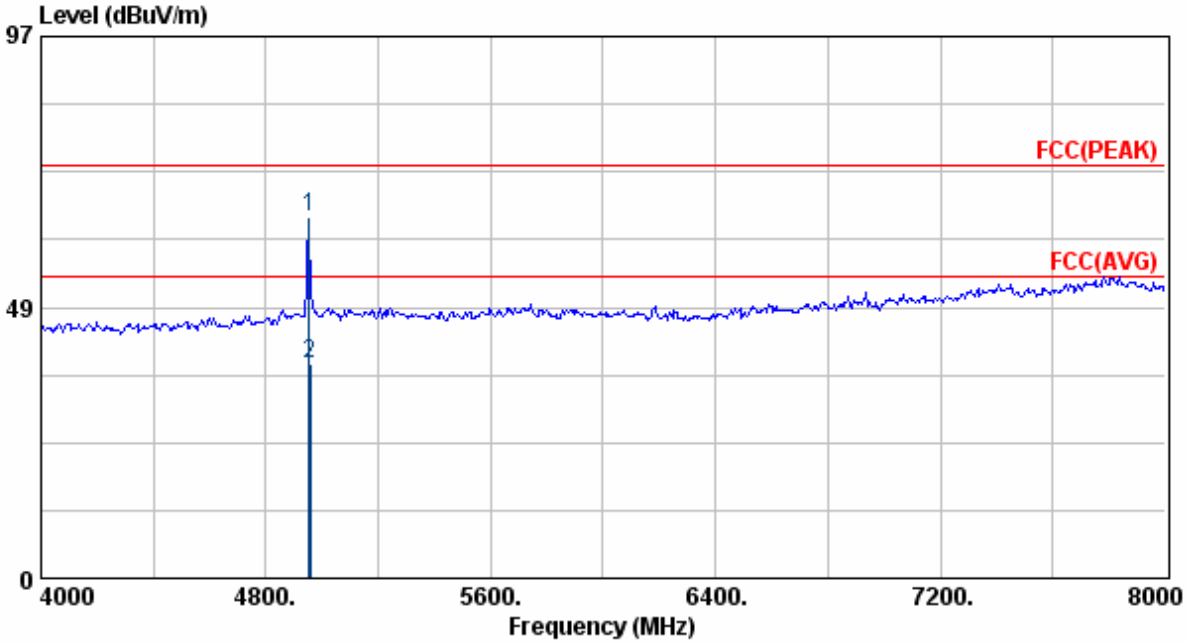


	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1	1239.06	50.05	-0.55	50.60	74.00	-23.95	---	---	HORIZONTAL	Peak
2	1239.06	26.95	-0.55	27.50	54.00	-27.05	---	---	HORIZONTAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

Test Mode	:	**2478MHz, Transmitter**			
Test Distance	:	3m	**Tester**	:	Bill
Polarization	:	Horizontal	**Frequency Range**	:	4GHz ~ 8GHz



	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Ant Pos	Table Pos	Pol/Phase	Remark
	MHz	dBuV/m	dB/m	dBuV	dBuV/m	dB	cm	deg		
1 !	4955.88	64.72	10.31	54.41	74.00	-9.28	---	---	HORIZONTAL	Peak
2 !	4956.05	38.28	10.31	27.97	54.00	-15.72	---	---	HORIZONTAL	Average

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + antenna factor – gain of pre-amplifier.

No signal can be detected from 8GHz to 25GHz, so the graphs are omitted above 8GHz.