

# FCC Radio Test Report

## FCC ID: XRSCRMXTIMO101

This report concerns (check one):  Original Grant  Class II Change

**Project No.** : 1412C113  
**Equipment** : 2.4G Wireless Control Module  
**Model Name** : 200-1502  
**Applicant** : LumenRadio AB  
**Address** : Svangatan 2B, SE-41668 Gothenburg, Sweden

**Date of Receipt** : Jan. 15, 2015  
**Date of Test** : Jan. 15, 2015 ~ Apr. 14, 2015  
**Issued Date** : Apr. 15, 2015  
**Tested by** : BTL Inc.

**Testing Engineer** : David Mao  
(David Mao)

**Technical Manager** : Leo Hung  
(Leo Hung)

**Authorized Signatory** : Steven Lu  
(Steven Lu)

**B T L I N C .**

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan,  
Guangdong, China.

TEL: +86-769-8318-3000 FAX: +86-769-8319-6000

## **Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A**.

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**BTL**'s laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

## **Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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**REPORT ISSUED HISTORY**

Issued No.	Description	Issued Date
BTL-FCCP-1-1412C113	Original Issue.	Apr. 15, 2015

## 1. CERTIFICATION

Equipment : 2.4G Wireless Control Module  
Brand Name : CRMx TiMo  
Model Name : 200-1502  
Applicant : LumenRadio AB  
Manufacturer : LumenRadio AB  
Address : Svangatan 2B, SE-41668 Gothenburg, Sweden  
Factory : Inission AB  
Address : Rimmaregatan 6, SE 422 55 Gothenburg, Sweden  
Date of Test : Jan. 15, 2015 ~ Apr. 14, 2015  
Test Item : ENGINEERING SAMPLE  
Standard(s) : FCC Part15, Subpart C : 2013 (15.247) / ANSI C63.4 : 2009 / FCC Public Notice DA 00-705, March 30, 2000.

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc..

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1412C113) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): 47 CFR Part 15, Subpart C: 2013;			
Standard(s) Section	Test Item	Judgment	Remark
FCC			
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247 (a)(1)	Hopping Channel Separation	PASS	
15.247 (b)(1)	Peak Output Power	PASS	
15.247(d) 15.209	Radiated Spurious Emission	PASS	
15.247 (a)(1)(iii)	Number of Hopping Frequency	PASS	
15.247 (a)(1)(iii)	Dwell Time	PASS	
15.205	Restricted Bands	PASS	
15.203	Antenna Requirement	PASS	

Note:

- (1)" N/A" denotes test is not applicable in this test report
- (2) According to FCC Public Notice DA 00-705, March 30, 2000.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dong Guan, China.523792  
BTL's test firm number for FCC: 319330

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	Note
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	Note
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~0MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	2.4G Wireless Control Module	
Brand Name	CRMX TiMo	
Model Name	200-1502	
Model Difference	N/A	
Output Power (Max.)	Operation Frequency	2402 MHz ~ 2480 MHz
	Modulation Technology	GFSK
	Bit Rate of Transmitter	1Mbps
	Output Power Max for Dipole Antenna	23.53 dBm
	Output Power Max for Chip Antenna	23.50 dBm
Power Source	Supplied from DC source.	
Power Rating	DC 3V	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	28	2429	55	2456
02	2403	29	2430	56	2457
03	2404	30	2431	57	2458
04	2405	31	2432	58	2459
05	2406	32	2433	59	2460
06	2407	33	2434	60	2461
07	2408	34	2435	61	2462
08	2409	35	2436	62	2463
09	2410	36	2437	63	2464
10	2411	37	2438	64	2465
11	2412	38	2439	65	2466
12	2413	39	2440	66	2467
13	2414	40	2441	67	2468
14	2415	41	2442	68	2469
15	2416	42	2443	69	2470
16	2417	43	2444	70	2471
17	2418	44	2445	71	2472
18	2419	45	2446	72	2473
19	2420	46	2447	73	2474
20	2421	47	2448	74	2475
21	2422	48	2449	75	2476
22	2423	49	2450	76	2477
23	2424	50	2451	77	2478
24	2425	51	2452	78	2479
25	2426	52	2453	79	2480
26	2427	53	2454		
27	2428	54	2455		

## 3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	<b>CRMX</b> <sup>TM</sup>	104-1001	Dipole	RP-TNC	2.15
2	N/A	N/A	Chip	N/A	0.5

## Note:

There are two kinds of antennas, Dipole Antenna and Chip Antennal. Only one antenna works per time. All test results are recorded for two kinds of antennas.

Dipole



Chip



### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode CH01/39/79
Mode 2	TX Mode <b>Note (1)</b>

For Conducted Emission	
Final Test Mode	Description
Mode 1	TX Mode <b>Note (1)</b>

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode CH01/39/79

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

**Note:**

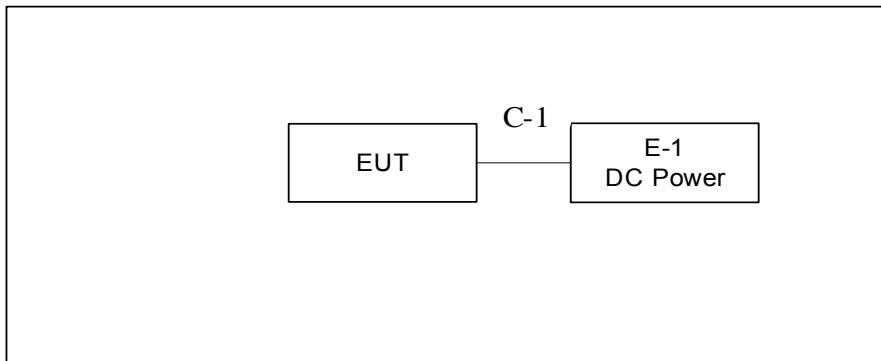
- (1) The measurements are performed at the high, middle, low available channels.

### 3.3 TABLE OF PARAMETERS OF TEXT 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 power parameters of FHSS

Test software version	N/A		
Frequency	2402 MHz	2440 MHz	2480 MHz
Parameters	N/A	N/A	N/A

### 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	DC POWER	NA	GPC-3030DN	N/A	N/A	-

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5m	DC Power

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)

Margin Level = Measurement Value - Limit Value

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

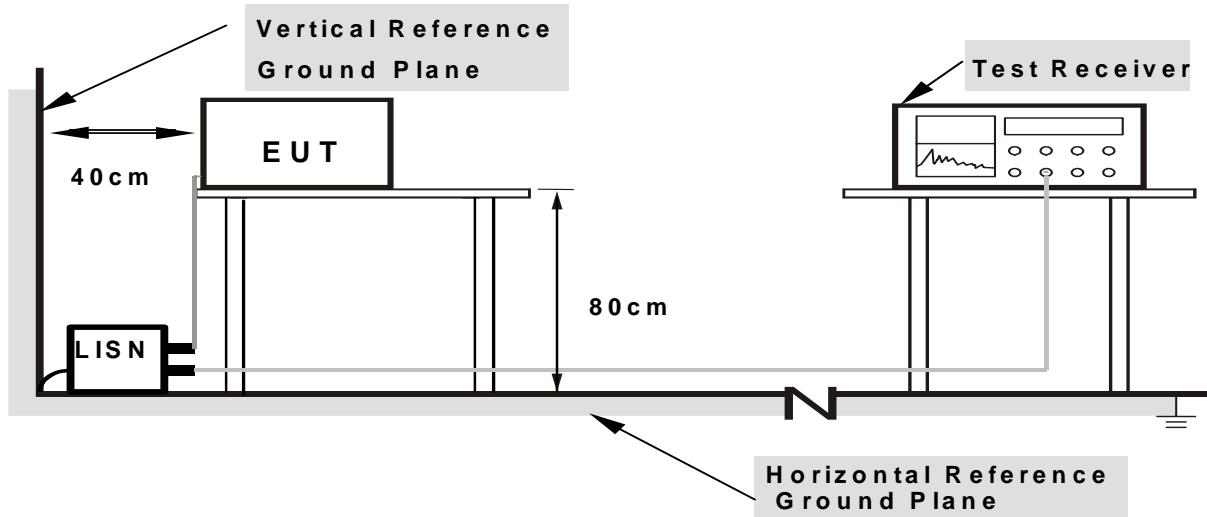
#### 4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. 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.
- c. 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.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.4 TEST SETUP



**Note:**

1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

#### 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C    Relative Humidity: 55%    Test Voltage: DC 3V

#### 4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of Note. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "\*" marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz -1000MHz)

20dB in any 100 KHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency (MHz)	Field Strength (microvolts/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
960~1000	500	3

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

#### Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dB<sub>B</sub>uV/m) = 20log Emission level (uV/m).
- (4) The test result calculated as following:

Measurement Value = Reading Level + Correct Factor

Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)

Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW	RBW1MHz VBW 3MHz Peak detector for PK value ,RMS detector for AV value

Spectrum Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz ~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz ~110KHz for QP detector
Start ~ Stop Frequency	110KHz ~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz ~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

#### 4.2.2 TEST PROCEDURE

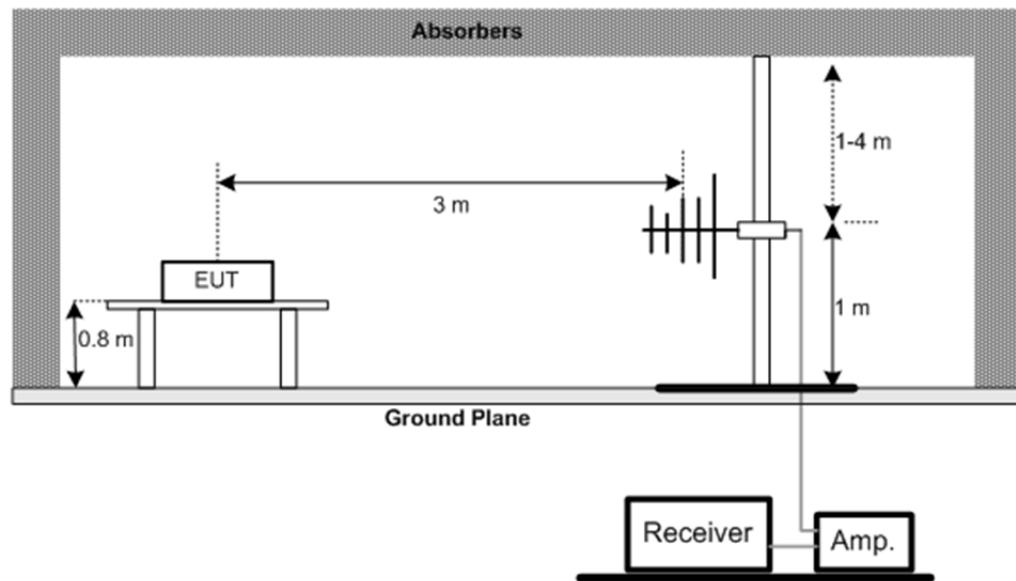
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.2.3 DEVIATION FROM TEST STANDARD

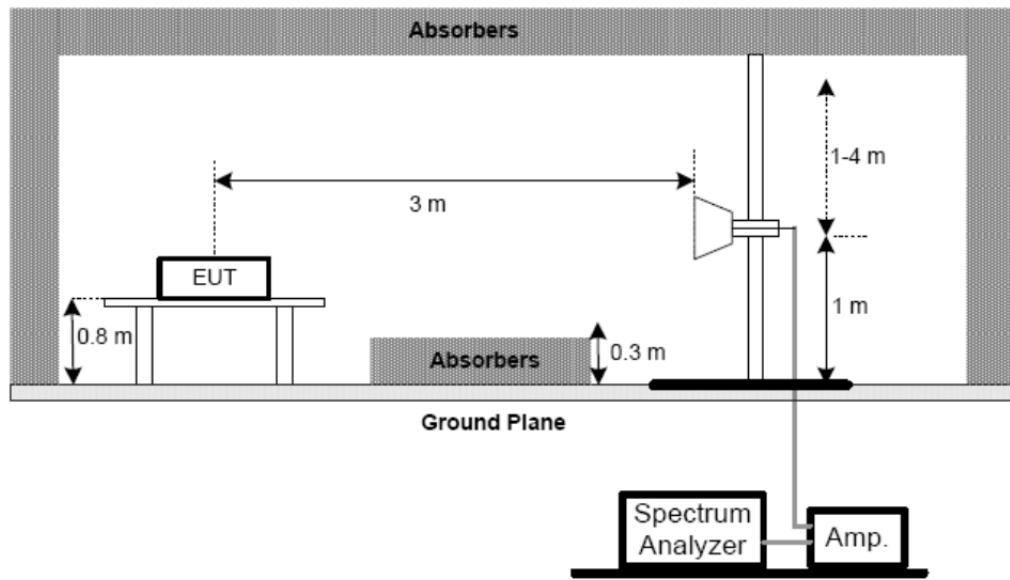
No deviation

#### 4.2.4 TEST SETUP

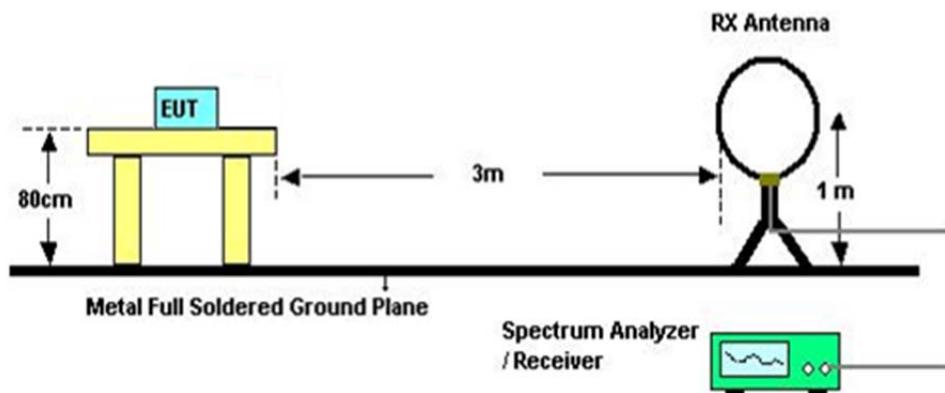
##### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



##### (B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For radiated emissions below 30MHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing

#### 4.2.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3V

#### 4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment B

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### **4.2.8 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ)**

**Please refer to the Attachment C.**

Remark:

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

#### **4.2.9 TEST RESULTS (ABOVE 1000 MHZ)**

**Please refer to the Attachment D.**

Remark:

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (3) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (4) EUT Orthogonal Axis:  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (5) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

## 5. NUMBER OF HOPPING CHANNEL

### 5.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Number of Hopping Channel	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW=100KHz, VBW=100KHz, Sweep time = Auto.

#### 5.1.2 DEVIATION FROM STANDARD

No deviation.

#### 5.1.3 TEST SETUP



#### 5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 5.1.5 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3V

#### 5.1.6 TEST RESULTS

Please refer to the Attachment E

## 6. AVERAGE TIME OF OCCUPANCY

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(iii)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

#### 6.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for packet transmitting.
- h. Measure the maximum time duration of one single pulse.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### **6.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

#### **6.1.5 EUT TEST CONDITIONS**

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3V

#### **6.1.6 TEST RESULTS**

**Please refer to the Attachment F**

## 7. HOPPING CHANNEL SEPARATION MEASUREMENT

### 7.1 APPLIED PROCEDURES / LIMIT

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.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

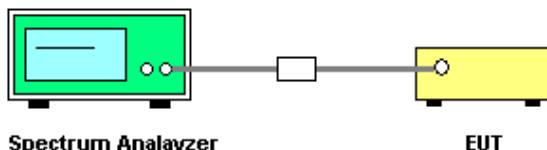
#### 7.1.1 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels
  - Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span
  - Video (or Average) Bandwidth (VBW)  $\geq$  RBW
  - Sweep = Auto
  - Detector function = Peak
  - Trace = Max Hold

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



#### 7.1.4 EUT TEST CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: DC 3V

#### 7.1.5 TEST RESULTS

Please refer to the Attachment G

## 8. BANDWIDTH TEST

### 8.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C		
Section	Test Item	Frequency Range (MHz)
15.247(a)(2)	Bandwidth	2400-2483.5

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 8.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep Time = Auto.

#### 8.1.2 DEVIATION FROM STANDARD

No deviation.

#### 8.1.3 TEST SETUP



#### 8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 8.1.5 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3V

#### 8.1.6 TEST RESULTS

Please refer to the Attachment H

## 9. PEAK OUTPUT POWER TEST

### 9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1)	Peak Output Power	1 Watt or 30dBm	2400-2483.5	PASS

#### 9.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 1MHz/3MHz, VBW= 1MHz/3MHz, Sweep time = Auto.

#### 9.1.2 DEVIATION FROM STANDARD

No deviation.

#### 9.1.3 TEST SETUP



#### 9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 9.1.5 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3V

#### 9.1.6 TEST RESULTS

**Please refer to the Attachment I**

## 10. ANTENNA CONDUCTED SPURIOUS EMISSION

### 10.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz 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 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

#### 10.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.

#### 10.1.2 DEVIATION FROM STANDARD

No deviation.

#### 10.1.3 TEST SETUP



#### 10.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

#### 10.1.5 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 3V

#### 10.1.6 TEST RESULTS

Please refer to the Attachment J

## 11. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Mar. 28, 2016
2	LISN	R&S	ENV216	101447	Mar. 28, 2016
3	Test Cable	N/A	C_17	N/A	Mar.13, 2016
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 28, 2016
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 28, 2016
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 17, 2015
3	Receiver	AGILENT	N9038A	MY5213003 9	Sep. 30, 2015
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 01, 2015
5	Antenna	ETS	3115	00075789	Mar. 28, 2016
6	Amplifier	Agilent	8449B	3008A02274	Nov. 02, 2015
7	Receiver	AGILENT	N9038A	MY5213003 9	Sep. 30, 2015
8	Test Cable	HUBER+SUHNER	C-48	N/A	Apr. 30, 2015
9	Controller	CT	SC100	N/A	N/A
10	Broad-Band Horn Antenna	Schwarbeck	BBHA 9170	9170319	Mar. 28, 2016
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
12	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 16, 2015
13	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

<b>6dB Bandwidth Measurement</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

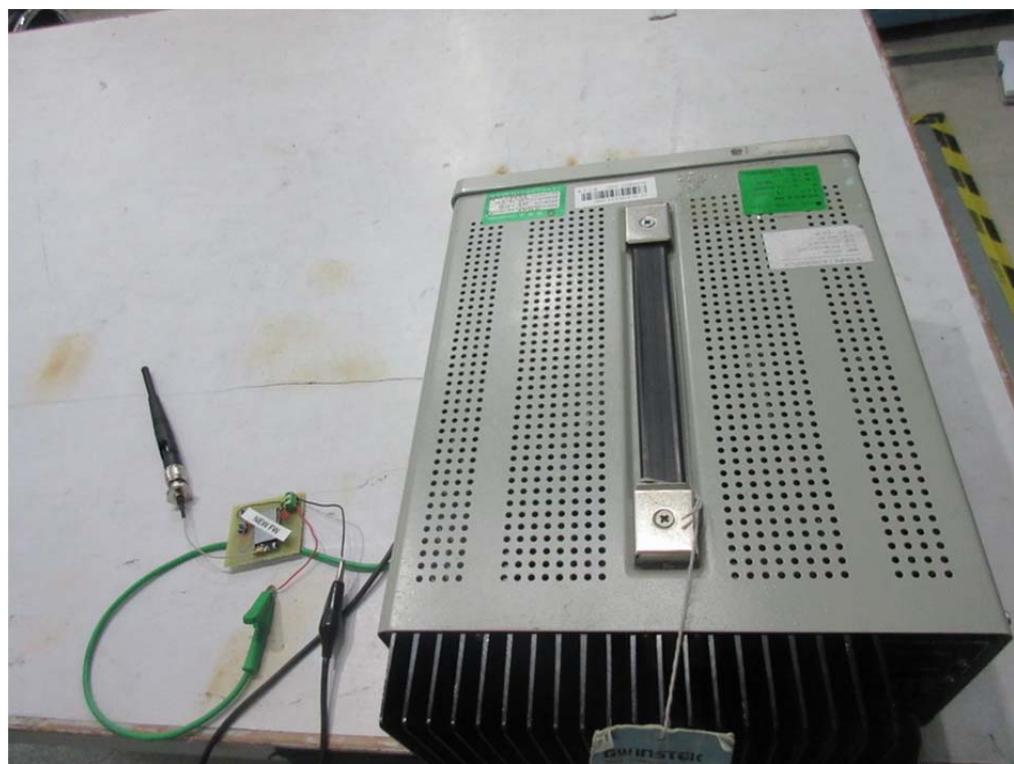
<b>Peak Output Power Measurement</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Mar. 29, 2015
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Mar. 29, 2015

<b>Antenna Conducted Spurious Emission Measurement</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

<b>Power Spectral Density Measurement</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 28, 2016

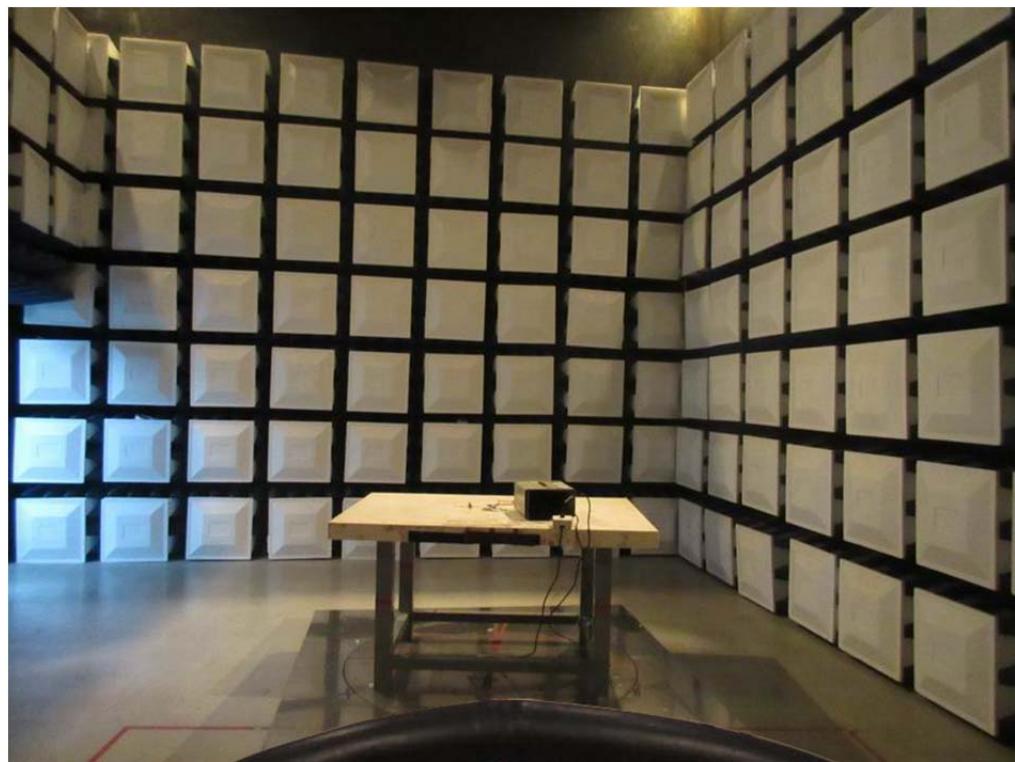
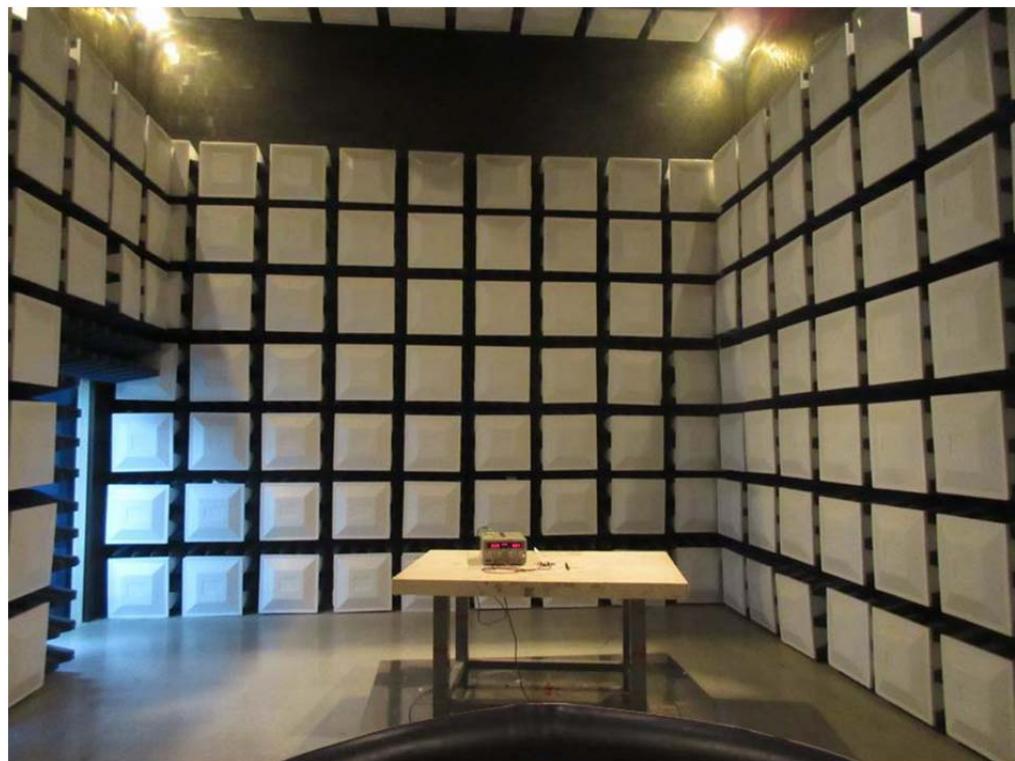
Remark: "N/A" denotes no model name, serial no. or calibration specified.

All calibration period of equipment list is one year.

**12. EUT TEST PHOTO****Conducted Measurement Photos**

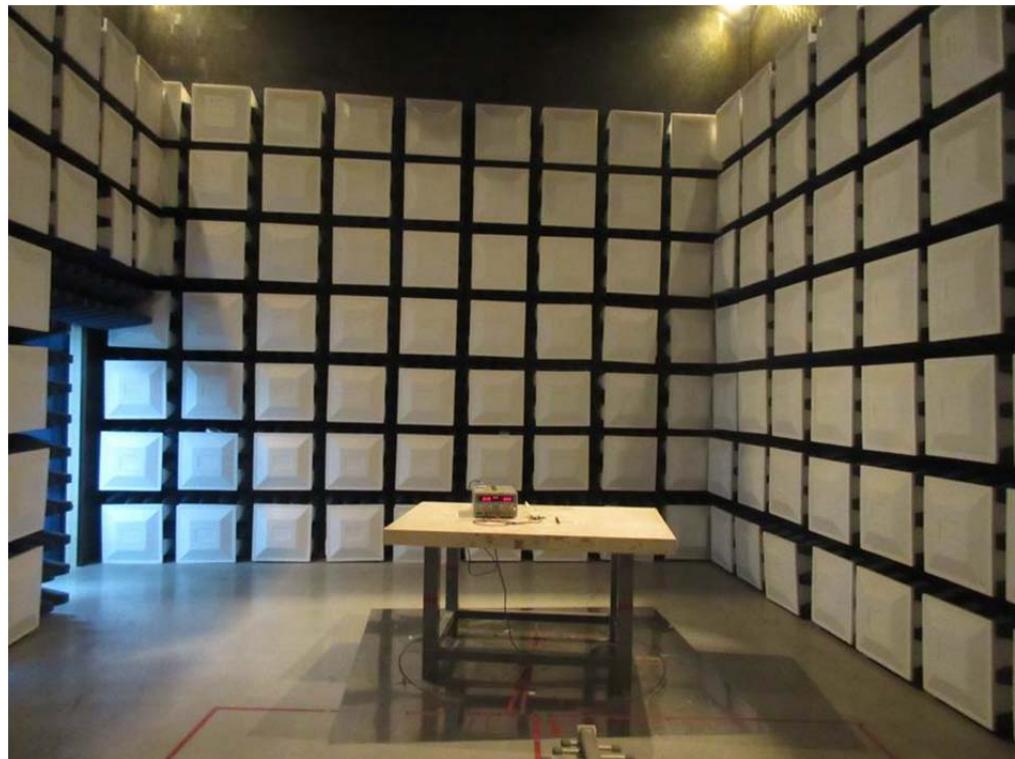
### Radiated Measurement Photos

**9KHz to 30MHz**



## Radiated Measurement Photos

30MHz to 1000MHz



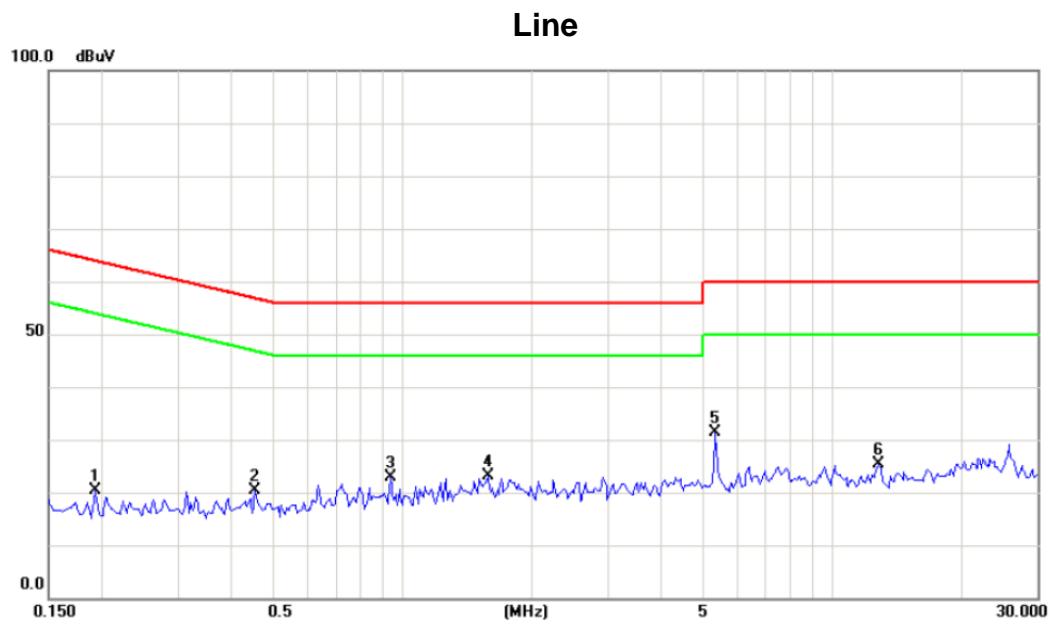
## Radiated Measurement Photos

### Above 1000MHz



## ATTACHMENT A - CONDUCTED EMISSION

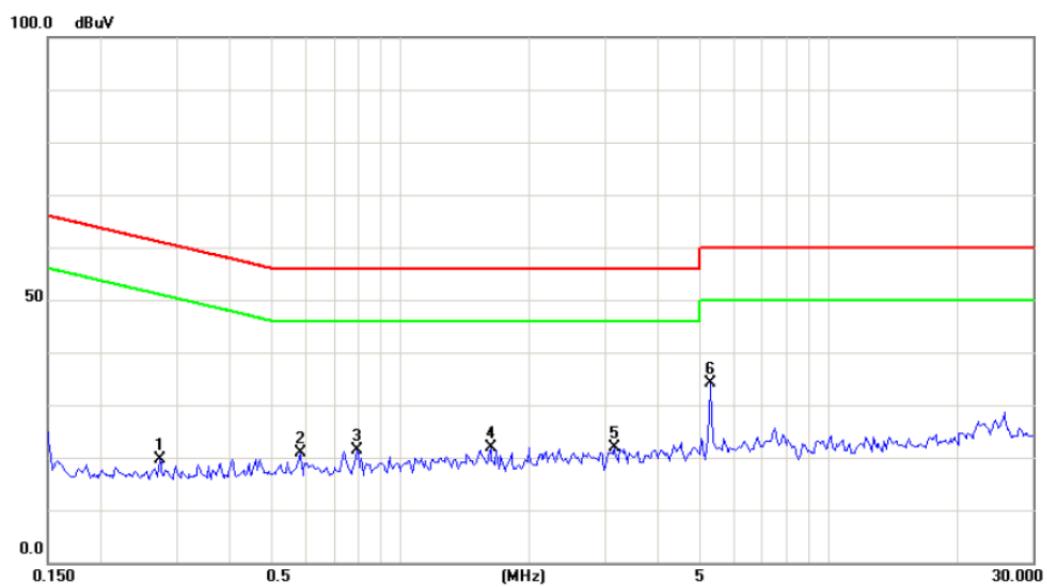
Test Mode : TX MODE



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1930	10.84	9.50	20.34	63.91	-43.57	peak	
2		0.4546	10.70	9.62	20.32	56.79	-36.47	peak	
3		0.9351	13.17	9.61	22.78	56.00	-33.22	peak	
4		1.5795	13.41	9.62	23.03	56.00	-32.97	peak	
5	*	5.3514	21.65	9.69	31.34	60.00	-28.66	peak	
6		12.7616	15.62	9.84	25.46	60.00	-34.54	peak	

Test Mode : TX MODE

## Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2750	10.04	9.57	19.61	60.97	-41.36	peak	
2		0.5835	11.41	9.58	20.99	56.00	-35.01	peak	
3		0.7944	11.89	9.59	21.48	56.00	-34.52	peak	
4		1.6226	12.14	9.62	21.76	56.00	-34.24	peak	
5		3.1640	12.18	9.65	21.83	56.00	-34.17	peak	
6	*	5.3006	24.47	9.69	34.16	60.00	-25.84	peak	

## **ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)**

## Dipole Antenna

Test Mode: TX Mode

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Note
0.0125	0°	1.82	24.30	26.12	125.67	-99.55	AVG
0.0125	0°	7.31	24.30	31.61	145.67	-114.06	PEAK
0.0236	0°	1.66	24.07	25.73	120.15	94.42	AVG
0.0236	0°	7.34	24.07	31.41	140.15	-108.74	PEAK
0.0397	0°	0.59	23.05	23.64	115.63	-91.99	AVG
0.0397	0°	6.39	23.05	29.44	135.63	-106.19	PEAK
0.0428	0°	0.98	22.86	23.84	114.98	-91.14	AVG
0.0428	0°	5.39	22.86	28.25	134.98	-106.73	PEAK
0.5236	0°	20.69	19.88	40.57	73.22	-32.65	QP
1.6020	0°	23.89	19.54	43.43	63.51	-20.08	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Note
0.0158	90°	2.08	24.30	26.38	123.63	-97.25	AVG
0.0158	90°	7.64	24.30	31.94	143.63	-111.69	PEAK
0.0195	90°	1.96	24.30	26.26	121.80	-95.54	AVG
0.0195	90°	6.83	24.30	31.13	141.80	-110.67	PEAK
0.0328	90°	1.52	23.49	25.01	117.29	-92.28	AVG
0.0328	90°	6.26	23.49	29.75	137.29	-107.54	PEAK
0.0463	90°	1.38	22.63	24.01	114.29	-90.28	AVG
0.0463	90°	6.03	22.63	28.66	134.29	-105.63	PEAK
0.4935	90°	20.19	19.82	40.01	73.74	-33.73	QP
1.6875	90°	24.67	19.53	44.20	63.06	-18.86	QP

## Chip Antenna

Test Mode: TX Mode

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Note
0.0136	0°	1.09	24.30	25.39	124.93	-99.54	AVG
0.0136	0°	6.99	24.30	31.29	144.93	-113.64	PEAK
0.0216	0°	1.69	24.20	25.89	120.92	-95.03	AVG
0.0216	0°	7.88	24.20	32.08	140.92	-108.84	PEAK
0.0288	0°	0.31	23.74	24.05	118.42	-94.37	AVG
0.0288	0°	4.52	22.81	27.33	138.42	-111.09	PEAK
0.0436	0°	-0.28	19.81	19.53	114.81	-92.28	AVG
0.0436	0°	5.08	19.54	24.62	134.81	-110.19	PEAK
0.4965	0°	21.39	0.00	21.39	73.69	-52.30	QP
1.6388	0°	24.13	0.00	24.13	63.31	-39.18	QP

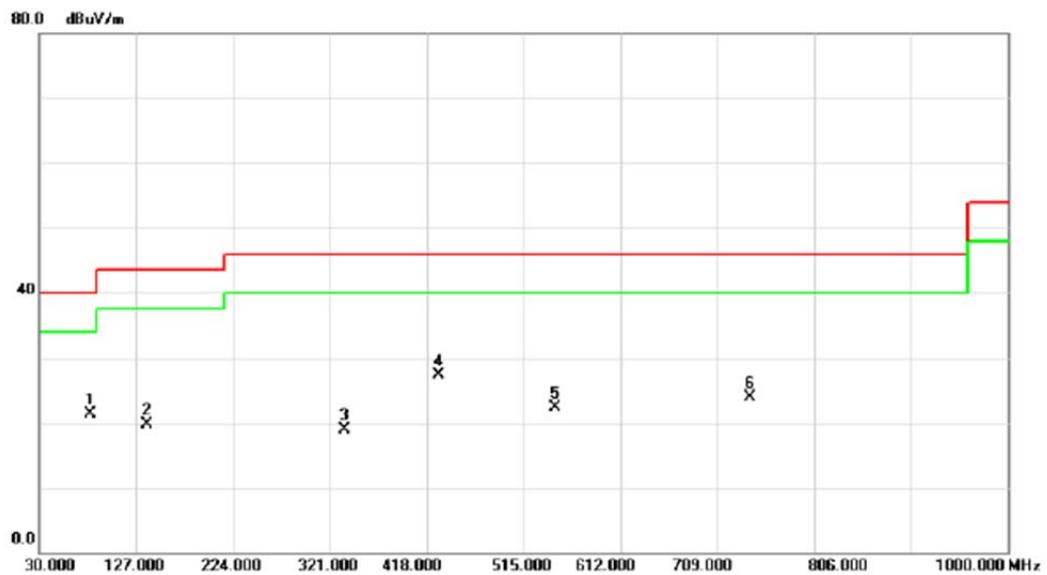
Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits (dBuV/m)	Margin (dB)	Note
0.0116	90°	3.97	24.30	28.27	126.32	-98.05	AVG
0.0116	90°	8.05	24.30	32.35	146.32	-113.97	PEAK
0.0186	90°	3.21	24.30	27.51	122.21	-94.70	AVG
0.0186	90°	7.22	24.30	31.52	142.21	-110.69	PEAK
0.3317	90°	2.66	20.20	22.86	97.19	-74.33	AVG
0.3317	90°	6.72	20.20	26.92	117.19	-90.27	PEAK
0.0436	90°	1.69	22.81	24.50	114.81	-90.31	AVG
0.0436	90°	5.89	22.81	28.70	134.81	-106.11	PEAK
0.5136	90°	21.03	19.84	40.87	73.39	-32.52	QP
1.5983	90°	24.98	19.54	44.52	63.53	-19.01	QP

## ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)

## Dipole Antenna

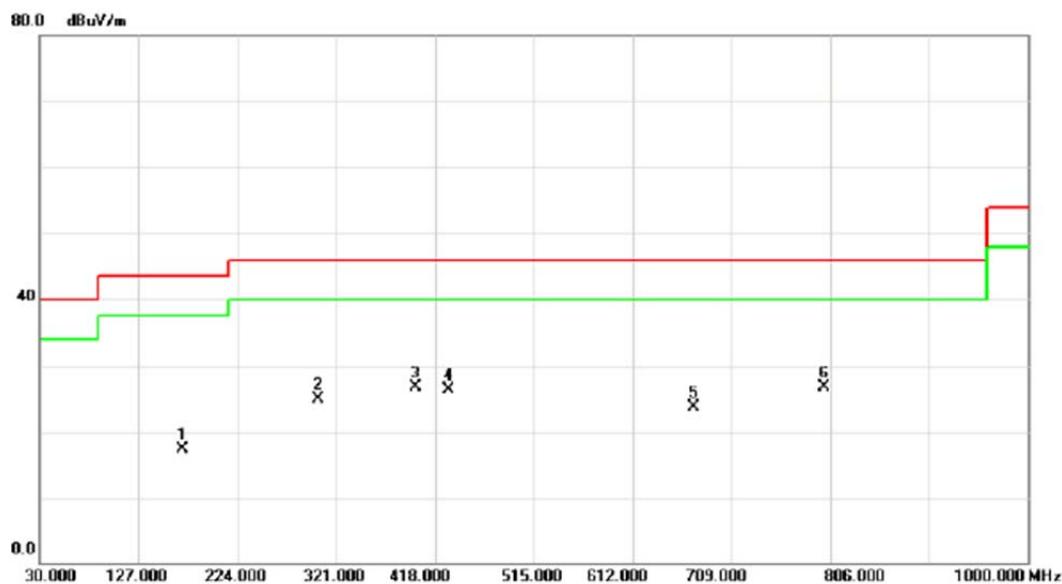
Test Mode: TX 2402MHz \_CH01

## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dB			
1		81.4100	38.47	-17.23	21.24	40.00	-18.76	peak	
2		138.6400	32.95	-13.15	19.80	43.50	-23.70	peak	
3		335.5500	30.40	-11.56	18.84	46.00	-27.16	peak	
4	*	429.6400	36.25	-8.99	27.26	46.00	-18.74	peak	
5		546.0400	30.50	-8.13	22.37	46.00	-23.63	peak	
6		741.9800	28.66	-4.69	23.97	46.00	-22.03	peak	

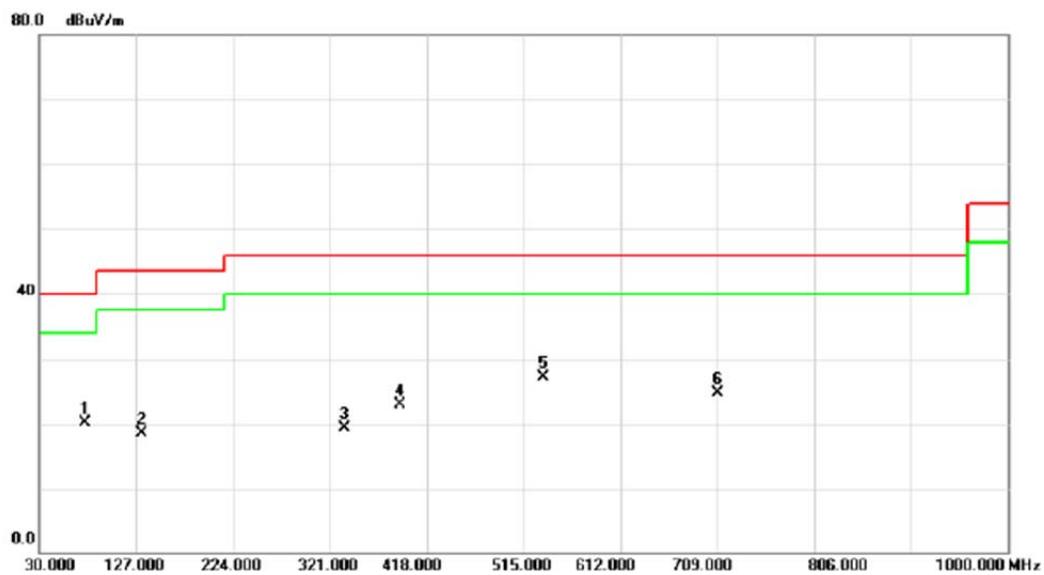
Test Mode: TX 2402MHz \_CH01

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		170.6500	29.99	-12.76	17.23	43.50	-26.27	peak	
2		303.5400	35.98	-11.05	24.93	46.00	-21.07	peak	
3		399.5700	36.18	-9.55	26.63	46.00	-19.37	peak	
4		431.5800	35.33	-8.95	26.38	46.00	-19.62	peak	
5		672.1400	28.78	-5.06	23.72	46.00	-22.28	peak	
6	*	800.1800	29.57	-2.89	26.68	46.00	-19.32	peak	

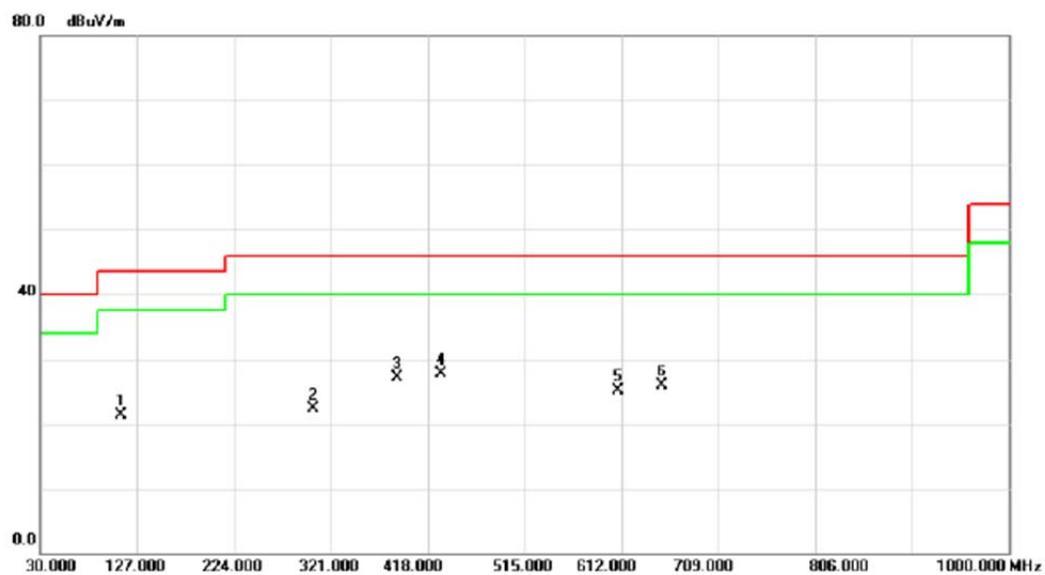
Test Mode: TX 2440MHz \_CH39

## Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		75.5900	36.70	-16.67	20.03	40.00	-19.97	peak
2		132.8200	31.53	-13.09	18.44	43.50	-25.06	peak
3		335.5500	30.81	-11.56	19.25	46.00	-26.75	peak
4		390.8400	32.88	-9.95	22.93	46.00	-23.07	peak
5	*	534.4000	35.81	-8.74	27.07	46.00	-18.93	peak
6		709.0000	29.61	-4.87	24.74	46.00	-21.26	peak

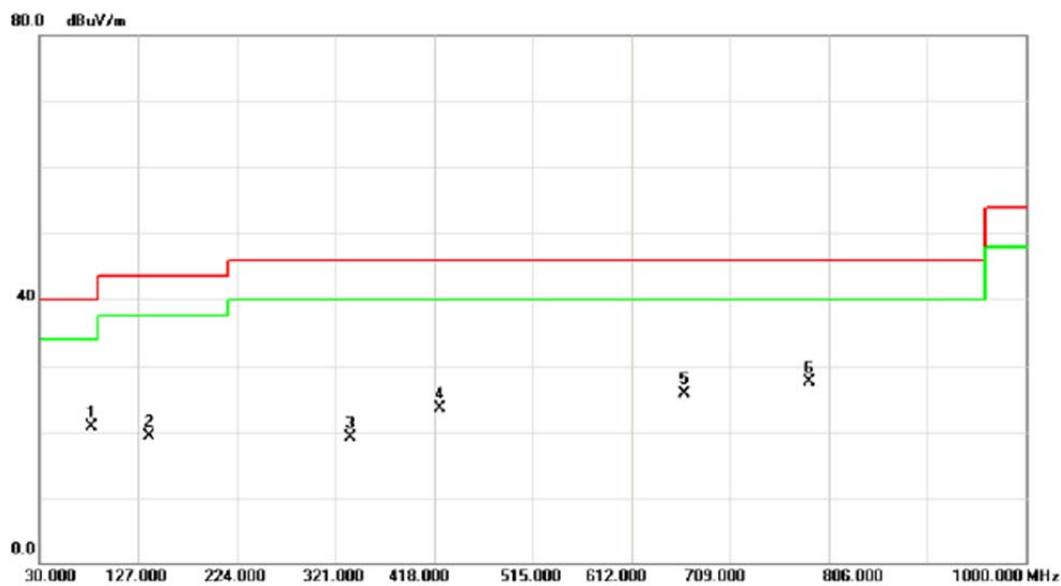
Test Mode: TX 2440MHz \_CH39

**Horizontal**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		110.5100	36.48	-15.22	21.26	43.50	-22.24	peak
2		303.5400	33.31	-11.05	22.26	46.00	-23.74	peak
3		387.9300	37.18	-10.07	27.11	46.00	-18.89	peak
4	*	431.5800	36.72	-8.95	27.77	46.00	-18.23	peak
5		608.1200	32.53	-7.47	25.06	46.00	-20.94	peak
6		652.7400	31.12	-5.13	25.99	46.00	-20.01	peak

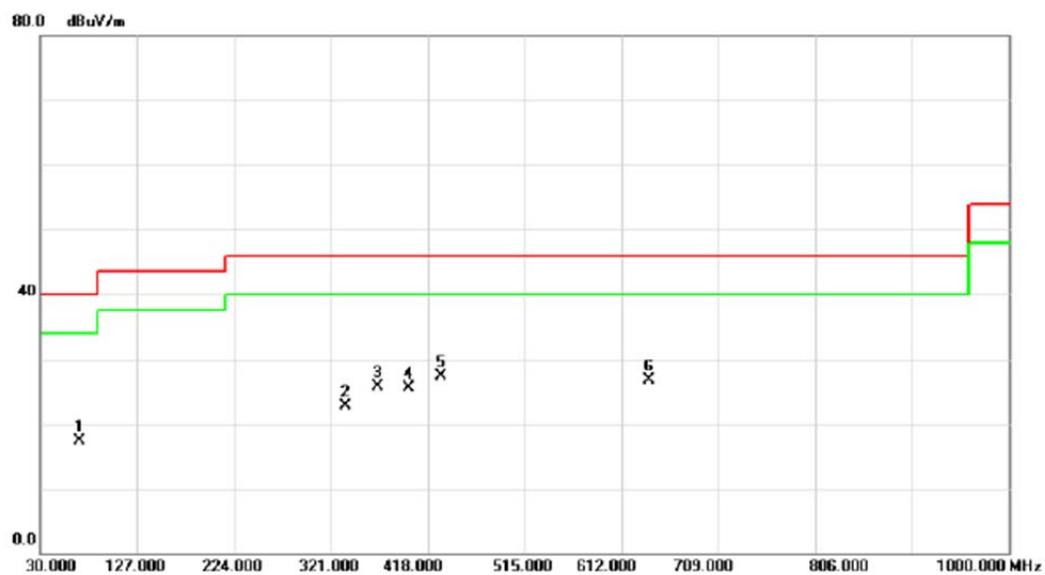
Test Mode: TX 2480MHz \_CH79

## Vertical



No.	Mk.	Freq. MHz	Reading dBuV	Correct Factor	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		81.4100	37.94	-17.23	20.71	40.00	-19.29	peak	
2		138.6400	32.44	-13.15	19.29	43.50	-24.21	peak	
3		335.5500	30.75	-11.56	19.19	46.00	-26.81	peak	
4		423.8200	32.68	-9.10	23.58	46.00	-22.42	peak	
5		664.3800	30.86	-5.09	25.77	46.00	-20.23	peak	
6	*	787.5700	30.91	-3.32	27.59	46.00	-18.41	peak	

Test Mode: TX 2480MHz \_CH79

**Horizontal**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		68.8000	33.35	-16.08	17.27	40.00	-22.73	peak
2		335.5500	34.34	-11.56	22.78	46.00	-23.22	peak
3		367.5600	36.69	-11.00	25.69	46.00	-20.31	peak
4		399.5700	34.98	-9.55	25.43	46.00	-20.57	peak
5	*	431.5800	36.23	-8.95	27.28	46.00	-18.72	peak
6		640.1300	32.46	-5.69	26.77	46.00	-19.23	peak

## Chip Antenna

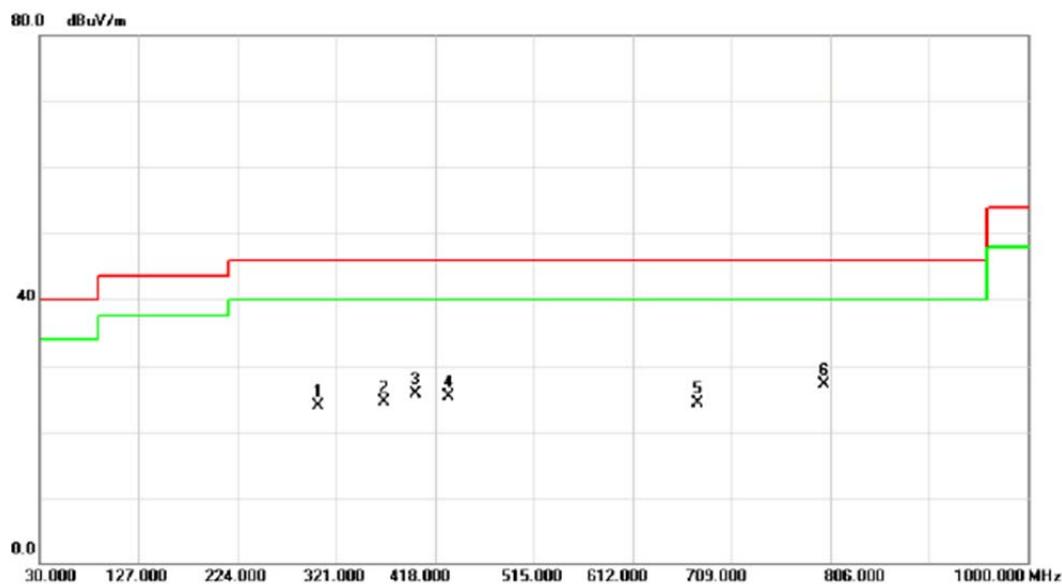
Test Mode: TX 2402MHz \_CH01

## Vertical



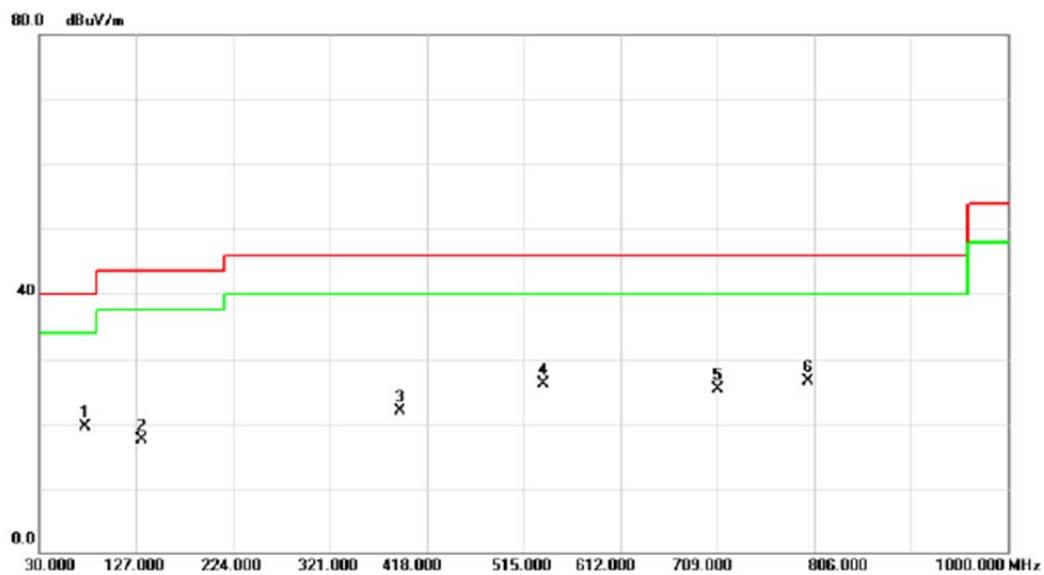
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dB			
1		81.4100	36.97	-17.23	19.74	40.00	-20.26		peak
2		138.6400	30.95	-13.15	17.80	43.50	-25.70		peak
3		387.9300	30.62	-10.07	20.55	46.00	-25.45		peak
4	*	429.6400	36.75	-8.99	27.76	46.00	-18.24		peak
5		546.0400	30.00	-8.13	21.87	46.00	-24.13		peak
6		698.3300	29.60	-4.93	24.67	46.00	-21.33		peak

Test Mode: TX 2402MHz \_CH01

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		303.5400	34.98	-11.05	23.93	46.00	-22.07	peak	
2		367.5600	35.53	-11.00	24.53	46.00	-21.47	peak	
3		399.5700	35.17	-9.55	25.62	46.00	-20.38	peak	
4		431.5800	34.33	-8.95	25.38	46.00	-20.62	peak	
5		676.0200	29.43	-5.04	24.39	46.00	-21.61	peak	
6	*	800.1800	30.07	-2.89	27.18	46.00	-18.82	peak	

Test Mode: TX 2440MHz \_CH39

**Vertical**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1		75.5900	36.20	-16.67	19.53	40.00	-20.47	peak
2		132.8200	30.53	-13.09	17.44	43.50	-26.06	peak
3		390.8400	31.89	-9.95	21.94	46.00	-24.06	peak
4		534.4000	34.80	-8.74	26.06	46.00	-19.94	peak
5		709.0000	30.11	-4.87	25.24	46.00	-20.76	peak
6	*	800.1800	29.41	-2.89	26.52	46.00	-19.48	peak

Test Mode: TX 2440MHz \_CH39

**Horizontal**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector Comment
1		110.5100	34.48	-15.22	19.26	43.50	-24.24	peak
2		303.5400	31.31	-11.05	20.26	46.00	-25.74	peak
3		335.5500	32.94	-11.56	21.38	46.00	-24.62	peak
4		367.5600	35.92	-11.00	24.92	46.00	-21.08	peak
5		431.5800	35.23	-8.95	26.28	46.00	-19.72	peak
6	*	640.1300	33.25	-5.69	27.56	46.00	-18.44	peak

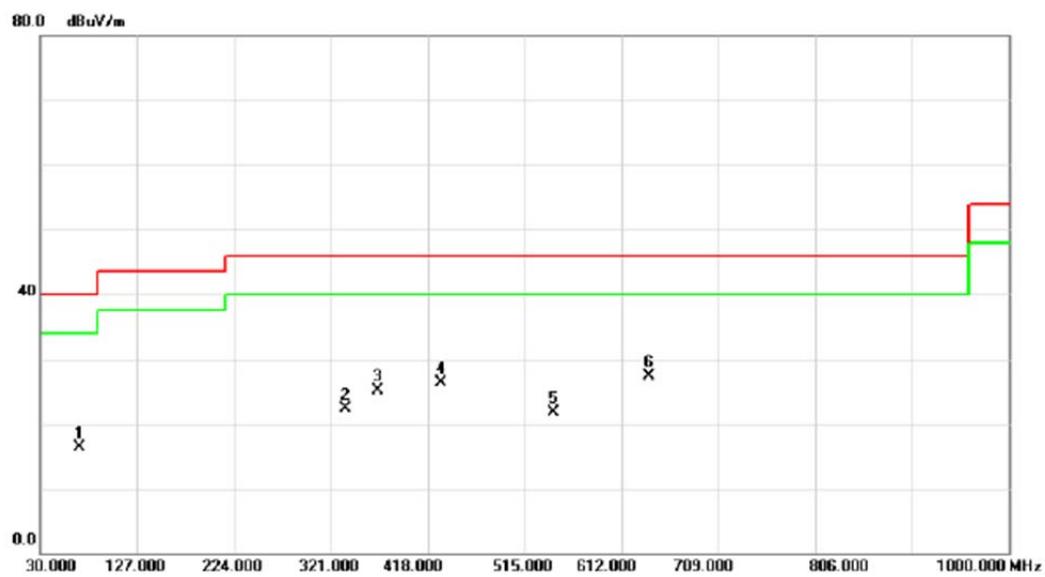
Test Mode: TX 2480MHz \_CH79

## Vertical



No.	Mk.	Reading	Correct	Measure-	Limit	Margin		
		Level	Factor	ment	dBuV/m	dB	Detector	Comment
		MHz	dBuV					
1	*	81.4100	37.44	-17.23	20.21	40.00	-19.79	peak
2		138.6400	31.44	-13.15	18.29	43.50	-25.21	peak
3		291.9000	29.08	-11.15	17.93	46.00	-28.07	peak
4		423.8200	32.18	-9.10	23.08	46.00	-22.92	peak
5		564.4700	30.02	-7.93	22.09	46.00	-23.91	peak
6		664.3800	29.86	-5.09	24.77	46.00	-21.23	peak

Test Mode: TX 2480MHz \_CH79

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
1		68.8000	32.35	-16.08	16.27	40.00	-23.73	peak	
2		335.5500	33.84	-11.56	22.28	46.00	-23.72	peak	
3		367.5600	36.19	-11.00	25.19	46.00	-20.81	peak	
4		431.5800	35.23	-8.95	26.28	46.00	-19.72	peak	
5		544.1000	29.90	-8.23	21.67	46.00	-24.33	peak	
6	*	640.1300	32.96	-5.69	27.27	46.00	-18.73	peak	

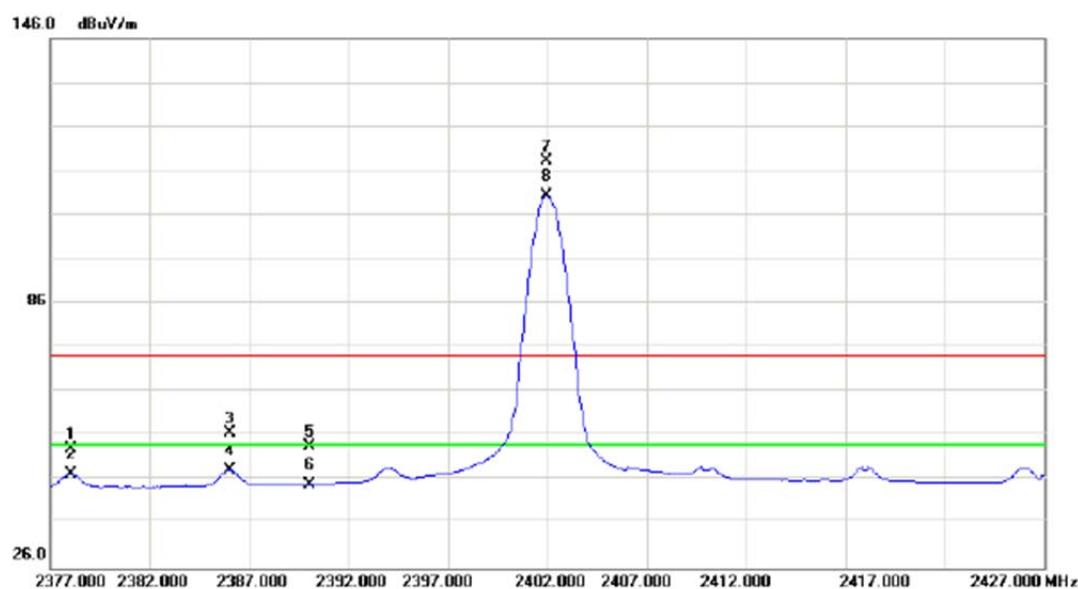
## ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

## Dipole Antenna

Orthogonal Axis : X

Test Mode : TX 2402MHz \_CH01

## Vertical



No. Mk.	Freq. MHz	Reading Level	Correct Factor	Measure- ment	Limit	Margin	Detector	Comment
		dBuV	dB	dBuV/m	dBuV/m	dB		
1	2378.000	21.31	31.86	53.17	74.00	-20.83	peak	
2	2378.000	15.73	31.86	47.59	54.00	-6.41	AVG	
3	2386.000	25.00	31.87	56.87	74.00	-17.13	peak	
4	2386.000	16.45	31.87	48.32	54.00	-5.68	AVG	
5	2390.000	21.81	31.88	53.69	74.00	-20.31	peak	
6	2390.000	13.28	31.88	45.16	54.00	-8.84	AVG	
7	X 2401.950	86.34	31.89	118.23	74.00	44.23	peak	no limit
8	* 2401.950	78.65	31.89	110.54	54.00	56.54	AVG	no limit

Orthogonal Axis : X

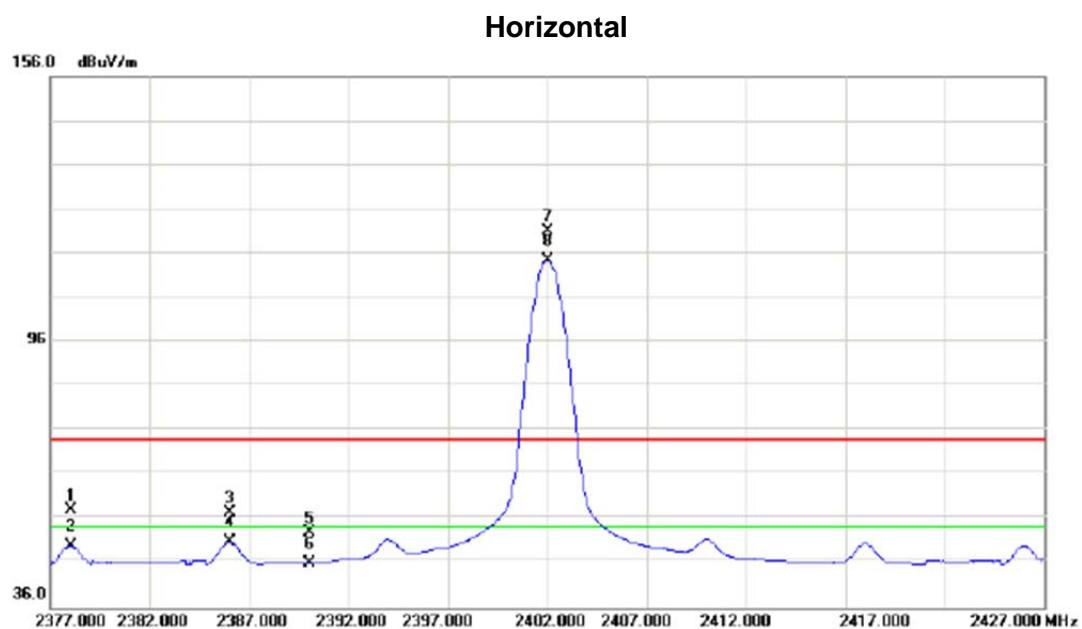
Test Mode : TX 2402MHz \_CH01

## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4804.210	58.64	3.58	62.22	74.00	-11.78	peak
2		4804.210	35.93	3.58	39.51	54.00	-14.49	AVG

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH01



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dB			
1	2378.000	26.17	31.86	58.03	74.00	-15.97	peak		
2	2378.000	18.18	31.86	50.04	54.00	-3.96	AVG		
3	2386.000	25.49	31.87	57.36	74.00	-16.64	peak		
4	2386.000	18.98	31.87	50.85	54.00	-3.15	AVG		
5	2390.000	20.99	31.88	52.87	74.00	-21.13	peak		
6	2390.000	14.22	31.88	46.10	54.00	-7.90	AVG		
7	X 2402.000	89.20	31.89	121.09	74.00	47.09	peak	no limit	
8	* 2402.000	82.61	31.89	114.50	54.00	60.50	AVG	no limit	

Orthogonal Axis : X

Test Mode : TX 2402MHz \_CH01

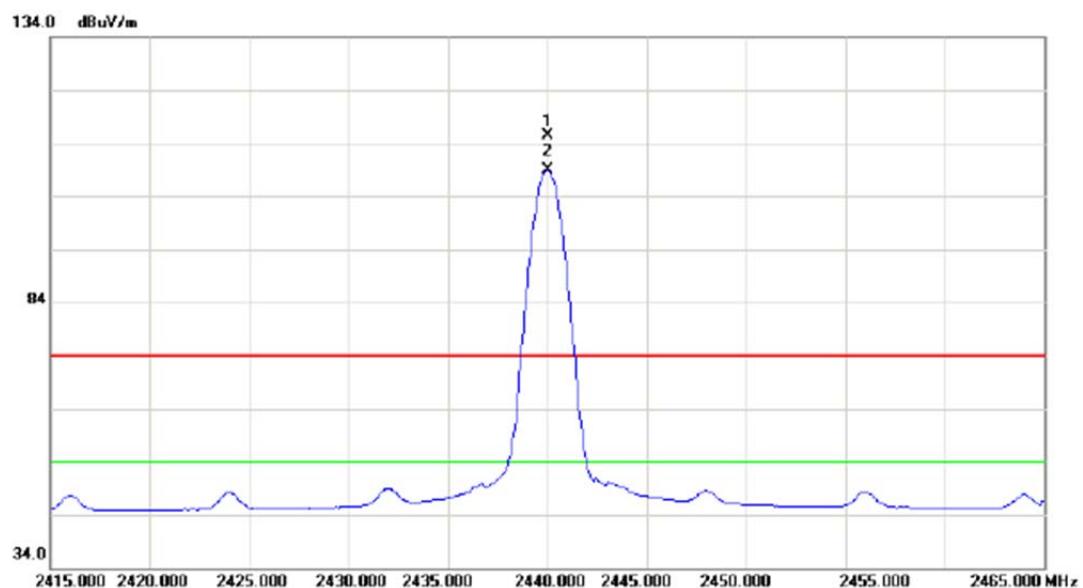
**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4804.000	57.65	3.58	61.23	74.00	-12.77	peak
2		4804.000	33.29	3.58	36.87	54.00	-17.13	AVG

Orthogonal Axis : X

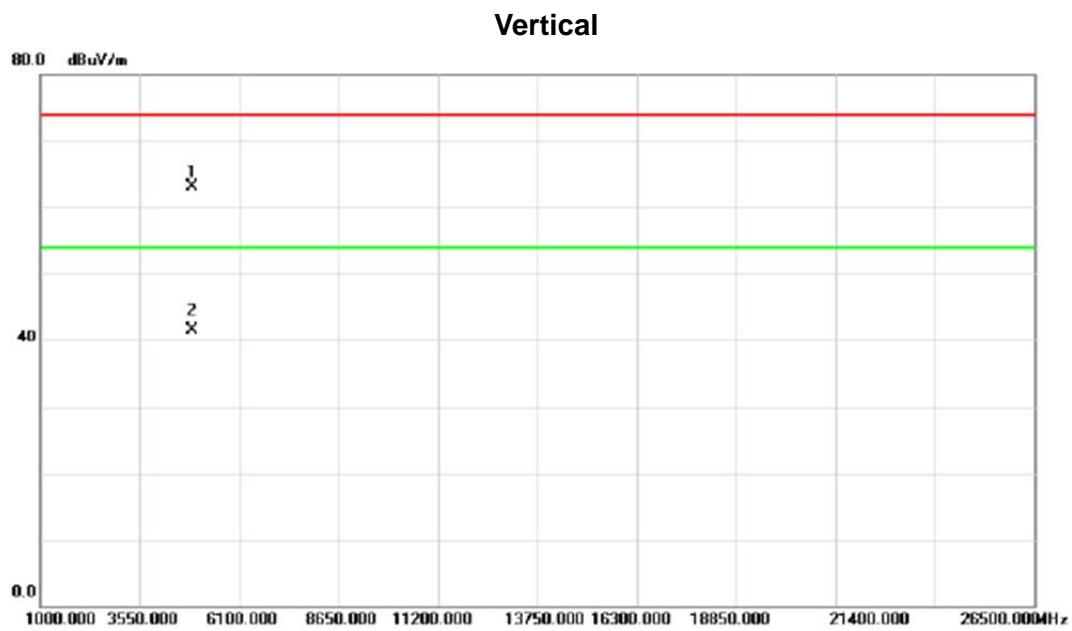
Test Mode : TX 2440MHz \_ CH39

## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	X	2440.000	83.44	31.95	115.39	74.00	41.39	peak no limit
2	*	2440.000	76.88	31.95	108.83	54.00	54.83	AVG no limit

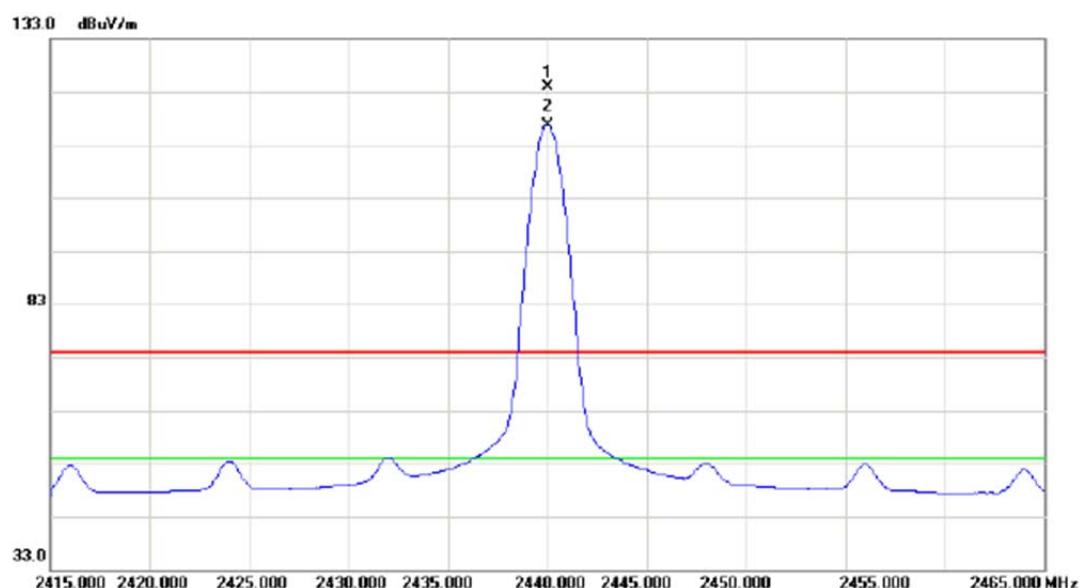
Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH39



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4880.980	59.45	3.73	63.18	74.00	-10.82	peak
2		4880.980	37.79	3.73	41.52	54.00	-12.48	AVG

Orthogonal Axis : X

Test Mode : TX 2440MHz \_CH39

**Horizontal**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	X	2440.000	92.02	31.95	123.97	74.00	49.97	peak no limit
2	*	2440.000	84.73	31.95	116.68	54.00	62.68	AVG no limit

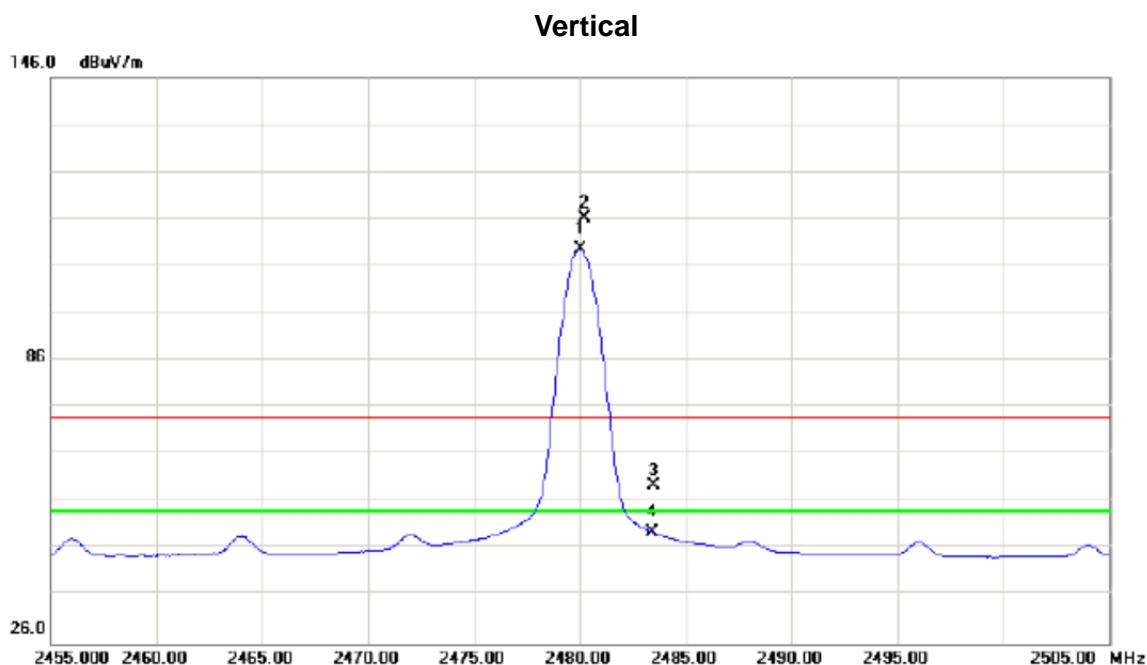
Orthogonal Axis : X

Test Mode : TX 2440MHz \_CH39

**Horizontal**

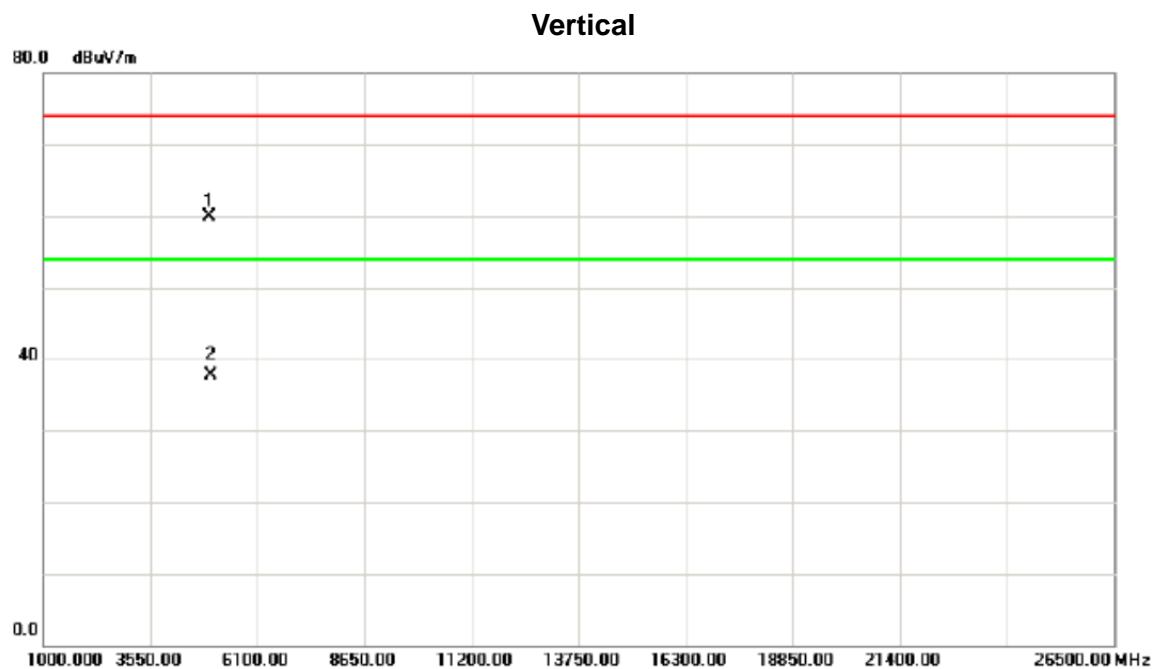
No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4880.100	56.66	3.73	60.39	74.00	-13.61	peak
2		4880.100	33.32	3.73	37.05	54.00	-16.95	AVG

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _ CH79



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dB			
1	*	2480.000	77.60	32.00	109.60	54.00	55.60	AVG	no limit
2	X	2480.230	84.21	32.00	116.21	74.00	42.21	peak	no limit
3		2483.500	27.34	32.01	59.35	74.00	-14.65	peak	
4		2483.500	17.40	32.01	49.41	54.00	-4.59	AVG	

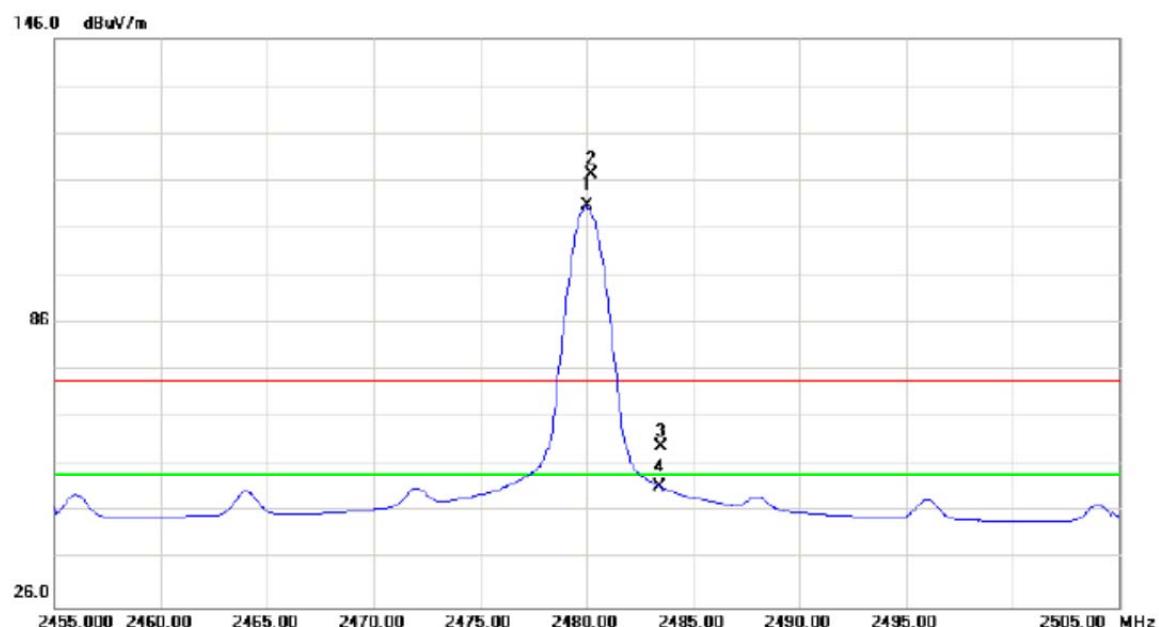
Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH79



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4960.310	55.99	3.88	59.87	74.00	-14.13	peak
2		4960.310	33.81	3.88	37.69	54.00	-16.31	AVG

Orthogonal Axis : X

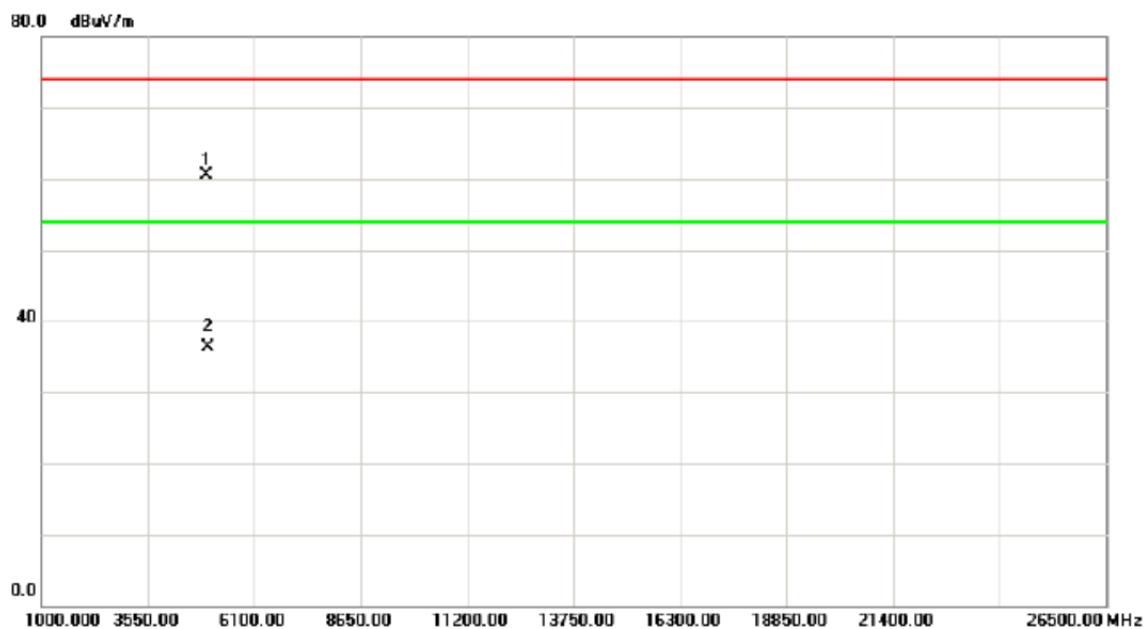
Test Mode : TX 2480MHz \_CH79

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dB			
1	*	2480.000	78.68	32.00	110.68	54.00	56.68	AVG	no limit
2	X	2480.230	85.27	32.00	117.27	74.00	43.27	peak	no limit
3		2483.500	28.17	32.01	60.18	74.00	-13.82	peak	
4		2483.500	19.32	32.01	51.33	54.00	-2.67	AVG	

Orthogonal Axis : X

Test Mode : TX 2480MHz \_CH79

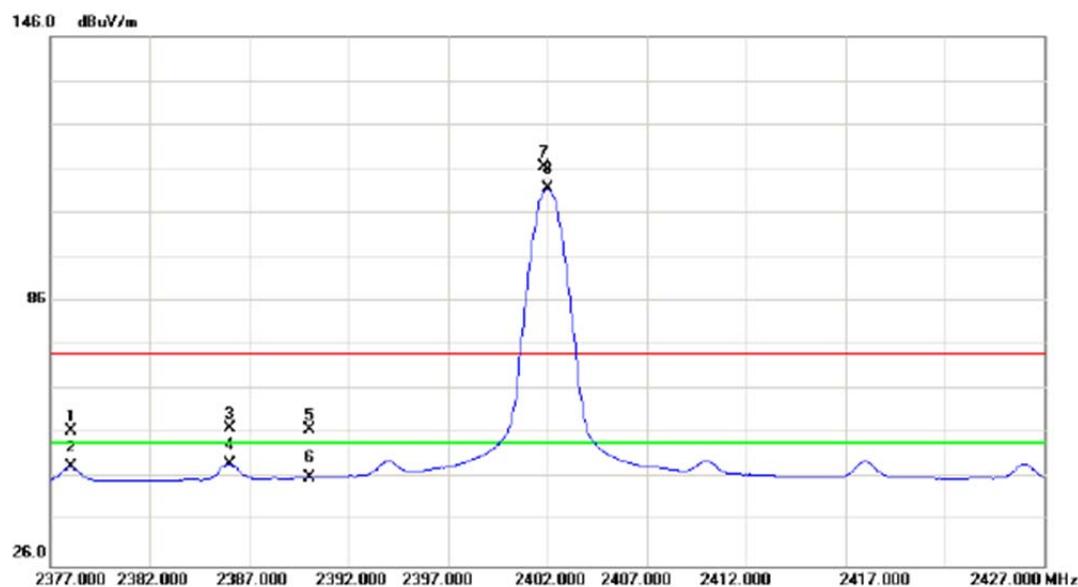
**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4960.180	56.66	3.88	60.54	74.00	-13.46	peak	
2		4960.180	32.49	3.88	36.37	54.00	-17.63	AVG	

## Chip Antenna

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH01

## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2378.000	25.01	31.86	56.87	74.00	-17.13	peak	
2		2378.000	16.73	31.86	48.59	54.00	-5.41	AVG	
3		2386.000	25.36	31.87	57.23	74.00	-16.77	peak	
4		2386.000	17.45	31.87	49.32	54.00	-4.68	AVG	
5		2390.000	25.03	31.88	56.91	74.00	-17.09	peak	
6		2390.000	14.28	31.88	46.16	54.00	-7.84	AVG	
7	X	2401.850	84.69	31.89	116.58	74.00	42.58	peak	no limit
8	*	2402.000	79.69	31.89	111.58	54.00	57.58	AVG	no limit

Orthogonal Axis : X

Test Mode : TX 2402MHz \_CH01

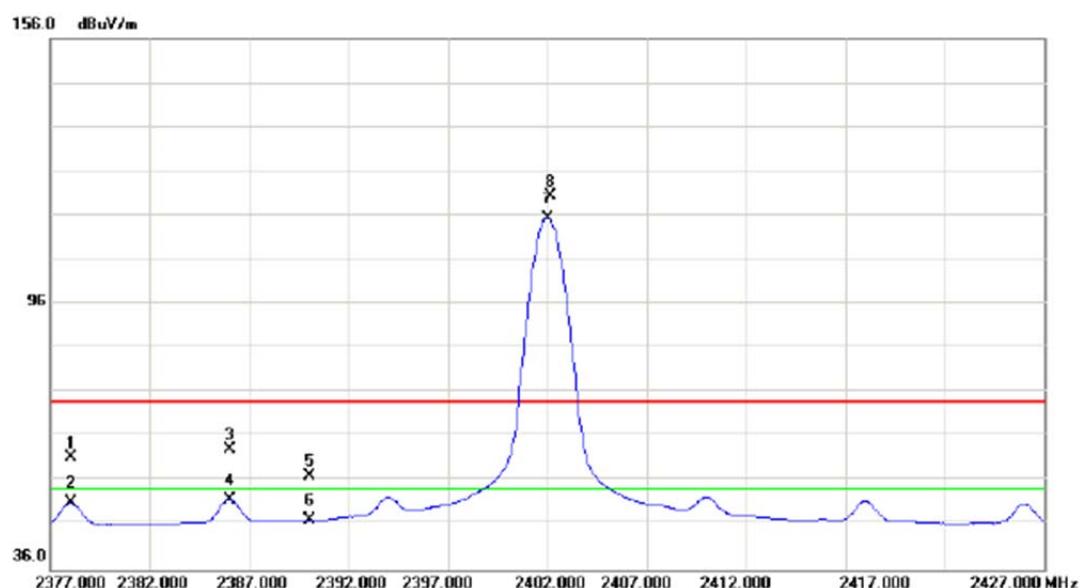
## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4804.030	59.31	3.58	62.89	74.00	-11.11	peak
2		4804.030	36.06	3.58	39.64	54.00	-14.36	AVG

Orthogonal Axis : X

Test Mode : TX 2402MHz \_CH01

**Horizontal**

No.	Mk.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
		Freq.	Level	Factor				
		MHz	dBuV	dB	dBuV/m	dB		
1	2378.000	29.52	31.86	61.38	74.00	-12.62	peak	
2	2378.000	19.18	31.86	51.04	54.00	-2.96	AVG	
3	2386.000	31.42	31.87	63.29	74.00	-10.71	peak	
4	2386.000	19.98	31.87	51.85	54.00	-2.15	AVG	
5	2390.000	25.24	31.88	57.12	74.00	-16.88	peak	
6	2390.000	15.22	31.88	47.10	54.00	-6.90	AVG	
7	*	2402.000	83.61	31.89	115.50	54.00	61.50	AVG no limit
8	X	2402.200	88.59	31.89	120.48	74.00	46.48	peak no limit

Orthogonal Axis : X

Test Mode : TX 2402MHz \_CH01

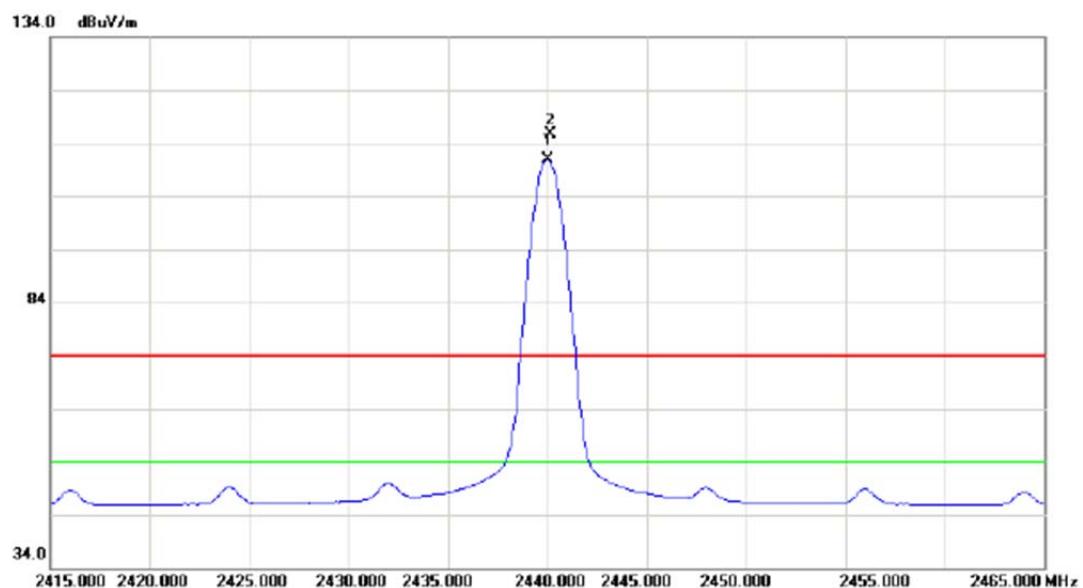
**Horizontal**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4803.960	57.17	3.58	60.75	74.00	-13.25	peak
2		4803.960	33.61	3.58	37.19	54.00	-16.81	AVG

Orthogonal Axis : X

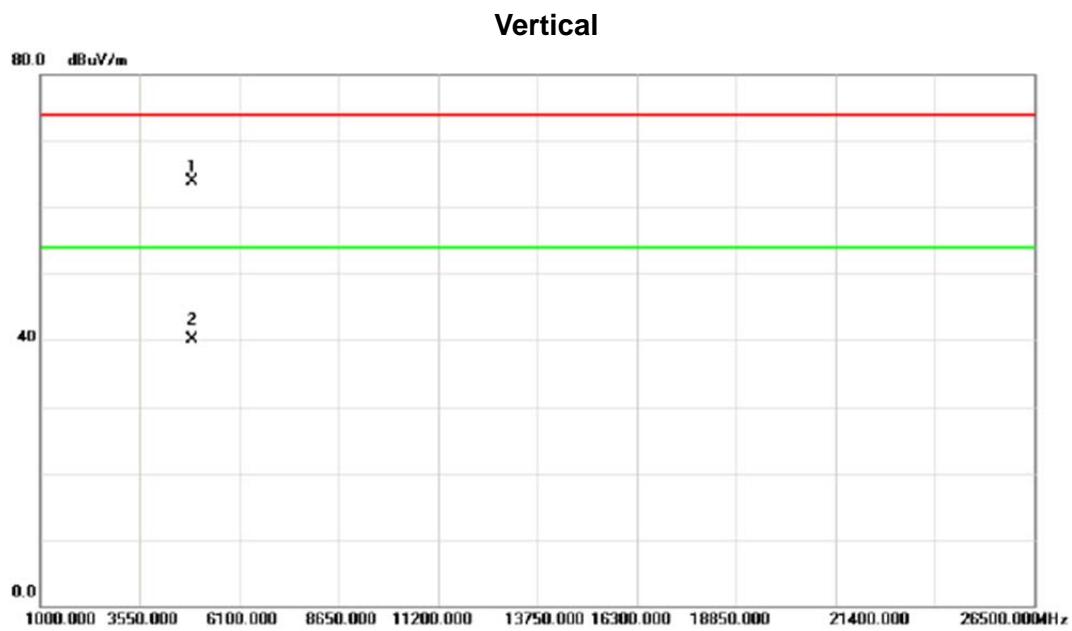
Test Mode : TX 2440MHz \_ CH39

## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	2440.000	78.88	31.95	110.83	54.00	56.83	AVG no limit
2	X	2440.150	83.80	31.95	115.75	74.00	41.75	peak no limit

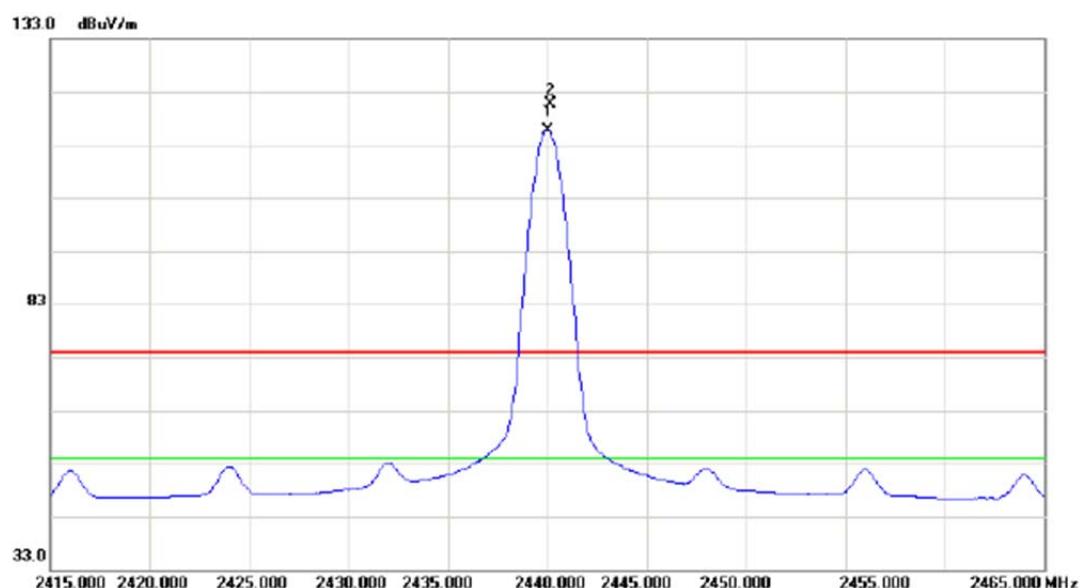
Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH39



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4880.260	60.24	3.73	63.97	74.00	-10.03	peak
2		4880.260	36.35	3.73	40.08	54.00	-13.92	AVG

Orthogonal Axis : X

Test Mode : TX 2440MHz \_CH39

**Horizontal**

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	2440.000	83.73	31.95	115.68	54.00	61.68	AVG no limit
2	X	2440.150	88.69	31.95	120.64	74.00	46.64	peak no limit

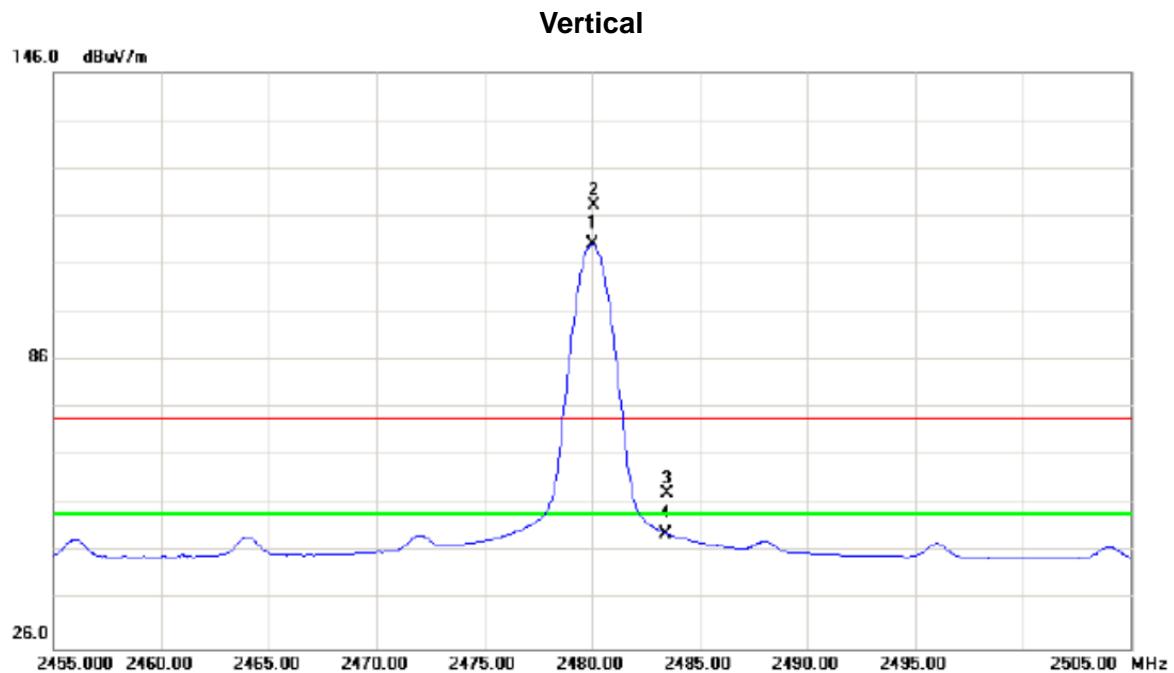
Orthogonal Axis : X

Test Mode : TX 2440MHz \_CH39

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4880.100	57.35	3.73	61.08	74.00	-12.92	peak
2		4880.100	33.48	3.73	37.21	54.00	-16.79	AVG

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _ CH79

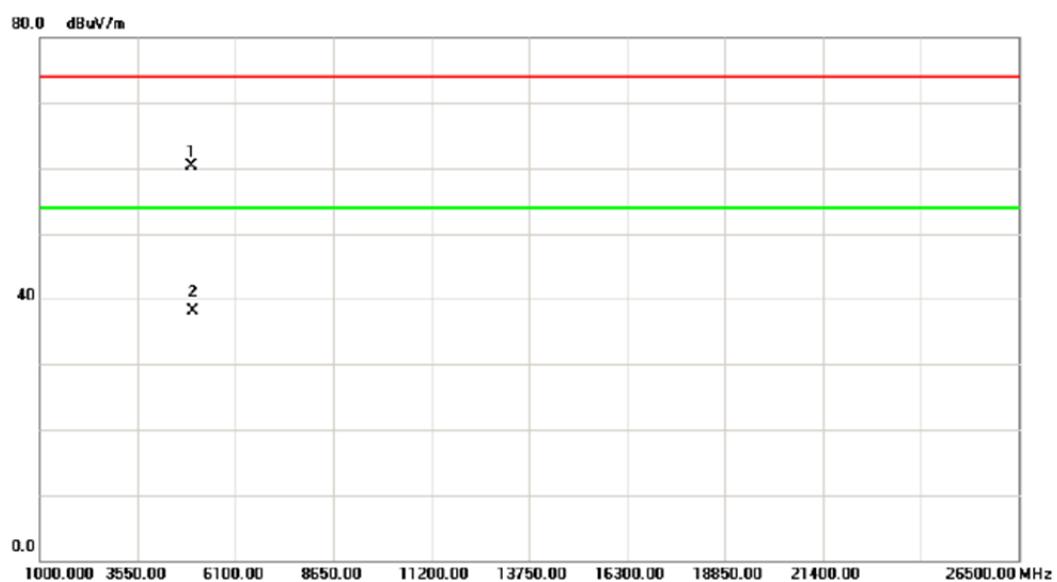


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dB $\mu$ V	dB	dB $\mu$ V/m	dB $\mu$ V/m	dB		
1	*	2480.000	78.10	32.00	110.10	54.00	56.10	AVG	no limit
2	X	2480.100	86.20	32.00	118.20	74.00	44.20	peak	no limit
3		2483.500	26.17	32.01	58.18	74.00	-15.82	peak	
4		2483.500	17.90	32.01	49.91	54.00	-4.09	AVG	

Orthogonal Axis : X

Test Mode : TX 2480MHz \_CH79

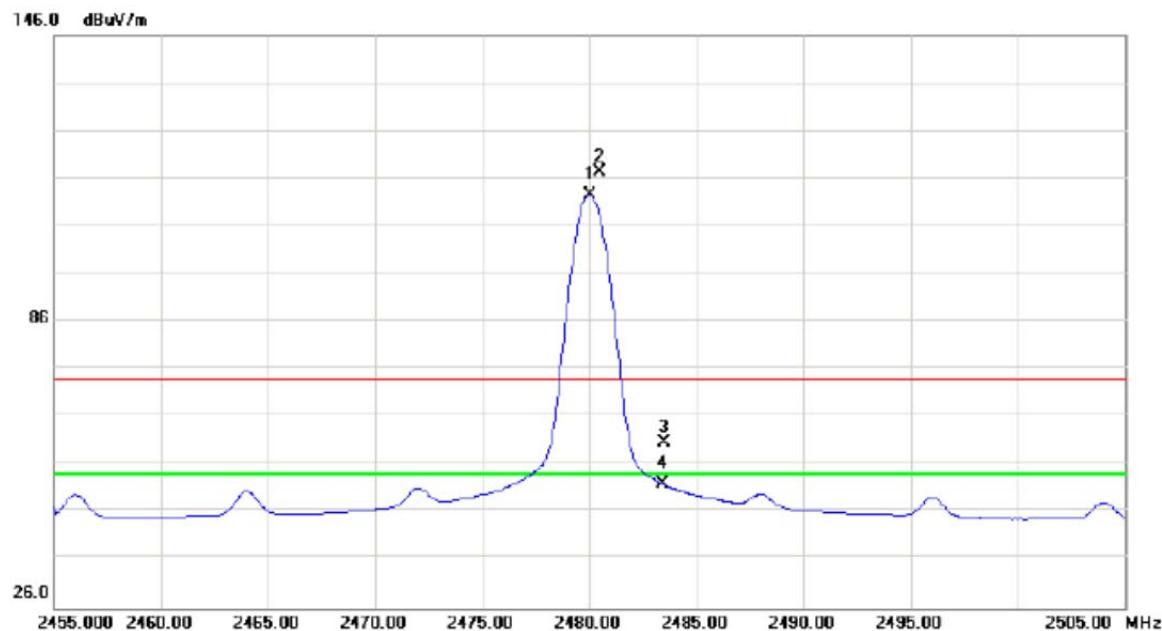
## Vertical



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4960.000	56.51	3.88	60.39	74.00	-13.61	peak
2		4960.000	34.28	3.88	38.16	54.00	-15.84	AVG

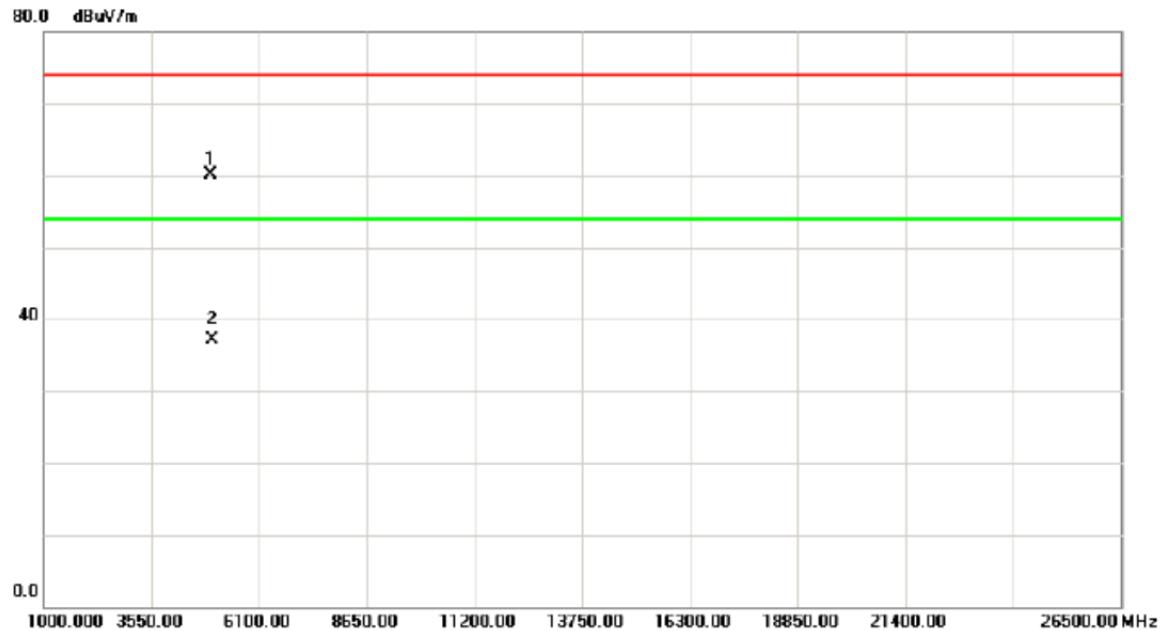
Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH79

### Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	Detector	Comment
			Level	Factor	ment				
		MHz	dBuV	dB	dBuV/m	dB			
1	*	2480.000	80.68	32.00	112.68	54.00	58.68	AVG	no limit
2	X	2480.520	85.34	32.00	117.34	74.00	43.34	peak	no limit
3		2483.500	28.69	32.01	60.70	74.00	-13.30	peak	
4		2483.500	19.82	32.01	51.83	54.00	-2.17	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH79

**Horizontal**

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin	
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV/m	dB	Detector	Comment
1	*	4960.020	56.13	3.88	60.01	74.00	-13.99	peak
2		4960.020	33.25	3.88	37.13	54.00	-16.87	AVG

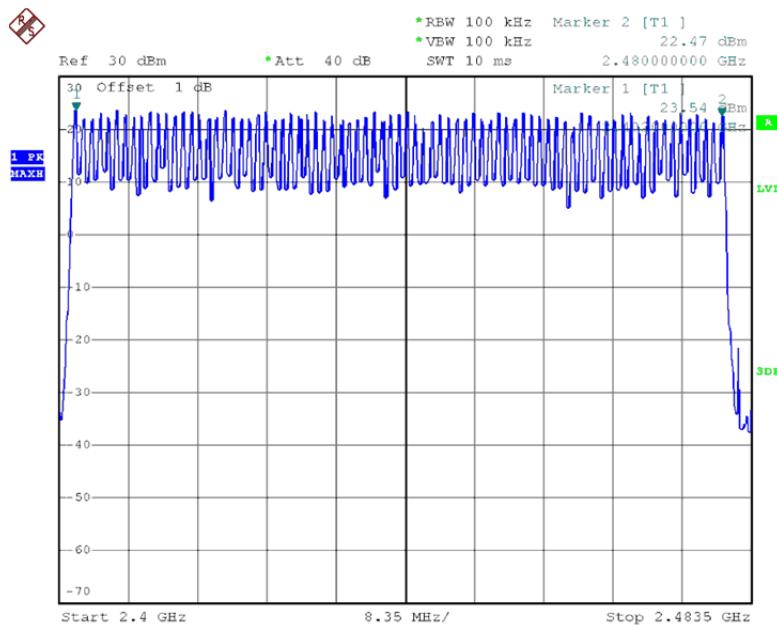
## ATTACHMENT E - NUMBER OF HOPPING CHANNEL

## Dipole Antenna

## Test Mode

## Hopping Mode

Number of Hopping Channel



Date: 10.MAR.2015 18:41:26