


# FCC Radio Test Report


## FCC ID: 2AF8ZMK8021511


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

**Project No.** : 1511C175  
**Equipment** : 1MORE BLUETOOTH OVER-EAR HEADPHONES  
**Model Name** : 1MEJ005HA  
**Applicant** : 1MORE INC.  
**Address** : Tianliao Building F14 East Block (New Materials Industrial Park), Xueyuan Road, Nanshan District, Shenzhen, P.R. China

**Date of Receipt** : Nov. 11, 2015  
**Date of Test** : Nov. 11, 2015 ~ Nov. 19, 2015  
**Issued Date** : Nov. 20, 2015  
**Tested by** : BTL Inc.

**Testing Engineer** :   
(Niklaus Lai)

**Technical Manager** :   
(David Mao)

**Authorized Signatory** :   
(Steven Lu)

# **B T L I N C .**

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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-2-1511C175	Original Issue.	Nov. 20, 2015

## 1. CERTIFICATION

Equipment : 1MORE BLUETOOTH OVER-EAR HEADPHONES  
Brand Name : 1MORE  
Model Name : 1MEJ005HA  
Applicant : 1MORE INC.  
Manufacturer: COSONIC ACOUSTIC TECHNOLOGY CO., LTD.  
Address : 5/F, Building 1, No. 6, South Industrial Road, Songshan Lake National Hitech  
Industrial Development Zone, Dongguan, Guangdong, China  
Factory : COSONIC ACOUSTIC TECHNOLOGY CO., LTD.  
Address : 5/F, Building 1, No. 6, South Industrial Road, Songshan Lake National Hitech  
Industrial Development Zone, Dongguan, Guangdong, China  
Date of Test : Nov. 11, 2015 ~ Nov. 19, 2015  
Test Sample : Engineering Sample  
Standard(s) : FCC Part15, Subpart C :2014 (15.247) / ANSI C63.10-2013

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-2-1511C175) 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):

<b>Applied Standard(s): FCC Part15 (15.247) , Subpart C: 2014</b>			
Standard(s) Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247(a)(2)	6dB Bandwidth	PASS	
15.247(b)(3)	Peak Output Power	PASS	
15.247(e)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
15.209/15.205	Transmitter Radiated Emissions	PASS	

**NOTE:**

(1) "N/A" denotes test is not applicable to this device.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.  
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 BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{\text{CISPR}}$  requirement.

The reported uncertainty of measurement  $y \pm U$ , where expanded 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)
DG-C02	CISPR	150 kHz ~ 30MHz	2.32

### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB03 (3m)	CISPR	9KHz ~ 30MHz	V	3.79
		9KHz ~ 30MHz	H	3.57
		30MHz ~ 200MHz	V	3.82
		30MHz ~ 200MHz	H	3.78
		200MHz ~ 1,000MHz	V	4.10
		200MHz ~ 1,000MHz	H	4.06
		1GHz ~ 18GHz	V	3.12
		1GHz ~ 18GHz	H	3.68
		18GHz ~ 40GHz	V	4.15
		18GHz ~ 40GHz	H	4.14

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	1MORE BLUETOOTH OVER-EAR HEADPHONES	
Brand Name	1MORE	
Model Name	1MEJ005HA	
Model Difference	N/A	
Product Description	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps)
	Bit Rate of Transmitter	
	Output Power (Max.)	2.80 dBm (1Mbps)
Power Source	1# Supplied from USB port. 2# Battery supplied.	
Power Rating	1# EUT I/P: DC 5V 2# DC 3.7V 200mAh 0.74Wh	

Note:

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

2.

Channel List			
Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	PIFA	N/A	0.5

### 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 <b>NOTE (1)</b>
Mode 2	TX Mode

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

For Conducted Test	
Final Test Mode	Description
Mode 2	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode <b>NOTE (1)</b>

Note:

- (1) The measurements are performed at the high, middle, low available channels.
- (2) USB port and battery are evaluated, USB port is the worst case of conduction test, and battery is the worst case of other projects.

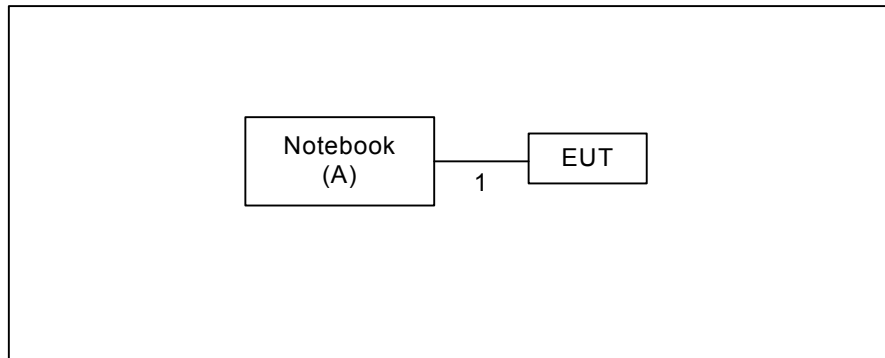
### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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 WLAN

Test Software Version	0		
Frequency (MHz)	2402	2440	2480
BT LE	N/A	N/A	N/A

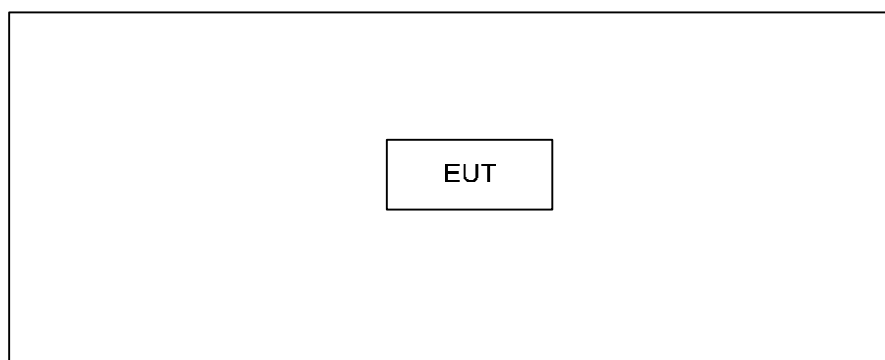
### 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

#### Conducted TX Mode:



-----  
Control Room

#### Radiated TX Mode:



-----  
Control Room

### 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.
A	NOTEBOOK	DELL	INSPIRON 1420	DOC	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	YES	NO	0.3m	USB Cable

Note:

- (1) For detachable type I/O cable should be specified the length in m in 『Length』 column.

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 -0.5	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

Note:

- (1) The limit of " \* " decreases with the logarithm of the frequency
- (2) 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

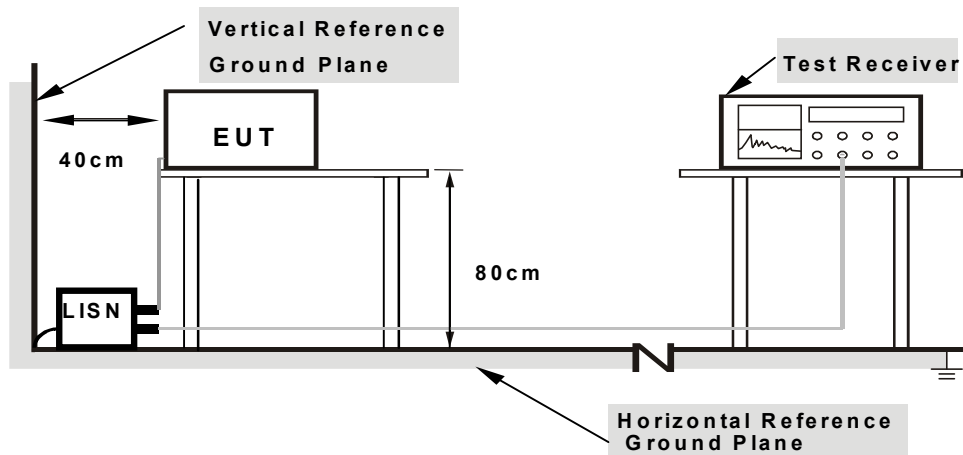
#### 4.1.2 TEST PROCEDURE

- 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 fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

#### 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: AC 120V/60Hz

#### 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.
- (3) “ N/A” denotes test is not applicable to this device.

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS

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.

#### LIMITS OF RADIATED EMISSION MEASUREMENT (9KHz-1000MHz)

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)	(dBuV/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 (dBuV/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 (Emission in restricted band)	RBW 1MHz VBW 3MHz peak detector for Pk value RMS detector for AV value



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

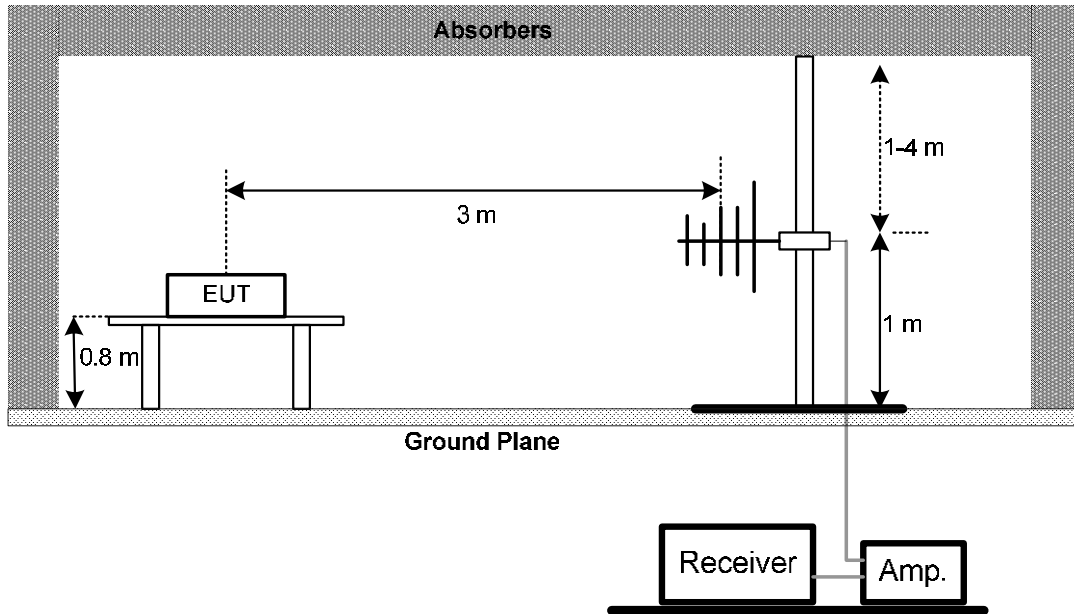
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter 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)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5m, 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.
- d. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. 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. (below 1GHz)
- f. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.2.3 DEVIATION FROM TEST STANDARD

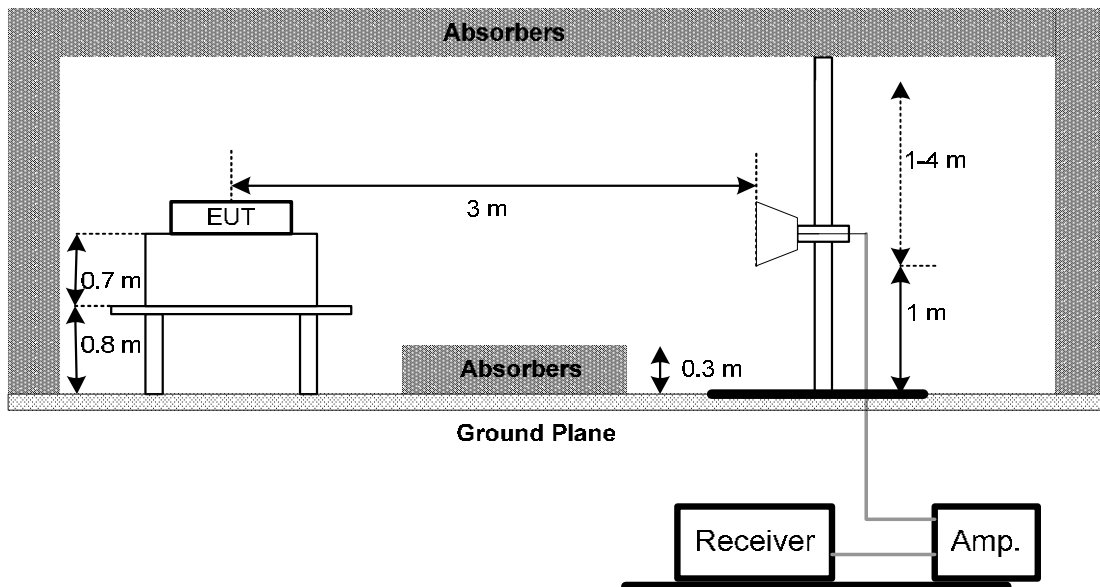
No deviation

#### 4.2.4 TEST SETUP

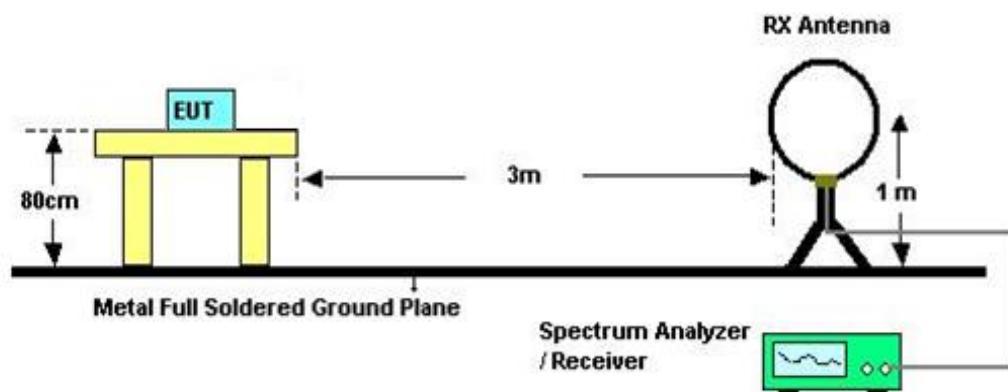
##### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



##### (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 3.7V

#### 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 (30MHZ TO 1000 MHZ)**

**Please refer to the Attachment C.**

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) Measuring frequency range from 30MHz to 1000MHz.
- (3) 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
- (6) No limit: This is fundamental signal, the judgment is not applicable.  
For fundamental signal judgment was referred to Peak output test.

## 5. BANDWIDTH TEST

### 5.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

#### 5.1.1 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=300KHz, Sweep time = 2.5 ms.

#### 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 3.7V

#### 5.1.6 TEST RESULTS

Please refer to the Attachment E.

## 6. MAXIMUM OUTPUT POWER TEST

### 6.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Maximum Output Power	1 watt or 30dBm	2400-2483.5	PASS

#### 6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- b. The maximum **peak** conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance v03r03.

#### 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 3.7V

#### 6.1.6 TEST RESULTS

Please refer to the Attachment F.

## 7. ANTENNA CONDUCTED SPURIOUS EMISSION

### 7.1 Applied procedures / limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

#### 7.1.1 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=300KHz, Sweep time = 10 ms.
- c. Offset=antenna gain+cable loss

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



#### 7.1.4 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.

#### 7.1.5 EUT OPERATION CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: DC 3.7V

#### 7.1.6 TEST RESULTS

**Please refer to the Attachment G.**

## 8. POWER SPECTRAL DENSITY TEST

### 8.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e)	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

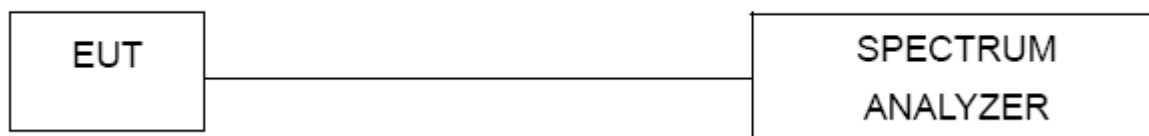
#### 8.1.1 TEST PROCEDURE

- 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=3KHz, VBW=10 KHz, 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 3.7V

#### 8.1.6 TEST RESULTS

Please refer to the Attachment H.



## 9. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	699837	0052765	Mar. 28, 2016
2	LISN	R&S	ENV216	101447	Mar. 28, 2016
3	Test Cable	emci	RG223(9KHz-30 MHz)	C_17	Mar. 13, 2016
4	EMI Test Receiver	R&S	ESCS30	826547/022	Mar. 28, 2016
5	50Ω Terminator	SHX	TF2-3G-A	08122901	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	Schwarzbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 09, 2016
3	Receiver	AGILENT	N9038A	MY52130039	Oct. 11, 2016
4	Test Cable	emci	LMR-400(30MHz-1GHz)	C-01	Jun. 28, 2016
5	Controller	CT	SC100	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Antenna	ETS	3115	00075789	Mar. 28, 2016
8	Amplifier	Agilent	8449B	3008A02274	Nov. 01, 2016
9	Test Cable	emci	EMC104-SM-S M-10000(1GHz-26.5GHz)	C-68	Jun. 28, 2016
10	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
11	Microwave Pre-amplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
12	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 07, 2016

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

<b>Peak Output Power Measurement</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	ANRITSU	ML2495A	1128009	Mar. 28, 2016
2	Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 28, 2016

<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	Oct. 11, 2016

<b>Power Spectral Density Measurement</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

Remark: "N/A" denotes no model name, serial no. or calibration specified.  
 All calibration period of equipment list is one year.

## 10. EUT TEST PHOTO

### Conducted Measurement Photos



## Radiated Measurement Photos

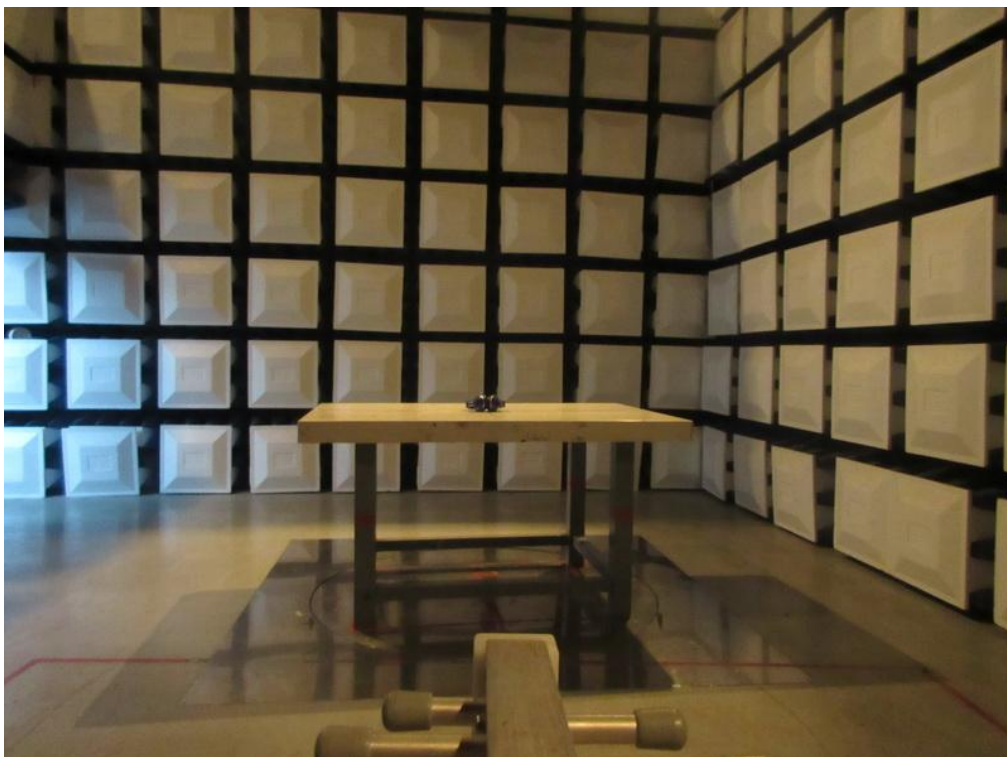
9KHz to 30MHz





## Radiated Measurement Photos

30M to 1000MHz



## Radiated Measurement Photos

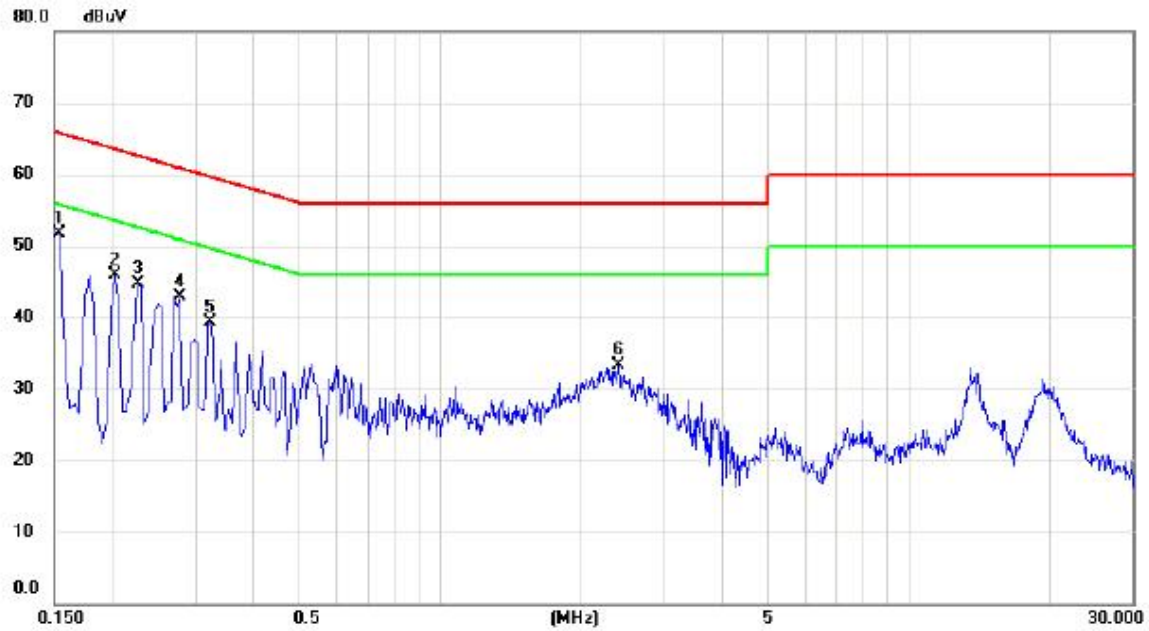
Above 1000MHz



## ATTACHMENT A - CONDUCTED EMISSION

Test Mode: TX Mode

### Line

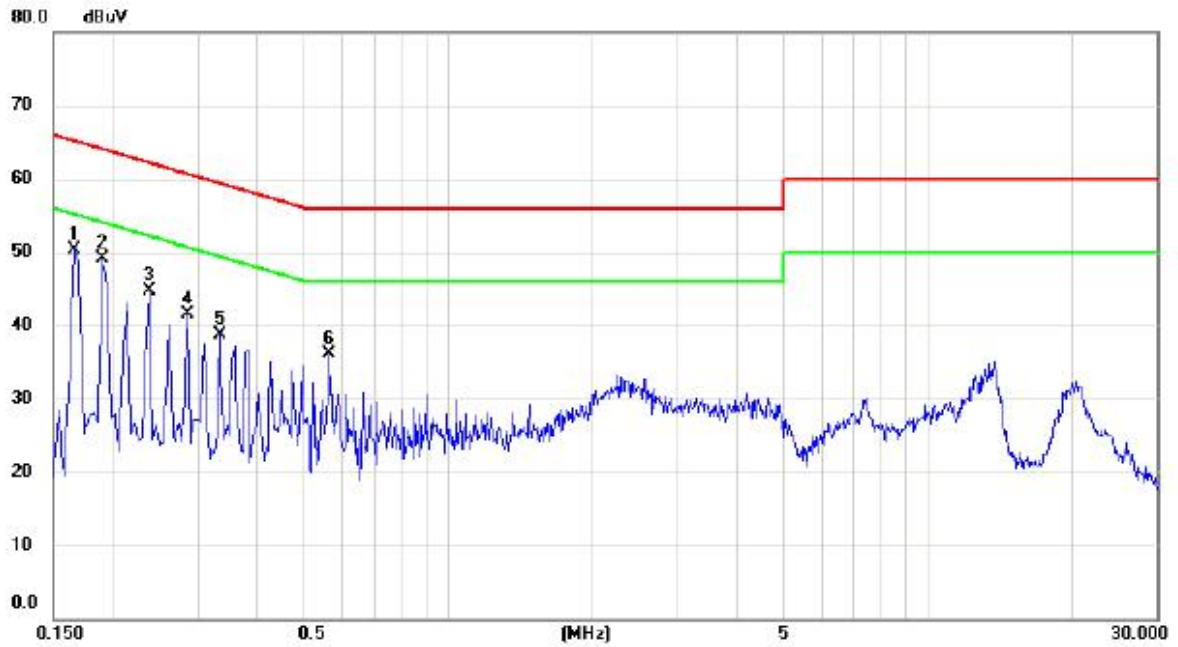


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1540	42.16	9.54	51.70	65.78	-14.08	peak	
2		0.2020	36.39	9.57	45.96	63.53	-17.57	peak	
3		0.2260	35.19	9.59	44.78	62.60	-17.82	peak	
4		0.2780	33.28	9.63	42.91	60.88	-17.97	peak	
5		0.3220	29.67	9.64	39.31	59.66	-20.35	peak	
6		2.4060	23.24	9.99	33.23	56.00	-22.77	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	*	0.1667	40.80	9.48	50.28	65.12	-14.84	peak	
2		0.1900	39.68	9.49	49.17	64.04	-14.87	peak	
3		0.2380	35.20	9.51	44.71	62.17	-17.46	peak	
4		0.2860	31.96	9.52	41.48	60.64	-19.16	peak	
5		0.3340	29.10	9.53	38.63	59.35	-20.72	peak	
6		0.5660	26.54	9.56	36.10	56.00	-19.90	peak	

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

Test Mode:	TX Mode
------------	---------

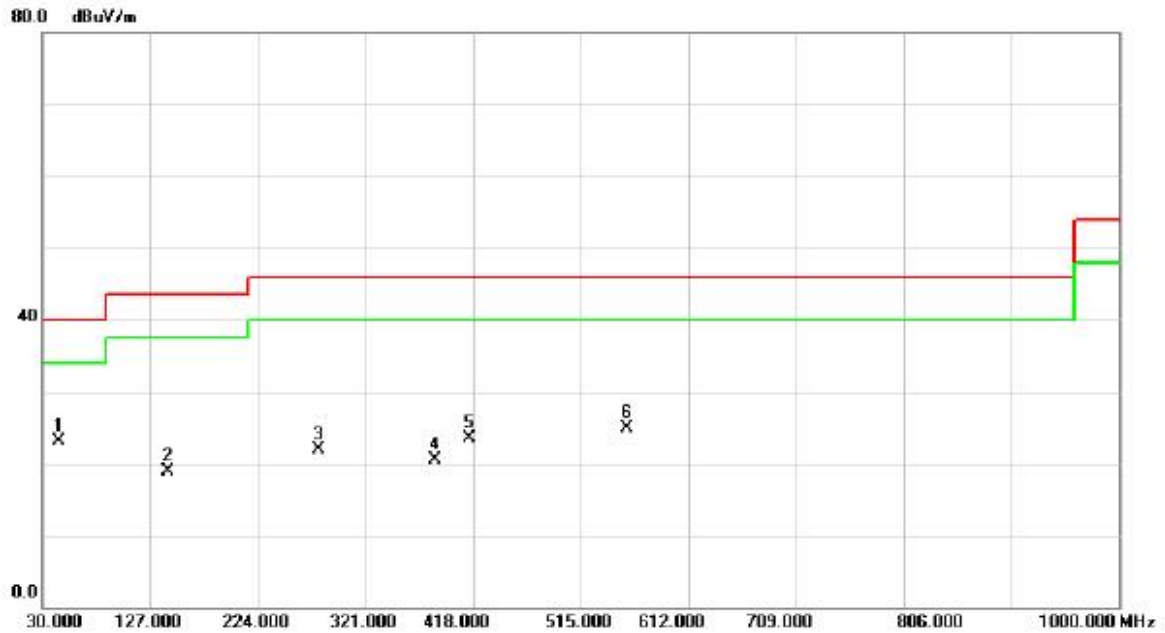
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0093	0°	13.47	24.98	38.45	128.23	-89.79	AVG
0.0093	0°	14.69	24.98	39.67	148.23	-108.57	PEAK
0.0210	0°	6.32	24.24	30.56	121.16	-90.60	AVG
0.0210	0°	8.40	24.24	32.64	141.16	-108.52	PEAK
0.0309	0°	3.77	23.61	27.38	117.81	-90.43	AVG
0.0309	0°	5.63	23.61	29.24	137.81	-108.57	PEAK
0.0477	0°	1.95	22.55	24.50	114.03	-89.54	AVG
0.0477	0°	2.74	22.55	25.29	134.03	-108.75	PEAK
0.4947	0°	19.44	19.81	39.25	73.72	-34.46	QP
1.7114	0°	23.11	19.53	42.64	69.54	-26.90	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0096	90°	13.14	24.30	37.44	127.96	-90.52	AVG
0.0096	90°	14.22	24.30	38.52	147.96	-109.44	PEAK
0.0211	90°	7.62	24.23	31.85	121.12	-89.27	AVG
0.0211	90°	8.34	24.23	32.57	141.12	-108.55	PEAK
0.0357	90°	5.63	23.31	28.94	116.55	-87.62	AVG
0.0357	90°	6.25	23.31	29.56	136.55	-107.00	PEAK
0.0410	90°	1.74	22.97	24.71	115.35	-90.64	AVG
0.0410	90°	2.61	22.97	25.58	135.35	-109.77	PEAK
0.4914	90°	22.07	19.82	41.89	73.78	-31.88	QP
1.7662	90°	24.21	19.52	43.73	69.54	-25.81	QP

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

Test Mode: TX 2402MHz -CH00 -1Mbps

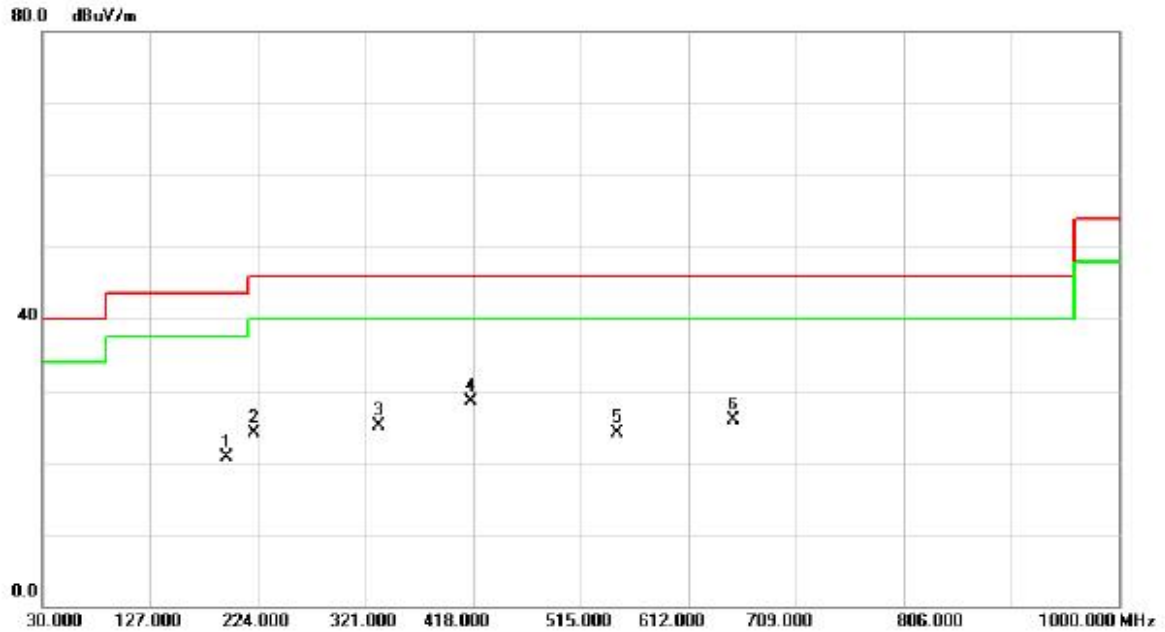
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	44.5500	37.41	-14.23	23.18	40.00	-16.82	peak	
2		142.5200	33.99	-15.00	18.99	43.50	-24.51	peak	
3		279.2900	36.03	-14.07	21.96	46.00	-24.04	peak	
4		384.0500	32.55	-11.95	20.60	46.00	-25.40	peak	
5		415.0900	34.60	-11.01	23.59	46.00	-22.41	peak	
6		556.7100	32.95	-7.99	24.96	46.00	-21.04	peak	

Test Mode: TX 2402MHz -CH00 -1Mbps

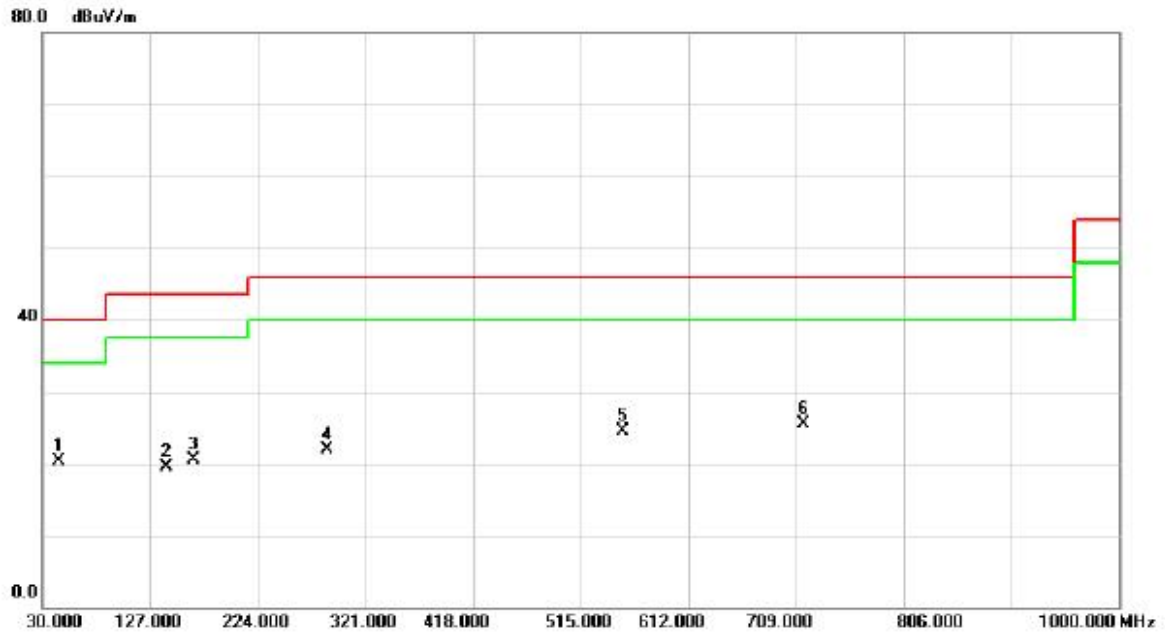
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		195.8700	37.04	-16.30	20.74	43.50	-22.76	peak	
2		221.0900	39.97	-15.79	24.18	46.00	-21.82	peak	
3		333.6100	37.90	-12.84	25.06	46.00	-20.94	peak	
4	*	416.0600	39.57	-10.99	28.58	46.00	-17.42	peak	
5		547.9800	31.99	-7.79	24.20	46.00	-21.80	peak	
6		652.7400	33.48	-7.62	25.86	46.00	-20.14	peak	

Test Mode: TX 2440MHz -CH19 -1Mbps

Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	44.5500	34.60	-14.23	20.37	40.00	-19.63	peak	
2		141.5500	34.53	-15.10	19.43	43.50	-24.07	peak	
3		166.7700	34.46	-14.01	20.45	43.50	-23.05	peak	
4		286.0800	35.14	-13.17	21.97	46.00	-24.03	peak	
5		552.8300	32.24	-7.77	24.47	46.00	-21.53	peak	
6		715.7900	32.58	-7.03	25.55	46.00	-20.45	peak	

Test Mode: TX 2440MHz -CH19 -1Mbps

Horizontal

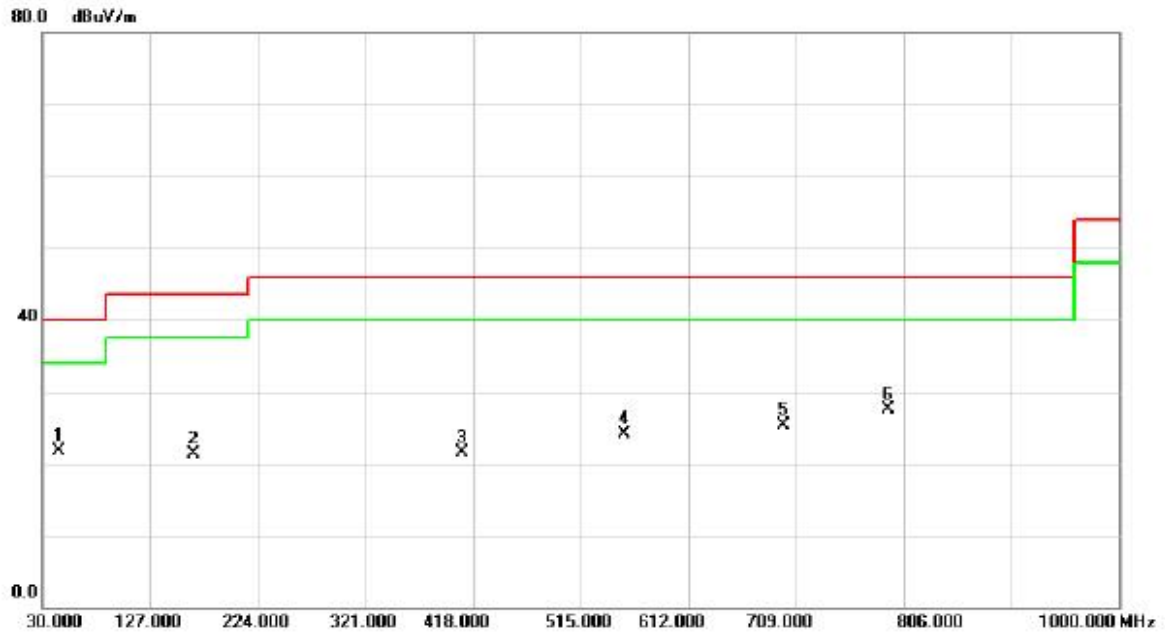


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1		57.1600	34.49	-14.94	19.55	40.00	-20.45	peak	
2		196.8400	37.24	-16.39	20.85	43.50	-22.65	peak	
3		221.0900	40.58	-15.79	24.79	46.00	-21.21	peak	
4		333.6100	37.27	-12.84	24.43	46.00	-21.57	peak	
5		384.0500	36.31	-11.95	24.36	46.00	-21.64	peak	
6	*	667.2900	35.47	-7.38	28.09	46.00	-17.91	peak	



Test Mode: TX 2480MHz -CH39 -1Mbps

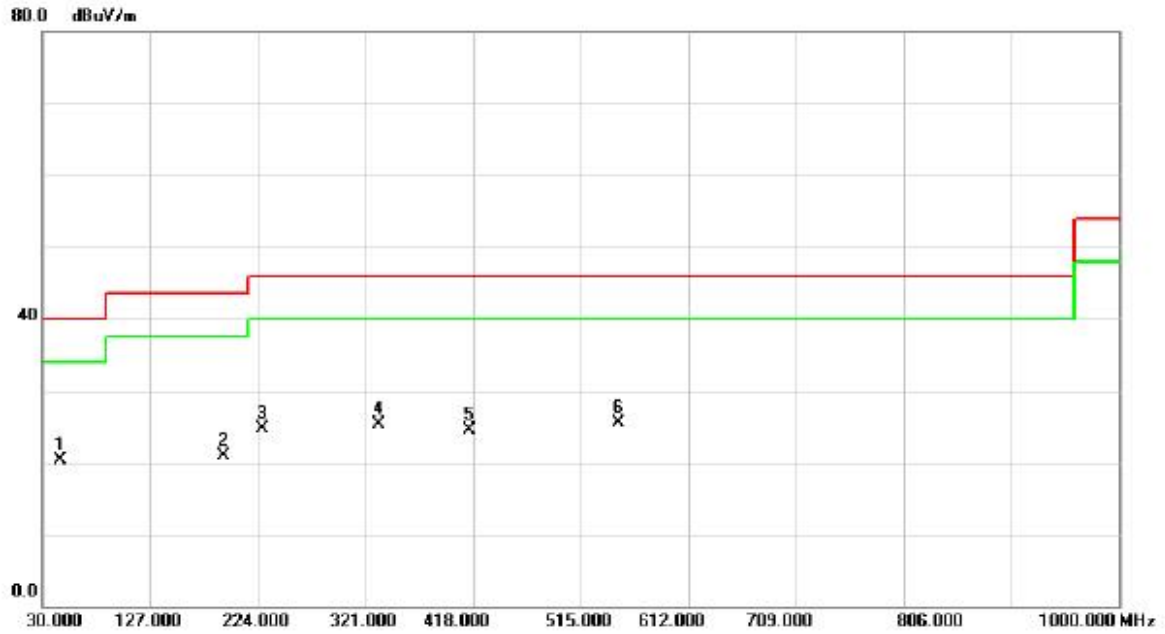
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	44.5500	35.93	-14.23	21.70	40.00	-18.30	peak	
2		166.7700	35.31	-14.01	21.30	43.50	-22.20	peak	
3		408.3000	32.68	-11.18	21.50	46.00	-24.50	peak	
4		554.7700	32.03	-7.88	24.15	46.00	-21.85	peak	
5		698.3300	32.19	-6.89	25.30	46.00	-20.70	peak	
6		792.4200	32.80	-5.26	27.54	46.00	-18.46	peak	

Test Mode: TX 2480MHz -CH39 -1Mbps

Horizontal

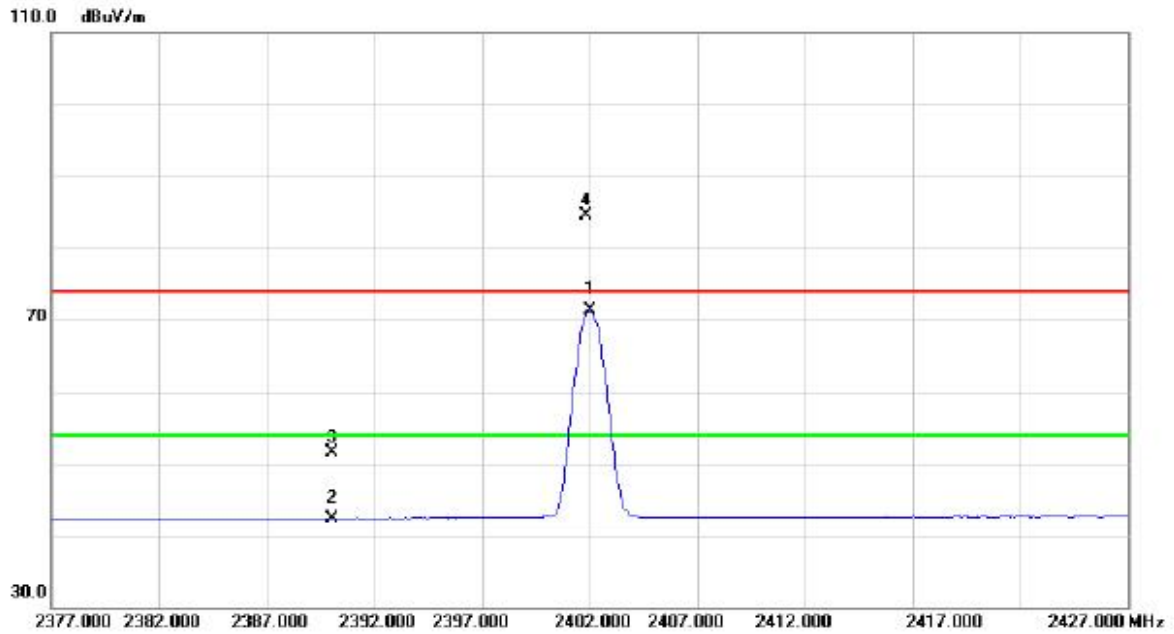


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	45.5200	34.31	-14.08	20.23	40.00	-19.77	peak	
2		193.9300	37.13	-16.13	21.00	43.50	-22.50	peak	
3		227.8800	40.61	-15.84	24.77	46.00	-21.23	peak	
4		332.6400	38.08	-12.83	25.25	46.00	-20.75	peak	
5		415.0900	35.58	-11.01	24.57	46.00	-21.43	peak	
6		549.9200	33.16	-7.62	25.54	46.00	-20.46	peak	

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

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

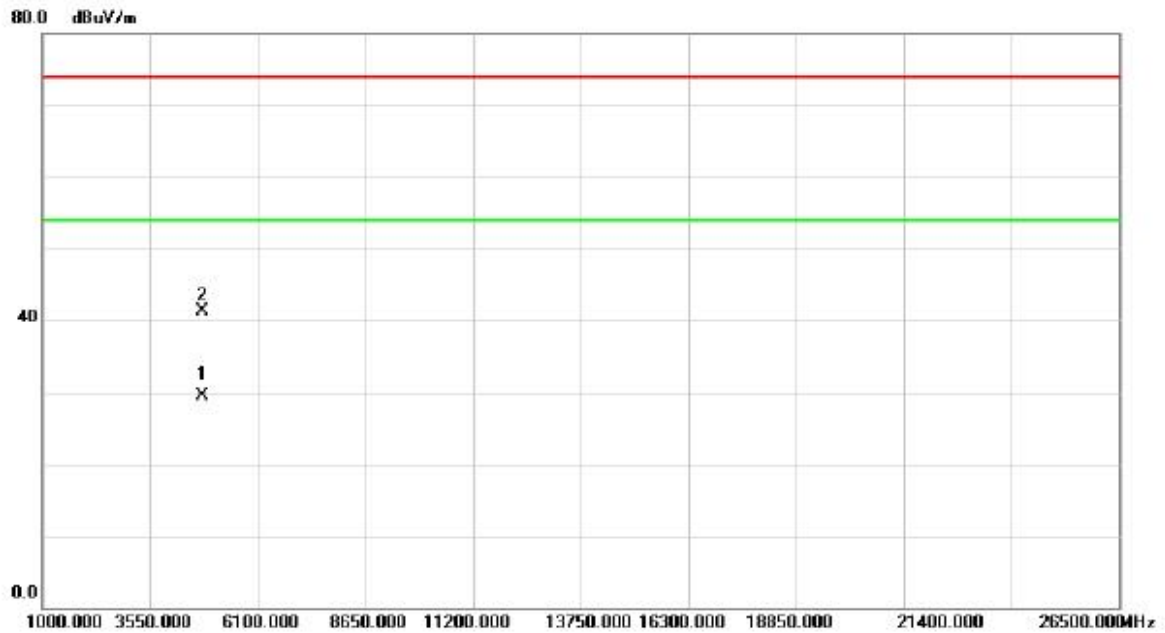
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2402.000	42.31	28.92	71.23	54.00	17.23	AVG	NO LIMIT
2		2390.000	13.41	28.91	42.32	54.00	-11.68	AVG	
3		2390.000	22.51	28.91	51.42	74.00	-22.58	peak	
4	X	2401.800	55.49	28.92	84.41	74.00	10.41	peak	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

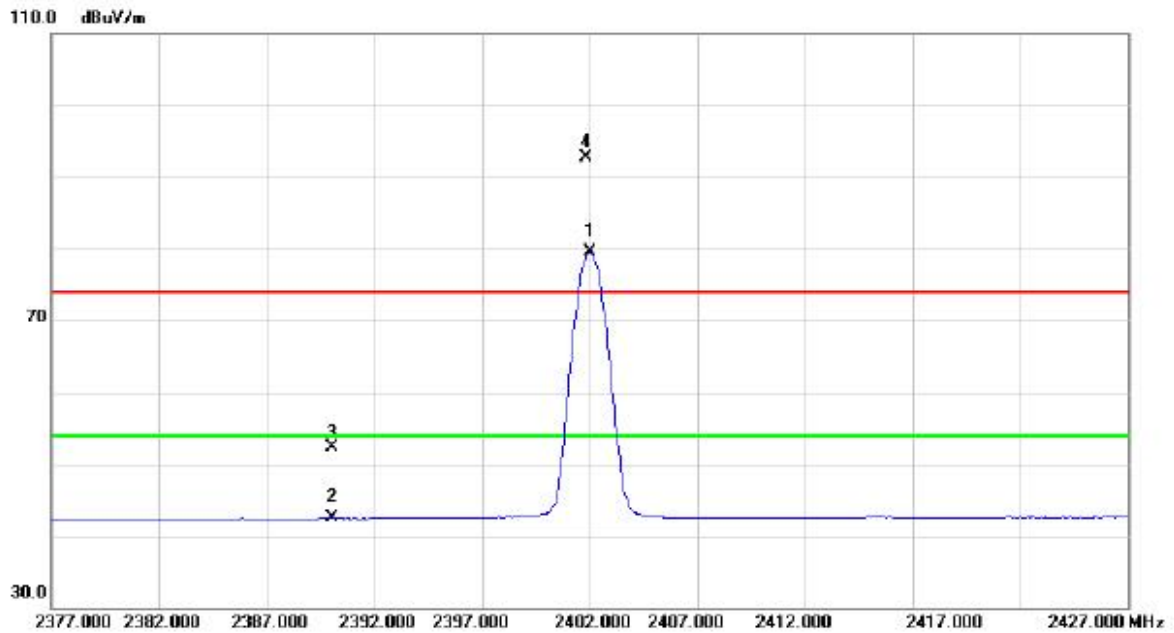
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4804.336	29.55	-0.12	29.43	54.00	-24.57	AVG	
2		4804.664	41.44	-0.12	41.32	74.00	-32.68	peak	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

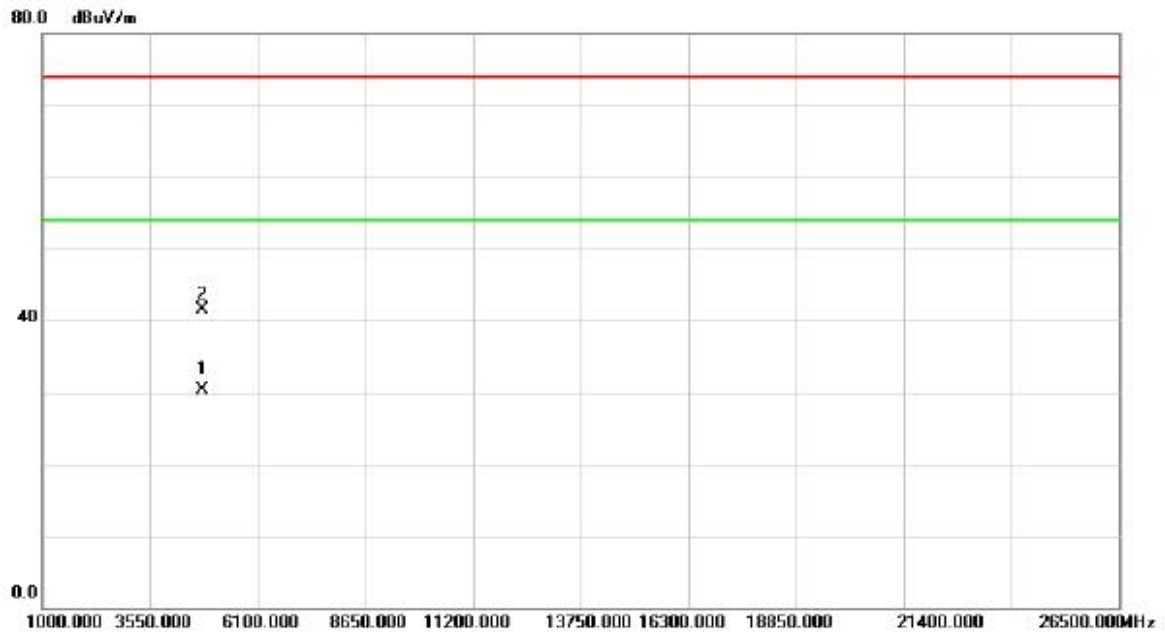
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2402.000	50.54	28.92	79.46	54.00	25.46	AVG	NO LIMIT
2		2390.000	13.50	28.91	42.41	54.00	-11.59	AVG	
3		2390.000	23.44	28.91	52.35	74.00	-21.65	peak	
4	X	2401.800	63.84	28.92	92.76	74.00	18.76	peak	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

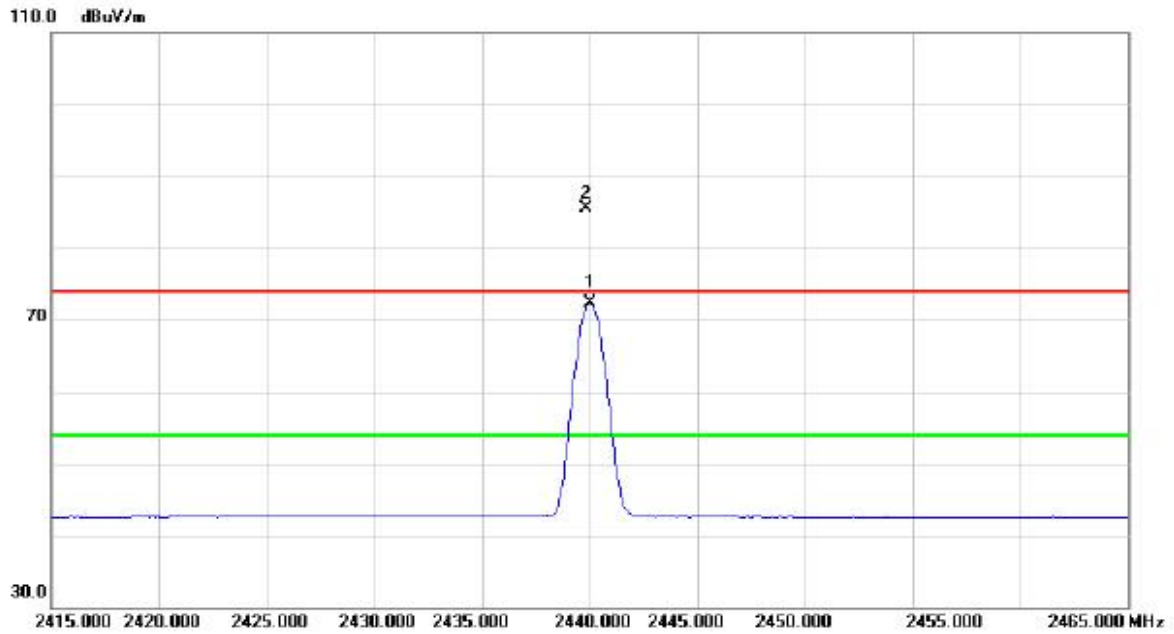
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4804.587	30.51	-0.12	30.39	54.00	-23.61	AVG	
2		4804.224	41.61	-0.12	41.49	74.00	-32.51	peak	

Orthogonal Axis :	X
Test Mode :	TX 2440MHz_CH19_1Mbps

**Vertical**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	2440.000	43.28	28.95	72.23	54.00	18.23	AVG	NO LIMIT
2	X	2439.800	56.54	28.95	85.49	74.00	11.49	peak	NO LIMIT



Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

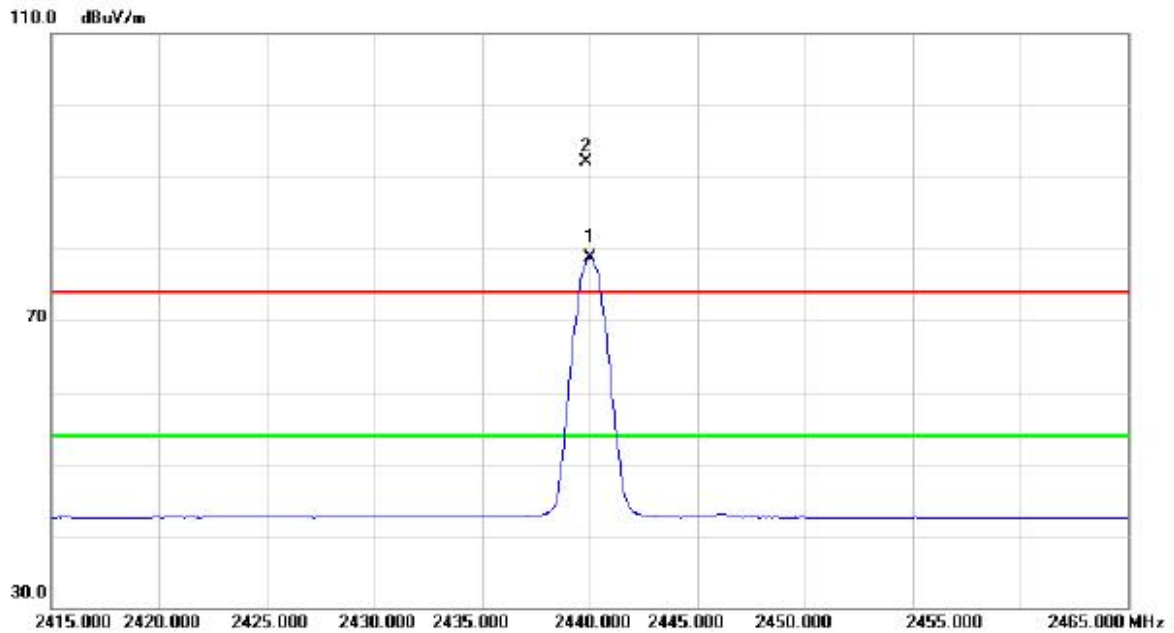
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4880.940	29.59	0.06	29.65	54.00	-24.35	AVG	
2		4880.062	41.41	0.06	41.47	74.00	-32.53	peak	

Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

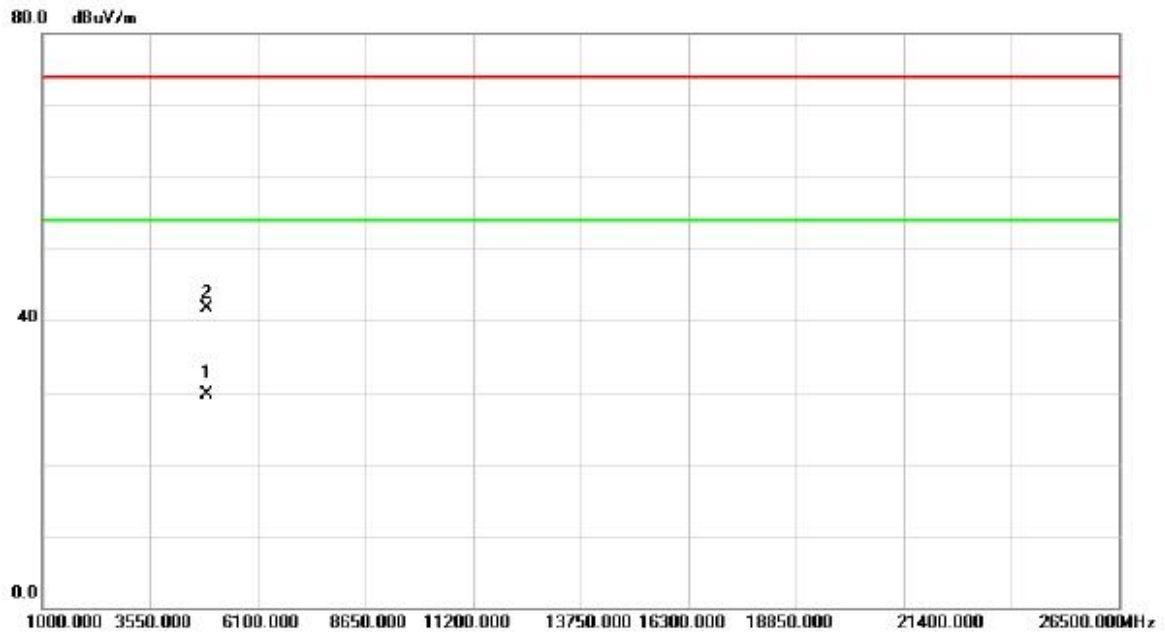
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	2440.000	49.78	28.95	78.73	54.00	24.73	AVG	NO LIMIT
2	X	2439.800	63.11	28.95	92.06	74.00	18.06	peak	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

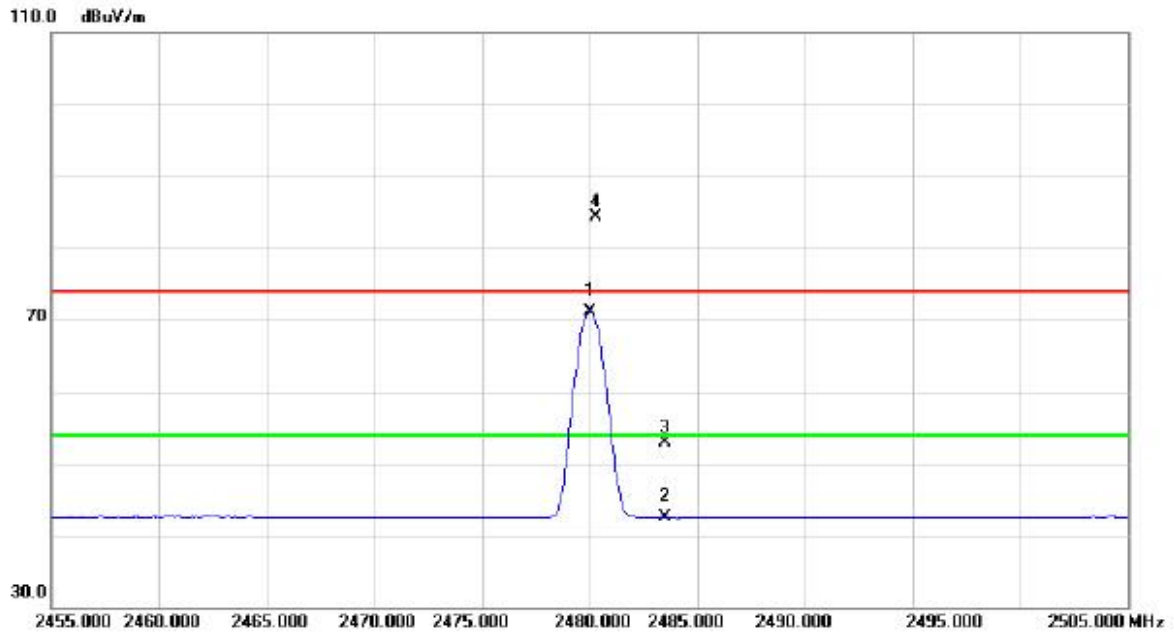
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4879.940	29.60	0.06	29.66	54.00	-24.34	AVG	
2		4880.014	41.58	0.06	41.64	74.00	-32.36	peak	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH39_1Mbps

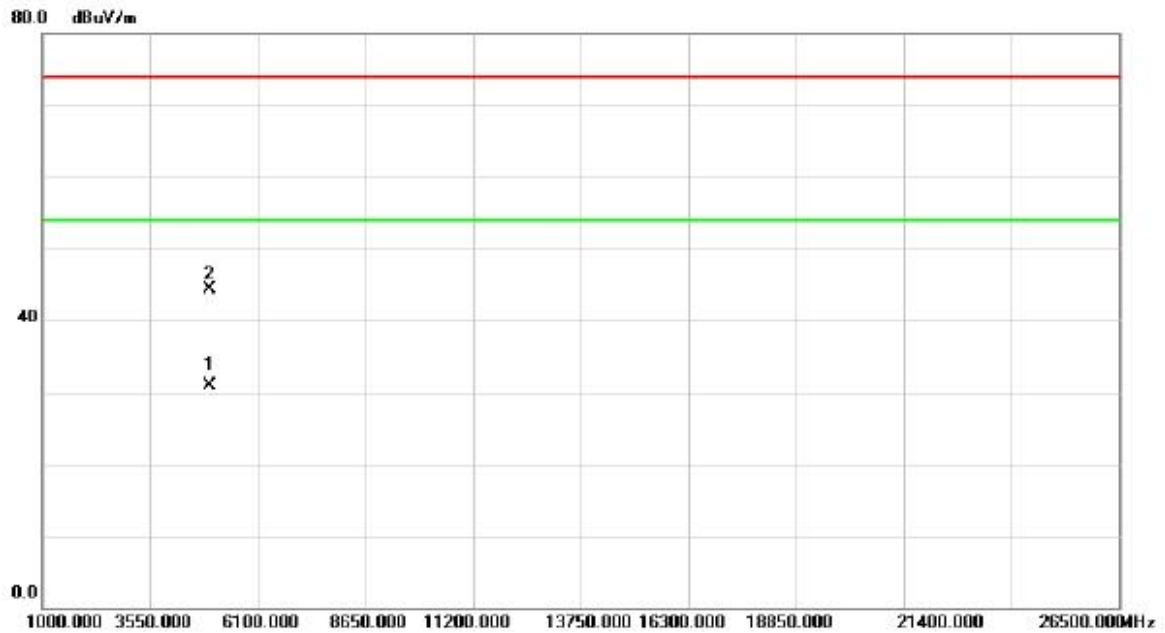
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2480.000	42.13	28.98	71.11	54.00	17.11	AVG	NO LIMIT
2		2483.500	13.47	28.99	42.46	54.00	-11.54	AVG	
3		2483.500	23.94	28.99	52.93	74.00	-21.07	peak	
4	X	2480.300	55.25	28.98	84.23	74.00	10.23	peak	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH39_1Mbps

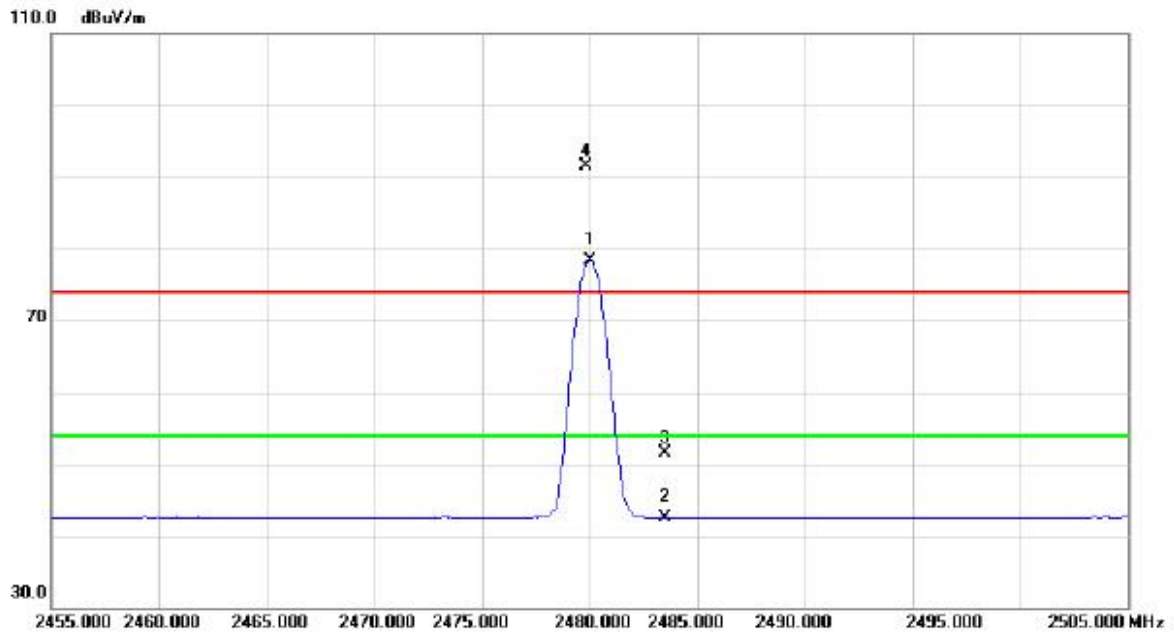
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.008	30.57	0.24	30.81	54.00	-23.19	AVG	
2		4960.112	44.15	0.24	44.39	74.00	-29.61	peak	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH39_1Mbps

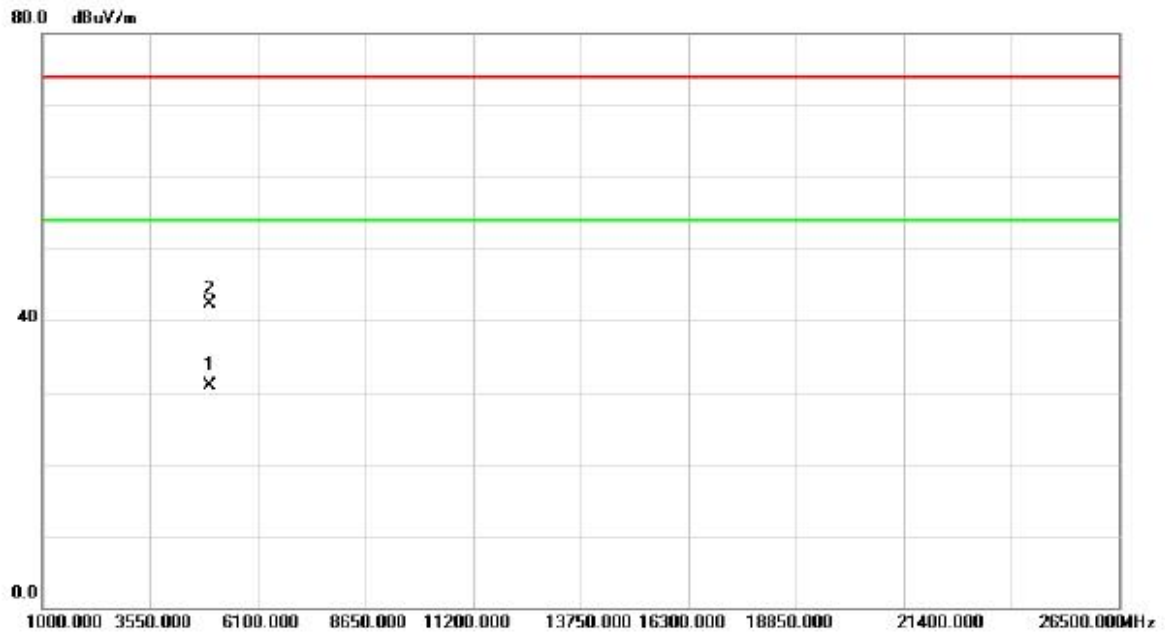
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	2480.000	49.31	28.98	78.29	54.00	24.29	AVG	NO LIMIT
2		2483.500	13.42	28.99	42.41	54.00	-11.59	AVG	
3		2483.500	22.48	28.99	51.47	74.00	-22.53	peak	
4	X	2479.800	62.58	28.98	91.56	74.00	17.56	peak	NO LIMIT

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH39_1Mbps

### Horizontal



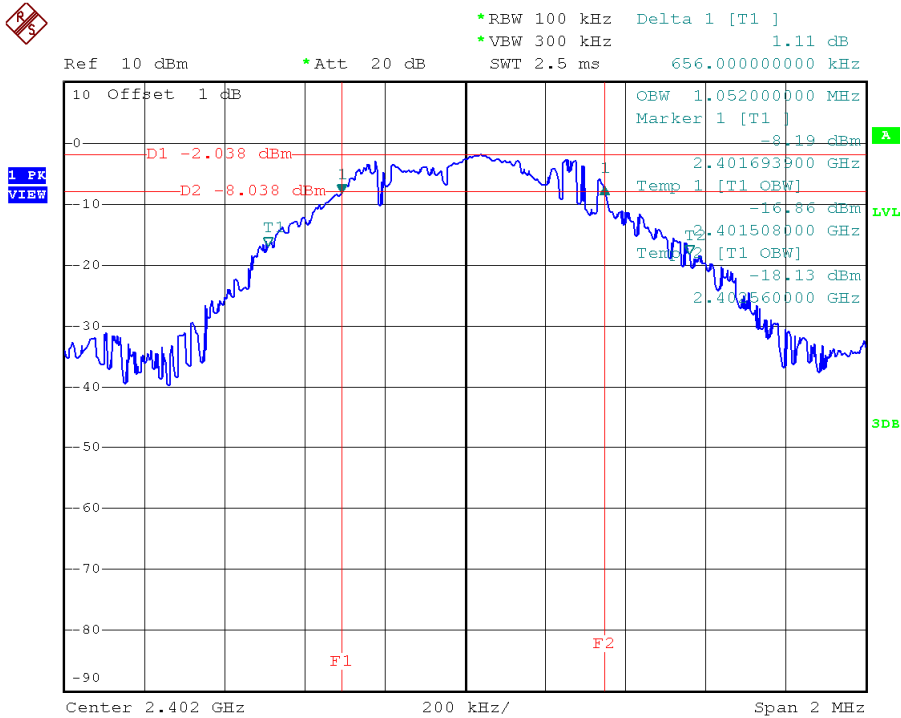
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector	Comment
1	*	4960.176	30.59	0.24	30.83	54.00	-23.17	AVG	
2		4959.506	42.16	0.24	42.40	74.00	-31.60	peak	

## ATTACHMENT E - BANDWIDTH



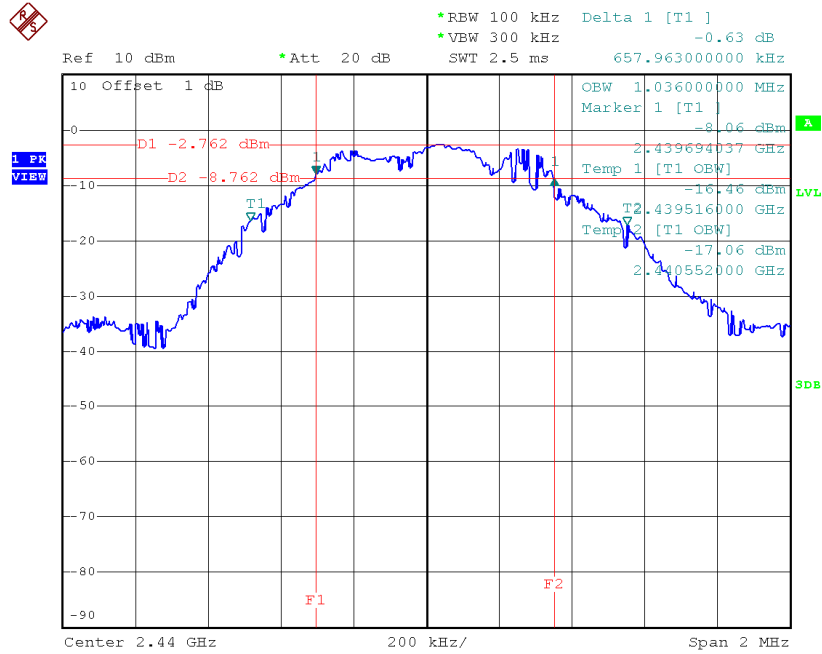
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2402	0.656	1.052	500	Complies
2440	0.658	1.036	500	Complies
2480	0.664	1.032	500	Complies

### TX CH00



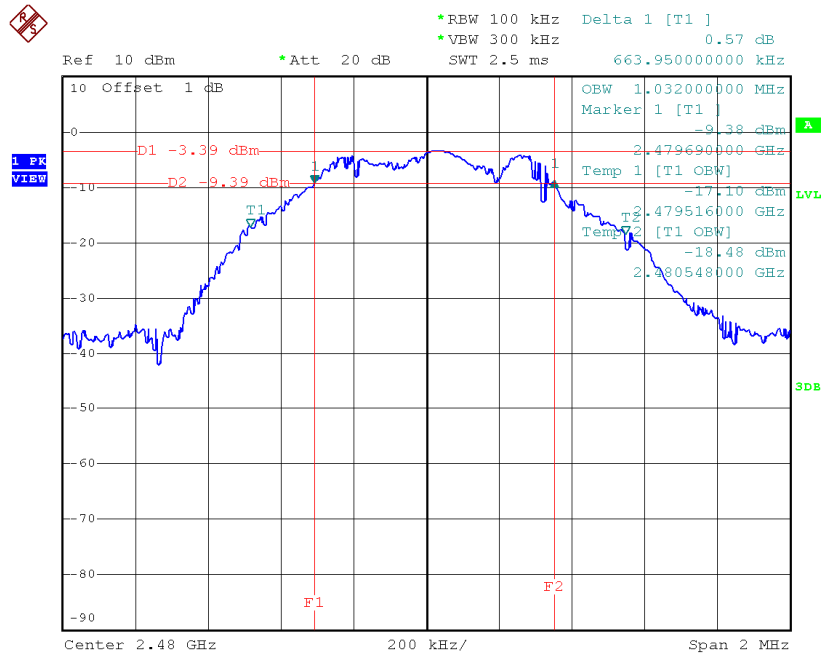
Date: 13.NOV.2015 14:50:35

### TX CH19



Date: 13.NOV.2015 14:52:25

### TX CH39



Date: 13.NOV.2015 14:54:07

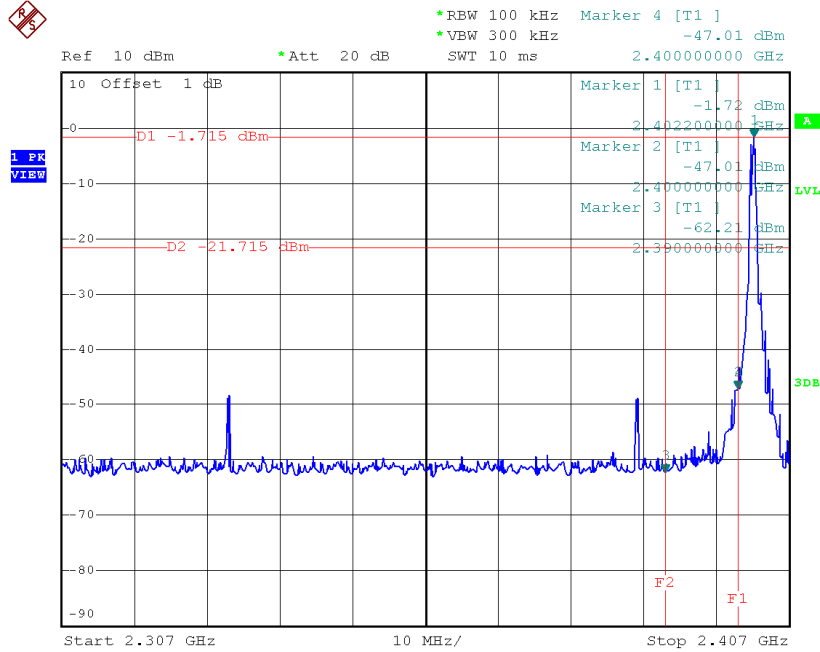
## ATTACHMENT F - MAXIMUM OUTPUT POWER TEST

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	1.30	0.0013	30.00	1.00	Complies
2440	2.41	0.0017	30.00	1.00	Complies
2480	2.80	0.0019	30.00	1.00	Complies

**ATTACHMENT G - ANTENNA CONDUCTED SPURIOUS  
EMISSION**

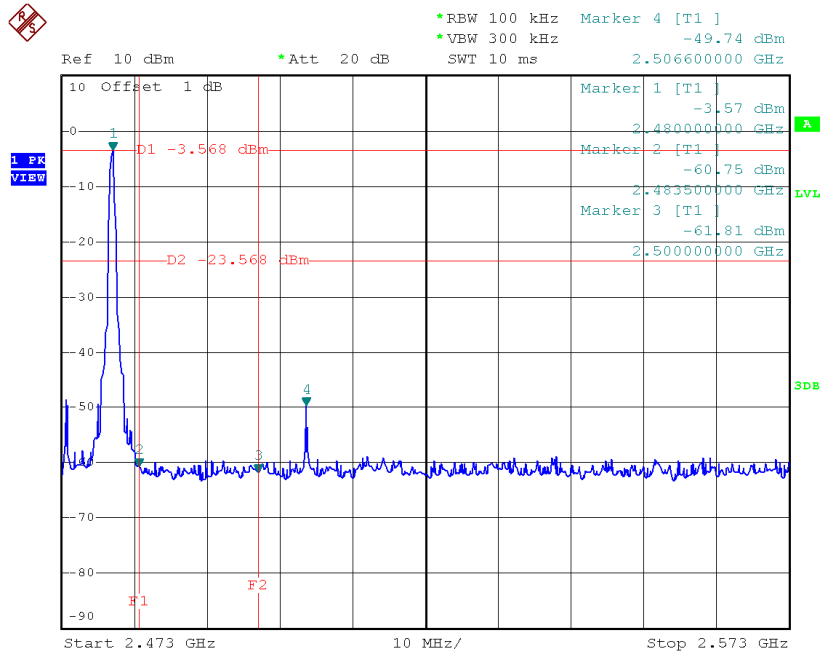
Test Mode : CH00, CH19 , CH39 - 1Mbps

### CH00 (Lower) - 1Mbps



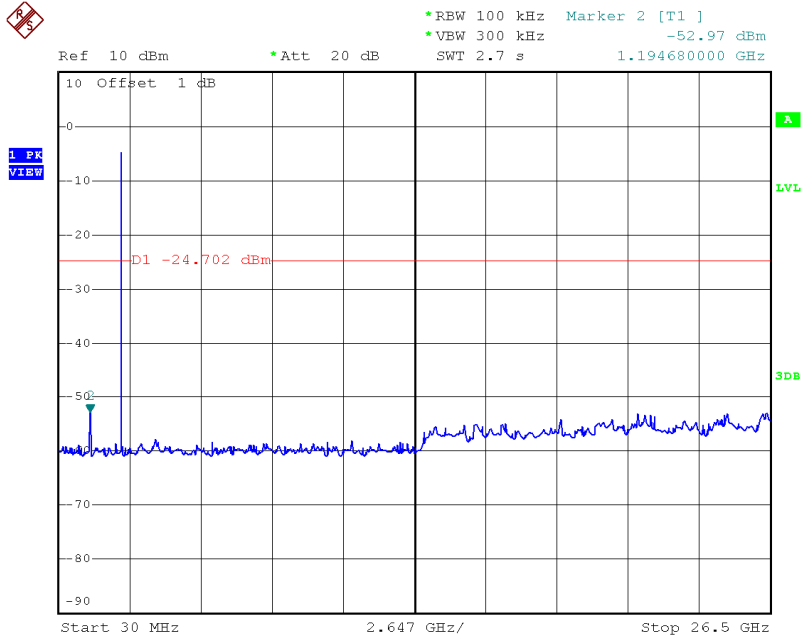
Date: 13.NOV.2015 14:50:44

### CH39 (upper) - 1Mbps



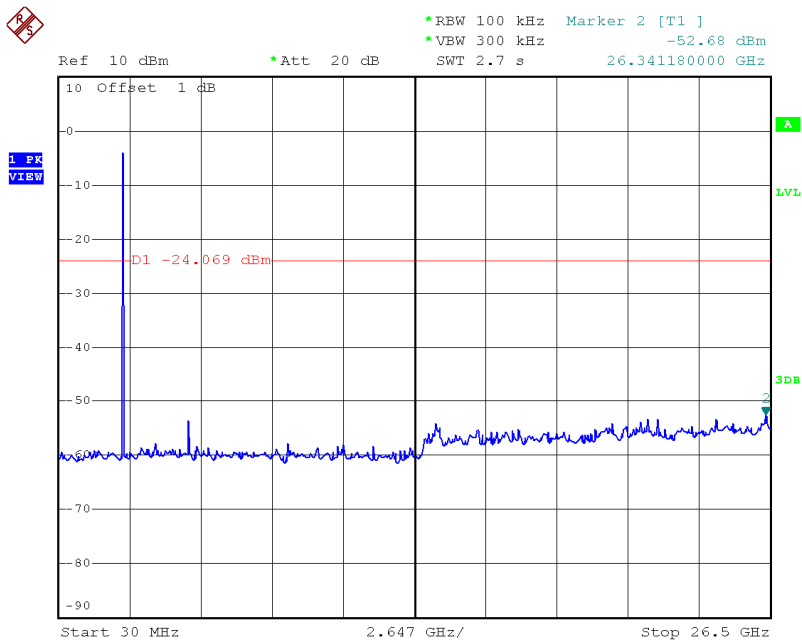
Date: 13.NOV.2015 14:54:16

### CH00 (10 Harmonic of the frequency)



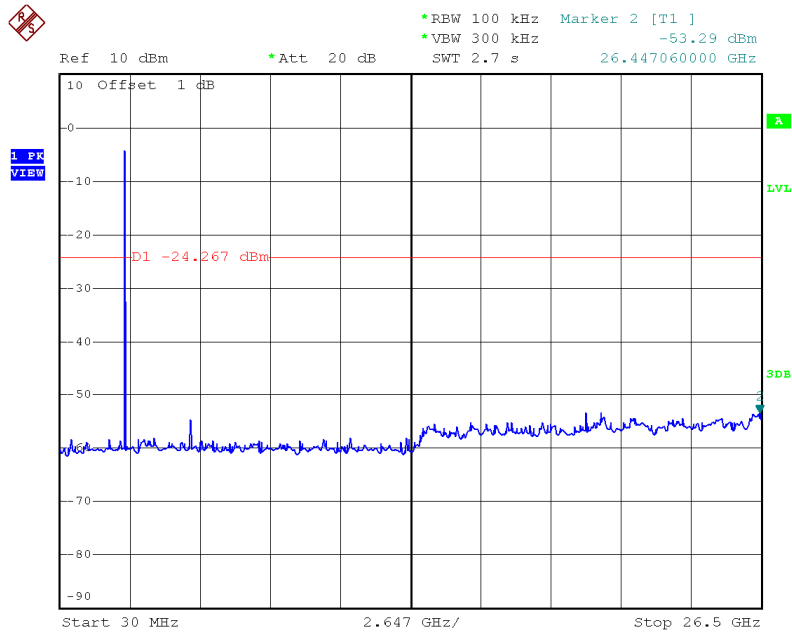
Date: 13.NOV.2015 14:51:01

### CH19 (10 Harmonic of the frequency)



Date: 13.NOV.2015 14:52:40

### CH39 (10 Harmonic of the frequency)



Date: 13.NOV.2015 14:54:29

## ATTACHMENT H - POWER SPECTRAL DENSITY TEST



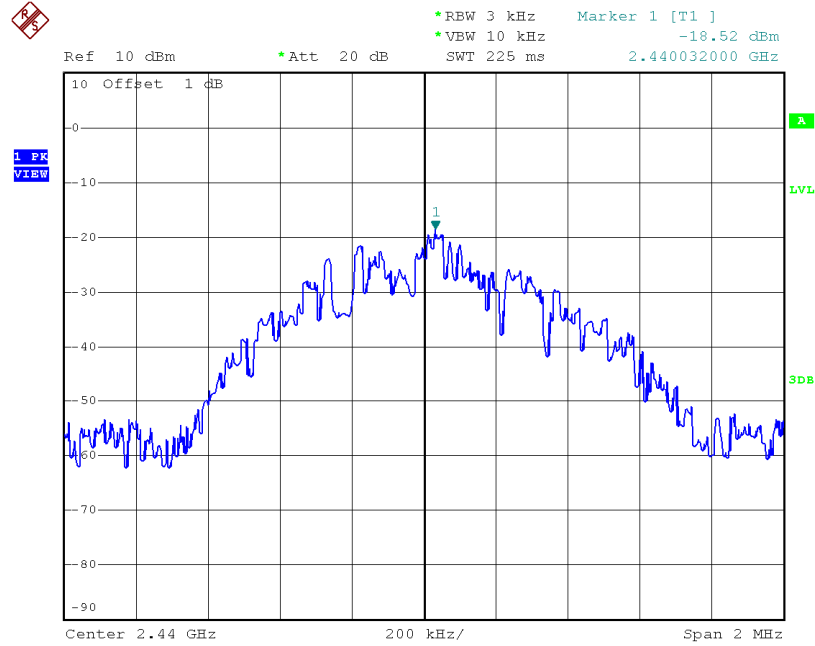
Frequency (MHz)	Power Density (dBm)	Max. Limit (dBm)	Result
2402	-17.26	8	Complies
2440	-18.52	8	Complies
2480	-17.63	8	Complies

**TX CH00**



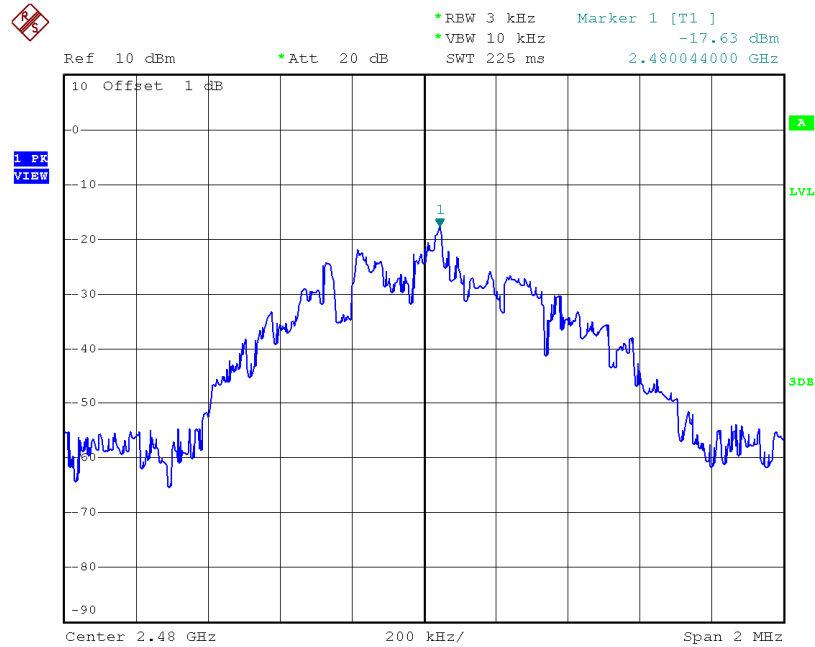
Date: 13.NOV.2015 14:51:07

### TX CH19



Date: 13.NOV.2015 14:52:46

### TX CH39



Date: 13.NOV.2015 14:54:35