

# FCC Radio Test Report

## FCC ID: V7TMESH3F

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

**Project No.** : 1803C313  
**Equipment** : AC1200 Whole Home Mesh WiFi System  
**Test Model** : Mesh3f  
**Series Model** : MW3  
**Applicant** : SHENZHEN TENDA TECHNOLOGY CO.,LTD.  
**Address** : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052

**Date of Receipt** : Mar. 29, 2018  
**Date of Test** : Mar. 30, 2018 ~ Apr. 18, 2018  
**Issued Date** : Apr. 25, 2018  
**Tested by** : BTL Inc.

**Testing Engineer** : Welly Zhou  
(Welly Zhou)

**Technical Manager** : Shawn Xiao  
(Shawn Xiao)

**Authorized Signatory** : David Mao  
(David Mao)

# **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



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### REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1803C313	Original Issue.	Apr. 25, 2018

## 1. CERTIFICATION

Equipment : AC1200 Whole Home Mesh WiFi System  
Brand Name : Tenda  
Test Model : Mesh3f  
Series Model : MW3  
Applicant : SHENZHEN TENDA TECHNOLOGY CO.,LTD.  
Manufacturer : SHENZHEN TENDA TECHNOLOGY CO.,LTD  
Address : 6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District,  
Shenzhen, China. 518052  
Date of Test : Mar. 30, 2018 ~ Apr. 18, 2018  
Test Sample : Engineering Sample NO.: D180302743  
Standard(s) : FCC Part15, Subpart C:(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-1-1803C313) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

**Test results included in this report is only for the WIFI 2.4GHz part.**

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247) , Subpart C			
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	
15.247(d)/ 15.205/ 15.209	Transmitter Radiated Emissions	PASS	

**NOTE:**

(1) "N/A" denotes test is not applicable in this test report.

## 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: 854385

BTL's designation number for FCC: CN5020

## 2.2 MEASUREMENT UNCERTAINTY

The measurement uncertainty figures shall be calculated according the methods described in the ETSI TR 100 028 and shall correspond to an expansion factor (coverage factor)  $k=1.96$  or  $k=2$ (which provide confidence levels of respectively 90% and 95.45% in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian)). Measurement Uncertainty for a Level of Confidence of 95 %,  $U=2xUc(y)$ .

The BTL measurement uncertainty as below table:

### 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	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	AC1200 Whole Home Mesh WiFi System	
Brand Name	Tenda	
Test Model	Mesh3f	
Series Model	MW3	
Model Difference	Only differ in model number.	
Product Description	Operation Frequency	2412~2462 MHz
	Modulation Technology	802.11b:DSSS 802.11g:OFDM 802.11n:OFDM
	Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n up to 300 Mbps
	Output Power (Max.) Non Beamforming	802.11b: 27.64dBm 802.11g: 27.76dBm 802.11n(20MHz): 27.72dBm 802.11n(40MHz): 27.75dBm
	Output Power (Max.) With Beamforming	802.11n(20MHz): 27.58dBm 802.11n(40MHz): 27.38dBm
Power Source	DC Voltage supplied from AC/DC adapter. Model: BN052-A09009U	
Power Rating	I/P: 100-240V~ 50/60Hz 0.3A O/P: 9V --- 1.0A	

Note:

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

2. Channel List:

CH01 - CH11 for 802.11b, 802.11g, 802.11n(20MHz) CH03 - CH09 for 802.11n(40MHz)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Internal	N/A	3
2	N/A	N/A	Internal	N/A	3

Note:

The EUT incorporates a MIMO function. Physically, the EUT provides two completed two transmitters and two receivers (2T2R), all transmit signals are completely correlated, then, Directional gain =  $G_{ANT} + 10\log(N)$  dBi =  $3 + 10\log(2)$ , that is Directional gain = 6.01.

So, the out power limit is  $30 - 6.01 + 6 = 29.99$ , the power density limit is  $8 - 6.01 + 6 = 7.99$ .

4. The worst case for 1TX/ 2TX as follow:

Operating Mode	TX Mode	
	1TX	2TX
802.11b	V (ANT 1)	-
802.11g	V (ANT 1)	-
802.11n(20MHz)	-	V (ANT 1+ANT 2)
802.11n(40MHz)	-	V (ANT 1+ANT 2)

### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly 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 B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09
Mode 5	Normal Link

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 5	Normal Link

For Radiated Test	
Final Test Mode	Description
Mode 1	TX B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

For Band Edge Test	
Final Test Mode	Description
Mode 1	TX B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

6dB Spectrum Bandwidth	
Final Test Mode	Description
Mode 1	TX B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

Maximum Conducted Output Power	
Final Test Mode	Description
Mode 1	TX B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

Power Spectral Density	
Final Test Mode	Description
Mode 1	TX B MODE CHANNEL 01/06/11
Mode 2	TX G MODE CHANNEL 01/06/11
Mode 3	TX N-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

**Note:**

- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: DBPSK (1Mbps)  
 802.11g mode: OFDM (6Mbps)  
 802.11n HT20 mode : BPSK (13Mbps)  
 802.11n HT40 mode : BPSK (27Mbps)  
 For radiated emission tests, the highest output powers were set for final test.
- (3) For radiated below 1G test, the 802.11b is found to be the worst case and recorded.
- (4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

### 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

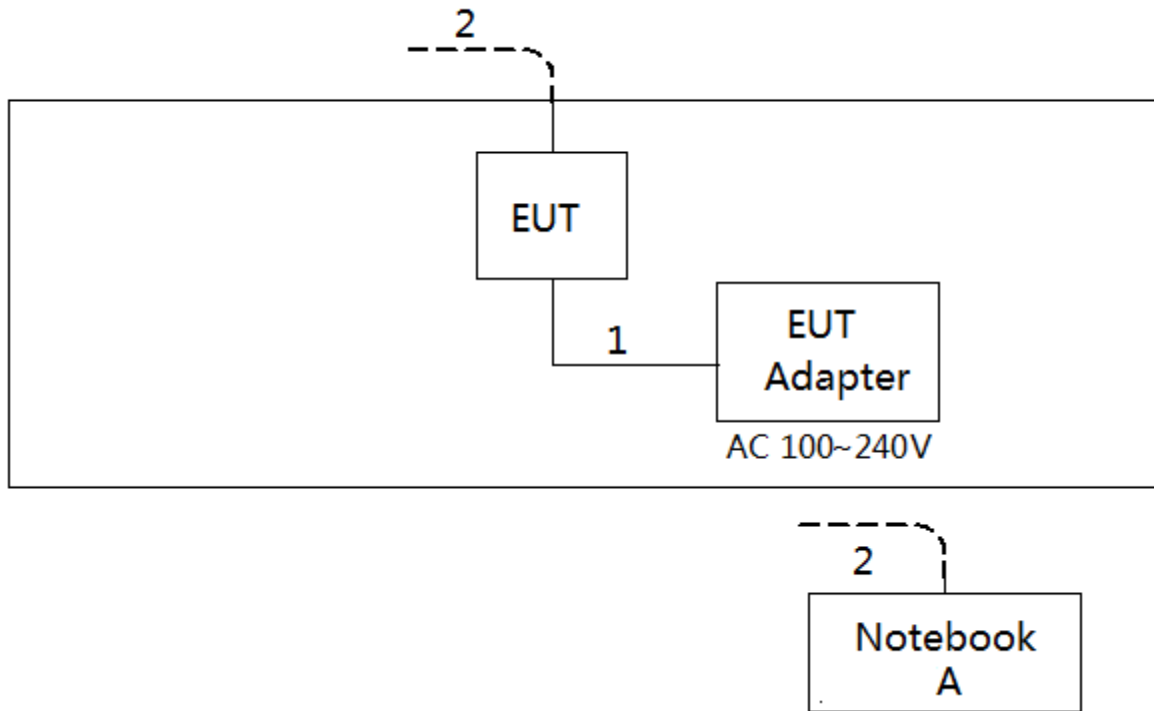
#### Non Beamforming

Test software version	MP_TEST		
Frequency (MHz)	2412	2437	2462
802.11b	38	38	38
802.11g	26	28	28
802.11n (20MHz)	27/24	28/25	29/26
Frequency (MHz)	2422	2437	2452
802.11n (40MHz)	27/25	28/26	28/26

#### With Beamforming

Test software version	MP_TEST		
Frequency (MHz)	2412	2437	2462
802.11n (20MHz)	27/24	28/25	29/26
Frequency (MHz)	2422	2437	2452
802.11n (40MHz)	27/25	28/26	28/26

### 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.
A	Notebook	Lenovo	INSPIRON 1420	DOC	JX193A01SDC2

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.2m	DC Cable
2	NO	NO	10m	RJ45 Cable

## 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 (dBμV)	
	Quasi-pe <sub>pk</sub>	Average <sub>av</sub>
0.15 -0.50	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

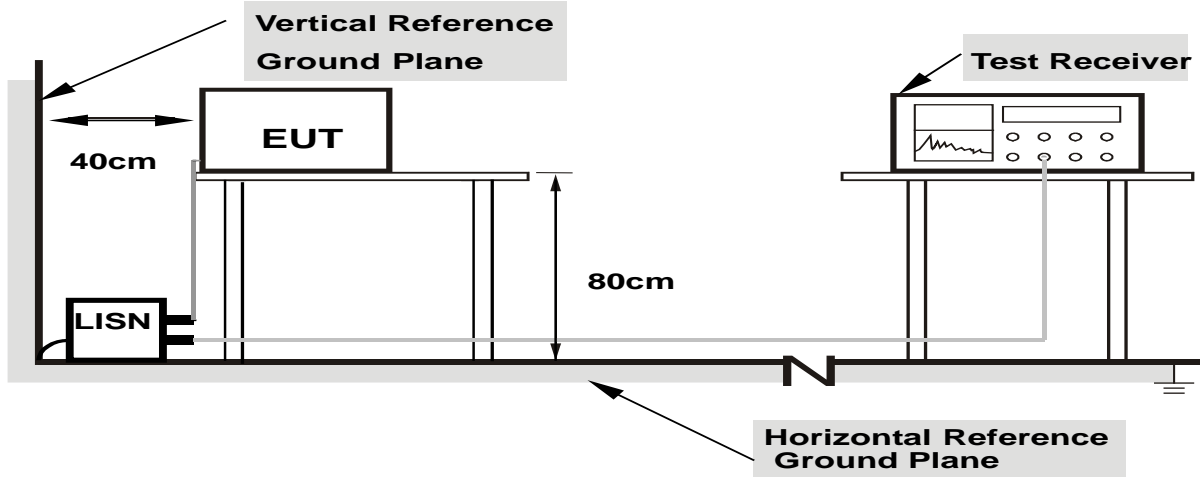
#### 4.1.2 TEST PROCEDURE

- 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 equipment 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 from other units and other metal planes

#### 4.1.5 EUT OPERATING CONDITIONS

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

#### 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 Appendix A.



## 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)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average

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

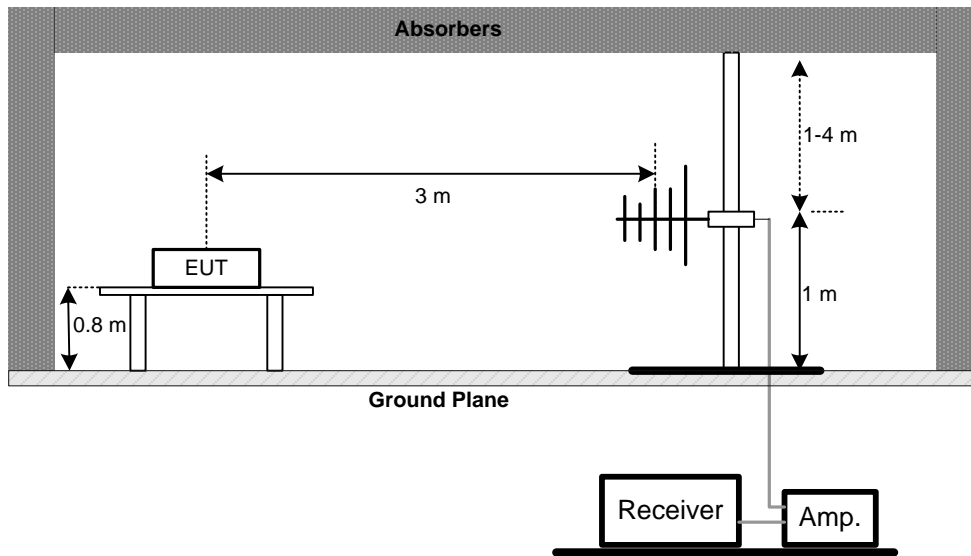
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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 0.8m 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. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. 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.
- g. 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)
- h. 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)
- i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

#### 4.2.3 DEVIATION FROM TEST STANDARD

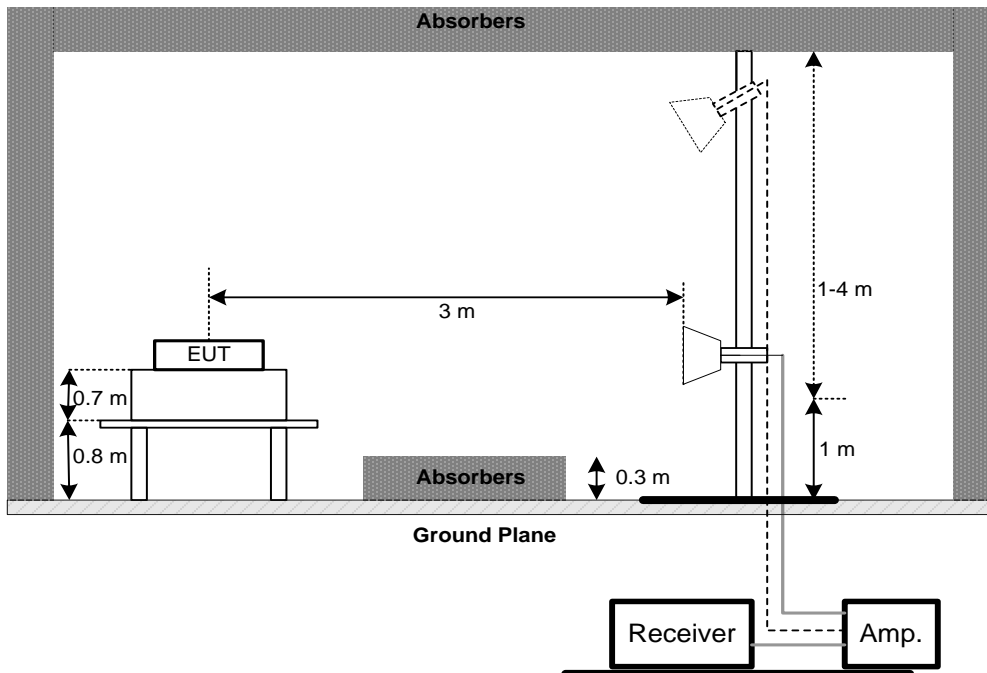
No deviation

#### 4.2.4 TEST SETUP

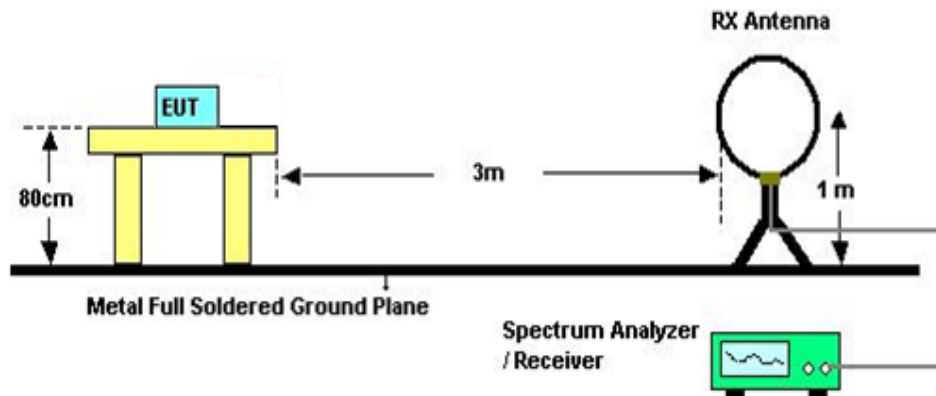
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For Radiated Emissions Below 30MHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.2.6 EUT TEST CONDITIONS

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

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

Please refer to the Appendix 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 1000MHZ)

Please refer to the Appendix C.

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

Please refer to the Appendix D.

Remark:

- (1) 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

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(2)	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 was programmed to be in continuously transmitting mode.

#### 5.1.5 EUT TEST CONDITIONS

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

#### 5.1.6 TEST RESULTS

Please refer to the Appendix E.

## 6. MAXIMUM PEAK CONDUCTED 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 and FCC KDB 662911 D01 Multiple Transmitter Output.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### 6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 6.1.5 EUT TEST CONDITIONS

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

#### 6.1.6 TEST RESULTS

Please refer to the Appendix 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.

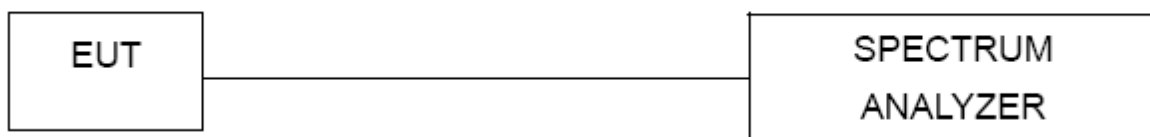
#### 7.1.1 TEST PROCEDURE

- 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 = Auto.
- 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 was programmed to be in continuously transmitting mode.

#### 7.1.5 EUT TEST CONDITIONS

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

#### 7.1.6 TEST RESULTS

Please refer to the Appendix 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

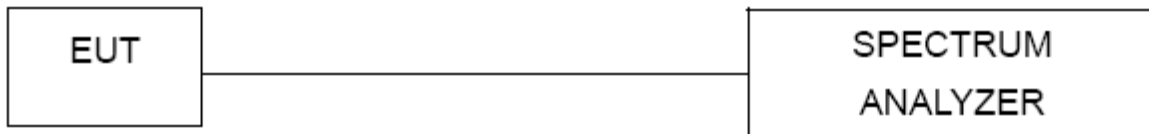
#### 8.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting: RBW=3KHz, VBW=10KHz, Sweep time = Auto.

#### 8.1.2 DEVIATION FROM STANDARD

No deviation.

#### 8.1.3 TEST SETUP



#### 8.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 8.1.5 EUT TEST CONDITIONS

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

#### 8.1.6 TEST RESULTS

Please refer to the Appendix H.



## 9. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 11, 2019
2	LISN	EMCO	3816/2	52765	Mar. 11, 2019
3	50Ω Terminator	SHX	TF2-3G-A	8122901	Mar. 11, 2019
4	TWO-LINE V-NETWORK	R&S	ENV216	101447	Mar. 11, 2019
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Oct. 19, 2018

Radiated Emission Measurement - Below 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 11, 2019
2	Amplifier	HP	8447D	2944A09673	Oct. 19, 2018
3	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	Jun. 26, 2018
5	Controller	CT	SC100	N/A	N/A
6	Controller	MF	MF-7802	MF780208416	N/A
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Antenna	EM	EM-6876-1	230	Feb. 07, 2019

Radiated Emission Measurement - Above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 11, 2019
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018
3	Amplifier	Agilent	8449B	3008A02274	Mar. 11, 2019
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 11, 2019
5	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018
6	Controller	CT	SC100	N/A	N/A
7	Controller	MF	MF-7802	MF780208416	N/A
8	Cable	emci	EMC104-SM-SM-1 2000(12m)	N/A	Jun. 26, 2018
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

**6dB Bandwidth Measurement**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

**Peak Output Power Measurement**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	ANRITSU	ML2495A	1128009	Mar. 11, 2019
2	Pulse Power Sensor	ANRITSU	MA 2411B	1027500	Mar. 11, 2019

**Antenna Conducted Spurious Emission Measurement**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

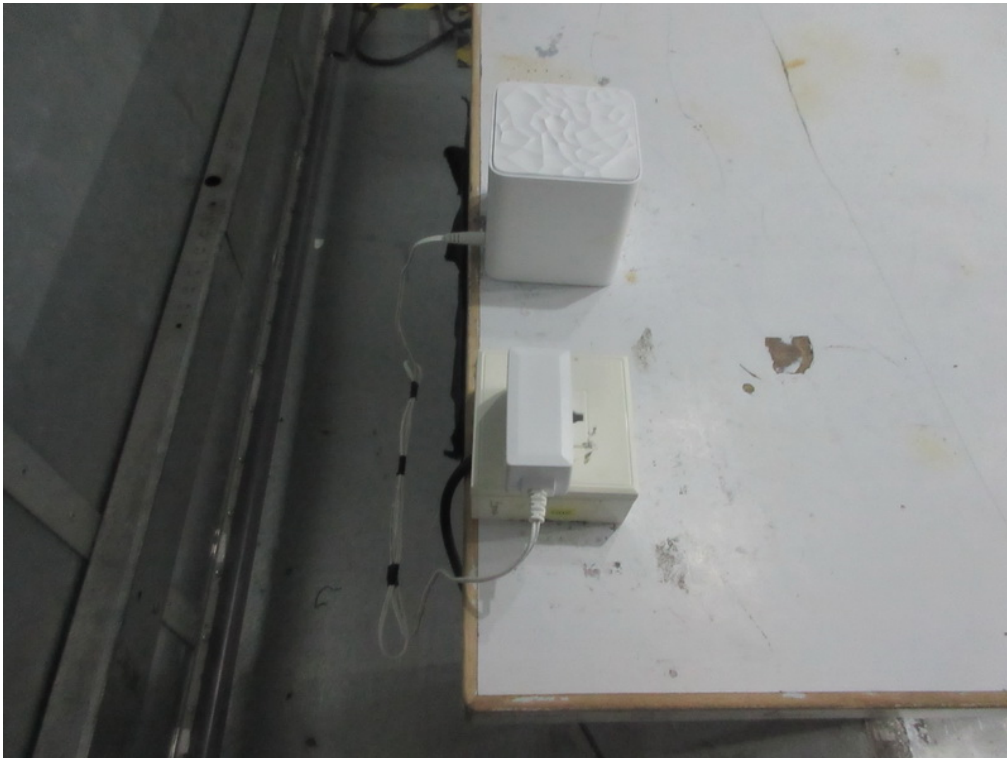
**Power Spectral Density Measurement**

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

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

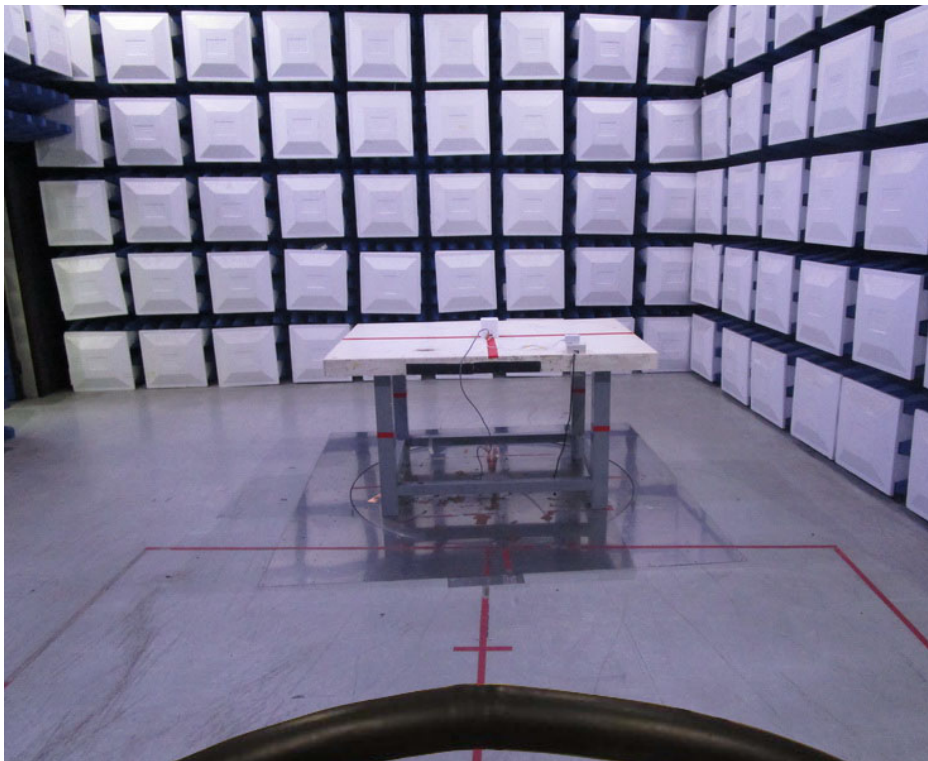
**10. EUT TEST PHOTO**

**Conducted Measurement Photos**



**Radiated Measurement Photos**

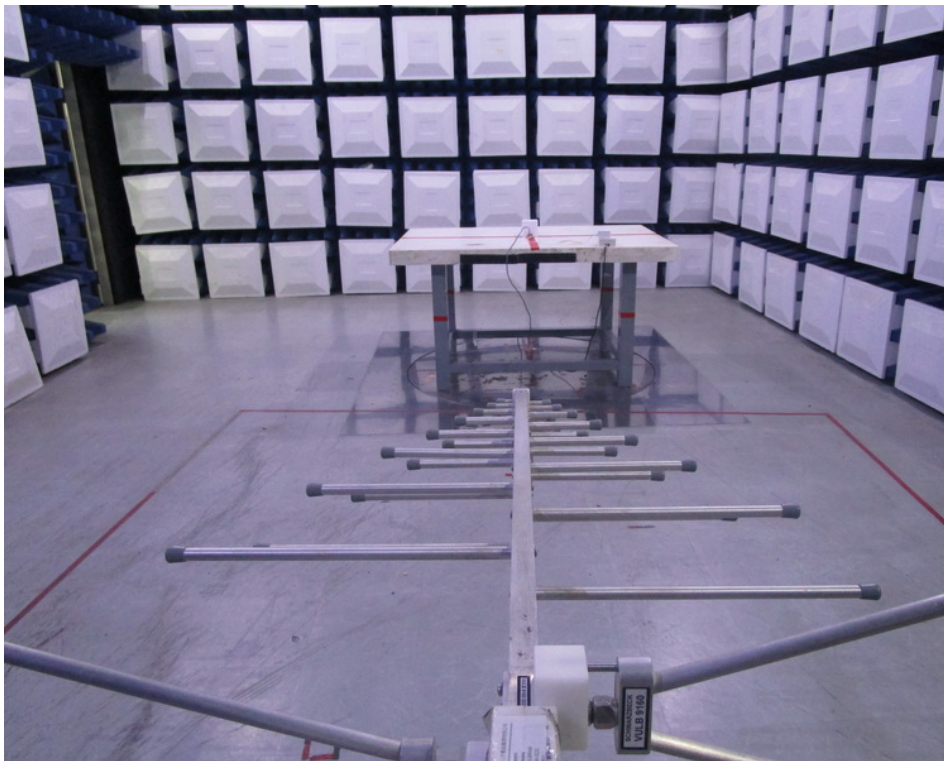
**9KHz to 30MHz**





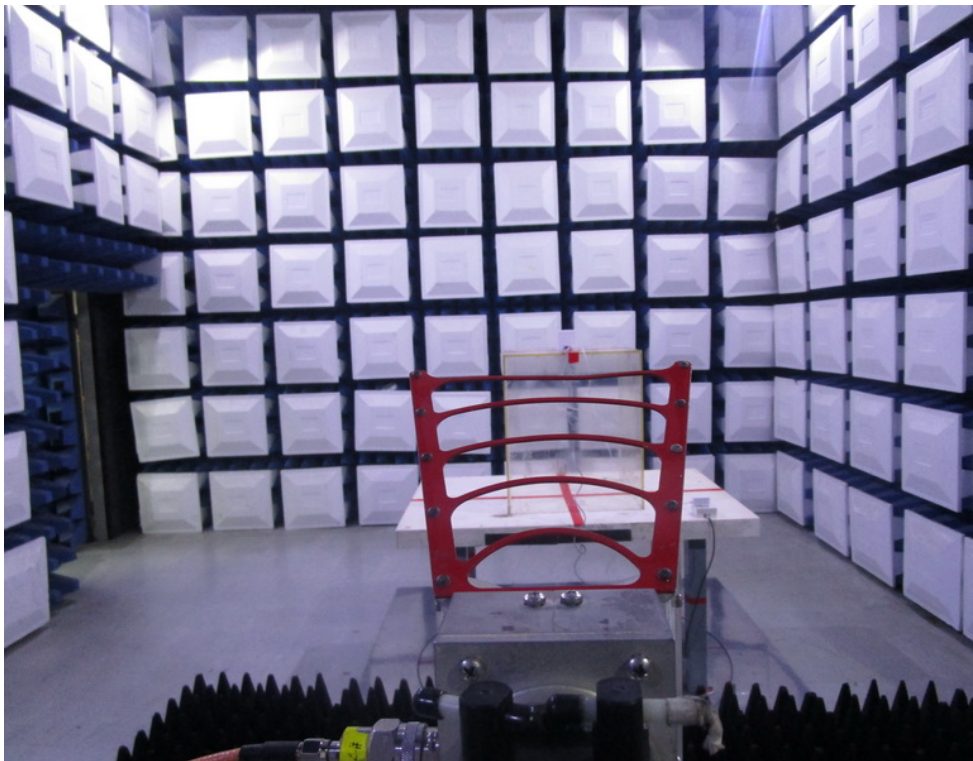
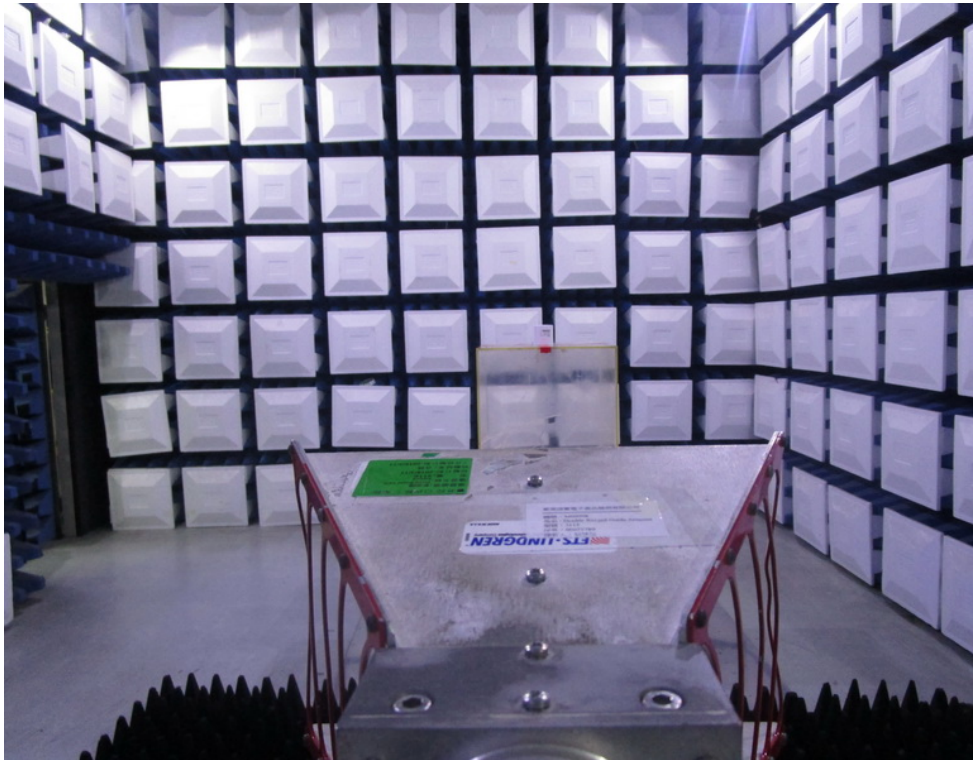
**Radiated Measurement Photos**

**30MHz to 1000MHz**



**Radiated Measurement Photos**

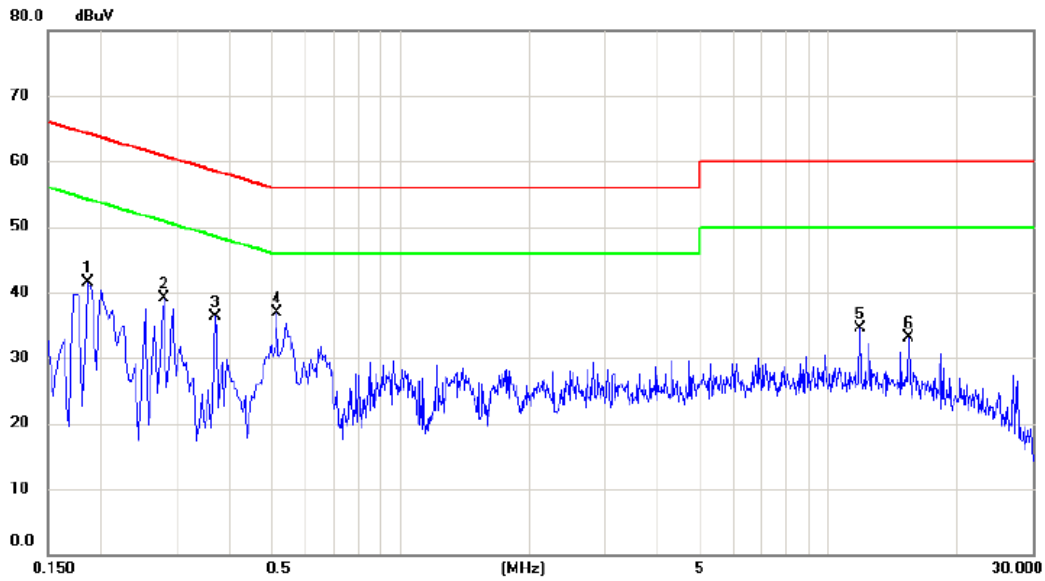
**Above 1000MHz**



## APPENDIX A - CONDUCTED EMISSION

Test Mode :

### Line

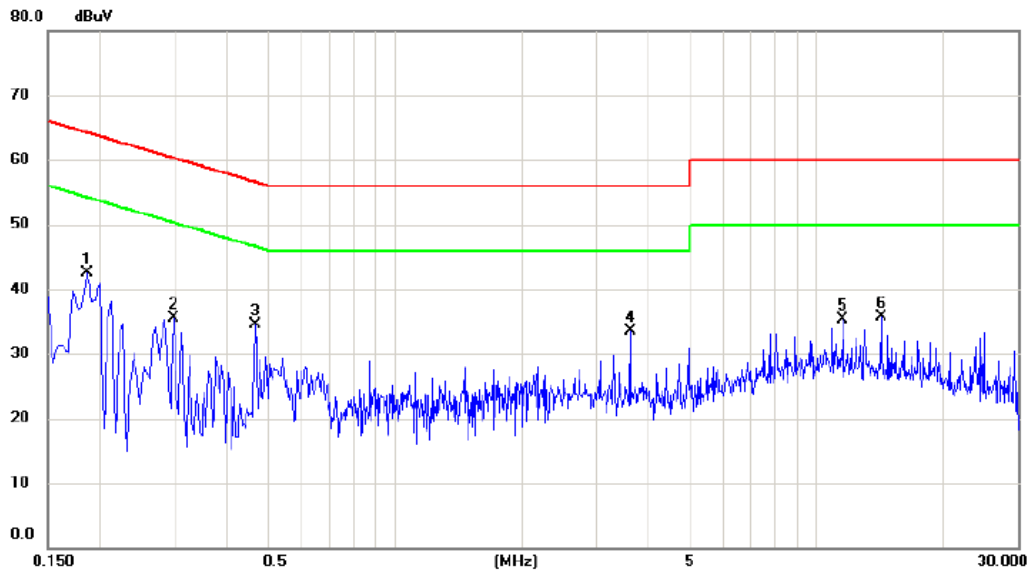


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1860	31.72	9.77	41.49	64.21	-22.72	peak	
2	0.2805	29.29	9.73	39.02	60.80	-21.78	peak	
3	0.3704	26.52	9.75	36.27	58.49	-22.22	peak	
4 *	0.5144	27.12	9.73	36.85	56.00	-19.15	peak	
5	11.8230	24.12	10.42	34.54	60.00	-25.46	peak	
6	15.3690	22.58	10.62	33.20	60.00	-26.80	peak	



Test Mode : Normal Link

### Neutral

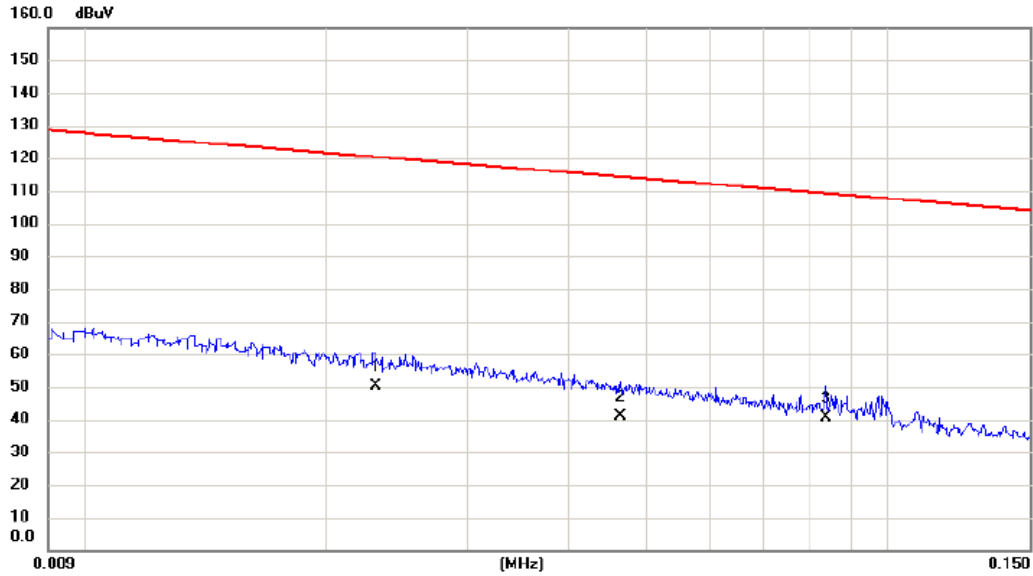


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1860	32.90	9.69	42.59	64.21	-21.62	peak	
2		0.2985	25.88	9.65	35.53	60.28	-24.75	peak	
3		0.4650	24.87	9.63	34.50	56.60	-22.10	peak	
4		3.6195	23.66	9.93	33.59	56.00	-22.41	peak	
5		11.5034	24.93	10.39	35.32	60.00	-24.68	peak	
6		14.2035	25.08	10.58	35.66	60.00	-24.34	peak	

## APPENDIX B - RADIATED EMISSION (9KHZ TO 30MHZ)

Test Mode: TX MODE

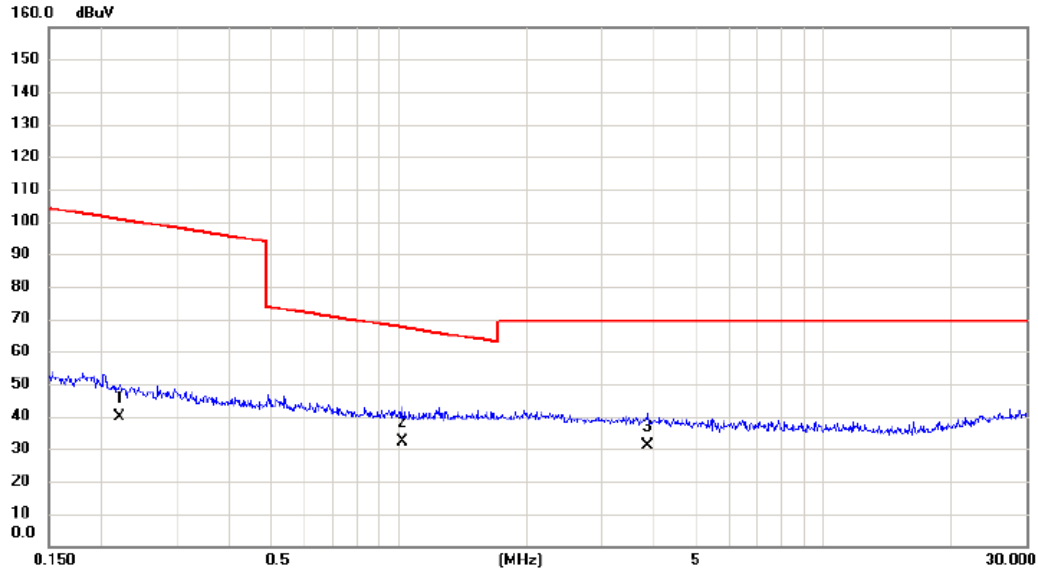
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.0230	30.80	19.53	50.33	120.37	-70.04	AVG	
2		0.0465	22.30	18.82	41.12	114.26	-73.14	AVG	
3	*	0.0838	22.60	18.02	40.62	109.14	-68.52	AVG	

Test Mode: TX MODE

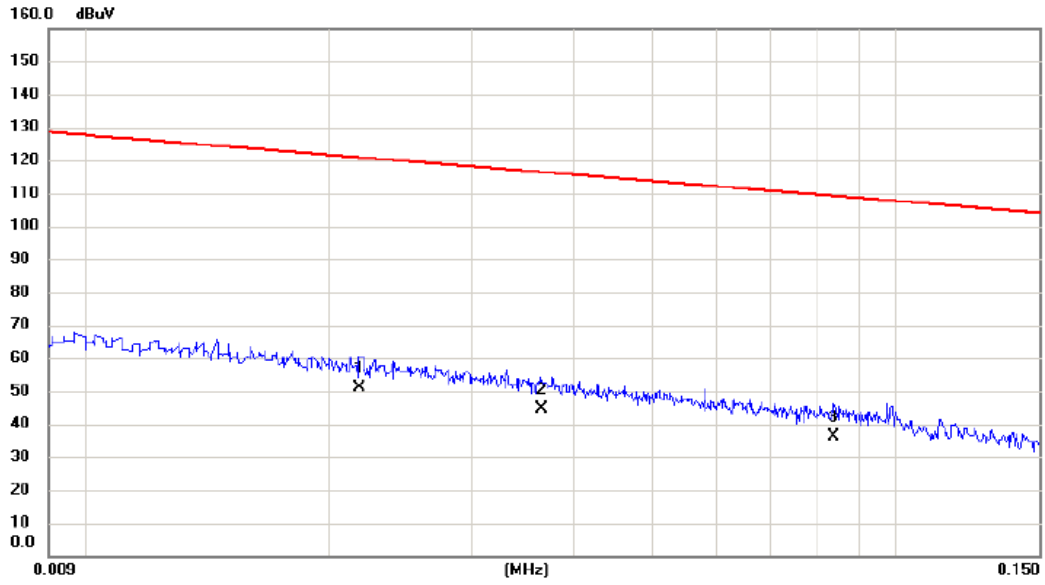
Ant 0°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2197	23.10	16.74	39.84	100.77	-60.93	AVG	
2	*	1.0211	16.40	15.88	32.28	67.42	-35.14	QP	
3		3.8603	15.90	14.99	30.89	69.54	-38.65	QP	

Test Mode: TX MODE

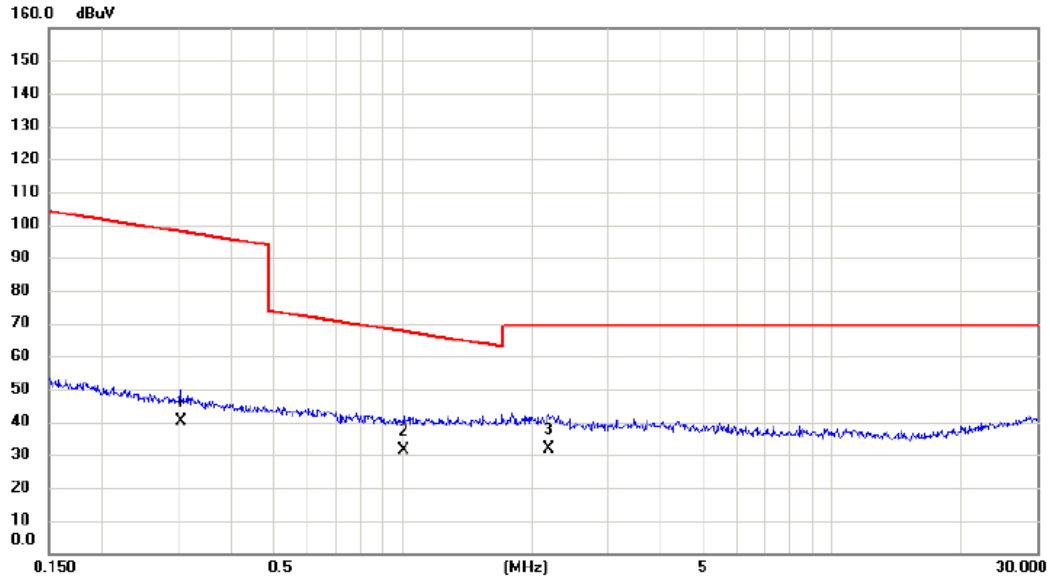
Ant 90°



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.0218	31.30	19.57	50.87	120.84	-69.97	AVG	
2		0.0365	25.60	19.13	44.73	116.36	-71.63	AVG	
3		0.0838	18.30	18.02	36.32	109.14	-72.82	AVG	

Test Mode: TX MODE

Ant 90°



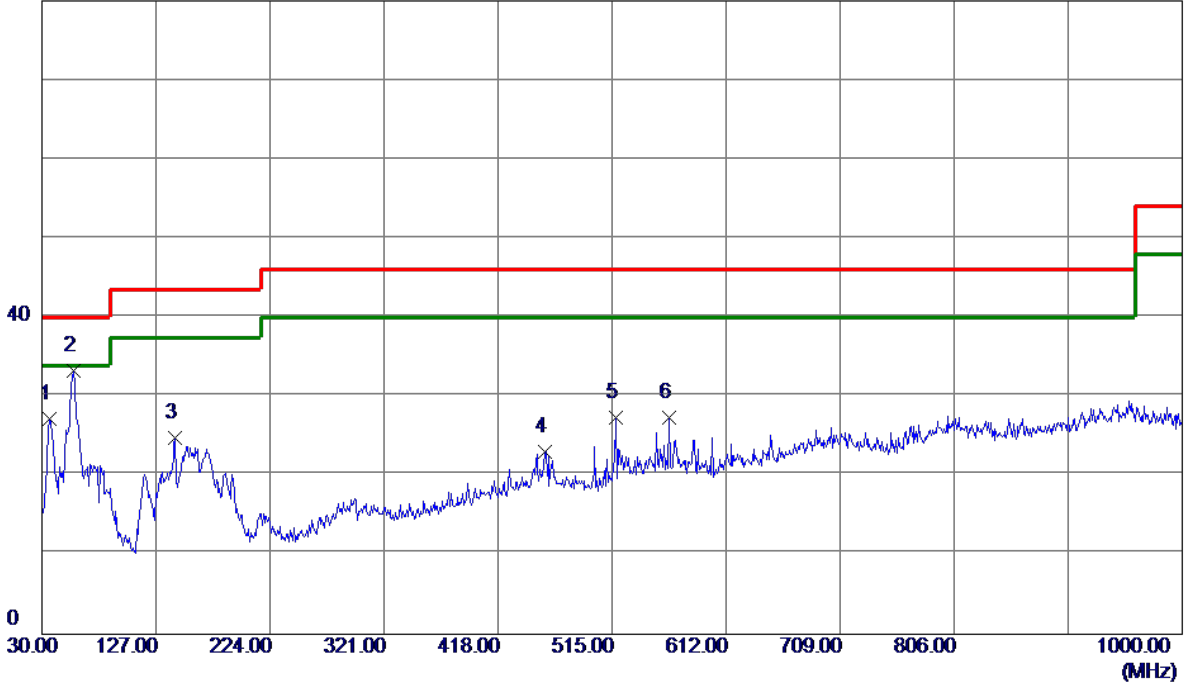
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.3051	23.50	16.62	40.12	97.92	-57.80	AVG	
2	*	1.0050	15.70	15.89	31.59	67.56	-35.97	QP	
3		2.1898	16.30	15.45	31.75	69.54	-37.79	QP	

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

Test Mode: TX B MODE CHANNEL 01

**Vertical**

80 dBuV/m



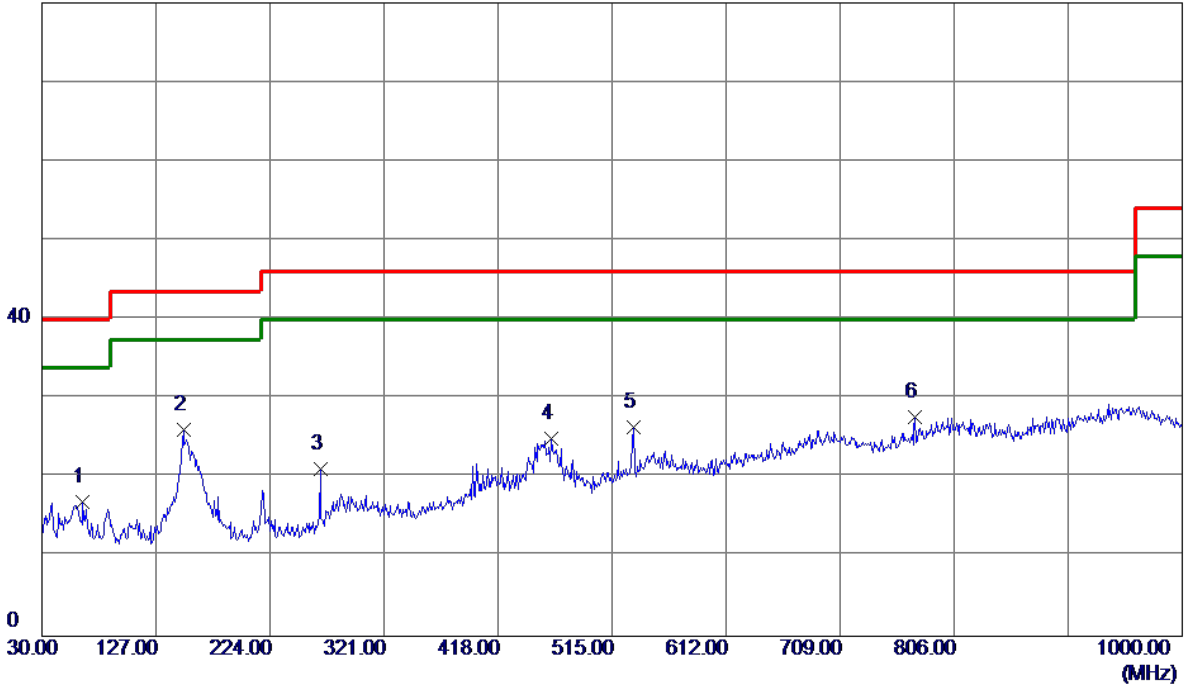
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	36.7900	42.49	-15.24	27.25	40.00	-12.75	Peak	
2 *	57.1600	49.06	-15.73	33.33	40.00	-6.67	Peak	
3	143.4900	37.38	-12.56	24.82	43.50	-18.68	Peak	
4	457.7700	31.27	-8.28	22.99	46.00	-23.01	Peak	
5	517.9099	35.54	-8.13	27.41	46.00	-18.59	Peak	
6	563.5000	33.73	-6.38	27.35	46.00	-18.65	Peak	



Test Mode: TX B MODE CHANNEL 01

**Horizontal**

80 dBuV/m

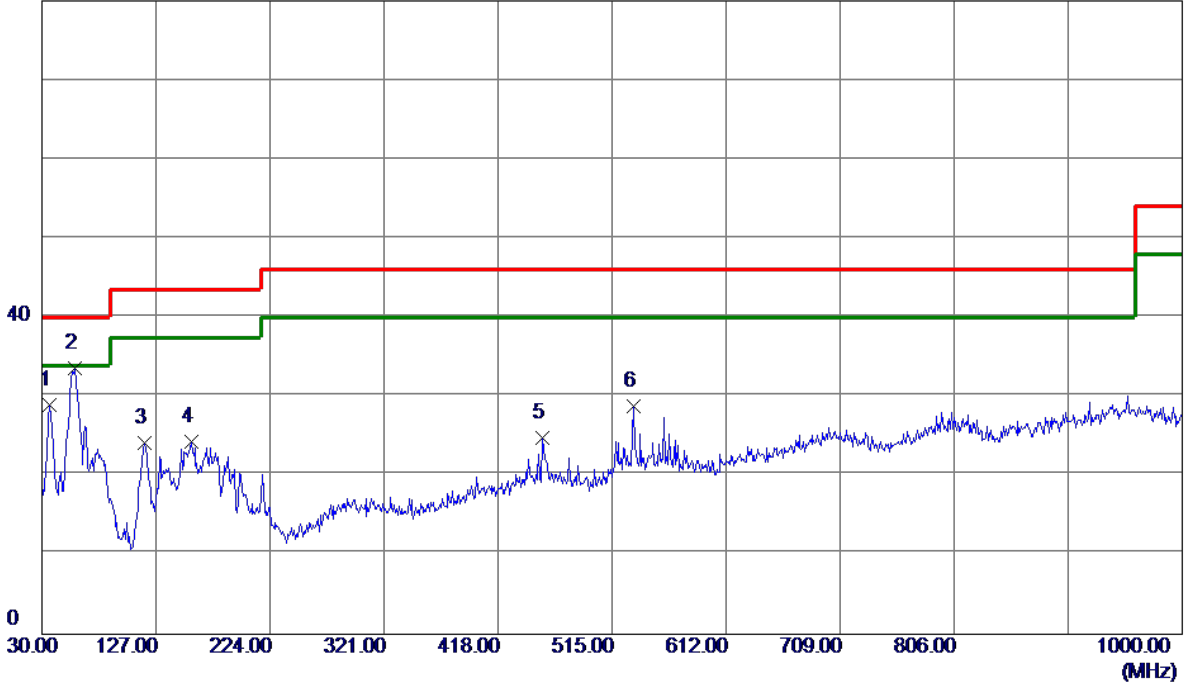


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	64.9200	33.98	-17.03	16.95	40.00	-23.05	Peak	
2 *	150.2800	38.29	-12.16	26.13	43.50	-17.37	Peak	
3	266.6800	34.76	-13.59	21.17	46.00	-24.83	Peak	
4	463.5900	33.31	-8.41	24.90	46.00	-21.10	Peak	
5	533.4300	33.52	-7.17	26.35	46.00	-19.65	Peak	
6	773.0200	30.90	-3.26	27.64	46.00	-18.36	Peak	

Test Mode: TX B MODE CHANNEL 06

**Vertical**

80 dBuV/m

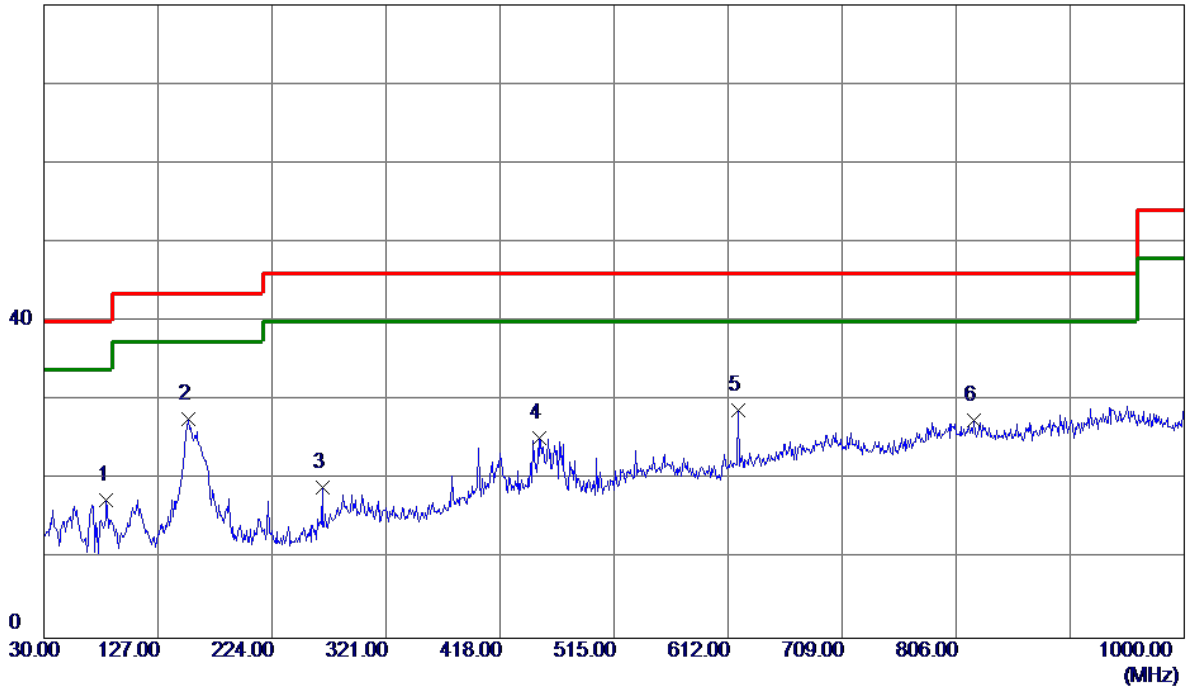


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	36.7900	44.20	-15.24	28.96	40.00	-11.04	Peak	
2 *	58.1300	49.46	-15.91	33.55	40.00	-6.45	Peak	
3	117.3000	39.90	-15.75	24.15	43.50	-19.35	Peak	
4	157.0700	35.82	-11.55	24.27	43.50	-19.23	Peak	
5	455.8300	33.10	-8.24	24.86	46.00	-21.14	Peak	
6	533.4300	35.99	-7.17	28.82	46.00	-17.18	Peak	

Test Mode: TX B MODE CHANNEL 06

Horizontal

80 dBuV/m

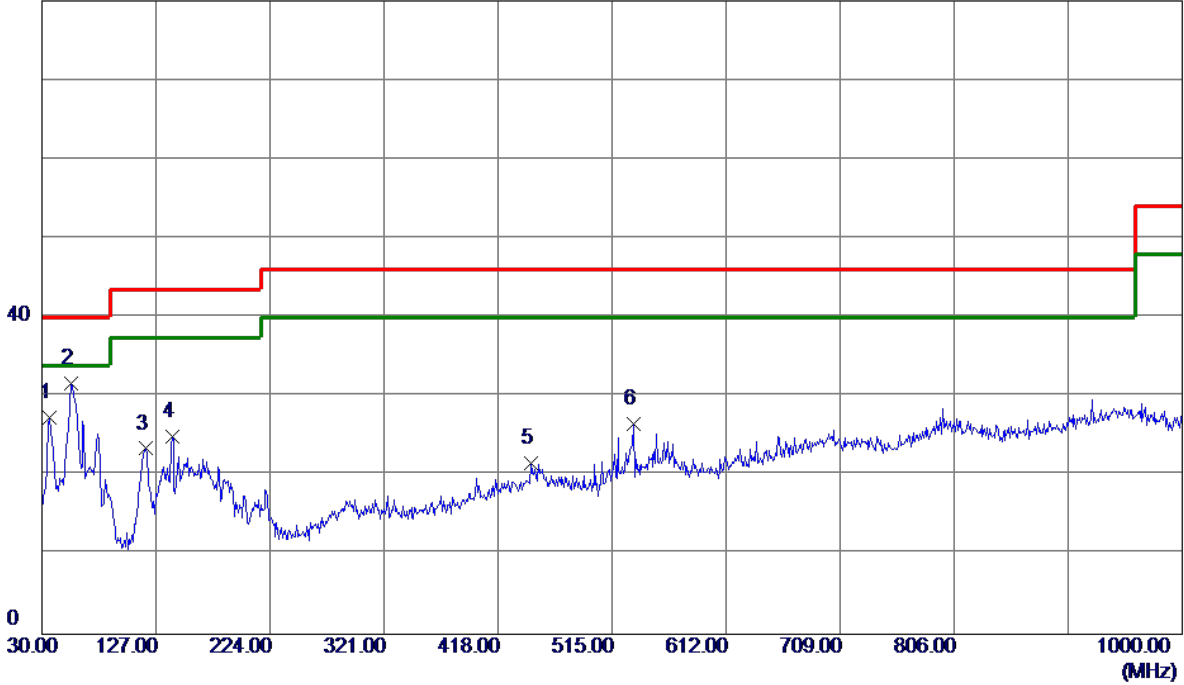


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	83.3500	36.99	-19.51	17.48	40.00	-22.52	Peak	
2 *	153.1900	39.55	-11.90	27.65	43.50	-15.85	Peak	
3	266.6800	32.61	-13.59	19.02	46.00	-26.98	Peak	
4	450.9800	33.47	-8.13	25.34	46.00	-20.66	Peak	
5	620.7300	35.28	-6.51	28.77	46.00	-17.23	Peak	
6	821.5200	29.40	-1.94	27.46	46.00	-18.54	Peak	

Test Mode: TX B MODE CHANNEL 11

**Vertical**

80 dBuV/m

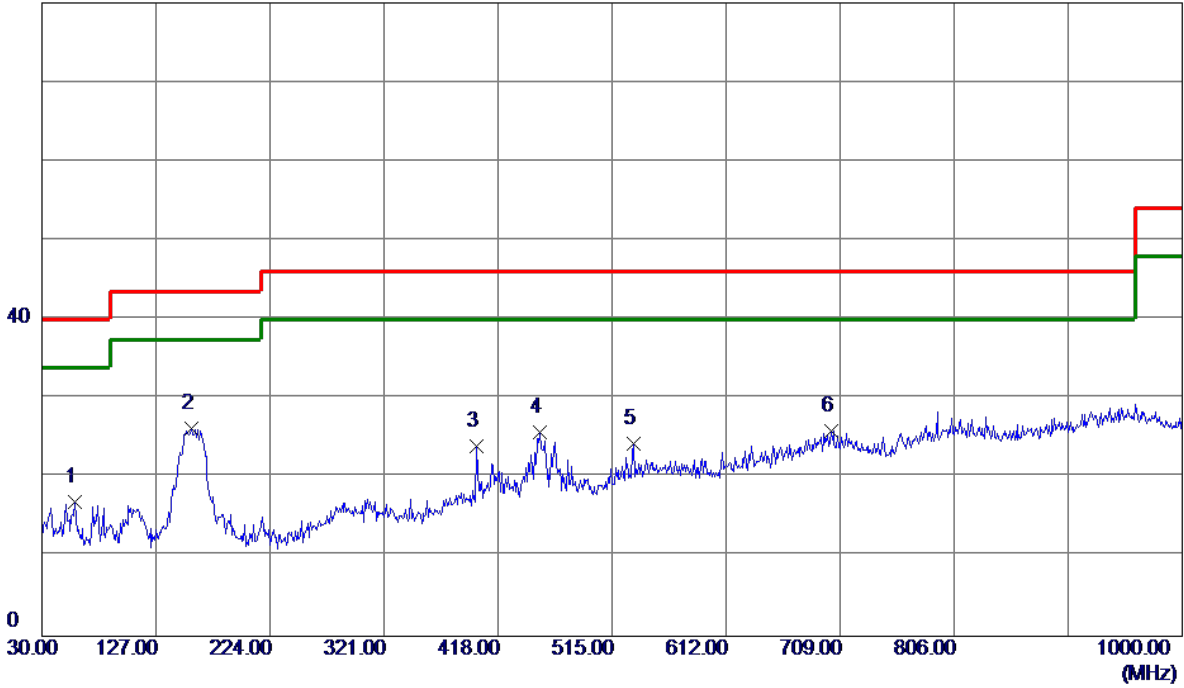


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	36.7900	42.56	-15.24	27.32	40.00	-12.68	Peak	
2 *	55.2200	47.10	-15.47	31.63	40.00	-8.37	Peak	
3	118.2700	39.04	-15.60	23.44	43.50	-20.06	Peak	
4	140.5800	37.76	-12.73	25.03	43.50	-18.47	Peak	
5	446.1300	29.79	-8.26	21.53	46.00	-24.47	Peak	
6	533.4300	33.67	-7.17	26.50	46.00	-19.50	Peak	

Test Mode: TX B MODE CHANNEL 11

Horizontal

80 dBuV/m

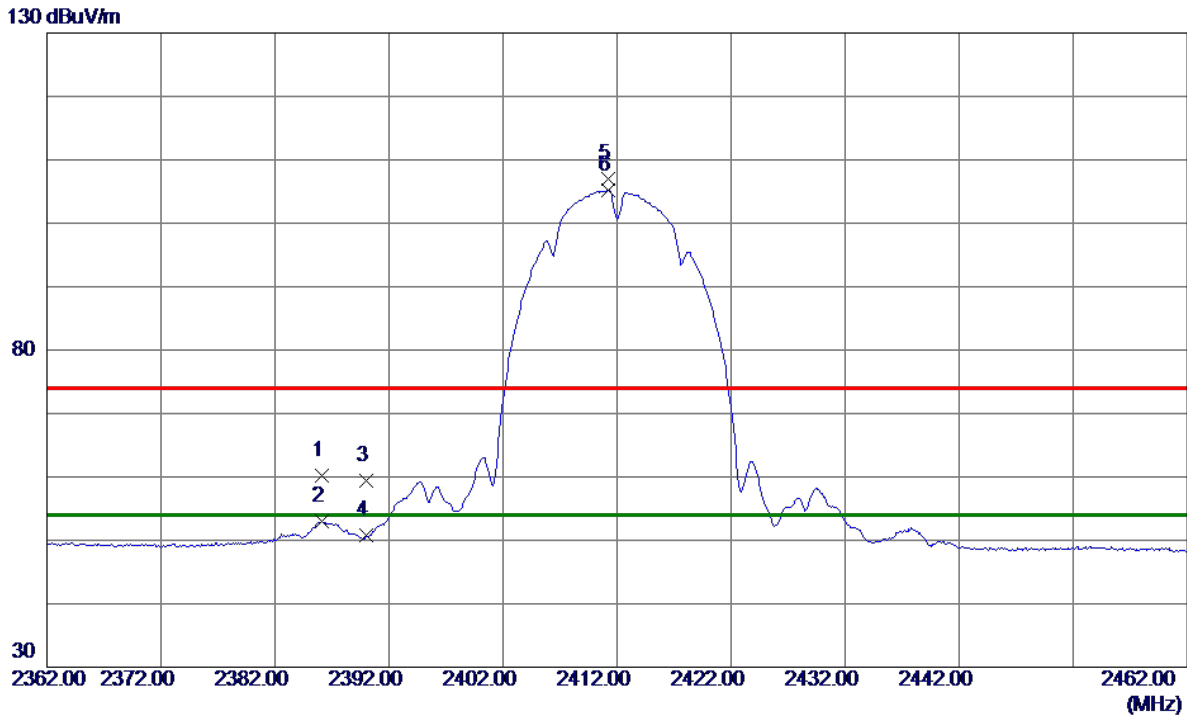


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	58.1300	32.89	-15.91	16.98	40.00	-23.02	Peak	
2 *	157.0700	37.75	-11.55	26.20	43.50	-17.30	Peak	
3	399.5700	34.04	-10.11	23.93	46.00	-22.07	Peak	
4	453.8900	33.93	-8.20	25.73	46.00	-20.27	Peak	
5	533.4300	31.42	-7.17	24.25	46.00	-21.75	Peak	
6	701.2400	29.35	-3.44	25.91	46.00	-20.09	Peak	

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

Orthogonal Axis :	X
Test Mode :	TX B MODE 2412MHz

**Vertical**

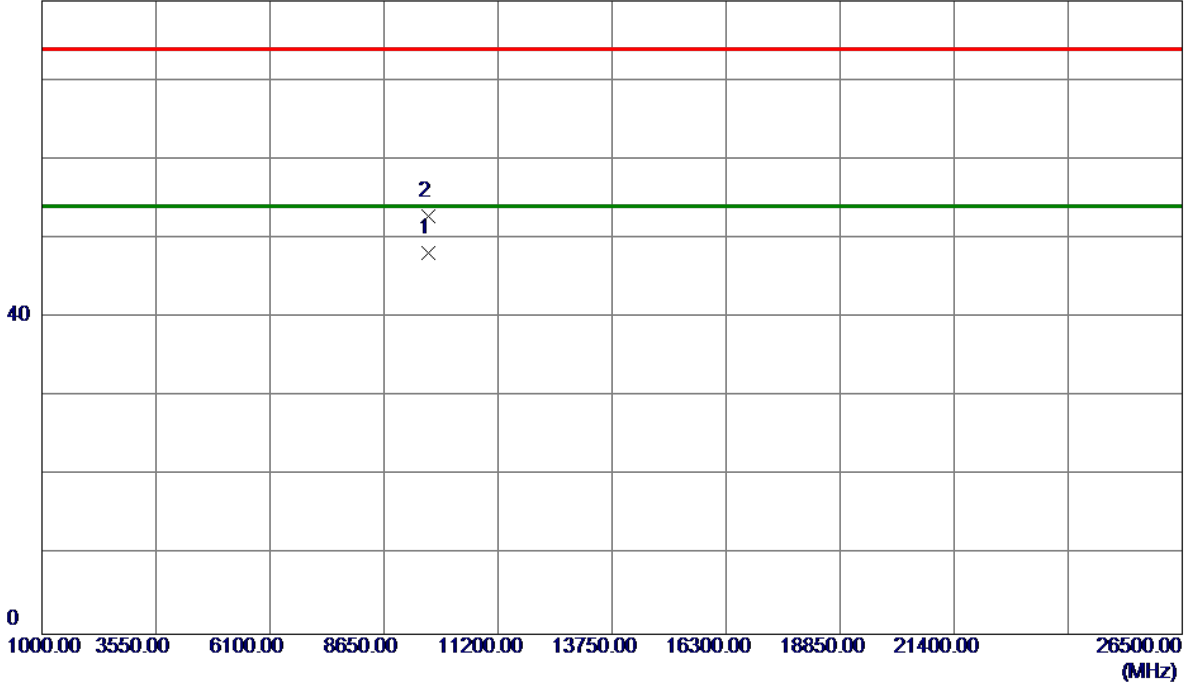


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2386.1000	41.16	19.12	60.28	74.00	-13.72	Peak	
2	2386.1000	33.92	19.12	53.04	54.00	-0.96	AVG	
3	2390.0000	40.24	19.14	59.38	74.00	-14.62	Peak	
4	2390.0000	31.59	19.14	50.73	54.00	-3.27	AVG	
5	2411.2000	87.86	19.22	107.08	74.00	33.08	Peak	No Limit
6 *	2411.2000	86.03	19.22	105.25	54.00	51.25	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX B MODE 2412MHz

**Vertical**

80 dBuV/m

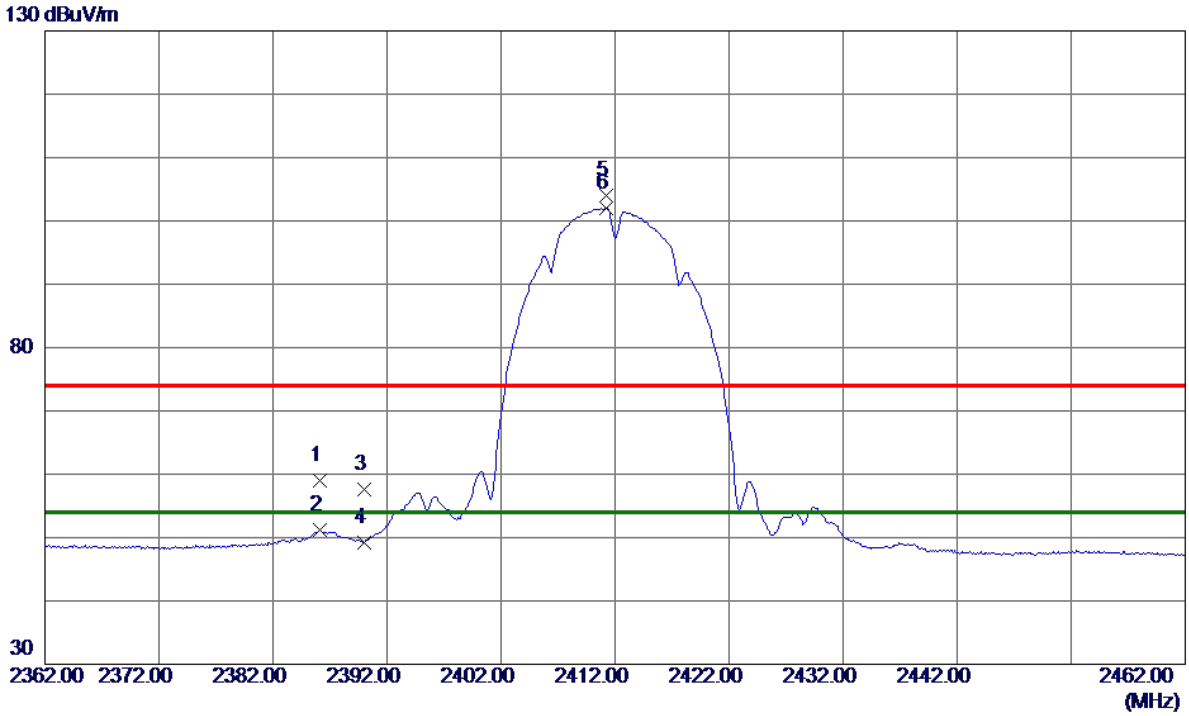


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9648.0100	34.14	13.97	48.11	54.00	-5.89	AVG	
2	9648.0400	38.90	13.97	52.87	74.00	-21.13	Peak	



Orthogonal Axis :	X
Test Mode :	TX B MODE 2412MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2386.1000	39.93	19.12	59.05	74.00	-14.95	Peak	
2	2386.1000	32.01	19.12	51.13	54.00	-2.87	AVG	
3	2390.0000	38.52	19.14	57.66	74.00	-16.34	Peak	
4	2390.0000	30.15	19.14	49.29	54.00	-4.71	AVG	
5	2411.2000	84.73	19.22	103.95	74.00	29.95	Peak	No Limit
6 *	2411.2000	82.79	19.22	102.01	54.00	48.01	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX B MODE 2412MHz

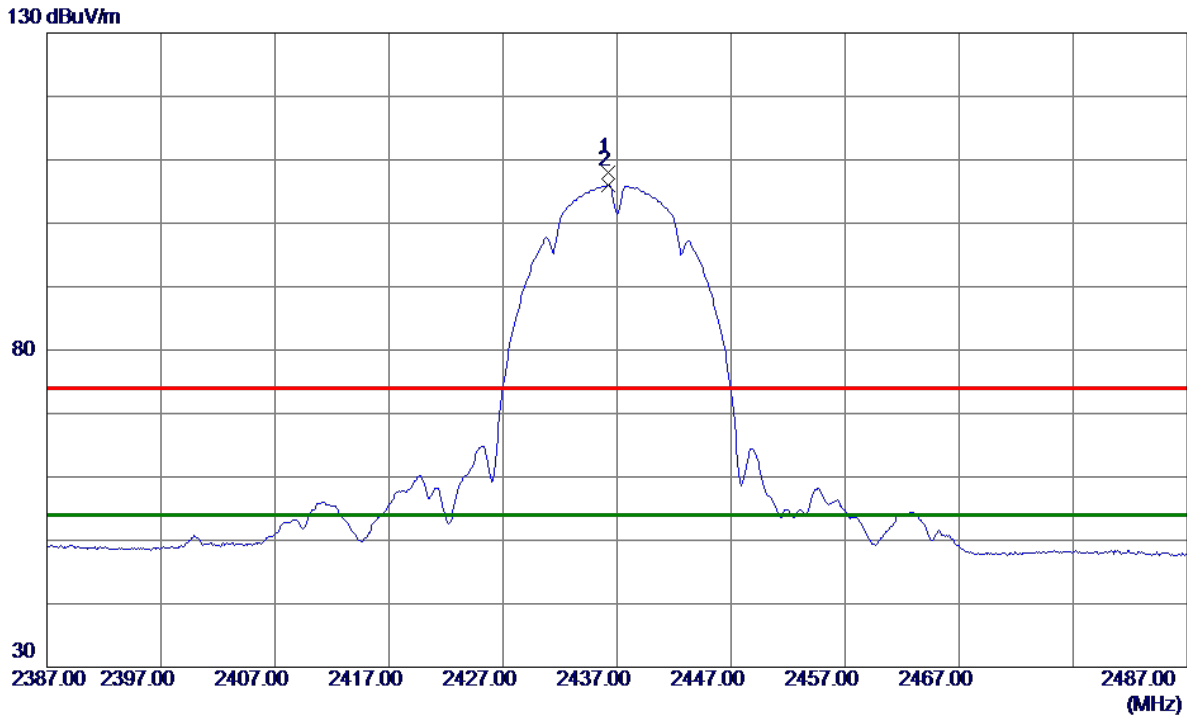
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9647.3700	36.44	13.97	50.41	74.00	-23.59	Peak	
2 *	9648.0199	29.66	13.97	43.63	54.00	-10.37	AVG	

Orthogonal Axis :	X
Test Mode :	TX B MODE 2437MHz

**Vertical**

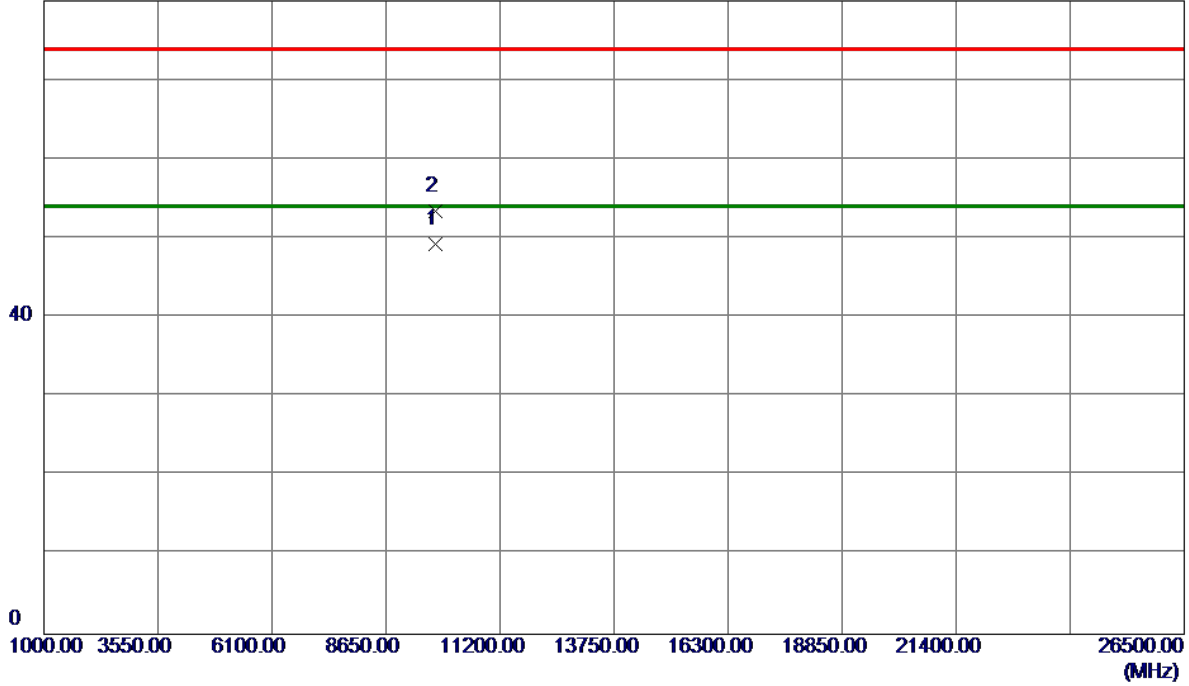


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2436.2000	88.66	19.31	107.97	74.00	33.97	Peak	No Limit
2 *	2436.2000	86.71	19.31	106.02	54.00	52.02	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX B MODE 2437MHz

**Vertical**

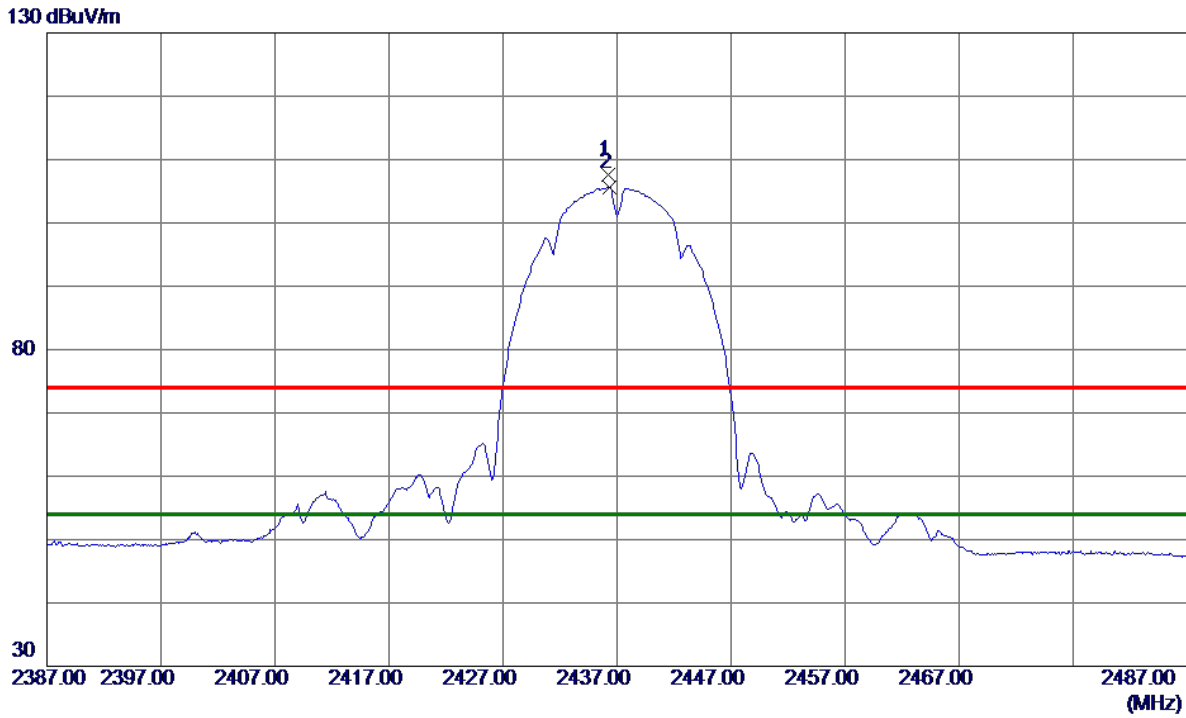
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9748.0300	35.17	14.04	49.21	54.00	-4.79	AVG	
2	9748.0500	39.45	14.04	53.49	74.00	-20.51	Peak	

Orthogonal Axis :	X
Test Mode :	TX B MODE 2437MHz

**Horizontal**

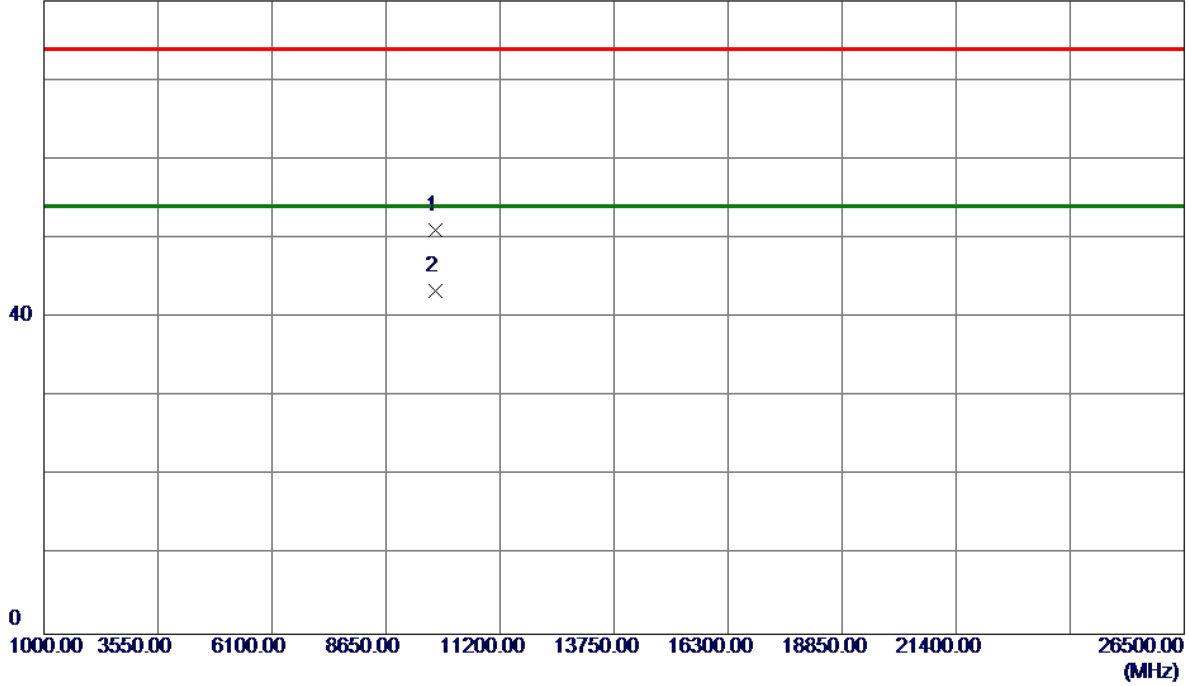


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2436.2000	88.32	19.31	107.63	74.00	33.63	Peak	No Limit
2 *	2436.3000	86.37	19.31	105.68	54.00	51.68	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX B MODE 2437MHz

### Horizontal

80 dBuV/m

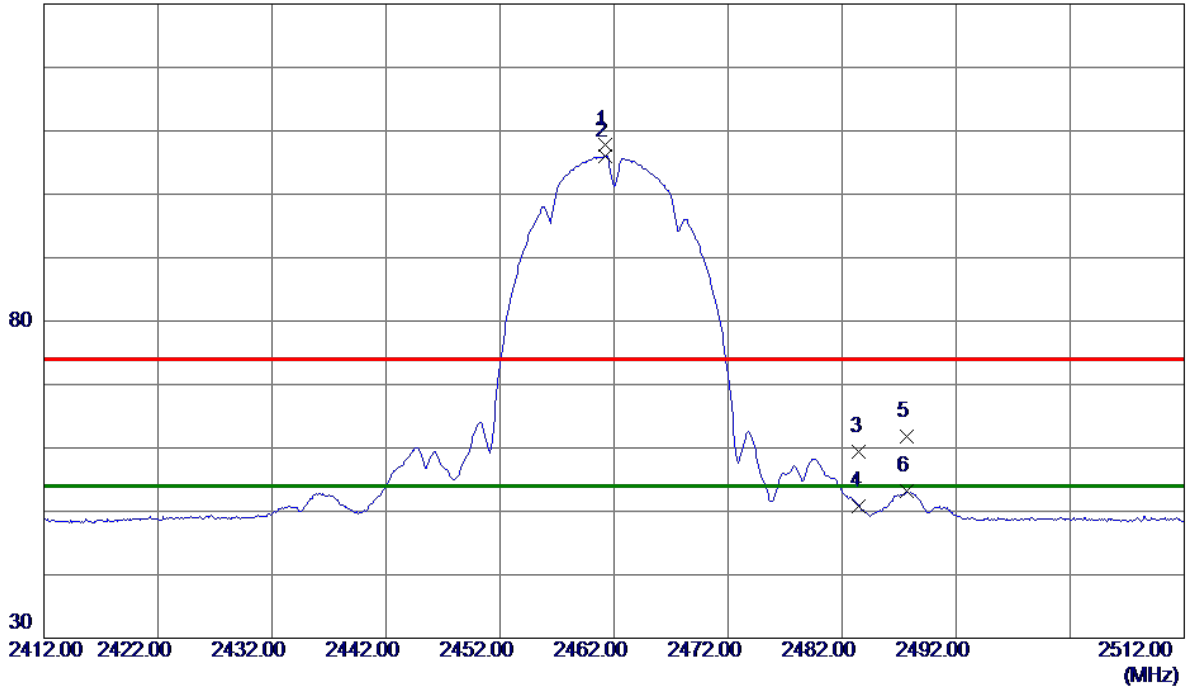


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9747.8099	37.00	14.04	51.04	74.00	-22.96	Peak	
2 *	9748.1000	29.33	14.04	43.37	54.00	-10.63	AVG	

Orthogonal Axis :	X
Test Mode :	TX B MODE 2462MHz

### Vertical

130 dBuV/m

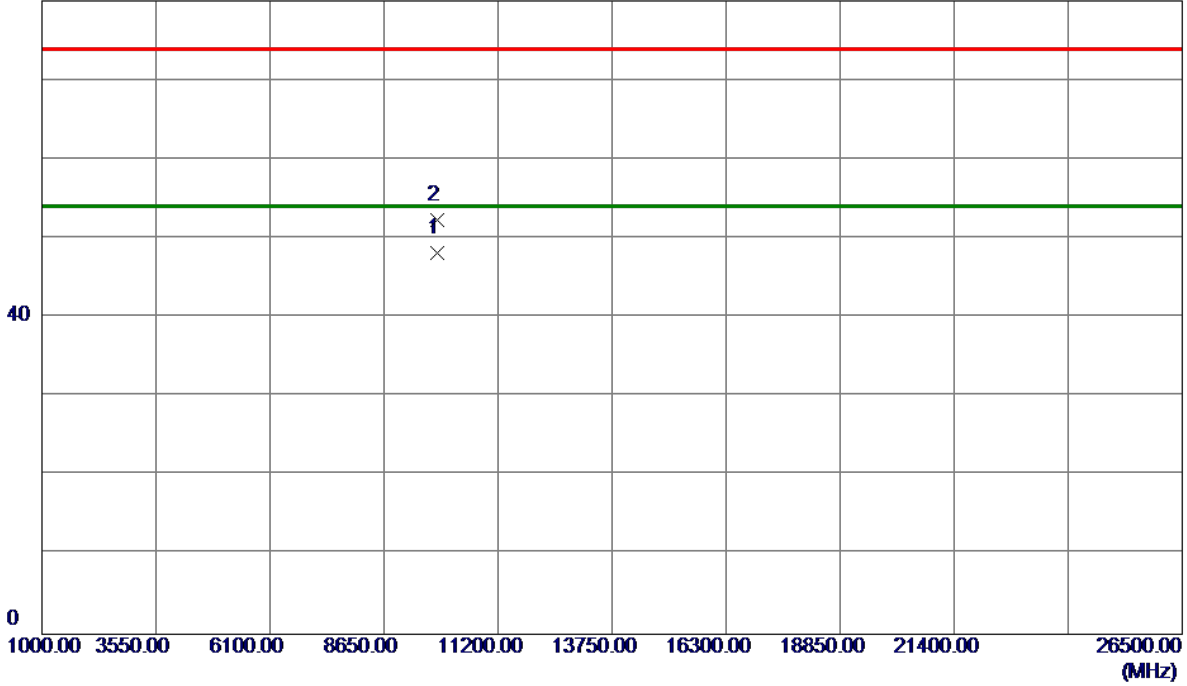


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2461.2000	88.45	19.40	107.85	74.00	33.85	Peak	No Limit
2 *	2461.2000	86.66	19.40	106.06	54.00	52.06	AVG	No Limit
3	2483.5000	39.95	19.48	59.43	74.00	-14.57	Peak	
4	2483.5000	31.35	19.48	50.83	54.00	-3.17	AVG	
5	2487.7000	42.21	19.50	61.71	74.00	-12.29	Peak	
6	2487.7000	33.63	19.50	53.13	54.00	-0.87	AVG	

Orthogonal Axis :	X
Test Mode :	TX B MODE 2462MHz

**Vertical**

80 dBuV/m



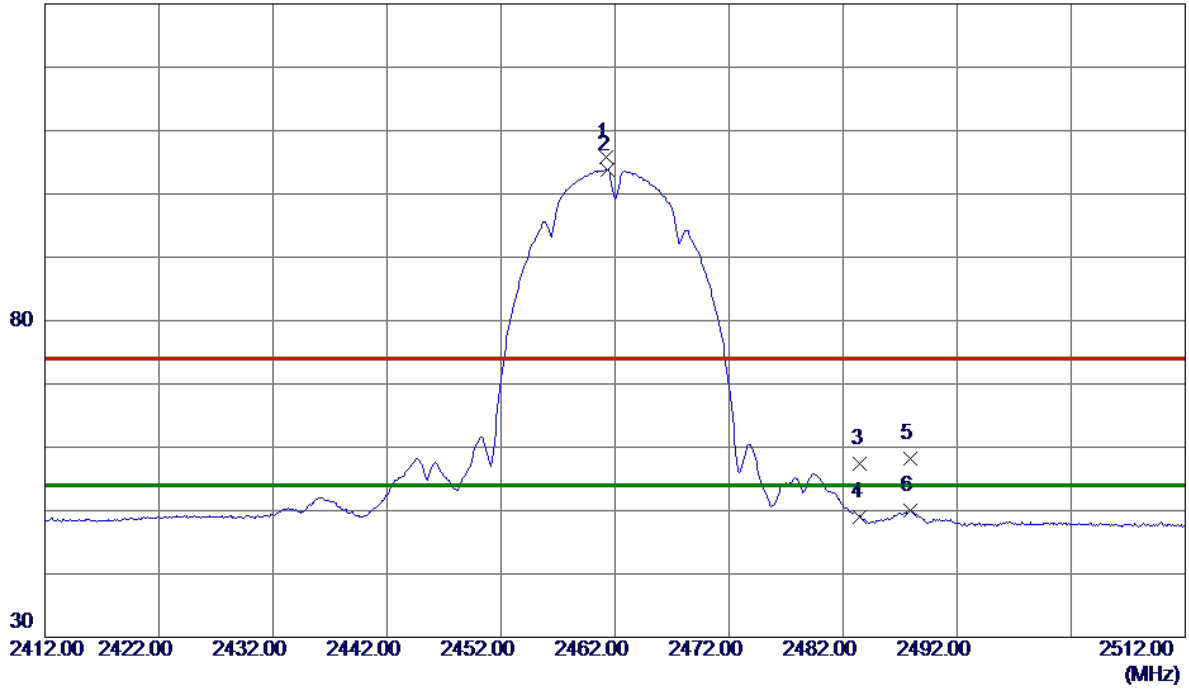
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9848.0100	33.98	14.11	48.09	54.00	-5.91	AVG	
2	9848.0300	38.17	14.11	52.28	74.00	-21.72	Peak	



Orthogonal Axis :	X
Test Mode :	TX B MODE 2462MHz

### Horizontal

130 dBuV/m

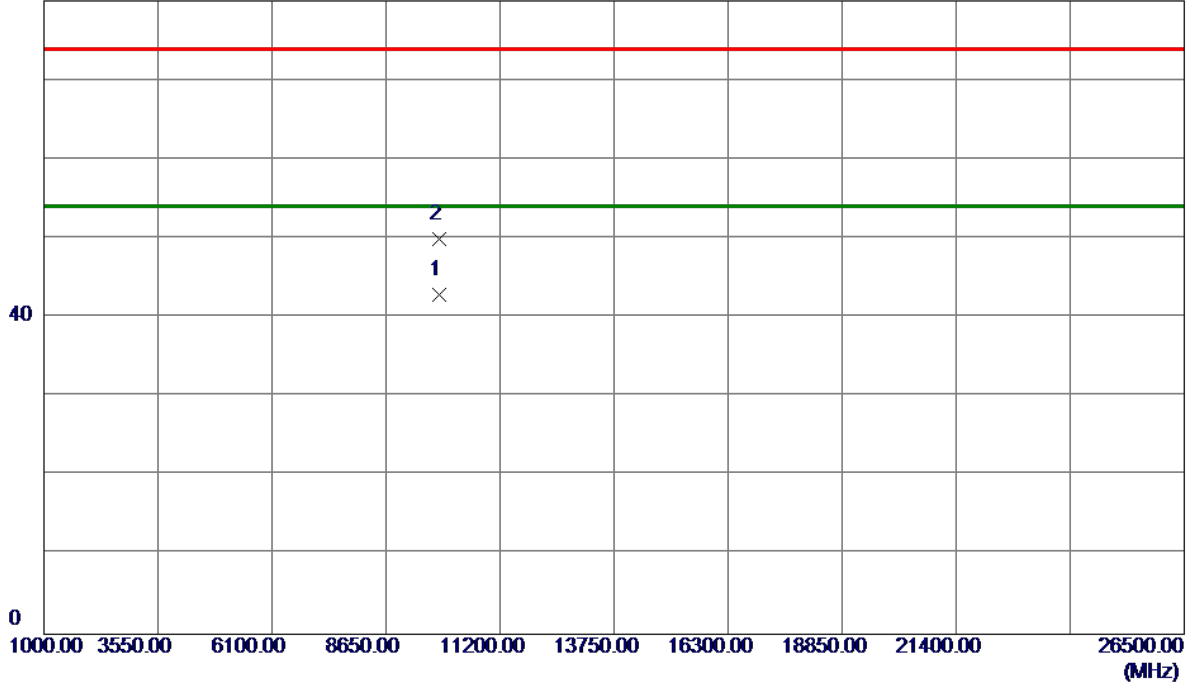


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2461.2000	86.45	19.40	105.85	74.00	31.85	Peak	No Limit
2 *	2461.3000	84.48	19.40	103.88	54.00	49.88	AVG	No Limit
3	2483.5000	37.92	19.48	57.40	74.00	-16.60	Peak	
4	2483.5000	29.60	19.48	49.08	54.00	-4.92	AVG	
5	2487.9000	38.65	19.50	58.15	74.00	-15.85	Peak	
6	2487.9000	30.42	19.50	49.92	54.00	-4.08	AVG	

Orthogonal Axis :	X
Test Mode :	TX B MODE 2462MHz

### Horizontal

80 dBuV/m

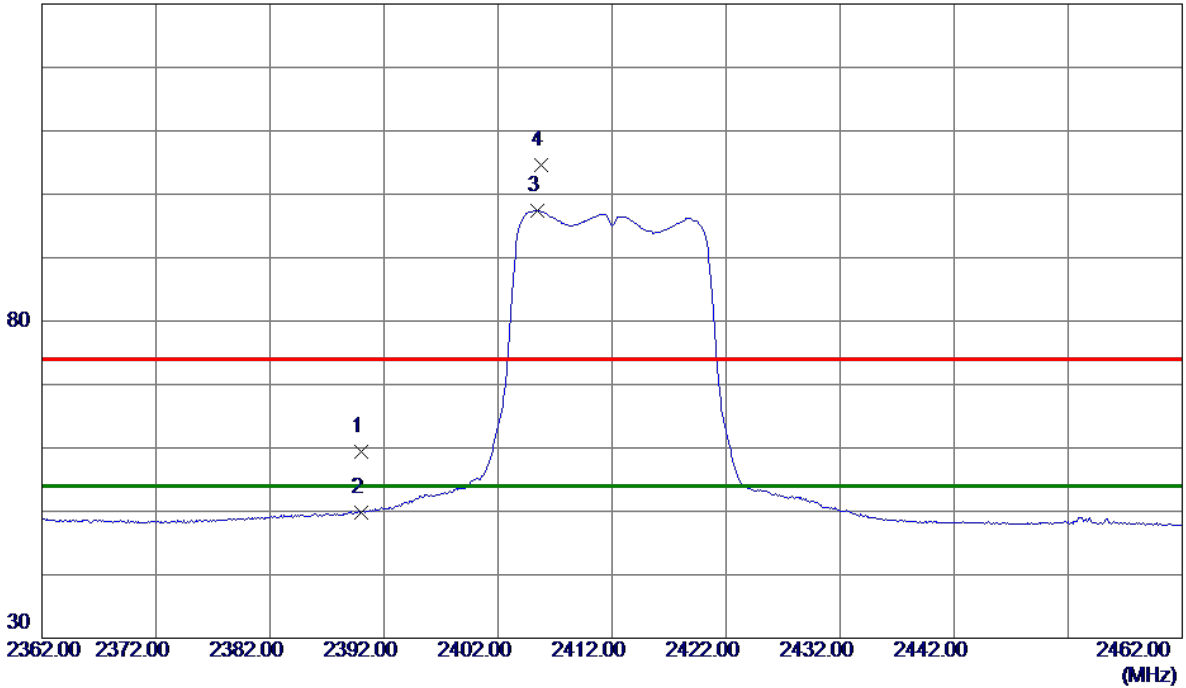


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9848.0900	28.74	14.11	42.85	54.00	-11.15	AVG	
2	9848.1100	35.88	14.11	49.99	74.00	-24.01	Peak	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2412MHz

**Vertical**

130 dBuV/m

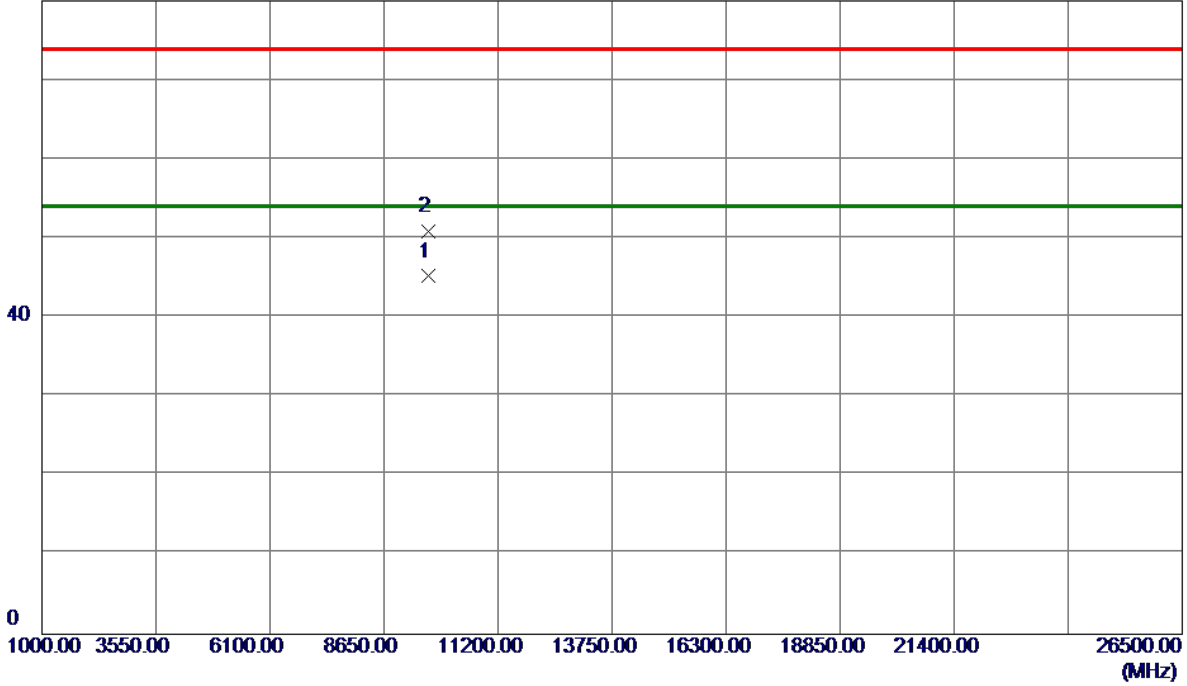


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	40.35	19.14	59.49	74.00	-14.51	Peak	
2	2390.0000	30.74	19.14	49.88	54.00	-4.12	AVG	
3 *	2405.4000	78.23	19.19	97.42	54.00	43.42	AVG	No Limit
4	2405.8000	85.45	19.20	104.65	74.00	30.65	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX G MODE 2412MHz

**Vertical**

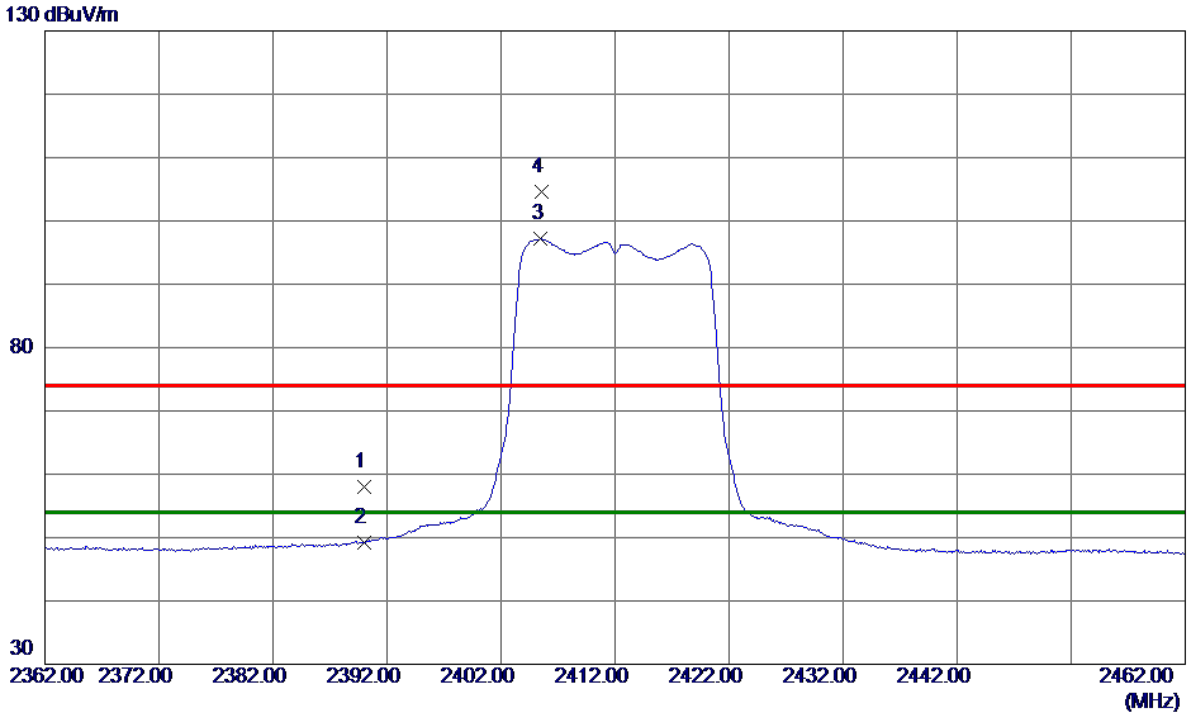
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9647.9900	31.23	13.97	45.20	54.00	-8.80	AVG	
2	9648.0400	36.92	13.97	50.89	74.00	-23.11	Peak	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2412MHz

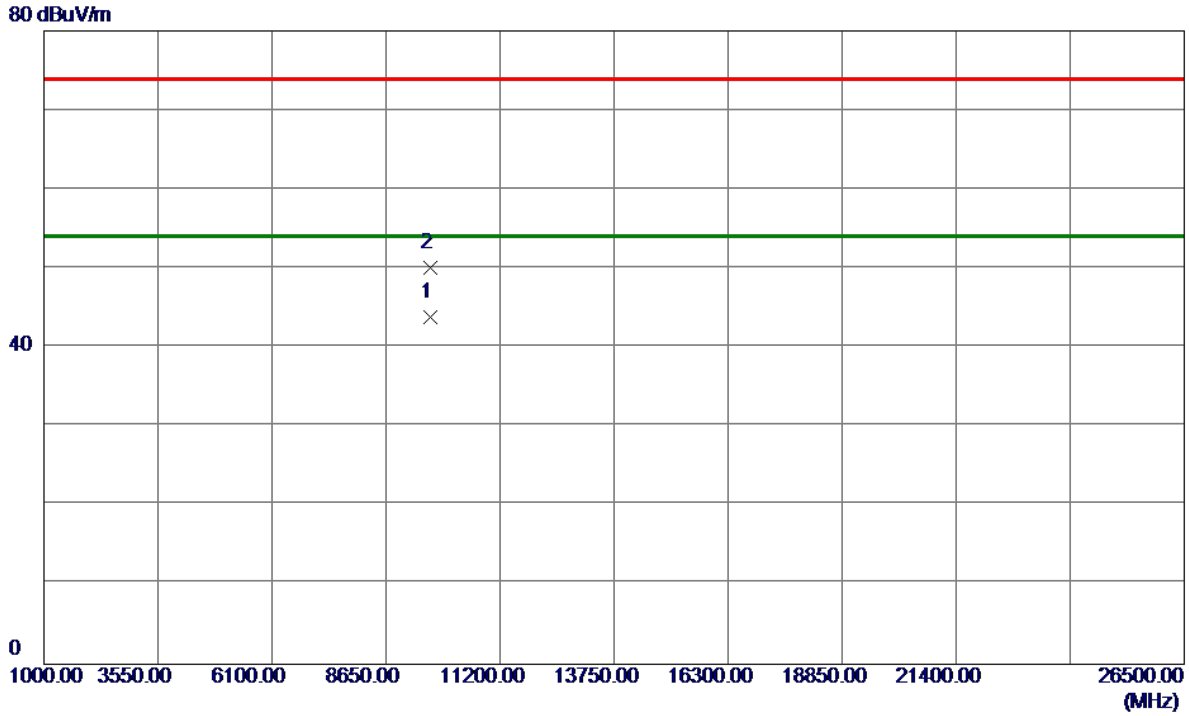
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	38.95	19.14	58.09	74.00	-15.91	Peak	
2	2390.0000	30.12	19.14	49.26	54.00	-4.74	AVG	
3 *	2405.5000	77.92	19.19	97.11	54.00	43.11	AVG	No Limit
4	2405.6000	85.35	19.19	104.54	74.00	30.54	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX G MODE 2412MHz

### Horizontal

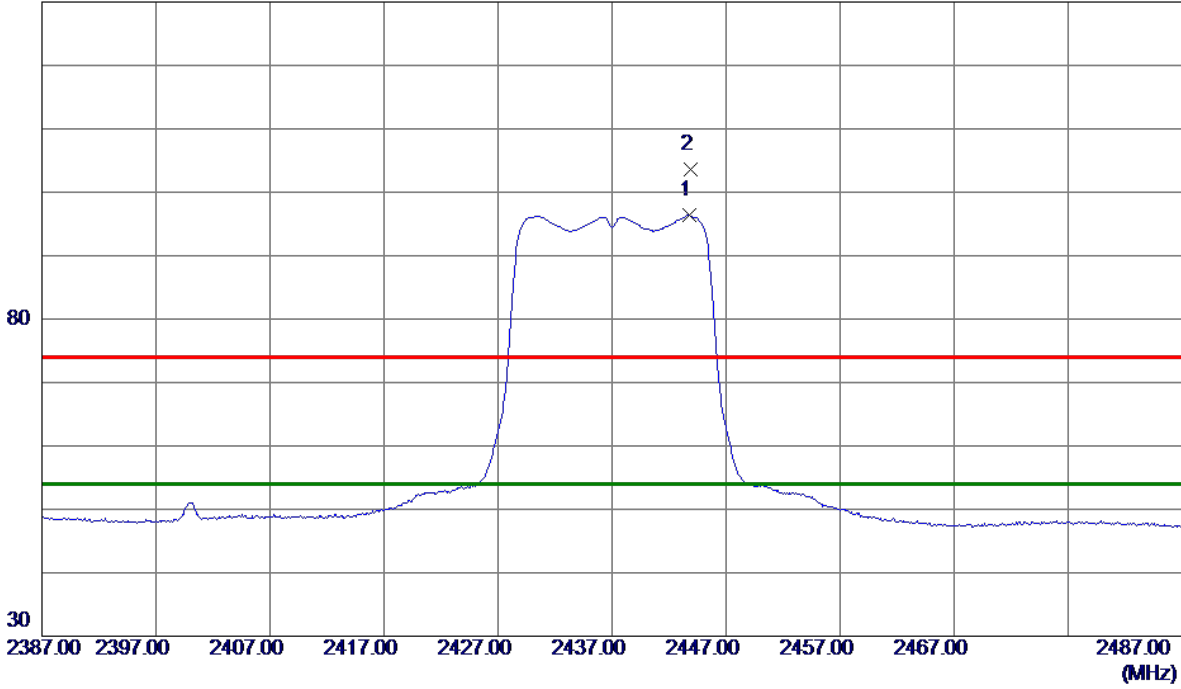


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9648.0400	29.85	13.97	43.82	54.00	-10.18	AVG	
2	9648.2100	36.09	13.97	50.06	74.00	-23.94	Peak	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2437MHz

**Vertical**

130 dBuV/m

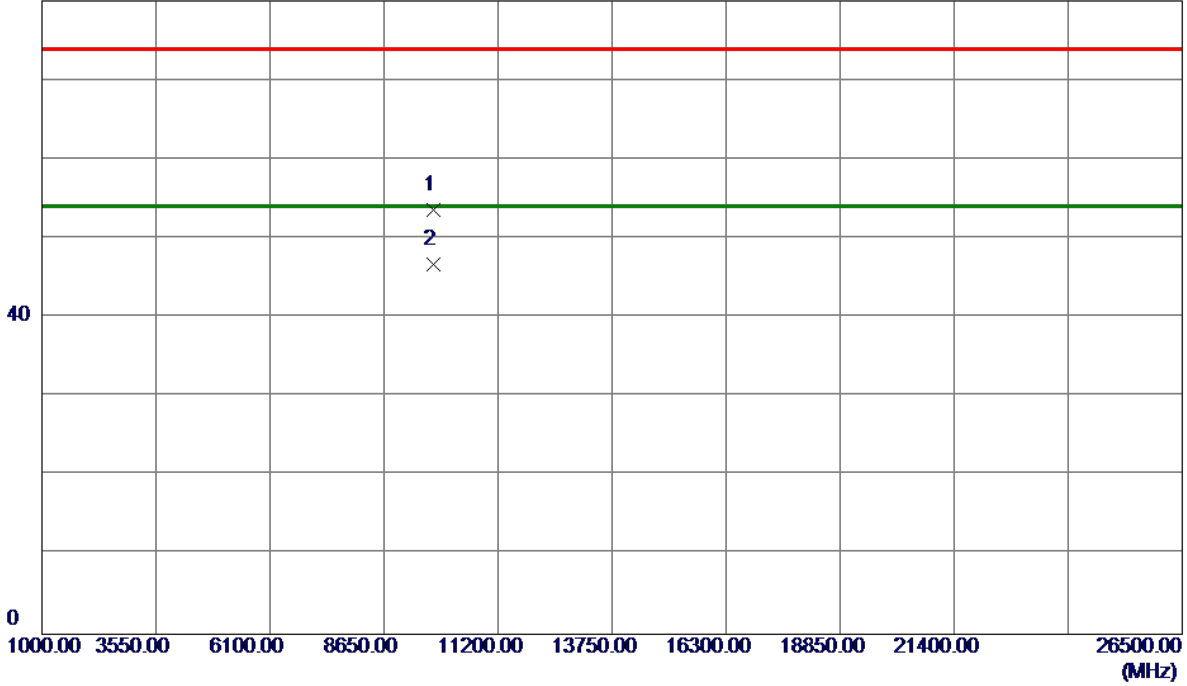


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2443.8000	77.00	19.34	96.34	54.00	42.34	AVG	No Limit
2	2443.9000	84.24	19.34	103.58	74.00	29.58	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX G MODE 2437MHz

**Vertical**

80 dBuV/m

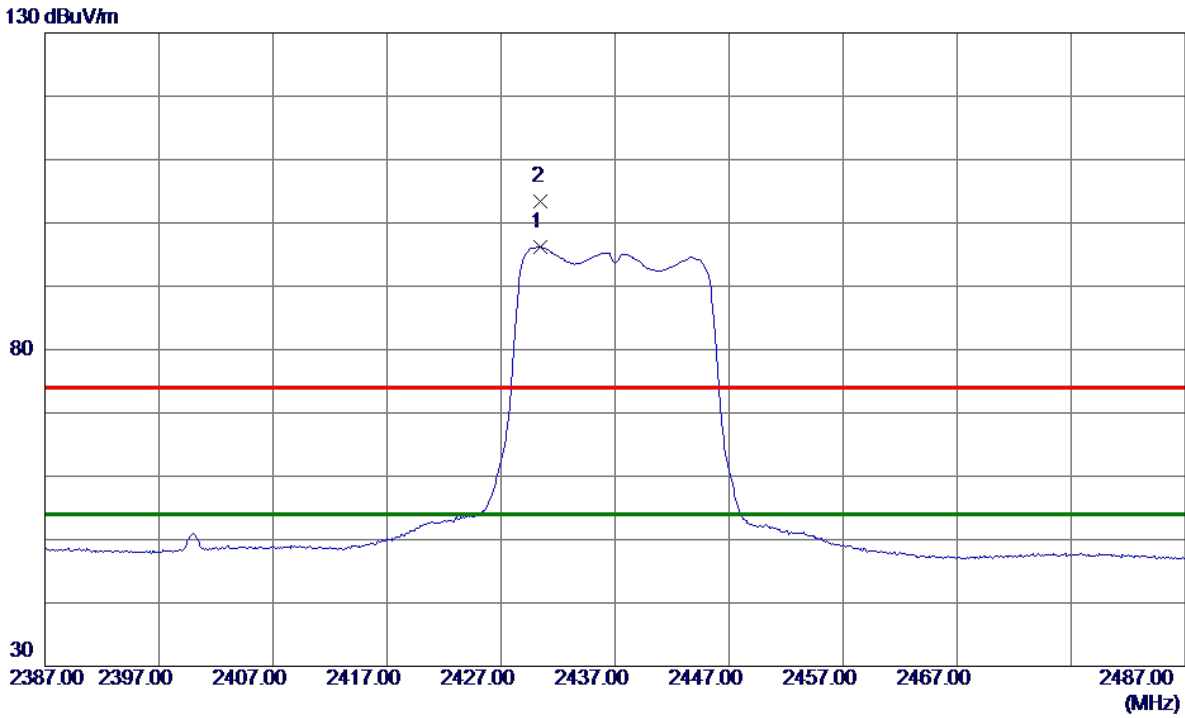


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9747.8900	39.50	14.04	53.54	74.00	-20.46	Peak	
2 *	9748.0400	32.71	14.04	46.75	54.00	-7.25	AVG	



Orthogonal Axis :	X
Test Mode :	TX G MODE 2437MHz

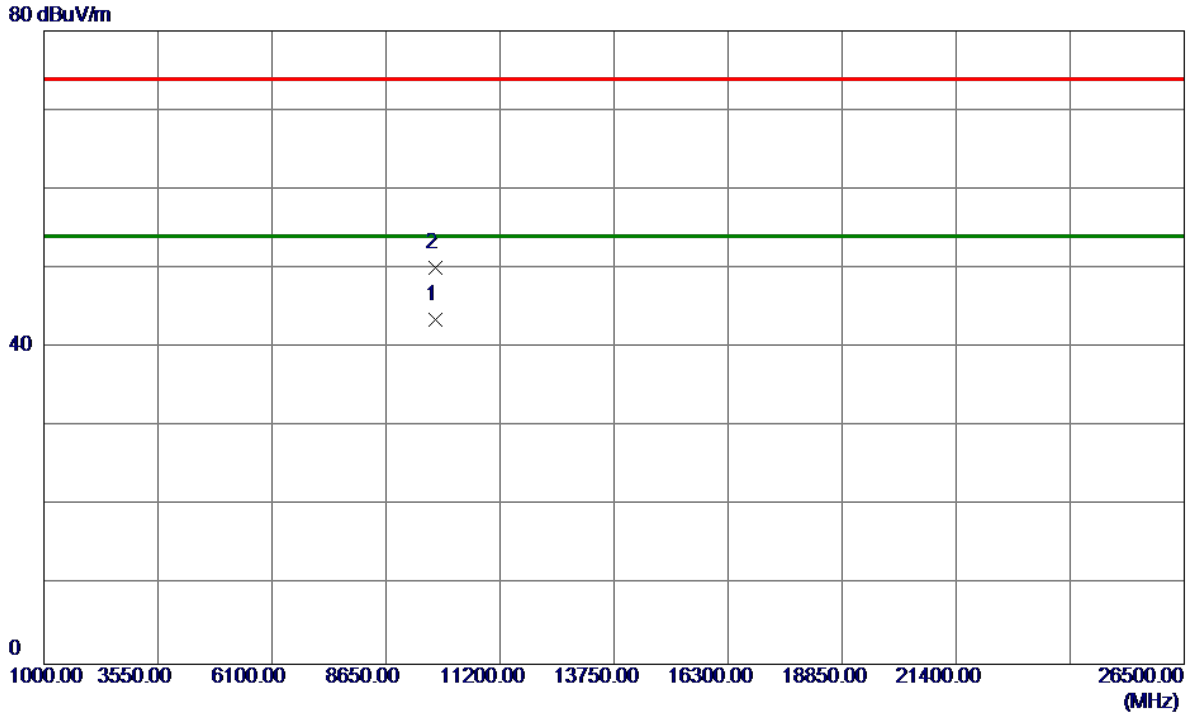
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2430.4000	76.91	19.29	96.20	54.00	42.20	AVG	No Limit
2	2430.5000	84.15	19.29	103.44	74.00	29.44	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX G MODE 2437MHz

### Horizontal

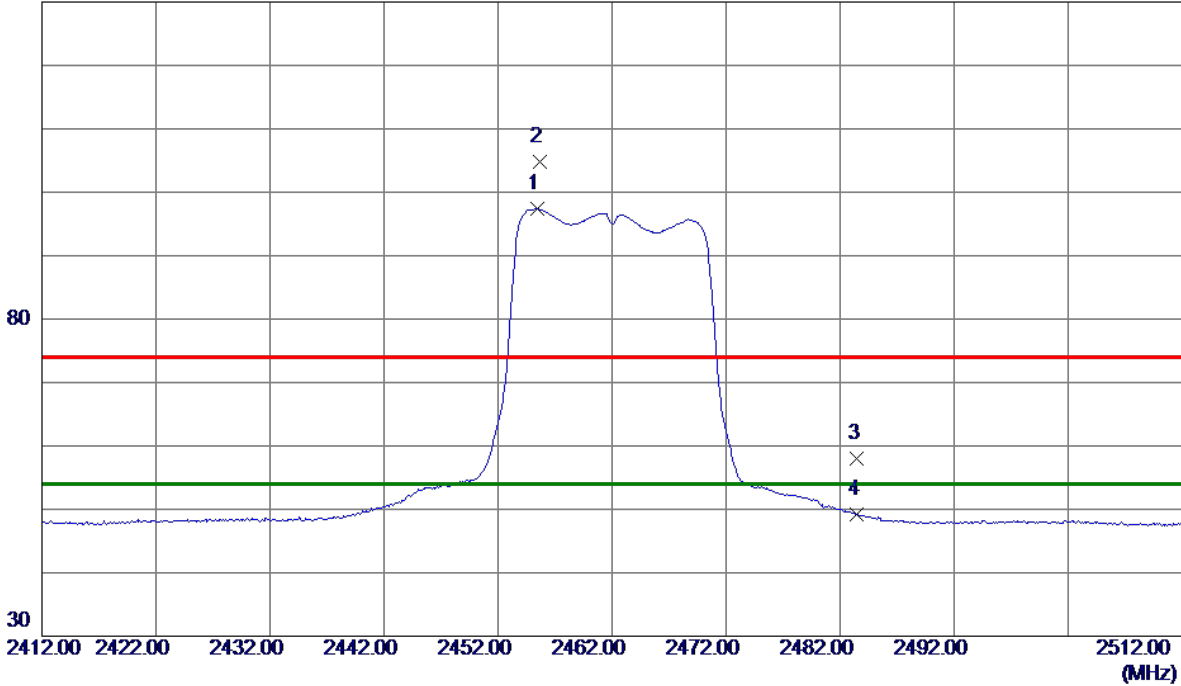


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9748.0800	29.41	14.04	43.45	54.00	-10.55	AVG	
2	9748.2300	36.02	14.04	50.06	74.00	-23.94	Peak	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2462MHz

**Vertical**

130 dBuV/m

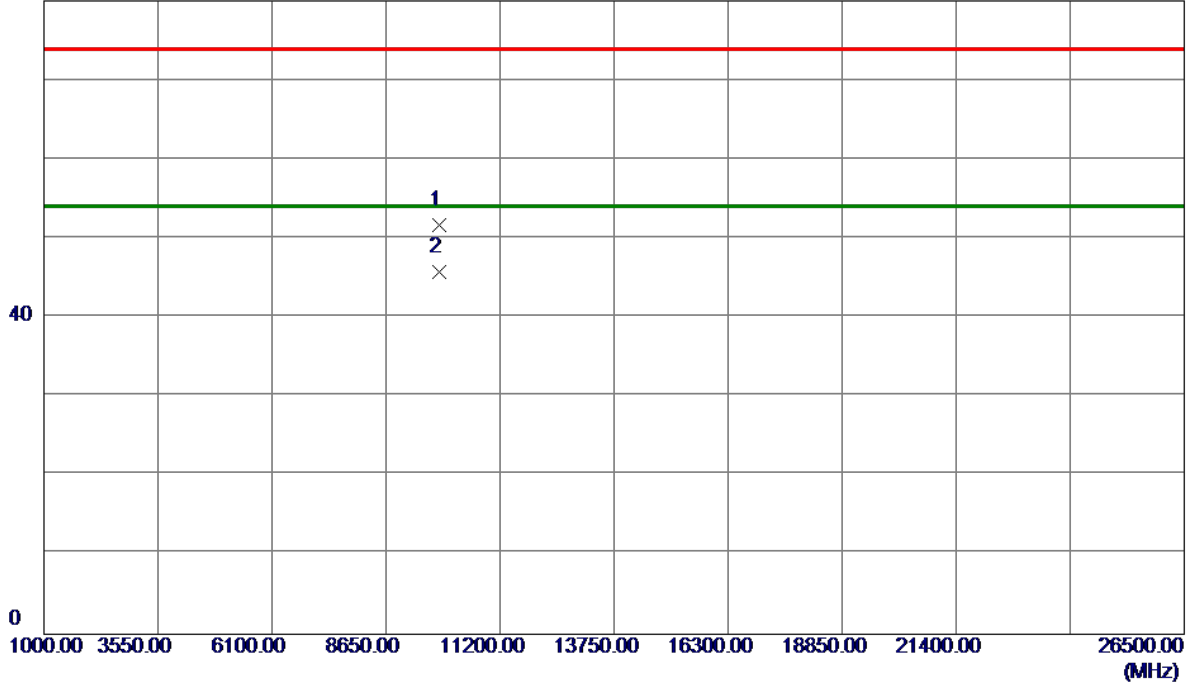


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2455.4000	78.00	19.38	97.38	54.00	43.38	AVG	No Limit
2	2455.7000	85.35	19.38	104.73	74.00	30.73	Peak	No Limit
3	2483.5000	38.44	19.48	57.92	74.00	-16.08	Peak	
4	2483.5000	29.66	19.48	49.14	54.00	-4.86	AVG	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2462MHz

**Vertical**

80 dBuV/m

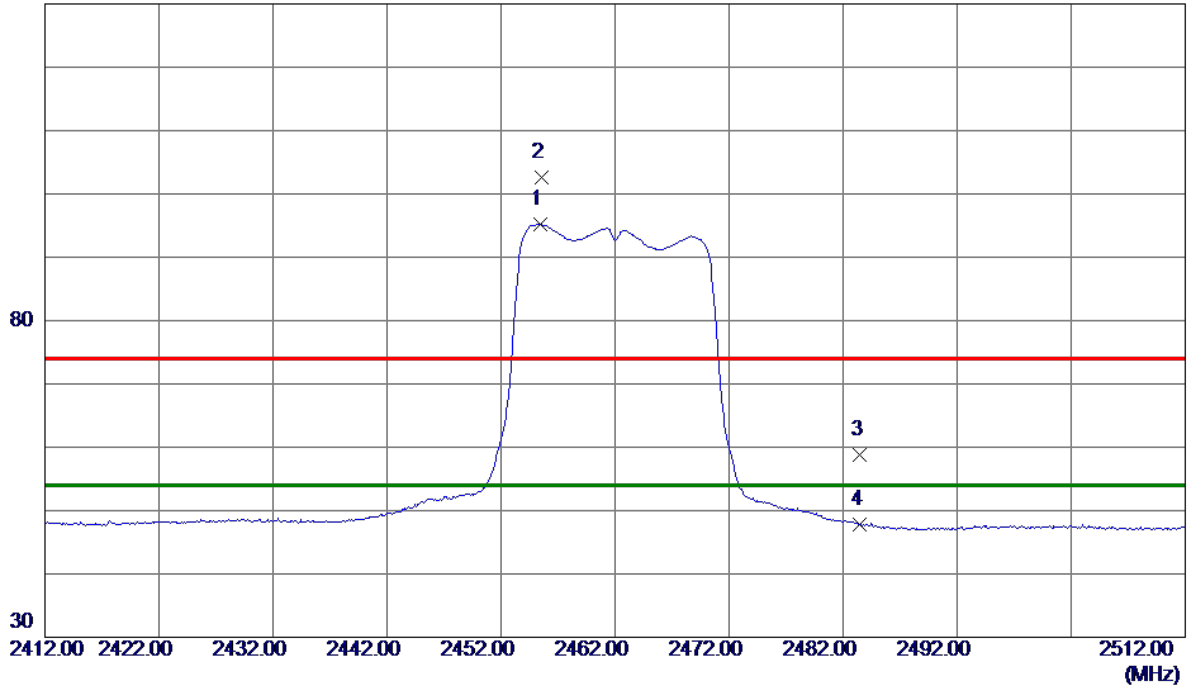


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9847.9600	37.59	14.11	51.70	74.00	-22.30	Peak	
2 *	9848.0300	31.71	14.11	45.82	54.00	-8.18	AVG	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2462MHz

**Horizontal**

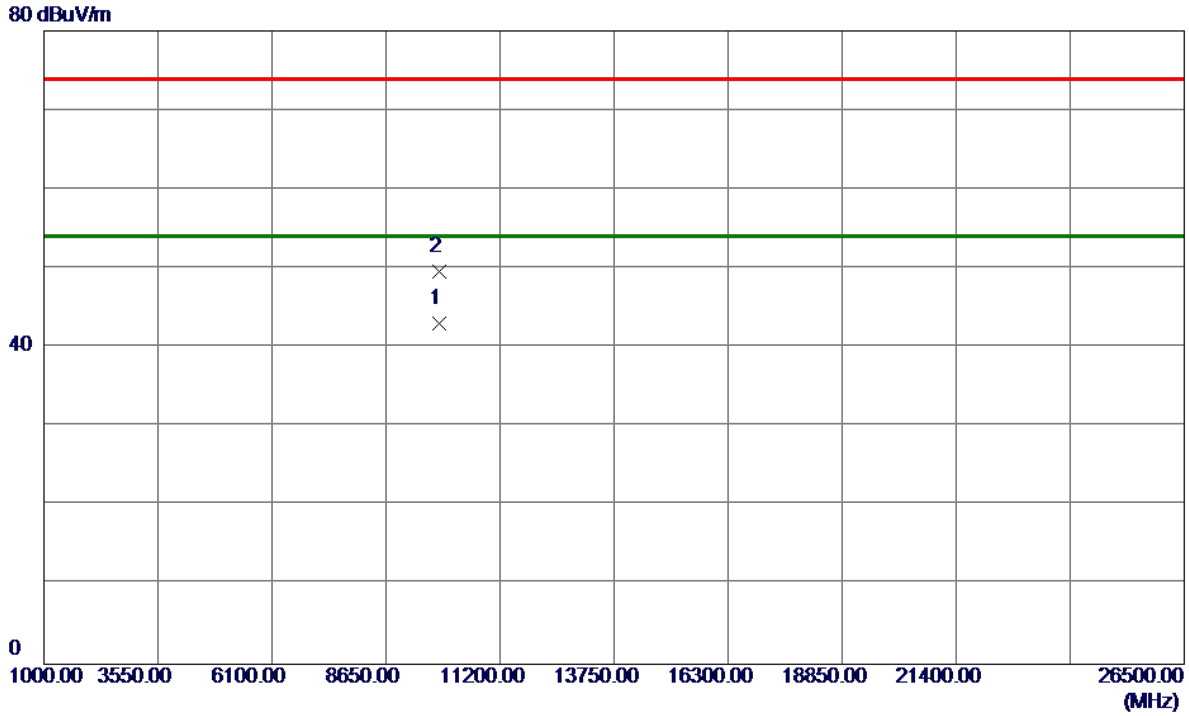
130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2455.4000	75.82	19.38	95.20	54.00	41.20	AVG	No Limit
2	2455.6000	83.22	19.38	102.60	74.00	28.60	Peak	No Limit
3	2483.5000	39.30	19.48	58.78	74.00	-15.22	Peak	
4	2483.5000	28.39	19.48	47.87	54.00	-6.13	AVG	

Orthogonal Axis :	X
Test Mode :	TX G MODE 2462MHz

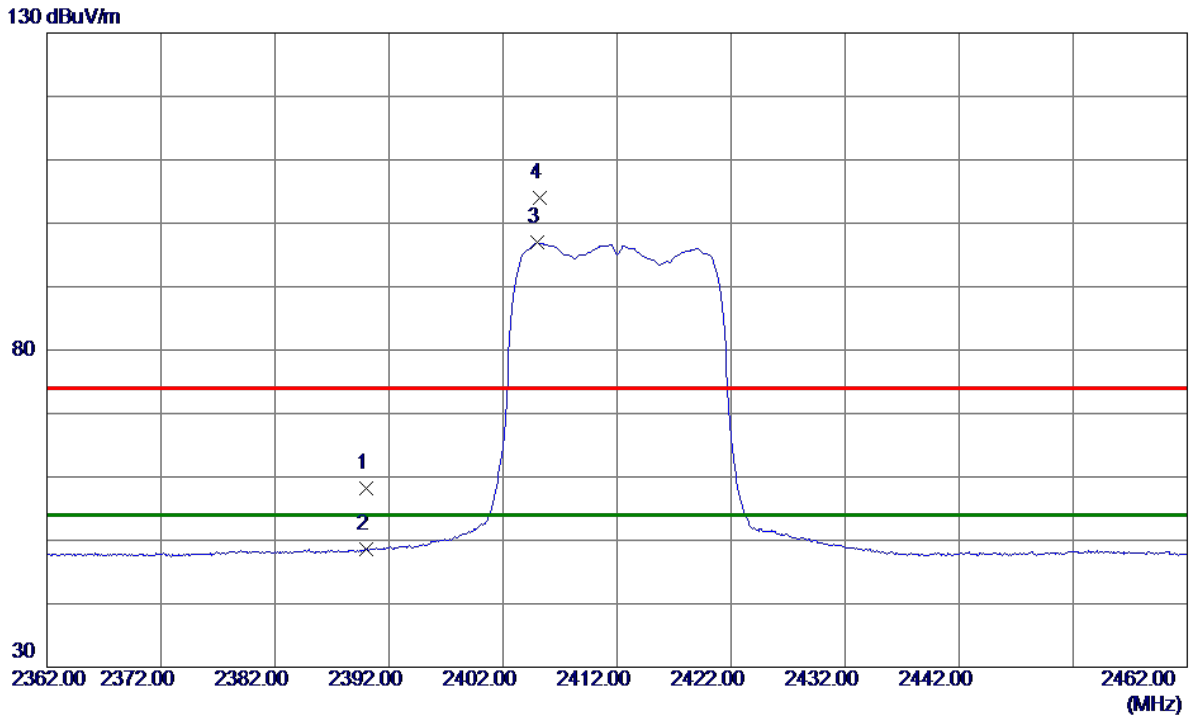
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9848.0500	28.94	14.11	43.05	54.00	-10.95	AVG	
2	9848.0800	35.55	14.11	49.66	74.00	-24.34	Peak	

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2412MHz

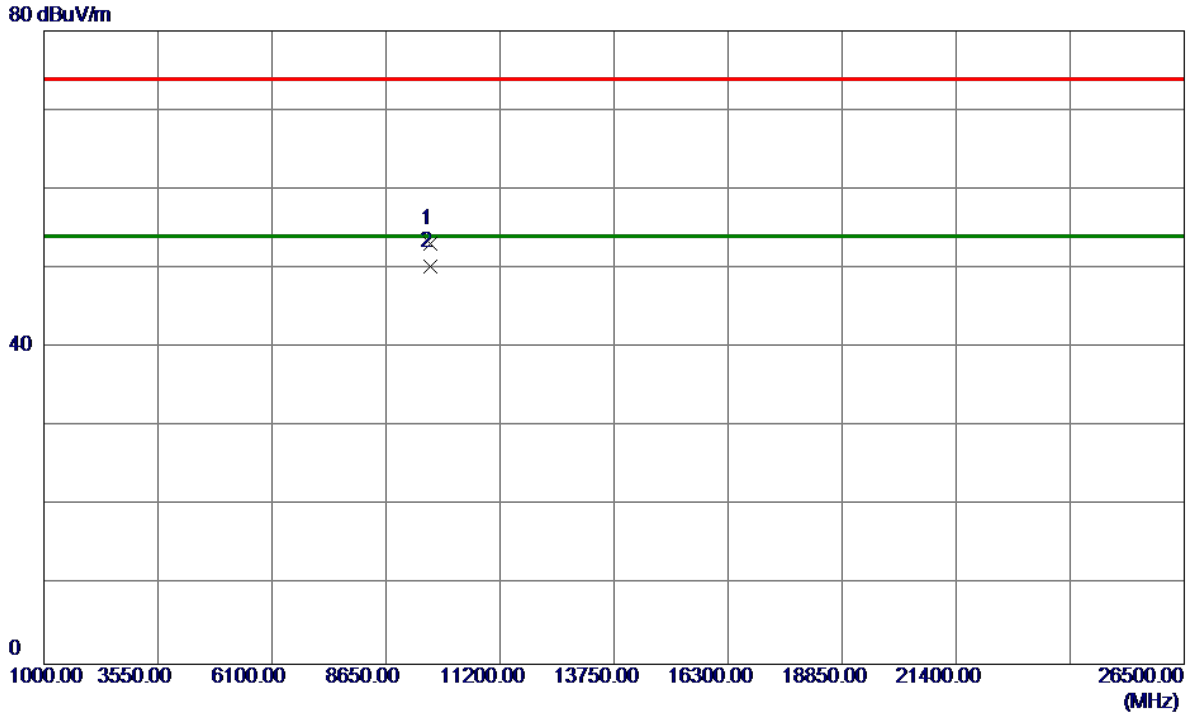
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	39.10	19.14	58.24	74.00	-15.76	Peak	
2	2390.0000	29.44	19.14	48.58	54.00	-5.42	AVG	
3 *	2405.0000	77.71	19.19	96.90	54.00	42.90	AVG	No Limit
4	2405.2000	84.74	19.19	103.93	74.00	29.93	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2412MHz

**Vertical**



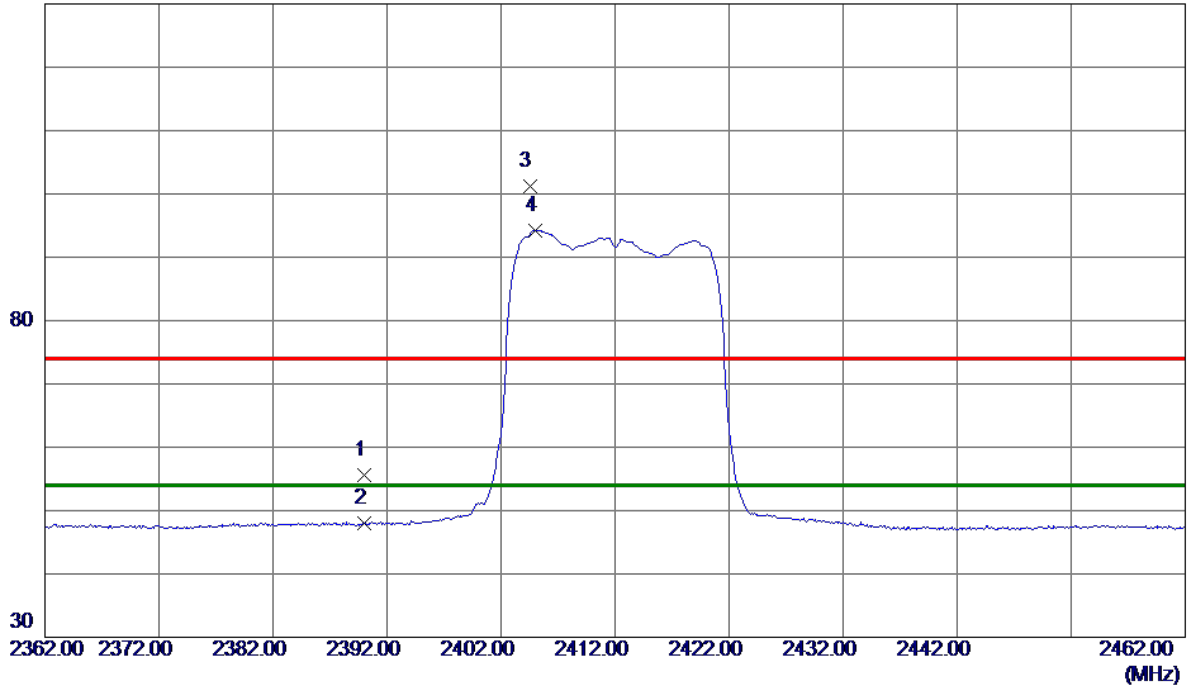
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9647.9900	39.11	13.97	53.08	74.00	-20.92	Peak	
2 *	9648.0199	36.20	13.97	50.17	54.00	-3.83	AVG	



Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2412MHz

**Horizontal**

130 dBuV/m

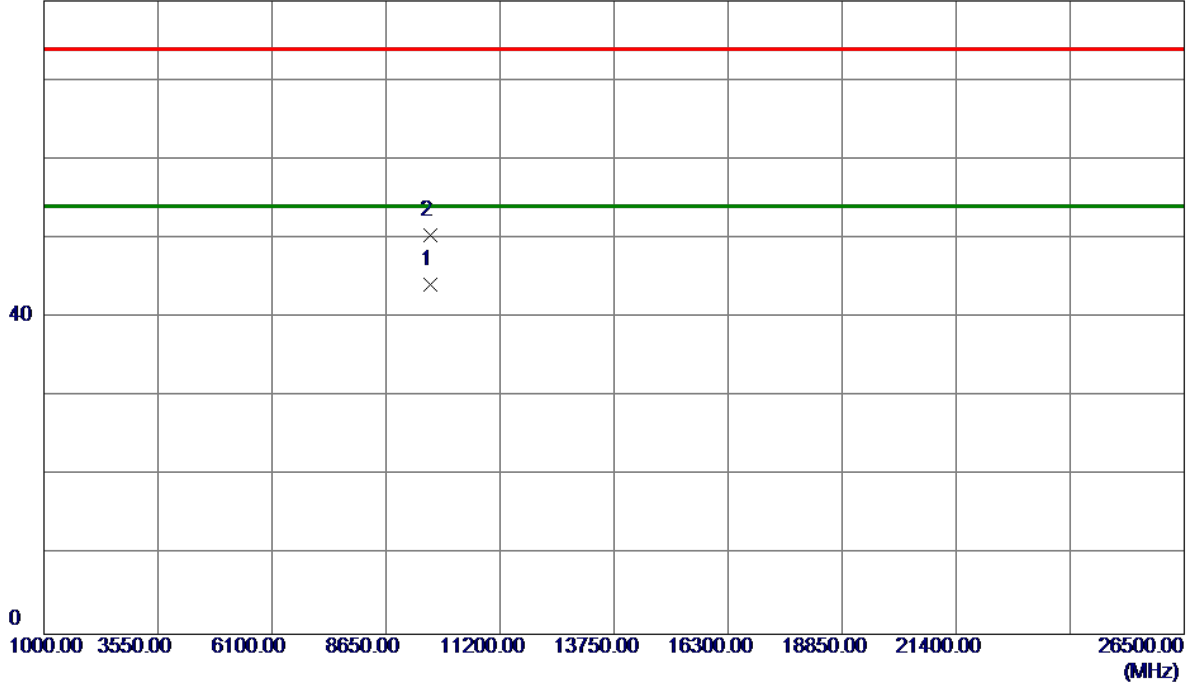


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	36.44	19.14	55.58	74.00	-18.42	Peak	
2	2390.0000	28.86	19.14	48.00	54.00	-6.00	AVG	
3	2404.5000	82.09	19.19	101.28	74.00	27.28	Peak	No Limit
4 *	2405.0000	75.10	19.19	94.29	54.00	40.29	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2412MHz

**Horizontal**

80 dBuV/m

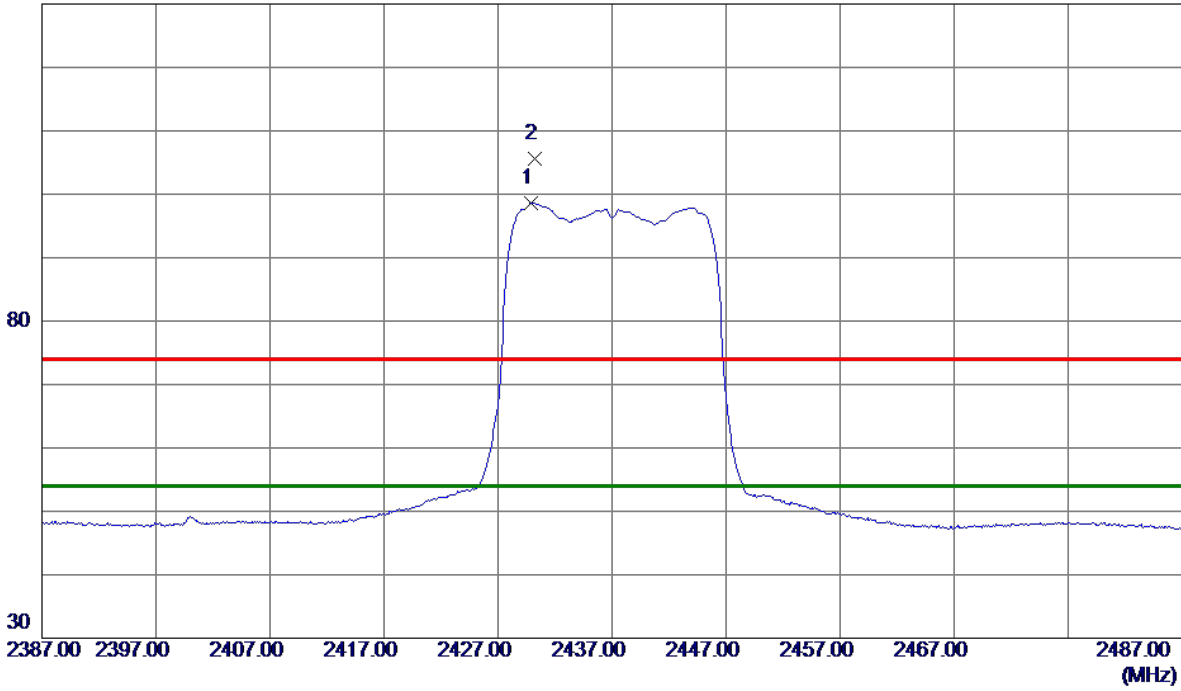


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9648.0100	30.18	13.97	44.15	54.00	-9.85	AVG	
2	9648.1700	36.49	13.97	50.46	74.00	-23.54	Peak	

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2437MHz

**Vertical**

130 dBuV/m

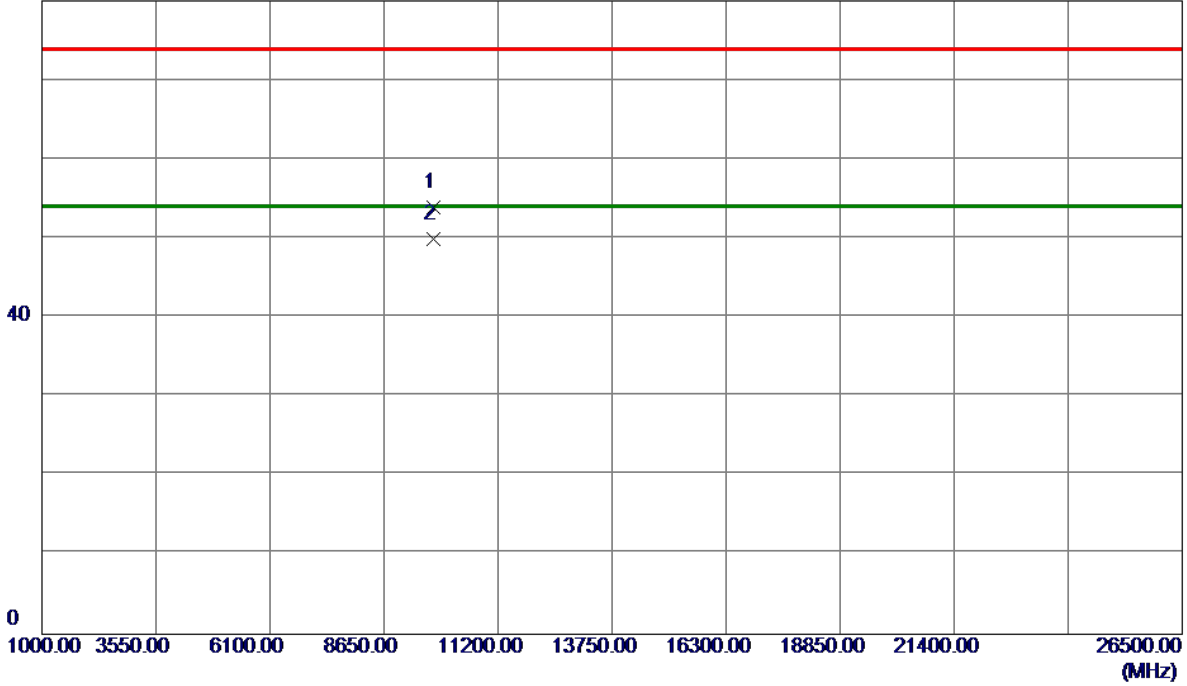


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2429.9000	79.34	19.28	98.62	54.00	44.62	AVG	No Limit
2	2430.2000	86.31	19.29	105.60	74.00	31.60	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2437MHz

**Vertical**

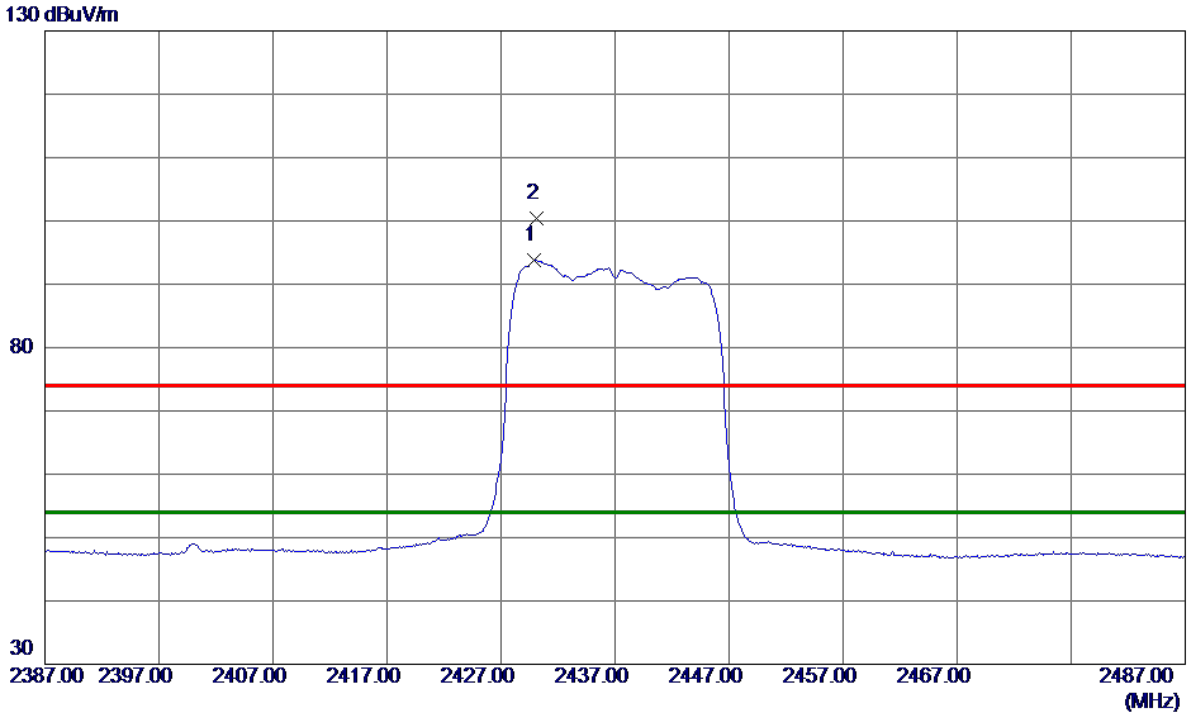
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9748.0100	39.91	14.04	53.95	74.00	-20.05	Peak	
2 *	9748.0500	35.87	14.04	49.91	54.00	-4.09	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2437MHz

### Horizontal

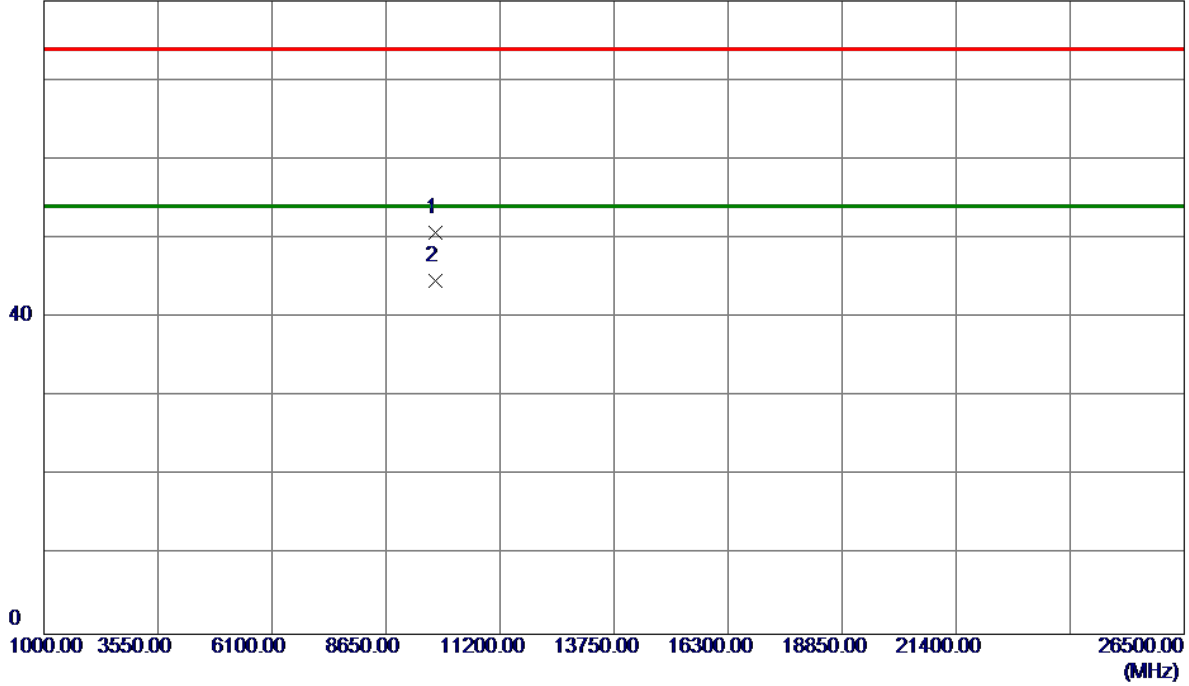


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2429.9000	74.45	19.28	93.73	54.00	39.73	AVG	No Limit
2	2430.1000	81.19	19.29	100.48	74.00	26.48	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2437MHz

### Horizontal

80 dBuV/m

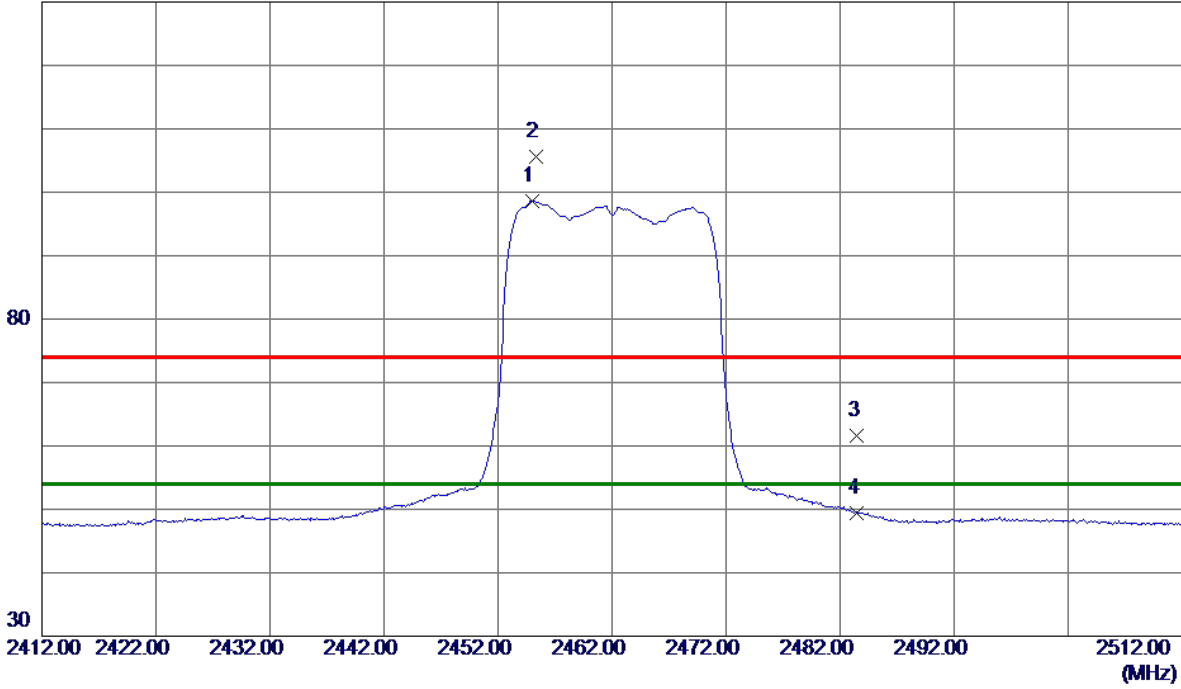


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9747.9000	36.62	14.04	50.66	74.00	-23.34	Peak	
2 *	9748.0400	30.53	14.04	44.57	54.00	-9.43	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2462MHz

**Vertical**

130 dBuV/m

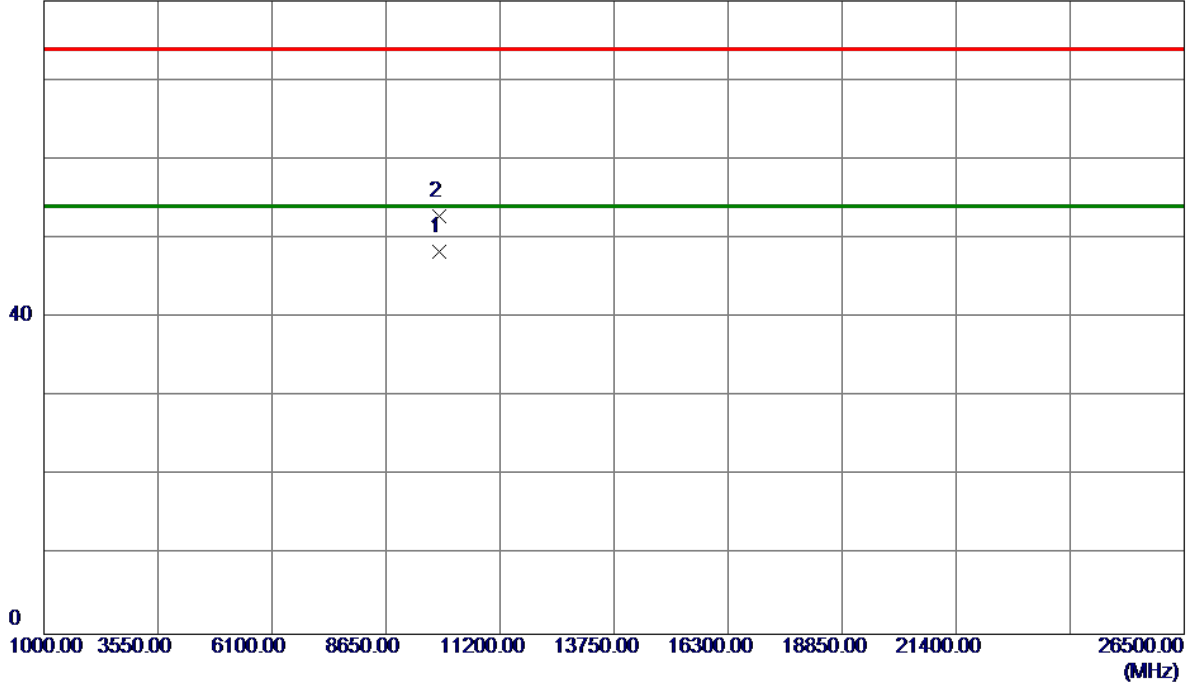


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2455.0000	79.23	19.38	98.61	54.00	44.61	AVG	No Limit
2	2455.3000	86.18	19.38	105.56	74.00	31.56	Peak	No Limit
3	2483.5000	42.09	19.48	61.57	74.00	-12.43	Peak	
4	2483.5000	29.93	19.48	49.41	54.00	-4.59	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2462MHz

**Vertical**

80 dBuV/m



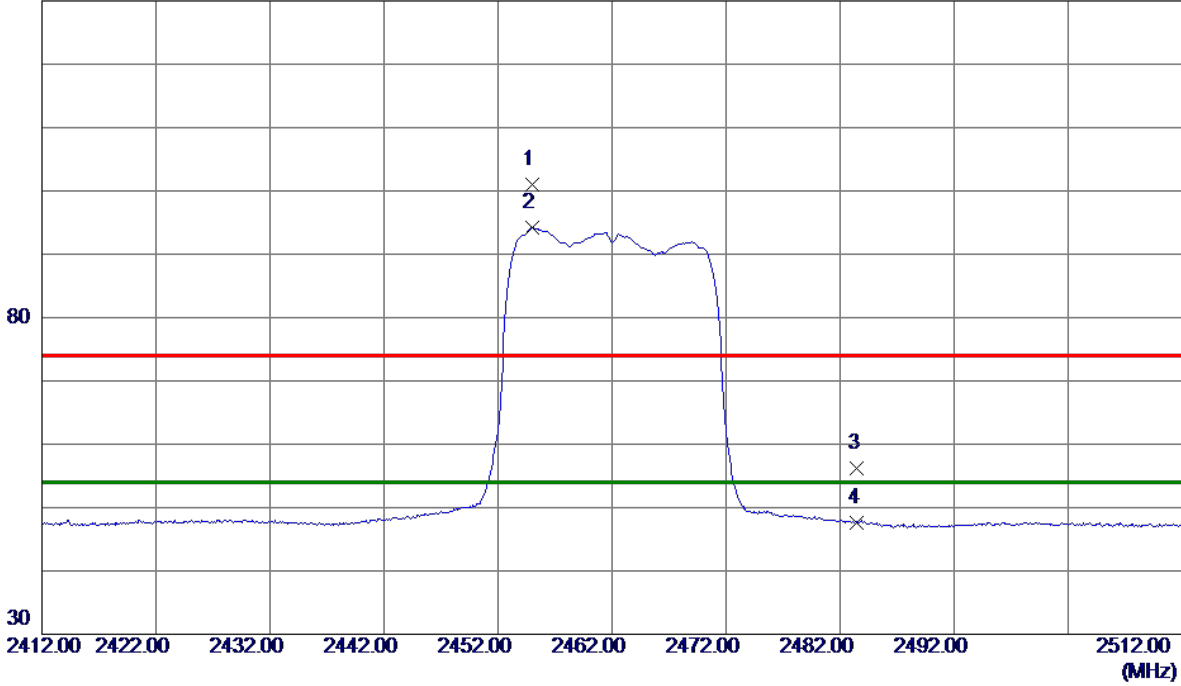
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9848.0500	34.25	14.11	48.36	54.00	-5.64	AVG	
2	9848.1500	38.65	14.11	52.76	74.00	-21.24	Peak	



Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2462MHz

**Horizontal**

130 dBuV/m

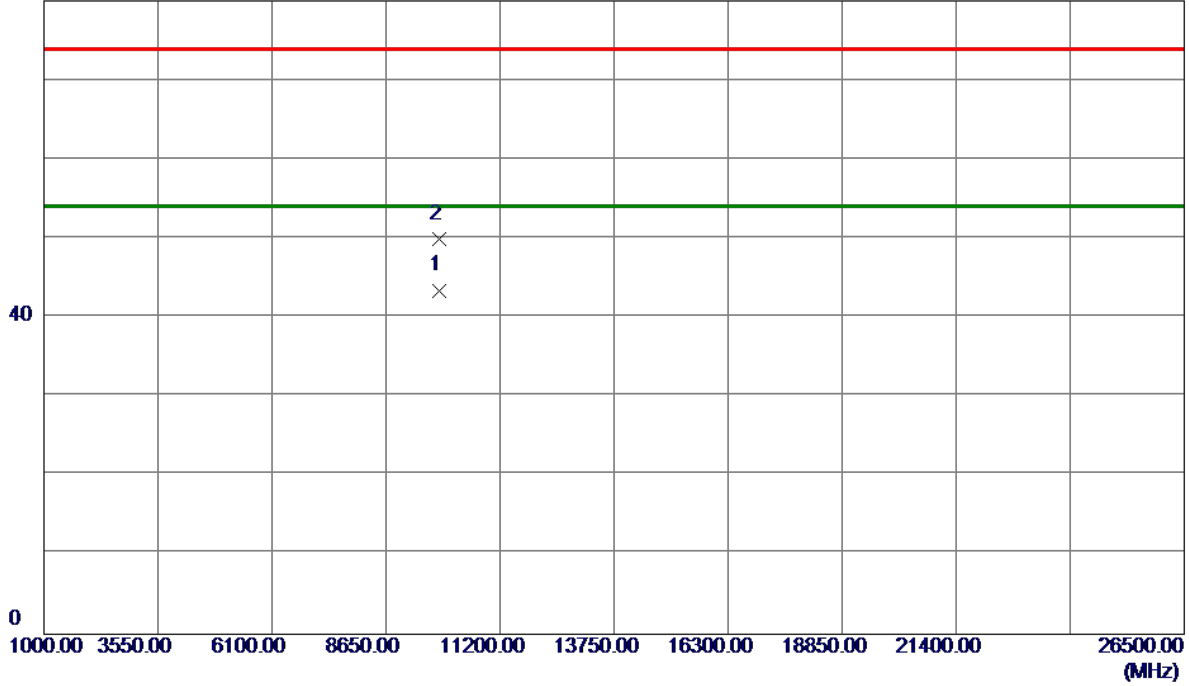


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2455.0000	81.61	19.38	100.99	74.00	26.99	Peak	No Limit
2 *	2455.0000	74.80	19.38	94.18	54.00	40.18	AVG	No Limit
3	2483.5000	36.80	19.48	56.28	74.00	-17.72	Peak	
4	2483.5000	28.07	19.48	47.55	54.00	-6.45	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2462MHz

### Horizontal

80 dBuV/m

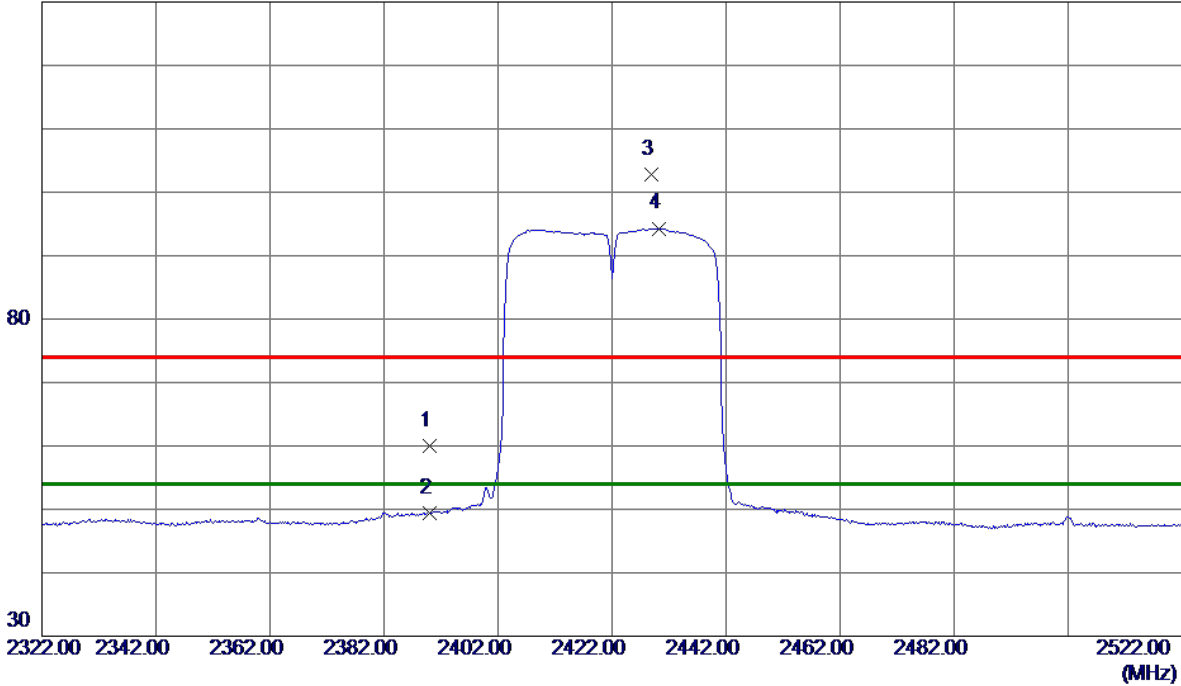


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9848.0400	29.33	14.11	43.44	54.00	-10.56	AVG	
2	9848.0599	35.88	14.11	49.99	74.00	-24.01	Peak	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2422MHz

**Vertical**

130 dBuV/m

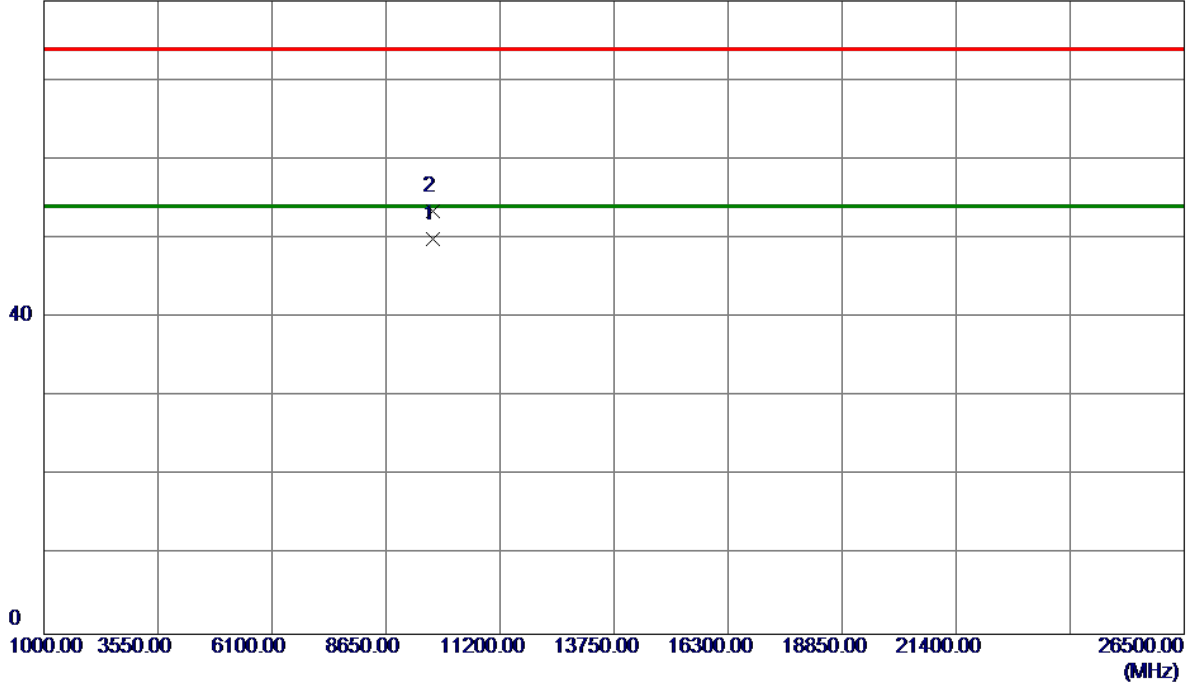


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	40.79	19.14	59.93	74.00	-14.07	Peak	
2	2390.0000	30.25	19.14	49.39	54.00	-4.61	AVG	
3	2428.8000	83.55	19.28	102.83	74.00	28.83	Peak	No Limit
4 *	2430.2000	75.01	19.29	94.30	54.00	40.30	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2422MHz

**Vertical**

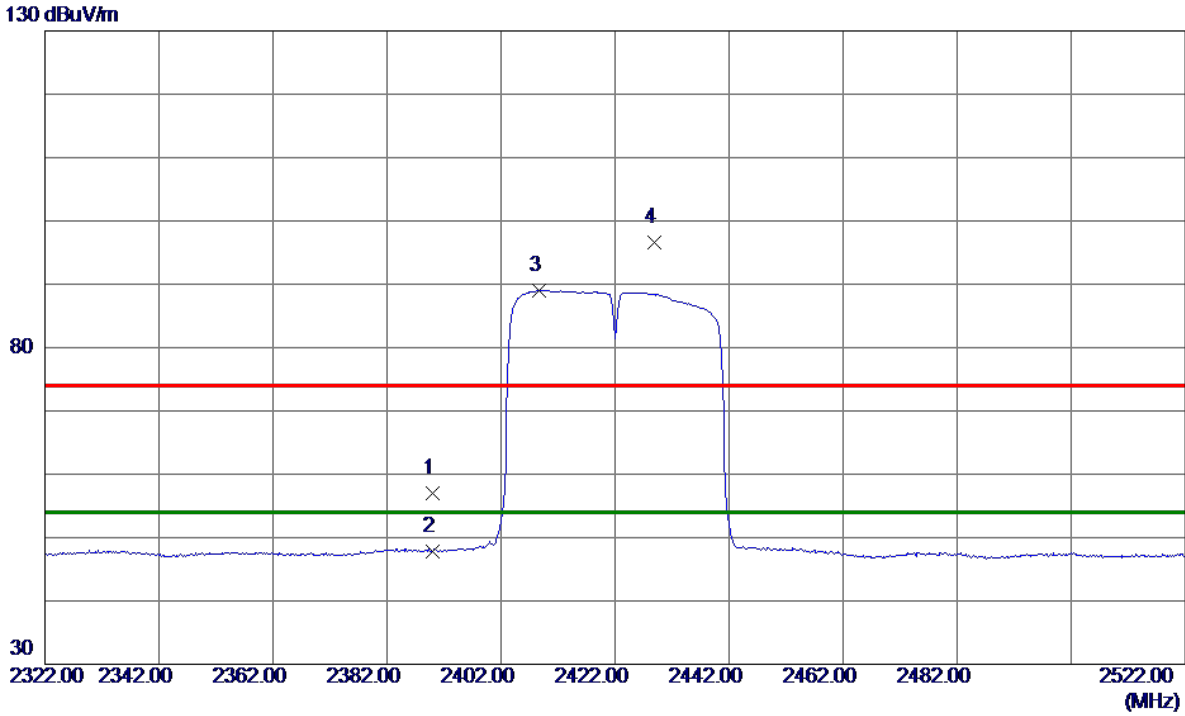
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9688.0300	35.86	14.00	49.86	54.00	-4.14	AVG	
2	9688.1100	39.45	14.00	53.45	74.00	-20.55	Peak	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2422MHz

**Horizontal**

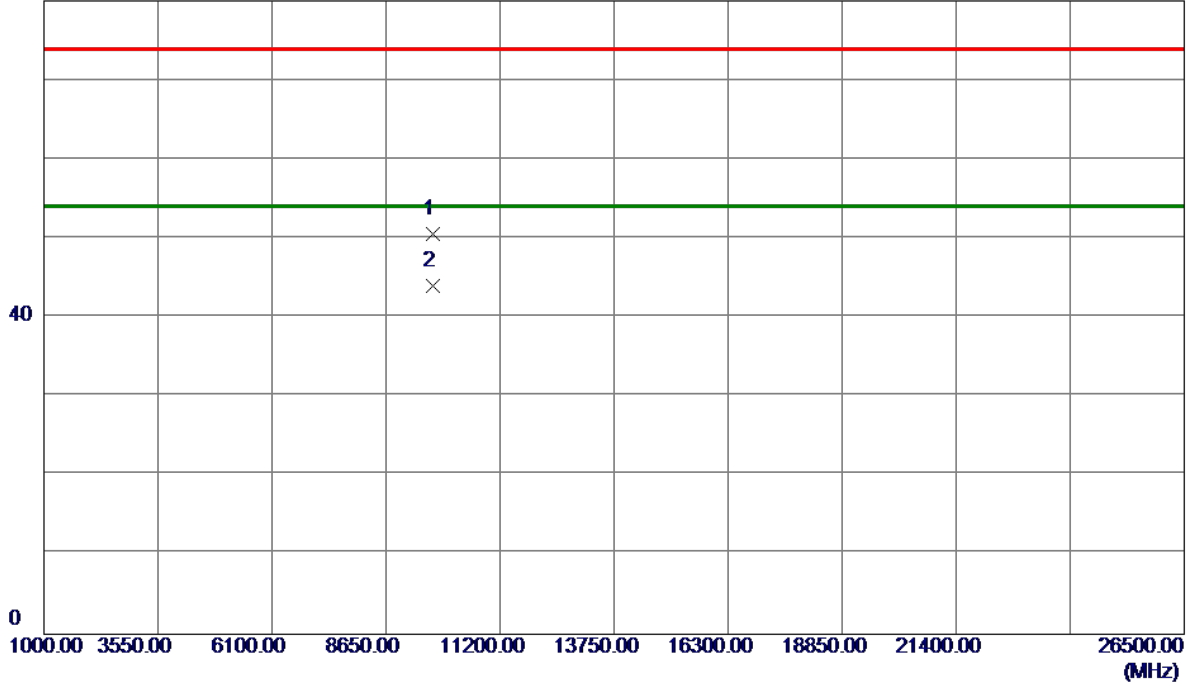


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	37.81	19.14	56.95	74.00	-17.05	Peak	
2	2390.0000	28.70	19.14	47.84	54.00	-6.16	AVG	
3 *	2408.6000	69.83	19.21	89.04	54.00	35.04	AVG	No Limit
4	2428.8000	77.39	19.28	96.67	74.00	22.67	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2422MHz

### Horizontal

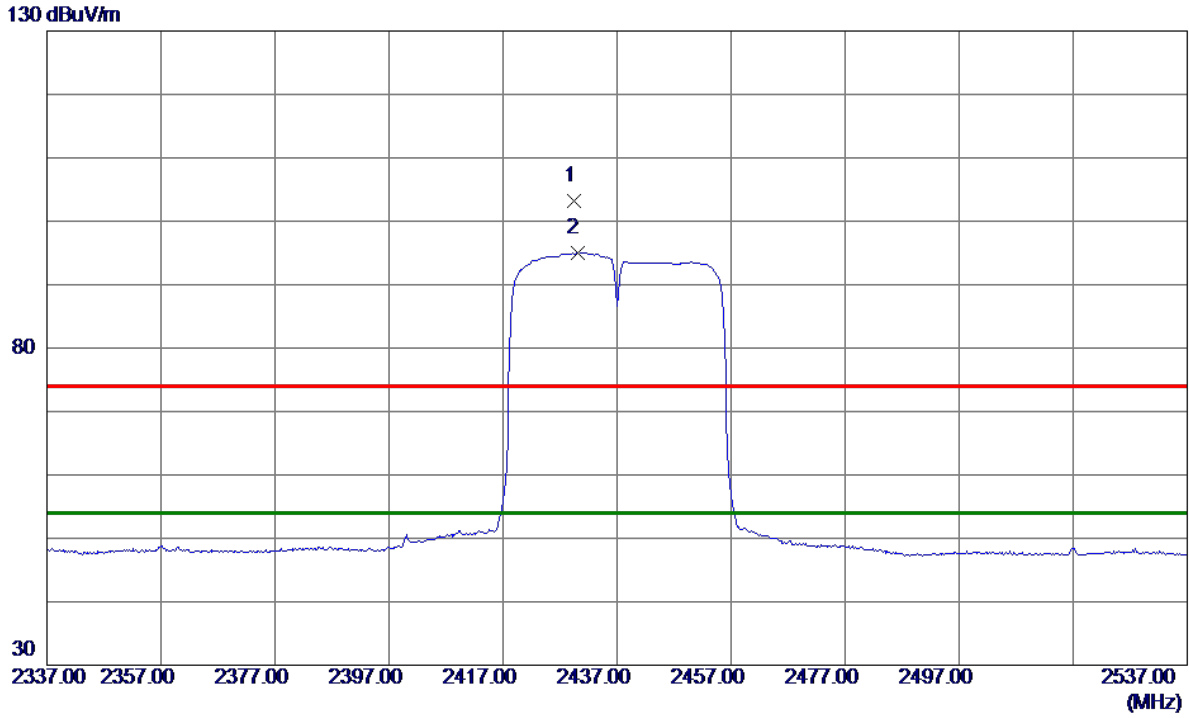
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9687.8700	36.52	14.00	50.52	74.00	-23.48	Peak	
2 *	9688.0199	30.05	14.00	44.05	54.00	-9.95	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2437MHz

**Vertical**

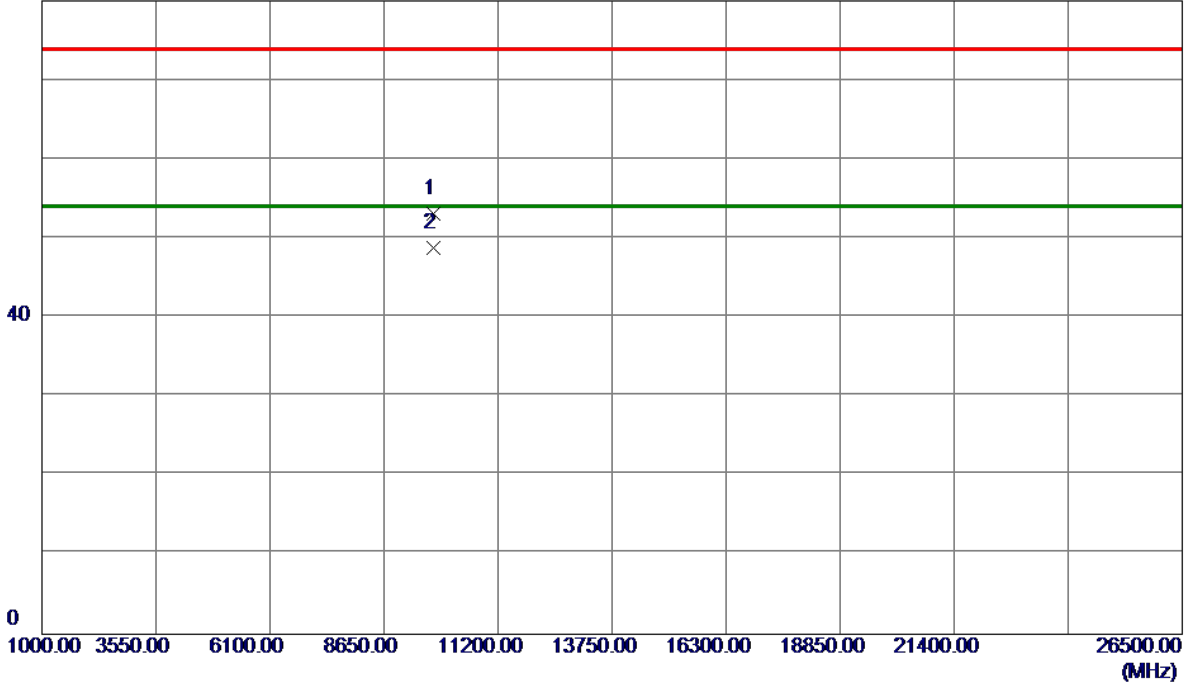


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2429.4000	83.83	19.28	103.11	74.00	29.11	Peak	No Limit
2 *	2430.0000	75.70	19.29	94.99	54.00	40.99	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2437MHz

**Vertical**

80 dBuV/m

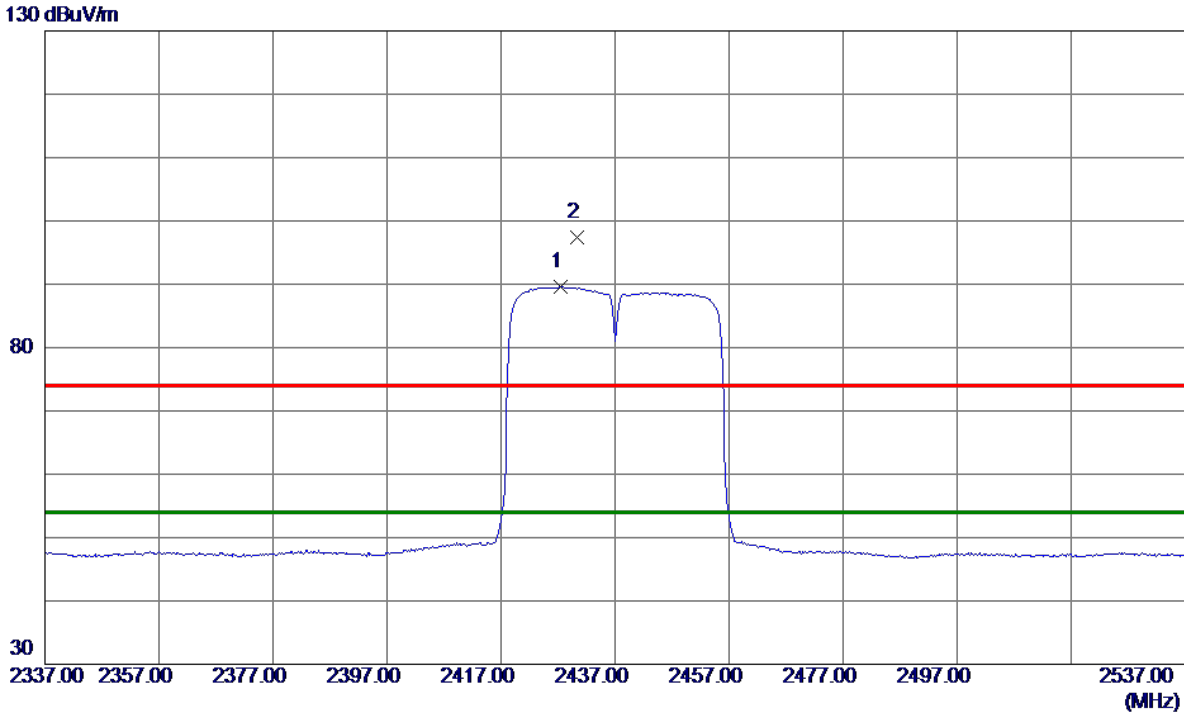


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9748.0199	39.05	14.04	53.09	74.00	-20.91	Peak	
2 *	9748.0800	34.82	14.04	48.86	54.00	-5.14	AVG	



Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2437MHz

**Horizontal**

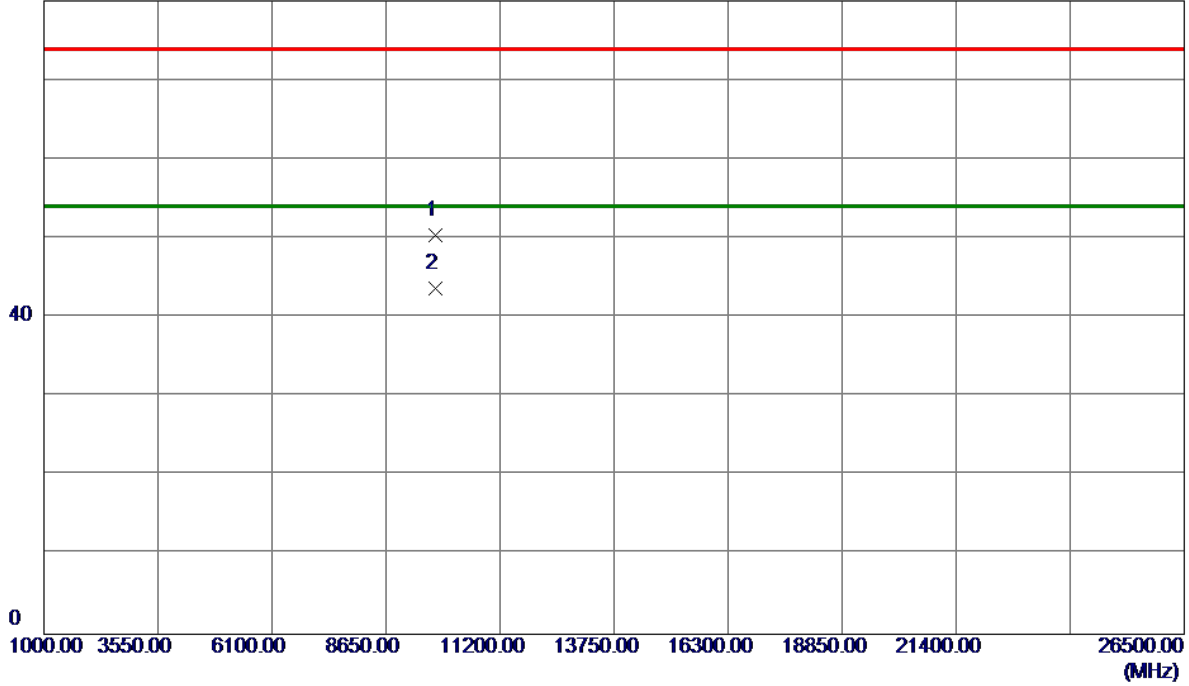


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2427.4000	70.26	19.28	89.54	54.00	35.54	AVG	No Limit
2	2430.4000	78.08	19.29	97.37	74.00	23.37	Peak	No Limit

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2437MHz

**Horizontal**

80 dBuV/m

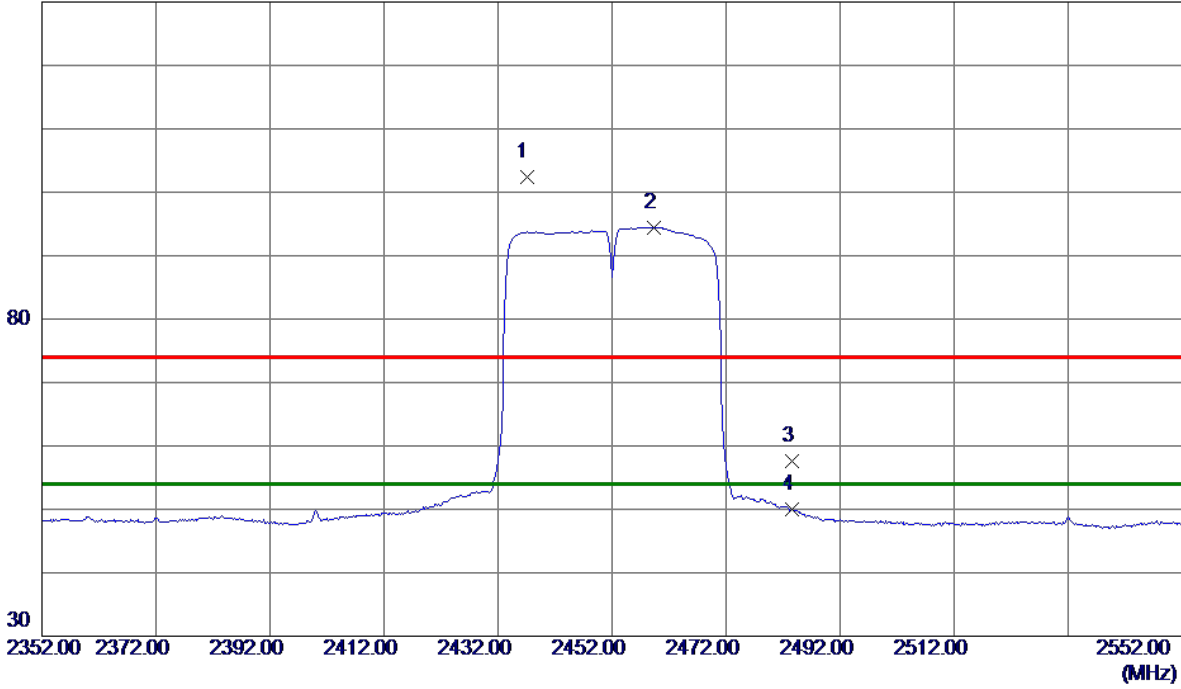


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9747.9700	36.39	14.04	50.43	74.00	-23.57	Peak	
2 *	9748.0599	29.71	14.04	43.75	54.00	-10.25	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2452MHz

**Vertical**

130 dBuV/m

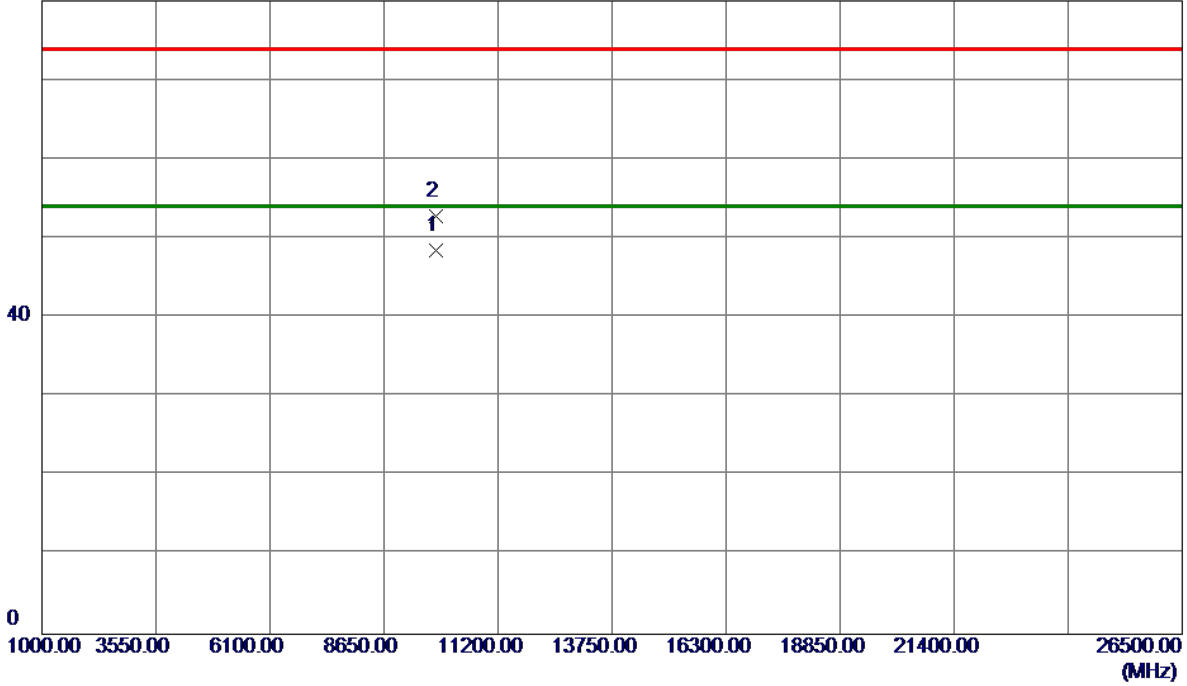


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2437.0000	83.00	19.31	102.31	74.00	28.31	Peak	No Limit
2 *	2459.4000	75.07	19.39	94.46	54.00	40.46	AVG	No Limit
3	2483.5000	38.15	19.48	57.63	74.00	-16.37	Peak	
4	2483.5000	30.53	19.48	50.01	54.00	-3.99	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2452MHz

**Vertical**

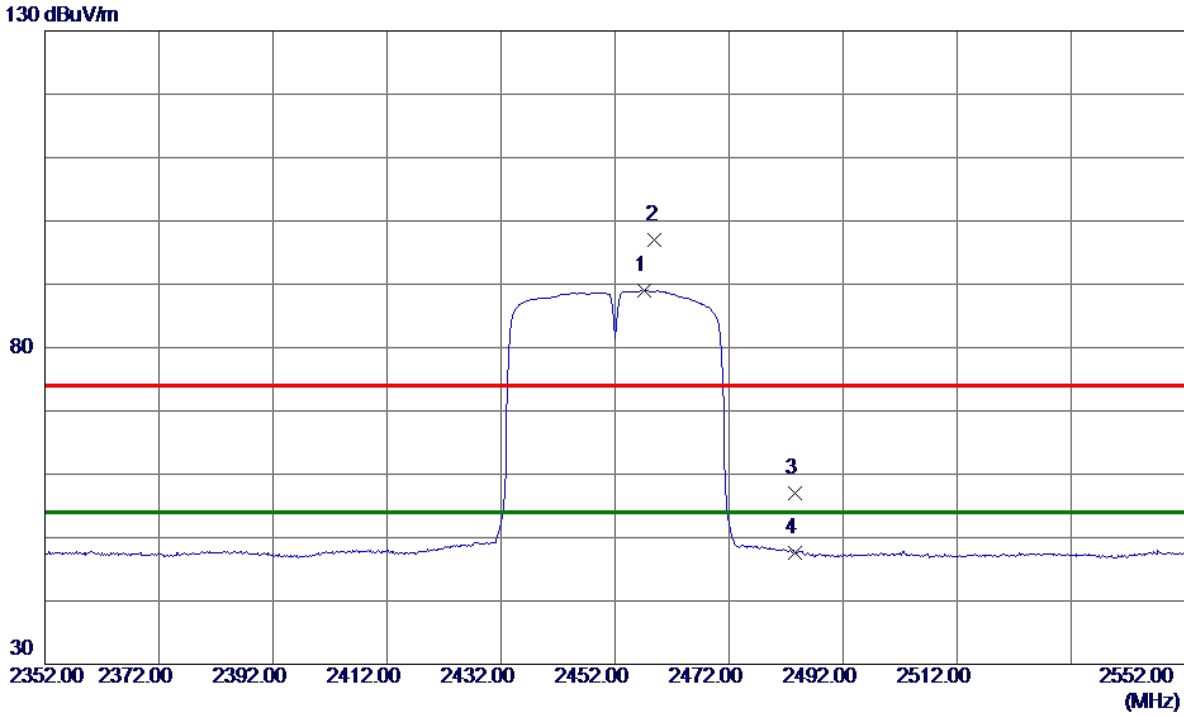
80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	9808.0400	34.41	14.08	48.49	54.00	-5.51	AVG	
2	9808.2699	38.74	14.08	52.82	74.00	-21.18	Peak	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2452MHz

**Horizontal**

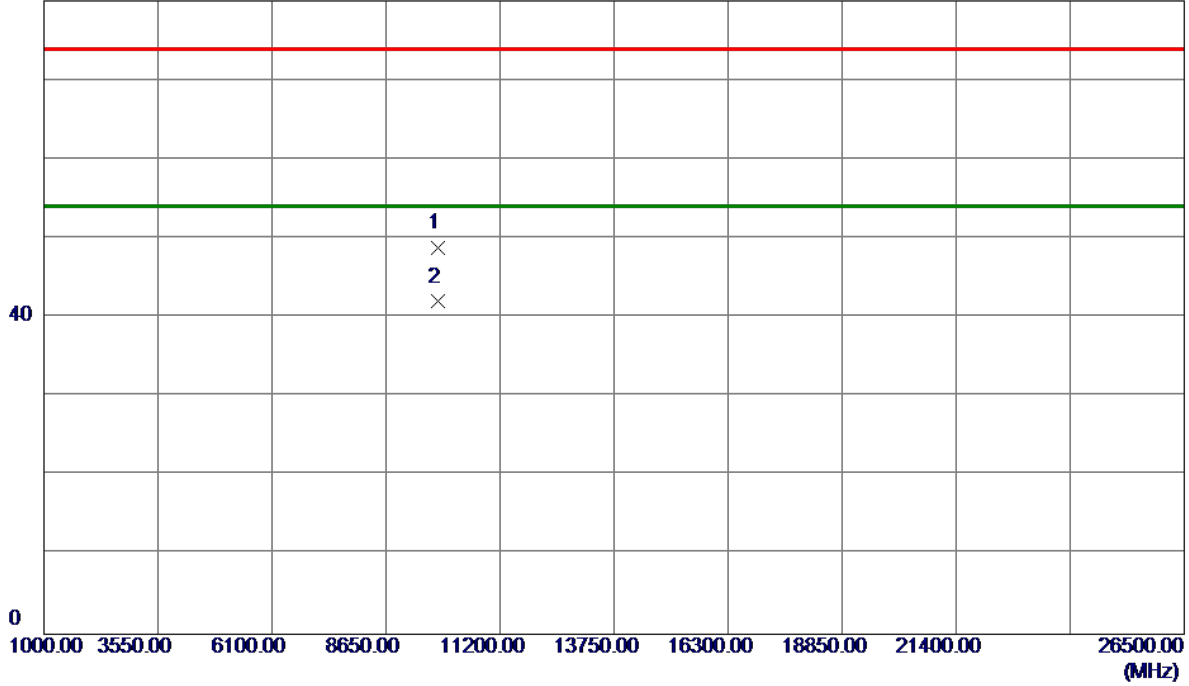


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2457.2000	69.58	19.39	88.97	54.00	34.97	AVG	No Limit
2	2459.0000	77.65	19.39	97.04	74.00	23.04	Peak	No Limit
3	2483.5000	37.47	19.48	56.95	74.00	-17.05	Peak	
4	2483.5000	28.18	19.48	47.66	54.00	-6.34	AVG	

Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2452MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	9807.9800	34.73	14.08	48.81	74.00	-25.19	Peak	
2 *	9808.0400	27.92	14.08	42.00	54.00	-12.00	AVG	

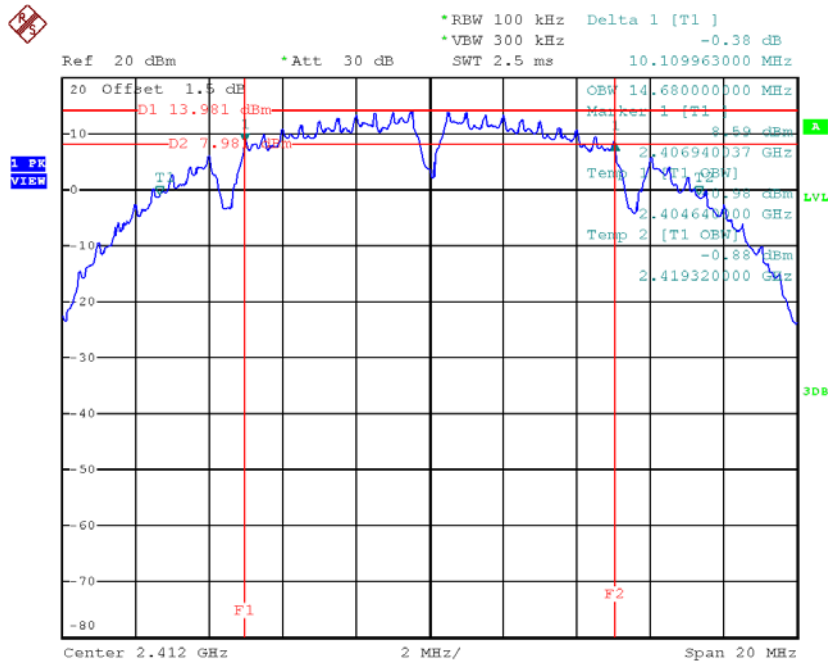
## APPENDIX E - BANDWIDTH

### Non Beamforming

Test Mode : TX B Mode\_CH01/06/11

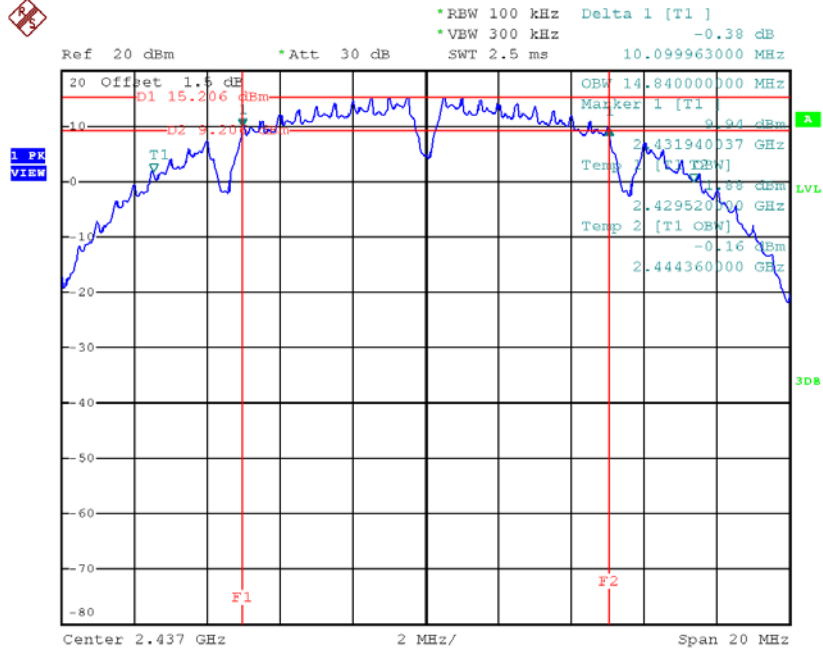
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	10.11	14.68	500	Complies
2437	10.10	14.84	500	Complies
2462	10.10	14.64	500	Complies

### TX CH01

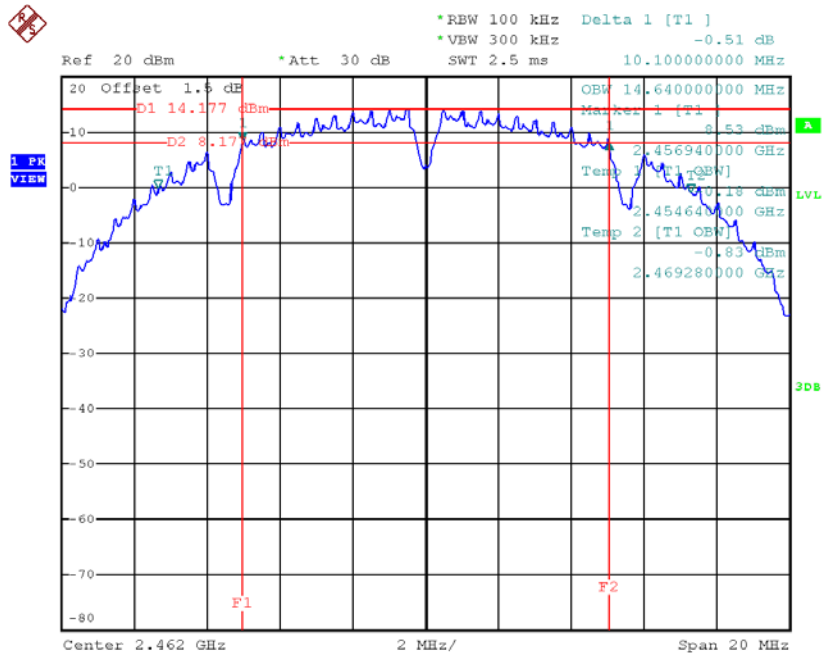




**TX CH06**



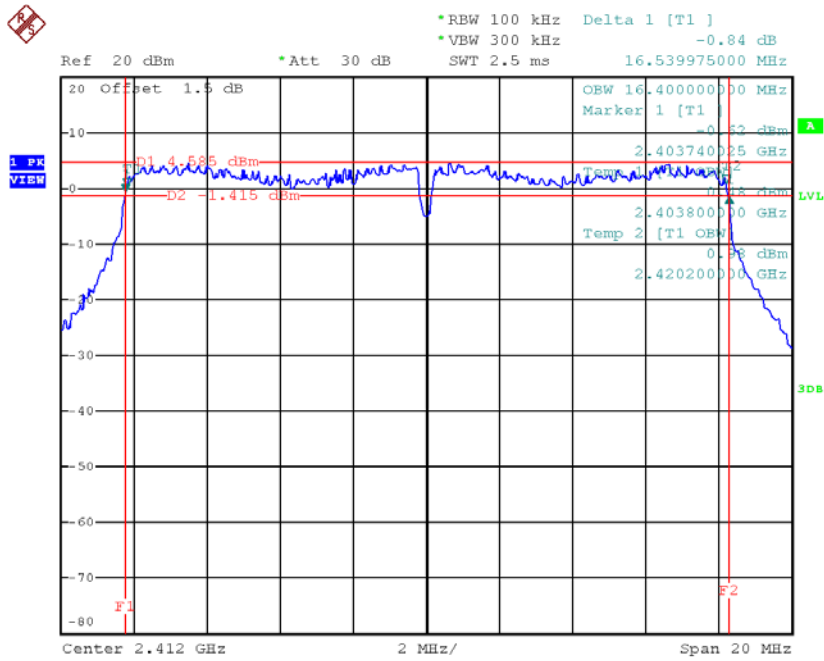
**TX CH11**



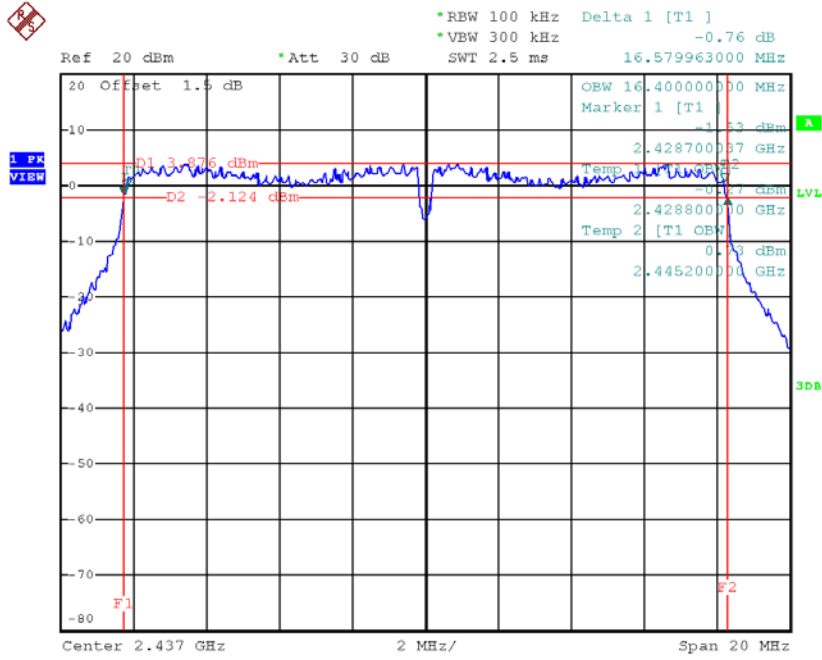
**Test Mode: TX G Mode\_CH01/06/11**

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	16.54	16.4	500	Complies
2437	16.58	16.4	500	Complies
2462	16.58	16.44	500	Complies

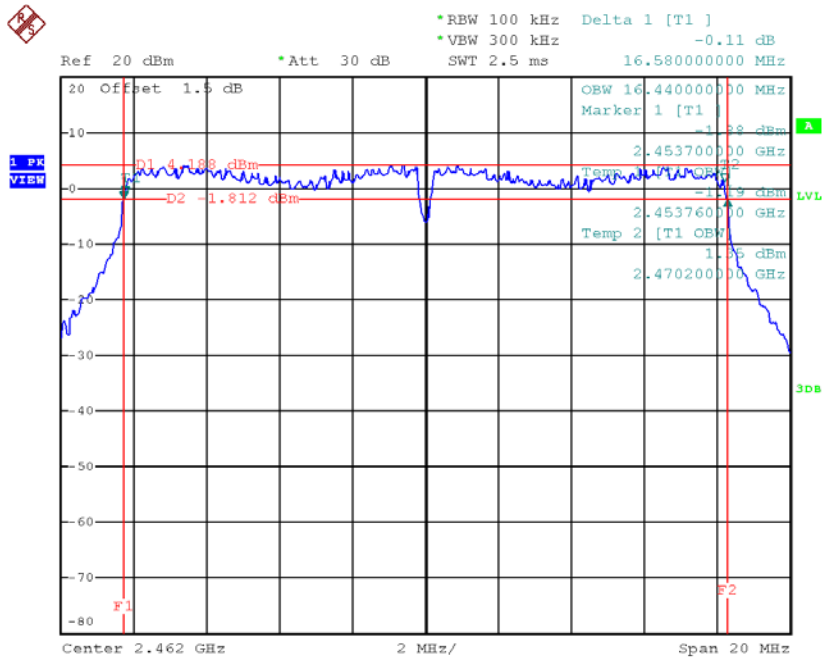
**TX CH01**



### TX CH06

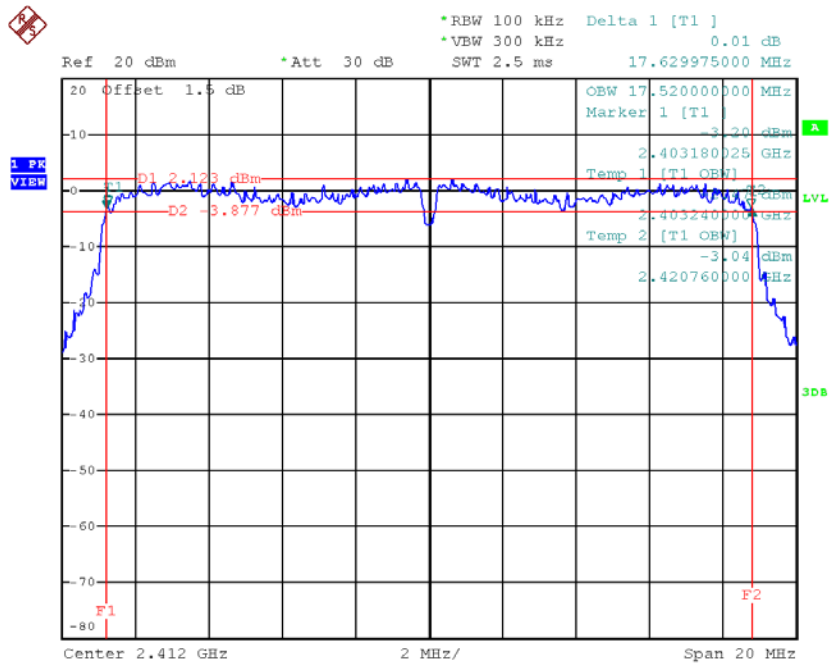


### TX CH11

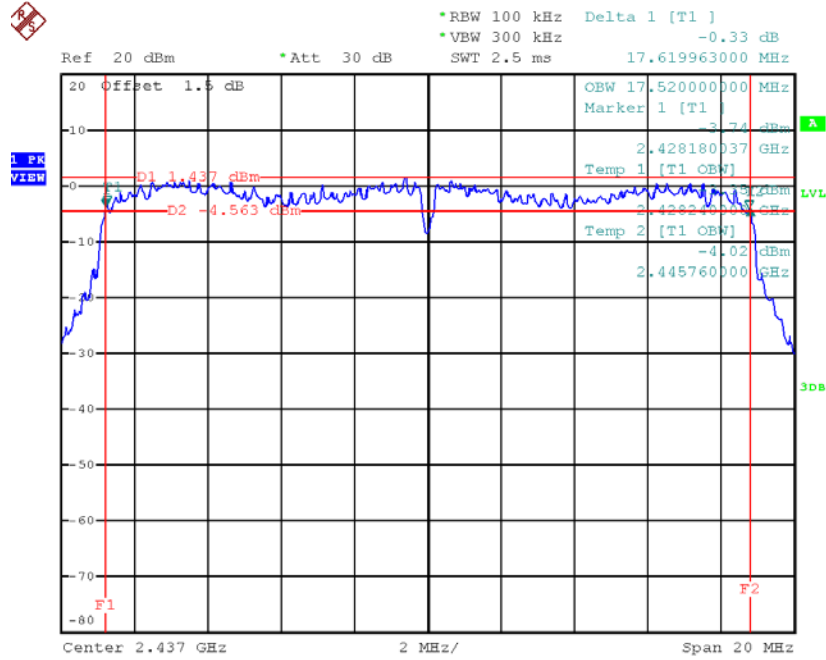


**Test Mode : TX N-20MHz Mode\_CH01/06/11**

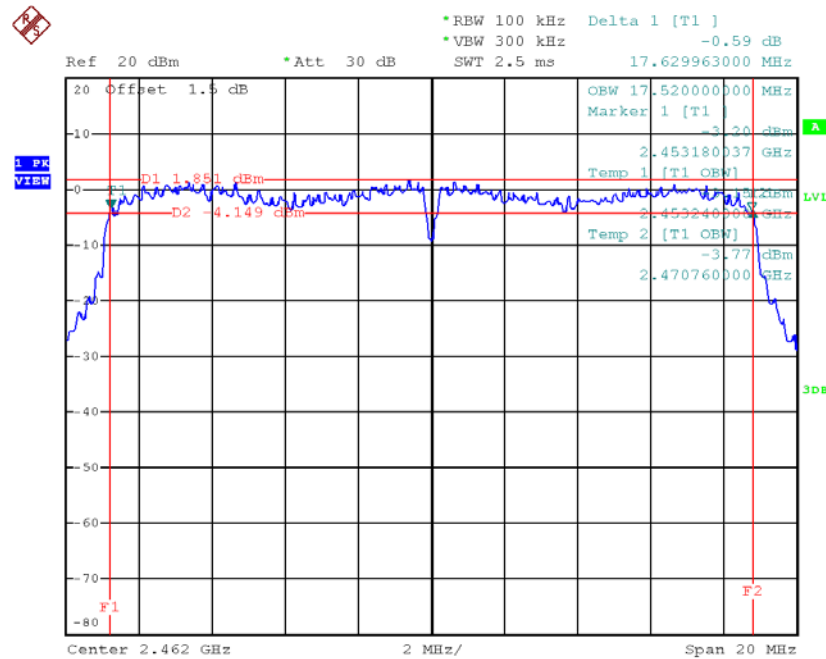
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	17.63	17.52	500	Complies
2437	17.62	17.52	500	Complies
2462	17.63	17.52	500	Complies

**TX CH01**


### TX CH06



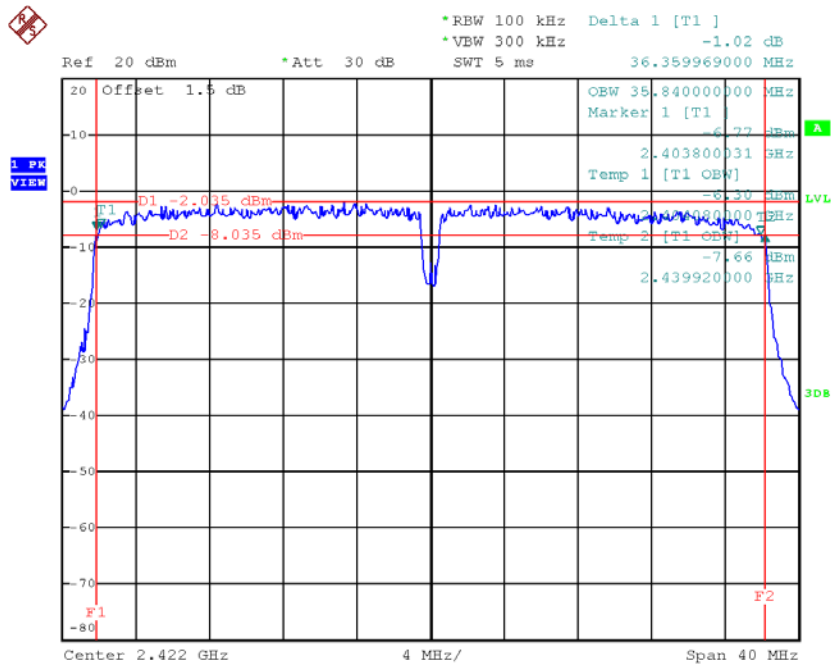
### TX CH11



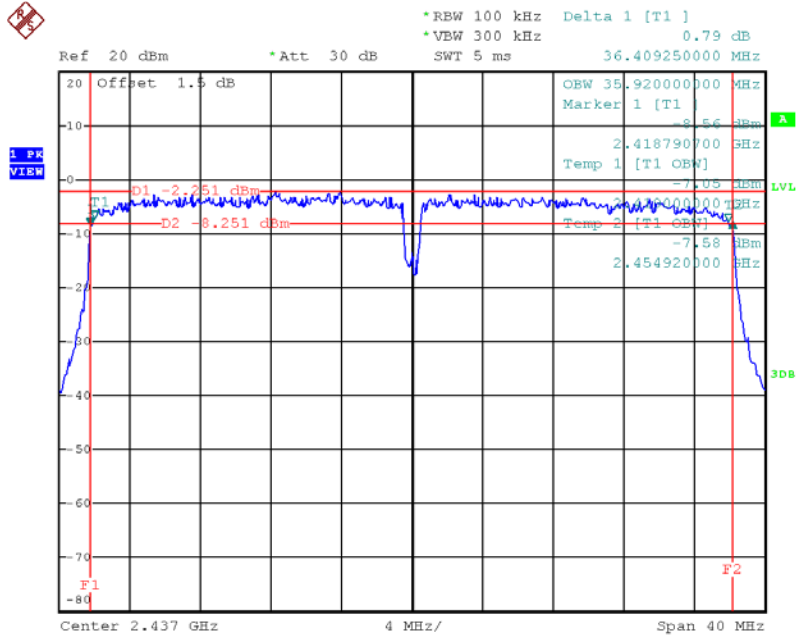
**Test Mode : TX N-40MHz Mode\_CH03/06/09**

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2422	36.36	35.84	500	Complies
2437	36.41	35.92	500	Complies
2452	36.49	35.92	500	Complies

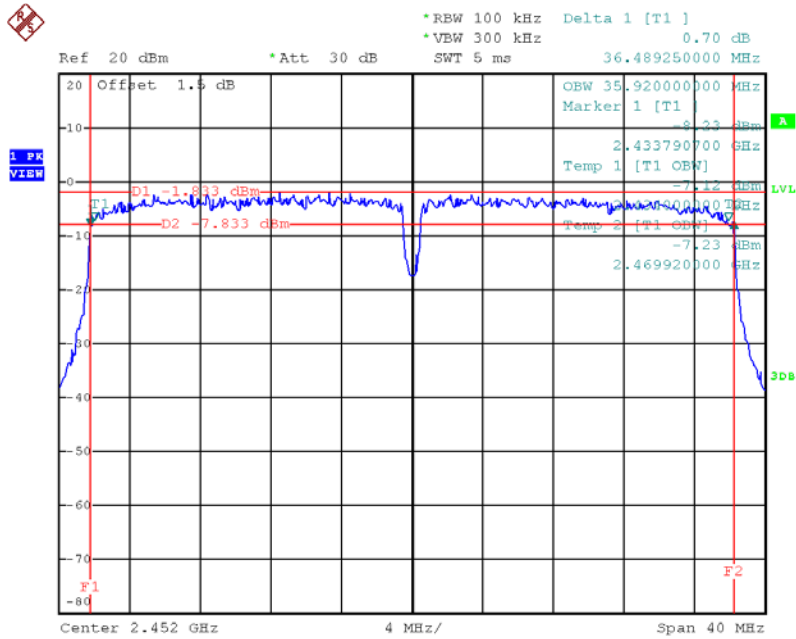
**TX CH03**



**TX CH06**



**TX CH09**

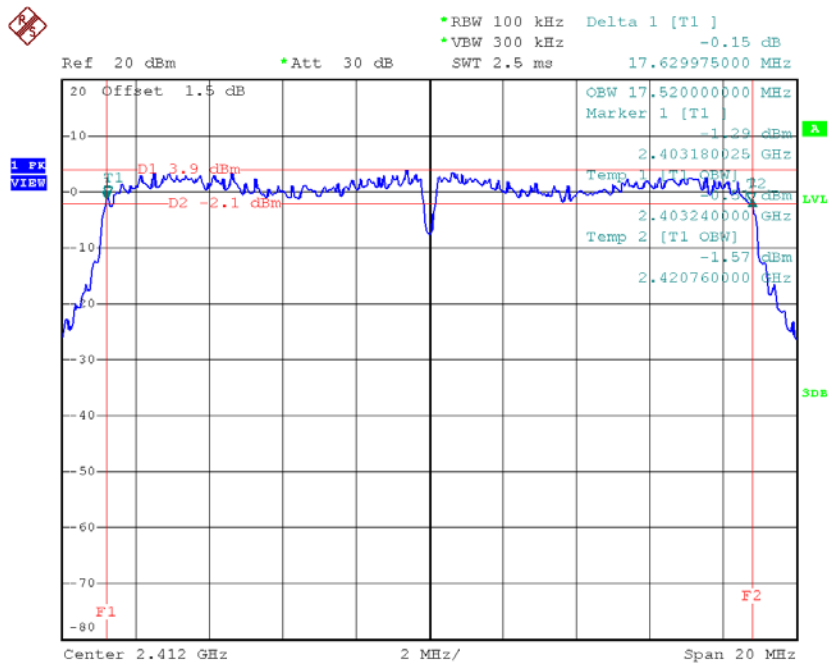


### With Beamforming

**Test Mode : TX N-20MHz Mode\_CH01/06/11**

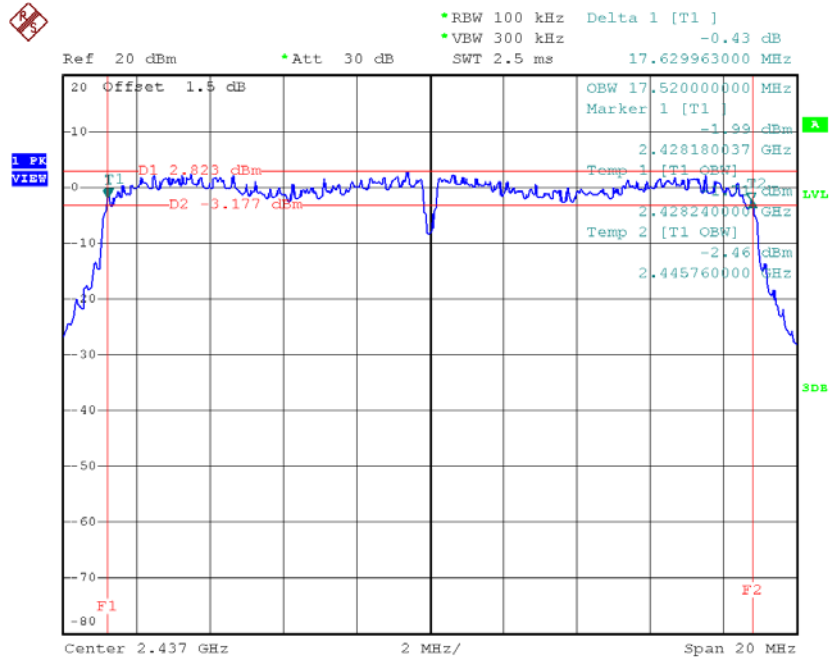
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	17.63	17.52	500	Complies
2437	17.63	17.52	500	Complies
2462	17.62	17.52	500	Complies

### TX CH01

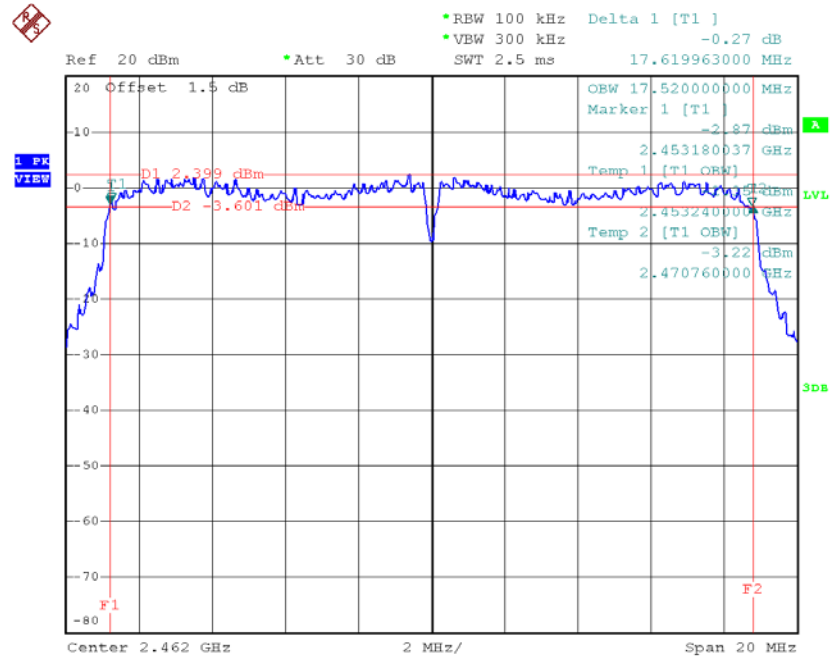




**TX CH06**



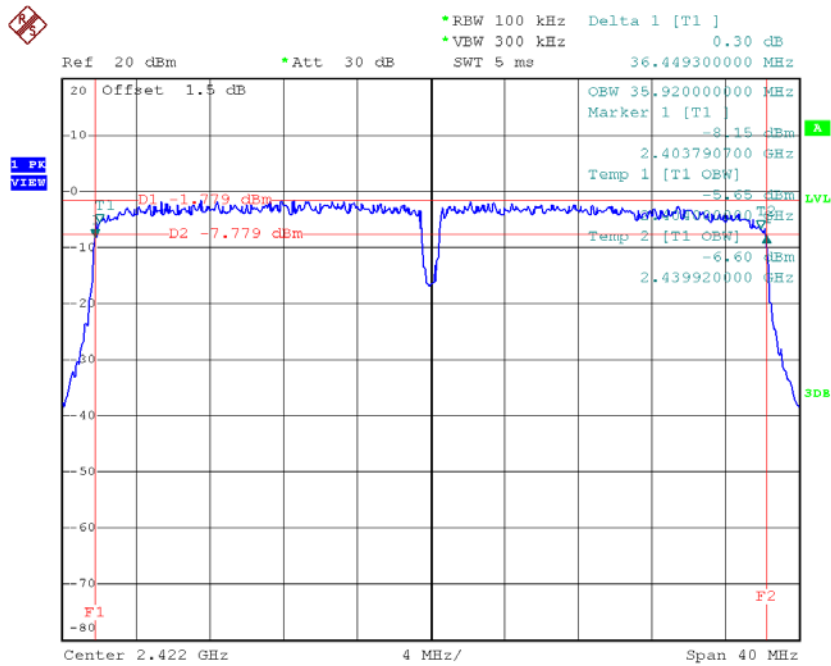
**TX CH11**



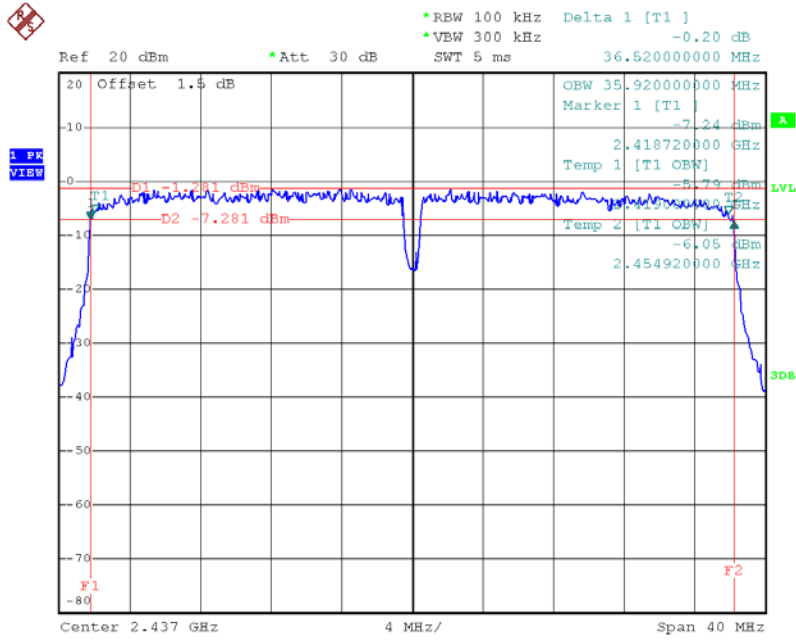
**Test Mode : TX N-40MHz Mode\_CH03/06/09**

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2422	36.45	35.92	500	Complies
2437	36.52	35.92	500	Complies
2452	36.56	35.92	500	Complies

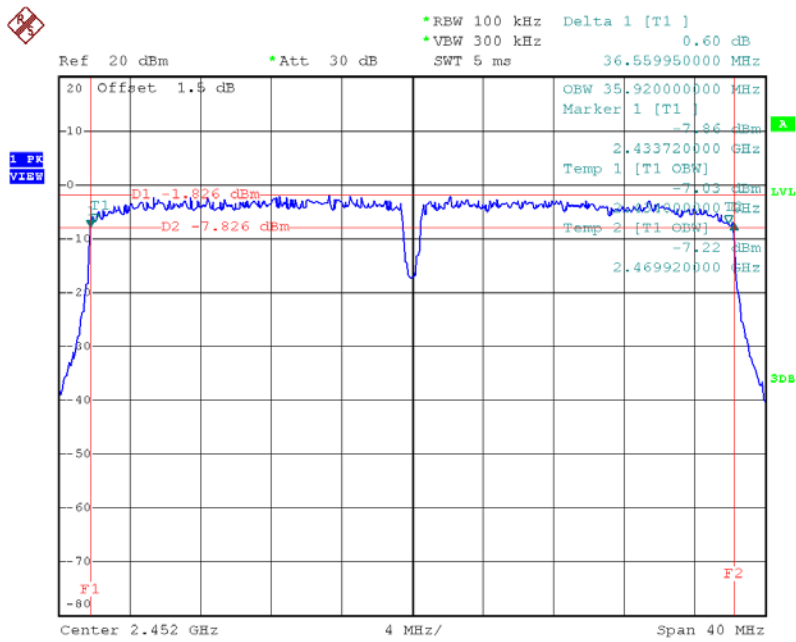
**TX CH03**



**TX CH06**



**TX CH09**



# APPENDIX F - MAXIMUM PEAK CONDUCTED OUTPUT POWER

**Non Beamforming**

**Test Mode :TX B Mode\_CH01/06/11**

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	27.46	0.56	30.00	1.00	Complies
2437	27.64	0.58	30.00	1.00	Complies
2462	27.39	0.55	30.00	1.00	Complies

**Test Mode :TX G Mode\_CH01/06/11**

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	27.44	0.55	30.00	1.00	Complies
2437	27.76	0.60	30.00	1.00	Complies
2462	27.58	0.57	30.00	1.00	Complies

Test Mode :TX N20 Mode_CH01/06/11_ANT 1					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	24.47	0.28	29.99	0.9977	Complies
2437	24.92	0.31	29.99	0.9977	Complies
2462	24.26	0.27	29.99	0.9977	Complies

Test Mode :TX N20 Mode_CH01/06/11_ANT 2					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	24.56	0.29	29.99	0.9977	Complies
2437	24.48	0.28	29.99	0.9977	Complies
2462	24.35	0.27	29.99	0.9977	Complies

Test Mode :TX N20 Mode_CH01/06/11_Total					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	27.53	0.57	29.99	0.9977	Complies
2437	27.72	0.59	29.99	0.9977	Complies
2462	27.32	0.54	29.99	0.9977	Complies

Test Mode :TX N40 Mode_CH03/06/09_ANT 1					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	24.57	0.29	29.99	0.9977	Complies
2437	24.41	0.28	29.99	0.9977	Complies
2452	24.63	0.29	29.99	0.9977	Complies

Test Mode :TX N40 Mode_CH03/06/09_ANT 2					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	24.23	0.26	29.99	0.9977	Complies
2437	24.42	0.28	29.99	0.9977	Complies
2452	24.85	0.31	29.99	0.9977	Complies

Test Mode :TX N40 Mode_CH03/06/09_Total					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	27.41	0.55	29.99	0.9977	Complies
2437	27.43	0.55	29.99	0.9977	Complies
2452	27.75	0.60	29.99	0.9977	Complies

**With Beamforming**

<b>Test Mode :TX N20 Mode_CH01/06/11_ANT 1</b>					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	24.41	0.28	29.99	0.9977	Complies
2437	24.76	0.30	29.99	0.9977	Complies
2462	24.18	0.26	29.99	0.9977	Complies

<b>Test Mode :TX N20 Mode_CH01/06/11_ANT 2</b>					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	24.43	0.28	29.99	0.9977	Complies
2437	24.37	0.27	29.99	0.9977	Complies
2462	24.54	0.28	29.99	0.9977	Complies

<b>Test Mode :TX N20 Mode_CH01/06/11_Total</b>					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	27.43	0.55	29.99	0.9977	Complies
2437	27.58	0.57	29.99	0.9977	Complies
2462	27.37	0.55	29.99	0.9977	Complies



Test Mode :TX N40 Mode_CH03/06/09_ANT 1					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	24.41	0.28	29.99	0.9977	Complies
2437	24.36	0.27	29.99	0.9977	Complies
2452	24.32	0.27	29.99	0.9977	Complies

Test Mode :TX N40 Mode_CH03/06/09_ANT 2					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	24.18	0.26	29.99	0.9977	Complies
2437	24.38	0.27	29.99	0.9977	Complies
2452	24.29	0.27	29.99	0.9977	Complies

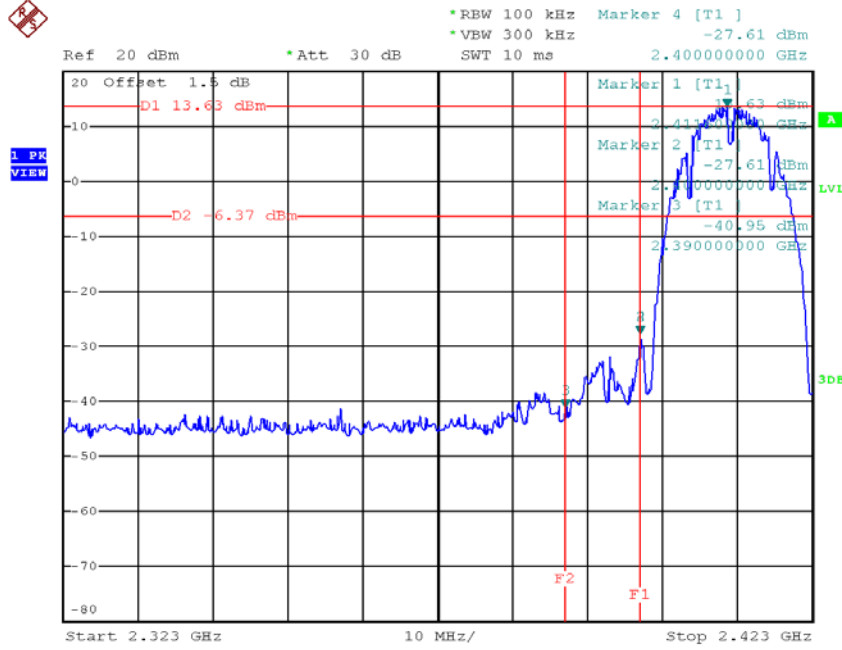
Test Mode :TX N40 Mode_CH03/06/09_Total					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	27.31	0.54	29.99	0.9977	Complies
2437	27.38	0.55	29.99	0.9977	Complies
2452	27.32	0.54	29.99	0.9977	Complies

# APPENDIX G - ANTENNA CONDUCTED SPURIOUS EMISSION

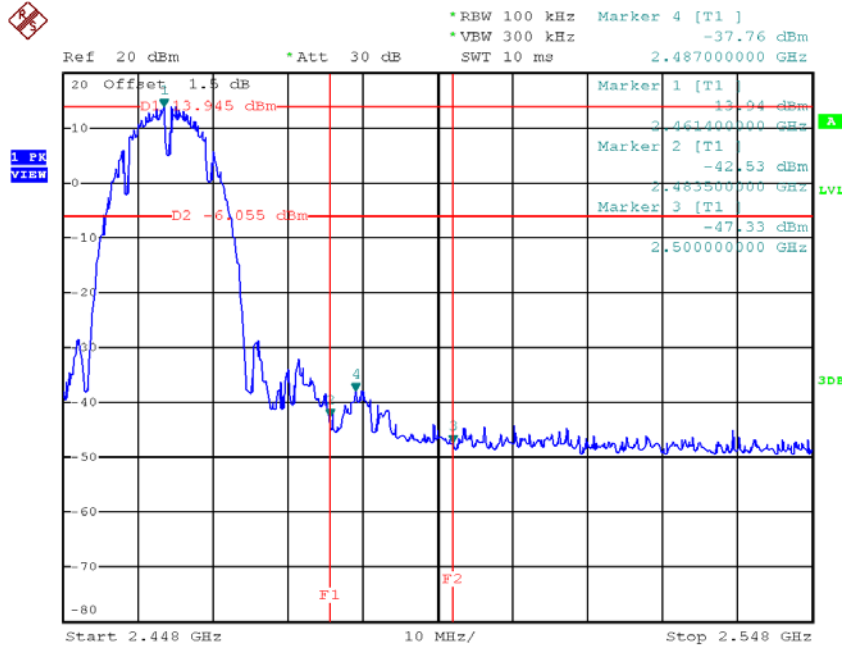
**Non Beamforming**

**Test Mode : TX B Mode**

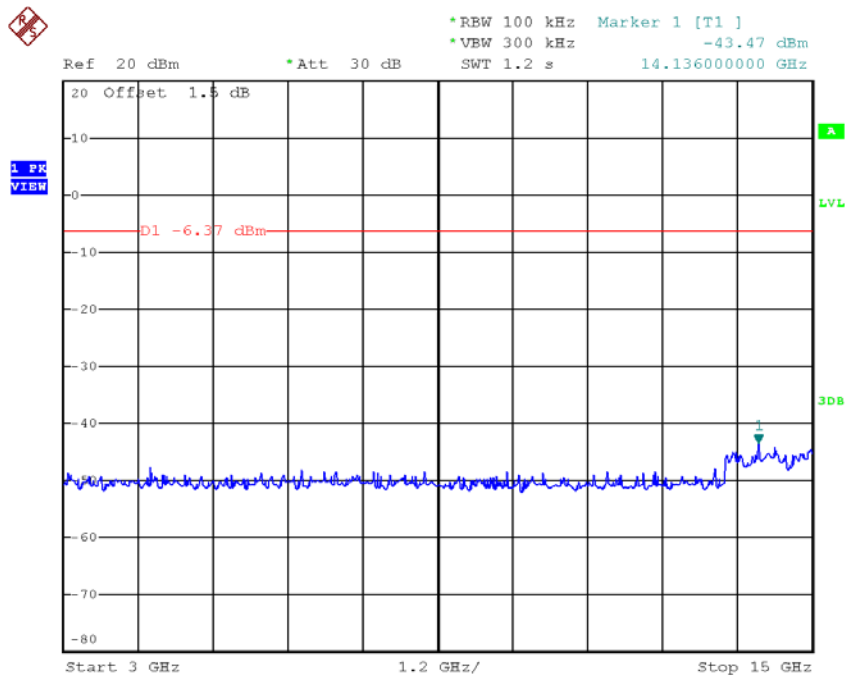
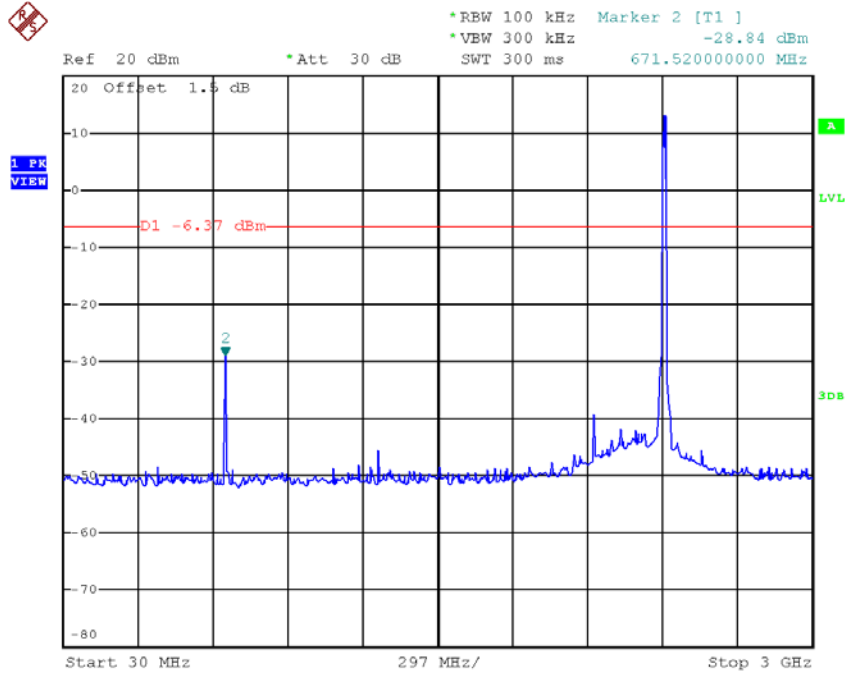
**TX B mode CH01**

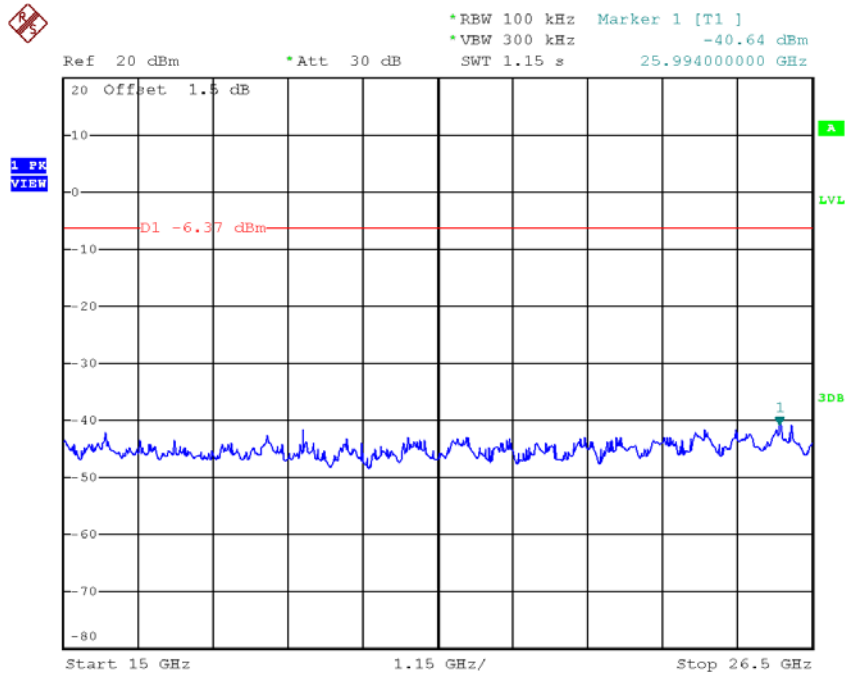


**TX B mode CH11**

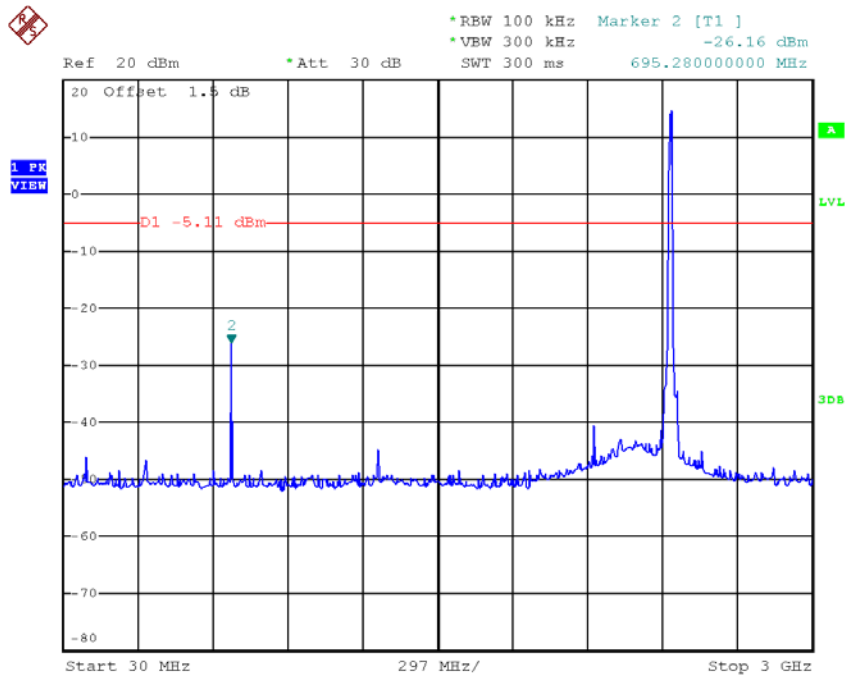


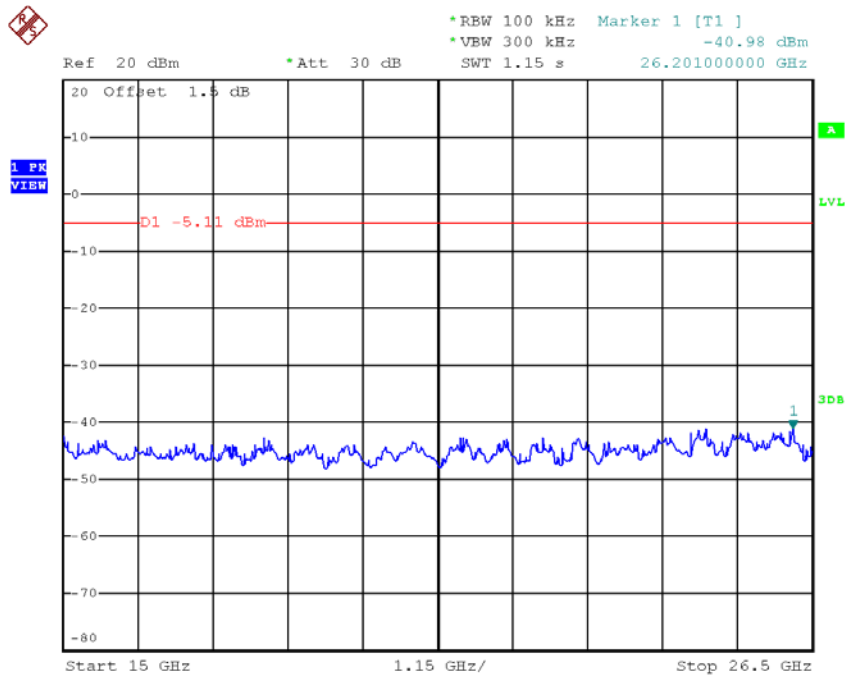
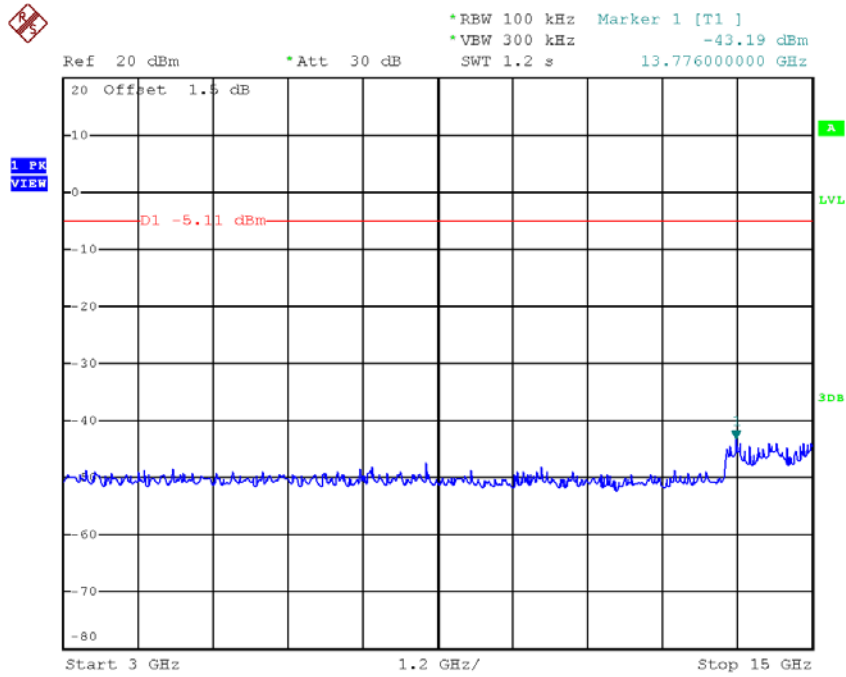
### TX B mode CH01 (10 Harmonic of the frequency)



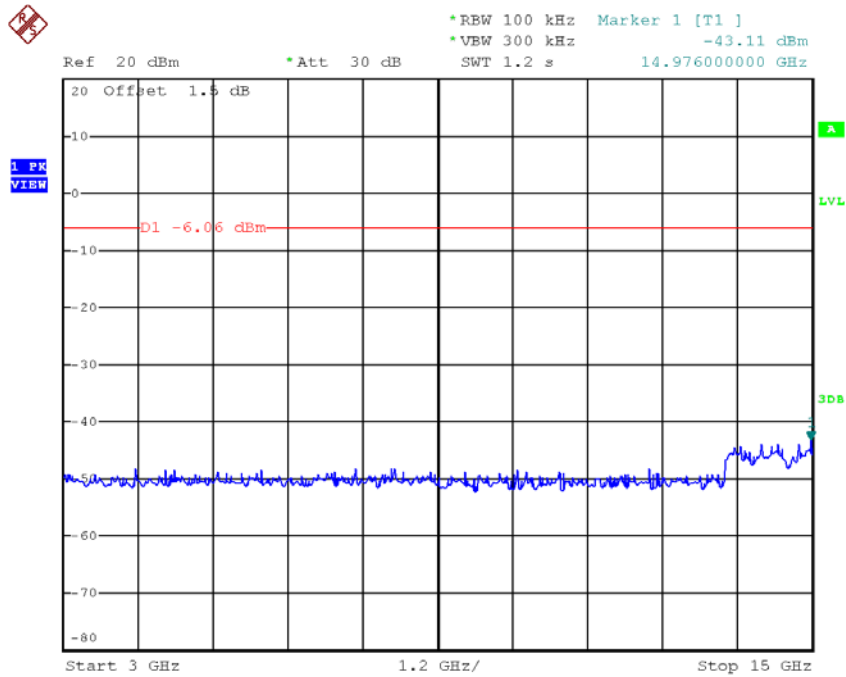
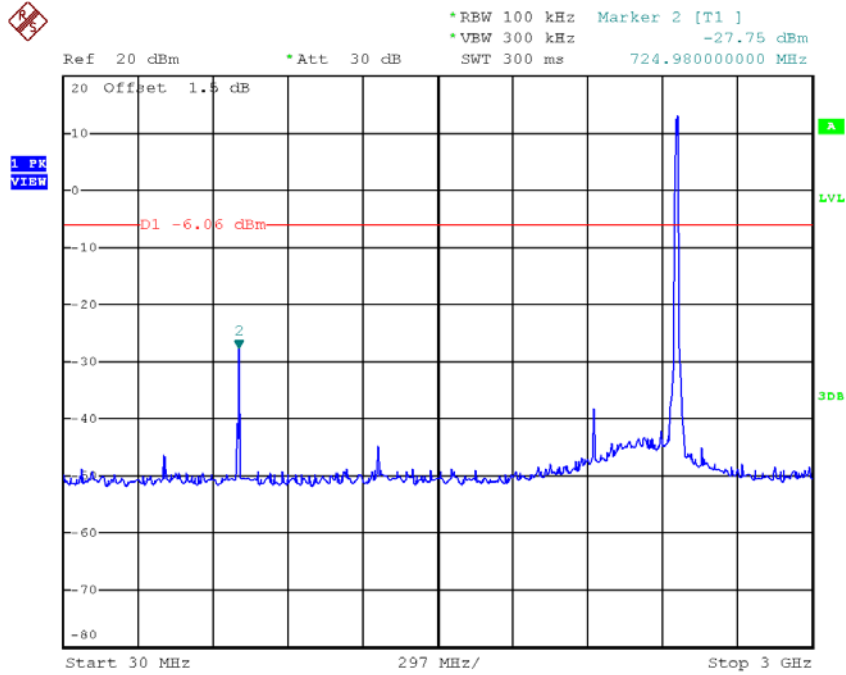


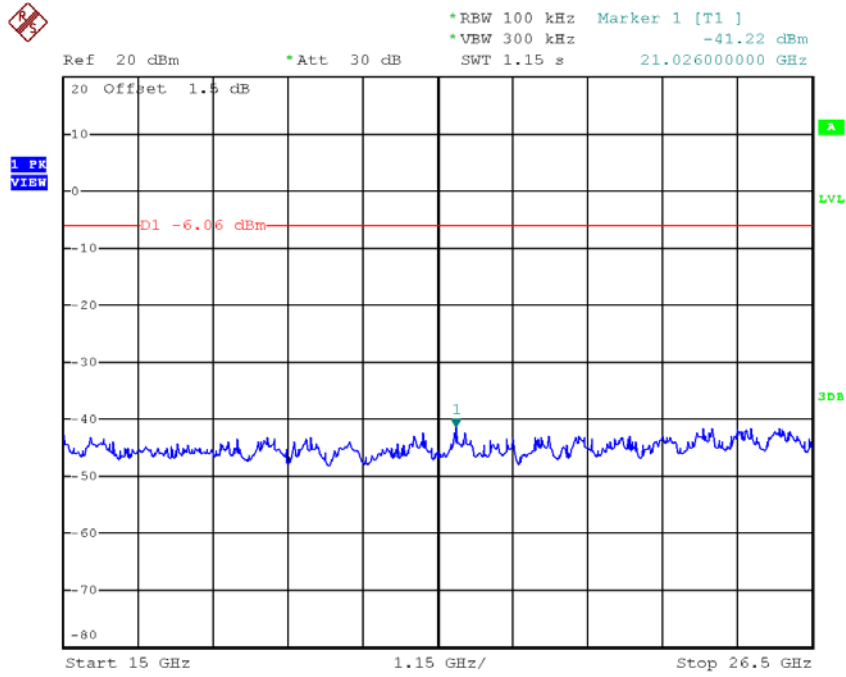
**TX B mode CH06 (10 Harmonic of the frequency)**





### TX B mode CH11 (10 Harmonic of the frequency)

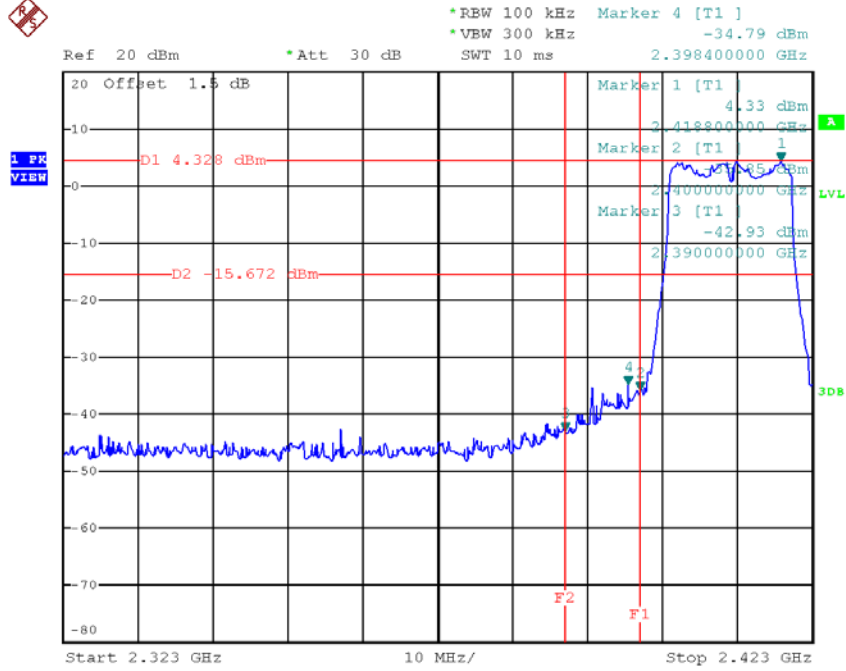




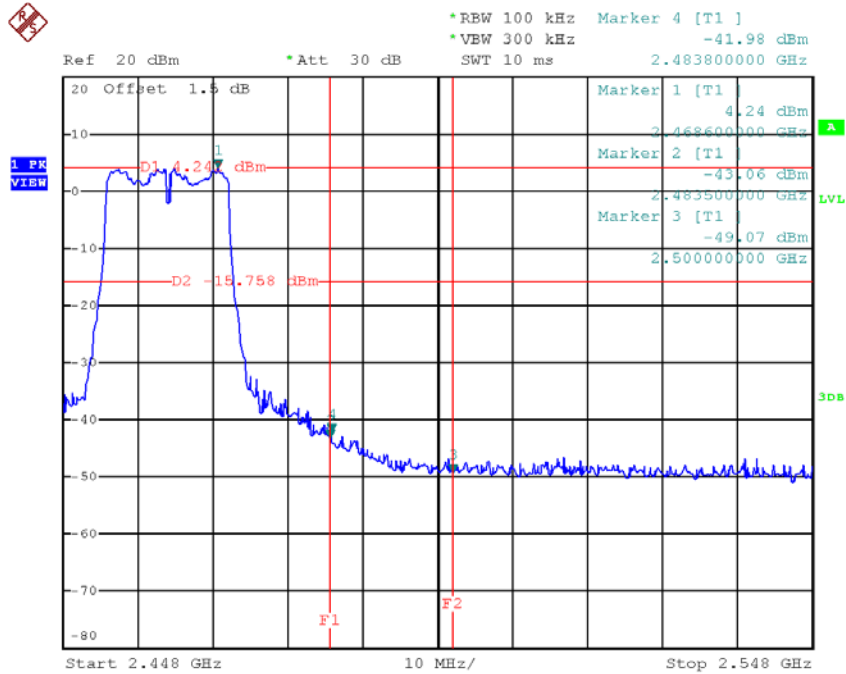


Test Mode : TX G Mode

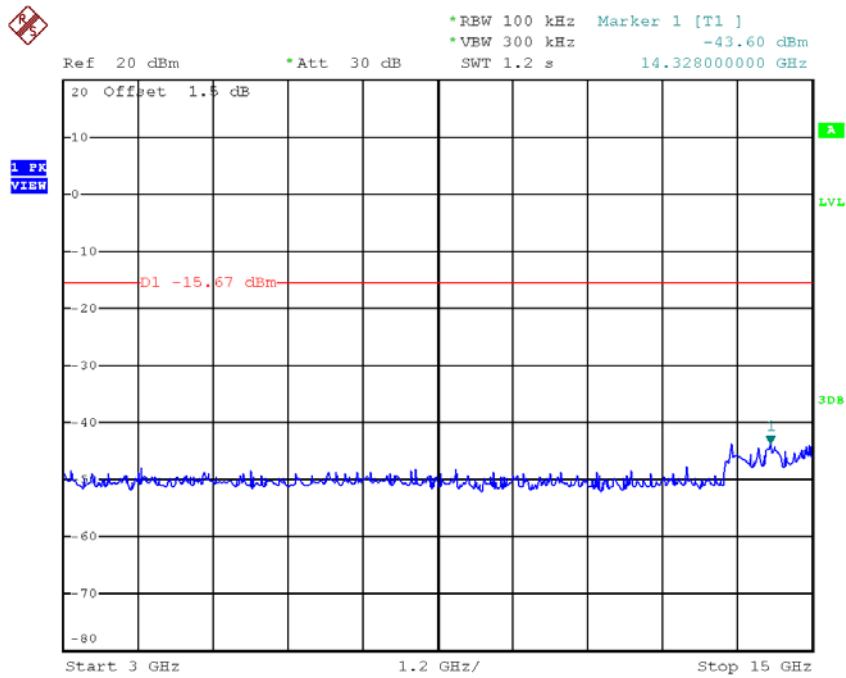
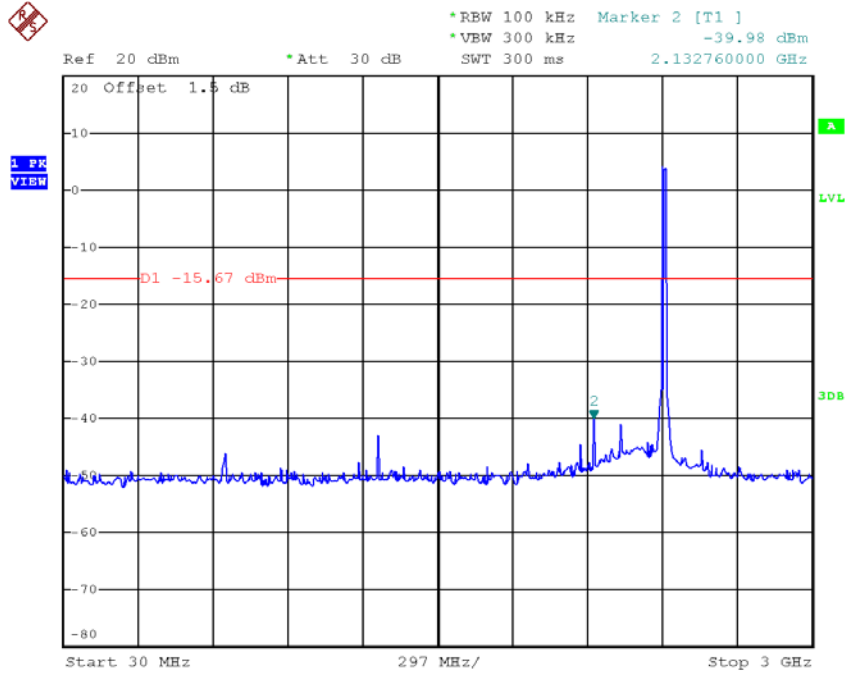
**TX G mode CH01**

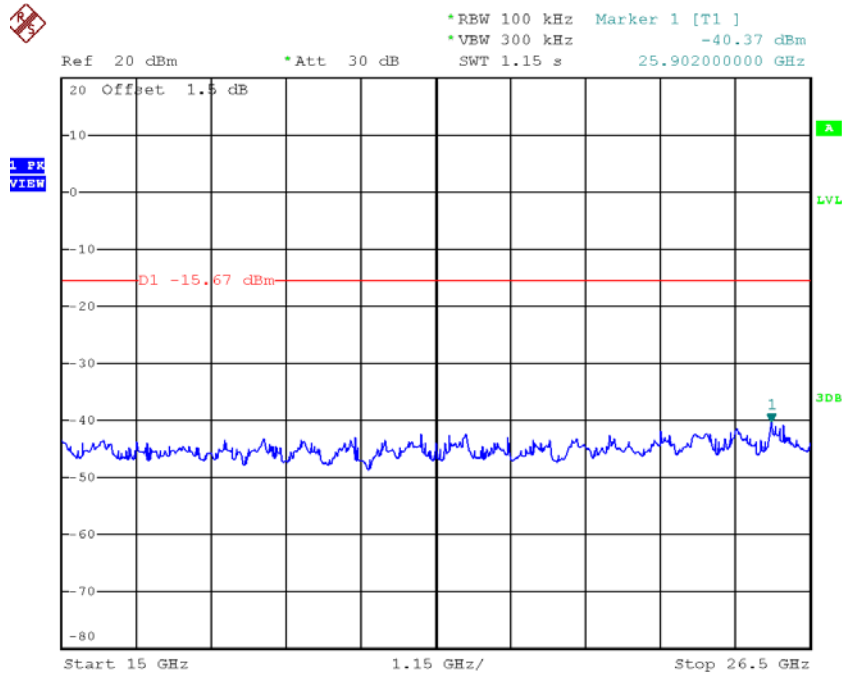


**TX G mode CH11**

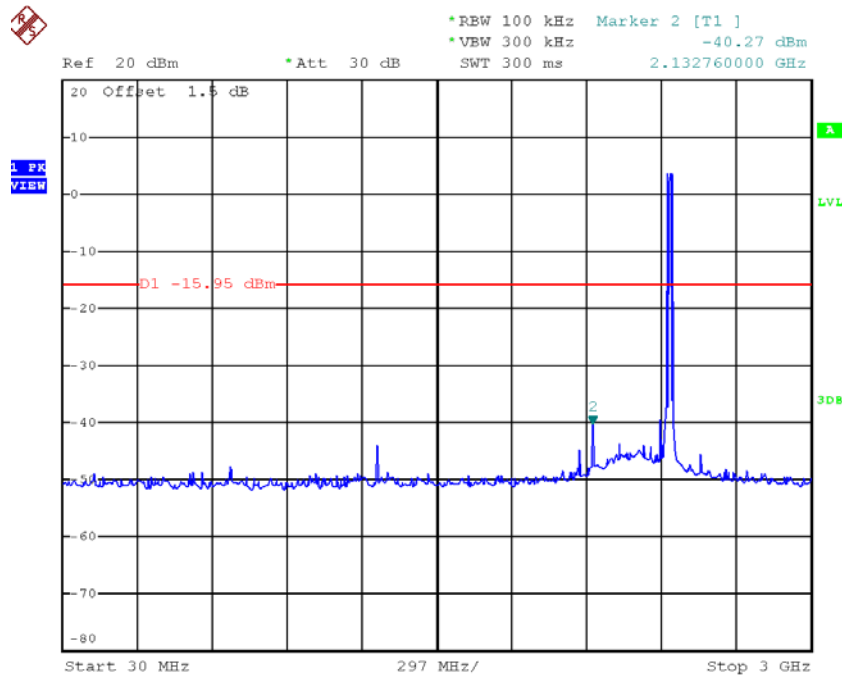


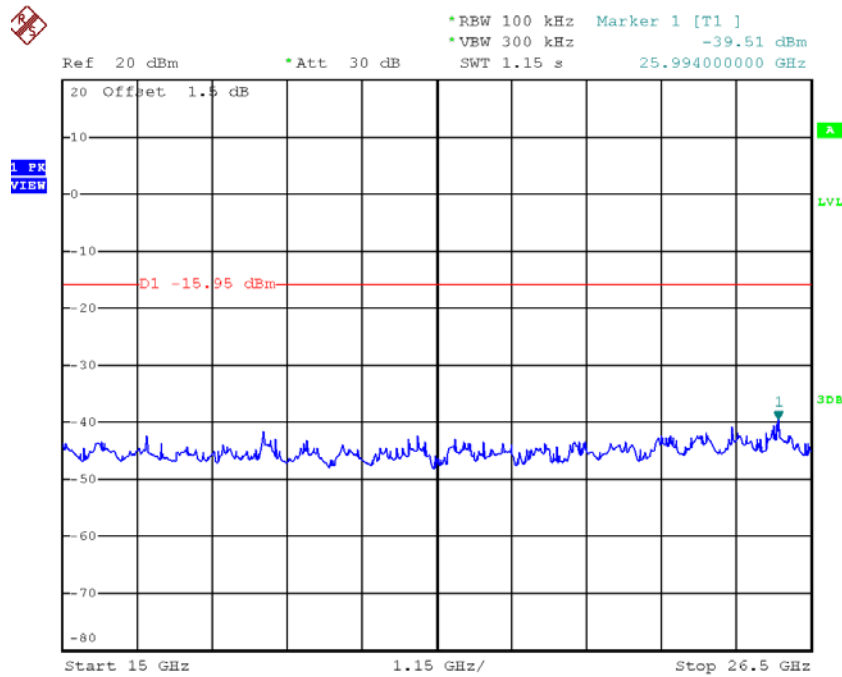
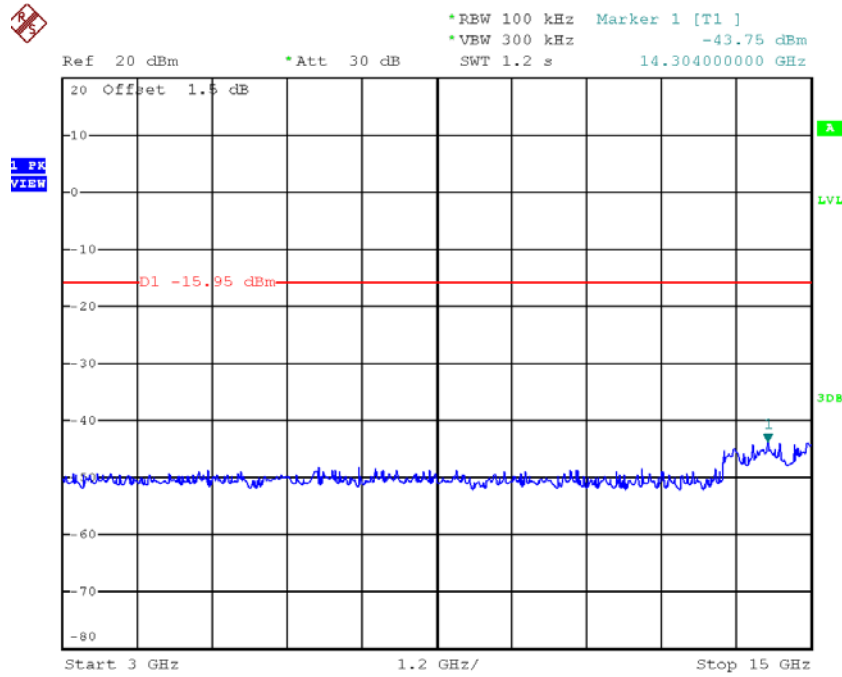
### TX G mode CH01 (10 Harmonic of the frequency)



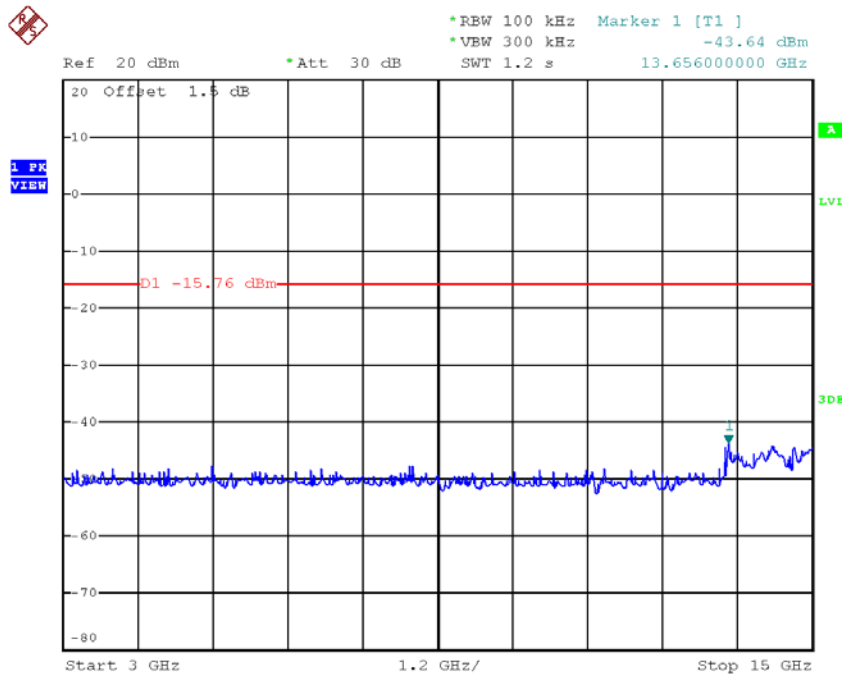
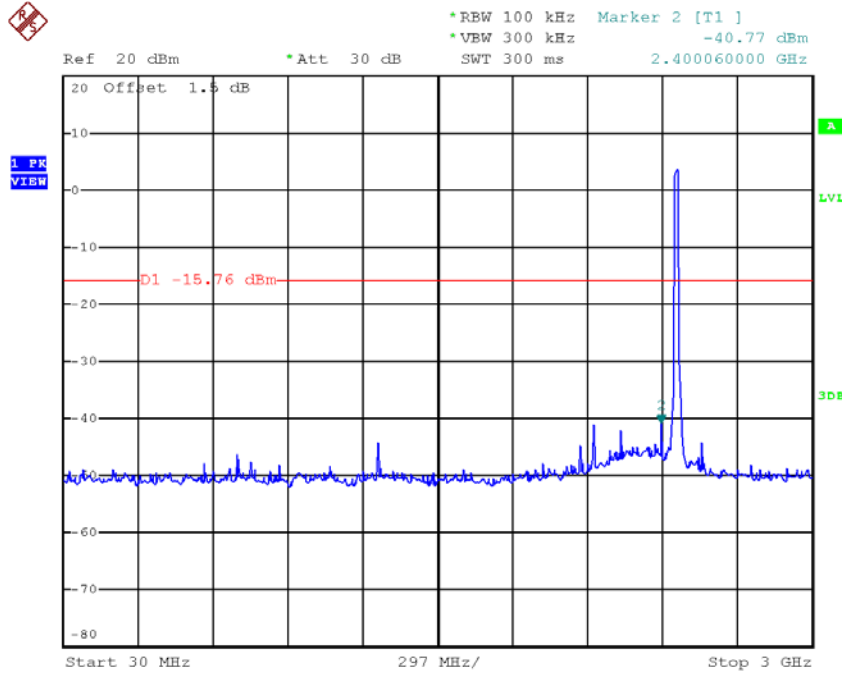


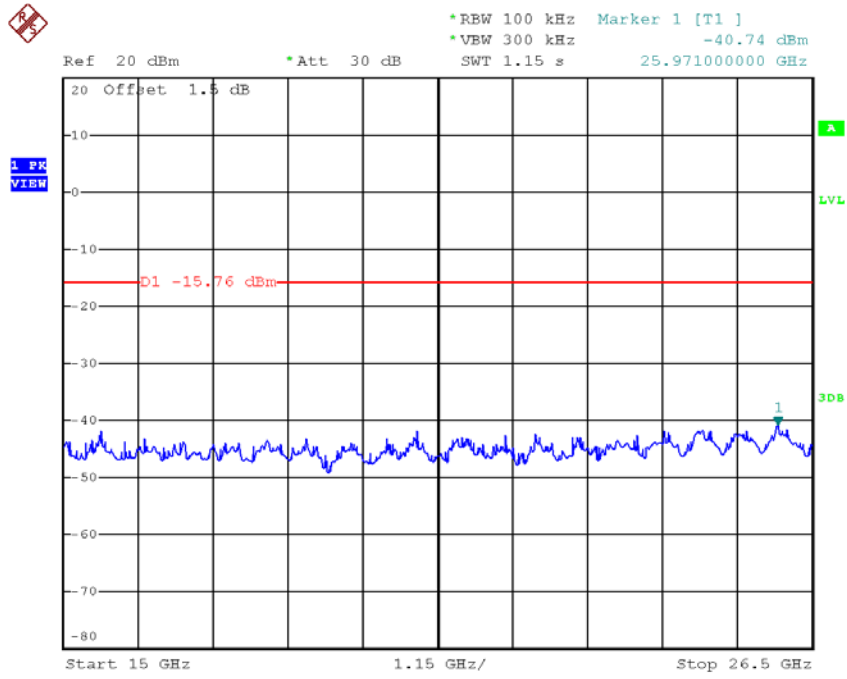
### TX G mode CH06 (10 Harmonic of the frequency)





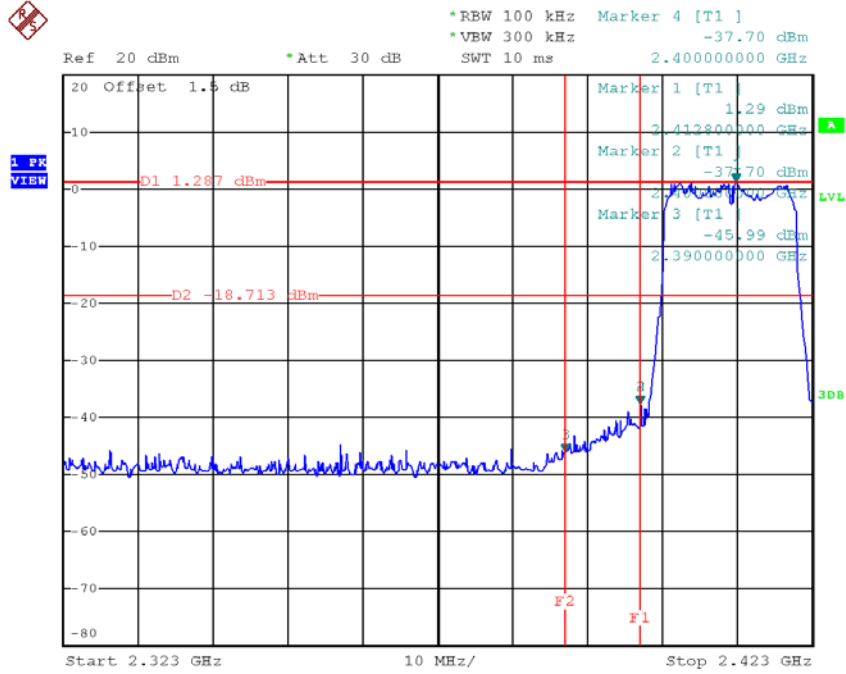
### TX G mode CH11 (10 Harmonic of the frequency)



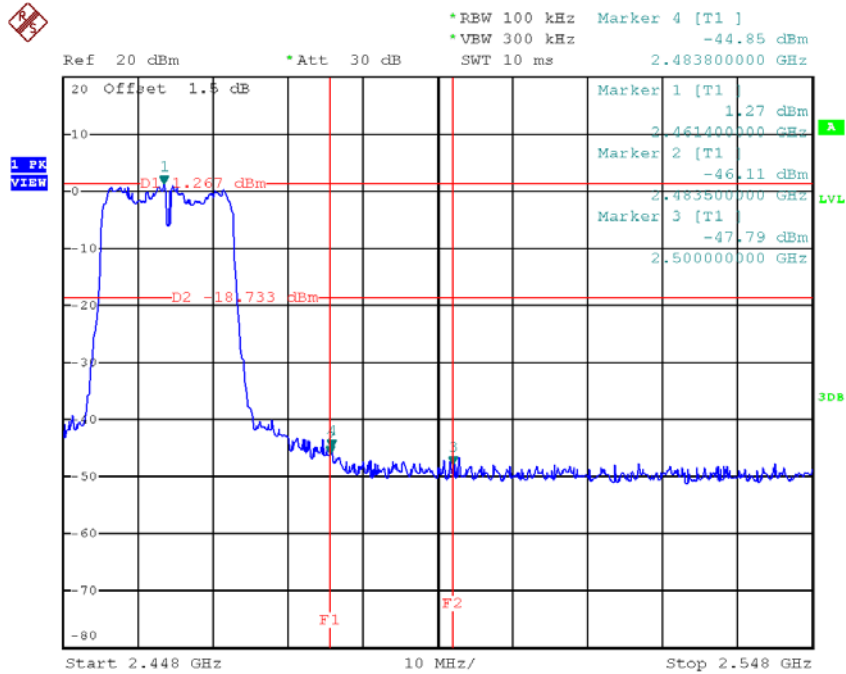


Test Mode : TX N-20M Mode\_ANT 1

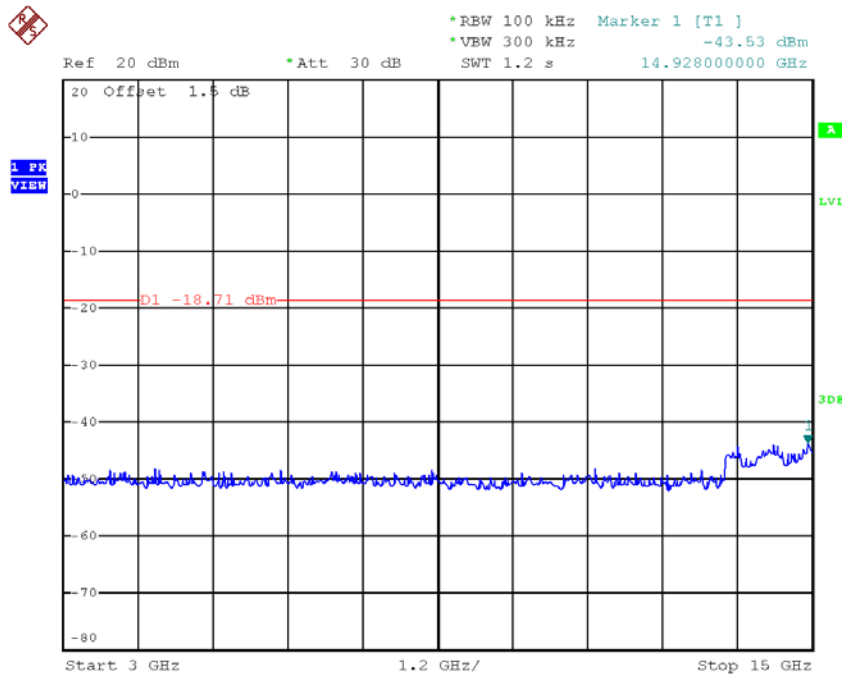
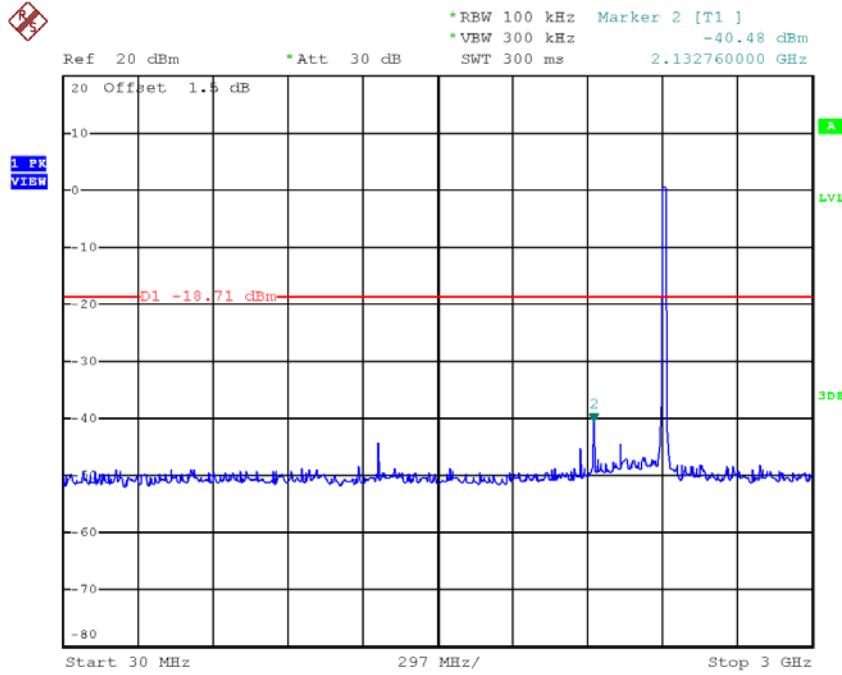
**TX HT20 mode CH01**



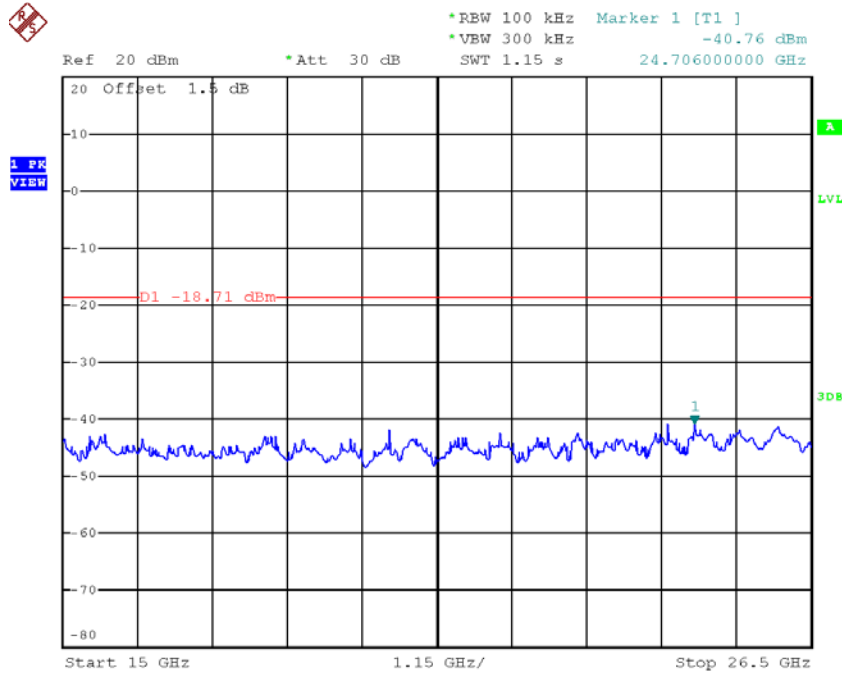
**TX HT20 mode CH11**



### TX HT20 mode CH01 (10 Harmonic of the frequency)







**TX HT20 mode CH06 (10 Harmonic of the frequency)**

