

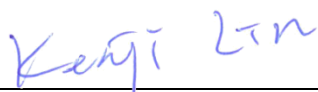
# FCC Radio Test Report

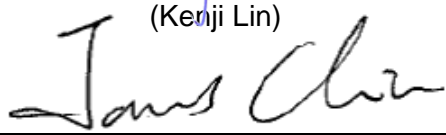
## FCC ID: WS2-WG6611

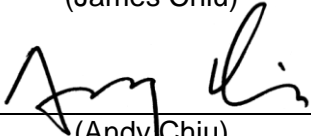
This report concerns (check one):  Original Grant  Class II Change

**Project No.** : 1707167  
**Equipment** : WLAN module  
**Test Model** : WG6611-00  
**Serial Model** : WG6611P00  
**Applicant** : Jorjin Technologies INC.  
**Address** : 17F, No 239, Datong Road, Sec 1, Xizhi District, New Taipei City, Taiwan 22161

**Date of Receipt** : Jul. 27, 2017  
**Date of Test** : Jul. 27, 2017 ~ Aug. 10, 2017  
**Issued Date** : Sep. 14, 2017  
**Tested by** : BTL Inc.

**Testing Engineer** :   
(Kenji Lin)

**Technical Manager** :   
(James Chiu)

**Authorized Signatory** :   
(Andy Chiu)

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

B1, No.37, Lane 365, Yang Guang St.,  
Nei-Hu District, Taipei City 114, Taiwan.  
TEL:+886-2-2657-3299 FAX: +886-2- 2657-3331



**Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

**BTL's** reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

**BTL's** report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **BTL-self**, extracts from the test report shall not be reproduced except in full with **BTL's** authorized written approval.

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

**Limitation**

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

<b>Table of Contents</b>	<b>Page</b>
<b>1 . CERTIFICATION</b>	<b>6</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>7</b>
2.1 TEST FACILITY	8
2.2 MEASUREMENT UNCERTAINTY	8
<b>3 . GENERAL INFORMATION</b>	<b>10</b>
3.1 GENERAL DESCRIPTION OF EUT	10
3.2 DESCRIPTION OF TEST MODES	11
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	12
3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	13
3.5 DESCRIPTION OF SUPPORT UNITS	13
<b>4 . EMC EMISSION TEST</b>	<b>14</b>
4.1 CONDUCTED EMISSION MEASUREMENT	14
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	14
4.1.2 TEST PROCEDURE	14
4.1.3 DEVIATION FROM TEST STANDARD	14
4.1.4 TEST SETUP	15
4.1.5 EUT OPERATING CONDITIONS	15
4.1.6 EUT TEST CONDITIONS	15
4.1.7 TEST RESULTS	15
4.2 RADIATED EMISSION MEASUREMENT	16
4.2.1 RADIATED EMISSION LIMITS	16
4.2.2 TEST PROCEDURE	17
4.2.3 DEVIATION FROM TEST STANDARD	17
4.2.4 TEST SETUP	18
4.2.5 EUT OPERATING CONDITIONS	19
4.2.6 EUT TEST CONDITIONS	19
4.2.7 TEST RESULTS (9KHZ TO 30MHZ)	20
4.2.8 TEST RESULTS (30MHZ TO 1000 MHZ)	20
4.2.9 TEST RESULTS (ABOVE 1000 MHZ)	20
<b>5 . BANDWIDTH TEST</b>	<b>21</b>
5.1 APPLIED PROCEDURES	21
5.1.1 TEST PROCEDURE	21
5.1.2 DEVIATION FROM STANDARD	21
5.1.3 TEST SETUP	21
5.1.4 EUT OPERATION CONDITIONS	21
5.1.5 EUT TEST CONDITIONS	21
5.1.6 TEST RESULTS	21
<b>6 . MAXIMUM PEAK CONDUCTED OUTPUT POWER TEST</b>	<b>22</b>

<b>Table of Contents</b>	<b>Page</b>
<b>6.1 APPLIED PROCEDURES / LIMIT</b>	<b>22</b>
6.1.1 TEST PROCEDURE	22
6.1.2 DEVIATION FROM STANDARD	22
6.1.3 TEST SETUP	22
6.1.4 EUT OPERATION CONDITIONS	22
6.1.5 EUT TEST CONDITIONS	22
6.1.6 TEST RESULTS	22
<b>7 . ANTENNA CONDUCTED SPURIOUS EMISSION</b>	<b>23</b>
7.1 APPLIED PROCEDURES / LIMIT	23
7.1.1 TEST PROCEDURE	23
7.1.2 DEVIATION FROM STANDARD	23
7.1.3 TEST SETUP	23
7.1.4 EUT OPERATION CONDITIONS	23
7.1.5 EUT TEST CONDITIONS	23
7.1.6 TEST RESULTS	23
<b>8 . POWER SPECTRAL DENSITY TEST</b>	<b>24</b>
8.1 APPLIED PROCEDURES / LIMIT	24
8.1.1 TEST PROCEDURE	24
8.1.2 DEVIATION FROM STANDARD	24
8.1.3 TEST SETUP	24
8.1.4 EUT OPERATION CONDITIONS	24
8.1.5 EUT TEST CONDITIONS	24
8.1.6 TEST RESULTS	24
<b>9 . MEASUREMENT INSTRUMENTS LIST</b>	<b>25</b>
<b>10 . EUT TEST PHOTO</b>	<b>27</b>
<b>APPENDIX A - CONDUCTED EMISSION</b>	<b>31</b>
<b>APPENDIX B - RADIATED EMISSION (9KHZ TO 30MHZ)</b>	<b>34</b>
<b>APPENDIX C - RADIATED EMISSION (30MHZ TO 1000MHZ)</b>	<b>39</b>
<b>APPENDIX D - RADIATED EMISSION (ABOVE 1000MHZ)</b>	<b>42</b>
<b>APPENDIX E - BANDWIDTH</b>	<b>83</b>
<b>APPENDIX F – MAXIMUM PEAK CONDUCTED OUTPUT POWER</b>	<b>90</b>
<b>APPENDIX G - ANTENNA CONDUCTED SPURIOUS EMISSION</b>	<b>92</b>
<b>APPENDIX H - POWER SPECTRAL DENSITY</b>	<b>111</b>

### REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1707167	Original Issue.	Sep. 14, 2017

## 1. CERTIFICATION

Equipment : WLAN module  
Brand Name : Jorjin  
Test Model : WG6611-00  
Serial Model : WG6611P00  
Applicant : Jorjin Technologies INC.  
Manufacturer : Jorjin Technologies INC.  
Address : 17F, No 239, Datong Road, Sec 1, Xizhi District, New Taipei City, Taiwan 22161  
Factory : Jorjin Technologies INC.  
Address : 17F, No 239, Datong Road, Sec 1, Xizhi District, New Taipei City, Taiwan 22161  
Date of Test : Jul. 27, 2017 ~ Aug. 10, 2017  
Test Sample : Production Unit  
Standard(s) : FCC Part15, Subpart C:(15.247) / ANSI C63.10-2013

The above equipment has been tested and found in 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-1-1707167) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247) , Subpart C				
Standard(s)	Section	Test Item	Judgement	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 in this test report.

## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

### Conducted emission Test:

**C05:** (VCCI RN: C-4742; FCC RN:965108; FCC DN:TW1082)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

### Radiated emission Test (Below 1 GHz):

**CB15:** (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

### Radiated emission Test (Above 1 GHz):

**CB15:** (FCC RN:674415; FCC DN:TW0659)

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

## 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 emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
C05	CISPR	150 kHz ~ 30MHz	2.68

### B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (3m)	CISPR	9kHz ~ 150kHz	2.82
		150kHz ~ 30MHz	2.58

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	30MHz ~ 200MHz	V	4.20
		30MHz ~ 200MHz	H	3.64
		200MHz ~ 1,000MHz	V	4.56
		200MHz ~ 1,000MHz	H	3.90

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)
CB15 (3m)	CISPR	1GHz ~ 6GHz	V	4.46
		1GHz ~ 6GHz	H	4.40
		6GHz ~ 18GHz	V	3.88
		6GHz ~ 18GHz	H	4.00

Test Site	Method	Measurement Frequency Range	U,(dB)
CB15 (1m)	CISPR	18 ~ 26.5 GHz	4.62
		26.5 ~ 40 GHz	5.12



Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our  $U_{lab}$  values in CISPR 16-4-2 terminology. Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called  $U_{CISPR}$ , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz: 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz: 5.2 dB

It can be seen that our  $U_{lab}$  values are smaller than  $U_{CISPR}$ .

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	WLAN module	
Brand Name	Jorjin	
Test Model	WG6611-00	
Serial Model	WG6611P00	
Model Difference	WG6611P00 with extend base board	
Power Source	Supplied from PC PCI Slot.	
Power Rating	DC 3.3V	
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 72.2 Mbps
	Output Power (Max.)	802.11b: 19.83dBm 802.11g: 23.23dBm 802.11n(20MHz): 22.14dBm

Note:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- Channel List:

CH01 – CH11 for 802.11b, 802.11g, 802.11n(20MHz)							
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	Unictron	AA273	PIFA	IPEX	3.58

### 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	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 4	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

Note:

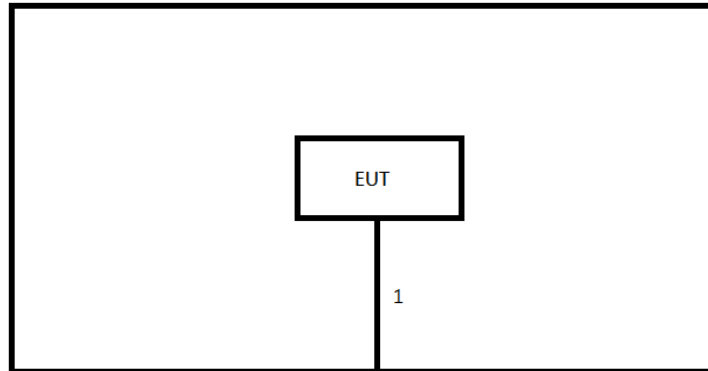
- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: DBPSK (1Mbps)  
 802.11g mode: OFDM (6Mbps)  
 802.11n HT20 mode : BPSK (6.5Mbps)  
 For radiated emission tests, the highest output powers were set for final test.
- (3) For radiated below 1G test, the N-20MHZ 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

Test software version	UI_mptool		
Frequency (MHz)	2412	2437	2462
802.11b	40	40	41
802.11g	45	45	41
802.11n (20MHz)	43	43	44

**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	PC	ASUS	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	3M	Test 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 (dB $\mu$ V)	
	Quasi-peak	Average
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

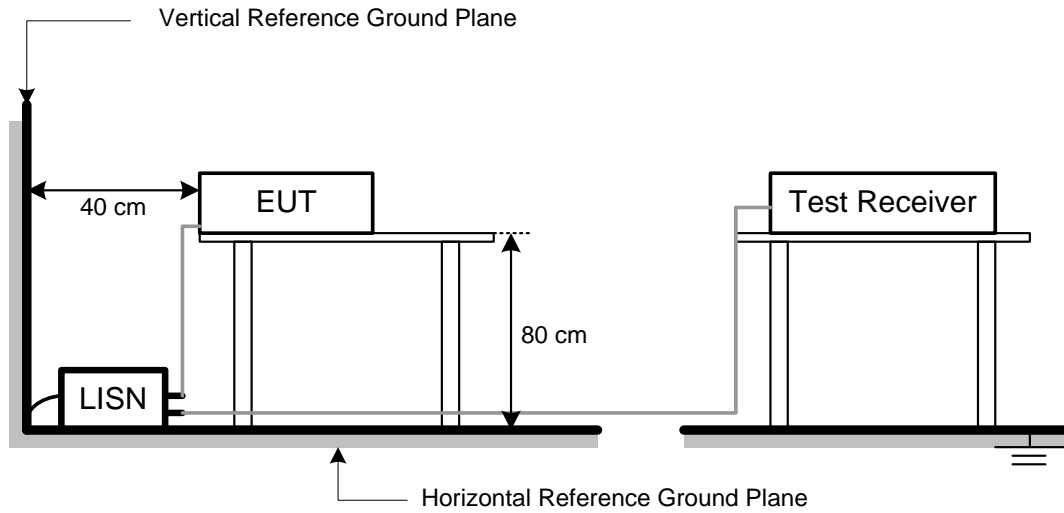
#### 4.1.2 TEST PROCEDURE

- 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 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



#### 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

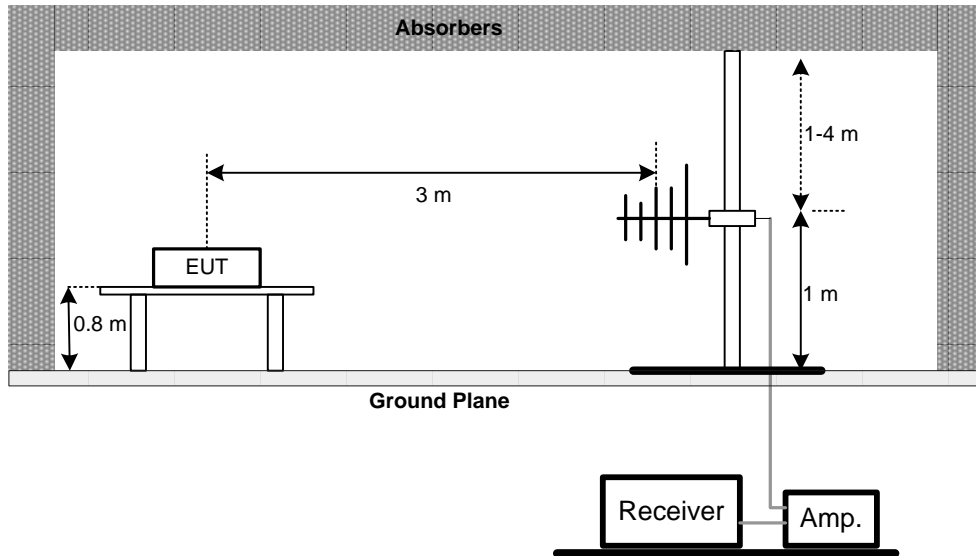
- a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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 0.8 m or 1.5 m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 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

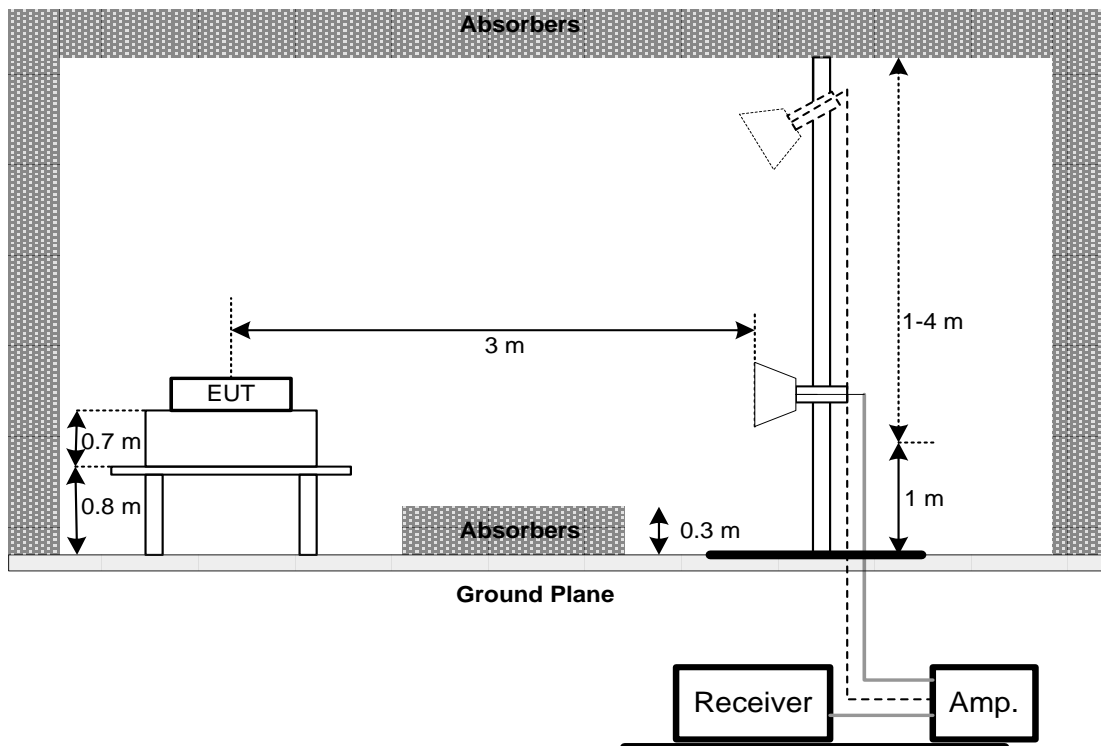
No deviation

**4.2.4 TEST SETUP**

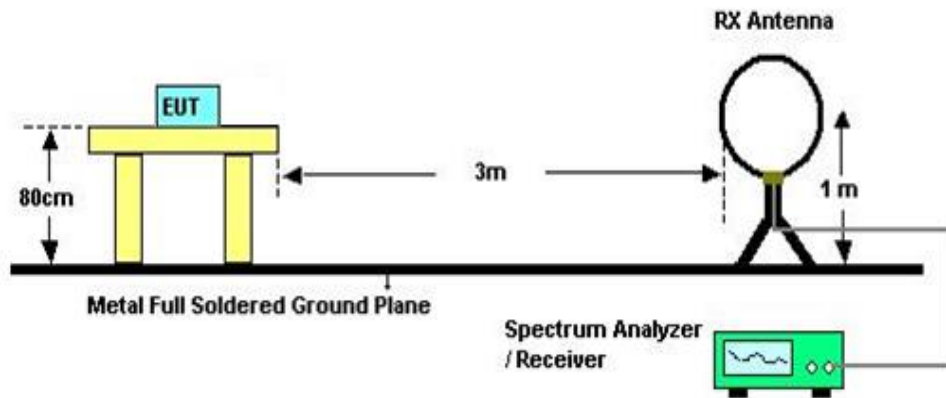
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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: 23°C    Relative Humidity: 70%    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 1000 MHZ)**

Please refer to the Appendix C.

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

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

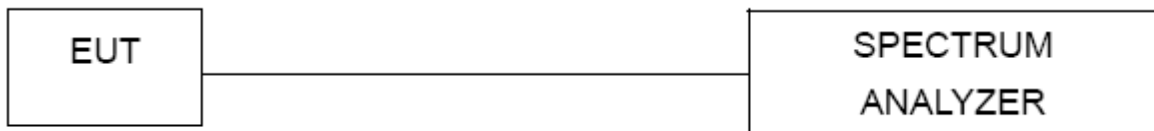
#### 5.1.1 TEST PROCEDURE

- 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

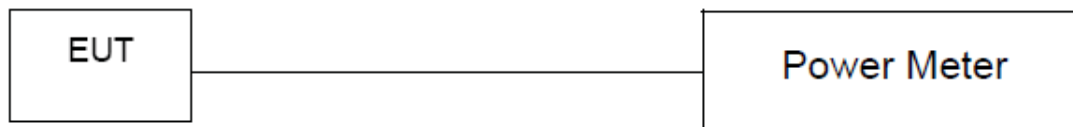
#### 6.1.1 TEST PROCEDURE

- The EUT was directly connected to the power meter and antenna output port as show in the block diagram below,
- The maximum peak conducted output power was performed in accordance with method 9.1.2 of FCC KDB 558074 D01 DTS Meas Guidance v03r04.

#### 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.

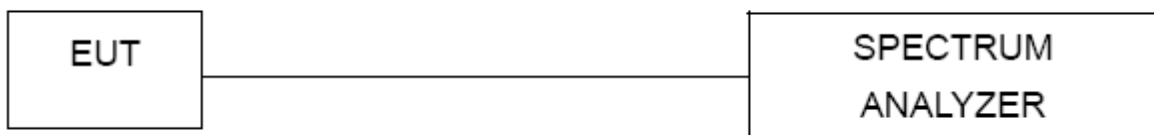
#### 7.1.1 TEST PROCEDURE

- 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

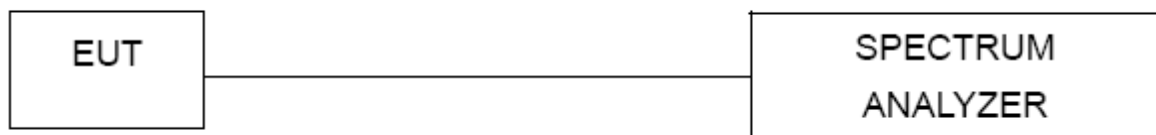
#### 8.1.1 TEST PROCEDURE

- 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=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	TWO-LINE V-NETWORK	R&S	ENV216	101050	Jan. 25, 2018
2	Test Cable	TIMES	CFD300-NL	C02	Jun. 14, 2018
3	EMI Test Receiver	R&S	ESR7	101433	Dec. 09, 2017
4	Measurement Software	EZ	EZ_EMG (Version NB-03A)	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Preamplifier	EMCI	012645B	980267	Feb. 28, 2018
2	Preamplifier	EMCI	EMC02325	980217	Dec. 29, 2017
3	Test Cable	EMCI	EMC104-SM-S M-8000	8m	Jan. 04, 2018
4	Test Cable	EMCI	EMC104-SM-S M-800	150207	Jan. 04, 2018
5	Test Cable	EMCI	EEMC104-SM-S M-3000	151205	Jan. 04, 2018
6	MXE EMI Receiver	Agilent	N9038A	MY5542012 7	Jan. 09, 2018
7	Signal Analyzer	Agilent	N9010A	MY5222099 0	Feb. 22, 2018
8	Loop Ant	EMCO	6502	42960	Nov. 24, 2017
9	Horn Ant	SCHWARZBECK	BBHA 9120D	9120D-1342	Feb. 28, 2018
10	Horn Ant	Schwarzbeck	BBHA 9170	187	Dec. 07, 2017
11	Trilog-Broadband Antenna	Schwarzbeck	VULB 9168	9168-548	Jan. 16, 2018
12	5dB Attenuator	EMCI	EMCI-N-6-05	AT-N0623	Jan. 16, 2018

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2495A	1128008	Aug. 17, 2018
2	Power Sensor	Anritsu	MA2411B	1126001	Aug. 17, 2018

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	R&S/FSP30	100854	May 25, 2018

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

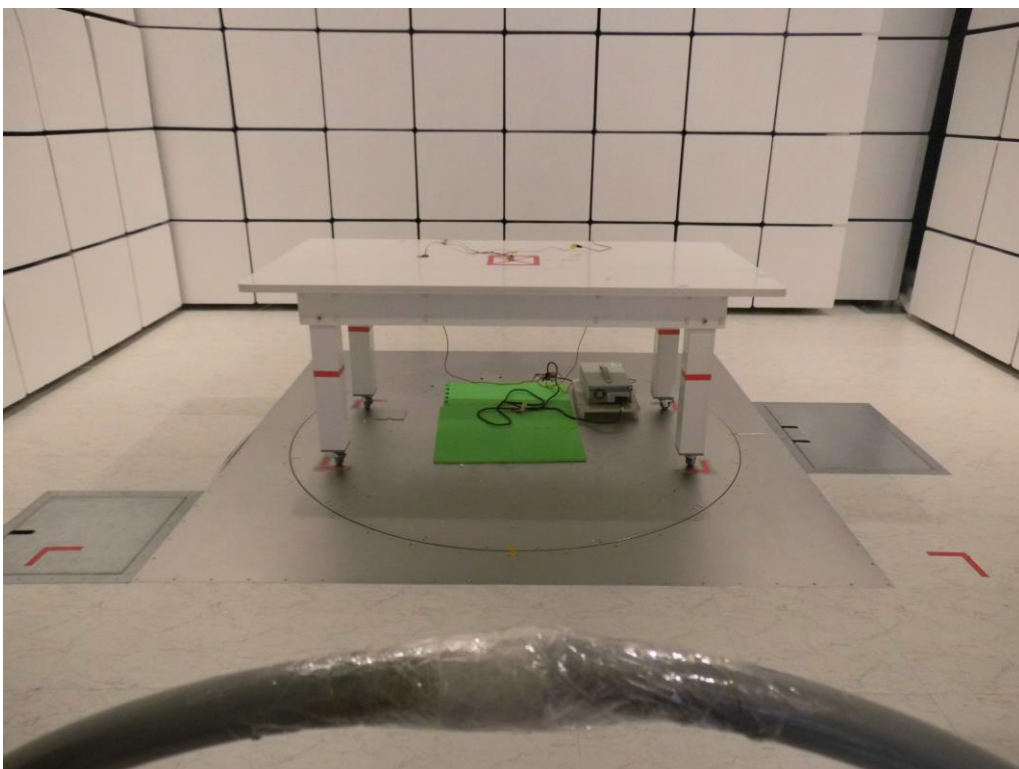
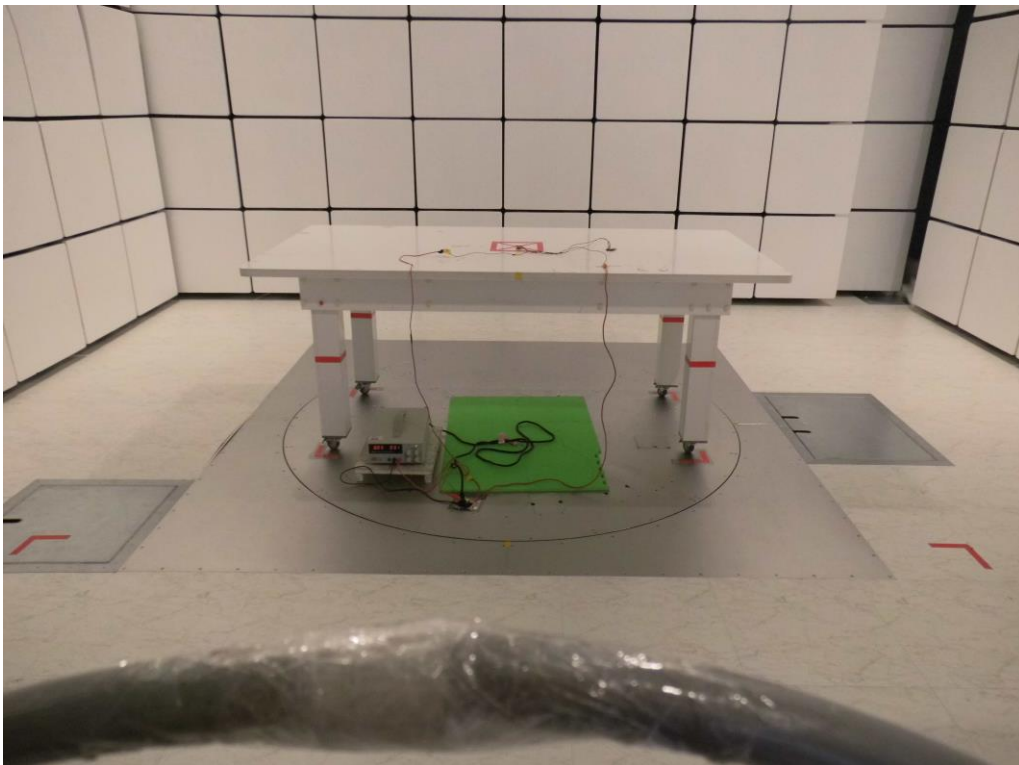
## 10. EUT TEST PHOTO

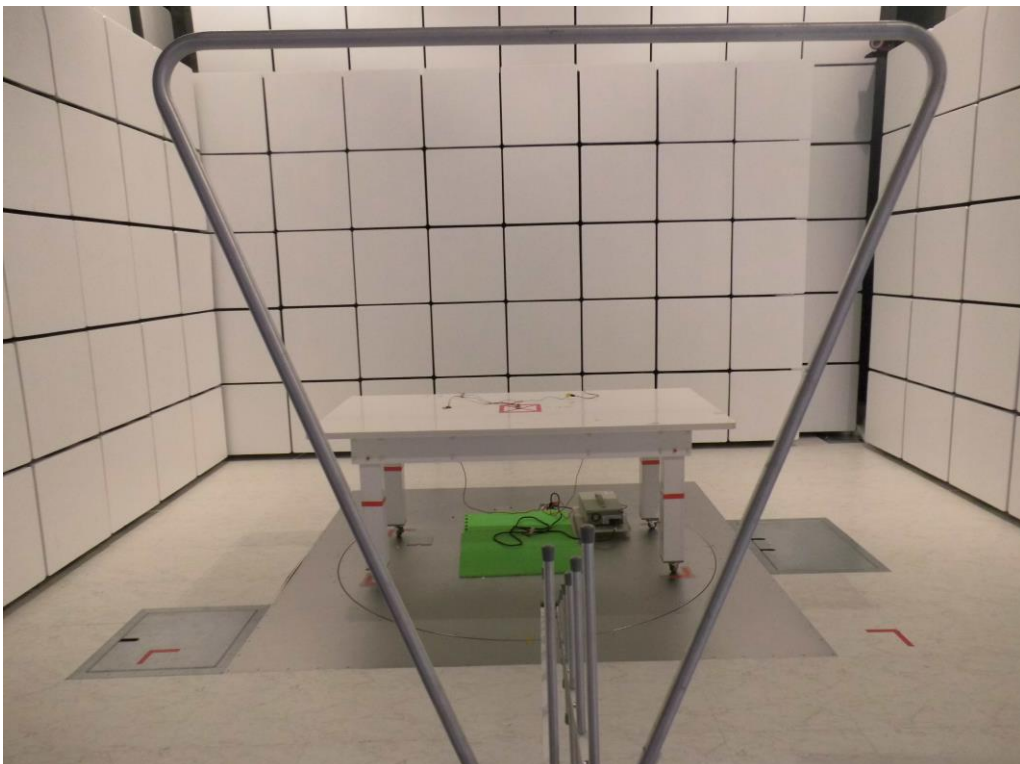
### Conducted Measurement Photos



**Radiated Measurement Photos**

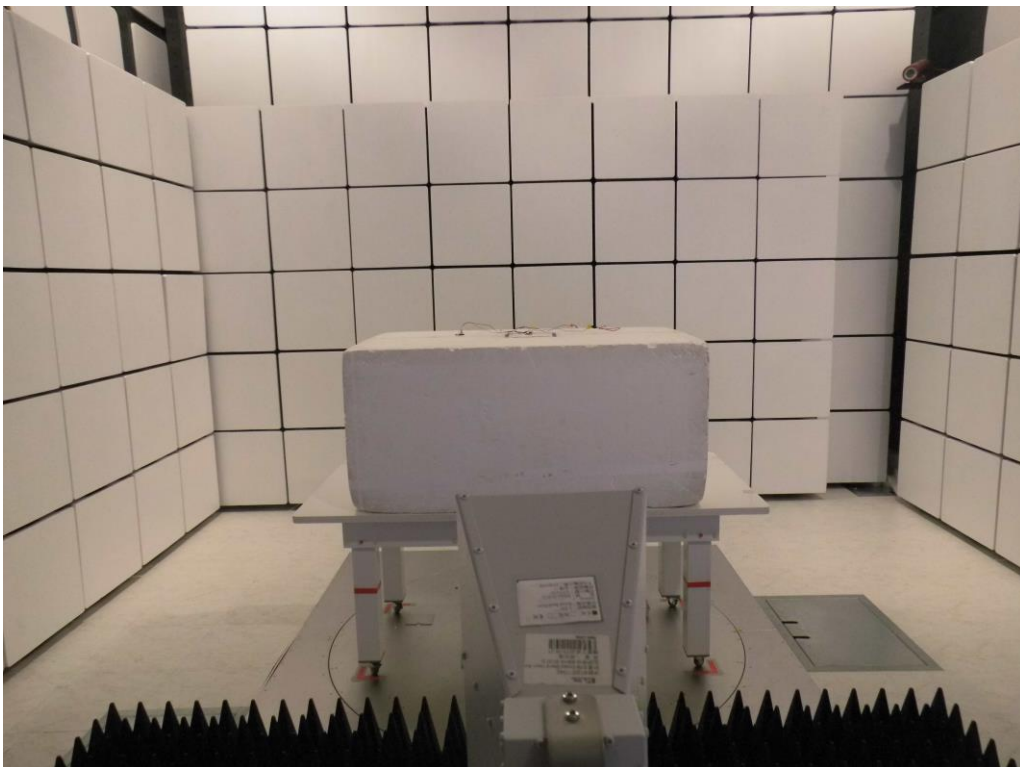
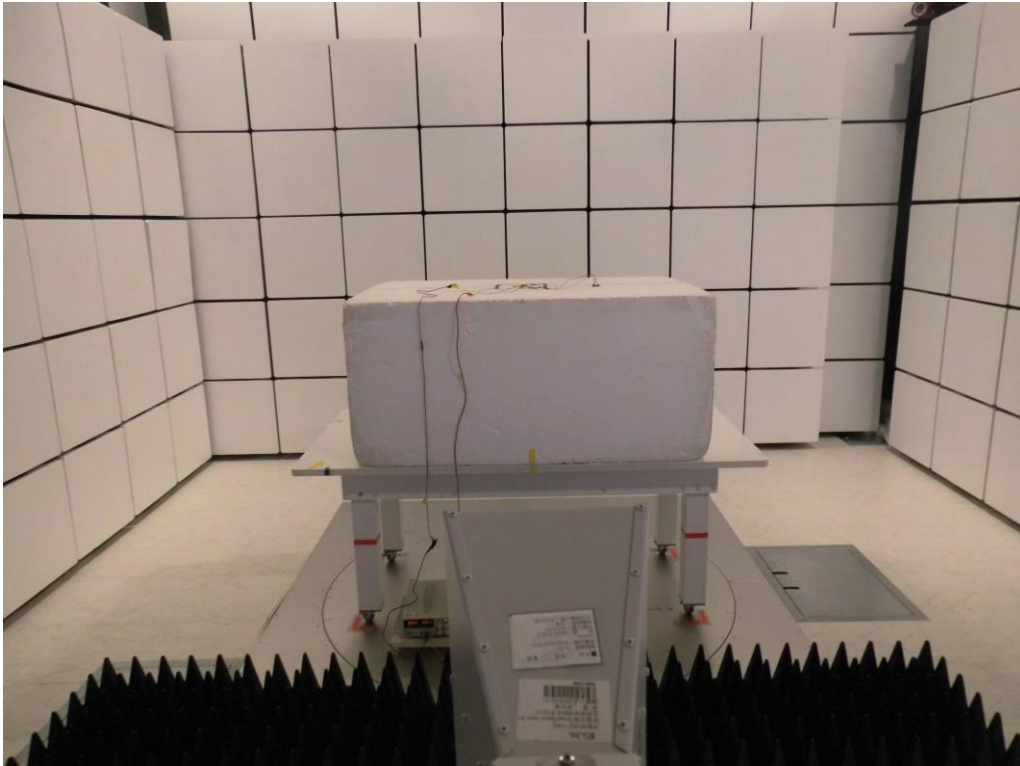
**9KHz to 30MHz**



**Radiated Measurement Photos****30MHz to 1000MHz**

**Radiated Measurement Photos**

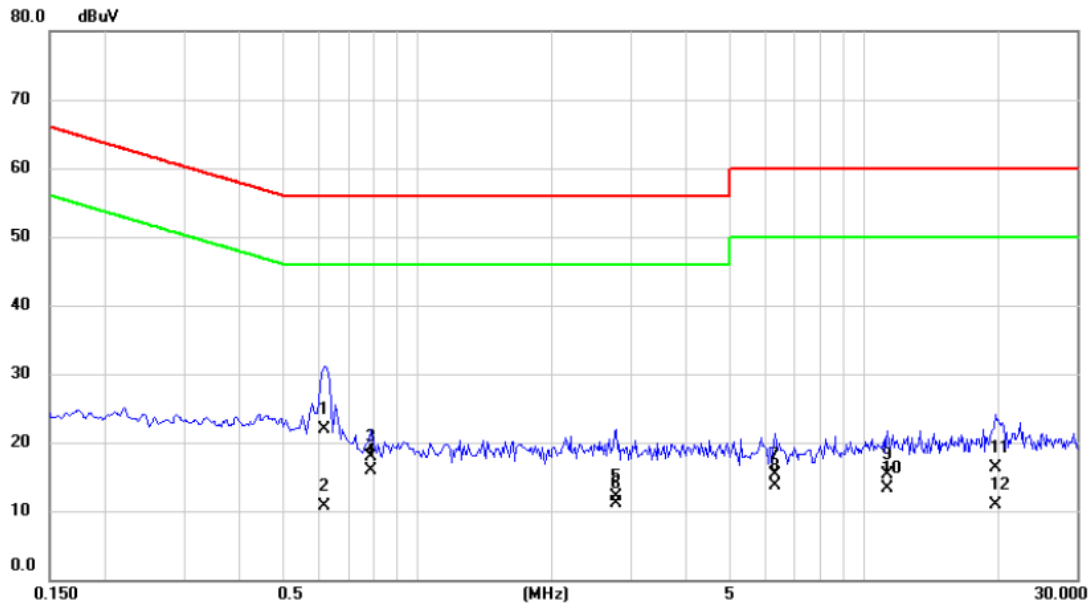
**Above 1000MHz**



## APPENDIX A - CONDUCTED EMISSION

Test Mode : Normal Link

### Line

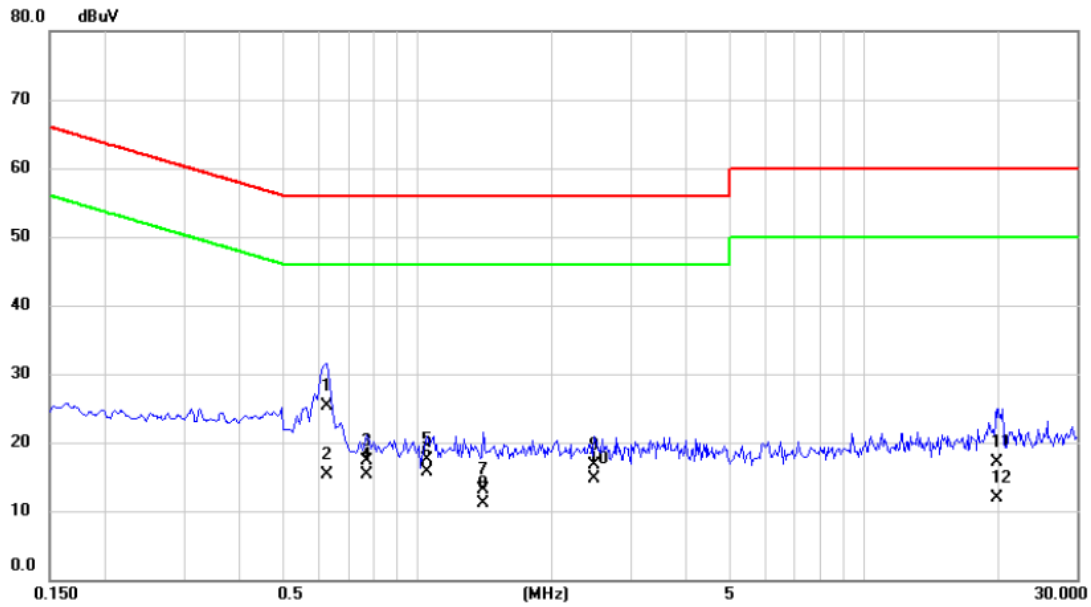


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.6170	12.10	9.77	21.87	56.00	-34.13	QP	
2		0.6170	1.00	9.77	10.77	46.00	-35.23	AVG	
3		0.7880	8.20	9.78	17.98	56.00	-38.02	QP	
4	*	0.7880	6.10	9.78	15.88	46.00	-30.12	AVG	
5		2.7770	2.20	9.84	12.04	56.00	-43.96	QP	
6		2.7770	1.20	9.84	11.04	46.00	-34.96	AVG	
7		6.3000	5.40	9.92	15.32	60.00	-44.68	QP	
8		6.3000	3.70	9.92	13.62	50.00	-36.38	AVG	
9		11.3000	5.30	10.00	15.30	60.00	-44.70	QP	
10		11.3000	3.40	10.00	13.40	50.00	-36.60	AVG	
11		19.6500	6.30	10.00	16.30	60.00	-43.70	QP	
12		19.6500	1.00	10.00	11.00	50.00	-39.00	AVG	



Test Mode : Normal Link

### Neutral

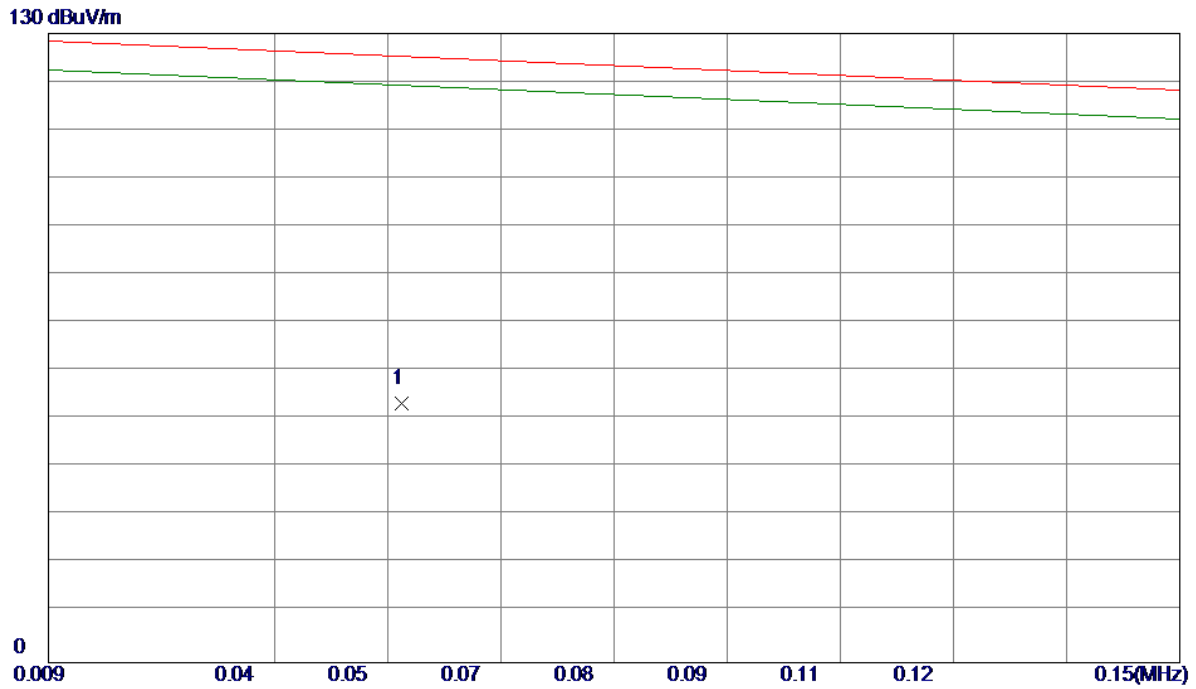


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.6260	15.60	9.71	25.31	56.00	-30.69	QP	
2		0.6260	5.60	9.71	15.31	46.00	-30.69	AVG	
3		0.7700	7.60	9.73	17.33	56.00	-38.67	QP	
4		0.7700	5.50	9.73	15.23	46.00	-30.77	AVG	
5		1.0490	7.80	9.75	17.55	56.00	-38.45	QP	
6	*	1.0490	6.00	9.75	15.75	46.00	-30.25	AVG	
7		1.4000	3.40	9.75	13.15	56.00	-42.85	QP	
8		1.4000	1.30	9.75	11.05	46.00	-34.95	AVG	
9		2.4890	7.00	9.78	16.78	56.00	-39.22	QP	
10		2.4890	5.00	9.78	14.78	46.00	-31.22	AVG	
11		19.8000	7.00	10.04	17.04	60.00	-42.96	QP	
12		19.8000	1.90	10.04	11.94	50.00	-38.06	AVG	

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

Test Mode: TX B MODE CHANNEL 01

Ant 0°

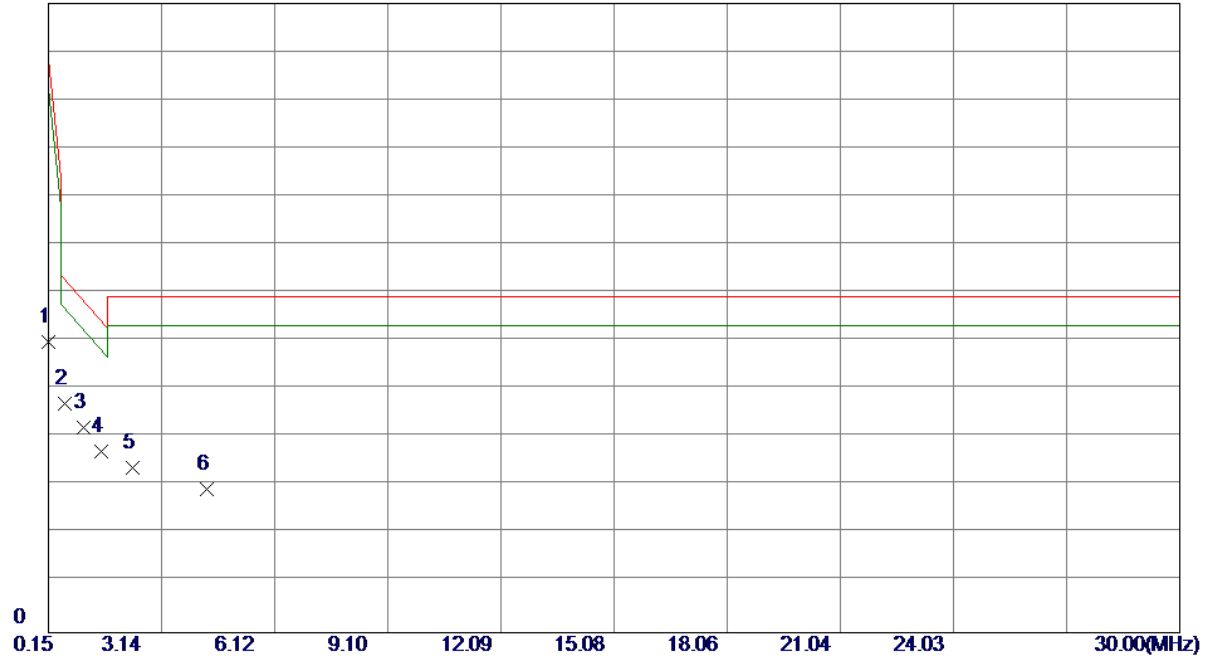


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	0.0530	40.57	12.95	53.52	125.34	-71.82	Peak	

Test Mode: TX B MODE CHANNEL 01

Ant 0°

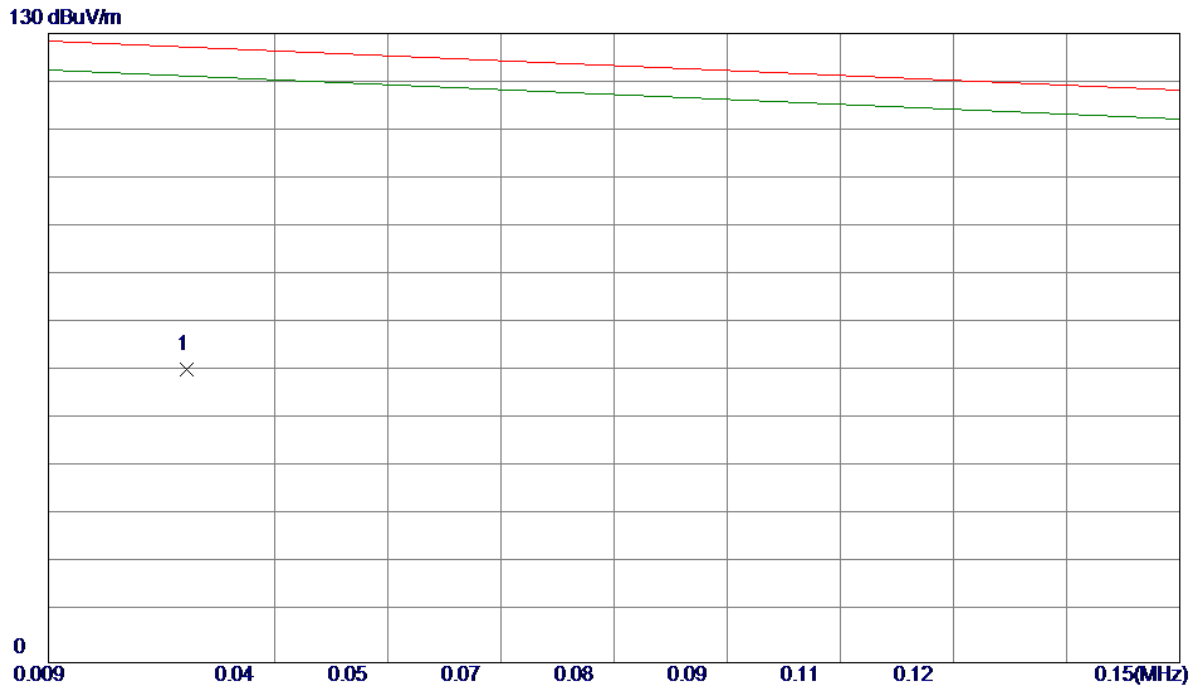
130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	0.1500	47.94	12.02	59.96	118.33	-58.37	Peak	
2 *	0.5675	35.40	11.83	47.23	73.11	-25.88	Peak	
3	1.0750	30.36	11.97	42.33	68.58	-26.25	Peak	
4	1.5530	25.58	11.75	37.33	64.32	-26.99	Peak	
5	2.3887	22.56	11.38	33.94	69.54	-35.60	Peak	
6	4.3290	18.38	11.30	29.68	69.54	-39.86	Peak	

Test Mode: TX B MODE CHANNEL 01

Ant 90°

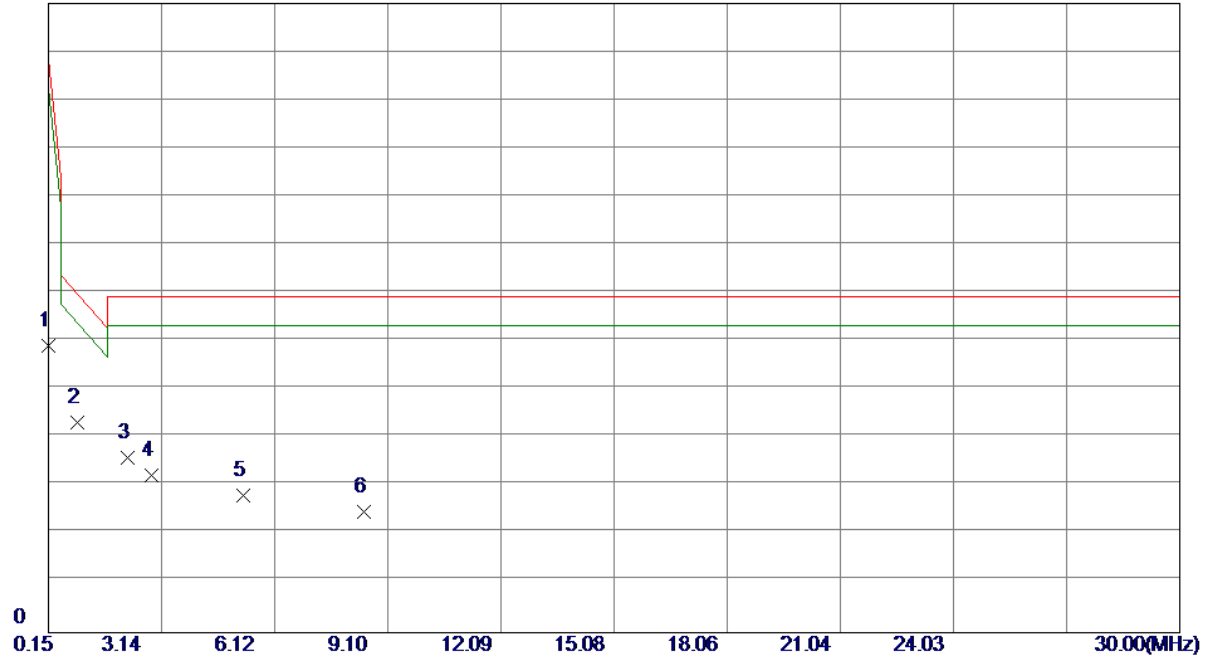


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	0.0262	44.46	16.02	60.48	127.27	-66.79	Peak	

Test Mode: TX B MODE CHANNEL 01

Ant 90°

130 dBuV/m

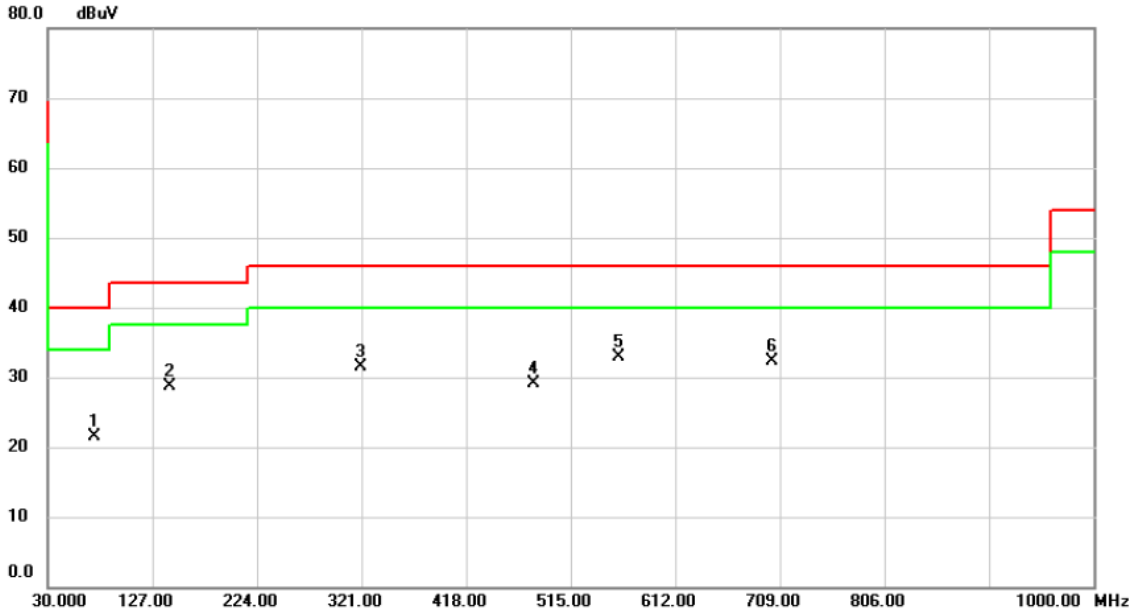


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	0.1500	47.17	12.02	59.19	118.33	-59.14	Peak	
2 *	0.9261	31.48	11.97	43.45	69.91	-26.46	Peak	
3	2.2395	24.62	11.44	36.06	69.54	-33.48	Peak	
4	2.8664	21.25	11.16	32.41	69.54	-37.13	Peak	
5	5.2842	16.97	11.39	28.36	69.54	-41.18	Peak	
6	8.4780	13.54	11.33	24.87	69.54	-44.67	Peak	

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

Test Mode: TX N-20M MODE 2462MHz

**Vertical**

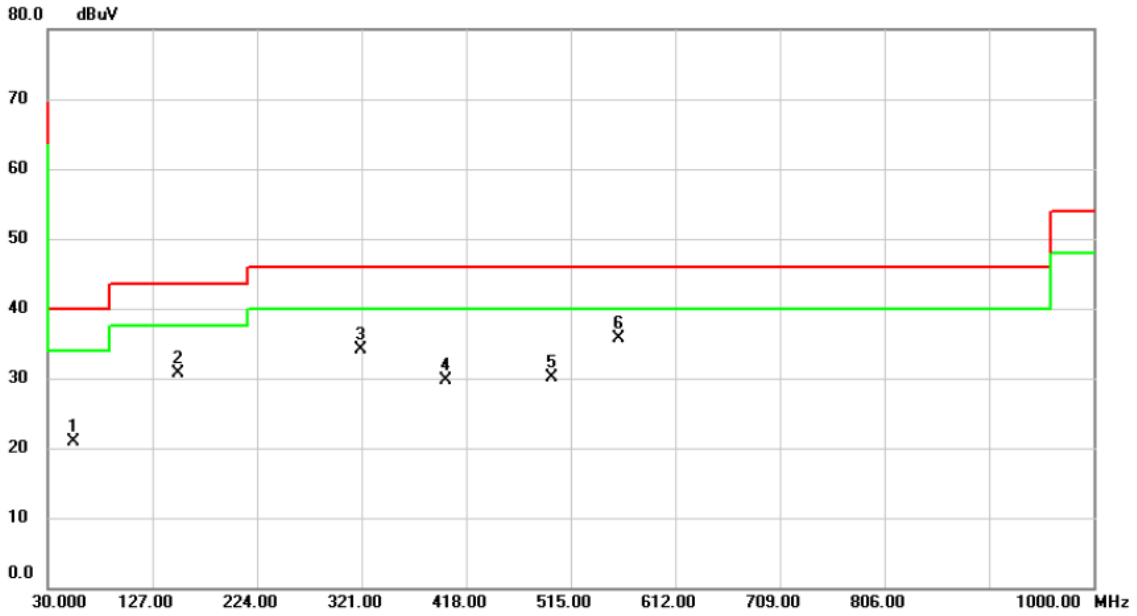


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		72.6800	32.11	-10.65	21.46	40.00	-18.54	peak	
2		143.4900	37.72	-9.09	28.63	43.50	-14.87	peak	
3		320.0300	38.57	-6.99	31.58	46.00	-14.42	peak	
4		480.0800	32.12	-3.06	29.06	46.00	-16.94	peak	
5	*	559.6200	34.44	-1.47	32.97	46.00	-13.03	peak	
6		701.2400	31.50	0.88	32.38	46.00	-13.62	peak	



Test Mode: TX N-20M MODE 2462MHz

**Horizontal**

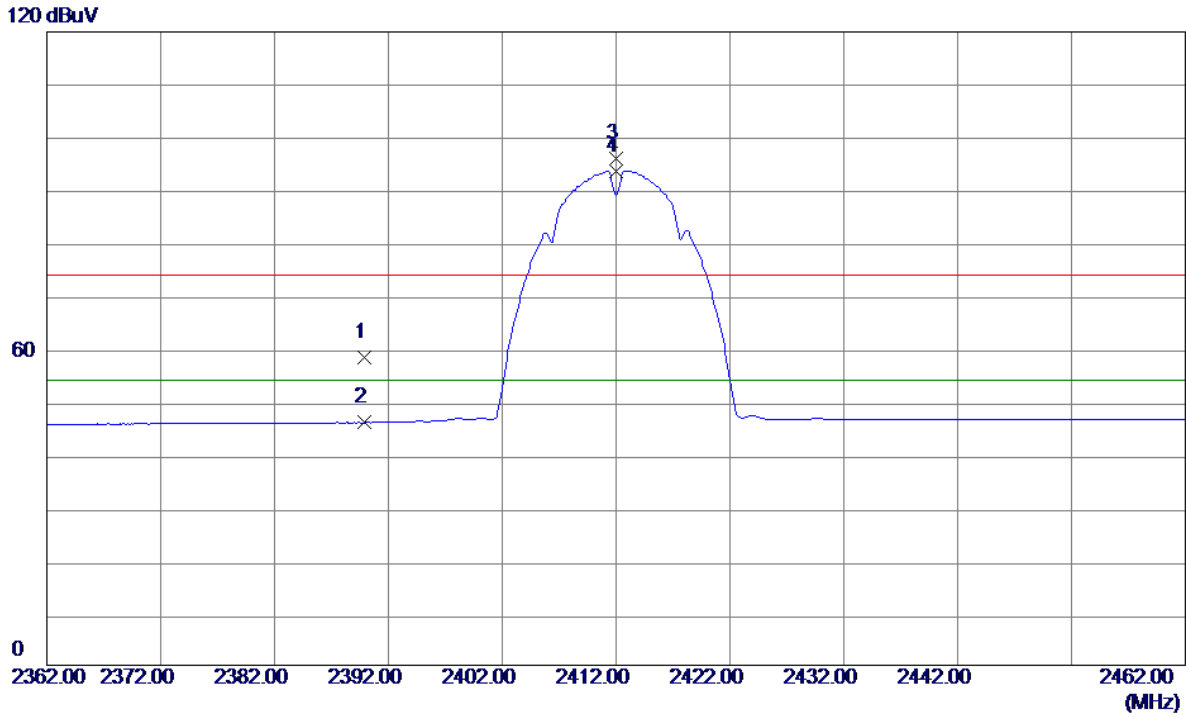


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		54.2500	29.42	-8.44	20.98	40.00	-19.02	peak	
2		150.2800	39.75	-8.95	30.80	43.50	-12.70	peak	
3		320.0300	41.03	-6.99	34.04	46.00	-11.96	peak	
4		399.5700	34.68	-4.95	29.73	46.00	-16.27	peak	
5		497.5400	32.89	-2.77	30.12	46.00	-15.88	peak	
6	*	559.6200	37.08	-1.47	35.61	46.00	-10.39	peak	

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

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

**Vertical**

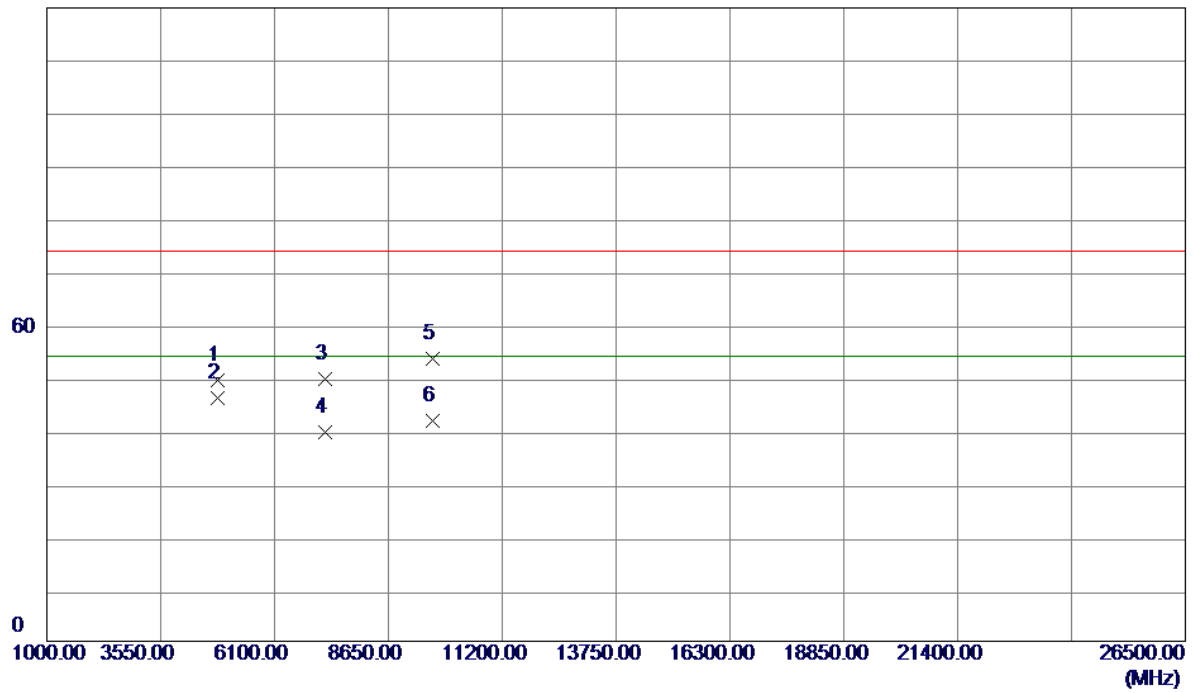


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2389.8879	27.15	31.06	58.21	74.00	-15.79	Peak	
2	2389.8879	14.94	31.06	46.00	54.00	-8.00	AVG	
3	2412.0000	64.82	31.15	95.97	74.00	21.97	Peak	
4 *	2412.0000	62.50	31.15	93.65	54.00	39.65	AVG	

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

### Vertical

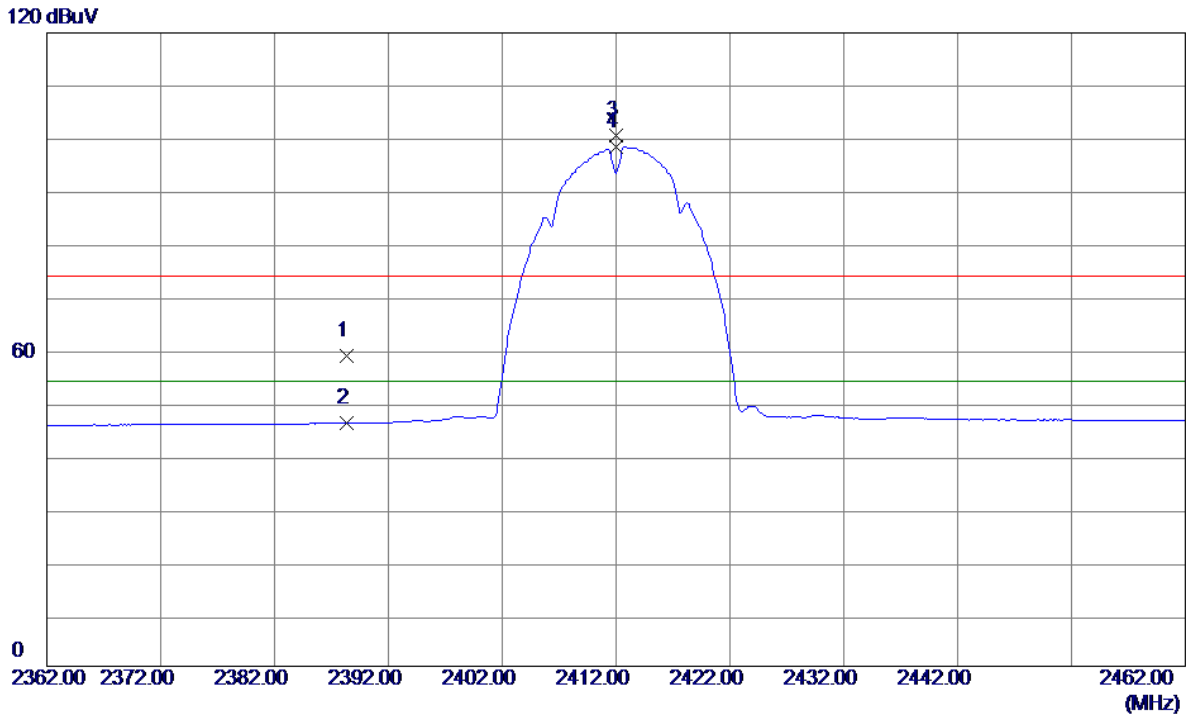
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measurement dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	60.74	-11.37	49.37	74.00	-24.63	Peak	
2 *	4824.0000	57.44	-11.37	46.07	54.00	-7.93	AVG	
3	7236.0000	55.04	-5.40	49.64	74.00	-24.36	Peak	
4	7236.0000	44.99	-5.40	39.59	54.00	-14.41	AVG	
5	9648.0000	52.91	0.53	53.44	74.00	-20.56	Peak	
6	9648.0000	41.29	0.53	41.82	54.00	-12.18	AVG	

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

### Horizontal

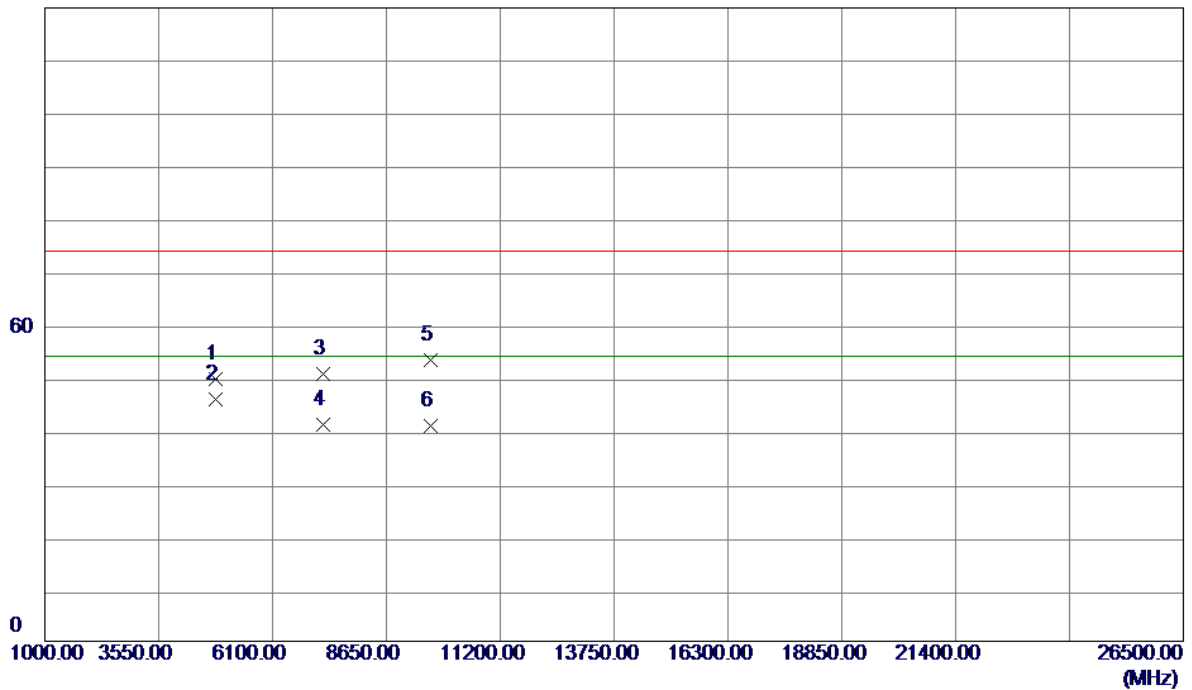


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2388.2920	27.68	31.06	58.74	74.00	-15.26	Peak	
2	2388.2920	15.01	31.06	46.07	54.00	-7.93	AVG	
3	2412.0000	69.37	31.15	100.52	74.00	26.52	Peak	
4 *	2412.0000	67.19	31.15	98.34	54.00	44.34	AVG	

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

### Horizontal

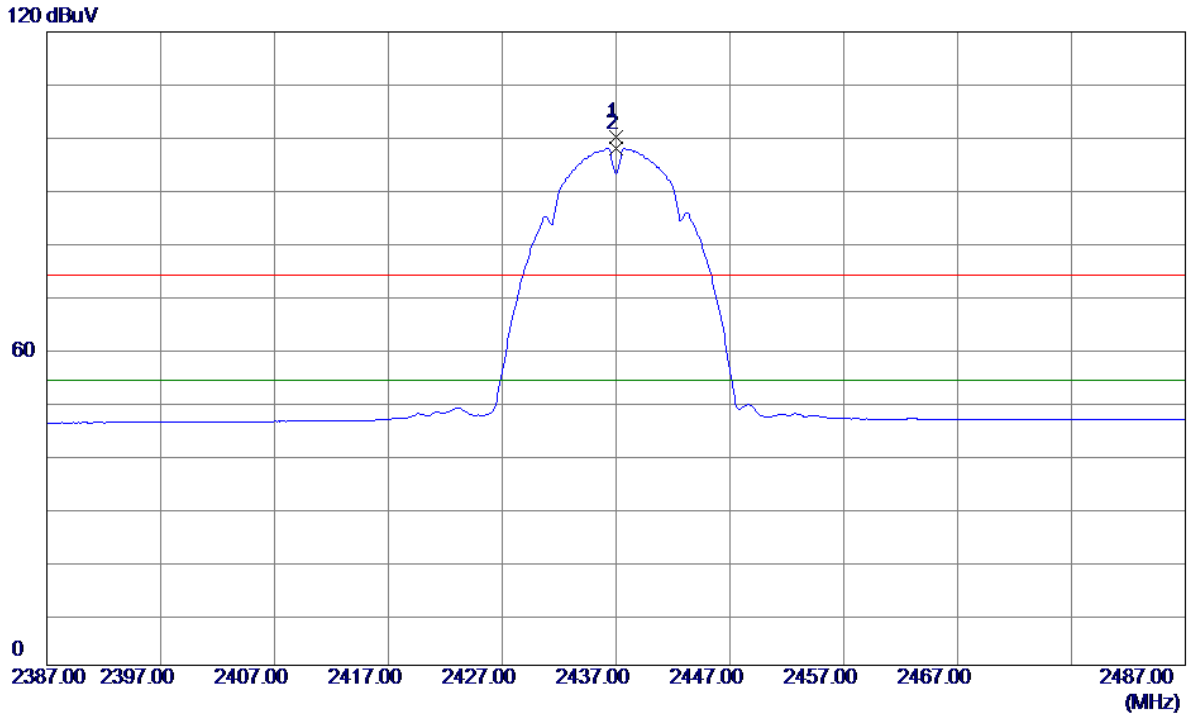
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	61.05	-11.37	49.68	74.00	-24.32	Peak	
2 *	4824.0000	57.24	-11.37	45.87	54.00	-8.13	AVG	
3	7236.0000	56.13	-5.40	50.73	74.00	-23.27	Peak	
4	7236.0000	46.45	-5.40	41.05	54.00	-12.95	AVG	
5	9648.0000	52.73	0.53	53.26	74.00	-20.74	Peak	
6	9648.0000	40.27	0.53	40.80	54.00	-13.20	AVG	

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

**Vertical**

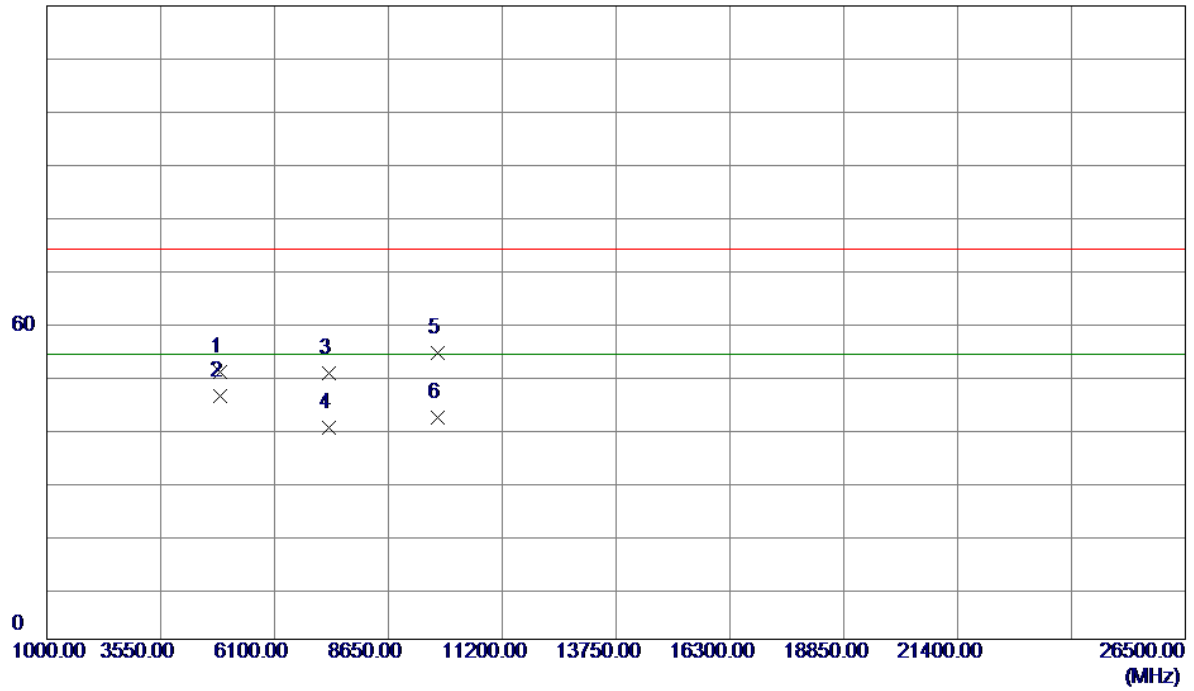


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2437.0000	68.94	31.24	100.18	74.00	26.18	Peak	
2 *	2437.0000	66.60	31.24	97.84	54.00	43.84	AVG	

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

**Vertical**

120 dBuV

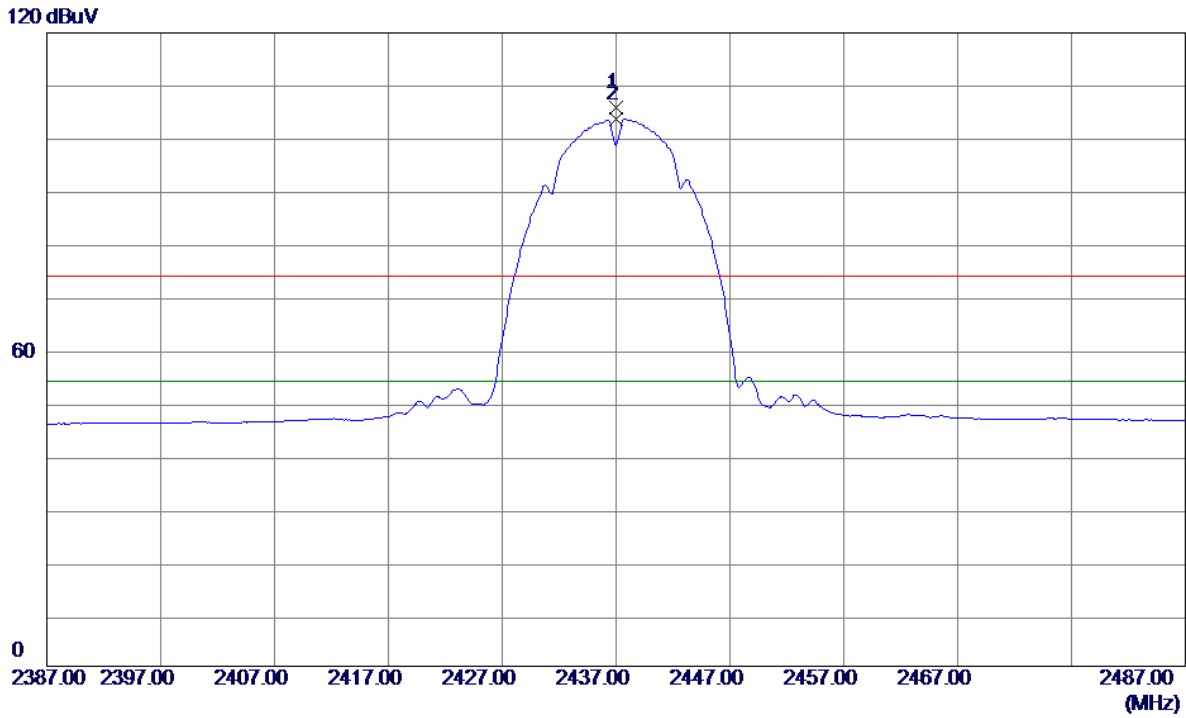


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4874.0000	61.88	-11.29	50.59	74.00	-23.41	Peak	
2 *	4874.0000	57.42	-11.29	46.13	54.00	-7.87	AVG	
3	7311.0000	55.56	-5.14	50.42	74.00	-23.58	Peak	
4	7311.0000	45.25	-5.14	40.11	54.00	-13.89	AVG	
5	9748.0000	53.24	0.90	54.14	74.00	-19.86	Peak	
6	9748.0000	41.10	0.90	42.00	54.00	-12.00	AVG	



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

### Horizontal

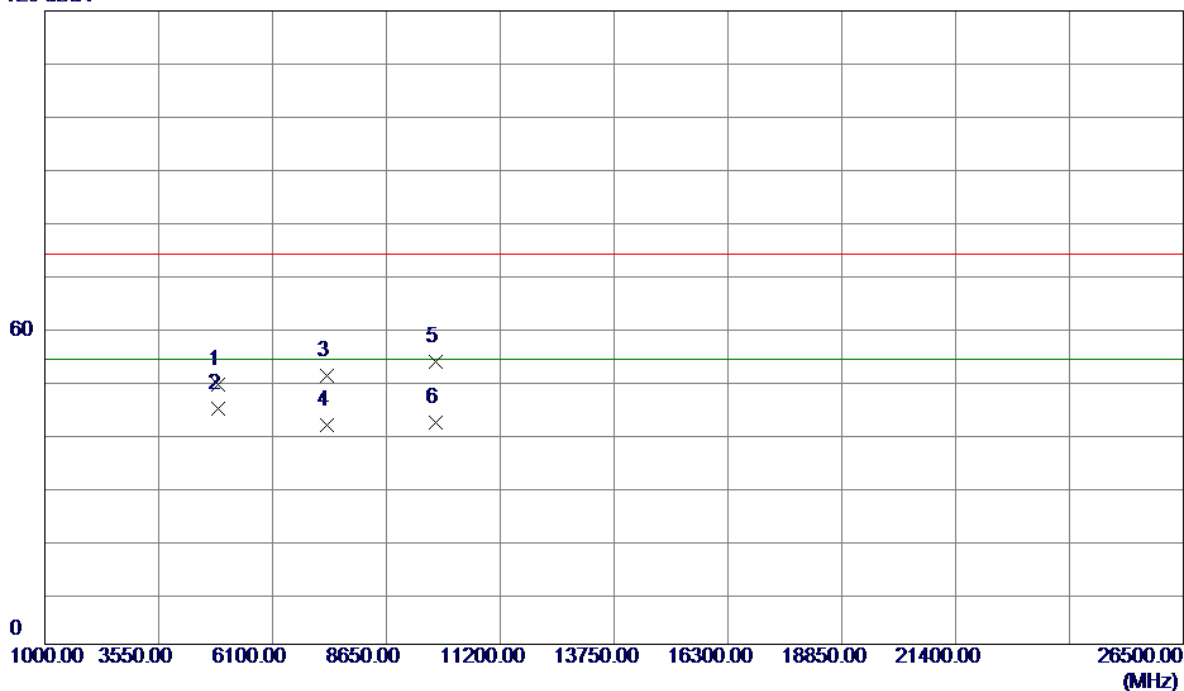


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2437.0000	74.63	31.24	105.87	74.00	31.87	Peak	
2 *	2437.0000	72.36	31.24	103.60	54.00	49.60	AVG	

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

### Horizontal

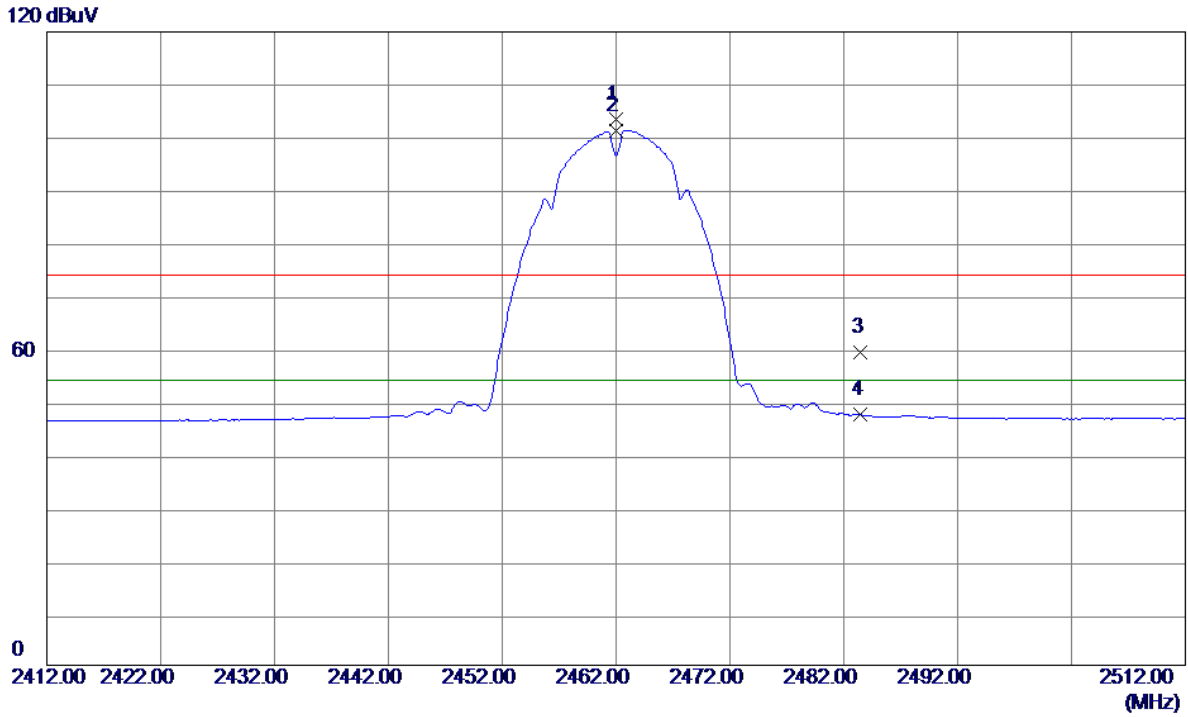
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4874.0000	60.53	-11.29	49.24	74.00	-24.76	Peak	
2 *	4874.0000	55.88	-11.29	44.59	54.00	-9.41	AVG	
3	7311.0000	56.08	-5.14	50.94	74.00	-23.06	Peak	
4	7311.0000	46.60	-5.14	41.46	54.00	-12.54	AVG	
5	9748.0000	52.64	0.90	53.54	74.00	-20.46	Peak	
6	9748.0000	41.00	0.90	41.90	54.00	-12.10	AVG	

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

**Vertical**

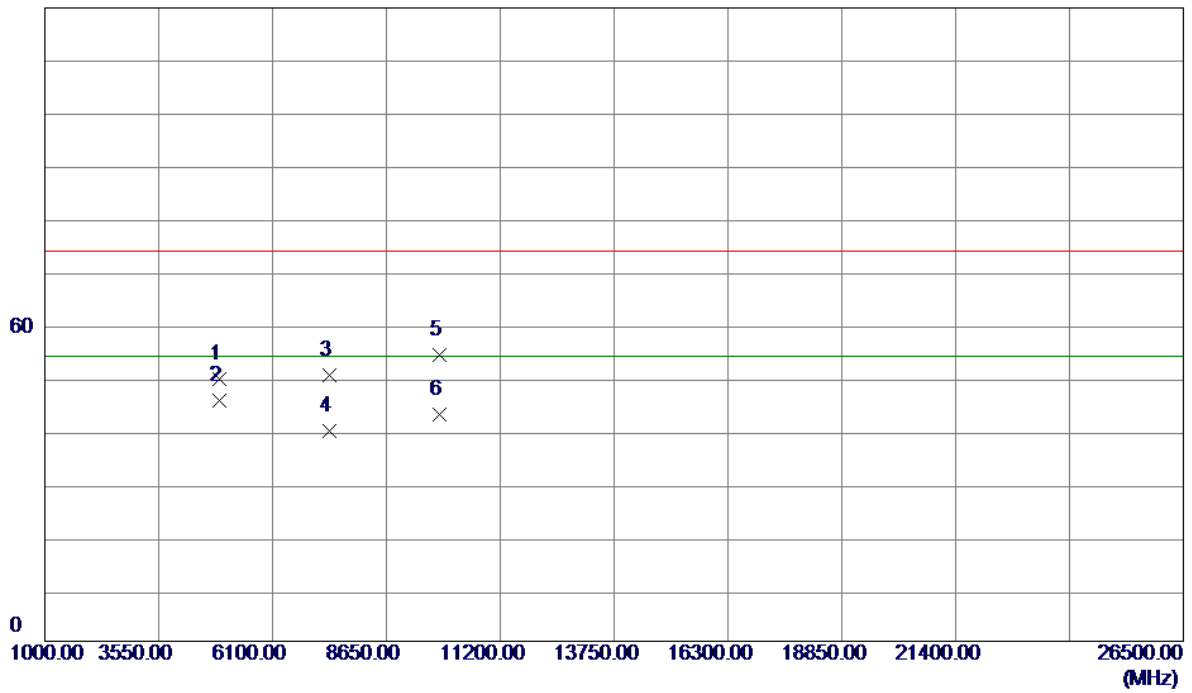


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2462.0000	72.15	31.33	103.48	74.00	29.48	Peak	
2 *	2462.0000	69.98	31.33	101.31	54.00	47.31	AVG	
3	2483.5000	27.87	31.41	59.28	74.00	-14.72	Peak	
4	2483.5000	16.03	31.41	47.44	54.00	-6.56	AVG	

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

**Vertical**

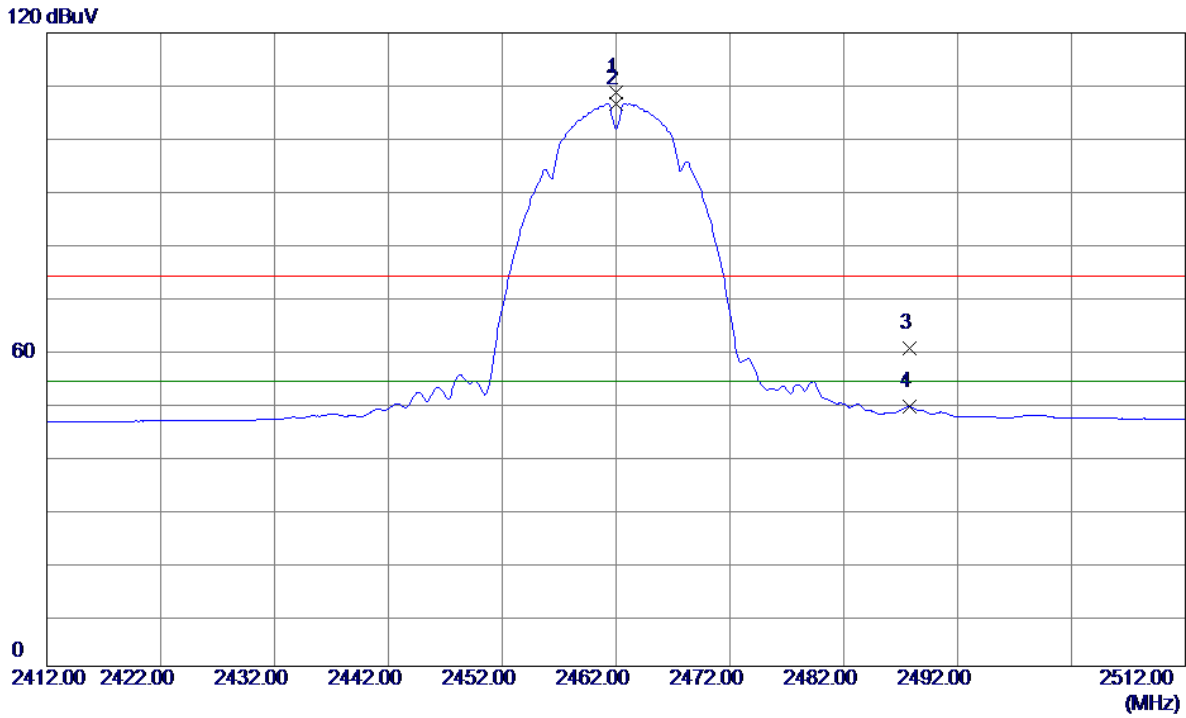
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4924.0000	60.99	-11.22	49.77	74.00	-24.23	Peak	
2 *	4924.0000	56.84	-11.22	45.62	54.00	-8.38	AVG	
3	7386.0000	55.31	-4.87	50.44	74.00	-23.56	Peak	
4	7386.0000	44.82	-4.87	39.95	54.00	-14.05	AVG	
5	9848.0000	53.07	1.27	54.34	74.00	-19.66	Peak	
6	9848.0000	41.66	1.27	42.93	54.00	-11.07	AVG	

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

### Horizontal

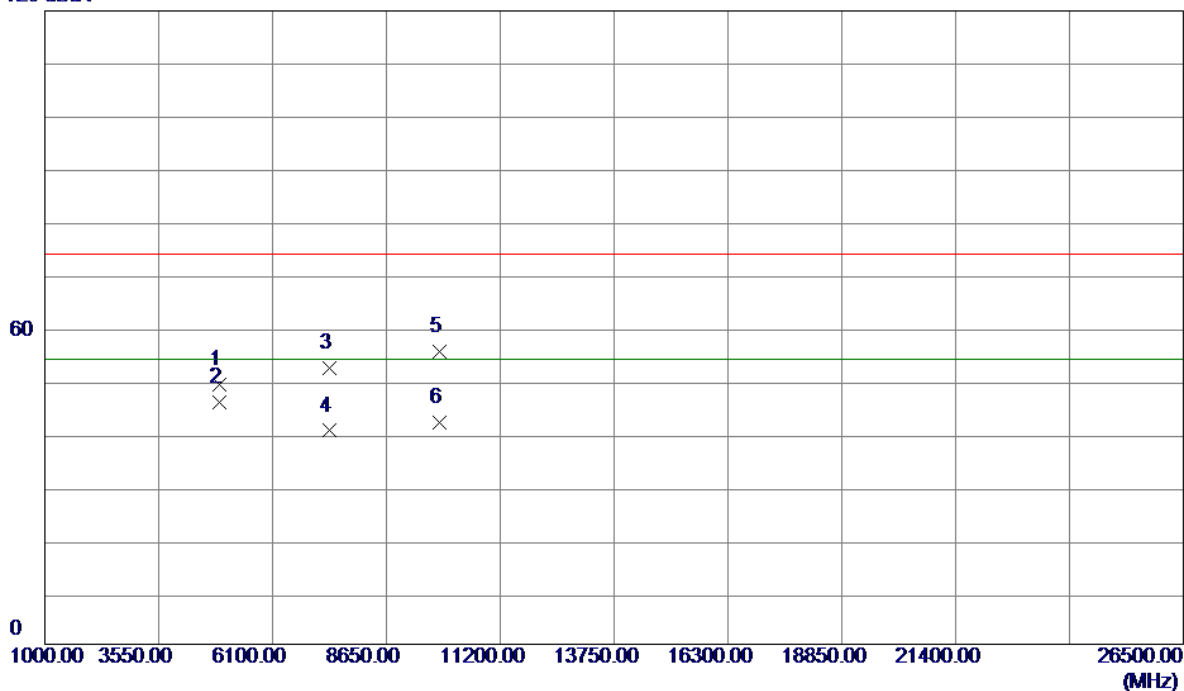


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2462.0000	77.49	31.33	108.82	74.00	34.82	Peak	
2 *	2462.0000	75.27	31.33	106.60	54.00	52.60	AVG	
3	2487.7569	28.81	31.42	60.23	74.00	-13.77	Peak	
4	2487.7569	17.88	31.42	49.30	54.00	-4.70	AVG	

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

### Horizontal

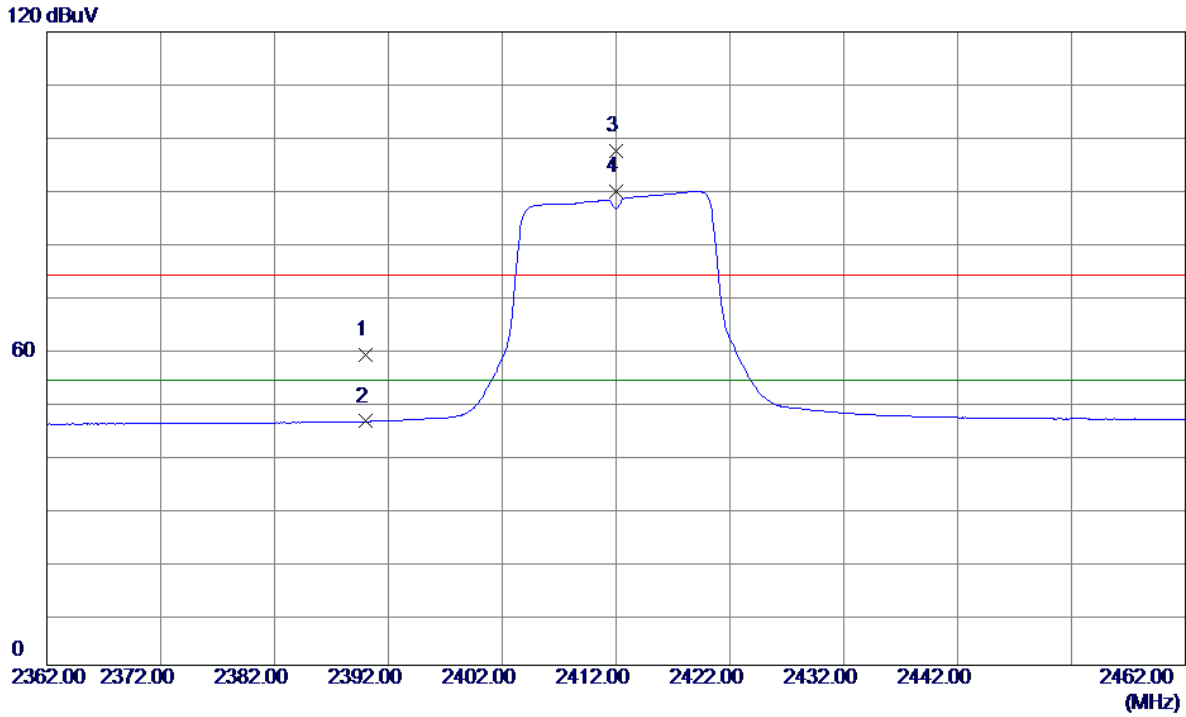
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4924.0000	60.33	-11.22	49.11	74.00	-24.89	Peak	
2 *	4924.0000	56.98	-11.22	45.76	54.00	-8.24	AVG	
3	7386.0000	57.11	-4.87	52.24	74.00	-21.76	Peak	
4	7386.0000	45.31	-4.87	40.44	54.00	-13.56	AVG	
5	9848.0000	54.21	1.27	55.48	74.00	-18.52	Peak	
6	9848.0000	40.74	1.27	42.01	54.00	-11.99	AVG	

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

### Vertical

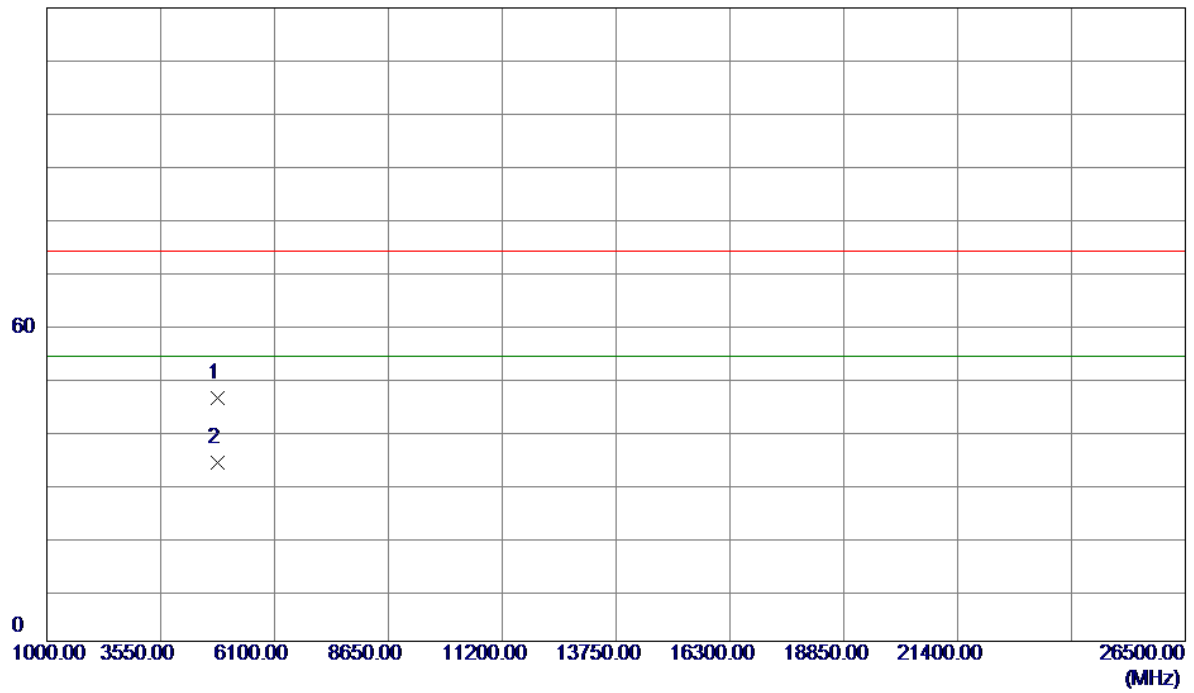


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2390.0000	27.75	31.07	58.82	74.00	-15.18	Peak	
2	2390.0000	15.13	31.07	46.20	54.00	-7.80	AVG	
3	2412.0000	66.33	31.15	97.48	74.00	23.48	Peak	
4 *	2412.0000	58.56	31.15	89.71	54.00	35.71	AVG	

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

**Vertical**

120 dBuV

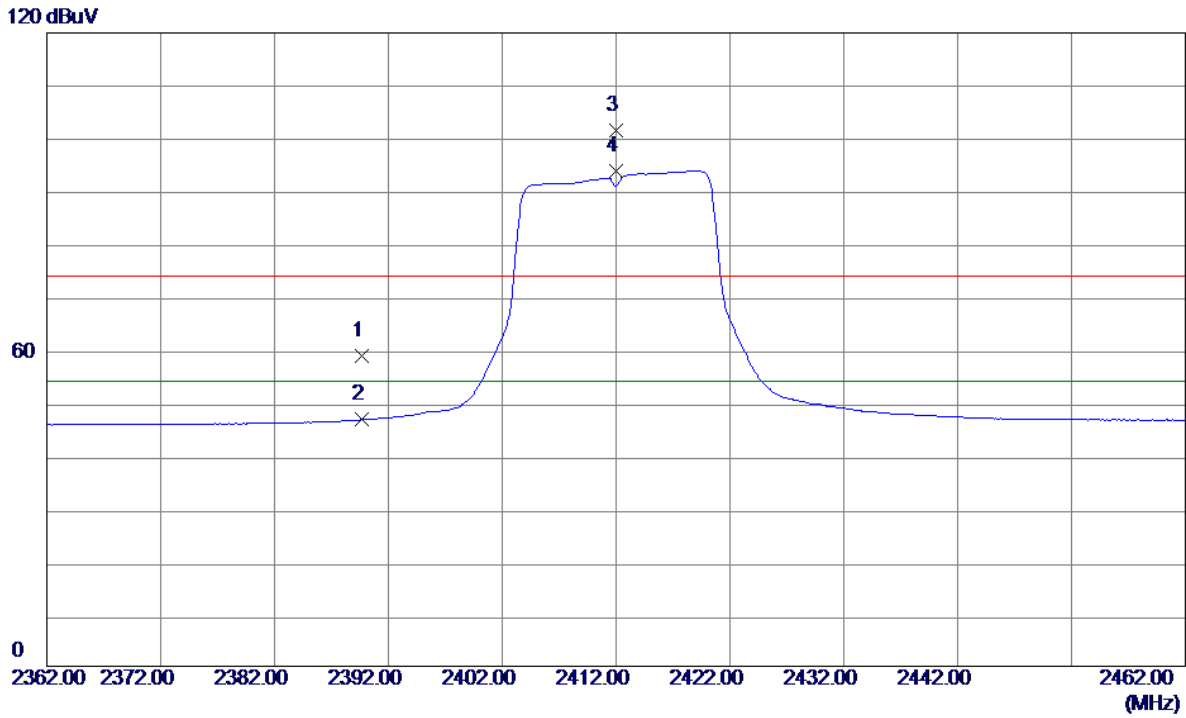


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	57.56	-11.37	46.19	74.00	-27.81	Peak	
2 *	4824.0000	45.12	-11.37	33.75	54.00	-20.25	AVG	



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

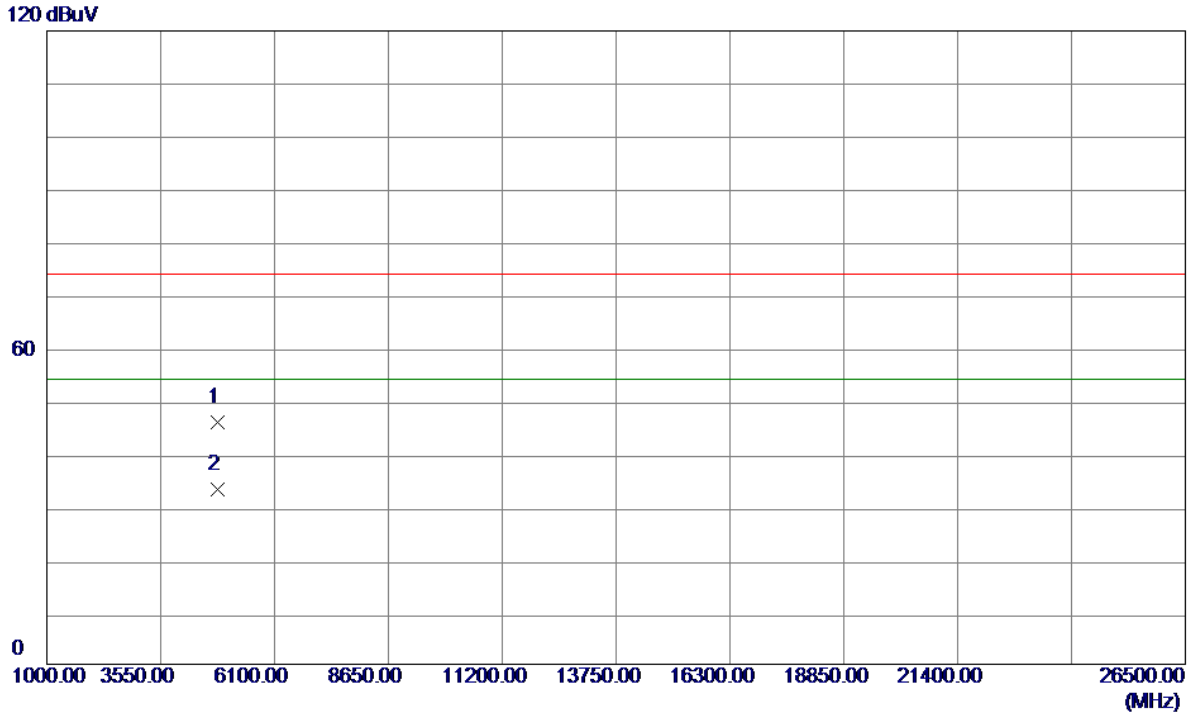
### Horizontal



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2389.6640	27.67	31.06	58.73	74.00	-15.27	Peak	
2	2389.6640	15.66	31.06	46.72	54.00	-7.28	AVG	
3	2412.0000	70.44	31.15	101.59	74.00	27.59	Peak	
4 *	2412.0000	62.67	31.15	93.82	54.00	39.82	AVG	

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

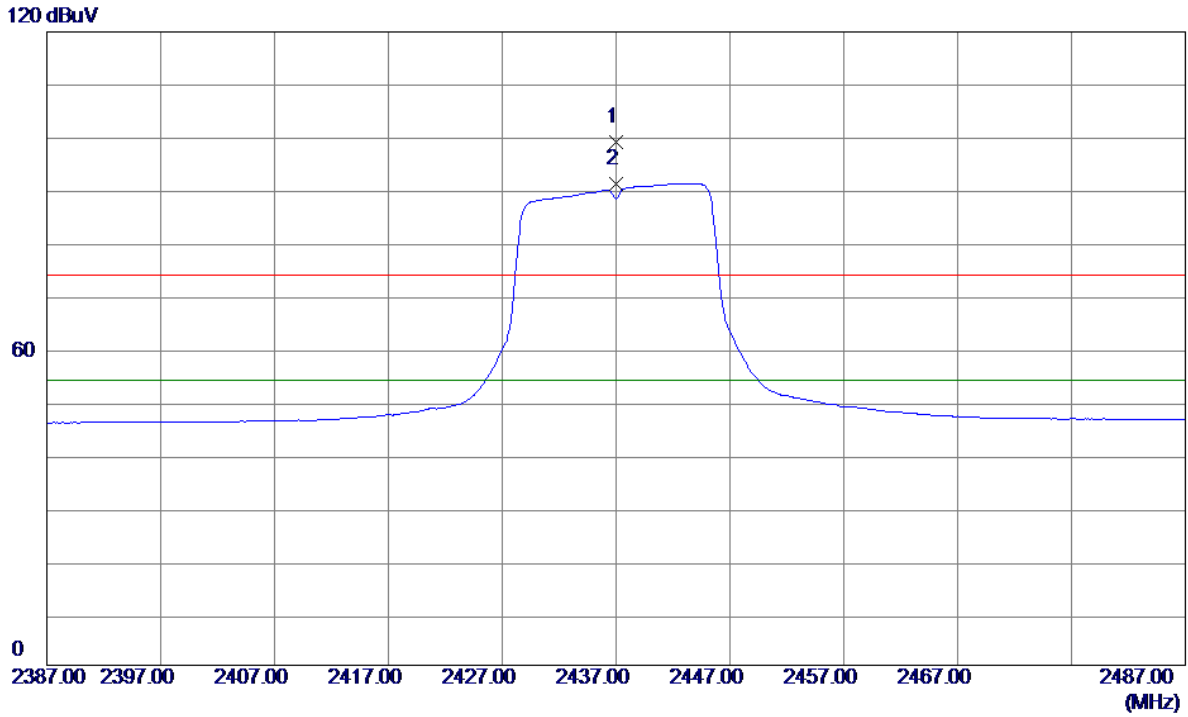
**Horizontal**



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	57.20	-11.37	45.83	74.00	-28.17	Peak	
2 *	4824.0000	44.56	-11.37	33.19	54.00	-20.81	AVG	

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

**Vertical**

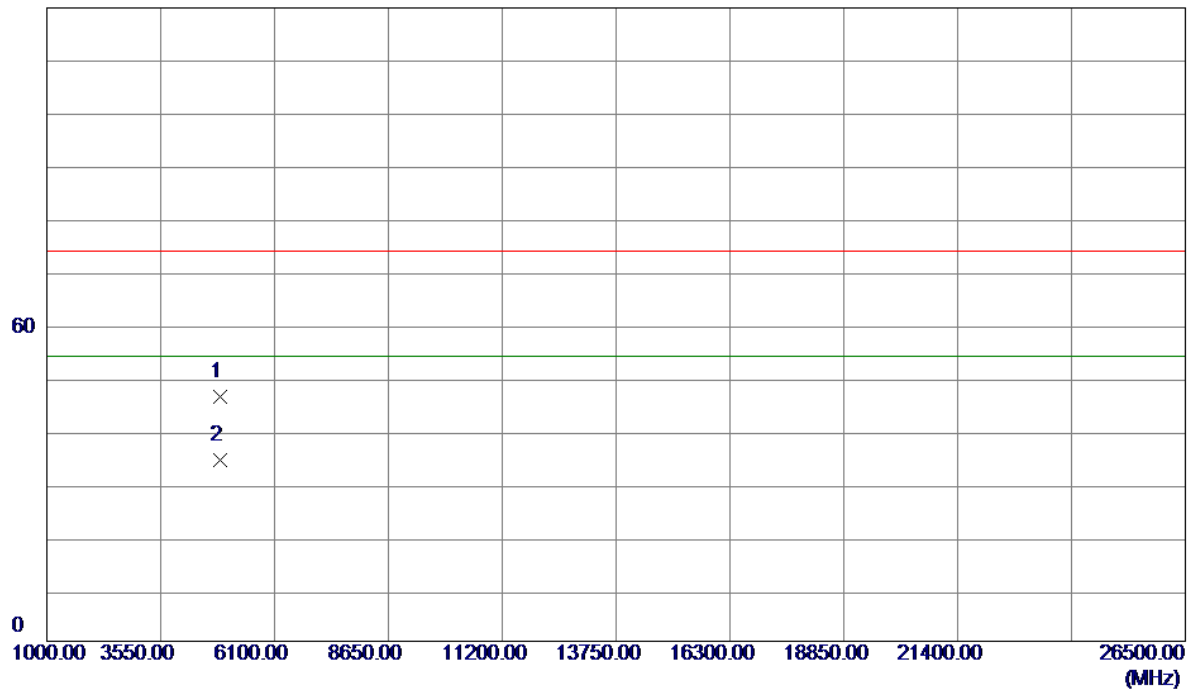


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2437.0000	67.82	31.24	99.06	74.00	25.06	Peak	
2 *	2437.0000	60.07	31.24	91.31	54.00	37.31	AVG	

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

**Vertical**

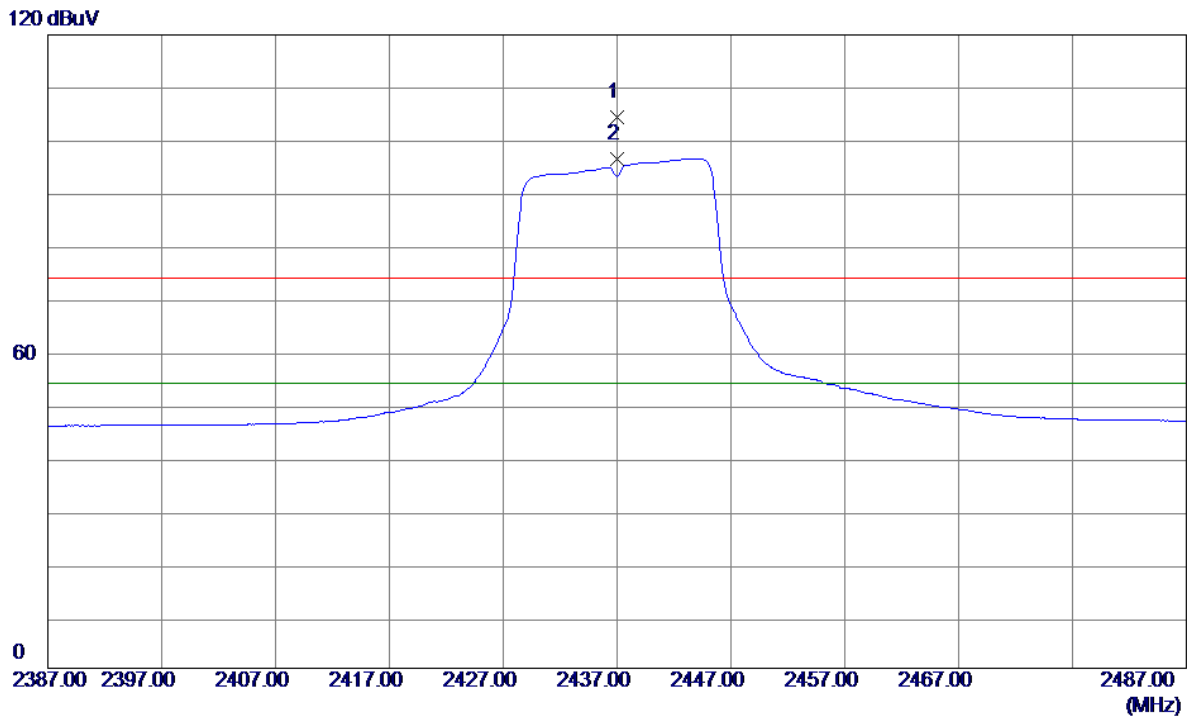
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4874.0000	57.64	-11.29	46.35	74.00	-27.65	Peak	
2 *	4874.0000	45.66	-11.29	34.37	54.00	-19.63	AVG	

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

### Horizontal

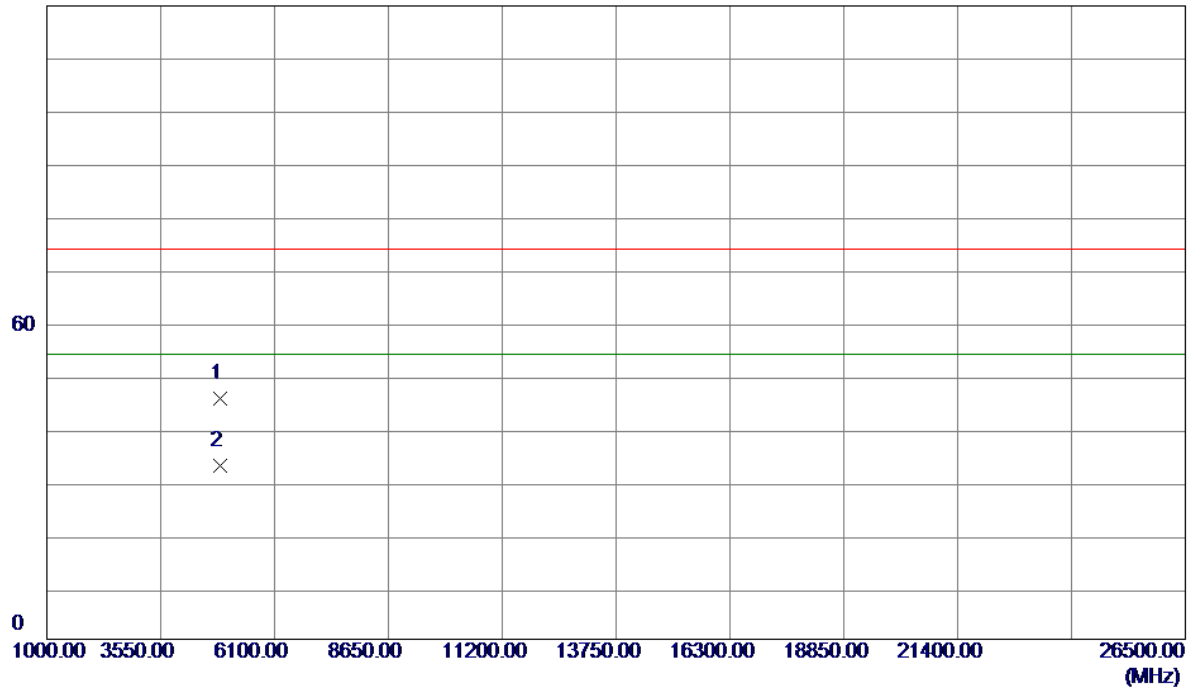


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2437.0000	73.07	31.24	104.31	74.00	30.31	Peak	
2 *	2437.0000	65.30	31.24	96.54	54.00	42.54	AVG	

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

**Horizontal**

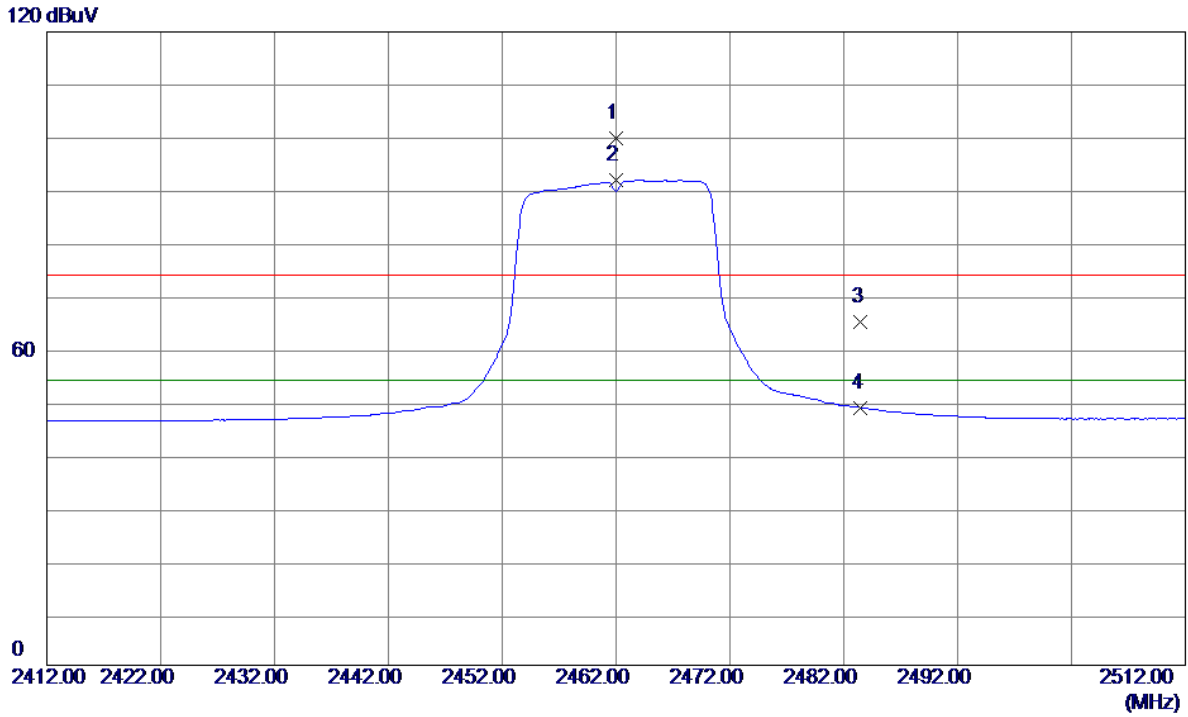
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4874.0000	56.94	-11.29	45.65	74.00	-28.35	Peak	
2 *	4874.0000	44.21	-11.29	32.92	54.00	-21.08	AVG	

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

### Vertical

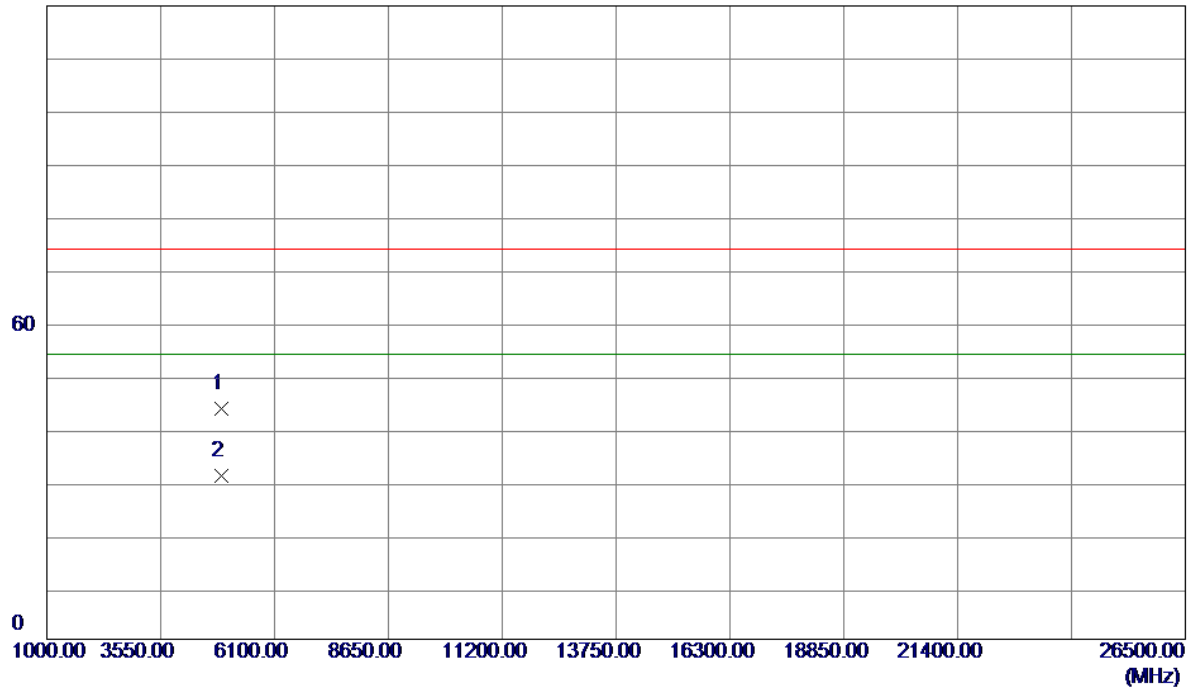


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2462.0000	68.46	31.33	99.79	74.00	25.79	Peak	
2 *	2462.0000	60.51	31.33	91.84	54.00	37.84	AVG	
3	2483.5000	33.65	31.41	65.06	74.00	-8.94	Peak	
4	2483.5000	17.35	31.41	48.76	54.00	-5.24	AVG	

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

**Vertical**

120 dBuV/m

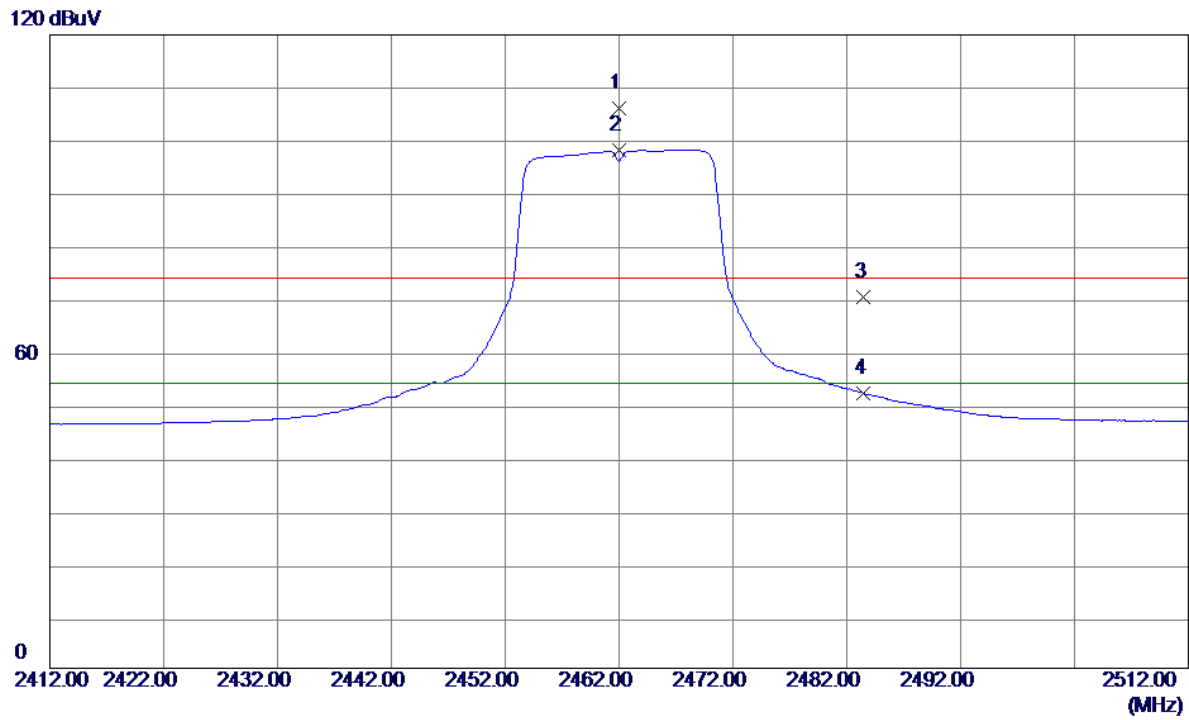


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4924.0000	54.81	-11.22	43.59	74.00	-30.41	Peak	
2 *	4924.0000	42.15	-11.22	30.93	54.00	-23.07	AVG	



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

### Horizontal

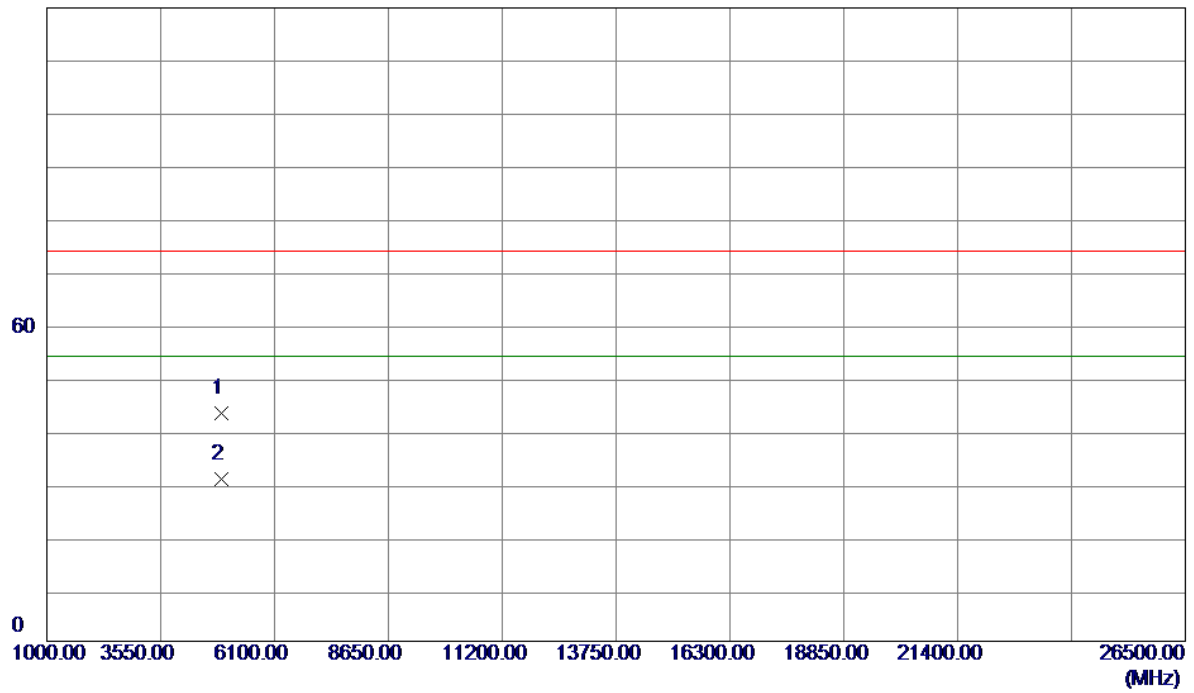


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2462.0000	74.66	31.33	105.99	74.00	31.99	Peak	
2 *	2462.0000	66.86	31.33	98.19	54.00	44.19	AVG	
3	2483.5000	38.81	31.41	70.22	74.00	-3.78	Peak	
4	2483.5000	20.61	31.41	52.02	54.00	-1.98	AVG	

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

**Horizontal**

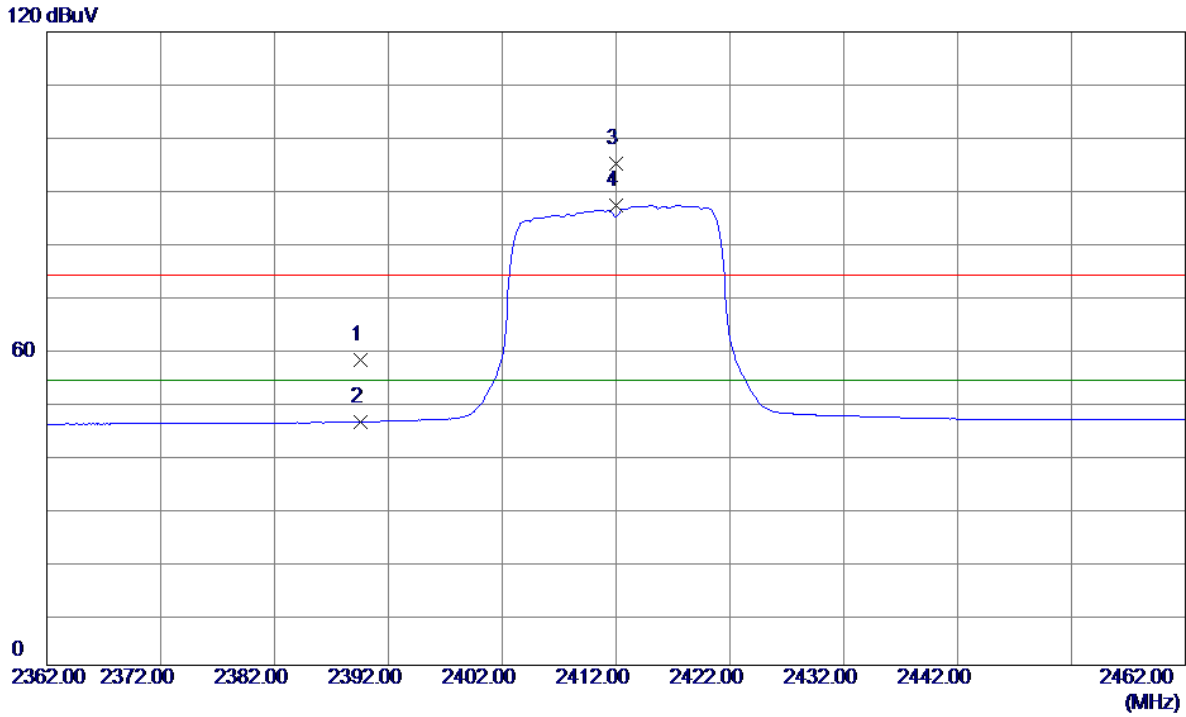
120 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4924.0000	54.37	-11.22	43.15	74.00	-30.85	Peak	
2 *	4924.0000	41.93	-11.22	30.71	54.00	-23.29	AVG	

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

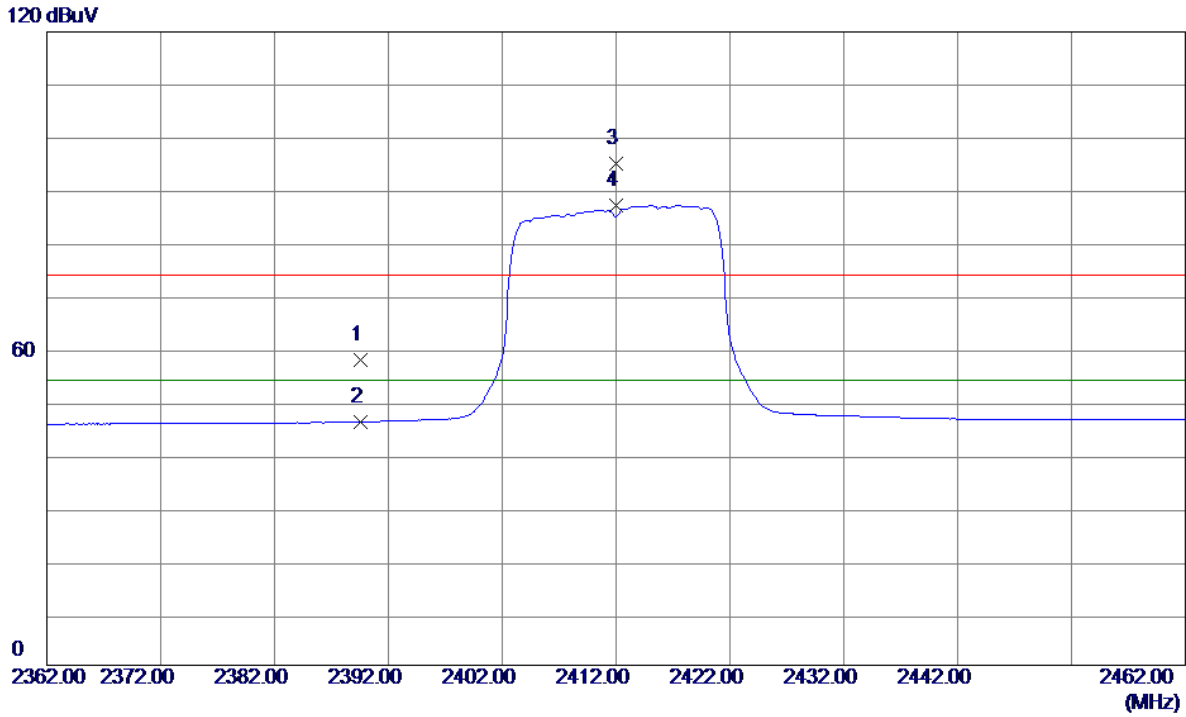
### Vertical



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2389.5520	26.73	31.06	57.79	74.00	-16.21	Peak	
2	2389.5520	15.05	31.06	46.11	54.00	-7.89	AVG	
3	2412.0000	63.79	31.15	94.94	74.00	20.94	Peak	
4 *	2412.0000	55.90	31.15	87.05	54.00	33.05	AVG	

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

### Vertical

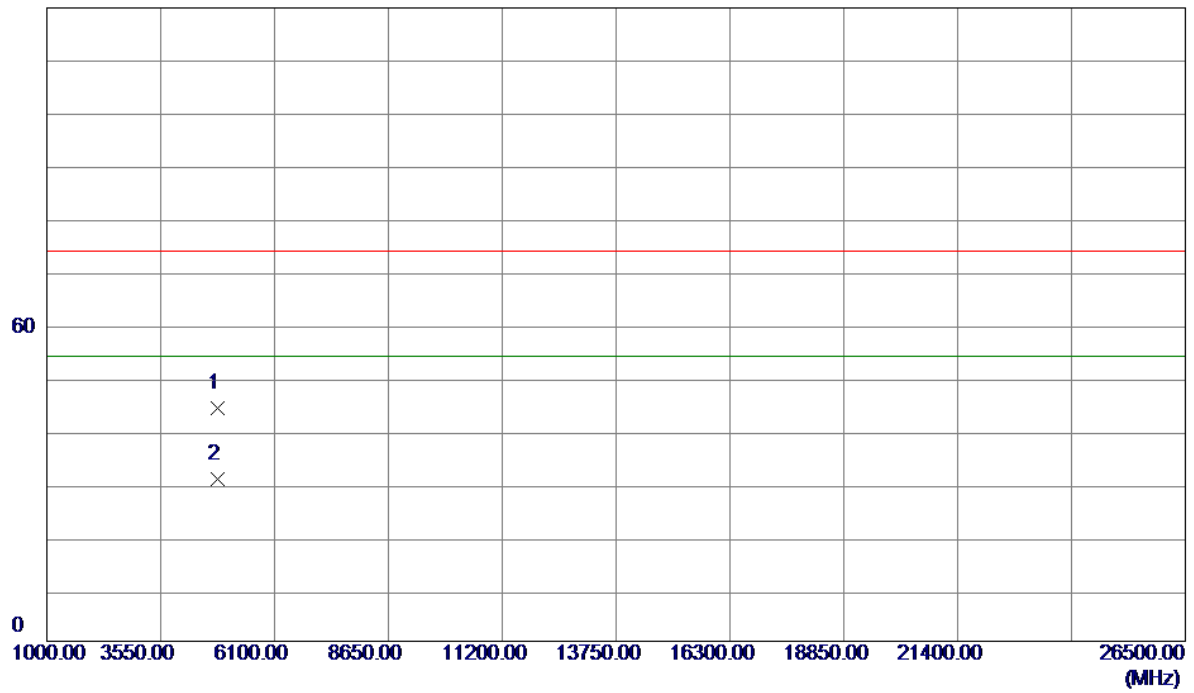


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2389.5520	26.73	31.06	57.79	74.00	-16.21	Peak	
2	2389.5520	15.05	31.06	46.11	54.00	-7.89	AVG	
3	2412.0000	63.79	31.15	94.94	74.00	20.94	Peak	
4 *	2412.0000	55.90	31.15	87.05	54.00	33.05	AVG	

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

### Vertical

120 dBuV

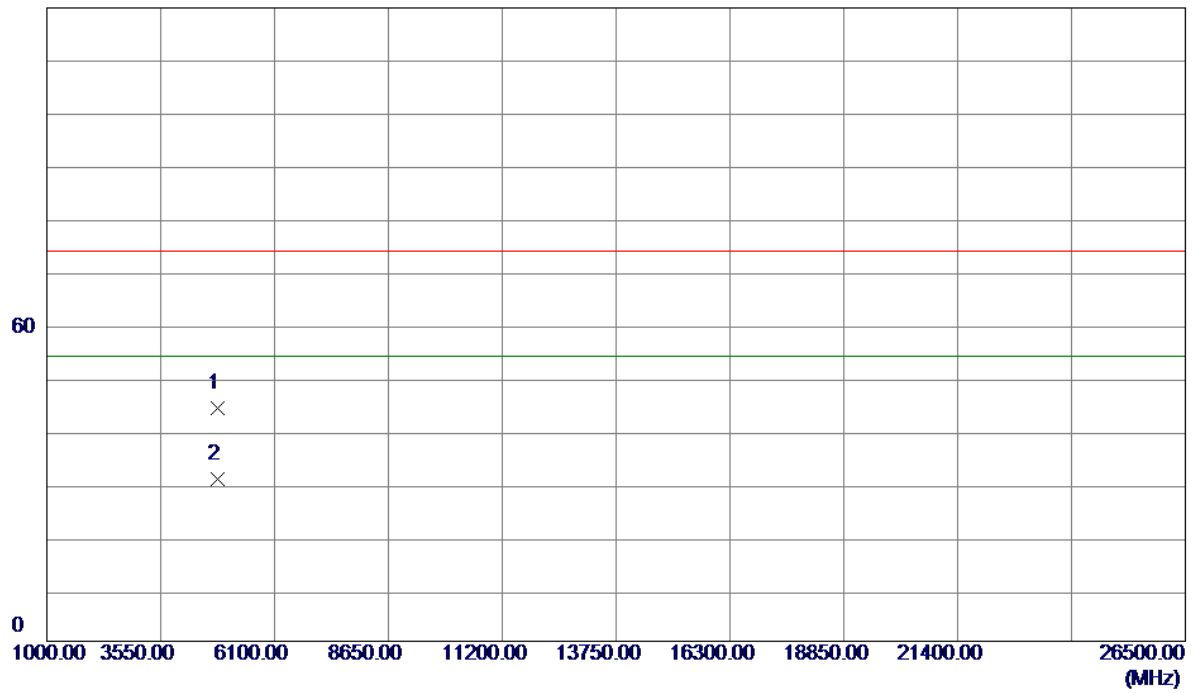


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	55.55	-11.37	44.18	74.00	-29.82	Peak	
2 *	4824.0000	41.99	-11.37	30.62	54.00	-23.38	AVG	

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

### Vertical

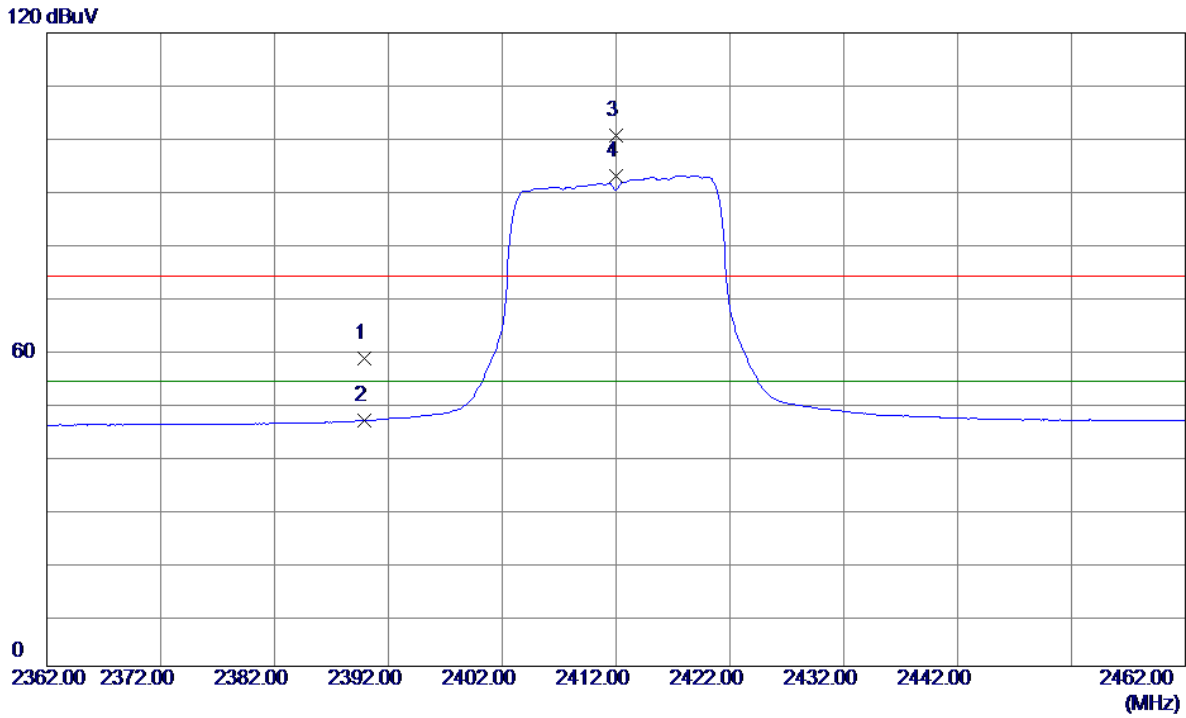
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	55.55	-11.37	44.18	74.00	-29.82	Peak	
2 *	4824.0000	41.99	-11.37	30.62	54.00	-23.38	AVG	

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

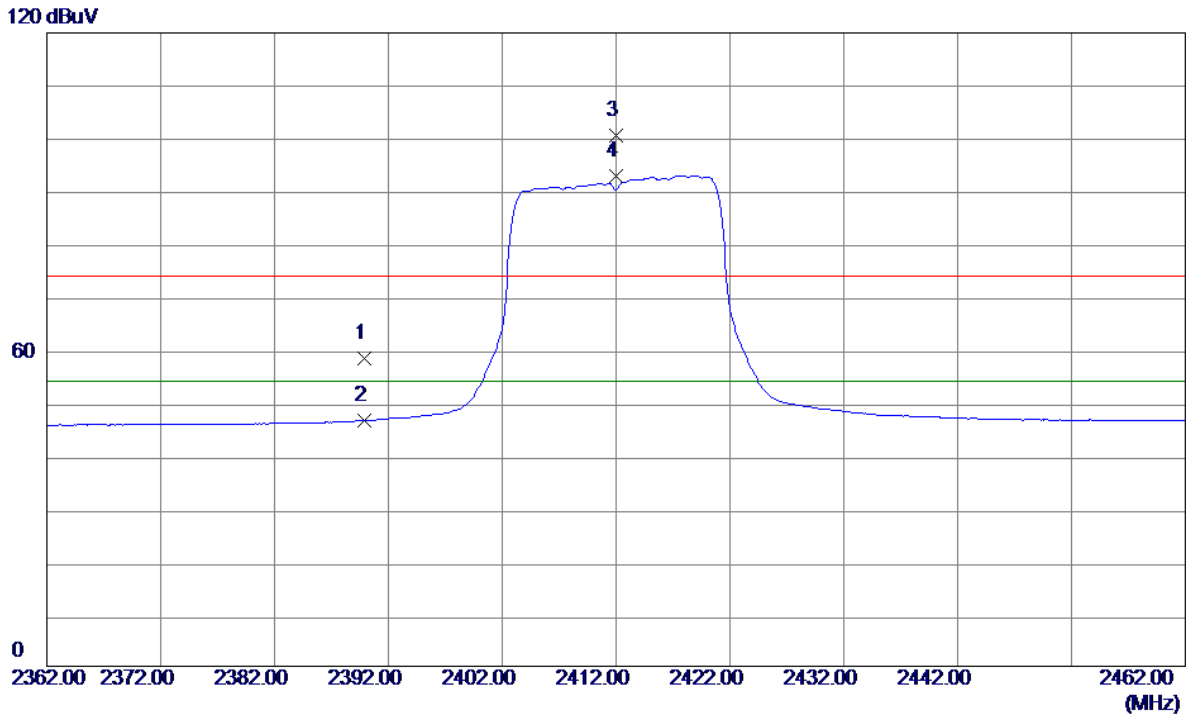
### Horizontal



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2389.8879	27.32	31.06	58.38	74.00	-15.62	Peak	
2	2389.8879	15.51	31.06	46.57	54.00	-7.43	AVG	
3	2412.0000	69.31	31.15	100.46	74.00	26.46	Peak	
4 *	2412.0000	61.71	31.15	92.86	54.00	38.86	AVG	

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

### Horizontal

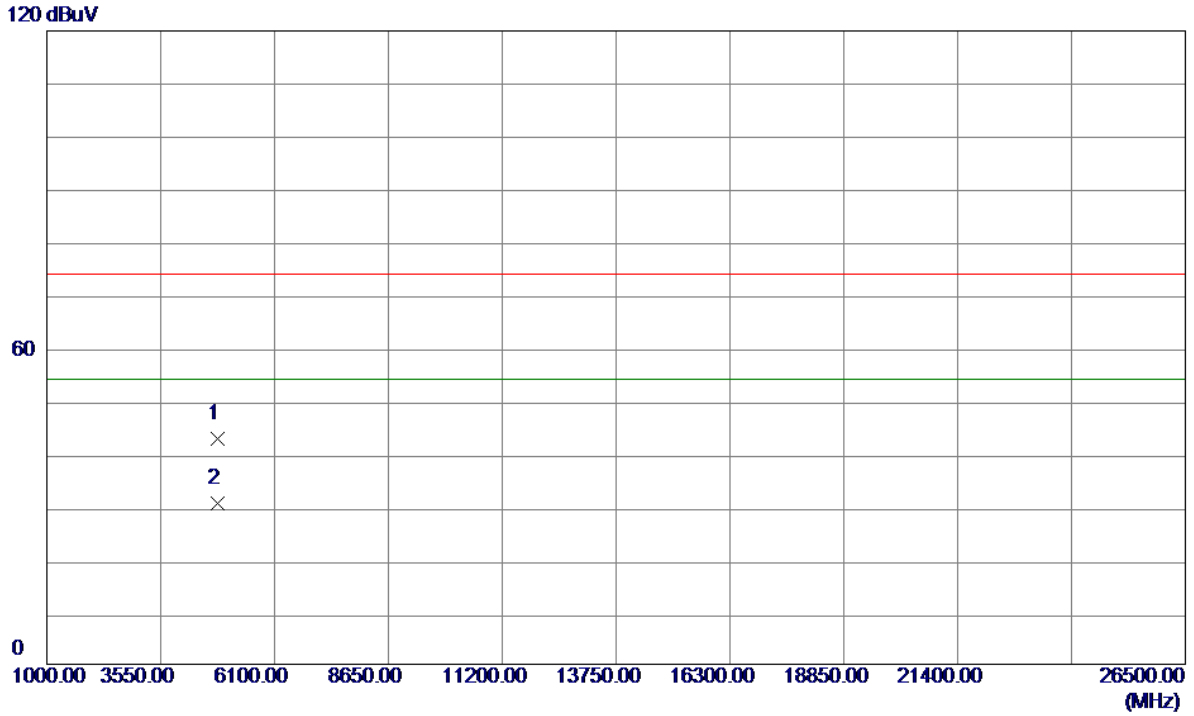


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2389.8879	27.32	31.06	58.38	74.00	-15.62	Peak	
2	2389.8879	15.51	31.06	46.57	54.00	-7.43	AVG	
3	2412.0000	69.31	31.15	100.46	74.00	26.46	Peak	
4 *	2412.0000	61.71	31.15	92.86	54.00	38.86	AVG	



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

**Horizontal**

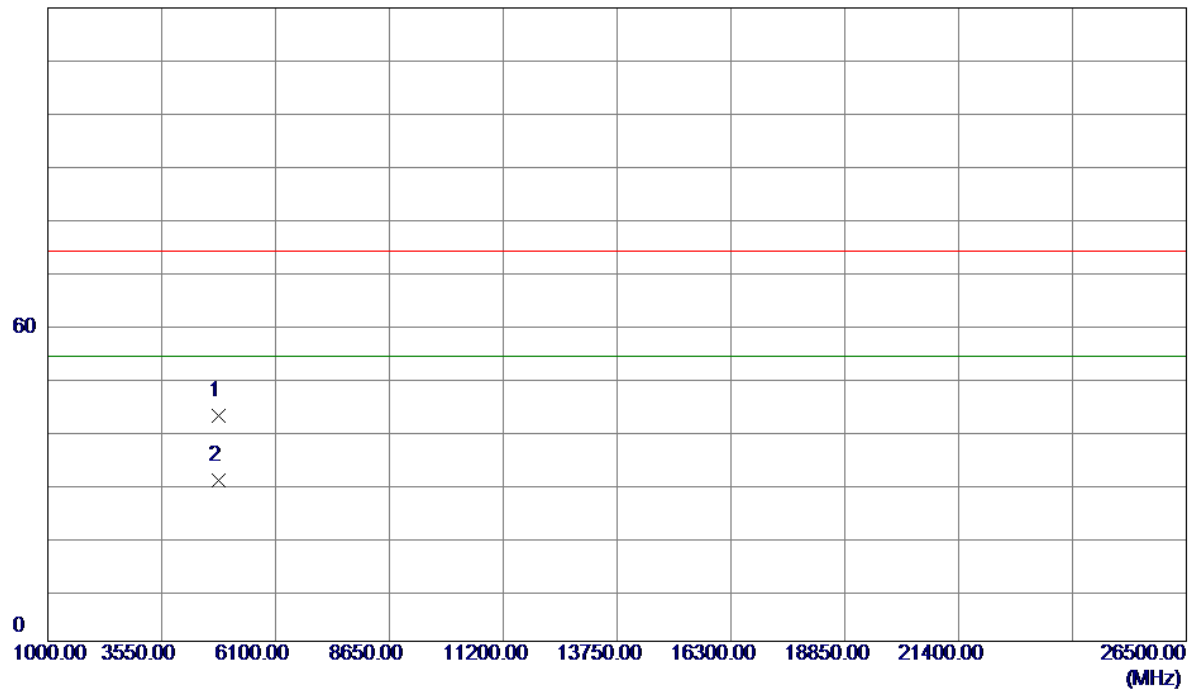


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	53.98	-11.37	42.61	74.00	-31.39	Peak	
2 *	4824.0000	41.87	-11.37	30.50	54.00	-23.50	AVG	

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

**Horizontal**

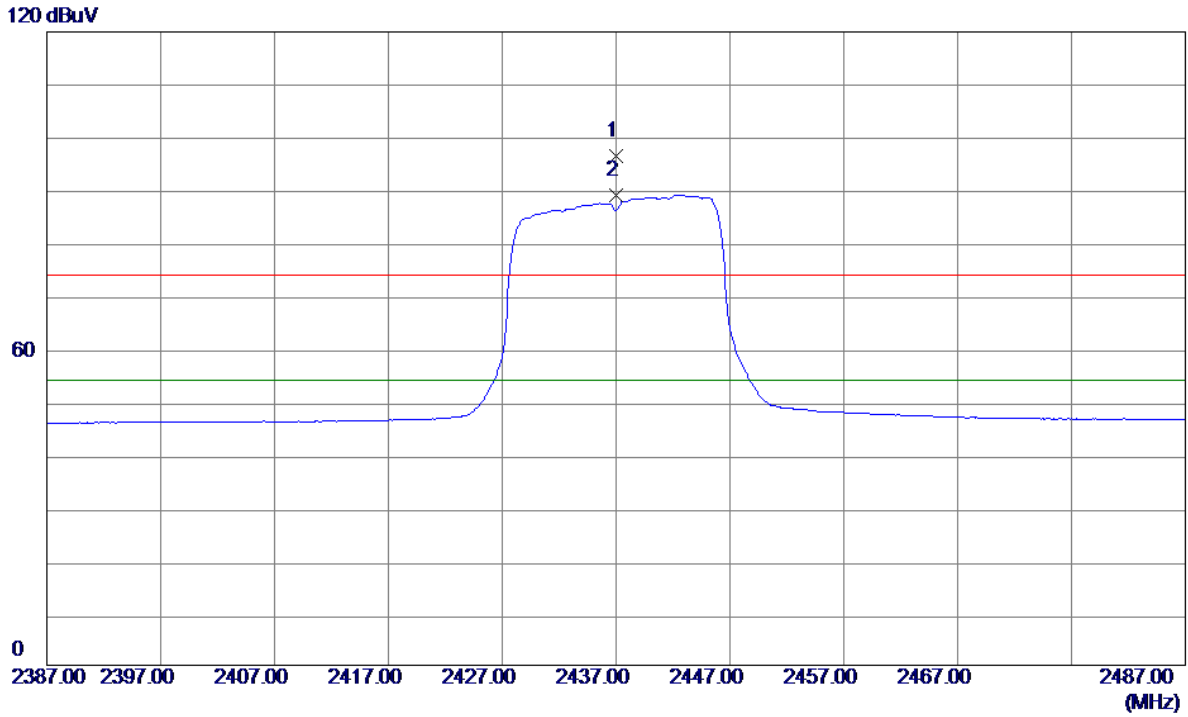
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4824.0000	53.98	-11.37	42.61	74.00	-31.39	Peak	
2 *	4824.0000	41.87	-11.37	30.50	54.00	-23.50	AVG	

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

**Vertical**

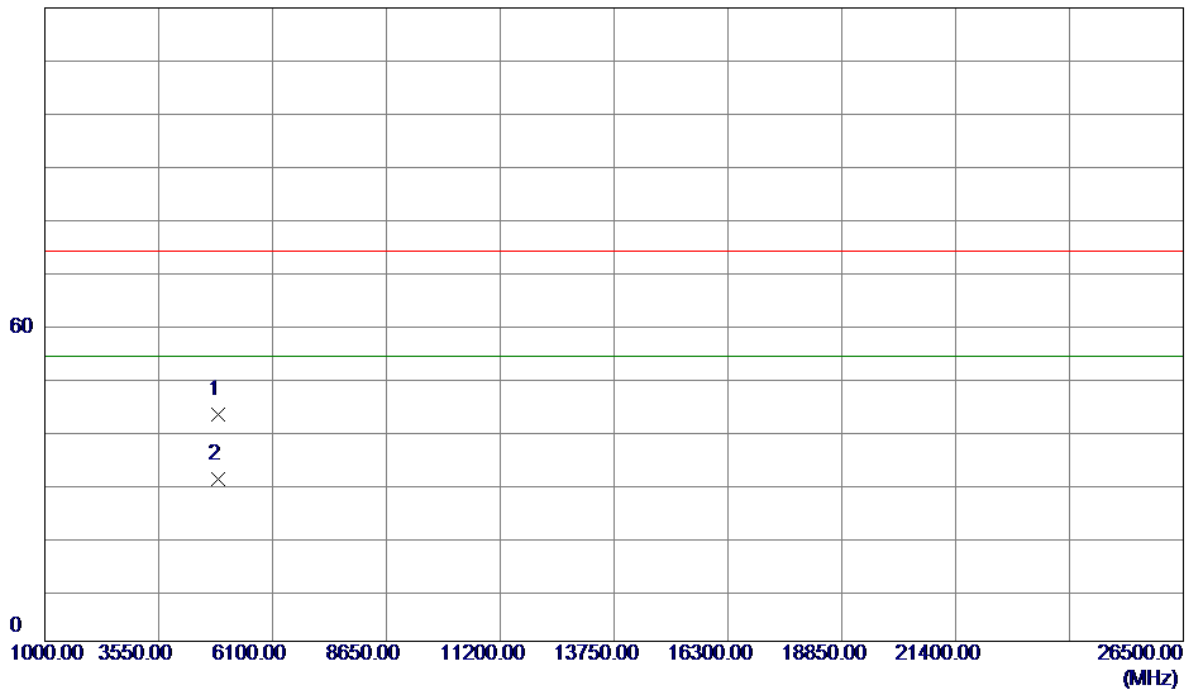


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2437.0000	65.30	31.24	96.54	74.00	22.54	Peak	
2 *	2437.0000	57.81	31.24	89.05	54.00	35.05	AVG	

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

### Vertical

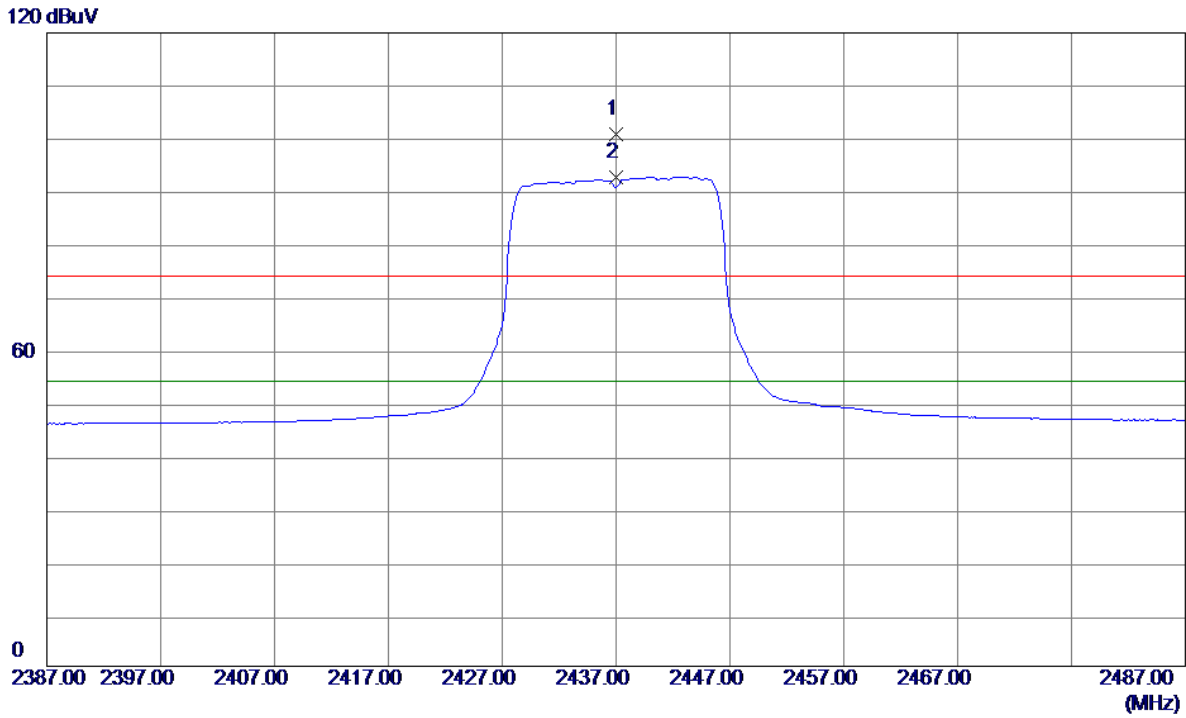
120 dBuV



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4874.0000	54.18	-11.29	42.89	74.00	-31.11	Peak	
2 *	4874.0000	41.91	-11.29	30.62	54.00	-23.38	AVG	

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

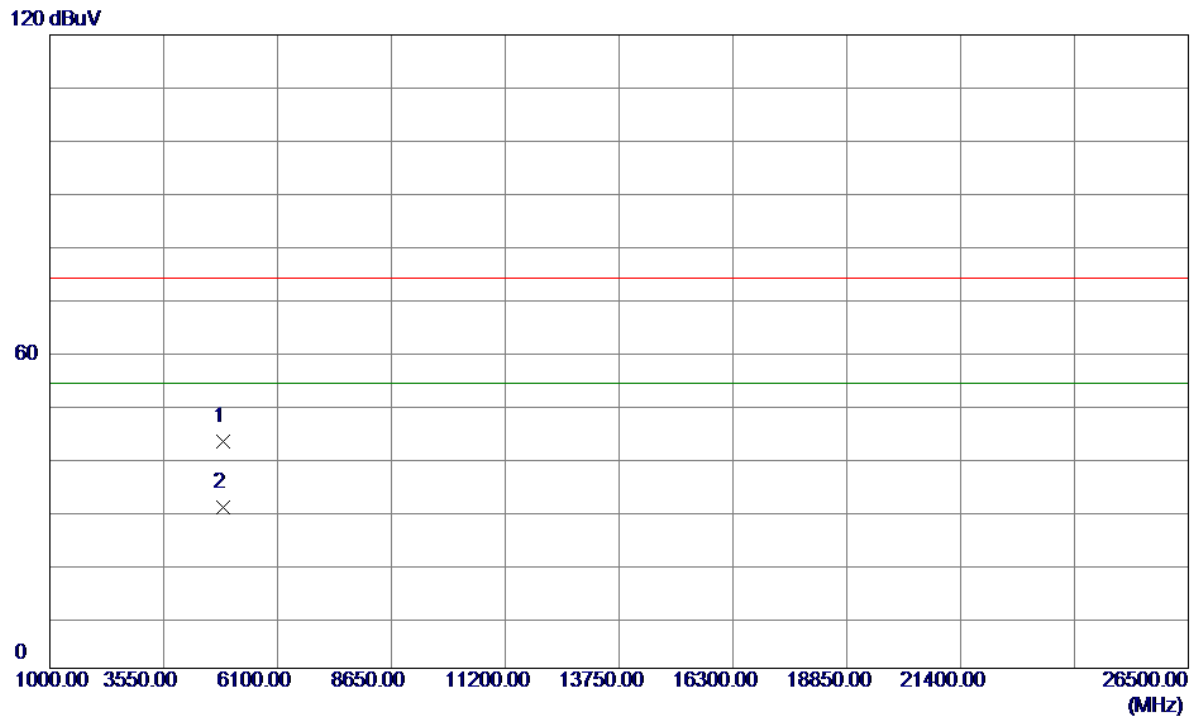
### Horizontal



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2437.0000	69.50	31.24	100.74	74.00	26.74	Peak	
2 *	2437.0000	61.51	31.24	92.75	54.00	38.75	AVG	

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

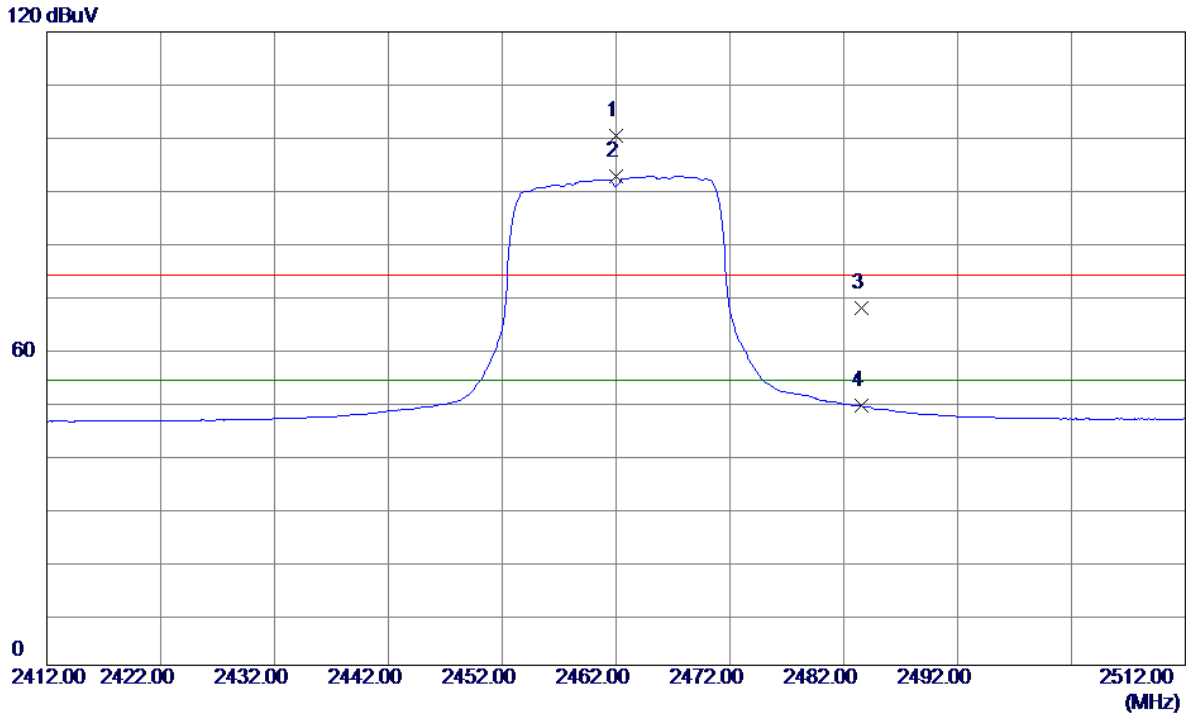
### Horizontal



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4874.0000	54.34	-11.29	43.05	74.00	-30.95	Peak	
2 *	4874.0000	41.83	-11.29	30.54	54.00	-23.46	AVG	

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

**Vertical**

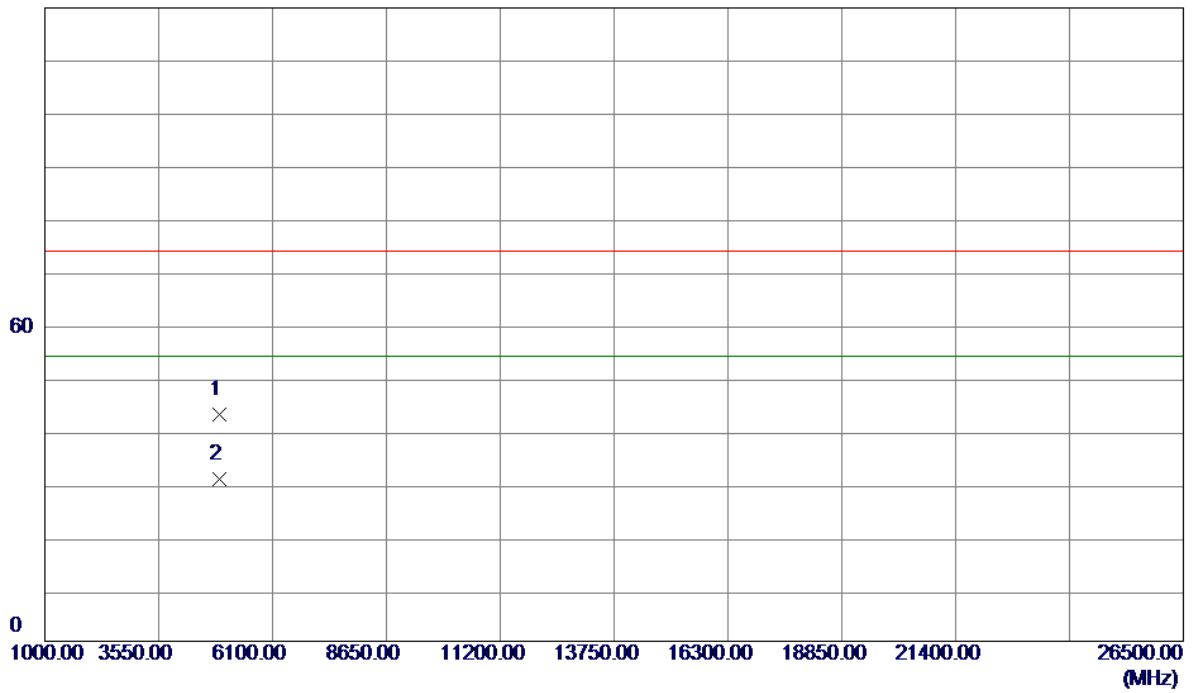


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2462.0000	68.99	31.33	100.32	74.00	26.32	Peak	
2 *	2462.0000	61.33	31.33	92.66	54.00	38.66	AVG	
3	2483.5820	36.17	31.41	67.58	74.00	-6.42	Peak	
4	2483.5820	17.71	31.41	49.12	54.00	-4.88	AVG	

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

### Vertical

120 dBuV

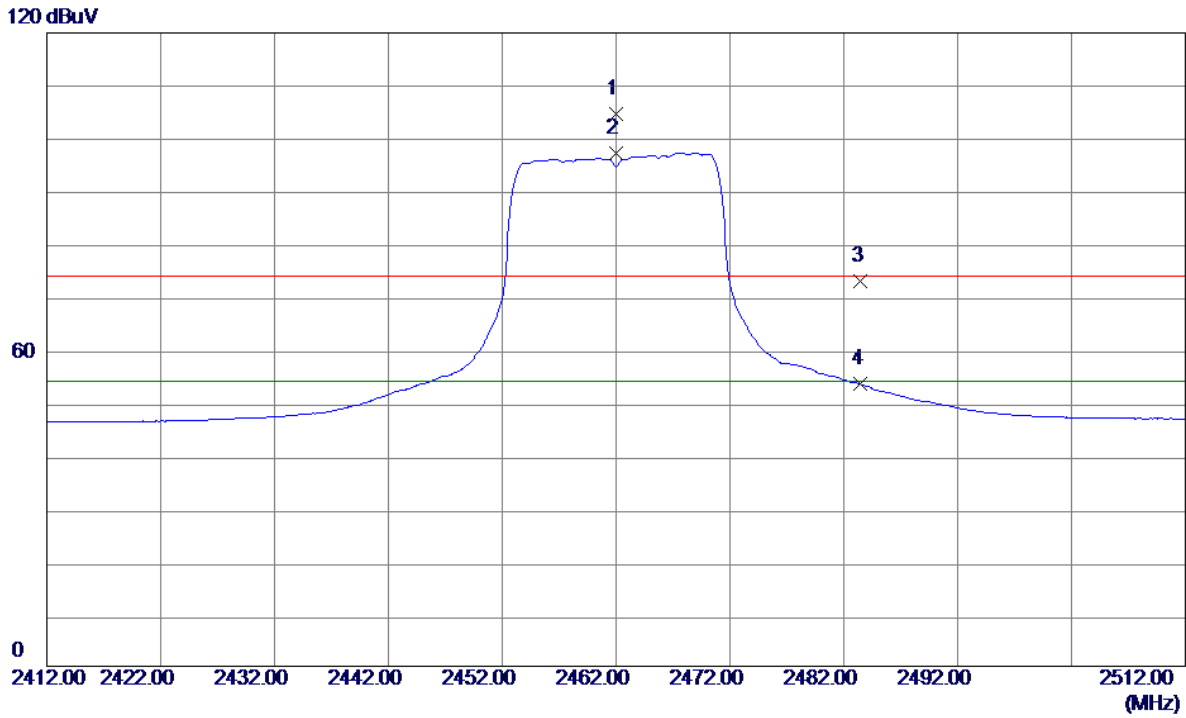


No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4924.0000	54.07	-11.22	42.85	74.00	-31.15	Peak	
2 *	4924.0000	41.85	-11.22	30.63	54.00	-23.37	AVG	



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

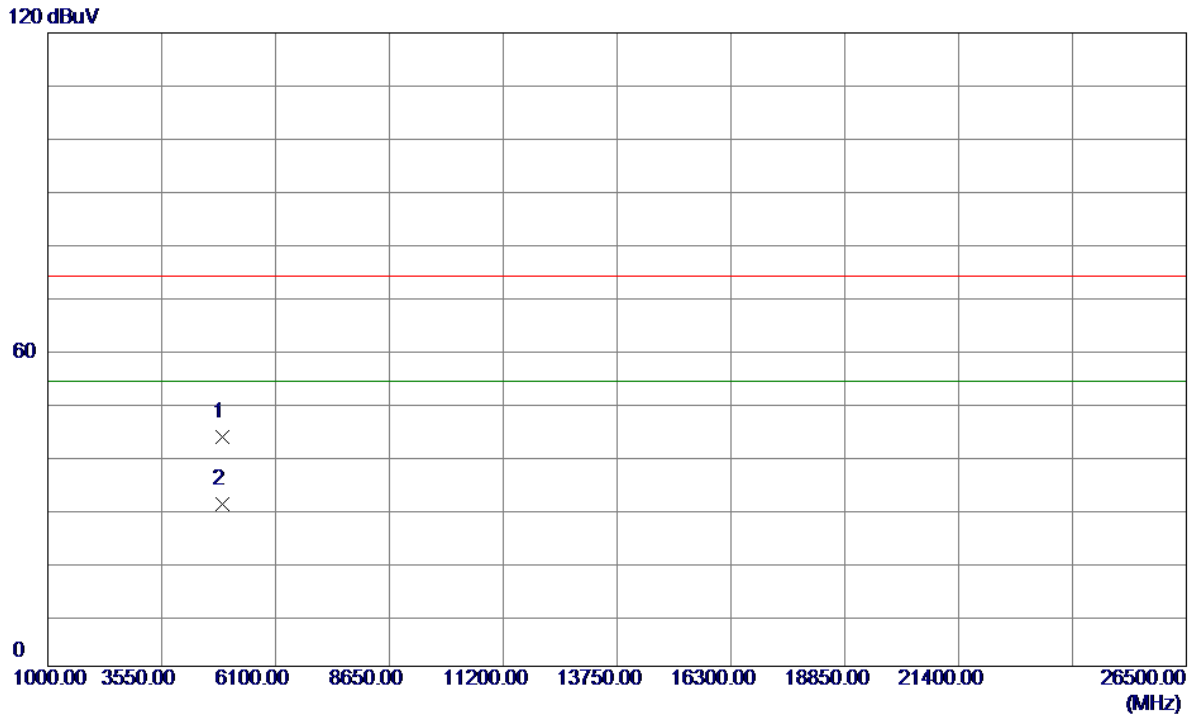
### Horizontal



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	2462.0000	73.39	31.33	104.72	74.00	30.72	Peak	
2 *	2462.0000	65.84	31.33	97.17	54.00	43.17	AVG	
3	2483.5000	41.57	31.41	72.98	74.00	-1.02	Peak	
4	2483.5000	22.11	31.41	53.52	54.00	-0.48	AVG	

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

### Horizontal



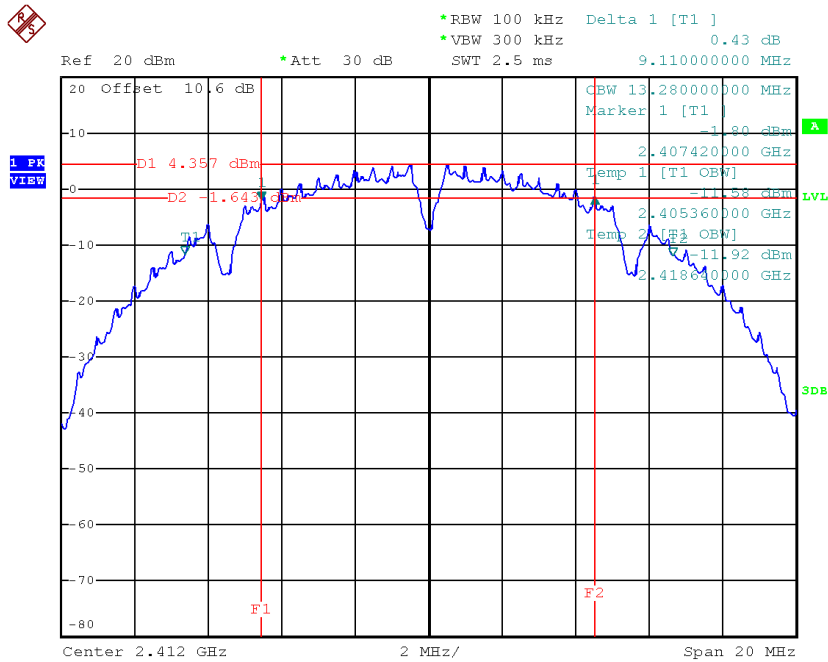
No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	4924.0000	54.61	-11.22	43.39	74.00	-30.61	Peak	
2 *	4924.0000	42.02	-11.22	30.80	54.00	-23.20	AVG	

## APPENDIX E - BANDWIDTH

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

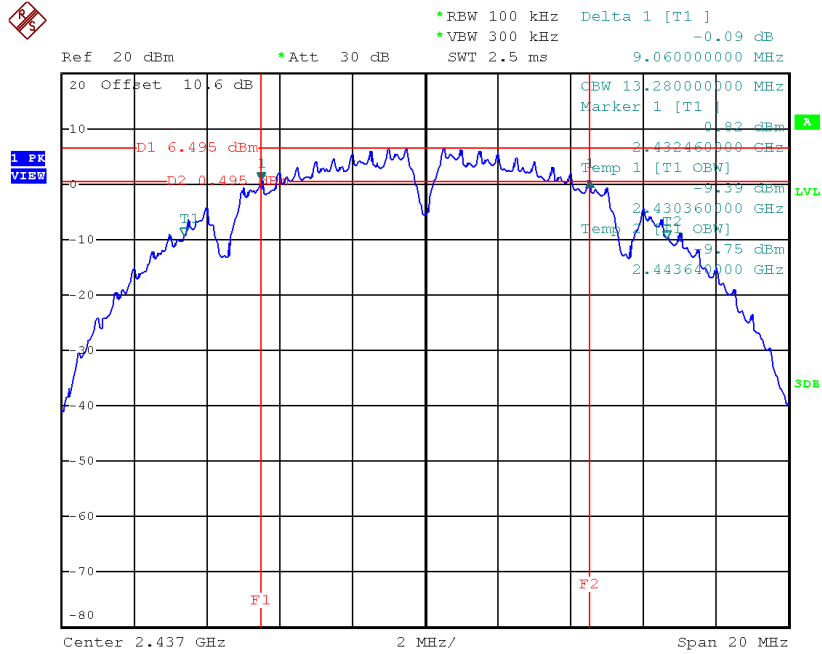
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	9.11	13.28	500	Complies
2437	9.06	13.28	500	Complies
2462	9.12	13.24	500	Complies

**TX CH01**



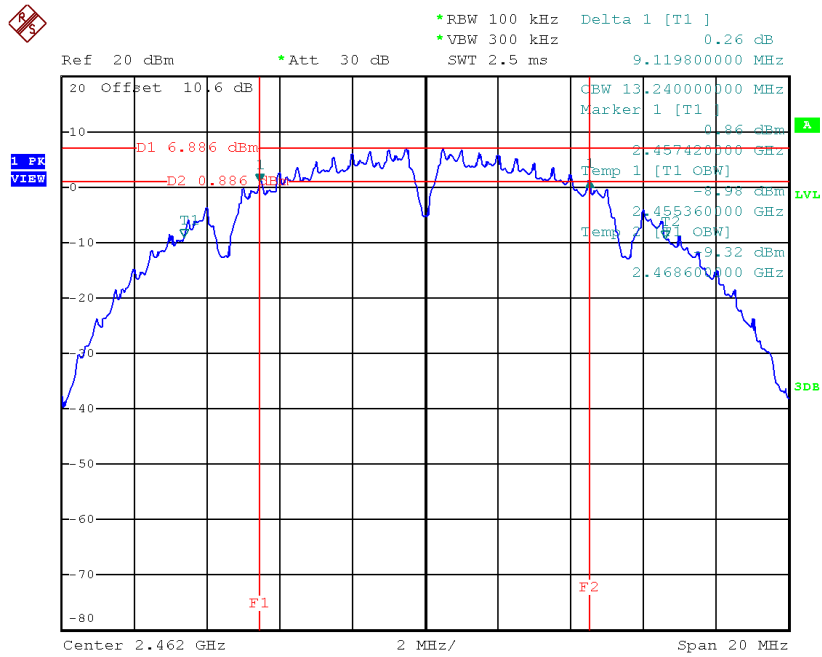
Date: 9.AUG.2017 16:08:04

**TX CH06**



Date: 9.AUG.2017 16:10:18

**TX CH11**

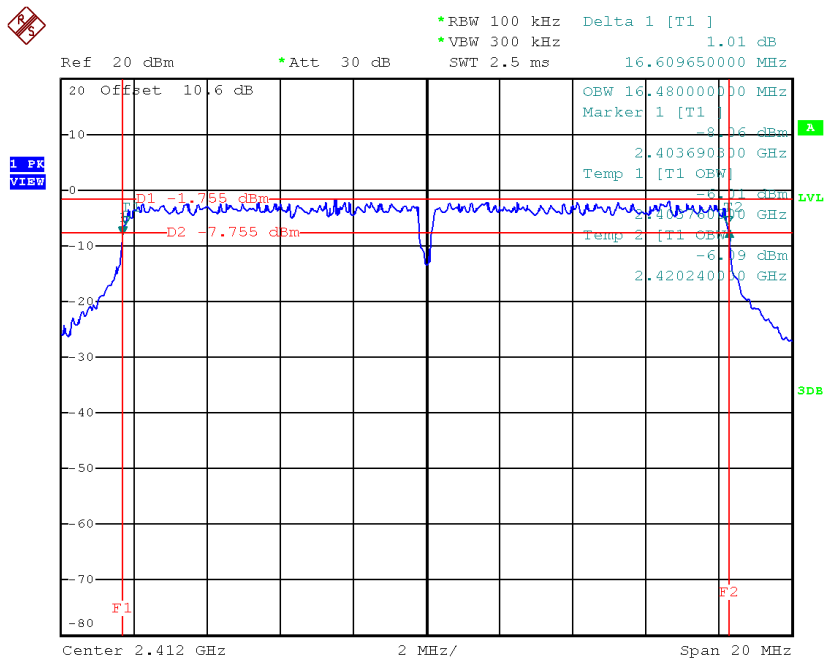


Date: 9.AUG.2017 16:14:30

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

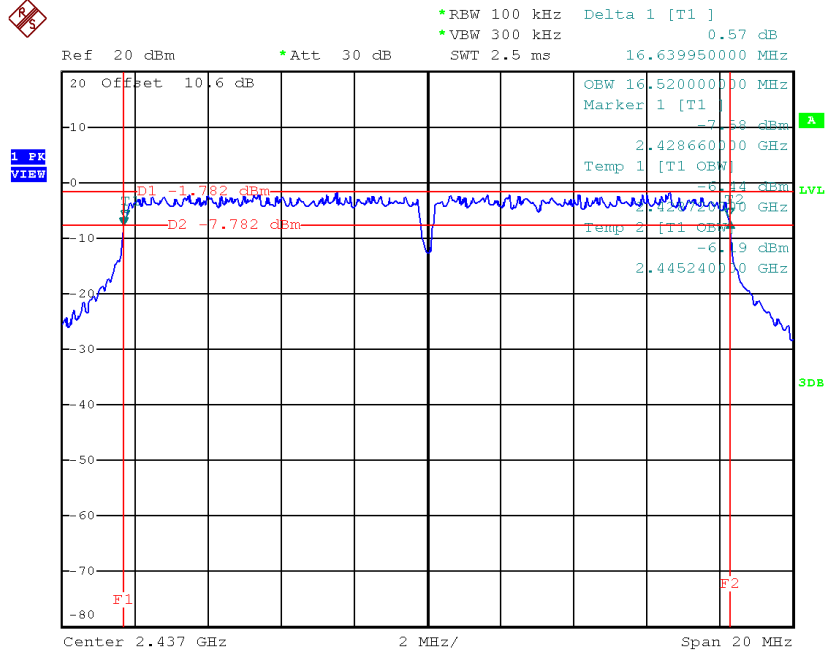
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	16.61	16.48	500	Complies
2437	16.64	16.52	500	Complies
2462	16.62	16.48	500	Complies

**TX CH01**



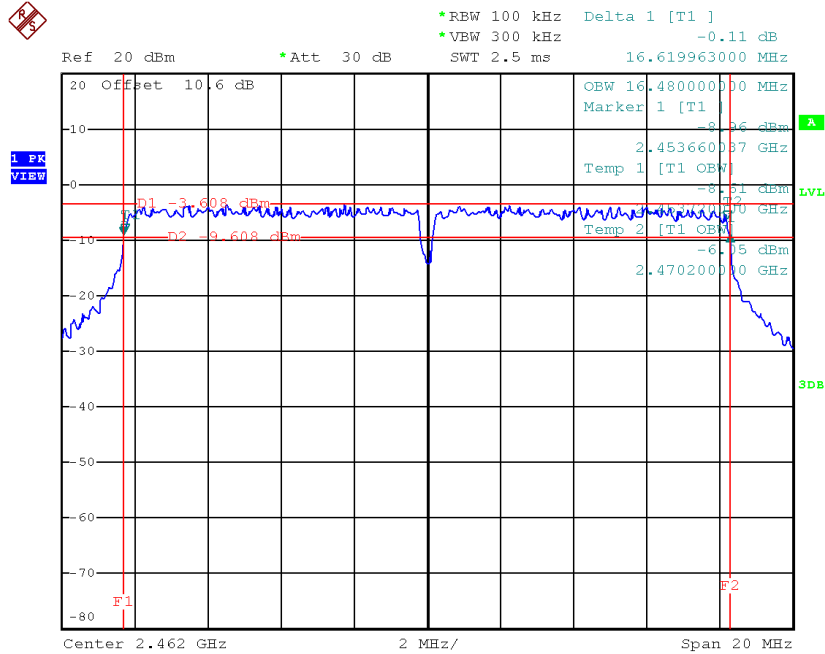
Date: 9.AUG.2017 16:16:20

**TX CH06**



Date: 9.AUG.2017 16:18:17

**TX CH11**

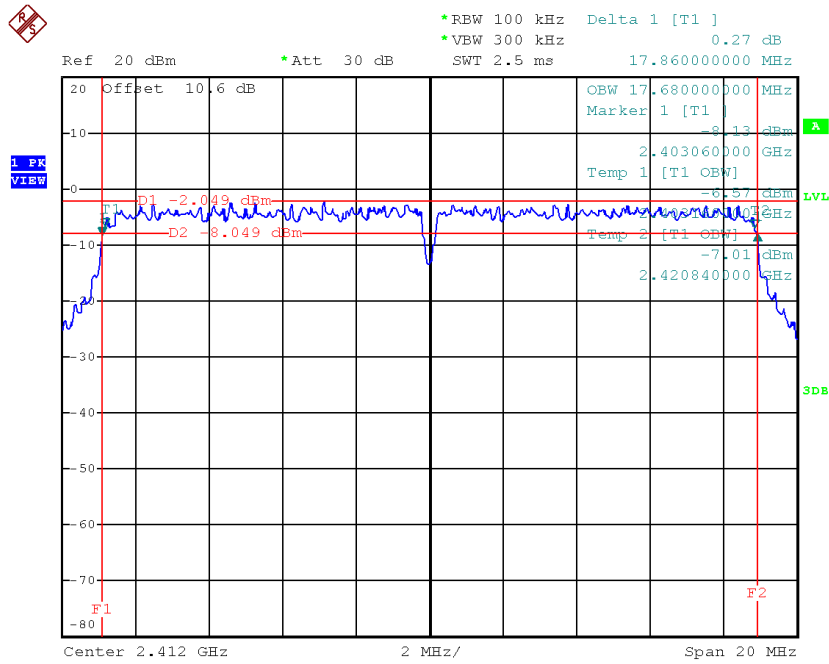


Date: 10.AUG.2017 21:43:21

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

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	17.86	17.68	500	Complies
2437	17.84	17.68	500	Complies
2462	17.86	17.68	500	Complies

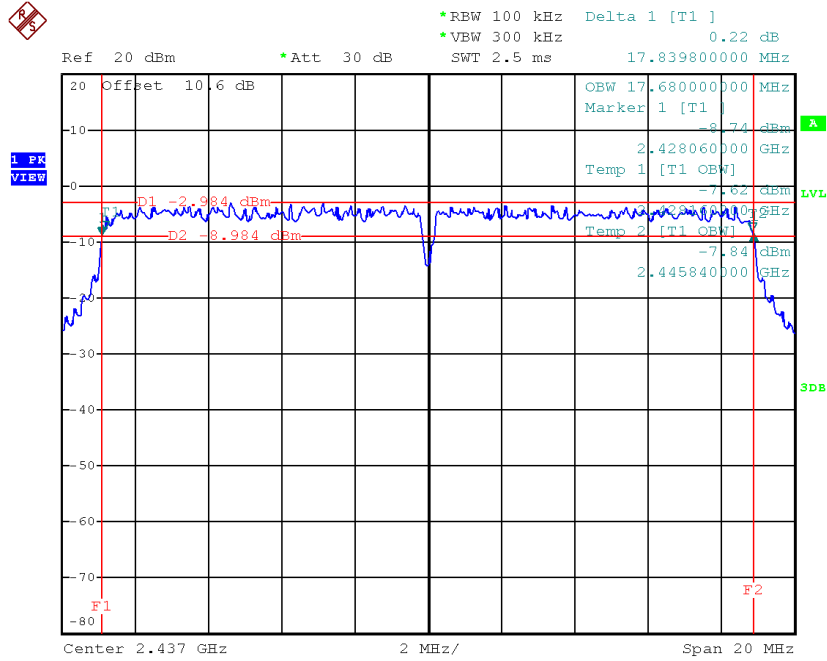
**TX CH01**



Date: 9.AUG.2017 16:21:34

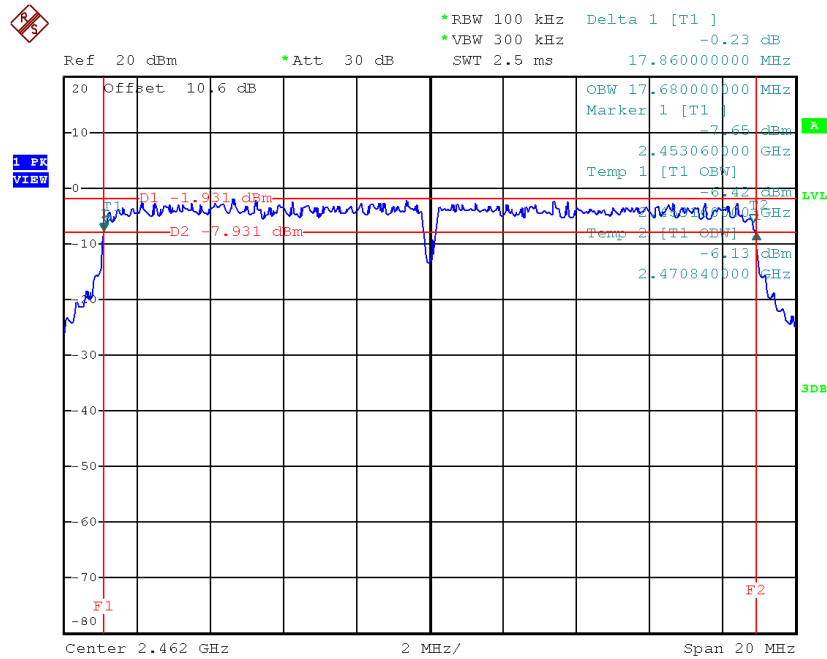


**TX CH06**



Date: 9.AUG.2017 16:24:13

**TX CH11**



Date: 9.AUG.2017 16:27:15

## APPENDIX F – MAXIMUM PEAK CONDUCTED OUTPUT POWER

### For 1T1R

Test Mode :TX B Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	19.77	0.09	30.00	1.00	Complies
2437	19.83	0.10	30.00	1.00	Complies
2462	19.64	0.09	30.00	1.00	Complies

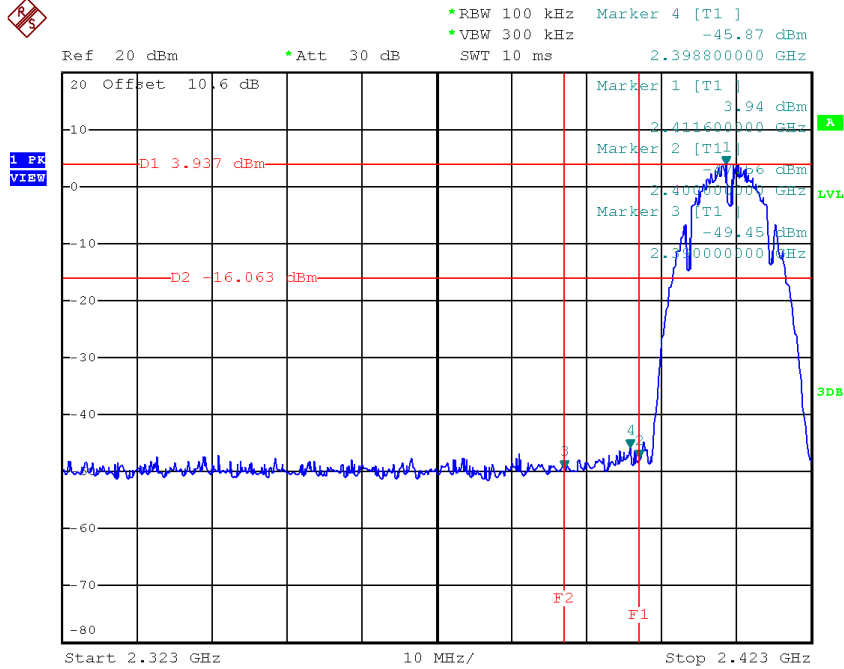
Test Mode :TX G Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	23.12	0.21	30.00	1.00	Complies
2437	23.23	0.21	30.00	1.00	Complies
2462	21.12	0.13	30.00	1.00	Complies

Test Mode :TX N20 Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	22.10	0.16	30.00	1.00	Complies
2437	22.01	0.16	30.00	1.00	Complies
2462	22.14	0.16	30.00	1.00	Complies

## APPENDIX G - ANTENNA CONDUCTED SPURIOUS EMISSION

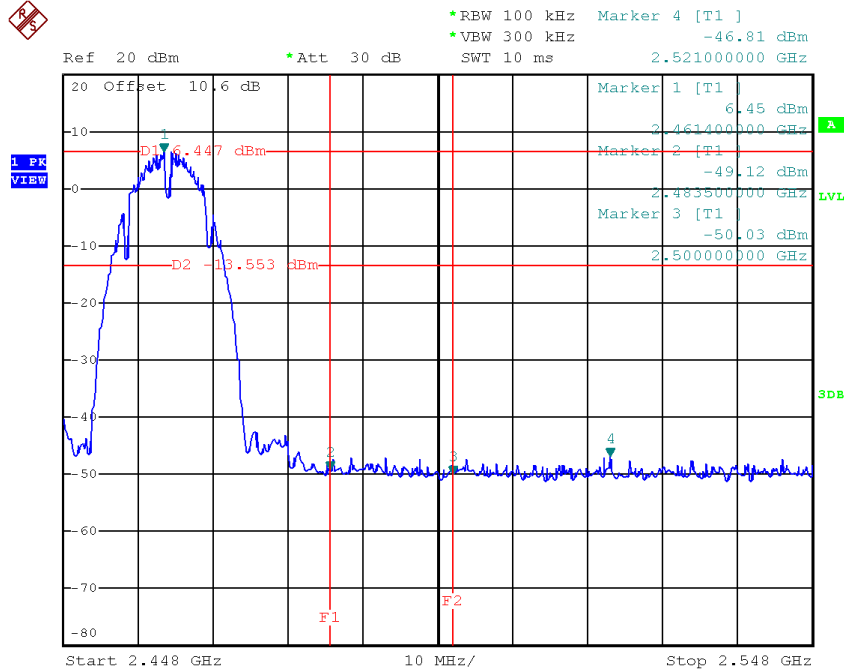
Test Mode : TX B Mode

**TX B mode CH01**



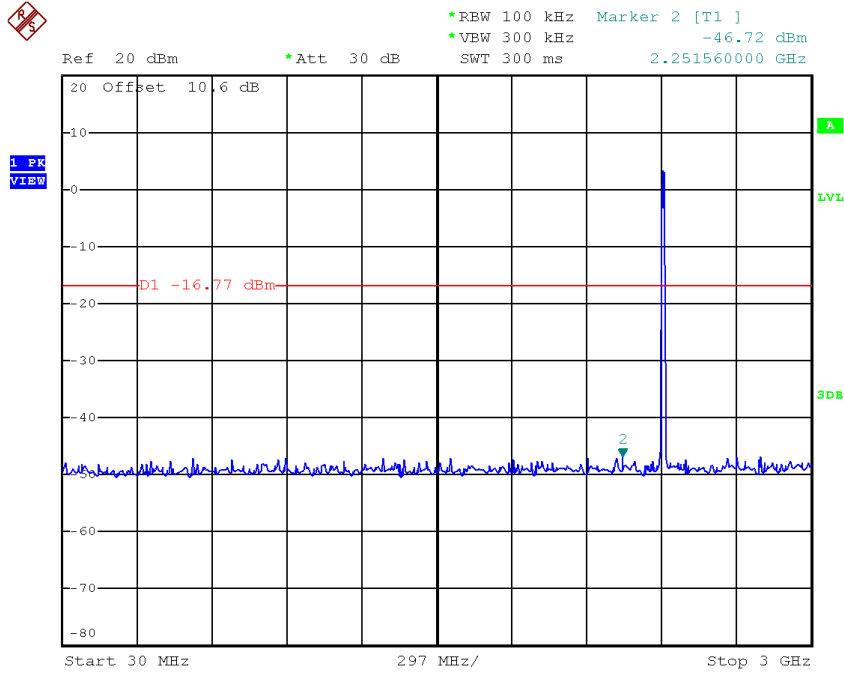
Date: 9.AUG.2017 16:08:55

**TX B mode CH11**

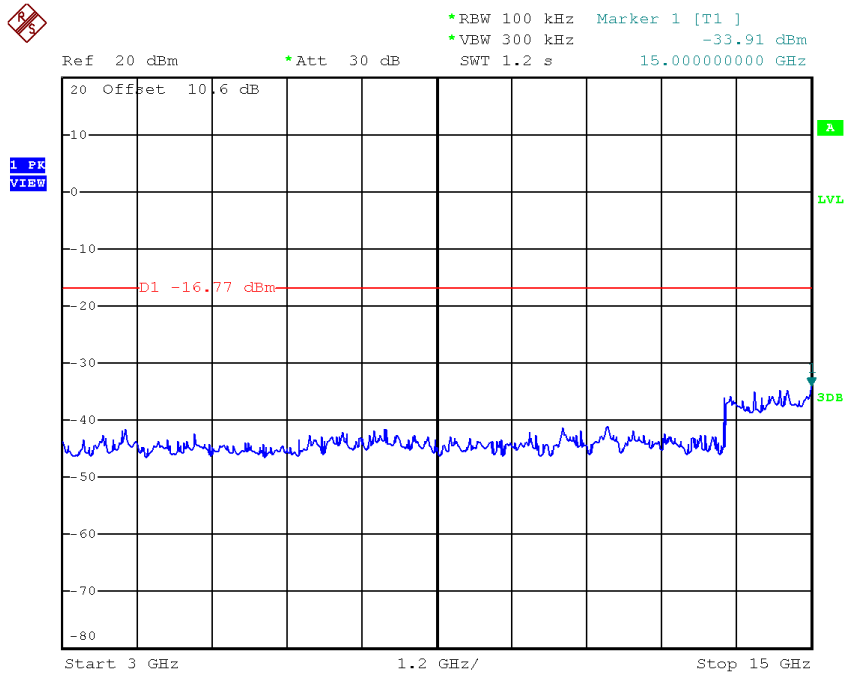


Date: 9.AUG.2017 16:15:04

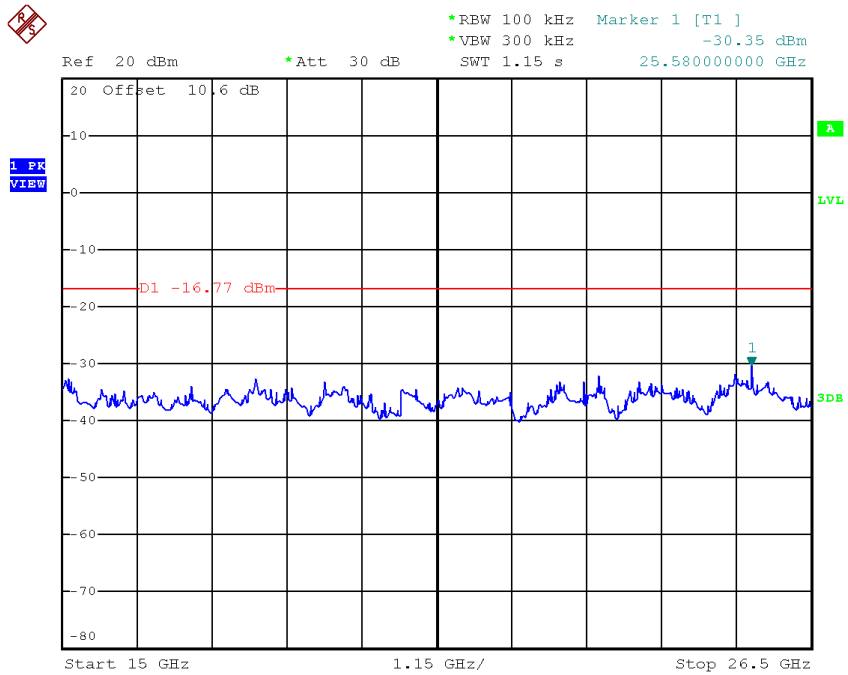
### TX B mode CH01 (10 Harmonic of the frequency)



Date: 9.AUG.2017 16:08:17

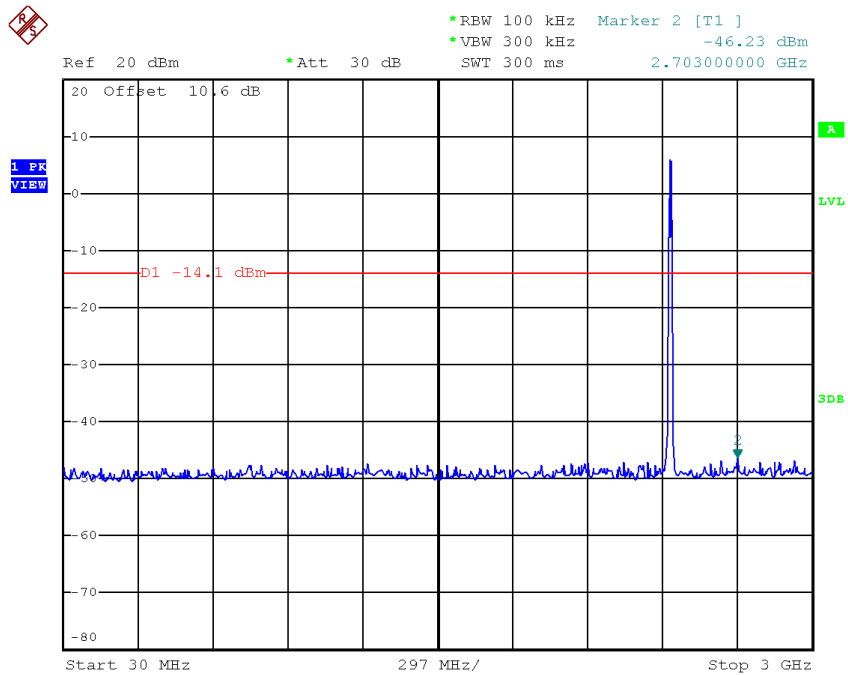


Date: 9.AUG.2017 16:08:24

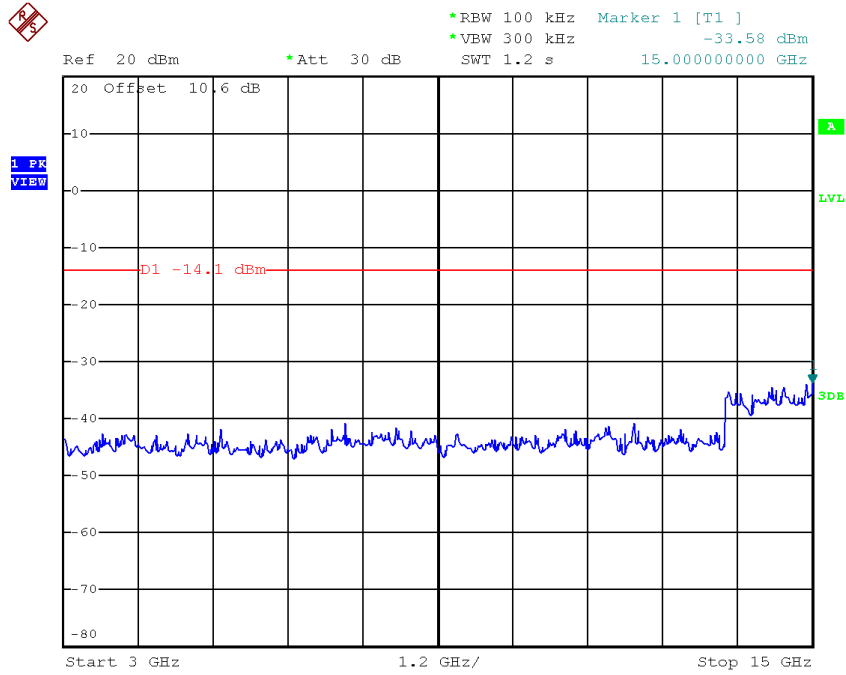


Date: 9.AUG.2017 16:08:31

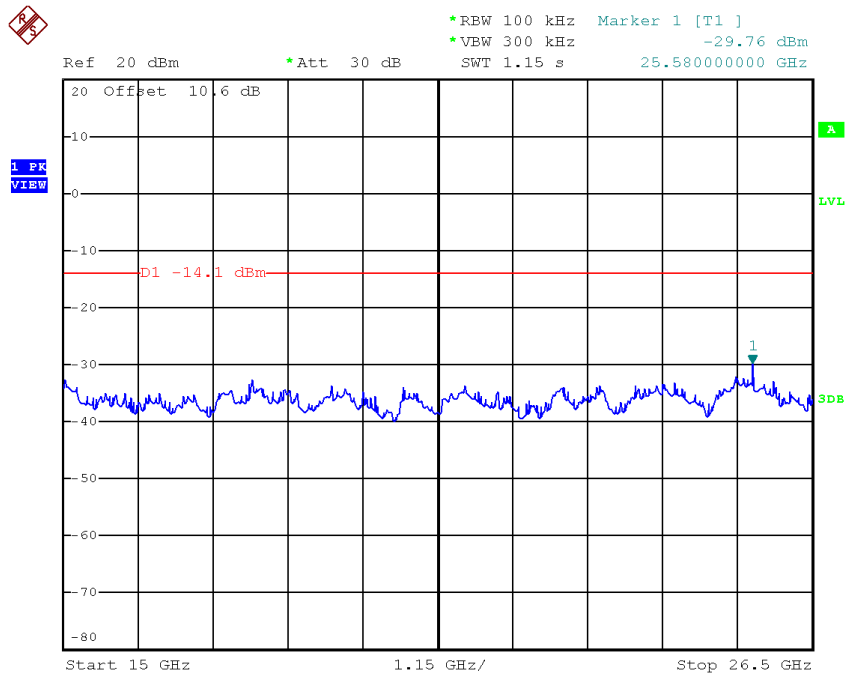
### TX B mode CH06 (10 Harmonic of the frequency)



Date: 9.AUG.2017 16:10:31



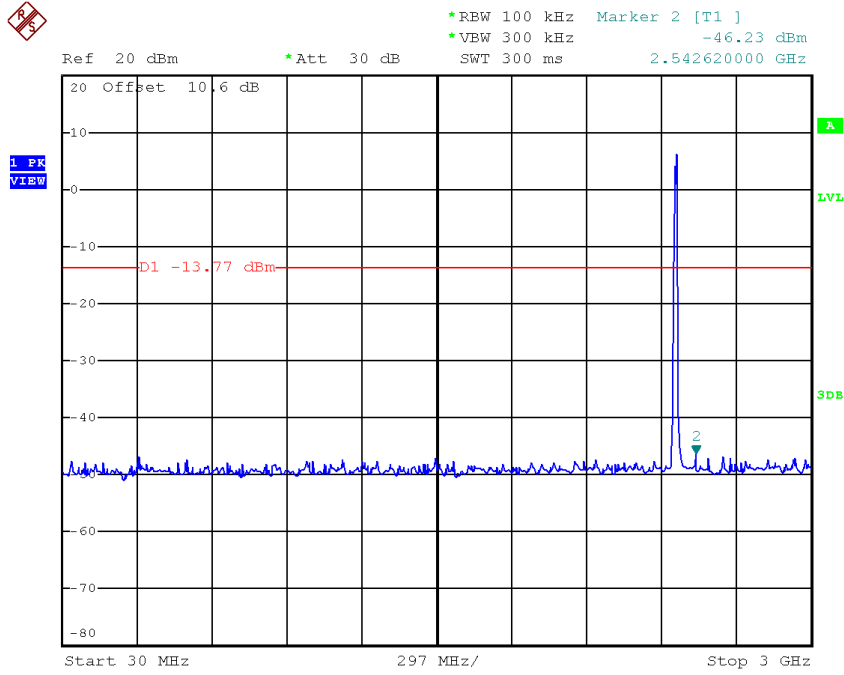
Date: 9.AUG.2017 16:10:38



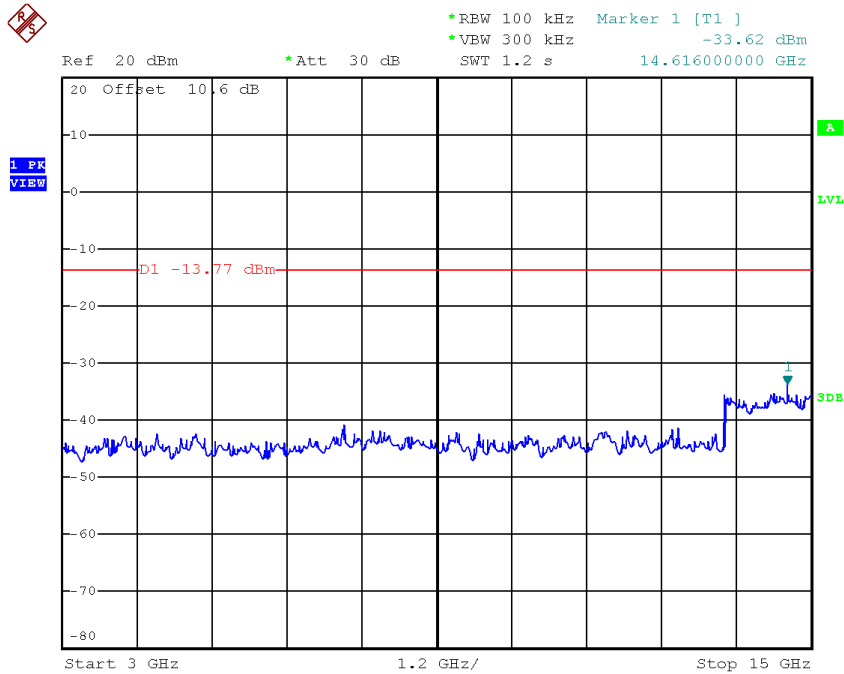
Date: 9.AUG.2017 16:10:44



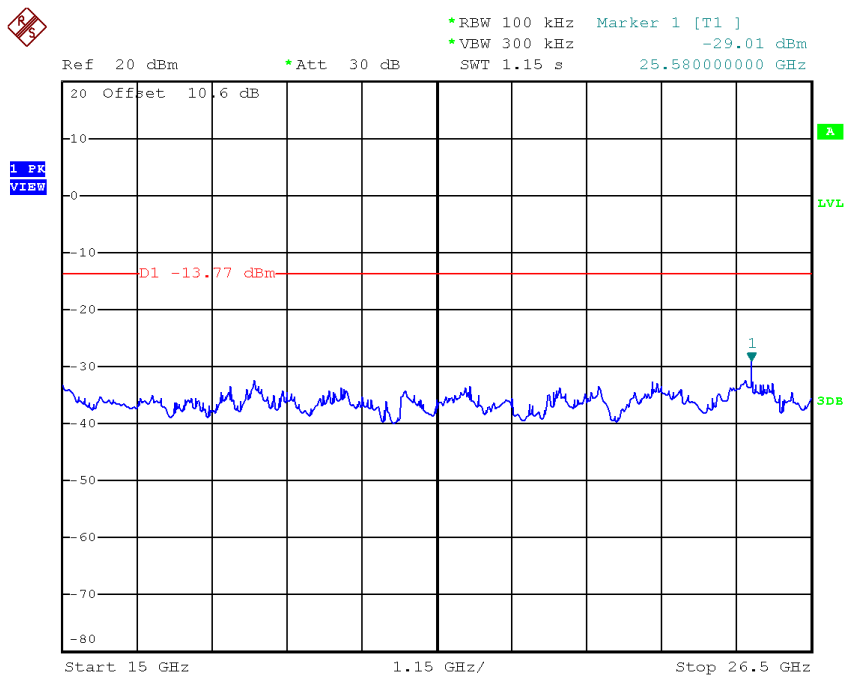
### TX B mode CH11 (10 Harmonic of the frequency)



Date: 9.AUG.2017 16:14:44



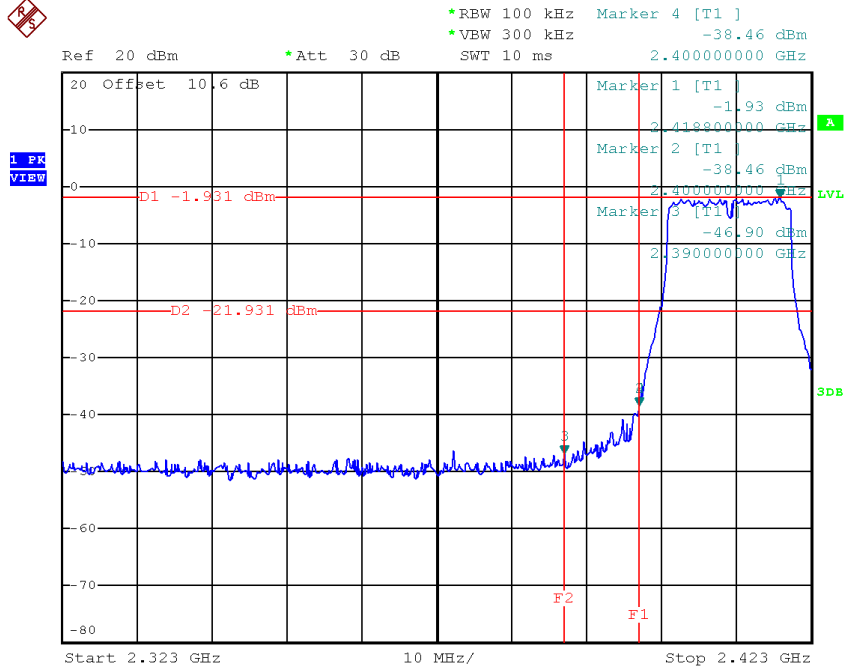
Date: 9.AUG.2017 16:14:51



Date: 9.AUG.2017 16:14:57

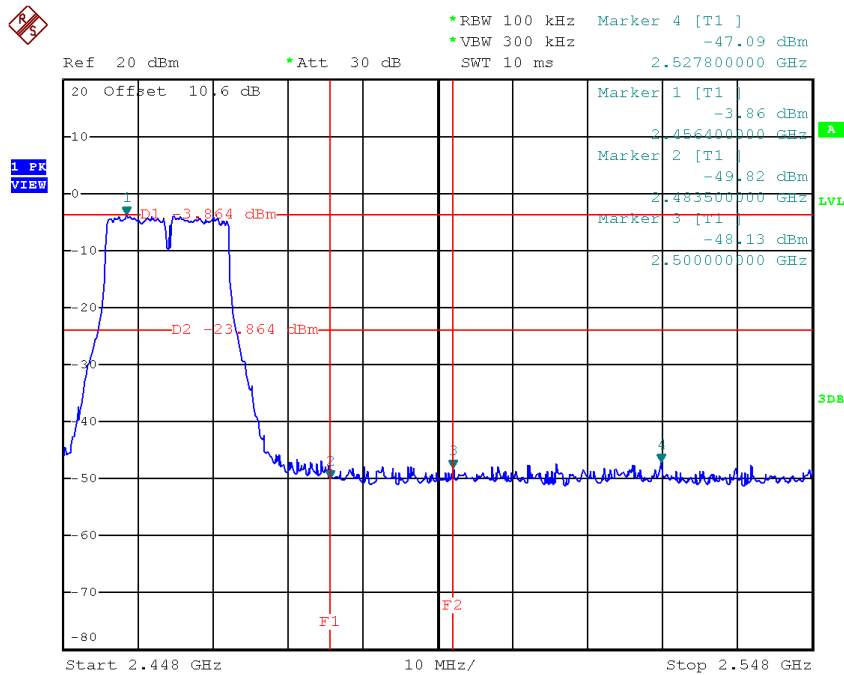
Test Mode : TX G Mode

**TX G mode CH01**



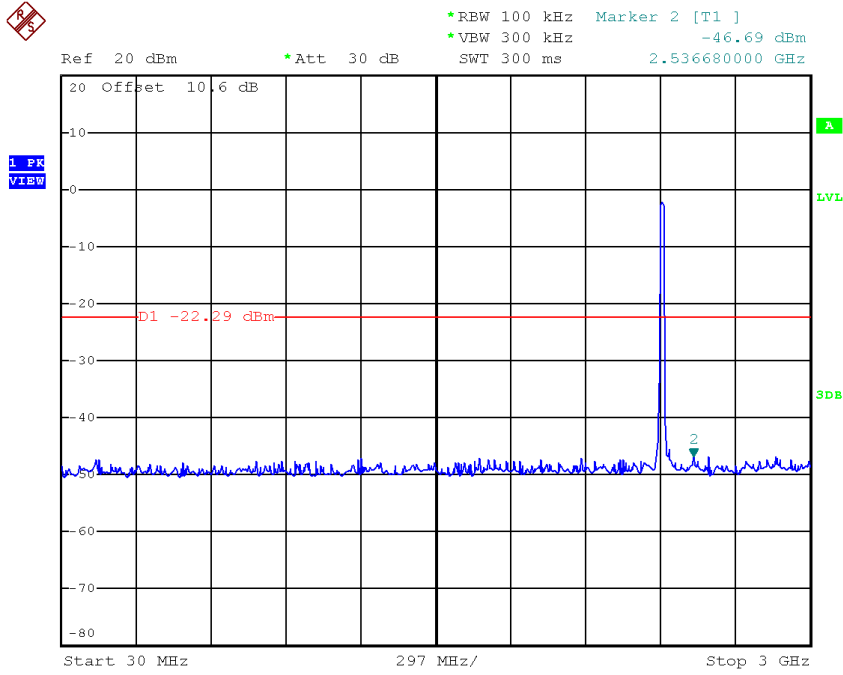
Date: 9.AUG.2017 16:17:11

**TX G mode CH11**

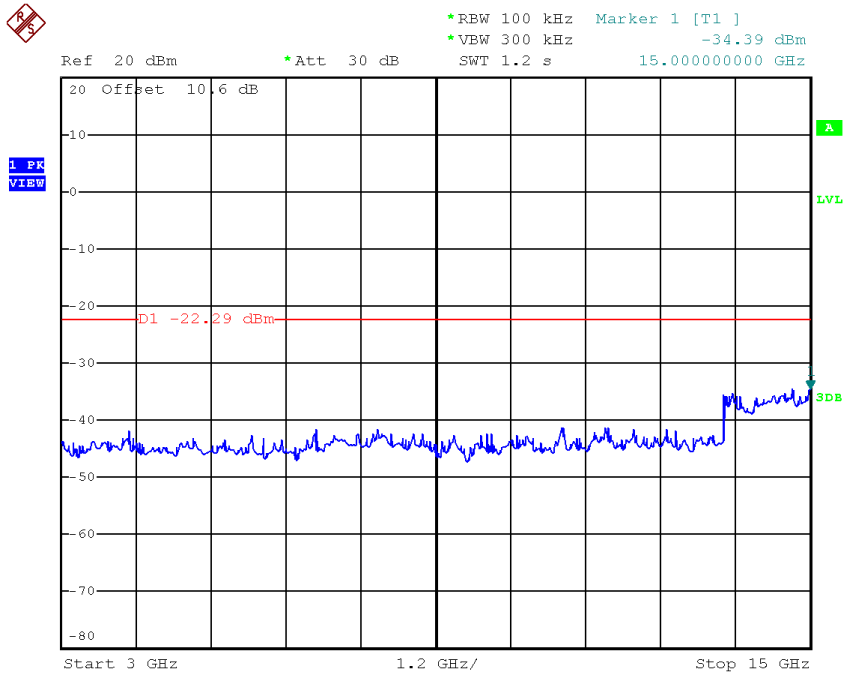


Date: 10.AUG.2017 21:43:55

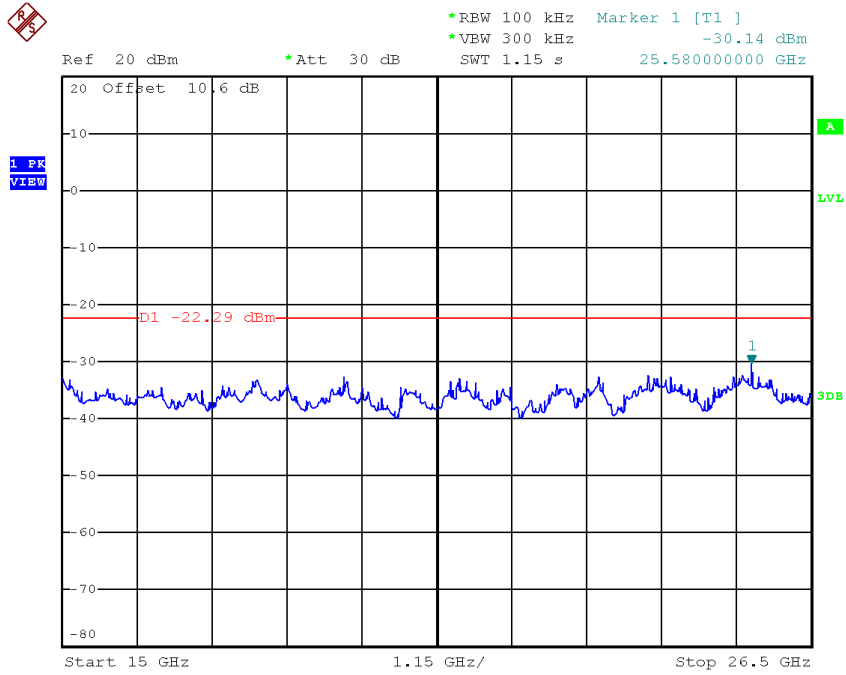
**TX G mode CH01 (10 Harmonic of the frequency)**



Date: 9.AUG.2017 16:16:33

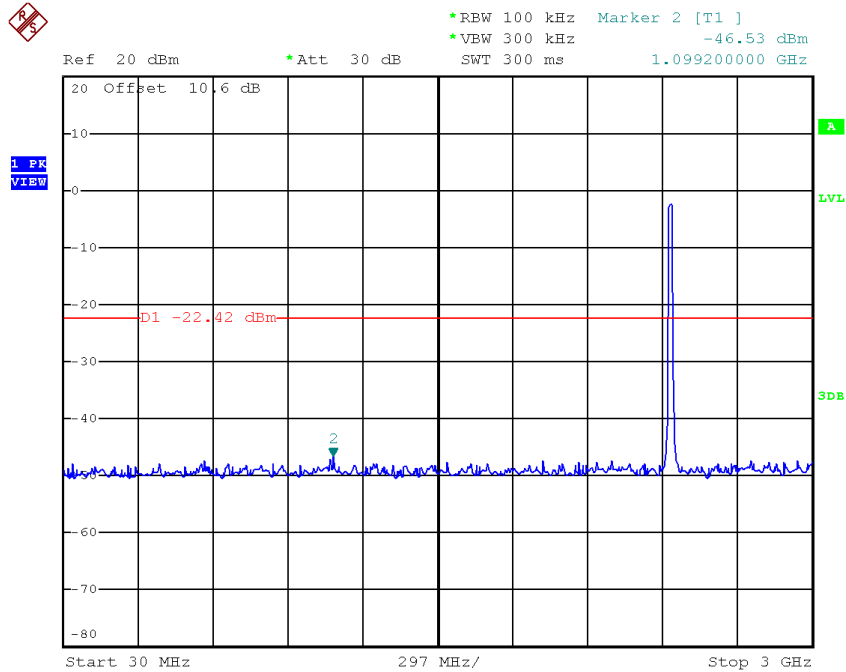


Date: 9.AUG.2017 16:16:40

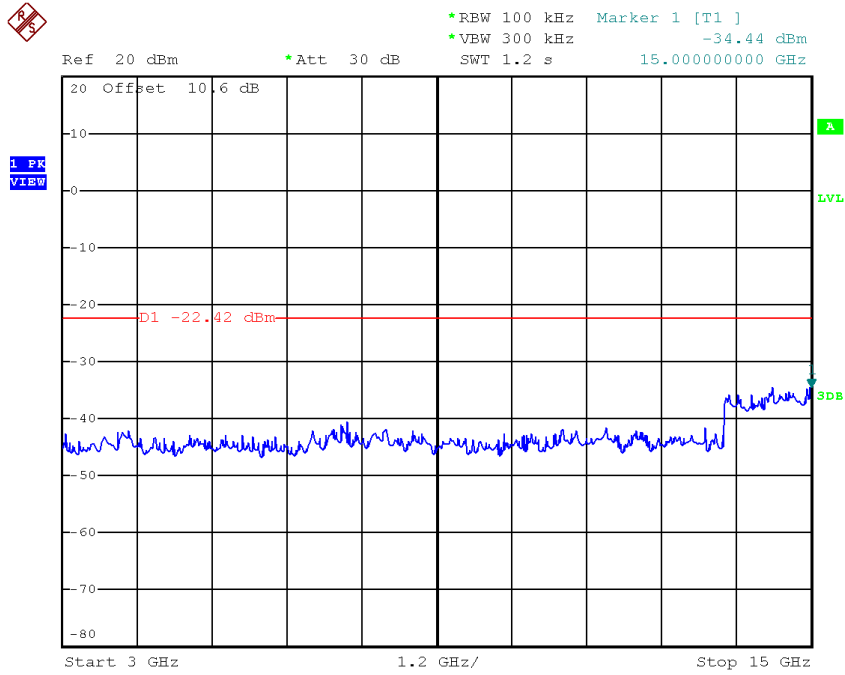


Date: 9.AUG.2017 16:16:47

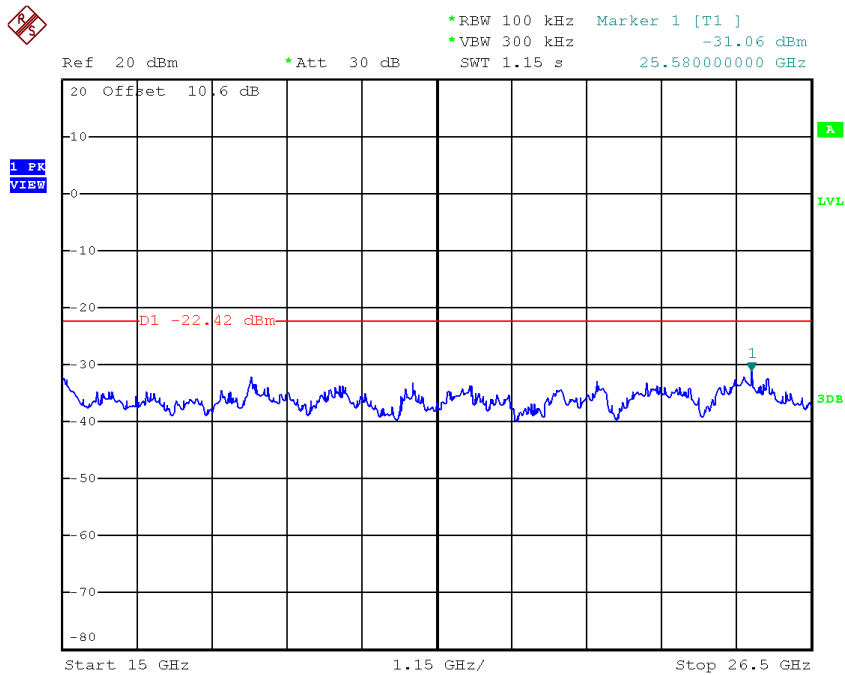
**TX G mode CH06 (10 Harmonic of the frequency)**



Date: 9.AUG.2017 16:18:31

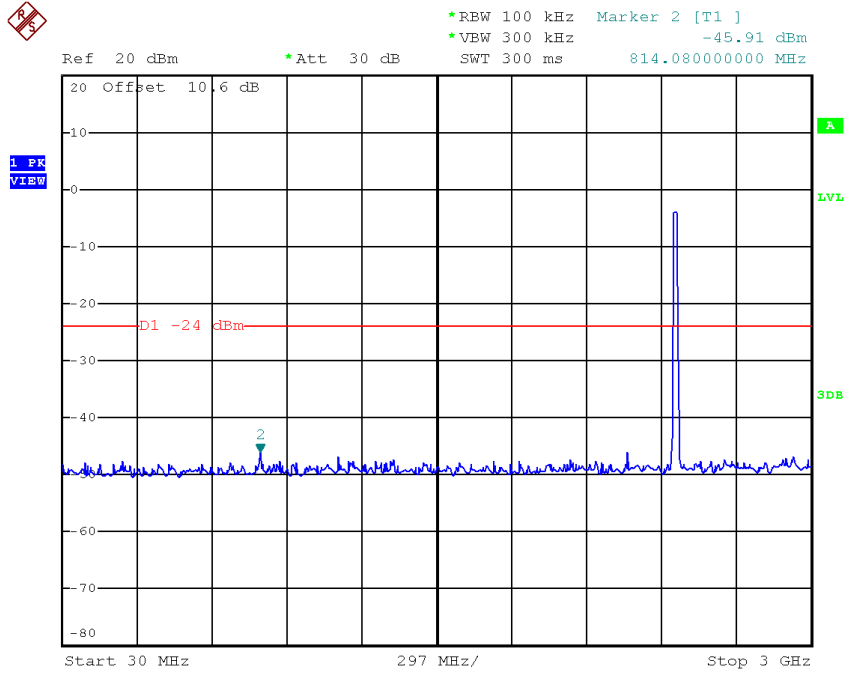


Date: 9.AUG.2017 16:18:38

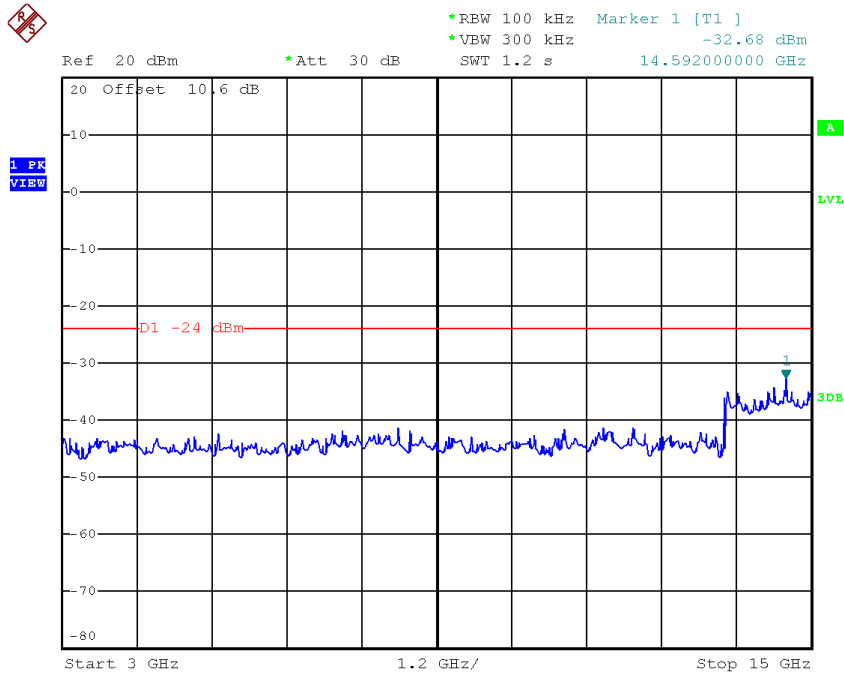


Date: 9.AUG.2017 16:18:45

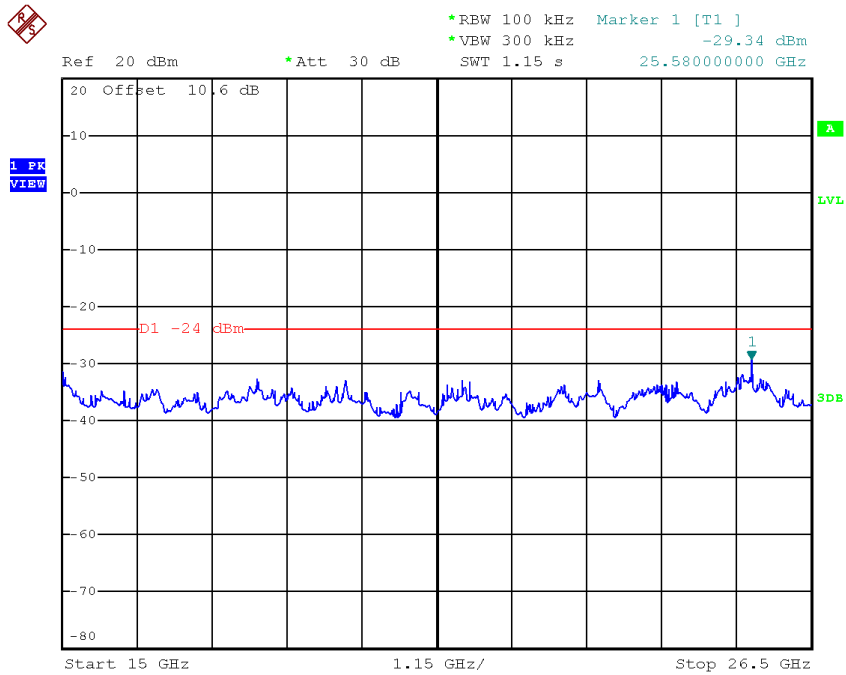
**TX G mode CH11 (10 Harmonic of the frequency)**



Date: 10.AUG.2017 21:43:34



Date: 10.AUG.2017 21:43:41

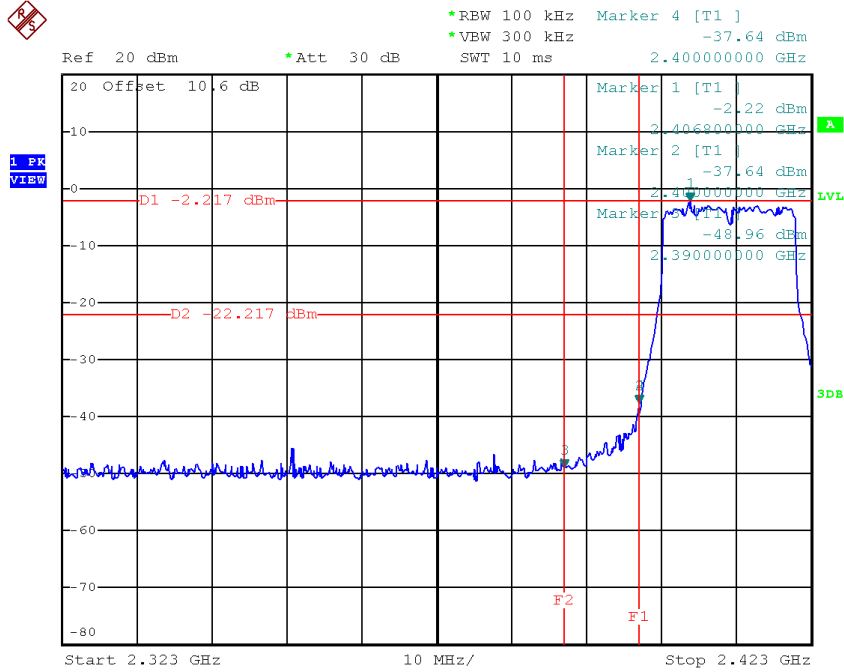


Date: 10.AUG.2017 21:43:48



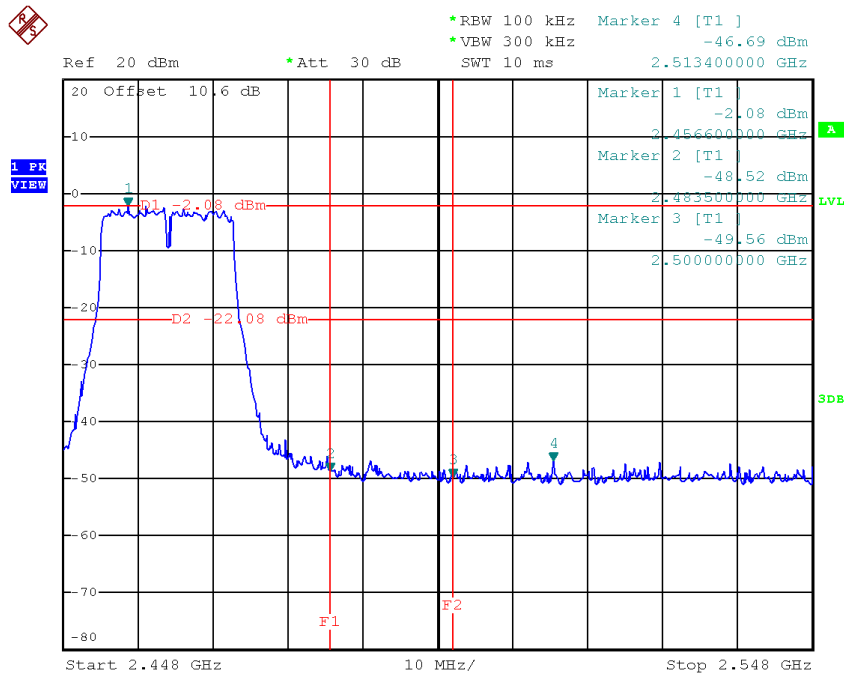
**Test Mode : TX N-20M Mode**

**TX HT20 mode CH01**



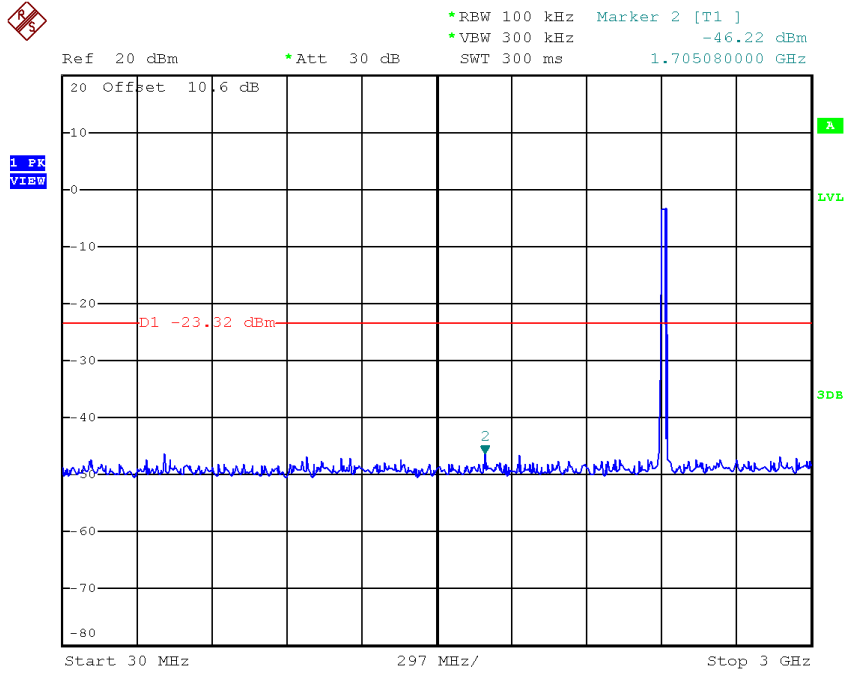
Date: 9.AUG.2017 16:22:24

**TX HT20 mode CH11**

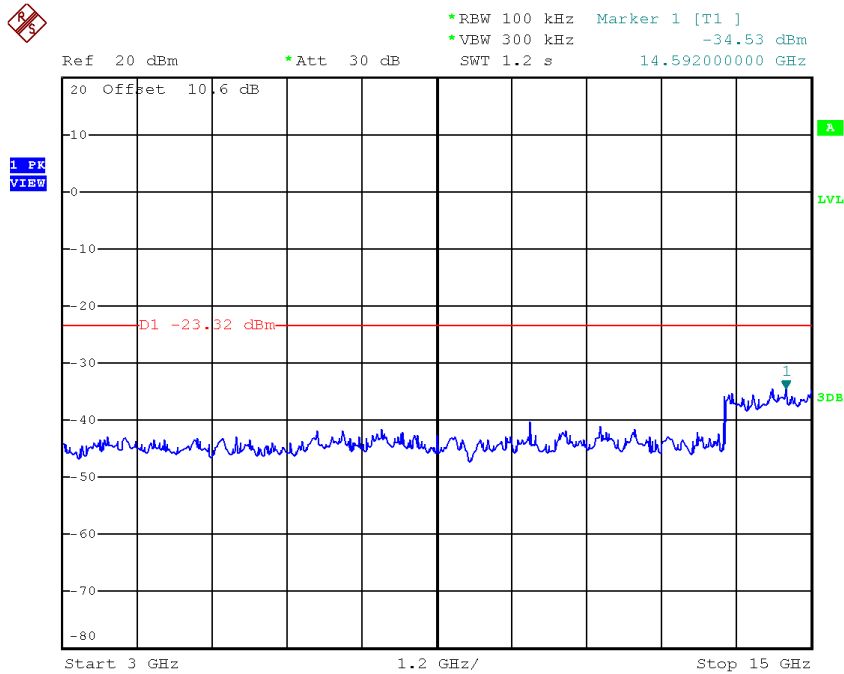


Date: 9.AUG.2017 16:27:49

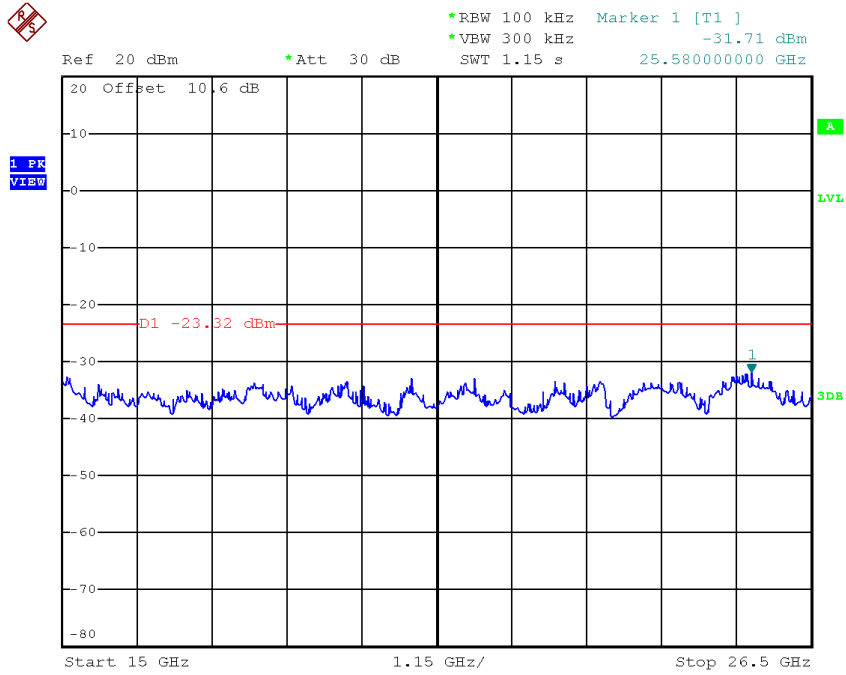
**TX HT20 mode CH01 (10 Harmonic of the frequency)**



Date: 9.AUG.2017 16:21:47

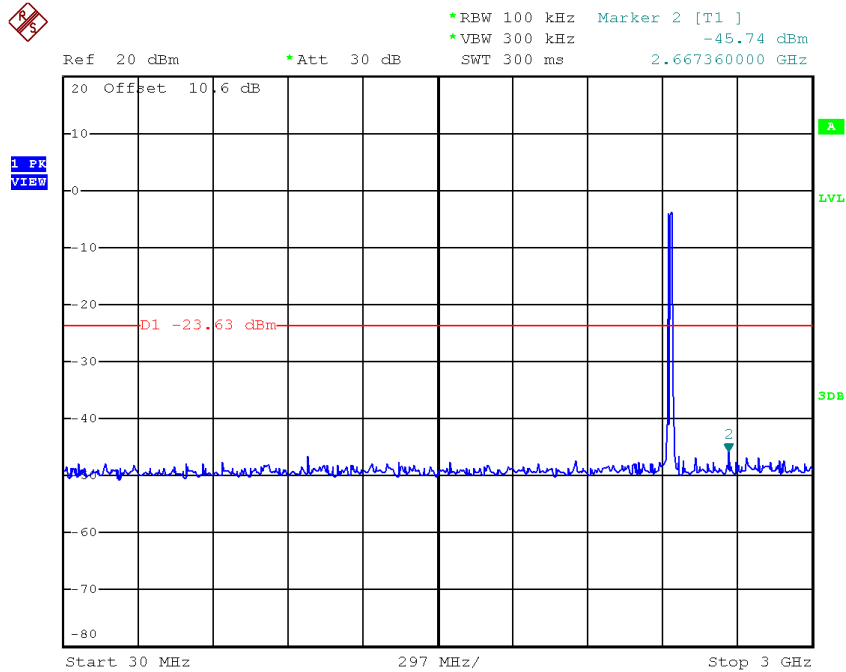


Date: 9.AUG.2017 16:21:54

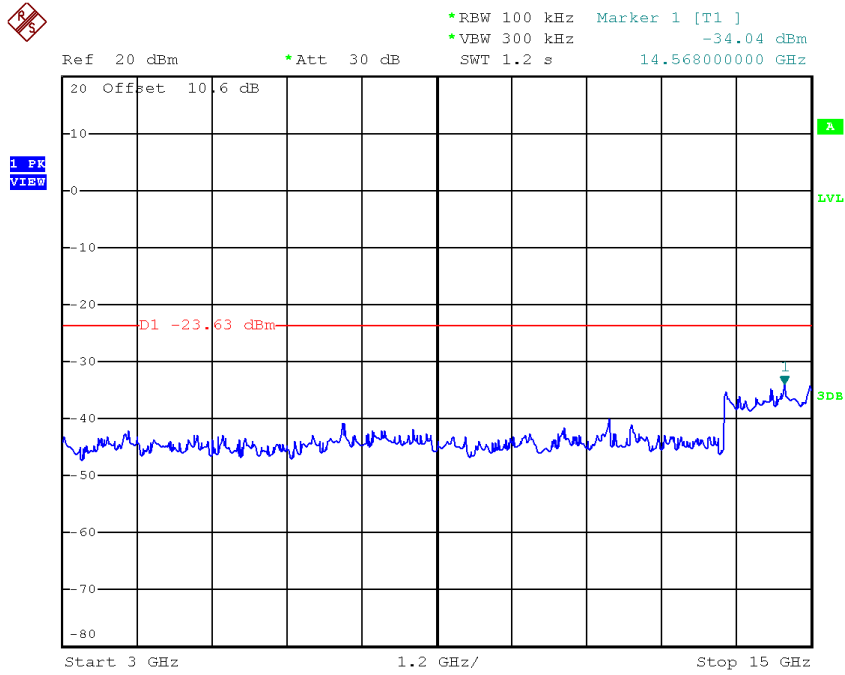


Date: 9.AUG.2017 16:22:00

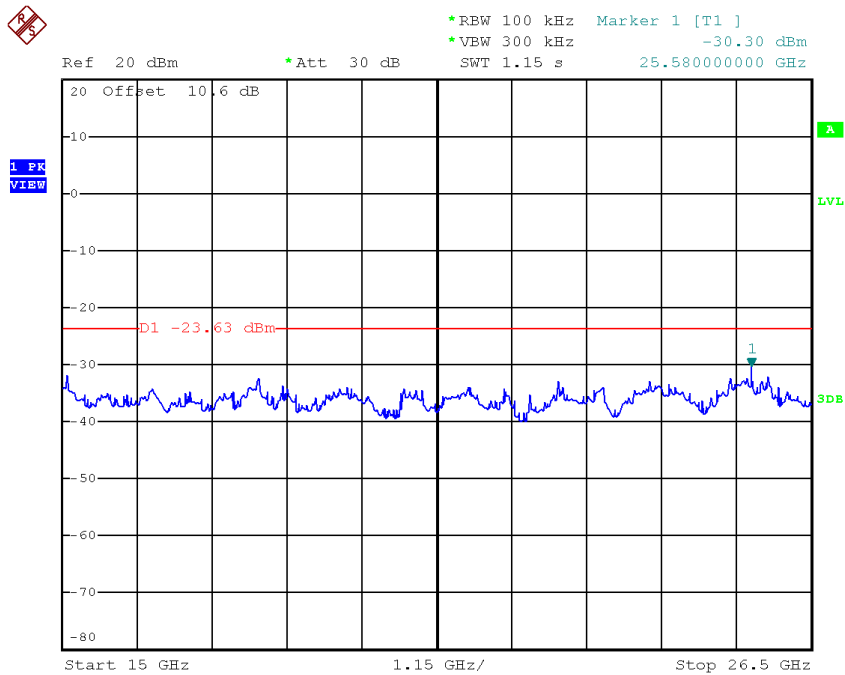
**TX HT20 mode CH06 (10 Harmonic of the frequency)**



Date: 9.AUG.2017 16:24:26



Date: 9.AUG.2017 16:24:33

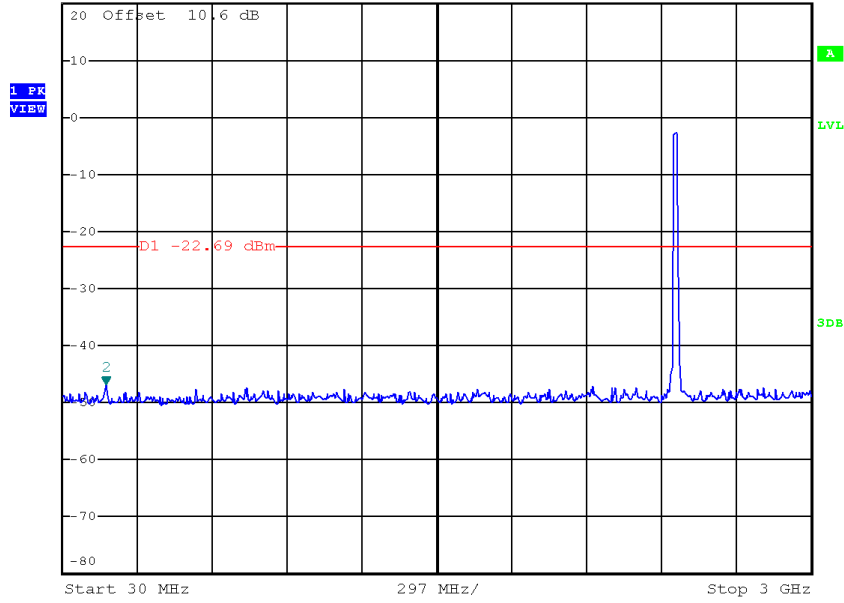


Date: 9.AUG.2017 16:24:40

### TX HT20 mode CH11 (10 Harmonic of the frequency)



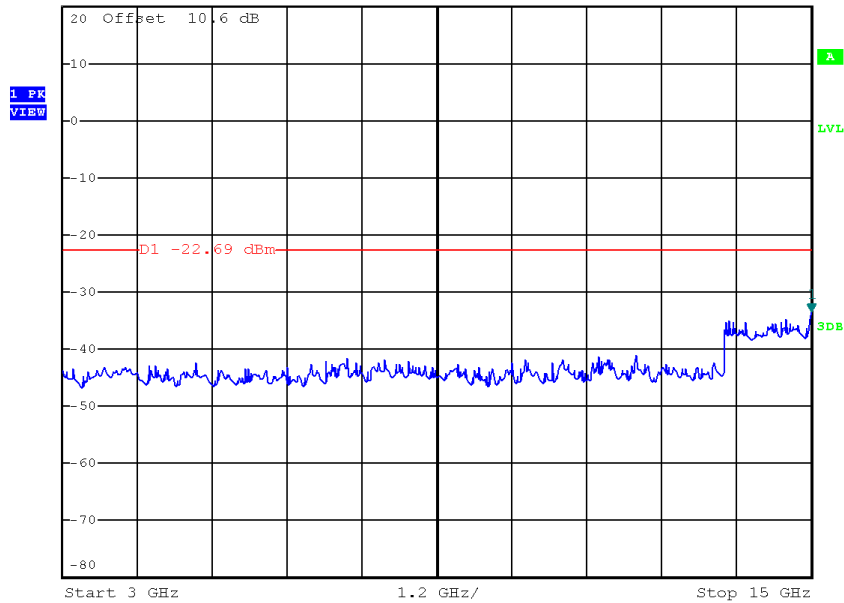
Ref 20 dBm      \*Att 30 dB      \*REW 100 kHz      Marker 2 [T1 ]  
\*VEW 300 kHz      -46.81 dBm  
SWT 300 ms      202.260000000 MHz



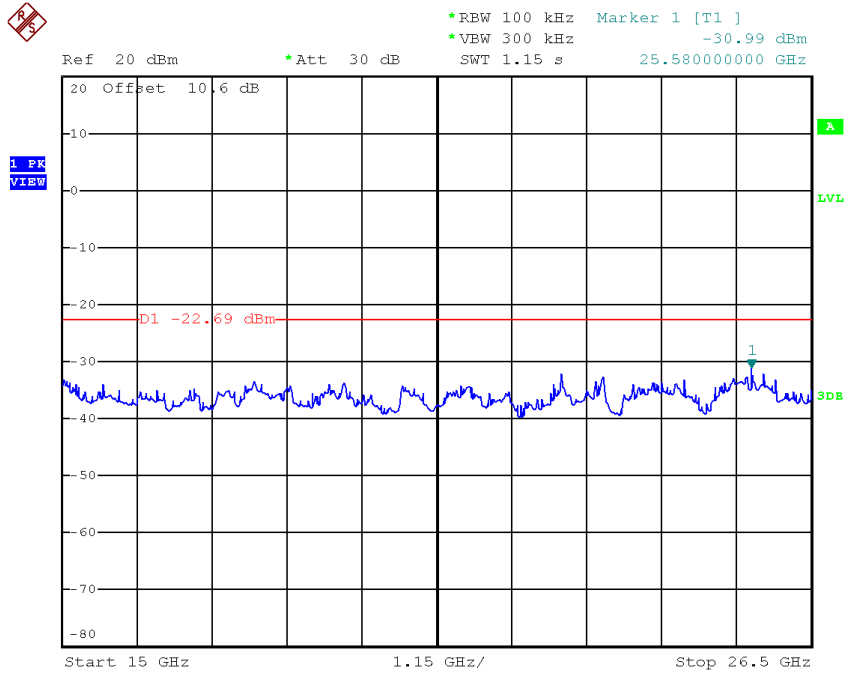
Date: 9.AUG.2017 16:27:29



Ref 20 dBm      \*Att 30 dB      \*REW 100 kHz      Marker 1 [T1 ]  
\*VEW 300 kHz      -33.38 dBm  
SWT 1.2 s      15.000000000 GHz



Date: 9.AUG.2017 16:27:36



Date: 9.AUG.2017 16:27:42

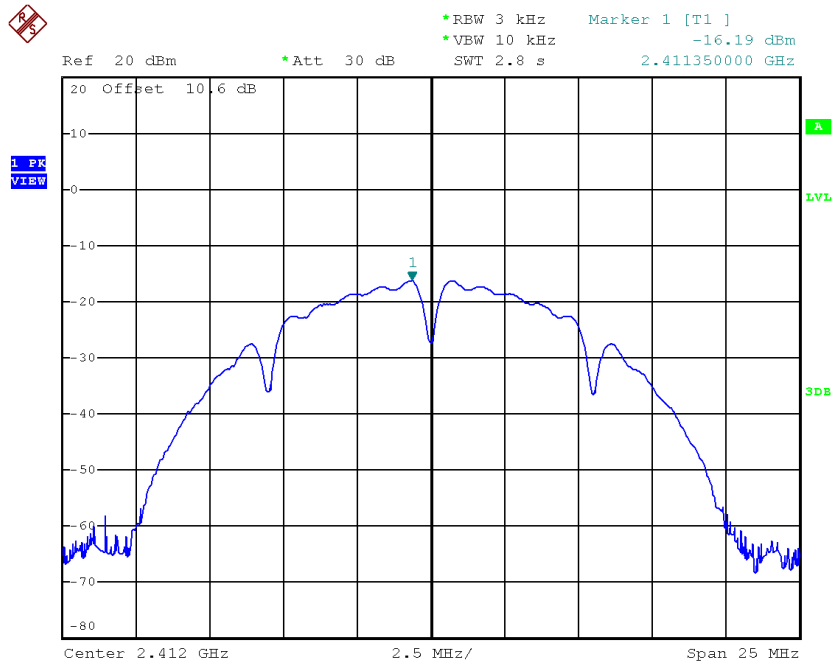
## APPENDIX H - POWER SPECTRAL DENSITY

For 1T1R

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

Frequency (MHz)	Power Density (dBm/3kHz)	Power Density (mW/3kHz)	Max. Limit (dBm/3kHz)	Result
2412	-16.19	0.0240	8.00	Complies
2437	-13.90	0.0407	8.00	Complies
2462	-13.56	0.0441	8.00	Complies

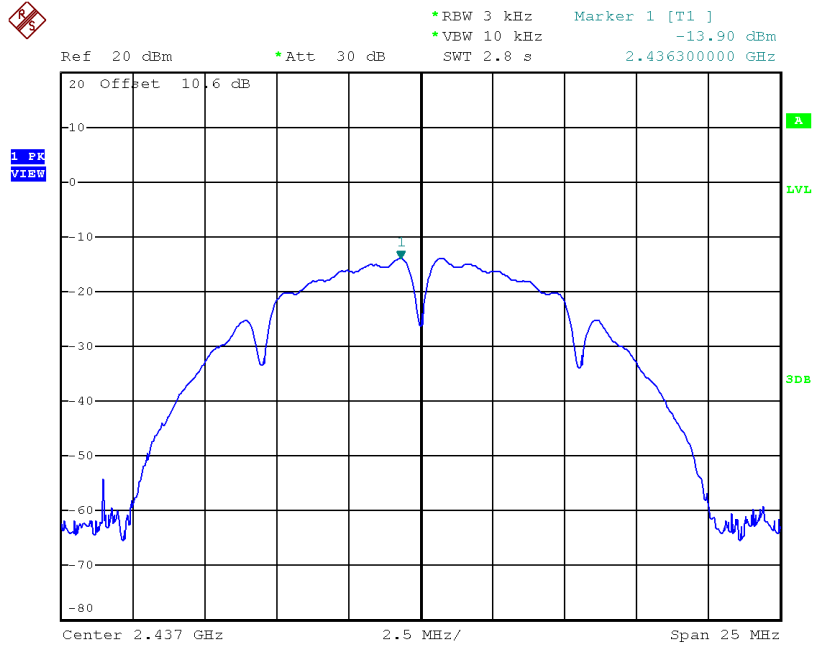
**TX CH01**



Date: 9.AUG.2017 16:09:03

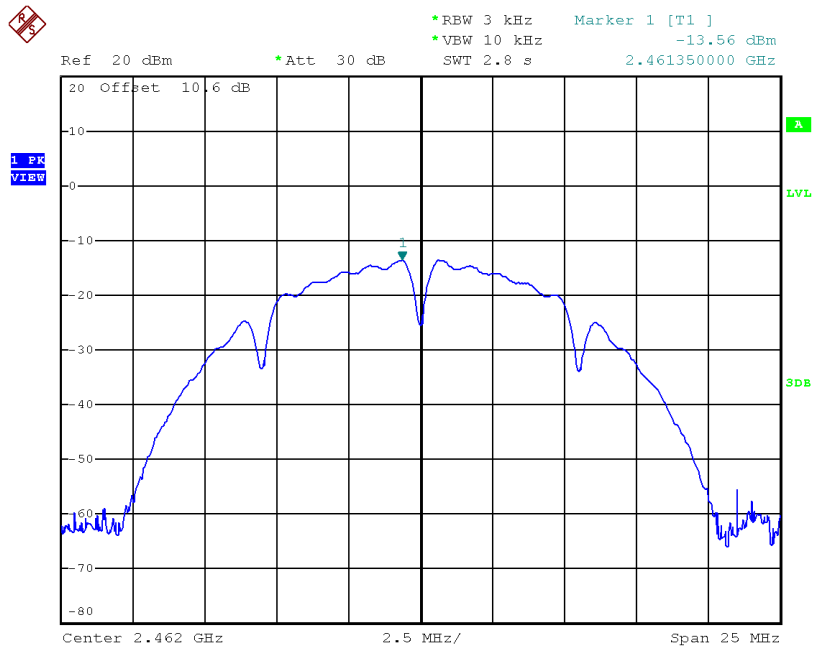


### TX CH06



Date: 9.AUG.2017 16:10:53

### TX CH11

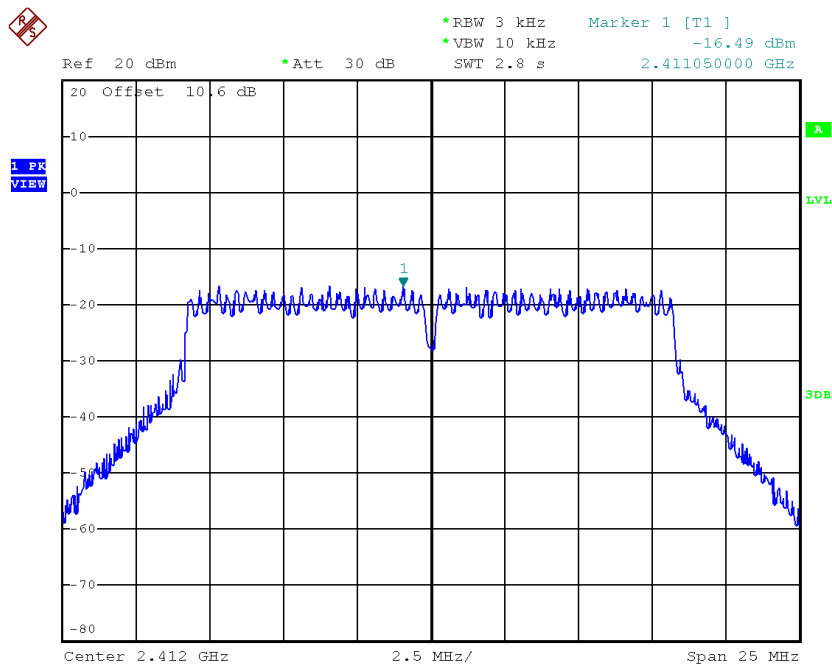


Date: 9.AUG.2017 16:15:13

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

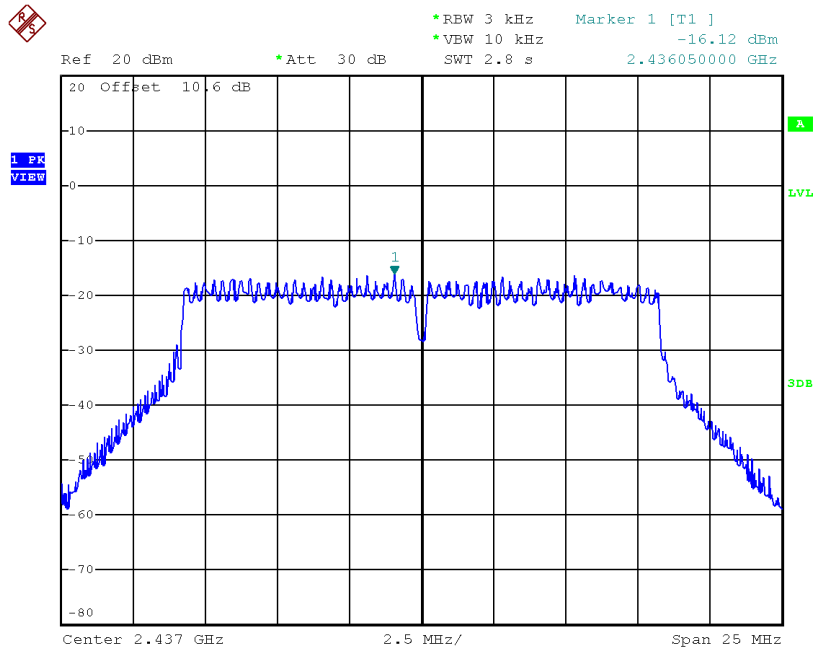
Frequency (MHz)	Power Density (dBm/3kHz)	Power Density (mW/3kHz)	Max. Limit (dBm/3kHz)	Result
2412	-16.49	0.0224	8.00	Complies
2437	-16.12	0.0244	8.00	Complies
2462	-16.36	0.0231	8.00	Complies

**TX CH01**



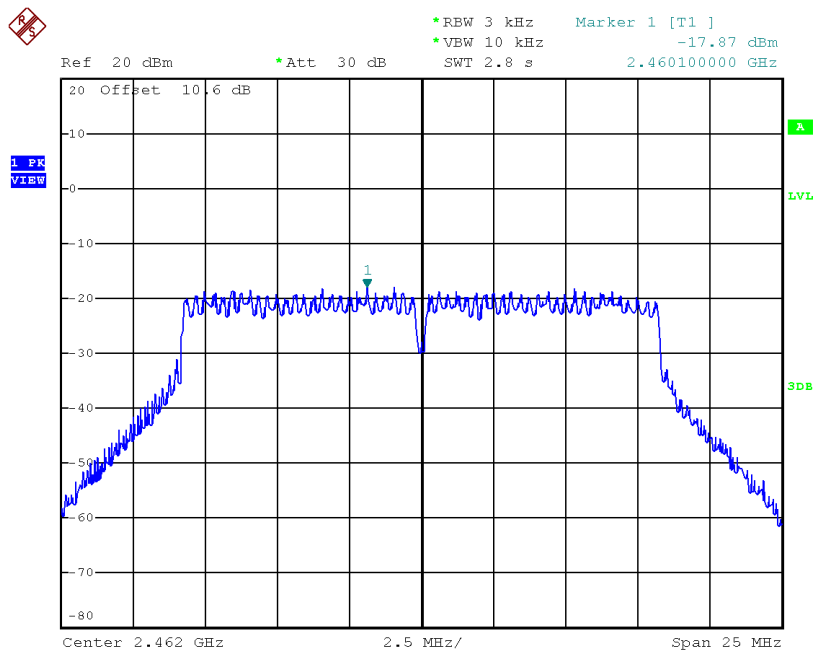
Date: 9.AUG.2017 16:17:19

### TX CH06



Date: 9.AUG.2017 16:18:53

### TX CH11

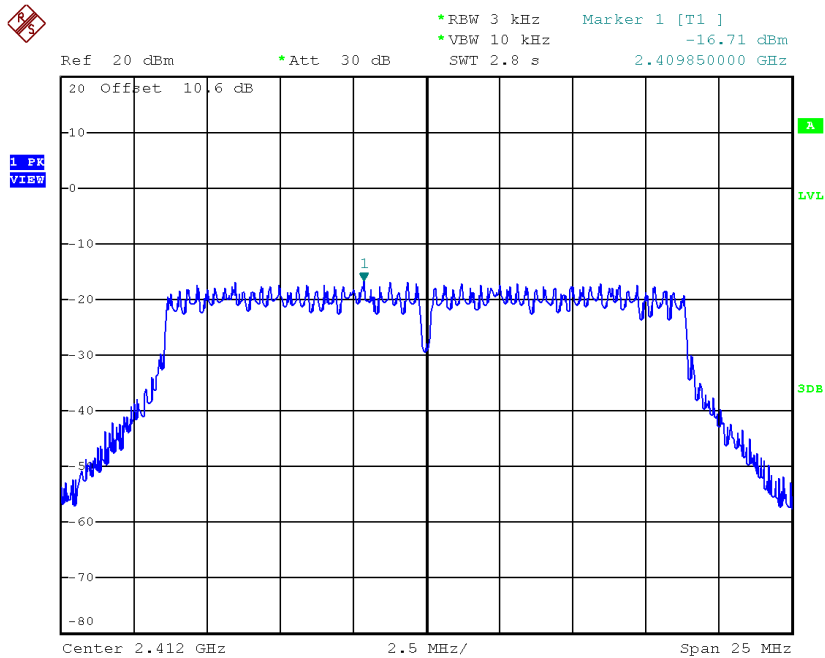


Date: 10.AUG.2017 21:44:04

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

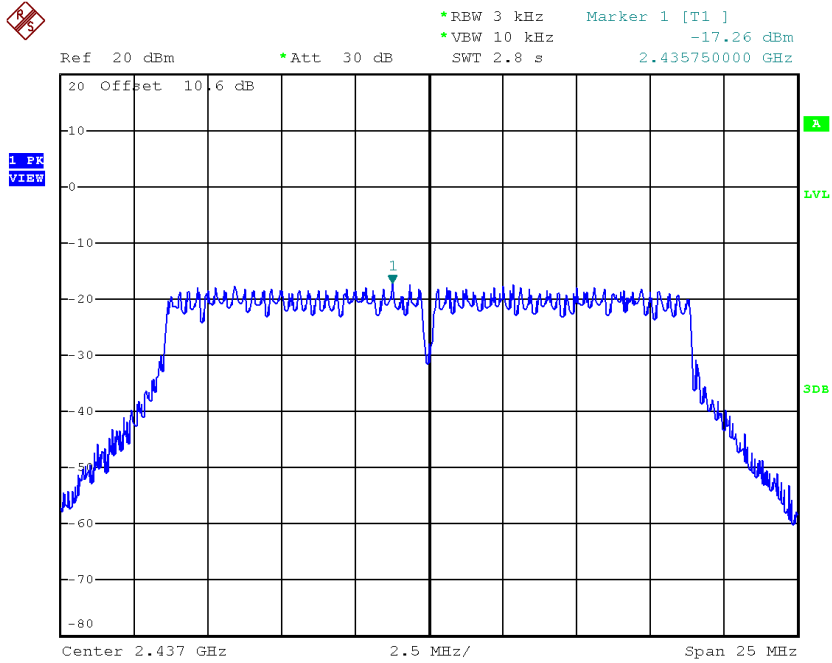
Frequency (MHz)	Power Density (dBm/3kHz)	Power Density (mW/3kHz)	Max. Limit (dBm/3kHz)	Result
2412	-16.71	0.0213	8.00	Complies
2437	-17.26	0.0188	8.00	Complies
2462	-16.45	0.0226	8.00	Complies

**TX CH01**



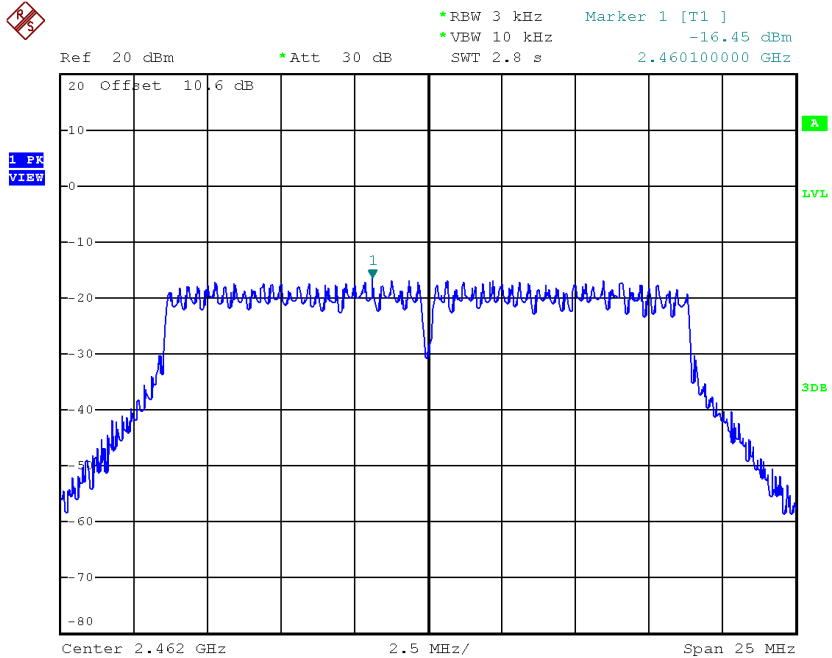
Date: 9.AUG.2017 16:22:33

### TX CH06



Date: 9.AUG.2017 16:24:49

### TX CH11



Date: 9.AUG.2017 16:27:58