

# FCC Radio Test Report

## FCC ID: APIHKOMNI10P

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

**Project No.** : 1603C096  
**Equipment** : Streaming wireless speaker  
**Model Name** : HK OMNI 10+  
**Applicant** : Harman International Industries, Incorporated  
**Address** : 8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES

**Date of Receipt** : Mar. 08, 2016  
**Date of Test** : Mar. 08, 2016 ~ Jul. 05, 2016  
**Issued Date** : Jul. 06, 2016  
**Tested by** : BTL Inc.

**Testing Engineer** : Shawn Xiao  
(Shawn Xiao)

**Technical Manager** : David Mao  
(David Mao)

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

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

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

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

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### REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-3-1603C096	Original Issue.	Jul. 06, 2016

## 1. CERTIFICATION

Equipment : Streaming wireless speaker  
Brand Name : harman/Kardon  
Model Name : HK OMNI 10+  
Applicant : Harman International Industries, Incorporated  
Manufacturer : Harman International Industries, Incorporated  
Address : 8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES  
Factory : Guoguang Electric Co.,Ltd  
Address : No.8 Jinghu Road, Xinhua Street, Huadu Reg, Guangzhou, China  
Date of Test : Mar. 08, 2016 ~ Jul. 05, 2016  
Test Sample : Engineering Sample  
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-3-1603C096) 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).

**Test results included in this report is only for the 2.4G WLAN 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	
	15.209/15.205	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 is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.  
 BTL's test firm number for FCC: 319330

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{CISPR}$  requirement.

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

### A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150 KHz ~ 30MHz	2.32

### B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
DG-CB03	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	Streaming wireless speaker	
Brand Name	harman/Kardon	
Model Name	HK OMNI 10+	
Model Difference	N/A	
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 150 Mbps
	Output Power (Max.)	802.11b: 20.46dBm 802.11g: 24.79dBm 802.11n(20MHz): 24.97dBm 802.11n(40MHz): 25.27dBm
Power Source	DC voltage supplied from AC/DC adapter. Band / Model: GIP / NDT19V-3C-DC	
Power Rating	I/P: AC 100-240V 50/60Hz 1.5A O/P: DC 19V 3A	

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 – CH11 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	harman/Kardon	N/A	Internal	N/A	4.04

### 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:**

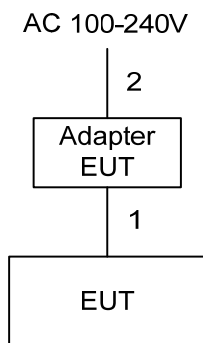
- (1) The measurements are performed at the high, middle, low available channels.
- (2) 802.11b mode: DBPSK (1Mbps)  
 802.11g mode: OFDM (6Mbps)  
 802.11n HT20 mode : BPSK (6.5Mbps)  
 802.11n HT40 mode : BPSK (13.5Mbps)  
 For radiated emission tests, the highest output powers were set for final test.
- (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

Test software version	N/A		
Frequency (MHz)	2412	2437	2462
802.11b	64	64	64
802.11g	58	64	60
802.11n (20MHz)	58	64	58
Frequency	2422	2437	2452
802.11n (40MHz)	48	64	50

### 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.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.6m	DC Cable
2	NO	NO	1.5m	AC 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

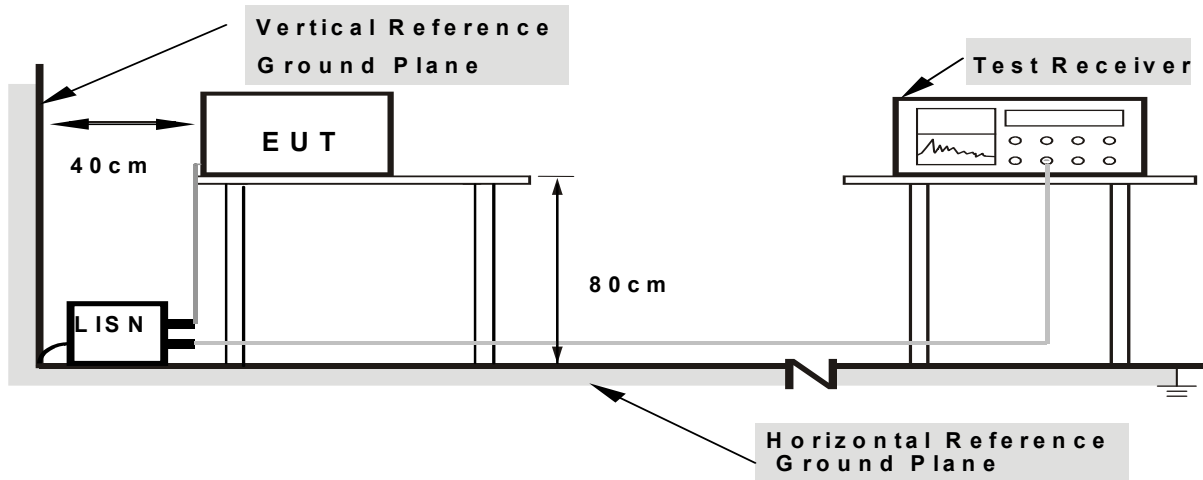
#### 4.1.2 TEST PROCEDURE

- 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



- 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 Attachment 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

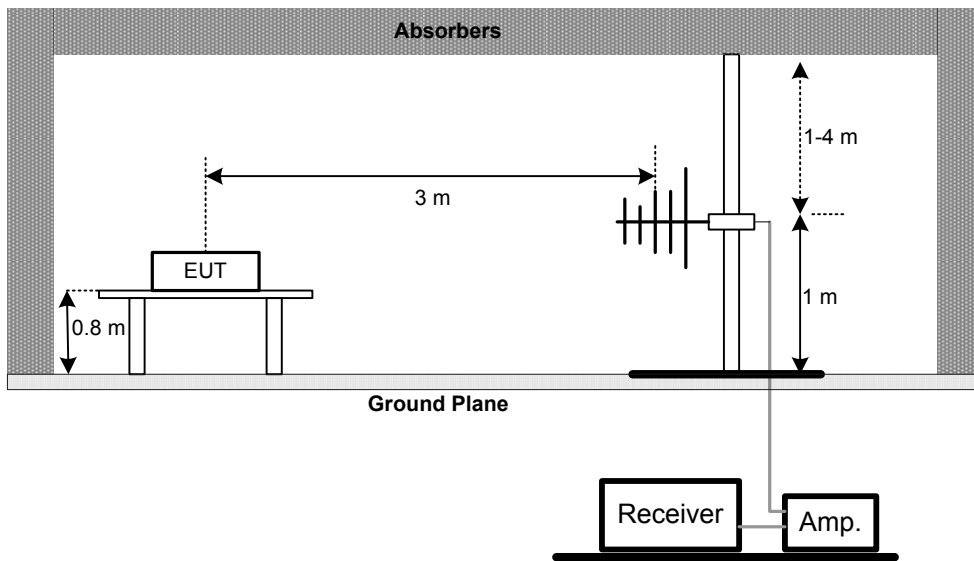
- a. The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of at 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 conducted 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

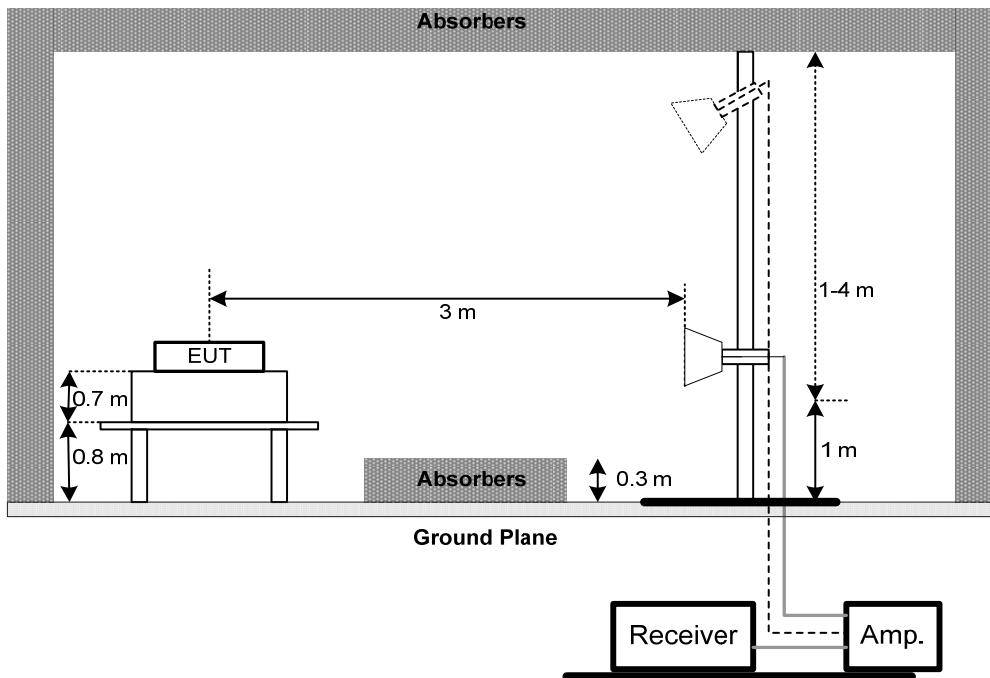
No deviation

**4.2.4 TEST SETUP**

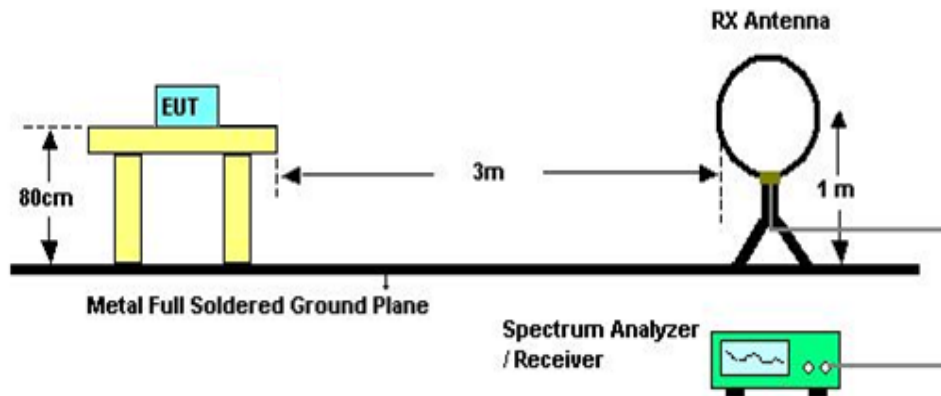
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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 Attachment B

Remark:

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

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

Please refer to the Attachment C.

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

Please refer to the Attachment 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

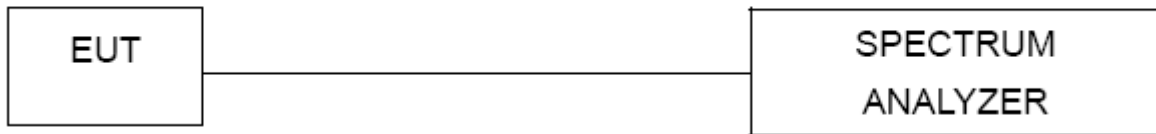
#### 5.1.1 TEST PROCEDURE

- 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 Attachment 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 c03r05.

#### 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 Attachment F.

## 7. ANTENNA CONDUCTED SPURIOUS EMISSION

### 7.1 APPLIED PROCEDURES / LIMIT

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits.

#### 7.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = 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 Attachment G.

## 8. POWER SPECTRAL DENSITY TEST

### 8.1 APPLIED PROCEDURES / LIMIT

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

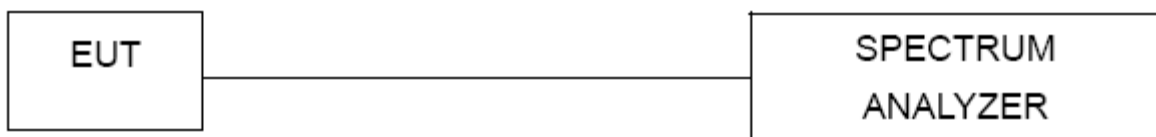
#### 8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW=3KHz, VBW=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 Attachment H.

## 9. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	0052765	Mar. 27, 2017
2	LISN	R&S	ENV216	101447	Mar. 27, 2017
3	Test Cable	emci	RG223(9KHz -30MHz)	C_17	Mar. 10, 2017
4	EMI Test Receiver	R&S	ESCI	100382	Mar. 27, 2017
5	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 27, 2017
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1 -01	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 27, 2017
2	Amplifier	HP	8447D	2944A09673	Nov. 09, 2016
3	Receiver	AGILENT	N9038A	MY5213003 9	Oct. 11, 2016
4	Test Cable	emci	LMR-400(30MH z-1GHz)	C-01	Jun. 27, 2017
5	Control	CT	SC100	N/A	N/A
6	Position Control	MF	MF-7802	MF78020841 6	N/A
7	Antenna	ETS	3115	00075789	Mar. 27, 2017
8	Amplifier	Agilent	8449B	3008A02274	Nov. 01, 2016
9	Receiver	AGILENT	N9038A	MY5213003 9	Oct. 11, 2016
10	Test Cable	emci	EMC104-SM-S M-10000(1GHz -26.5GHz)	C-68	Jun. 27, 2017
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Apr. 23, 2017
12	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 27, 2017
13	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Sep. 07, 2016
14	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	FSP 40	100185	Oct. 11, 2016

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Mar. 27, 2017
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Mar. 27, 2017

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

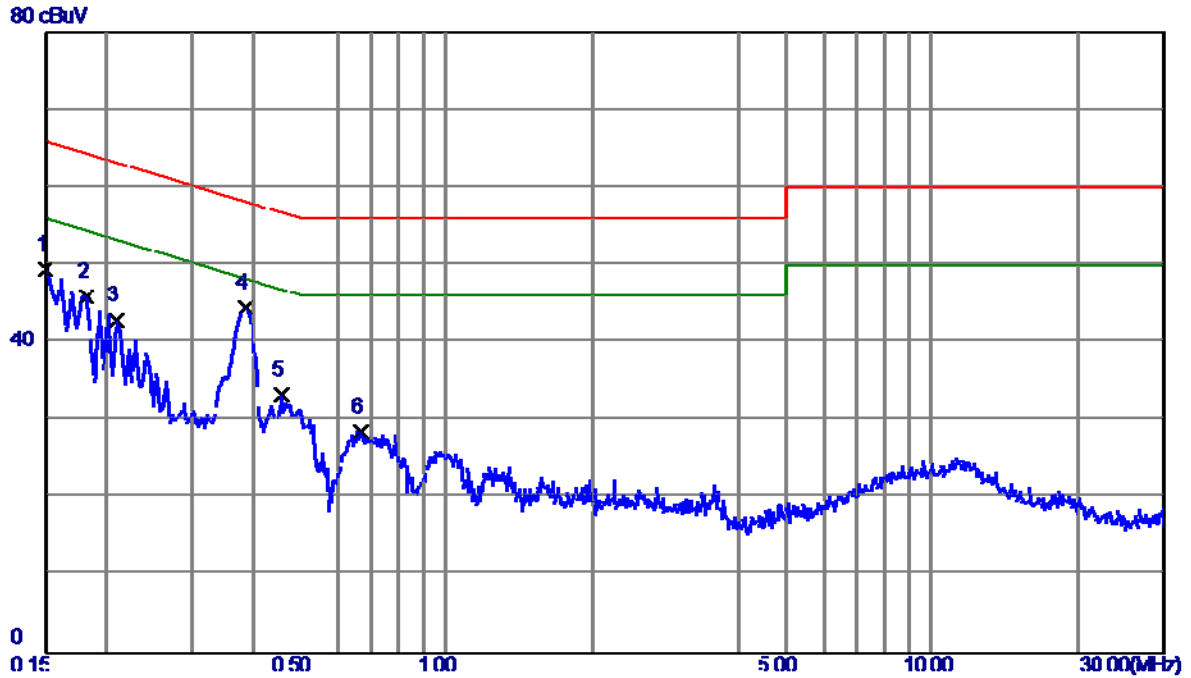
Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Oct. 11, 2016

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

## ATTACHMENT A - CONDUCTED EMISSION

Test Mode : Normal Link

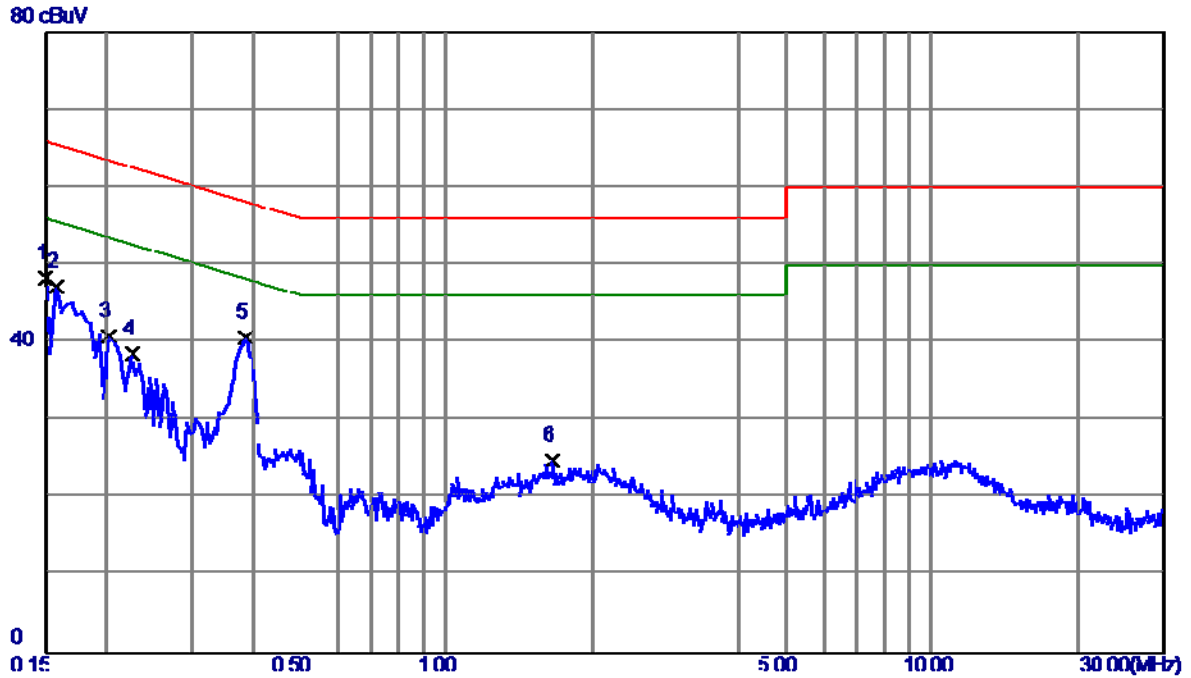
### Line



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1500	39.97	9.52	49.49	66.00	-16.51	Peak	
2	0.1819	36.36	9.55	45.91	64.40	-18.49	Peak	
3	0.2100	33.37	9.57	42.94	63.21	-20.27	Peak	
4 *	0.3860	34.87	9.66	44.53	58.15	-13.62	Peak	
5	0.4580	23.60	9.67	33.27	56.73	-23.46	Peak	
6	0.6700	18.78	9.74	28.52	56.00	-27.48	Peak	

Test Mode : Normal Link

**Neutral**



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.1500	38.78	9.47	48.25	66.00	-17.75	Peak	
2	0.1580	37.74	9.47	47.21	65.57	-18.36	Peak	
3	0.2020	31.30	9.49	40.79	63.53	-22.74	Peak	
4	0.2260	28.99	9.50	38.49	62.60	-24.11	Peak	
5 *	0.3860	31.19	9.52	40.71	58.15	-17.44	Peak	
6	1.6580	15.14	9.68	24.82	56.00	-31.18	Peak	

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

Test Mode:	TX B MODE CHANNEL 01
------------	----------------------

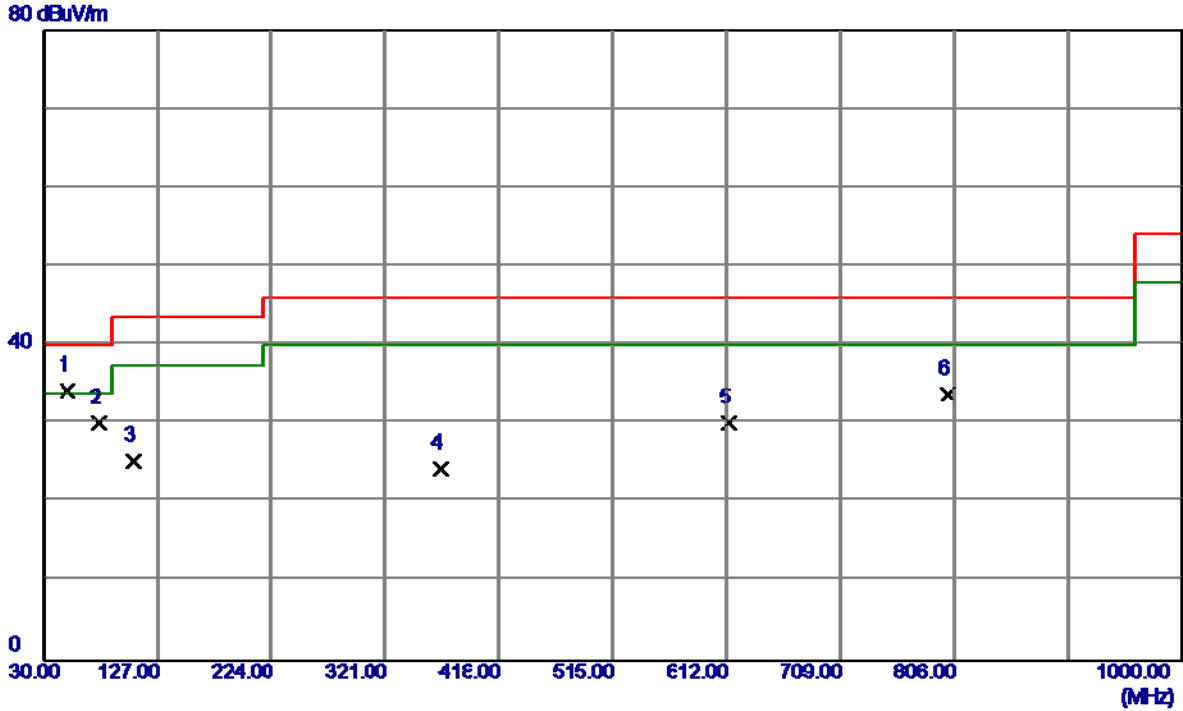
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0112	0°	13.52	24.8573	38.3773	126.6199	-88.2425	AVG
0.0112	0°	14.63	24.8573	39.4873	146.6199	-107.1325	PEAK
0.0292	0°	6.85	23.7173	30.5673	118.2966	-87.7292	AVG
0.0292	0°	8.35	23.7173	32.0673	138.2966	-106.2292	PEAK
0.0388	0°	3.26	23.1093	26.3693	115.8276	-89.4583	AVG
0.0388	0°	5.76	23.1093	28.8693	135.8276	-106.9583	PEAK
0.0597	0°	1.29	22.2060	23.4960	112.0847	-88.5887	AVG
0.0597	0°	2.67	22.2060	24.8760	132.0847	-107.2087	PEAK
0.5106	0°	19.42	19.8339	39.2539	73.4426	-34.1887	QP
1.9732	0°	23.85	19.5027	43.3527	69.5400	-26.1873	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0137	90°	13.42	24.3000	37.7200	124.8698	-87.1498	AVG
0.0137	90°	14.97	24.3000	39.2700	144.8698	-105.5998	PEAK
0.0249	90°	7.63	23.9897	31.6197	119.6802	-88.0606	AVG
0.0249	90°	9.04	23.9897	33.0297	139.6802	-106.6506	PEAK
0.0446	90°	5.33	22.7420	28.0720	114.6175	-86.5455	AVG
0.0446	90°	6.25	22.7420	28.9920	134.6175	-105.6255	PEAK
0.0593	90°	1.67	22.2140	23.8840	112.1431	-88.2591	AVG
0.0593	90°	2.91	22.2140	25.1240	132.1431	-107.0191	PEAK
0.6345	90°	22.36	20.2304	42.5904	71.5556	-28.9652	QP
2.0604	90°	24.73	19.4638	44.1938	69.5400	-25.3462	QP

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

Test Mode: TX B MODE CHANNEL 01

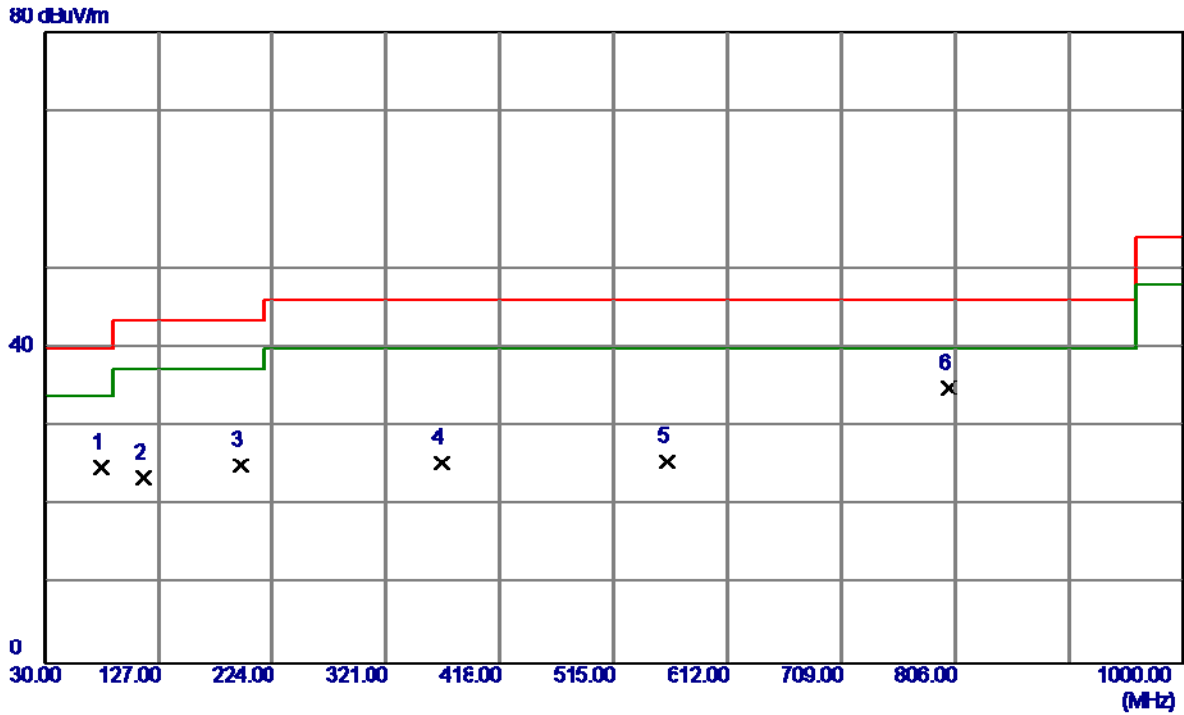
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	50.3700	46.34	-12.06	34.28	40.00	-5.72	Peak	
2	77.0450	46.35	-16.34	30.01	40.00	-9.99	Peak	
3	106.1450	39.33	-14.06	25.27	43.50	-18.23	Peak	
4	368.5300	33.79	-9.46	24.33	46.00	-21.67	Peak	
5	614.4250	34.28	-4.17	30.11	46.00	-15.89	Peak	
6	800.1800	33.61	0.20	33.81	46.00	-12.19	Peak	

Test Mode: TX B MODE CHANNEL 01

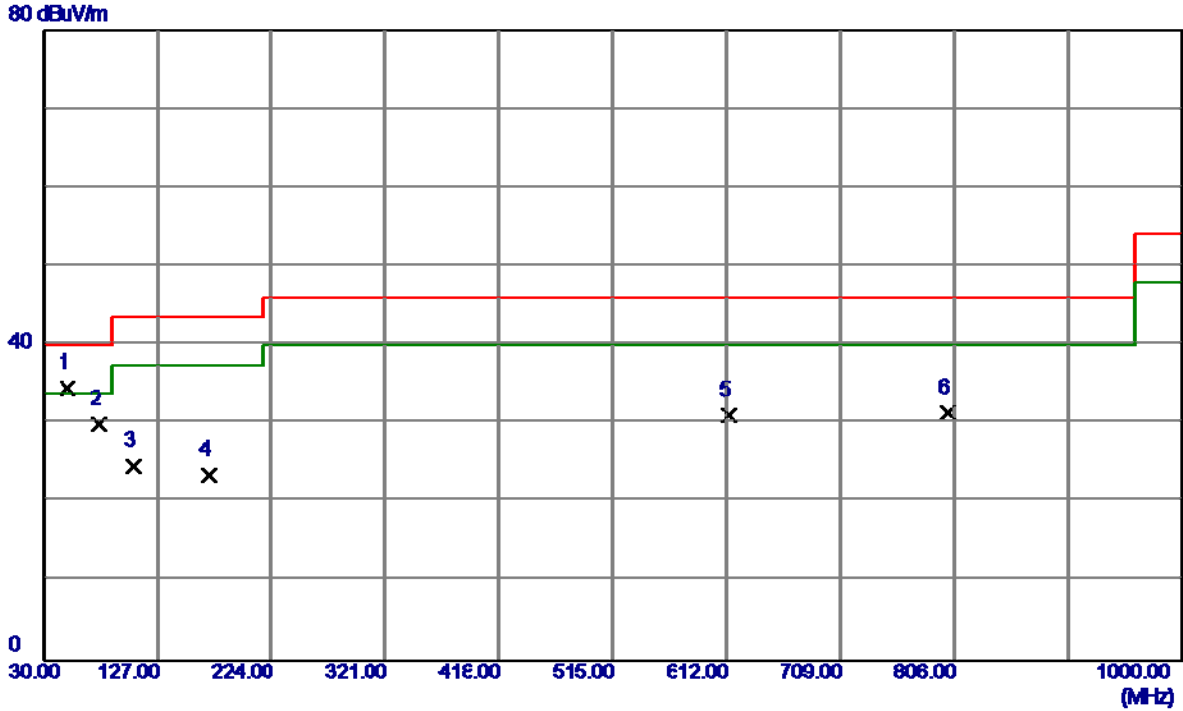
**Horizontal**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	78.5000	41.35	-16.50	24.85	40.00	-15.15	Peak	
2	113.9050	36.80	-13.31	23.49	43.50	-20.01	Peak	
3	196.8400	38.56	-13.47	25.09	43.50	-18.41	Peak	
4	368.5300	34.89	-9.46	25.43	46.00	-20.57	Peak	
5	560.1050	30.31	-4.73	25.58	46.00	-20.42	Peak	
6 *	800.1800	34.71	0.20	34.91	46.00	-11.09	Peak	

Test Mode: TX B MODE CHANNEL 06

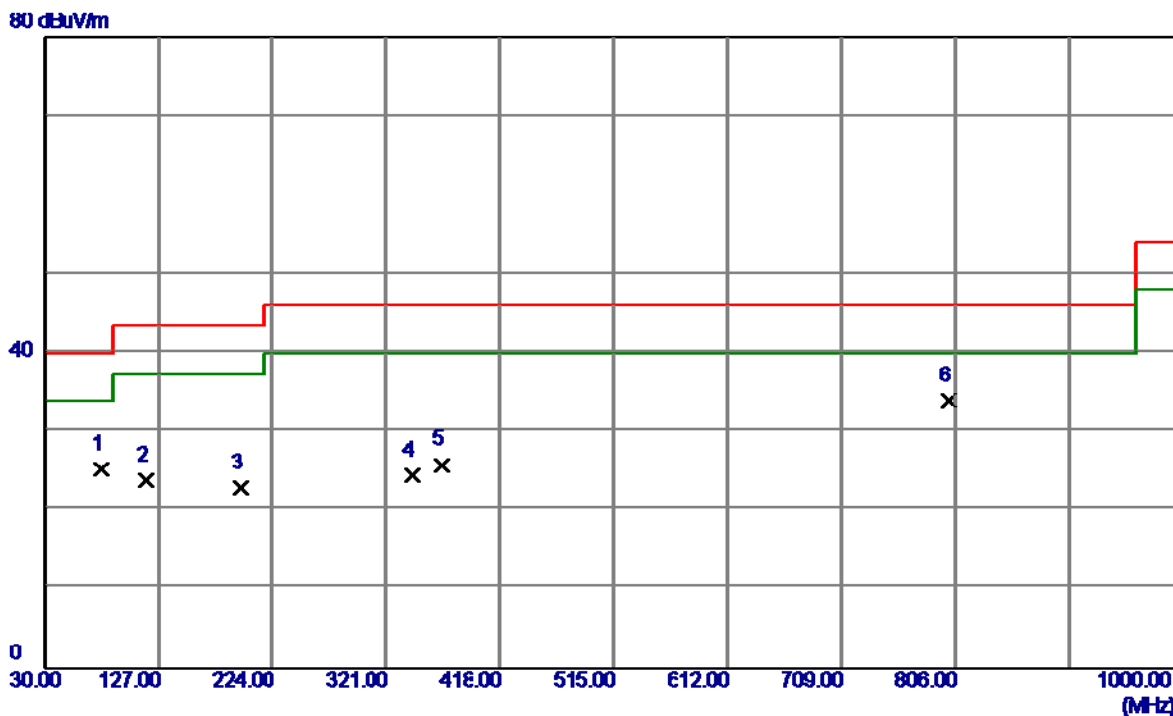
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	50.3700	46.61	-12.06	34.55	40.00	-5.45	Peak	
2	77.0450	46.21	-16.34	29.87	40.00	-10.13	Peak	
3	106.1450	38.71	-14.06	24.65	43.50	-18.85	Peak	
4	171.1350	34.42	-10.85	23.57	43.50	-19.93	Peak	
5	614.4250	35.15	-4.17	30.98	46.00	-15.02	Peak	
6	800.1800	31.21	0.20	31.41	46.00	-14.59	Peak	

Test Mode: TX B MODE CHANNEL 06

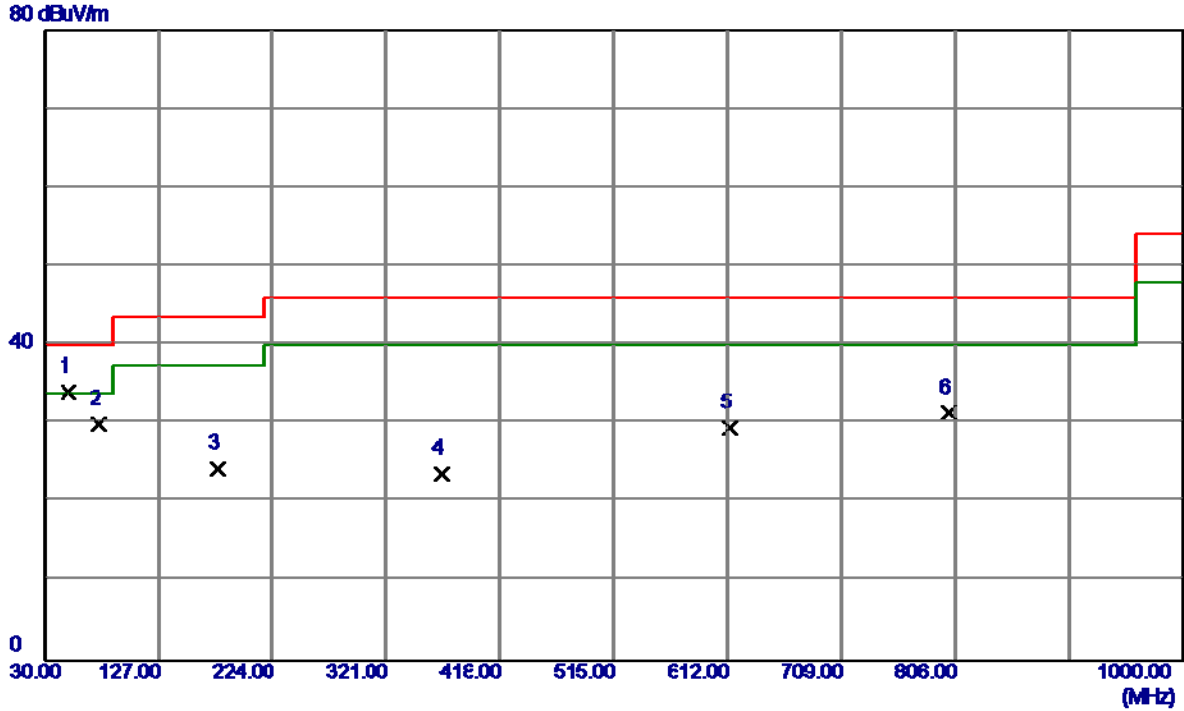
Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	78.9850	41.90	-16.56	25.34	40.00	-14.66	Peak	
2	115.8450	36.87	-13.07	23.80	43.50	-19.70	Peak	
3	196.8400	36.31	-13.47	22.84	43.50	-20.66	Peak	
4	343.7950	35.18	-10.68	24.50	46.00	-21.50	Peak	
5	368.5300	35.30	-9.46	25.84	46.00	-20.16	Peak	
6 *	800.1800	33.72	0.20	33.92	46.00	-12.08	Peak	

Test Mode: TX B MODE CHANNEL 11

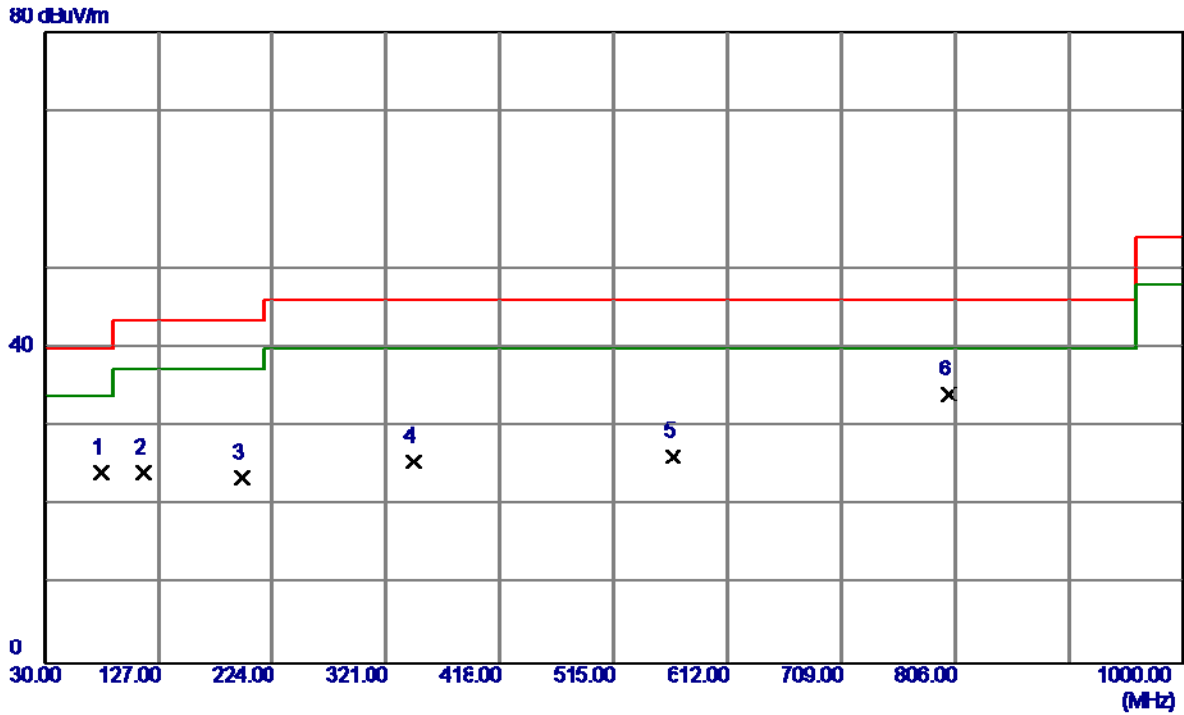
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	50.3700	46.09	-12.06	34.03	40.00	-5.97	Peak	
2	76.0750	46.14	-16.23	29.91	40.00	-10.09	Peak	
3	177.4400	36.03	-11.76	24.27	43.50	-19.23	Peak	
4	368.5300	33.10	-9.46	23.64	46.00	-22.36	Peak	
5	614.4250	33.60	-4.17	29.43	46.00	-16.57	Peak	
6	800.1800	31.12	0.20	31.32	46.00	-14.68	Peak	

Test Mode: TX B MODE CHANNEL 11

Horizontal

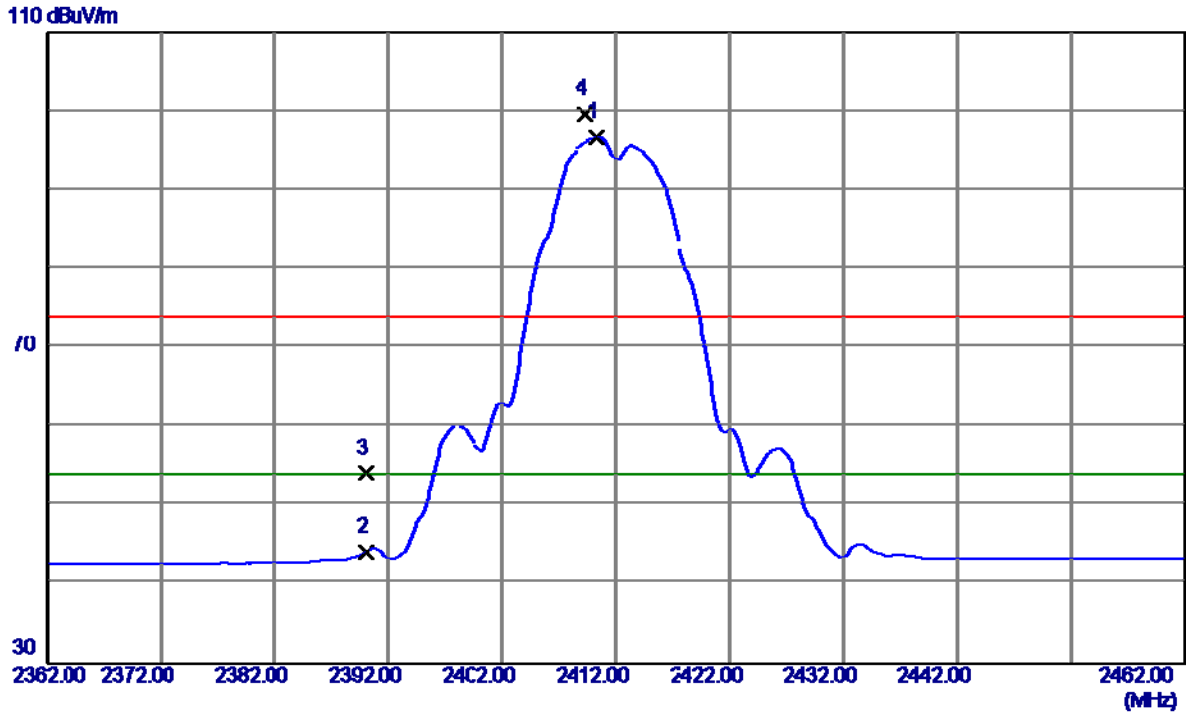


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	78.0150	40.61	-16.45	24.16	40.00	-15.84	Peak	
2	114.3900	37.38	13.25	24.13	43.50	19.37	Peak	
3	198.2950	37.13	-13.54	23.59	43.50	-19.91	Peak	
4	344.2800	36.28	-10.69	25.59	46.00	-20.41	Peak	
5	565.4400	30.97	-4.78	26.19	46.00	-19.81	Peak	
6 *	800.1800	33.94	0.20	34.14	46.00	-11.86	Peak	

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

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

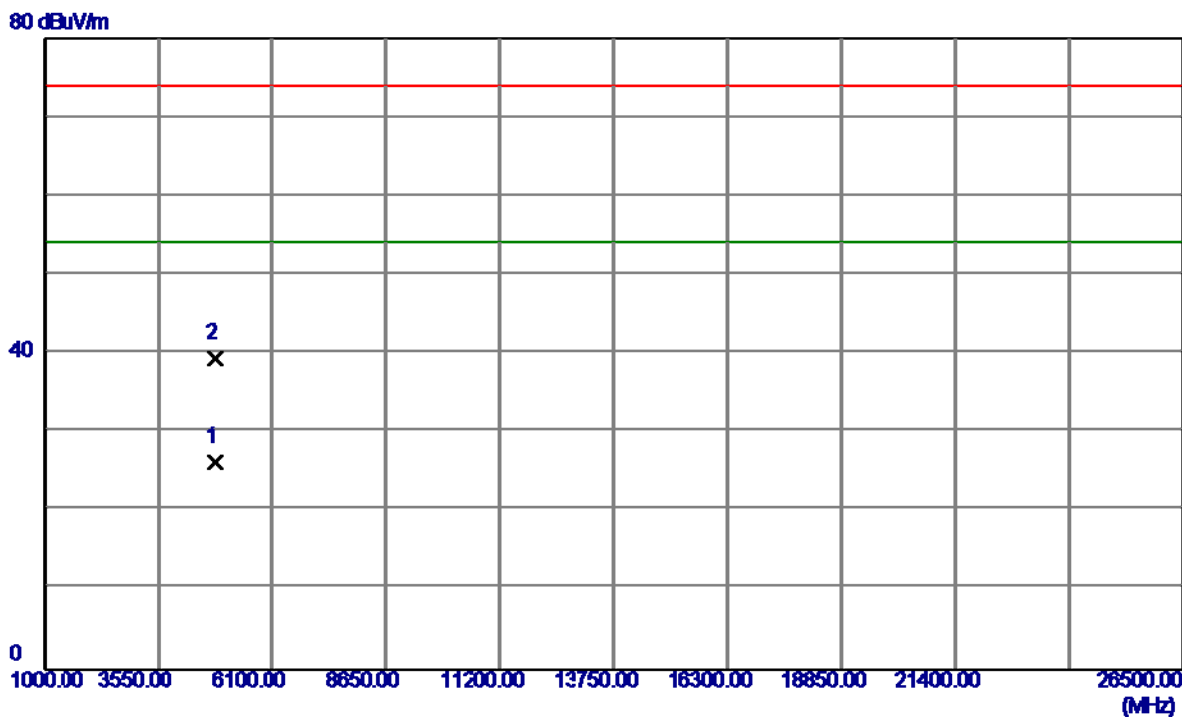
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2410.3000	67.61	29.09	96.70	54.00	42.70	AVG	No Limit
2	2390.0000	15.15	28.99	44.14	54.00	-9.86	AVG	
3	2390.0000	25.09	28.99	54.08	74.00	-19.92	Peak	
4	2409.3000	70.58	29.08	99.66	74.00	25.66	Peak	No Limit

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

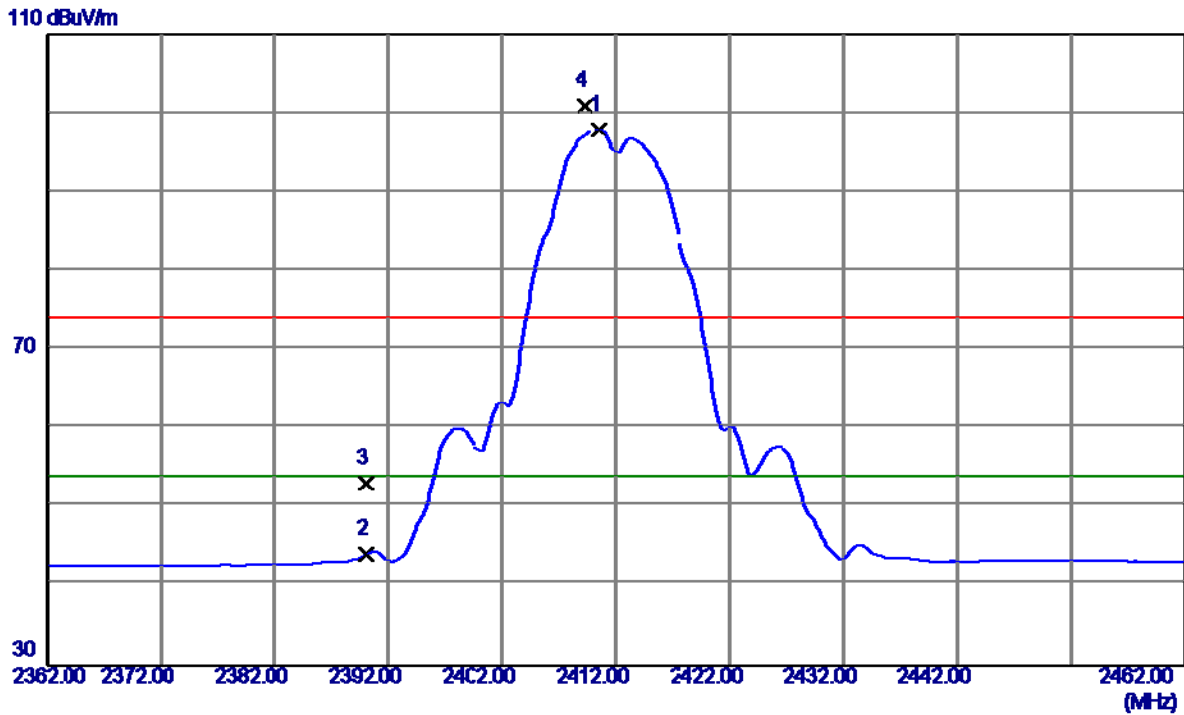
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4823.7719	22.49	3.77	26.26	54.00	-27.74	AVG	
2	4824.1770	35.57	3.77	39.34	74.00	-34.66	Peak	

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

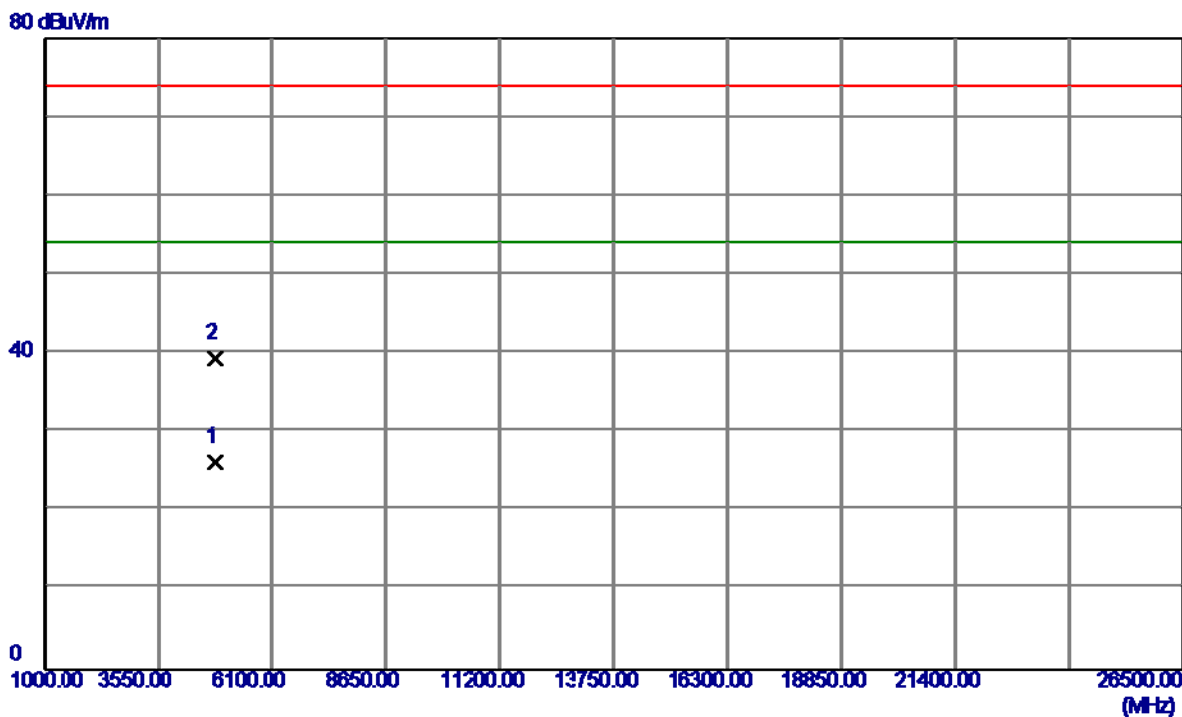
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2410.6000	68.72	29.09	97.81	54.00	43.81	AVG	No Limit
2	2390.0000	15.06	28.99	44.05	54.00	-9.95	AVG	
3	2390.0000	24.12	28.99	53.11	74.00	-20.89	Peak	
4	2409.3000	71.74	29.08	100.82	74.00	26.82	Peak	No Limit

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

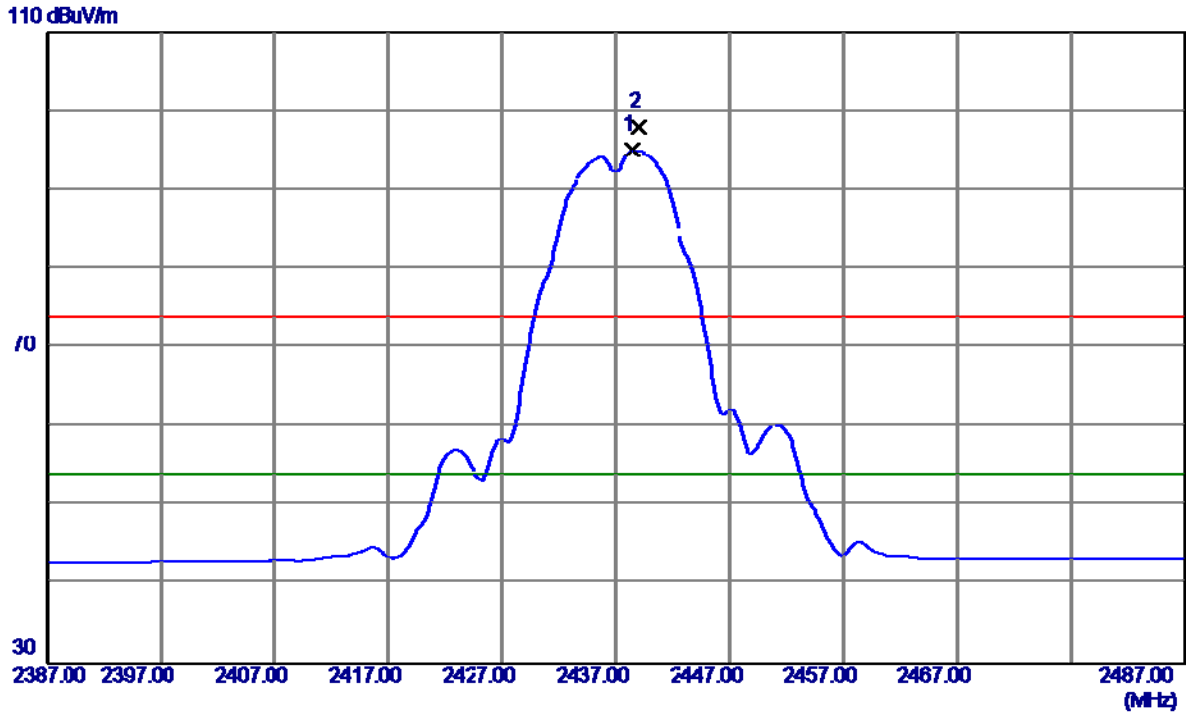
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4821.6020	22.55	3.76	26.31	54.00	-27.69	AVG	
2	4823.3870	35.59	3.77	39.36	74.00	-34.64	Peak	

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

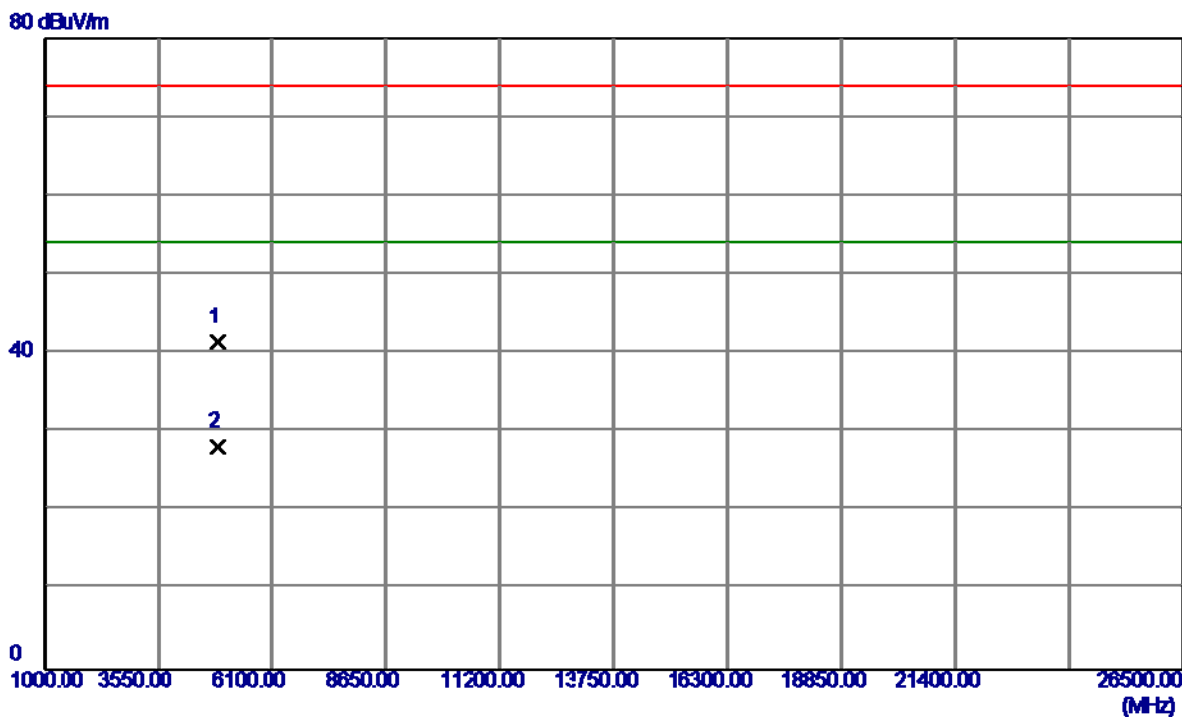
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2438.4000	65.82	29.22	95.04	54.00	41.04	AVG	No Limit
2	2438.9810	68.82	29.22	98.04	74.00	24.04	Peak	No Limit

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

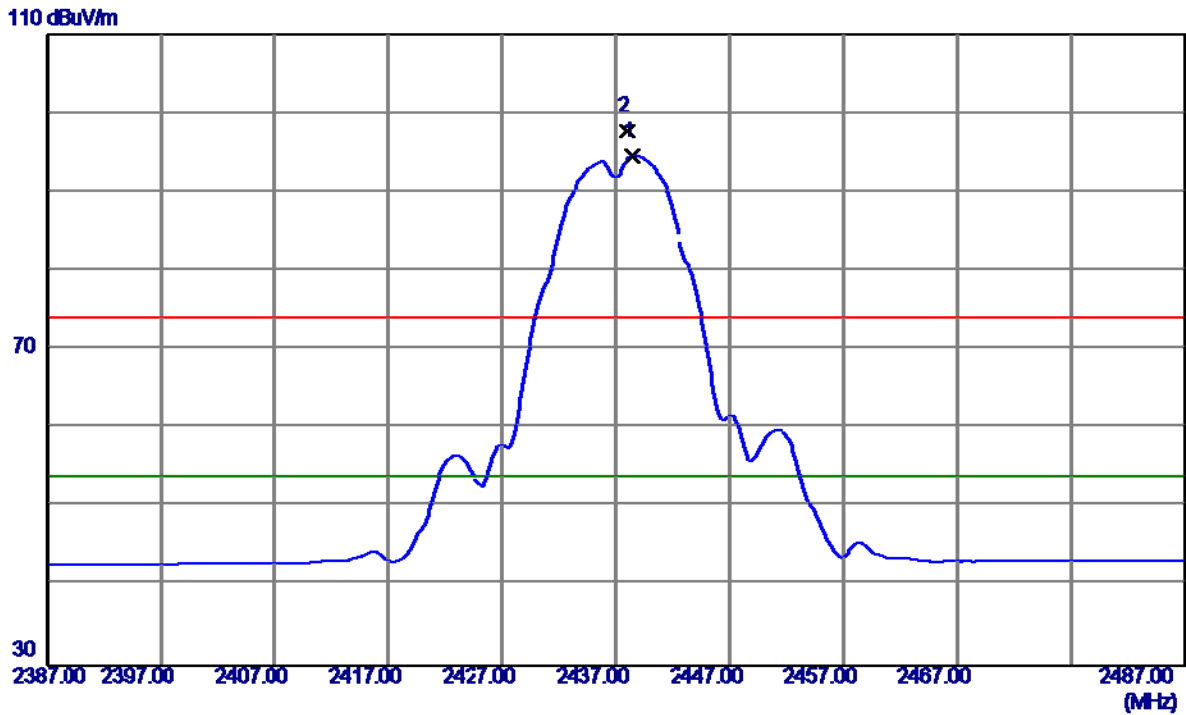
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.9650	37.39	4.01	41.40	74.00	-32.60	Peak	
2 *	4876.5000	24.07	4.02	28.09	54.00	-25.91	AVG	

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

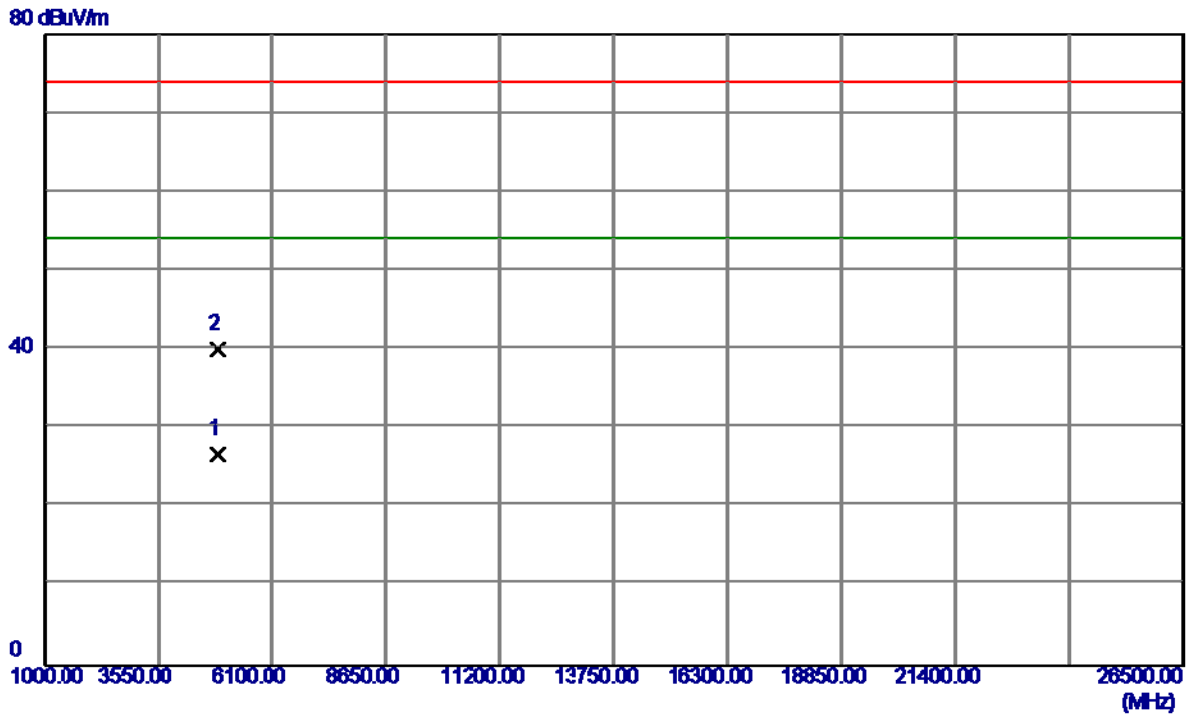
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2438.4000	65.33	29.22	94.55	54.00	40.55	AVG	No Limit
2	2438.0000	68.51	29.21	97.72	74.00	23.72	Peak	No Limit

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

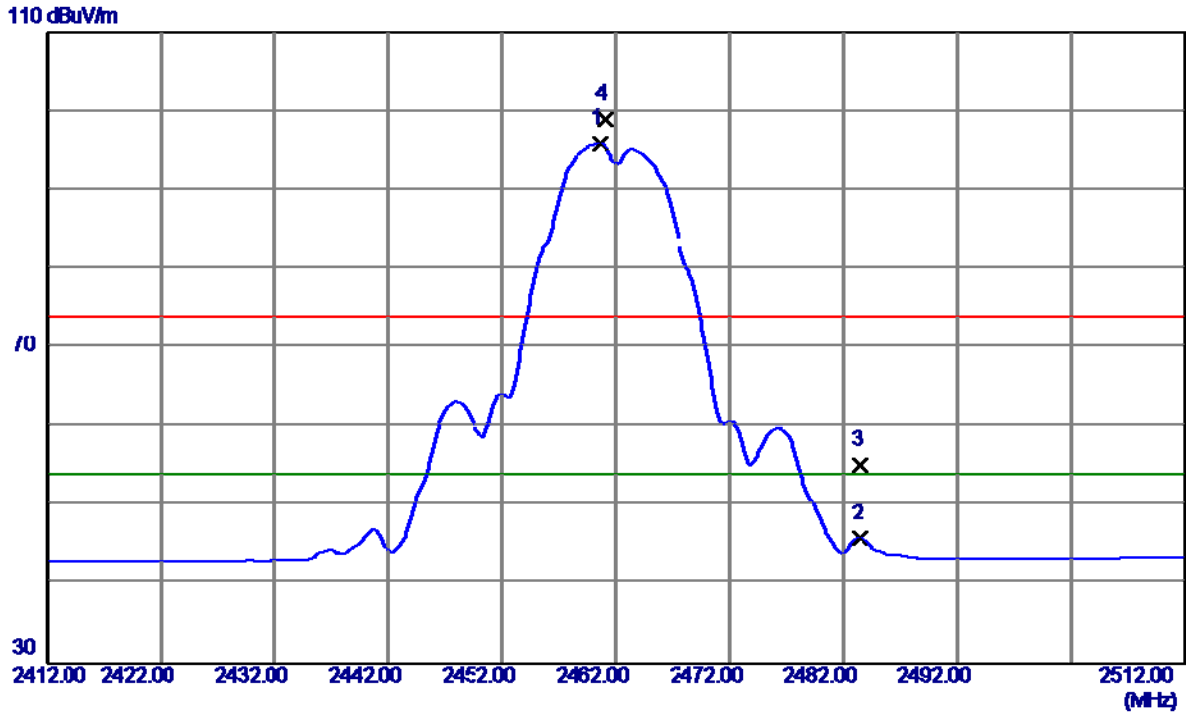
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4871.5019	22.77	4.00	26.77	54.00	-27.23	AVG	
2	4875.3230	35.94	4.01	39.95	74.00	-34.05	Peak	

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

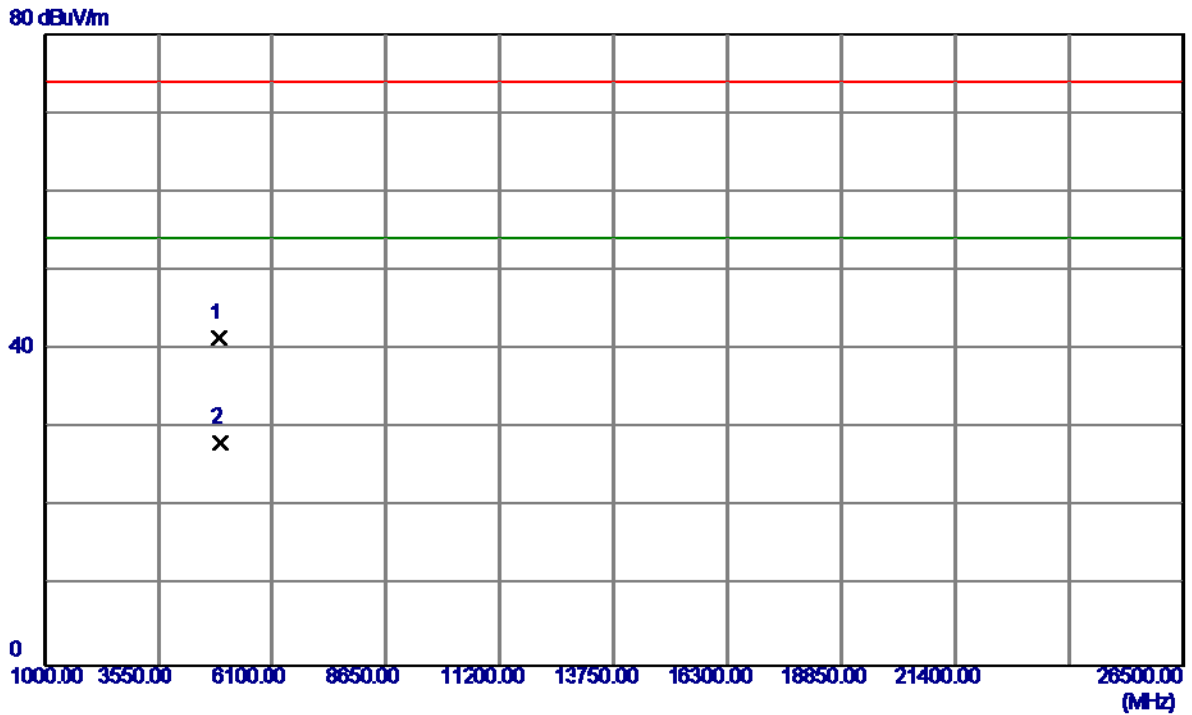
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2460.7000	66.65	29.32	95.97	54.00	41.97	AVG	No Limit
2	2483.5000	16.42	29.42	45.84	54.00	-8.16	AVG	
3	2483.5000	25.71	29.42	55.13	74.00	-18.87	Peak	
4	2461.1000	69.68	29.32	99.00	74.00	25.00	Peak	No Limit

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

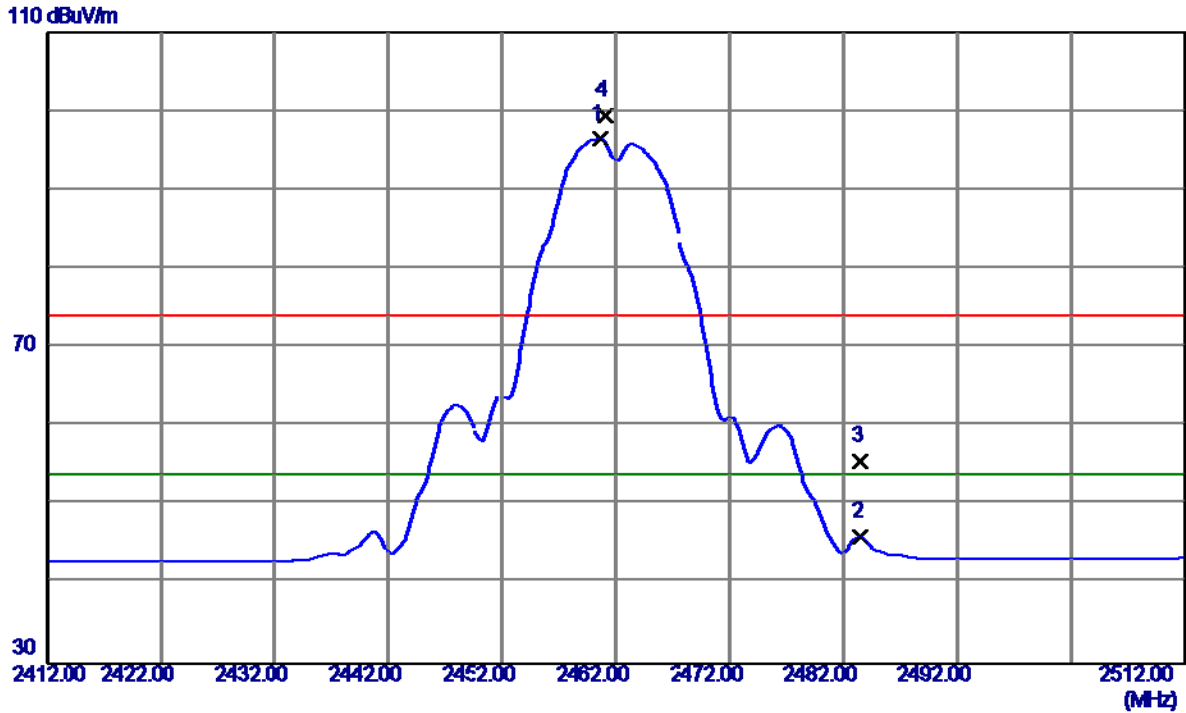
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4923.8330	37.16	4.24	41.40	74.00	-32.60	Peak	
2 *	4924.2550	23.85	4.24	28.09	54.00	-25.91	AVG	

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

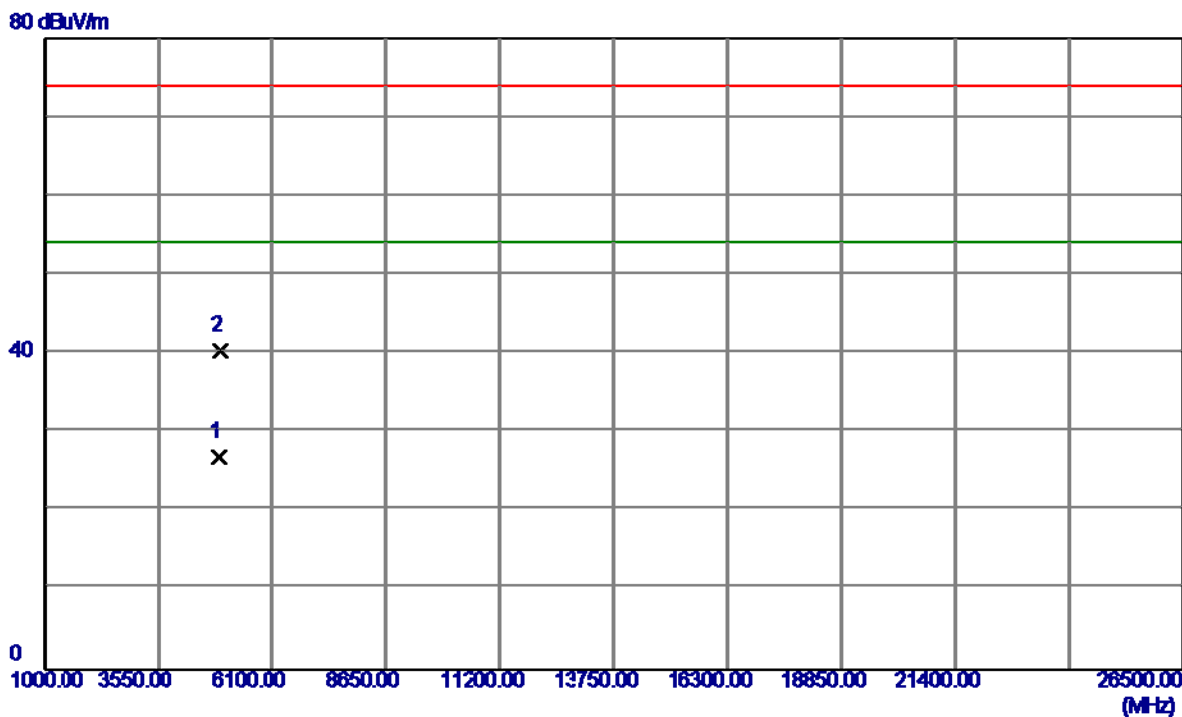
Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2460.7000	67.06	29.32	96.38	54.00	42.38	AVG	No Limit
2	2483.5000	16.53	29.42	45.95	54.00	-8.05	AVG	
3	2483.5000	26.21	29.42	55.63	74.00	-18.37	Peak	
4	2461.1000	70.07	29.32	99.39	74.00	25.39	Peak	No Limit

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

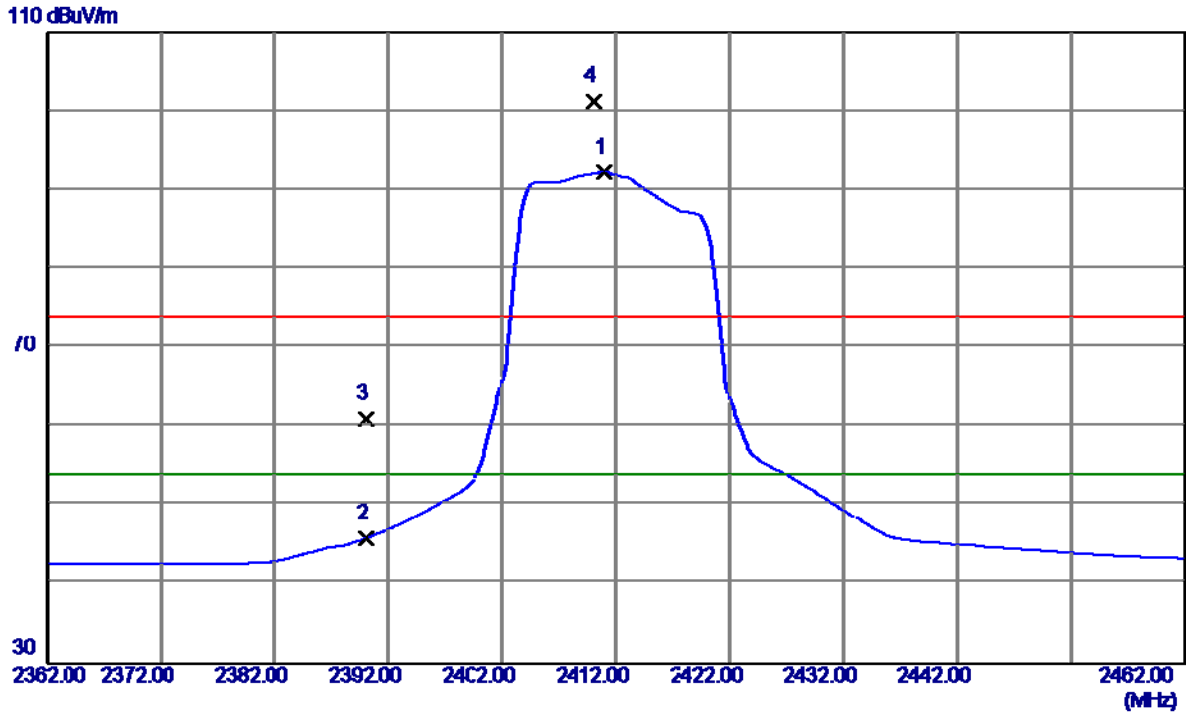
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4921.7080	22.69	4.23	26.92	54.00	-27.08	AVG	
2	4925.4350	36.14	4.25	40.39	74.00	-33.61	Peak	

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

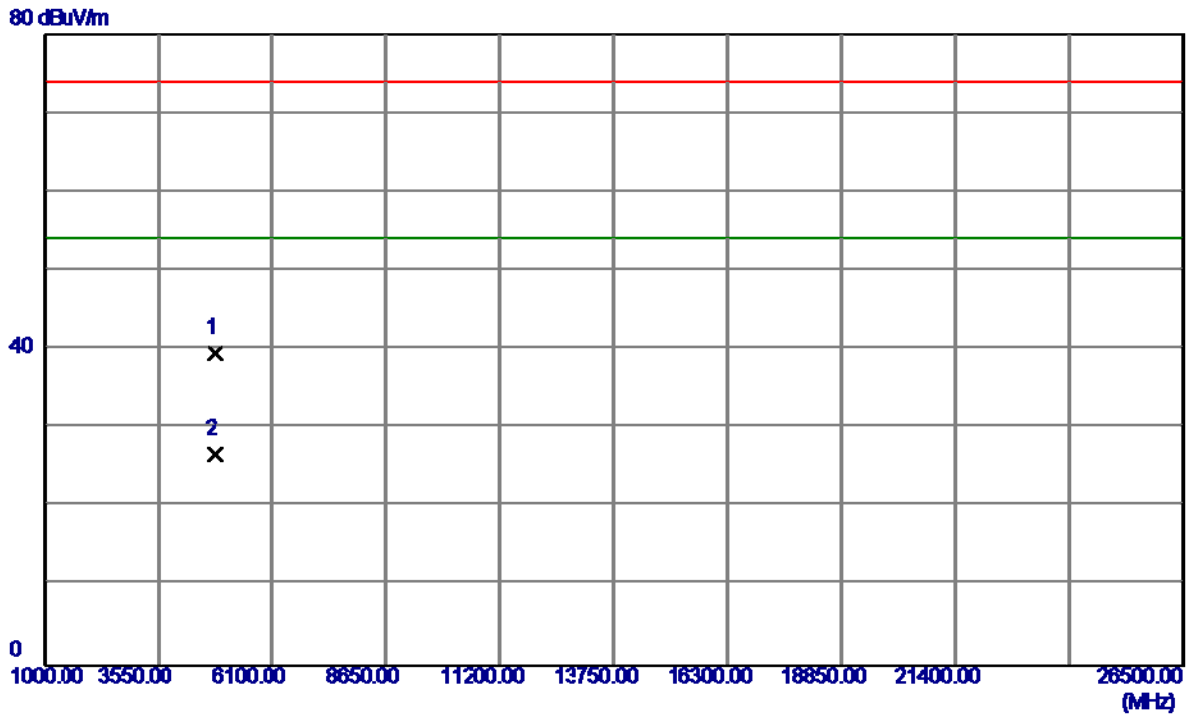
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2411.0000	63.22	29.09	92.31	54.00	38.31	AVG	No Limit
2	2390.0000	16.92	28.99	45.91	54.00	-8.09	AVG	
3	2390.0000	32.00	28.99	60.99	74.00	-13.01	Peak	
4	2410.1000	72.10	29.09	101.19	74.00	27.19	Peak	No Limit

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

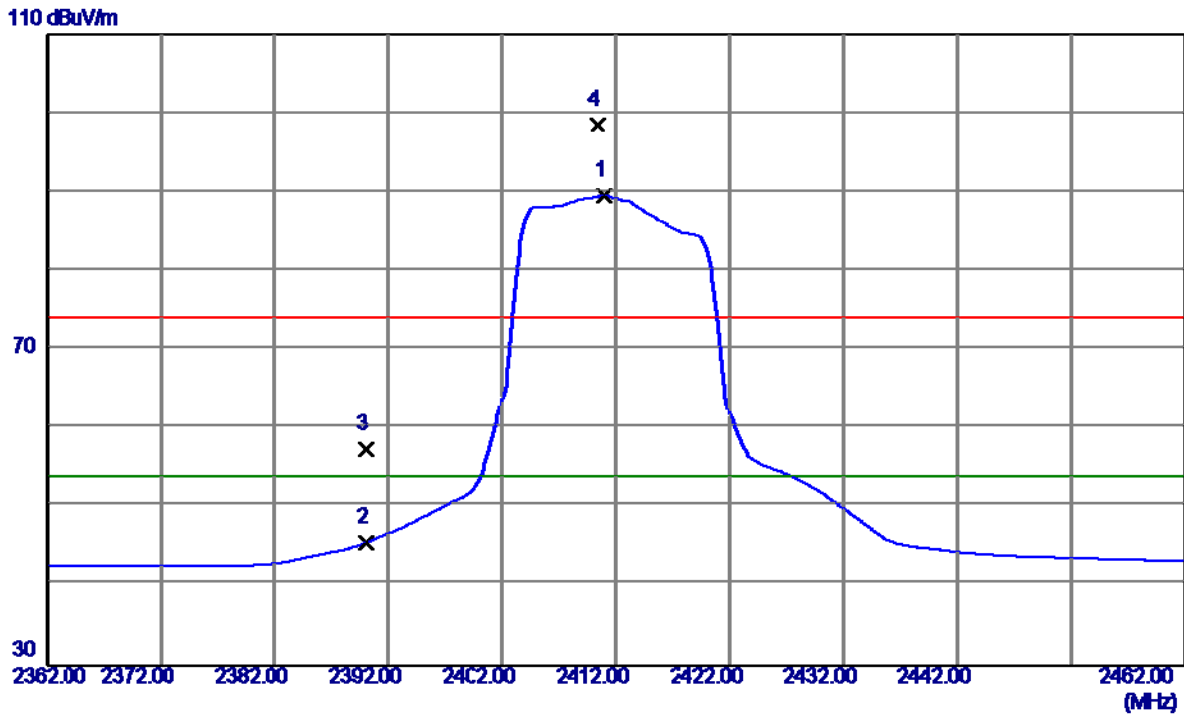
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4824.4520	35.74	3.77	39.51	74.00	-34.49	Peak	
2 *	4825.6200	22.96	3.78	26.74	54.00	-27.26	AVG	

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

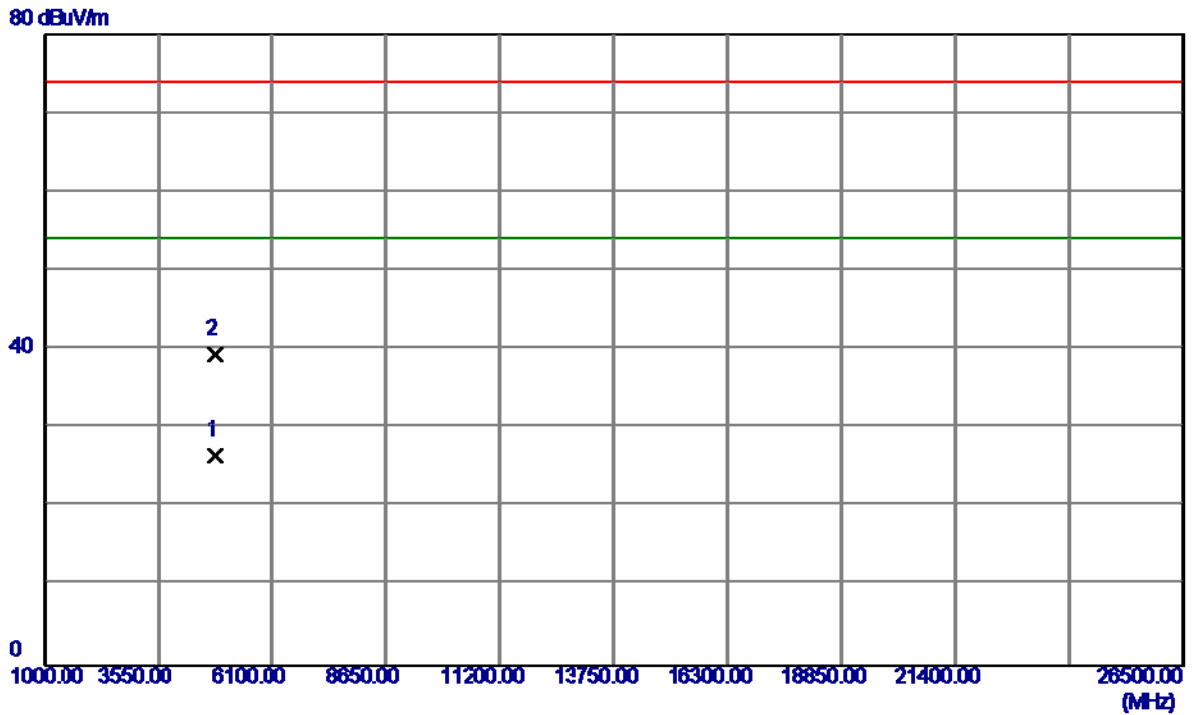
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2411.0000	60.50	29.09	89.59	54.00	35.59	AVG	No Limit
2	2390.0000	16.59	28.99	45.58	54.00	-8.42	AVG	
3	2390.0000	28.30	28.99	57.29	74.00	-16.71	Peak	
4	2410.4000	69.36	29.09	98.45	74.00	24.45	Peak	No Limit

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

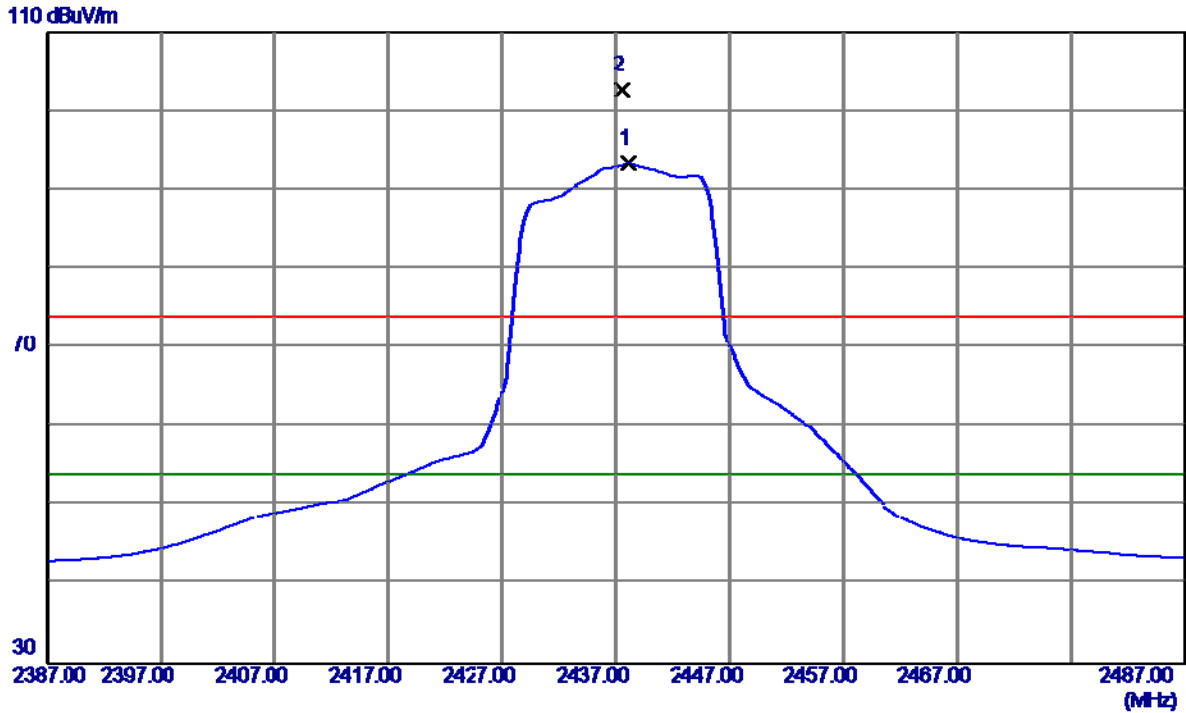
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4822.6549	22.73	3.77	26.50	54.00	-27.50	AVG	
2	4824.9650	35.58	3.78	39.36	74.00	-34.64	Peak	

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

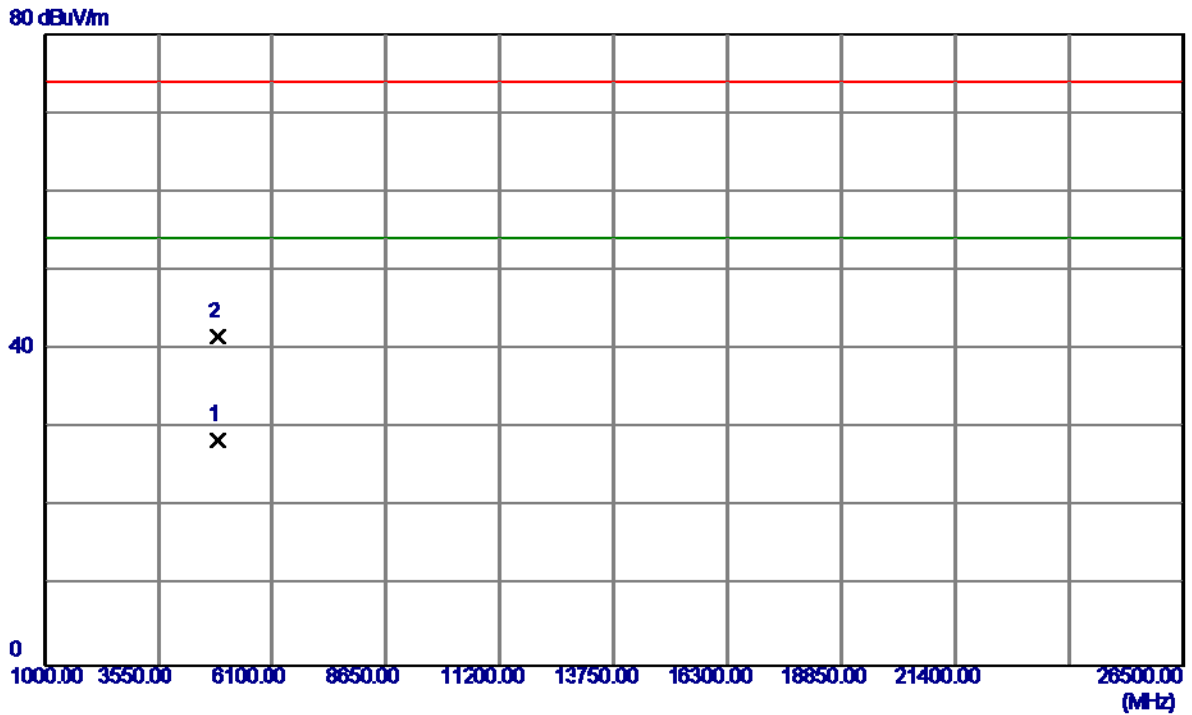
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2438.1000	64.09	29.22	93.31	54.00	39.31	AVG	No Limit
2	2437.6000	73.35	29.21	102.56	74.00	28.56	Peak	No Limit

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

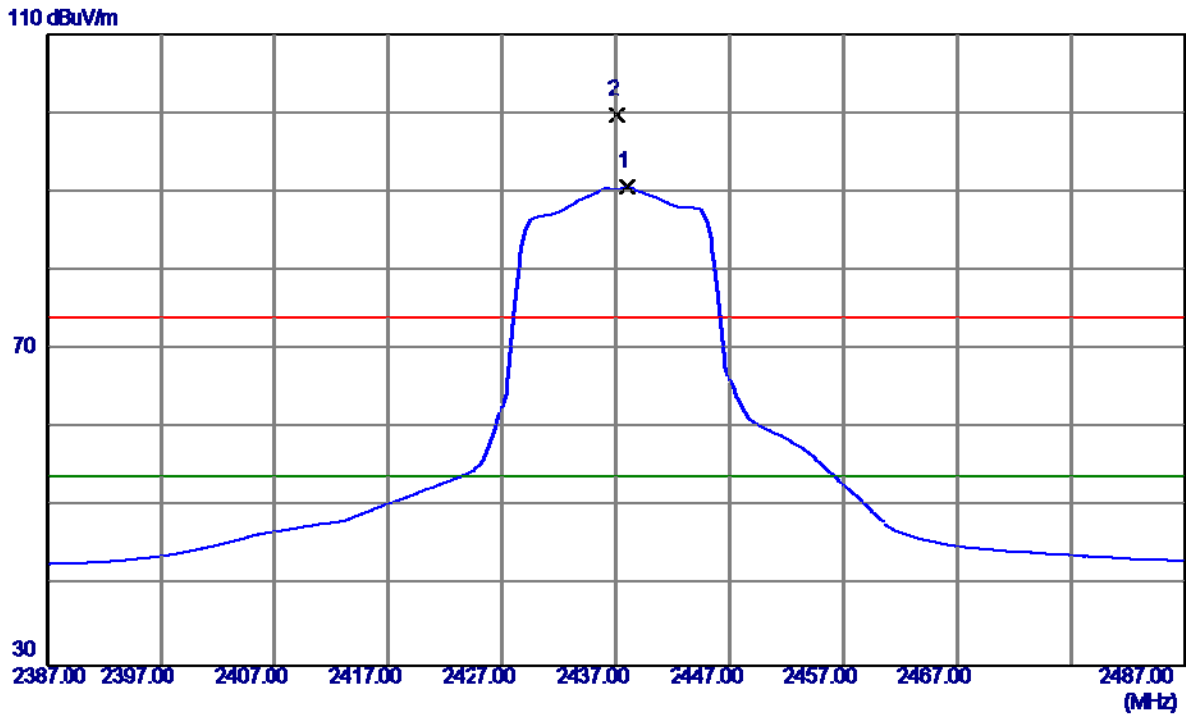
### Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4873.9780	24.48	4.01	28.49	54.00	-25.51	AVG	
2	4874.6200	37.66	4.01	41.67	74.00	-32.33	Peak	

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

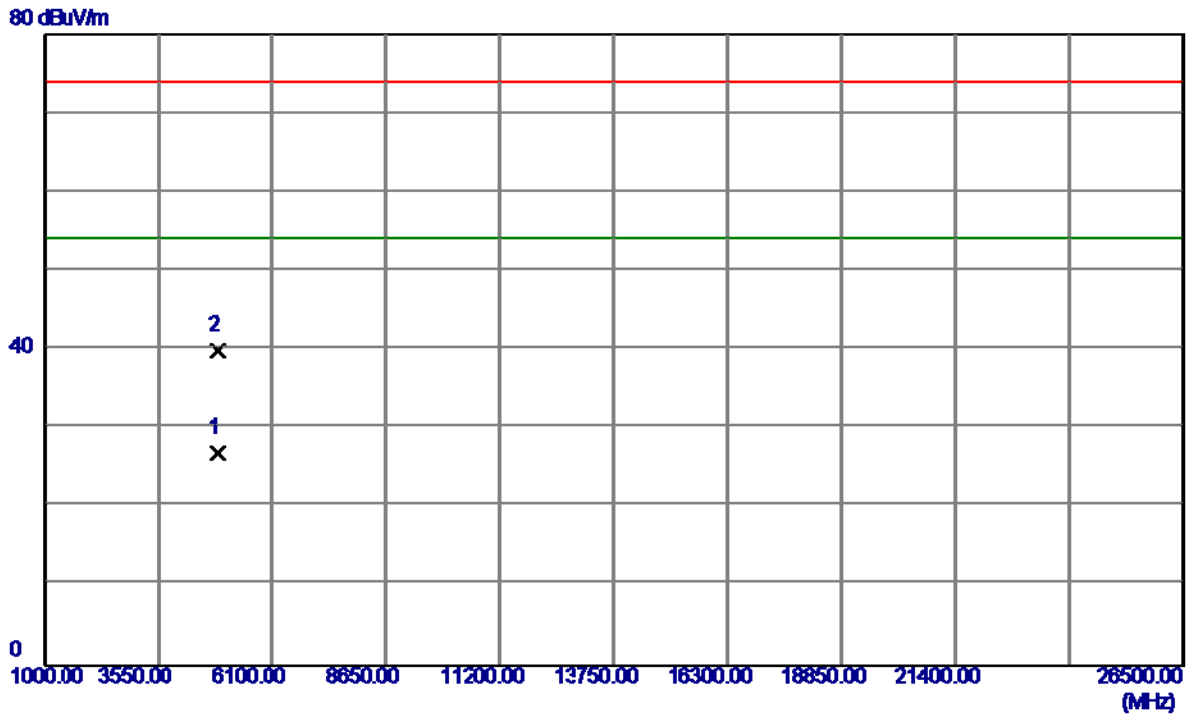
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2438.0000	61.36	29.21	90.57	54.00	36.57	AVG	No Limit
2	2437.1000	70.49	29.21	99.70	74.00	25.70	Peak	No Limit

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

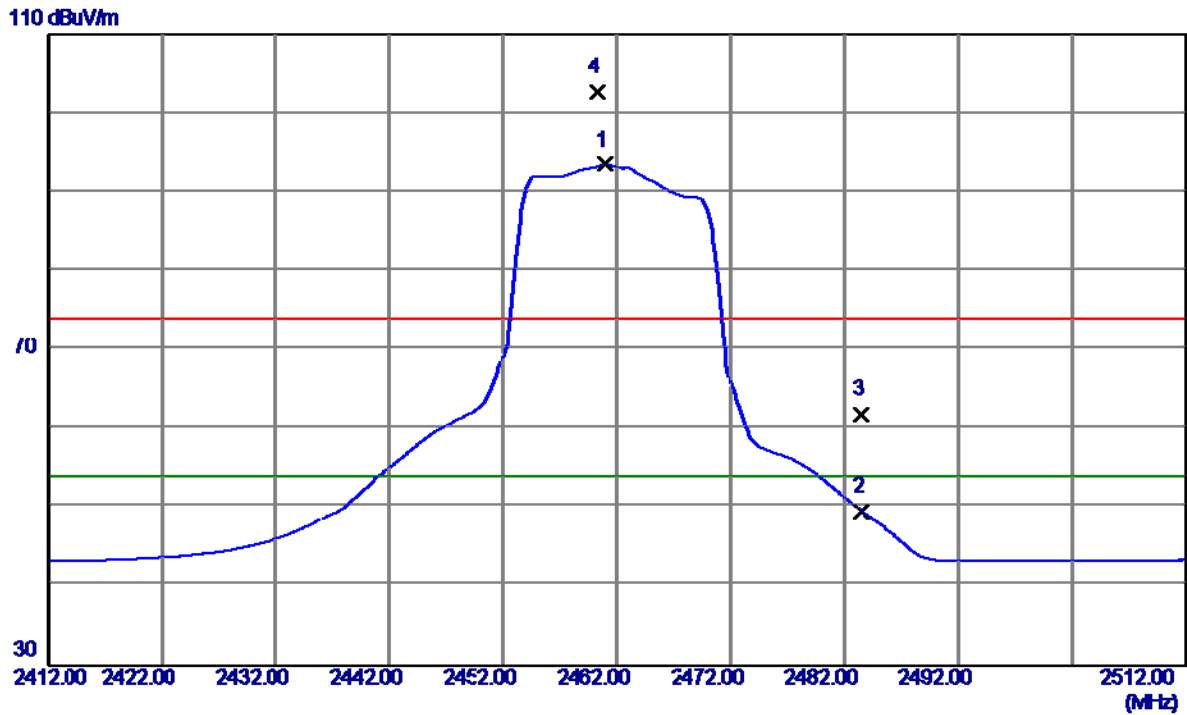
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4873.6640	22.92	4.01	26.93	54.00	-27.07	AVG	
2	4875.2550	35.89	4.01	39.90	74.00	-34.10	Peak	

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

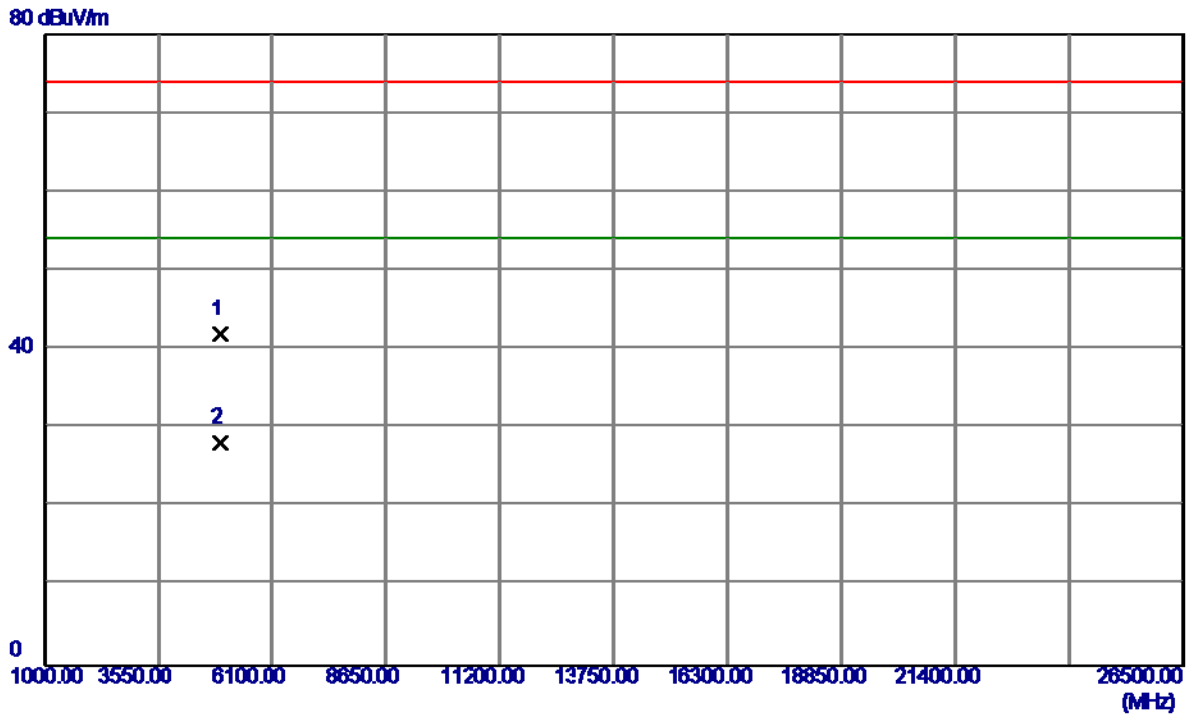
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2461.0000	64.12	29.32	93.44	54.00	39.44	AVG	No Limit
2	2483.5000	20.15	29.42	49.57	54.00	-4.43	AVG	
3	2483.5000	32.38	29.42	61.80	74.00	-12.20	Peak	
4	2460.3000	73.28	29.32	102.60	74.00	28.60	Peak	No Limit

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

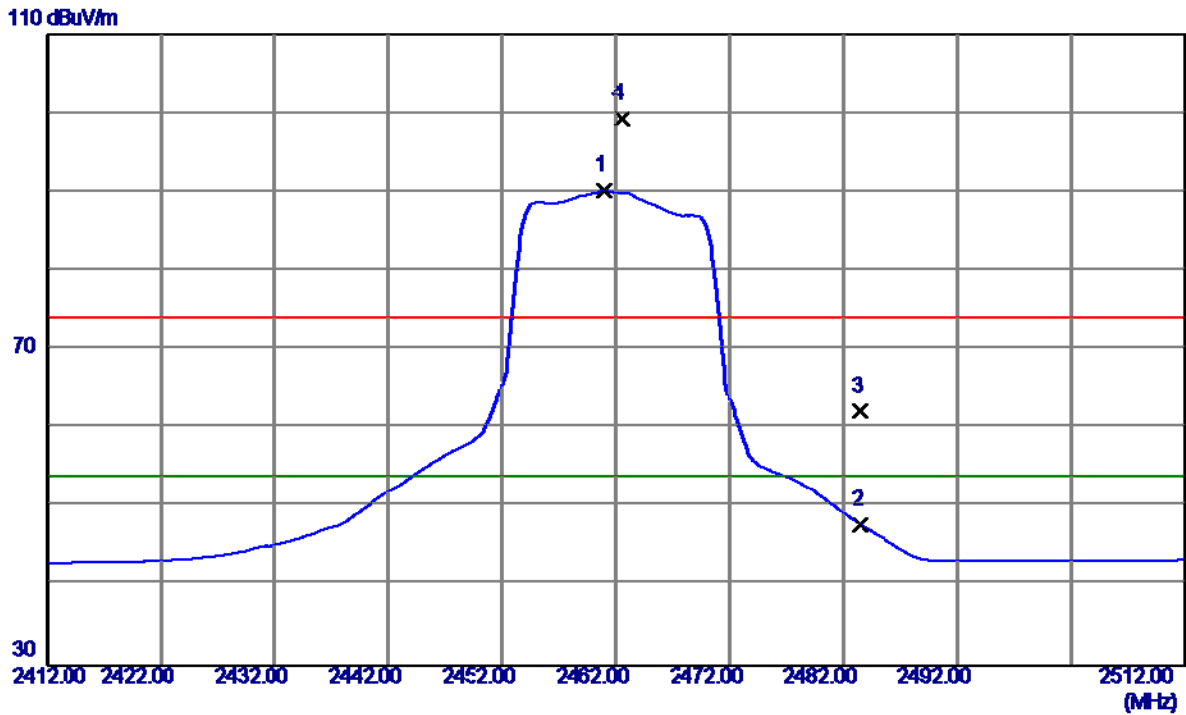
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4924.6520	37.73	4.25	41.98	74.00	-32.02	Peak	
2 *	4925.6970	23.96	4.25	28.21	54.00	-25.79	AVG	

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

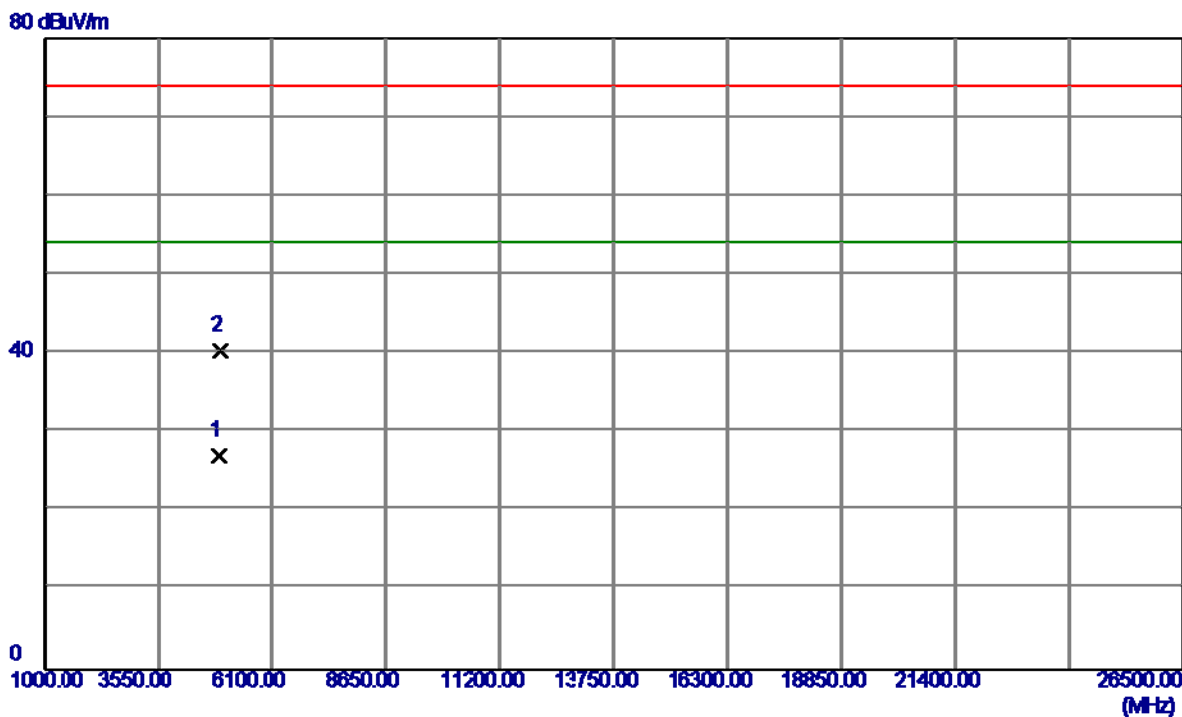
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2461.0000	60.87	29.32	90.19	54.00	36.19	AVG	No Limit
2	2483.5000	18.36	29.42	47.78	54.00	-6.22	AVG	
3	2483.5000	32.68	29.42	62.10	74.00	-11.90	Peak	
4	2462.6000	69.98	29.33	99.31	74.00	25.31	Peak	No Limit

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

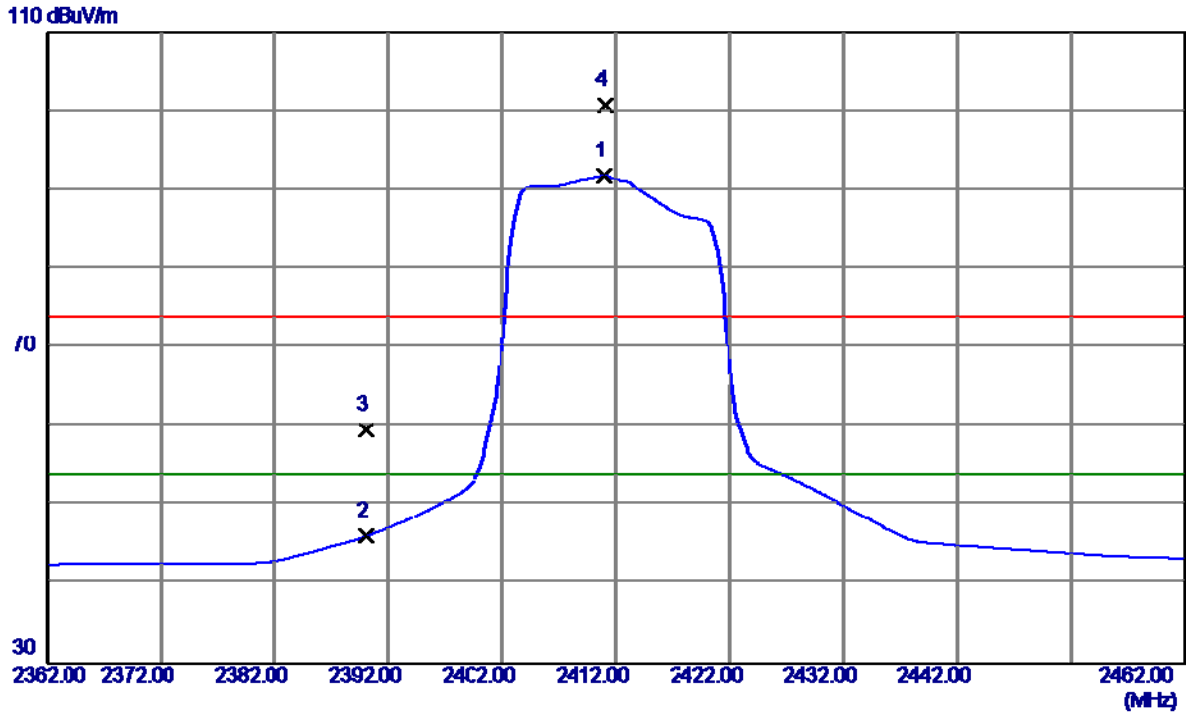
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4923.6540	22.75	4.24	26.99	54.00	-27.01	AVG	
2	4926.4420	36.14	4.25	40.39	74.00	-33.61	Peak	

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

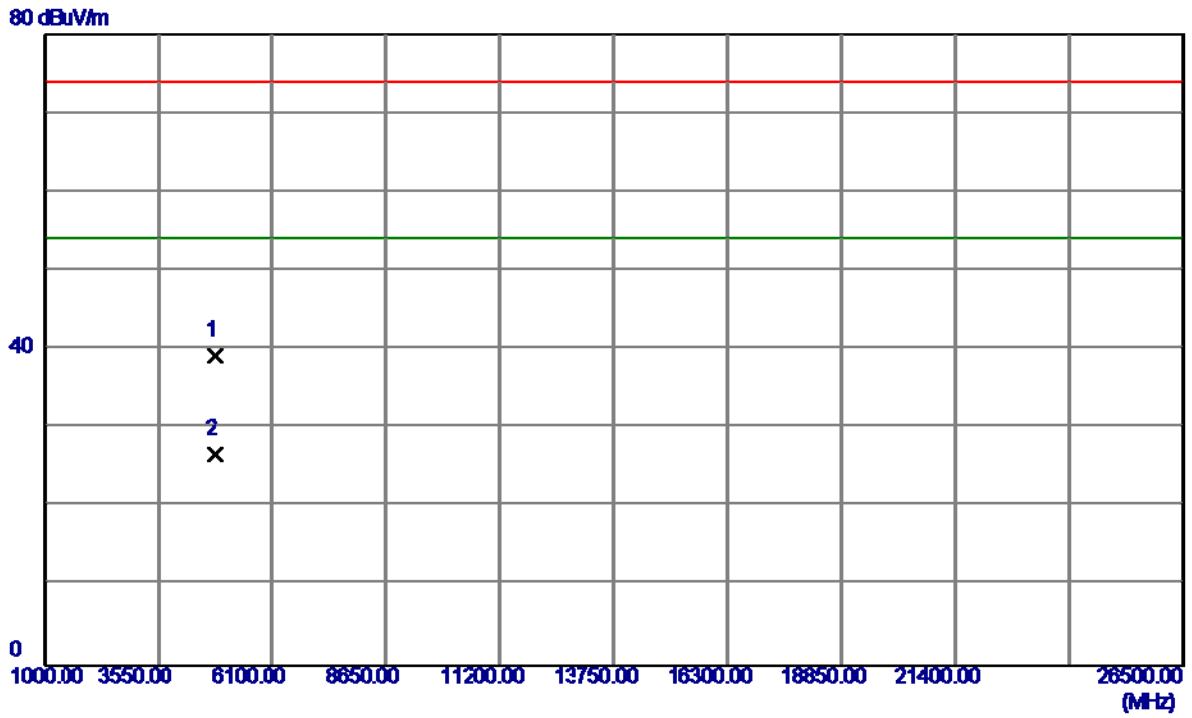
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2411.0000	62.68	29.09	91.77	54.00	37.77	AVG	No Limit
2	2390.0000	17.11	28.99	46.10	54.00	-7.90	AVG	
3	2390.0000	30.55	28.99	59.54	74.00	-14.46	Peak	
4	2411.1000	71.60	29.09	100.69	74.00	26.69	Peak	No Limit

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

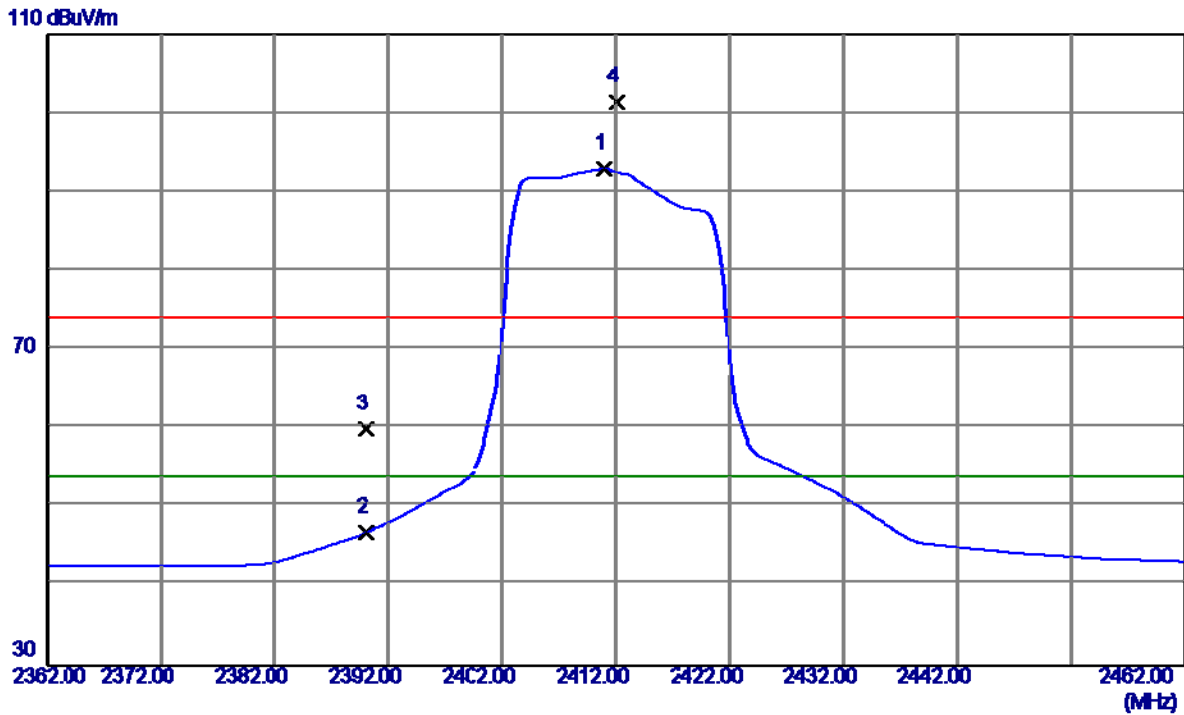
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4823.5560	35.37	3.77	39.14	74.00	-34.86	Peak	
2 *	4825.0470	22.96	3.78	26.74	54.00	-27.26	AVG	

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

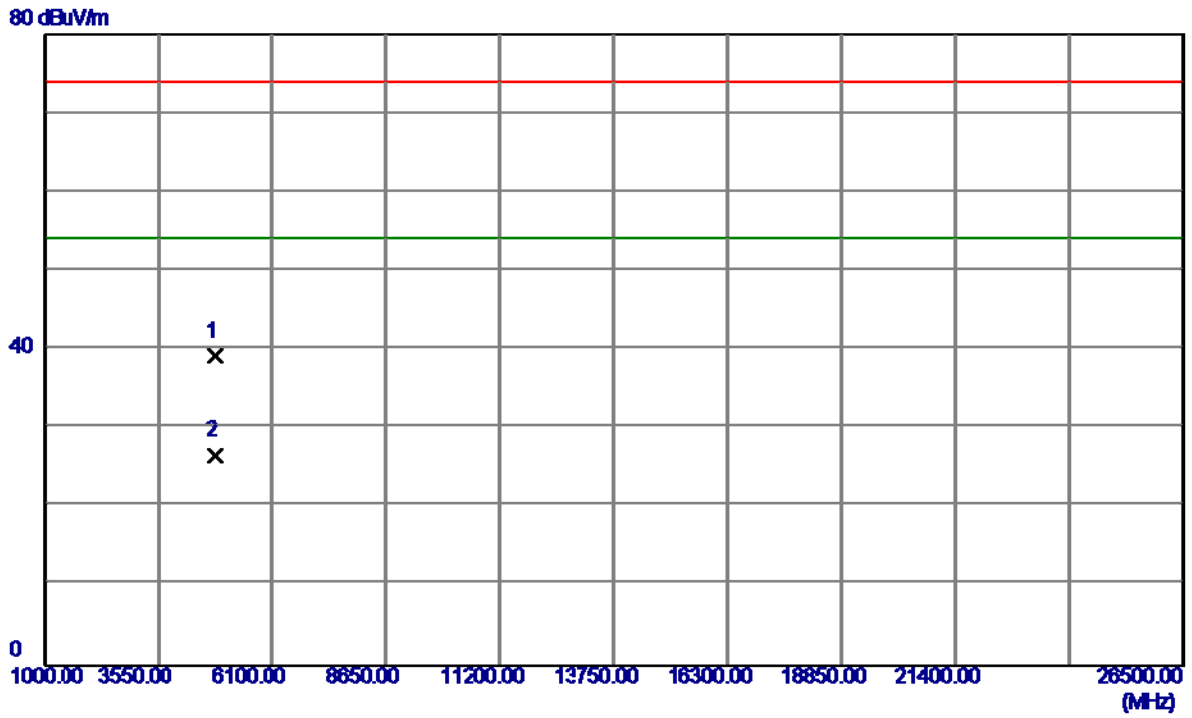
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2411.0000	63.83	29.09	92.92	54.00	38.92	AVG	No Limit
2	2390.0000	17.79	28.99	46.78	54.00	-7.22	AVG	
3	2390.0000	30.96	28.99	59.95	74.00	-14.05	Peak	
4	2412.1000	72.28	29.10	101.38	74.00	27.38	Peak	No Limit

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

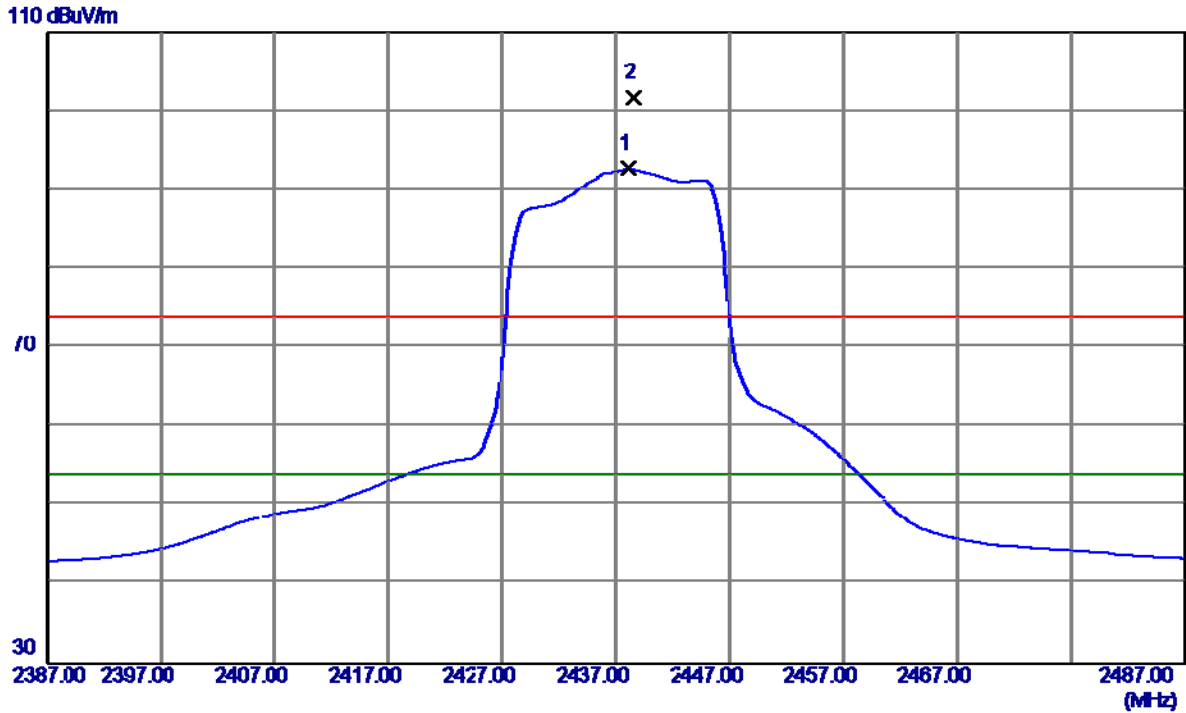
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4824.2650	35.35	3.77	39.12	74.00	-34.88	Peak	
2 *	4824.9049	22.75	3.78	26.53	54.00	-27.47	AVG	

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

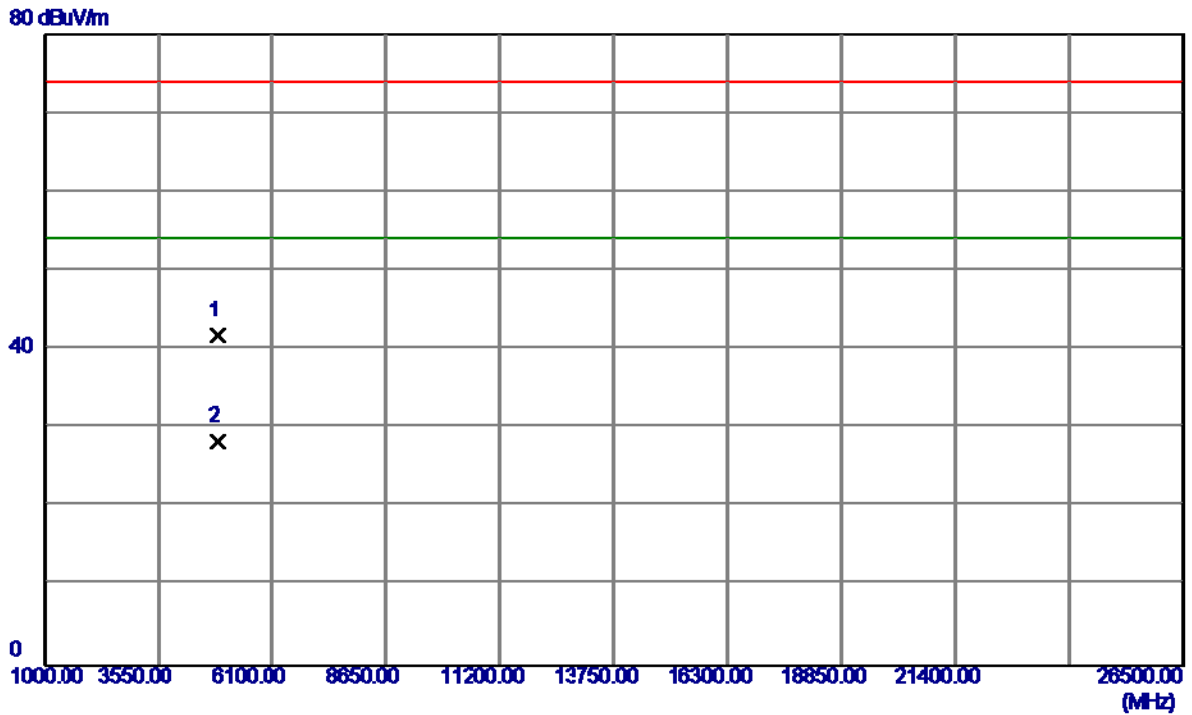
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2438.1000	63.45	29.22	92.67	54.00	38.67	AVG	No Limit
2	2438.6000	72.41	29.22	101.63	74.00	27.63	Peak	No Limit

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

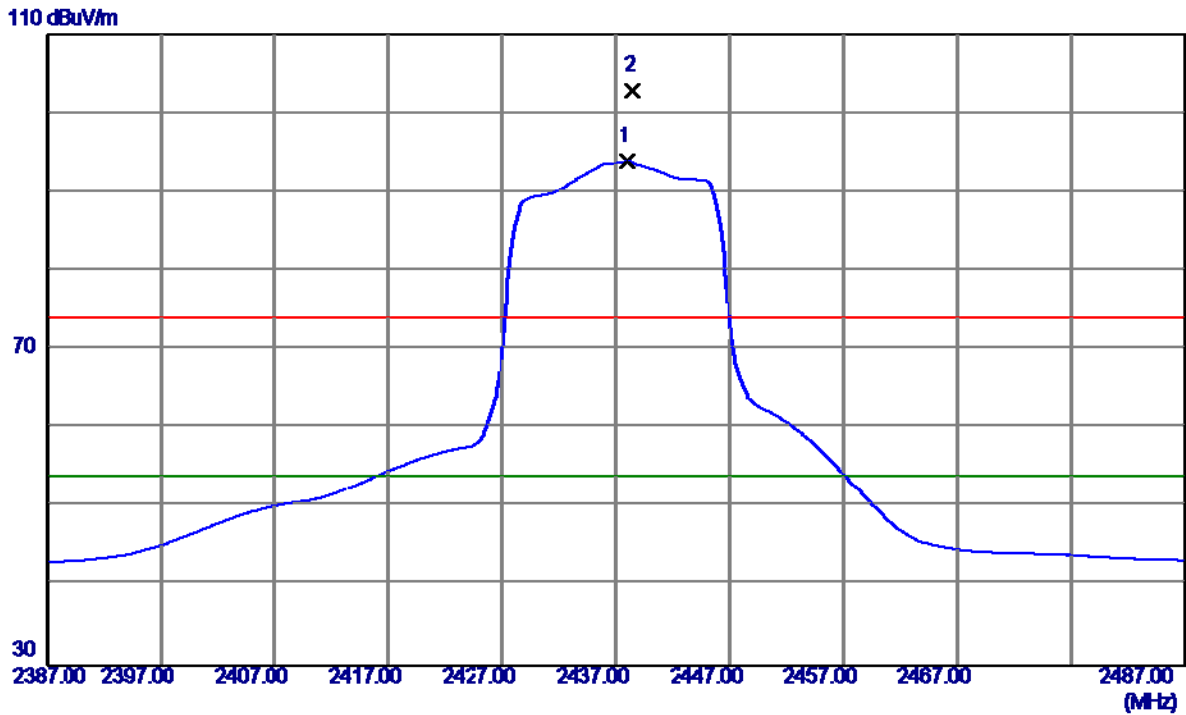
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.8550	37.75	4.01	41.76	74.00	-32.24	Peak	
2 *	4874.6580	24.26	4.01	28.27	54.00	-25.73	AVG	

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

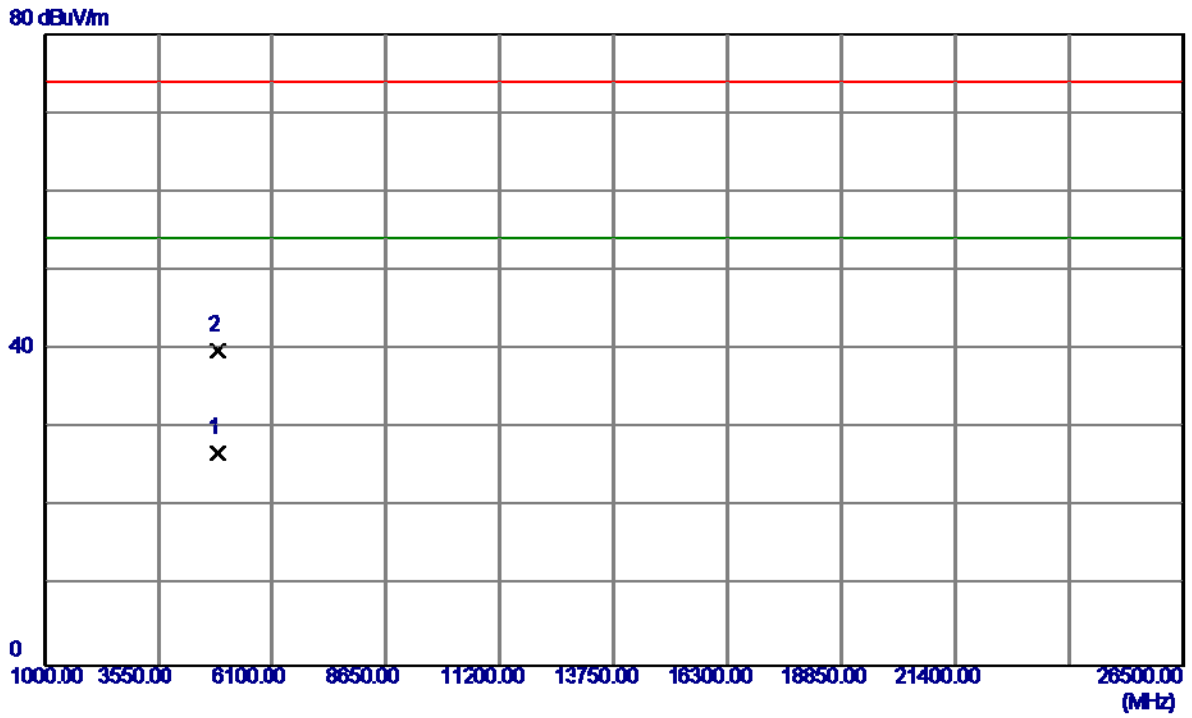
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2438.0000	64.61	29.21	93.82	54.00	39.82	AVG	No Limit
2	2438.5000	73.54	29.22	102.76	74.00	28.76	Peak	No Limit

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

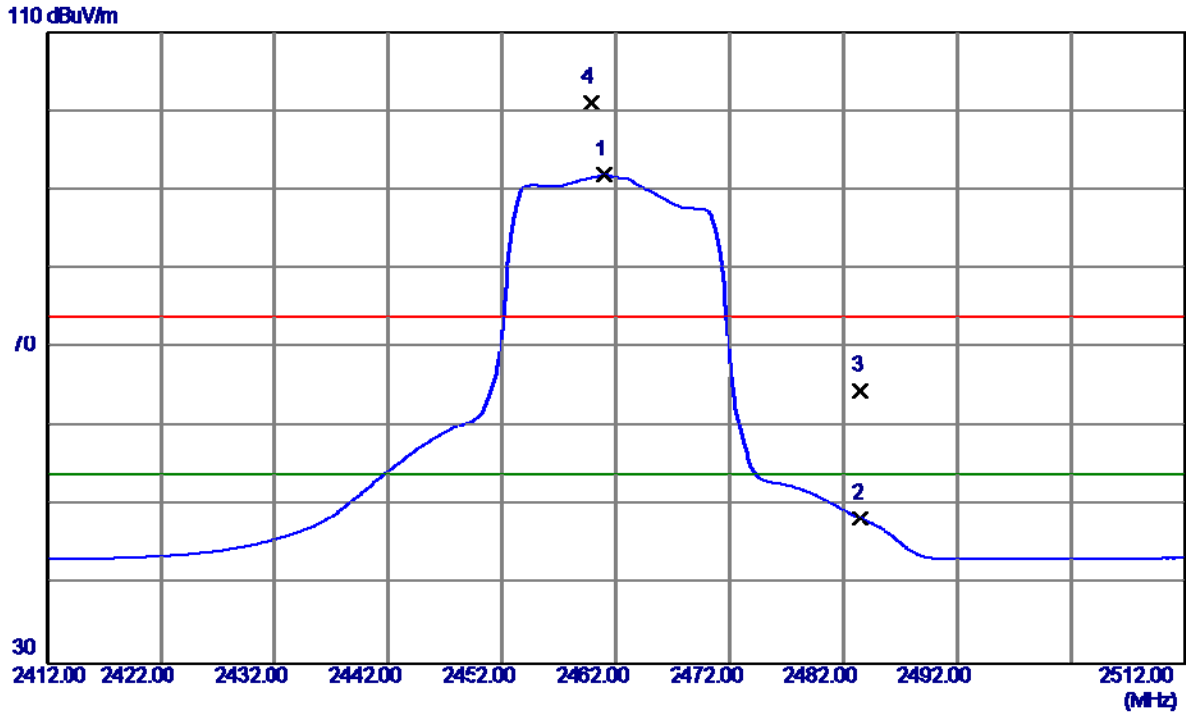
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4875.0720	22.85	4.01	26.86	54.00	-27.14	AVG	
2	4875.1450	35.84	4.01	39.85	74.00	-34.15	Peak	

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

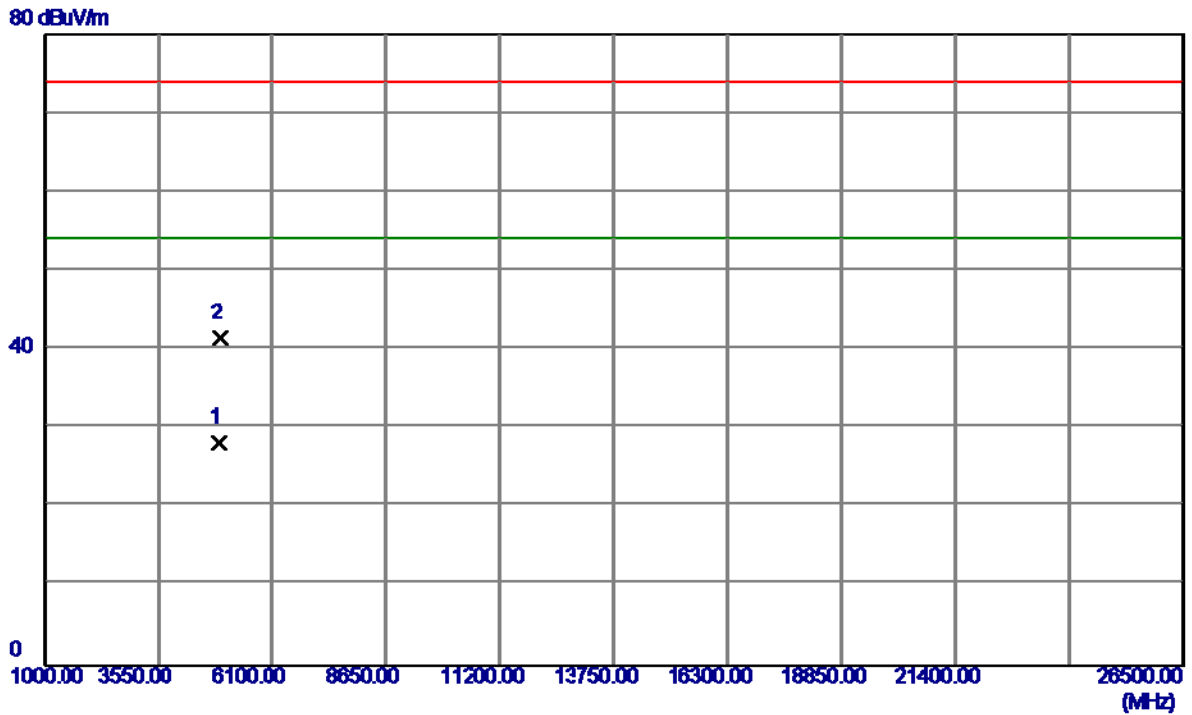
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2461.0000	62.58	29.32	91.90	54.00	37.90	AVG	No Limit
2	2483.5000	18.91	29.42	48.33	54.00	-5.67	AVG	
3	2483.5000	35.12	29.42	64.54	74.00	-9.46	Peak	
4	2459.9000	71.65	29.32	100.97	74.00	26.97	Peak	No Limit

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

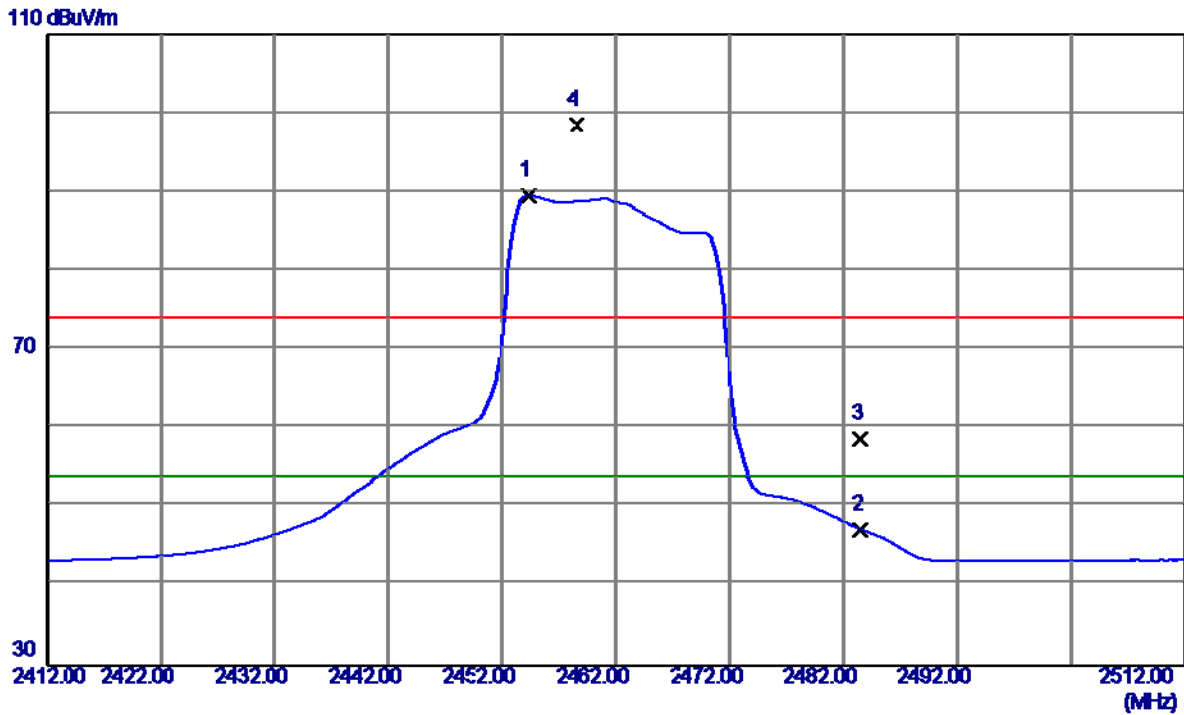
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4922.5990	23.85	4.24	28.09	54.00	-25.91	AVG	
2	4924.6250	37.15	4.25	41.40	74.00	-32.60	Peak	

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

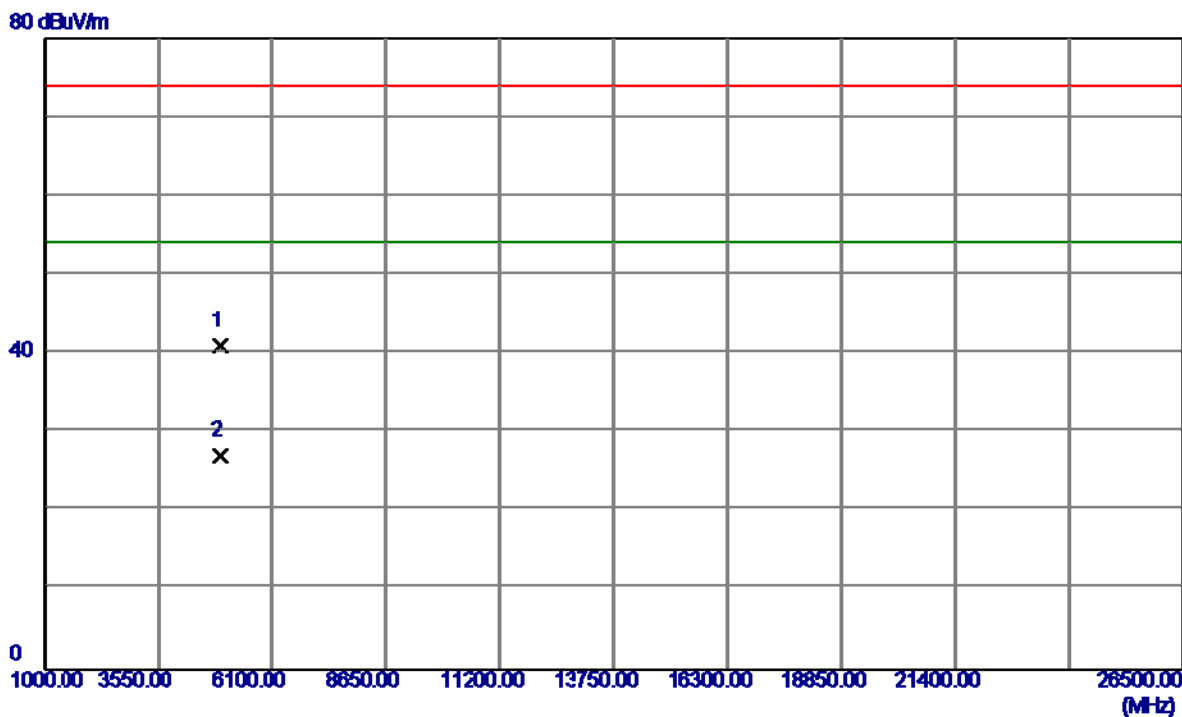
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2454.3000	60.26	29.29	89.55	54.00	35.55	AVG	No Limit
2	2483.5000	17.75	29.42	47.17	54.00	-6.83	AVG	
3	2483.5000	29.15	29.42	58.57	74.00	-15.43	Peak	
4	2458.6000	69.12	29.31	98.43	74.00	24.43	Peak	No Limit

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

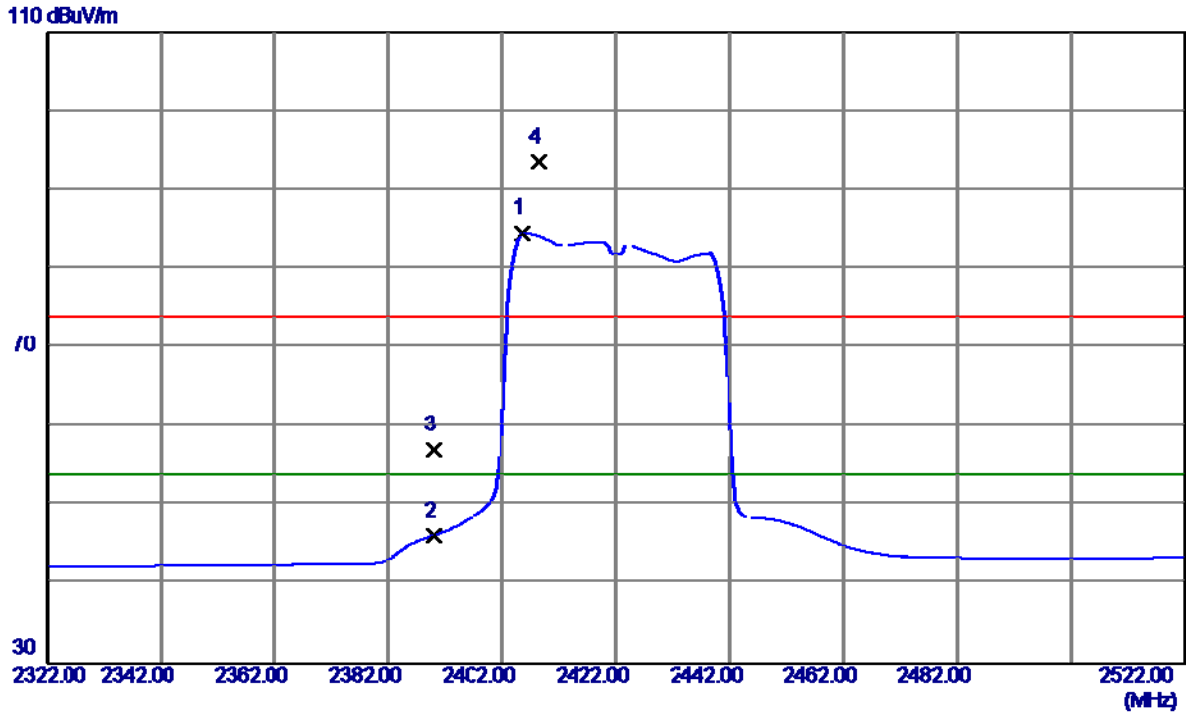
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4924.6220	36.67	4.25	40.92	74.00	-33.08	Peak	
2 *	4925.0780	22.75	4.25	27.00	54.00	-27.00	AVG	

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

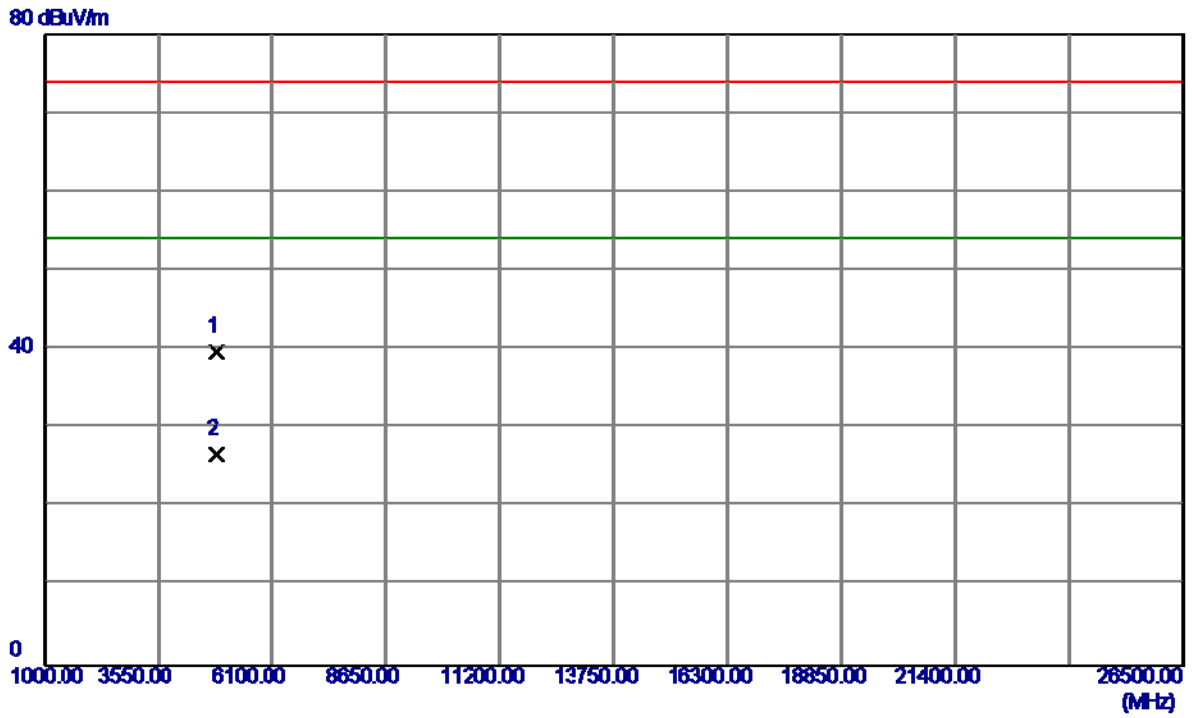
Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2405.6000	55.54	29.07	84.61	54.00	30.61	AVG	No Limit
2	2390.0000	17.24	28.99	46.23	54.00	-7.77	AVG	
3	2390.0000	27.98	28.99	56.97	74.00	-17.03	Peak	
4	2408.4000	64.49	29.08	93.57	74.00	19.57	Peak	No Limit

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

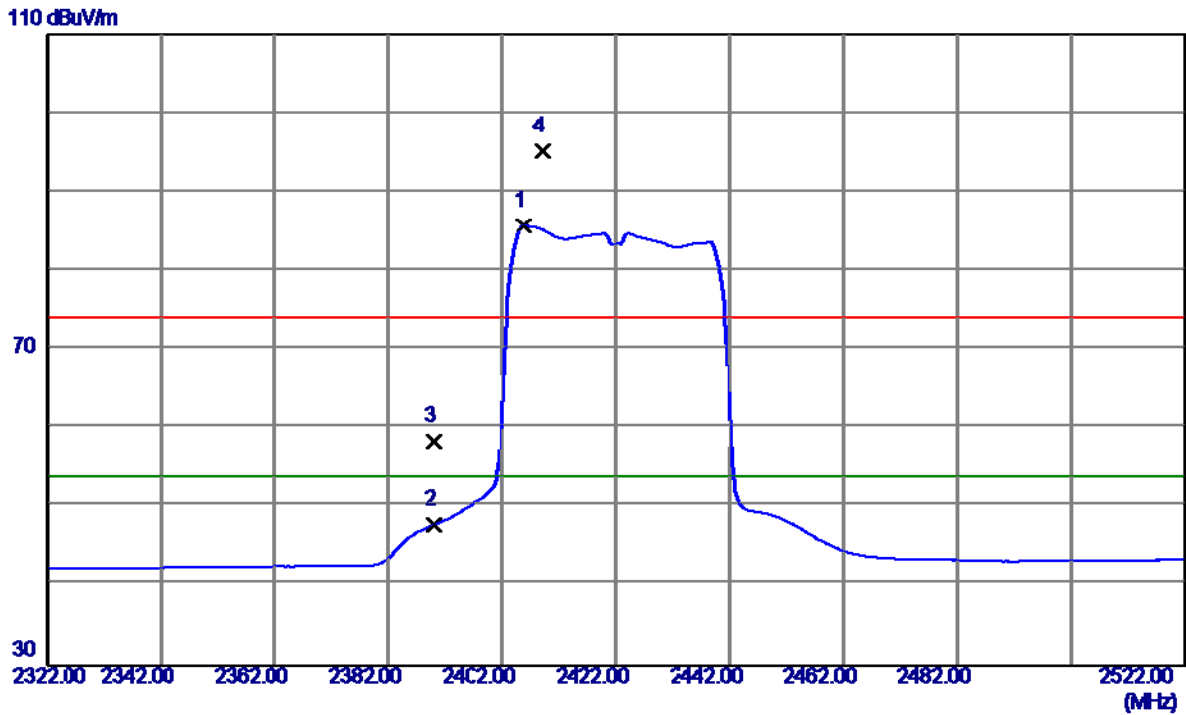
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4844.3650	35.84	3.87	39.71	74.00	-34.29	Peak	
2 *	4845.3769	22.87	3.87	26.74	54.00	-27.26	AVG	

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

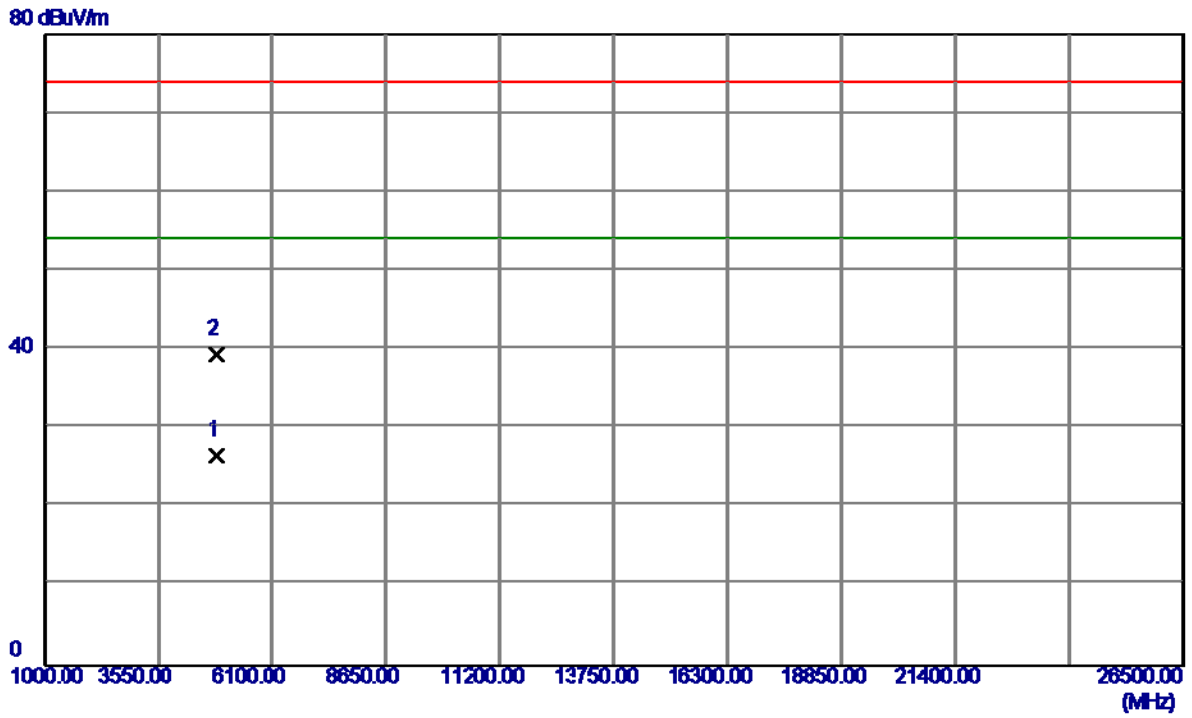
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2405.8000	56.58	29.07	85.65	54.00	31.65	AVG	No Limit
2	2390.0000	18.79	28.99	47.78	54.00	-6.22	AVG	
3	2390.0000	29.37	28.99	58.36	74.00	-15.64	Peak	
4	2409.2000	66.06	29.08	95.14	74.00	21.14	Peak	No Limit

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

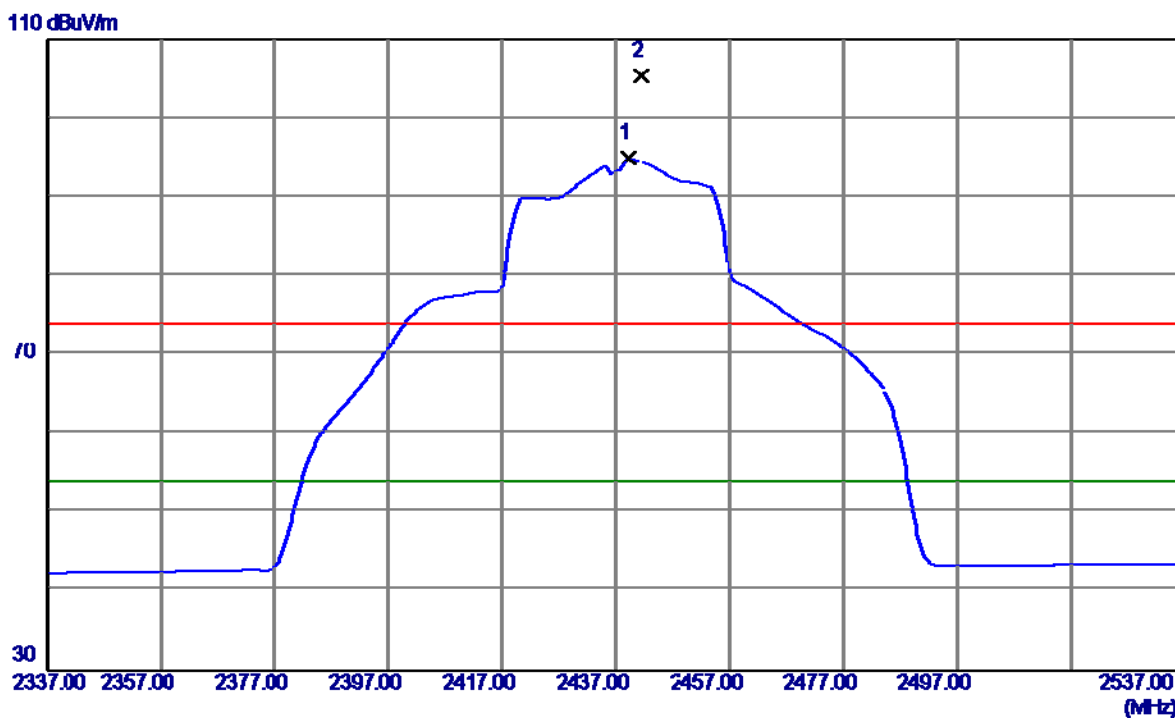
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4843.6250	22.73	3.86	26.59	54.00	-27.41	AVG	
2	4844.7200	35.49	3.87	39.36	74.00	-34.64	Peak	

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

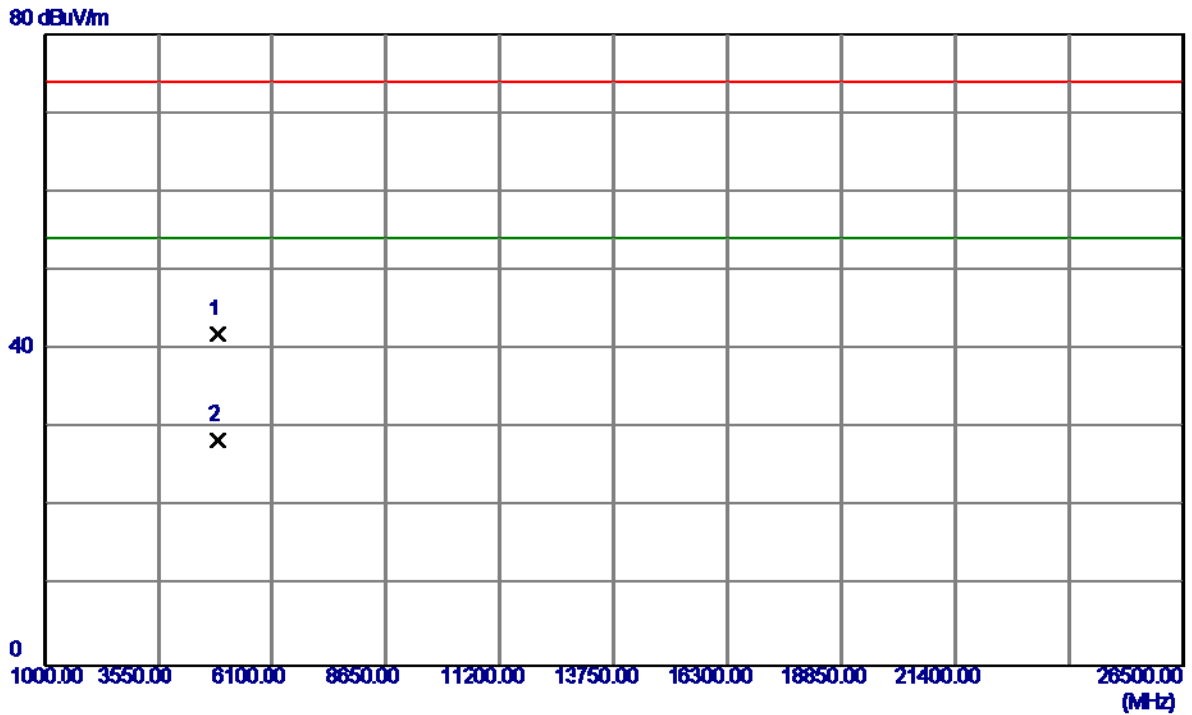
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2439.2000	65.67	29.22	94.89	54.00	40.89	AVG	No Limit
2	2441.4000	76.07	29.23	105.30	74.00	31.30	Peak	No Limit

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

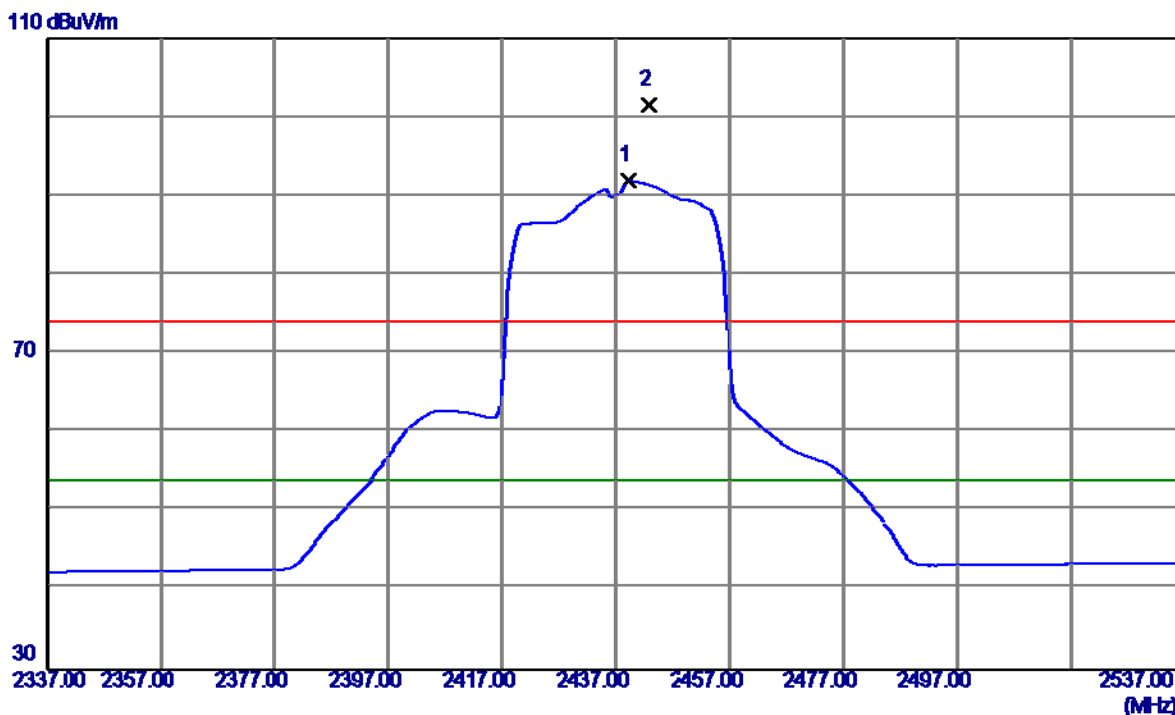
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4874.1480	37.90	4.01	41.91	74.00	-32.09	Peak	
2 *	4875.0259	24.52	4.01	28.53	54.00	-25.47	AVG	

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

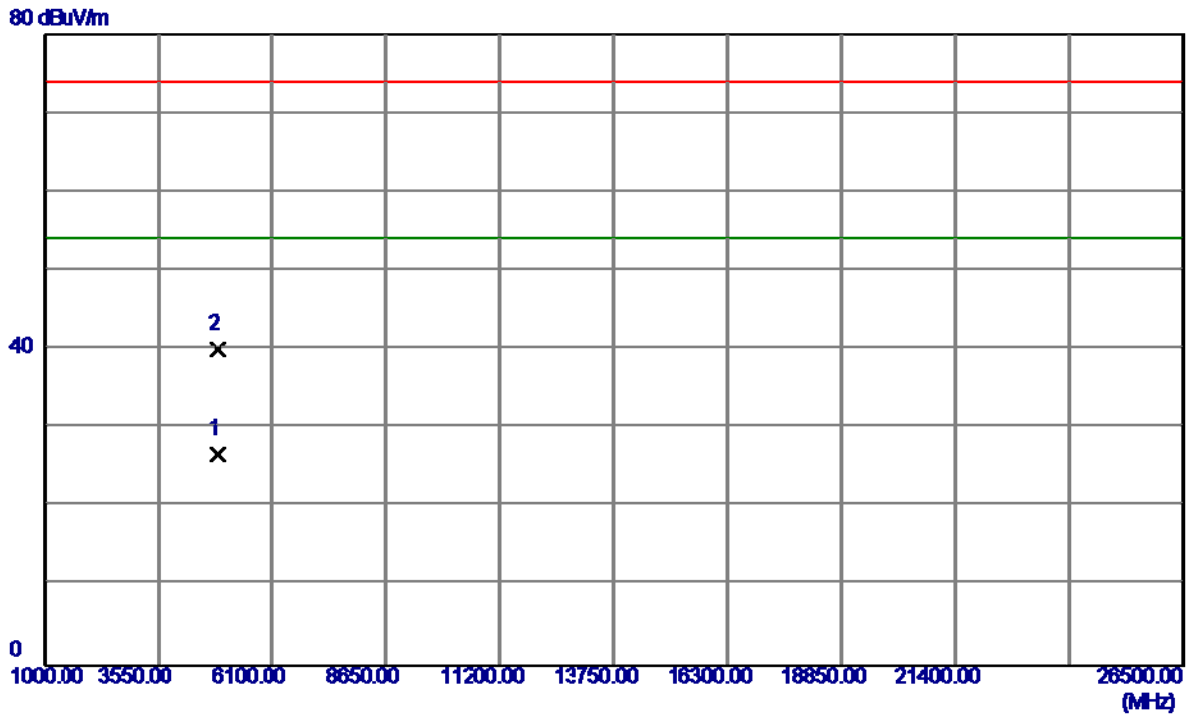
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2439.2000	62.66	29.22	91.88	54.00	37.88	AVG	No Limit
2	2442.8000	72.35	29.24	101.59	74.00	27.59	Peak	No Limit

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

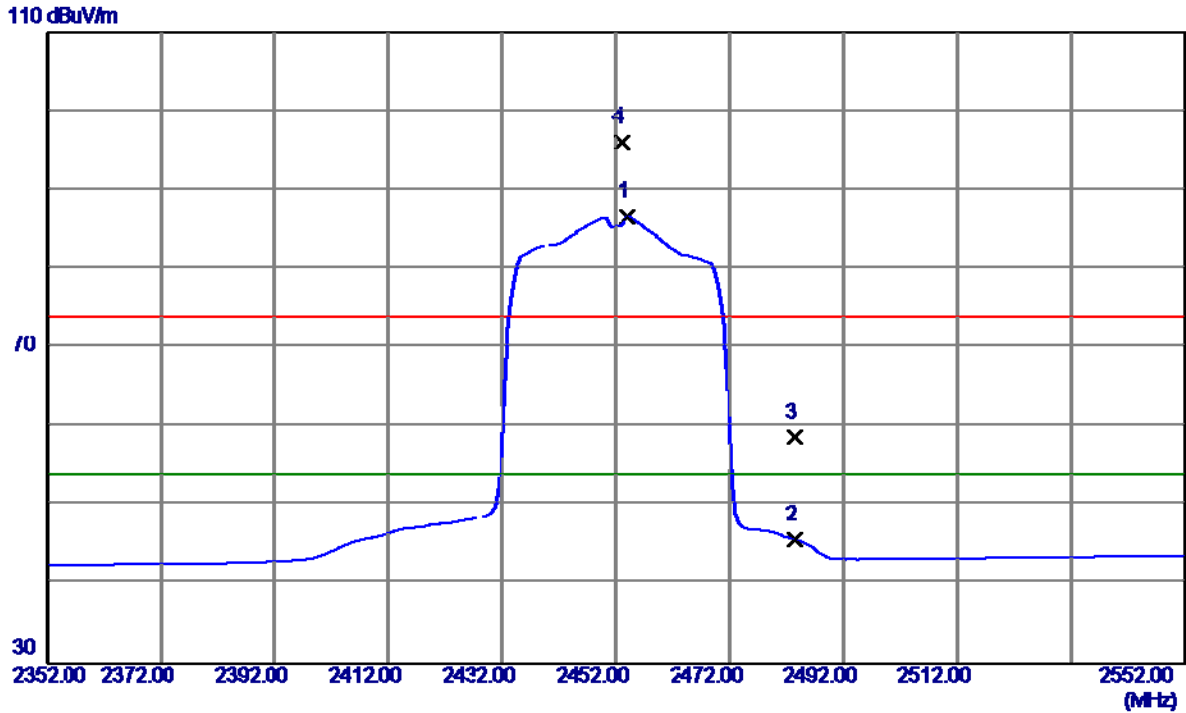
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4874.6520	22.76	4.01	26.77	54.00	-27.23	AVG	
2	4875.9660	35.96	4.02	39.98	74.00	-34.02	Peak	

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

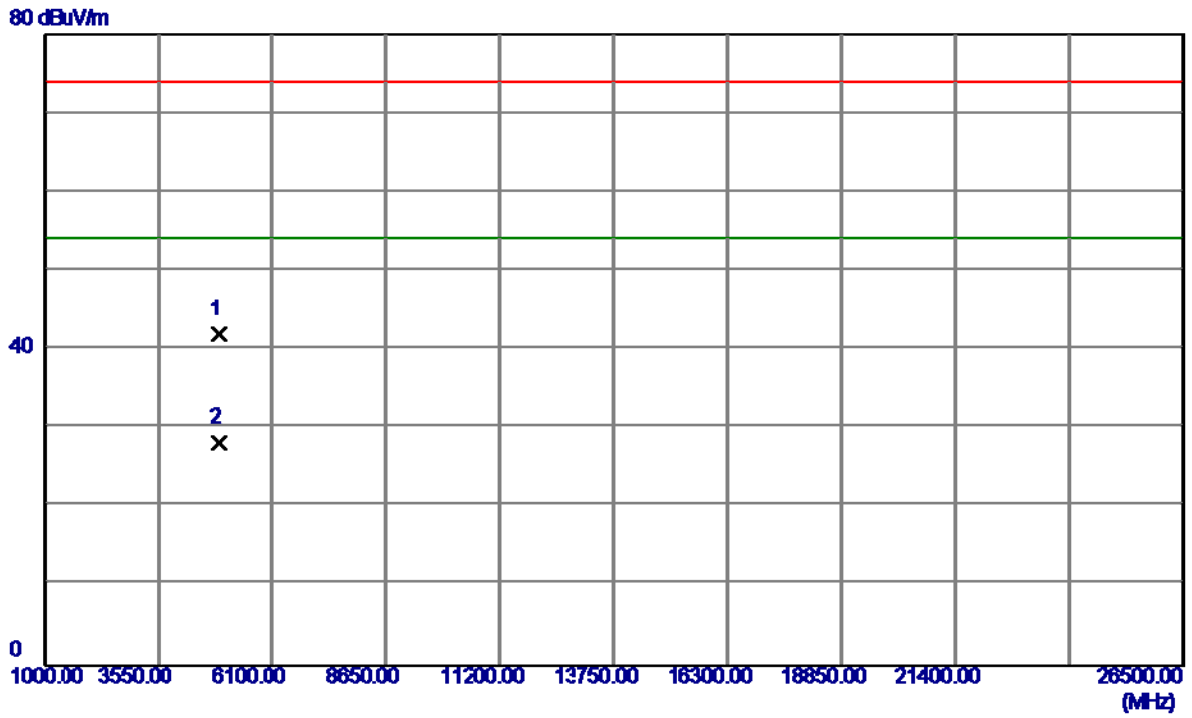
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2454.0000	57.38	29.29	86.67	54.00	32.67	AVG	No Limit
2	2483.5000	16.21	29.42	45.63	54.00	-8.37	AVG	
3	2483.5000	29.24	29.42	58.66	74.00	-15.34	Peak	
4	2453.2000	66.88	29.28	96.16	74.00	22.16	Peak	No Limit

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

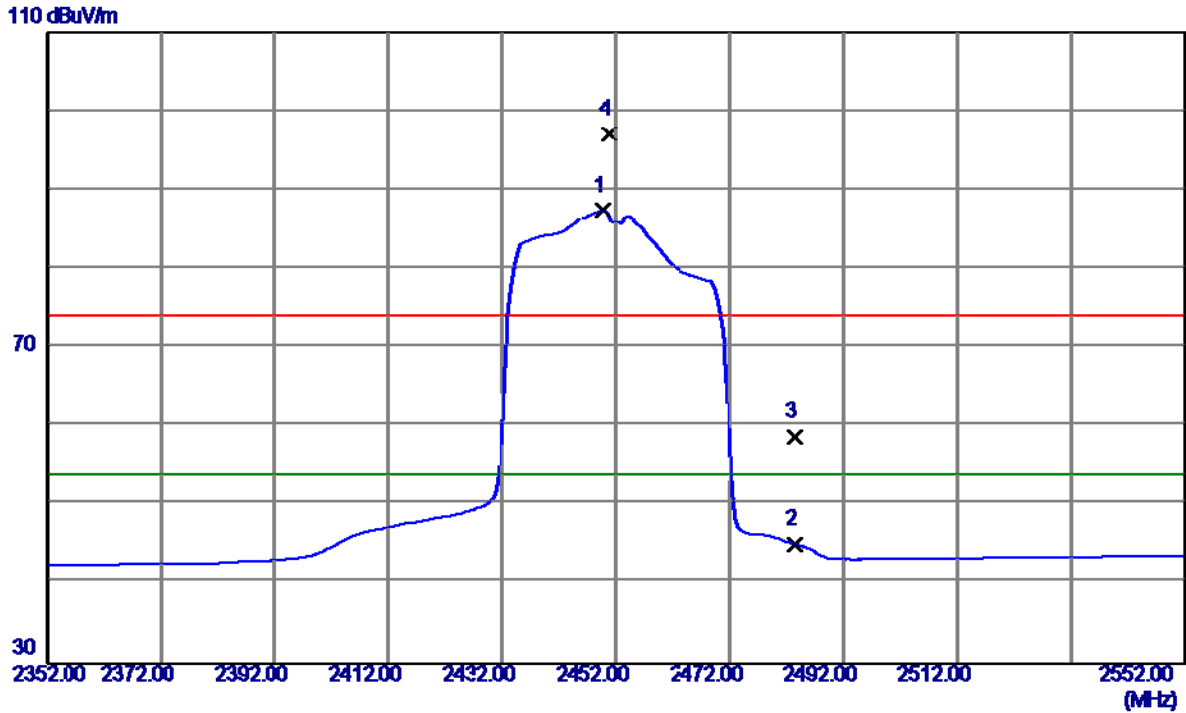
**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4904.3330	37.83	4.15	41.98	74.00	-32.02	Peak	
2 *	4905.1220	24.06	4.15	28.21	54.00	-25.79	AVG	

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

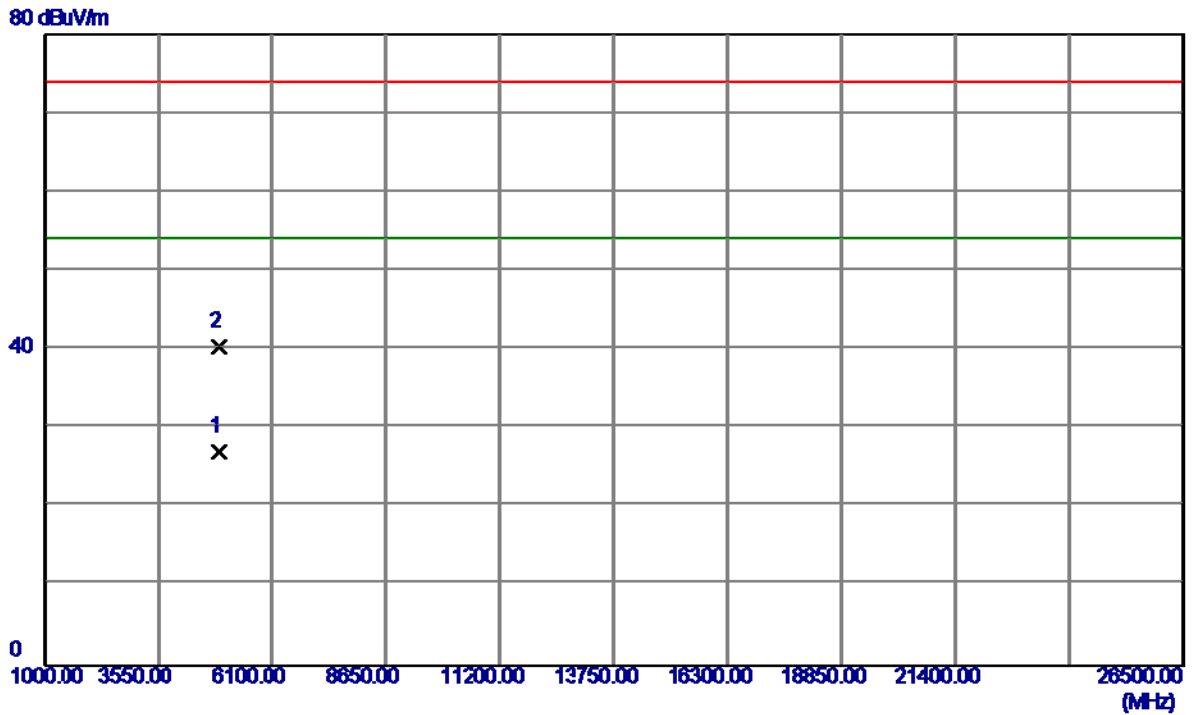
### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2449.8000	58.09	29.27	87.36	54.00	33.36	AVG	No Limit
2	2483.5000	15.63	29.42	45.05	54.00	-8.95	AVG	
3	2483.5000	29.21	29.42	58.63	74.00	-15.37	Peak	
4	2450.8000	67.75	29.27	97.02	74.00	23.02	Peak	No Limit

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

### Horizontal

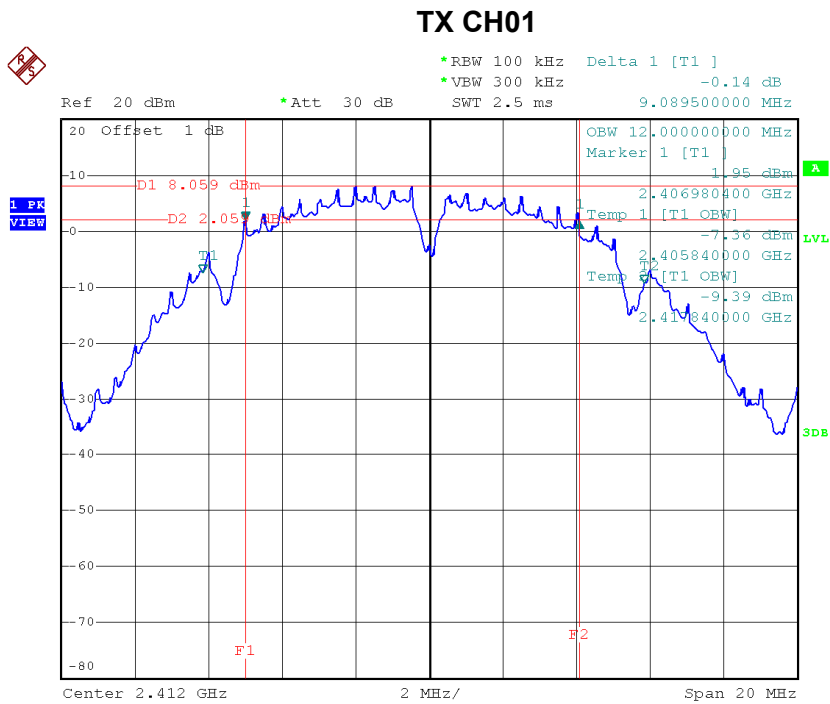


No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4903.7550	22.84	4.15	26.99	54.00	-27.01	AVG	
2	4905.2650	36.24	4.15	40.39	74.00	-33.61	Peak	

## ATTACHMENT E - BANDWIDTH

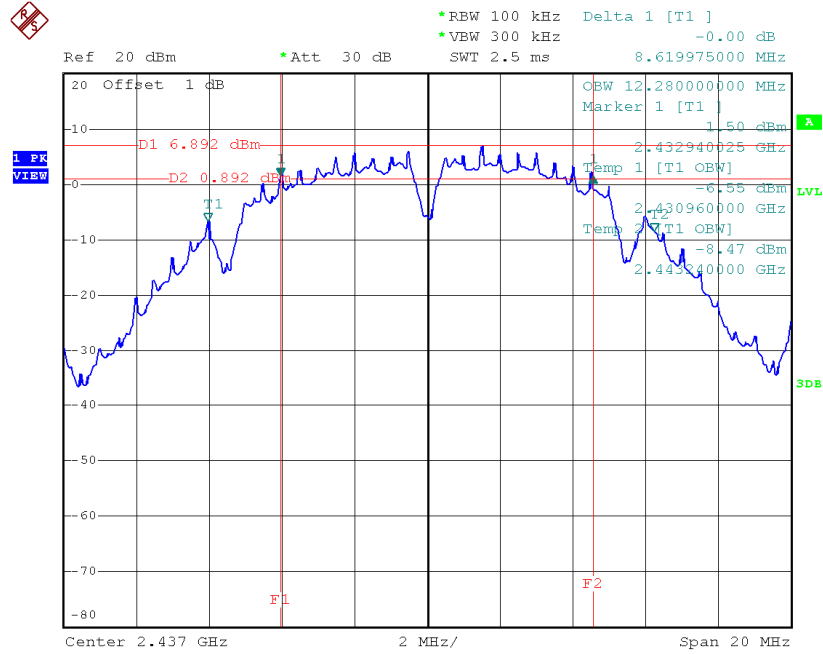
**Test Mode : TX B Mode\_CH01/06/11**

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	9.09	12.00	500	Complies
2437	8.62	12.28	500	Complies
2462	8.07	12.24	500	Complies



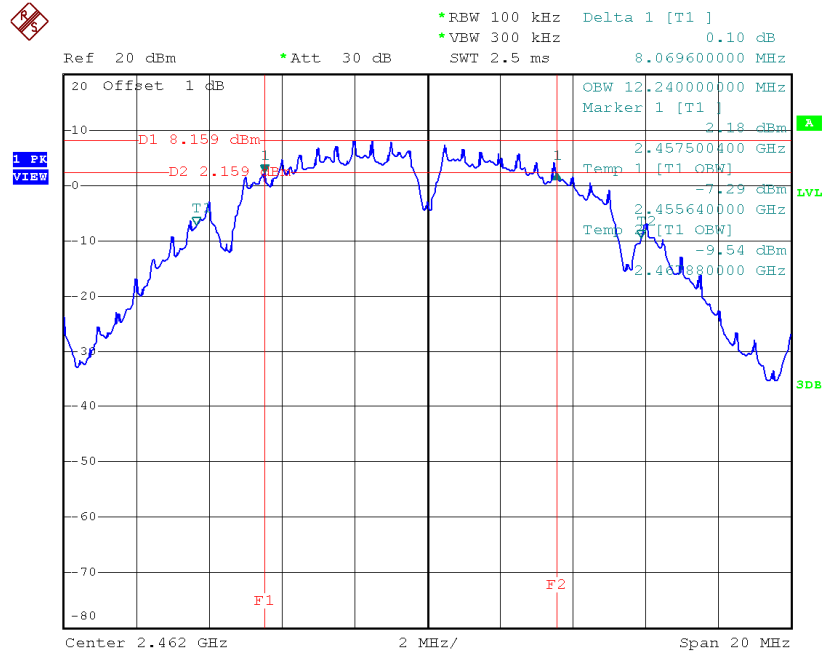
Date: 23.JUN.2016 15:27:55

**TX CH06**



Date: 23.JUN.2016 15:30:13

**TX CH11**

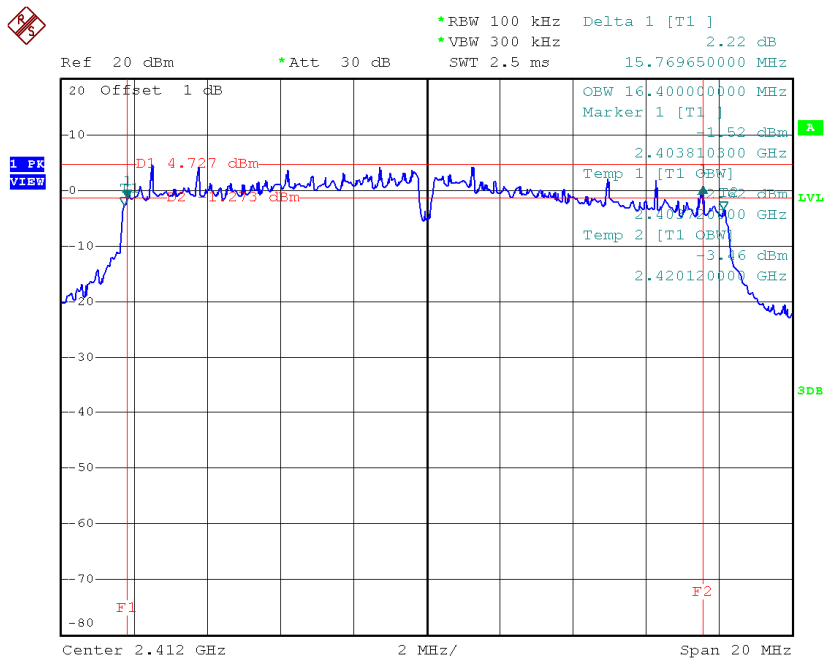


Date: 23.JUN.2016 15:40:05

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

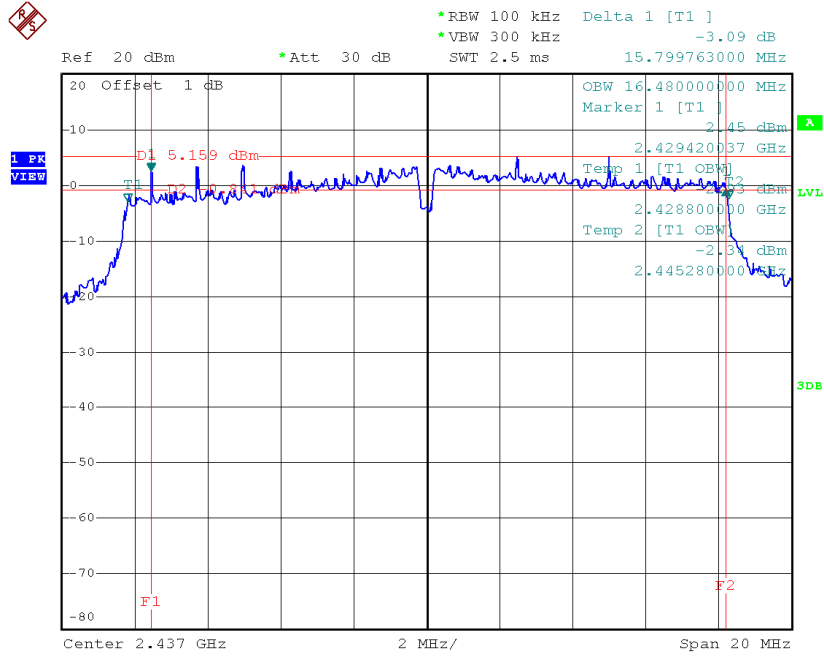
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	15.77	16.40	500	Complies
2437	15.80	16.48	500	Complies
2462	12.32	16.48	500	Complies

**TX CH01**



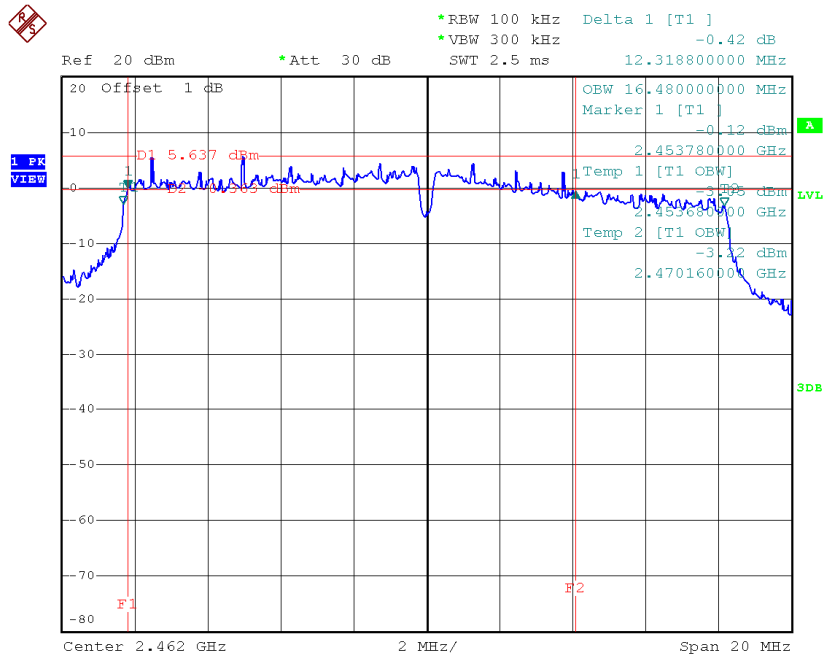
Date: 23.JUN.2016 15:41:35

**TX CH06**



Date: 23.JUN.2016 15:43:12

**TX CH11**

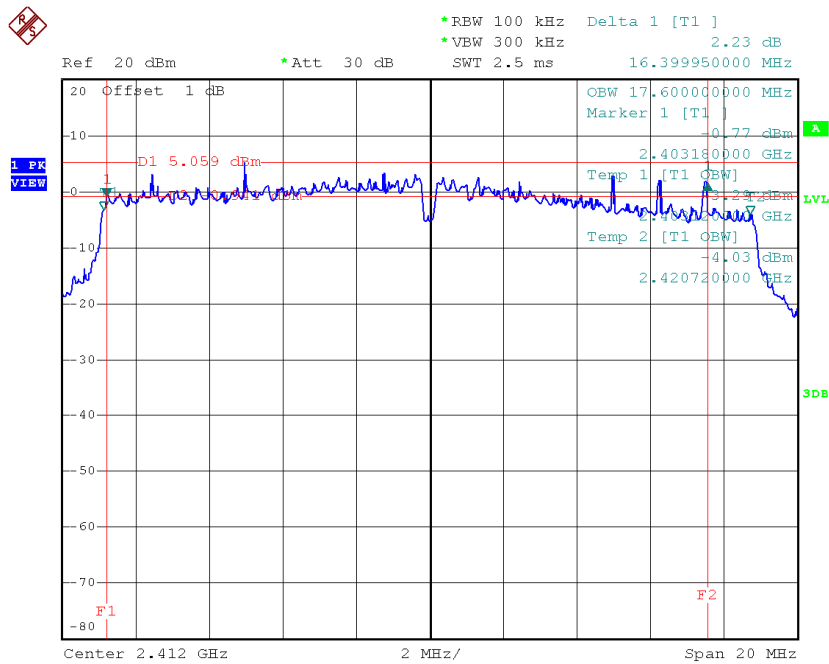


Date: 23.JUN.2016 15:44:39

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

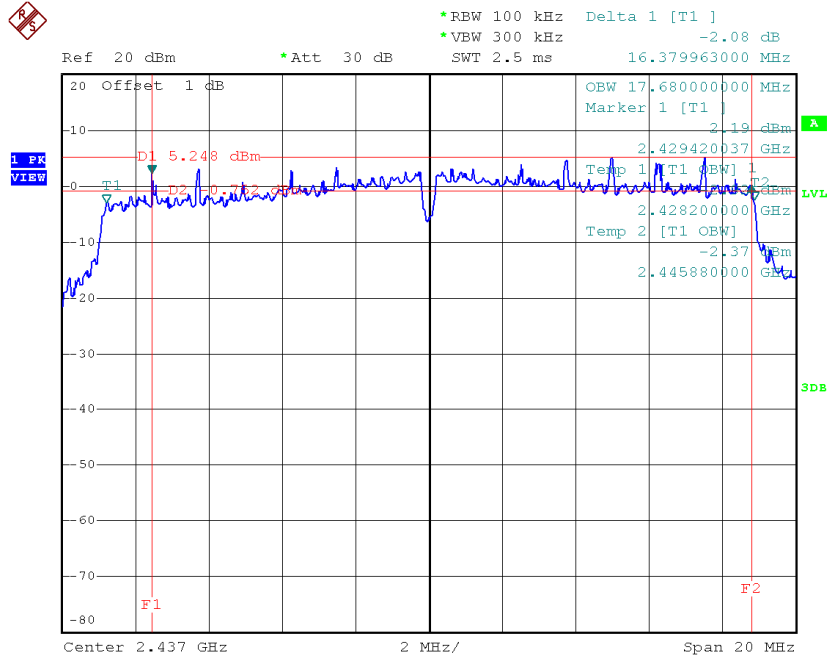
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	16.40	17.60	500	Complies
2437	16.38	17.68	500	Complies
2462	16.45	17.64	500	Complies

**TX CH01**



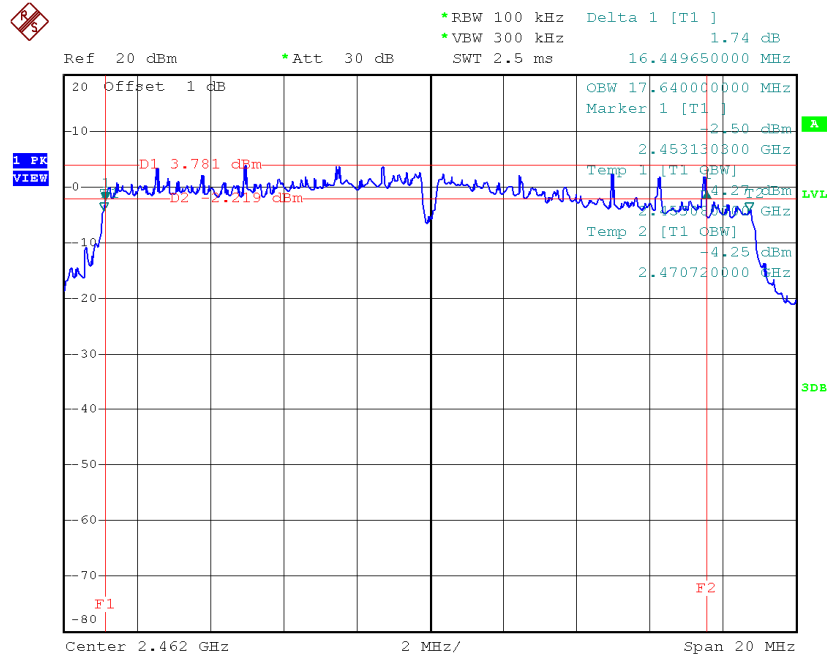
Date: 23.JUN.2016 15:46:16

### TX CH06



Date: 23.JUN.2016 15:47:41

### TX CH11

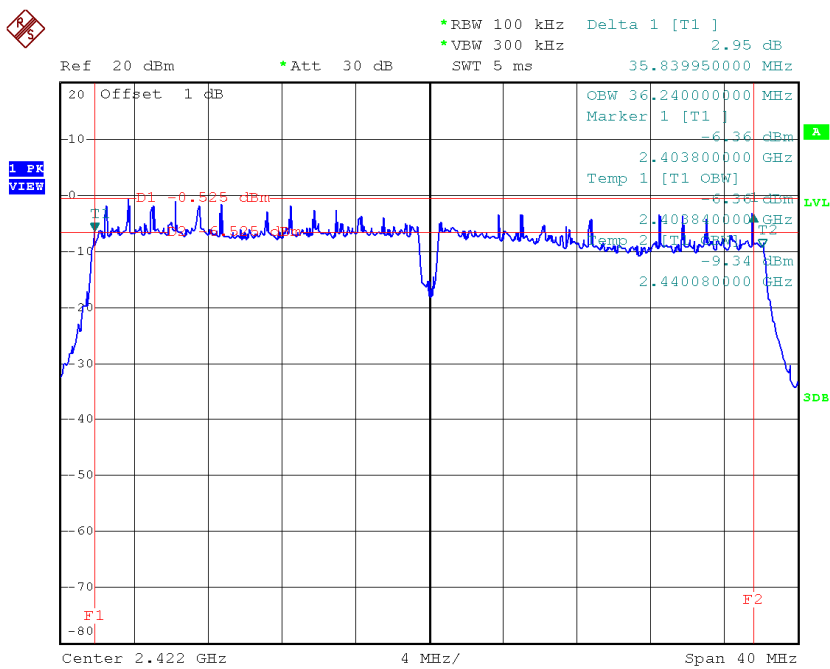


Date: 23.JUN.2016 15:48:56

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

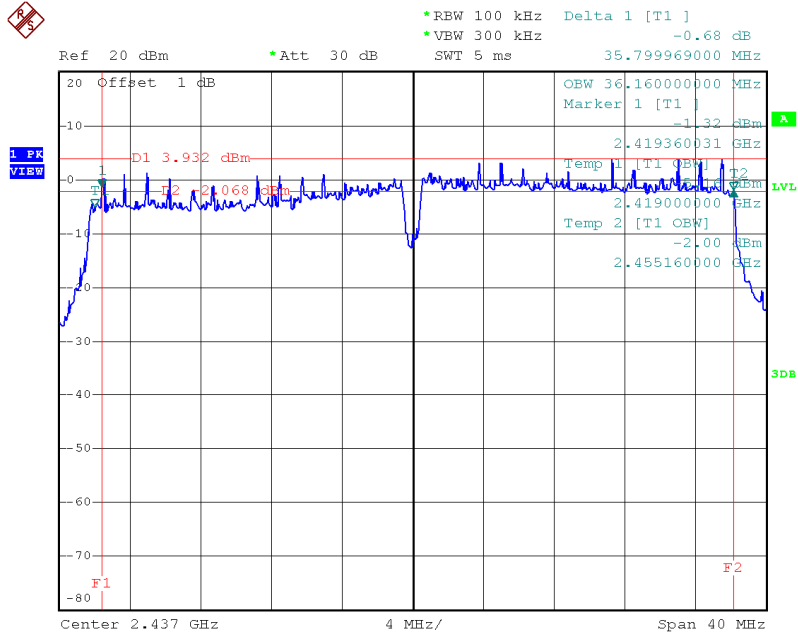
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2422	35.84	36.24	500	Complies
2437	35.80	36.16	500	Complies
2452	35.20	35.68	500	Complies

**TX CH03**



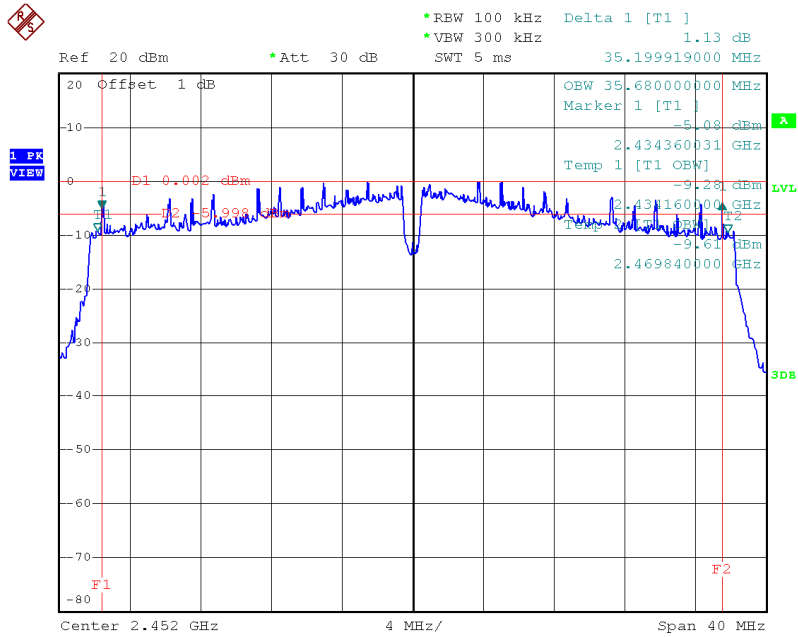
Date: 23.JUN.2016 15:50:21

**TX CH06**



Date: 23.JUN.2016 15:51:54

**TX CH09**



Date: 23.JUN.2016 15:53:47

# ATTACHMENT F – MAXIMUM PEAK CONDUCTED OUTPUT POWER

Test Mode :TX B Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	20.46	0.11	30.00	1.00	Complies
2437	19.33	0.09	30.00	1.00	Complies
2462	18.88	0.08	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	24.79	0.30	30.00	1.00	Complies
2437	24.52	0.28	30.00	1.00	Complies
2462	23.38	0.22	30.00	1.00	Complies

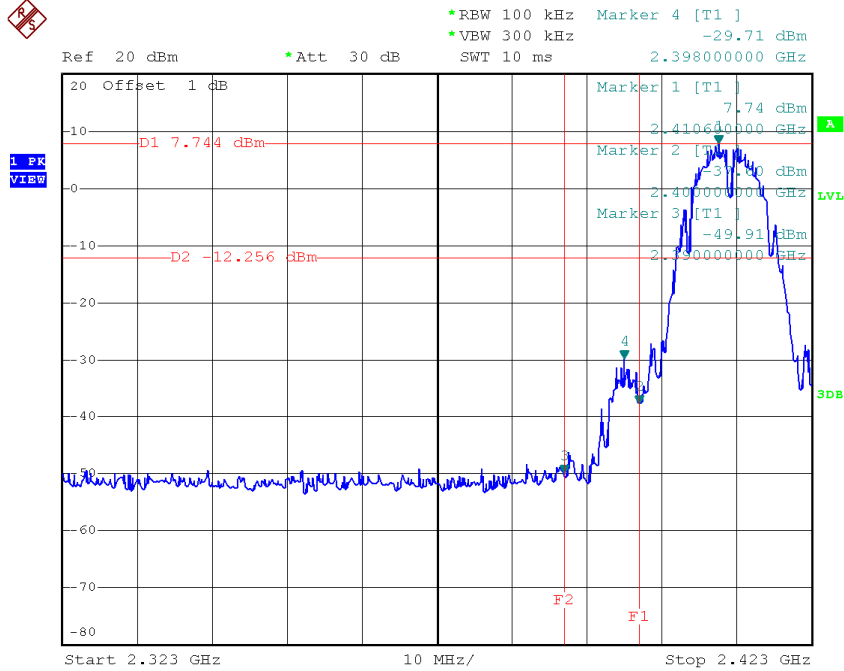
Test Mode :TX N20 Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	24.97	0.31	30.00	1.00	Complies
2437	24.88	0.31	30.00	1.00	Complies
2462	23.35	0.22	30.00	1.00	Complies

Test Mode :TX N40 Mode_CH03/06/09					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	23.57	0.23	30.00	1.00	Complies
2437	25.27	0.34	30.00	1.00	Complies
2452	23.33	0.22	30.00	1.00	Complies

# ATTACHMENT G - ANTENNA CONDUCTED SPURIOUS EMISSION

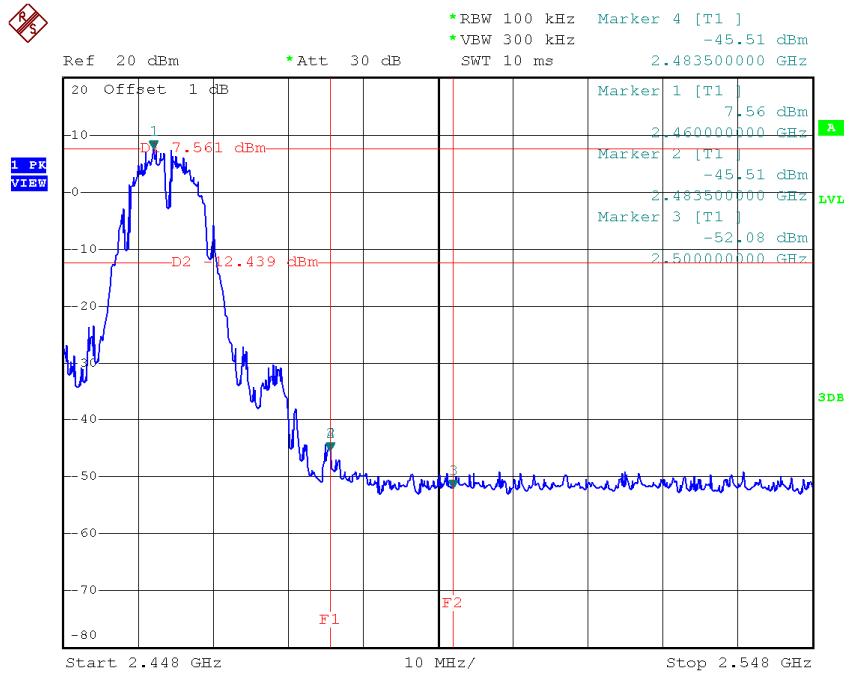
Test Mode : TX B Mode

**TX B mode CH01**



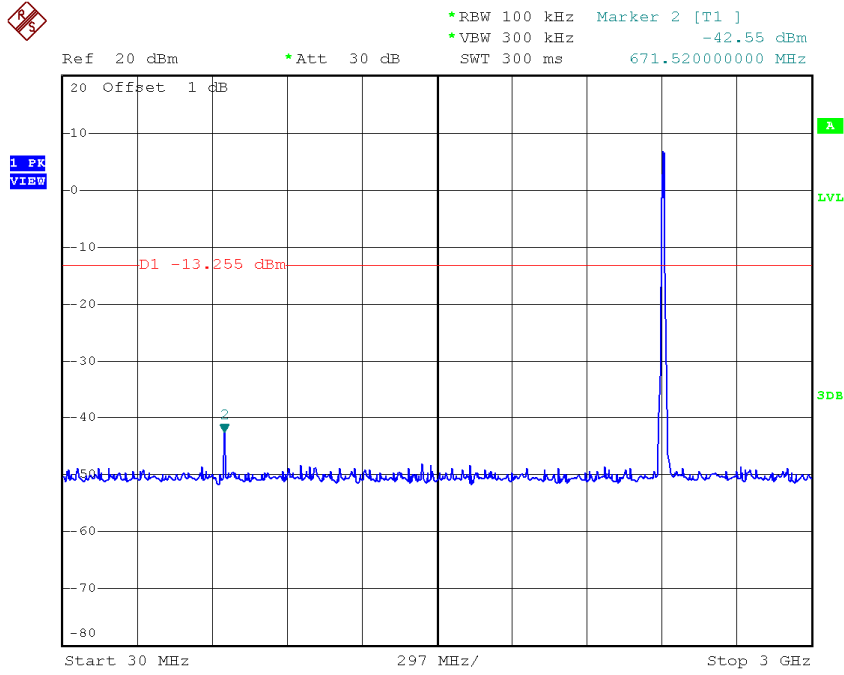
Date: 23.JUN.2016 15:28:34

**TX B mode CH11**



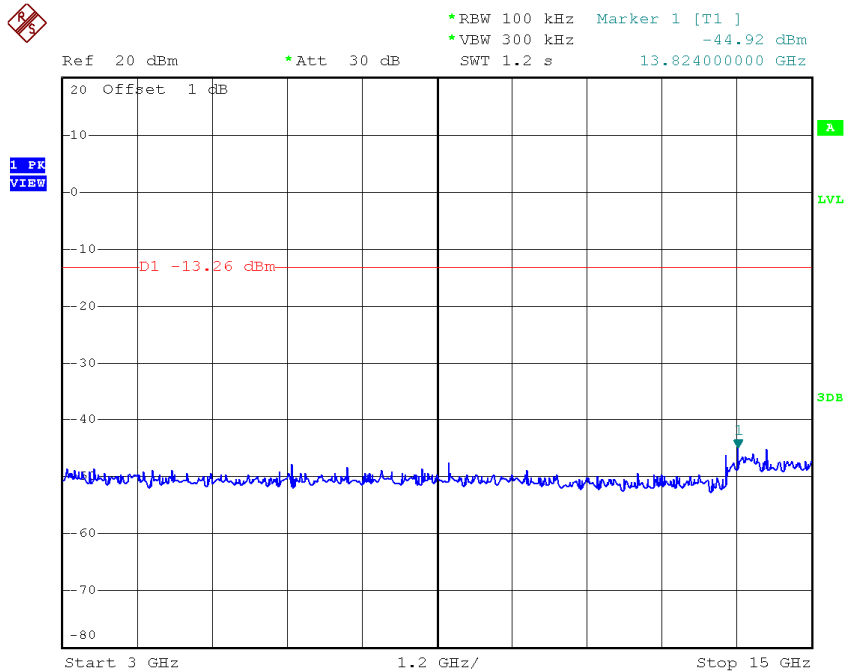
Date: 23.JUN.2016 15:40:44

### TX B mode CH01 (10 Harmonic of the frequency) 1



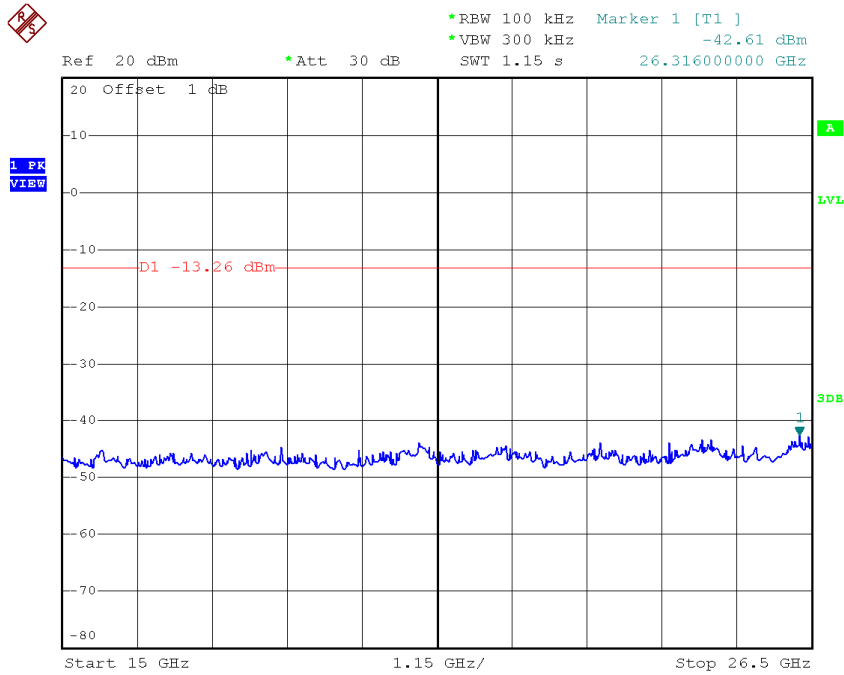
Date: 23.JUN.2016 15:28:10

### TX B mode CH01 (10 Harmonic of the frequency) 2



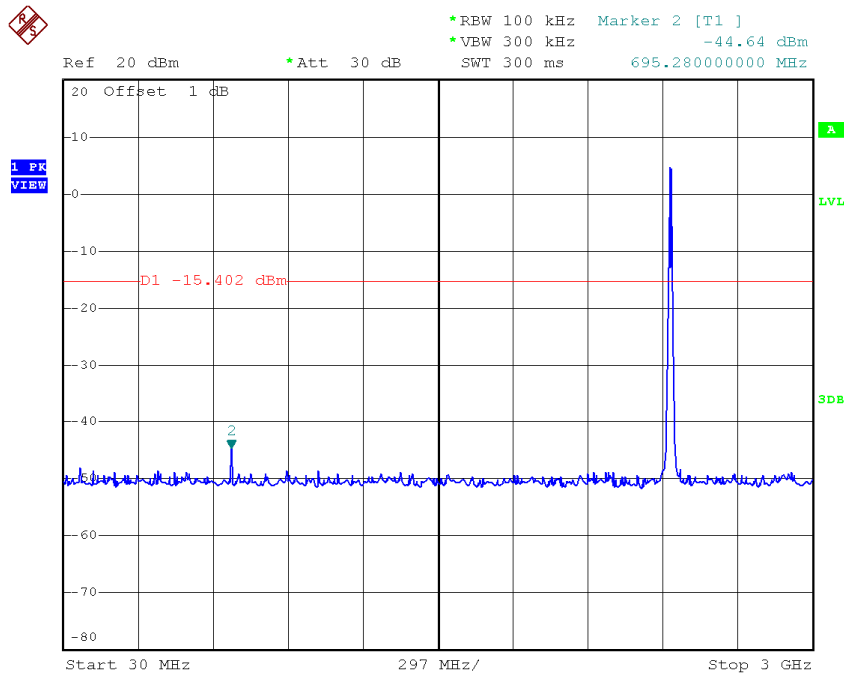
Date: 23.JUN.2016 15:28:18

**TX B mode CH01 (10 Harmonic of the frequency) 3**



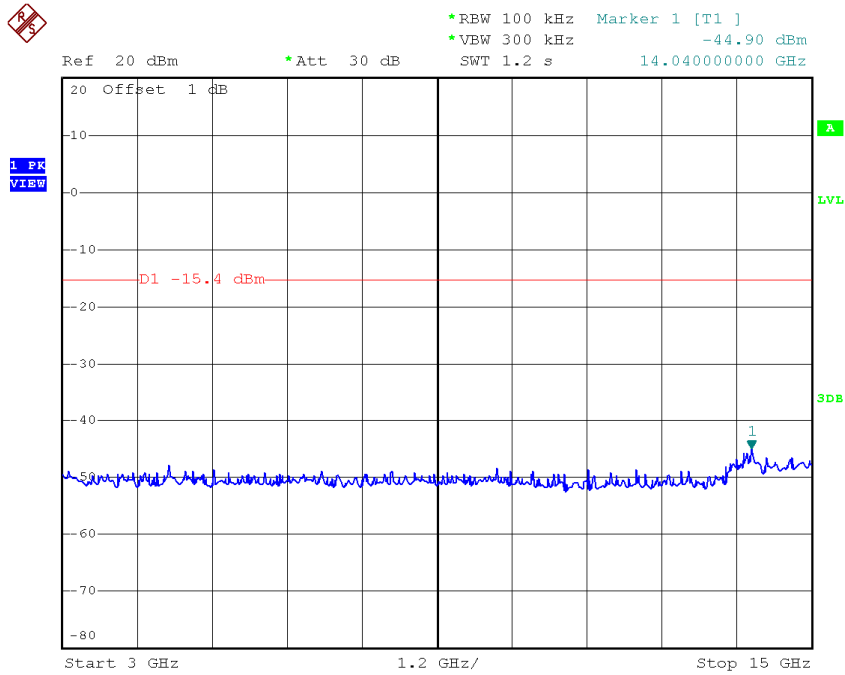
Date: 23.JUN.2016 15:28:27

**TX B mode CH06 (10 Harmonic of the frequency) 1**



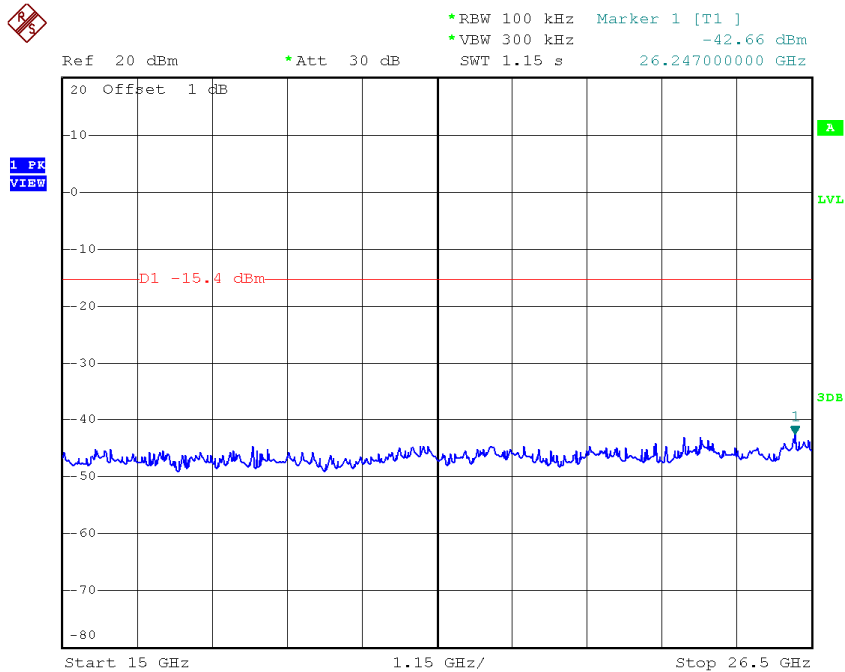
Date: 23.JUN.2016 15:30:27

**TX B mode CH06 (10 Harmonic of the frequency) 2**



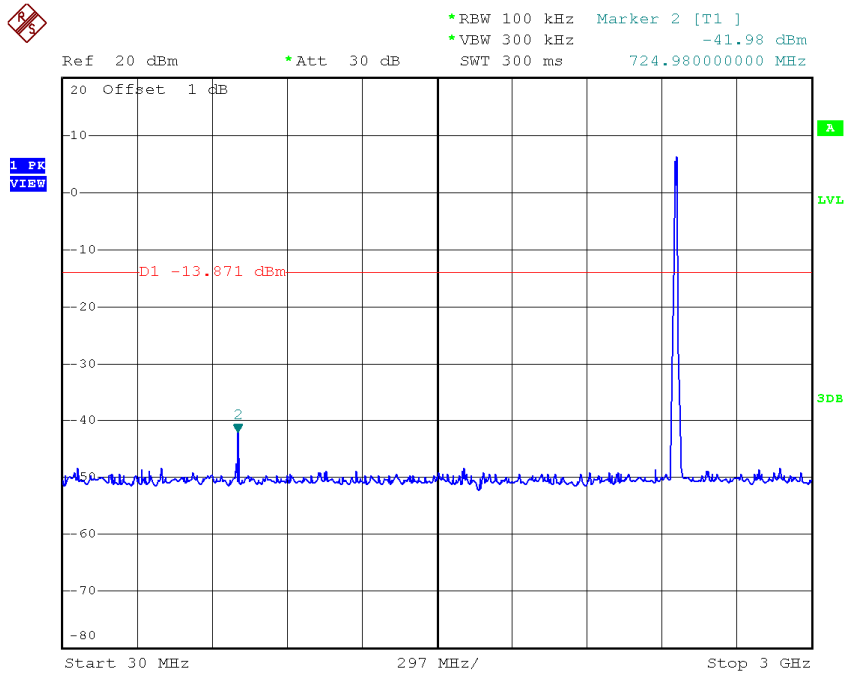
Date: 23.JUN.2016 15:30:36

**TX B mode CH06 (10 Harmonic of the frequency) 3**



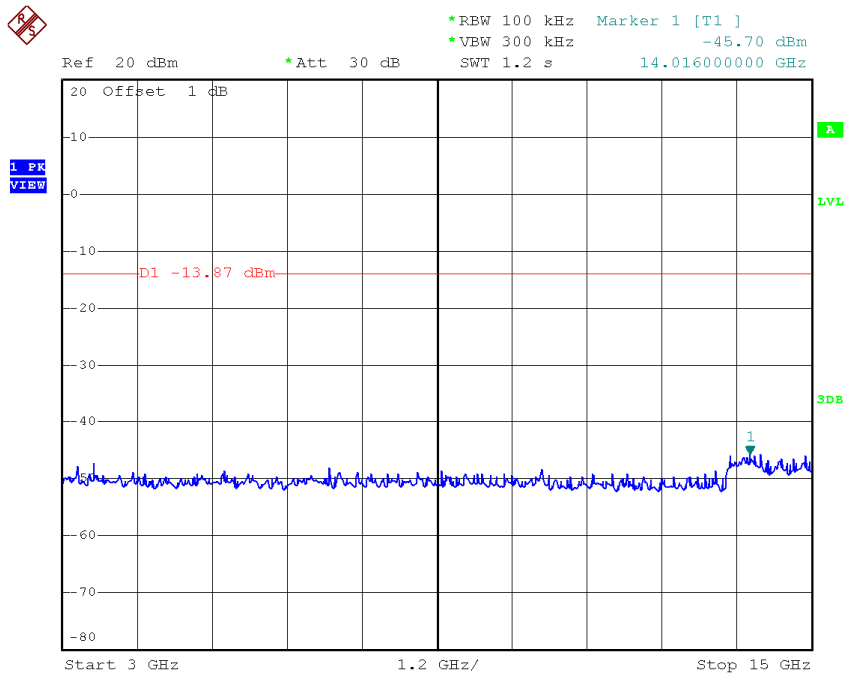
Date: 23.JUN.2016 15:30:44

### TX B mode CH11 (10 Harmonic of the frequency) 1



Date: 23.JUN.2016 15:40:19

### TX B mode CH11 (10 Harmonic of the frequency) 2

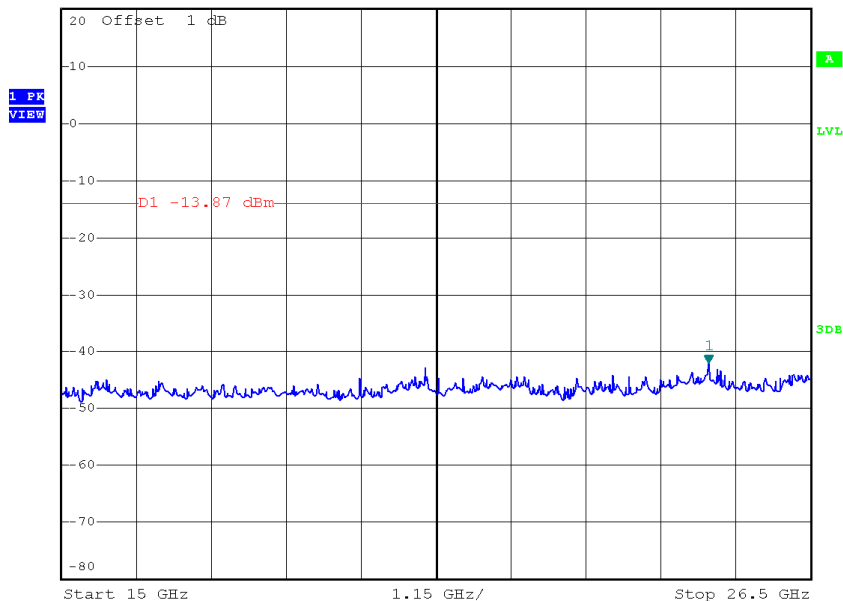


Date: 23.JUN.2016 15:40:28

### TX B mode CH11 (10 Harmonic of the frequency) 3



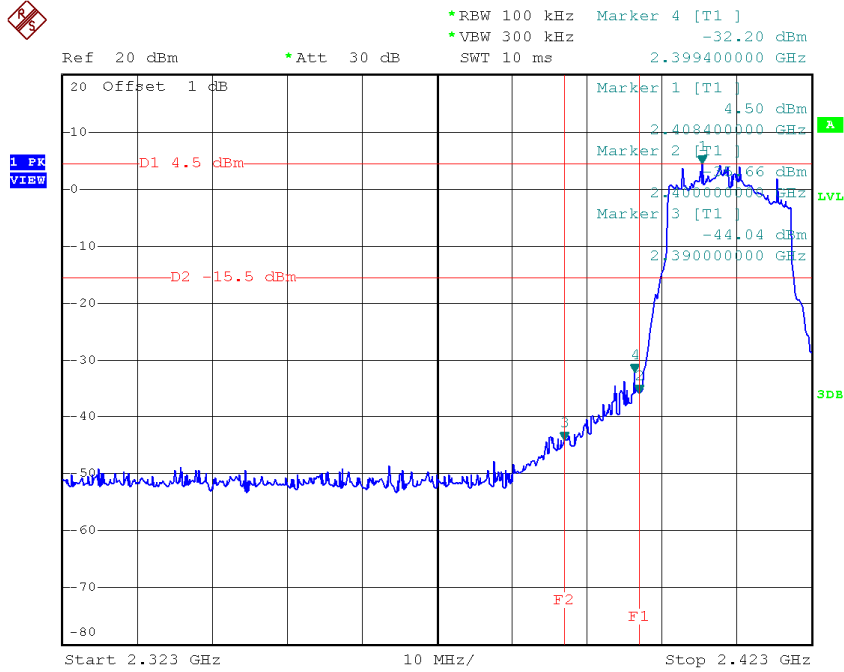
Ref 20 dBm      \*Att 30 dB      SWT 1.15 s      24.93600000 GHz  
\*RBW 100 kHz      Marker 1 [T1 ]  
\*VEW 300 kHz      -42.12 dBm



Date: 23.JUN.2016 15:40:36

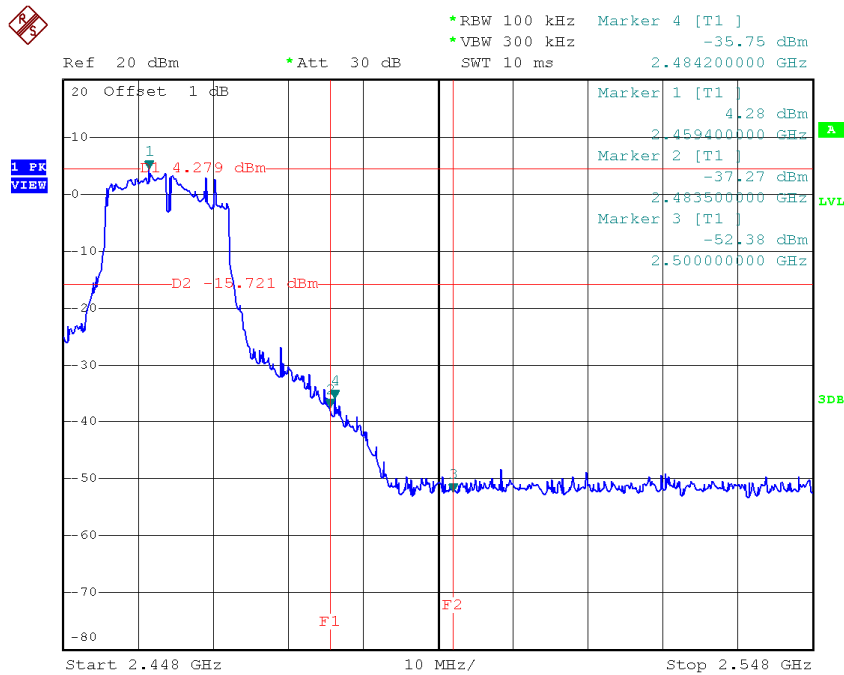
Test Mode : TX G Mode

**TX G mode CH01**



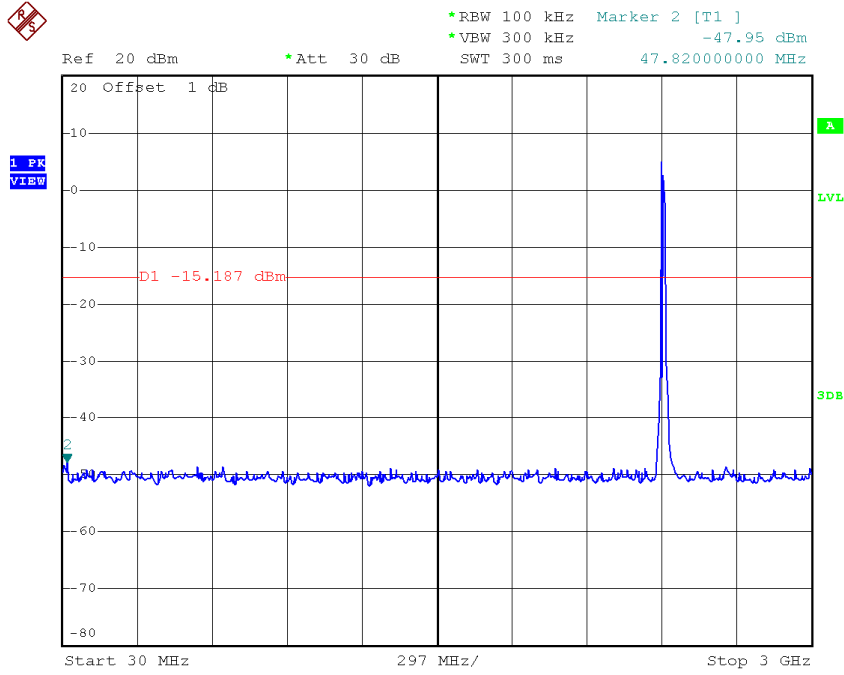
Date: 23.JUN.2016 15:42:14

**TX G mode CH11**



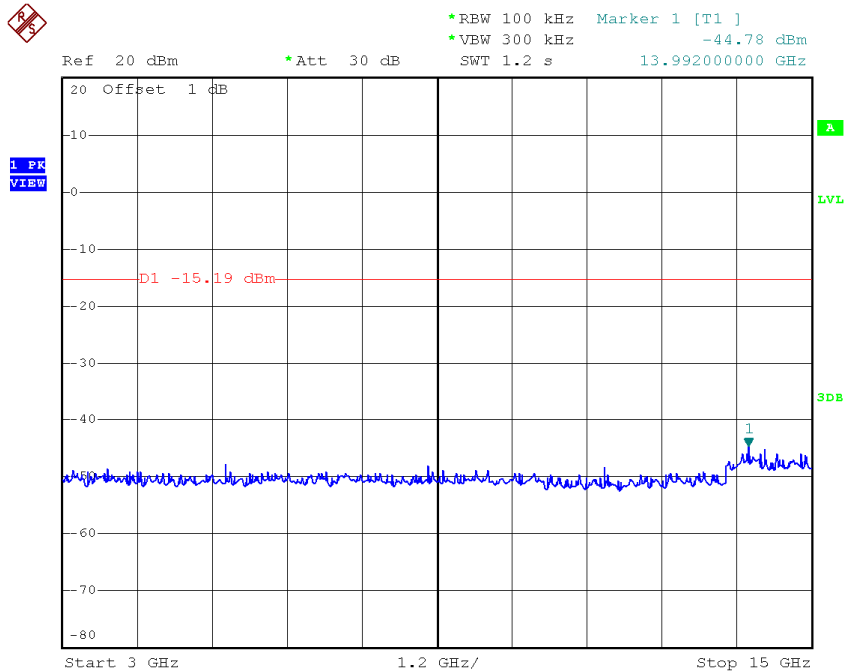
Date: 23.JUN.2016 15:45:18

**TX G mode CH01 (10 Harmonic of the frequency) 1**



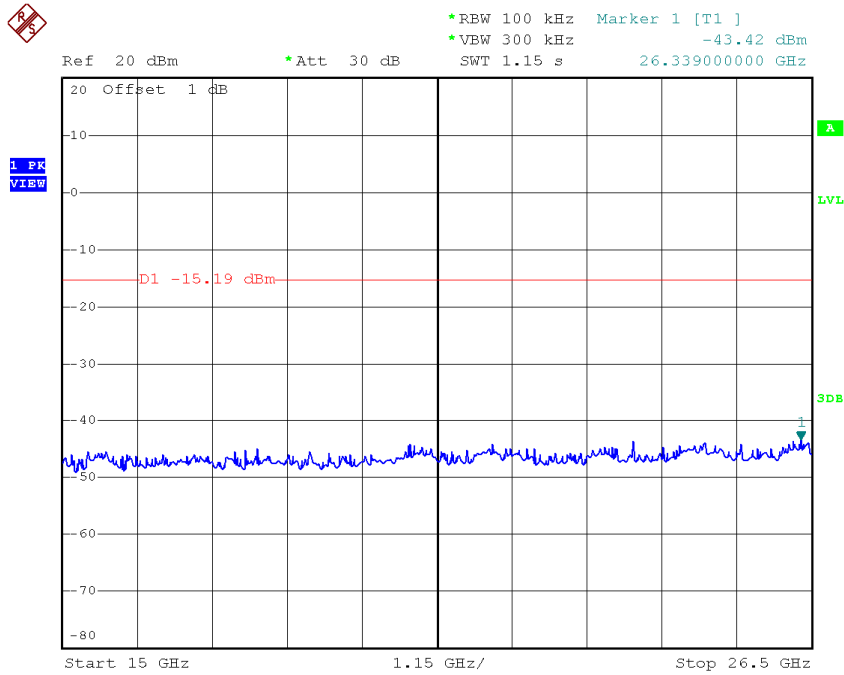
Date: 23.JUN.2016 15:41:49

**TX G mode CH01 (10 Harmonic of the frequency) 2**



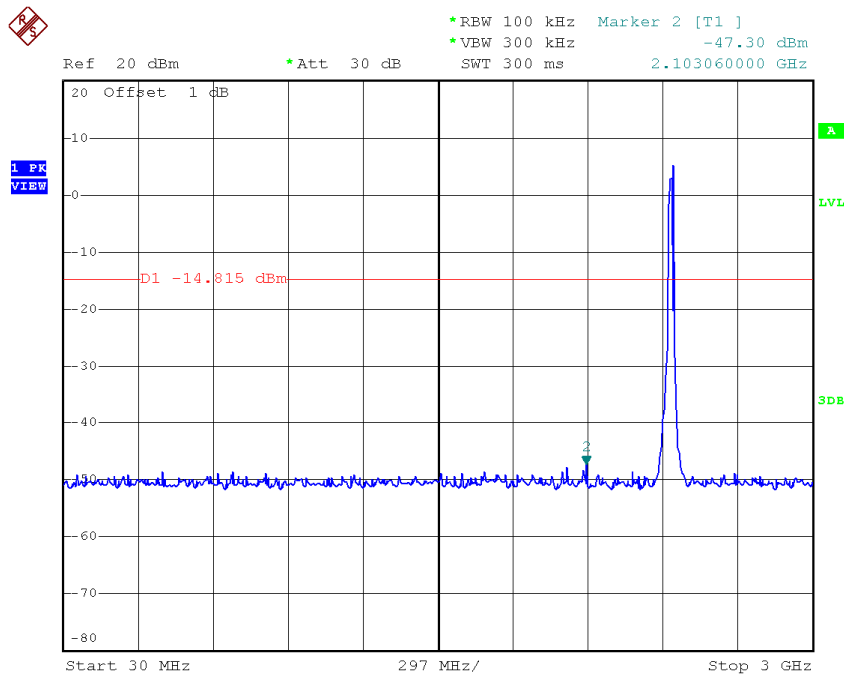
Date: 23.JUN.2016 15:41:58

**TX G mode CH01 (10 Harmonic of the frequency) 3**



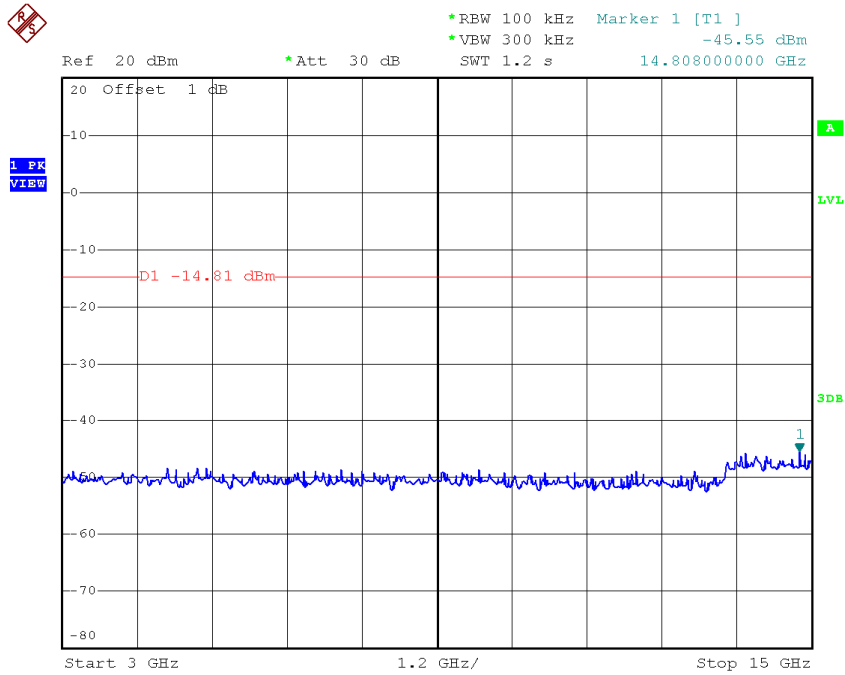
Date: 23.JUN.2016 15:42:06

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



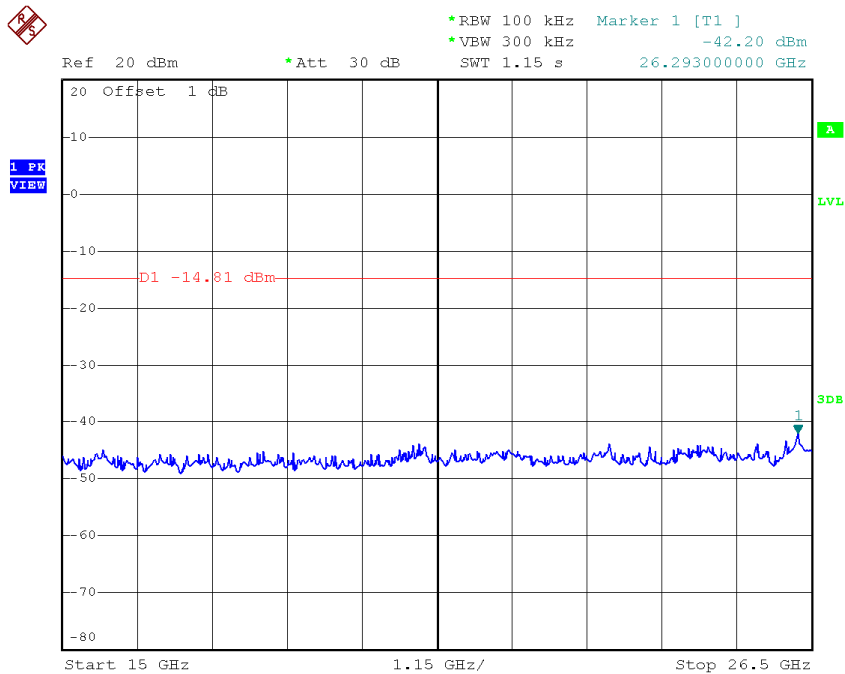
Date: 23.JUN.2016 15:43:26

### TX G mode CH06 (10 Harmonic of the frequency) 2



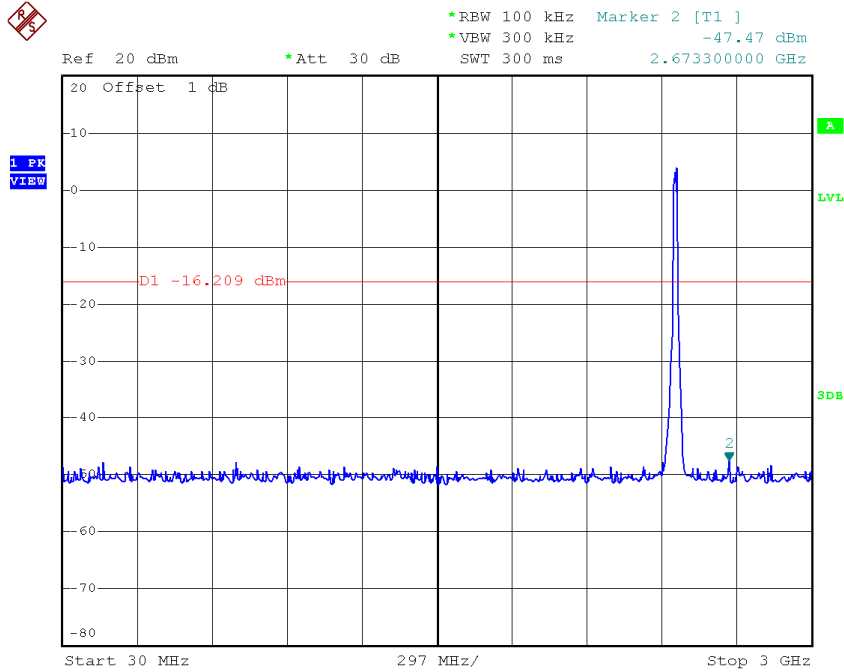
Date: 23.JUN.2016 15:43:34

### TX G mode CH06 (10 Harmonic of the frequency) 3



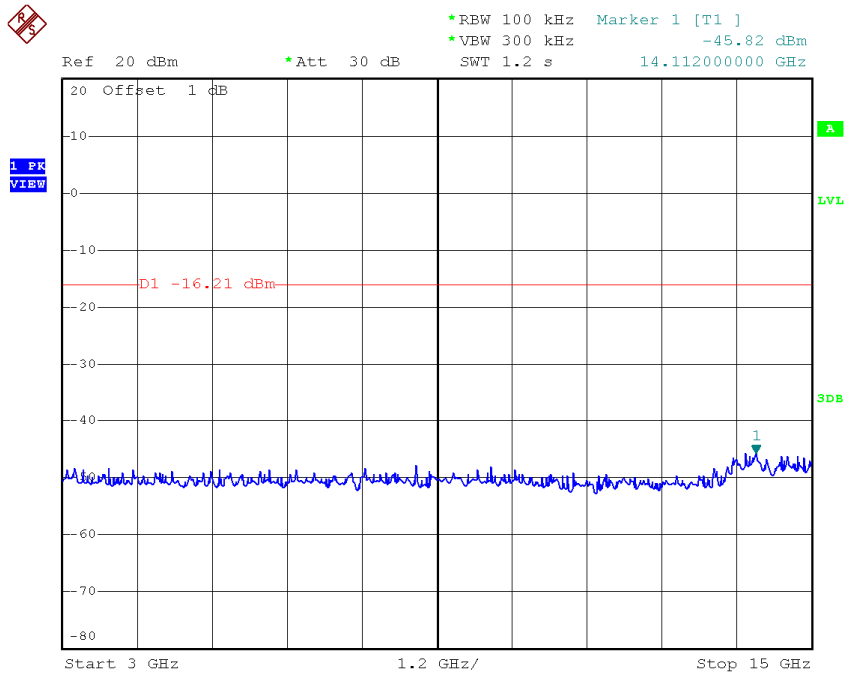
Date: 23.JUN.2016 15:43:43

### TX G mode CH11 (10 Harmonic of the frequency) 1



Date: 23.JUN.2016 15:44:53

### TX G mode CH11 (10 Harmonic of the frequency) 2



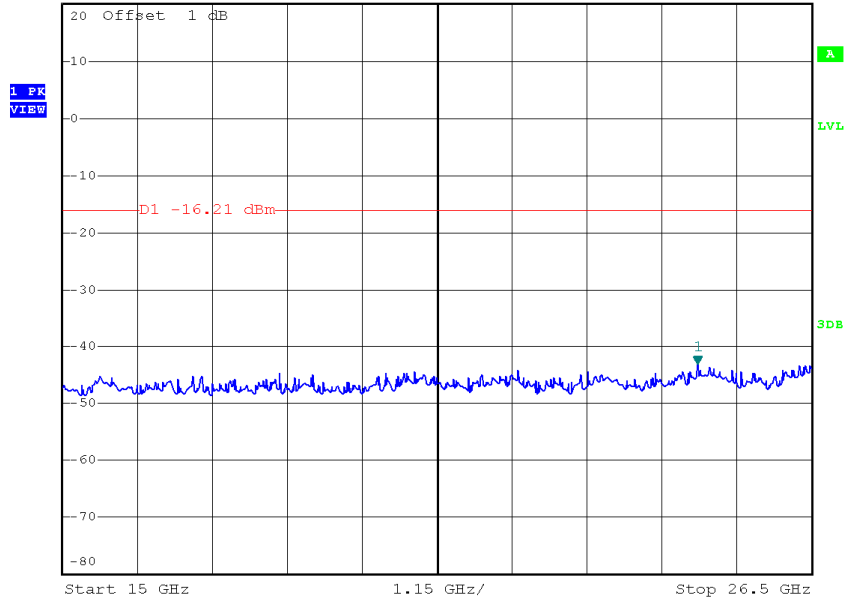
Date: 23.JUN.2016 15:45:01

### TX G mode CH11 (10 Harmonic of the frequency) 3



\*RBW 100 kHz Marker 1 [T1 ]  
\*VEW 300 kHz -43.25 dBm  
SWT 1.15 s 24.752000000 GHz

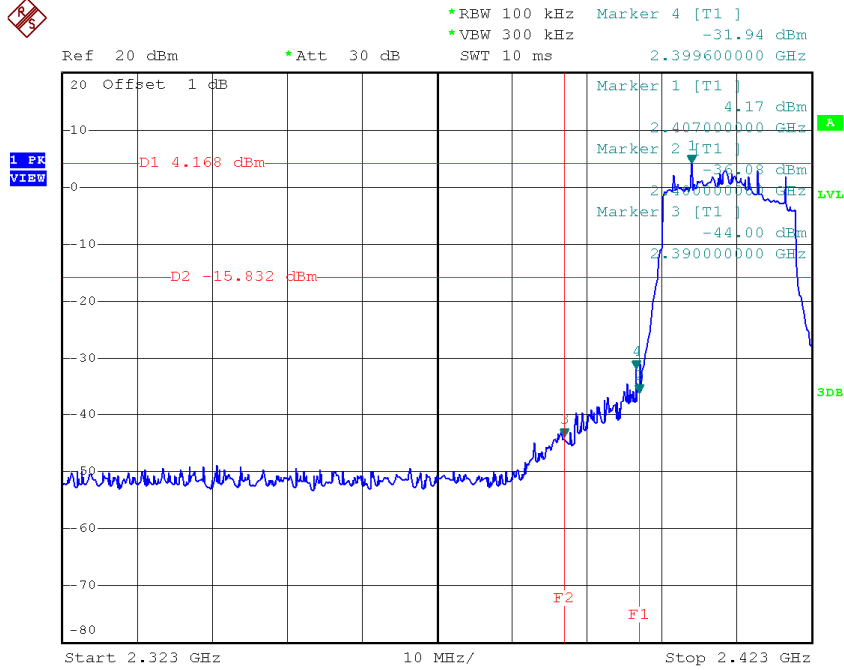
Ref 20 dBm \*Att 30 dB



Date: 23.JUN.2016 15:45:10

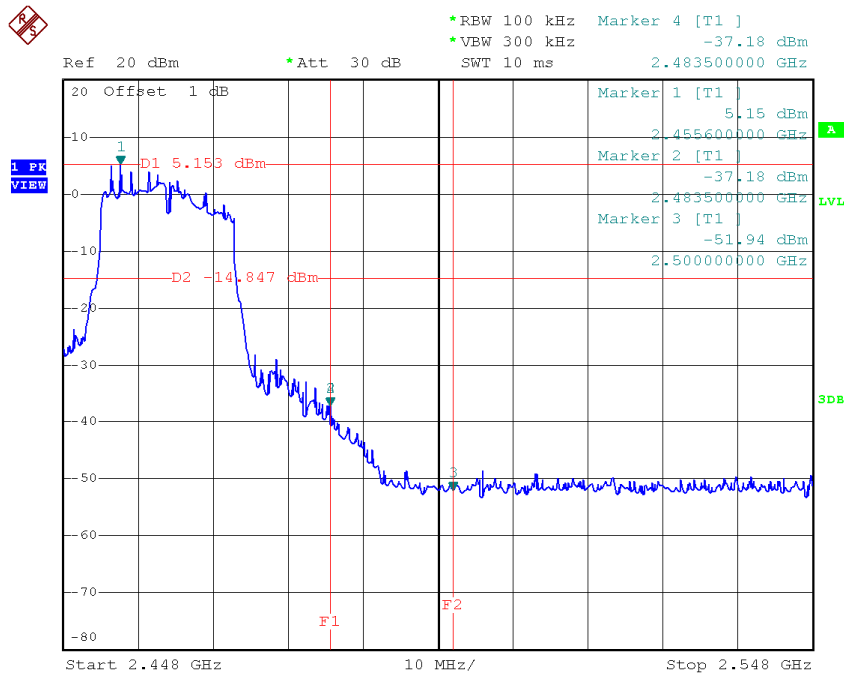
Test Mode : TX N-20M Mode

**TX HT20 mode CH01**



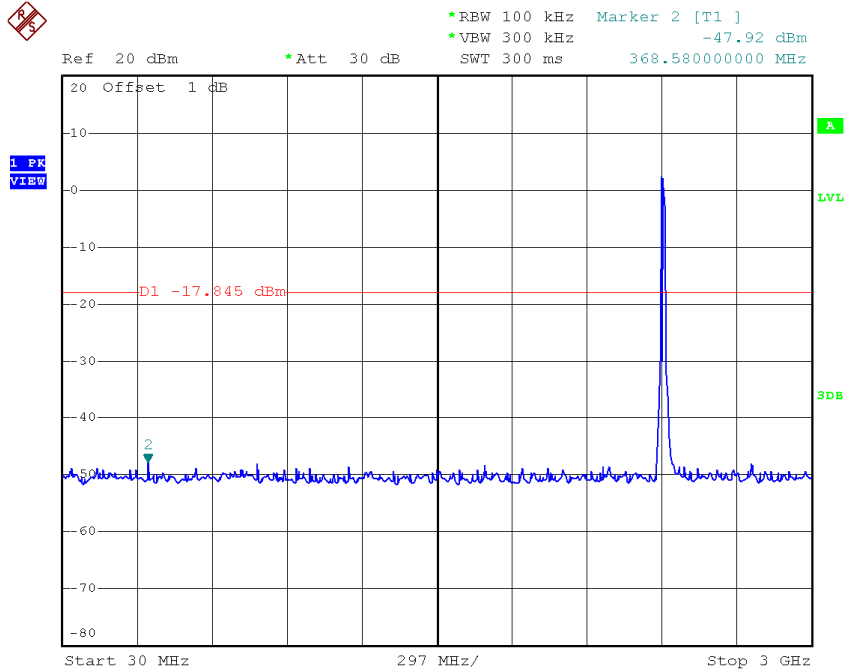
Date: 23.JUN.2016 15:46:55

**TX HT20 mode CH11**



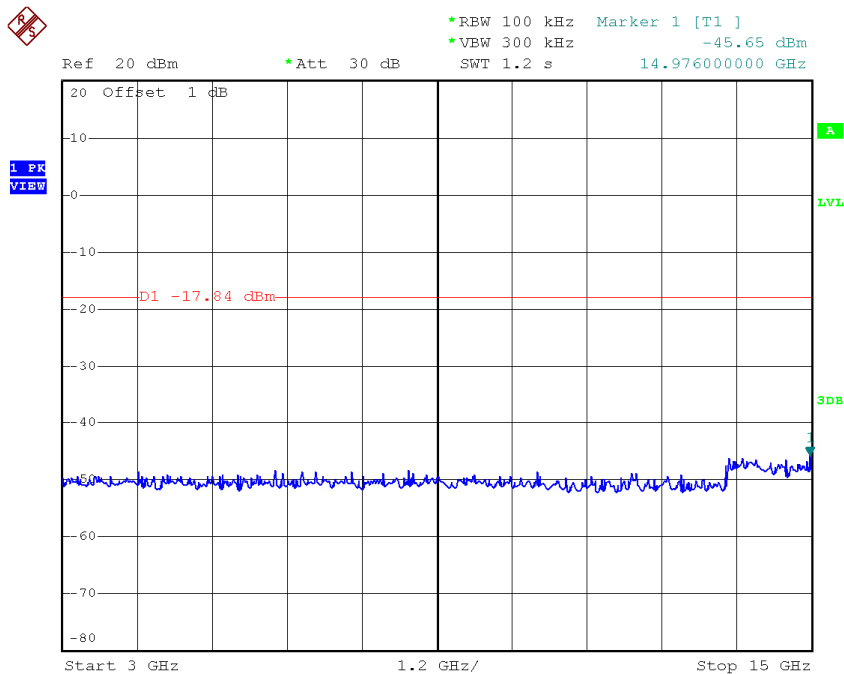
Date: 23.JUN.2016 15:49:34

**TX HT20 mode CH01 (10 Harmonic of the frequency) 1**



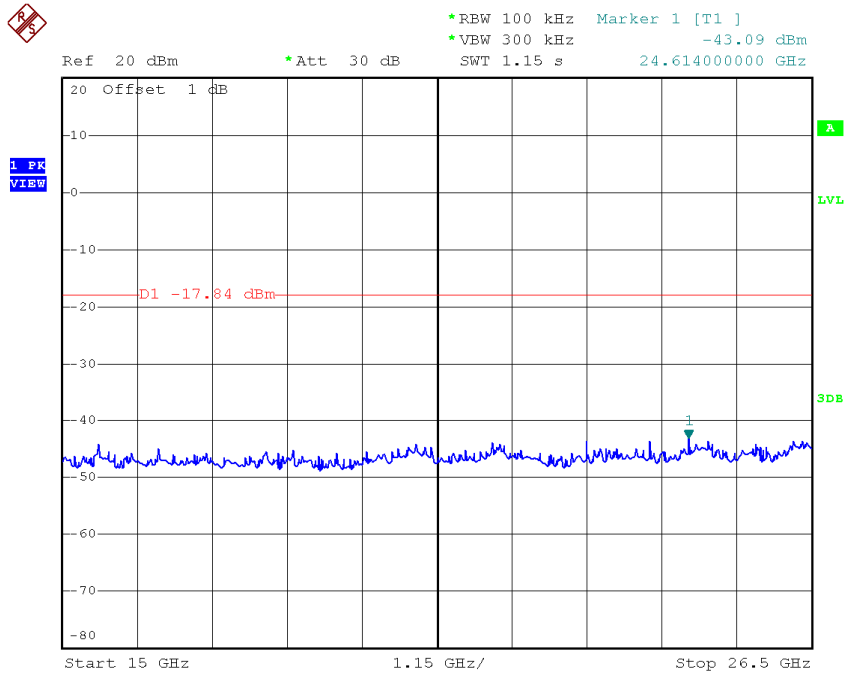
Date: 23.JUN.2016 15:46:30

**TX HT20 mode CH01 (10 Harmonic of the frequency) 2**



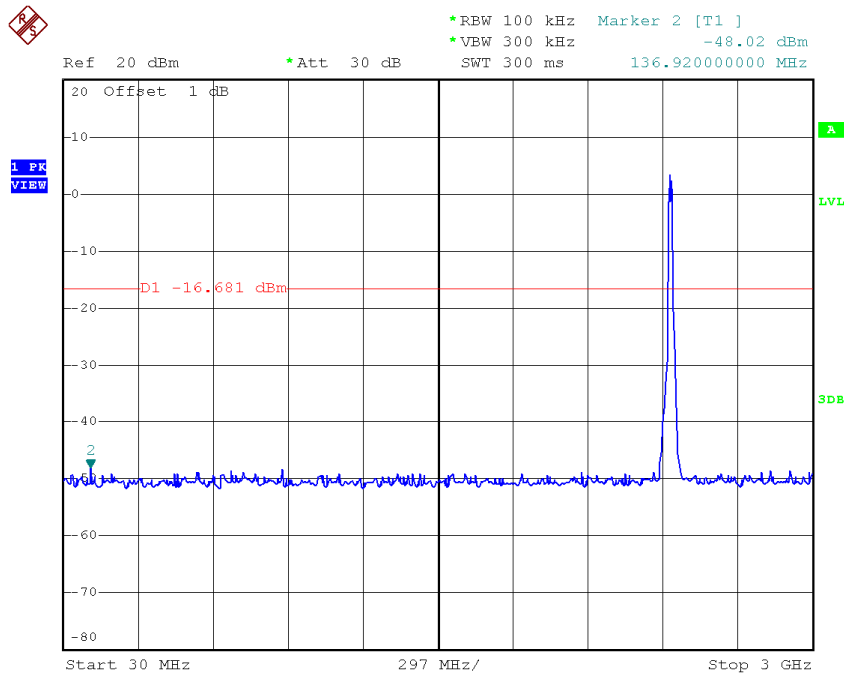
Date: 23.JUN.2016 15:46:39

### TX HT20 mode CH01 (10 Harmonic of the frequency) 3



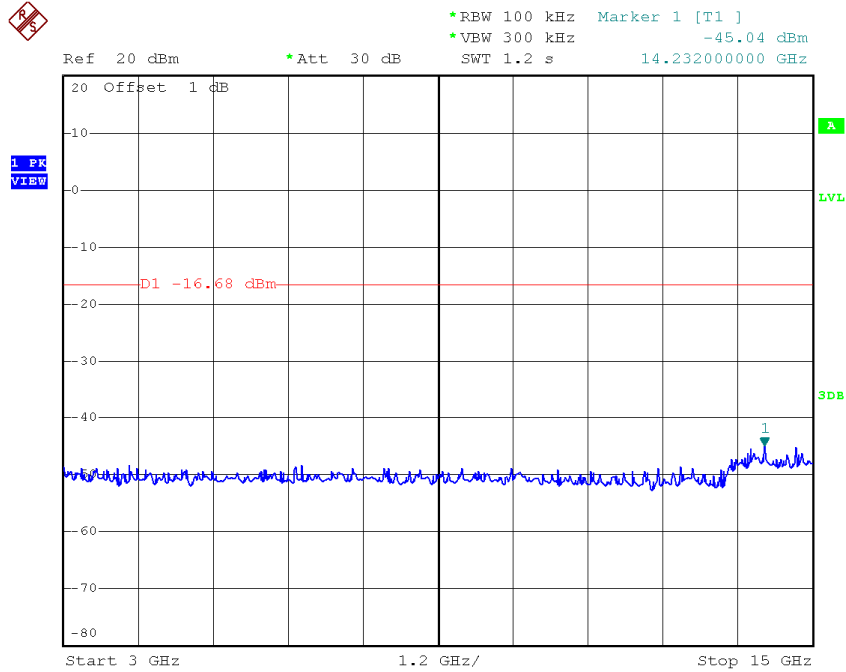
Date: 23.JUN.2016 15:46:47

### TX HT20 mode CH06 (10 Harmonic of the frequency) 1



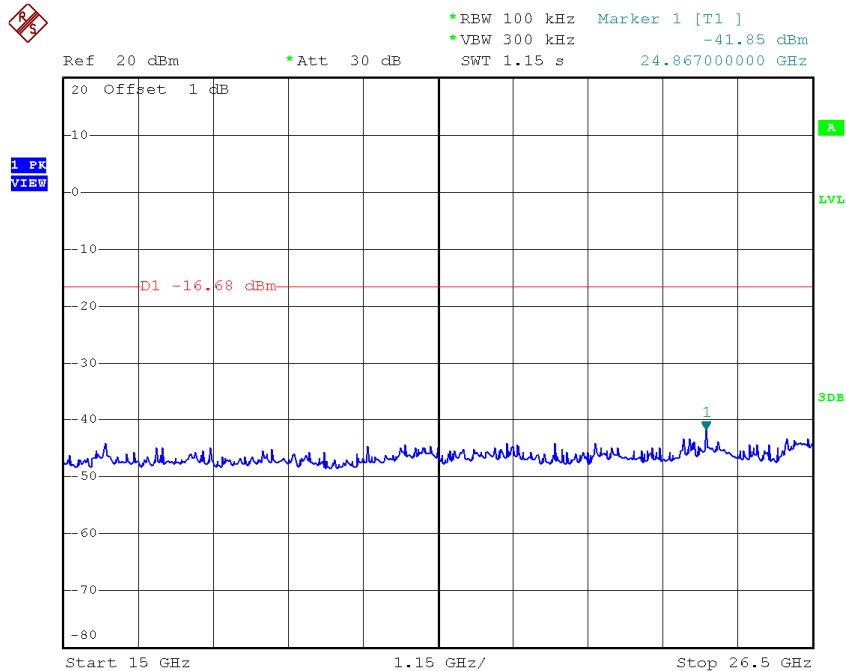
Date: 23.JUN.2016 15:47:55

**TX HT20 mode CH06 (10 Harmonic of the frequency) 2**



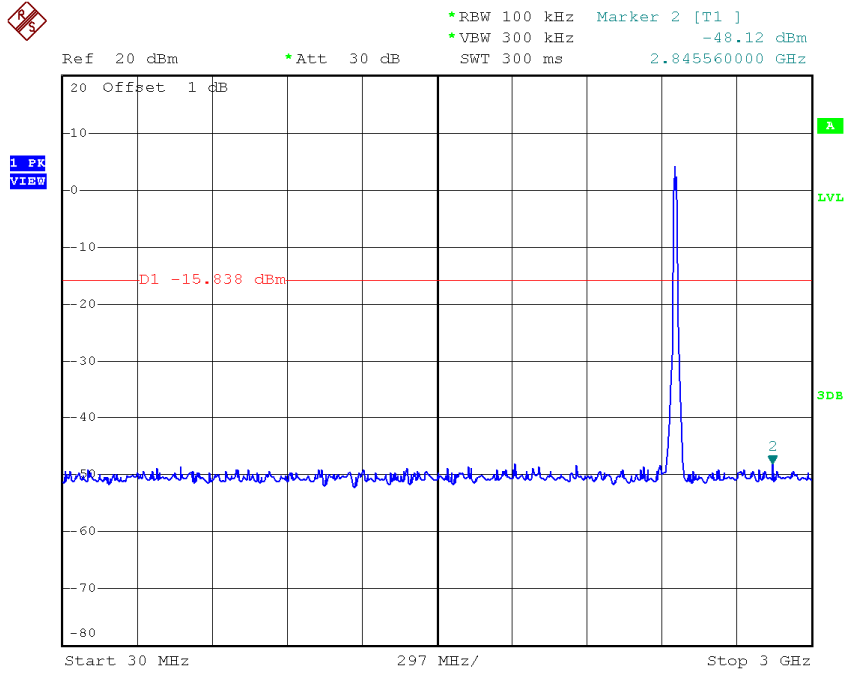
Date: 23.JUN.2016 15:48:03

**TX HT20 mode CH06 (10 Harmonic of the frequency) 3**



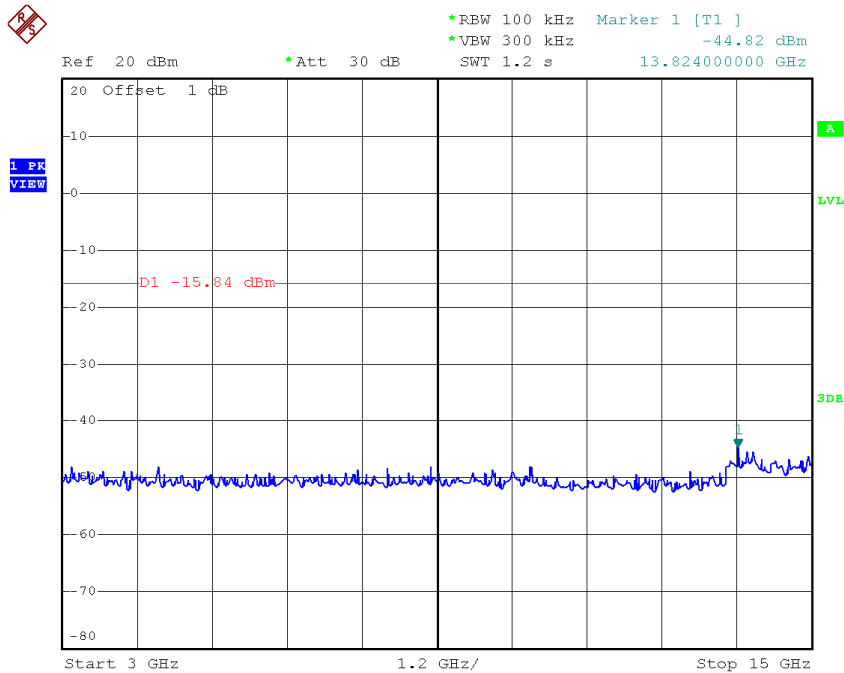
Date: 23.JUN.2016 15:48:12

**TX HT20 mode CH11 (10 Harmonic of the frequency) 1**



Date: 23.JUN.2016 15:49:10

**TX HT20 mode CH11 (10 Harmonic of the frequency) 2**



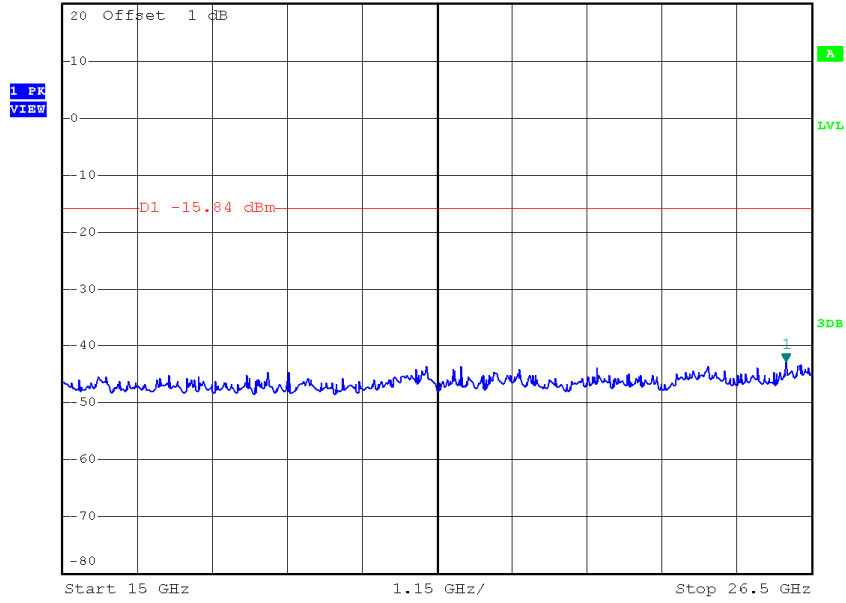
Date: 23.JUN.2016 15:49:18

### TX HT20 mode CH11 (10 Harmonic of the frequency) 3



\*REW 100 kHz Marker 1 [T1 ]  
\*VEW 300 kHz -42.87 dBm

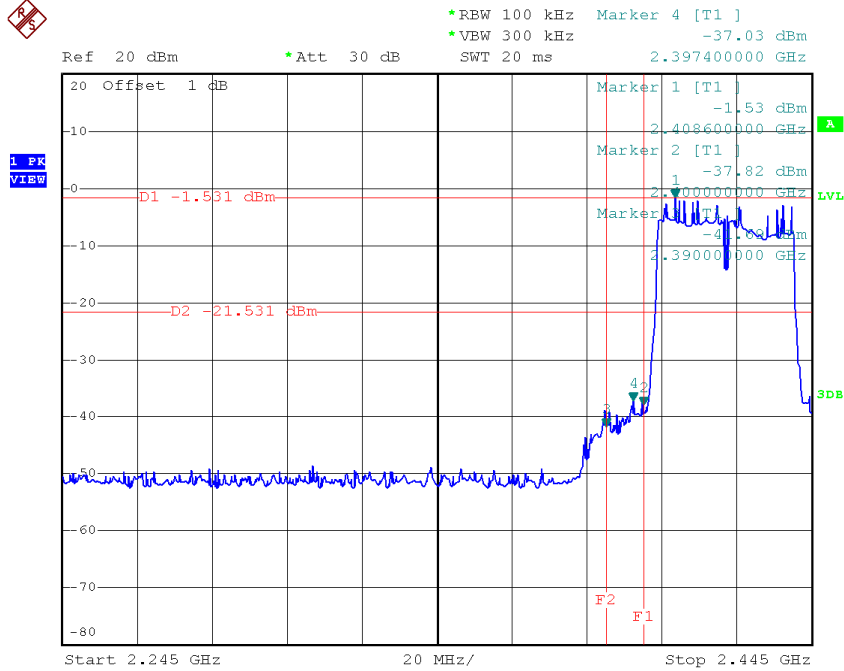
Ref 20 dBm \*Att 30 dB SWT 1.15 s 26.109000000 GHz



Date: 23.JUN.2016 15:49:27

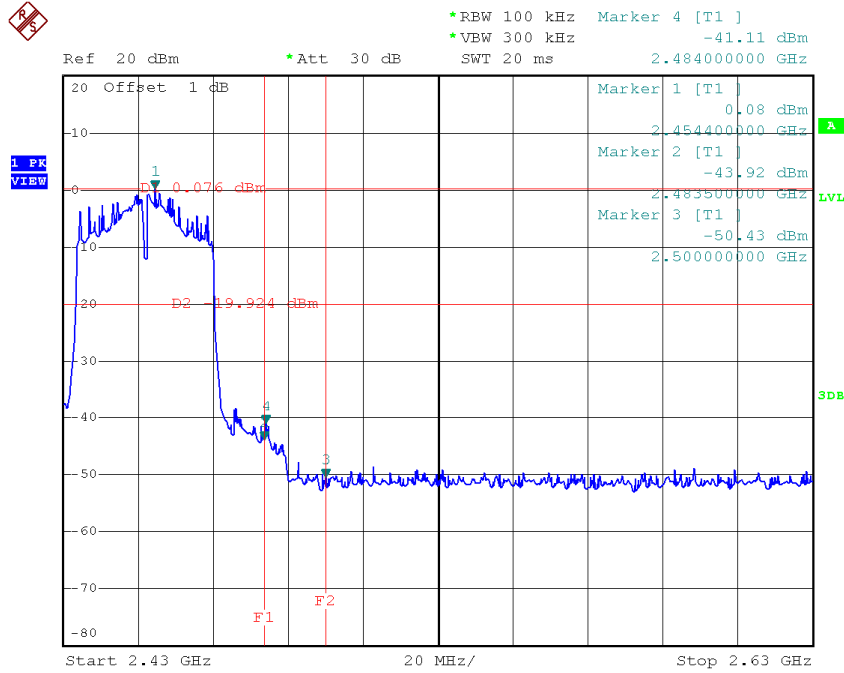
Test Mode : TX N-40M Mode

**TX HT40 mode CH03**



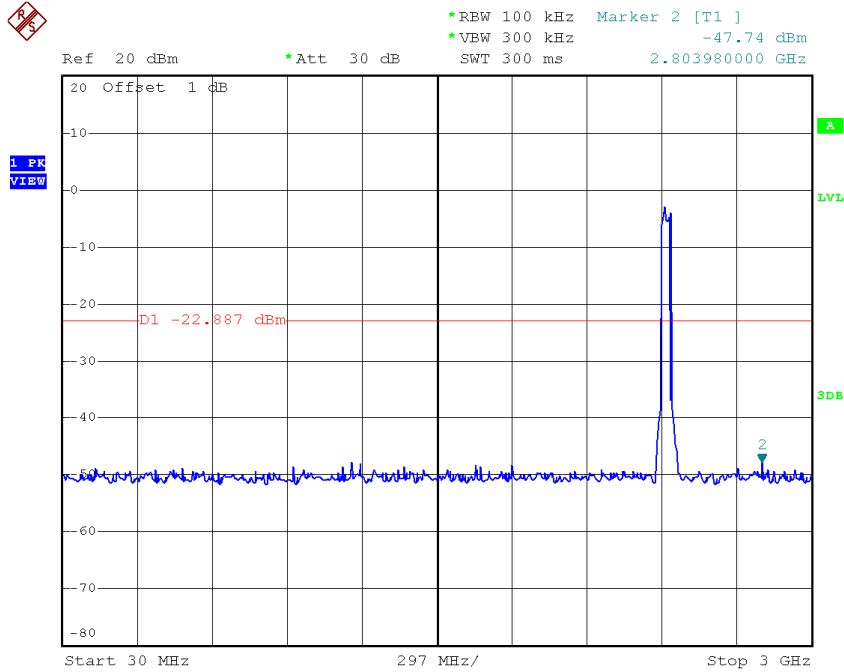
Date: 23.JUN.2016 15:50:59

**TX HT40 mode CH09**



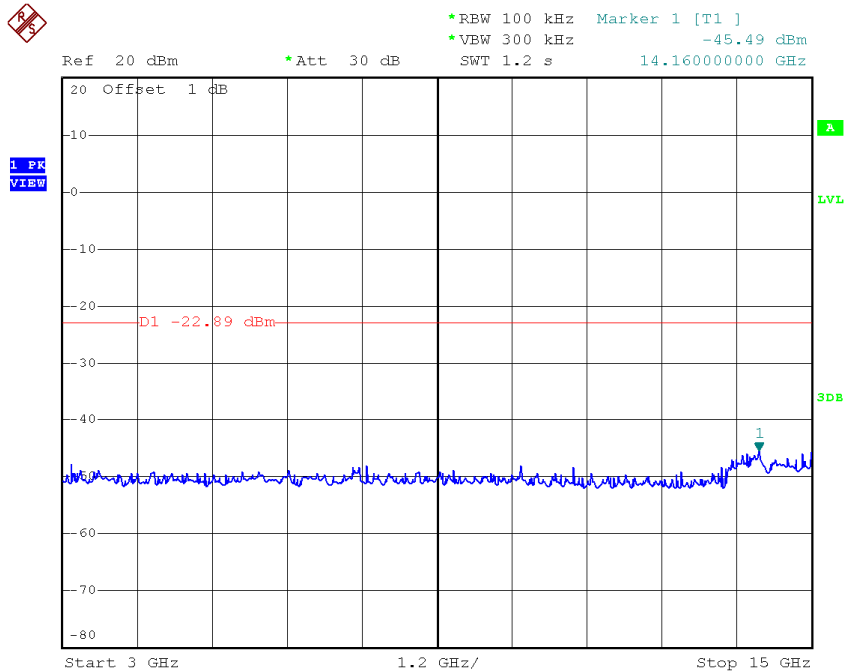
Date: 23.JUN.2016 15:54:26

### TX HT40 mode CH03 (10 Harmonic of the frequency) 1



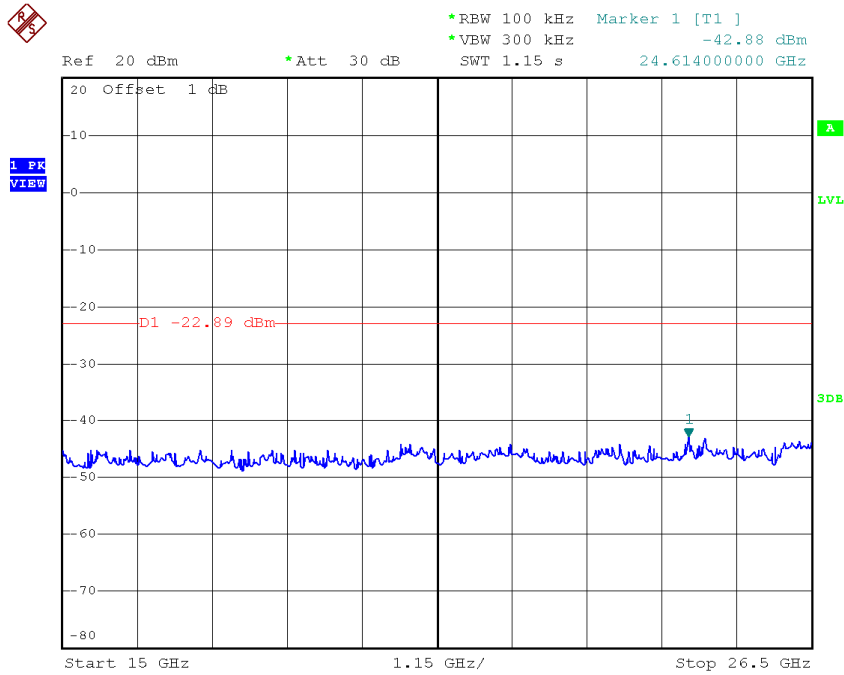
Date: 23.JUN.2016 15:50:35

### TX HT40 mode CH03 (10 Harmonic of the frequency) 2



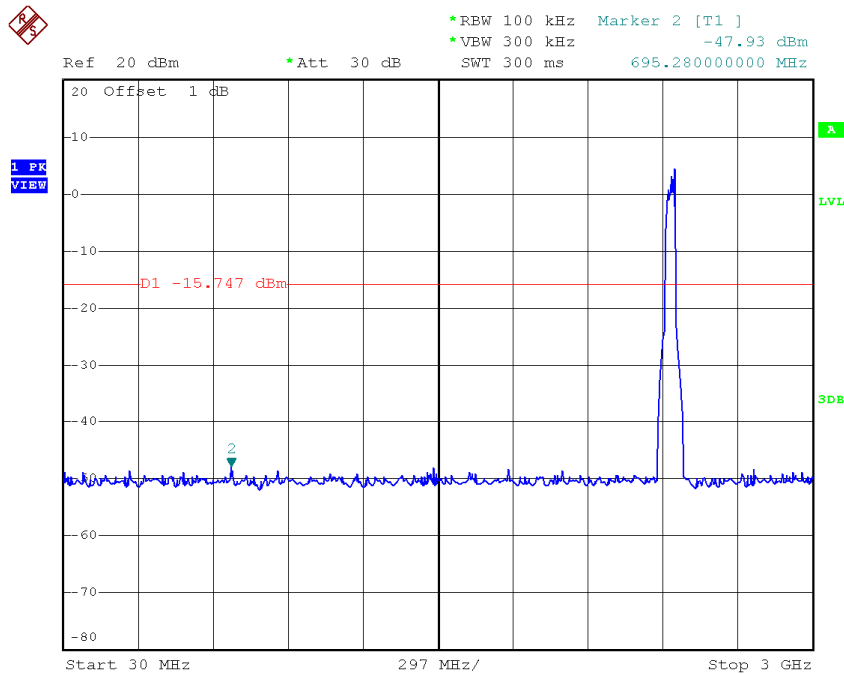
Date: 23.JUN.2016 15:50:43

**TX HT40 mode CH03 (10 Harmonic of the frequency) 3**



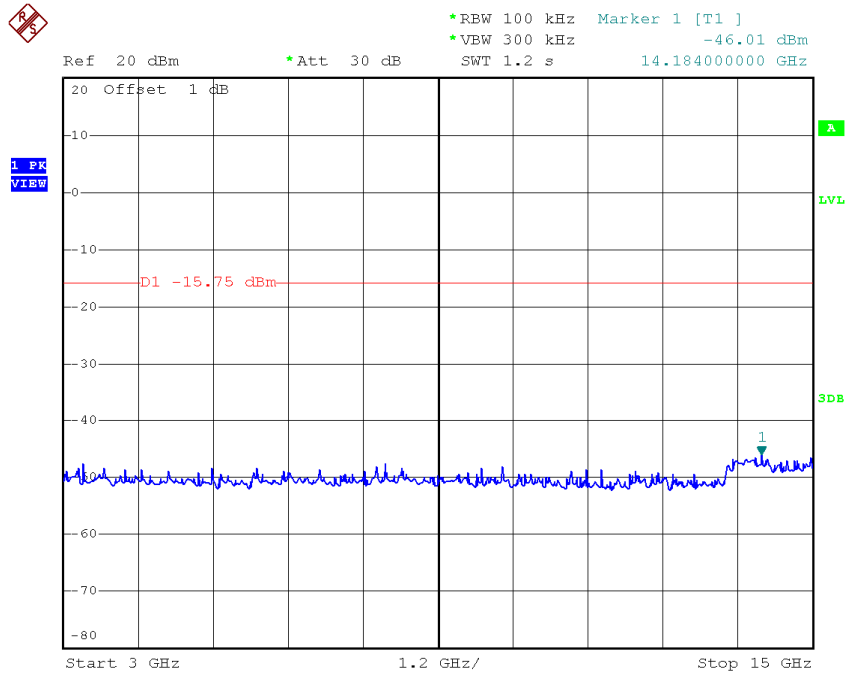
Date: 23.JUN.2016 15:50:51

**TX HT40 mode CH06 (10 Harmonic of the frequency) 1**



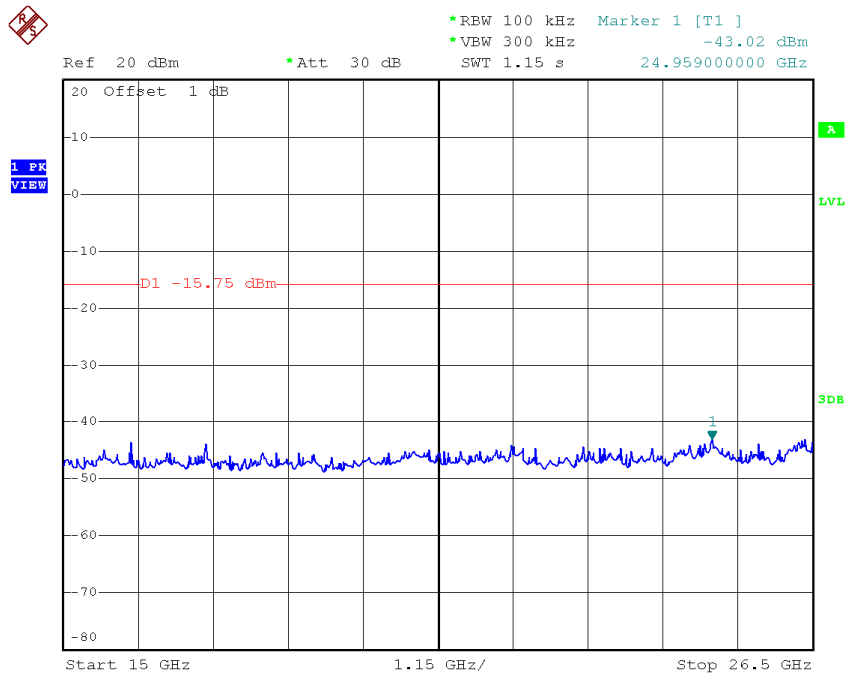
Date: 23.JUN.2016 15:52:09

**TX HT40 mode CH06 (10 Harmonic of the frequency) 2**



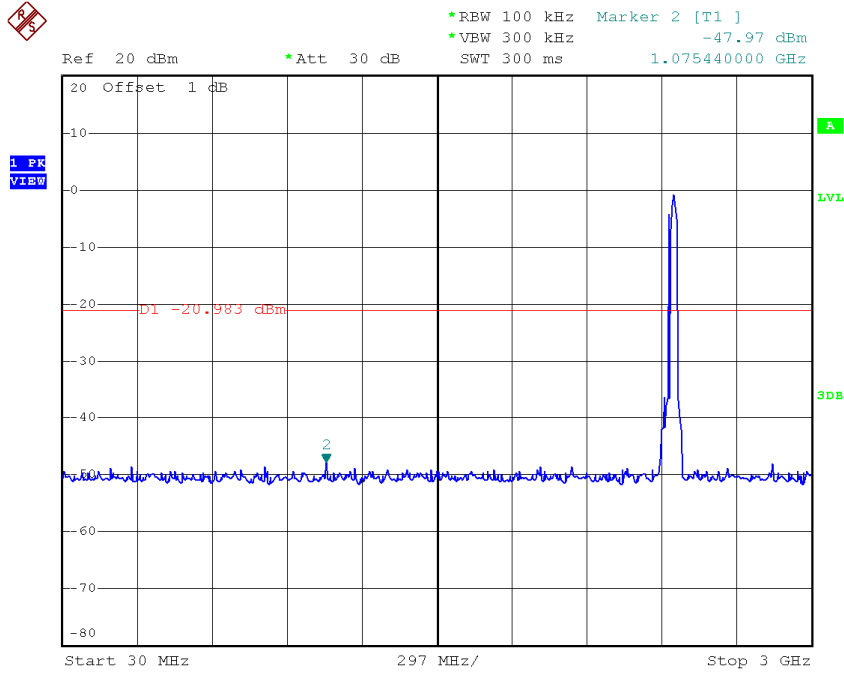
Date: 23.JUN.2016 15:52:17

**TX HT40 mode CH06 (10 Harmonic of the frequency) 3**



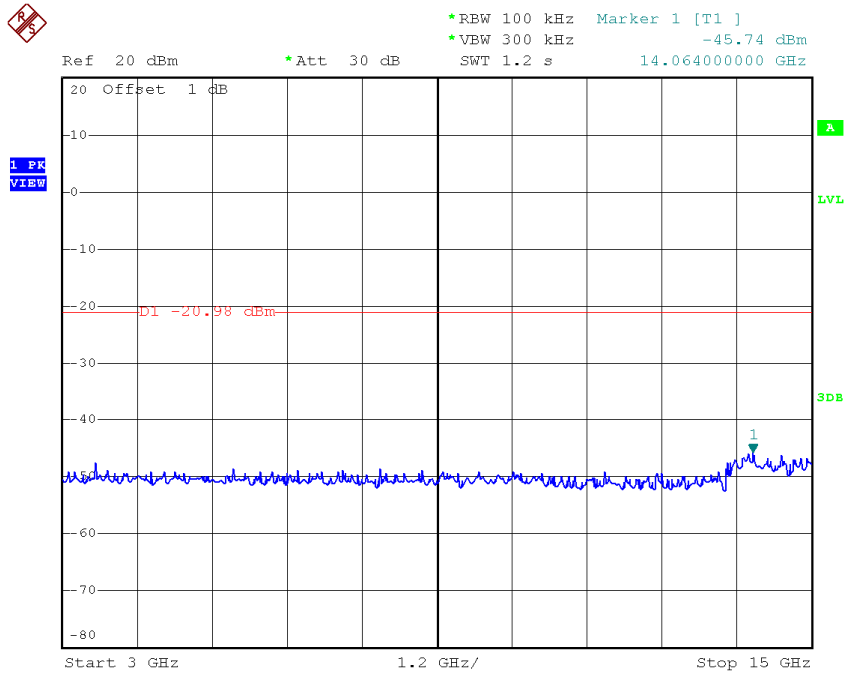
Date: 23.JUN.2016 15:52:26

### TX HT40 mode CH09 (10 Harmonic of the frequency) 1



Date: 23.JUN.2016 15:54:02

### TX HT40 mode CH09 (10 Harmonic of the frequency) 2

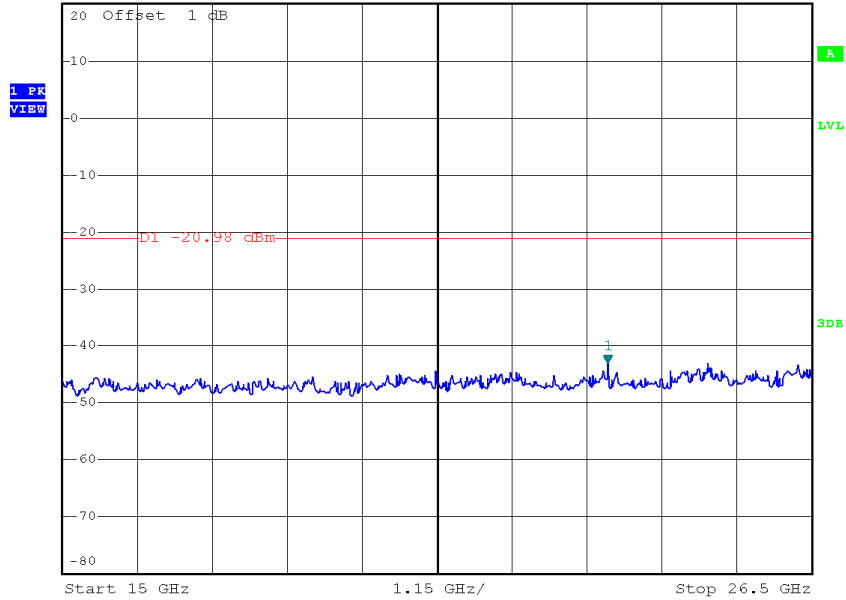


Date: 23.JUN.2016 15:54:10

### TX HT40 mode CH09 (10 Harmonic of the frequency) 3



\*REW 100 kHz Marker 1 [T1 ]  
\*VEW 300 kHz -43.19 dBm  
Ref 20 dBm \*Att 30 dB SWT 1.15 s 23.37200000 GHz

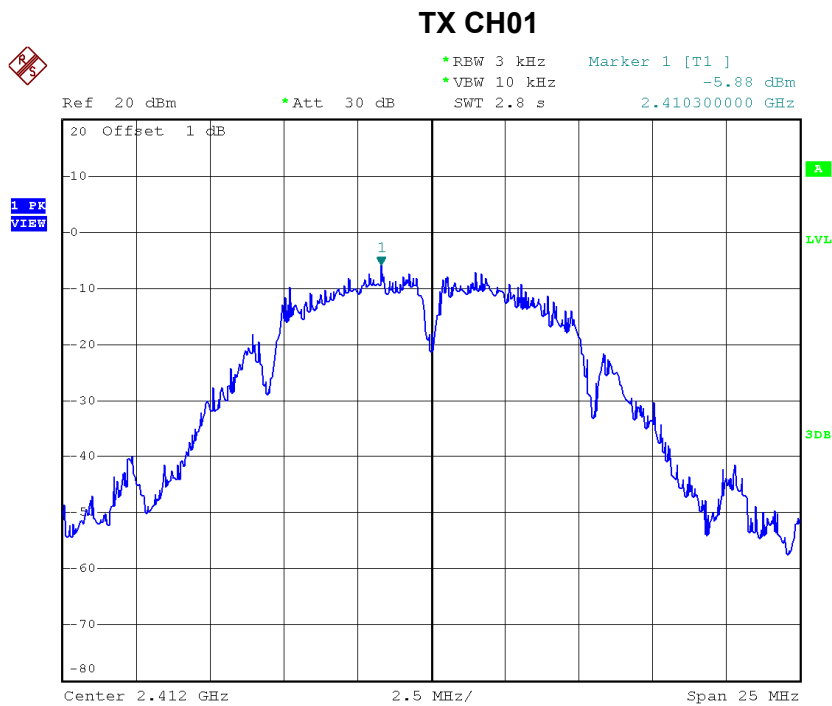


Date: 23.JUN.2016 15:54:19

## ATTACHMENT H - POWER SPECTRAL DENSITY

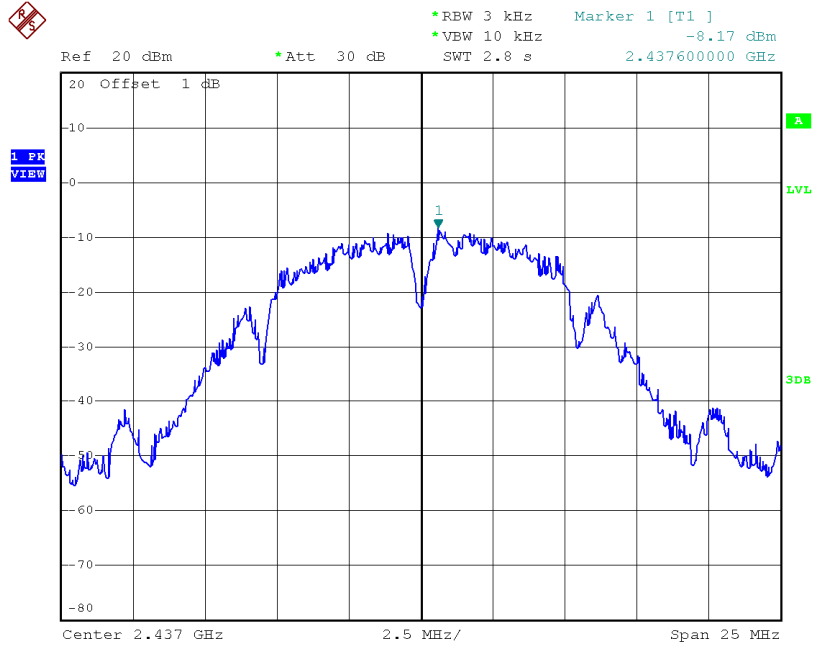
**Test Mode :TX B Mode\_CH01/06/11**

Frequency (MHz)	Power Density (dBm/3kHz)	Power Density (mW/3kHz)	Max. Limit (dBm/3kHz)	Result
2412	-5.88	0.2582	8.00	Complies
2437	-8.17	0.1524	8.00	Complies
2462	-6.41	0.2286	8.00	Complies



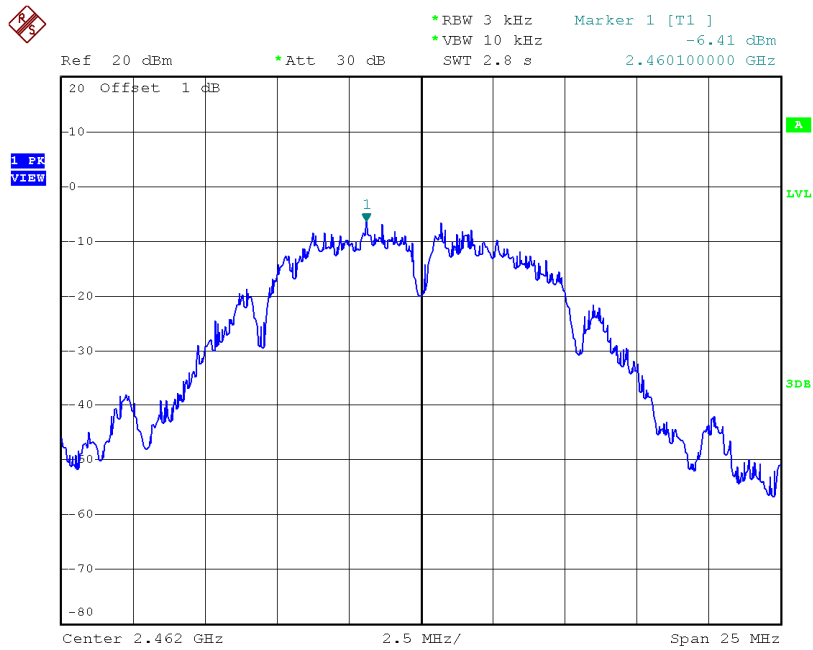
Date: 23.JUN.2016 15:28:44

**TX CH06**



Date: 23.JUN.2016 15:30:53

**TX CH11**

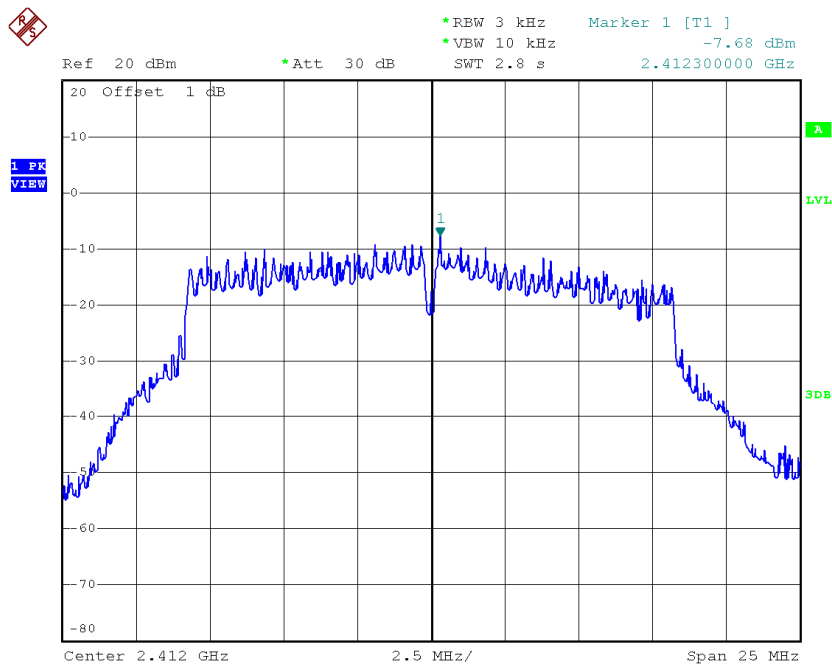


Date: 23.JUN.2016 15:40:53

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

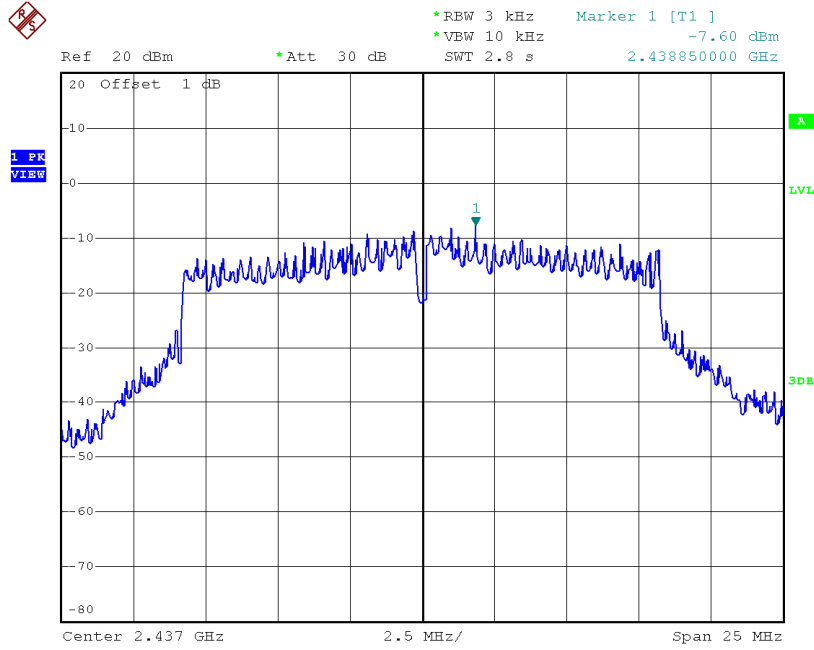
Frequency (MHz)	Power Density (dBm/3kHz)	Power Density (mW/3kHz)	Max. Limit (dBm/3kHz)	Result
2412	-7.68	0.1706	8.00	Complies
2437	-7.60	0.1738	8.00	Complies
2462	-8.43	0.1435	8.00	Complies

**TX CH01**



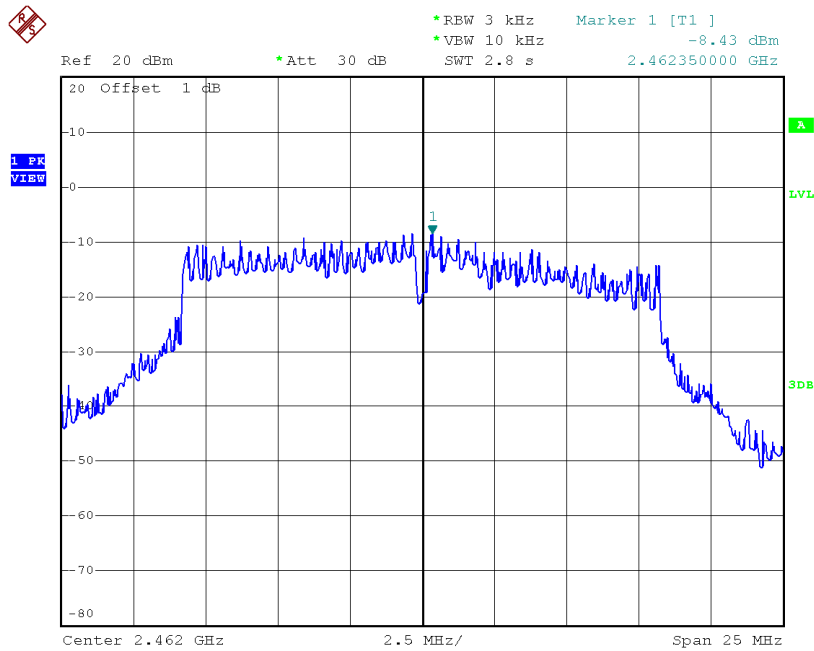
Date: 23.JUN.2016 15:42:23

### TX CH06



Date: 23.JUN.2016 15:43:52

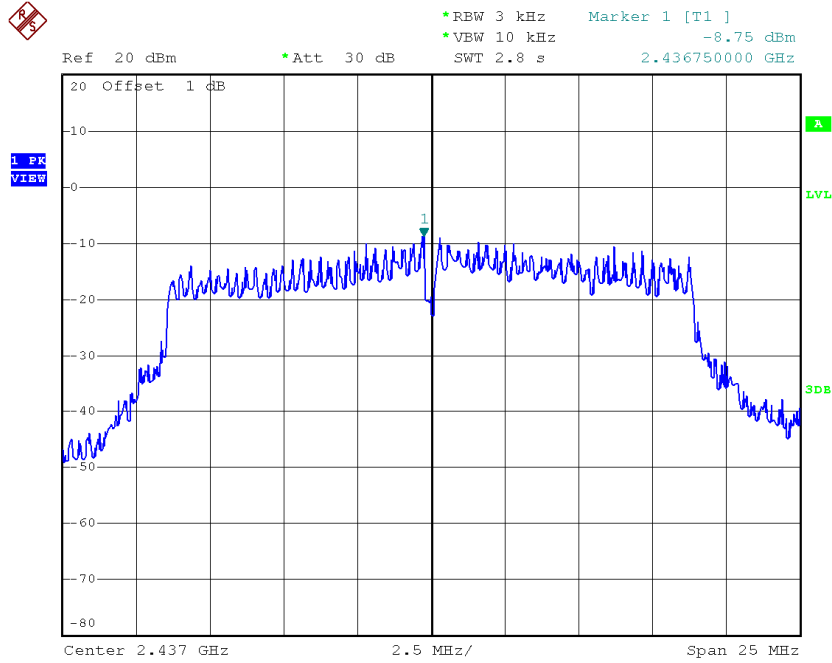
### TX CH11



Date: 23.JUN.2016 15:45:27

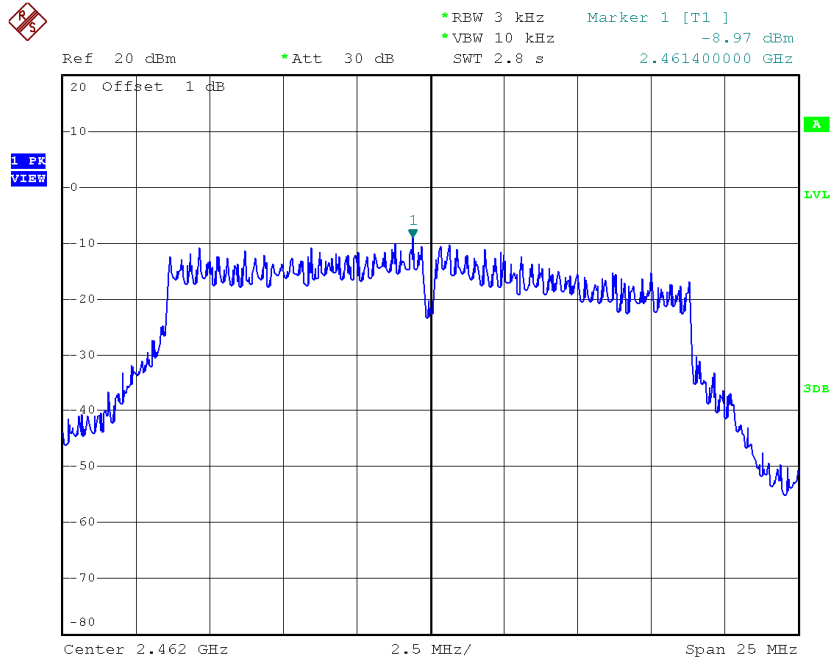


### TX CH06



Date: 23.JUN.2016 15:48:21

### TX CH11

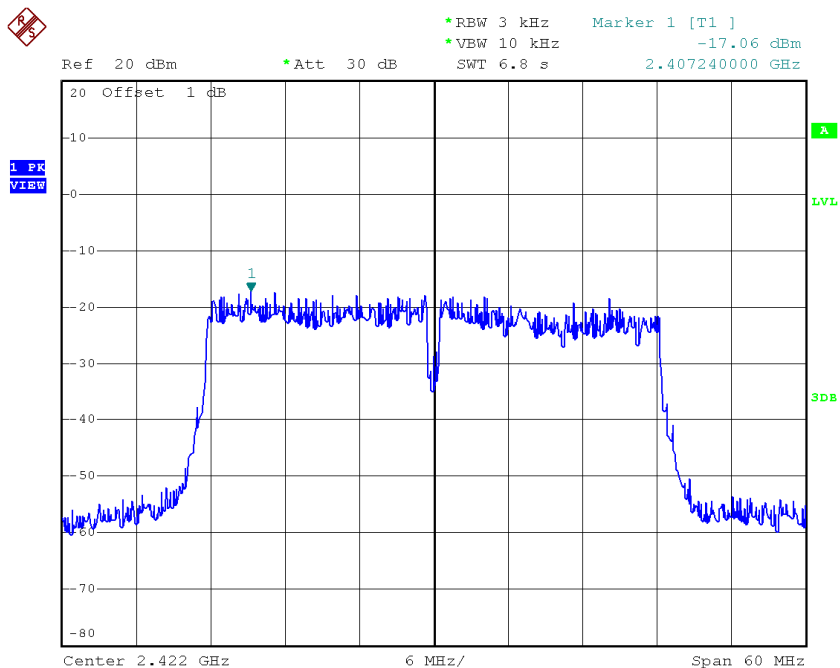


Date: 23.JUN.2016 15:49:44

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

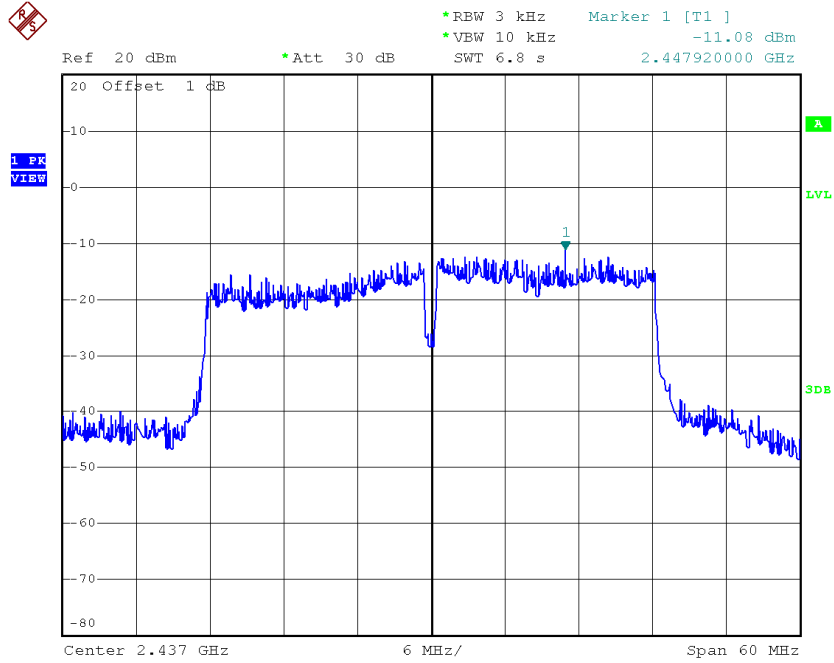
Frequency (MHz)	Power Density (dBm/3kHz)	Power Density (mW/3kHz)	Max. Limit (dBm/3kHz)	Result
2422	-17.06	0.0197	8.00	Complies
2437	-11.08	0.0780	8.00	Complies
2452	-13.33	0.0465	8.00	Complies

**TX CH03**



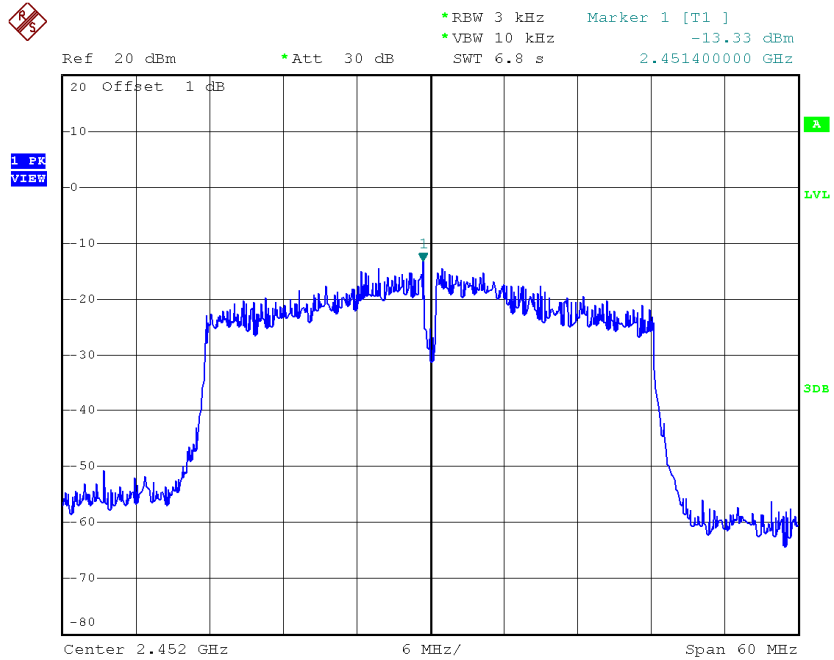
Date: 23.JUN.2016 15:51:11

### TX CH06



Date: 23.JUN.2016 15:52:38

### TX CH09



Date: 23.JUN.2016 15:54:39