FCC Radio Test Report

FCC ID: RRK-WMCAC15

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

Project No.	:	1805H003A
Equipment	:	Wifi Card
Test Model	:	WMC-AC15
Series Model	:	N/A
Applicant	:	Alpha
Address	:	No. 8, Li-shing 7th Road, Science-based Industrial Park, Hsinchu, Taiwan, R.O.C.

Date of Receipt	:	Aug. 29, 2018
Date of Test	:	Oct. 19, 2018 ~ Oct. 27, 2018
Issued Date	:	NOV. 19,2018
Tested by	:	BTL Inc.

Testing Engineer : Roy Cai
(Roy Cai)

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(James Chiu)

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Certificate # 5123.03

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.

The report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our 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.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements in all the possible configurations as representative of its intended use.

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.

Table of Contents Page

Table of Contents Page

REPORT ISSUED HISTORY

Report Version	Description	Issued Date
R00	Original Issue.	

1. CERTIFICATION

Equipment	:	Wifi Card
Brand Name	:	Alpha
Test Model	:	WMC-AC15
Series Model	:	N/A
Applicant	:	Alpha
Date of Test	:	Oct. 19, 2018 ~ Oct. 27, 2018
Test Sample	:	Engineering Sample No.:B180800106
Standard(s)	:	FCC Part15, Subpart C (15.247) / ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-1-1805H003A) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of A2LA according to the ISO-17025 quality assessment standard and technical standard(s).

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

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

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

Note:

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

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No. 29, Jintang Road, Tangzhen Industry Park, Pudong New Area, Shanghai 201210,China
BTL's test firm number for FCC: 598276
BTL's designation number for FCC: CN5032

2.2 MEASUREMENT UNCERTAINTY

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

The BTL measurement uncertainty as below table:

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
SH-C01	CISPR	150 kHz ~ 30 MHz	2.70

B. Radiated Measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)
SH-CB01	CISPR	9 KHz~30 MHz	V	3.79
		9 KHz~30 MHz	H	3.57
		30 MHz~200 MHz	V	4.04
		30 MH~200 MHz	H	3.76
		200 MHz~1,000 MHz	V	4.24
		200 MHz~1,000 MHz	H	3.84
		1 GHz~18 GHz	V	4.46
		1 GHz~18 GHz	H	4.40
		18 GHz~40 GHz	V	3.95
		18 GHz~40 GHz	H	3.95

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	Wifi Card	
Brand Name	Alpha	
Test Model	WMC-AC15	
Series Model	N/A	
Model Difference(s)	N/A	
Product Description	Operation Frequency	2412 MHz ~2462 MHz
	Modulation Technology	802.11b:DSSS 802.11g:OFDM 802.11n:OFDM
	Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n up to 300 Mbps
	Output Power (Max.)	802.11b: 21.34 dBm 802.11g: 28.92 dBm 802.11n(20 MHz): 28.95 dBm 802.11n(40 MHz): 27.72 dBm
Power Source	DC voltage supplied from AC Adapter (Support unit).	
Power Rating	I/P: 100-240V~50/60Hz 0.5A O/P: 5 V⎓2A	

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(20 MHz) CH03 - CH09 for 802.11n(40 MHz)							
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)	Note
1	CIU ANTENNE WIFI DUAL A01	296242441	PCB	N/A	0	N/A
2	CIU ANTENNE WIFI DUAL A01	296242441	PCB	N/A	0	N/A

Note: This EUT supports MIMO 2X2, any transmit signals are correlated with each other, so Directional gain = G_{ANT}+10log(N)dBi, that is Directional gain=0+10log(2)dBi=3.01

4. The worst case for 2TX as follow:

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

3.2 DESCRIPTION OF TEST MODES

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

Pretest Mode	Description
Mode 1	TX B Mode Channel 01/06/11
Mode 2	TX G Mode Channel 01/06/11
Mode 3	TX N-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel 03/06/09
Mode 5	TX Mode

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

For Conducted Test	
Final Test Mode:	Description
Mode 5	TX Mode

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-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz 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-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel 03/06/09

6 dB 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-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel 03/06/09

Maximum 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-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz 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-20 MHz Mode Channel 01/06/11
Mode 4	TX N-40 MHz Mode Channel 03/06/09

Note:

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

(2) 802.11b mode: DBPSK (1 Mbps)
802.11g mode: OFDM (6 Mbps)
802.11n HT20 mode : BPSK (13 Mbps)
802.11n HT40 mode : BPSK (27 Mbps)
For radiated emission tests, the highest output powers were set for final test.

(3) For radiated 30 MHz to 1000 MHz test, the 802.11b is found to be the worst case and recorded.

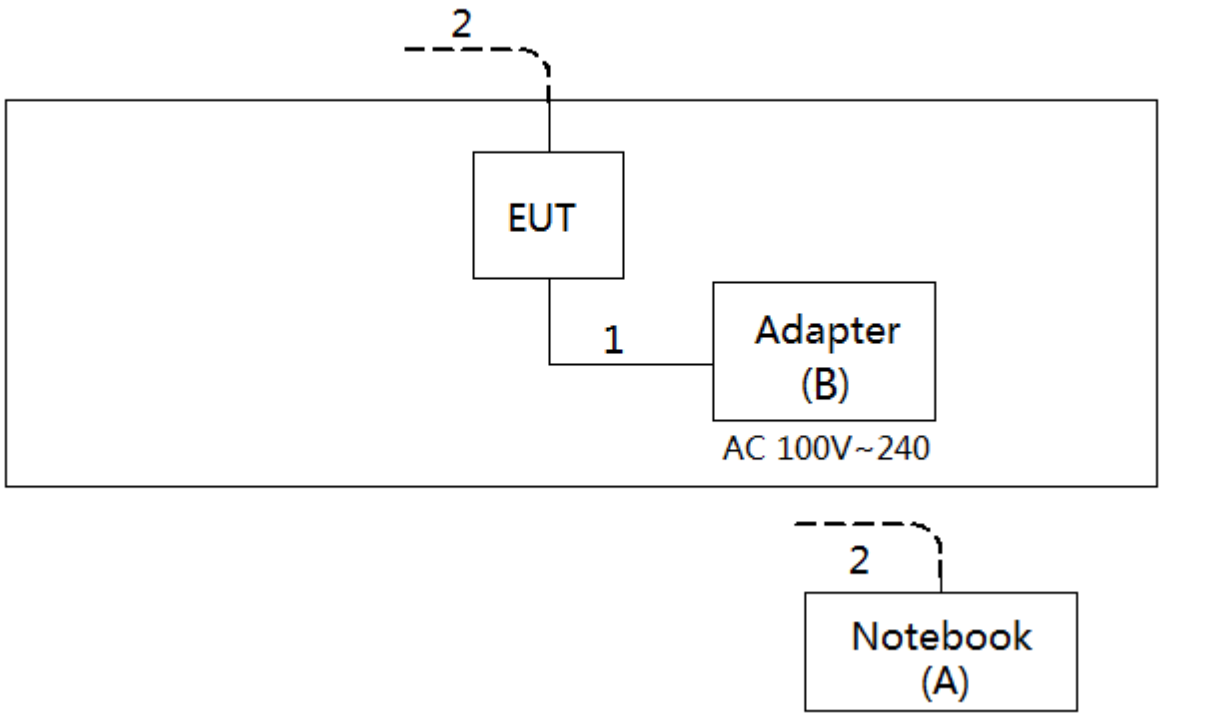
(4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

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	MP_TEST		
Frequency (MHz)	2412	2437	2462
802.11b	37/37	39/39	42/42
802.11g	45/42	55/52	50/50
802.11n (20 MHz)	39/38	55/52	50/47
Frequency (MHz)	2422	2437	2452
802.11n (40 MHz)	40/38	47/43	45/43

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
A	Notebook	ThinkPad	20H3-A00VCD	DOC	PF-0S8287
B	Adapter	D-Link	AMS135-0502000FU	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	0.4m	DC Cable
2	NO	NO	10m	RJ45 Cable

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	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

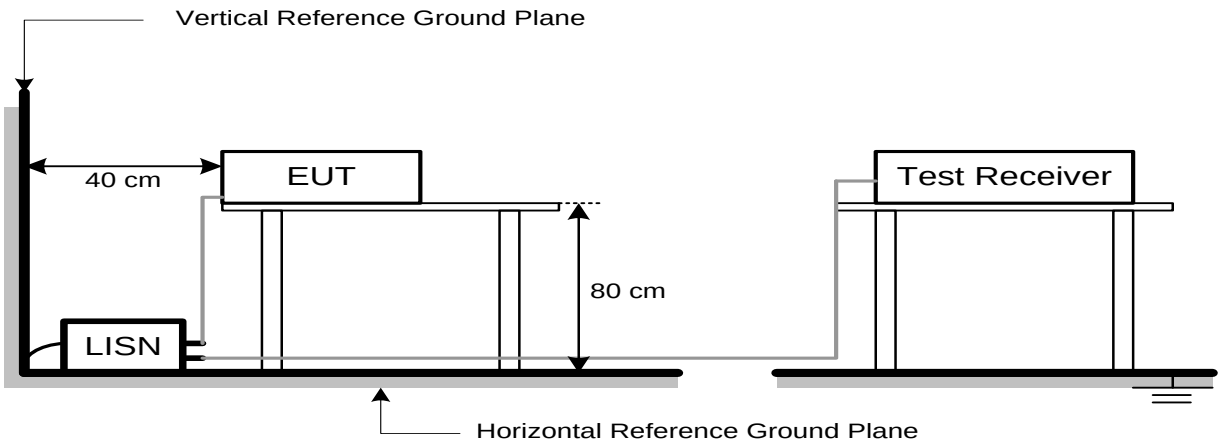
4.1.2 TEST PROCEDURE

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 equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the
cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



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: 23°C Relative Humidity: 50% Test Voltage: AC 120V/60Hz

4.1.7 TEST RESULTS

Please refer to the Appendix A.

Remark:

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

(2) Measuring frequency range from 150 kHz to 30 MHz.

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 (9 kHz-1000 MHz)

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 1000 MHz)

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

Note:

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

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

4.2.2 TEST PROCEDURE

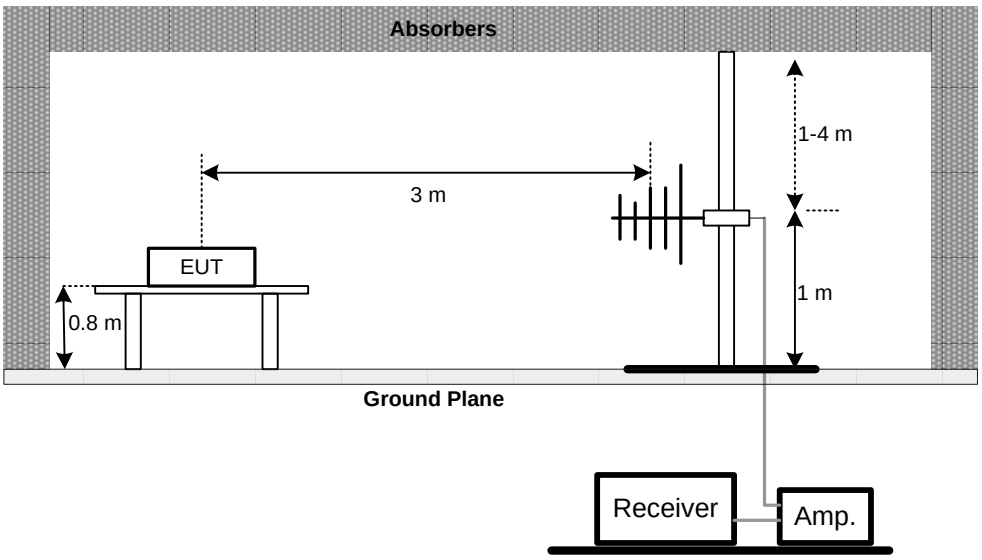
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1 GHz)
b. The measuring distance 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 1 GHz)
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 1 GHz.
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 1 GHz)
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 1 GHz)
i. For the actual test configuration, please refer to the related Item -EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

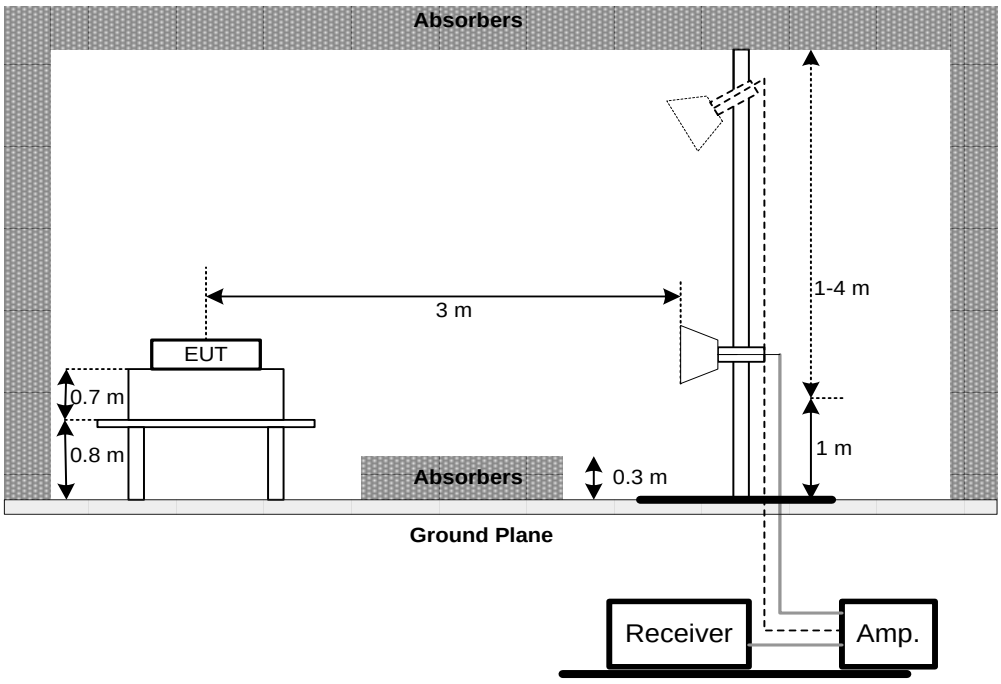
No deviation

4.2.4 TEST SETUP

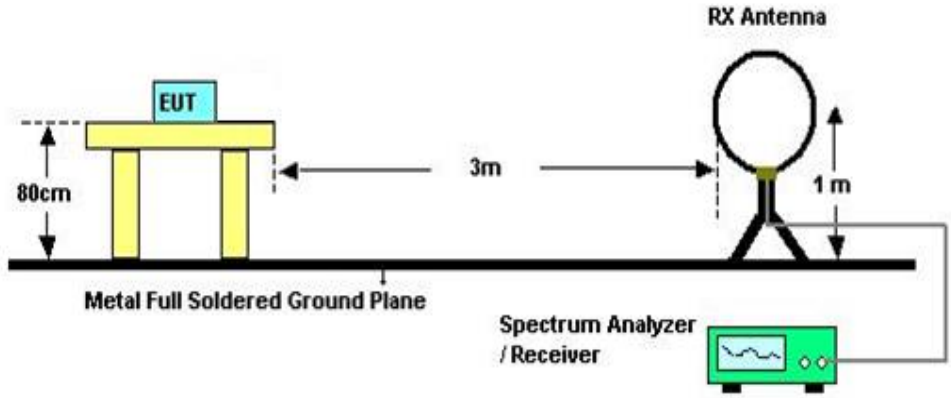
(A) Radiated Emission Test Set-Up Frequency 30 MHz-1000 MHz



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



(C) For Radiated Emissions 9 kHz-30 MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.2.6 EUT TEST CONDITIONS

Temperature: 20.8°C Relative Humidity: 43% Test Voltage: AC 120V/60Hz

4.2.7 TEST RESULTS (9 kHz TO 30 MHz)

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 (specific distance / test distance) (dB).
(3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8 TEST RESULTS (30 MHz 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

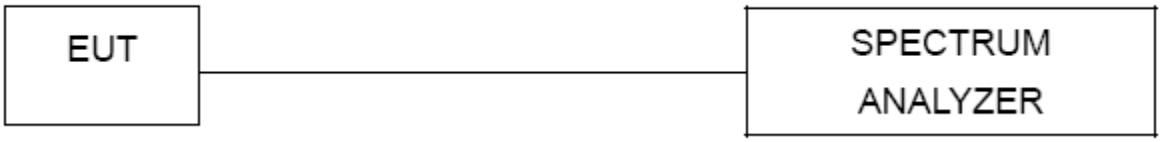
5.1.1 TEST PROCEDURE

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= 100 kHz, VBW=300 kHz, 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: 22°C Relative Humidity: 43.5% Test Voltage: AC 120V/60Hz

5.1.6 TEST RESULTS

Please refer to the Appendix E.

6. MAXIMUM OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

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

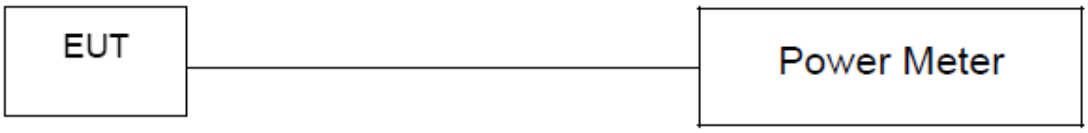
6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
b. The maximum conducted (average) output power & EIRP output power was performed in accordance with method 8.3.2 of FCC KDB 558074 D01 15.247 Meas Guidance v05 and FCC KDB 662911 D01 v02r01 Multiple Transmitter Output.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.1.5 EUT TEST CONDITIONS

Temperature: 22.5°C Relative Humidity: 46% 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 intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak Output Power limits. If the transmitter complies with the Output Power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

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= 100 kHz, VBW=300 kHz, Sweep time = Auto.

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: 23.6°C Relative Humidity: 44.5% 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 3 kHz)	2400-2483.5	PASS

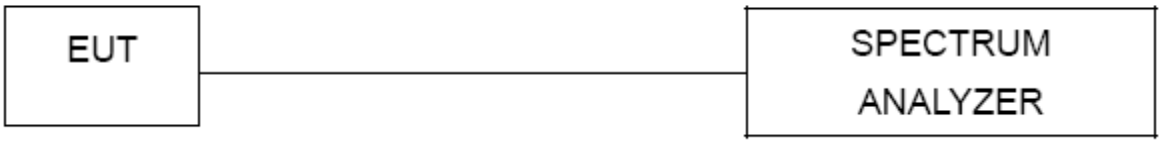
8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
b. The power spectral density was performed in accordance with method 10.2 of FCC KDB 558074 D01 v04 DTS Meas Guidance.
c. 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: 23.7°C Relative Humidity: 53.2% 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	Line Impedance Stabilisation Network	Schwarzbeck	NNLK 8121	8121-822	Mar. 30, 2019
2	TWO-LINE V-NETWORK	R&S	ENV216	101340	Jan. 17, 2019
3	EMI Test Receiver	R&S	ESCI	100082	Mar. 30, 2019
4	50Ω coaxial switch	Anritsu	MP59B	6201750902	Jul. 17, 2019
5	Cable	10m	EMCRG400-BM-NM-10000	170628	Jun. 10, 2019
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement-9 kHz TO 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Loop Antenna	EMCI	EMCI LPA600	275	Mar. 31, 2019
2	Cable	N/A	EMCRG400-BM-NM-10000	170628	Jun. 10, 2019
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 30, 2019
4	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A

Radiated Emission Measurement-30 MHz TO 1000 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	719	Mar. 30, 2019
2	Pre-Amplifier	emci	EMC9135	980400	Mar. 30, 2019
3	MXE EMI Receiver	Keysight	N9038A	MY57150106	Mar. 30, 2019
4	Attenuator	emci	EMCI-N-6-06	AT-N0644	Mar. 30, 2019
5	Cable	7m	EMC104-SM-SM-7000	170330	Jun. 10, 2019
6	Cable	1m	EMC104-SM-SM-1000	170331	Jun. 10, 2019
7	Cable	3.5m	EMC104-SM-NM-3500	170621	Jun. 10, 2019
8	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A

Radiated Emission Measurement - Above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double-Ridged Waveguide Horn Antenna	Schwarzbeck	BBHA 9120D	9120D-1787	Mar. 30, 2019
2	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3116C	00203919	Mar. 30, 2019
3	Pre-Amplifier	emci	EMC012645SE	980421	Mar. 30, 2019
4	Pre-Amplifier	emci	EMC184045SE	980409	Mar. 30, 2019
5	EXA Spectrum Analyzer	Keysight	N9010A	MY56480559	Mar. 30, 2019
6	MXE EMI Receiver	Keysight	N9038A	MY56400088	Mar. 30, 2019
7	Cable	7m	EMC104-SM-SM-7000	170330	Jun. 10, 2019
8	Cable	1m	EMC104-SM-SM-1000	170331	Jun. 10, 2019
9	Cable	3.5m	EMC104-SM-NM-3500	170621	Jun. 10, 2019
10	Cable	0.8m	EMC102-SM-SM-800	170335	Jun. 10, 2019
11	Cable	6m	EMC102-SM-SM-6000	170336	Jun. 10, 2019
12	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

6 dB Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100626	Mar. 31, 2019

Maximum output power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power Meter	Keysight	8990B	MY51000507	Jul. 27, 2019
2	Pulse Power Sensor	Keysight	N1923A	MY58310003	Aug. 07, 2019

Antenna Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100626	Mar. 31, 2019

Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100626	Mar. 31, 2019

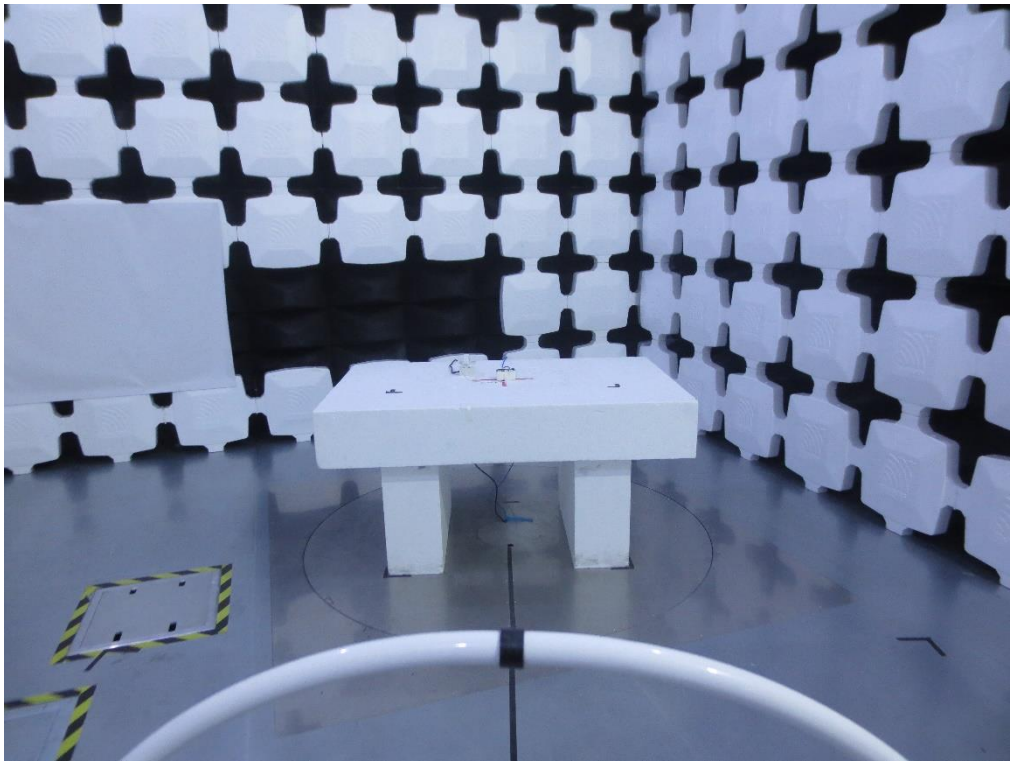
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

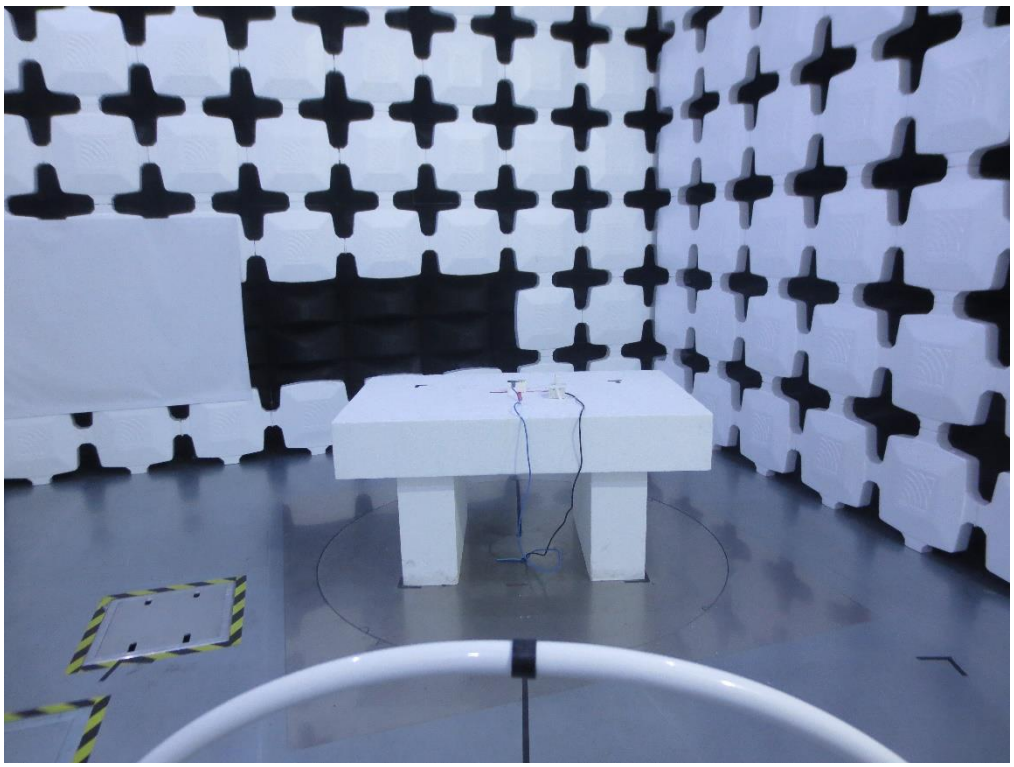
10. EUT TEST PHOTO

Conducted Measurement Photos

Radiated Measurement Photos

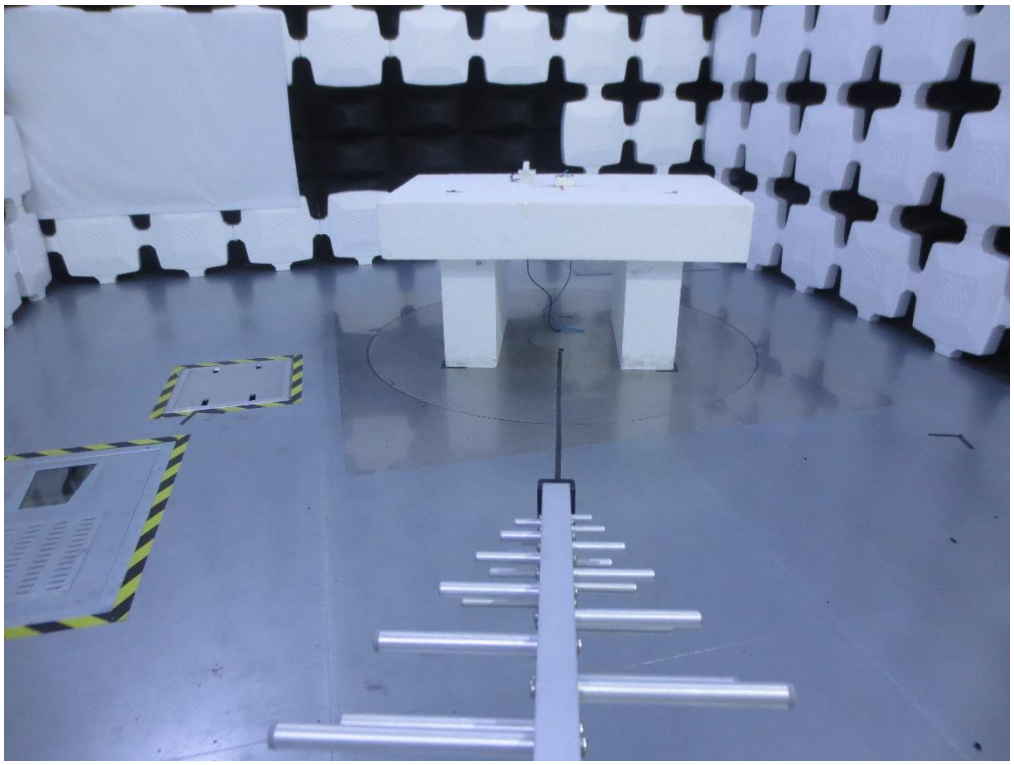
9 kHz to 30 MHz

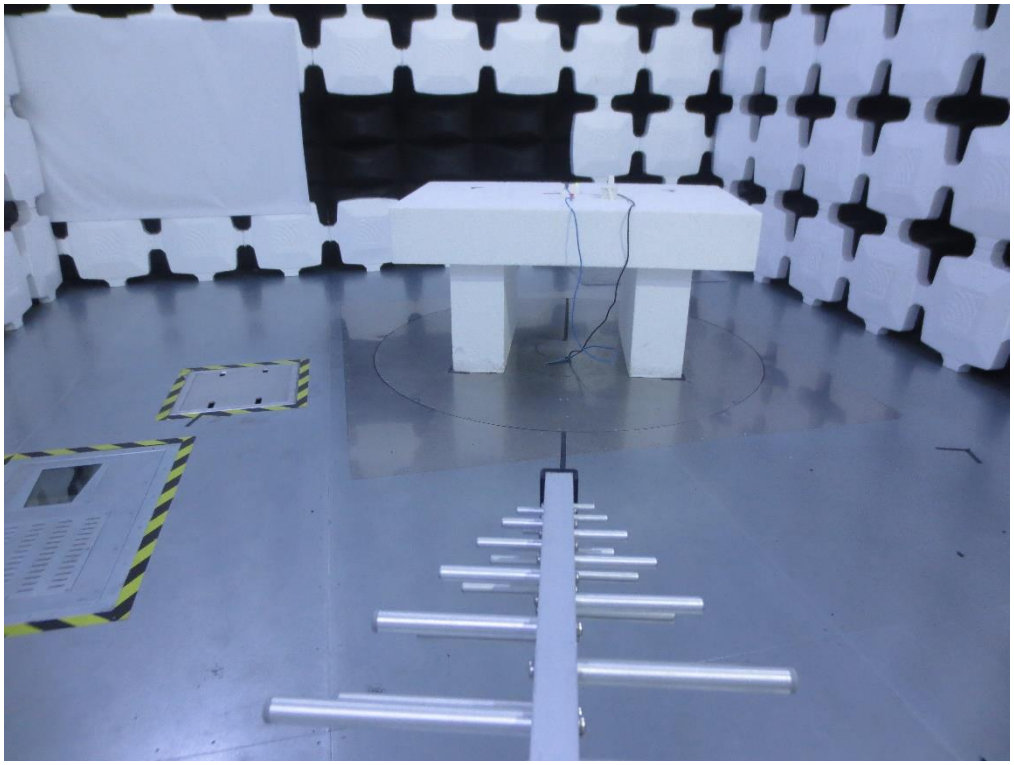




Radiated Measurement Photos

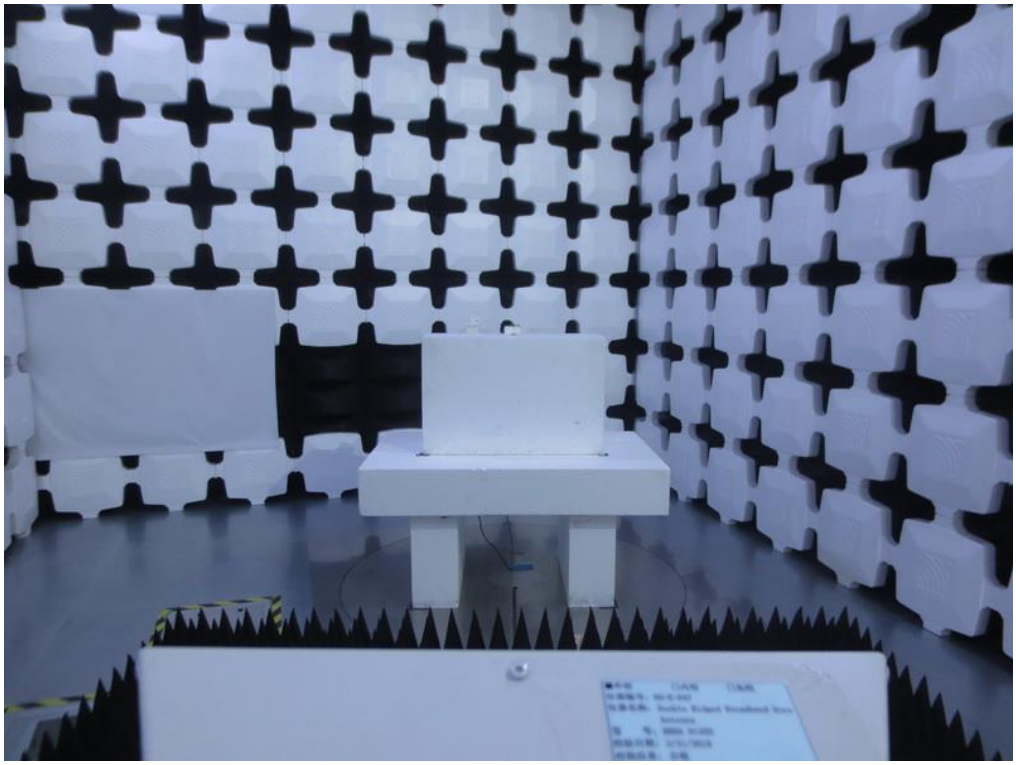
30 MHz to 1000 MHz

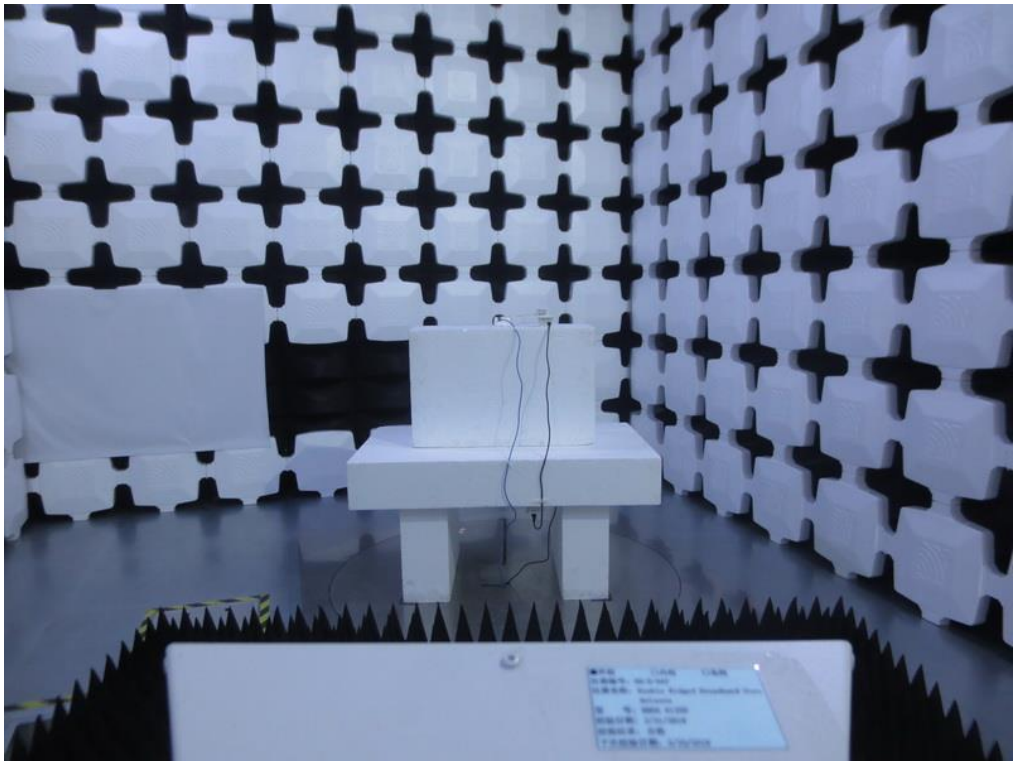




Radiated Measurement Photos

Above 1000 MHz

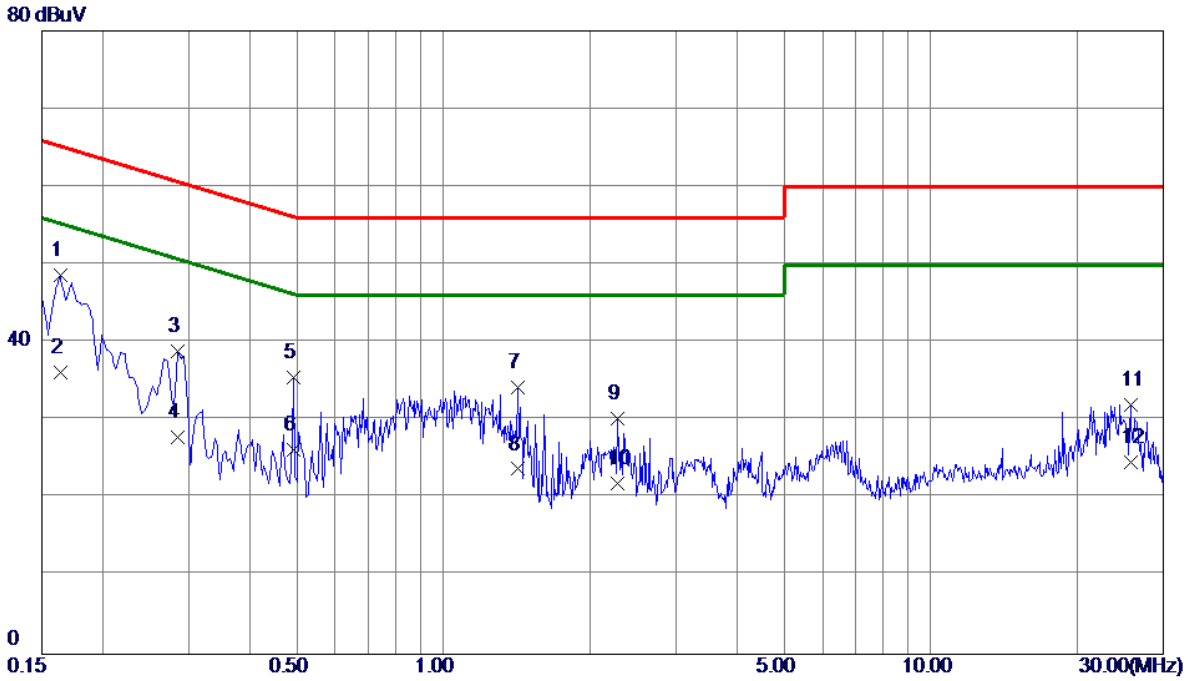




APPENDIX A - CONDUCTED EMISSION

Test Mode:	TX Mode

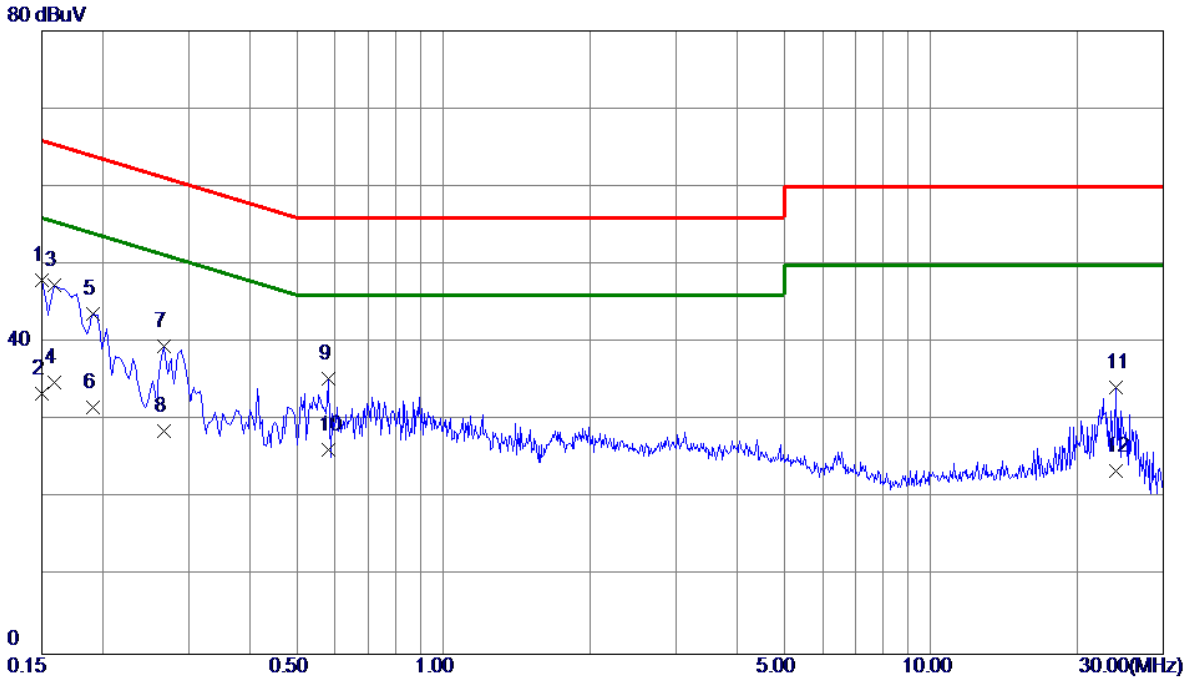
Line



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1635	38.81	9.80	48.61	65.28	-16.67	QP	
2	0.1635	26.30	9.80	36.10	55.28	-19.18	AVG	
3	0.2850	28.83	9.99	38.82	60.67	-21.85	QP	
4	0.2850	17.90	9.99	27.89	50.67	-22.78	AVG	
5	0.4920	25.51	9.98	35.49	56.13	-20.64	QP	
6	0.4920	16.20	9.98	26.18	46.13	-19.95	AVG	
7	1.4190	24.19	10.06	34.25	56.00	-21.75	QP	
8	1.4190	13.70	10.06	23.76	46.00	-22.24	AVG	
9	2.2830	20.26	10.01	30.27	56.00	-25.73	QP	
10	2.2830	11.89	10.01	21.90	46.00	-24.10	AVG	
11	25.6830	21.13	10.90	32.03	60.00	-27.97	QP	
12	25.6830	13.80	10.90	24.70	50.00	-25.30	AVG	

Test Mode:	TX Mode

Neutral

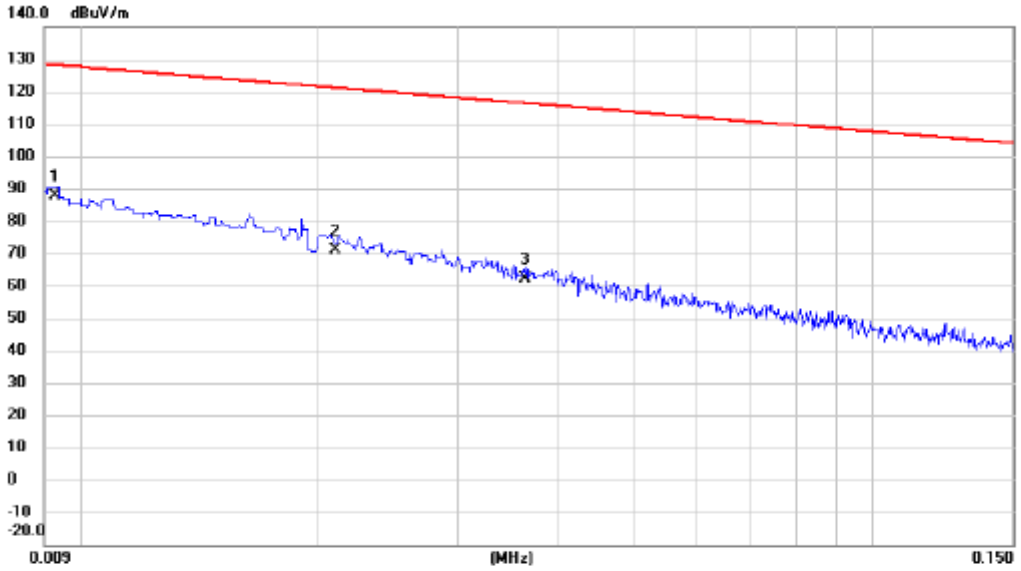


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1500	38.24	9.78	48.02	66.00	-17.98	QP	
2	0.1500	23.70	9.78	33.48	56.00	-22.52	AVG	
3	0.1590	37.50	9.79	47.29	65.52	-18.23	QP	
4	0.1590	25.10	9.79	34.89	55.52	-20.63	AVG	
5	0.1905	33.88	9.84	43.72	64.01	-20.29	QP	
6	0.1905	21.90	9.84	31.74	54.01	-22.27	AVG	
7	0.2670	29.51	9.99	39.50	61.21	-21.71	QP	
8	0.2670	18.60	9.99	28.59	51.21	-22.62	AVG	
9	0.5820	25.34	9.99	35.33	56.00	-20.67	QP	
10	0.5820	16.20	9.99	26.19	46.00	-19.81	AVG	
11	23.9280	23.49	10.75	34.24	60.00	-25.76	QP	
12	23.9280	12.70	10.75	23.45	50.00	-26.55	AVG	

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

Test Mode:	TX Mode

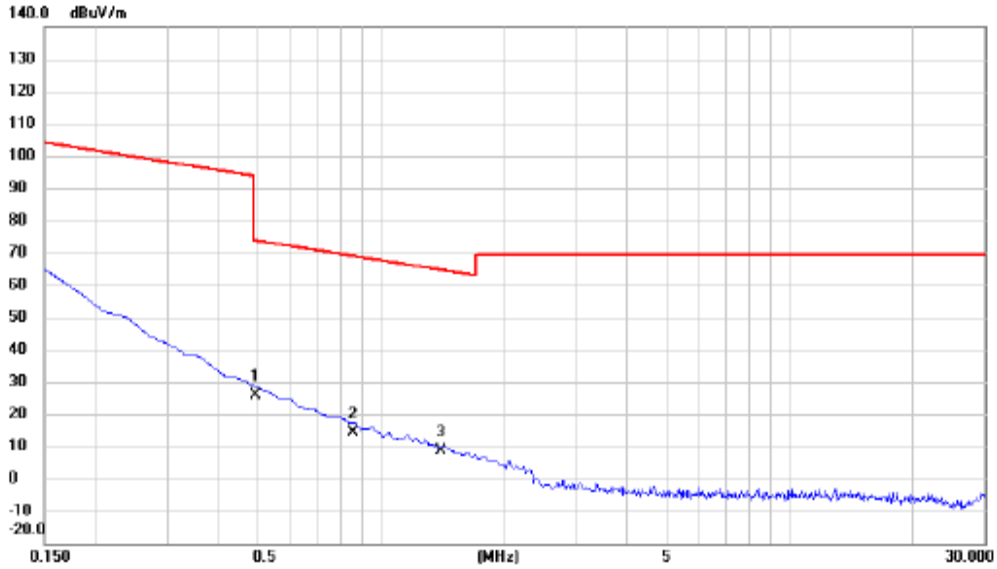
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0093	66.90	21.06	87.96	128.24	-40.28	AVG	
2		0.0210	51.26	19.59	70.85	121.16	-50.31	AVG	
3		0.0364	43.26	19.13	62.39	116.38	-53.99	AVG	

Test Mode:	TX Mode

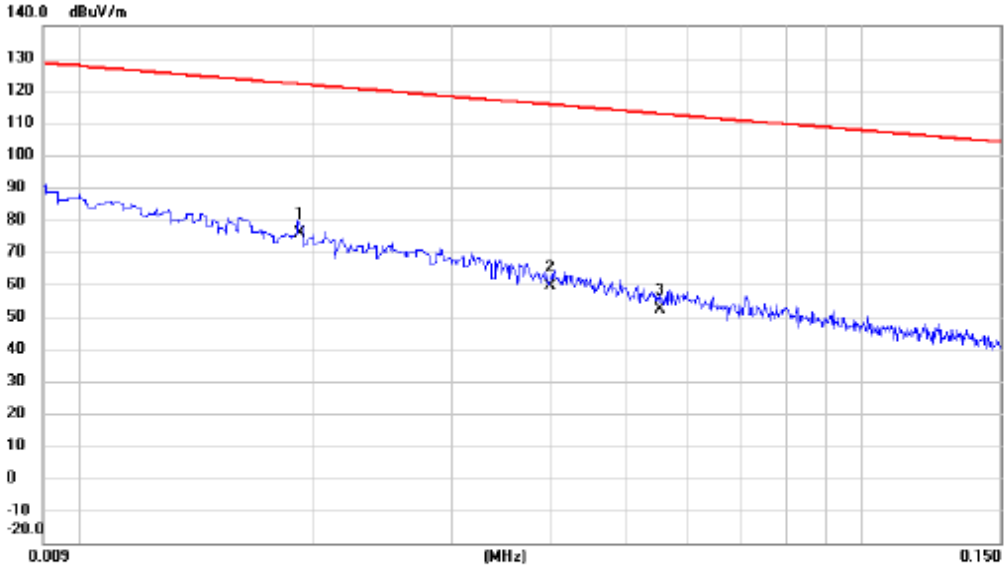
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.4941	9.34	16.47	25.81	73.73	-47.92	QP	
2		0.8573	-1.65	16.05	14.40	68.94	-54.54	QP	
3		1.4037	-7.07	15.74	8.67	64.66	-55.99	QP	

Test Mode:	TX Mode

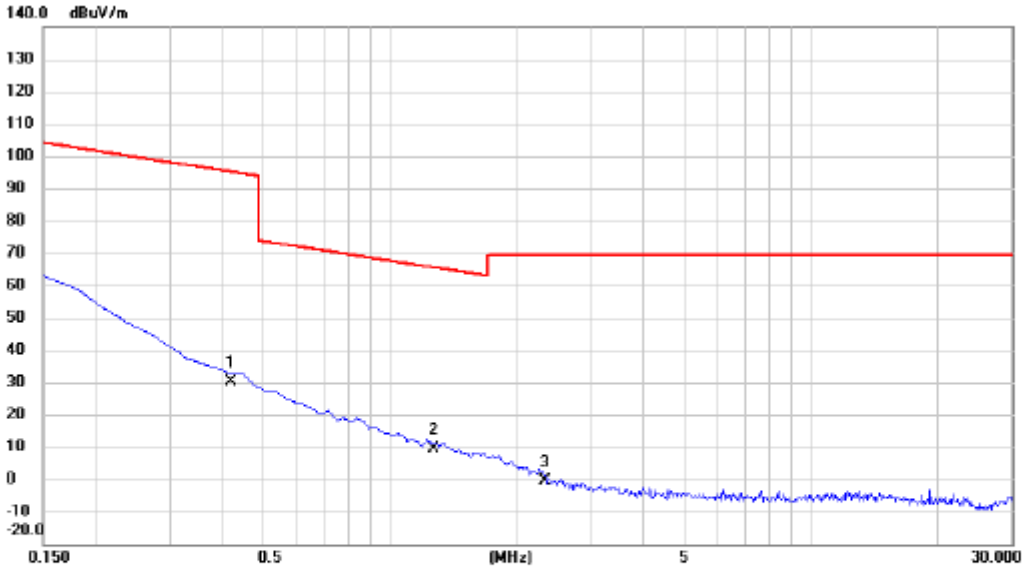
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0192	55.91	19.72	75.63	121.94	-46.31	AVG	
2		0.0400	40.57	19.02	59.59	115.56	-55.97	AVG	
3		0.0552	33.51	18.63	52.14	112.77	-60.63	AVG	

Test Mode:	TX Mode

Ant 90°

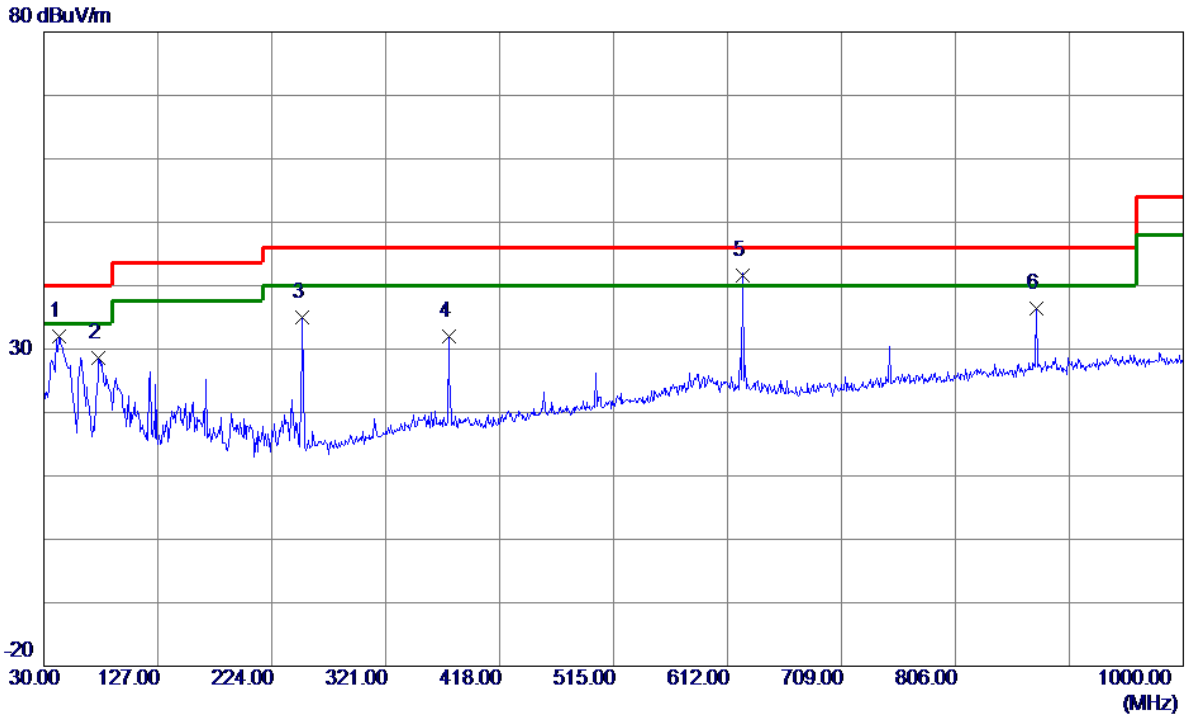


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.4187	13.52	16.54	30.06	95.17	-65.11	AVG	
2	*	1.2694	-6.56	15.79	9.23	65.53	-56.30	QP	
3		2.3291	-16.10	15.42	-0.68	69.54	-70.22	QP	

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

Test Mode:	TX B Mode Channel 01

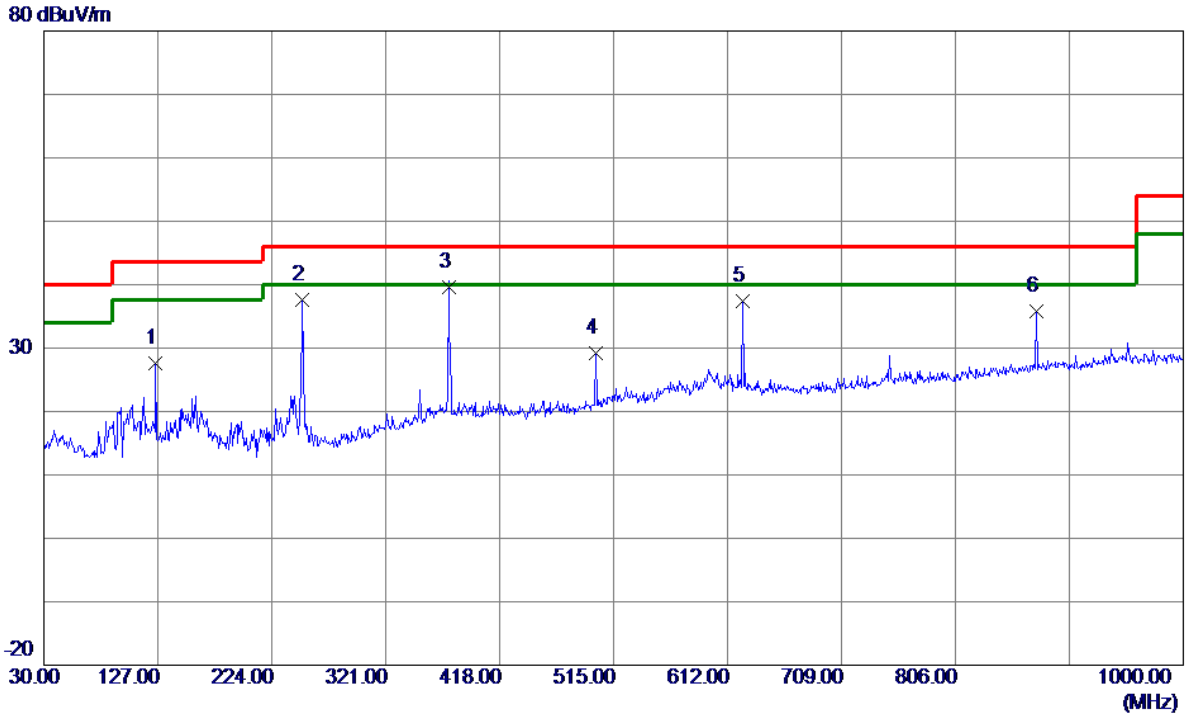
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	42.6100	48.80	-16.84	31.96	40.00	-8.04	Peak	
2	76.5600	49.18	-20.62	28.56	40.00	-11.44	Peak	
3	250.1900	52.48	-17.48	35.00	46.00	-11.00	Peak	
4	374.8350	46.41	-14.45	31.96	46.00	-14.04	Peak	
5 *	625.0949	51.16	-9.53	41.63	46.00	-4.37	Peak	
6	874.8700	42.93	-6.48	36.45	46.00	-9.55	Peak	

Test Mode:	TX B Mode Channel 01

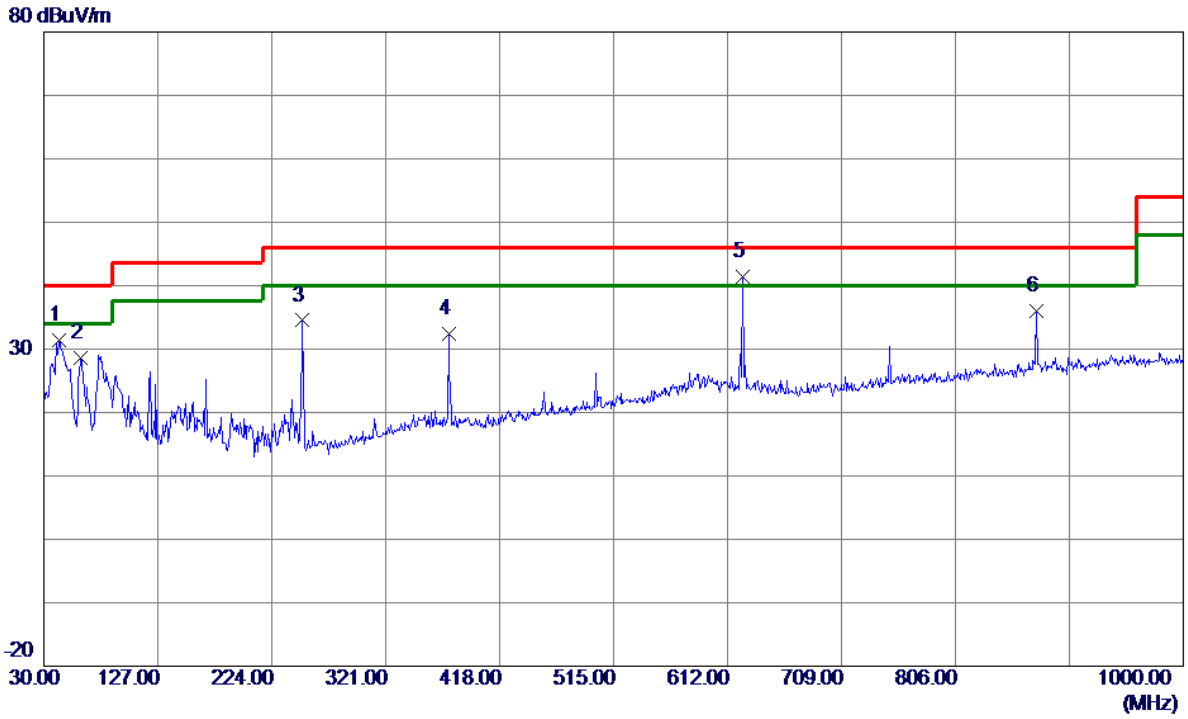
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	125.0600	45.04	-17.44	27.60	43.50	-15.90	Peak	
2	250.1900	55.07	-17.48	37.59	46.00	-8.41	Peak	
3 *	374.8350	54.14	-14.45	39.69	46.00	-6.31	Peak	
4	499.9650	40.92	-11.72	29.20	46.00	-16.80	Peak	
5	625.0949	47.01	-9.53	37.48	46.00	-8.52	Peak	
6	874.8700	42.20	-6.48	35.72	46.00	-10.28	Peak	

Test Mode:	TX B Mode Channel 06

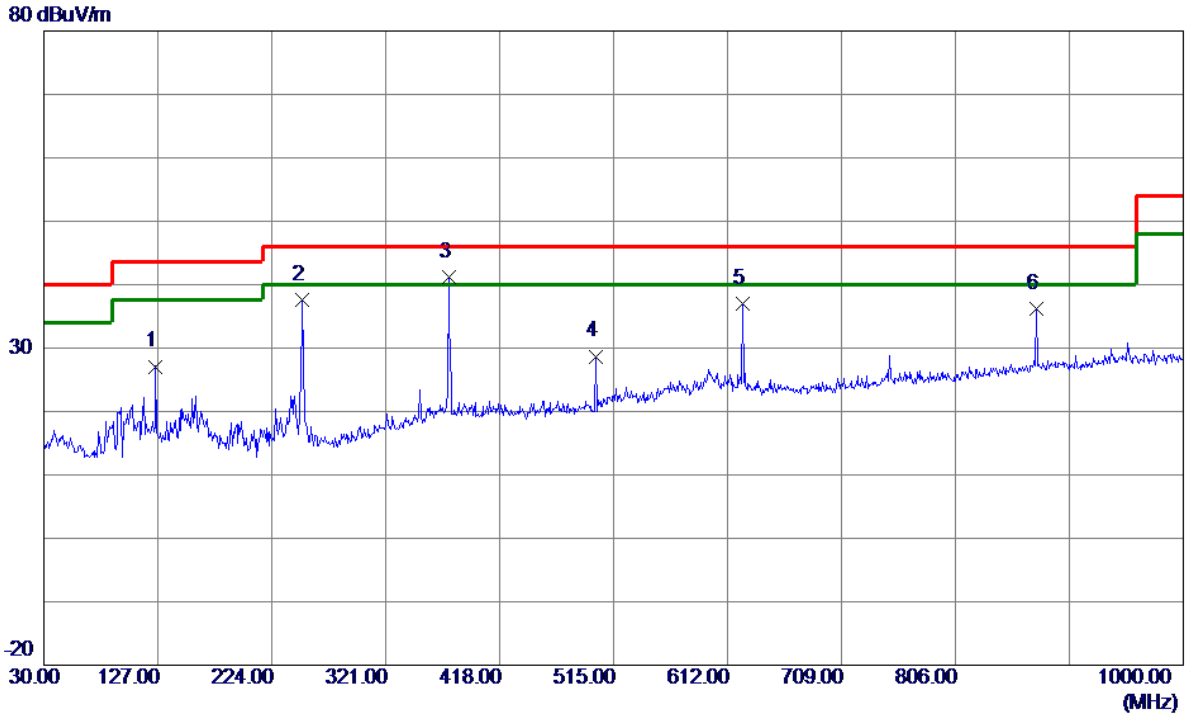
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	42.6100	48.30	-16.84	31.46	40.00	-8.54	Peak	
2	61.5250	46.80	-18.16	28.64	40.00	-11.36	Peak	
3	250.1900	51.98	-17.48	34.50	46.00	-11.50	Peak	
4	374.8350	46.91	-14.45	32.46	46.00	-13.54	Peak	
5 *	625.0949	50.97	-9.53	41.44	46.00	-4.56	Peak	
6	874.8700	42.43	-6.48	35.95	46.00	-10.05	Peak	

Test Mode:	TX B Mode Channel 06

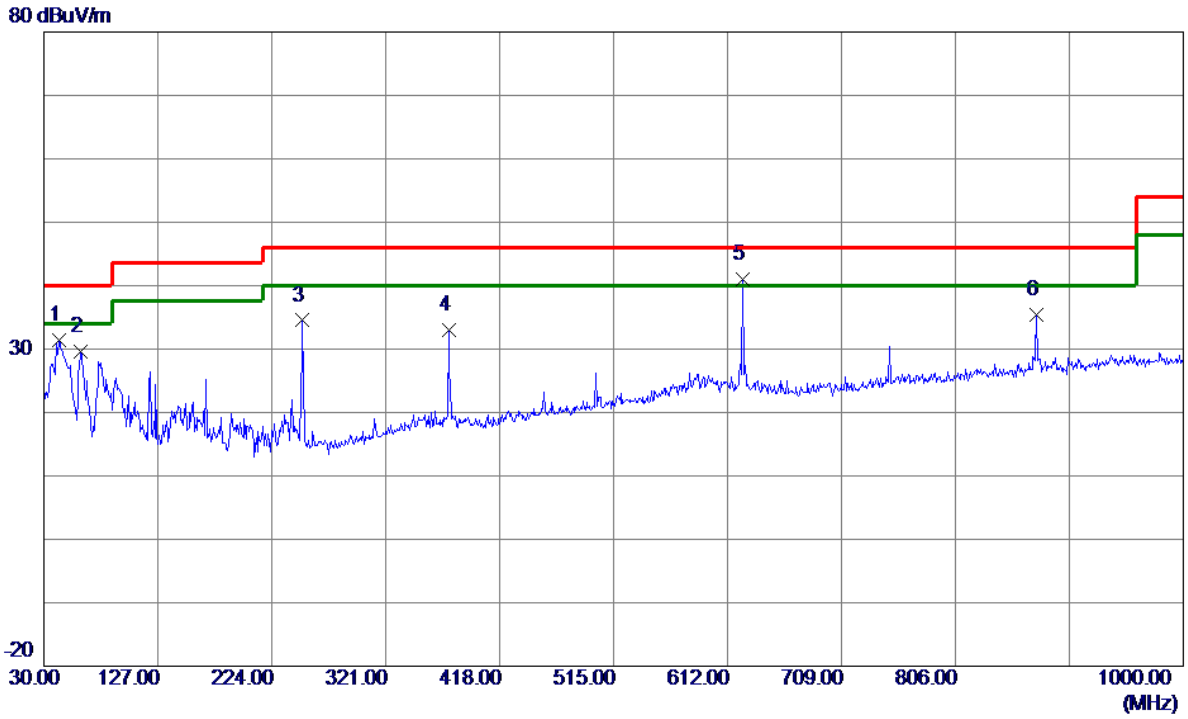
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	125.0600	44.54	-17.44	27.10	43.50	-16.40	Peak	
2	250.1900	55.07	-17.48	37.59	46.00	-8.41	Peak	
3 *	374.8350	55.58	-14.45	41.13	46.00	-4.87	Peak	
4	499.9650	40.42	-11.72	28.70	46.00	-17.30	Peak	
5	625.0949	46.51	-9.53	36.98	46.00	-9.02	Peak	
6	874.8700	42.70	-6.48	36.22	46.00	-9.78	Peak	

Test Mode:	TX B Mode Channel 11

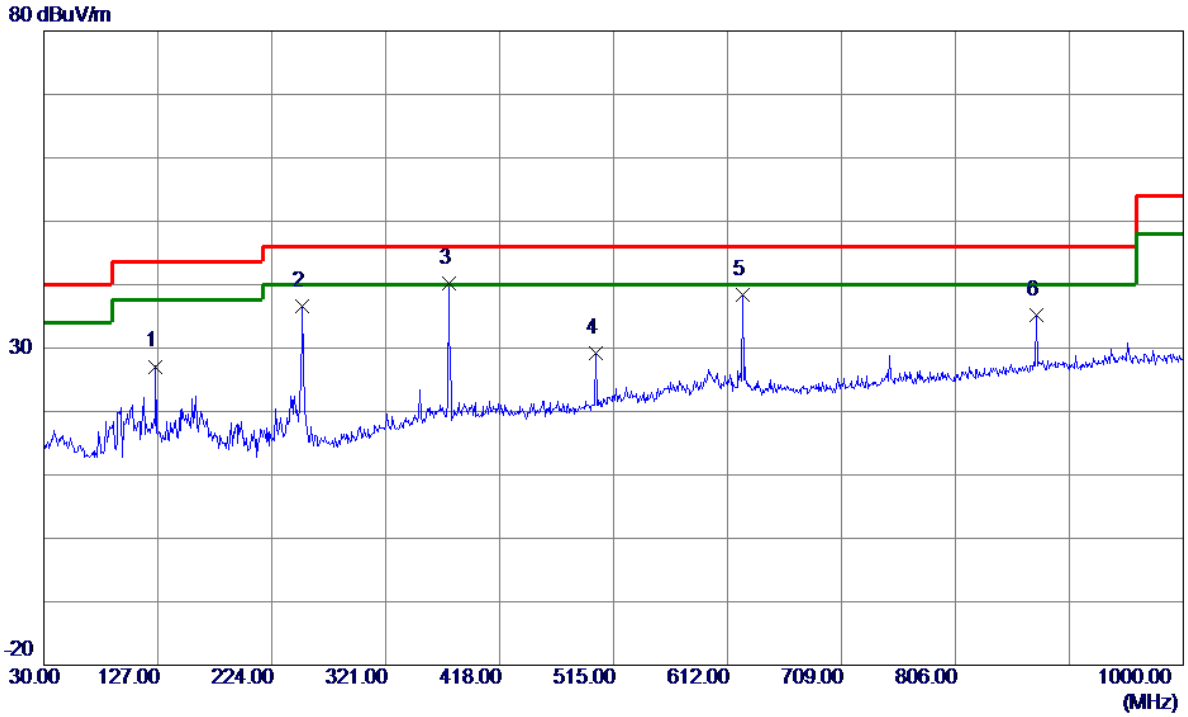
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	42.6100	48.30	-16.84	31.46	40.00	-8.54	Peak	
2	61.5250	47.80	-18.16	29.64	40.00	-10.36	Peak	
3	250.1900	51.98	-17.48	34.50	46.00	-11.50	Peak	
4	374.8350	47.41	-14.45	32.96	46.00	-13.04	Peak	
5 *	625.0949	50.47	-9.53	40.94	46.00	-5.06	Peak	
6	874.8700	41.93	-6.48	35.45	46.00	-10.55	Peak	

Test Mode:	TX B Mode Channel 11

Horizontal

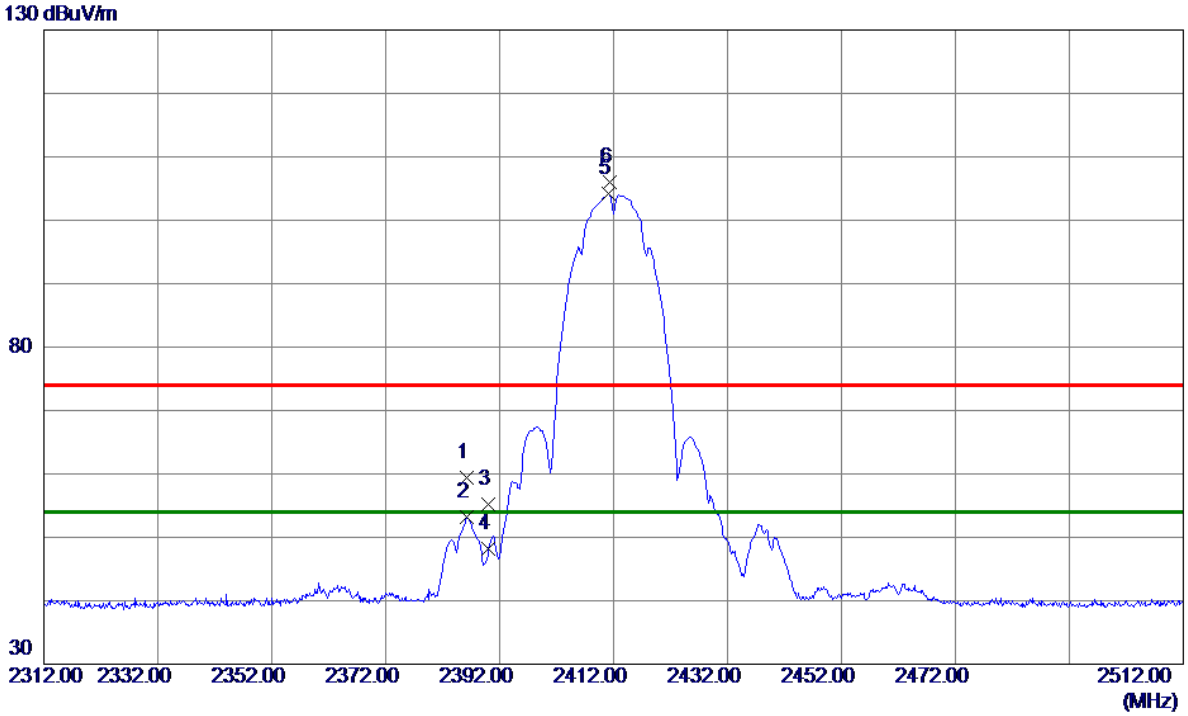


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	125.0600	44.54	-17.44	27.10	43.50	-16.40	Peak	
2	250.1900	54.07	-17.48	36.59	46.00	-9.41	Peak	
3 *	374.8350	54.58	-14.45	40.13	46.00	-5.87	Peak	
4	499.9650	40.92	-11.72	29.20	46.00	-16.80	Peak	
5	625.0949	48.01	-9.53	38.48	46.00	-7.52	Peak	
6	874.8700	41.70	-6.48	35.22	46.00	-10.78	Peak	

APPENDIX D - RADIATED EMISSION (ABOVE 1000 MHZ)

Orthogonal Axis	X
Test Mode:	TX B Mode 2412 MHz

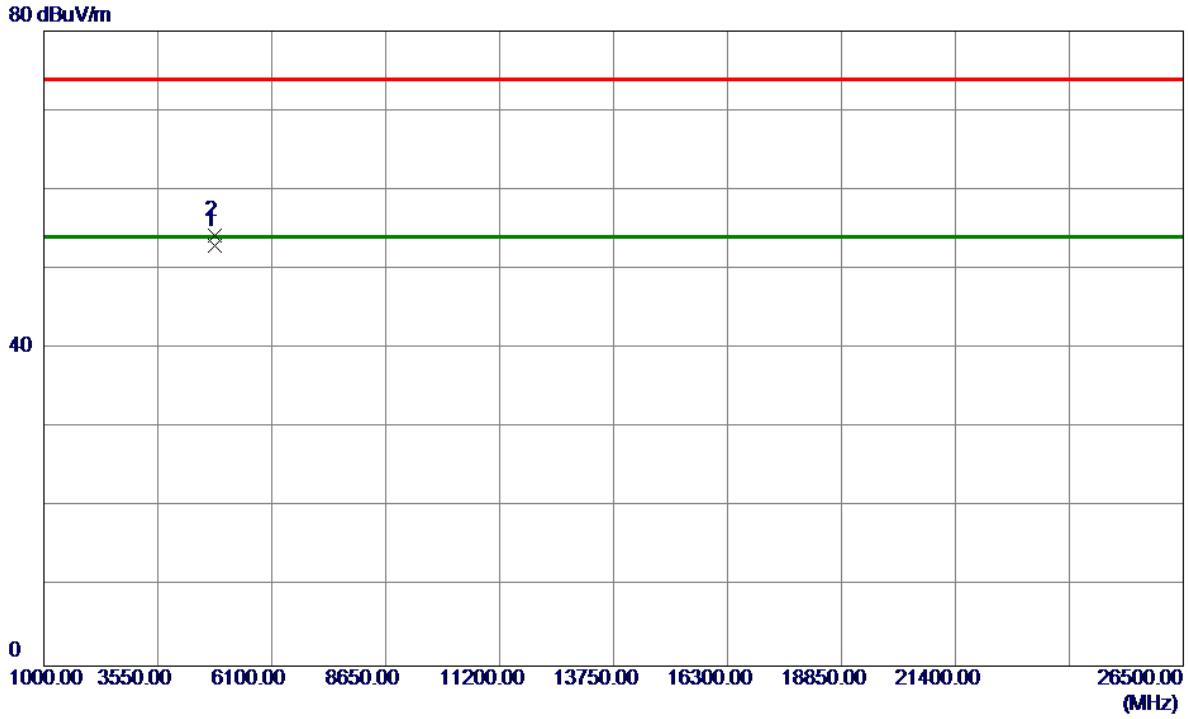
Vertical



No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2386.3000	27.65	31.78	59.43	74.00	-14.57	Peak	
2	2386.3000	21.34	31.78	53.12	54.00	-0.88	AVG	
3	2390.0000	23.48	31.79	55.27	74.00	-18.73	Peak	
4	2390.0000	16.39	31.79	48.18	54.00	-5.82	AVG	
5 *	2411.2000	72.32	31.85	104.17	54.00	50.17	AVG	No Limit
6	2411.4000	74.18	31.85	106.03	74.00	32.03	Peak	No Limit

Orthogonal Axis	X
Test Mode:	TX B Mode 2412 MHz

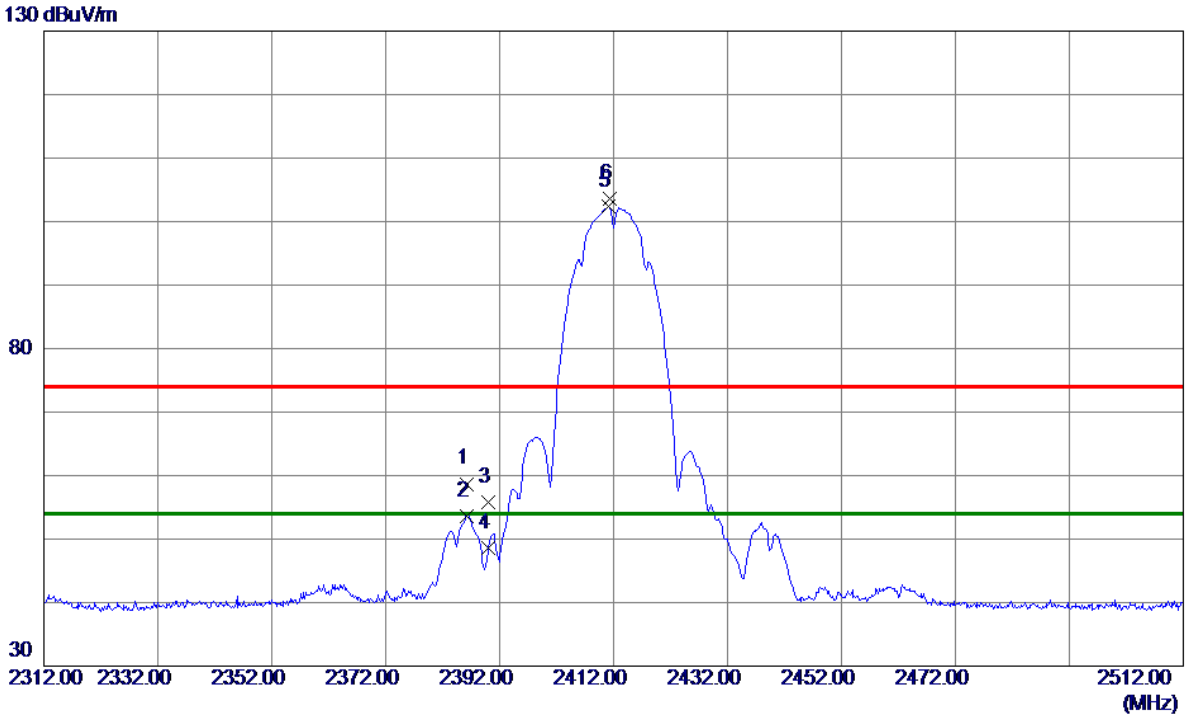
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4823.9750	63.63	-10.72	52.91	54.00	-1.09	AVG	
2	4824.1250	64.96	-10.72	54.24	74.00	-19.76	Peak	

Orthogonal Axis	X
Test Mode:	TX B Mode 2412 MHz

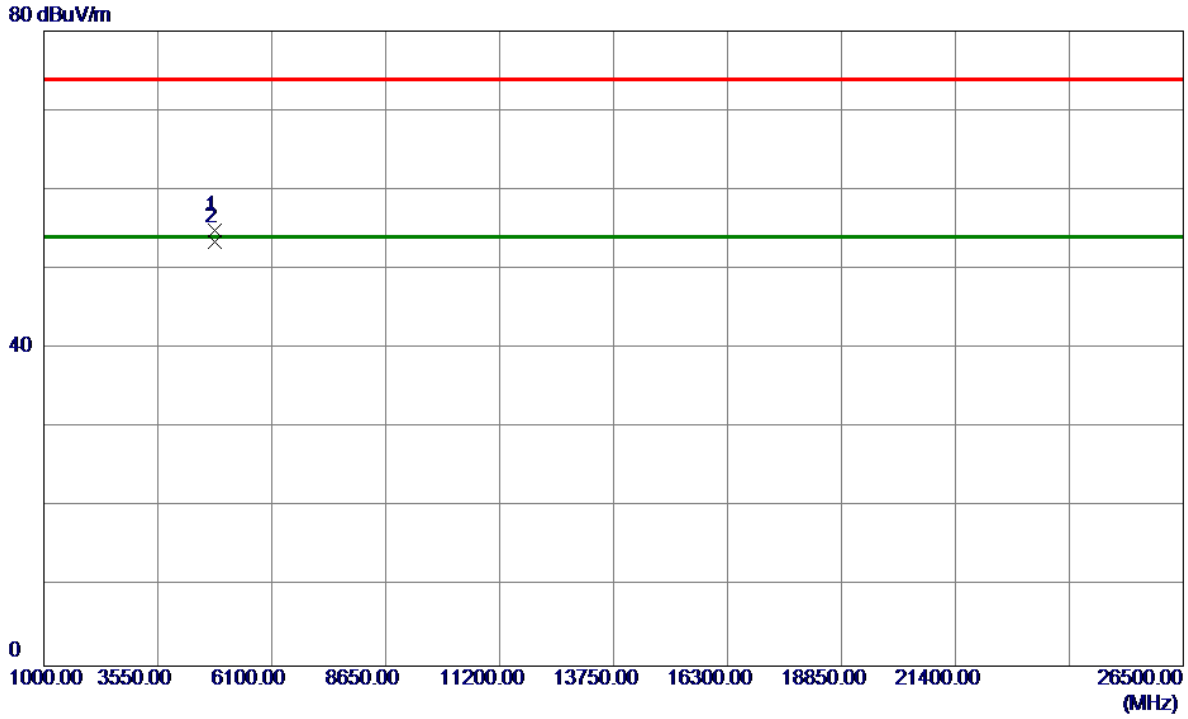
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2386.2000	26.92	31.78	58.70	74.00	-15.30	Peak	
2	2386.3000	21.76	31.78	53.54	54.00	-0.46	AVG	
3	2390.0000	24.09	31.79	55.88	74.00	-18.12	Peak	
4	2390.0000	16.84	31.79	48.63	54.00	-5.37	AVG	
5 *	2411.1000	70.52	31.85	102.37	54.00	48.37	AVG	No Limit
6	2411.4000	71.81	31.85	103.66	74.00	29.66	Peak	No Limit

Orthogonal Axis	X
Test Mode:	TX B Mode 2412 MHz

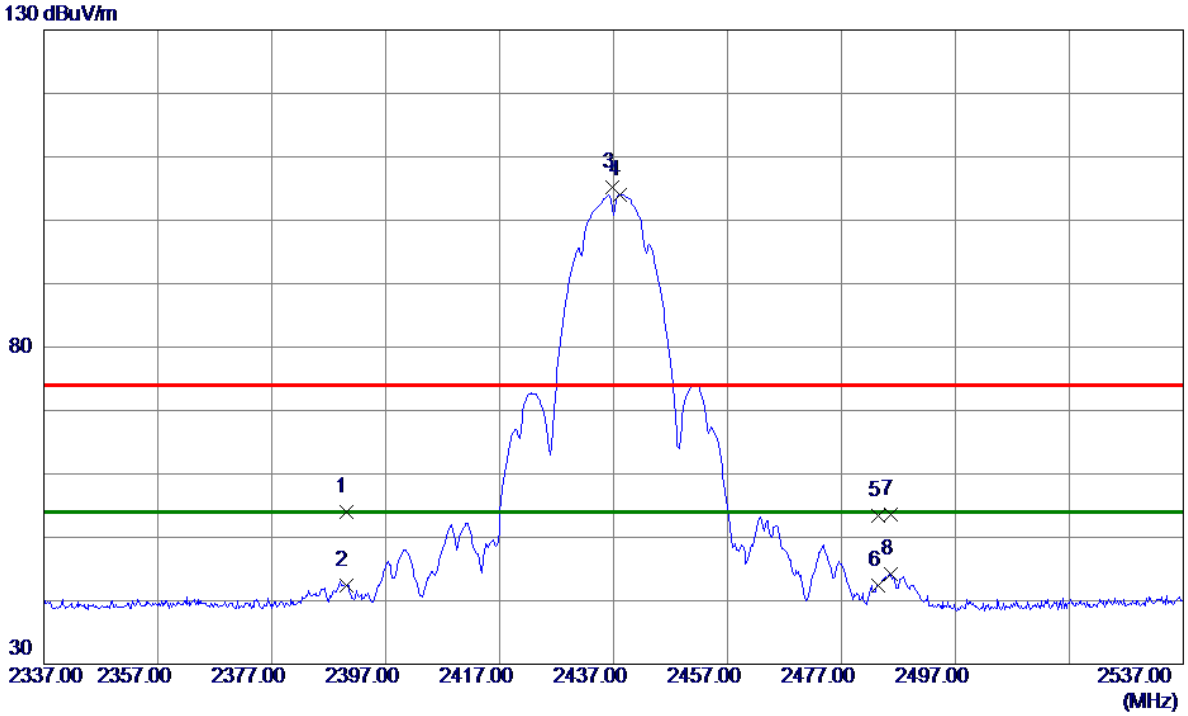
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4823.9750	65.67	-10.72	54.95	74.00	-19.05	Peak	
2 *	4823.9900	64.19	-10.72	53.47	54.00	-0.53	AVG	

Orthogonal Axis	X
Test Mode:	TX B Mode 2437 MHz

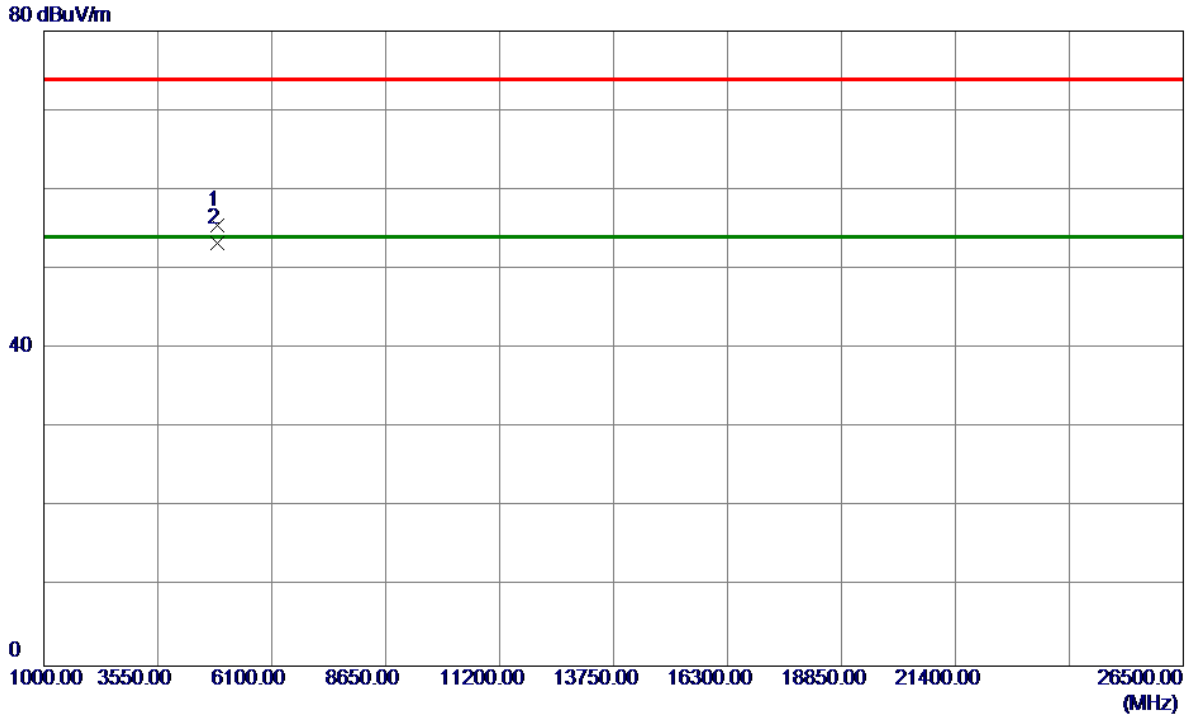
Vertical



No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	22.26	31.79	54.05	74.00	-19.95	Peak	
2	2390.0000	10.66	31.79	42.45	54.00	-11.55	AVG	
3	2436.8000	73.31	31.92	105.23	74.00	31.23	Peak	No Limit
4 *	2438.0000	72.15	31.92	104.07	54.00	50.07	AVG	No Limit
5	2483.5000	21.43	32.05	53.48	74.00	-20.52	Peak	
6	2483.5000	10.44	32.05	42.49	54.00	-11.51	AVG	
7	2485.7000	21.60	32.06	53.66	74.00	-20.34	Peak	
8	2485.7000	12.21	32.06	44.27	54.00	-9.73	AVG	

Orthogonal Axis	X
Test Mode:	TX B Mode 2437 MHz

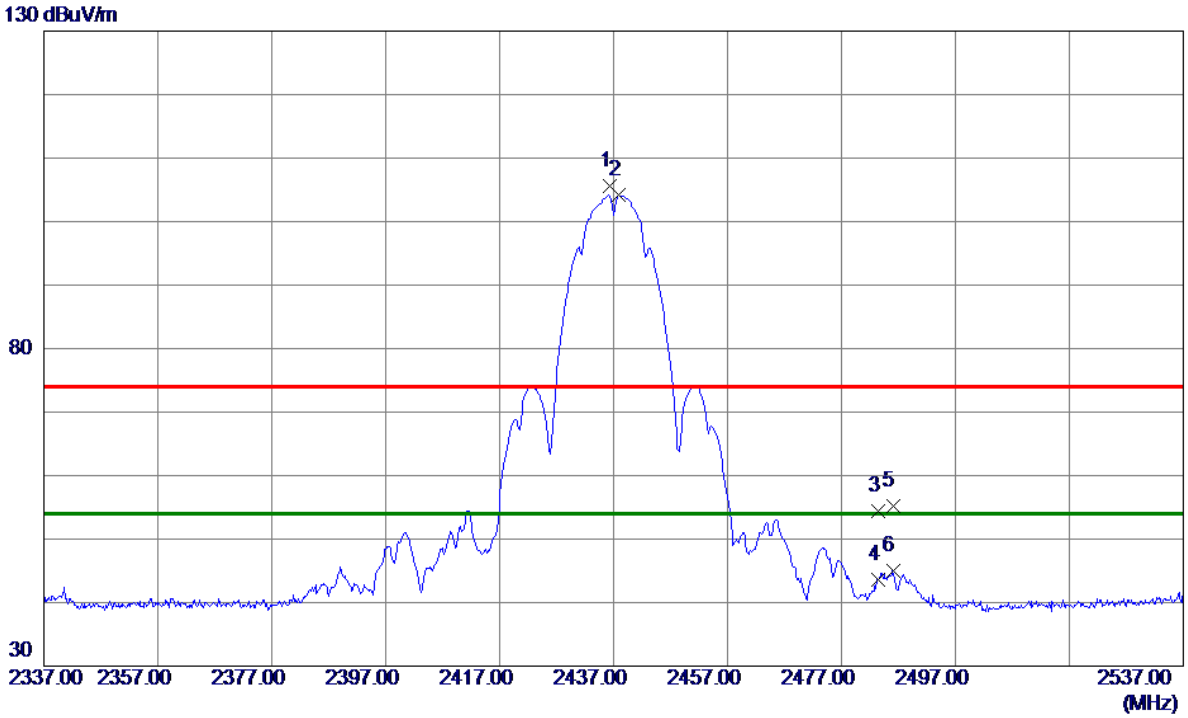
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4874.0500	66.04	-10.52	55.52	74.00	-18.48	Peak	
2 *	4874.0500	63.74	-10.52	53.22	54.00	-0.78	AVG	

Orthogonal Axis	X
Test Mode:	TX B Mode 2437 MHz

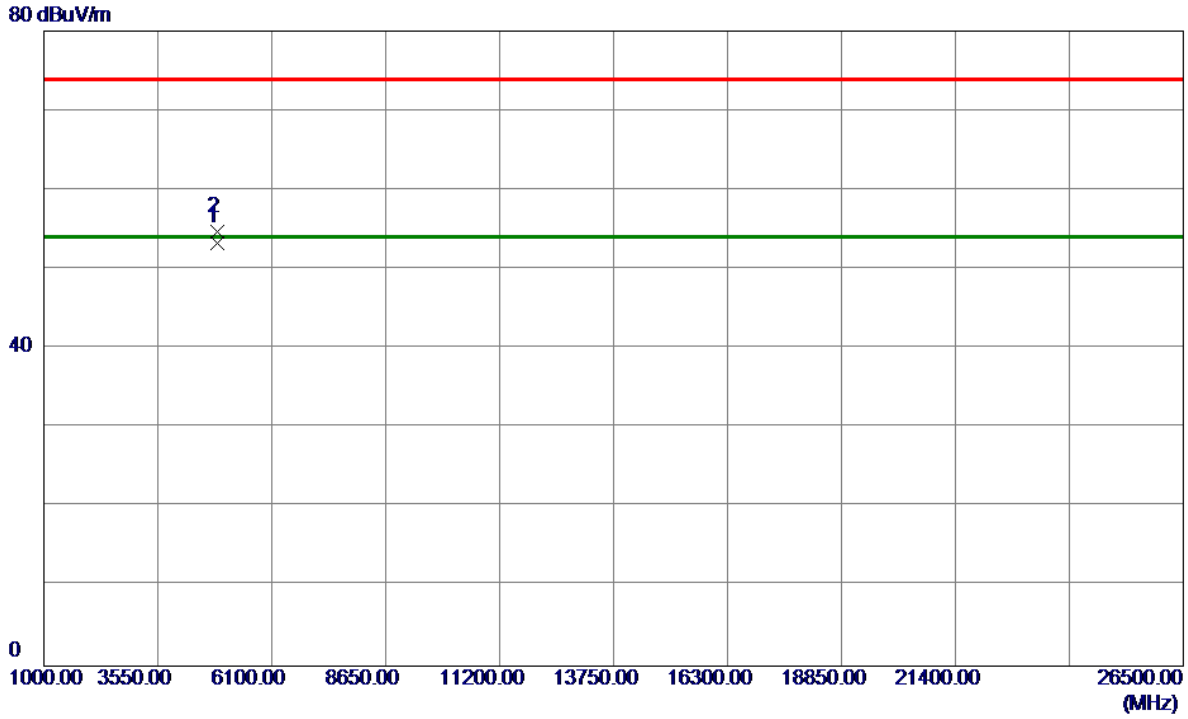
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2436.4000	73.76	31.92	105.68	74.00	31.68	Peak	No Limit
2 *	2437.9000	72.29	31.92	104.21	54.00	50.21	AVG	No Limit
3	2483.5000	22.38	32.05	54.43	74.00	-19.57	Peak	
4	2483.5000	11.46	32.05	43.51	54.00	-10.49	AVG	
5	2486.0000	23.19	32.06	55.25	74.00	-18.75	Peak	
6	2486.0000	12.89	32.06	44.95	54.00	-9.05	AVG	

Orthogonal Axis	X
Test Mode:	TX B Mode 2437 MHz

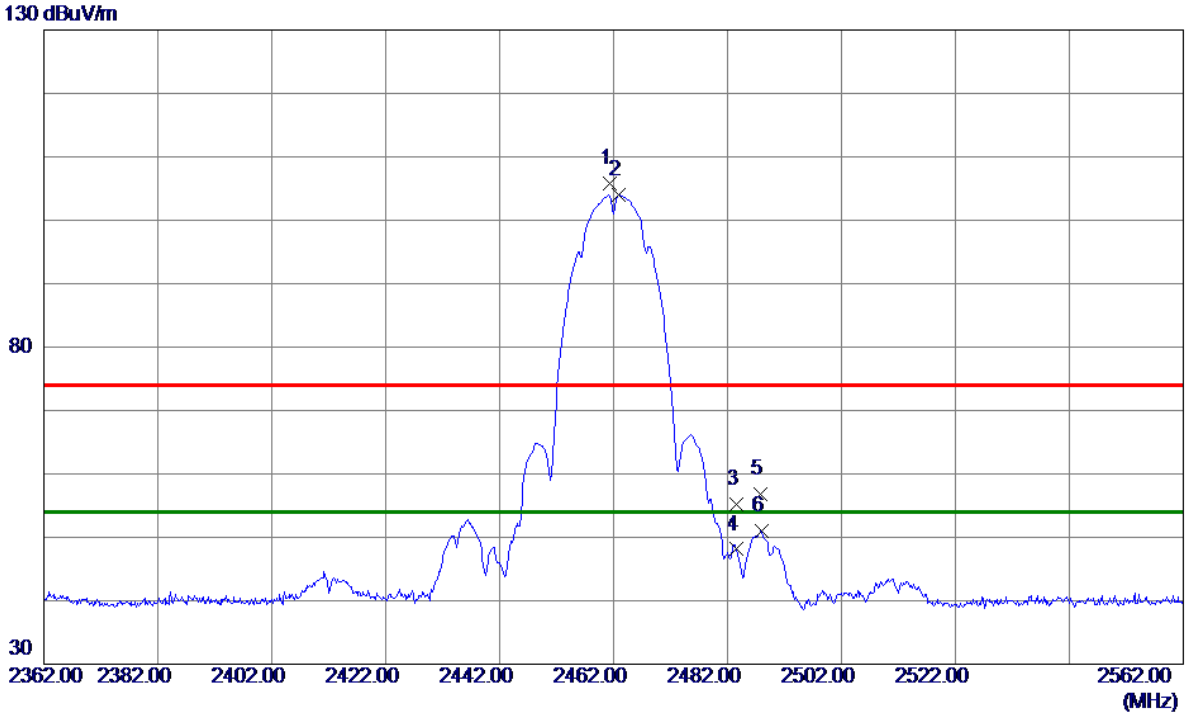
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.0250	63.88	-10.52	53.36	54.00	-0.64	AVG	
2	4874.1750	65.23	-10.51	54.72	74.00	-19.28	Peak	

Orthogonal Axis	X
Test Mode:	TX B Mode 2462 MHz

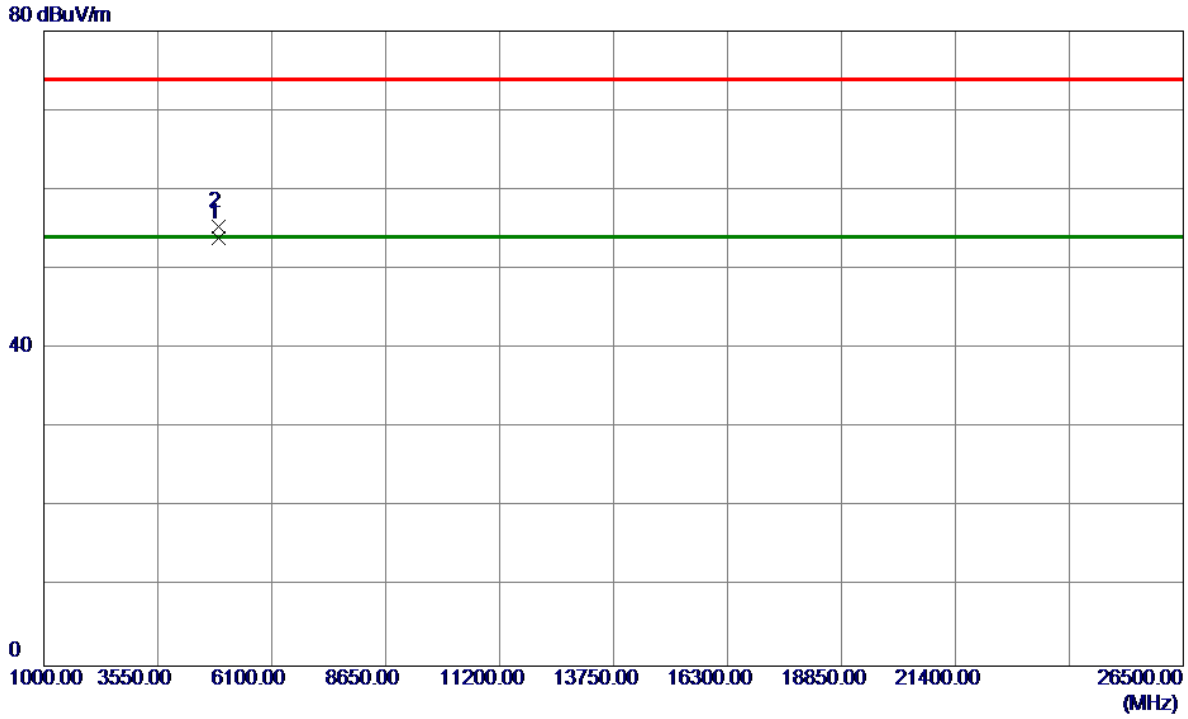
Vertical



No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2461.4000	73.83	31.99	105.82	74.00	31.82	Peak	No Limit
2 *	2462.9000	72.00	31.99	103.99	54.00	49.99	AVG	No Limit
3	2483.5000	23.17	32.05	55.22	74.00	-18.78	Peak	
4	2483.5000	16.05	32.05	48.10	54.00	-5.90	AVG	
5	2487.8000	24.64	32.07	56.71	74.00	-17.29	Peak	
6	2487.9000	18.96	32.07	51.03	54.00	-2.97	AVG	

Orthogonal Axis	X
Test Mode:	TX B Mode 2462 MHz

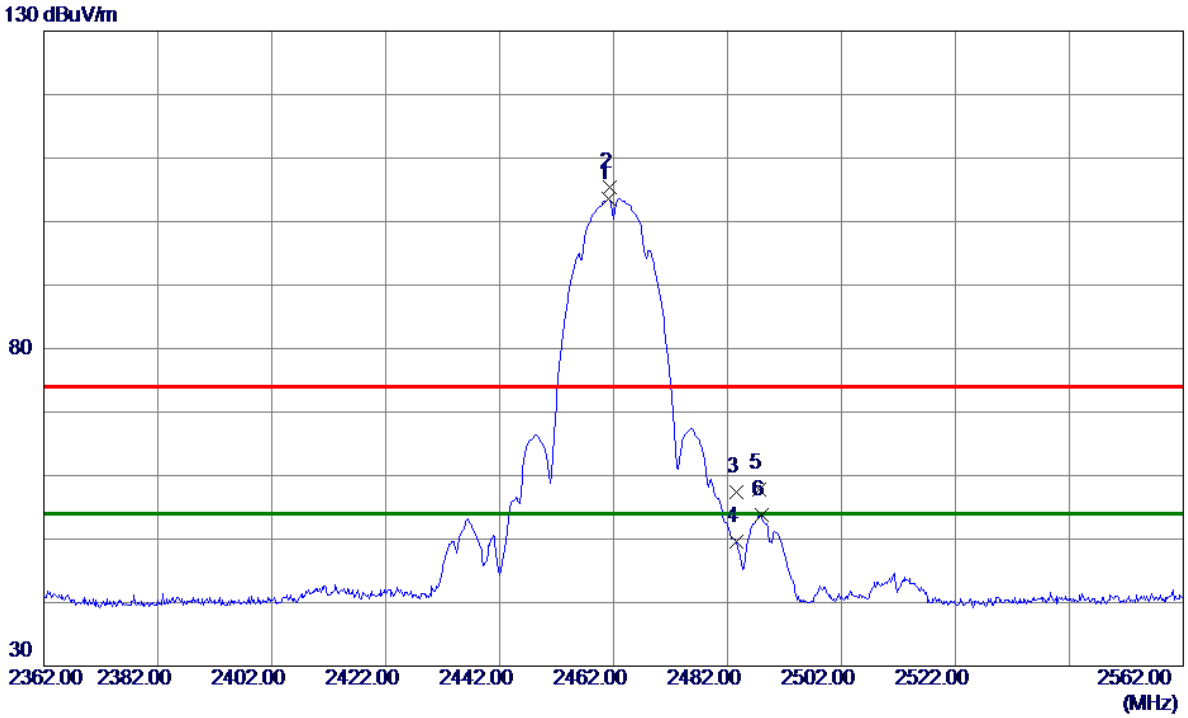
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4923.9800	64.20	-10.31	53.89	54.00	-0.11	AVG	
2	4923.9900	65.67	-10.31	55.36	74.00	-18.64	Peak	

Orthogonal Axis	X
Test Mode:	TX B Mode 2462 MHz

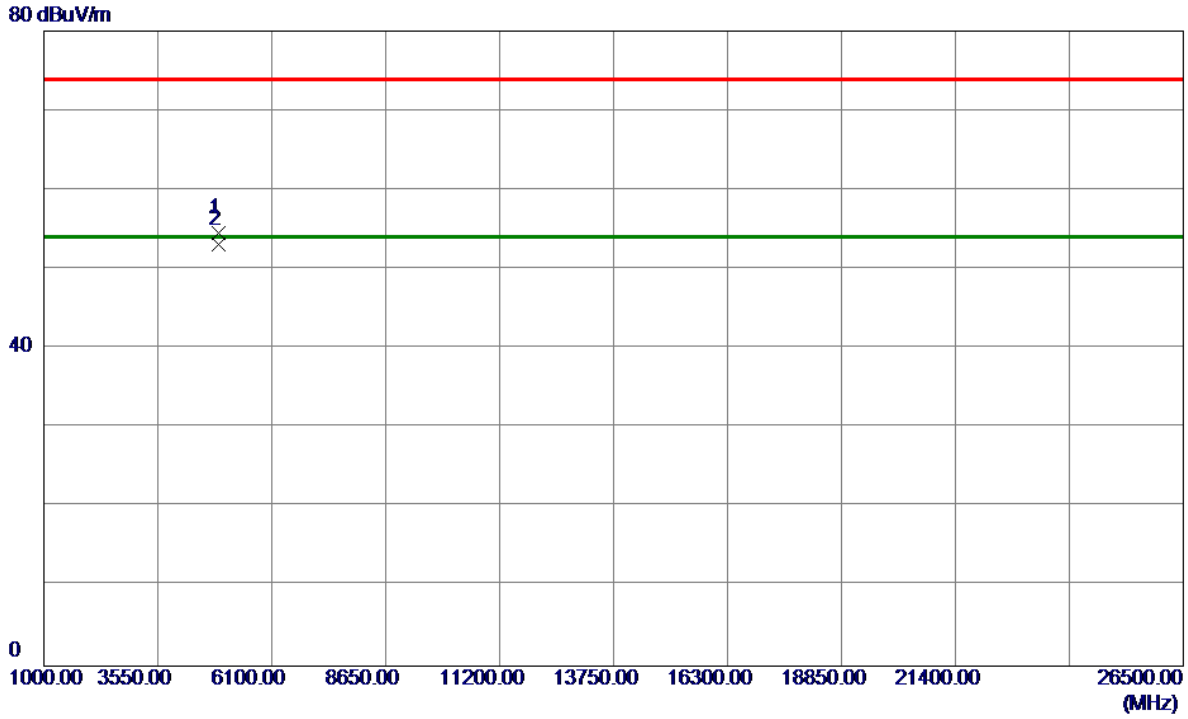
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2461.2000	71.54	31.99	103.53	54.00	49.53	AVG	No Limit
2	2461.4000	73.33	31.99	105.32	74.00	31.32	Peak	No Limit
3	2483.5000	25.29	32.05	57.34	74.00	-16.66	Peak	
4	2483.5000	17.55	32.05	49.60	54.00	-4.40	AVG	
5	2487.5000	25.84	32.06	57.90	74.00	-16.10	Peak	
6	2487.9000	21.77	32.07	53.84	54.00	-0.16	AVG	

Orthogonal Axis	X
Test Mode:	TX B Mode 2462 MHz

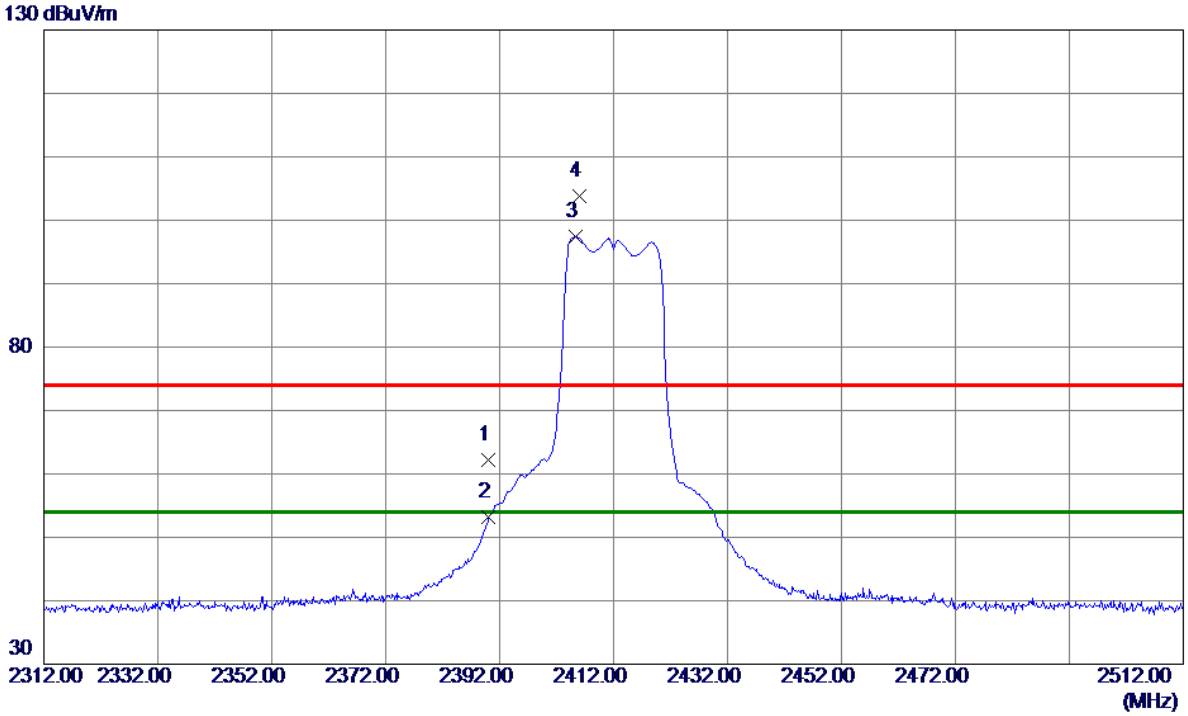
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4923.9600	64.84	-10.31	54.53	74.00	-19.47	Peak	
2 *	4924.0099	63.43	-10.31	53.12	54.00	-0.88	AVG	

Orthogonal Axis	X
Test Mode:	TX G Mode 2412 MHz

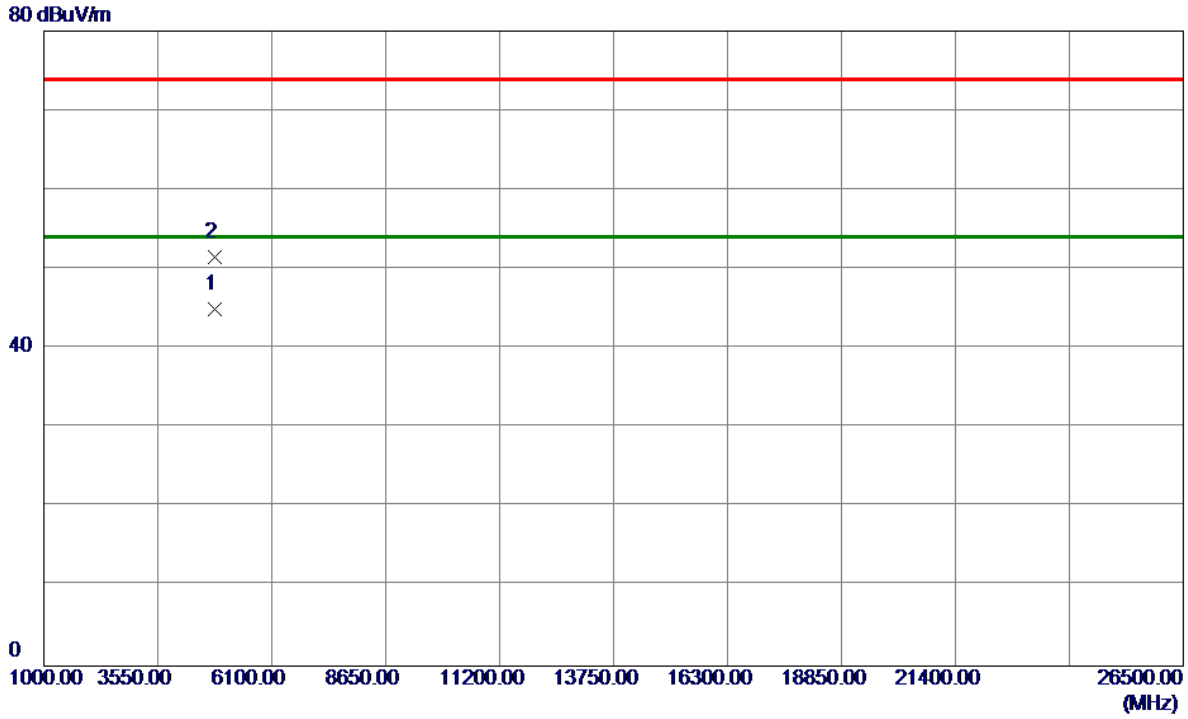
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	30.37	31.79	62.16	74.00	-11.84	Peak	
2	2390.0000	21.42	31.79	53.21	54.00	-0.79	AVG	
3 *	2405.4000	65.62	31.83	97.45	54.00	43.45	AVG	No Limit
4	2405.9000	72.01	31.83	103.84	74.00	29.84	Peak	No Limit

Orthogonal Axis	X
Test Mode:	TX G Mode 2412 MHz

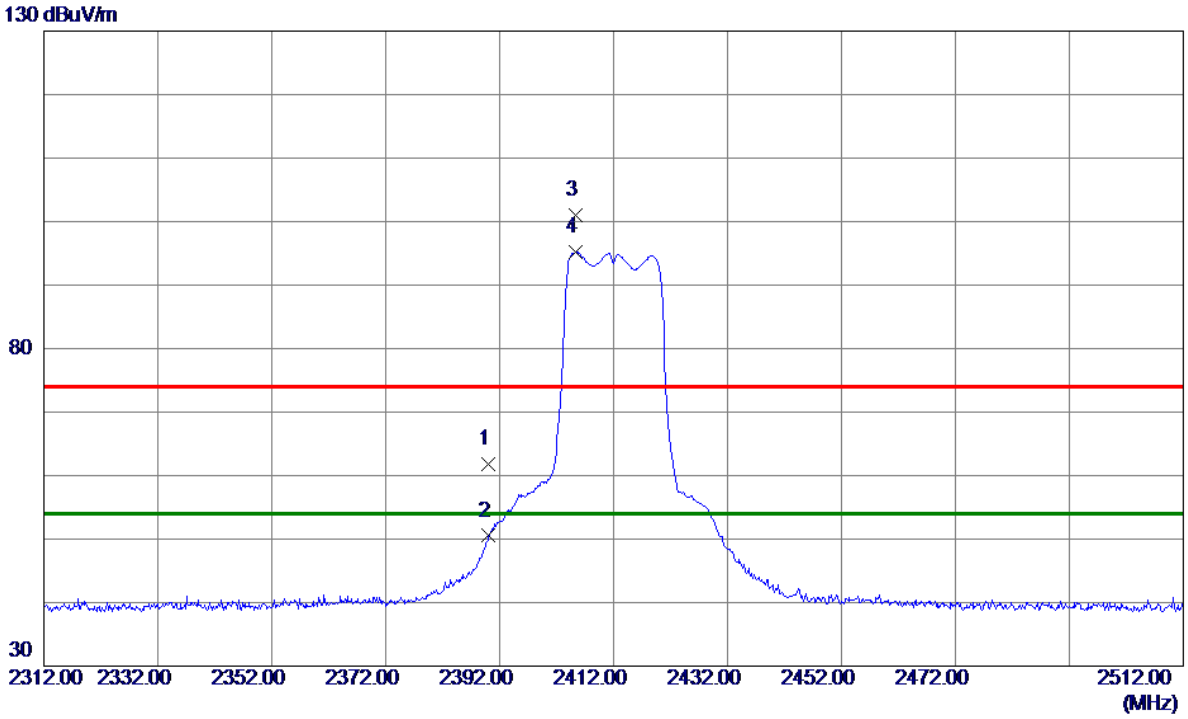
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4823.8600	55.68	-10.72	44.96	54.00	-9.04	AVG	
2	4824.0299	62.21	-10.72	51.49	74.00	-22.51	Peak	

Orthogonal Axis	X
Test Mode:	TX G Mode 2412 MHz

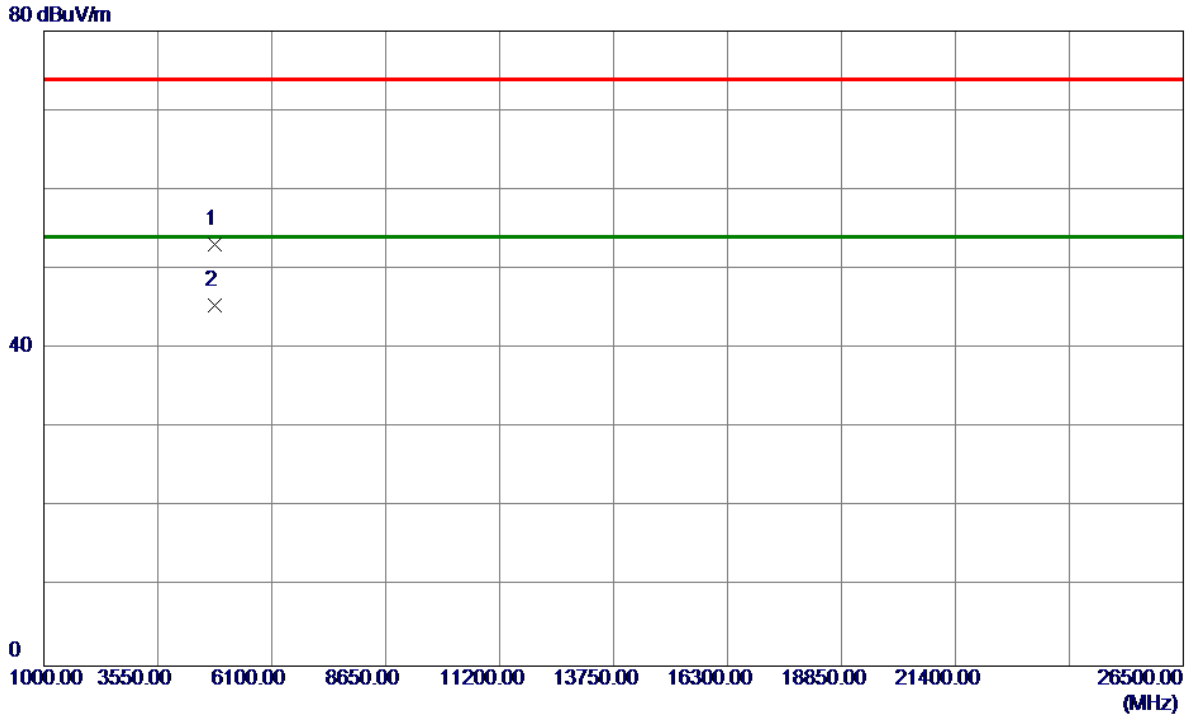
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	30.00	31.79	61.79	74.00	-12.21	Peak	
2	2390.0000	18.71	31.79	50.50	54.00	-3.50	AVG	
3	2405.3000	69.17	31.83	101.00	74.00	27.00	Peak	No Limit
4 *	2405.3000	63.42	31.83	95.25	54.00	41.25	AVG	No Limit

Orthogonal Axis	X
Test Mode:	TX G Mode 2412 MHz

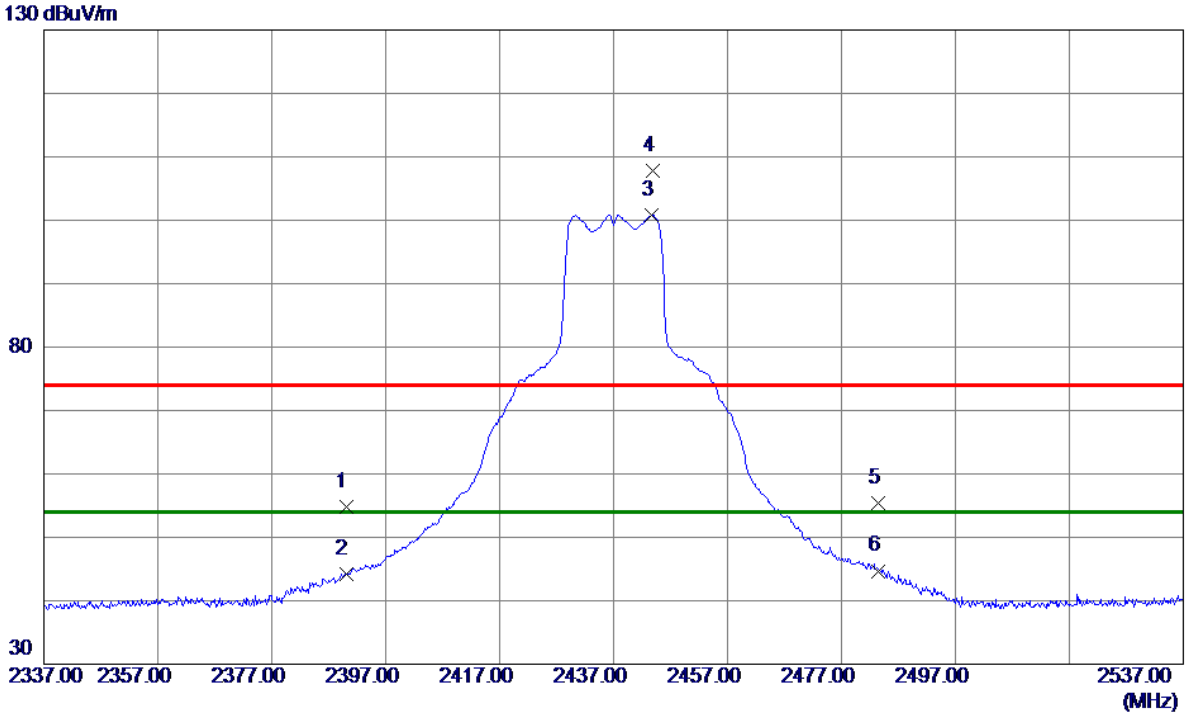
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4824.3000	63.88	-10.72	53.16	74.00	-20.84	Peak	
2 *	4824.8600	56.23	-10.72	45.51	54.00	-8.49	AVG	

Orthogonal Axis	X
Test Mode:	TX G Mode 2437 MHz

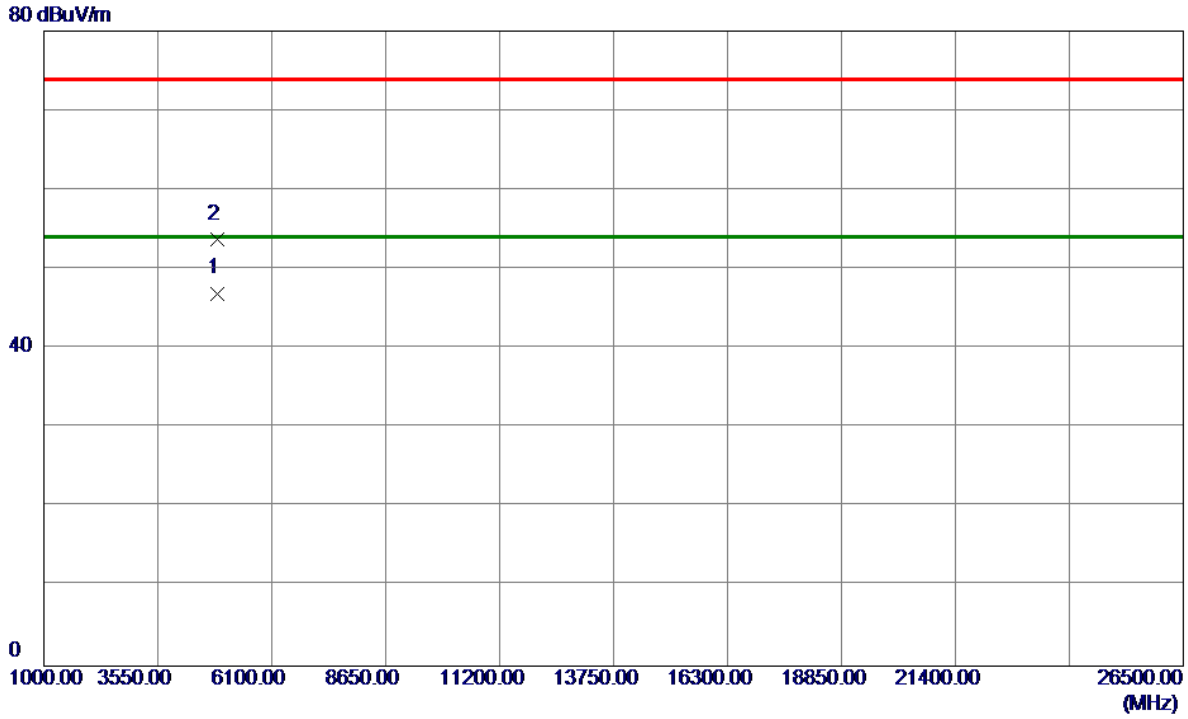
Vertical



No.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	23.04	31.79	54.83	74.00	-19.17	Peak	
2	2390.0000	12.32	31.79	44.11	54.00	-9.89	AVG	
3 *	2443.7000	68.92	31.94	100.86	54.00	46.86	AVG	No Limit
4	2443.9000	75.84	31.94	107.78	74.00	33.78	Peak	No Limit
5	2483.5000	23.39	32.05	55.44	74.00	-18.56	Peak	
6	2483.5000	12.65	32.05	44.70	54.00	-9.30	AVG	

Orthogonal Axis	X
Test Mode:	TX G Mode 2437 MHz

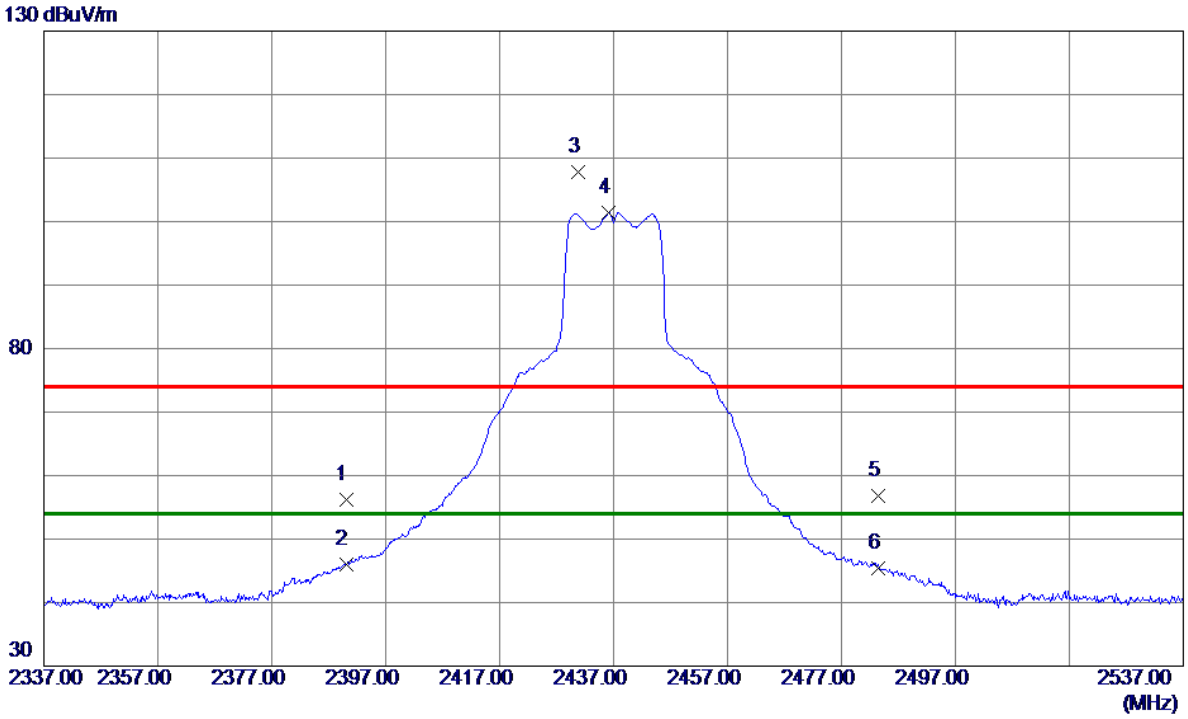
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4873.6700	57.48	-10.52	46.96	54.00	-7.04	AVG	
2	4874.1100	64.23	-10.52	53.71	74.00	-20.29	Peak	

Orthogonal Axis	X
Test Mode:	TX G Mode 2437 MHz

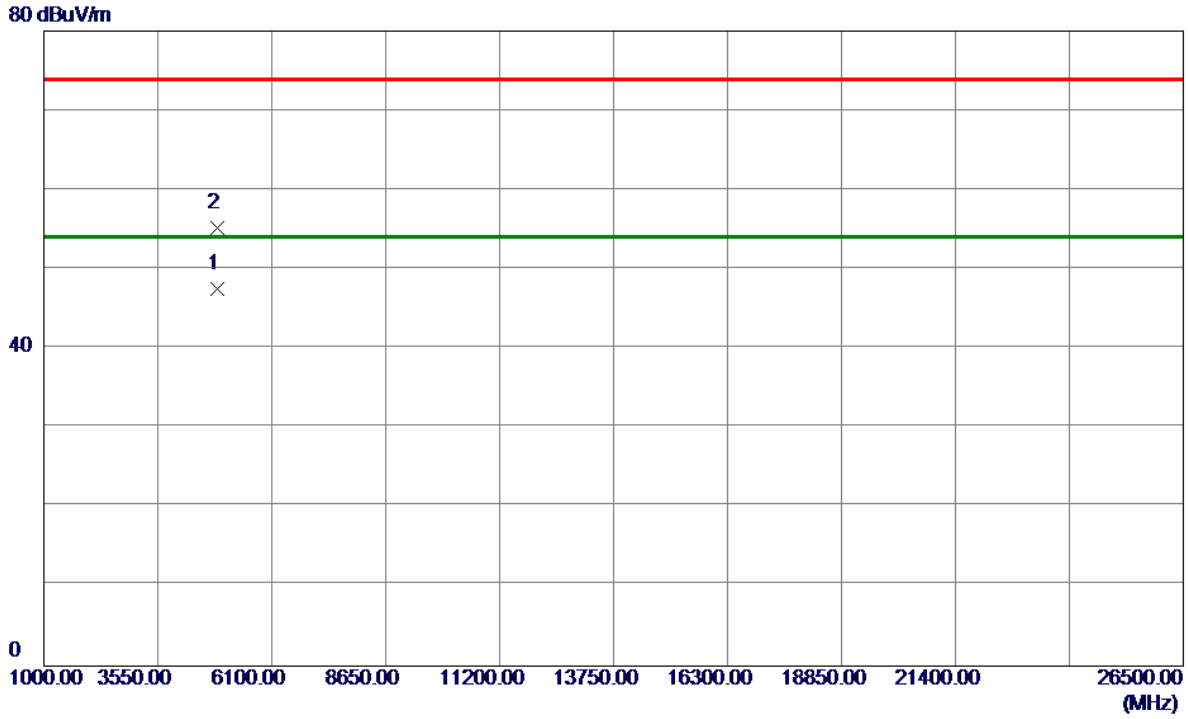
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	24.44	31.79	56.23	74.00	-17.77	Peak	
2	2390.0000	14.13	31.79	45.92	54.00	-8.08	AVG	
3	2430.8000	75.99	31.90	107.89	74.00	33.89	Peak	No Limit
4 *	2436.2000	69.50	31.92	101.42	54.00	47.42	AVG	No Limit
5	2483.5000	24.76	32.05	56.81	74.00	-17.19	Peak	
6	2483.5000	13.42	32.05	45.47	54.00	-8.53	AVG	

Orthogonal Axis	X
Test Mode:	TX G Mode 2437 MHz

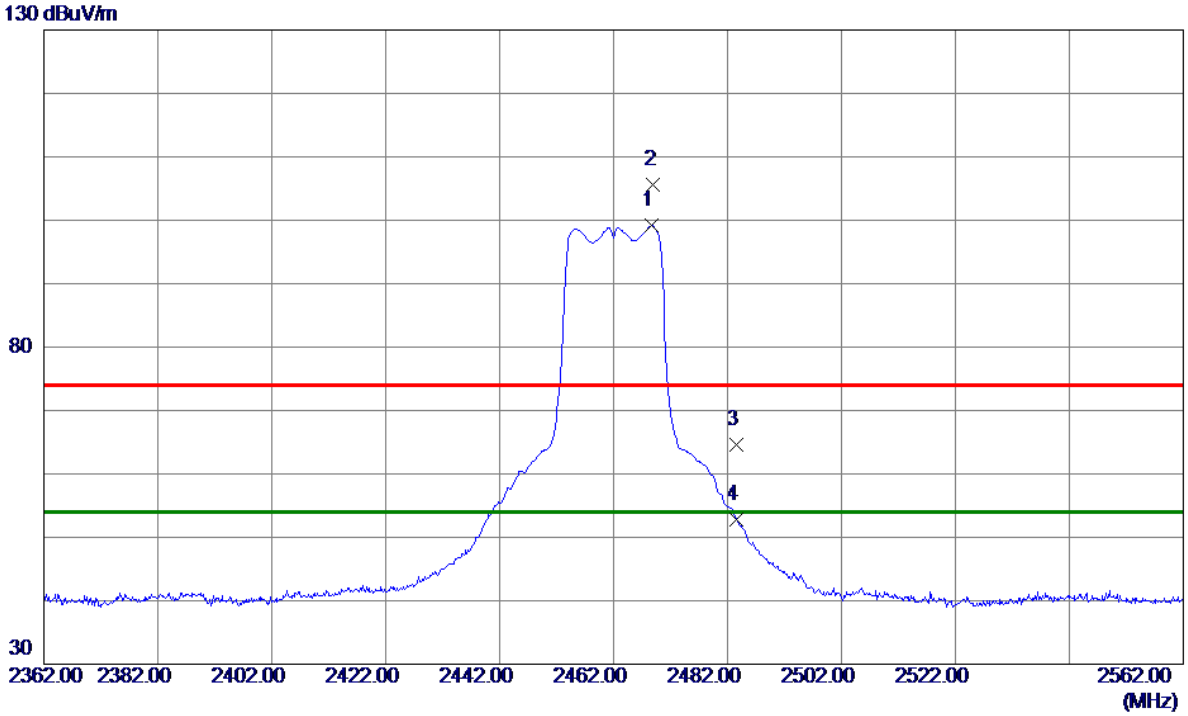
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4873.6200	58.07	-10.52	47.55	54.00	-6.45	AVG	
2	4874.2400	65.74	-10.51	55.23	74.00	-18.77	Peak	

Orthogonal Axis	X
Test Mode:	TX G Mode 2462 MHz

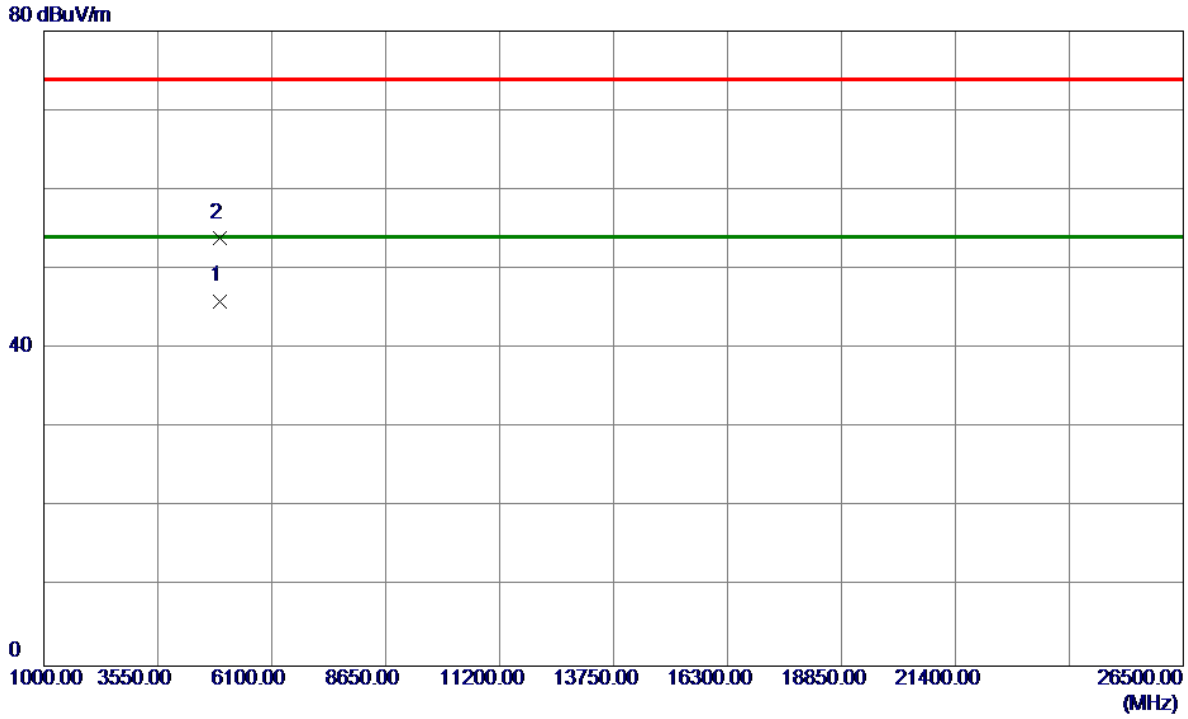
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2468.6000	67.12	32.01	99.13	54.00	45.13	AVG	No Limit
2	2469.0000	73.55	32.01	105.56	74.00	31.56	Peak	No Limit
3	2483.5000	32.49	32.05	64.54	74.00	-9.46	Peak	
4	2483.5000	20.83	32.05	52.88	54.00	-1.12	AVG	

Orthogonal Axis	X
Test Mode:	TX G Mode 2462 MHz

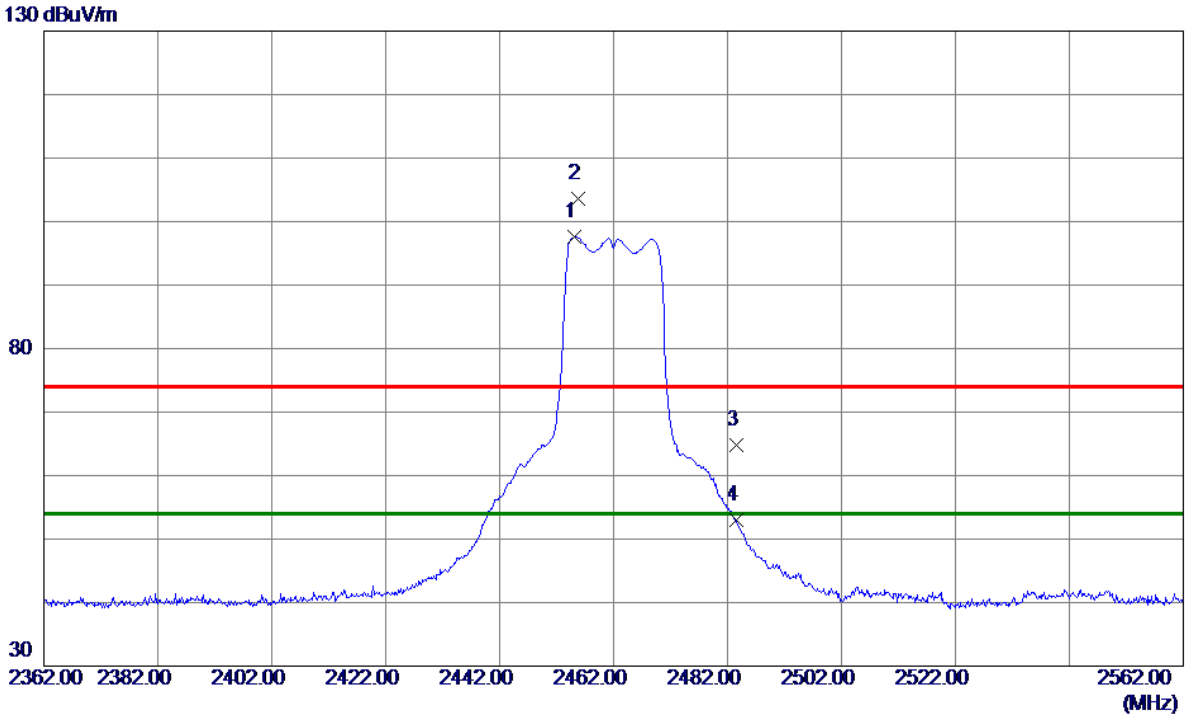
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4924.1700	56.31	-10.31	46.00	54.00	-8.00	AVG	
2	4924.2799	64.20	-10.31	53.89	74.00	-20.11	Peak	

Orthogonal Axis	X
Test Mode:	TX G Mode 2462 MHz

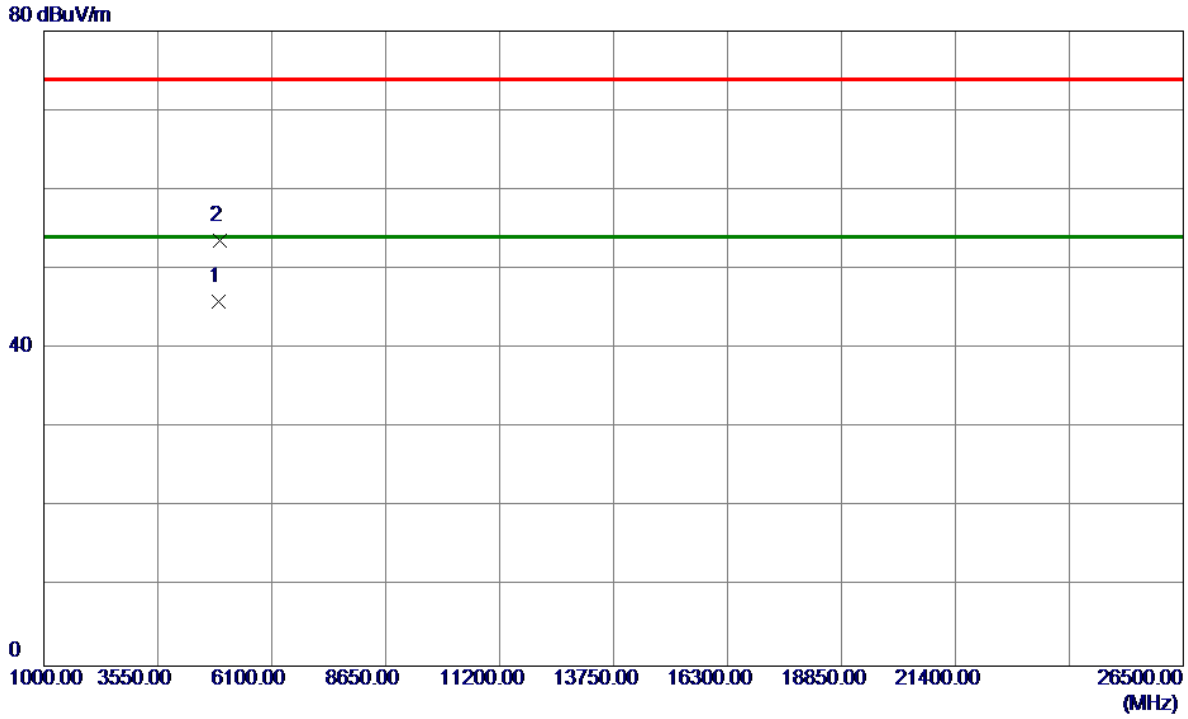
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2455.2000	65.69	31.97	97.66	54.00	43.66	AVG	No Limit
2	2455.8000	71.68	31.97	103.65	74.00	29.65	Peak	No Limit
3	2483.5000	32.83	32.05	64.88	74.00	-9.12	Peak	
4	2483.5000	20.90	32.05	52.95	54.00	-1.05	AVG	

Orthogonal Axis	X
Test Mode:	TX G Mode 2462 MHz

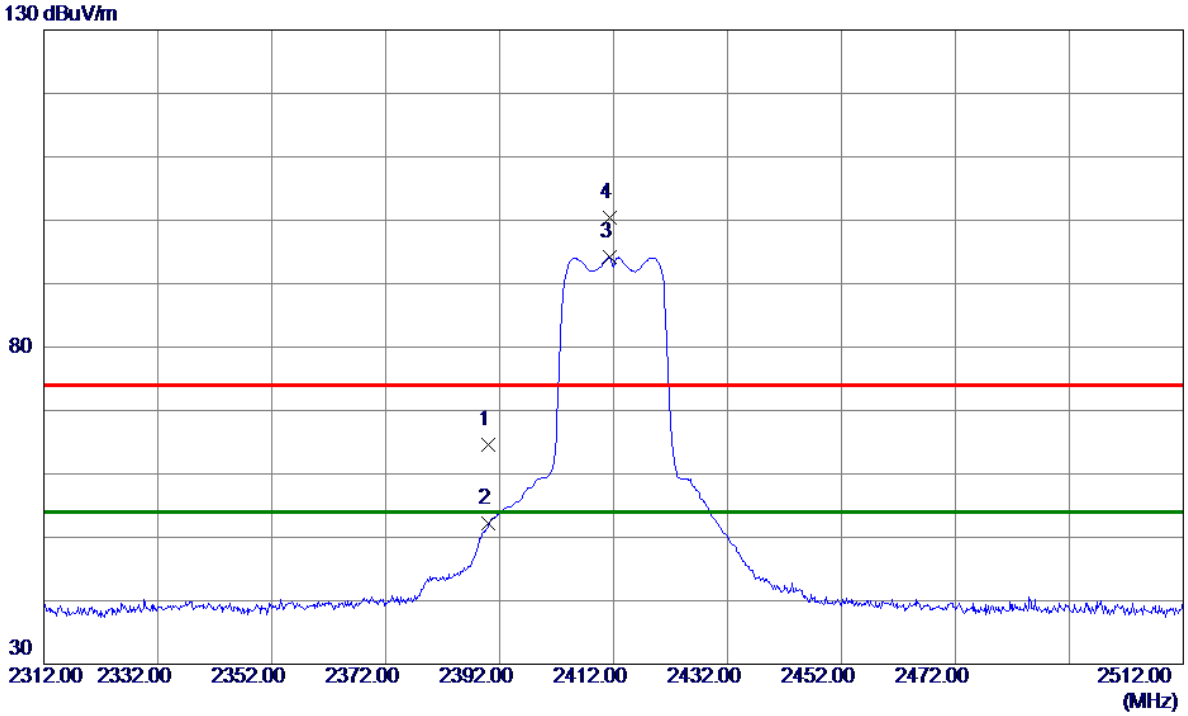
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4923.4100	56.26	-10.31	45.95	54.00	-8.05	AVG	
2	4924.3700	63.84	-10.31	53.53	74.00	-20.47	Peak	

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

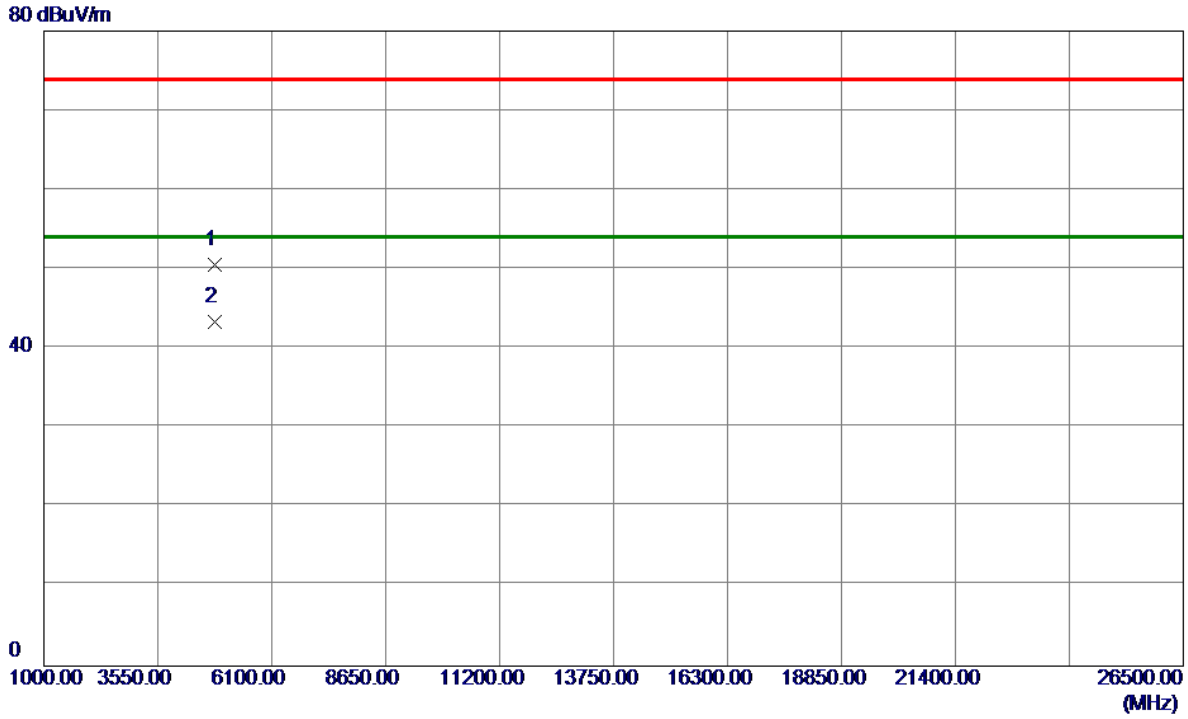
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	32.76	31.79	64.55	74.00	-9.45	Peak	
2	2390.0000	20.32	31.79	52.11	54.00	-1.89	AVG	
3 *	2411.3000	62.43	31.85	94.28	54.00	40.28	AVG	No Limit
4	2411.4000	68.50	31.85	100.35	74.00	26.35	Peak	No Limit

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

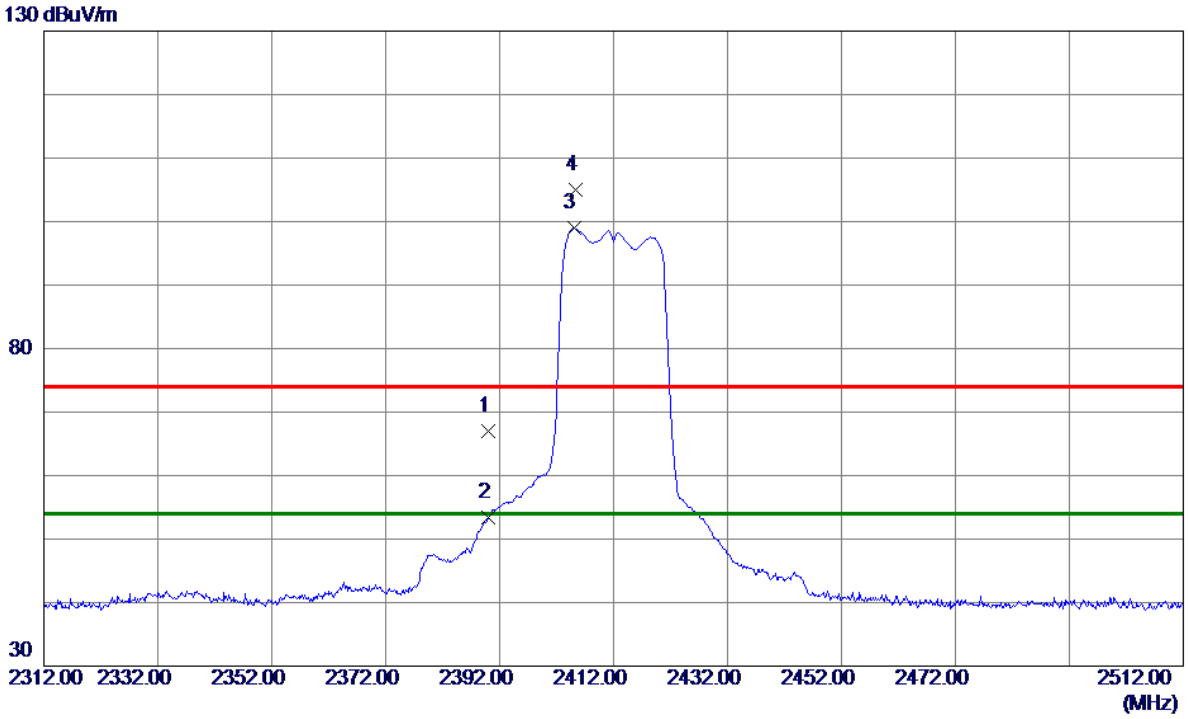
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4817.3000	61.38	-10.75	50.63	74.00	-23.37	Peak	
2 *	4818.9500	54.06	-10.75	43.31	54.00	-10.69	AVG	

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

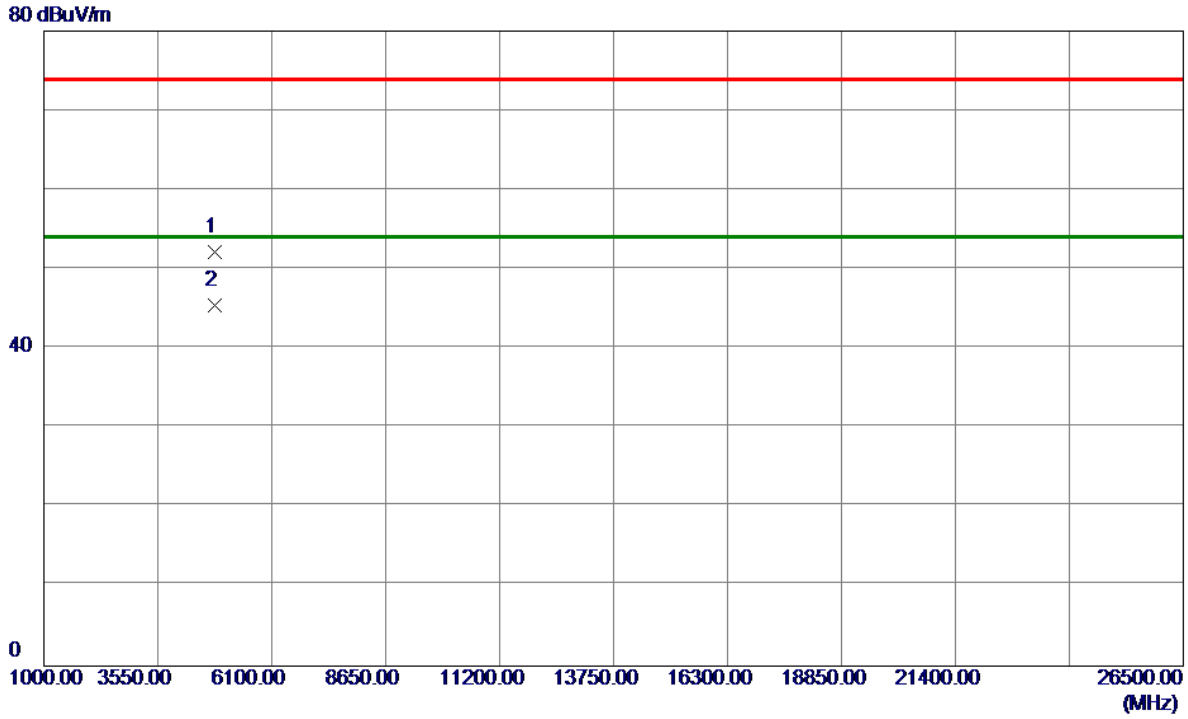
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	35.25	31.79	67.04	74.00	-6.96	Peak	
2	2390.0000	21.66	31.79	53.45	54.00	-0.55	AVG	
3 *	2405.0000	67.12	31.83	98.95	54.00	44.95	AVG	No Limit
4	2405.3000	73.07	31.83	104.90	74.00	30.90	Peak	No Limit

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

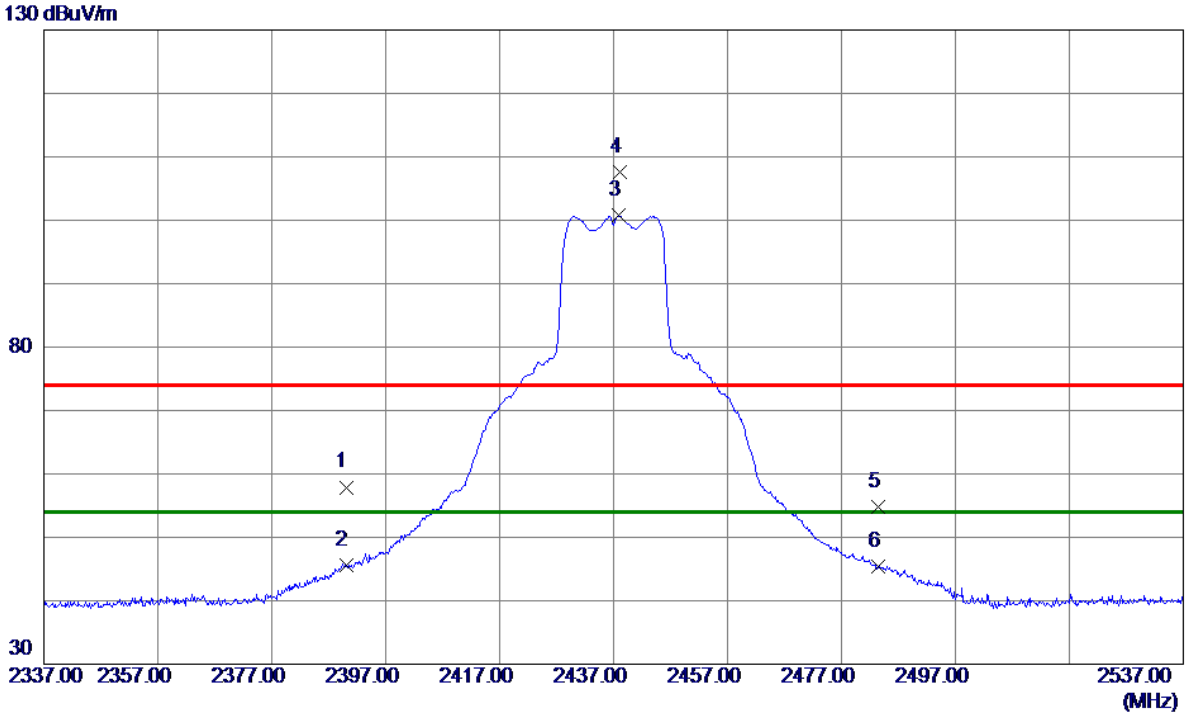
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4824.8500	62.82	-10.72	52.10	74.00	-21.90	Peak	
2 *	4825.1500	56.16	-10.72	45.44	54.00	-8.56	AVG	

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

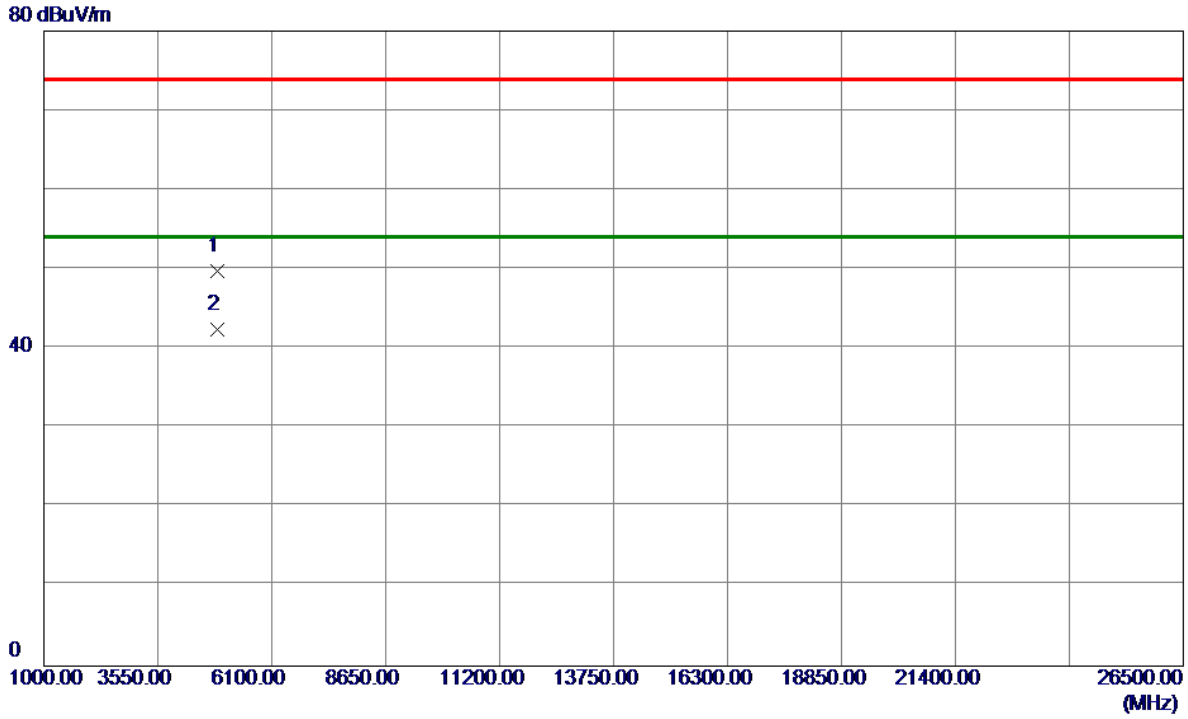
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	26.11	31.79	57.90	74.00	-16.10	Peak	
2	2390.0000	13.79	31.79	45.58	54.00	-8.42	AVG	
3 *	2437.9000	68.81	31.92	100.73	54.00	46.73	AVG	No Limit
4	2438.1000	75.67	31.92	107.59	74.00	33.59	Peak	No Limit
5	2483.5000	22.77	32.05	54.82	74.00	-19.18	Peak	
6	2483.5000	13.34	32.05	45.39	54.00	-8.61	AVG	

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

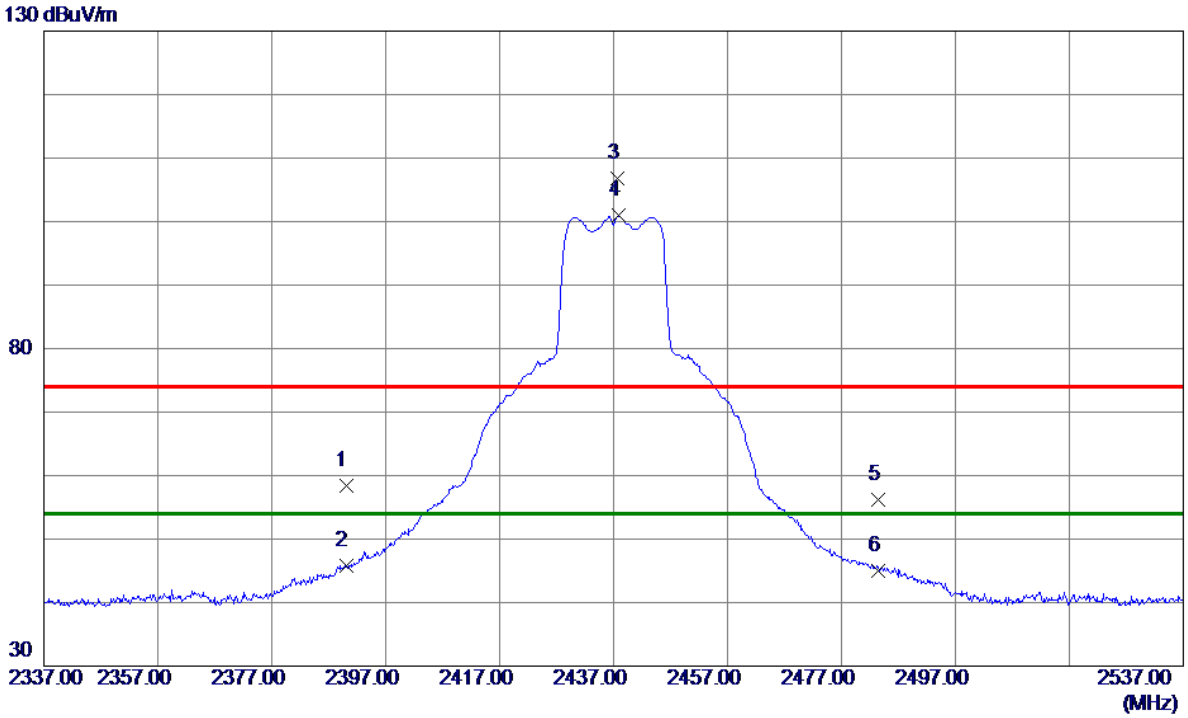
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4874.2200	60.33	-10.51	49.82	74.00	-24.18	Peak	
2 *	4874.9100	52.94	-10.51	42.43	54.00	-11.57	AVG	

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

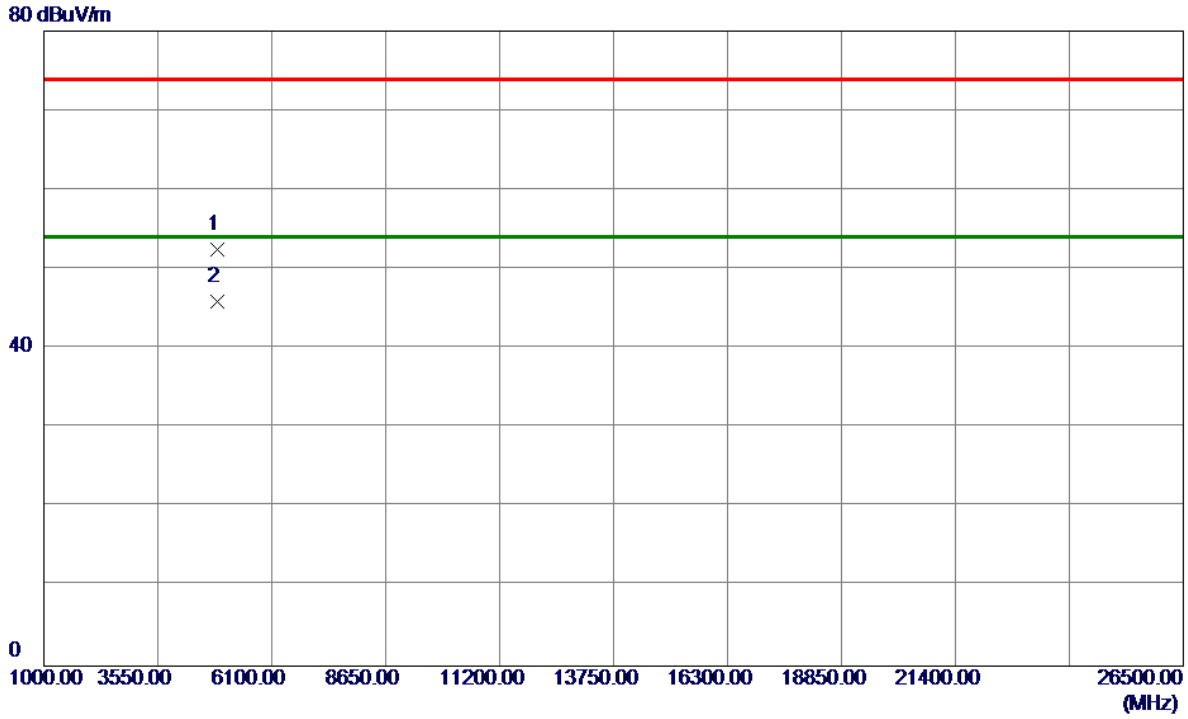
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	26.61	31.79	58.40	74.00	-15.60	Peak	
2	2390.0000	14.02	31.79	45.81	54.00	-8.19	AVG	
3	2437.7000	74.84	31.92	106.76	74.00	32.76	Peak	No Limit
4 *	2437.8000	69.00	31.92	100.92	54.00	46.92	AVG	No Limit
5	2483.5000	24.07	32.05	56.12	74.00	-17.88	Peak	
6	2483.5000	12.88	32.05	44.93	54.00	-9.07	AVG	

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

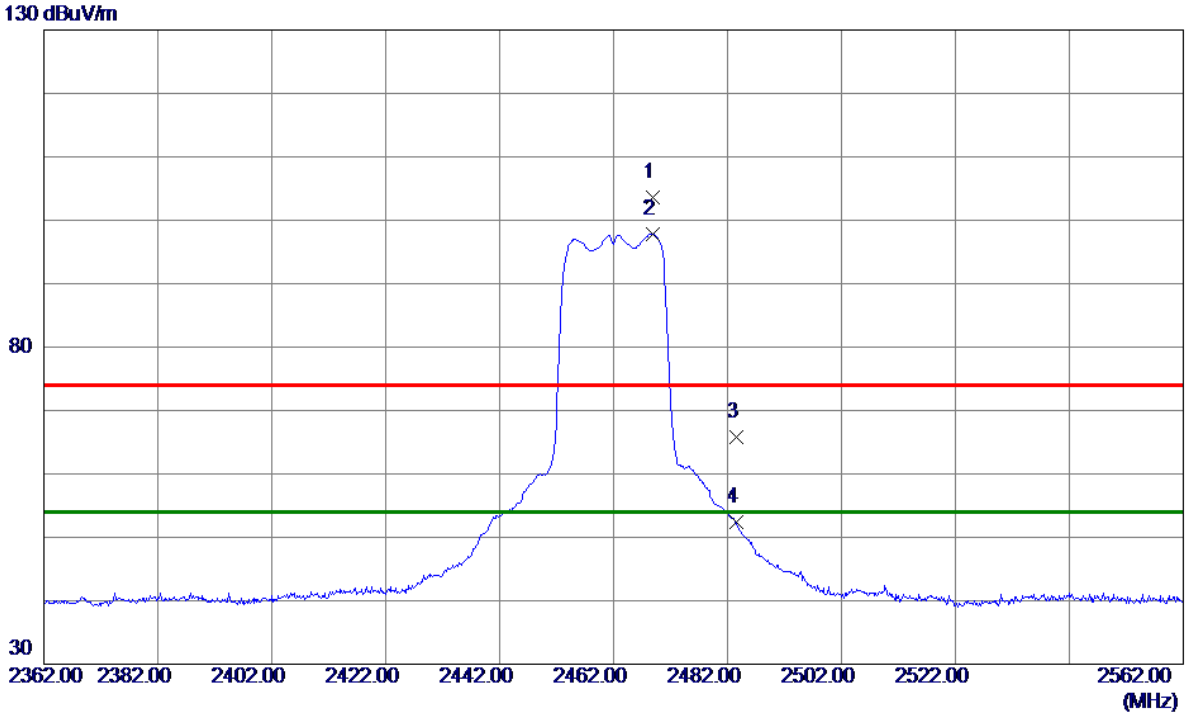
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.5500	62.97	-10.52	52.45	74.00	-21.55	Peak	
2 *	4874.2100	56.45	-10.51	45.94	54.00	-8.06	AVG	

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

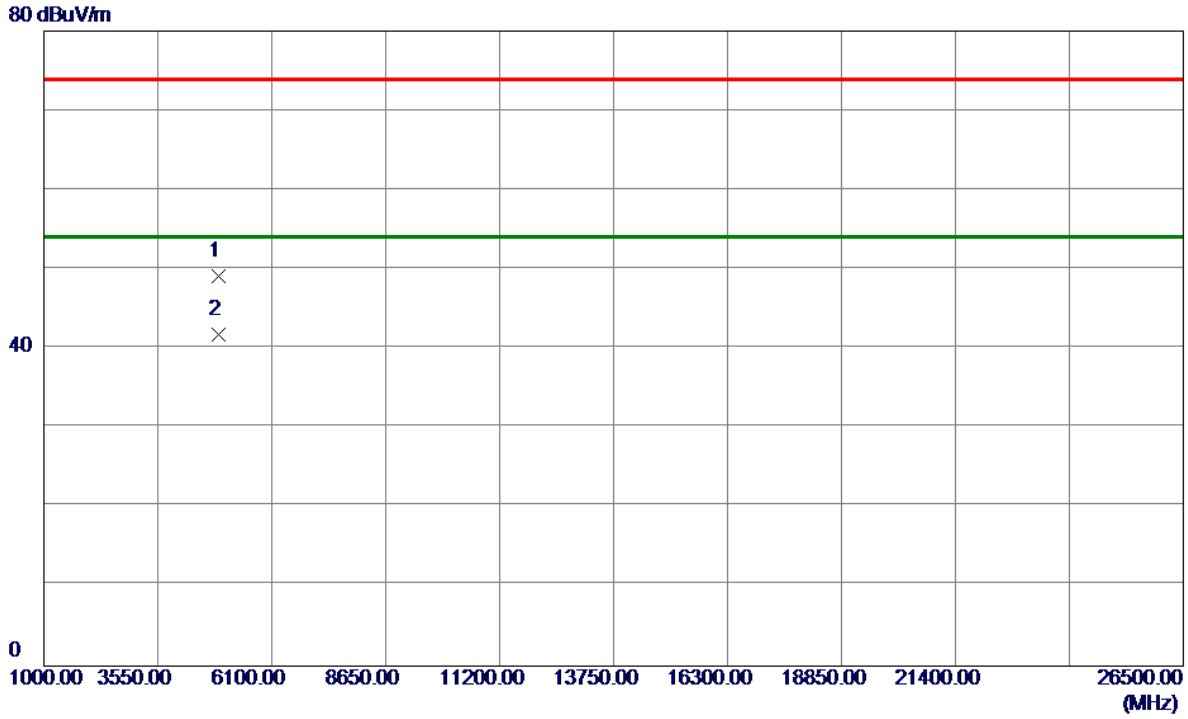
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2468.8000	71.66	32.01	103.67	74.00	29.67	Peak	No Limit
2 *	2468.9000	65.78	32.01	97.79	54.00	43.79	AVG	No Limit
3	2483.5000	33.69	32.05	65.74	74.00	-8.26	Peak	
4	2483.5000	20.32	32.05	52.37	54.00	-1.63	AVG	

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

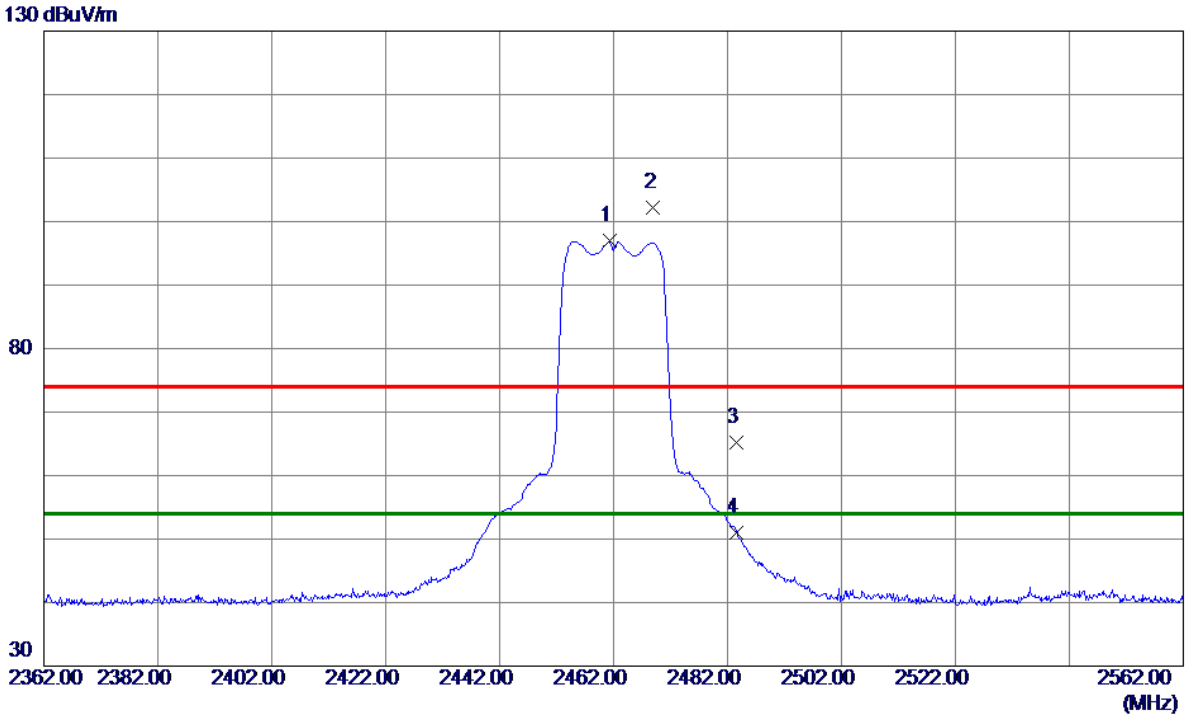
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4923.9200	59.43	-10.31	49.12	74.00	-24.88	Peak	
2 *	4924.0810	52.14	-10.31	41.83	54.00	-12.17	AVG	

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

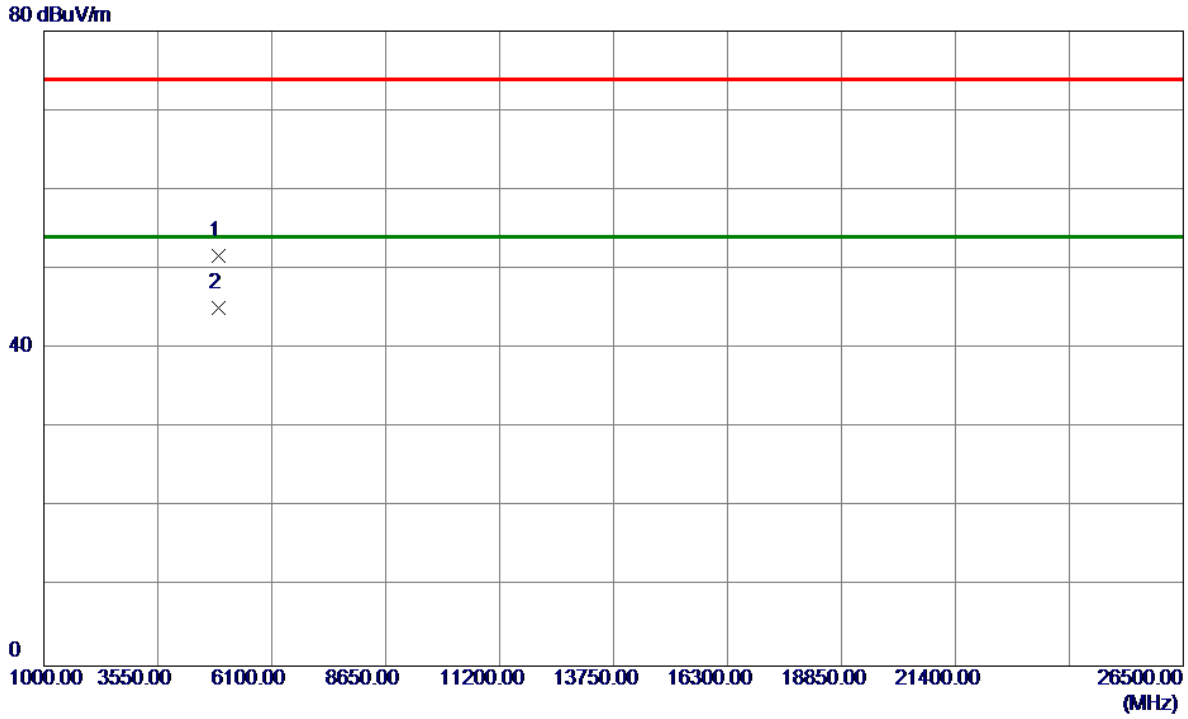
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2461.3000	64.95	31.99	96.94	54.00	42.94	AVG	No Limit
2	2469.0000	70.15	32.01	102.16	74.00	28.16	Peak	No Limit
3	2483.5000	33.21	32.05	65.26	74.00	-8.74	Peak	
4	2483.5000	18.99	32.05	51.04	54.00	-2.96	AVG	

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

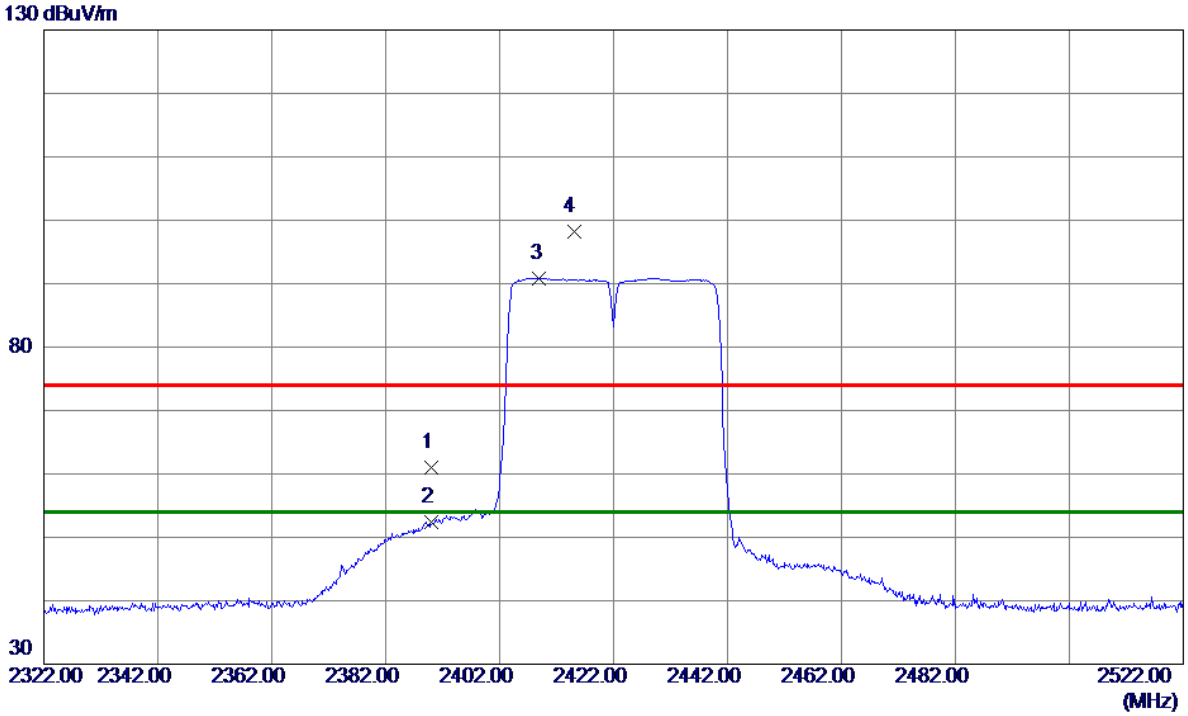
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4923.7500	62.03	-10.31	51.72	74.00	-22.28	Peak	
2 *	4924.1600	55.37	-10.31	45.06	54.00	-8.94	AVG	

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

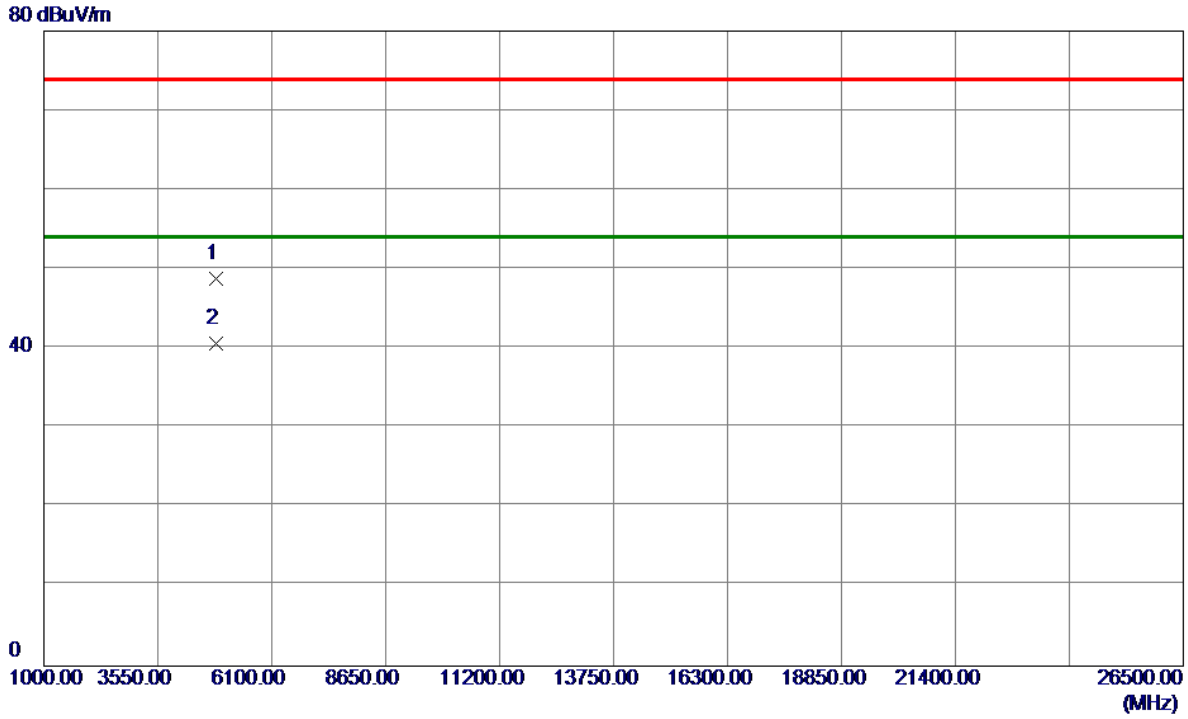
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	29.21	31.79	61.00	74.00	-13.00	Peak	
2	2390.0000	20.66	31.79	52.45	54.00	-1.55	AVG	
3 *	2409.0000	59.04	31.84	90.88	54.00	36.88	AVG	No Limit
4	2415.0000	66.39	31.86	98.25	74.00	24.25	Peak	No Limit

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

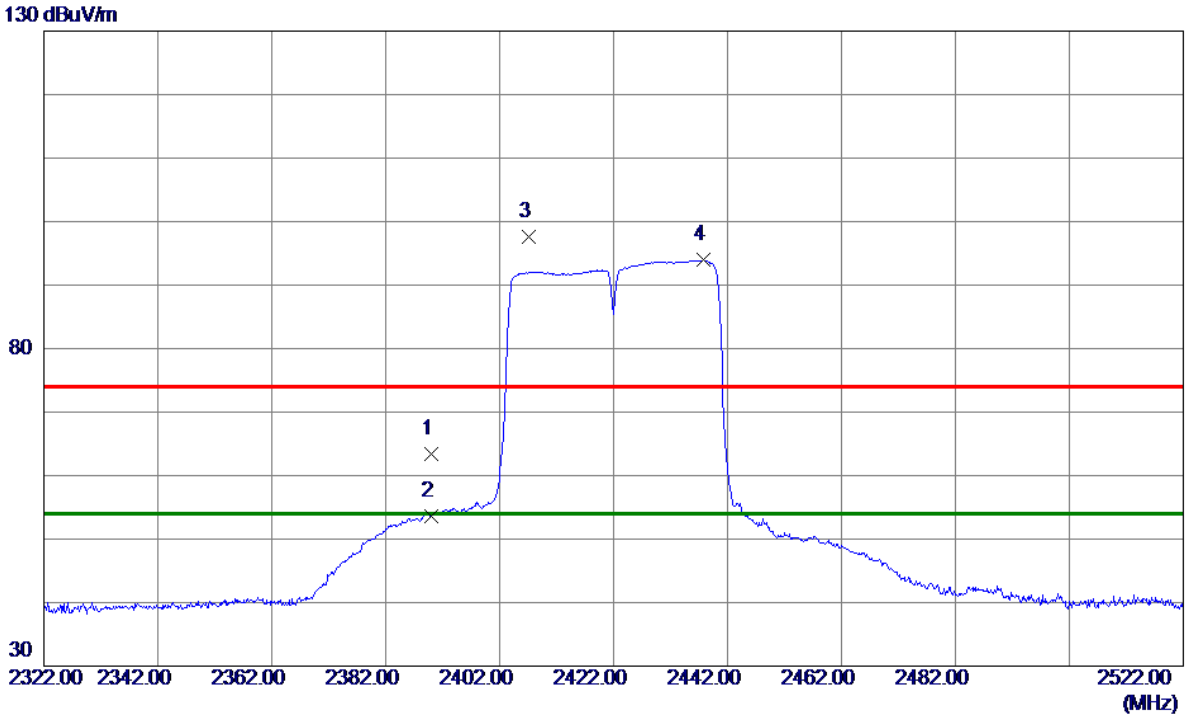
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4843.8400	59.39	-10.64	48.75	74.00	-25.25	Peak	
2 *	4844.3600	51.22	-10.64	40.58	54.00	-13.42	AVG	

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

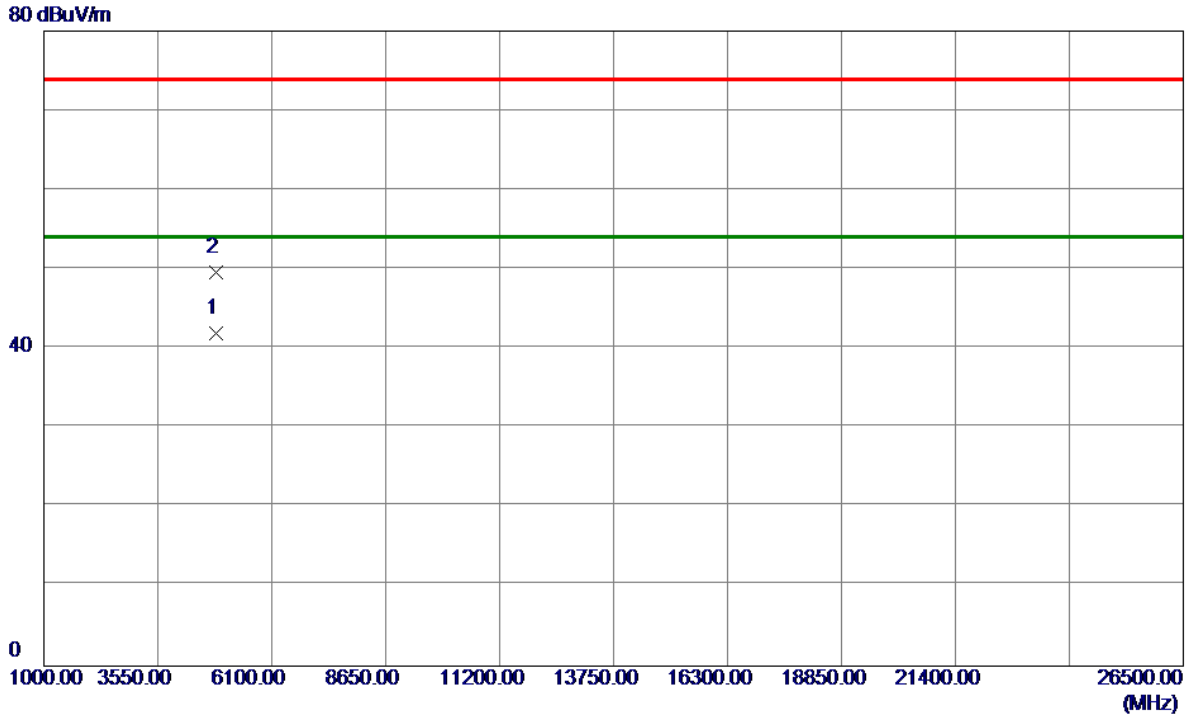
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	31.59	31.79	63.38	74.00	-10.62	Peak	
2	2390.0000	21.90	31.79	53.69	54.00	-0.31	AVG	
3	2407.1000	65.69	31.84	97.53	74.00	23.53	Peak	No Limit
4 *	2437.7000	62.04	31.92	93.96	54.00	39.96	AVG	No Limit

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

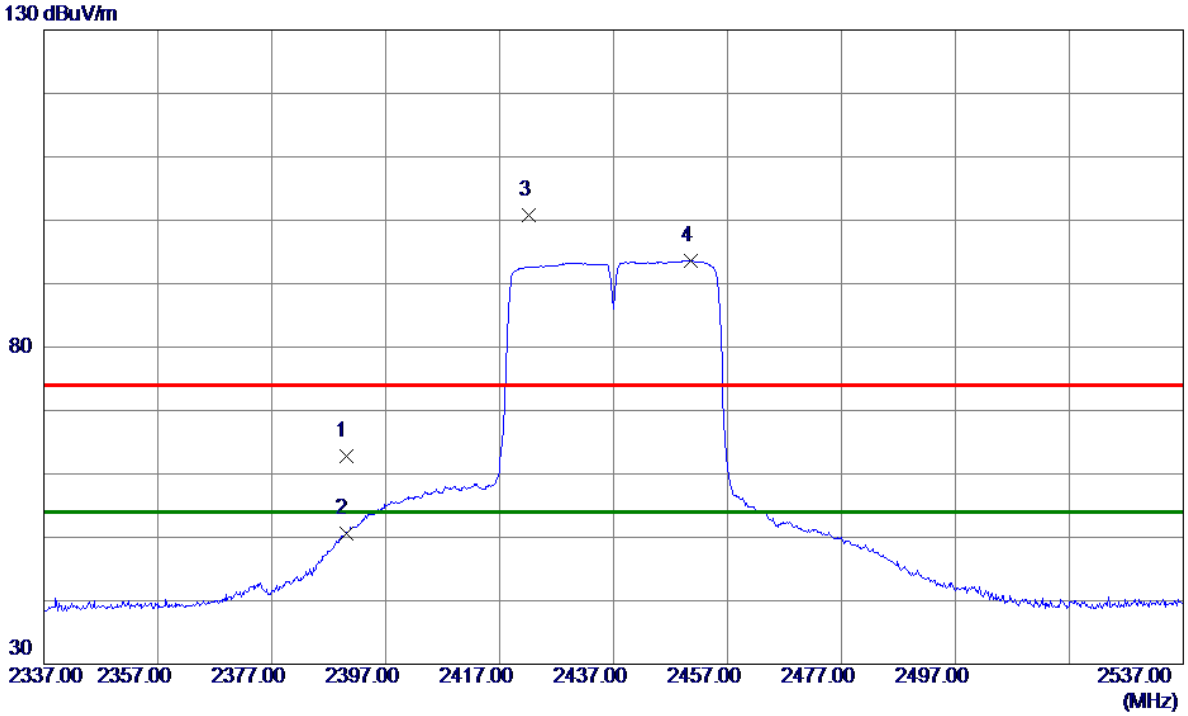
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4843.9600	52.61	-10.64	41.97	54.00	-12.03	AVG	
2	4844.2300	60.30	-10.64	49.66	74.00	-24.34	Peak	

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

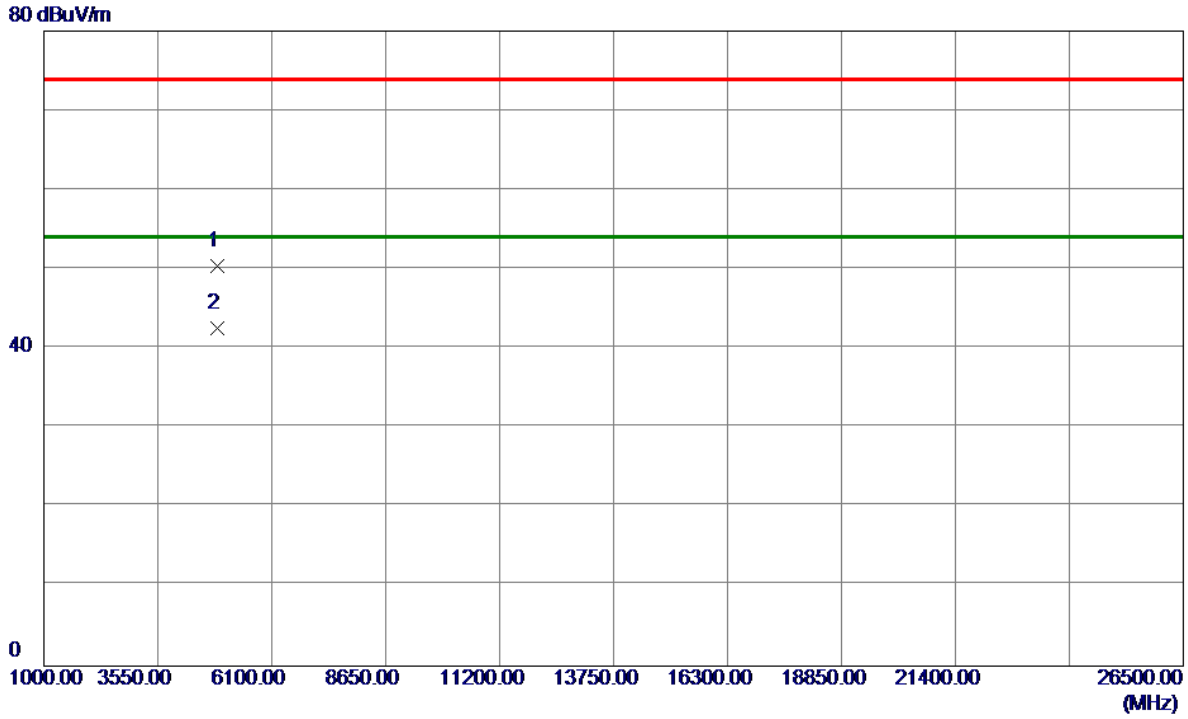
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	31.06	31.79	62.85	74.00	-11.15	Peak	
2	2390.0000	18.88	31.79	50.67	54.00	-3.33	AVG	
3	2422.1000	68.83	31.88	100.71	74.00	26.71	Peak	No Limit
4 *	2450.5000	61.66	31.96	93.62	54.00	39.62	AVG	No Limit

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

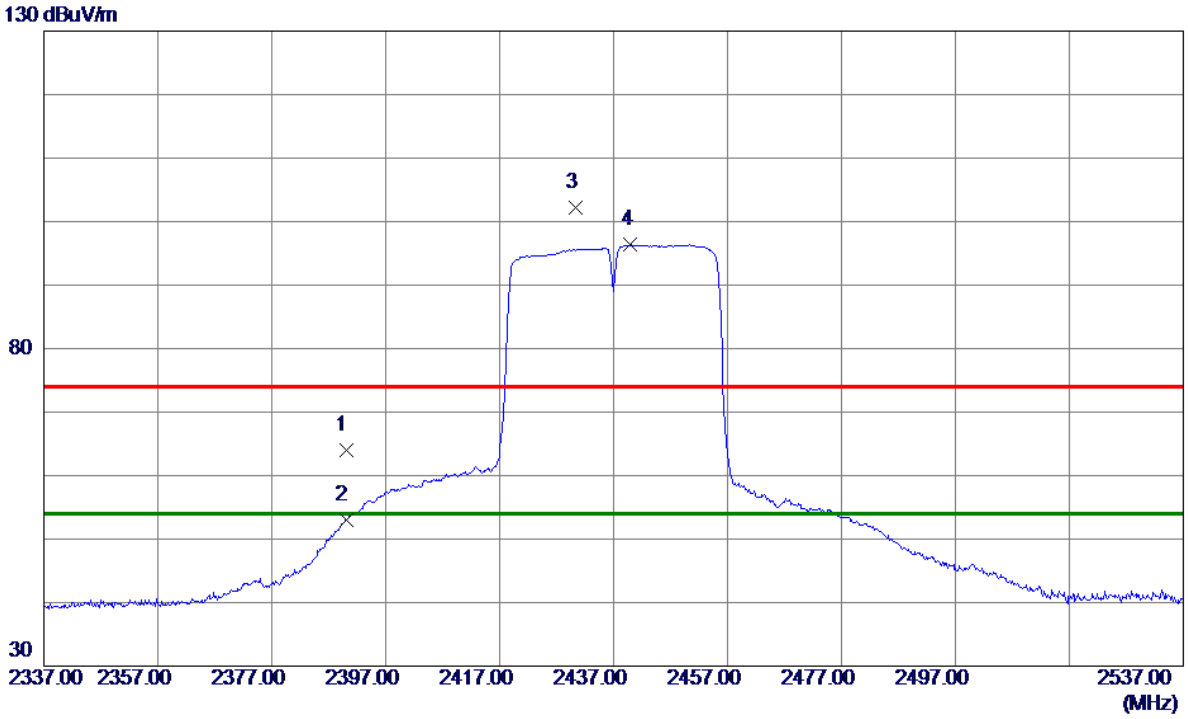
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.6200	60.97	-10.52	50.45	74.00	-23.55	Peak	
2 *	4874.1600	53.02	-10.51	42.51	54.00	-11.49	AVG	

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

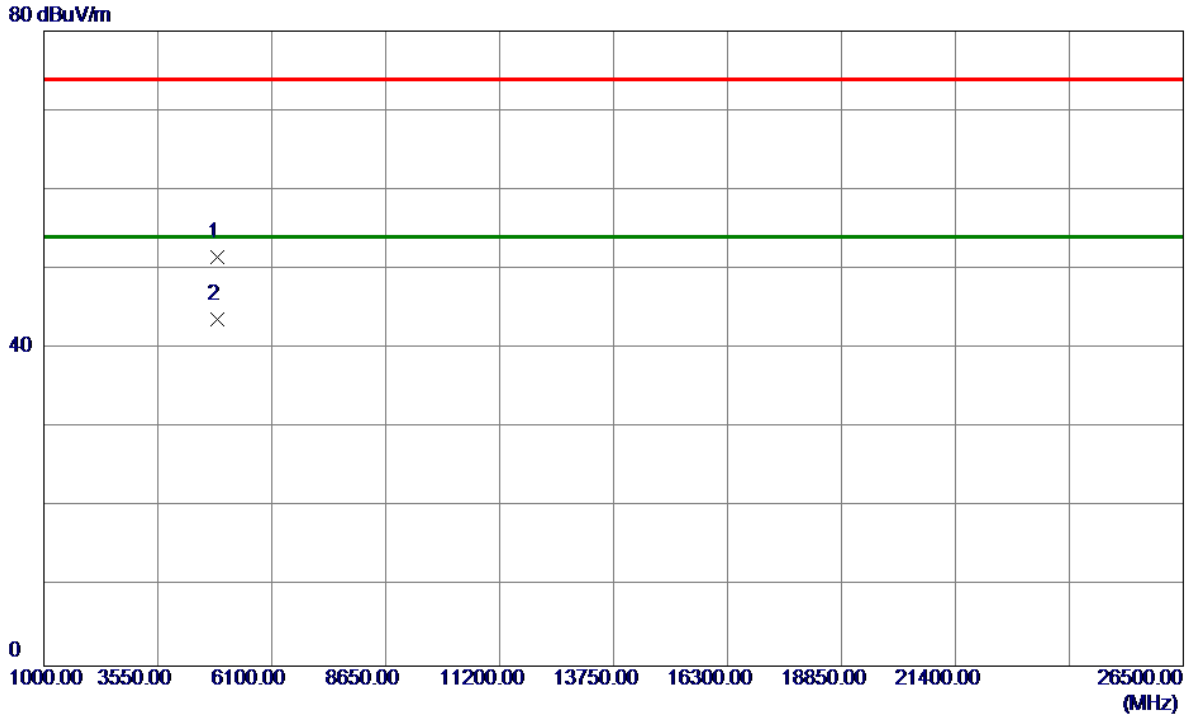
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	32.13	31.79	63.92	74.00	-10.08	Peak	
2	2390.0000	21.12	31.79	52.91	54.00	-1.09	AVG	
3	2430.3000	70.34	31.90	102.24	74.00	28.24	Peak	No Limit
4 *	2440.0000	64.40	31.93	96.33	54.00	42.33	AVG	No Limit

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

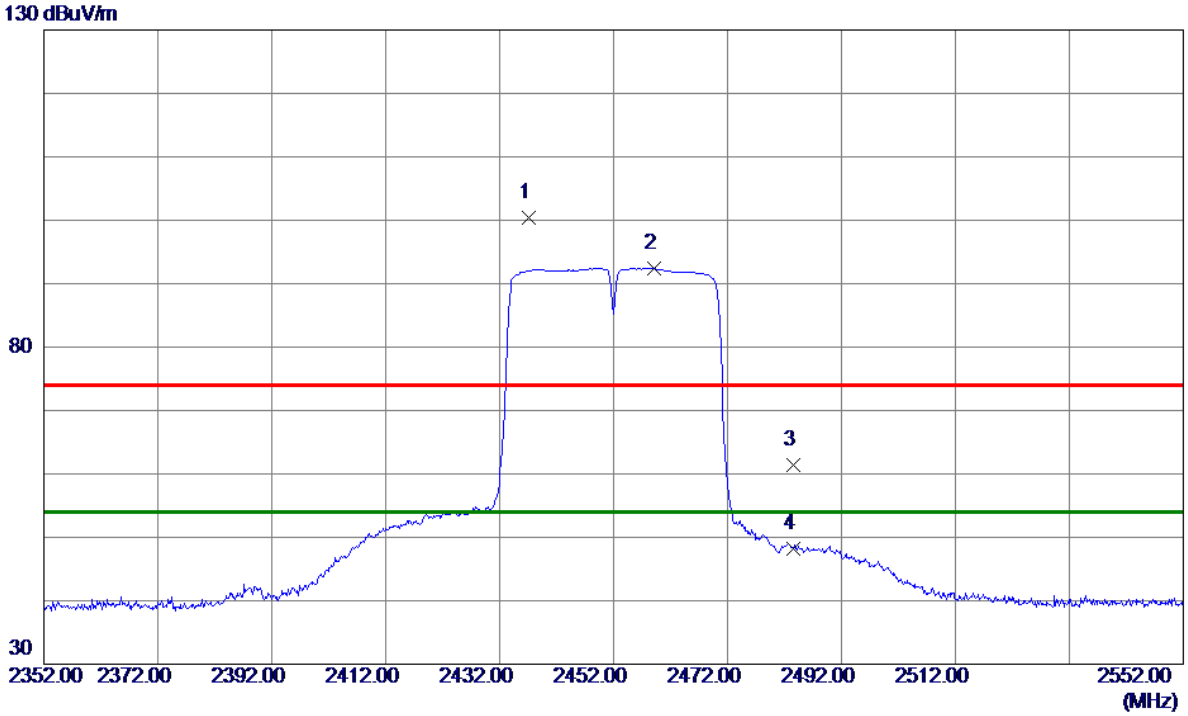
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4874.3700	62.08	-10.51	51.57	74.00	-22.43	Peak	
2 *	4874.4500	54.12	-10.51	43.61	54.00	-10.39	AVG	

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

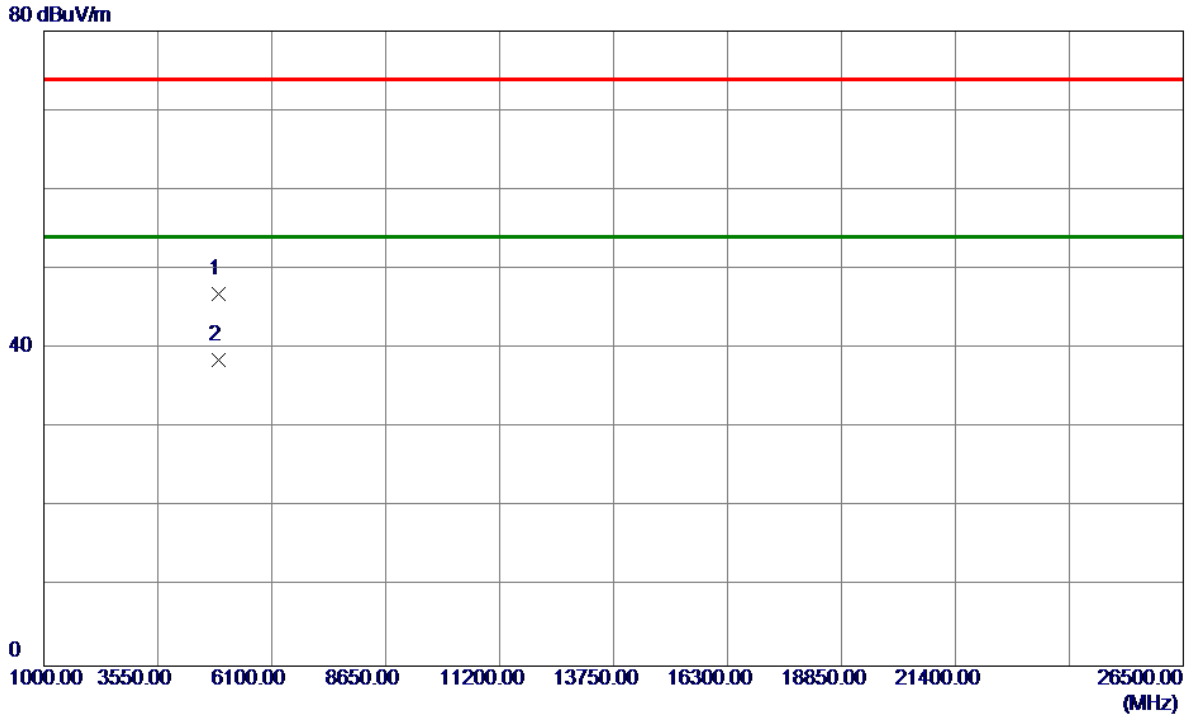
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2437.2000	68.55	31.92	100.47	74.00	26.47	Peak	No Limit
2 *	2459.2000	60.43	31.98	92.41	54.00	38.41	AVG	No Limit
3	2483.5000	29.27	32.05	61.32	74.00	-12.68	Peak	
4	2483.5000	16.10	32.05	48.15	54.00	-5.85	AVG	

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

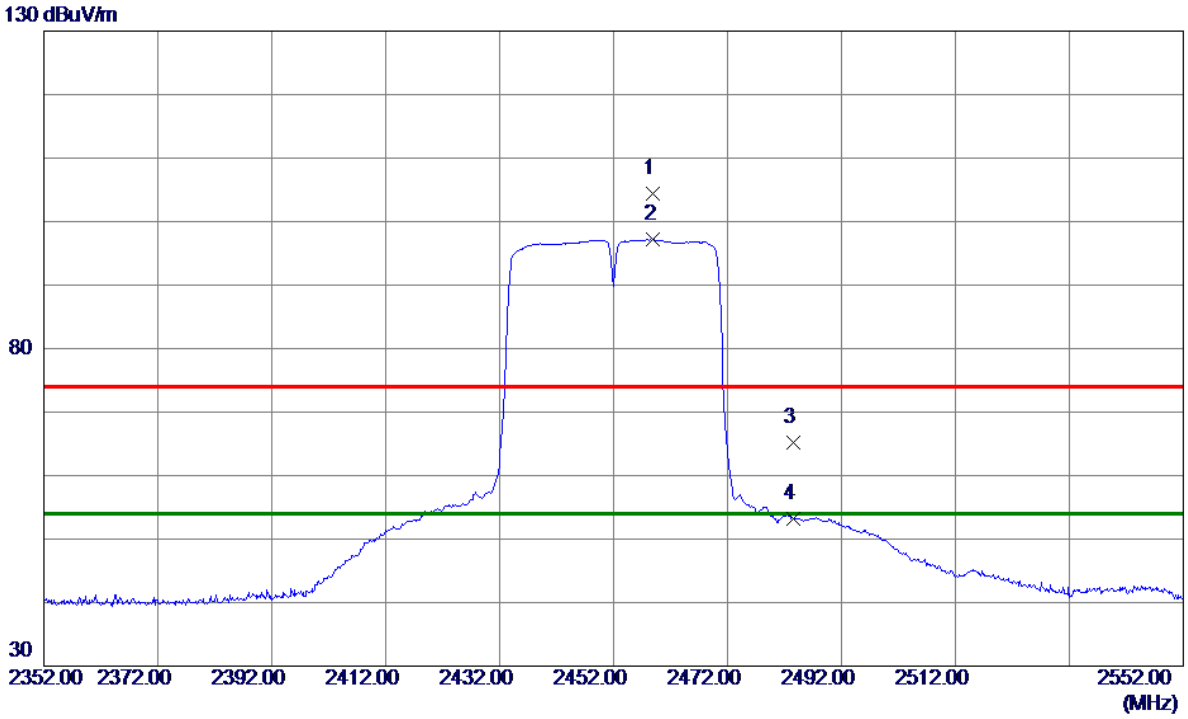
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4903.2700	57.20	-10.39	46.81	74.00	-27.19	Peak	
2 *	4903.8100	48.89	-10.39	38.50	54.00	-15.50	AVG	

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

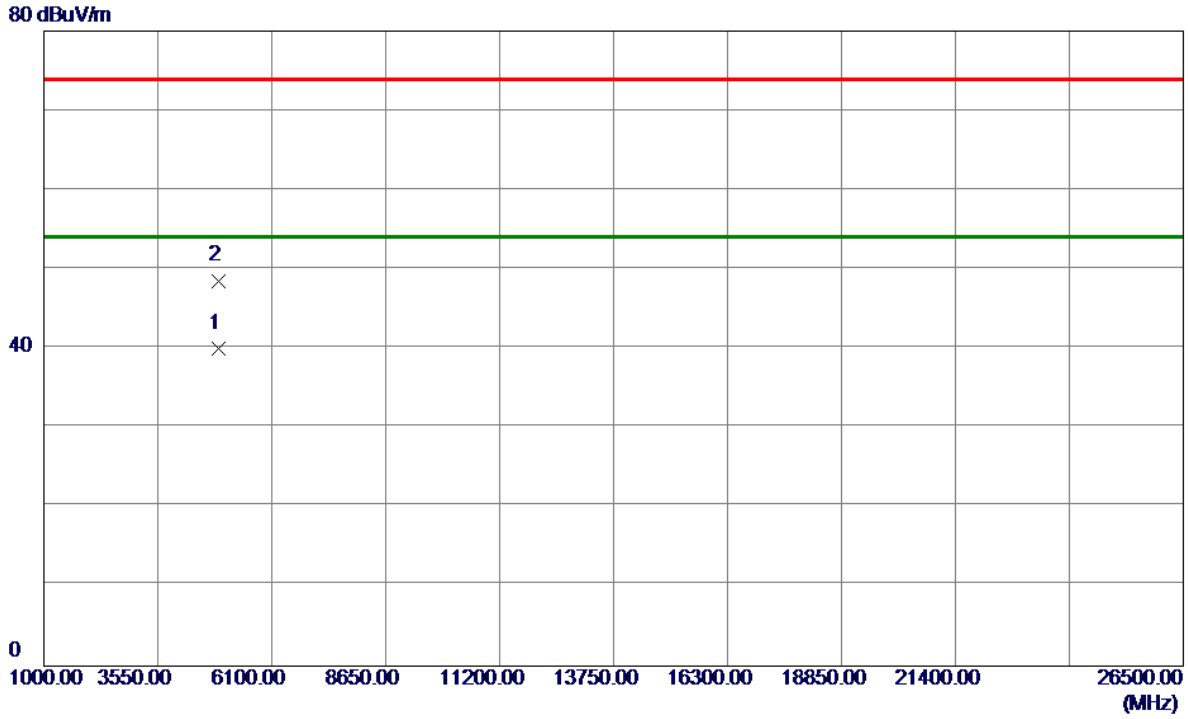
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2458.9000	72.47	31.98	104.45	74.00	30.45	Peak	No Limit
2 *	2459.0000	65.21	31.98	97.19	54.00	43.19	AVG	No Limit
3	2483.5000	33.08	32.05	65.13	74.00	-8.87	Peak	
4	2483.5000	21.09	32.05	53.14	54.00	-0.86	AVG	

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

Horizontal

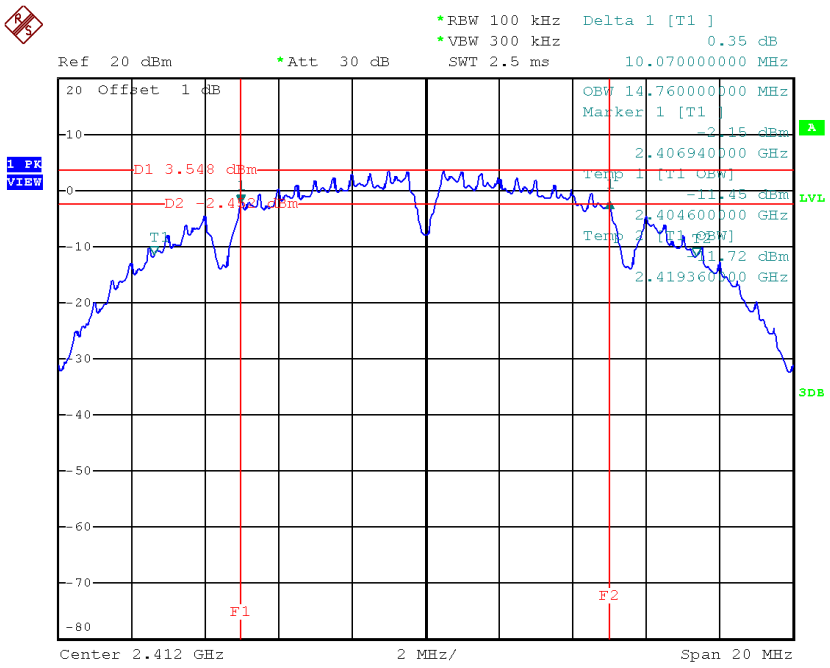


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4903.4600	50.32	-10.39	39.93	54.00	-14.07	AVG	
2	4904.2100	58.95	-10.39	48.56	74.00	-25.44	Peak	

APPENDIX E - BANDWIDTH

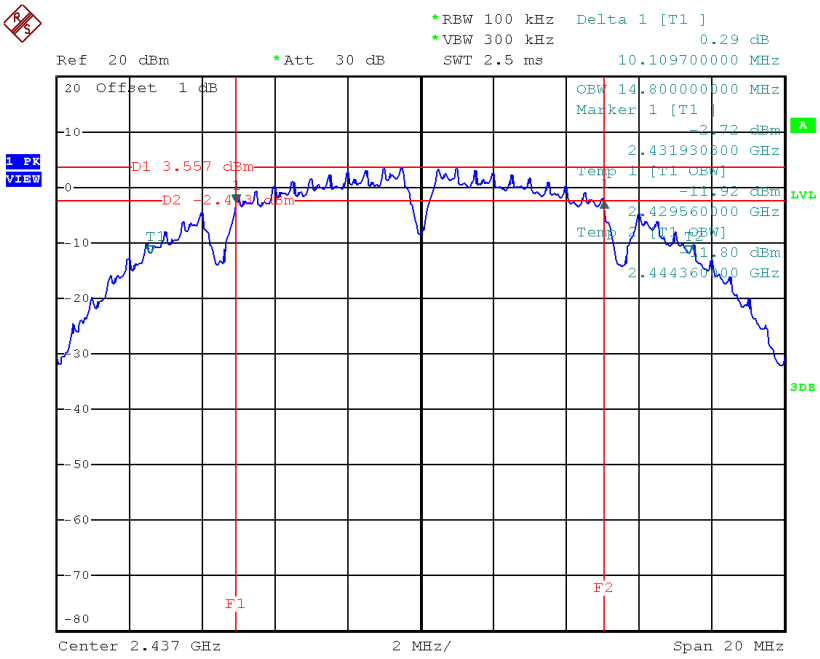
Test Mode: TX B Mode_CH01/06/11				
Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	10.07	14.76	500	Complies
2437	10.11	14.80	500	Complies
2462	10.10	14.72	500	Complies

TX CH01



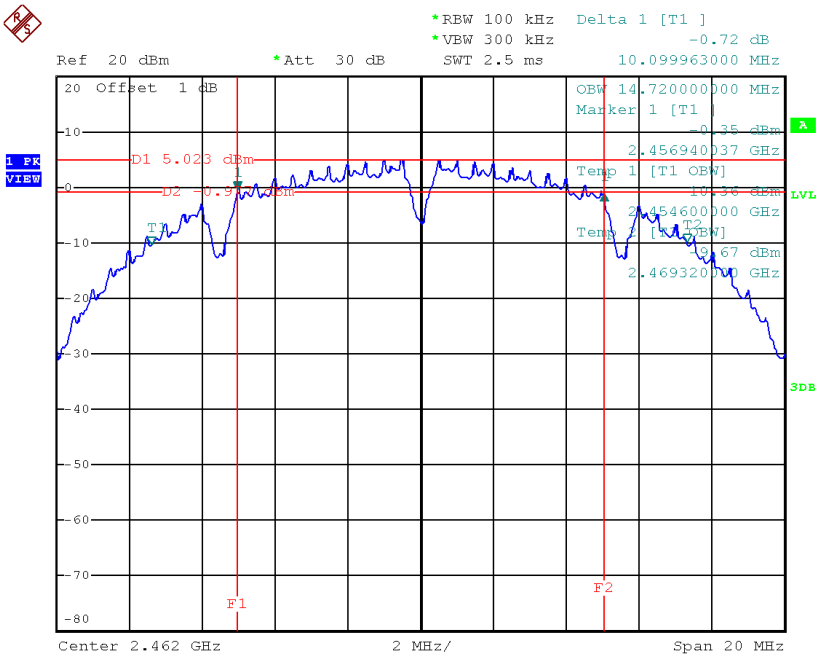
Date: 20.OCT.2018 13:42:47

TX CH06



Date: 20.OCT.2018 13:56:07

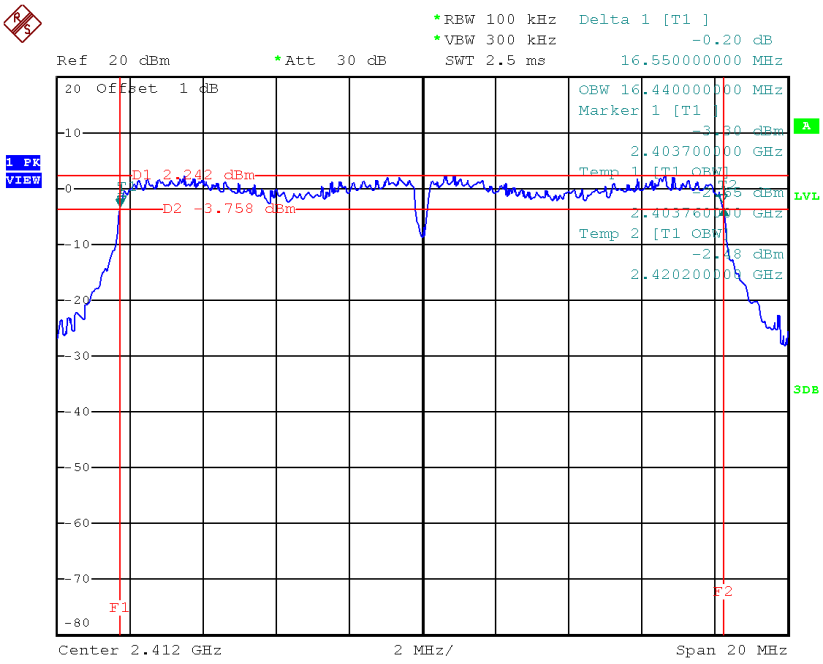
TX CH11



Date: 20.OCT.2018 13:59:28

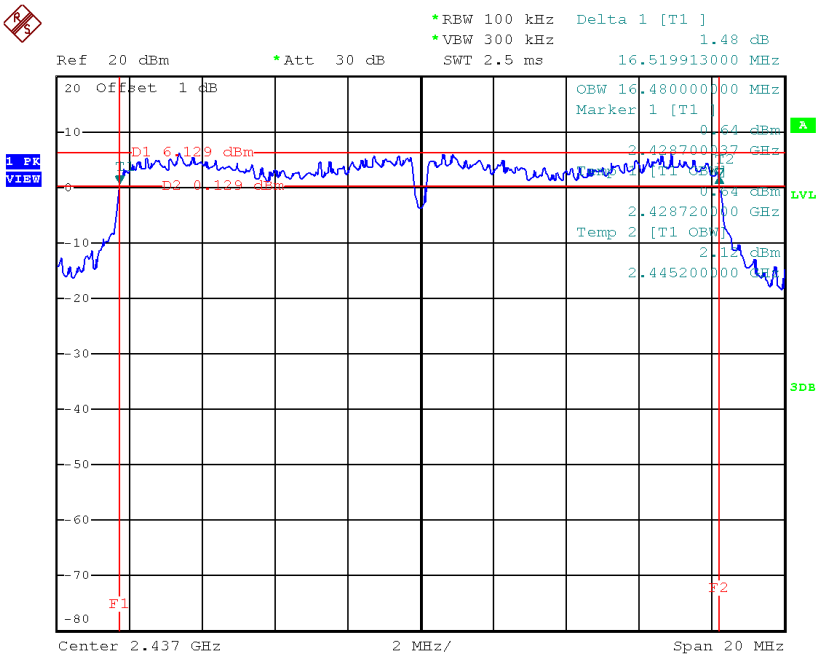
Test Mode: TX G Mode_CH01/06/11				
Frequency (MHz)	6 dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	16.55	16.44	500	Complies
2437	16.52	16.48	500	Complies
2462	16.52	16.44	500	Complies

TX CH01



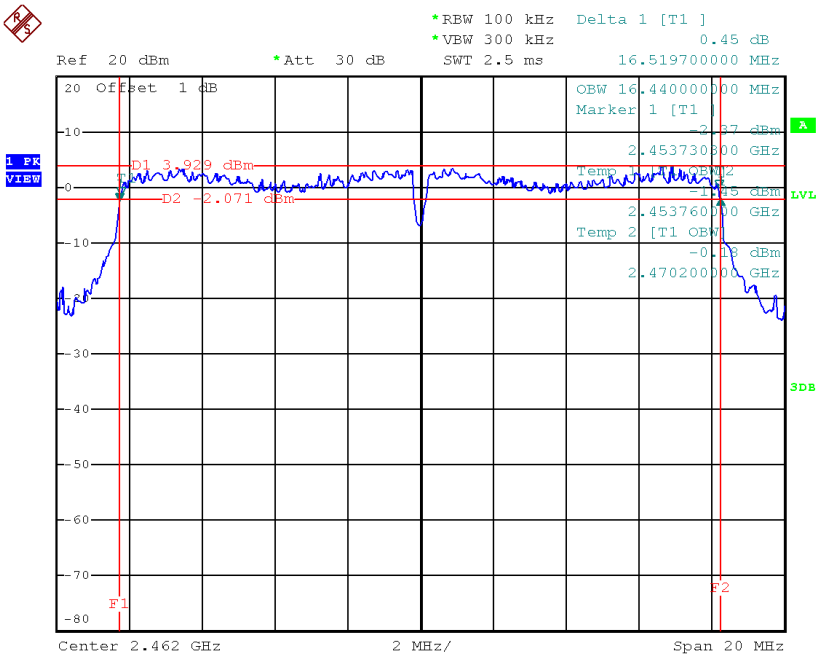
Date: 20.OCT.2018 14:07:05

TX CH06



Date: 20.OCT.2018 14:11:02

TX CH11



Date: 20.OCT.2018 14:21:24