FCC Radio Test Report

FCC ID: QMPM505PLUS

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

Project No.	:	1707C123
Equipment	:	ADSL2+/Ethernet WAN,Broadband Gateway
Model Name	:	M505+
Applicant	:	DQ TECHNOLOGY, INC.
Address	:	1343 Columbia Dr., #415, Richardson, TX 75081, U.S.A

Date of Receipt	:	Jul. 17, 2017
Date of Test	:	Jul. 17, 2017 ~ Aug. 08, 2017
Issued Date	:	Aug. 09, 2017
Tested by	:	BTL Inc.

Testing Engineer : Shawn Xiao
(Shawn Xiao)

Technical Manager : David Mao
(David Mao)

Authorized Signatory : Steven Lu
(Steven Lu)

BTL INC.

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
TEL: +86-769-8318-3000 FAX: +86-769-8319-6000

Declaration

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

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

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

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

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

Limitation

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

Table of Contents Page

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

6.1 APPLIED PROCEDURES / LIMIT 22
6.1.1 TEST PROCEDURE 22
6.1.2 DEVIATION FROM STANDARD 22
6.1.3 TEST SETUP 22
6.1.4 EUT OPERATION CONDITIONS 22
6.1.5 EUT TEST CONDITIONS 22
6.1.6 TEST RESULTS 22
7 . ANTENNA CONDUCTED SPURIOUS EMISSION 23
7.1 APPLIED PROCEDURES / LIMIT 23
7.1.1 TEST PROCEDURE 23
7.1.2 DEVIATION FROM STANDARD 23
7.1.3 TEST SETUP 23
7.1.4 EUT OPERATION CONDITIONS 23
7.1.5 EUT TEST CONDITIONS 23
7.1.6 TEST RESULTS 23
8 . POWER SPECTRAL DENSITY TEST 24
8.1 APPLIED PROCEDURES / LIMIT 24
8.1.1 TEST PROCEDURE 24
8.1.2 DEVIATION FROM STANDARD 24
8.1.3 TEST SETUP 24
8.1.4 EUT OPERATION CONDITIONS 24
8.1.5 EUT TEST CONDITIONS 24
8.1.6 TEST RESULTS 24
9 . MEASUREMENT INSTRUMENTS LIST 25
10 . EUT TEST PHOTO 27
ATTACHMENT A - CONDUCTED EMISSION 31
ATTACHMENT B - RADIATED EMISSION (9KHZ TO 30MHZ) 34
ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ) 39
ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ) 46
ATTACHMENT E - BANDWIDTH 95
ATTACHMENT F – MAXIMUM PEAK CONDUCTED OUTPUT POWER 104
ATTACHMENT G - ANTENNA CONDUCTED SPURIOUS EMISSION 108
ATTACHMENT H - POWER SPECTRAL DENSITY 145

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-1-1707C123	Original Issue.	Aug. 09, 2017

1. CERTIFICATION

Equipment	:	ADSL2+/Ethernet WAN,Broadband Gateway
Brand Name	:	VisionNet™
Model Name	:	M505+
Applicant	:	DQ TECHNOLOGY, INC.
Manufacturer	:	DQ TECHNOLOGY, INC.
Address	:	1343 Columbia Dr., #415, Richardson, TX 75081, U.S.A
Date of Test	:	Jul. 17, 2017 ~ Aug. 08, 2017
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-1-1707C123) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

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

NOTE:

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

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3,Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.
BTL's test firm number for FCC: 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 ± 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	ADSL2+/Ethernet WAN,Broadband Gateway	
Brand Name	VisionNet™	
Model Name	M505+	
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 300 Mbps
	Output Power (Max.)	802.11b: 21.62dBm 802.11g: 29.82dBm 802.11n(20MHz): 29.58dBm 802.11n(40MHz): 29.17dBm
Power Source	DC Voltage supplied from AC/DC adapter. Model: RD1201000-C55-26MG	
Power Rating	I/P: 100~240V ~ 50/60Hz 0.6A MAX O/P: 12V⎓1A	

Note:

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

2. Channel List:

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

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	PCB	N/A	3.3	N/A
2	N/A	N/A	PCB	N/A	3.3	N/A

4.

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

Operating Mode / TX Mode	1TX	2TX
802.11b	V (ANT2)	-
802.11g	V (ANT2)	-
802.11n(20MHz)	-	V (ANT1 + ANT2)
802.11n(40MHz)	-	V (ANT1 + ANT2)

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-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ 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-20MHZ MODE CHANNEL 01/06/11
Mode 4	TX N-40MHZ MODE CHANNEL 03/06/09

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

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

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

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

Note:

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

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

(3) For radiated below 1G test, the 802.11b is found to be the worst case and recorded.

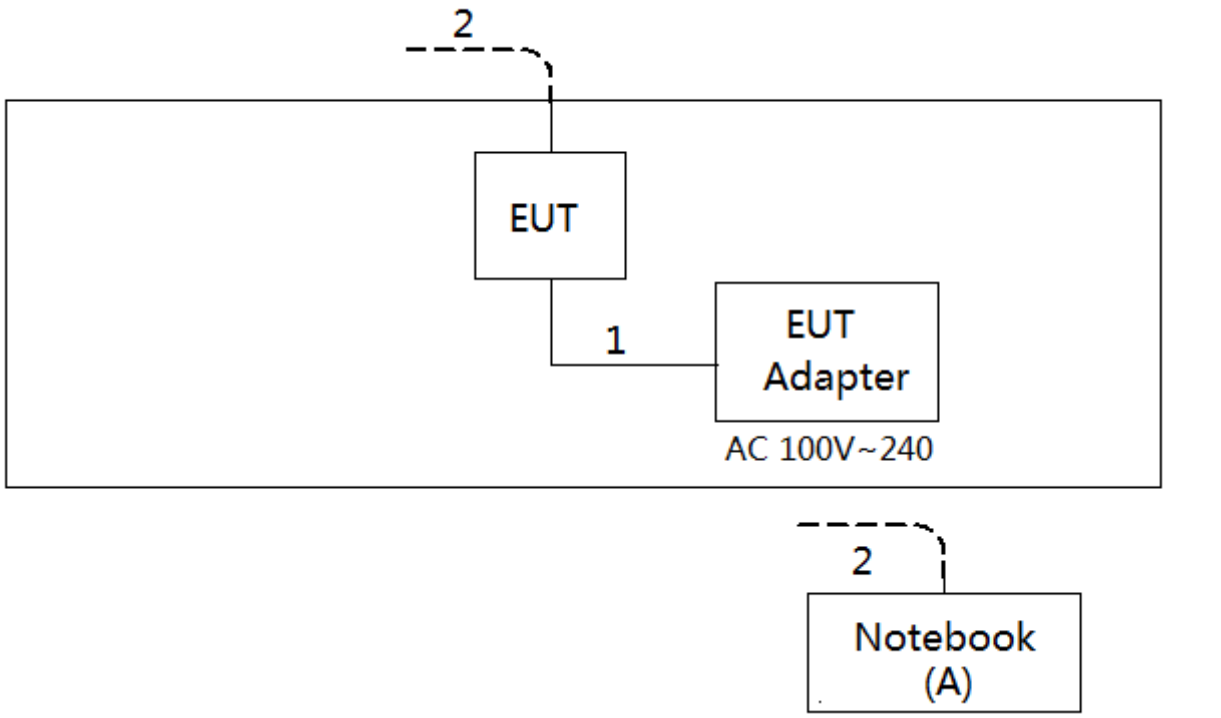
(4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of WLAN

Test software version	MTool_2.0.1.1		
Frequency (MHz)	2412	2437	2462
802.11b	60	62	64
802.11g	60	60	60
802.11n (20MHz)	46	46	46
Frequency	2422	2437	2452
802.11n (40MHz)	41	50	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.
A	Notebook	Lenovo	INSPIRON 1420	DOC	JX193A01SDC2

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.5m	AC Cable
2	NO	NO	10m	RJ-45 Cable

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-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

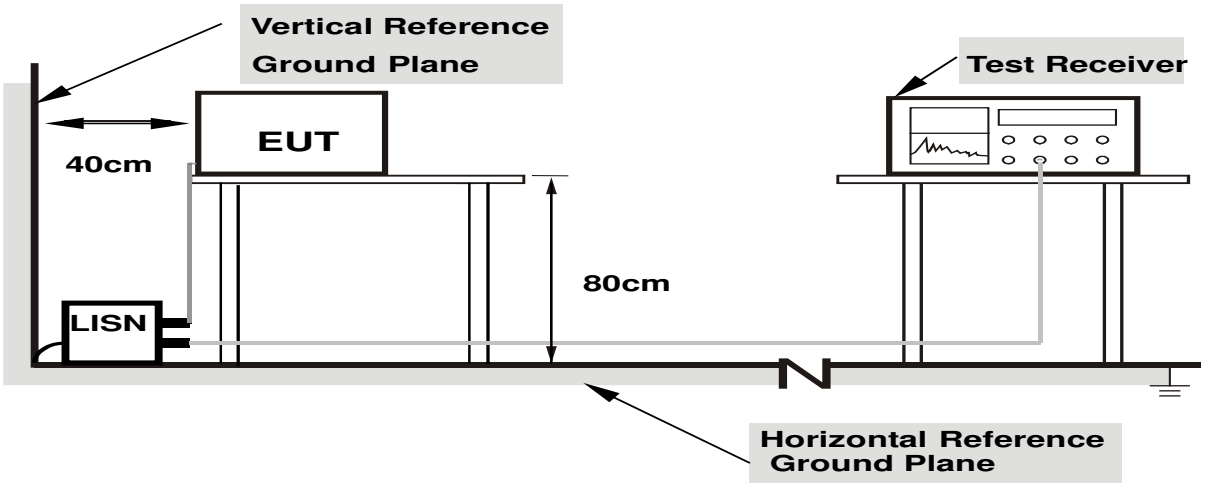
4.1.2 TEST PROCEDURE

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

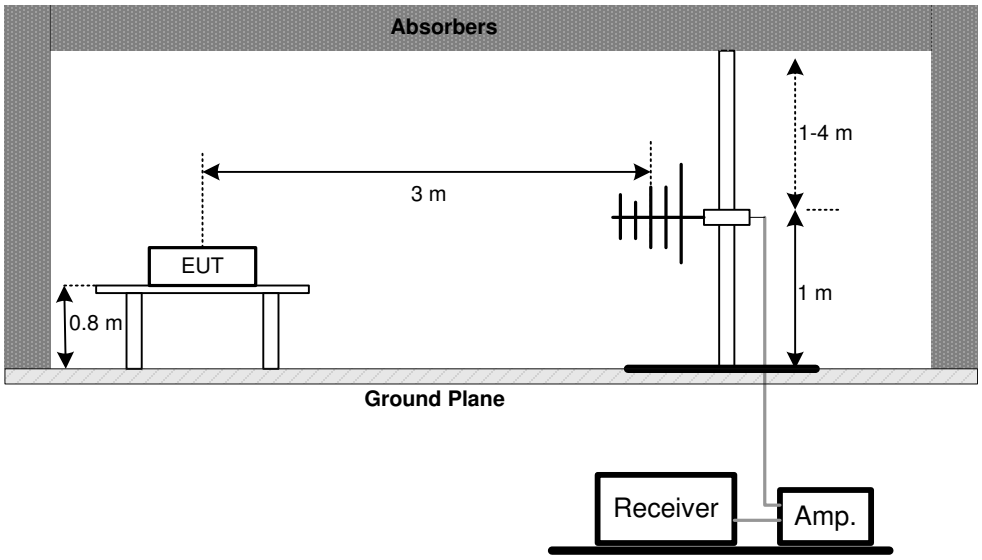
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m or 1.5m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
f. The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
g. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform. (below 1GHz)
h. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn‘t perform. (above 1GHz)
i. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

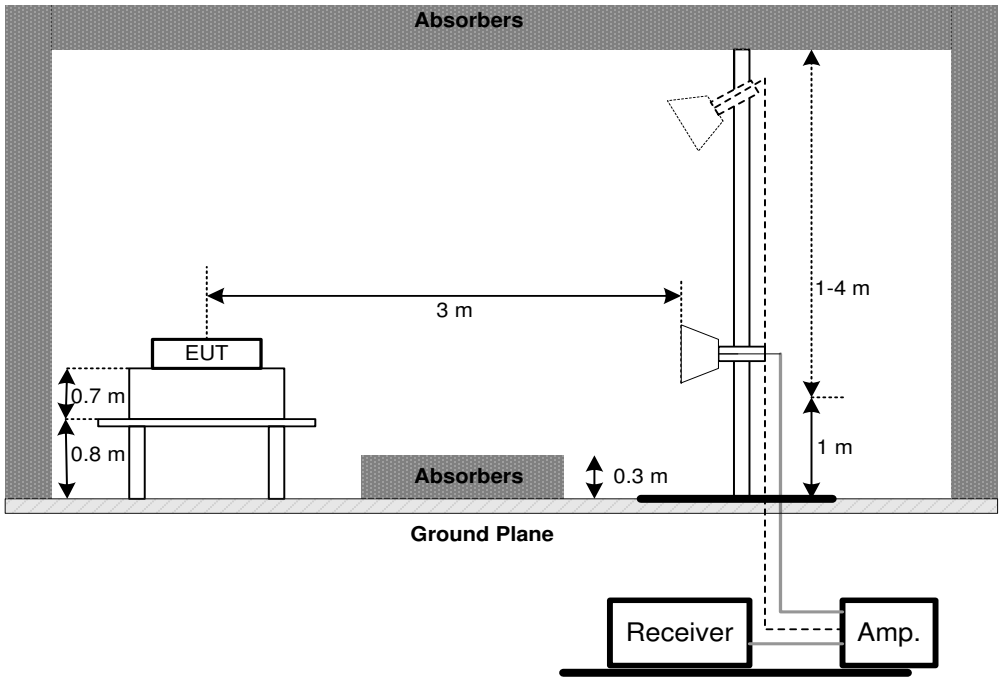
No deviation

4.2.4 TEST SETUP

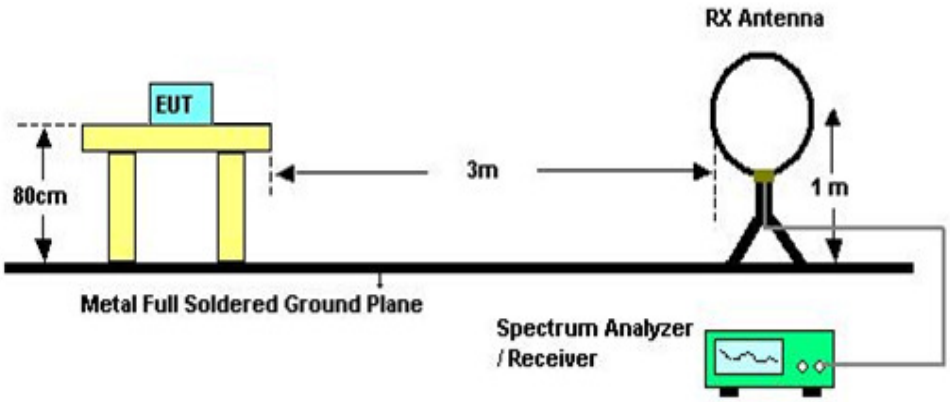
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For Radiated Emissions Below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

4.2.6 EUT TEST CONDITIONS

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

4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the 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

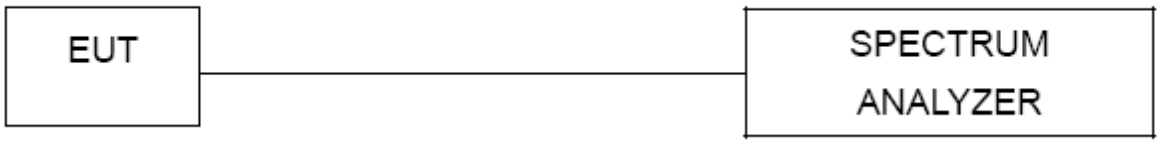
5.1.1 TEST PROCEDURE

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

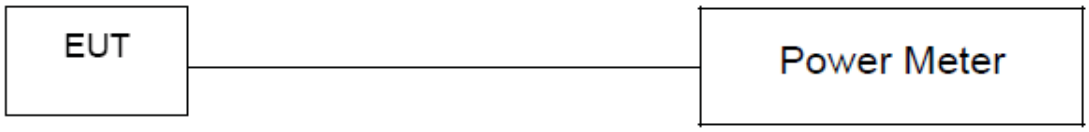
6.1.1 TEST PROCEDURE

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 and FCC KDB 662911 D01 Multiple Transmitter Output.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

6.1.5 EUT TEST CONDITIONS

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

6.1.6 TEST RESULTS

Please refer to the 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.

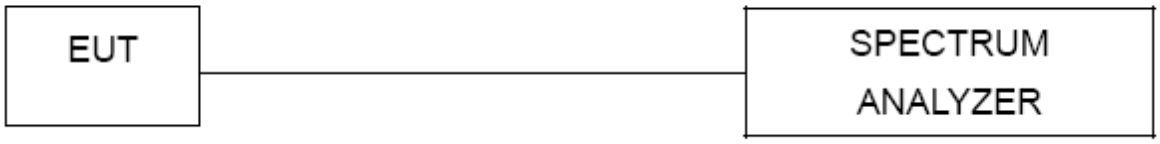
7.1.1 TEST PROCEDURE

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

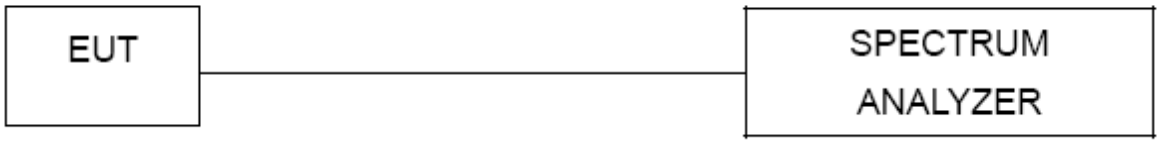
8.1.1 TEST PROCEDURE

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	EMI Test Receiver	R&S	ESCI	100382	Mar. 26, 2018
2	LISN	EMCO	3816/2	52765	Mar. 26, 2018
3	50Ω Terminator	SHX	TF2-3G-A	8122901	Mar. 26, 2018
4	TWO-LINE V-NETWORK	R&S	ENV216	101447	Mar. 26, 2018
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1 -01	N/A	N/A
6	Cable		RG223	12m	Oct. 20, 2017

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 26, 2018
2	Amplifier	HP	8447D	2944A09673	Oct. 20, 2017
3	Receiver	Agilent	N9038A	MY5213003 9	Sep. 04, 2017
4	Cable	emci	LMR-400(30MH z-1GHz)(8m+5m)	N/A	Jun. 26, 2018
5	Controller	CT	SC100	N/A	N/A
6	Controller	MF	MF-7802	MF78020841 6	N/A
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 26, 2018
9	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018
10	Amplifier	Agilent	8449B	3008A02274	May. 16, 2018
11	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 26, 2018
12	Antenna	EM	EM-6876-1	230	Jul. 07, 2018
13	Controller	MF	MF-7802	MF78020841 6	N/A
14	Cable	emci	EMC104-SM-S M-12000(12m)	N/A	Jun. 26, 2018
15	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Sep. 04, 2017

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100895	Mar. 26, 2018
2	Antenna	EM	EM-6876-1	230	Jul. 07, 2018

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Sep. 04, 2017

Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Sep. 04, 2017

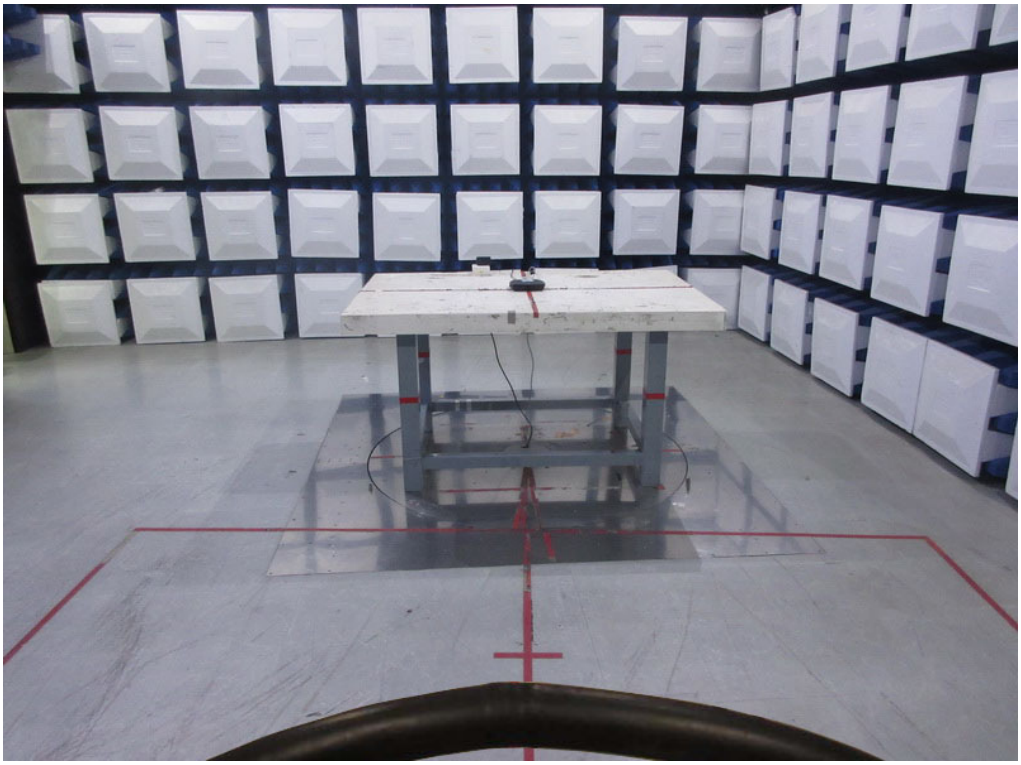
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

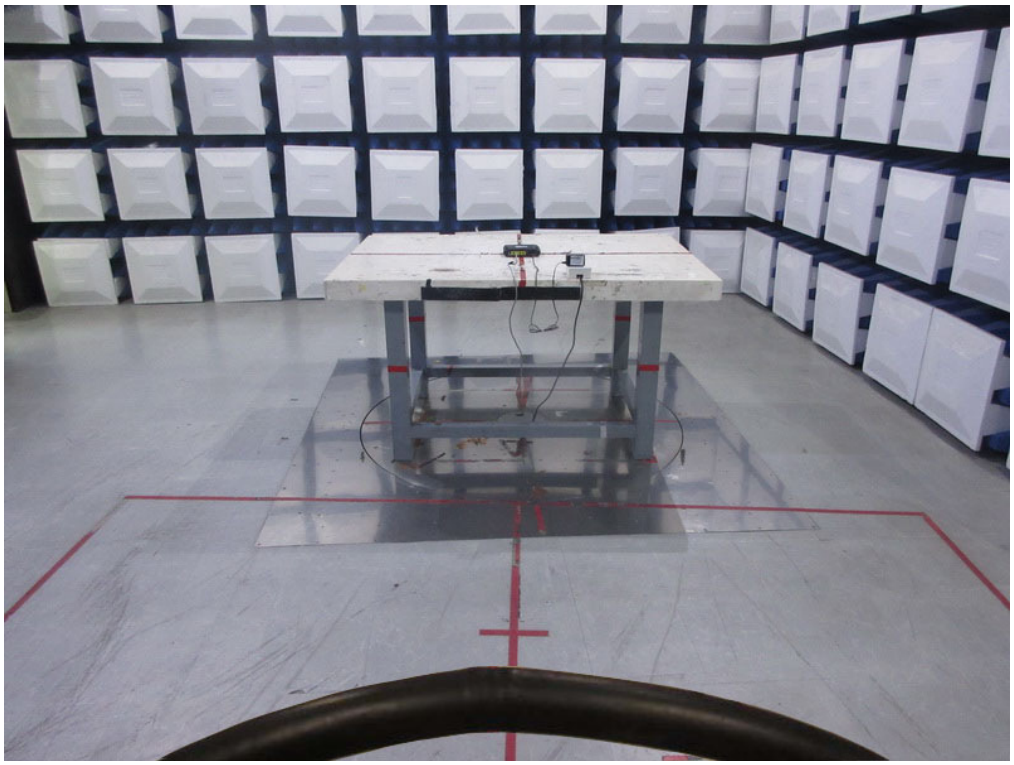
10. EUT TEST PHOTO

Conducted Measurement Photos

Radiated Measurement Photos

9KHz to 30MHz



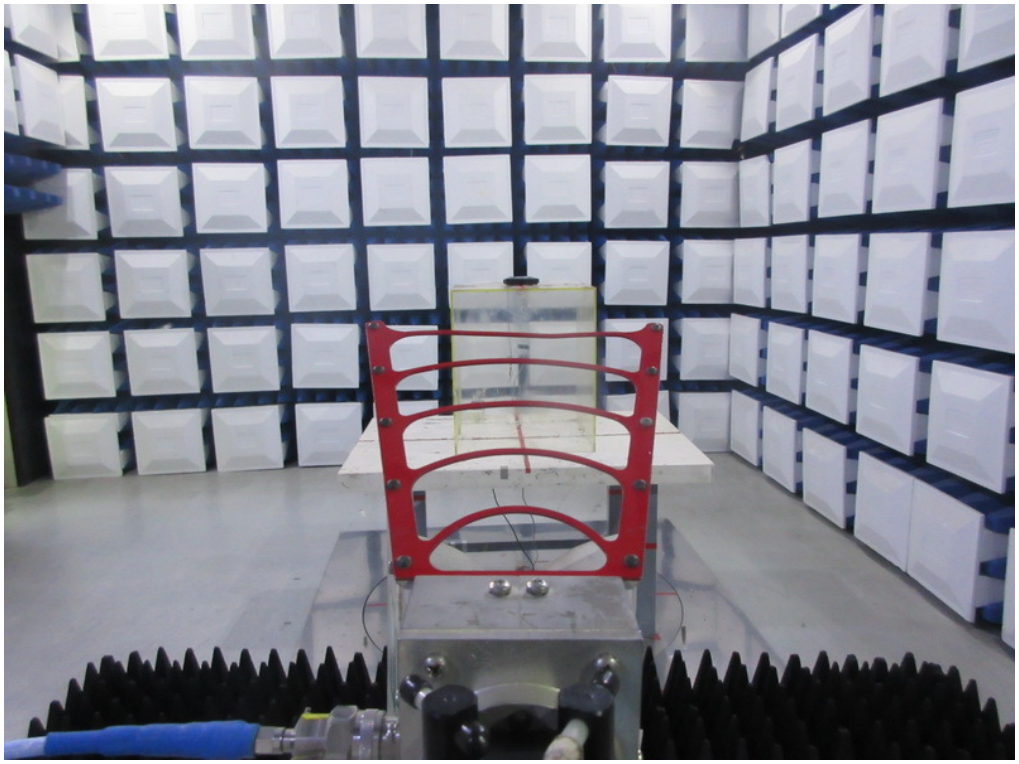


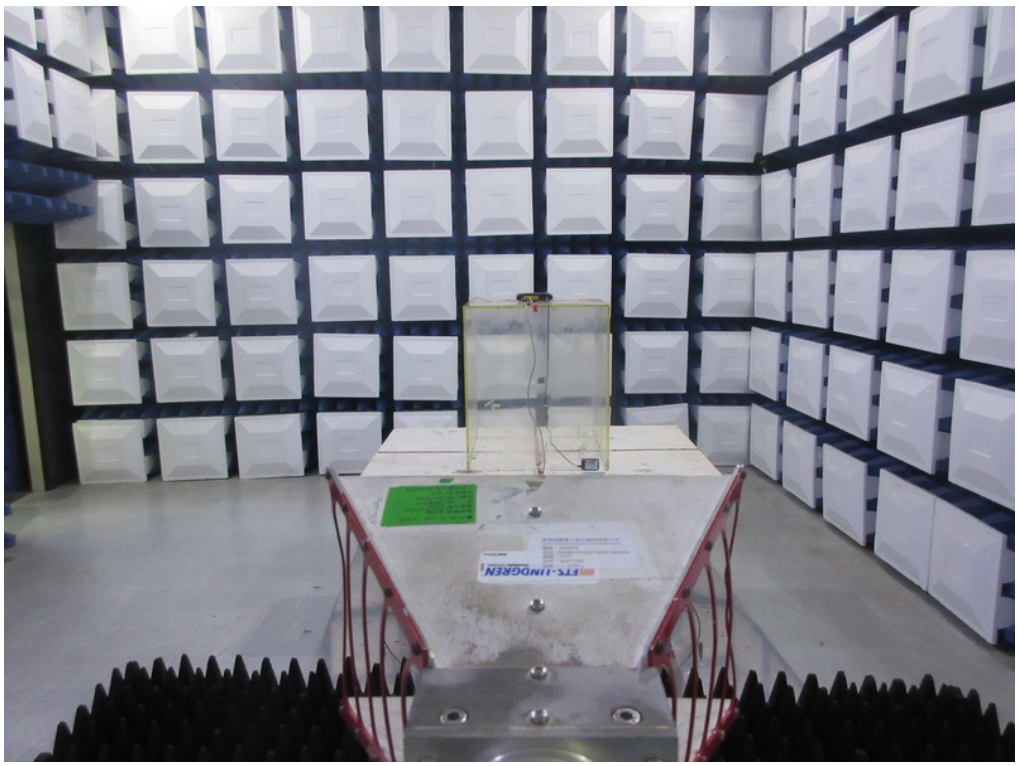
Radiated Measurement Photos

30MHz to 1000MHz

Radiated Measurement Photos

Above 1000MHz

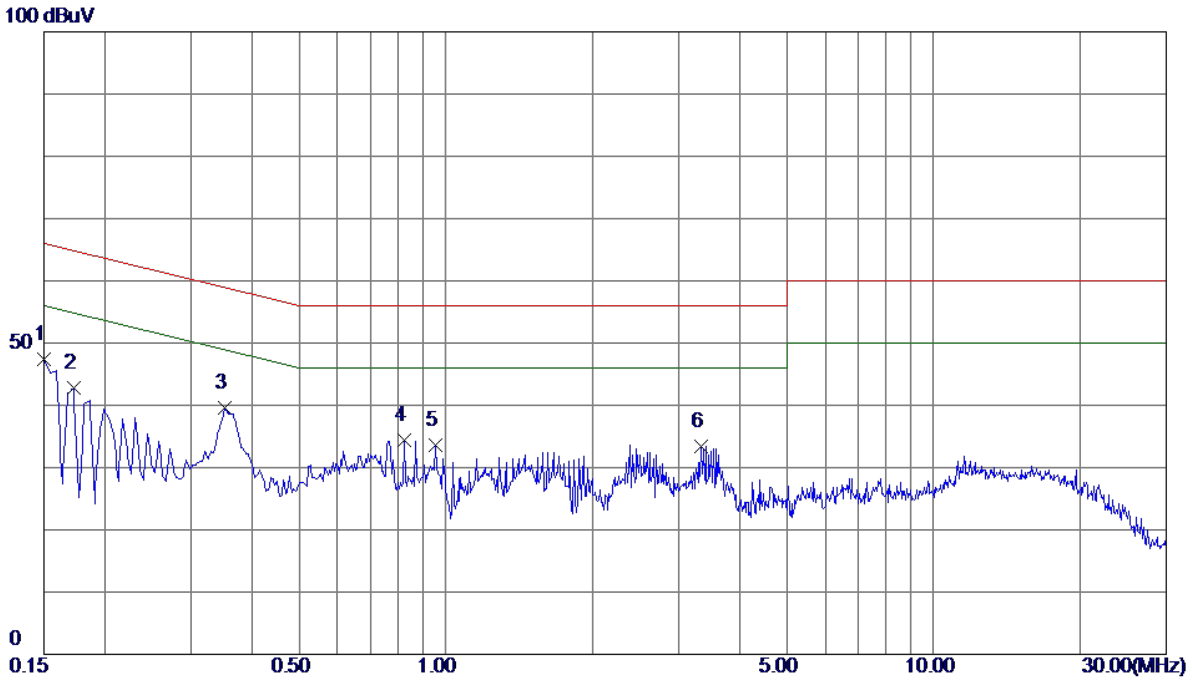




ATTACHMENT A - CONDUCTED EMISSION

Test Mode :	TX Mode

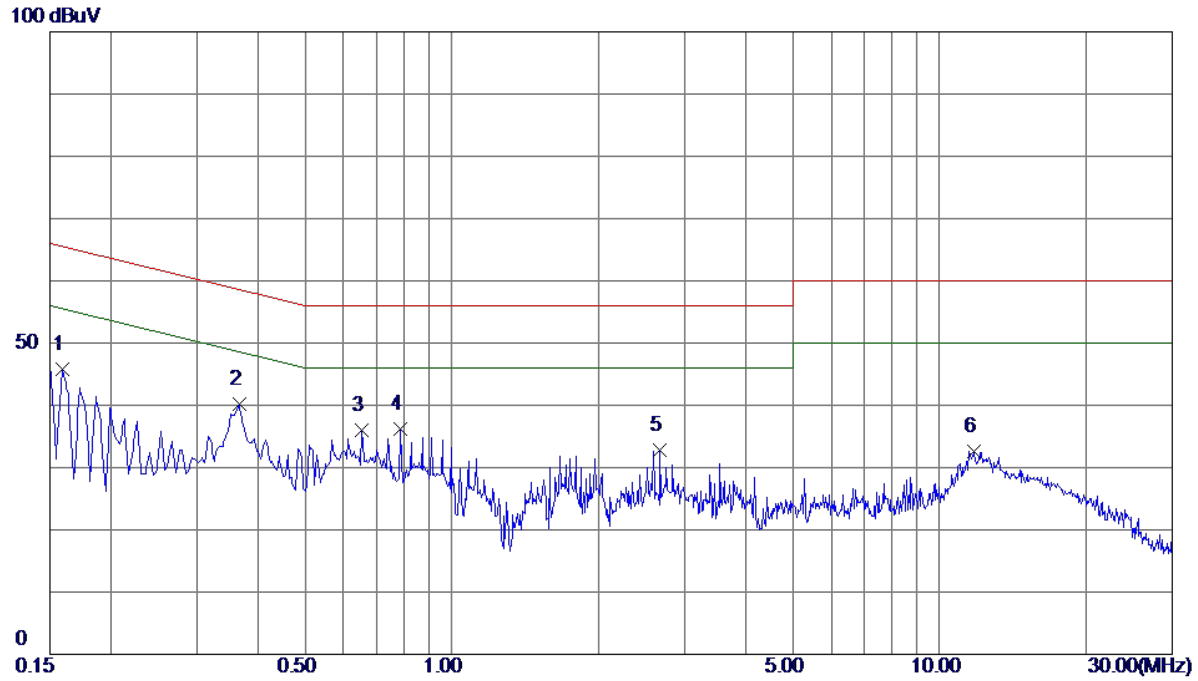
Line



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1 *	0.1500	37.52	9.79	47.31	66.00	-18.69	Peak	
2	0.1725	33.11	9.78	42.89	64.84	-21.95	Peak	
3	0.3525	29.90	9.79	39.69	58.90	-19.21	Peak	
4	0.8205	24.59	9.83	34.42	56.00	-21.58	Peak	
5	0.9510	23.74	9.84	33.58	56.00	-22.42	Peak	
6	3.3405	23.47	10.01	33.48	56.00	-22.52	Peak	

Test Mode :	TX Mode

Neutral

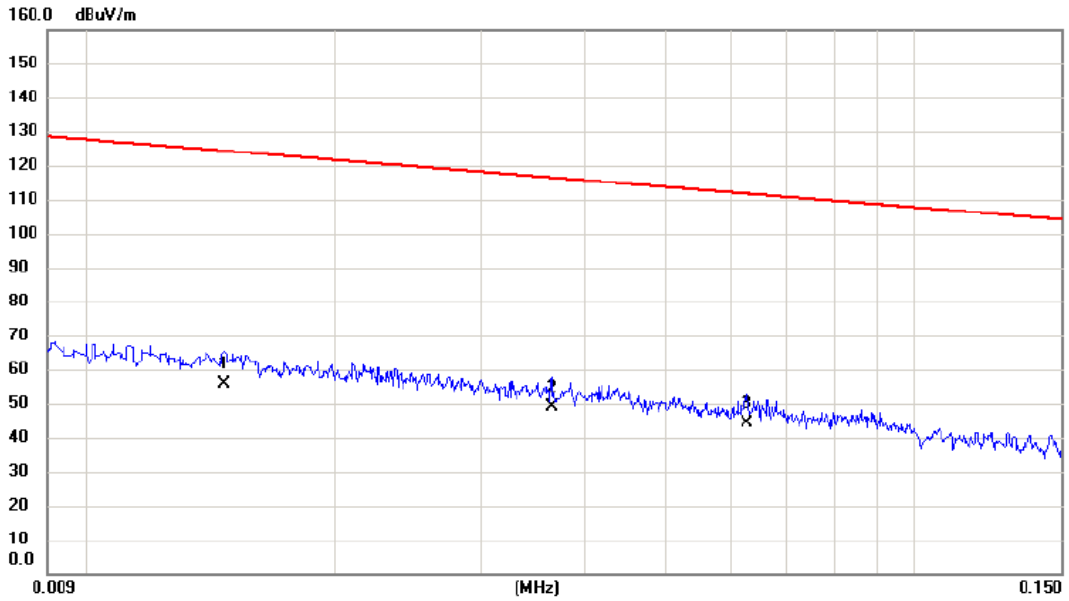


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	0.1590	36.09	9.68	45.77	65.52	-19.75	Peak	
2 *	0.3660	30.58	9.69	40.27	58.59	-18.32	Peak	
3	0.6540	26.30	9.72	36.02	56.00	-19.98	Peak	
4	0.7845	26.44	9.72	36.16	56.00	-19.84	Peak	
5	2.6700	22.84	9.88	32.72	56.00	-23.28	Peak	
6	11.7690	22.28	10.40	32.68	60.00	-27.32	Peak	

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

Test Mode:	TX B MODE CHANNEL 01

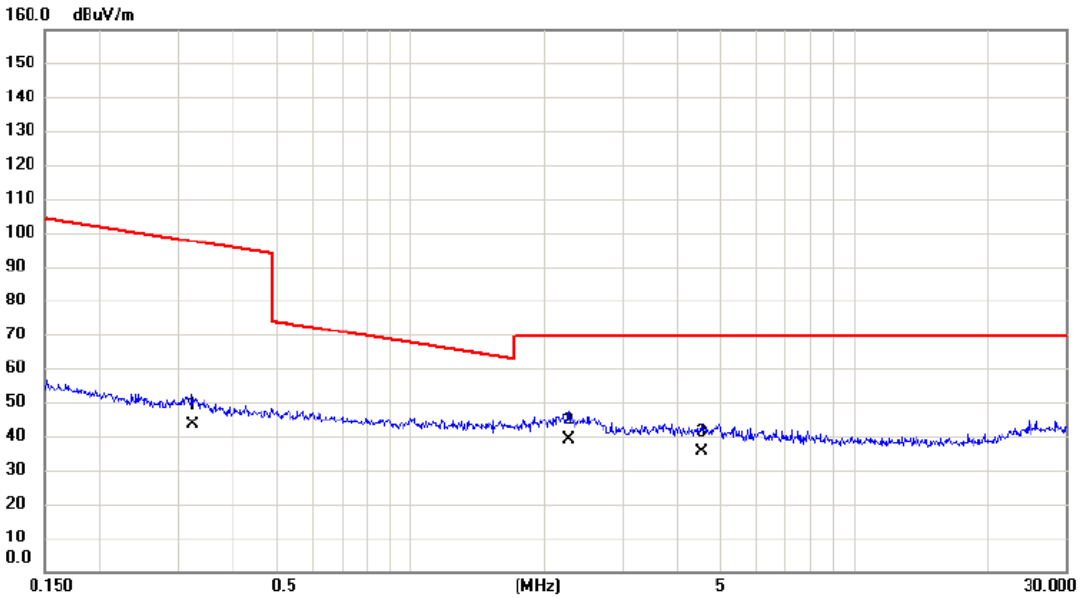
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0147	35.68	20.31	55.99	124.26	-68.27	AVG	
2		0.0365	29.87	19.13	49.00	116.36	-67.36	AVG	
3	*	0.0627	25.89	18.48	44.37	111.66	-67.29	AVG	

Test Mode:	TX B MODE CHANNEL 01

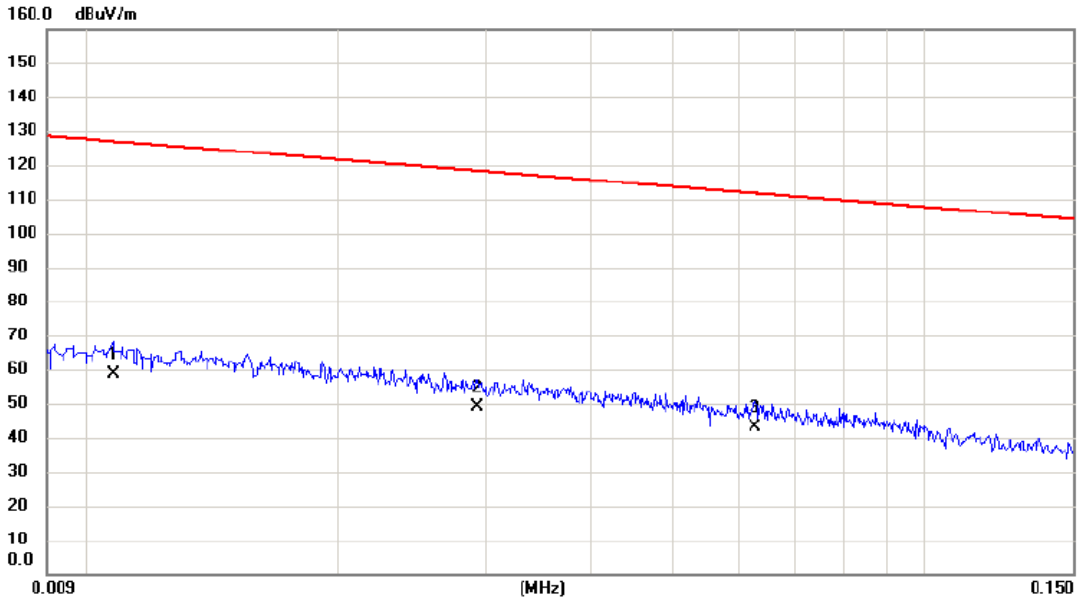
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.3217	26.89	16.60	43.49	97.46	-53.97	AVG	
2	*	2.2726	23.57	15.44	39.01	69.54	-30.53	QP	
3		4.5254	20.64	14.64	35.28	69.54	-34.26	QP	

Test Mode:	TX B MODE CHANNEL 01

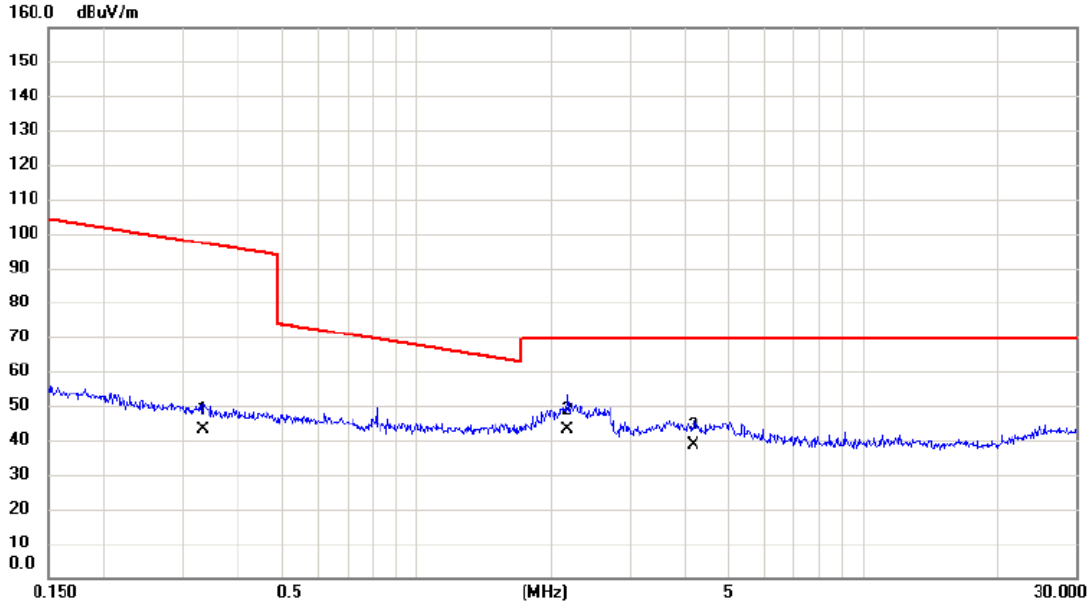
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	0.0108	37.68	20.82	58.50	126.94	-68.44	AVG	
2		0.0293	29.84	19.34	49.18	118.27	-69.09	AVG	
3		0.0627	24.61	18.48	43.09	111.66	-68.57	AVG	

Test Mode:	TX B MODE CHANNEL 01

Ant 90°

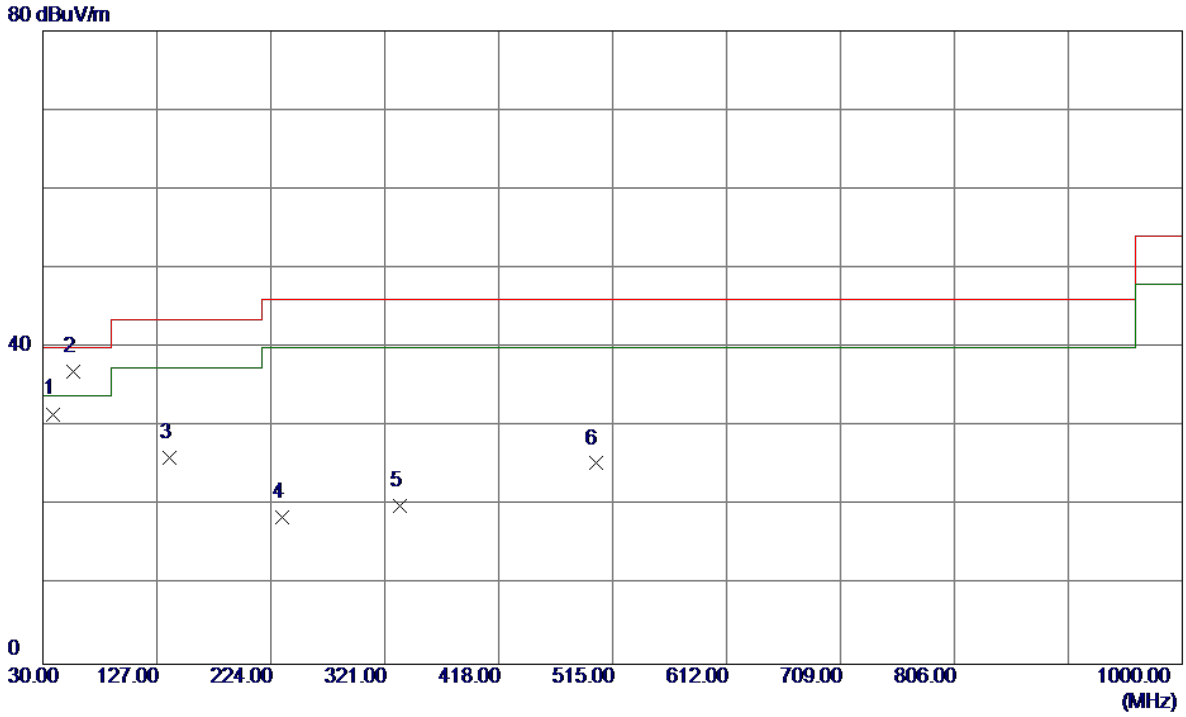


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.3321	26.57	16.59	43.16	97.18	-54.02	AVG	
2	*	2.1783	27.64	15.46	43.10	69.54	-26.44	QP	
3		4.1796	23.94	14.84	38.78	69.54	-30.76	QP	

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

Test Mode:	TX B MODE CHANNEL 01

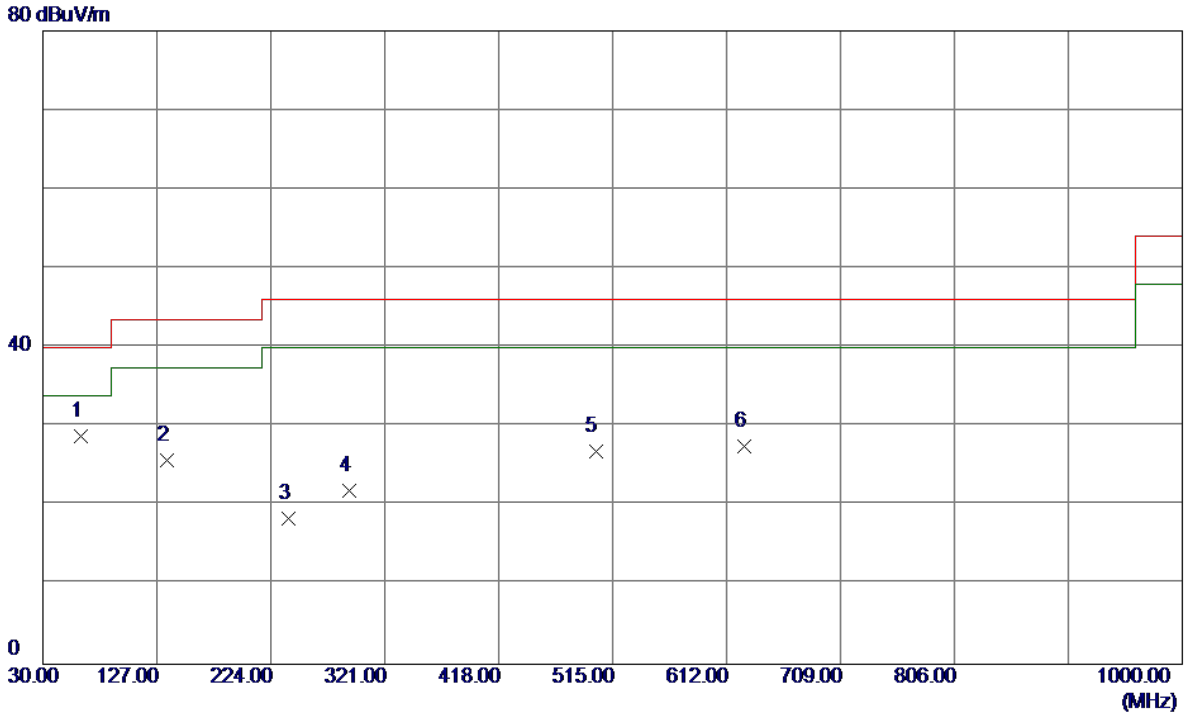
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	38.7300	44.49	-12.89	31.60	40.00	-8.40	Peak	
2 *	56.1900	49.70	-12.71	36.99	40.00	-3.01	QP	
3	137.6700	39.38	-13.31	26.07	43.50	-17.43	Peak	
4	233.7000	32.03	-13.51	18.52	46.00	-27.48	Peak	
5	333.6099	31.43	-11.47	19.96	46.00	-26.04	Peak	
6	500.4500	32.19	-6.83	25.36	46.00	-20.64	Peak	

Test Mode:	TX B MODE CHANNEL 01

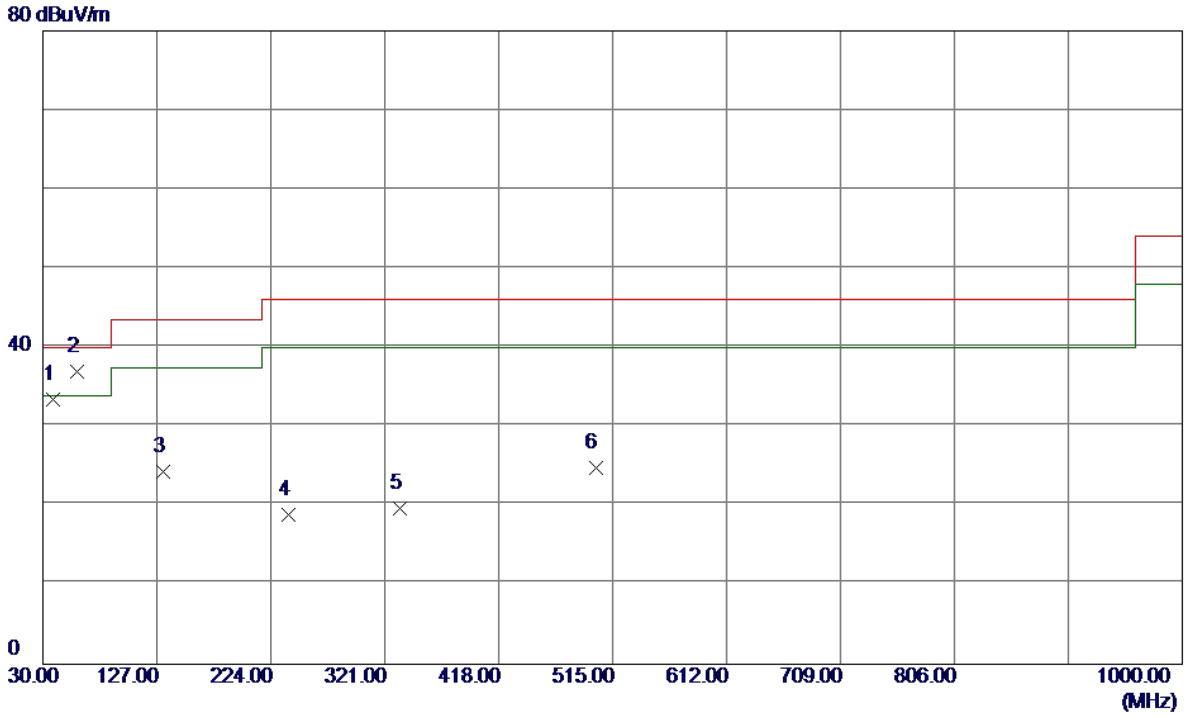
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	62.0100	42.15	-13.42	28.73	40.00	-11.27	Peak	
2	135.7300	39.18	-13.40	25.78	43.50	-17.72	Peak	
3	238.5500	32.01	-13.63	18.38	46.00	-27.62	Peak	
4	290.9300	35.48	-13.50	21.98	46.00	-24.02	Peak	
5	500.4500	33.67	-6.83	26.84	46.00	-19.16	Peak	
6	627.5200	31.14	-3.56	27.58	46.00	-18.42	Peak	

Test Mode:	TX B MODE CHANNEL 06

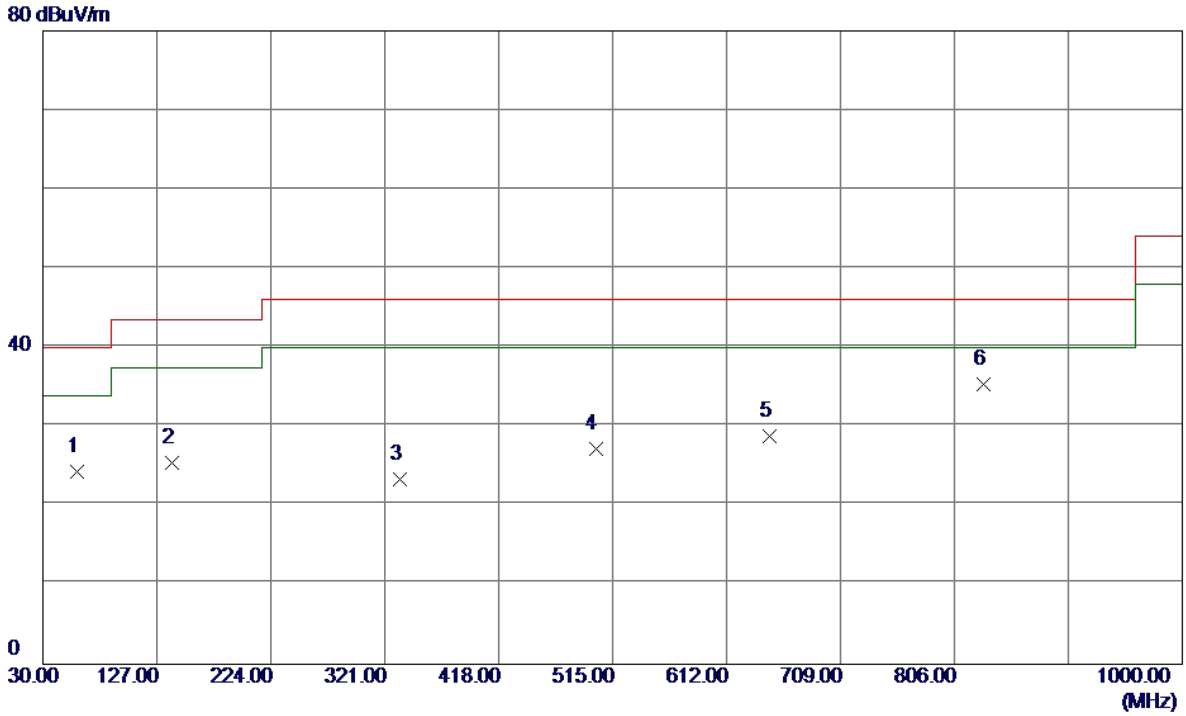
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	38.7300	46.26	-12.89	33.37	40.00	-6.63	Peak	
2 *	59.1000	50.00	-12.98	37.02	40.00	-2.98	QP	
3	132.8200	37.78	-13.53	24.25	43.50	-19.25	Peak	
4	238.5500	32.57	-13.63	18.94	46.00	-27.06	Peak	
5	333.6099	31.19	-11.47	19.72	46.00	-26.28	Peak	
6	500.4500	31.58	-6.83	24.75	46.00	-21.25	Peak	

Test Mode:	TX B MODE CHANNEL 06

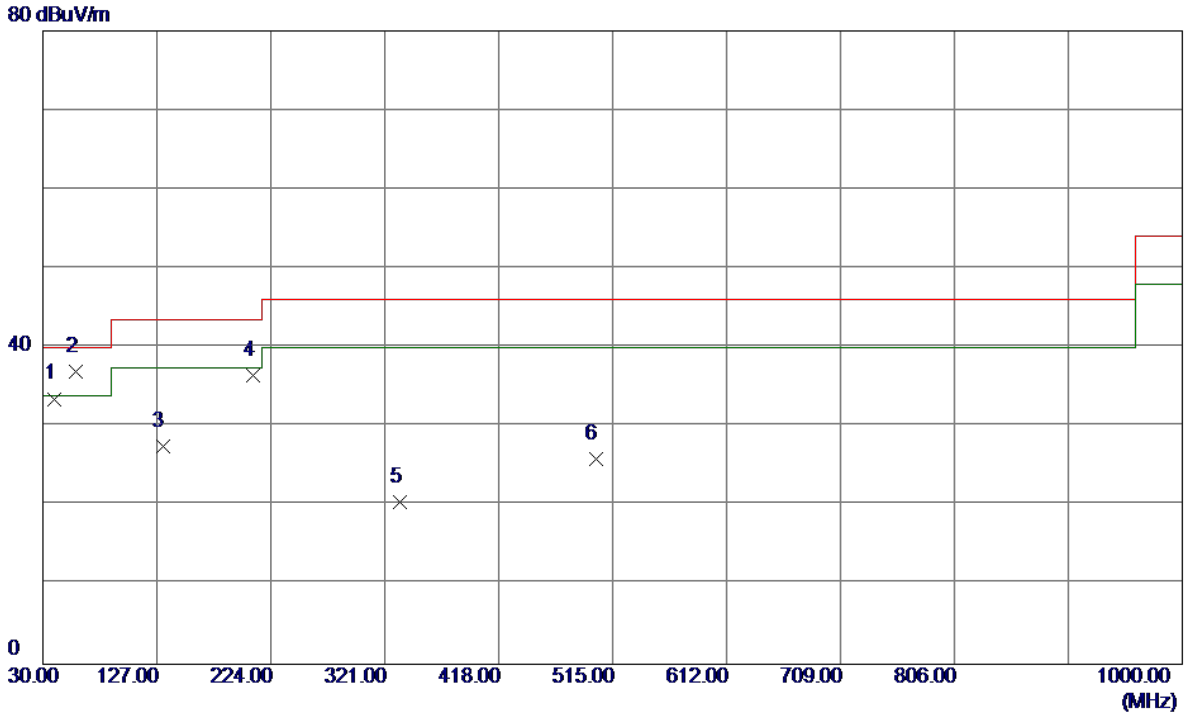
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	59.1000	37.31	-12.98	24.33	40.00	-15.67	Peak	
2	139.6100	38.64	-13.22	25.42	43.50	-18.08	Peak	
3	333.6099	34.85	-11.47	23.38	46.00	-22.62	Peak	
4	500.4500	33.97	-6.83	27.14	46.00	-18.86	Peak	
5	648.8600	31.88	-3.13	28.75	46.00	-17.25	Peak	
6 *	831.2199	33.63	1.72	35.35	46.00	-10.65	Peak	

Test Mode:	TX B MODE CHANNEL 11

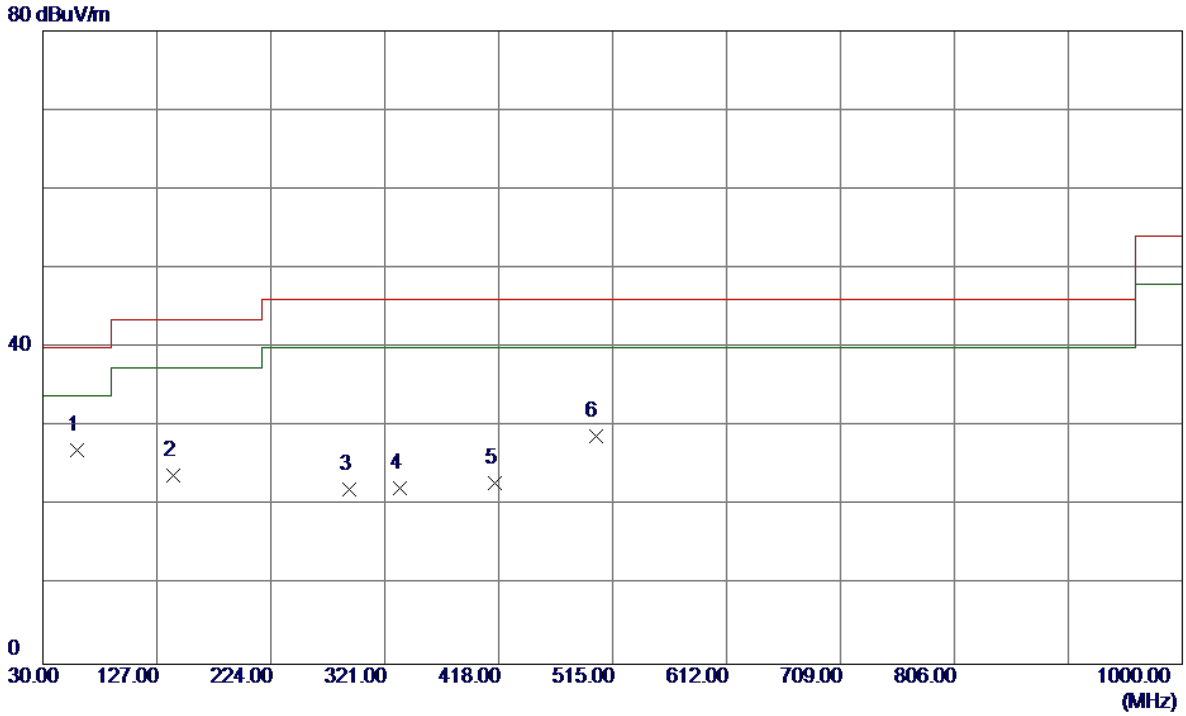
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	39.7000	46.25	-12.73	33.52	40.00	-6.48	Peak	
2 *	58.1300	49.81	-12.89	36.92	40.00	-3.08	QP	
3	131.8500	41.09	-13.57	27.52	43.50	-15.98	Peak	
4	208.4800	49.67	-13.17	36.50	43.50	-7.00	Peak	
5	333.6099	31.91	-11.47	20.44	46.00	-25.56	Peak	
6	500.4500	32.72	-6.83	25.89	46.00	-20.11	Peak	

Test Mode:	TX B MODE CHANNEL 11

Horizontal

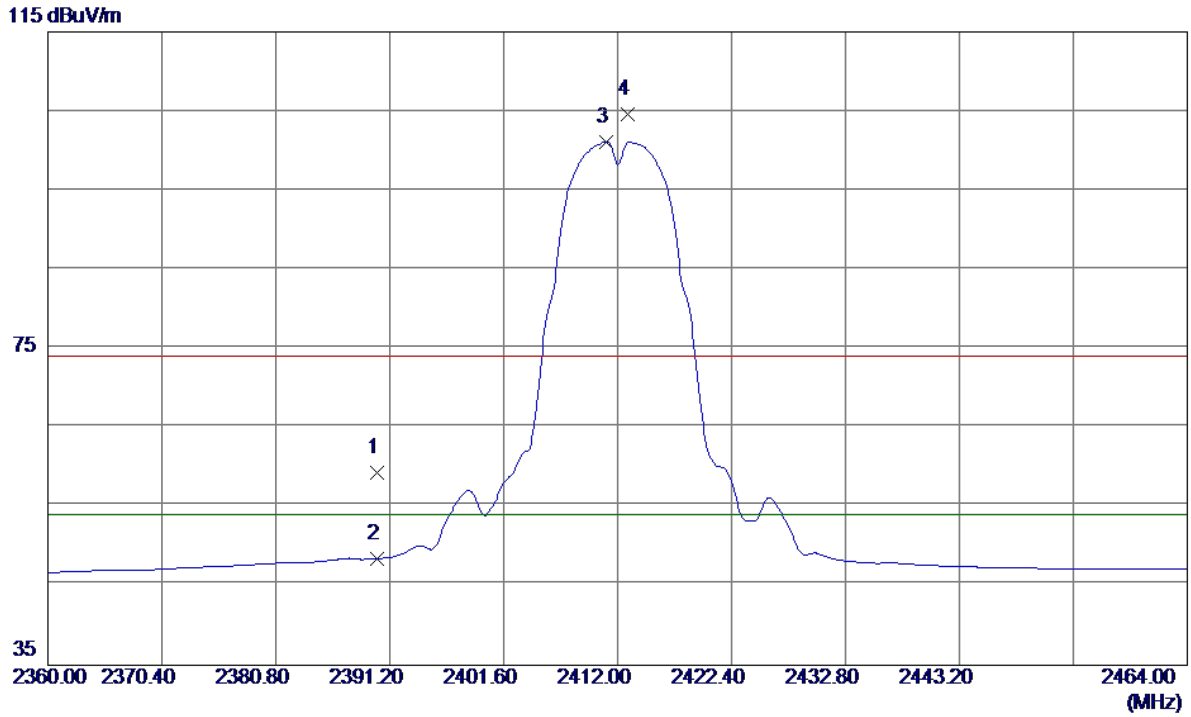


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	59.1000	40.00	-12.98	27.02	40.00	-12.98	Peak	
2	140.5800	37.07	-13.17	23.90	43.50	-19.60	Peak	
3	290.9300	35.54	-13.50	22.04	46.00	-23.96	Peak	
4	333.6099	33.65	-11.47	22.18	46.00	-23.82	Peak	
5	415.0900	32.49	-9.62	22.87	46.00	-23.13	Peak	
6	500.4500	35.60	-6.83	28.77	46.00	-17.23	Peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

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

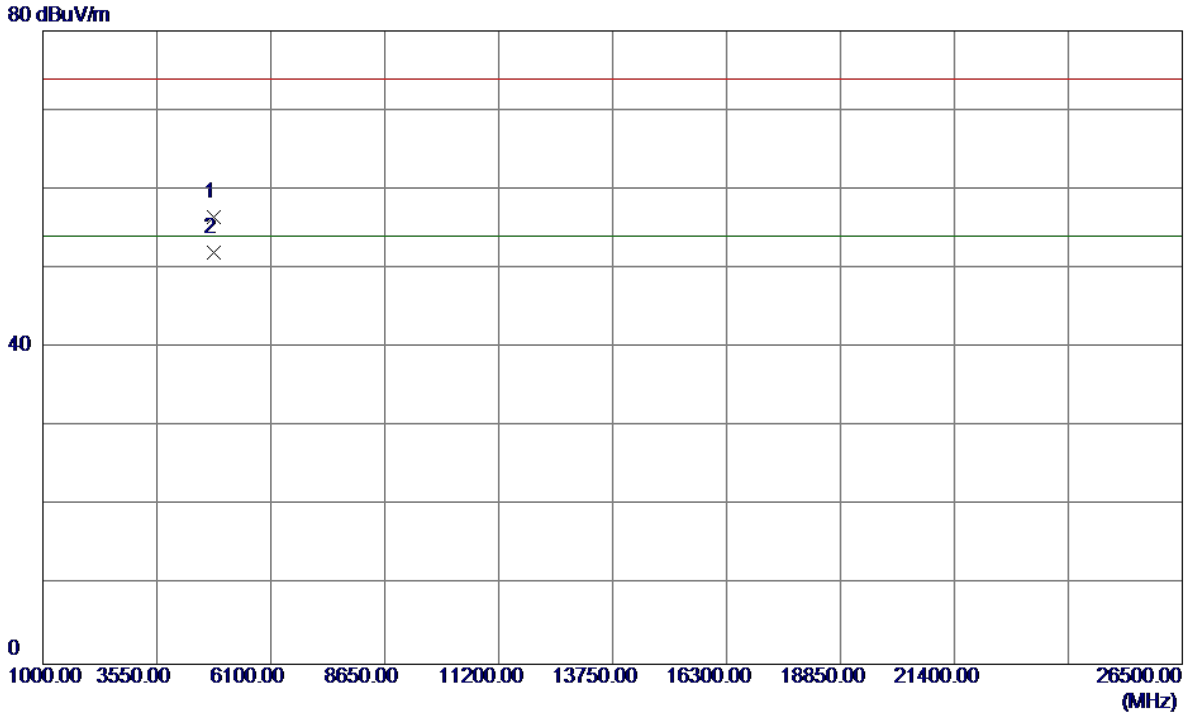
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	26.32	33.06	59.38	74.00	-14.62	Peak	
2	2390.0000	15.38	33.06	48.44	54.00	-5.56	AVG	
3 *	2410.9600	68.00	33.14	101.14	54.00	47.14	AVG	No Limit
4	2412.9360	71.49	33.14	104.63	74.00	30.63	Peak	No Limit

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

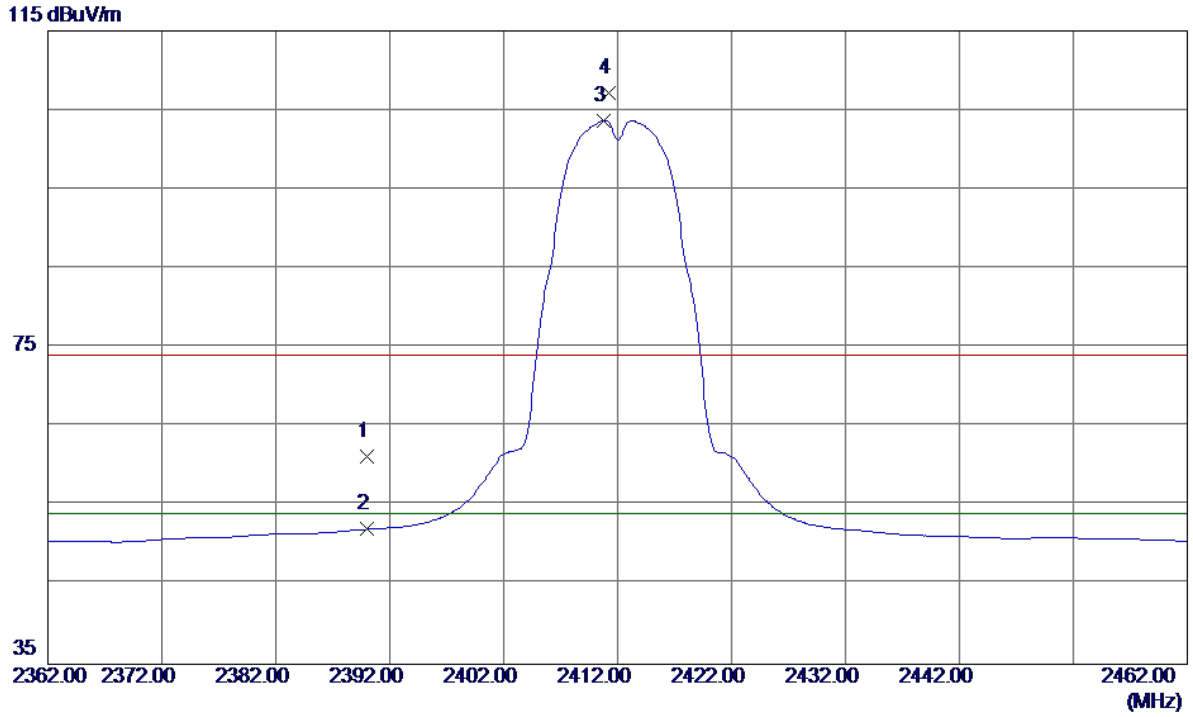
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4823.9680	50.13	6.32	56.45	74.00	-17.55	Peak	
2 *	4823.9740	45.69	6.32	52.01	54.00	-1.99	AVG	

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

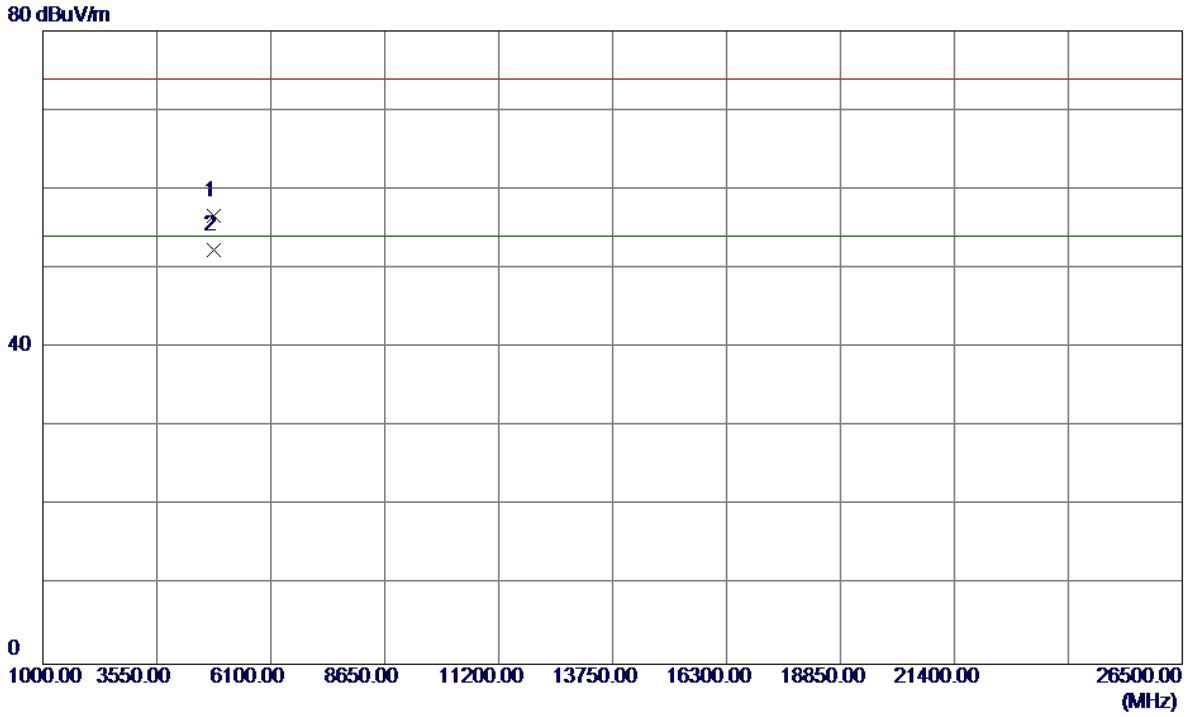
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	28.15	33.06	61.21	74.00	-12.79	Peak	
2	2390.0000	18.99	33.06	52.05	54.00	-1.95	AVG	
3 *	2410.8000	70.50	33.13	103.63	54.00	49.63	AVG	No Limit
4	2411.2000	74.00	33.14	107.14	74.00	33.14	Peak	No Limit

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

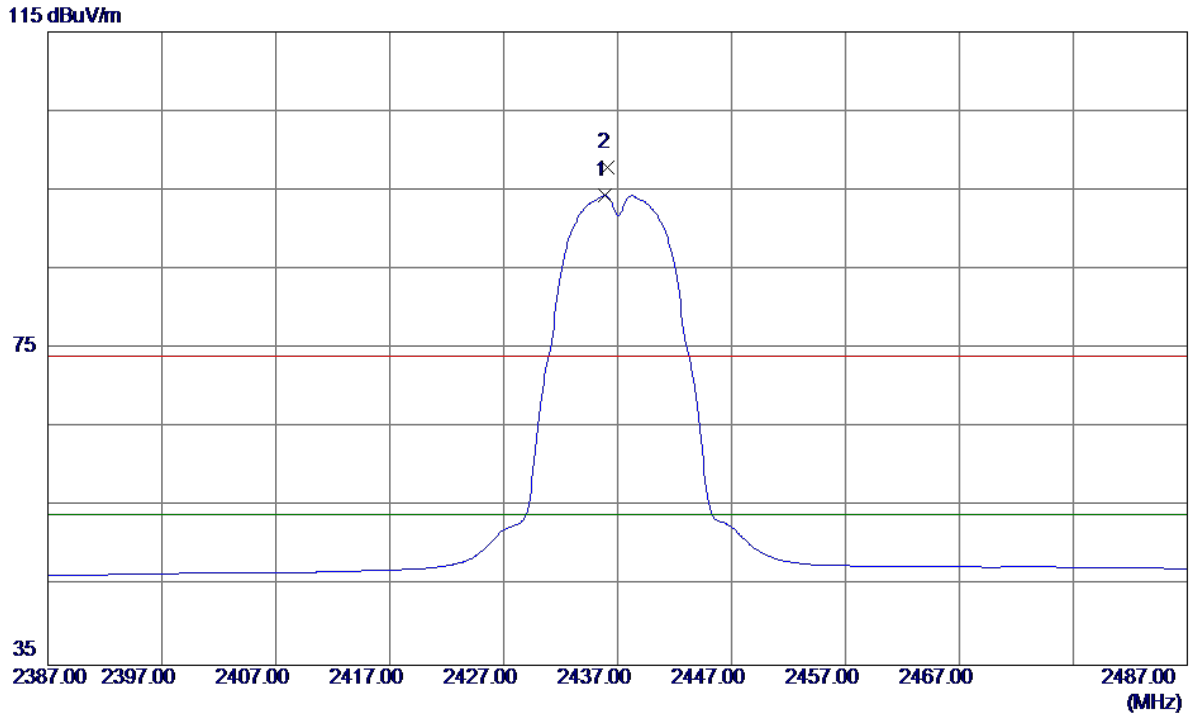
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4823.9660	50.26	6.32	56.58	74.00	-17.42	Peak	
2 *	4823.9700	46.07	6.32	52.39	54.00	-1.61	AVG	

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

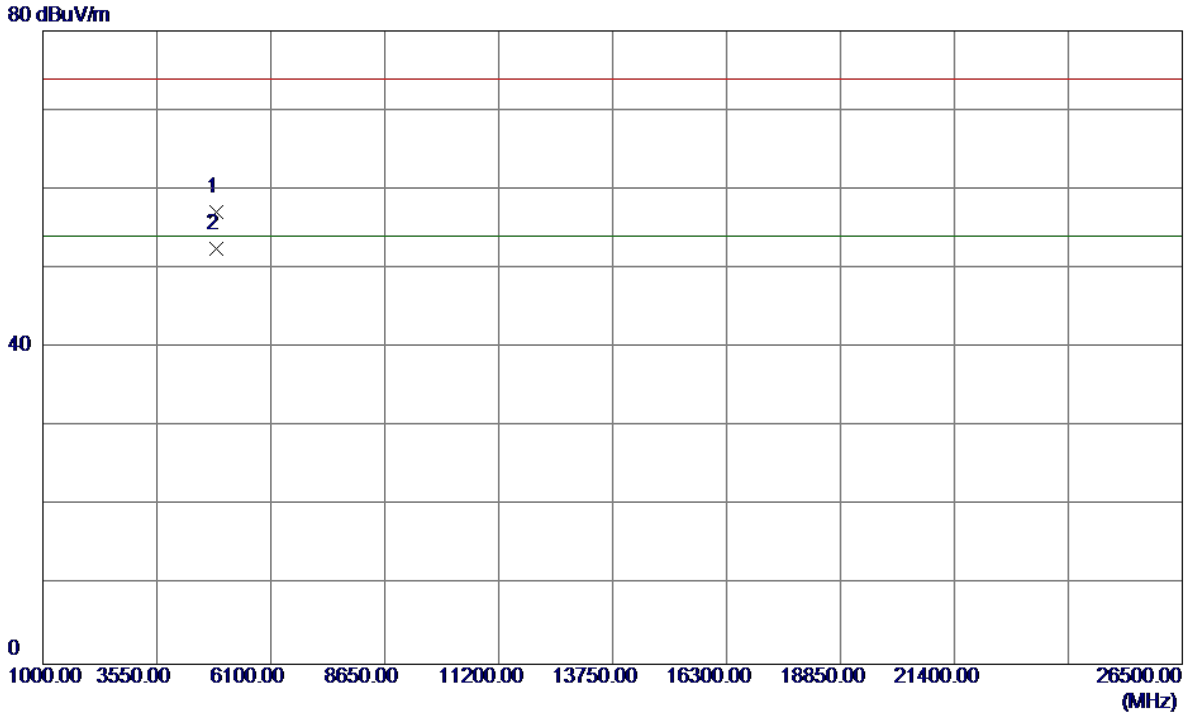
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2435.9000	61.10	33.23	94.33	54.00	40.33	AVG	No Limit
2	2436.1000	64.64	33.23	97.87	74.00	23.87	Peak	No Limit

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

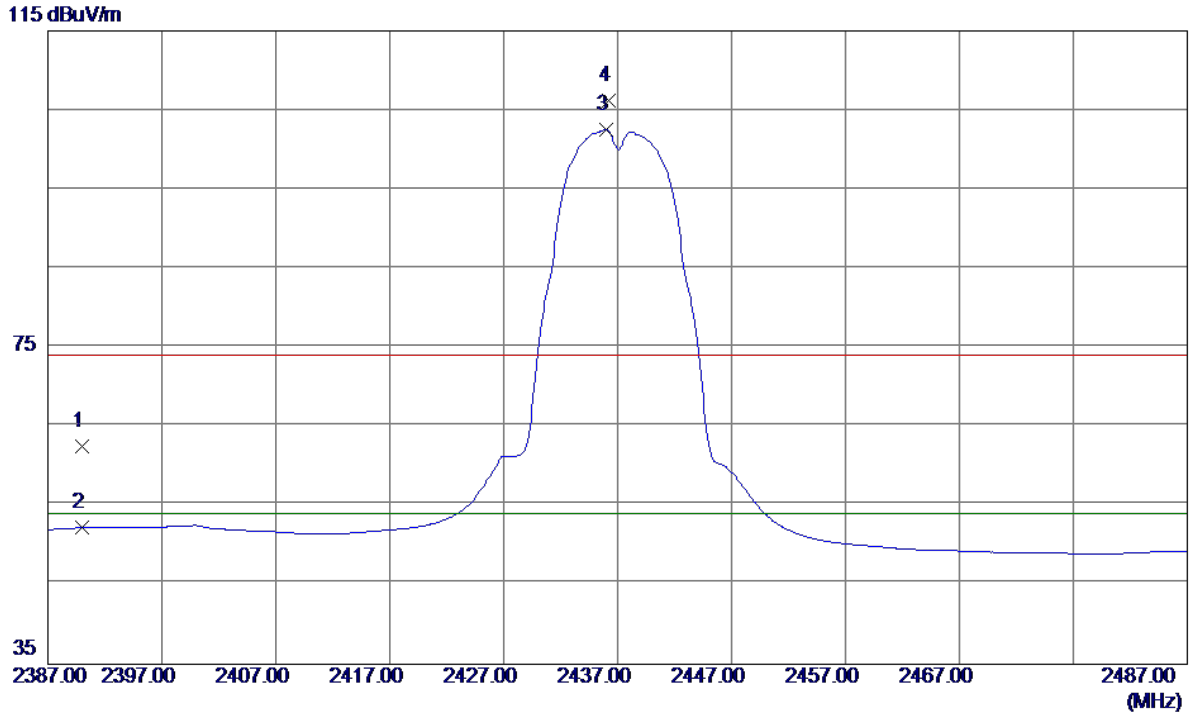
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.9100	50.69	6.44	57.13	74.00	-16.87	Peak	
2 *	4873.9840	46.10	6.44	52.54	54.00	-1.46	AVG	

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

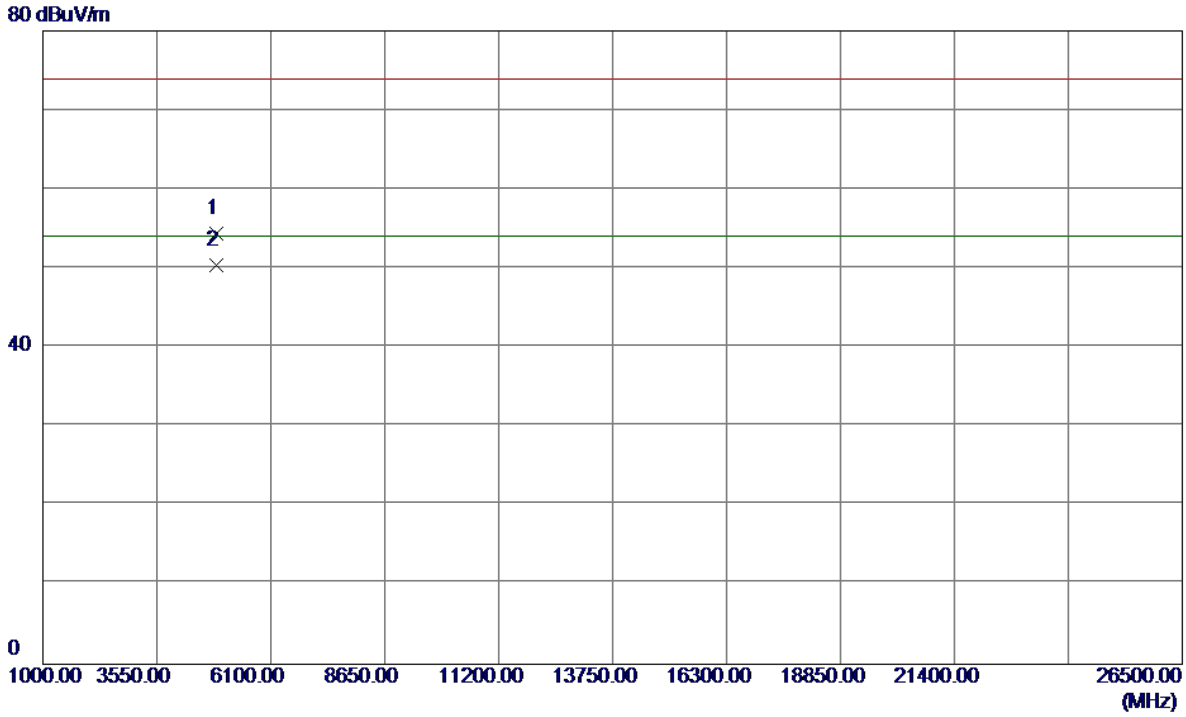
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	29.45	33.06	62.51	74.00	-11.49	Peak	
2	2390.0000	19.19	33.06	52.25	54.00	-1.75	AVG	
3 *	2436.0000	69.30	33.23	102.53	54.00	48.53	AVG	No Limit
4	2436.2000	72.90	33.23	106.13	74.00	32.13	Peak	No Limit

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

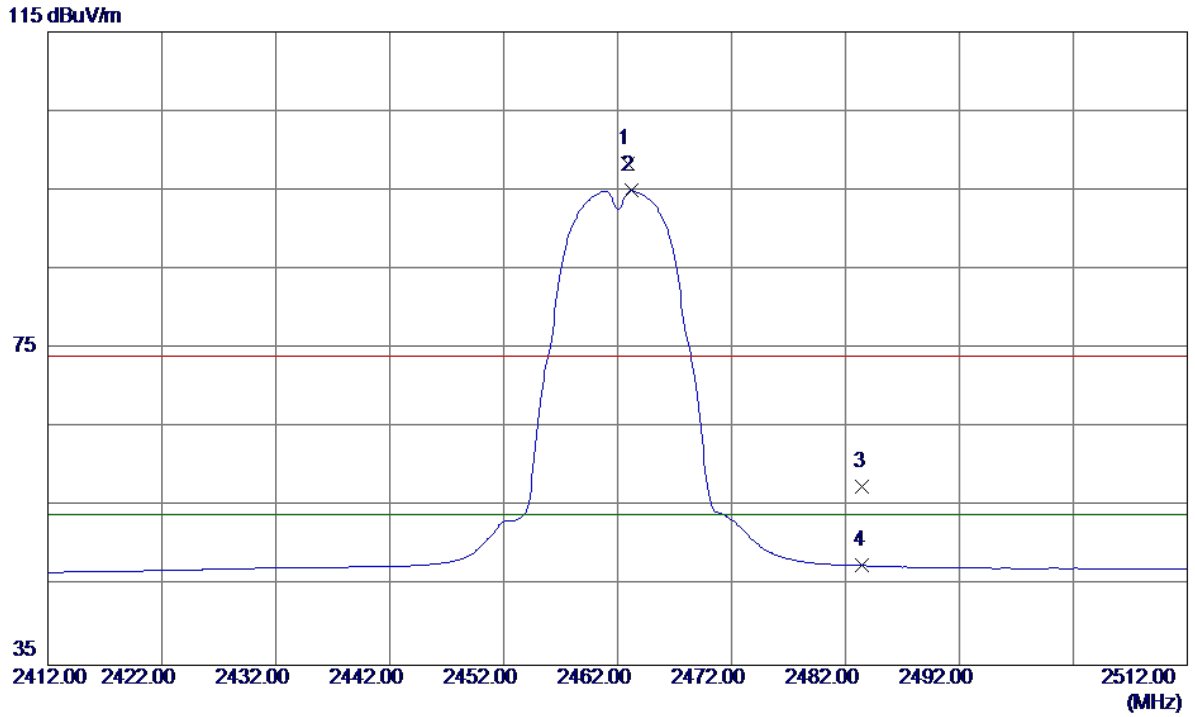
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.9560	48.04	6.44	54.48	74.00	-19.52	Peak	
2 *	4874.0080	44.04	6.44	50.48	54.00	-3.52	AVG	

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

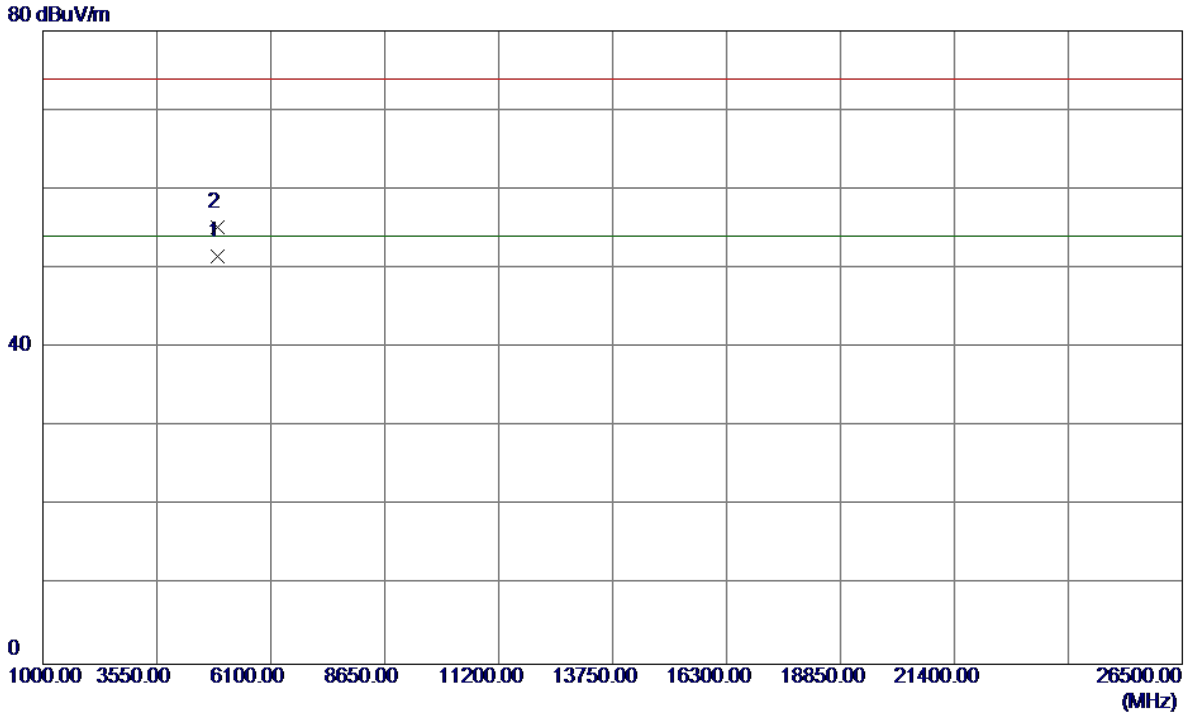
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2462.9000	64.98	33.33	98.31	74.00	24.31	Peak	No Limit
2 *	2463.2000	61.64	33.33	94.97	54.00	40.97	AVG	No Limit
3	2483.5000	24.20	33.41	57.61	74.00	-16.39	Peak	
4	2483.5000	14.17	33.41	47.58	54.00	-6.42	AVG	

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

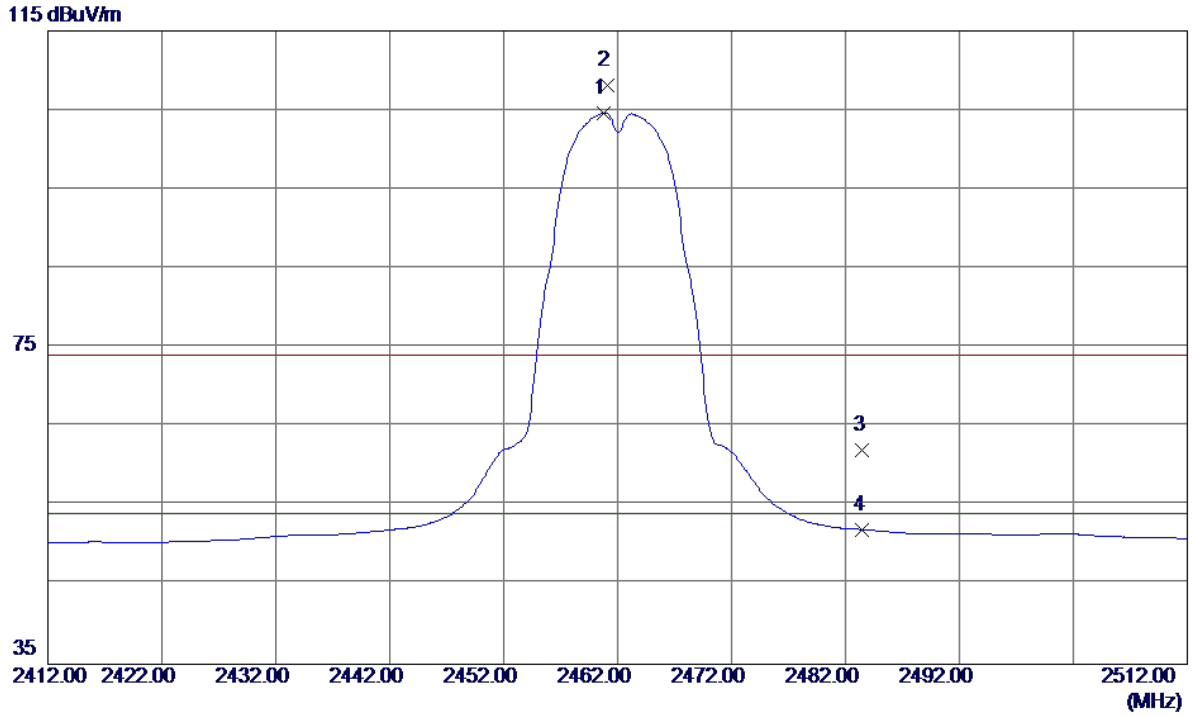
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4923.8600	44.97	6.57	51.54	54.00	-2.46	AVG	
2	4923.8650	48.64	6.57	55.21	74.00	-18.79	Peak	

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

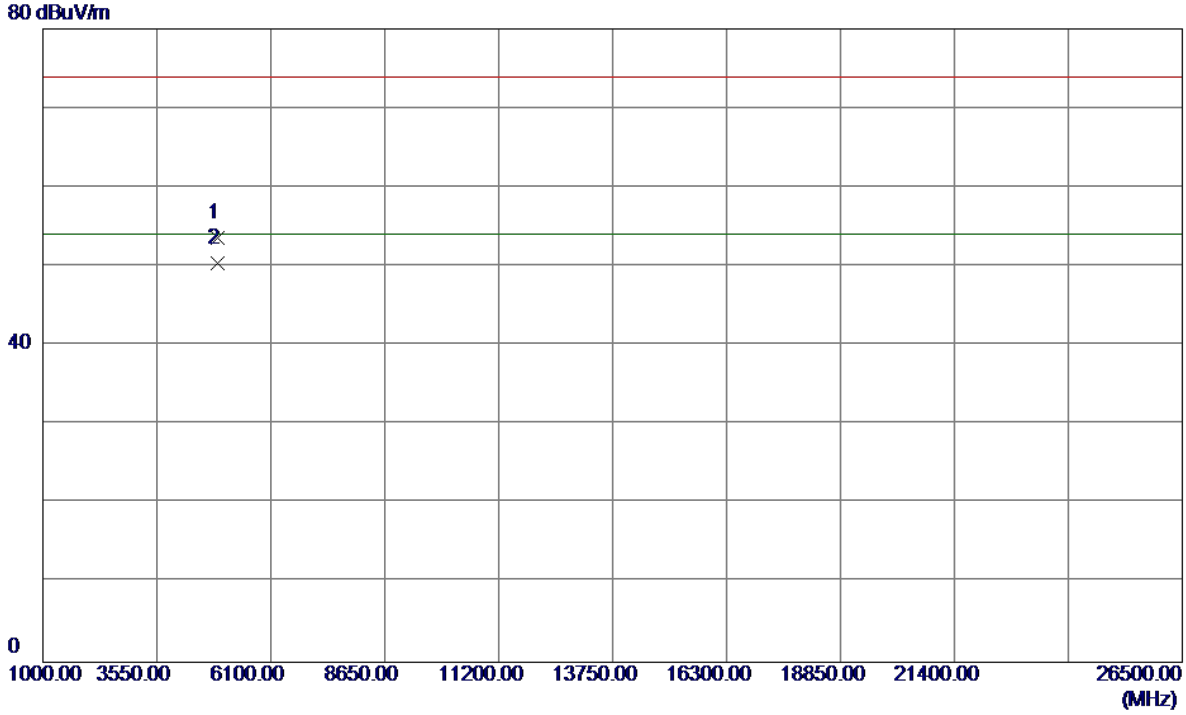
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2460.8000	71.34	33.32	104.66	54.00	50.66	AVG	No Limit
2	2461.1000	74.72	33.32	108.04	74.00	34.04	Peak	No Limit
3	2483.5000	28.57	33.41	61.98	74.00	-12.02	Peak	
4	2483.5000	18.61	33.41	52.02	54.00	-1.98	AVG	

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

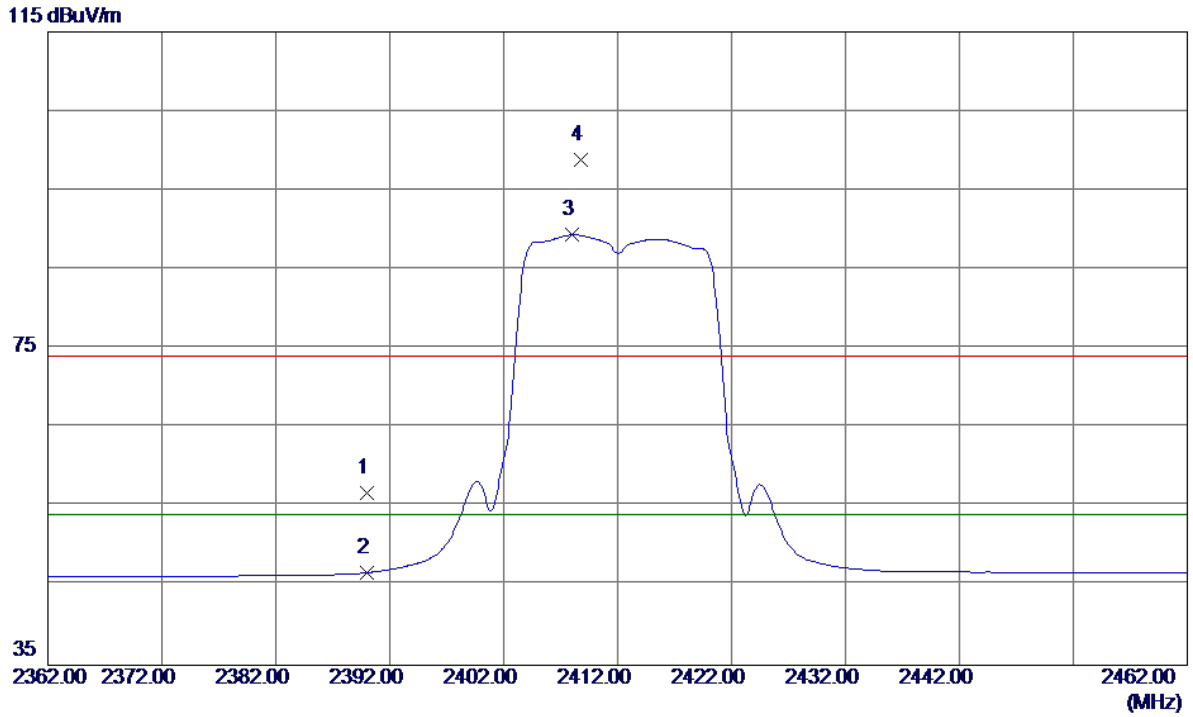
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4923.9180	46.99	6.57	53.56	74.00	-20.44	Peak	
2 *	4923.9700	43.86	6.57	50.43	54.00	-3.57	AVG	

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

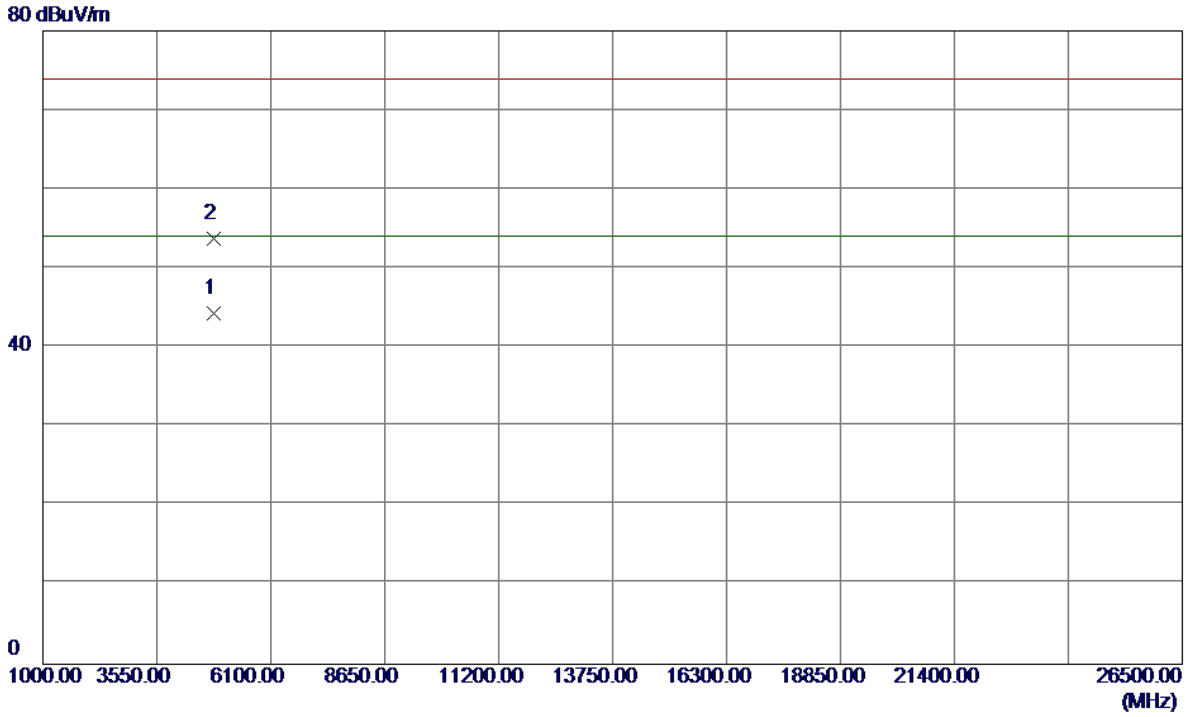
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	23.69	33.06	56.75	74.00	-17.25	Peak	
2	2390.0000	13.62	33.06	46.68	54.00	-7.32	AVG	
3 *	2408.0000	56.25	33.12	89.37	54.00	35.37	AVG	No Limit
4	2408.8000	65.69	33.13	98.82	74.00	24.82	Peak	No Limit

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

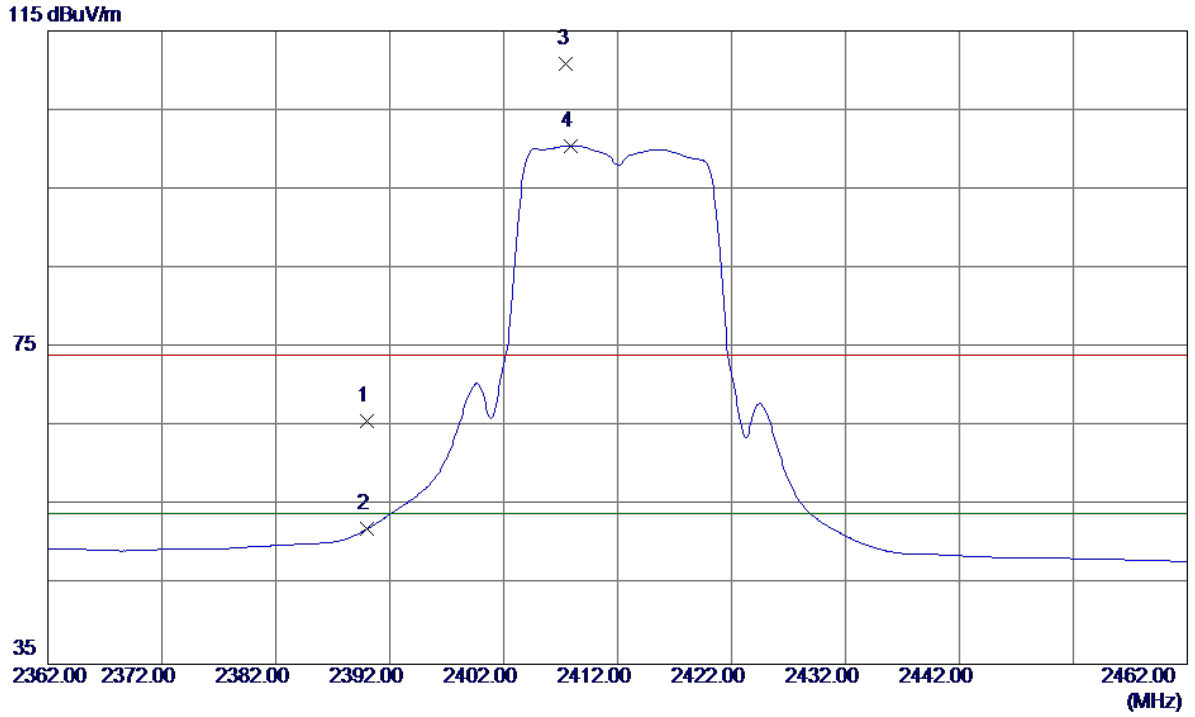
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4824.1400	38.02	6.32	44.34	54.00	-9.66	AVG	
2	4824.8000	47.51	6.32	53.83	74.00	-20.17	Peak	

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

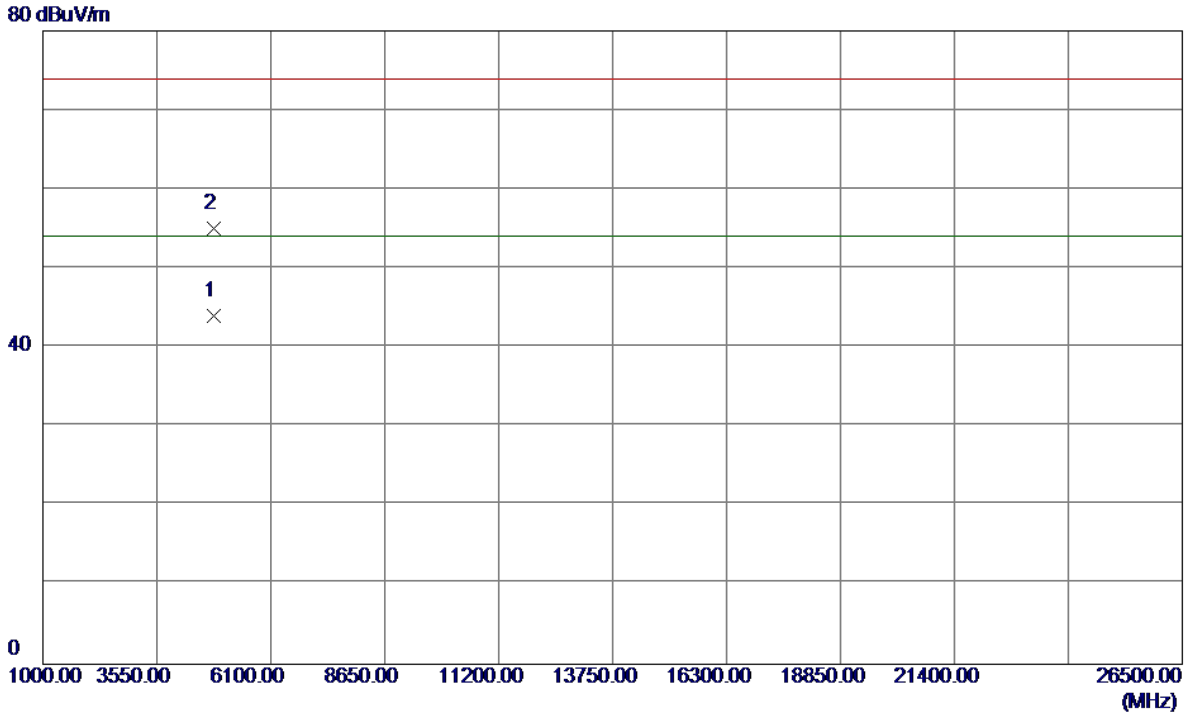
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	32.63	33.06	65.69	74.00	-8.31	Peak	
2	2390.0000	19.03	33.06	52.09	54.00	-1.91	AVG	
3	2407.5000	77.67	33.12	110.79	74.00	36.79	Peak	No Limit
4 *	2407.9000	67.39	33.12	100.51	54.00	46.51	AVG	No Limit

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

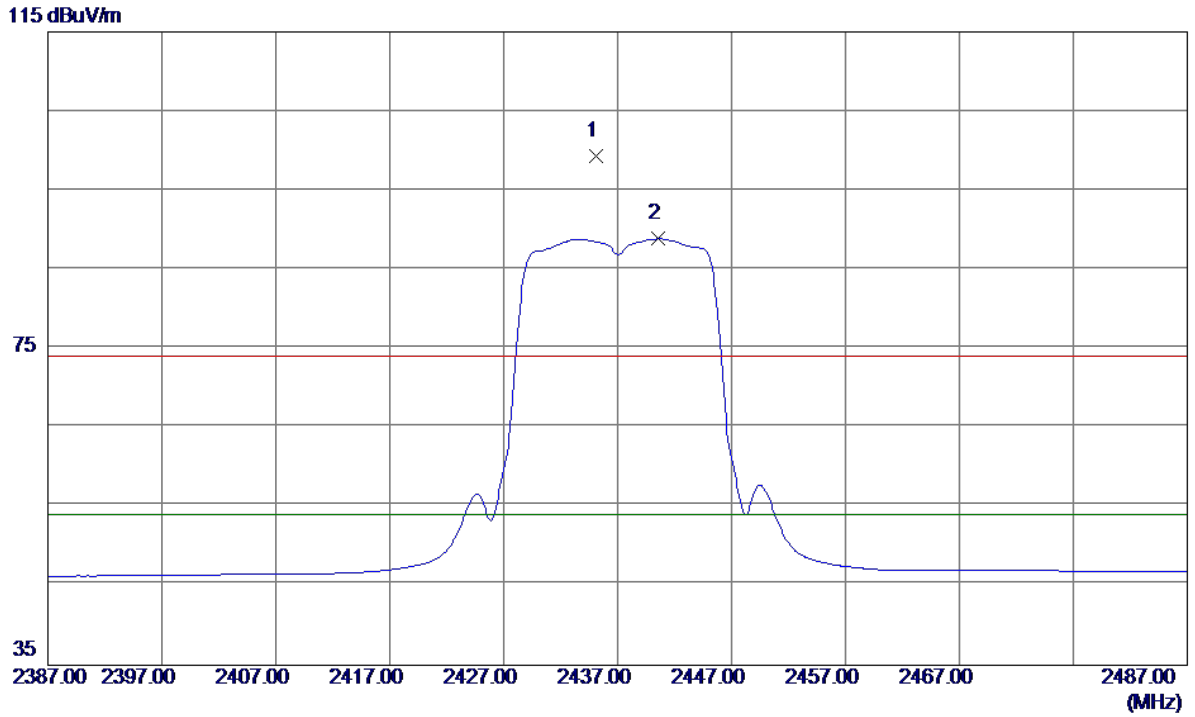
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4823.7599	37.61	6.32	43.93	54.00	-10.07	AVG	
2	4821.1200	48.76	6.31	55.07	74.00	-18.93	Peak	

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

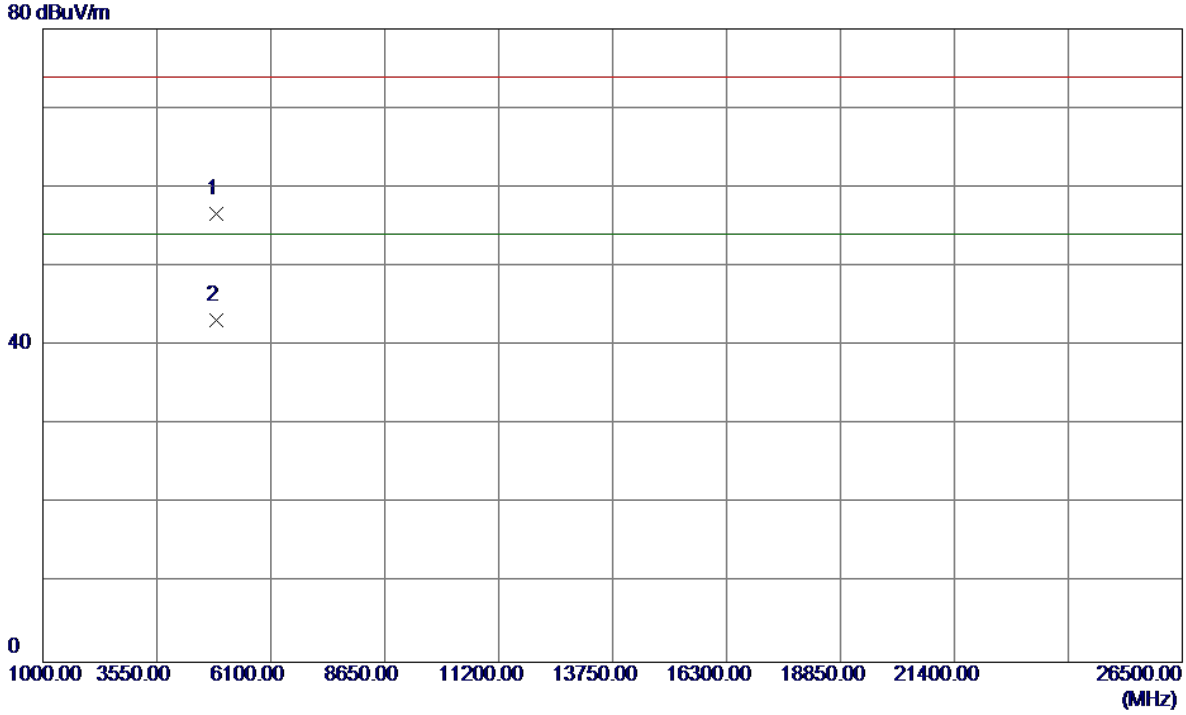
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2435.1000	66.11	33.23	99.34	74.00	25.34	Peak	No Limit
2 *	2440.6000	55.61	33.25	88.86	54.00	34.86	AVG	No Limit

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

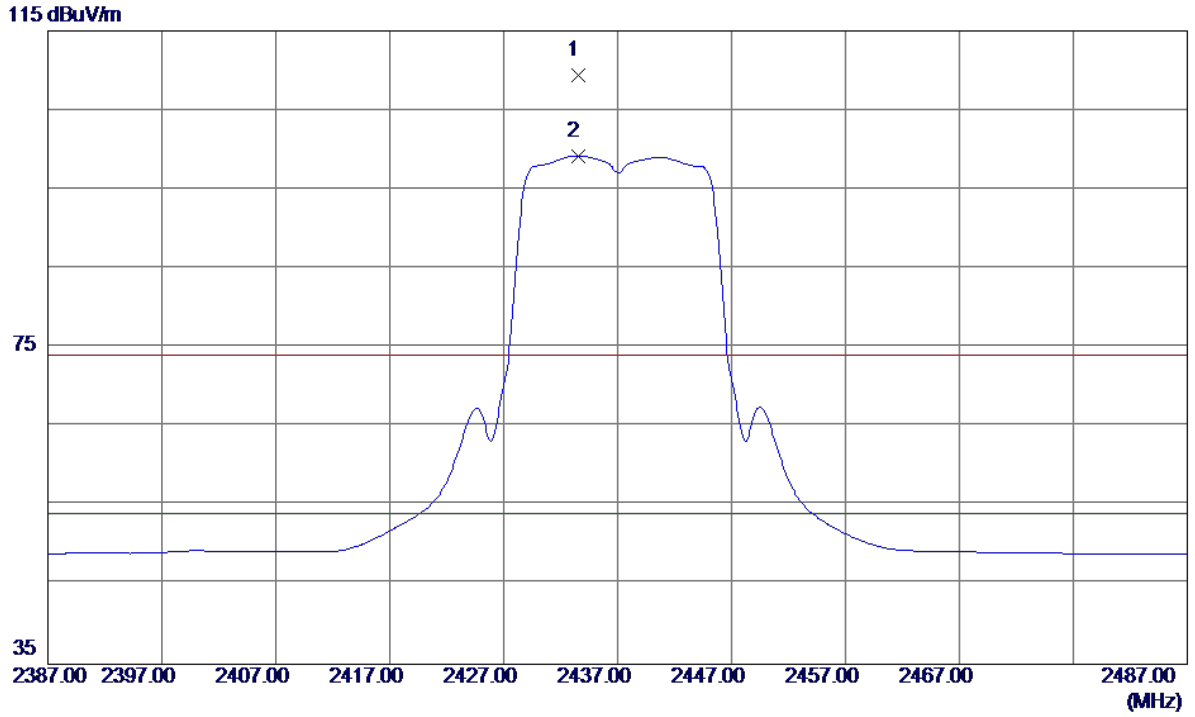
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4874.0000	50.27	6.44	56.71	74.00	-17.29	Peak	
2 *	4874.0000	36.77	6.44	43.21	54.00	-10.79	AVG	

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

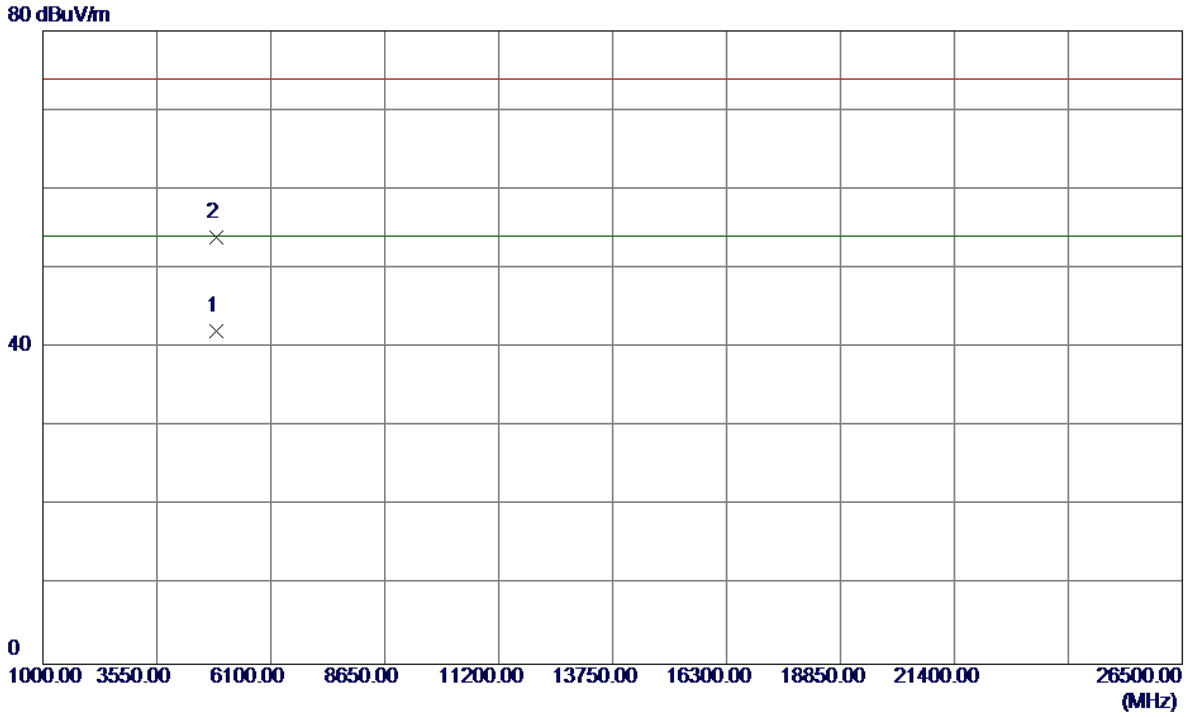
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2433.5000	76.20	33.22	109.42	74.00	35.42	Peak	No Limit
2 *	2433.5000	66.01	33.22	99.23	54.00	45.23	AVG	No Limit

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

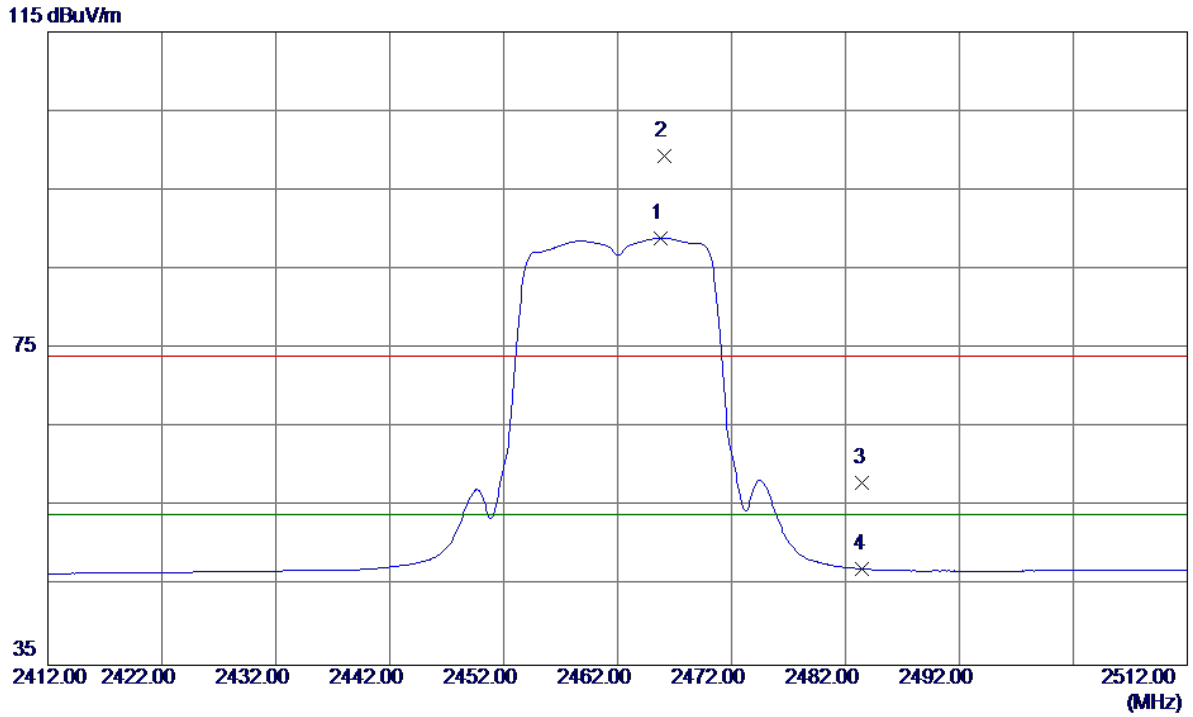
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4873.8500	35.68	6.44	42.12	54.00	-11.88	AVG	
2	4875.9800	47.50	6.45	53.95	74.00	-20.05	Peak	

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

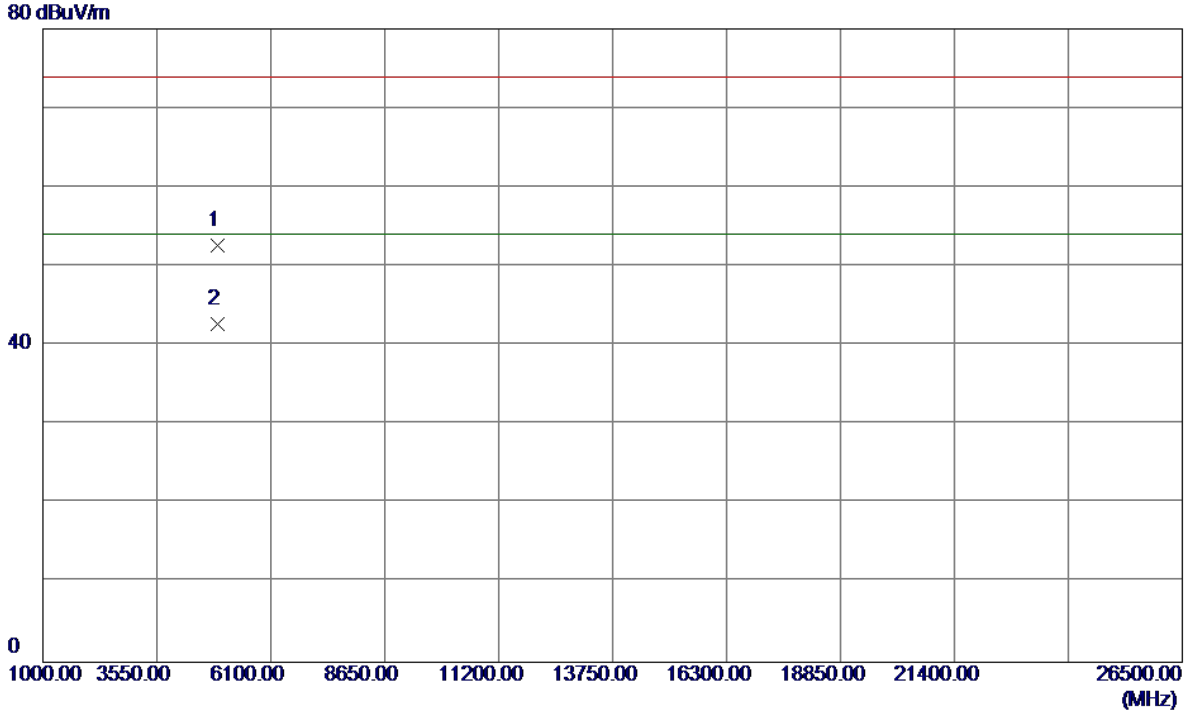
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2465.8000	55.61	33.34	88.95	54.00	34.95	AVG	No Limit
2	2466.1000	65.99	33.34	99.33	74.00	25.33	Peak	No Limit
3	2483.5000	24.70	33.41	58.11	74.00	-15.89	Peak	
4	2483.5000	13.75	33.41	47.16	54.00	-6.84	AVG	

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

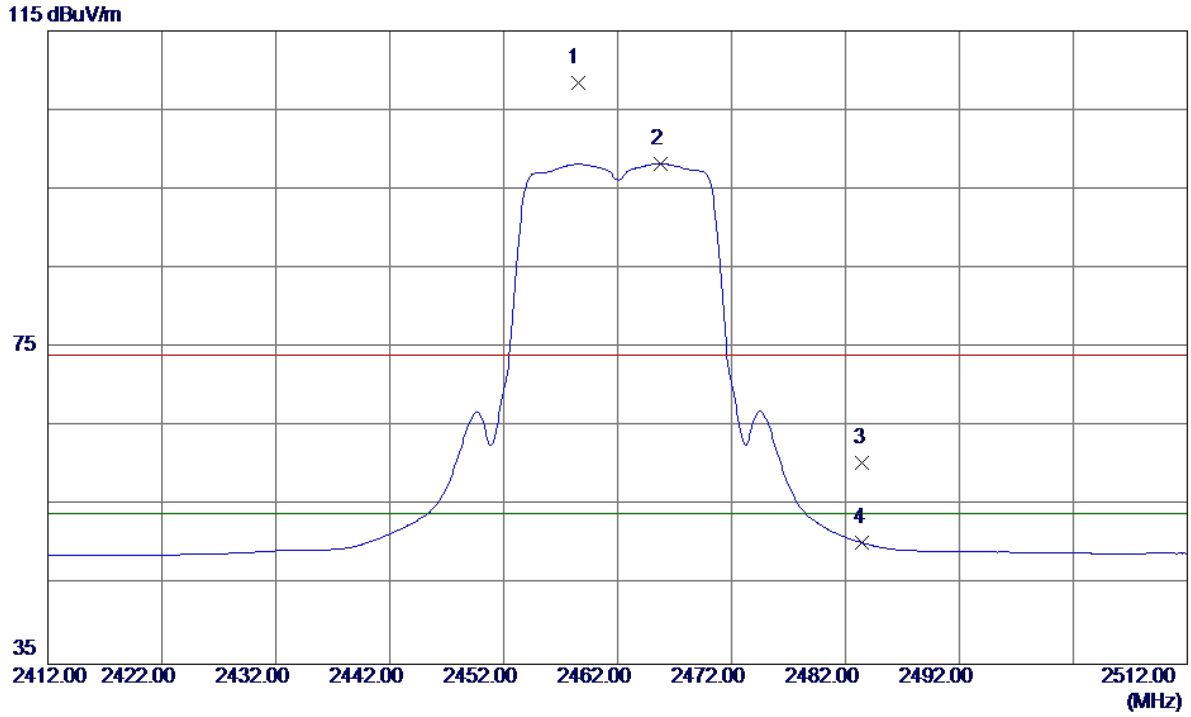
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4924.0000	46.09	6.57	52.66	74.00	-21.34	Peak	
2 *	4924.0000	36.13	6.57	42.70	54.00	-11.30	AVG	

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

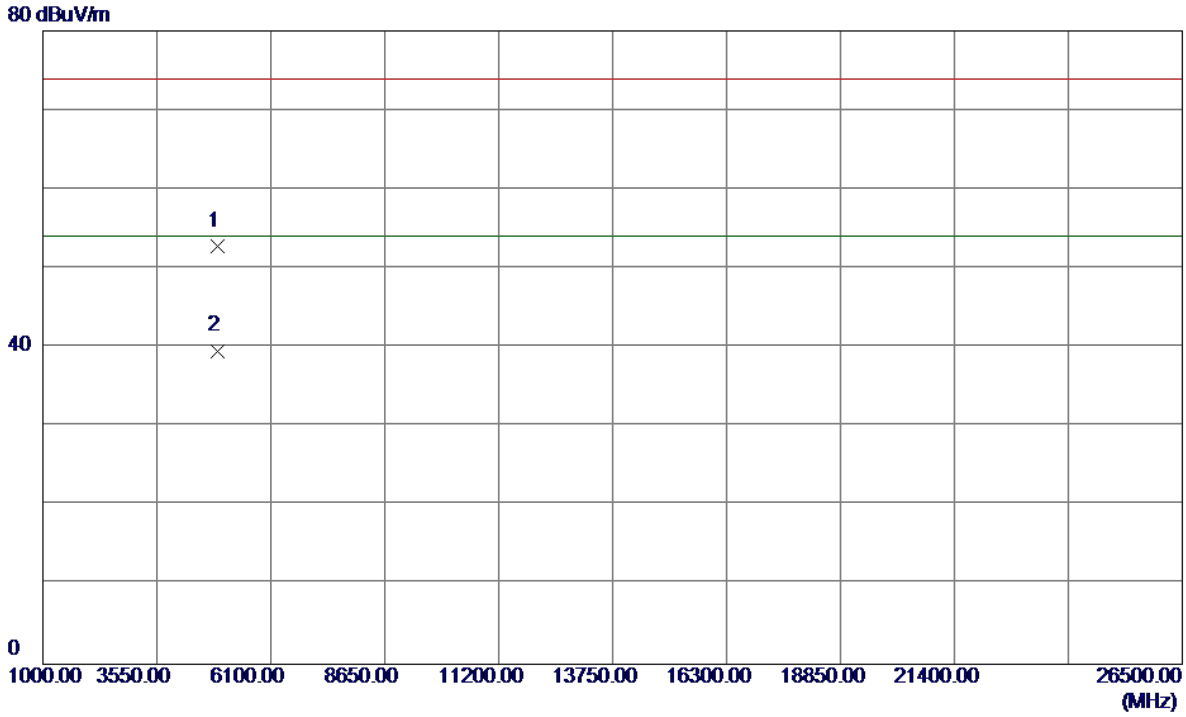
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2458.5000	75.18	33.31	108.49	74.00	34.49	Peak	No Limit
2 *	2465.8000	64.86	33.34	98.20	54.00	44.20	AVG	No Limit
3	2483.5000	27.05	33.41	60.46	74.00	-13.54	Peak	
4	2483.5000	16.92	33.41	50.33	54.00	-3.67	AVG	

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

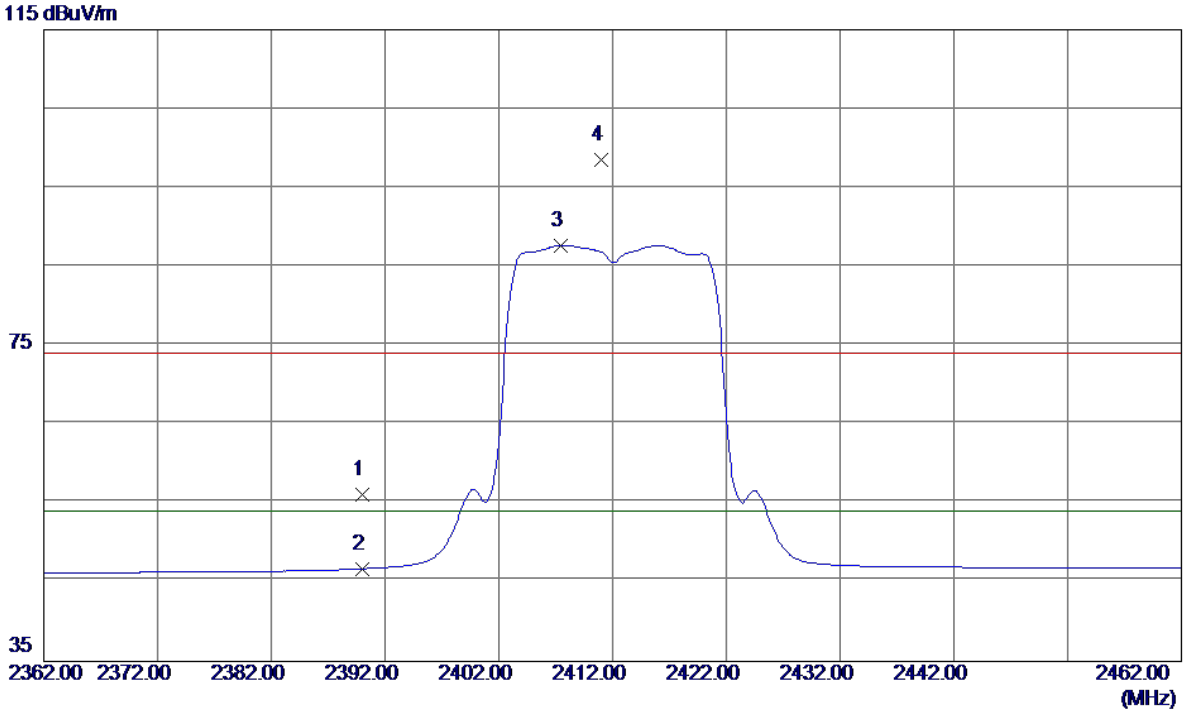
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4923.2200	46.29	6.57	52.86	74.00	-21.14	Peak	
2 *	4923.2200	33.03	6.57	39.60	54.00	-14.40	AVG	

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

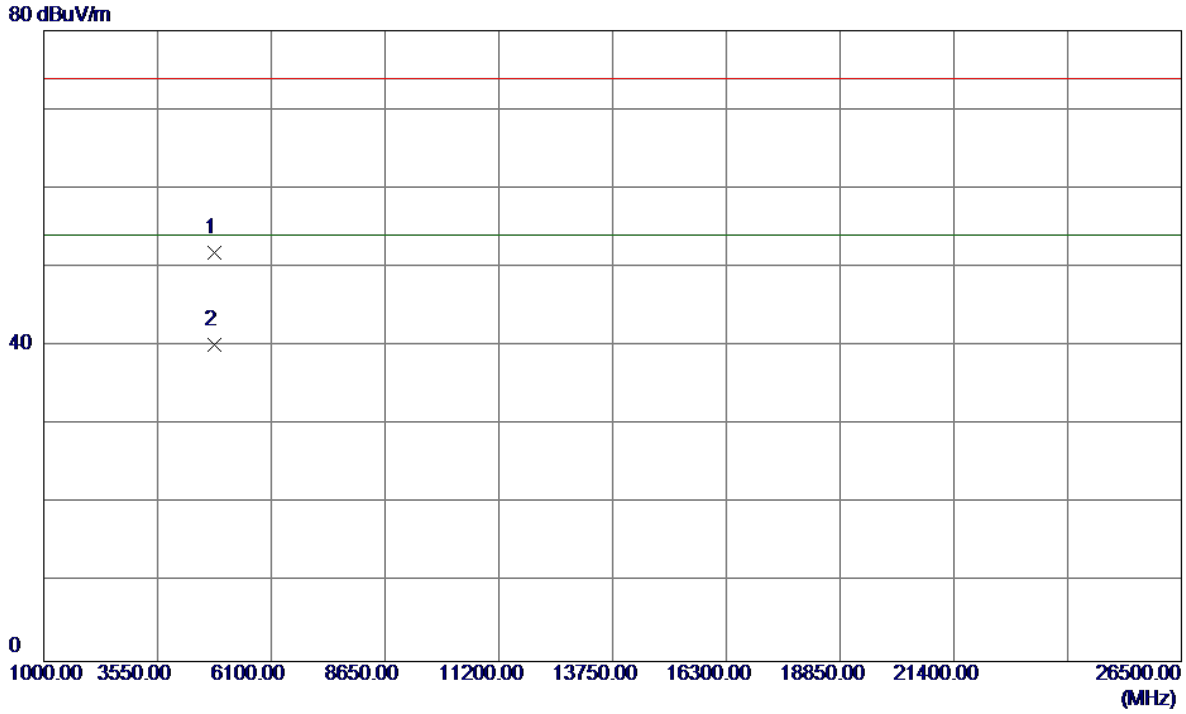
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	23.00	33.06	56.06	74.00	-17.94	Peak	
2	2390.0000	13.67	33.06	46.73	54.00	-7.27	AVG	
3 *	2407.4000	54.57	33.12	87.69	54.00	33.69	AVG	No Limit
4	2411.0000	65.41	33.14	98.55	74.00	24.55	Peak	No Limit

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

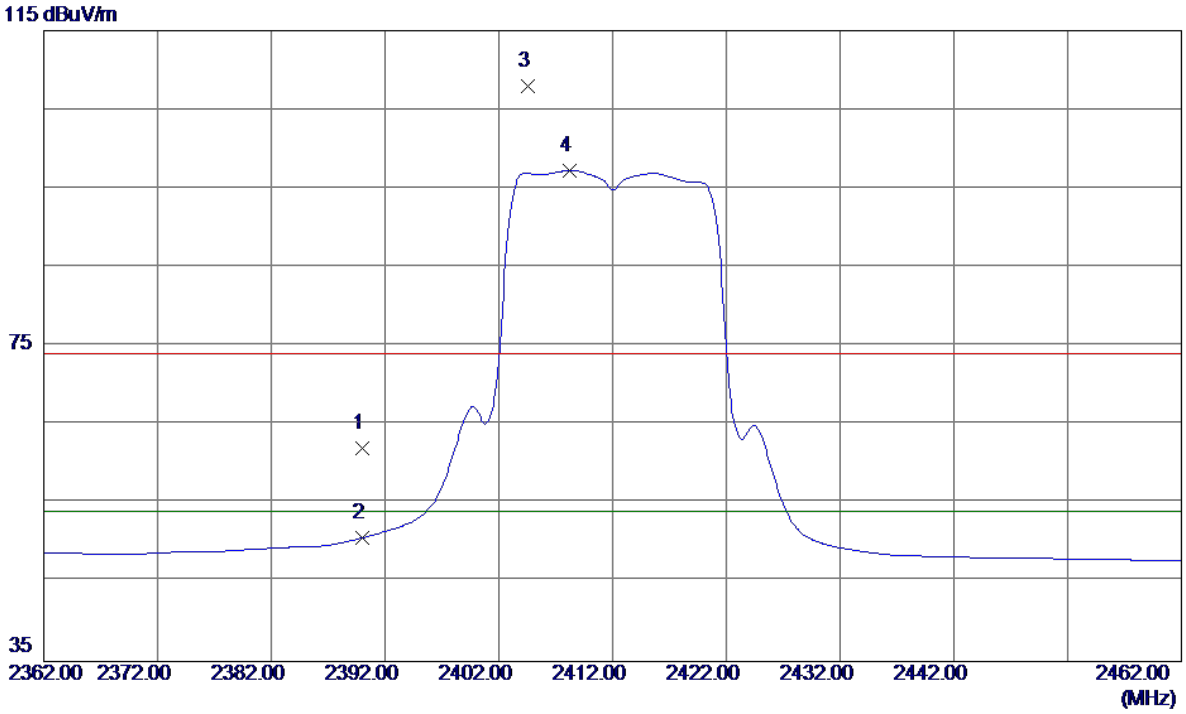
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4821.4600	45.46	6.31	51.77	74.00	-22.23	Peak	
2 *	4823.8400	33.84	6.32	40.16	54.00	-13.84	AVG	

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

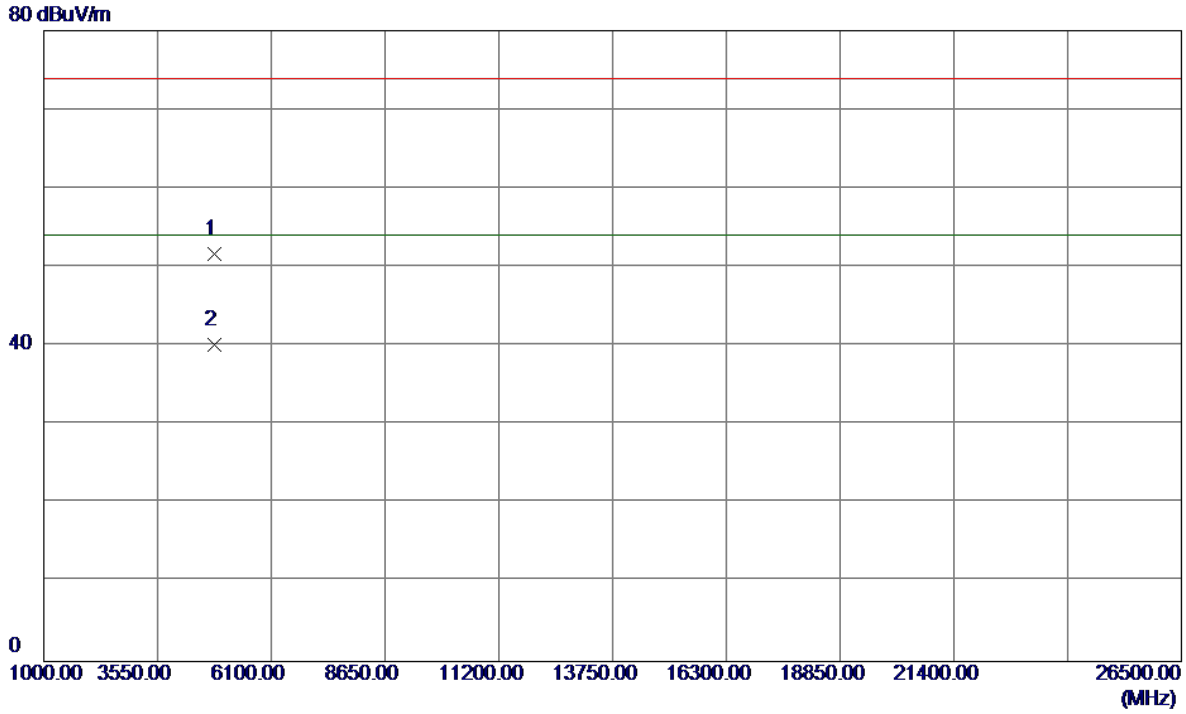
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	28.94	33.06	62.00	74.00	-12.00	Peak	
2	2390.0000	17.60	33.06	50.66	54.00	-3.34	AVG	
3	2404.6000	74.83	33.11	107.94	74.00	33.94	Peak	No Limit
4 *	2408.2000	64.19	33.12	97.31	54.00	43.31	AVG	No Limit

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

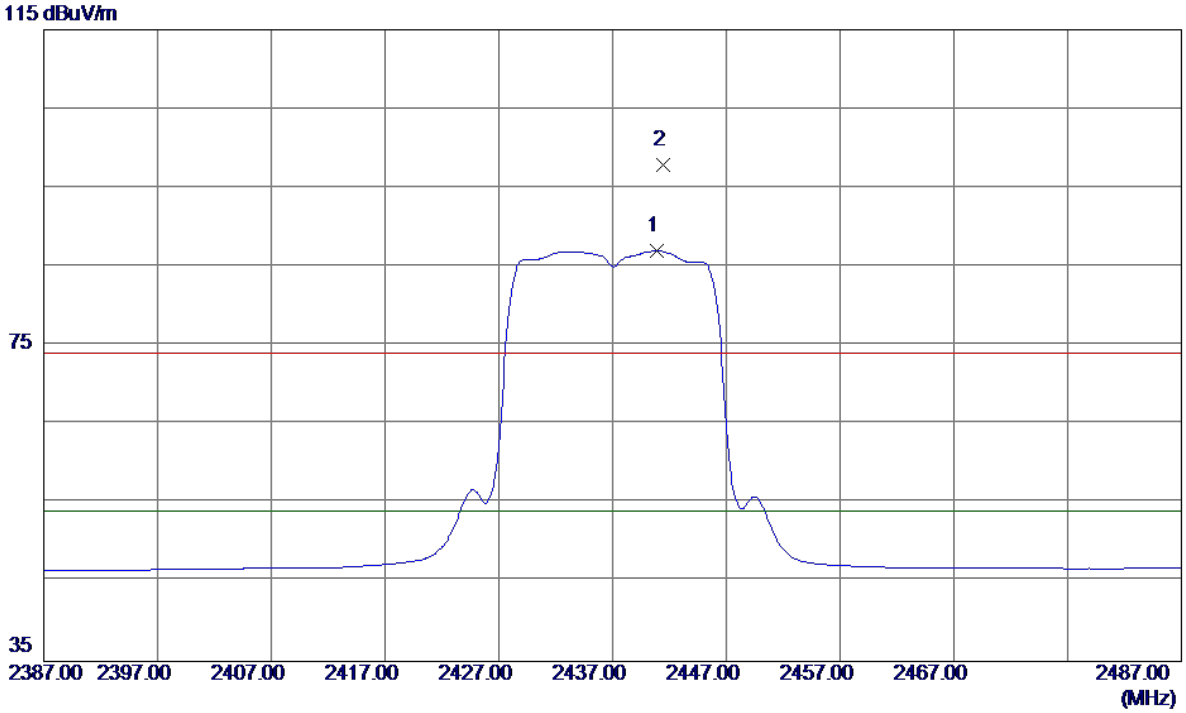
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4822.9000	45.35	6.31	51.66	74.00	-22.34	Peak	
2 *	4824.2000	33.82	6.32	40.14	54.00	-13.86	AVG	

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

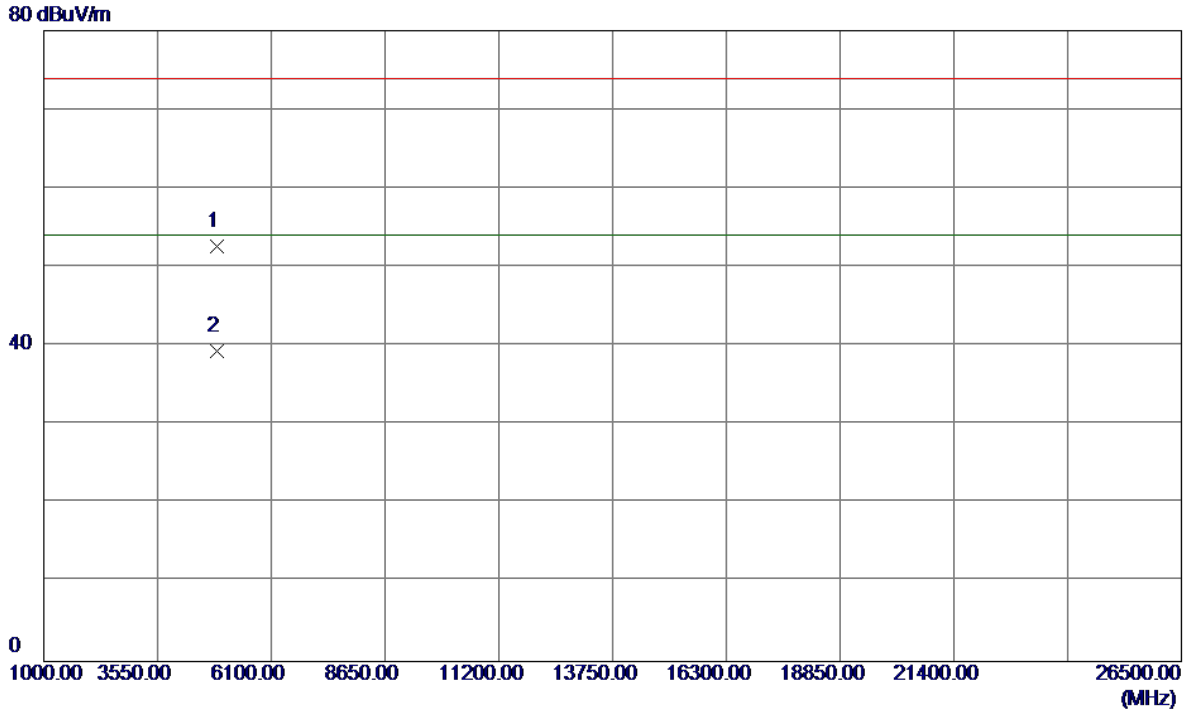
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2440.9000	53.75	33.25	87.00	54.00	33.00	AVG	No Limit
2	2441.4000	64.71	33.25	97.96	74.00	23.96	Peak	No Limit

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

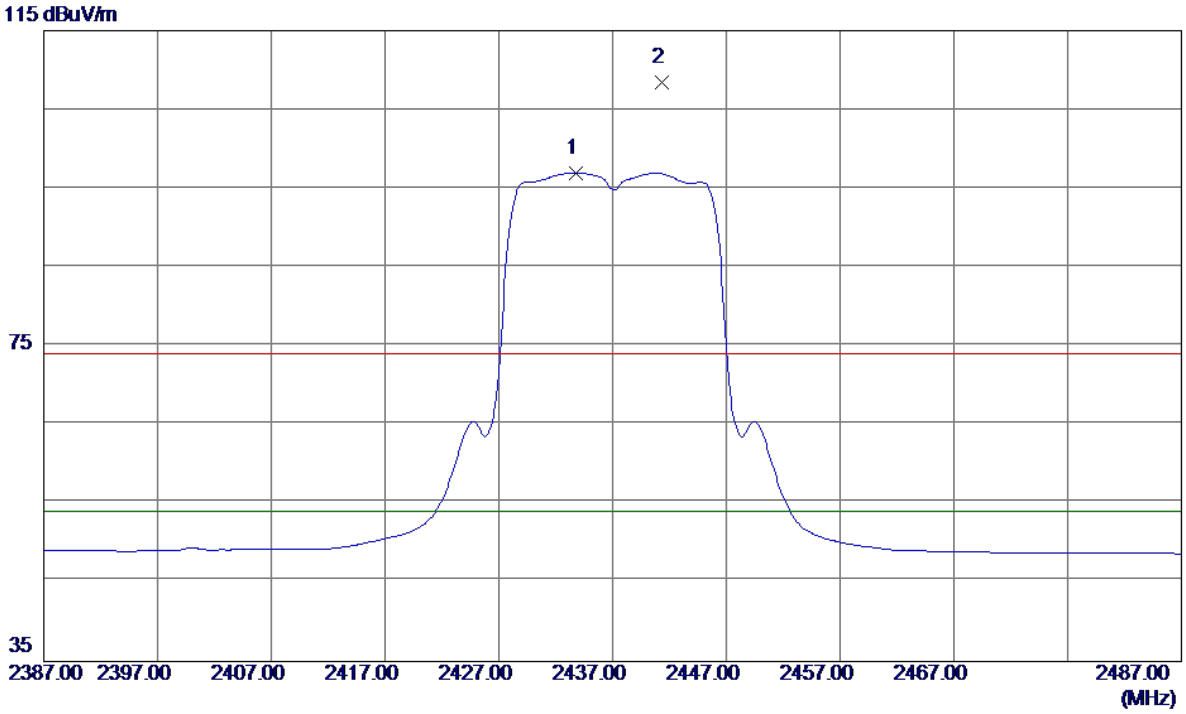
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4874.0000	46.27	6.44	52.71	74.00	-21.29	Peak	
2 *	4874.0000	32.89	6.44	39.33	54.00	-14.67	AVG	

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

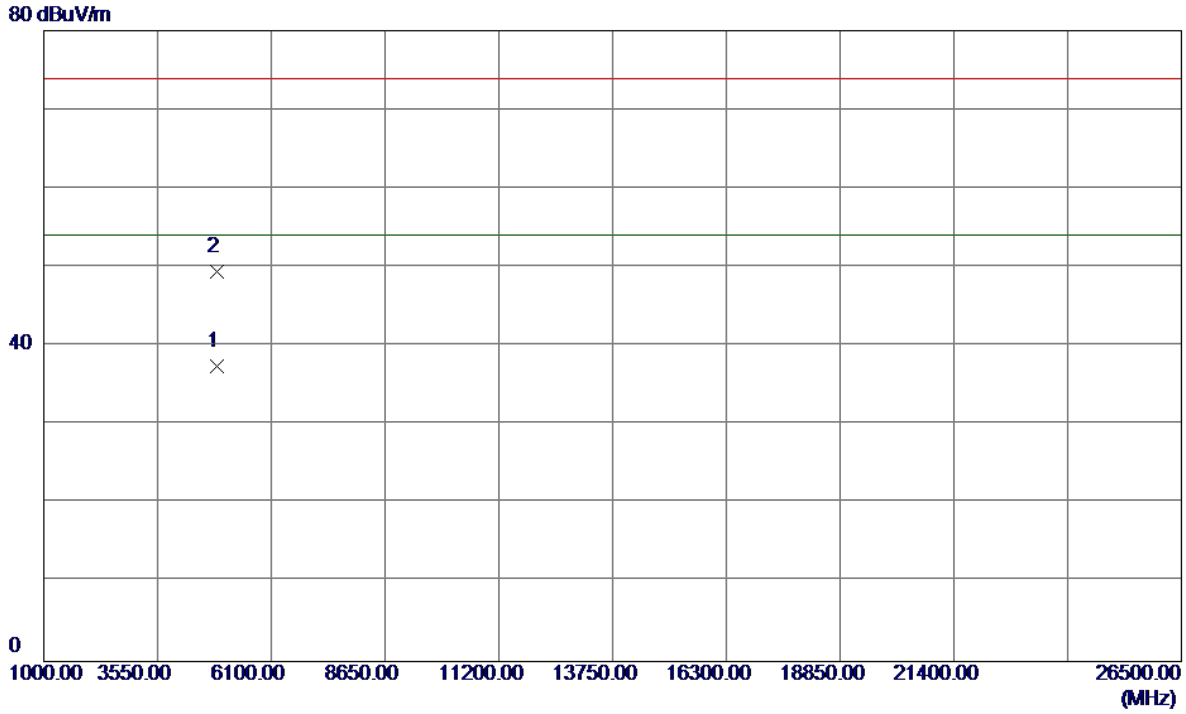
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2433.8000	63.74	33.22	96.96	54.00	42.96	AVG	No Limit
2	2441.3000	75.16	33.25	108.41	74.00	34.41	Peak	No Limit

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

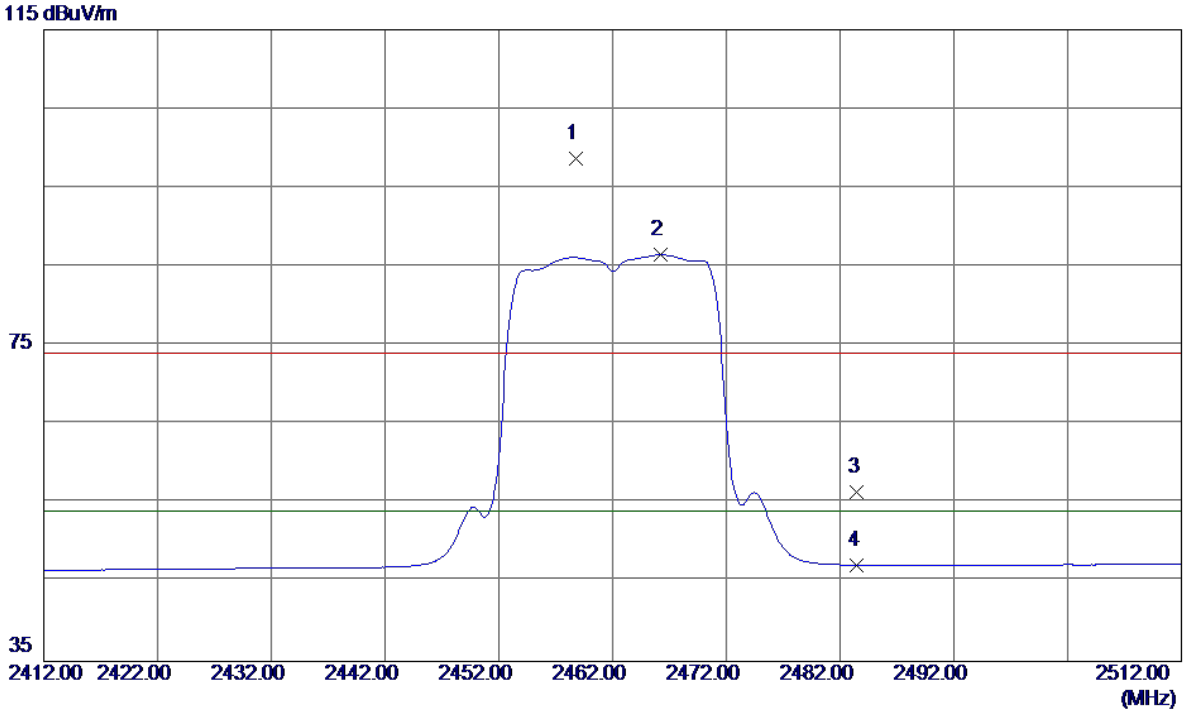
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.3500	31.03	6.44	37.47	54.00	-16.53	AVG	
2	4875.7500	42.95	6.45	49.40	74.00	-24.60	Peak	

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

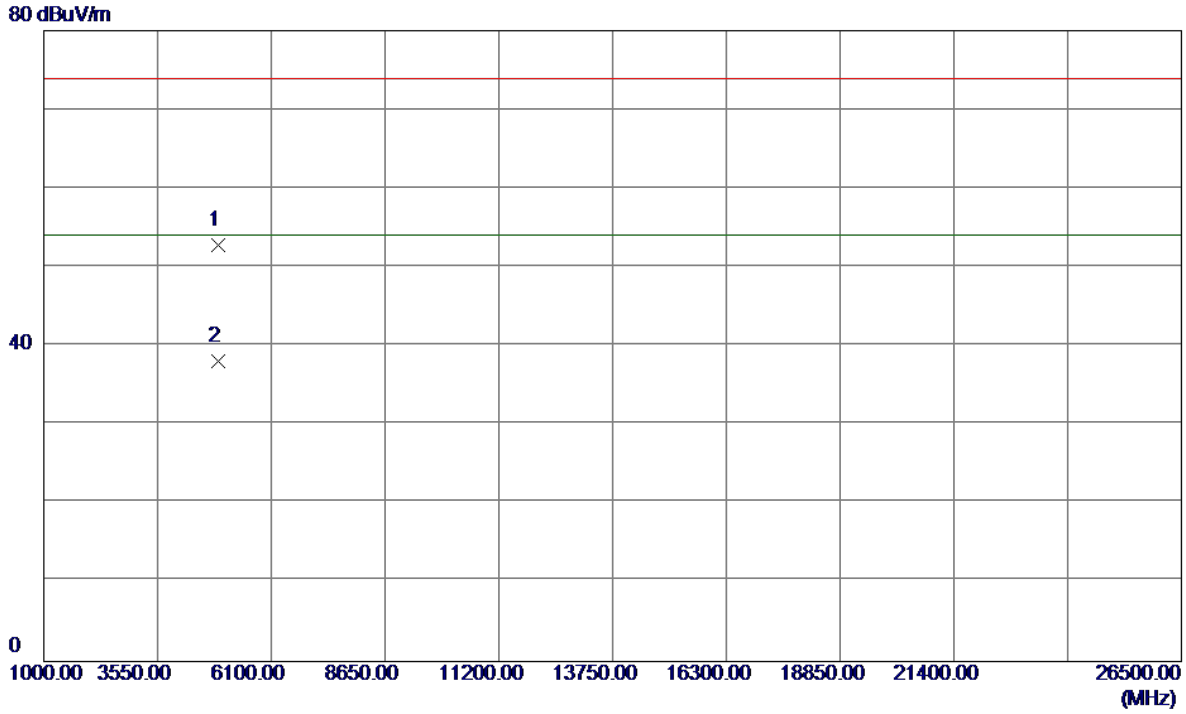
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2458.8000	65.34	33.31	98.65	74.00	24.65	Peak	No Limit
2 *	2466.2000	53.13	33.34	86.47	54.00	32.47	AVG	No Limit
3	2483.5000	23.07	33.41	56.48	74.00	-17.52	Peak	
4	2483.5000	13.78	33.41	47.19	54.00	-6.81	AVG	

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

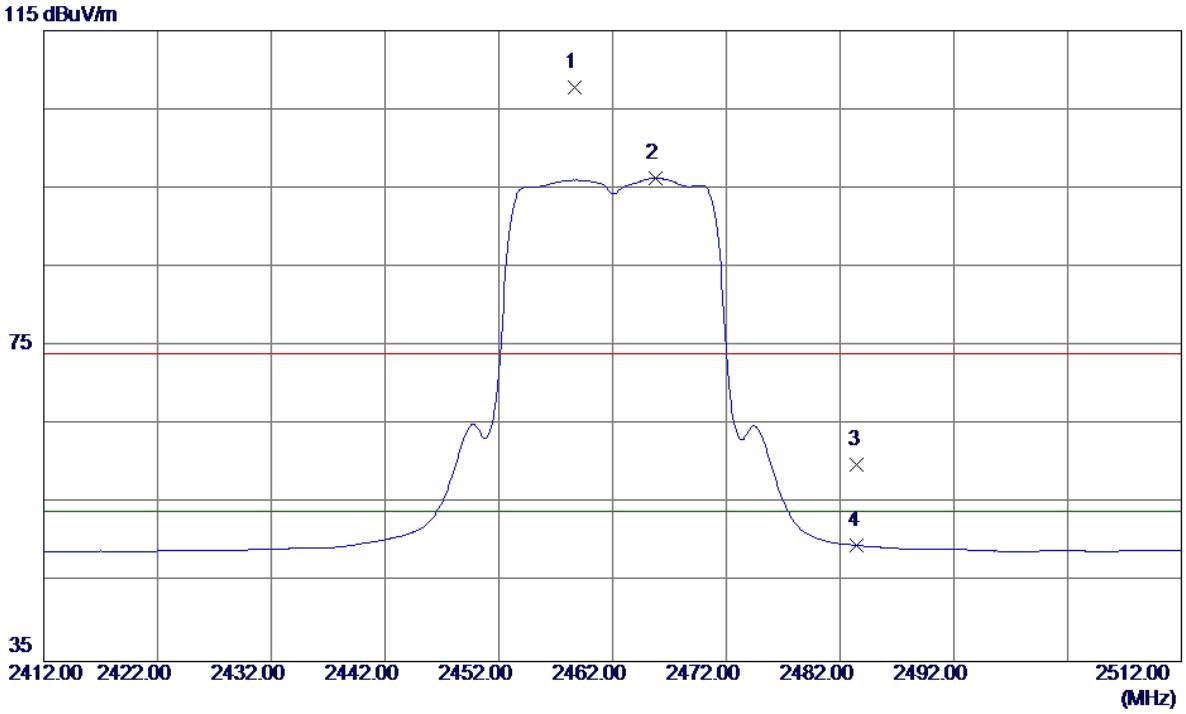
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4924.0000	46.21	6.57	52.78	74.00	-21.22	Peak	
2 *	4924.0000	31.58	6.57	38.15	54.00	-15.85	AVG	

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

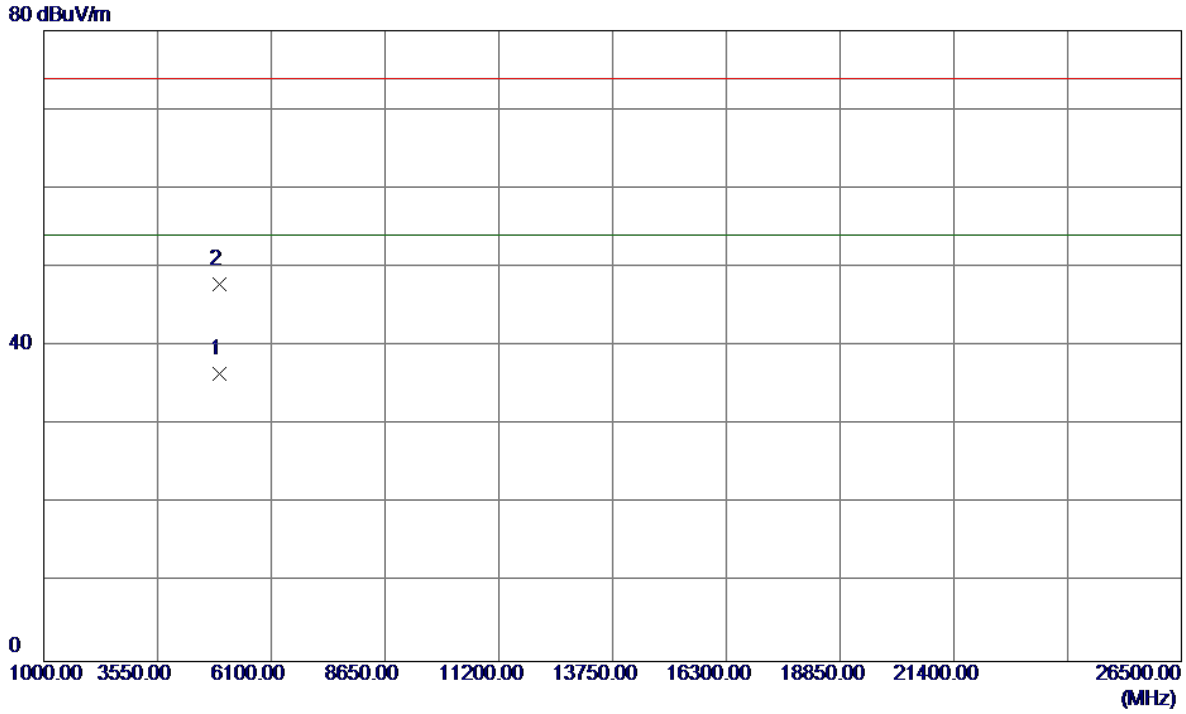
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2458.7000	74.53	33.31	107.84	74.00	33.84	Peak	No Limit
2 *	2465.8000	62.98	33.34	96.32	54.00	42.32	AVG	No Limit
3	2483.5000	26.48	33.41	59.89	74.00	-14.11	Peak	
4	2483.5000	16.31	33.41	49.72	54.00	-4.28	AVG	

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

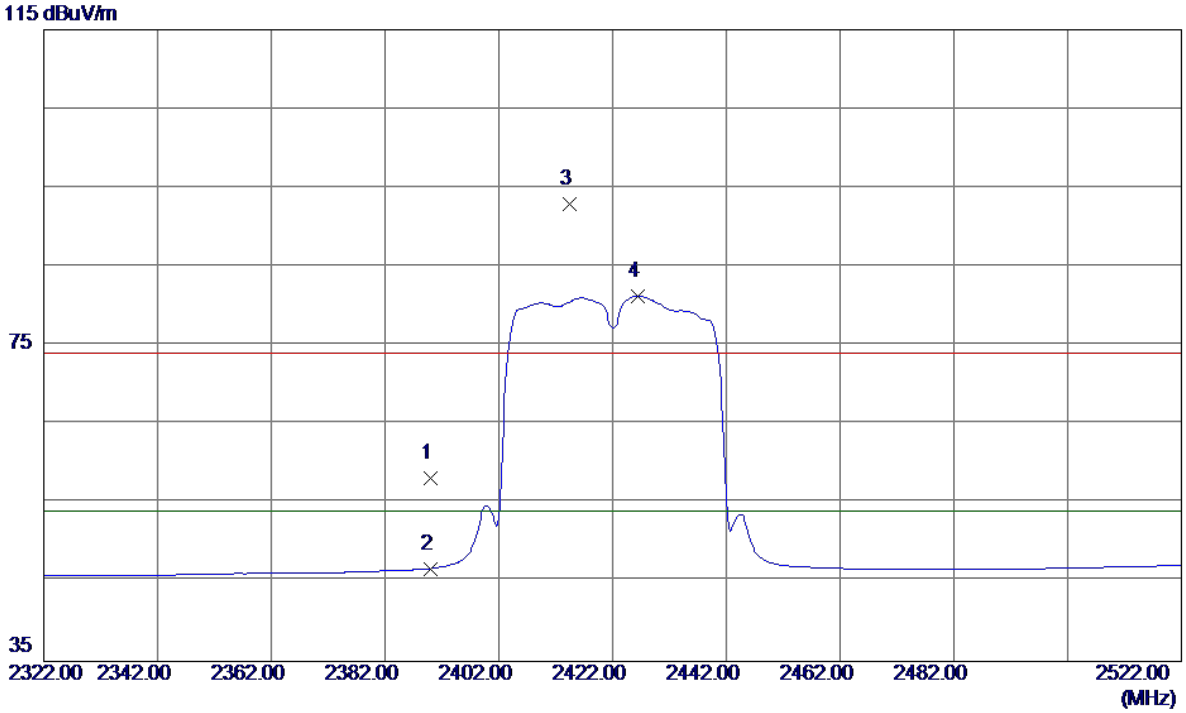
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4924.7500	29.87	6.57	36.44	54.00	-17.56	AVG	
2	4925.0500	41.22	6.57	47.79	74.00	-26.21	Peak	

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

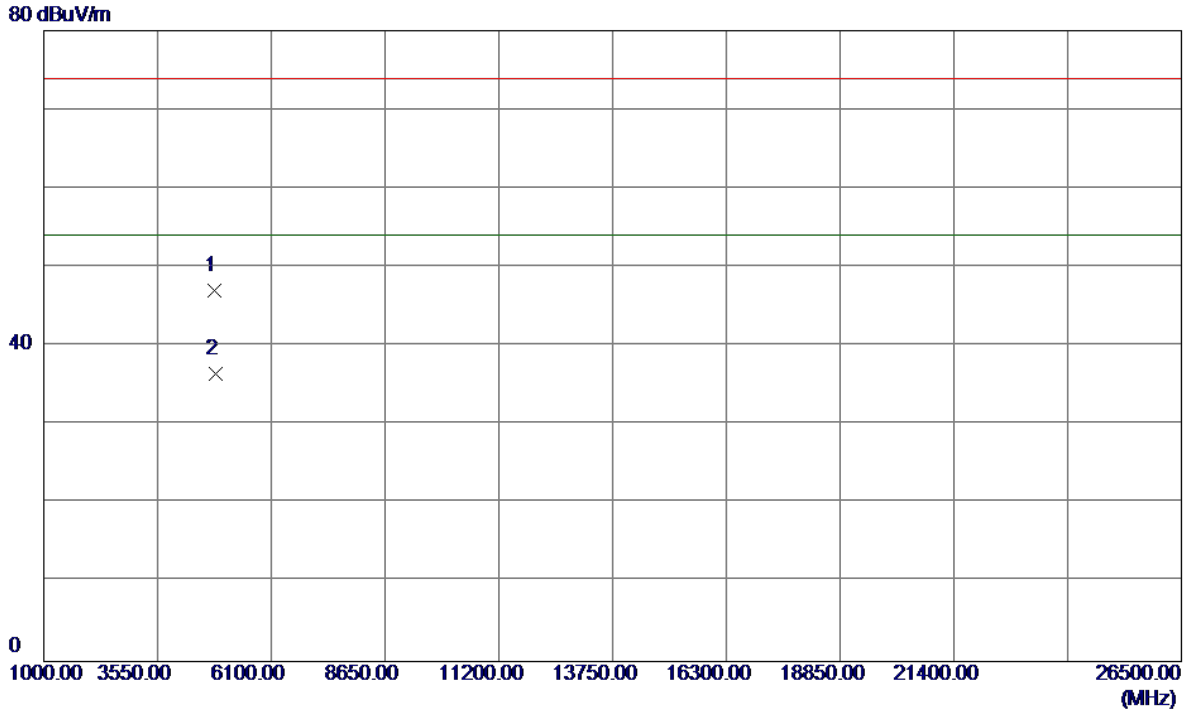
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	25.15	33.06	58.21	74.00	-15.79	Peak	
2	2390.0000	13.70	33.06	46.76	54.00	-7.24	AVG	
3	2414.4000	59.81	33.15	92.96	74.00	18.96	Peak	No Limit
4 *	2426.4000	48.08	33.19	81.27	54.00	27.27	AVG	No Limit

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

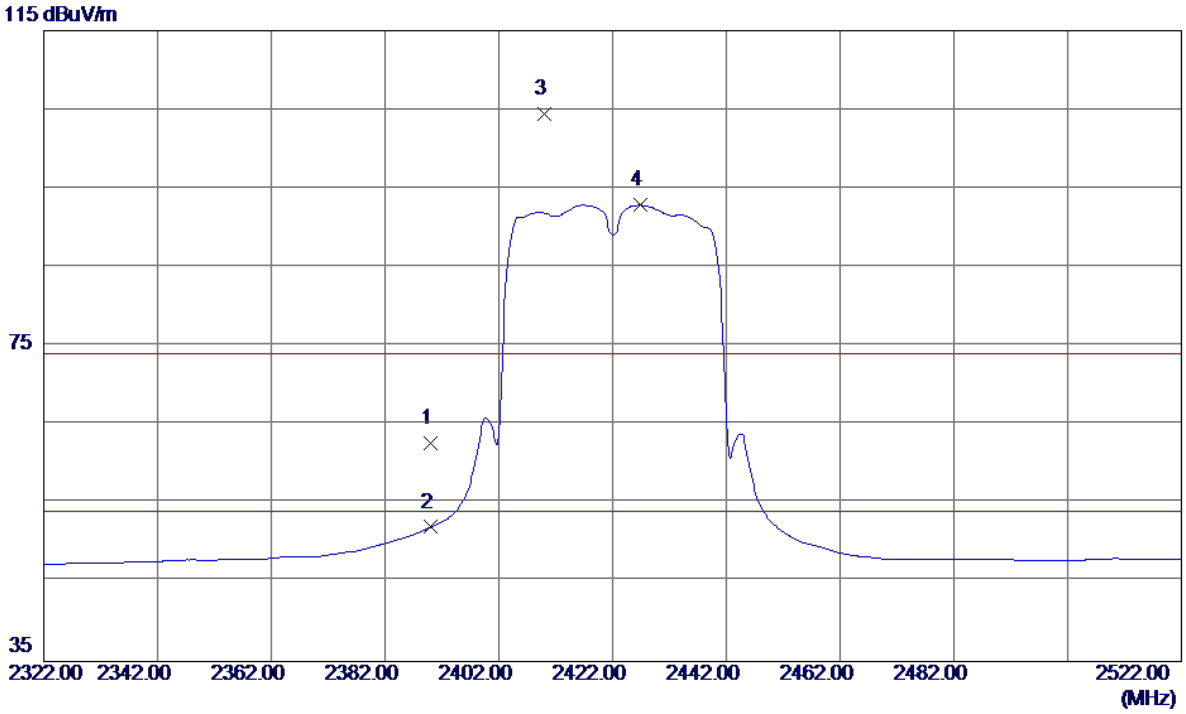
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4839.1000	40.71	6.35	47.06	74.00	-26.94	Peak	
2 *	4842.0000	30.07	6.36	36.43	54.00	-17.57	AVG	

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

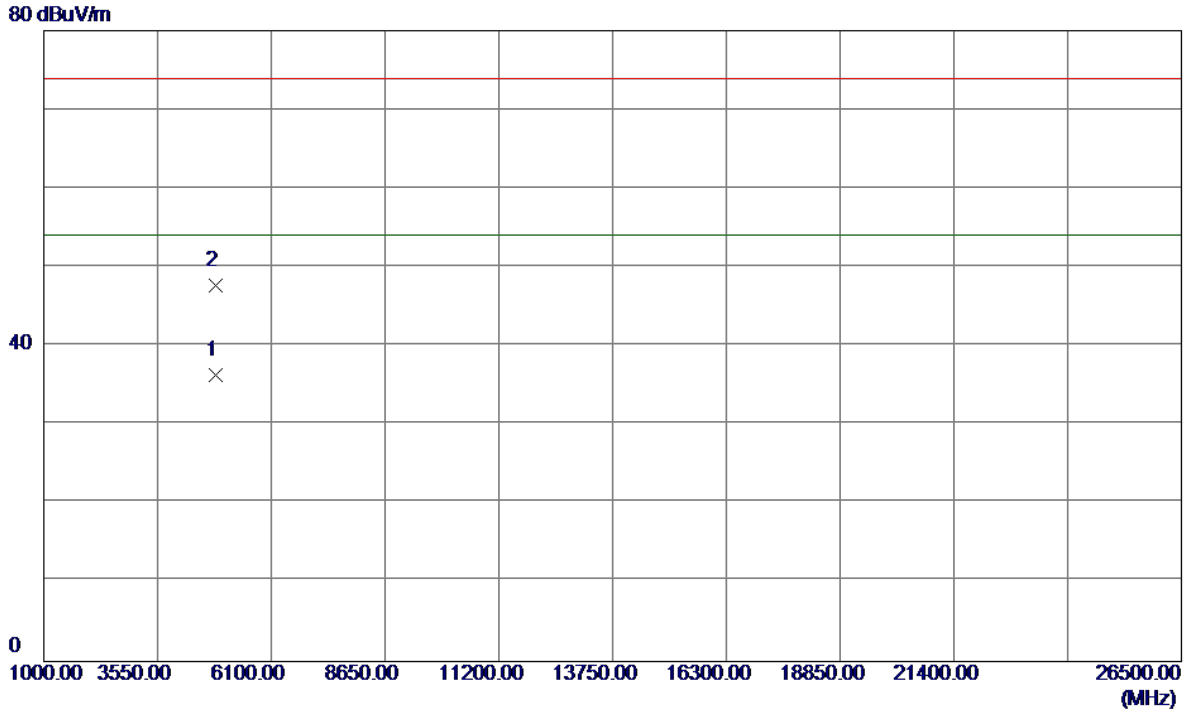
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	29.63	33.06	62.69	74.00	-11.31	Peak	
2	2390.0000	18.98	33.06	52.04	54.00	-1.96	AVG	
3	2410.0000	71.31	33.13	104.44	74.00	30.44	Peak	No Limit
4 *	2426.8000	59.67	33.19	92.86	54.00	38.86	AVG	No Limit

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

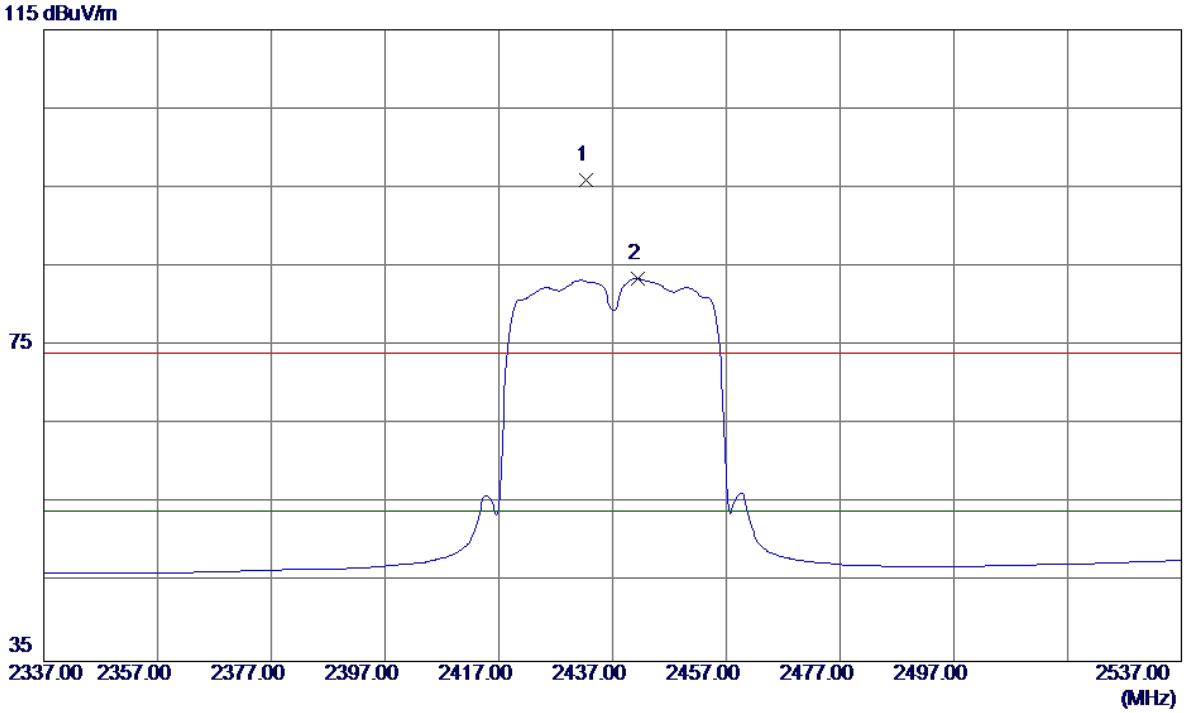
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4843.0500	29.95	6.36	36.31	54.00	-17.69	AVG	
2	4842.9500	41.26	6.36	47.62	74.00	-26.38	Peak	

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

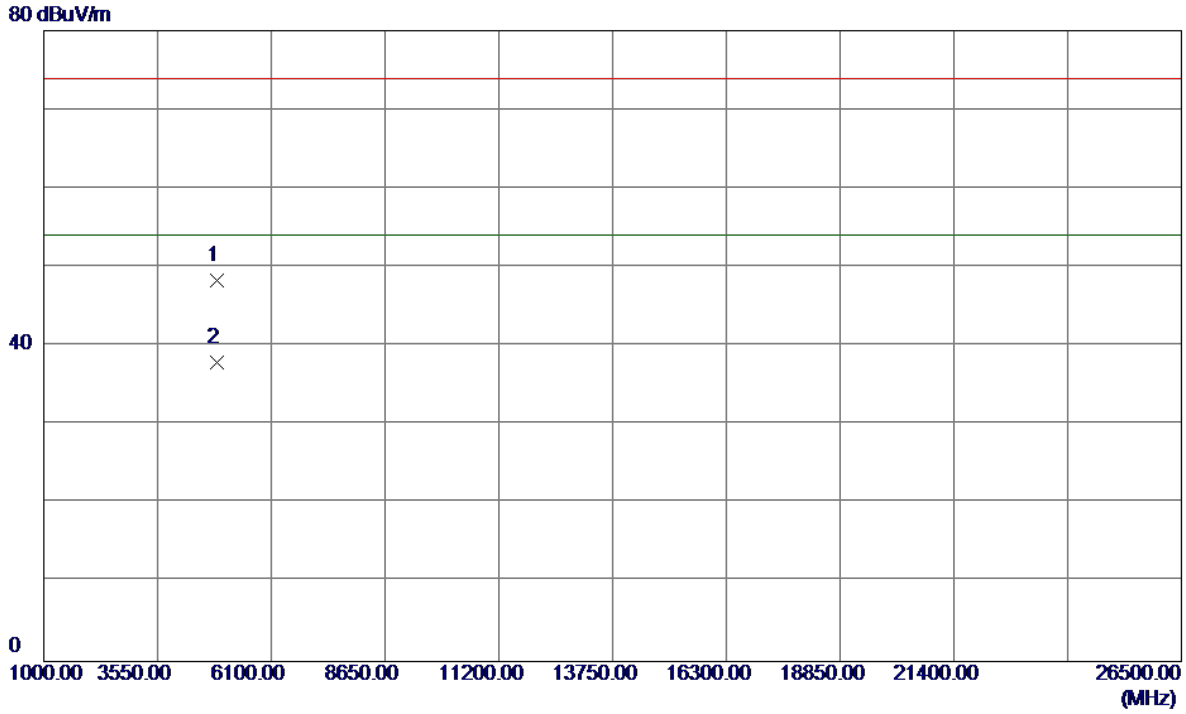
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2432.4000	62.70	33.22	95.92	74.00	21.92	Peak	No Limit
2 *	2441.4000	50.24	33.25	83.49	54.00	29.49	AVG	No Limit

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

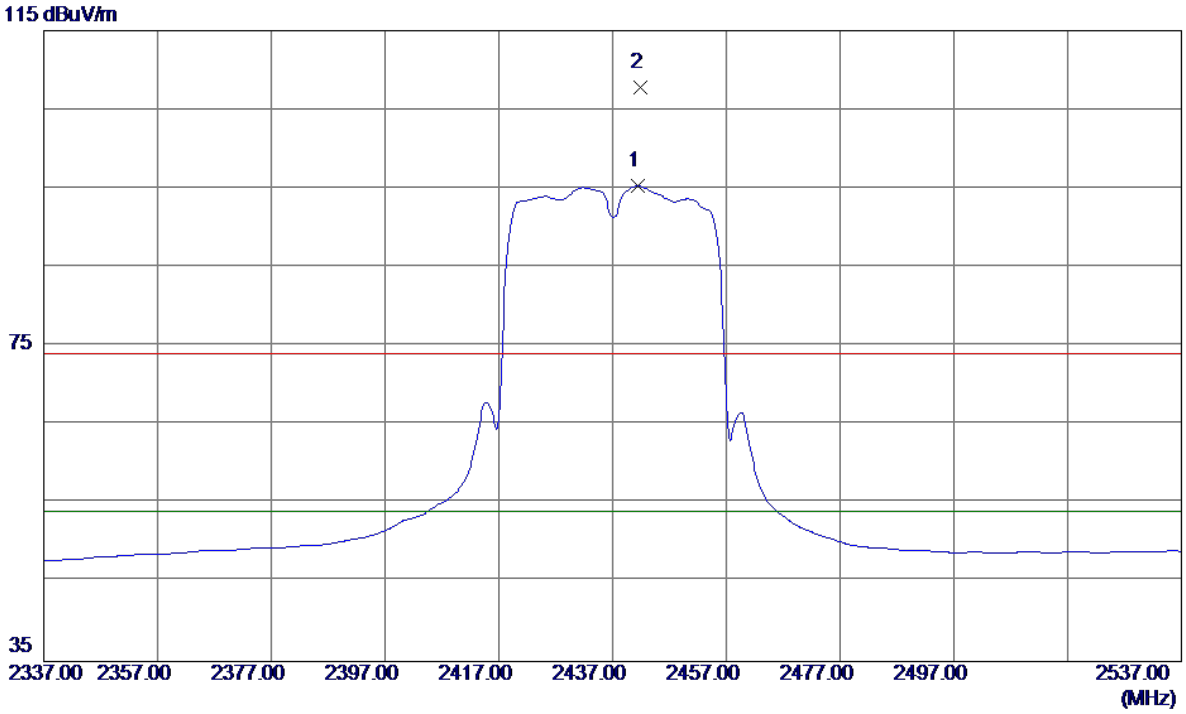
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4875.1000	41.80	6.45	48.25	74.00	-25.75	Peak	
2 *	4875.3000	31.51	6.45	37.96	54.00	-16.04	AVG	

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

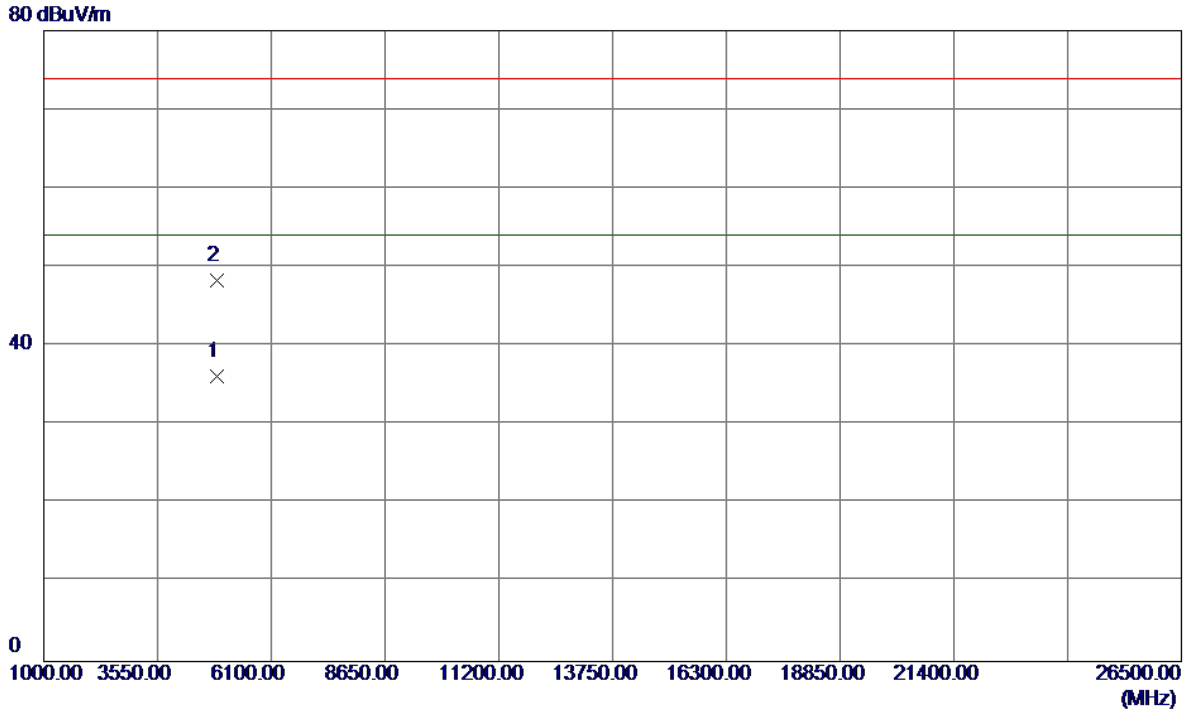
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2441.4000	62.06	33.25	95.31	54.00	41.31	AVG	No Limit
2	2441.8000	74.57	33.25	107.82	74.00	33.82	Peak	No Limit

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

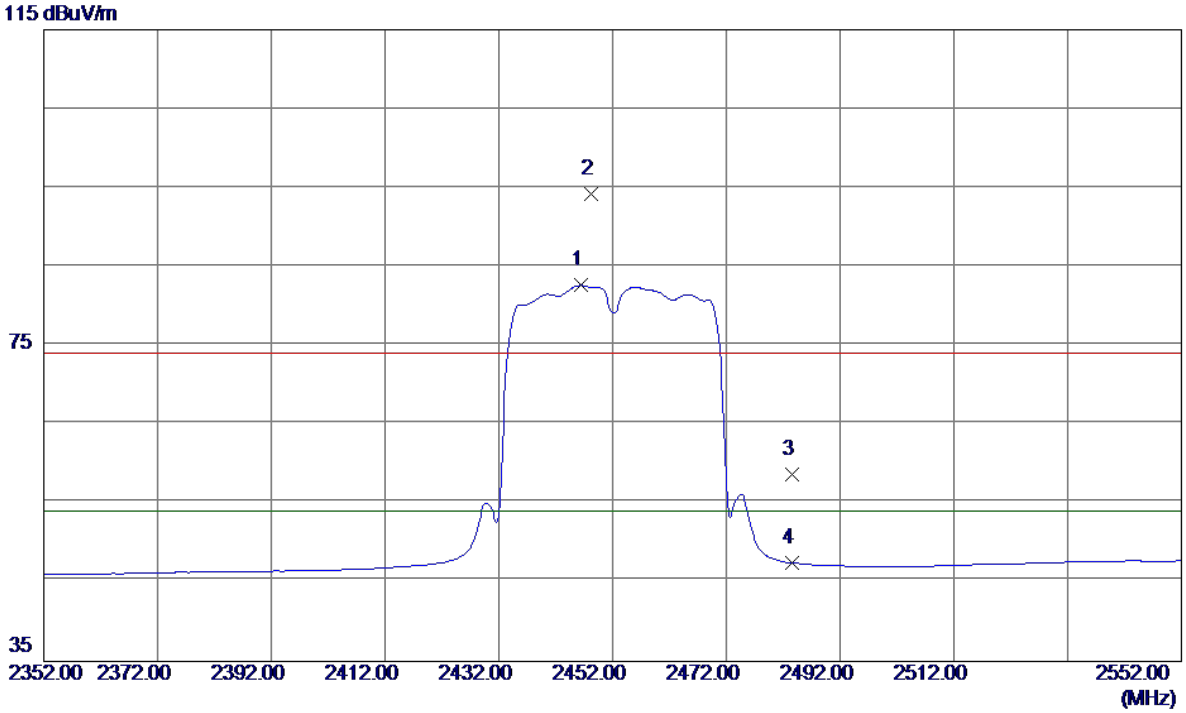
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.4000	29.70	6.44	36.14	54.00	-17.86	AVG	
2	4874.3000	41.85	6.44	48.29	74.00	-25.71	Peak	

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

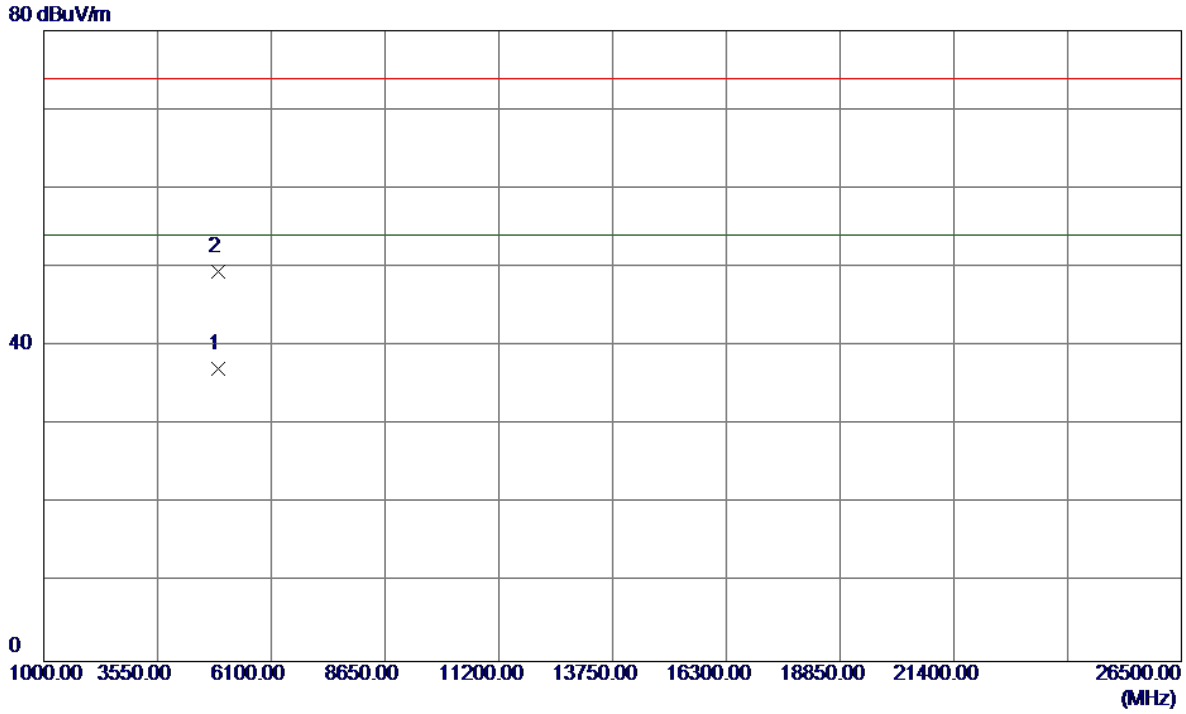
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2446.4000	49.34	33.27	82.61	54.00	28.61	AVG	No Limit
2	2448.2000	60.92	33.28	94.20	74.00	20.20	Peak	No Limit
3	2483.5000	25.32	33.41	58.73	74.00	-15.27	Peak	
4	2483.5000	14.06	33.41	47.47	54.00	-6.53	AVG	

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

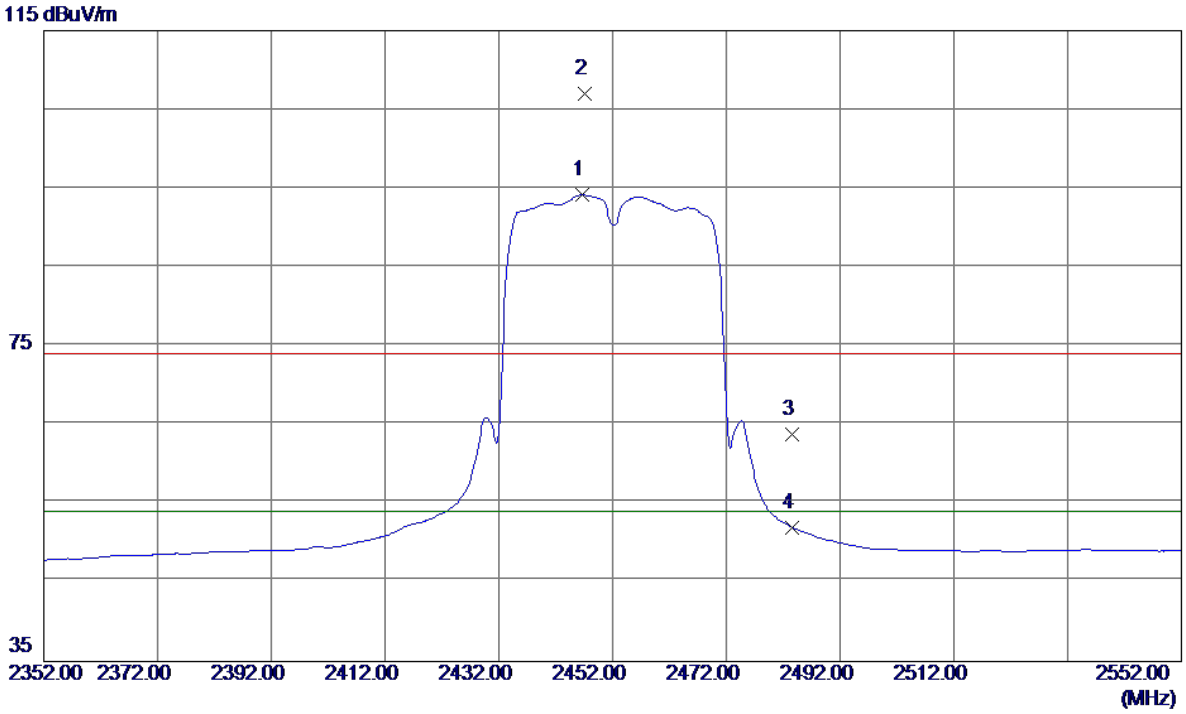
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4902.0000	30.63	6.51	37.14	54.00	-16.86	AVG	
2	4905.2000	42.96	6.52	49.48	74.00	-24.52	Peak	

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

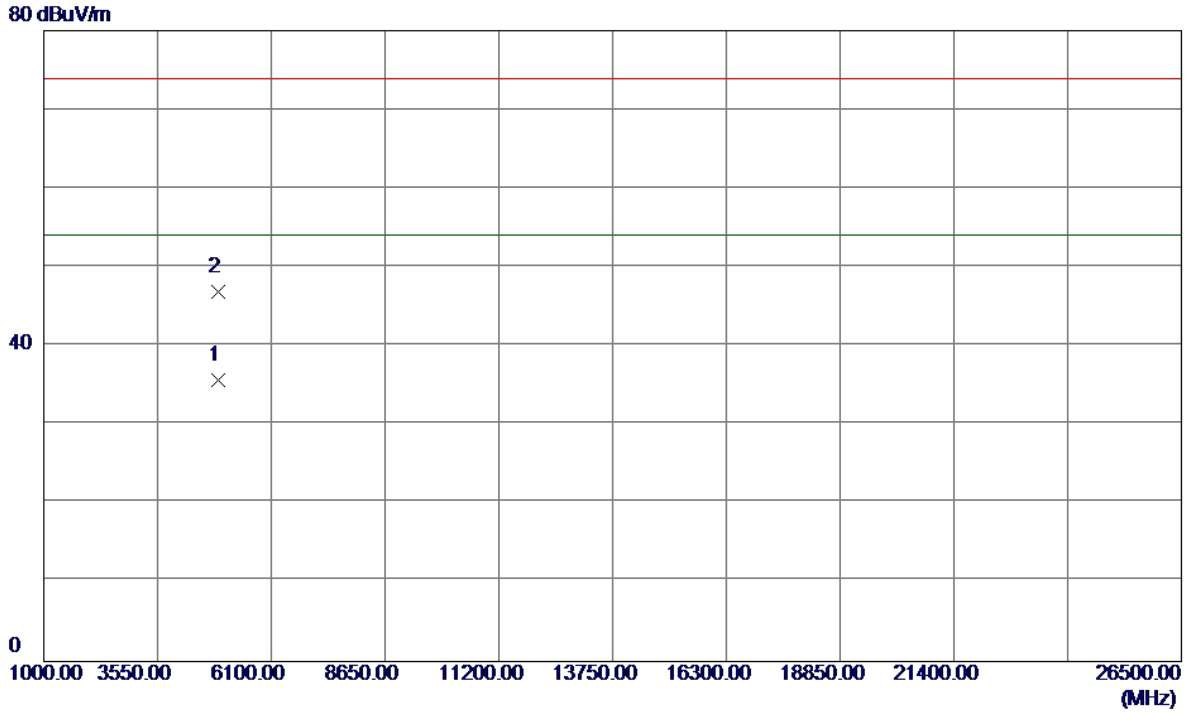
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2446.6000	60.91	33.27	94.18	54.00	40.18	AVG	No Limit
2	2447.2000	73.73	33.27	107.00	74.00	33.00	Peak	No Limit
3	2483.5000	30.41	33.41	63.82	74.00	-10.18	Peak	
4	2483.5000	18.58	33.41	51.99	54.00	-2.01	AVG	

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

Horizontal



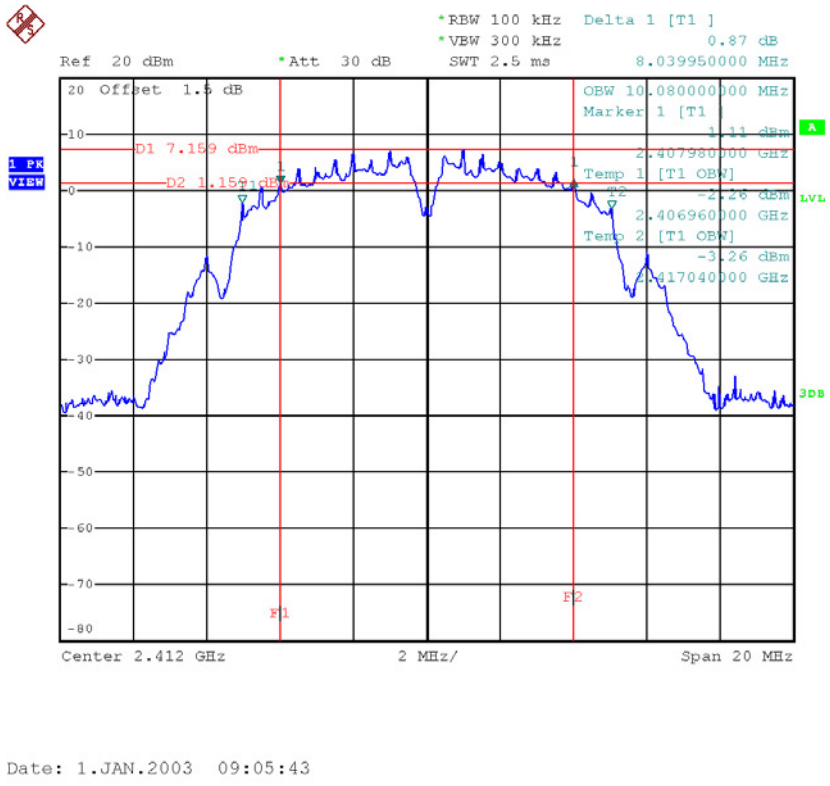
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4902.4500	29.22	6.51	35.73	54.00	-18.27	AVG	
2	4902.8000	40.30	6.51	46.81	74.00	-27.19	Peak	

ATTACHMENT E - BANDWIDTH

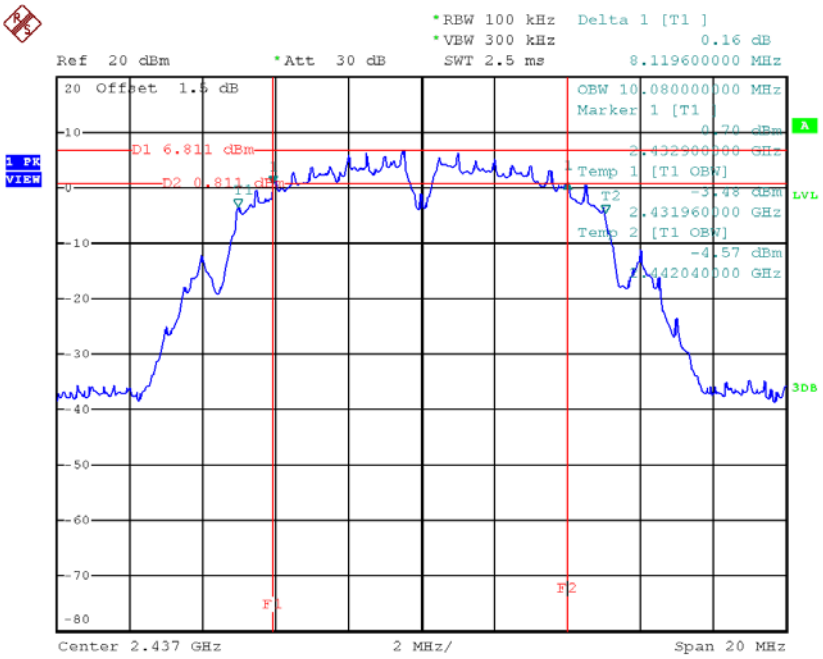
Test Mode : TX B Mode_CH01/06/11

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	8.04	10.08	500	Complies
2437	8.12	10.08	500	Complies
2462	8.56	10.08	500	Complies

TX CH01

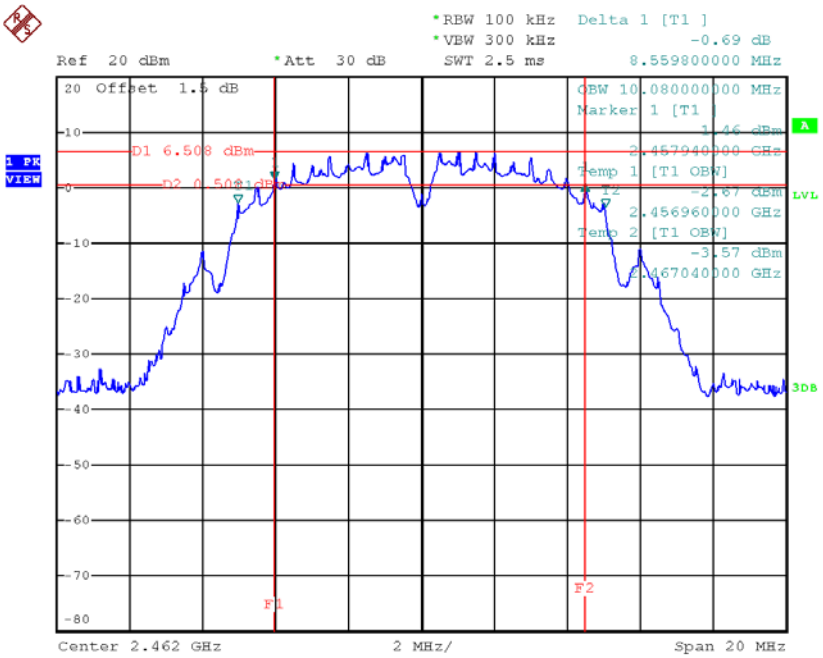


TX CH06



Date: 1.JAN.2003 09:17:30

TX CH11

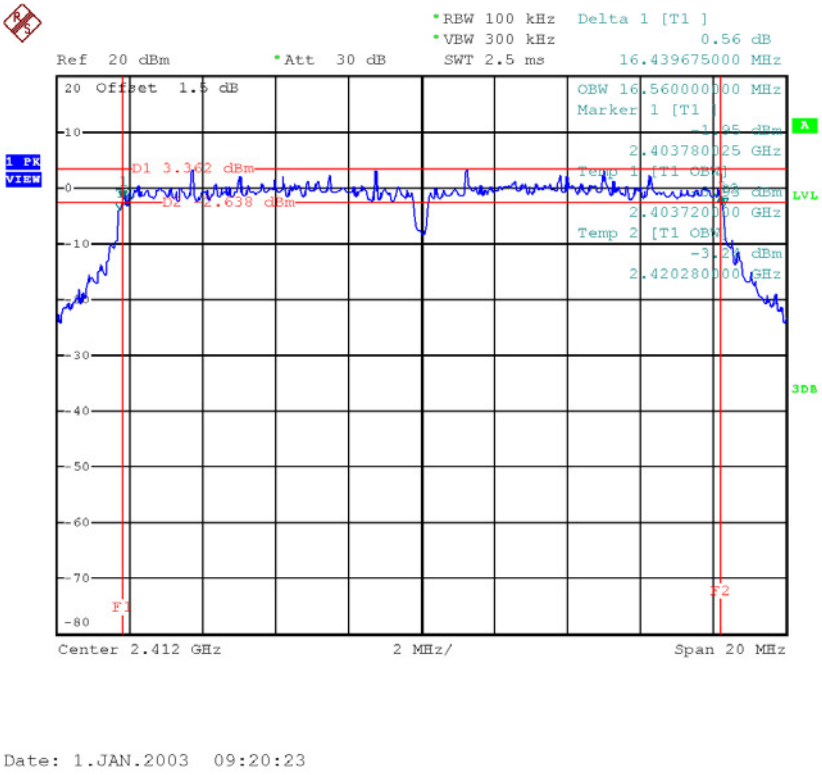


Date: 1.JAN.2003 09:19:02

Test Mode: TX G Mode_CH01/06/11

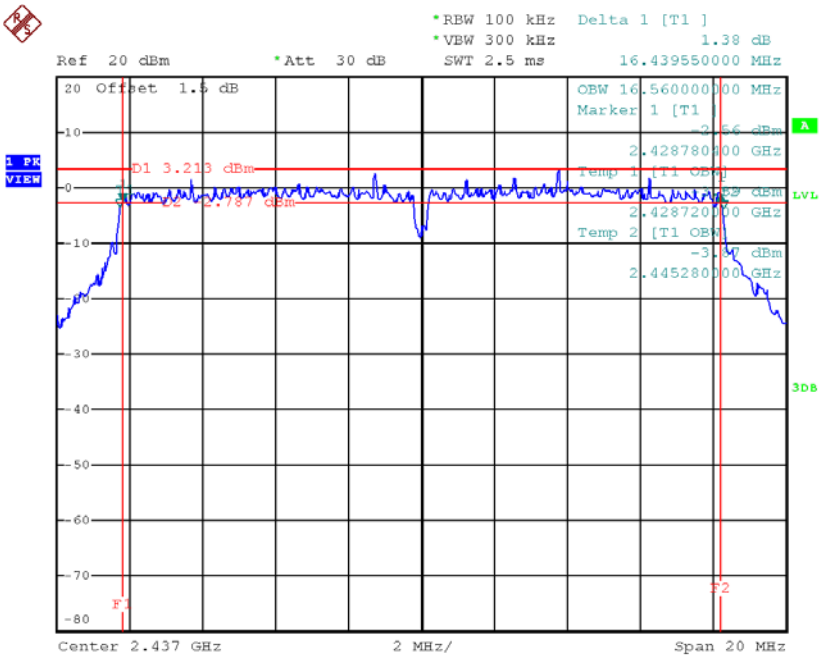
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	16.44	16.56	500	Complies
2437	16.44	16.56	500	Complies
2462	16.43	16.56	500	Complies

TX CH01



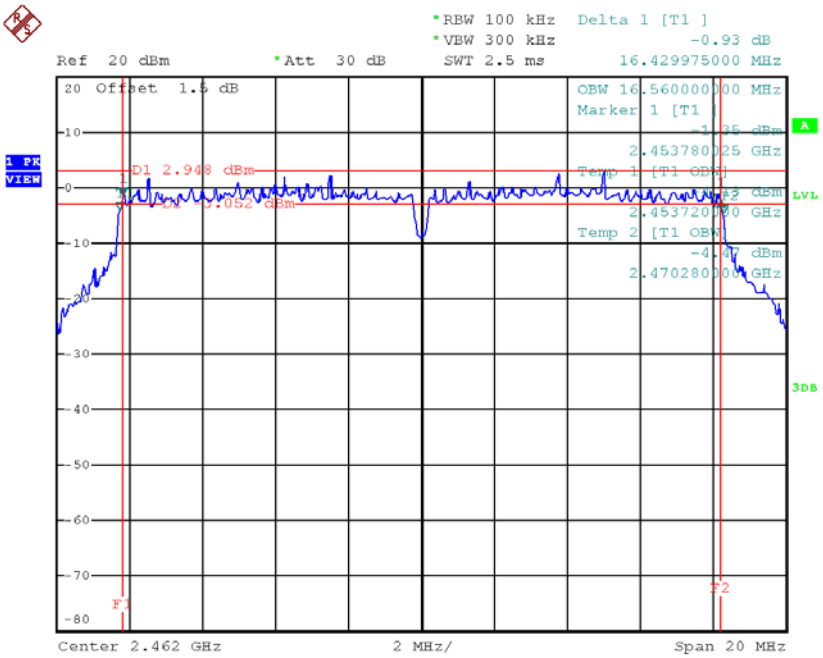
Date: 1.JAN.2003 09:20:23

TX CH06



Date: 1.JAN.2003 09:21:34

TX CH11

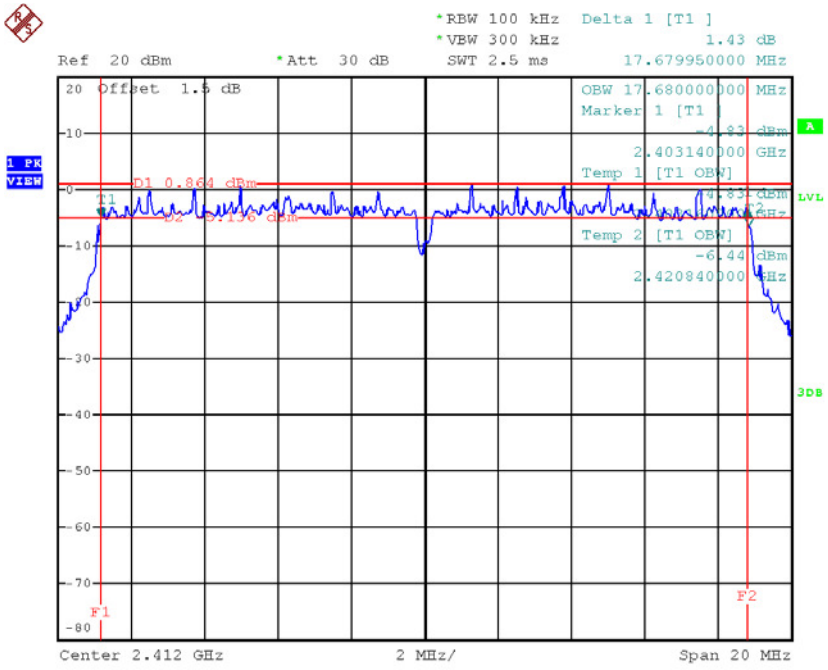


Date: 1.JAN.2003 09:24:49

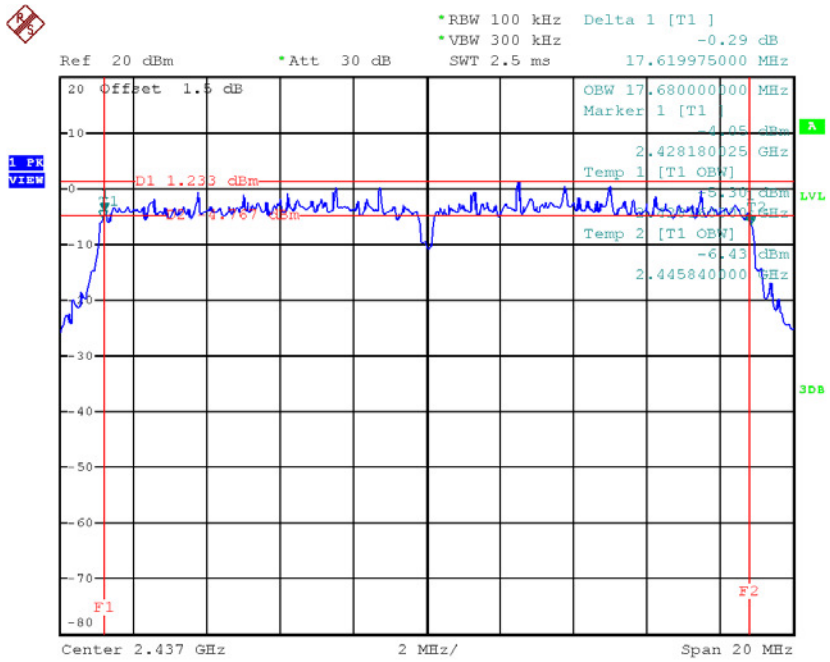
Test Mode : TX N-20MHz Mode_CH01/06/11

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	17.68	17.68	500	Complies
2437	17.62	17.68	500	Complies
2462	17.68	17.68	500	Complies

TX CH01

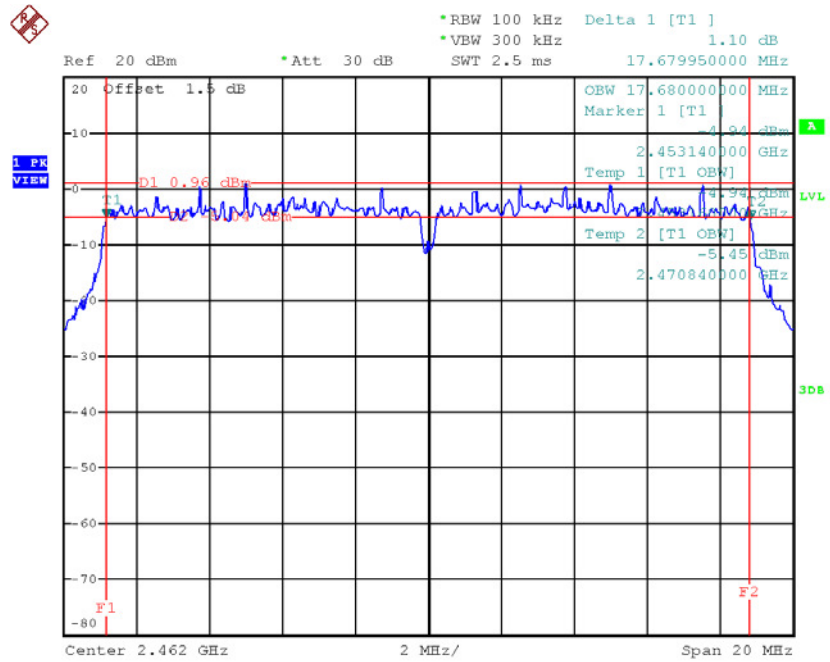


TX CH06



Date: 1.JAN.2003 09:28:08

TX CH11

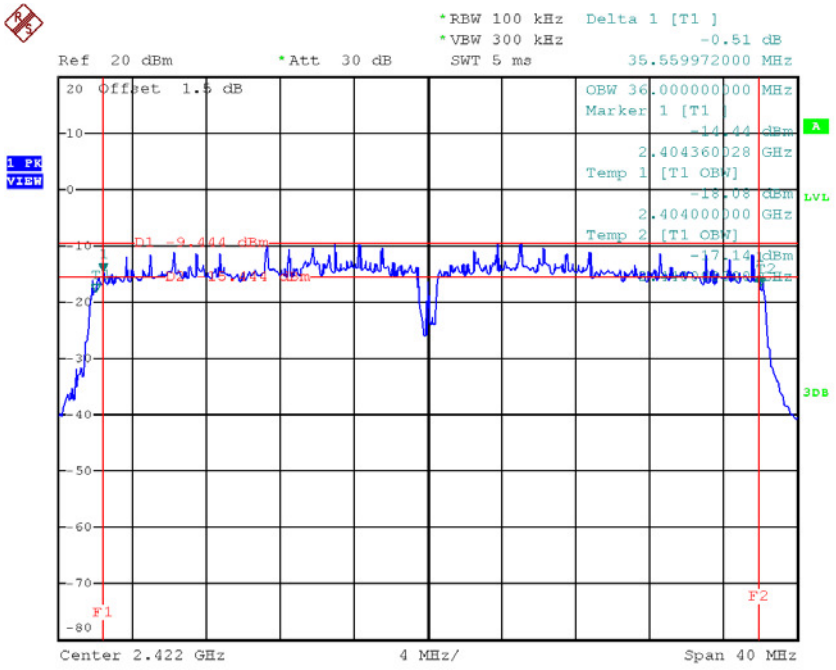


Date: 1.JAN.2003 09:29:11

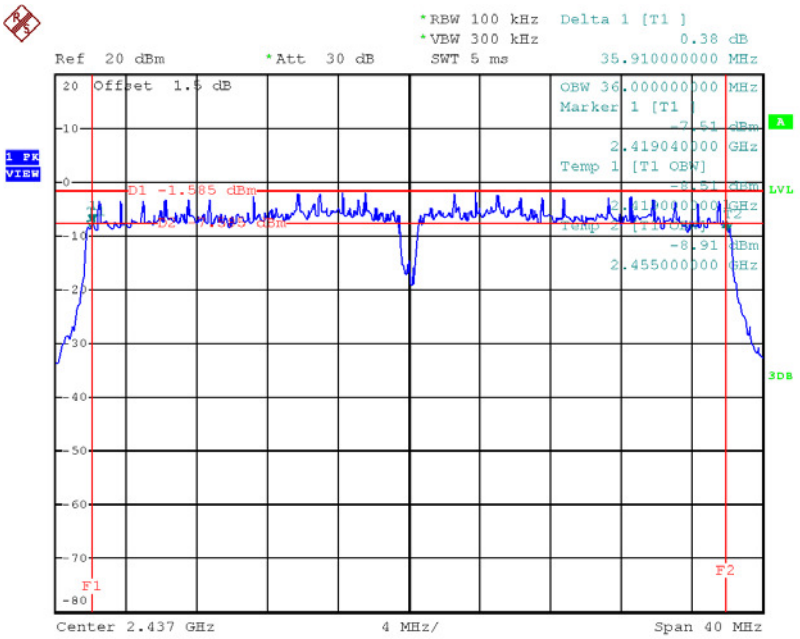
Test Mode : TX N-40MHz Mode_CH03/06/09

Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2422	35.56	36	500	Complies
2437	35.91	36	500	Complies
2452	35.44	36.08	500	Complies

TX CH03

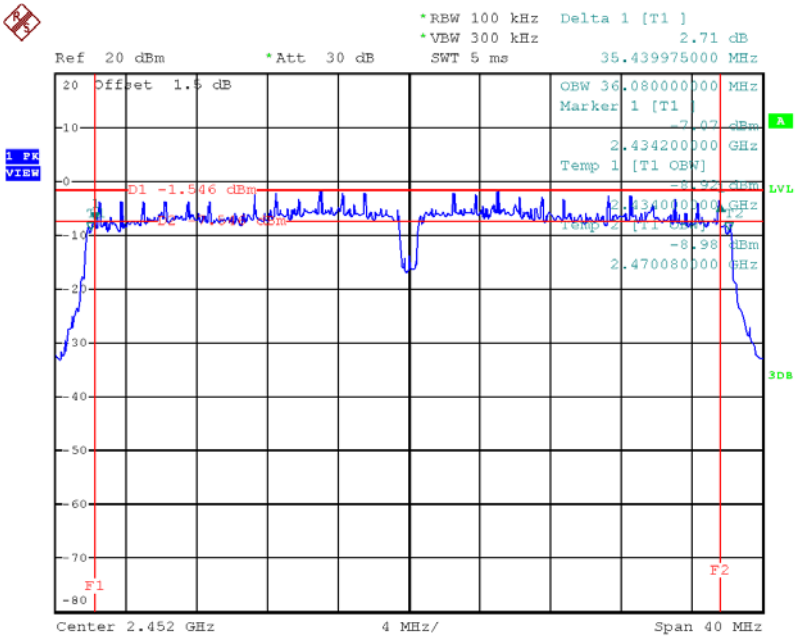


TX CH06



Date: 1.JAN.2003 09:37:15

TX CH09



Date: 1.JAN.2003 09:38:28

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	21.42	0.14	30.00	1.00	Complies
2437	21.62	0.15	30.00	1.00	Complies
2462	21.56	0.14	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	29.82	0.96	30.00	1.00	Complies
2437	29.37	0.86	30.00	1.00	Complies
2462	29.39	0.87	30.00	1.00	Complies

Test Mode :TX N20 Mode_CH01/06/11_ANT 1					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	25.05	0.32	30.00	1.00	Complies
2437	24.87	0.31	30.00	1.00	Complies
2462	24.55	0.29	30.00	1.00	Complies

Test Mode :TX N20 Mode_CH01/06/11_ANT 2					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	27.69	0.59	30.00	1.00	Complies
2437	27.24	0.53	30.00	1.00	Complies
2462	27.53	0.57	30.00	1.00	Complies

Test Mode :TX N20 Mode_CH01/06/11_Total					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	29.58	0.91	30.00	1.00	Complies
2437	29.23	0.84	30.00	1.00	Complies
2462	29.30	0.85	30.00	1.00	Complies