

# FCC Radio Test Report

## FCC ID: ACJ-V2CA

**This report concerns: Original Grant**

**Project No.** : 2009C113  
**Equipment** : Wireless Module  
**Brand Name** : Panasonic  
**Test Model** : PIOT-V2(CA)  
**Series Model** : N/A  
**Applicant** : Panasonic Corporation of North America  
**Address** : Two Riverfront Plaza, 9th Floor, Newark, NJ 07102-5490  
**Manufacturer** : China Hualu Panasonic AVC Networks Co., Ltd.  
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**Factory** : China Hualu Panasonic AVC Networks Co., Ltd.  
**Address** : No.1, Hua Road, Qixianling High Technology Zone Dalian, Liaoning 116023 China.  
**Date of Receipt** : Sep. 21, 2020  
**Date of Test** : Sep. 21, 2020 ~ Oct. 19, 2020  
**Issued Date** : Nov. 11, 2020  
**Report Version** : R01  
**Test Sample** : Engineering Sample No.: DG2020091750 for conducted, DG2020091750 for radiated.  
**Standard(s)** : FCC Part15, Subpart C (15.247)  
ANSI C63.10-2013  
FCC KDB 558074 D01 15.247 Meas Guidance v05r02

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and 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.

Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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**REPORT ISSUED HISTORY**

Report Version	Description	Issued Date
R00	Original Issue.	Oct. 22, 2020
R01	Revised report to address comments.	Nov. 11, 2020

## 1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

FCC Part15, Subpart C (15.247)				
Standard(s) Section	Test Item	Test Result	Judgment	Remark
15.207	AC Power Line Conducted Emissions	APPENDIX A	PASS	-----
15.247(d) 15.205(a) 15.209(a)	Radiated Emissions	APPENDIX B APPENDIX C APPENDIX D	PASS	-----
15.247(a)(2)	Bandwidth	APPENDIX E	PASS	-----
15.247(b)(3)	Maximum Output Power	APPENDIX F	PASS	-----
15.247(d)	Conducted Spurious Emissions	APPENDIX G	PASS	-----
15.247(e)	Power Spectral Density	APPENDIX H	PASS	-----
15.203	Antenna Requirement	-----	PASS	Note(2)

Note:

- (1) "N/A" denotes test is not applicable in this test report.
- (2) The device what use a permanently attached antenna were considered sufficient to comply with the provisions of 15.203.

## 1.1 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 Registration Number for FCC: 357015

BTL's Designation Number for FCC: CN1240

## 1.2 MEASUREMENT UNCERTAINTY

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

The BTL measurement uncertainty as below table:

### A. AC power line conducted emissions test:

Test Site	Method	Measurement Frequency Range	U, (dB)
DG-C02	CISPR	150kHz ~ 30MHz	2.68

### B. Radiated emissions test:

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	4.26
		30MHz ~ 200MHz	H	3.38
		200MHz ~ 1,000MHz	V	3.98
		200MHz ~ 1,000MHz	H	3.94
		1GHz ~ 6GHz	-	4.58
		6GHz ~ 18GHz	-	5.18
		18GHz ~ 26.5GHz	-	3.62
		26.5GHz ~ 40GHz	-	4.00

### C. Other Measurement:

Test Item	Uncertainty
Bandwidth	±3.8 %
Maximum Output Power	±0.95 dB
Conducted Spurious Emission	±2.71 dB
Power Spectral Density	±0.86 dB
Temperature	±0.08 °C
Time	±0.58 %
Supply voltages	±0.3 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.



**1.3 TEST ENVIRONMENT CONDITIONS**

Test Item	Temperature	Humidity	Test Voltage	Tested By
AC Power Line Conducted Emissions	25°C	53%	AC 120V/60Hz	Hand Huang
Radiated Emissions-9K-30MHz	25°C	60%	DC 5V	Kwok Guo
Radiated Emissions-30 MHz to 1GHz	26°C	52%	DC 5V	Kwok Guo
Radiated Emissions-Above 1000 MHz	26°C	52%	DC 5V	Kwok Guo
Bandwidth	24°C	52%	DC 5V	Jesse Wang
Maximum output power	24°C	52%	DC 5V	Jesse Wang
Conducted Spurious Emissions	24°C	52%	DC 5V	Jesse Wang
Power Spectral Density	24°C	52%	DC 5V	Jesse Wang

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Equipment	Wireless Module
Brand Name	Panasonic
Test Model	PIOT-V2(CA)
Series Model	N/A
Model Difference(s)	N/A
Power Source	DC voltage supplied from external power supply.
Power Rating	DC 4.5~5.5V
Operation Frequency	2412 MHz ~ 2462 MHz
Modulation Type	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n: OFDM
Bit Rate of Transmitter	IEEE 802.11b: 11/5.5/2/1 Mbps IEEE 802.11g: 54/48/36/24/18/12/9/6 Mbps IEEE 802.11n: up to 72.2 Mbps
Maximum Output Power	IEEE 802.11b: 23.99 dBm (0.2506 W) IEEE 802.11g: 25.83 dBm (0.3828 W) IEEE 802.11n (HT20): 25.69 dBm (0.3707 W)

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 IEEE 802.11b, IEEE 802.11g, IEEE 802.11n (HT20)							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3. Table for Filed Antenna:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Panasonic	PIOT-V2(CA)	Printed	N/A	-0.71
2	Panasonic	PIOT-V2(CA)	Printed	N/A	0.31

Note:

- (1) Smart antenna system with two transmit/receive chains, but operating in a mode where only one transmit/receive chain is used.
- (2) Ant.1 refers to main antenna, Ant.2 refers to aux antenna.
- (3) Both Ant.1 and Ant.2 had been tested, but the data of Ant.2 were the worst case, so only data of Ant.2 had been recorded of the test results.

## 2.2 DESCRIPTION OF TEST MODES

The test system was pre-tested based on the consideration of all possible combinations of EUT operation mode.

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 G Mode Channel 06

Following mode(s) was (were) found to be the worst case(s) and selected for the final test.

<b>AC power line conducted emissions test</b>	
Final Test Mode	Description
Mode 4	TX G Mode Channel 06

<b>Radiated emissions test - Below 1GHz</b>	
Final Test Mode	Description
Mode 4	TX G Mode Channel 06

<b>Radiated emissions test- Above 1GHz</b>	
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

<b>Conducted test</b>	
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

**NOTE:**

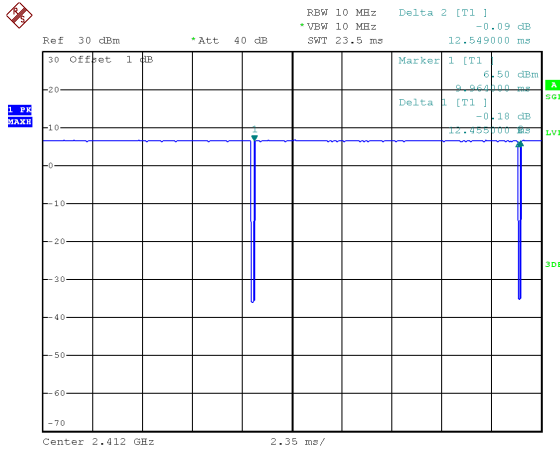
- (1) The measurements are performed at the high, middle, low available channels.
- (2) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- (3) For radiated emission below 1 GHz test, the IEEE 802.11g Channel 06 is found to be the worst case and recorded.
- (4) For radiated emission above 1 GHz test, 1GHz~26.5GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

**2.3 PARAMETERS OF TEST SOFTWARE**

Test Software	UI_mptool 1.0.0.1		
Frequency (MHz)	2412	2437	2462
IEEE 802.11b	105	113	104
IEEE 802.11g	108	123	97
IEEE 802.11n (HT20)	104	123	97

## 2.4 DUTY CYCLE

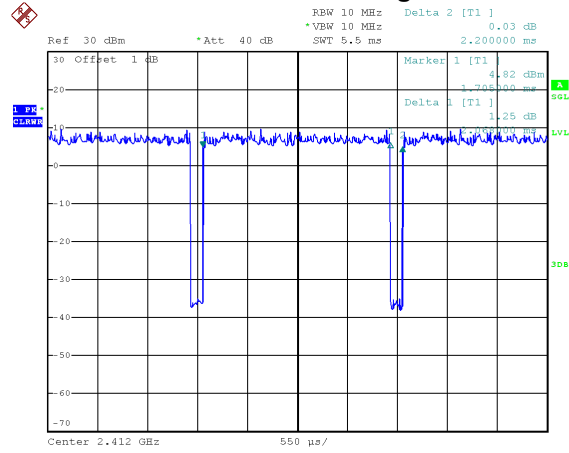
**IEEE 802.11b**



Date: 21.SEP.2020 16:06:37

Duty cycle = 12.455 ms / 12.549 ms = 99.25%  
 Duty Factor = 10 log(1/Duty cycle) = 0.00

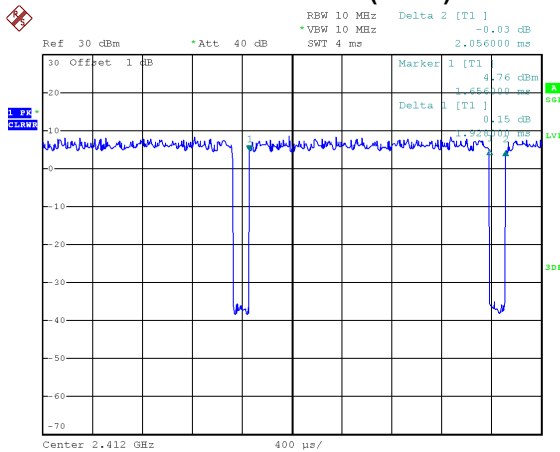
**IEEE 802.11g**



Date: 21.SEP.2020 16:06:58

Duty cycle = 2.068 ms / 2.200 ms = 94.00%  
 Duty Factor = 10 log(1/Duty cycle) = 0.27

**IEEE 802.11n (HT20)**



Date: 21.SEP.2020 16:07:17

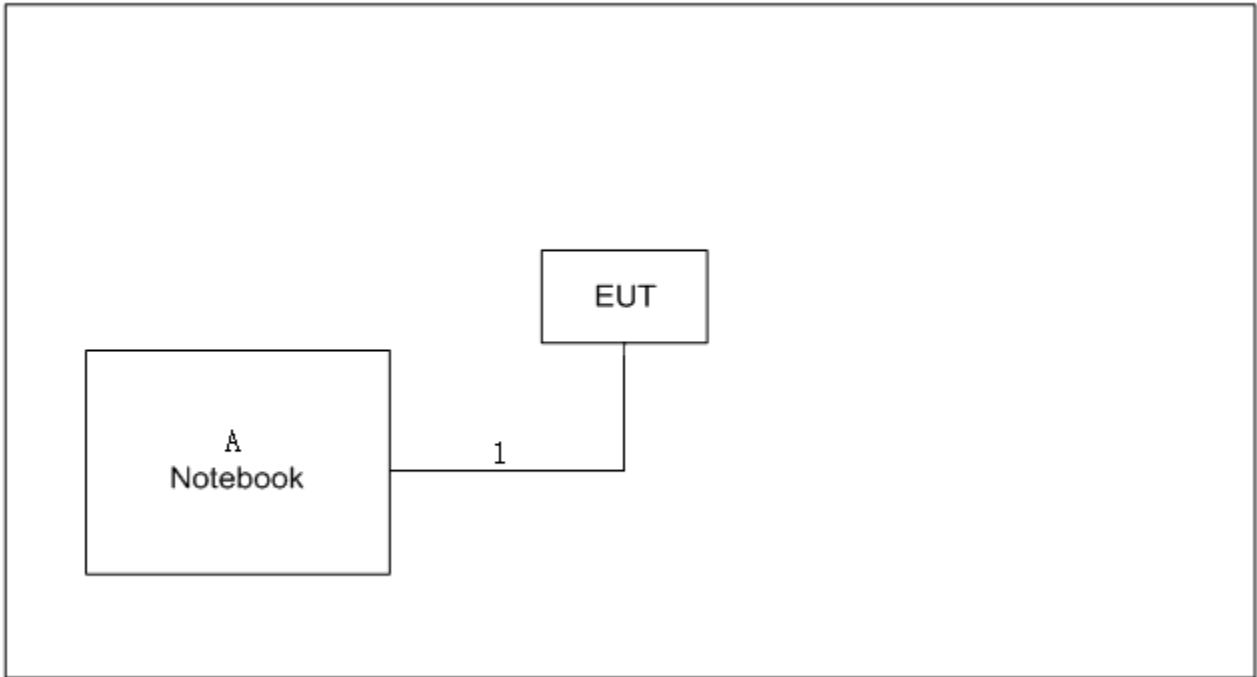
Duty cycle = 1.928 ms / 2.056 ms = 93.77%  
 Duty Factor = 10 log(1/Duty cycle) = 0.28

**NOTE:**

For IEEE 802.11g and IEEE 802.11n (HT20):

For radiated emissions frequency above 1 GHz, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1 kHz (Duty cycle < 98%).

**2.5 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED**



**2.6 SUPPORT UNITS**

Item	Equipment	Brand	Model No.	Series No.
A	Notebook	Lenovo	V310-14ISK	LR07GZNB

Item	Cable Type	Shielded Type	Ferrite Core	Length
1	Data Cable	NO	NO	0.5m

### 3. AC POWER LINE CONDUCTED EMISSIONS TEST

#### 3.1 LIMIT

Frequency of Emission (MHz)	Limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

**NOTE:**

- (1) The tighter limit applies at the band edges.
- (2) The limit of "\*" marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

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

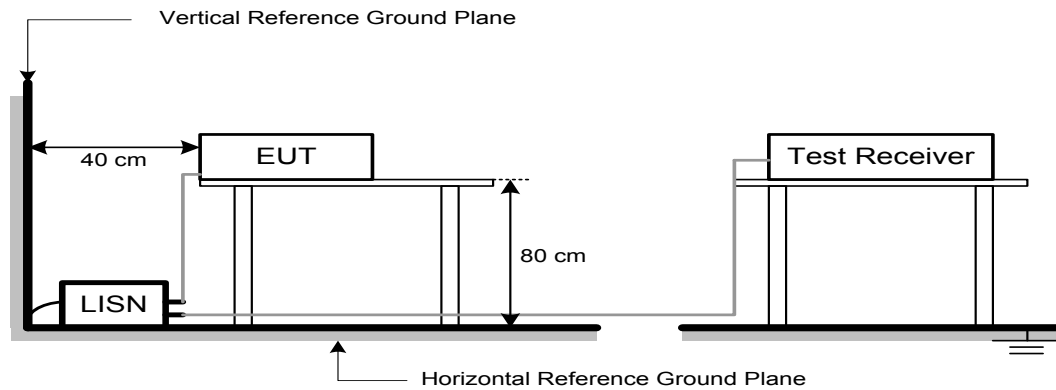
#### 3.2 TEST PROCEDURE

- 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.

#### 3.3 DEVIATION FROM TEST STANDARD

No deviation

### 3.4 TEST SETUP



### 3.5 EUT OPERATION CONDITIONS

EUT was programmed to be in continuously transmitting mode.

### 3.6 TEST RESULTS

Please refer to the APPENDIX A.



## 4. RADIATED EMISSIONS TEST

### 4.1 LIMIT

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
Above 960	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000 MHz)

Frequency (MHz)	(dBuV/m at 3 m)	
	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).

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

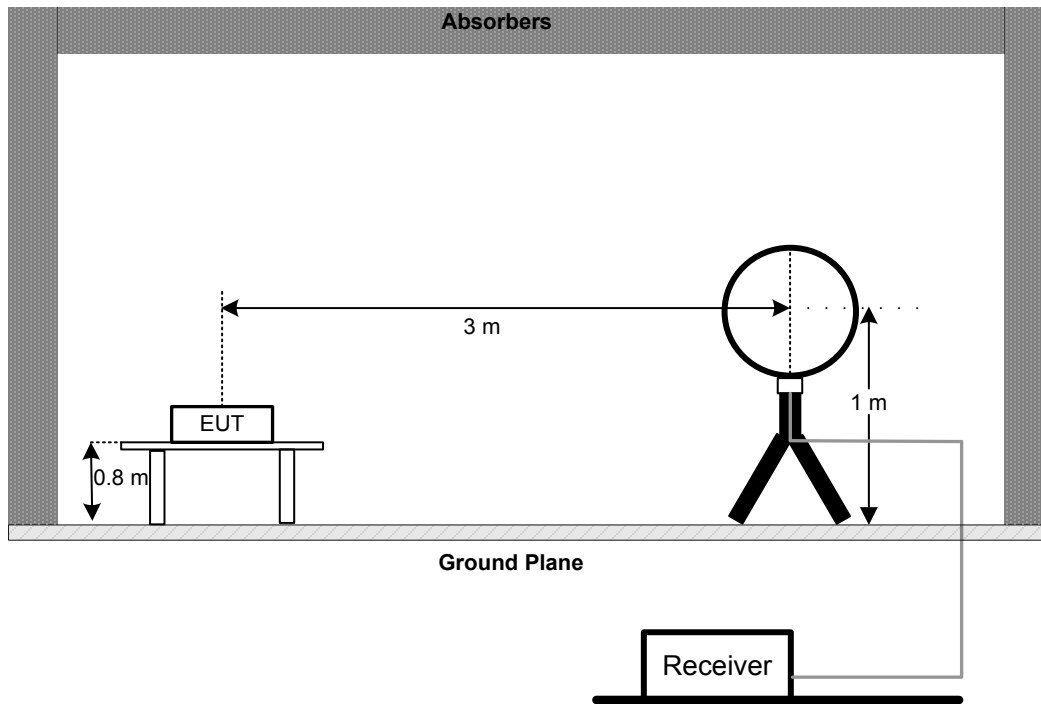
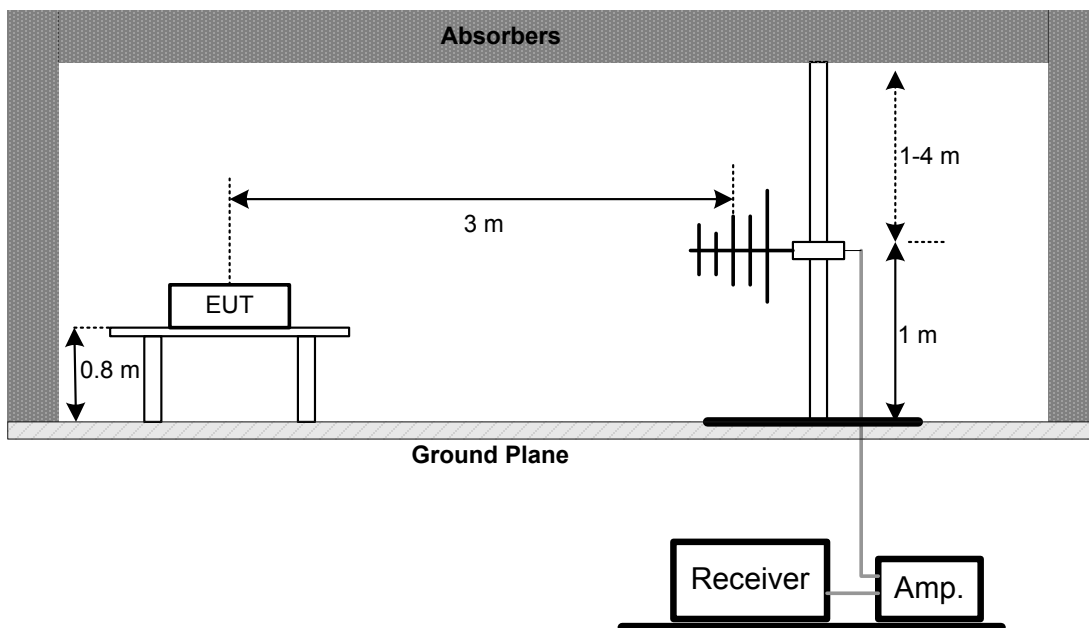
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9 kHz~90 kHz for PK/AVG detector
Start ~ Stop Frequency	90 kHz~110 kHz for QP detector
Start ~ Stop Frequency	110 kHz~490 kHz for PK/AVG detector
Start ~ Stop Frequency	490 kHz~30 MHz for QP detector
Start ~ Stop Frequency	30 MHz~1000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

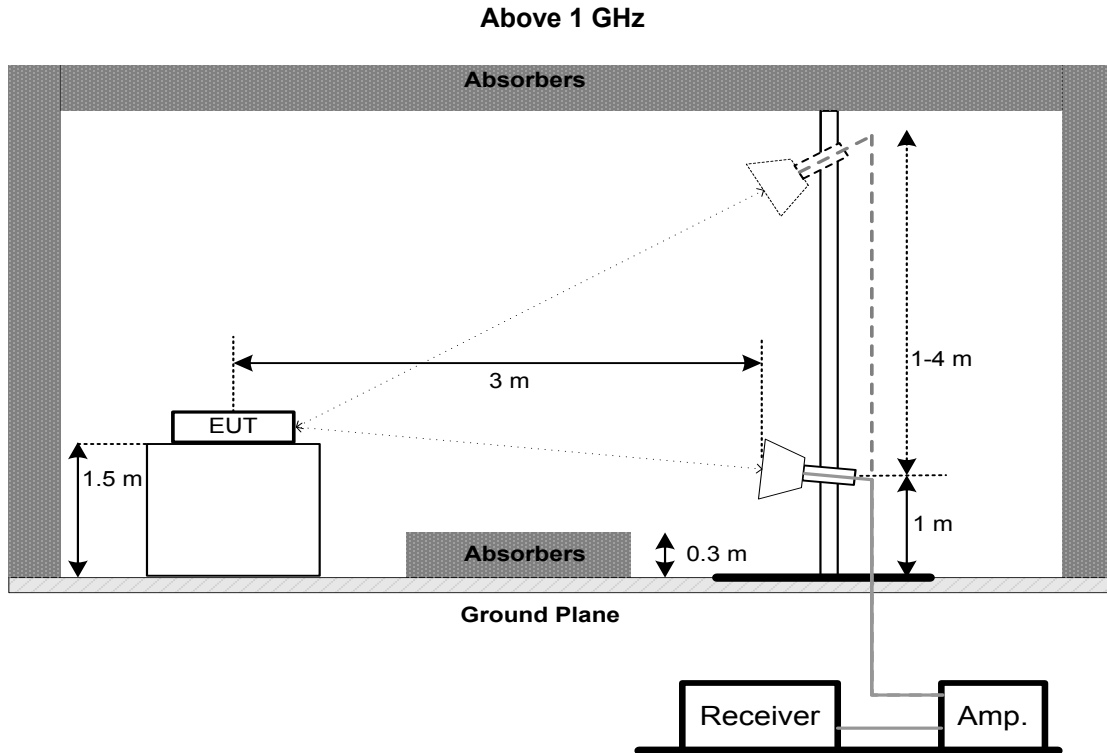
#### 4.2 TEST PROCEDURE

- 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.

#### 4.3 DEVIATION FROM TEST STANDARD

No deviation

**4.4 TEST SETUP****9 kHz-30 MHz****30 MHz to 1 GHz**



#### 4.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

#### 4.6 TEST RESULTS - 9 KHZ TO 30 MHZ

Please refer to the APPENDIX B

Remark:

- (1) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (2) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### 4.7 TEST RESULTS - 30 MHZ TO 1000 MHZ

Please refer to the APPENDIX C.

#### 4.8 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 LIMIT**

FCC Part15, Subpart C (15.247)		
Section	Test Item	Limit
15.247(a)(2)	6 dB Bandwidth	Minimum 500 kHz
	99% Emission Bandwidth	-

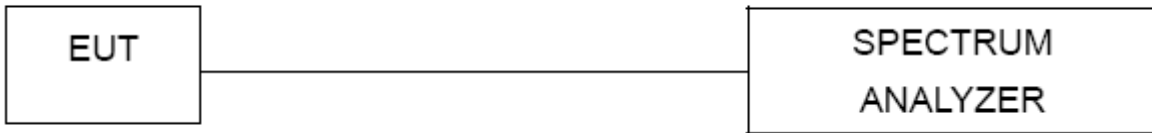
**5.2 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- b. Spectrum Setting:  
 For 6 dB Bandwidth : RBW= 100 kHz, VBW=300 kHz, Sweep time = auto.  
 For 99% Emission Bandwidth B/G/N-20 Mode: RBW= 300 KHz, VBW=1 MHz, Sweep time = 2.5 ms.
- c. The bandwidth was performed in accordance with method 11.8.1 of ANSI C63.10-2013.

**5.3 DEVIATION FROM STANDARD**

No deviation.

**5.4 TEST SETUP**



**5.5 EUT OPERATION CONDITIONS**

The EUT was programmed to be in continuously transmitting mode.

**5.6 TEST RESULTS**

Please refer to the APPENDIX E.

## 6. MAXIMUM OUTPUT POWER TEST

### 6.1 LIMIT

FCC Part15, Subpart C (15.247)		
Section	Test Item	Limit
15.247(b)(3)	Maximum Output Power	1 Watt or 30dBm

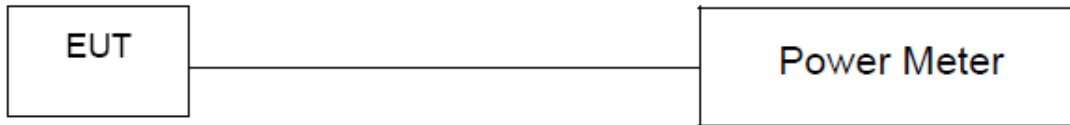
### 6.2 TEST PROCEDURE

- The EUT was directly connected to the power meter and antenna output port as show in the block diagram below.
- The maximum conducted output power was performed in accordance with method 11.9.1.3 of ANSI C63.10-2013.

### 6.3 DEVIATION FROM STANDARD

No deviation.

### 6.4 TEST SETUP



### 6.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 6.6 TEST RESULTS

Please refer to the APPENDIX F.

## 7. CONDUCTED SPURIOUS EMISSIONS

### 7.1 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.

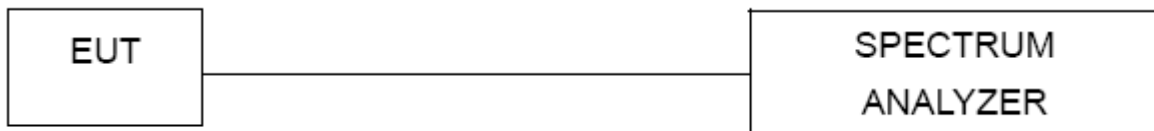
### 7.2 TEST PROCEDURE

- 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.

### 7.3 DEVIATION FROM STANDARD

No deviation.

### 7.4 TEST SETUP



### 7.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 7.6 TEST RESULTS

Please refer to the APPENDIX G.

## 8. POWER SPECTRAL DENSITY TEST

### 8.1 LIMIT

FCC Part15, Subpart C (15.247)		
Section	Test Item	Limit
15.247(e)	Power Spectral Density	8 dBm (in any 3 kHz)

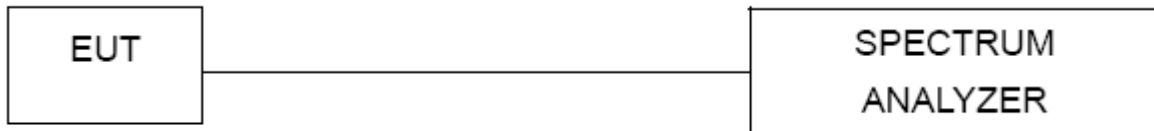
### 8.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below.
- Spectrum Setting: RBW=3 kHz, VBW=10 kHz, Sweep time = Auto.
- The Power Spectral Density was performed in accordance with method 11.10.2 of ANSI C63.10-2013.

### 8.3 DEVIATION FROM STANDARD

No deviation.

### 8.4 TEST SETUP



### 8.5 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

### 8.6 TEST RESULTS

Please refer to the APPENDIX H.



**9. MEASUREMENT INSTRUMENTS LIST**

AC Power Line Conducted Emissions					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Feb. 28, 2021
2	LISN	EMCO	3816/2	52765	Mar. 01, 2021
3	TWO-LINE V-NETWORK	R&S	ENV216	101447	Feb. 28, 2021
4	50Ω Terminator	SHX	TF5-3	15041305	Mar. 01, 2021
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Mar. 10, 2021
7	643 Shield Room	ETS	6*4*3m	N/A	N/A

Radiated Emissions - 9 kHz to 30 MHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	EM	EM-6876-1	230	Apr. 16, 2021
2	Cable	N/A	RG 213/U	N/A	May 29, 2021
3	EMI Test Receiver	R&S	ESCI	100895	Feb. 28, 2021
4	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
5	966 Chambe Room	RM	9*6*6m	N/A	Jul. 25, 2021

Radiated Emissions - 30 MHz to 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 09, 2021
2*	Amplifier	HP	8447D	2944A09673	Aug. 11, 2021
3	Receiver	Agilent	N9038A	MY52130039	Jul. 25, 2021
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	May 22, 2021
5	Controller	CT	SC100	N/A	N/A
6	Controller	MF	MF-7802	MF780208416	N/A
7	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
8	966 Chambe Room	RM	9*6*6m	N/A	Jul. 25, 2021

Radiated Emissions - Above 1 GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Guide Antenna	ETS	3115	75789	May 12, 2021
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jul. 07, 2021
3	Amplifier	Agilent	8449B	3008A02333	Mar. 01, 2021
4	Microwave Preampifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 07, 2021
5	Receiver	Agilent	N9038A	MY52130039	Jul. 25, 2021
6	Controller	CT	SC100	N/A	N/A
7	Controller	MF	MF-7802	MF780208416	N/A
8	Cable	N/A	EMC104-SM-SM-6000	N/A	May 09, 2021
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
10	Filter	STI	STI15-9912	N/A	Jul. 25, 2021
11	966 Chambe Room	RM	9*6*6m	N/A	Jul. 25, 2021

<b>Bandwidth &amp; Antenna Conducted Spurious Emissions &amp; Power Spectral Density</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Jul. 25, 2021
2	RF Cable	Tongkaichuan	N/A	N/A	N/A
3	DC Block	Mini	N/A	N/A	N/A

<b>Maximum Output Power</b>					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Peak Power Analyzer	Keysight	8990B	MY51000506	Aug. 07, 2021
2	Wideband power sensor	Keysight	N1923A	MY58310004	Jul. 25, 2021
3	Attenuator	WOKEN	6SM3502	VAS1214NL	Feb. 11, 2021
4	RF Cable	Tongkaichuan	N/A	N/A	N/A

Remark: "N/A" denotes no model name, serial no. or calibration specified.

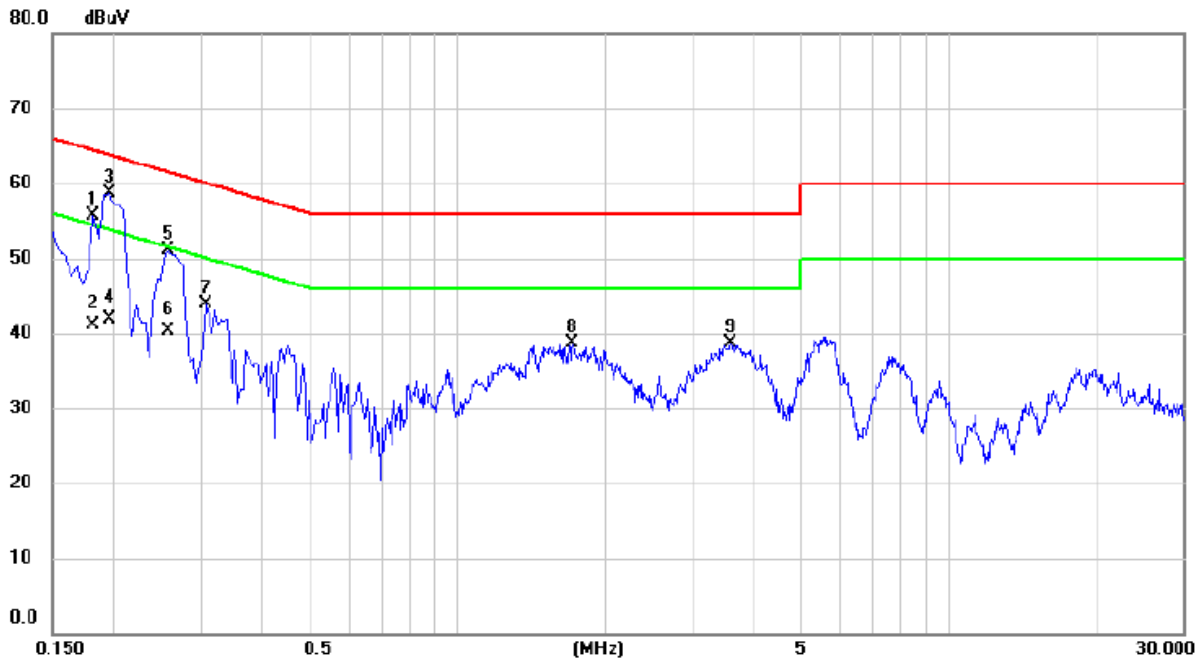
"\*\*" calibration period of equipment list is three year.

Except \* item, all calibration period of equipment list is one year.

## **APPENDIX A - AC POWER LINE CONDUCTED EMISSIONS**

Test Mode: TX G Mode Channel 06

### Line



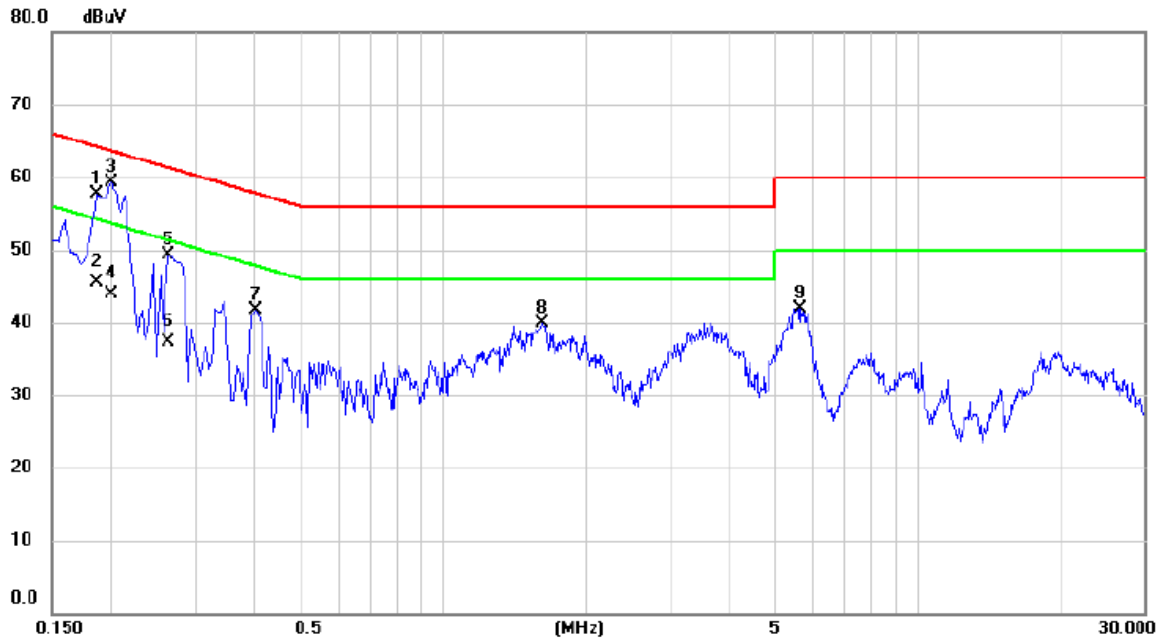
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.181	45.94	9.85	55.79	64.42	-8.63	peak	
2		0.181	31.30	9.85	41.15	54.42	-13.27	AVG	
3	*	0.195	48.73	9.90	58.63	63.82	-5.19	peak	
4		0.195	32.10	9.90	42.00	53.82	-11.82	AVG	
5		0.258	41.15	9.88	51.03	61.50	-10.47	peak	
6		0.258	30.50	9.88	40.38	51.50	-11.12	AVG	
7		0.307	34.06	9.89	43.95	60.04	-16.09	peak	
8		1.712	28.68	10.06	38.74	56.00	-17.26	peak	
9		3.597	28.56	10.22	38.78	56.00	-17.22	peak	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode Channel 06

### Neutral



No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	0.186	47.76	9.95	57.71	64.21	-6.50	peak	
2	0.186	35.60	9.95	45.55	54.21	-8.66	AVG	
3 *	0.200	49.38	10.01	59.39	63.63	-4.24	peak	
4	0.200	33.90	10.01	43.91	53.63	-9.72	AVG	
5	0.263	39.38	9.99	49.37	61.35	-11.98	peak	
6	0.263	27.30	9.99	37.29	51.35	-14.06	AVG	
7	0.402	31.57	10.09	41.66	57.81	-16.15	peak	
8	1.621	29.47	10.37	39.84	56.00	-16.16	peak	
9	5.654	31.26	10.72	41.98	60.00	-18.02	peak	

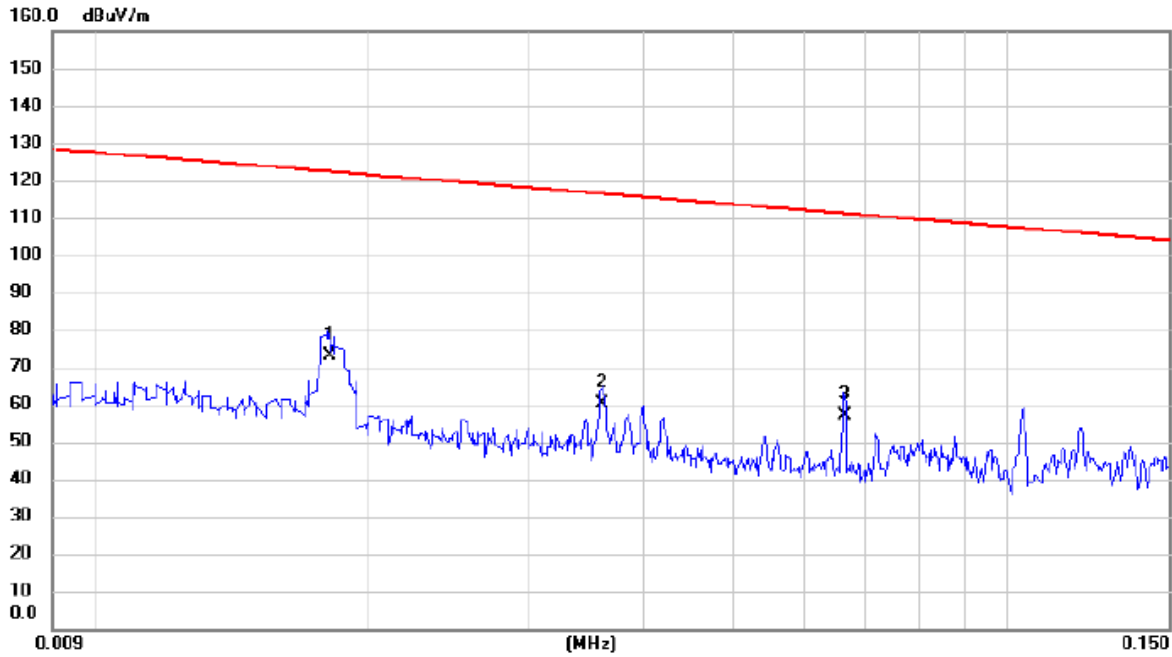
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

**APPENDIX B - RADIATED EMISSION - 9 KHZ TO 30 MHZ**

Test Mode: TX G Mode Channel 06

Ant 0°

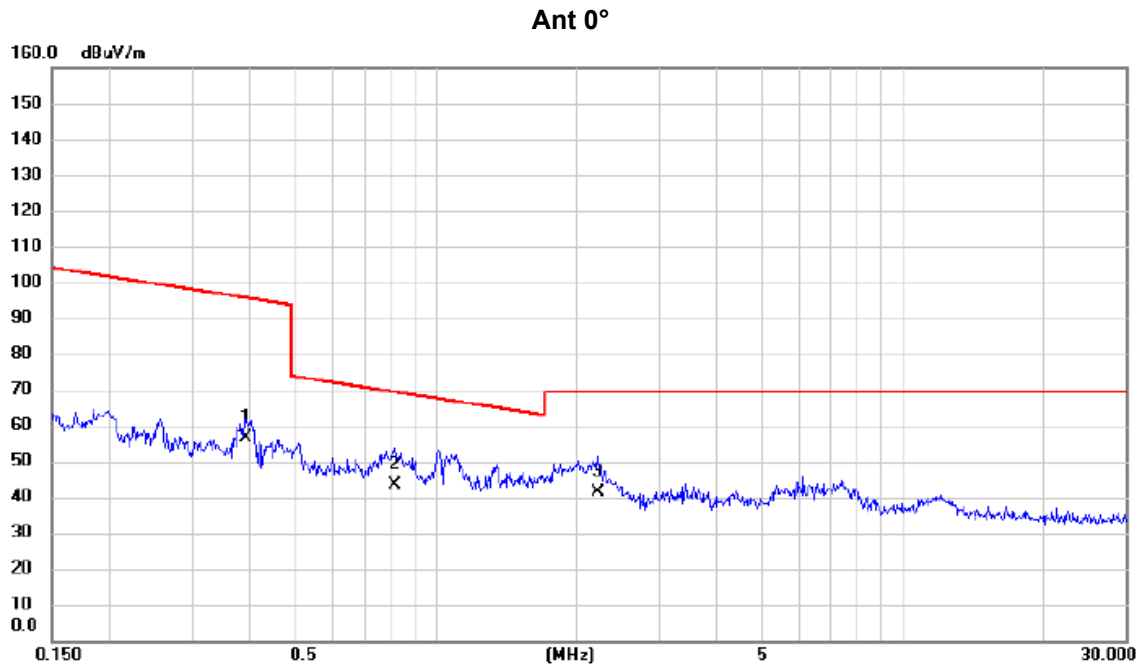


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	0.0181	59.36	13.81	73.17	122.45	-49.28	AVG	
2		0.0360	47.56	12.79	60.35	116.48	-56.13	AVG	
3		0.0663	44.31	12.52	56.83	111.17	-54.34	AVG	

REMARKS:

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode Channel 06



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		0.3893	44.25	12.29	56.54	95.80	-39.26	AVG	
2	*	0.8131	31.58	11.87	43.45	69.40	-25.95	QP	
3		2.2250	30.09	11.20	41.29	69.54	-28.25	QP	

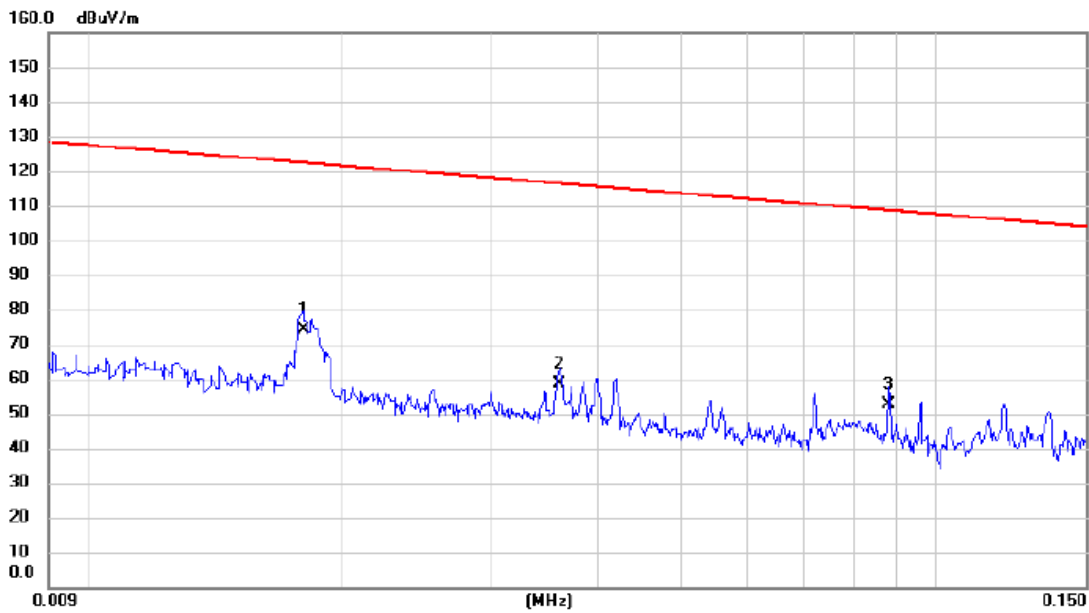
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.



Test Mode: TX G Mode Channel 06

**Ant 90°**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	*	0.0180	60.31	13.84	74.15	122.50	-48.35	AVG	
2		0.0360	45.91	12.79	58.70	116.48	-57.78	AVG	
3		0.0880	40.08	12.65	52.73	108.72	-55.99	AVG	

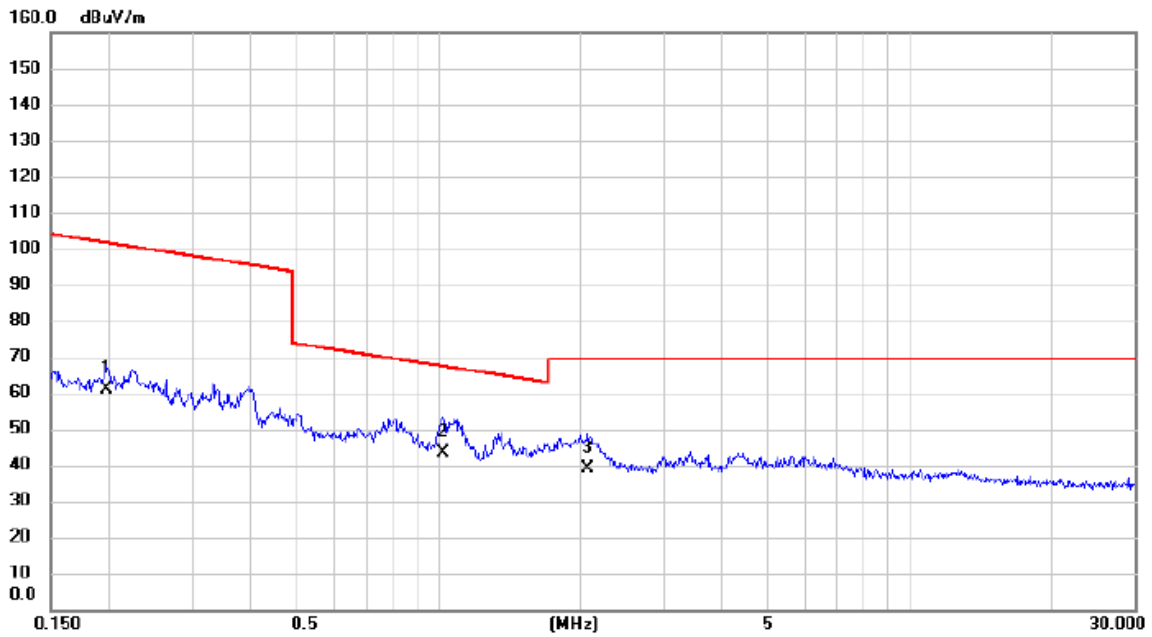
**REMARKS:**

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode Channel 06

**Ant 90°**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		0.1965	48.36	12.76	61.12	101.74	-40.62	AVG	
2	*	1.0211	31.52	11.79	43.31	67.42	-24.11	QP	
3		2.0768	27.66	11.26	38.92	69.54	-30.62	QP	

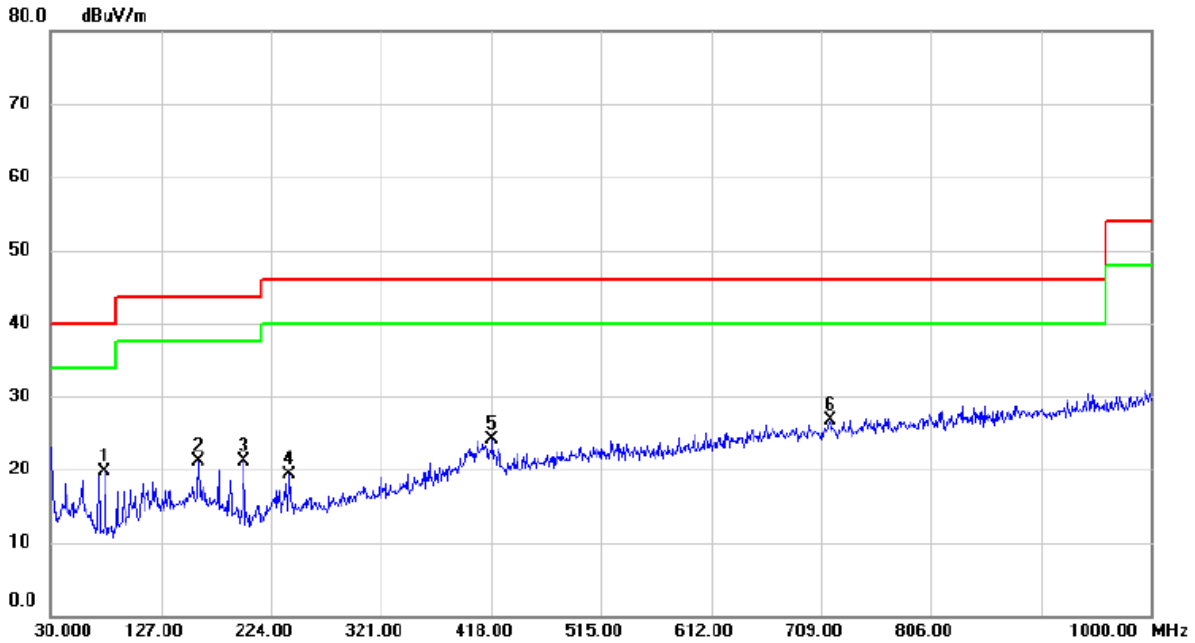
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

**APPENDIX C - RADIATED EMISSION - 30 MHZ TO 1000 MHZ**

Test Mode: TX G Mode Channel 06

### Vertical



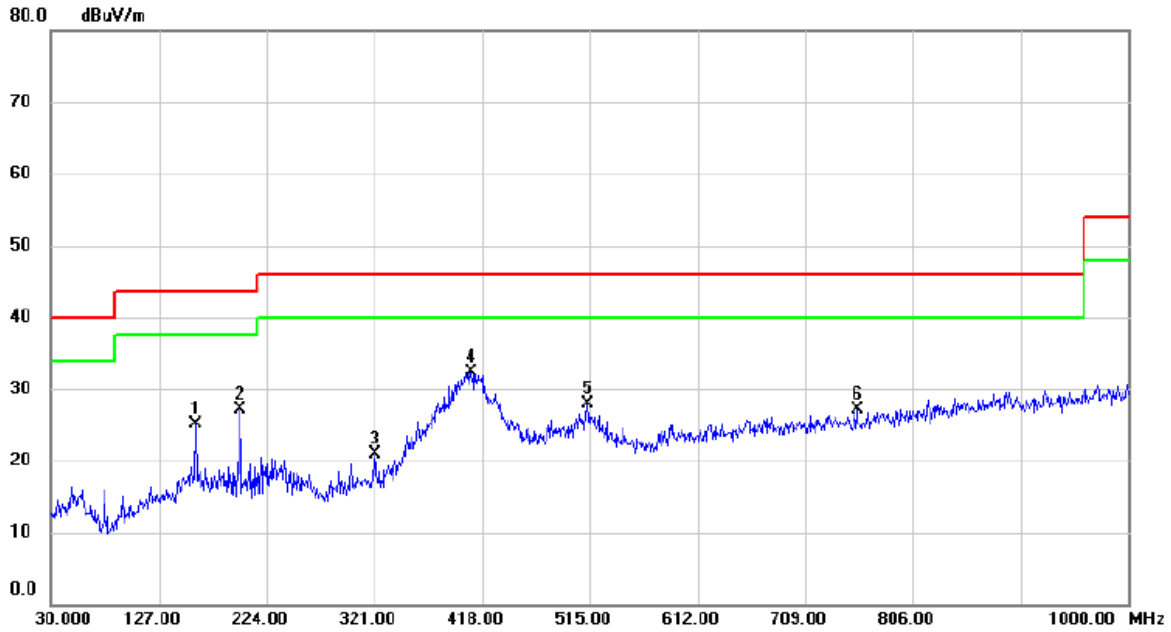
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		77.530	36.95	-17.29	19.66	40.00	-20.34	peak	
2		159.980	31.81	-10.67	21.14	43.50	-22.36	peak	
3		199.750	35.97	-14.79	21.18	43.50	-22.32	peak	
4		240.490	32.84	-13.57	19.27	46.00	-26.73	peak	
5		418.970	32.52	-8.48	24.04	46.00	-21.96	peak	
6	*	716.760	30.16	-3.45	26.71	46.00	-19.29	peak	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode Channel 06

### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		159.980	35.74	-10.67	25.07	43.50	-18.43	peak	
2		199.750	41.98	-14.79	27.19	43.50	-16.31	peak	
3		321.970	31.48	-10.65	20.83	46.00	-25.17	peak	
4	*	408.300	41.08	-8.78	32.30	46.00	-13.70	peak	
5		513.060	34.97	-7.14	27.83	46.00	-18.17	peak	
6		755.560	30.29	-3.12	27.17	46.00	-18.83	peak	

**REMARKS:**

(1) Measurement Value = Reading Level + Correct Factor.

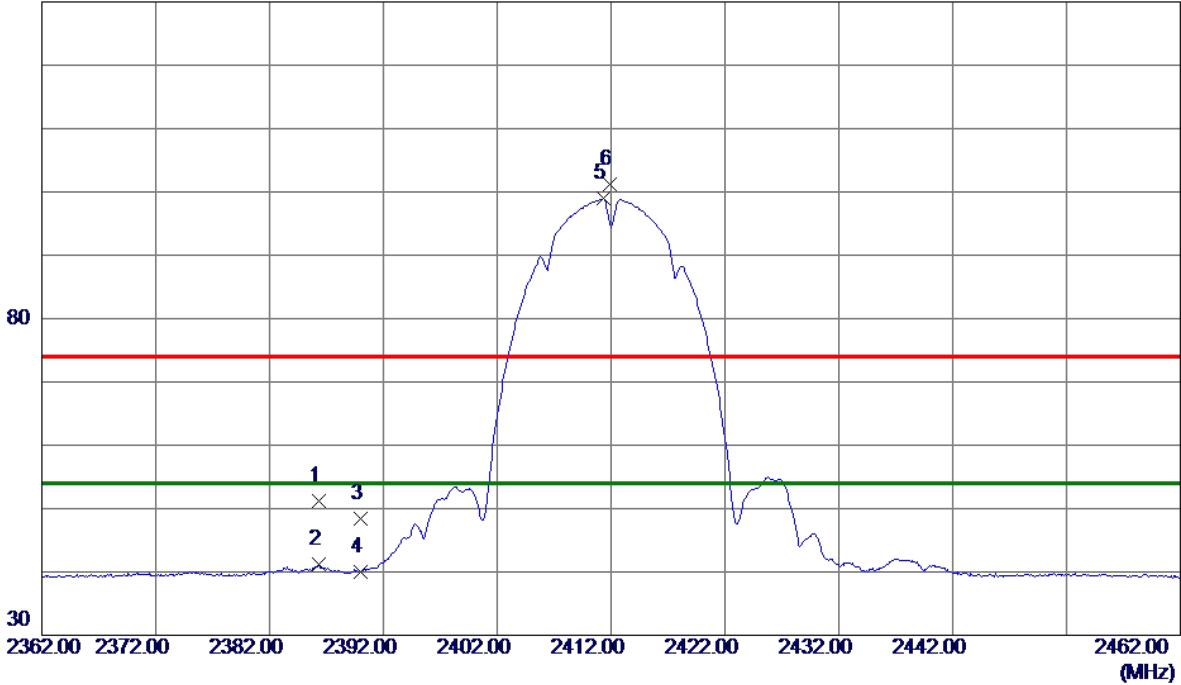
(2) Margin Level = Measurement Value - Limit Value.

## **APPENDIX D - RADIATED EMISSION- ABOVE 1000 MHZ**

Test Mode: TX B Mode 2412 MHz

### Vertical

130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2386.3000	42.87	8.28	51.15	74.00	-22.85	Peak	
2	2386.3000	32.86	8.28	41.14	54.00	-12.86	AVG	
3	2390.0000	40.16	8.29	48.45	74.00	-25.55	Peak	
4	2390.0000	31.76	8.29	40.05	54.00	-13.95	AVG	
5 *	2411.3000	90.63	8.31	98.94	54.00	44.94	AVG	No Limit
6	2411.9000	92.83	8.31	101.14	74.00	27.14	Peak	No Limit

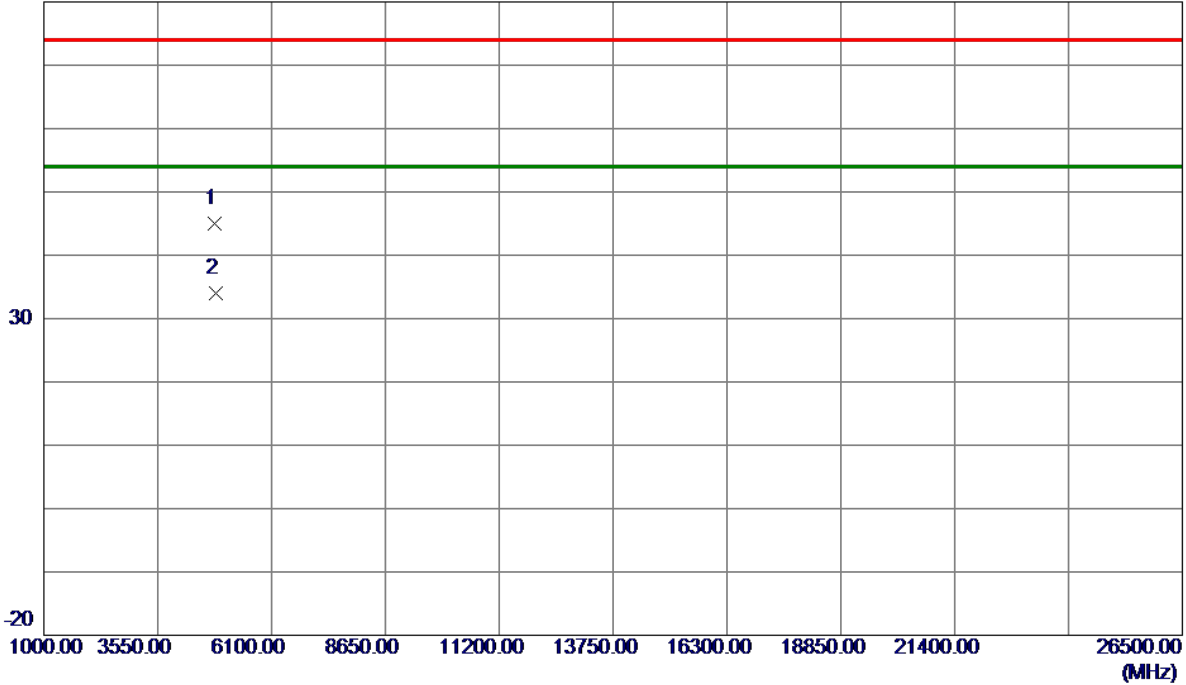
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2412 MHz

### Vertical

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4839.0000	39.67	5.36	45.03	74.00	-28.97	Peak	
2 *	4847.8500	28.67	5.39	34.06	54.00	-19.94	AVG	

**REMARKS:**

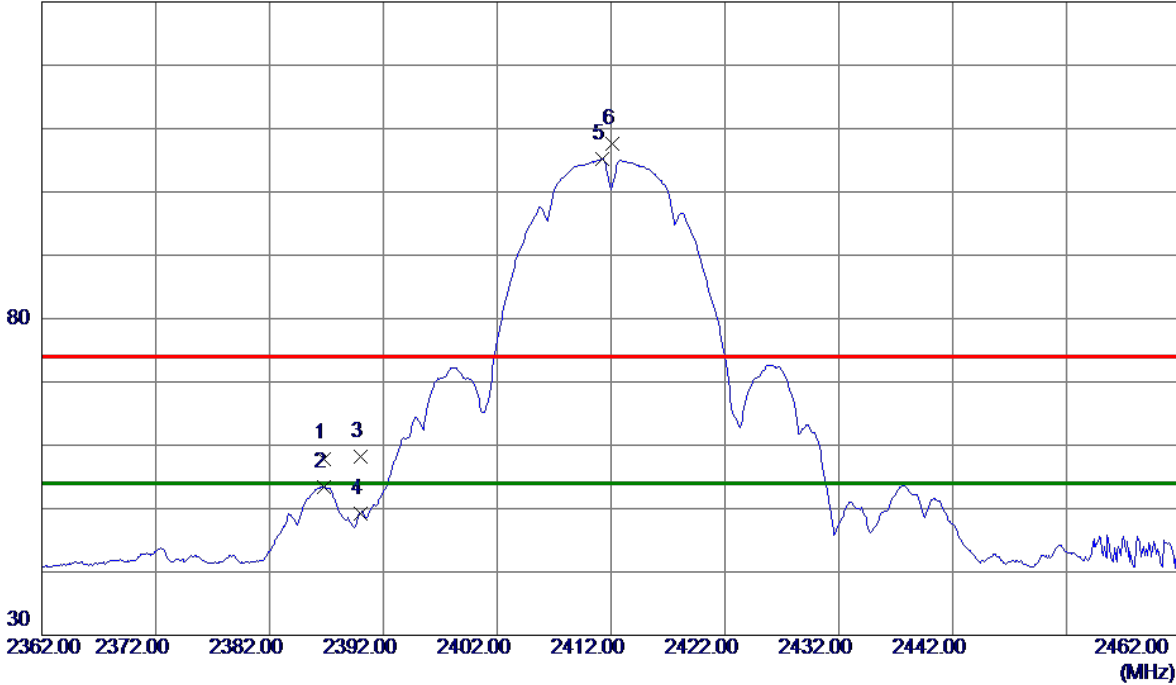
- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.



Test Mode: TX B Mode 2412 MHz

### Horizontal

130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2386.8000	49.62	8.28	57.90	74.00	-16.10	Peak	
2	2386.8000	45.18	8.28	53.46	54.00	-0.54	AVG	
3	2390.0000	49.85	8.29	58.14	74.00	-15.86	Peak	
4	2390.0000	40.89	8.29	49.18	54.00	-4.82	AVG	
5 *	2411.2000	96.88	8.31	105.19	54.00	51.19	AVG	No Limit
6	2412.1000	99.20	8.31	107.51	74.00	33.51	Peak	No Limit

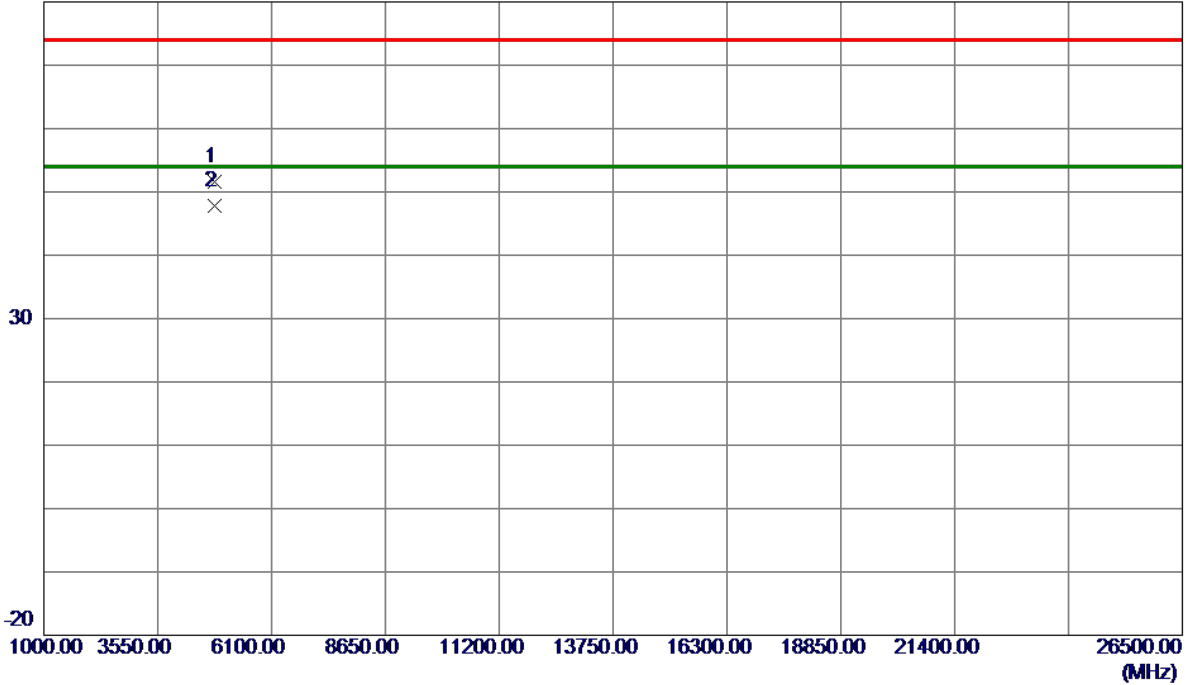
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2412 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4823.9360	46.34	5.32	51.66	74.00	-22.34	Peak	
2 *	4824.0179	42.53	5.32	47.85	54.00	-6.15	AVG	

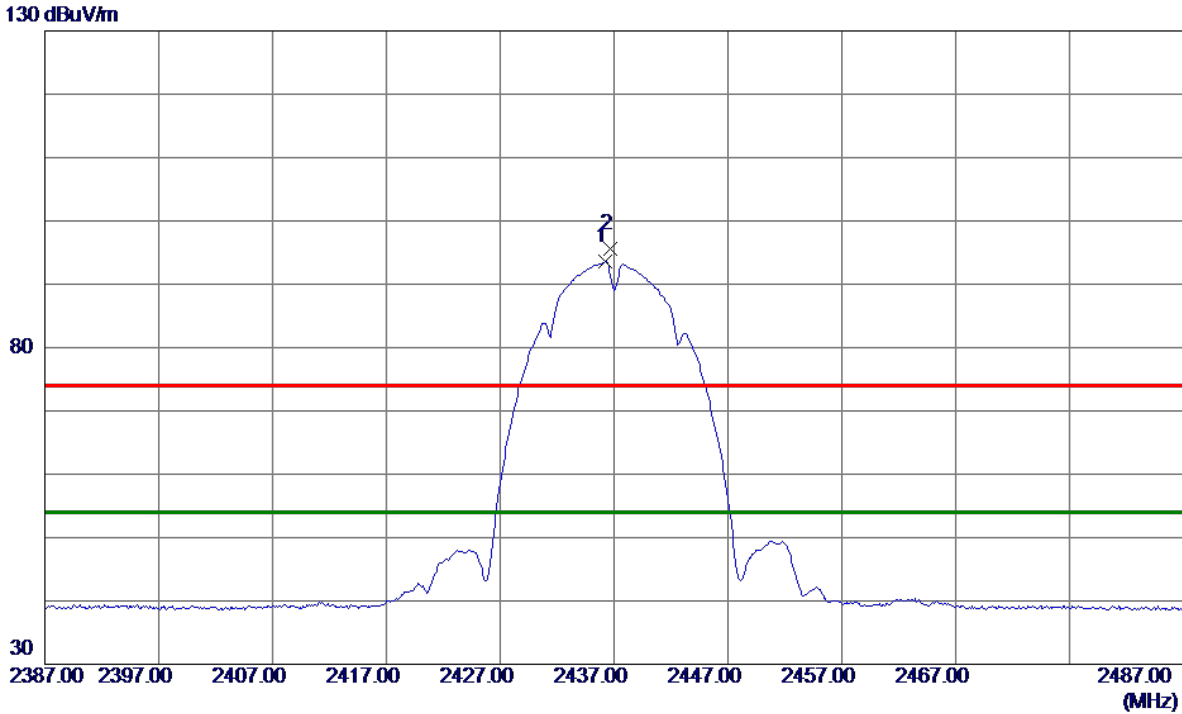
**REMARKS:**

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2437 MHz

**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2436.2000	85.23	8.34	93.57	54.00	39.57	AVG	No Limit
2	2436.7000	87.20	8.34	95.54	74.00	21.54	Peak	No Limit

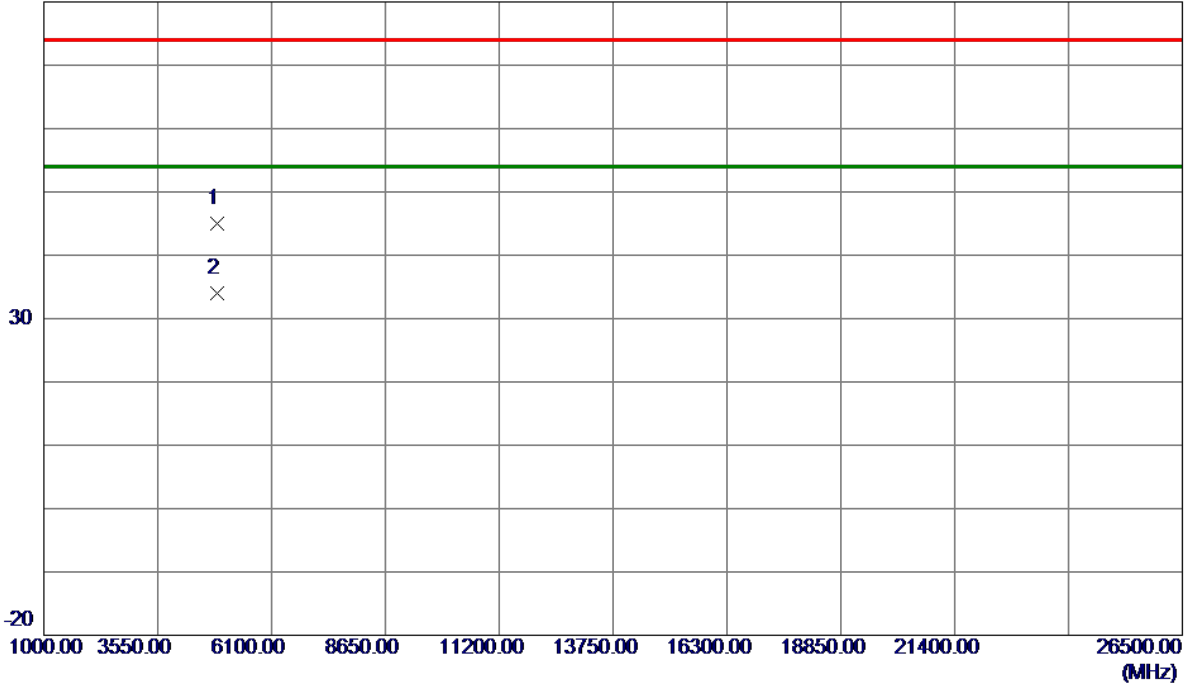
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2437 MHz

### Vertical

80 dBuV/m



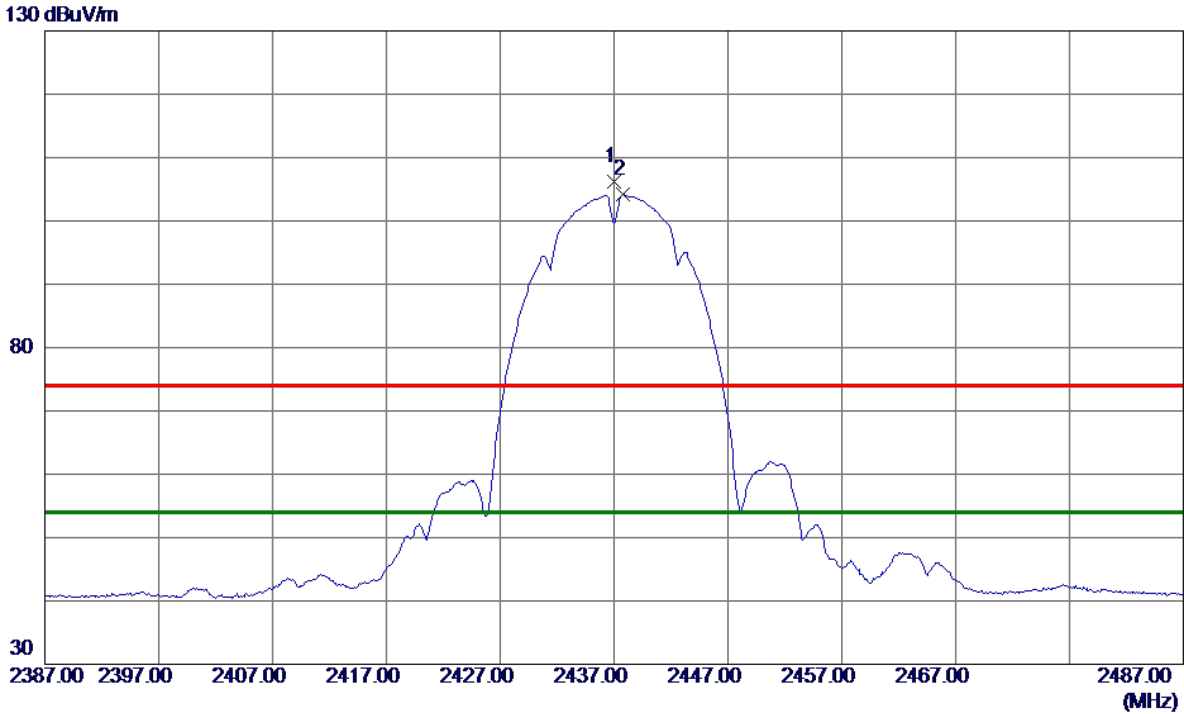
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.1580	39.55	5.46	45.01	74.00	-28.99	Peak	
2 *	4875.3520	28.53	5.46	33.99	54.00	-20.01	AVG	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2437 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2437.0000	97.92	8.34	106.26	74.00	32.26	Peak	No Limit
2 *	2437.8000	95.80	8.34	104.14	54.00	50.14	AVG	No Limit

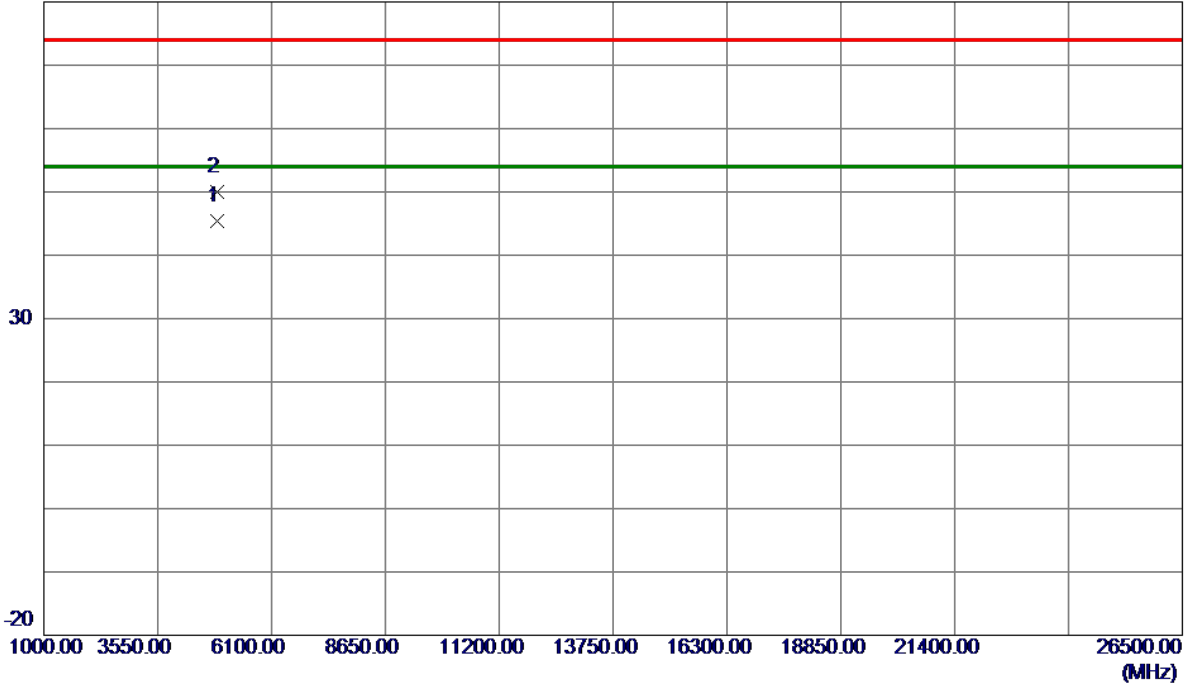
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2437 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4874.0530	39.87	5.46	45.33	54.00	-8.67	AVG	
2	4874.1460	44.47	5.46	49.93	74.00	-24.07	Peak	

**REMARKS:**

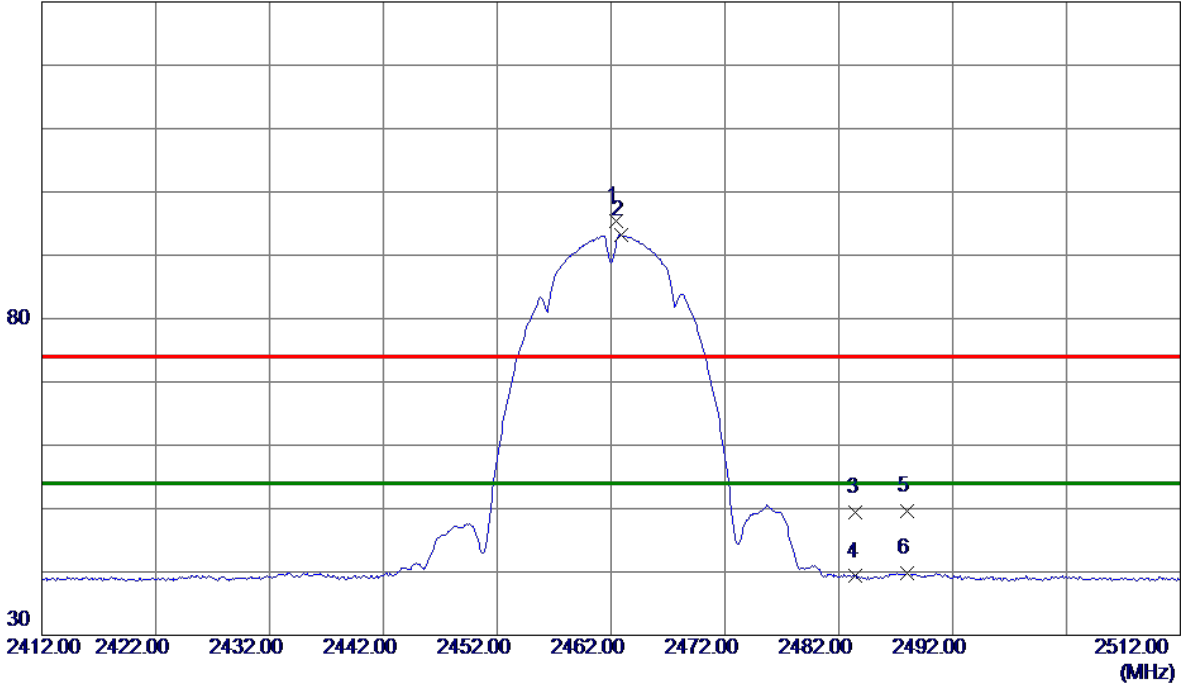
(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2462 MHz

**Vertical**

130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2462.4000	87.13	8.36	95.49	74.00	21.49	Peak	No Limit
2 *	2462.9000	84.85	8.37	93.22	54.00	39.22	AVG	No Limit
3	2483.5000	40.95	8.39	49.34	74.00	-24.66	Peak	
4	2483.5000	30.91	8.39	39.30	54.00	-14.70	AVG	
5	2488.0000	41.30	8.39	49.69	74.00	-24.31	Peak	
6	2488.0000	31.36	8.39	39.75	54.00	-14.25	AVG	

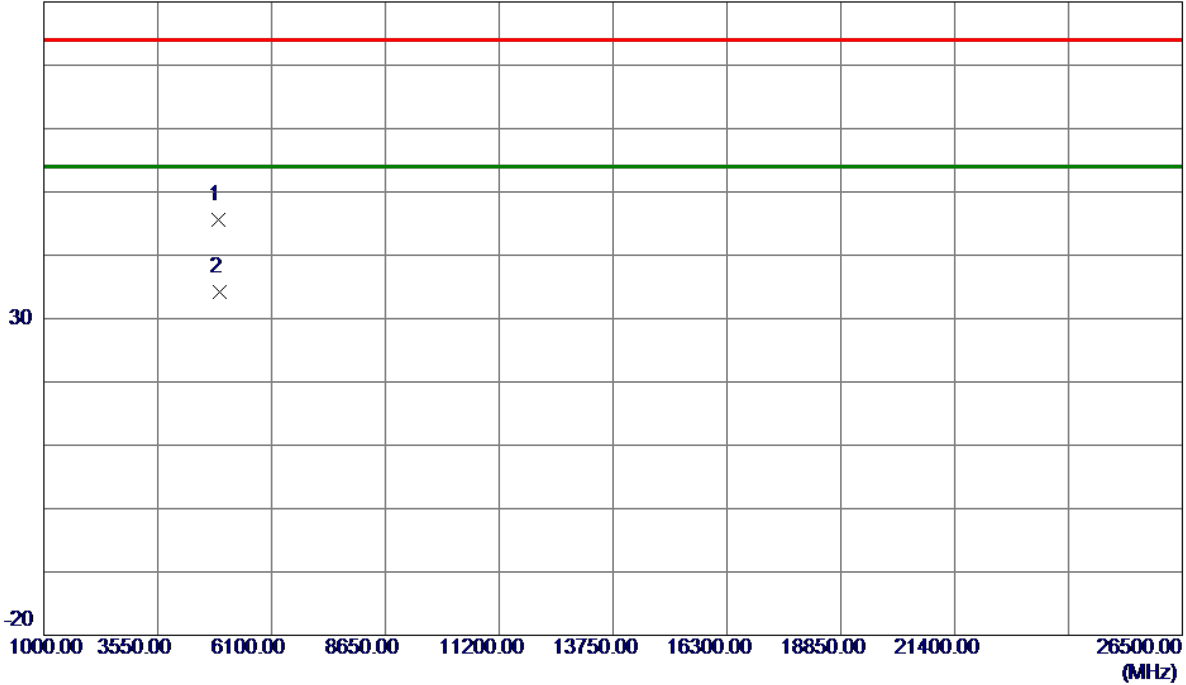
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2462 MHz

### Vertical

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4922.9100	40.02	5.59	45.61	74.00	-28.39	Peak	
2 *	4925.5070	28.56	5.60	34.16	54.00	-19.84	AVG	

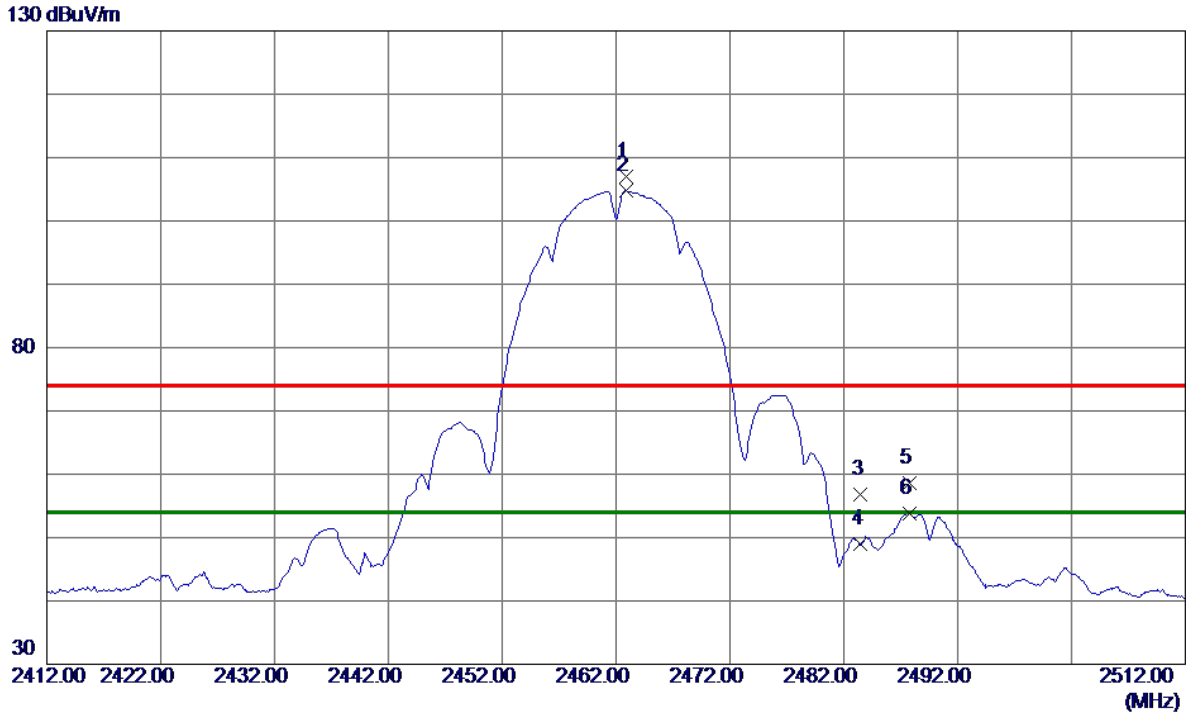
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.



Test Mode: TX B Mode 2462 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2462.9000	98.53	8.37	106.90	74.00	32.90	Peak	No Limit
2 *	2462.9000	96.37	8.37	104.74	54.00	50.74	AVG	No Limit
3	2483.5000	48.47	8.39	56.86	74.00	-17.14	Peak	
4	2483.5000	40.55	8.39	48.94	54.00	-5.06	AVG	
5	2487.8000	50.21	8.39	58.60	74.00	-15.40	Peak	
6	2487.8000	45.49	8.39	53.88	54.00	-0.12	AVG	

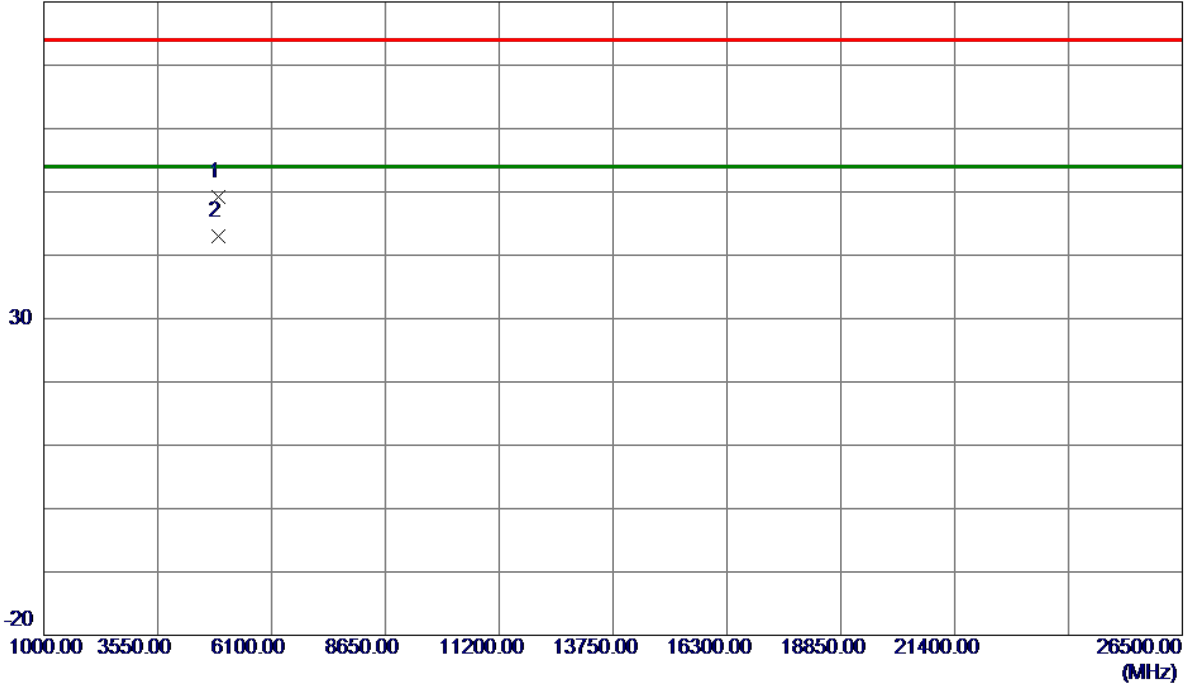
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX B Mode 2462 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4923.8060	43.63	5.59	49.22	74.00	-24.78	Peak	
2 *	4924.0040	37.42	5.59	43.01	54.00	-10.99	AVG	

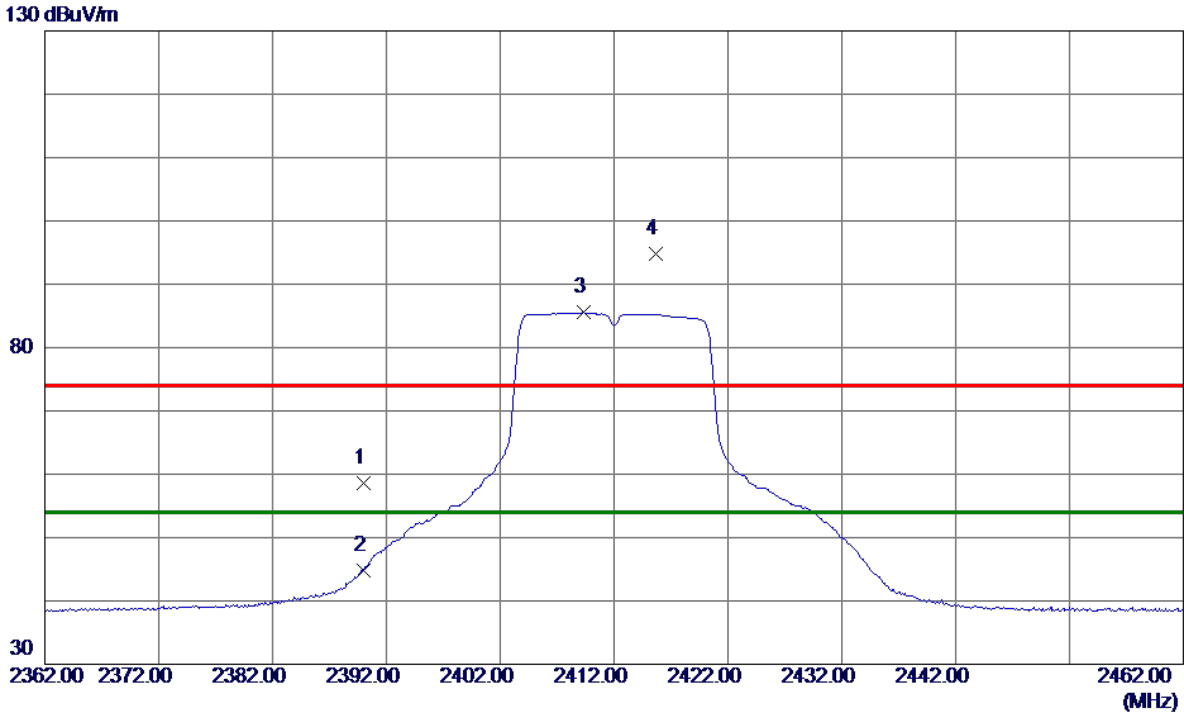
**REMARKS:**

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2412 MHz

### Vertical



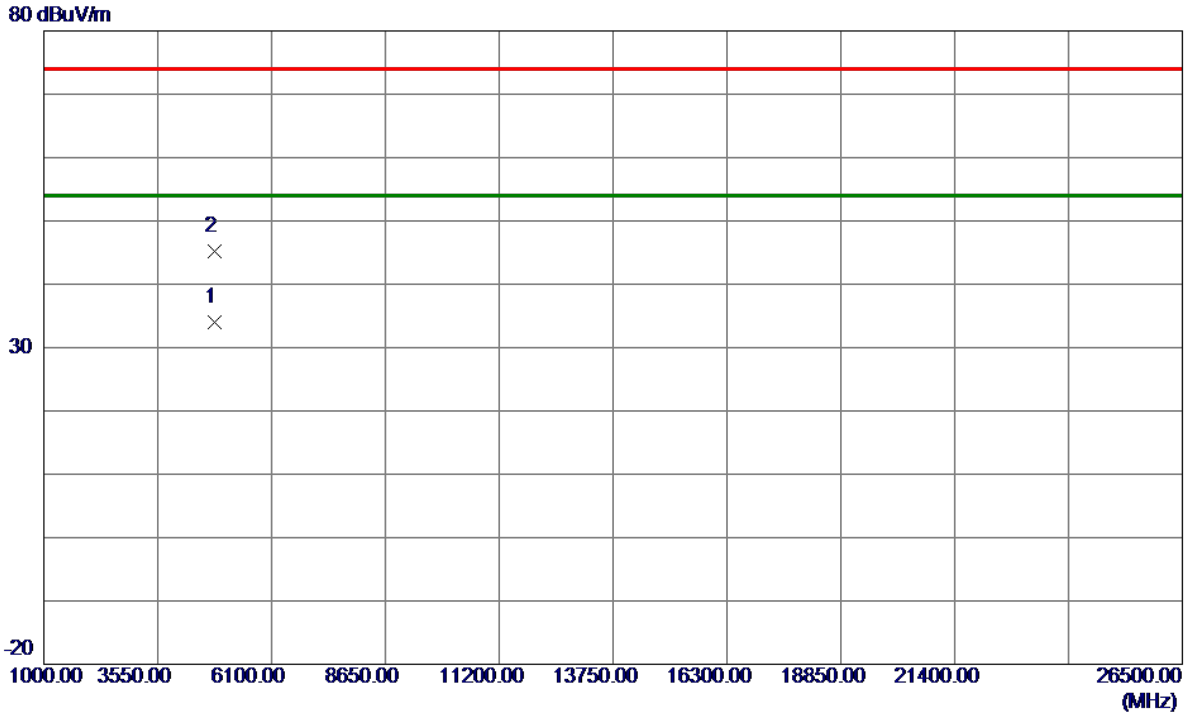
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	50.28	8.29	58.57	74.00	-15.43	Peak	
2	2390.0000	36.56	8.29	44.85	54.00	-9.15	AVG	
3 *	2409.3000	77.20	8.31	85.51	54.00	31.51	AVG	No Limit
4	2415.7000	86.54	8.31	94.85	74.00	20.85	Peak	No Limit

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2412 MHz

### Vertical



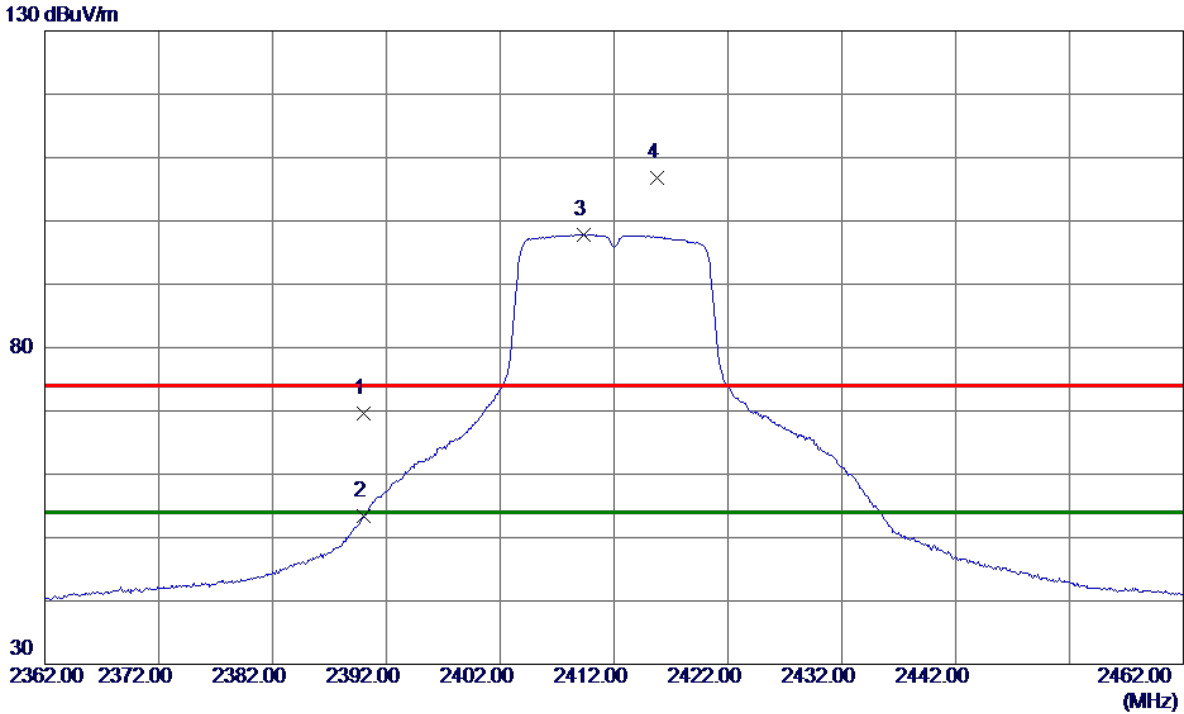
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4825.2100	28.67	5.33	34.00	54.00	-20.00	AVG	
2	4826.4480	39.88	5.33	45.21	74.00	-28.79	Peak	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2412 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	61.37	8.29	69.66	74.00	-4.34	Peak	
2	2390.0000	45.17	8.29	53.46	54.00	-0.54	AVG	
3 *	2409.3000	89.56	8.31	97.87	54.00	43.87	AVG	No Limit
4	2415.8000	98.52	8.31	106.83	74.00	32.83	Peak	No Limit

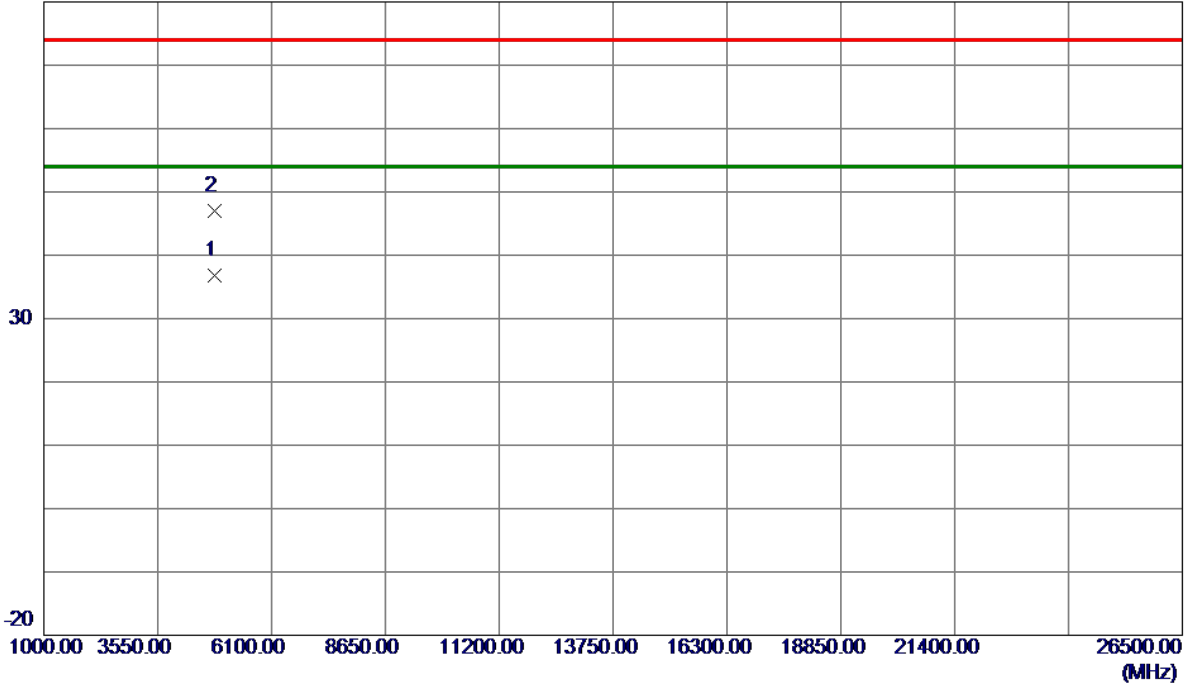
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2412 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4825.4250	31.50	5.33	36.83	54.00	-17.17	AVG	
2	4825.7000	41.64	5.33	46.97	74.00	-27.03	Peak	

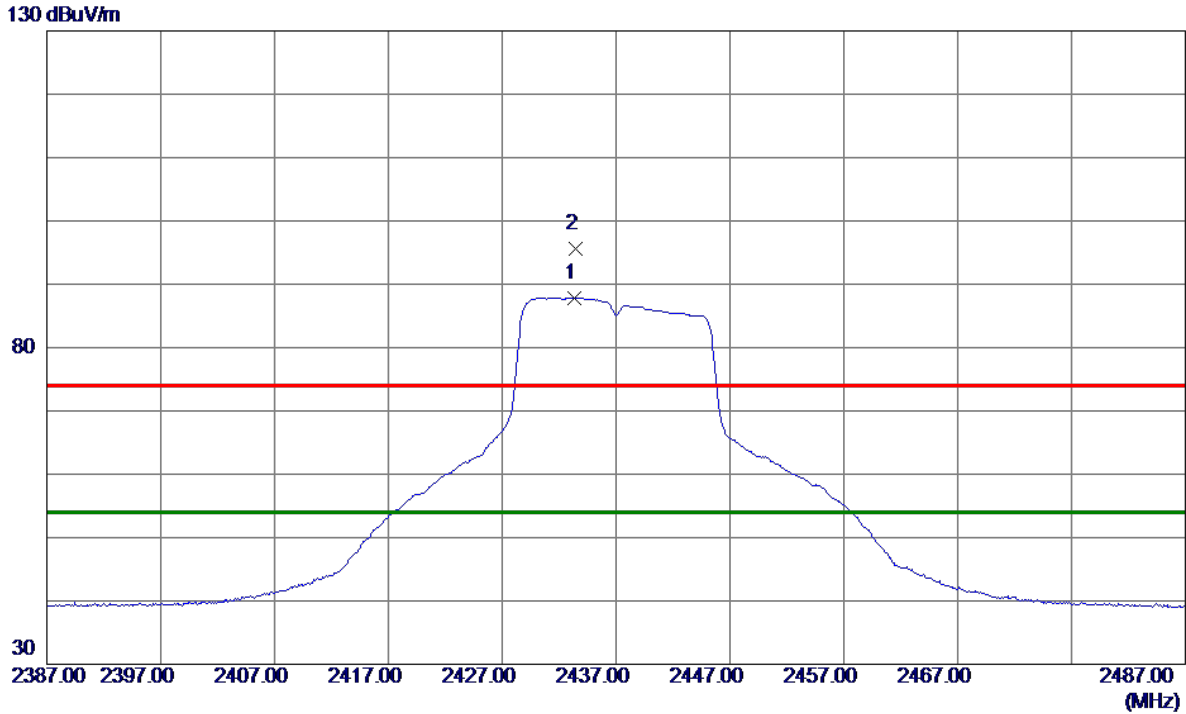
**REMARKS:**

(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2437 MHz

**Vertical**



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2433.3000	79.53	8.33	87.86	54.00	33.86	AVG	No Limit
2	2433.4000	87.18	8.33	95.51	74.00	21.51	Peak	No Limit

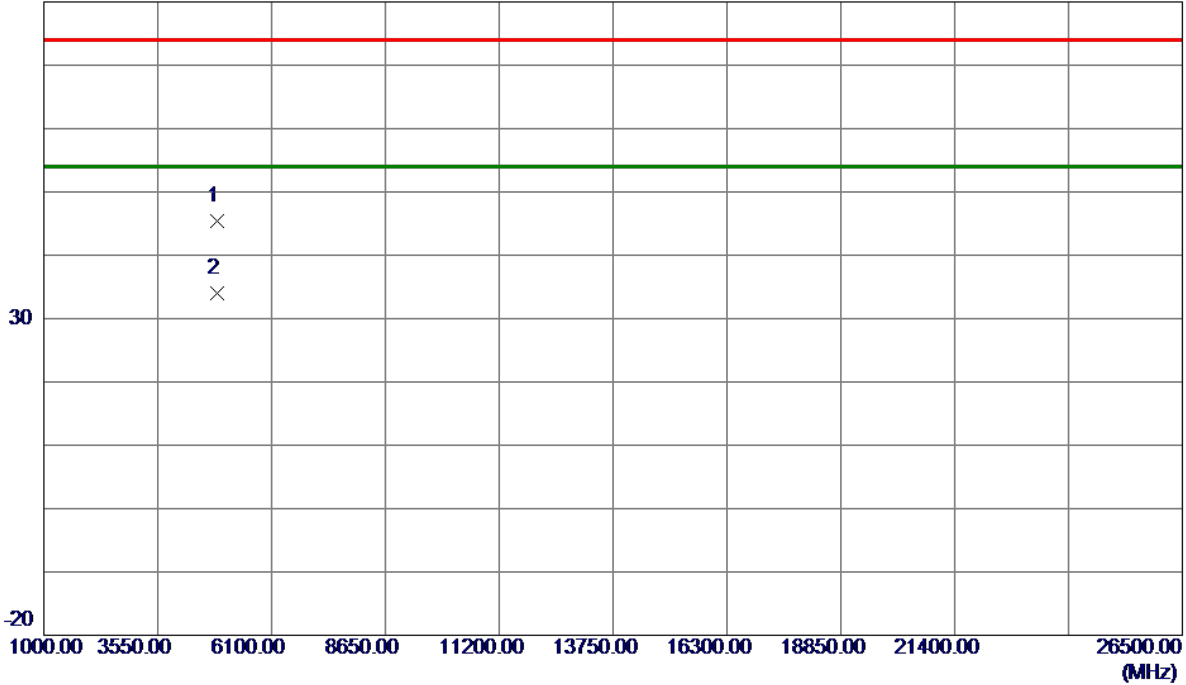
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2437 MHz

### Vertical

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4872.6770	40.01	5.46	45.47	74.00	-28.53	Peak	
2 *	4873.9650	28.49	5.46	33.95	54.00	-20.05	AVG	

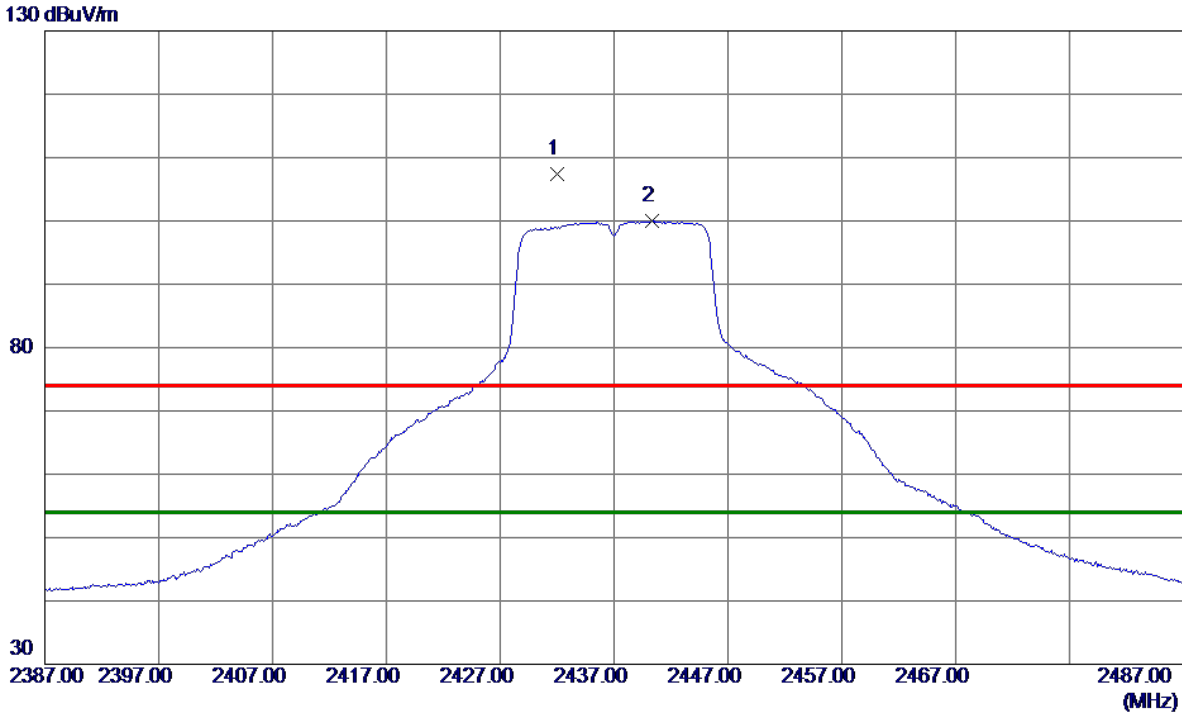
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.



Test Mode: TX G Mode 2437 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2432.0000	99.16	8.33	107.49	74.00	33.49	Peak	No Limit
2 *	2440.3000	91.60	8.34	99.94	54.00	45.94	AVG	No Limit

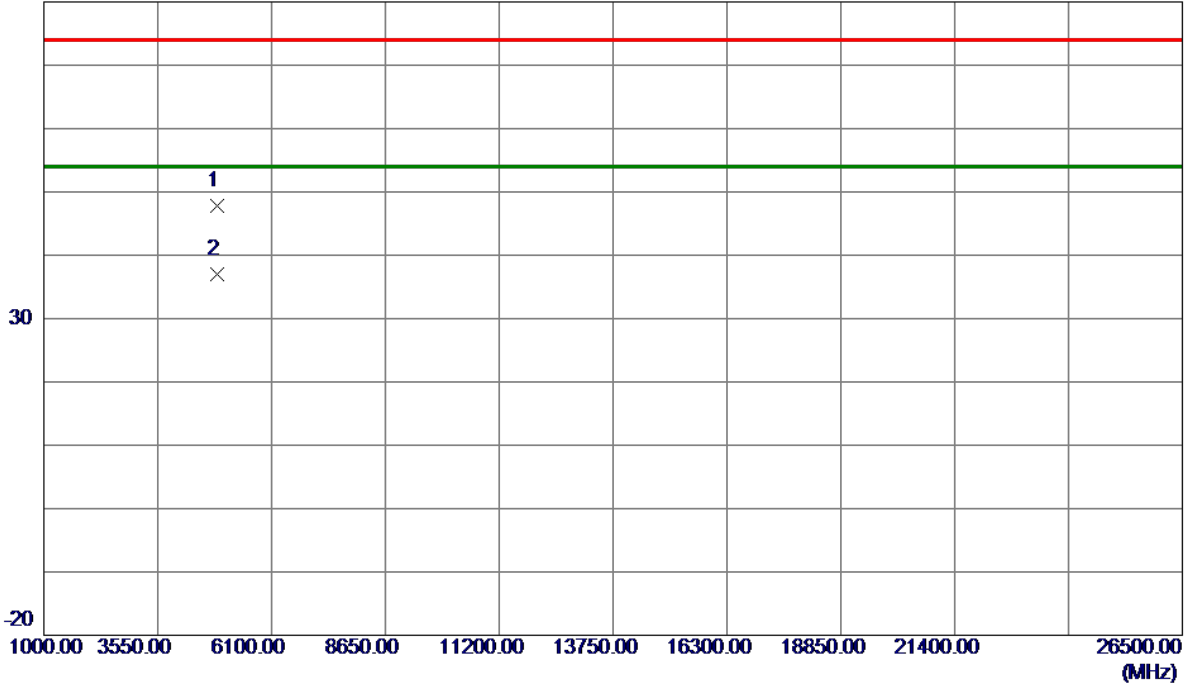
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2437 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4870.0000	42.44	5.45	47.89	74.00	-26.11	Peak	
2 *	4873.2250	31.49	5.46	36.95	54.00	-17.05	AVG	

**REMARKS:**

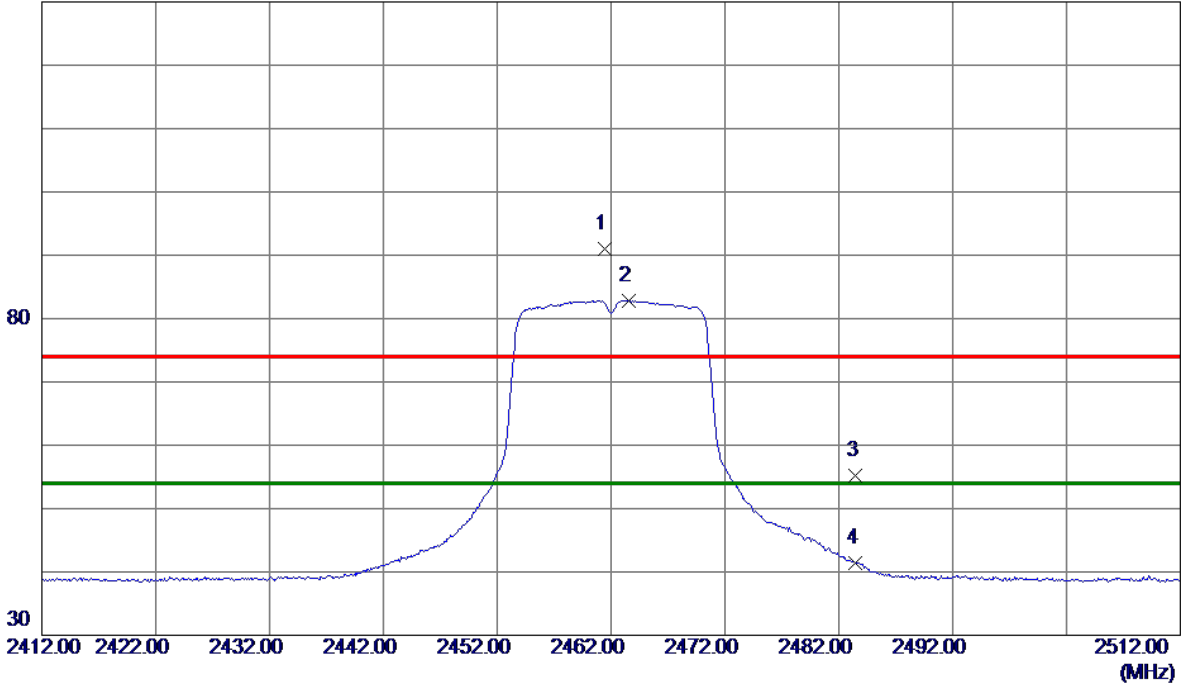
(1) Measurement Value = Reading Level + Correct Factor.

(2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2462 MHz

**Vertical**

130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2461.4000	82.74	8.36	91.10	74.00	17.10	Peak	No Limit
2 *	2463.6000	74.50	8.37	82.87	54.00	28.87	AVG	No Limit
3	2483.5000	46.81	8.39	55.20	74.00	-18.80	Peak	
4	2483.5000	33.03	8.39	41.42	54.00	-12.58	AVG	

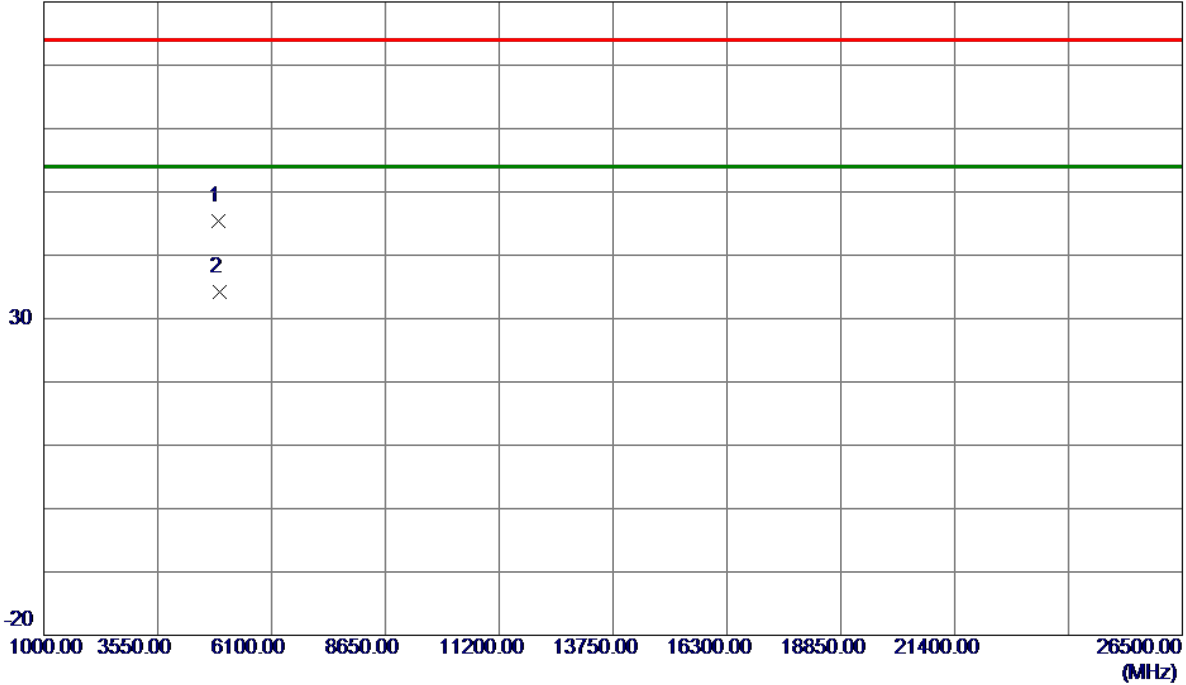
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2462 MHz

### Vertical

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4921.9900	39.82	5.59	45.41	74.00	-28.59	Peak	
2 *	4925.9270	28.60	5.60	34.20	54.00	-19.80	AVG	

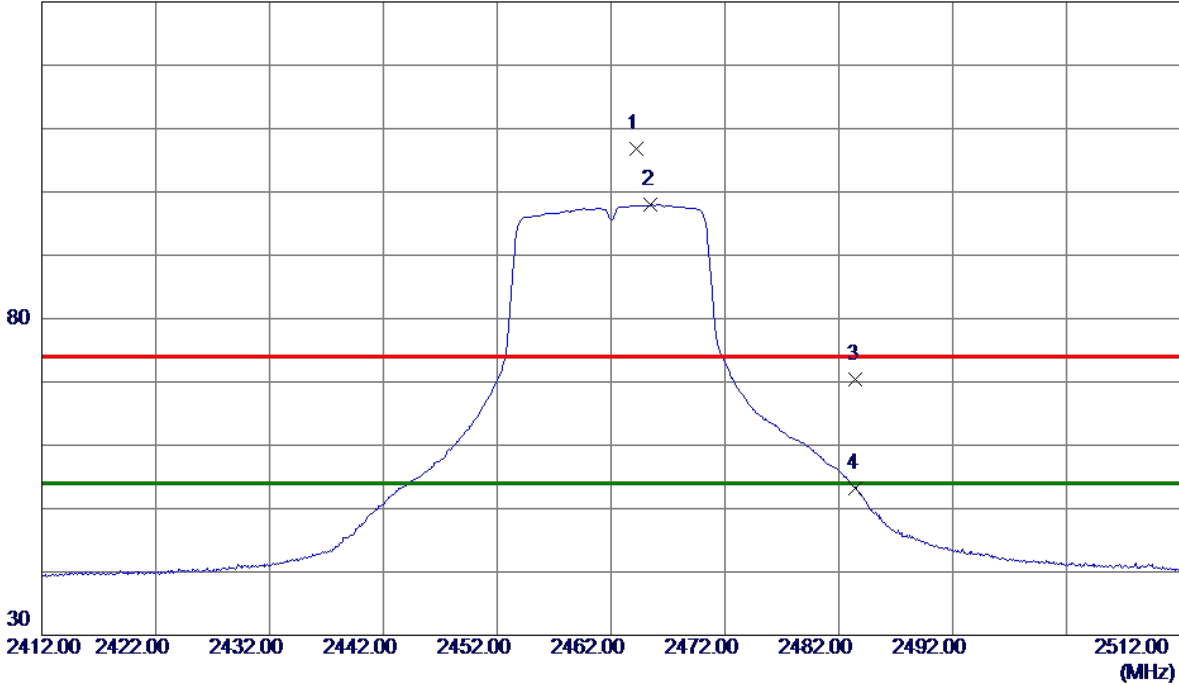
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2462 MHz

### Horizontal

130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2464.2000	98.35	8.37	106.72	74.00	32.72	Peak	No Limit
2 *	2465.5000	89.58	8.37	97.95	54.00	43.95	AVG	No Limit
3	2483.5000	62.00	8.39	70.39	74.00	-3.61	Peak	
4	2483.5000	44.80	8.39	53.19	54.00	-0.81	AVG	

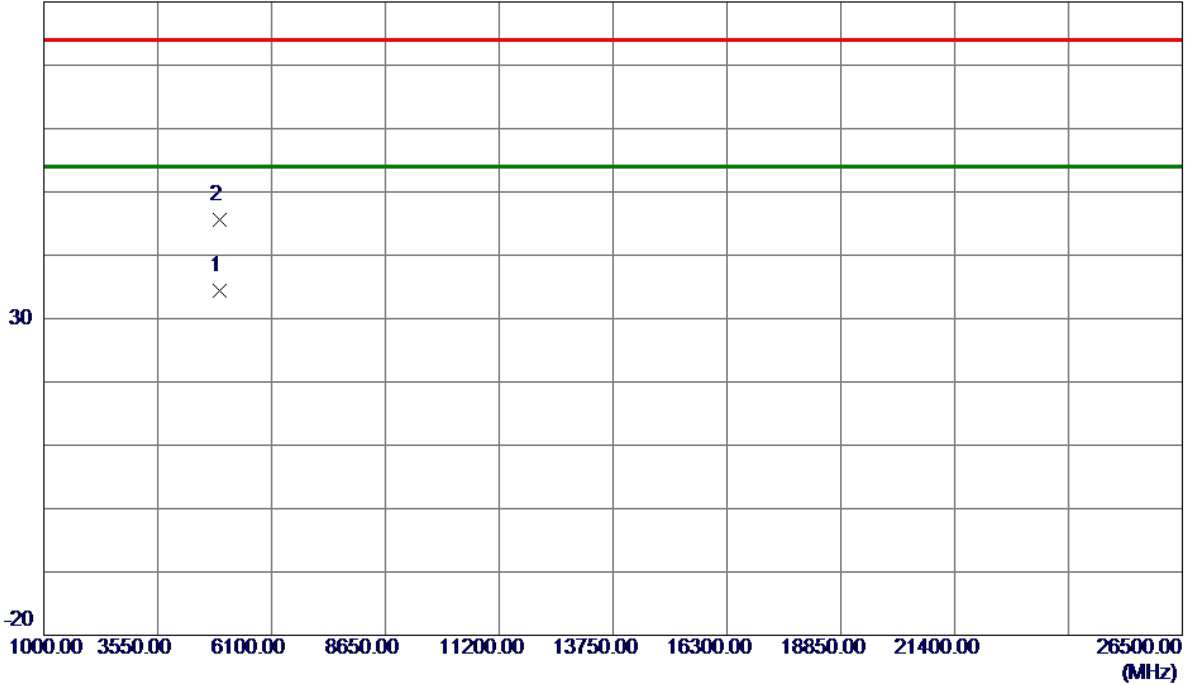
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX G Mode 2462 MHz

### Horizontal

80 dBuV/m



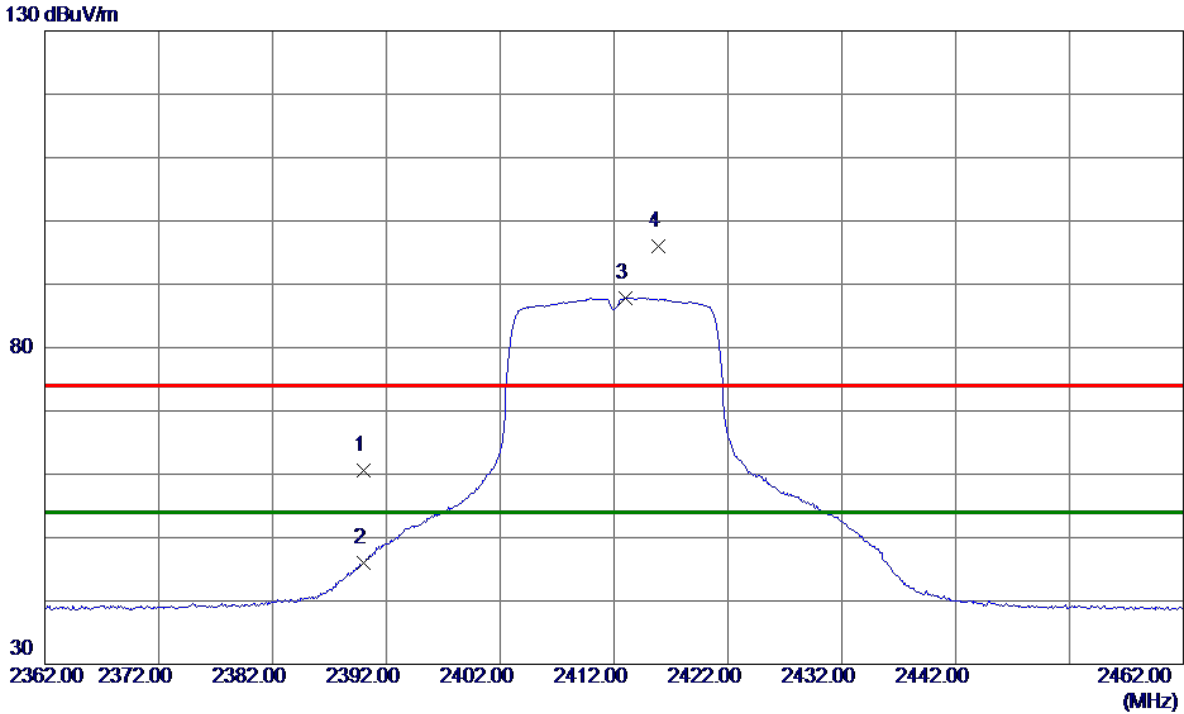
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	4925.6500	28.81	5.60	34.41	54.00	-19.59	AVG	
2	4926.8700	39.93	5.60	45.53	74.00	-28.47	Peak	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2412 MHz

### Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	52.32	8.29	60.61	74.00	-13.39	Peak	
2	2390.0000	37.69	8.29	45.98	54.00	-8.02	AVG	
3 *	2413.0000	79.52	8.31	87.83	54.00	33.83	AVG	No Limit
4	2415.9000	87.71	8.32	96.03	74.00	22.03	Peak	No Limit

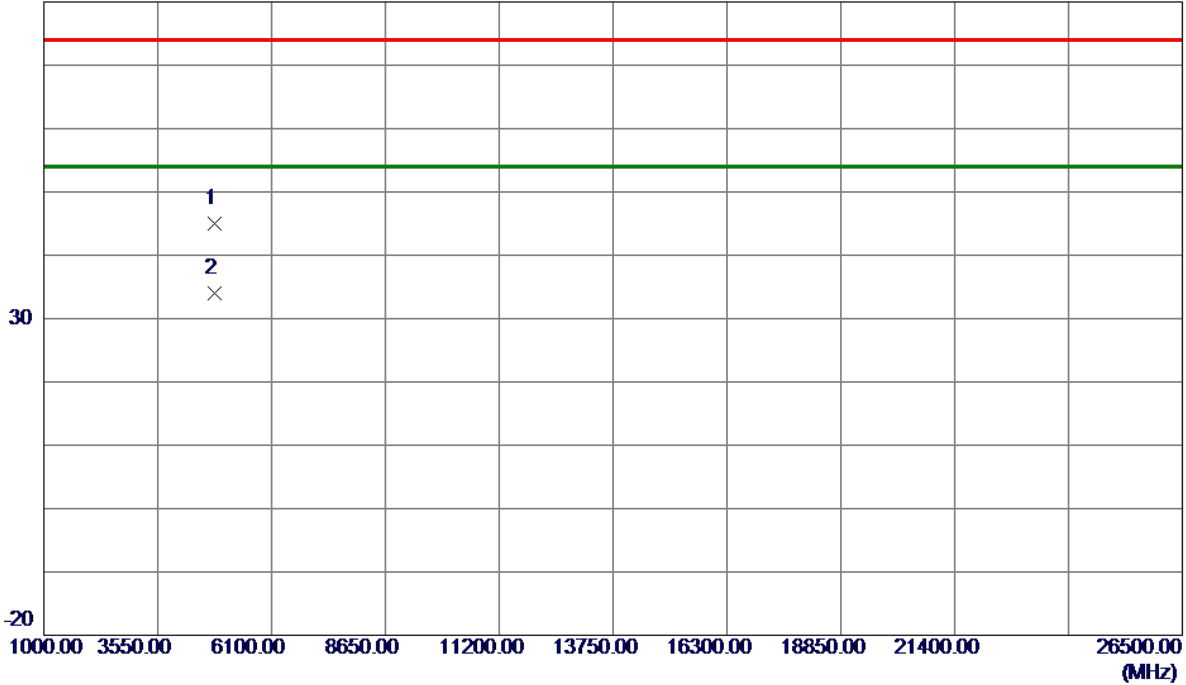
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2412 MHz

### Vertical

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4823.2830	39.72	5.32	45.04	74.00	-28.96	Peak	
2 *	4823.4300	28.63	5.32	33.95	54.00	-20.05	AVG	

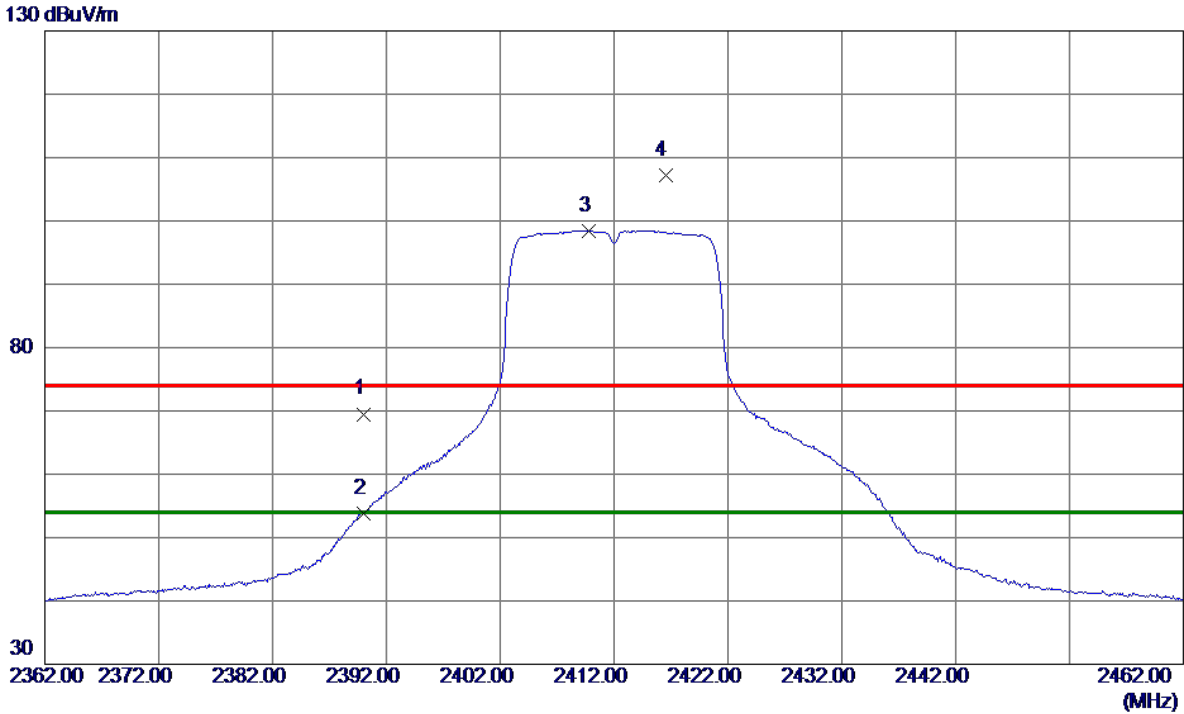
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.



Test Mode: TX N-20M Mode 2412 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2390.0000	61.21	8.29	69.50	74.00	-4.50	Peak	
2	2390.0000	45.51	8.29	53.80	54.00	-0.20	AVG	
3 *	2409.8000	90.15	8.31	98.46	54.00	44.46	AVG	No Limit
4	2416.5000	98.83	8.32	107.15	74.00	33.15	Peak	No Limit

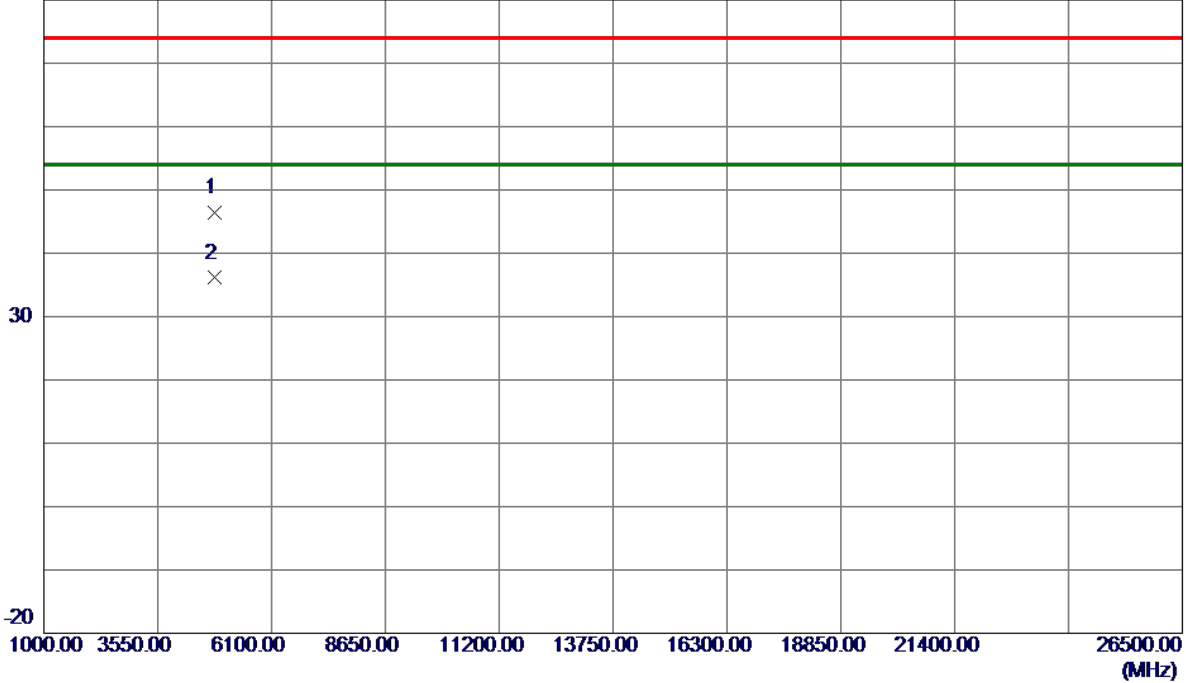
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2412 MHz

### Horizontal

80 dBuV/m



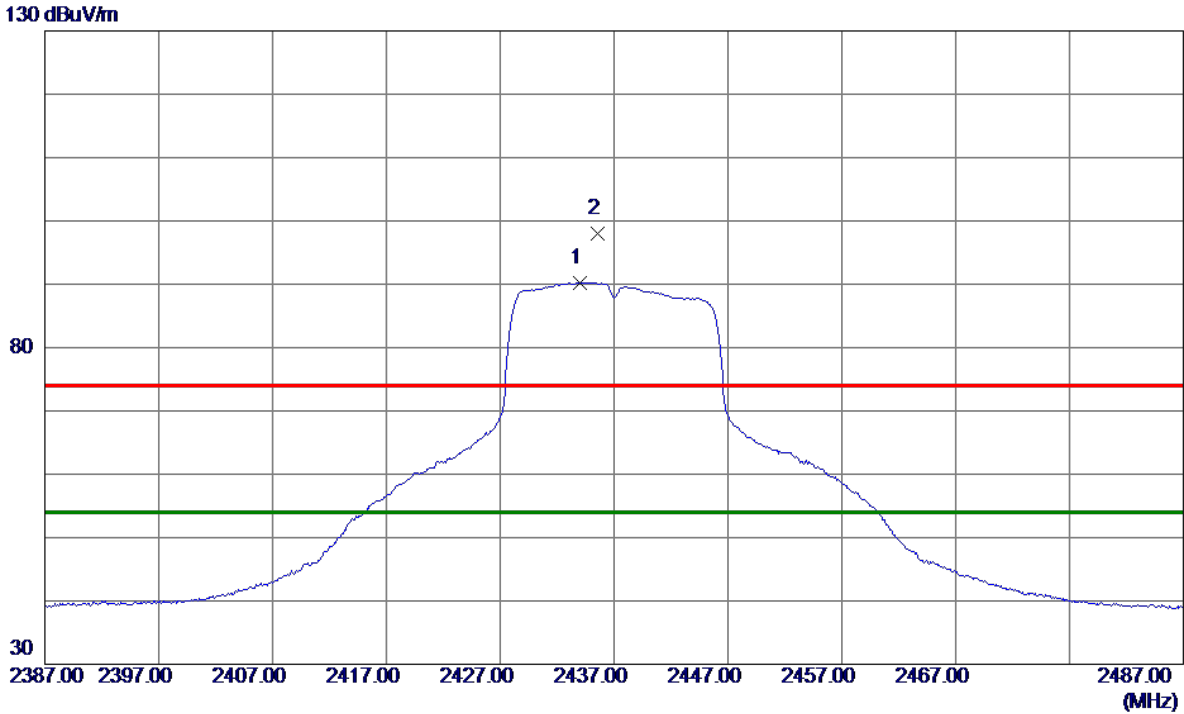
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4815.8750	41.05	5.30	46.35	74.00	-27.65	Peak	
2 *	4822.6500	30.78	5.32	36.10	54.00	-17.90	AVG	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2437 MHz

### Vertical



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2434.0000	81.91	8.33	90.24	54.00	36.24	AVG	No Limit
2	2435.6000	89.67	8.34	98.01	74.00	24.01	Peak	No Limit

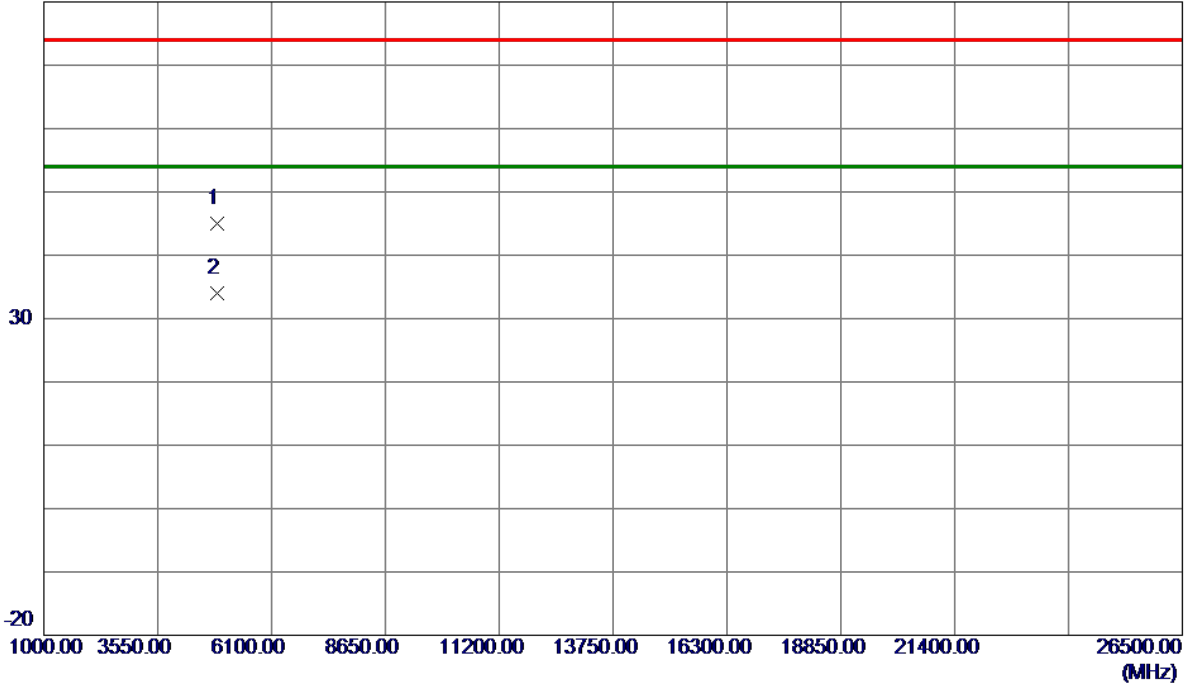
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2437 MHz

### Vertical

80 dBuV/m



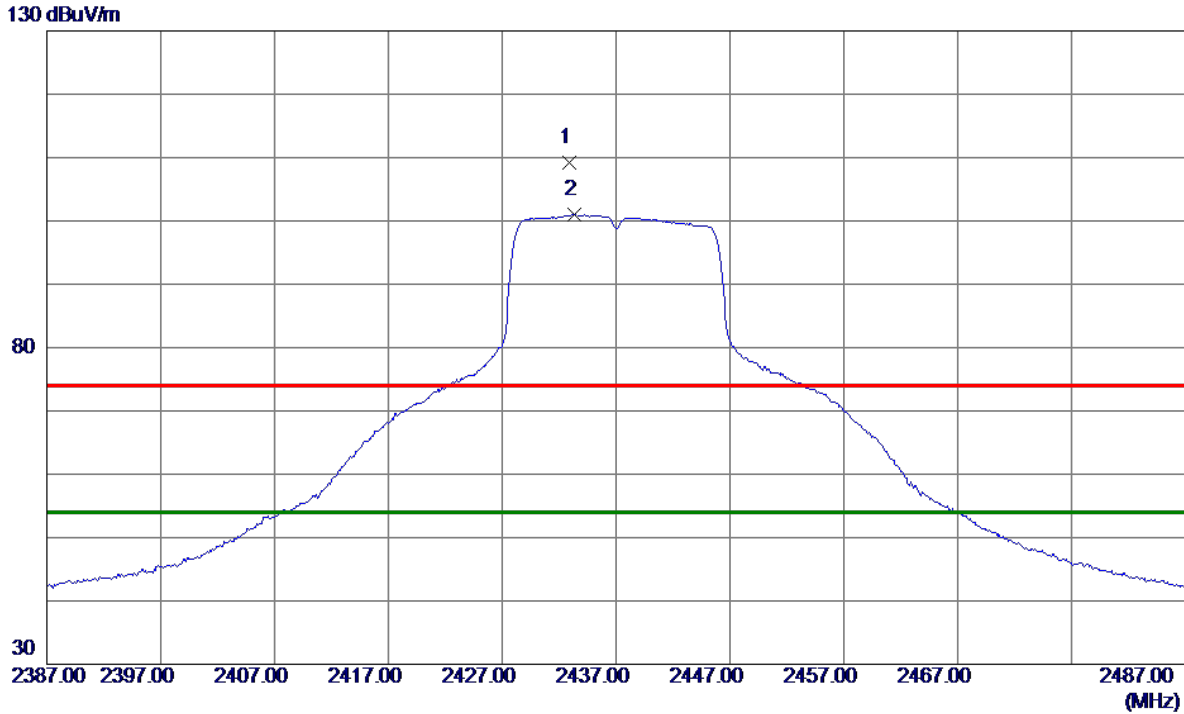
No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4872.6500	39.60	5.45	45.05	74.00	-28.95	Peak	
2 *	4875.1450	28.52	5.46	33.98	54.00	-20.02	AVG	

**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2437 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2432.9000	100.88	8.33	109.21	74.00	35.21	Peak	No Limit
2 *	2433.3000	92.66	8.33	100.99	54.00	46.99	AVG	No Limit

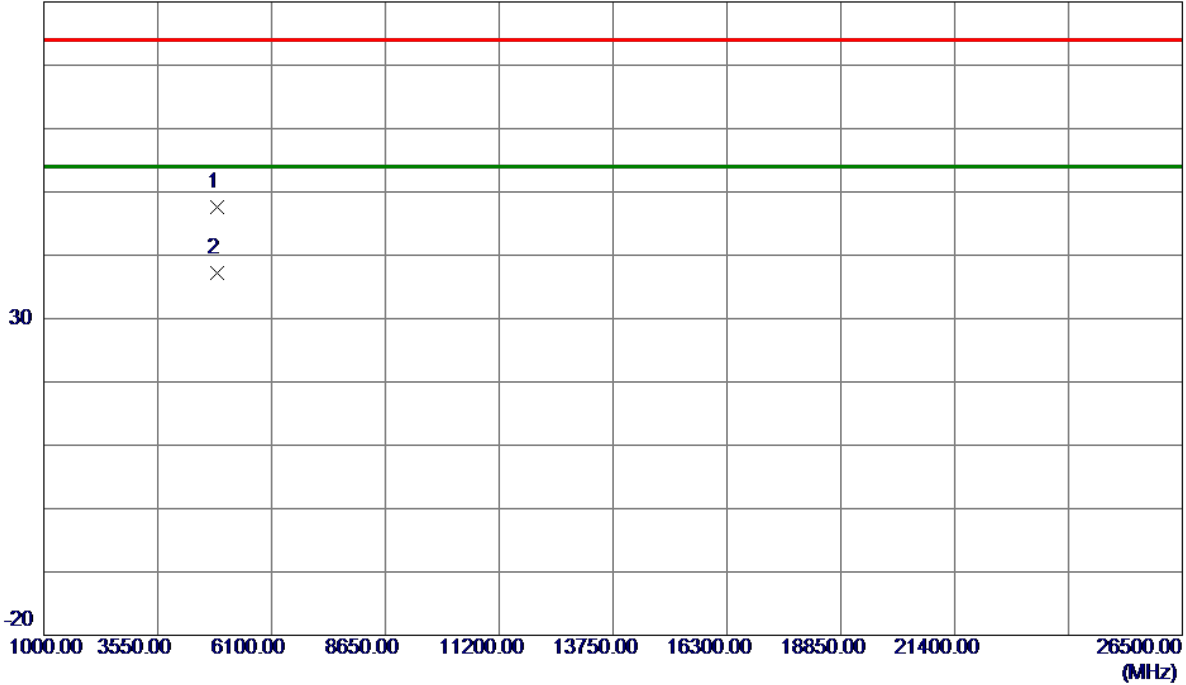
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2437 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4873.4250	42.23	5.46	47.69	74.00	-26.31	Peak	
2 *	4873.9750	31.77	5.46	37.23	54.00	-16.77	AVG	

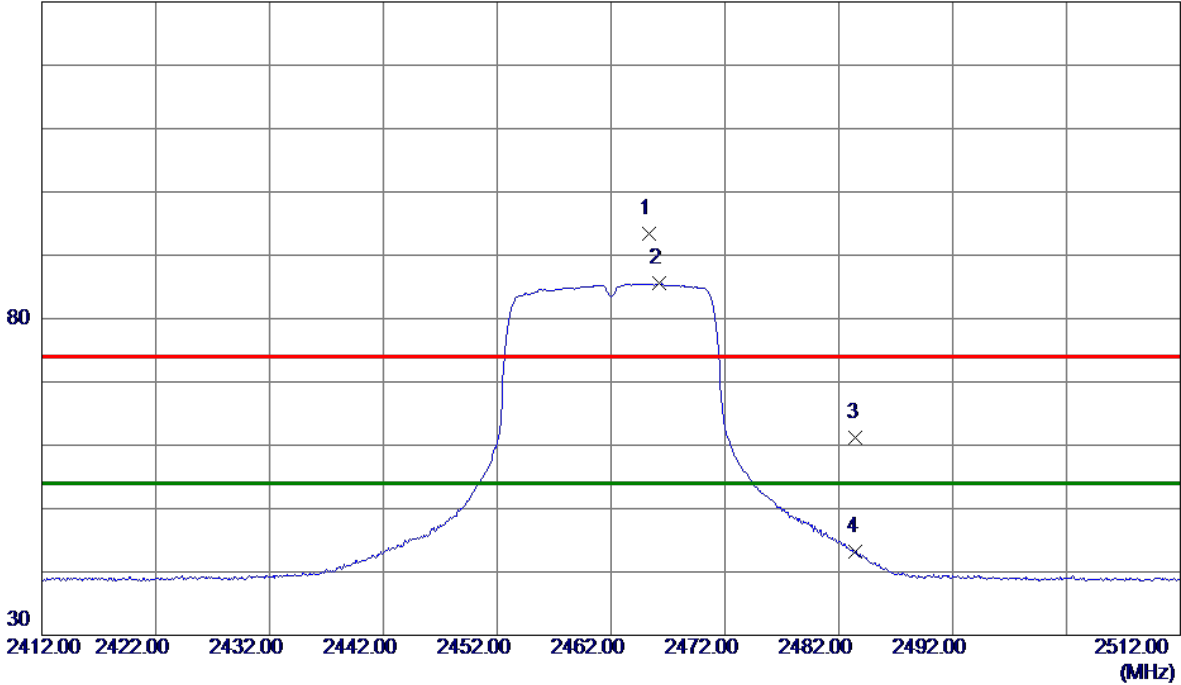
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2462 MHz

### Vertical

130 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	2465.3000	84.99	8.37	93.36	74.00	19.36	Peak	No Limit
2 *	2466.2000	77.21	8.37	85.58	54.00	31.58	AVG	No Limit
3	2483.5000	52.87	8.39	61.26	74.00	-12.74	Peak	
4	2483.5000	34.85	8.39	43.24	54.00	-10.76	AVG	

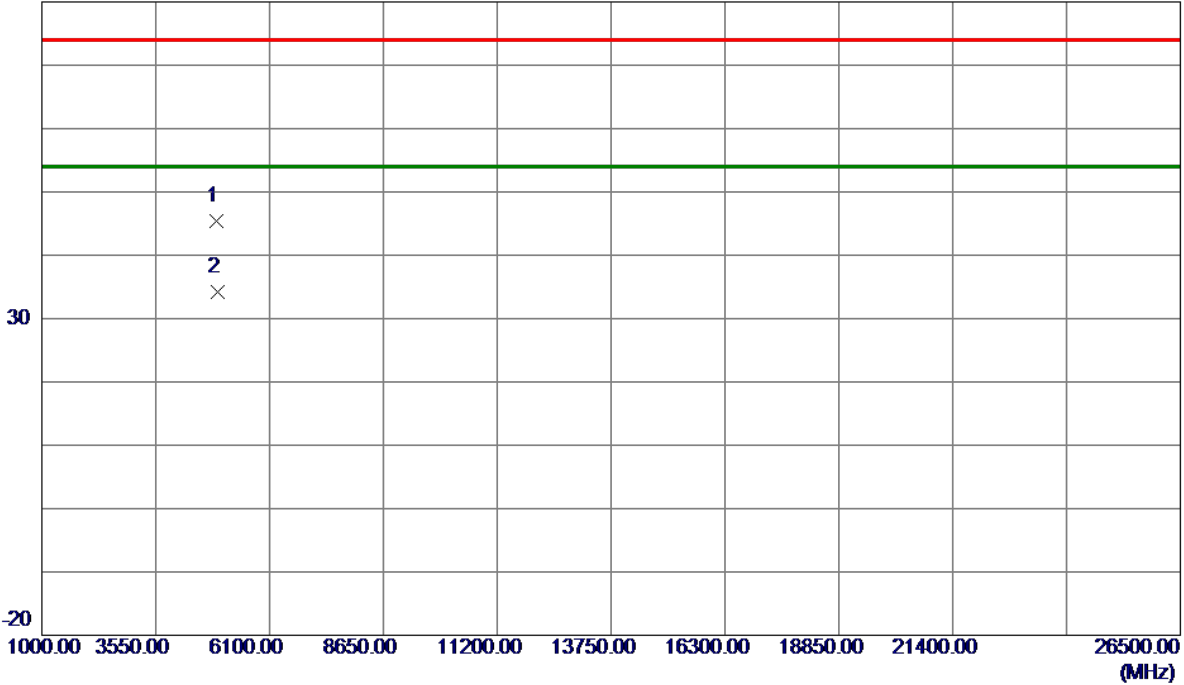
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2462 MHz

### Vertical

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4923.0230	39.85	5.59	45.44	74.00	-28.56	Peak	
2 *	4926.3769	28.64	5.60	34.24	54.00	-19.76	AVG	

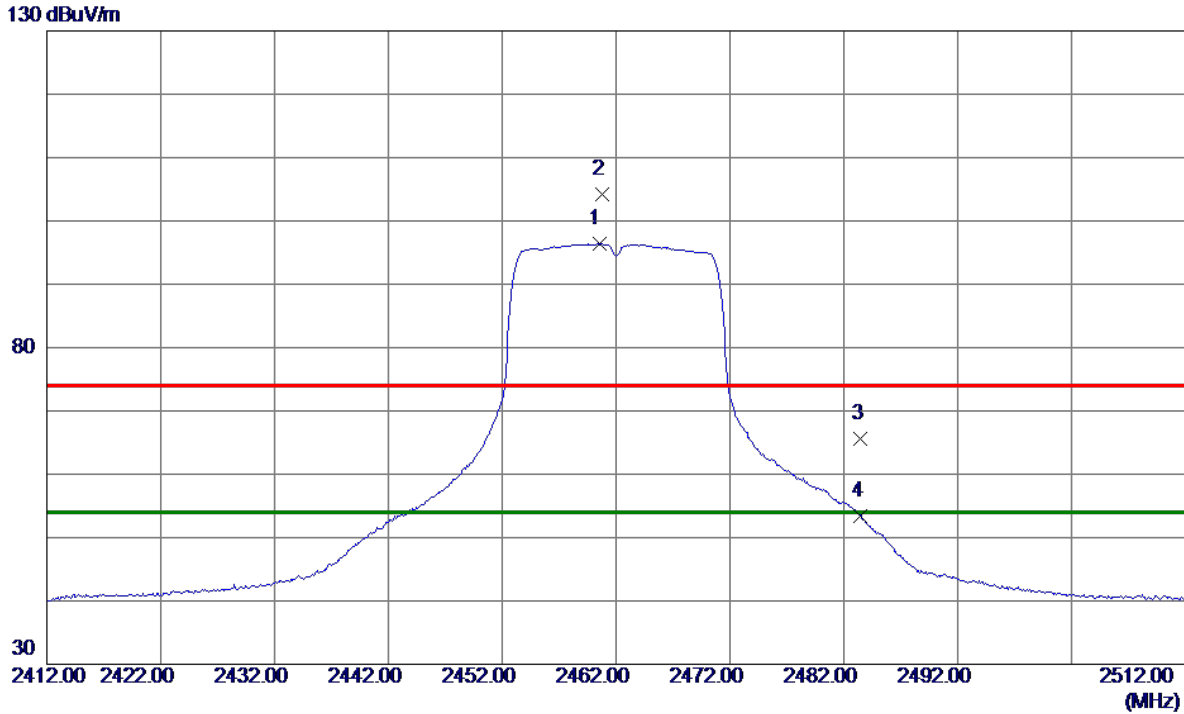
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.



Test Mode: TX N-20M Mode 2462 MHz

### Horizontal



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1 *	2460.5000	87.98	8.36	96.34	54.00	42.34	AVG	No Limit
2	2460.8000	95.77	8.36	104.13	74.00	30.13	Peak	No Limit
3	2483.5000	57.18	8.39	65.57	74.00	-8.43	Peak	
4	2483.5000	45.01	8.39	53.40	54.00	-0.60	AVG	

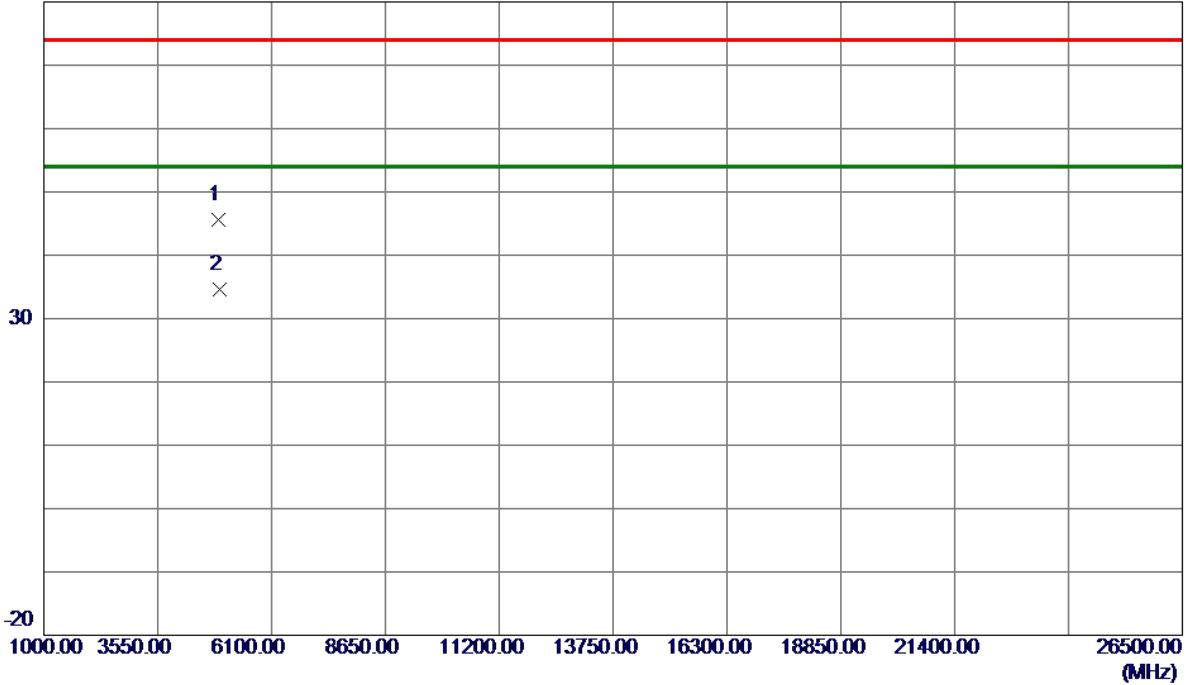
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

Test Mode: TX N-20M Mode 2462 MHz

### Horizontal

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	4921.7500	40.08	5.59	45.67	74.00	-28.33	Peak	
2 *	4927.5750	29.05	5.60	34.65	54.00	-19.35	AVG	

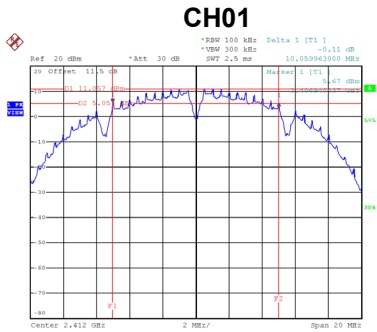
**REMARKS:**

- (1) Measurement Value = Reading Level + Correct Factor.
- (2) Margin Level = Measurement Value - Limit Value.

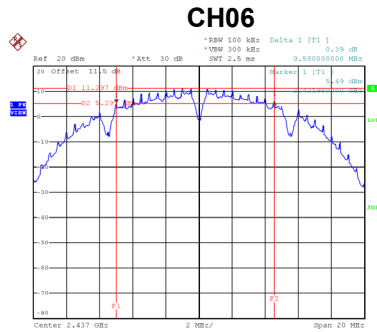
## APPENDIX E - BANDWIDTH

Test Mode	TX B Mode
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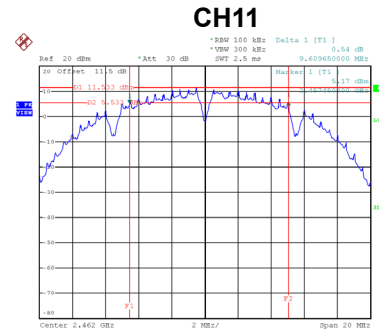
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
01	2412	10.06	500	Complies
06	2437	9.58	500	Complies
11	2462	9.61	500	Complies



Date: 21.SEP.2020 19:12:39

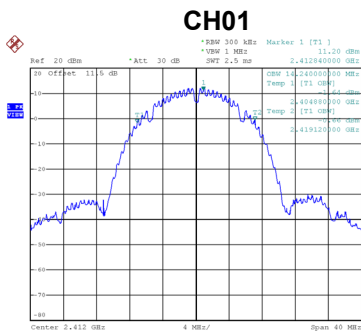


Date: 21.SEP.2020 19:14:13

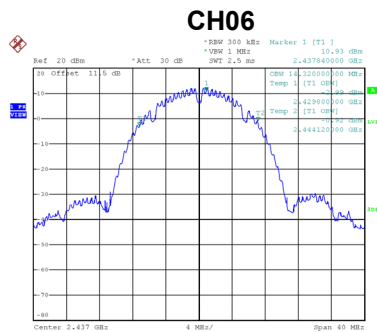


Date: 21.SEP.2020 19:15:39

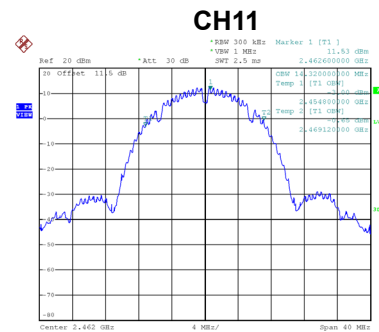
Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
01	2412	14.24	Complies
06	2437	14.32	Complies
11	2462	14.32	Complies



Date: 21.SEP.2020 19:12:47



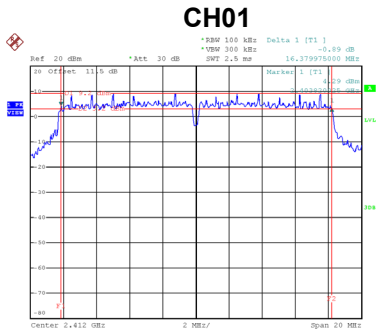
Date: 21.SEP.2020 19:14:21



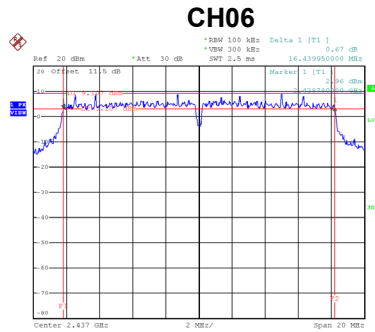
Date: 21.SEP.2020 19:15:47

Test Mode	TX G Mode
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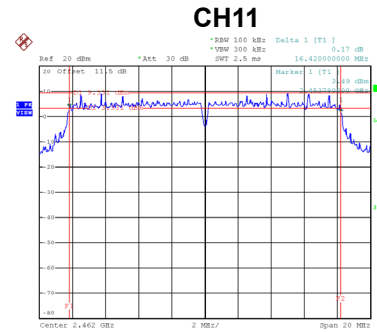
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
01	2412	16.38	500	Complies
06	2437	16.44	500	Complies
11	2462	16.42	500	Complies



Date: 21.SEP.2020 19:17:12

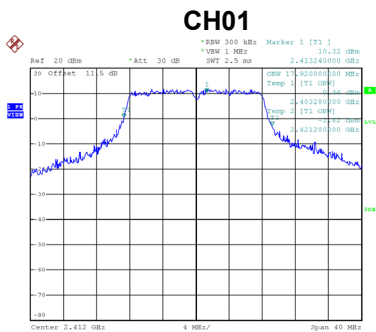


Date: 21.SEP.2020 19:18:28

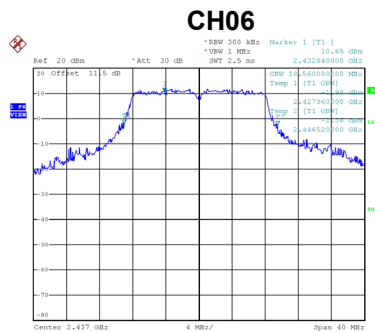


Date: 21.SEP.2020 19:19:47

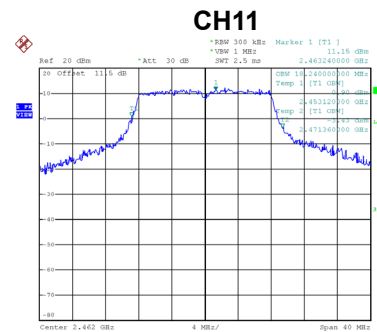
Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
01	2412	17.92	Complies
06	2437	18.56	Complies
11	2462	18.24	Complies



Date: 21.SEP.2020 19:17:19



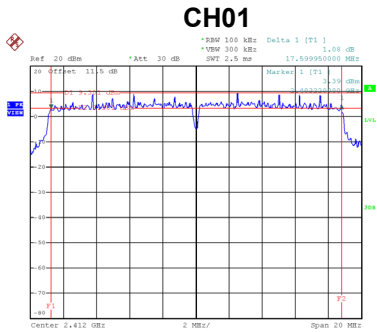
Date: 21.SEP.2020 19:18:35



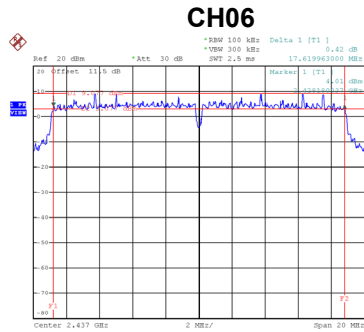
Date: 21.SEP.2020 19:19:54

Test Mode	TX N-20M Mode
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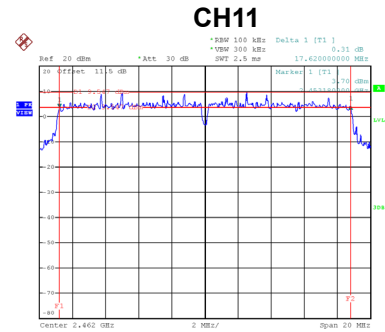
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth Min. Limit (kHz)	Result
01	2412	17.60	500	Complies
06	2437	17.62	500	Complies
11	2462	17.62	500	Complies



Date: 21.SEP.2020 19:21:09

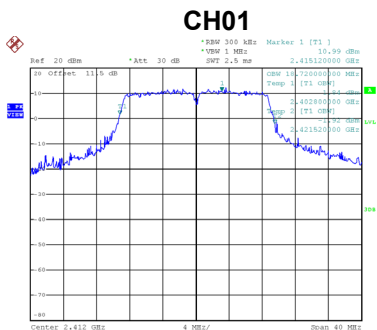


Date: 21.SEP.2020 19:22:33

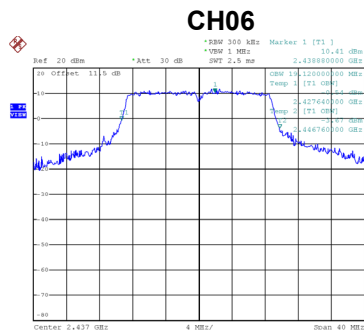


Date: 21.SEP.2020 19:23:46

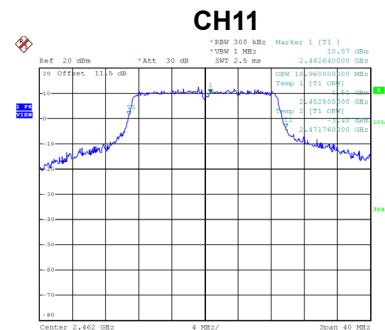
Channel	Frequency (MHz)	99 % Emission Bandwidth (MHz)	Result
01	2412	18.72	Complies
06	2437	19.12	Complies
11	2462	18.96	Complies



Date: 21.SEP.2020 19:21:17



Date: 21.SEP.2020 19:22:40



Date: 21.SEP.2020 19:23:53

## **APPENDIX F - MAXIMUM OUTPUT POWER**

Test Mode	TX B Mode
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Channel	Frequency (MHz)	Peak Output Power (dBm)	Max. Limit (dBm)	Result
01	2412	23.02	30.00	Complies
06	2437	23.99	30.00	Complies
11	2462	23.27	30.00	Complies

Test Mode	TX G Mode
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Channel	Frequency (MHz)	Peak Output Power (dBm)	Max. Limit (dBm)	Result
01	2412	25.28	30.00	Complies
06	2437	25.83	30.00	Complies
11	2462	24.31	30.00	Complies

Test Mode	TX N-20M Mode
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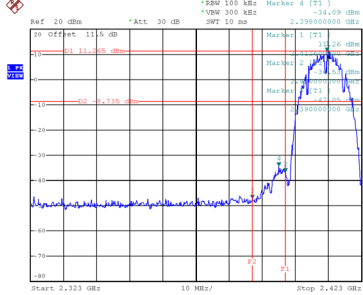
Channel	Frequency (MHz)	Peak Output Power (dBm)	Max. Limit (dBm)	Result
01	2412	25.17	30.00	Complies
06	2437	25.69	30.00	Complies
11	2462	24.35	30.00	Complies



## **APPENDIX G - CONDUCTED SPURIOUS EMISSIONS**

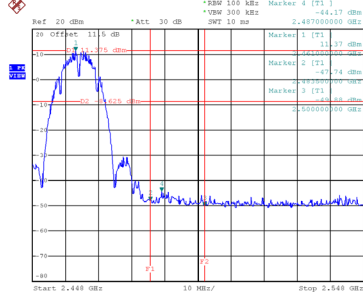
Test Mode TX B Mode

### Bandedge-CH01



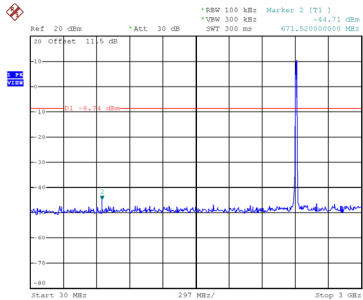
Date: 21.SEP.2020 19:12:54

### Bandedge-CH11

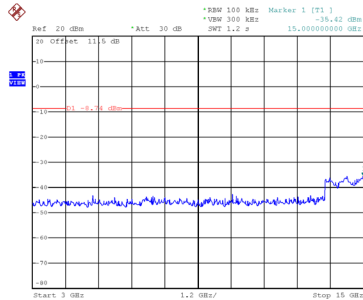


Date: 21.SEP.2020 19:15:54

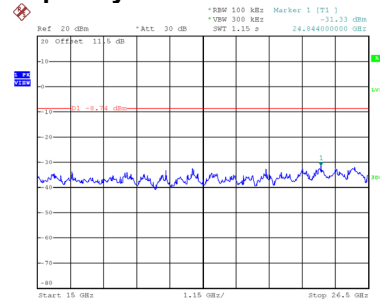
### CH01 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:13:08

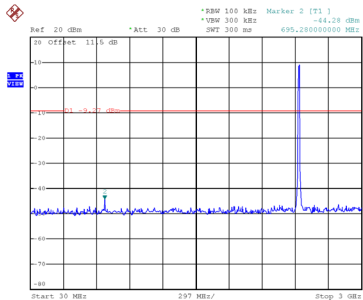


Date: 21.SEP.2020 19:13:15

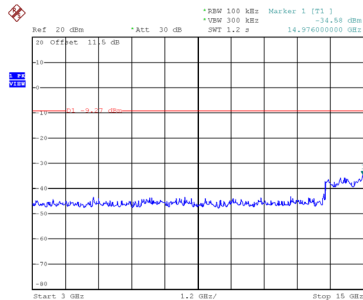


Date: 21.SEP.2020 19:13:23

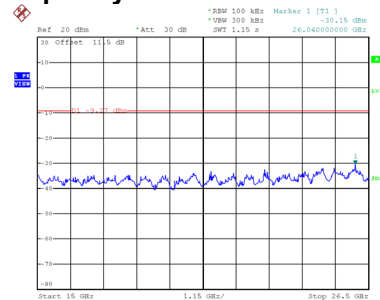
### CH06 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:14:41

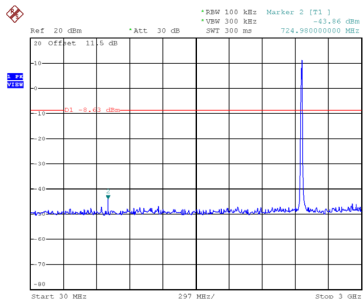


Date: 21.SEP.2020 19:14:49

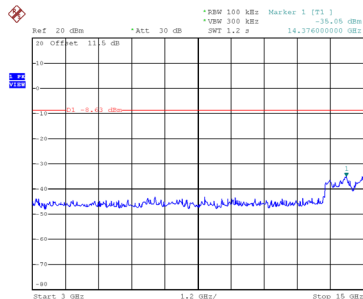


Date: 21.SEP.2020 19:14:56

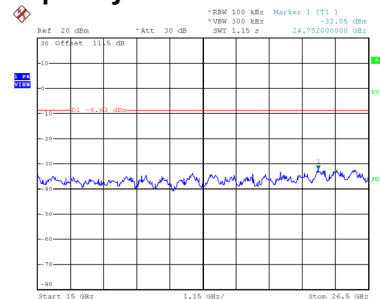
### CH11 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:16:08



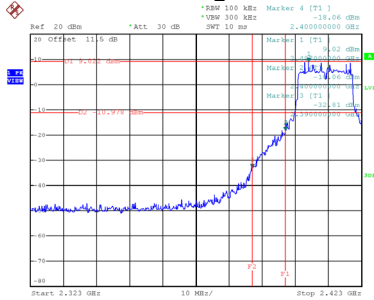
Date: 21.SEP.2020 19:16:15



Date: 21.SEP.2020 19:16:23

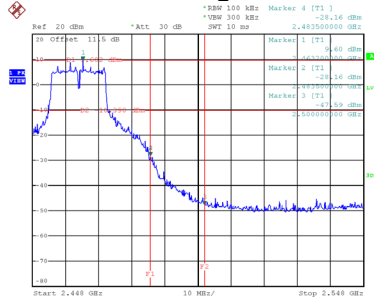
Test Mode TX G Mode

### Bandedge-CH01



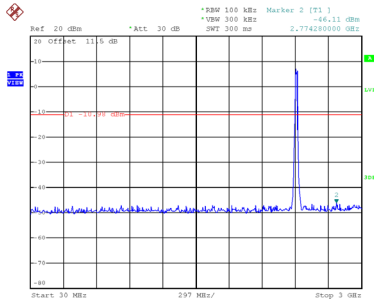
Date: 21.SEP.2020 19:17:27

### Bandedge-CH11

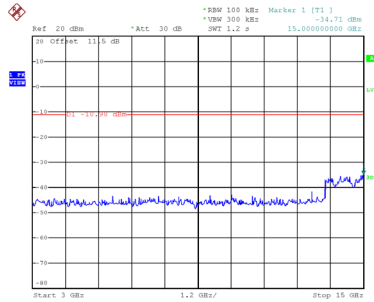


Date: 21.SEP.2020 19:20:02

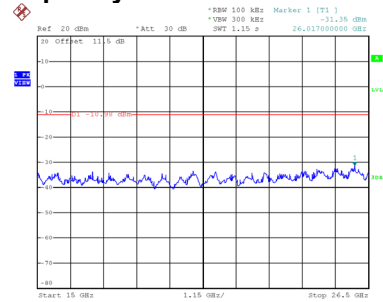
### CH01 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:17:40

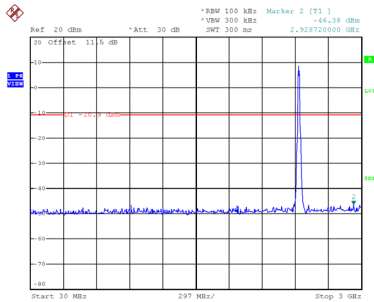


Date: 21.SEP.2020 19:17:48

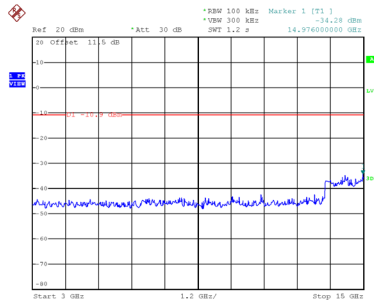


Date: 21.SEP.2020 19:17:55

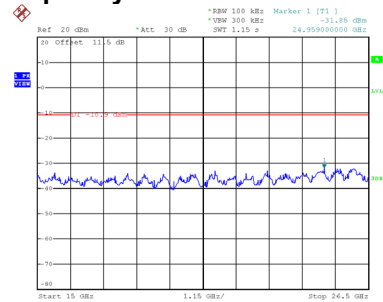
### CH06 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:18:56

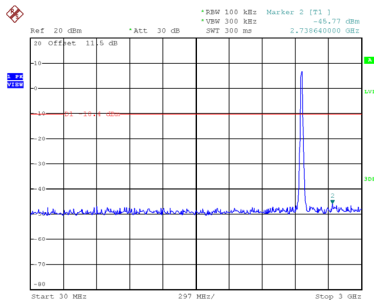


Date: 21.SEP.2020 19:19:03

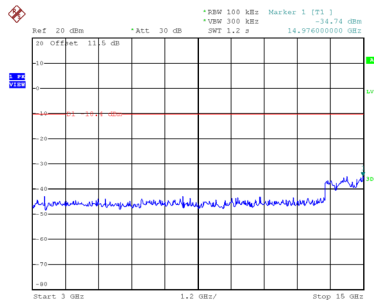


Date: 21.SEP.2020 19:19:11

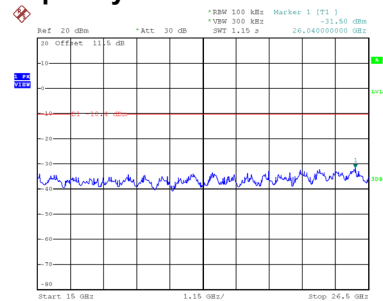
### CH11 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:20:16



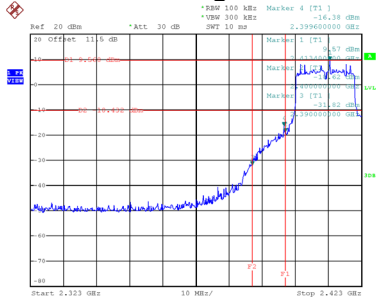
Date: 21.SEP.2020 19:20:23



Date: 21.SEP.2020 19:20:31

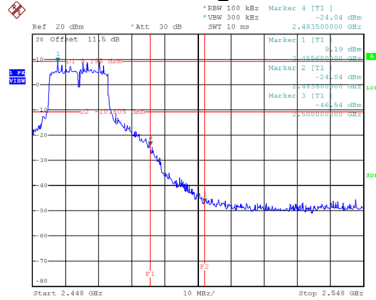
Test Mode TX N-20M Mode

### Bandedge-CH01



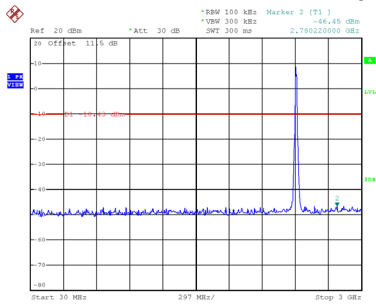
Date: 21.SEP.2020 19:21:24

### Bandedge-CH11

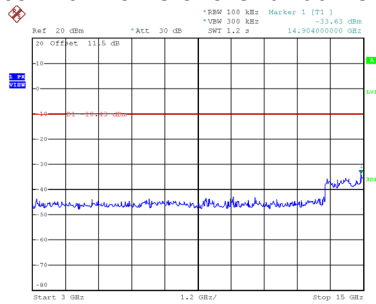


Date: 21.SEP.2020 19:24:01

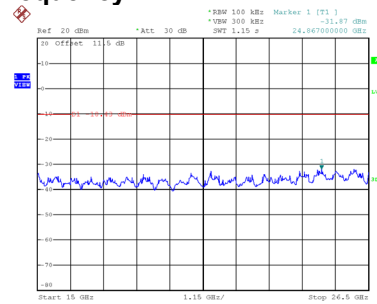
### CH01 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:21:38

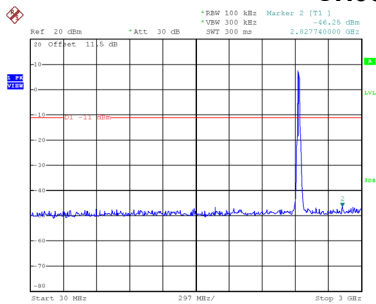


Date: 21.SEP.2020 19:21:45

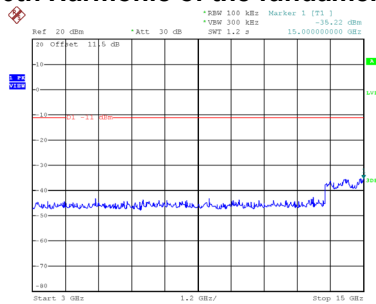


Date: 21.SEP.2020 19:21:53

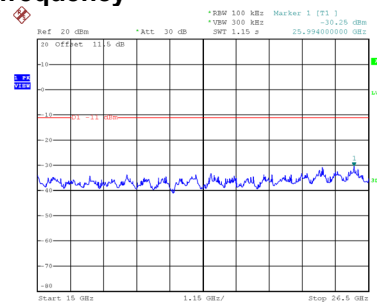
### CH06 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:23:01

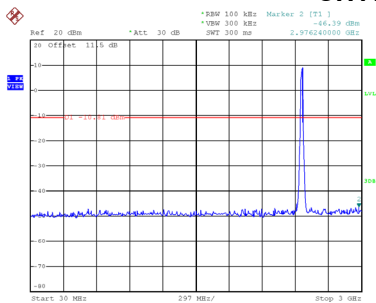


Date: 21.SEP.2020 19:23:09

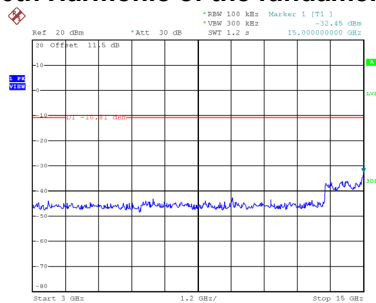


Date: 21.SEP.2020 19:23:16

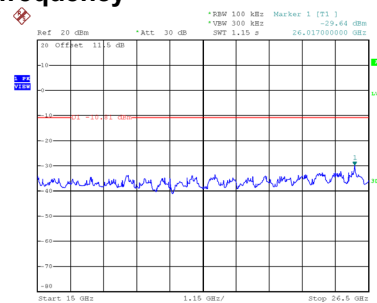
### CH11 – 10th Harmonic of the fundamental frequency



Date: 21.SEP.2020 19:24:14



Date: 21.SEP.2020 19:24:22

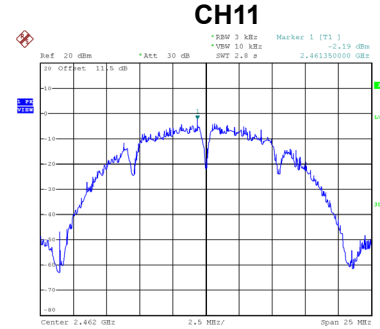
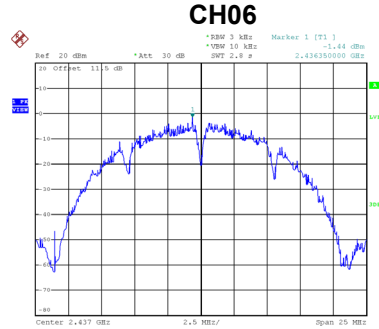
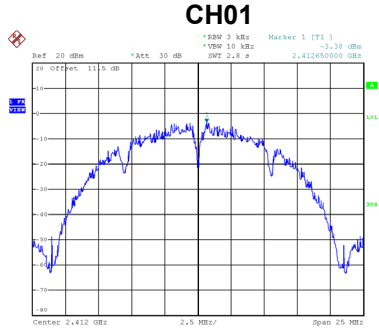


Date: 21.SEP.2020 19:24:29

## **APPENDIX H - POWER SPECTRAL DENSITY**

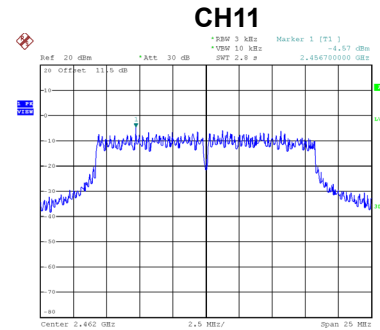
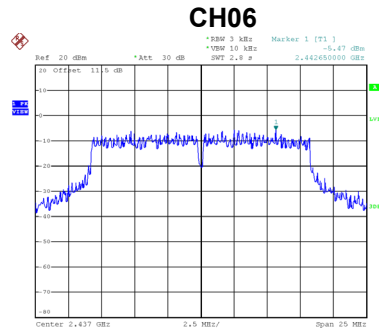
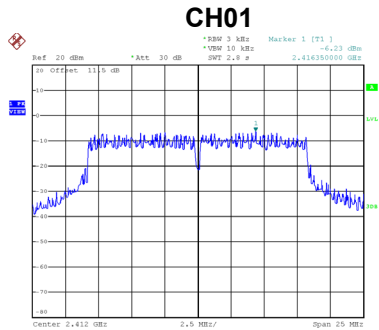
Test Mode	TX B Mode
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Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-3.38	8	Complies
06	2437	-1.44	8	Complies
11	2462	-2.19	8	Complies



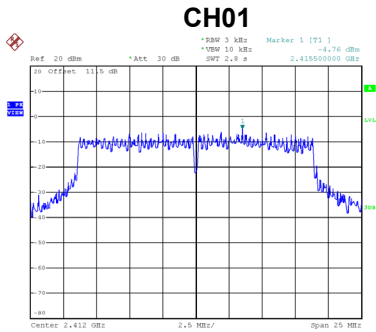
Test Mode	TX G Mode
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Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-6.23	8	Complies
06	2437	-5.47	8	Complies
11	2462	-4.57	8	Complies

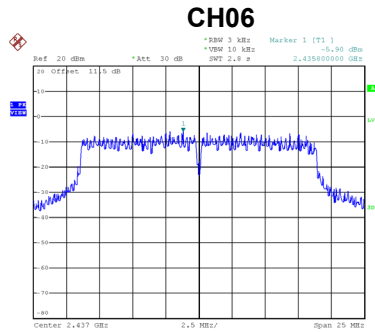


Test Mode	TX N-20M Mode
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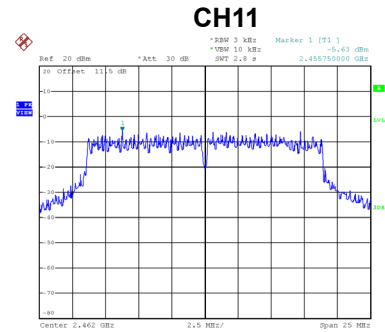
Channel	Frequency (MHz)	Power Spectral Density (dBm/3kHz)	Max. Limit (dBm/3kHz)	Result
01	2412	-4.76	8	Complies
06	2437	-5.90	8	Complies
11	2462	-5.63	8	Complies



Date: 21.SEP.2020 19:22:02



Date: 21.SEP.2020 19:23:26



Date: 21.SEP.2020 19:24:38

**End of Test Report**