FCC Radio Test Report

FCC ID: ZVA10

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

Project No.	:	1804C068
Equipment	:	WIFI+BT Audio Module
Test Model	:	TWM-A8516+MT6630T
Series Model	:	N/A
Applicant	:	TCL Technoly Electronics (Huizhou) Co., Ltd.
Address	:	Section 37, Zhongkai High-tech Development Zone, Huizhou City, Guang Dong Province, P.R. China.

Date of Receipt	:	Apr. 12, 2018
Date of Test	:	Apr. 16, 2018 ~ May 03, 2018
Issued Date	:	May 21, 2018
Tested by	:	BTL Inc.

Testing Engineer : Jivey Jiang
(Jivey Jiang)

Technical Manager : Shawn Xiao
(Shawn Xiao)

Authorized Signatory : David Mao
(David Mao)

BTL INC.

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

NVLAP TESTING
NVLAP LAB CODE 200788-0

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

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FCCP-3-1804C068	Original Issue.	May 16, 2018
MDG1805036	Update the Conducted Emission.	May 21, 2018

1. CERTIFICATION

Equipment	:	WIFI+BT Audio Module
Brand Name	:	TCL
Test Model	:	TWM-A8516+MT6630T
Series Model	:	N/A
Applicant	:	TCL Technoly Electronics (Huizhou) Co., Ltd.
Manufacturer	:	TCL Technoly Electronics (Huizhou) Co., Ltd.
Address	:	Section 37, Zhongkai High-tech Development Zone, Huizhou City, Guang Dong Province, P.R. China.
Factory	:	TCL Technoly Electronics (Huizhou) Co., Ltd.
Address	:	Section 37, Zhongkai High-tech Development Zone, Huizhou City, Guang Dong Province, P.R. China.
Date of Test	:	Apr. 16, 2018 ~ May 03, 2018
Test Sample	:	Engineering Sample NO.: D180403056
Standard(s)	:	FCC Part15, Subpart C:(15.247) / ANSI C63.10-2013

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FCCP-3-1804C068) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP according to the ISO-17025 quality assessment standard and technical standard(s).

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

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): FCC Part15 (15.247) , Subpart C			
Standard(s) Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247(a)(2)	6dB Bandwidth	PASS	
15.247(b)(3)	Peak Output Power	PASS	
15.247(e)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
15.247(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: 854385
BTL's designation number for FCC: CN5020

2.2 MEASUREMENT UNCERTAINTY

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

The BTL measurement uncertainty as below table:

A. Conducted Measurement:

Test Site	Method	Measurement Frequency Range	U, (dB)
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	WIFI+BT Audio Module	
Brand Name	TCL	
Test Model	TWM-A8516+MT6630T	
Series Model	N/A	
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: 18.51dBm 802.11g: 23.88dBm 802.11n(20MHz): 24.58dBm 802.11n(40MHz): 23.65dBm
Power Source	Supplied from PC USB port.	
Power Rating	DC 5V	

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	TCL	N/A	Printed	IPEX	3.00	N/A

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	Normal Link

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

For Conducted Test	
Final Test Mode	Description
Mode 5	Normal Link

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

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

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

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

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

Note:

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

(2) 802.11b mode: DBPSK (1Mbps)
802.11g mode: OFDM (6Mbps)
802.11n HT20 mode : BPSK (6.5Mbps)
802.11n HT40 mode : BPSK (13.5Mbps)
For radiated emission tests, the highest output powers were set for final test.

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

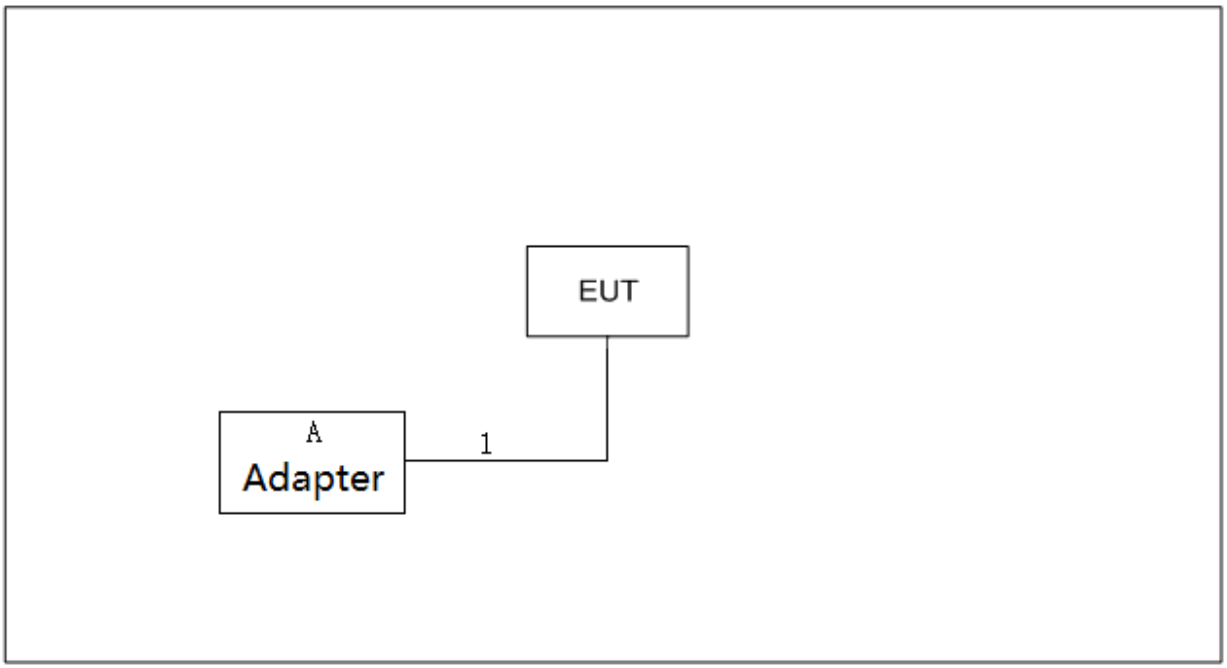
(4) The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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

Test software version	SP_META		
Frequency (MHz)	2412	2437	2462
802.11b	17	17	17
802.11g	16	16	16
802.11n (20MHz)	16	16	16
Frequency (MHz)	2422	2437	2452
802.11n (40MHz)	15	15	15

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.5 DESCRIPTION OF SUPPORT UNITS

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

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.
-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	0.8m	USB 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

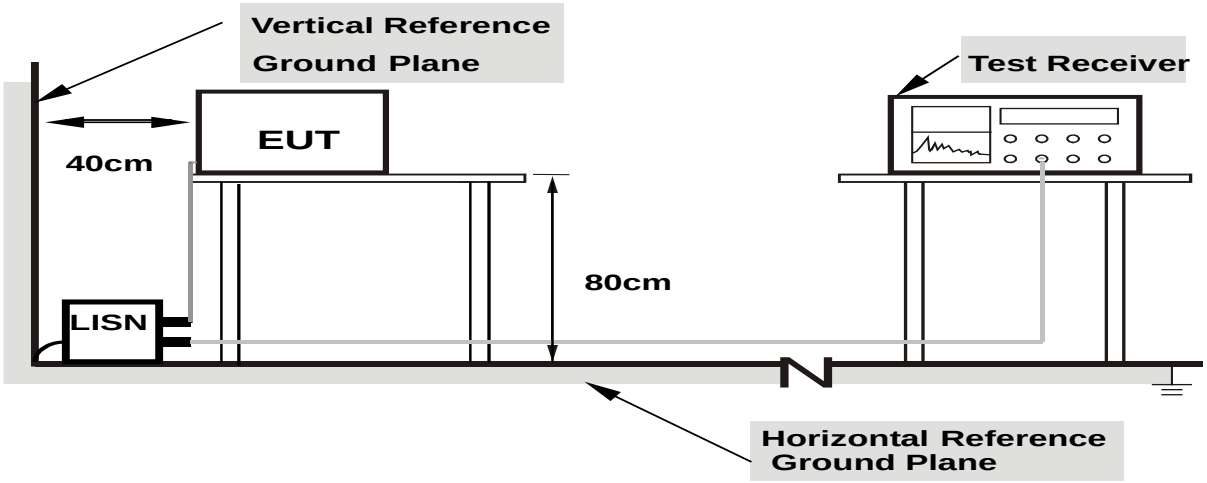
4.1.2 TEST PROCEDURE

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

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



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 Appendix A.

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

LIMITS OF RADIATED EMISSION MEASUREMENT (9KHz-1000MHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	(dBuV/m) (at 3 meters)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

(4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average

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

4.2.2 TEST PROCEDURE

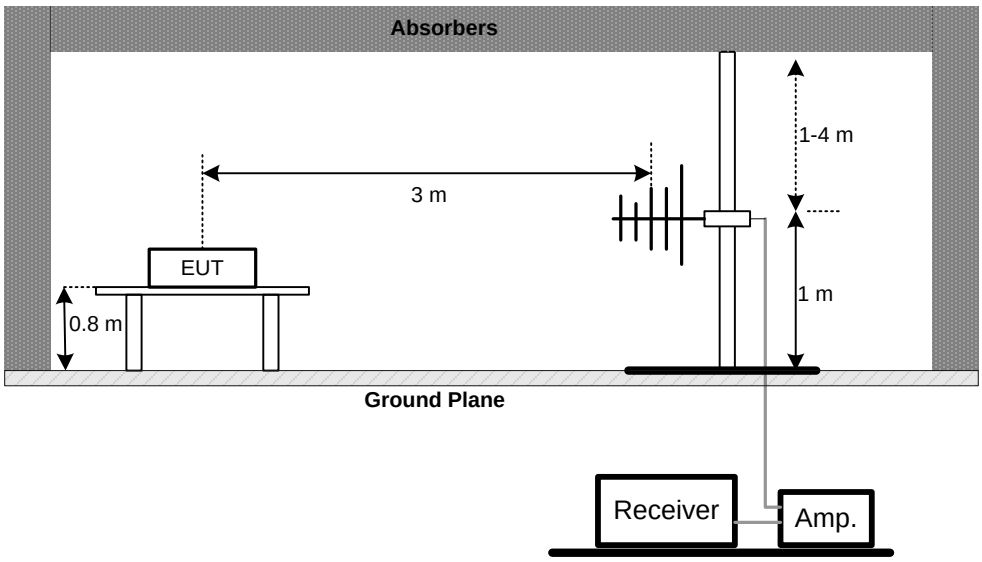
a. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The measuring distance of 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
c. The height of the equipment or of the substitution antenna shall be 0.8m 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

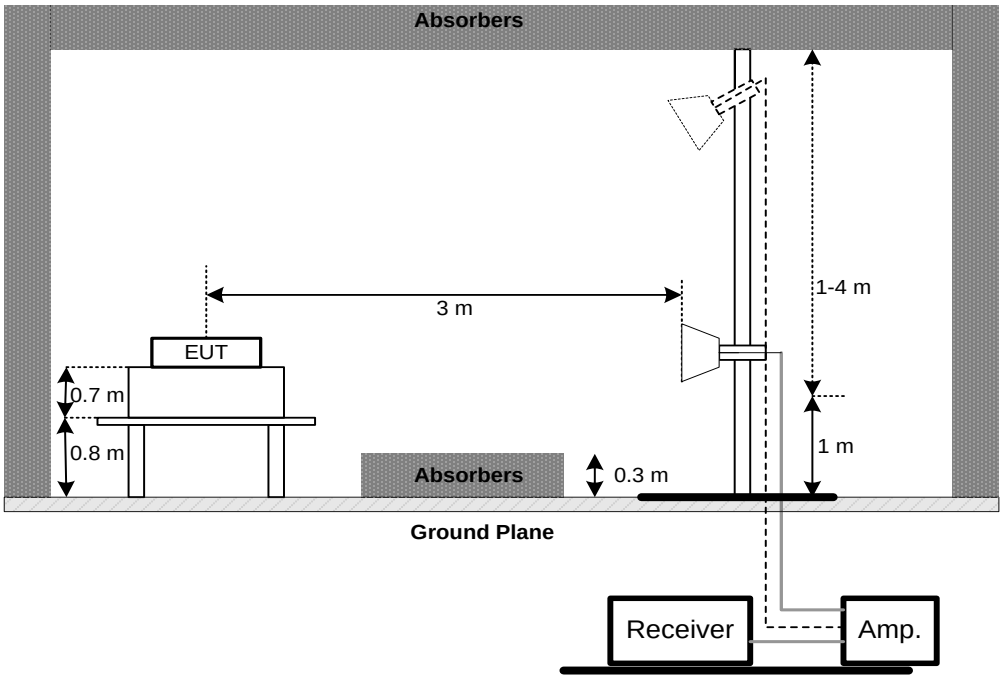
No deviation

4.2.4 TEST SETUP

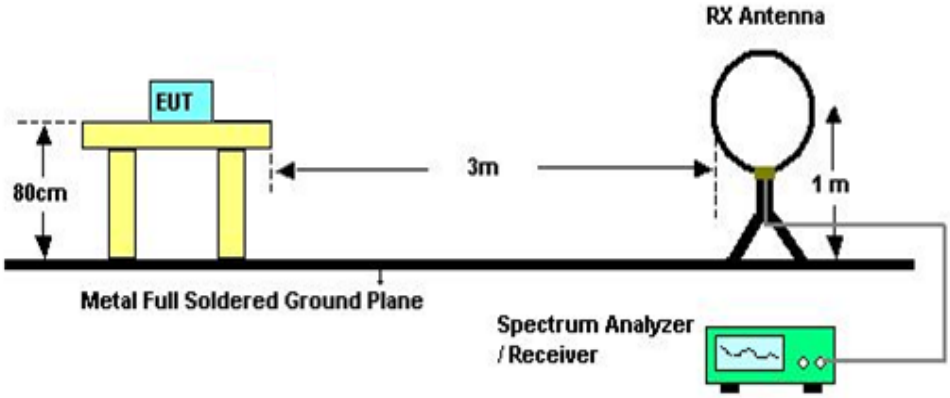
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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: DC 3.7V

4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Appendix B

Remark:

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

4.2.8 TEST RESULTS (30MHZ TO 1000MHZ)

Please refer to the Appendix C.

4.2.9 TEST RESULTS (ABOVE 1000MHZ)

Please refer to the Appendix D.

Remark:

(1) No limit: This is fundamental signal, the judgment is not applicable.
For fundamental signal judgment was referred to Peak output test.

5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	2400-2483.5	PASS

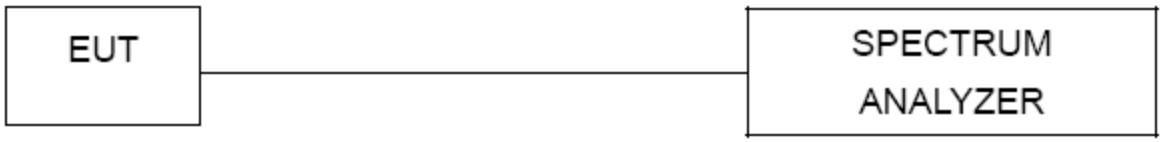
5.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = 2.5 ms.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

5.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: DC 3.7V

5.1.6 TEST RESULTS

Please refer to the Appendix E.

6. MAXIMUM PEAK CONDUCTED OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

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

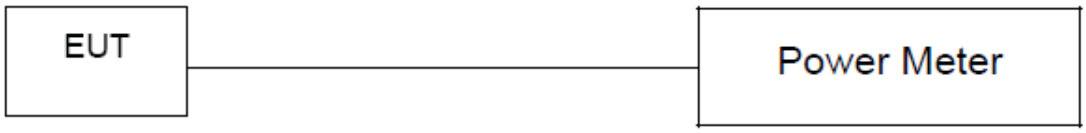
6.1.1 TEST PROCEDURE

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.

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: DC 3.7V

6.1.6 TEST RESULTS

Please refer to the Appendix F.

7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 APPLIED PROCEDURES / LIMIT

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

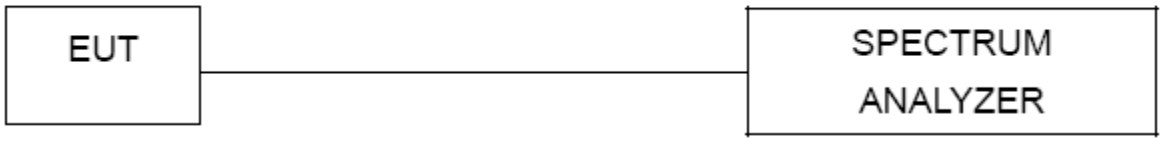
7.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW= 100KHz, VBW=300KHz, Sweep time = Auto.
c. Offset=antenna gain+cable loss

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

7.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: DC 3.7V

7.1.6 TEST RESULTS

Please refer to the Appendix G.

8. POWER SPECTRAL DENSITY TEST

8.1 APPLIED PROCEDURES / LIMIT

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

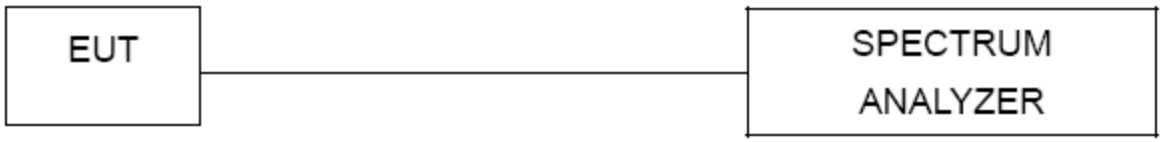
8.1.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting: RBW=3KHz, VBW=10KHz, Sweep time = Auto.

8.1.2 DEVIATION FROM STANDARD

No deviation.

8.1.3 TEST SETUP



8.1.4 EUT OPERATION CONDITIONS

The EUT was programmed to be in continuously transmitting mode.

8.1.5 EUT TEST CONDITIONS

Temperature: 25°C Relative Humidity: 55% Test Voltage: DC 3.7V

8.1.6 TEST RESULTS

Please refer to the Appendix H.

9. MEASUREMENT INSTRUMENTS LIST

Conducted Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100382	Mar. 11, 2019
2	LISN	EMCO	3816/2	52765	Mar. 11, 2019
3	50Ω Terminator	SHX	TF2-3G-A	8122901	Mar. 11, 2019
4	TWO-LINE V-NETWORK	R&S	ENV216	101447	Mar. 11, 2019
5	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
6	Cable	N/A	RG223	12m	Oct. 19, 2018

Radiated Emission Below 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 11, 2019
2	Amplifier	HP	8447D	2944A09673	Oct. 19, 2018
3	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018
4	Cable	emci	LMR-400(30MHz-1 GHz)(8m+5m)	N/A	Jun. 26, 2018
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	Antenna	EM	EM-6876-1	230	Feb. 07, 2019

Radiated Emission Above 1GHz					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Double Ridged Guide Antenna	ETS	3115	75789	Mar. 11, 2019
2	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Jun. 08, 2018
3	Amplifier	Agilent	8449B	3008A02274	Mar. 11, 2019
4	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 11, 2019
5	Receiver	Agilent	N9038A	MY52130039	Aug. 20, 2018
6	Controller	CT	SC100	N/A	N/A
7	Controller	MF	MF-7802	MF780208416	N/A
8	Cable	emci	EMC104-SM-SM-1 2000(12m)	N/A	Jun. 26, 2018
9	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

6dB Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Aug. 20, 2018
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Aug. 20, 2018

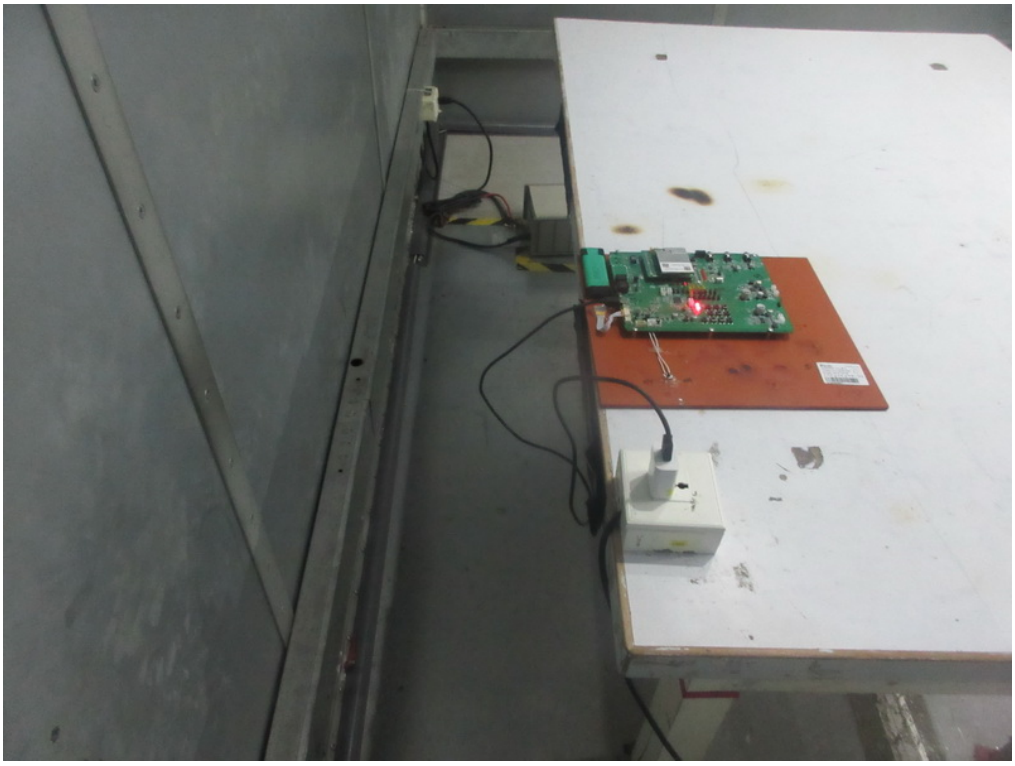
Antenna Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

Power Spectral Density					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP40	100185	Aug. 20, 2018

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

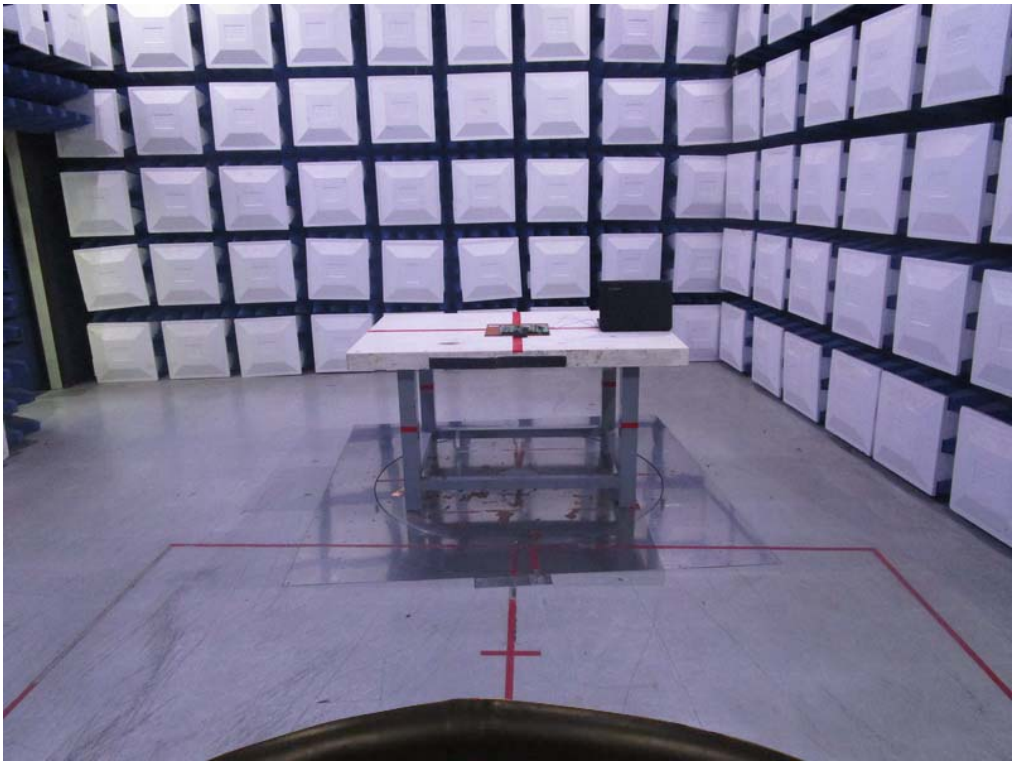
10. EUT TEST PHOTO

Conducted Measurement Photos



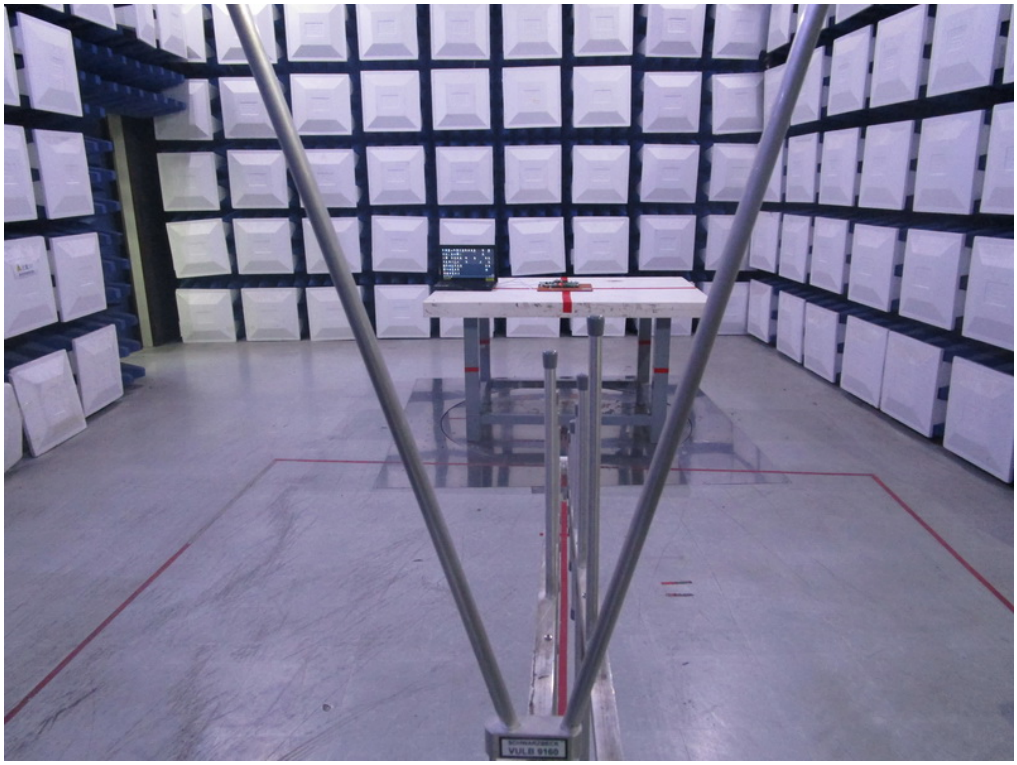
Radiated Measurement Photos

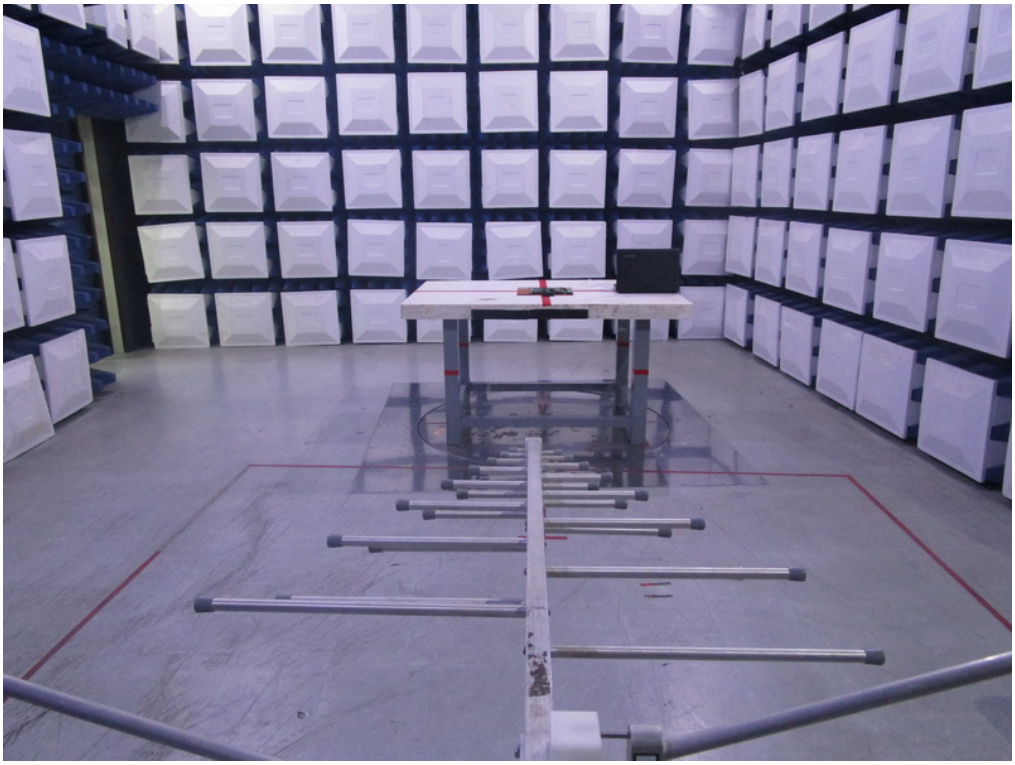
9KHz to 30MHz



Radiated Measurement Photos

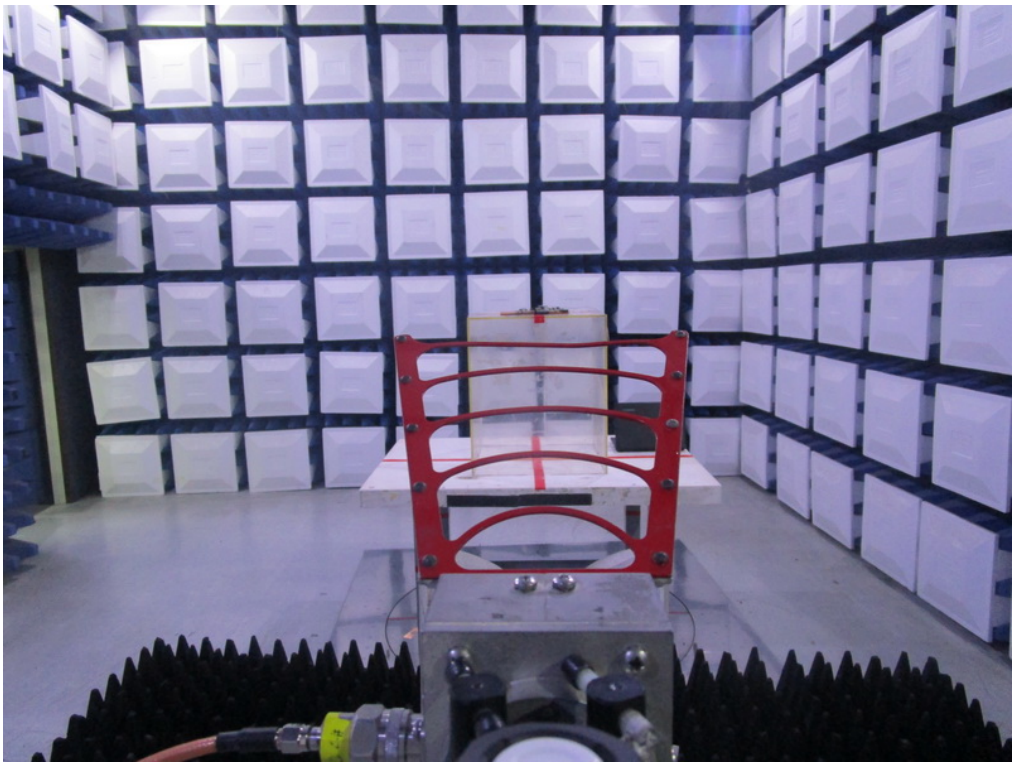
30MHz to 1000MHz

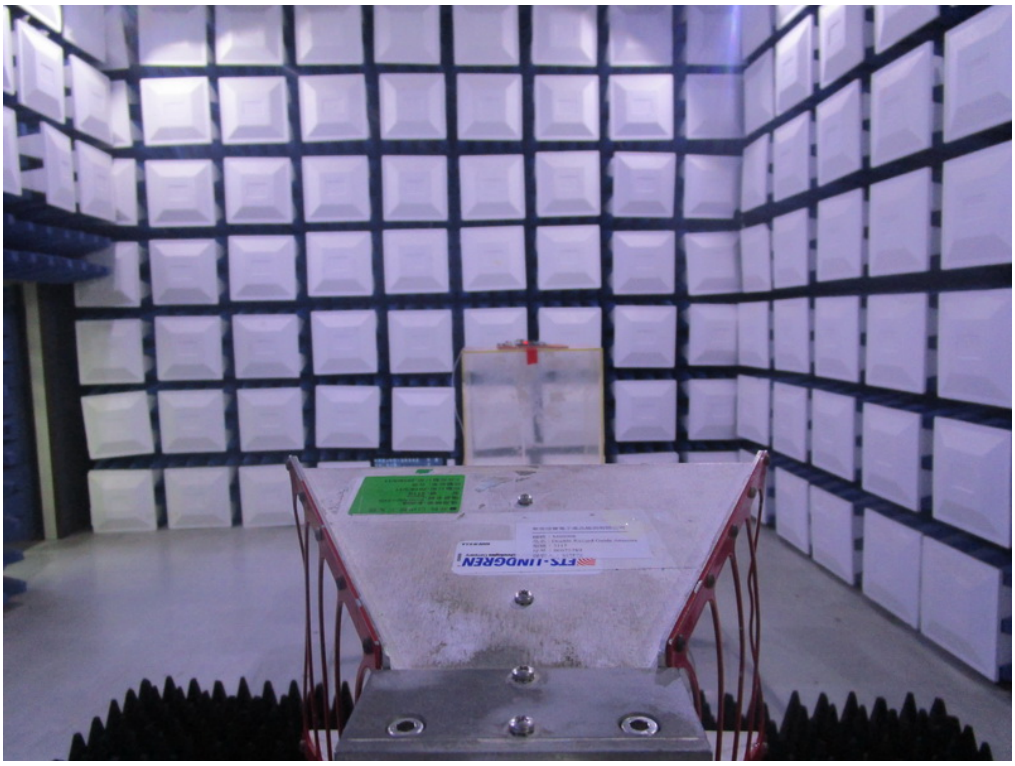




Radiated Measurement Photos

Above 1000MHz

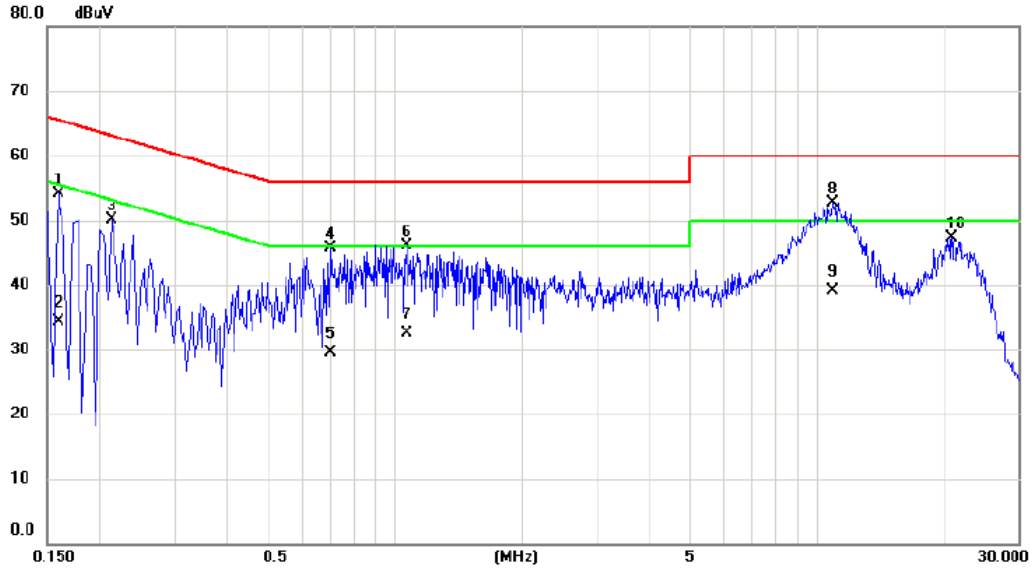




APPENDIX A - CONDUCTED EMISSION

Test Mode :	Normal Link

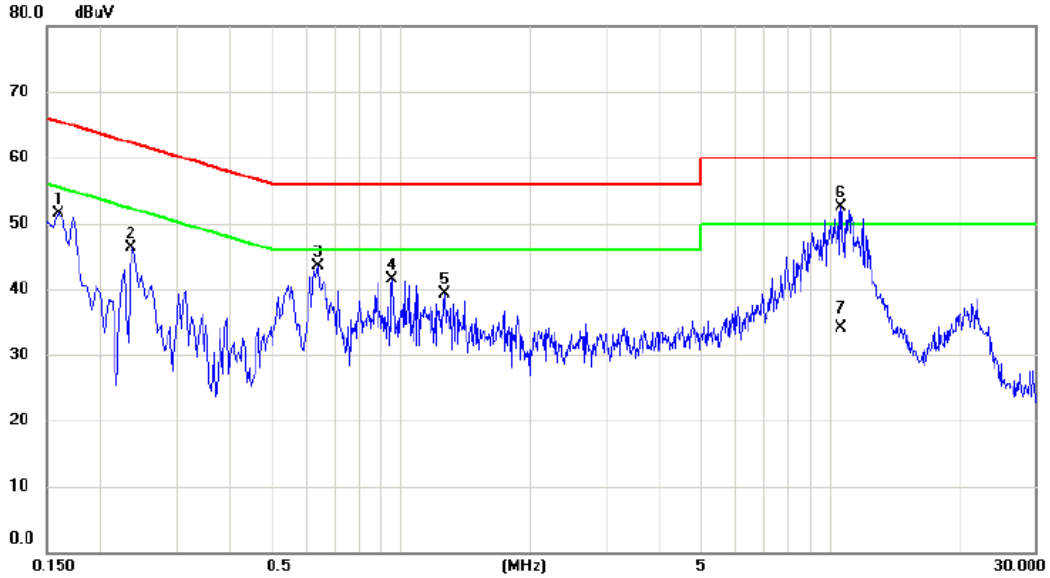
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	44.32	9.82	54.14	65.52	-11.38	peak	
2		0.1590	24.50	9.82	34.32	55.52	-21.20	AVG	
3		0.2130	40.21	9.82	50.03	63.09	-13.06	peak	
4		0.7035	35.76	9.87	45.63	56.00	-10.37	peak	
5		0.7035	19.60	9.87	29.47	46.00	-16.53	AVG	
6		1.0635	36.16	9.92	46.08	56.00	-9.92	peak	
7		1.0635	22.60	9.92	32.52	46.00	-13.48	AVG	
8	*	10.8600	42.22	10.53	52.75	60.00	-7.25	peak	
9		10.8600	28.50	10.53	39.03	50.00	-10.97	AVG	
10		20.9130	36.12	11.17	47.29	60.00	-12.71	peak	

Test Mode :	Normal Link

Neutral

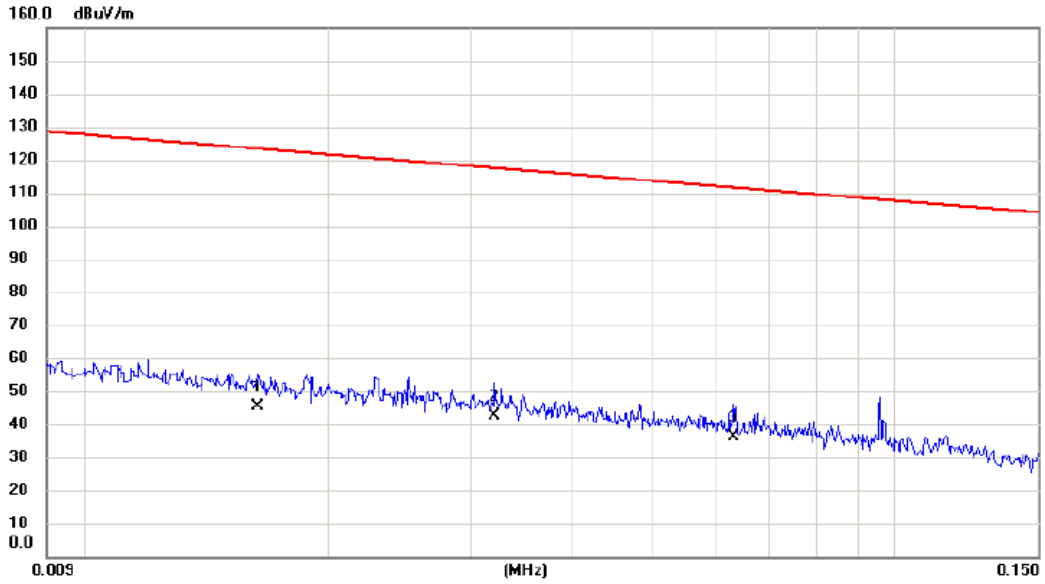


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1590	41.54	9.91	51.45	65.52	-14.07	peak	
2		0.2355	36.34	9.91	46.25	62.25	-16.00	peak	
3		0.6405	33.51	10.01	43.52	56.00	-12.48	peak	
4		0.9510	31.41	10.11	41.52	56.00	-14.48	peak	
5		1.2660	29.10	10.14	39.24	56.00	-16.76	peak	
6	*	10.6080	41.77	10.78	52.55	60.00	-7.45	peak	
7		10.6080	23.30	10.78	34.08	50.00	-15.92	AVG	

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

Test Mode:	TX MODE

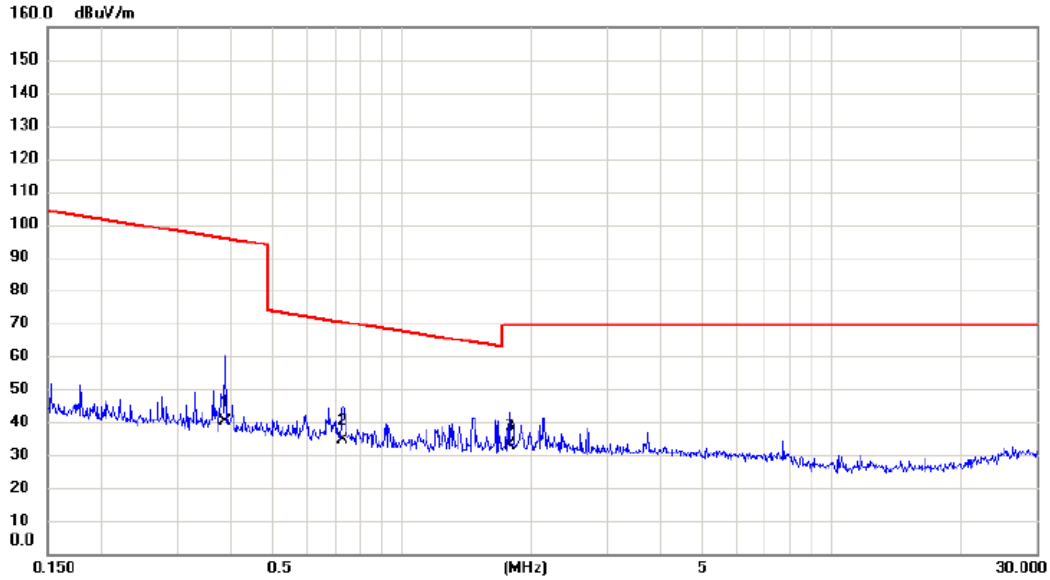
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0164	25.47	20.09	45.56	123.31	-77.75	AVG	
2	*	0.0321	23.30	19.26	42.56	117.47	-74.91	AVG	
3		0.0632	17.84	18.47	36.31	111.59	-75.28	AVG	

Test Mode:	TX MODE

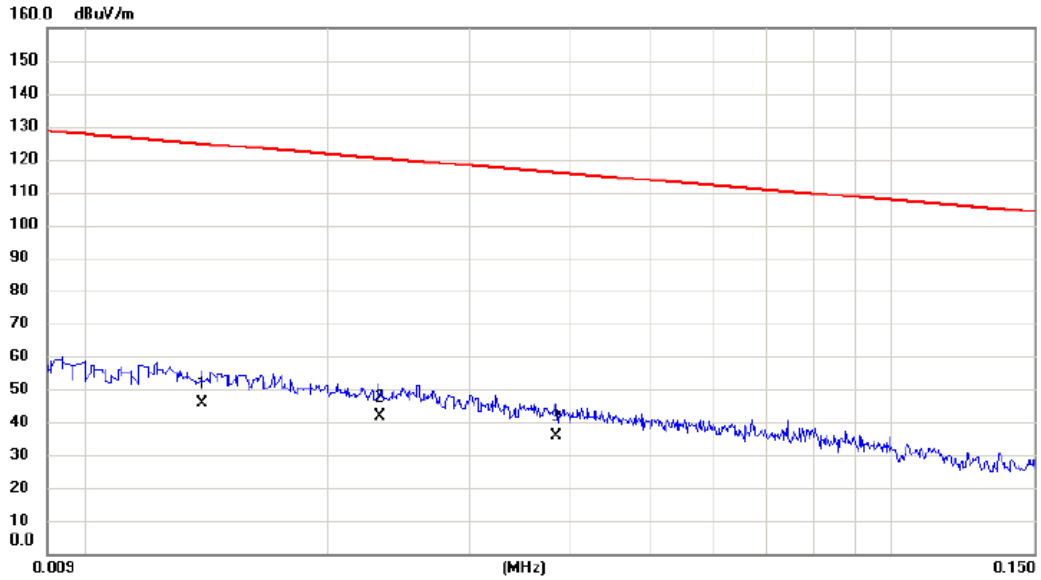
Ant 0°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.3871	23.67	16.55	40.22	95.85	-55.63	AVG	
2	*	0.7273	18.36	16.21	34.57	70.37	-35.80	QP	
3		1.7810	17.42	15.60	33.02	69.54	-36.52	QP	

Test Mode:	TX MODE

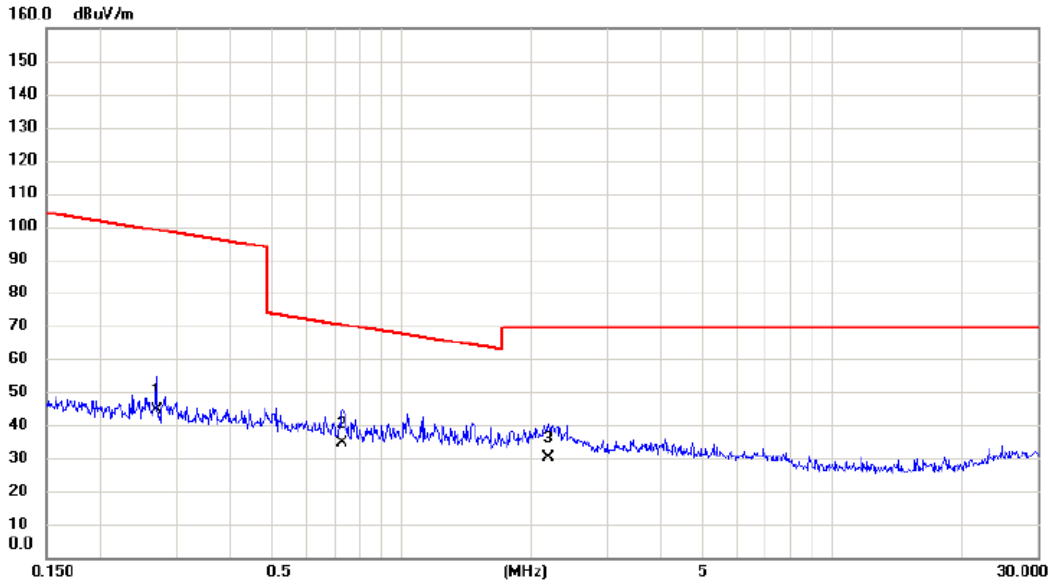
Ant 90°



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.0140	25.30	20.40	45.70	124.68	-78.98	AVG	
2	*	0.0232	22.11	19.52	41.63	120.30	-78.67	AVG	
3		0.0383	16.61	19.07	35.68	115.94	-80.26	AVG	

Test Mode:	TX MODE

Ant 90°

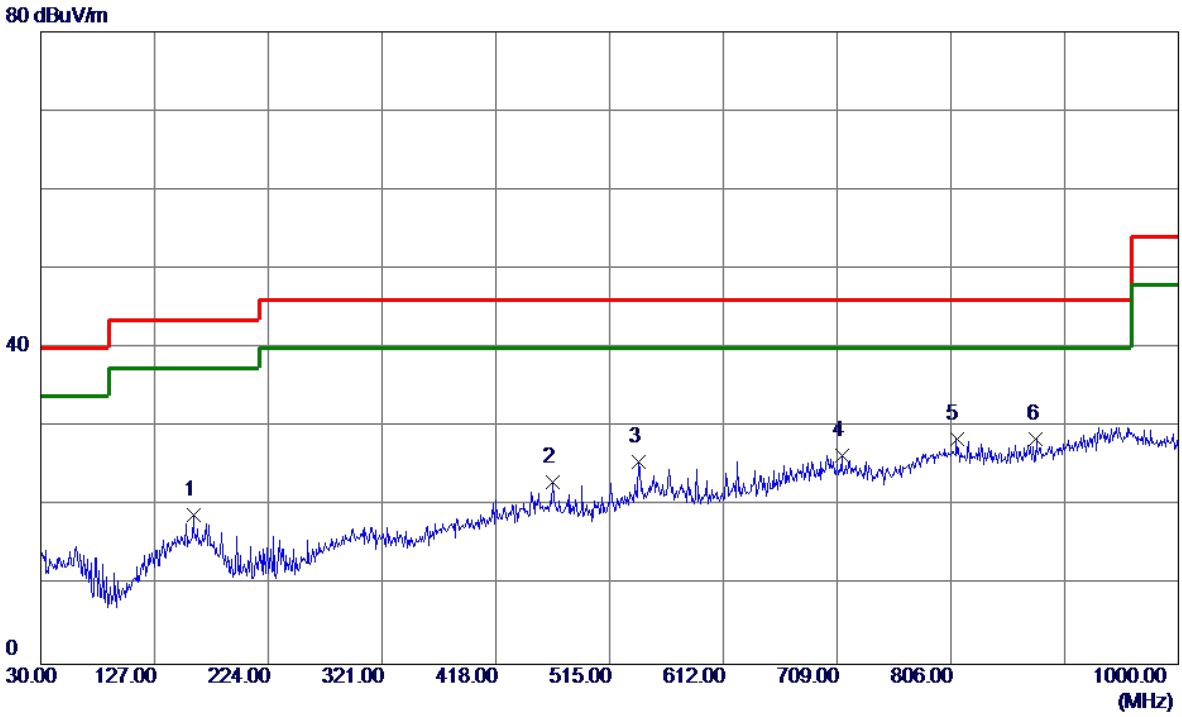


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		0.2701	27.99	16.64	44.63	98.97	-54.34	AVG	
2	*	0.7273	18.59	16.21	34.80	70.37	-35.57	QP	
3		2.1898	14.64	15.45	30.09	69.54	-39.45	QP	

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

Test Mode:	TX B MODE CHANNEL 01

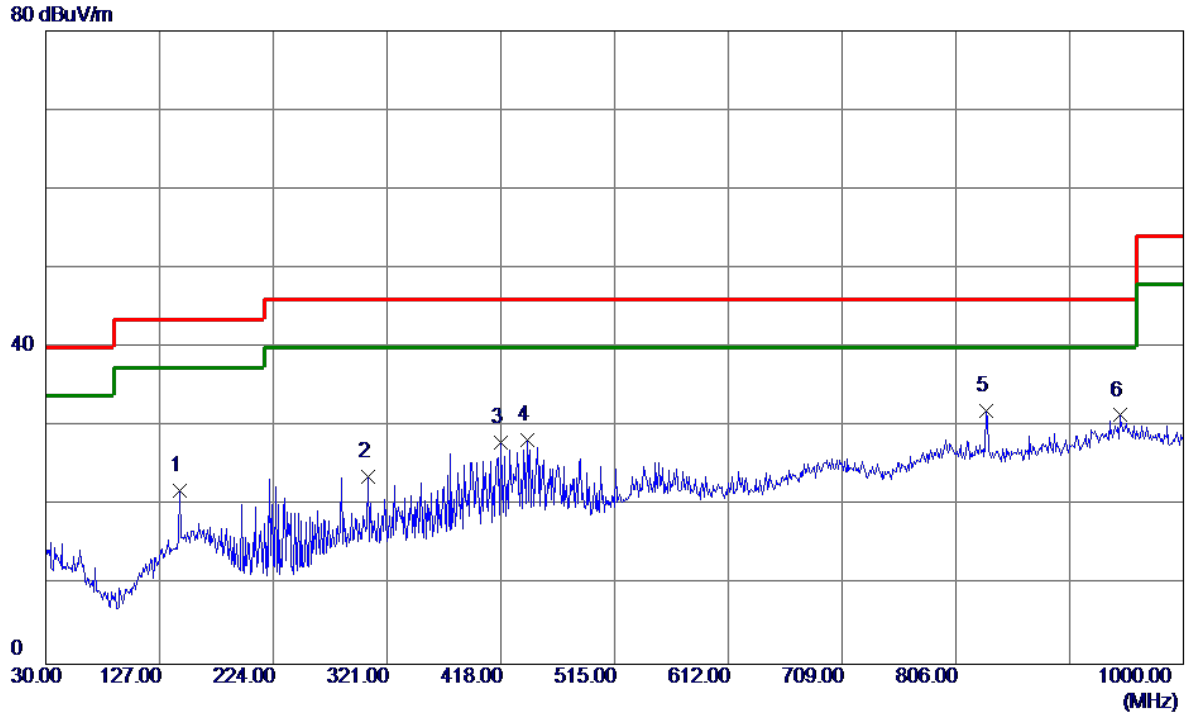
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	159.9800	30.12	-11.30	18.82	43.50	-24.68	Peak	
2	466.5000	31.45	-8.48	22.97	46.00	-23.03	Peak	
3	540.2199	32.39	-6.75	25.64	46.00	-20.36	Peak	
4	712.8800	30.14	-3.73	26.41	46.00	-19.59	Peak	
5	810.8500	30.19	-1.78	28.41	46.00	-17.59	Peak	
6 *	878.7500	30.14	-1.65	28.49	46.00	-17.51	Peak	

Test Mode:	TX B MODE CHANNEL 01

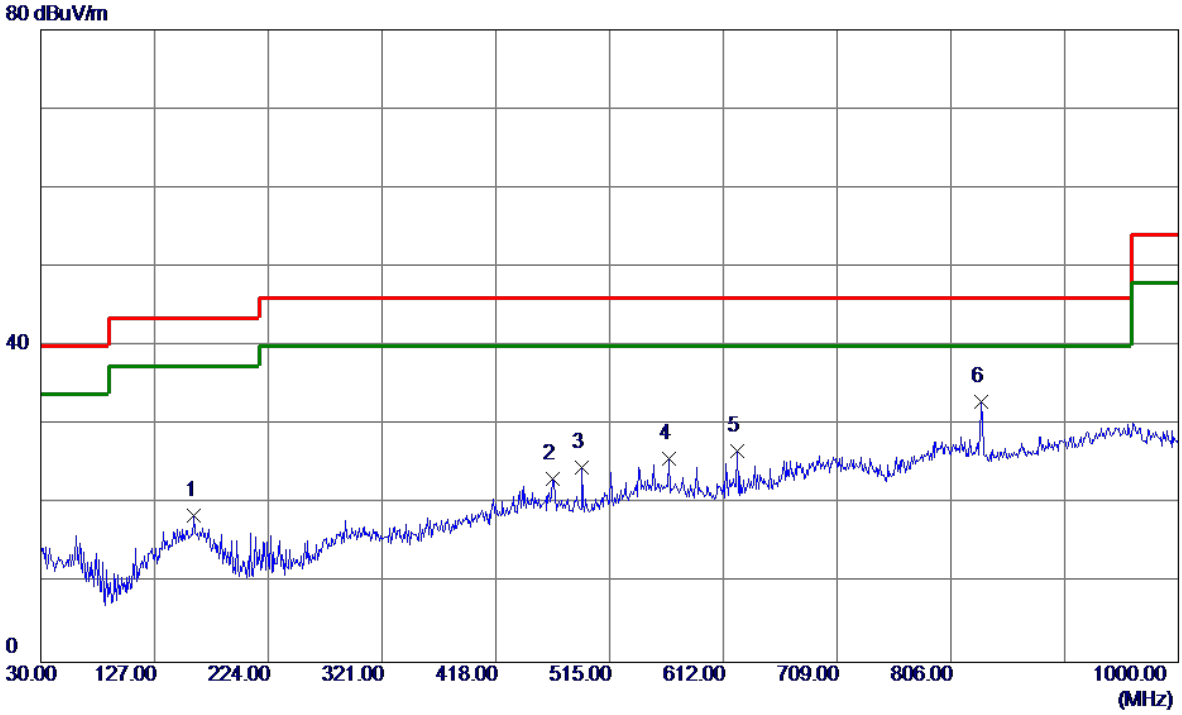
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	144.4600	34.37	-12.50	21.87	43.50	-21.63	Peak	
2	304.5100	34.88	-11.18	23.70	46.00	-22.30	Peak	
3	418.0000	37.39	-9.38	28.01	46.00	-17.99	Peak	
4	440.3100	36.80	-8.49	28.31	46.00	-17.69	Peak	
5 *	832.1900	34.09	-2.09	32.00	46.00	-14.00	Peak	
6	945.6800	30.69	0.75	31.44	46.00	-14.56	Peak	

Test Mode:	TX B MODE CHANNEL 06

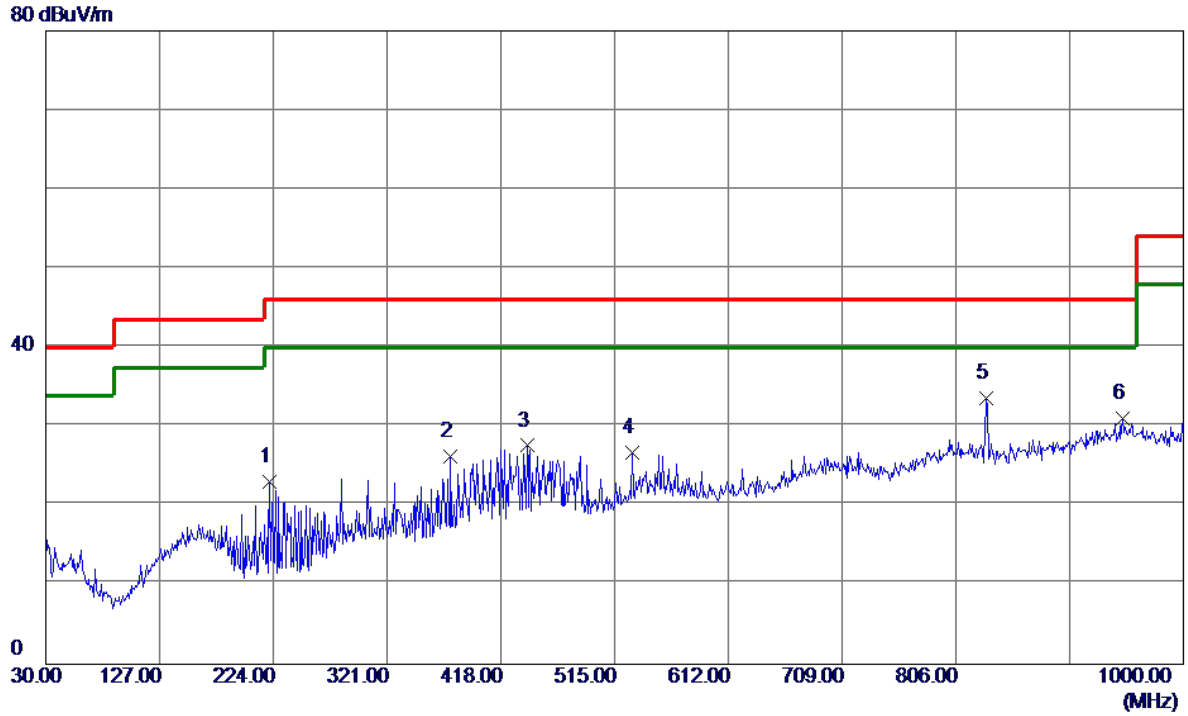
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	160.9500	29.84	-11.35	18.49	43.50	-25.01	Peak	
2	466.5000	31.62	-8.48	23.14	46.00	-22.86	Peak	
3	491.7200	33.61	-9.04	24.57	46.00	-21.43	Peak	
4	565.4400	32.15	-6.41	25.74	46.00	-20.26	Peak	
5	623.6400	33.10	-6.45	26.65	46.00	-19.35	Peak	
6 *	832.1900	35.09	-2.09	33.00	46.00	-13.00	Peak	

Test Mode:	TX B MODE CHANNEL 06

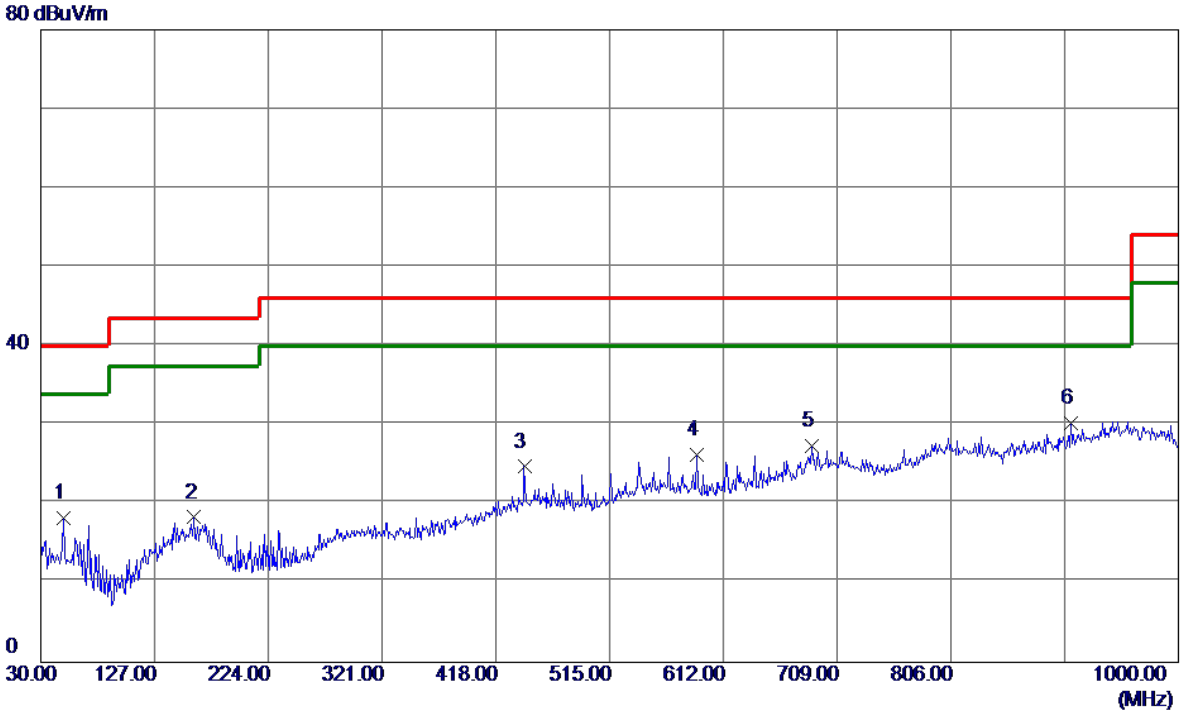
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	221.0900	38.57	-15.59	22.98	46.00	-23.02	Peak	
2	375.3200	37.14	-10.94	26.20	46.00	-19.80	Peak	
3	440.3100	36.09	-8.49	27.60	46.00	-18.40	Peak	
4	530.5200	34.02	-7.35	26.67	46.00	-19.33	Peak	
5 *	832.1900	35.66	-2.09	33.57	46.00	-12.43	Peak	
6	948.5900	30.24	0.87	31.11	46.00	-14.89	Peak	

Test Mode:	TX B MODE CHANNEL 11

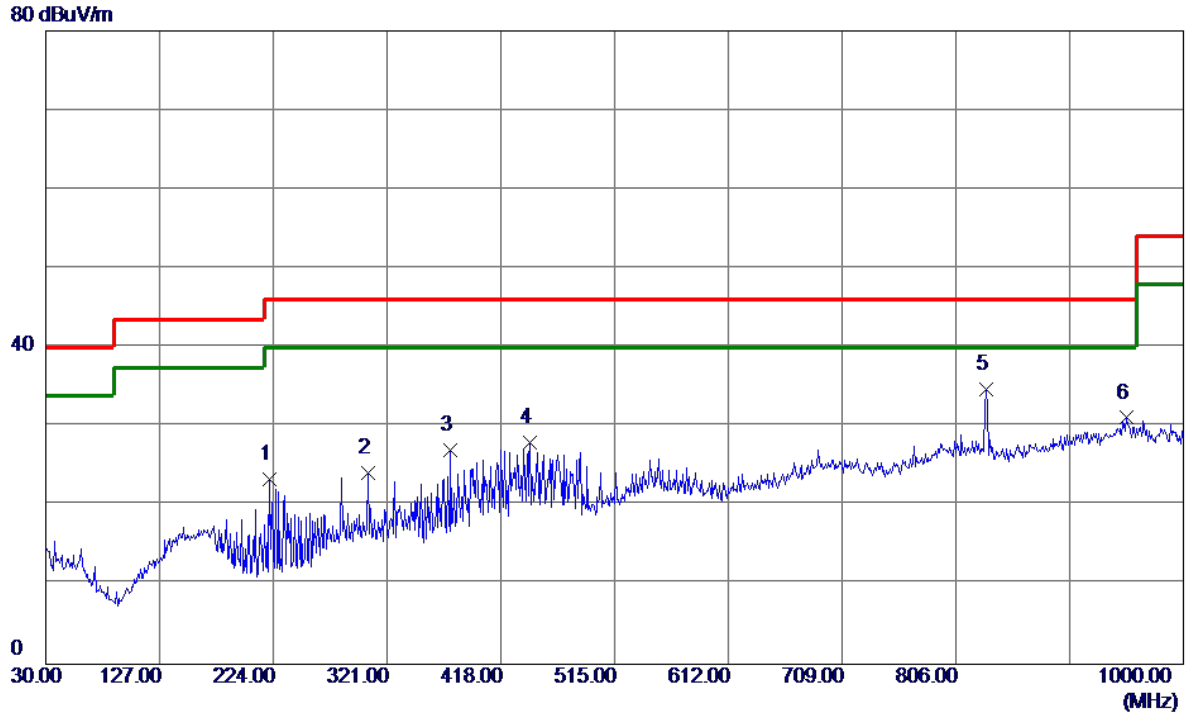
Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	49.4000	33.48	-15.25	18.23	40.00	-21.77	Peak	
2	160.9500	29.67	-11.35	18.32	43.50	-25.18	Peak	
3	442.2500	33.14	-8.42	24.72	46.00	-21.28	Peak	
4	589.6900	33.04	-6.82	26.22	46.00	-19.78	Peak	
5	687.6599	31.43	-4.01	27.42	46.00	-18.58	Peak	
6 *	908.8200	30.95	-0.76	30.19	46.00	-15.81	Peak	

Test Mode:	TX B MODE CHANNEL 11

Horizontal

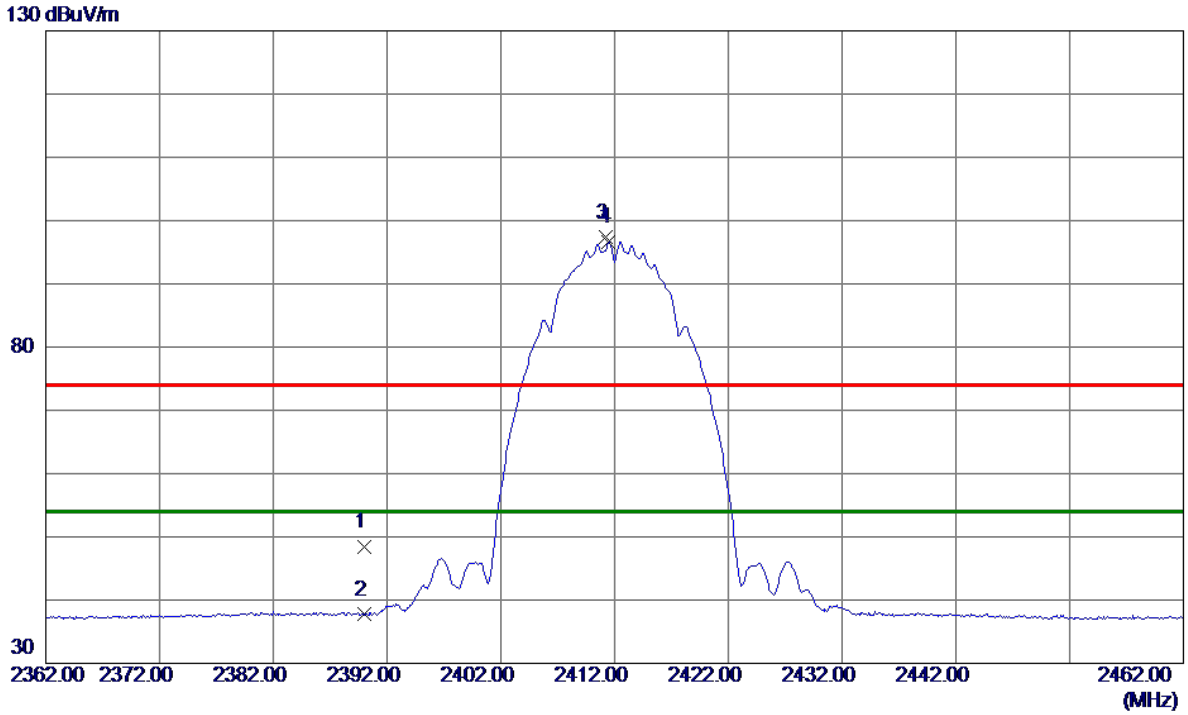


No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	221.0900	38.91	-15.59	23.32	46.00	-22.68	Peak	
2	304.5100	35.30	-11.18	24.12	46.00	-21.88	Peak	
3	375.3200	37.97	-10.94	27.03	46.00	-18.97	Peak	
4	443.2200	36.36	-8.38	27.98	46.00	-18.02	Peak	
5 *	832.1900	36.86	-2.09	34.77	46.00	-11.23	Peak	
6	951.5000	30.23	0.89	31.12	46.00	-14.88	Peak	

APPENDIX 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	39.33	9.00	48.33	74.00	-25.67	Peak	
2	2390.0000	28.70	9.00	37.70	54.00	-16.30	AVG	
3	2411.2000	88.30	9.00	97.30	74.00	23.30	Peak	No Limit
4 *	2411.5000	87.62	9.00	96.62	54.00	42.62	AVG	No Limit

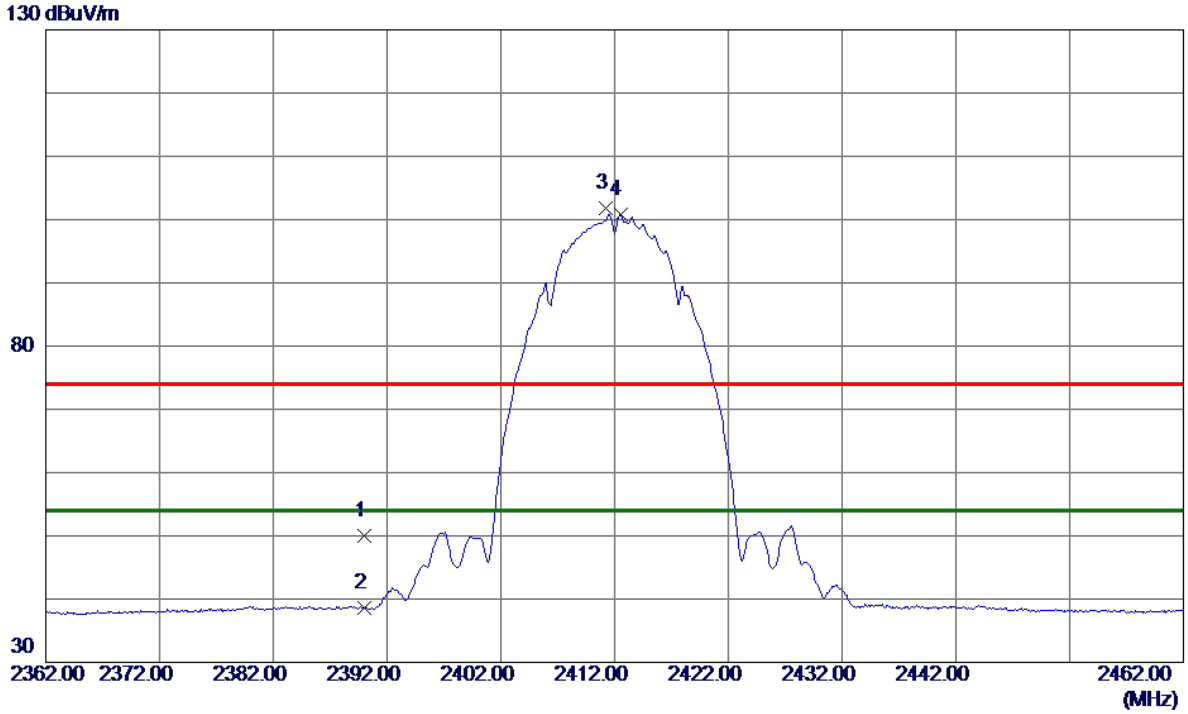
Orthogonal Axis :	X
Test Mode :	TX B MODE 2412MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4821.9700	36.26	5.77	42.03	74.00	-31.97	Peak	
2 *	4823.9900	24.82	5.78	30.60	54.00	-23.40	AVG	

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

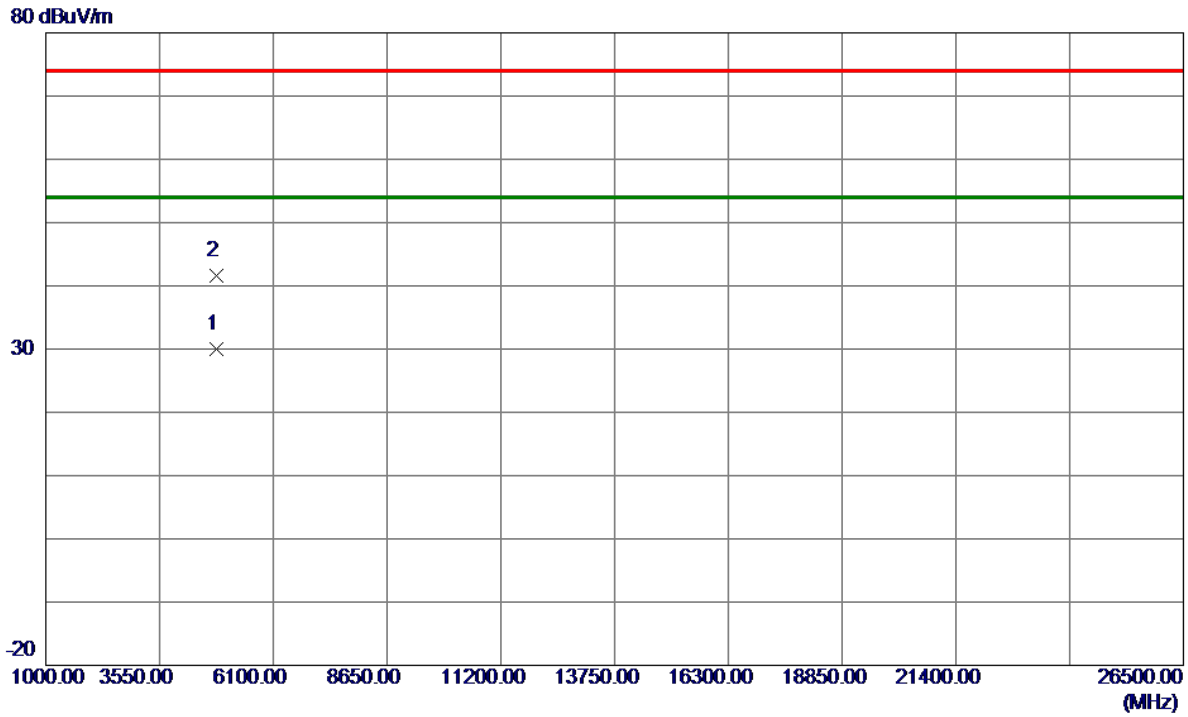
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	40.96	9.00	49.96	74.00	-24.04	Peak	
2	2390.0000	29.61	9.00	38.61	54.00	-15.39	AVG	
3	2411.2000	92.78	9.00	101.78	74.00	27.78	Peak	No Limit
4 *	2412.5000	91.85	8.99	100.84	54.00	46.84	AVG	No Limit

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

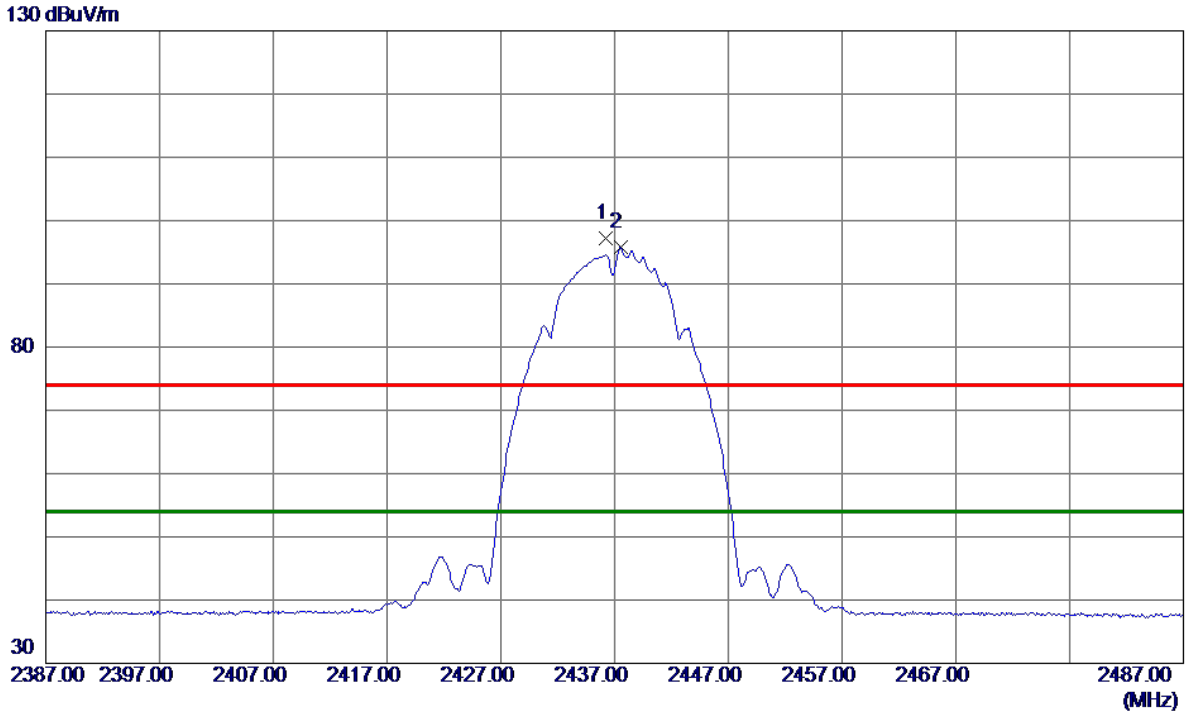
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4823.1250	24.31	5.78	30.09	54.00	-23.91	AVG	
2	4823.2000	35.87	5.78	41.65	74.00	-32.35	Peak	

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	2436.2000	88.25	8.99	97.24	74.00	23.24	Peak	No Limit
2 *	2437.5000	86.79	8.98	95.77	54.00	41.77	AVG	No Limit

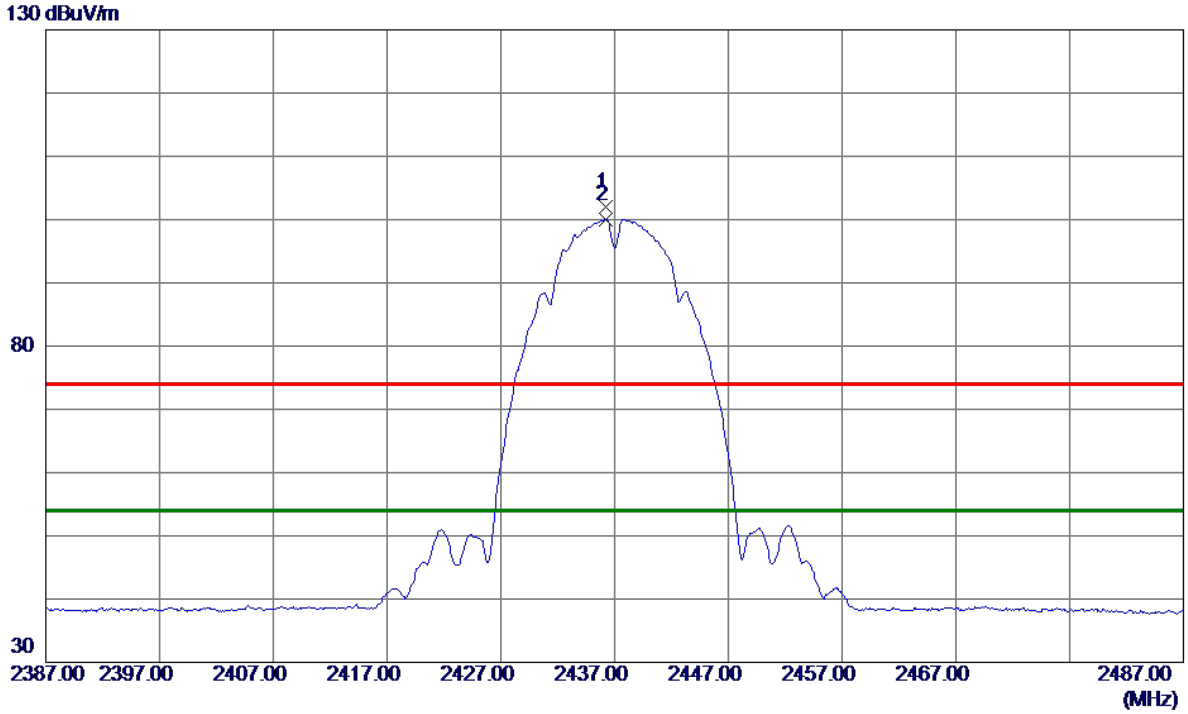
Orthogonal Axis :	X
Test Mode :	TX B MODE 2437MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.1800	24.46	5.91	30.37	54.00	-23.63	AVG	
2	4876.2799	35.42	5.91	41.33	74.00	-32.67	Peak	

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	2436.2000	93.06	8.99	102.05	74.00	28.05	Peak	No Limit
2 *	2436.2000	91.08	8.99	100.07	54.00	46.07	AVG	No Limit

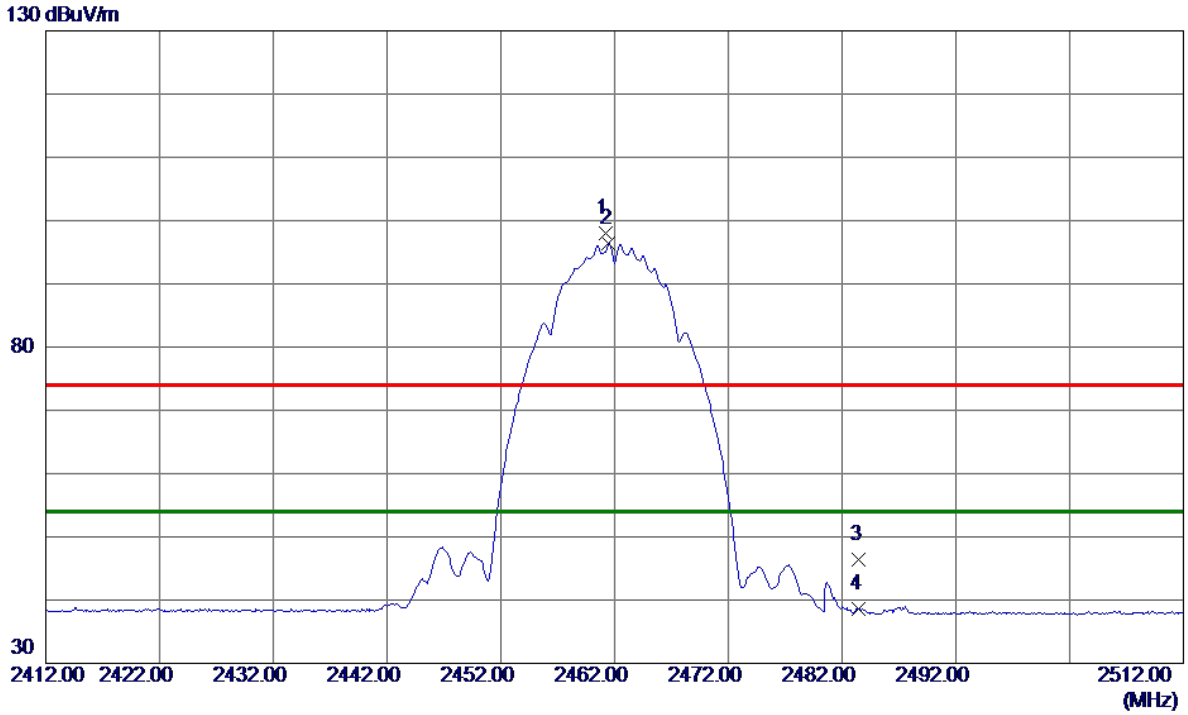
Orthogonal Axis :	X
Test Mode :	TX B MODE 2437MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4874.8550	24.02	5.91	29.93	54.00	-24.07	AVG	
2	4875.6750	35.16	5.91	41.07	74.00	-32.93	Peak	

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	2461.2000	88.94	8.98	97.92	74.00	23.92	Peak	No Limit
2 *	2461.5000	87.38	8.98	96.36	54.00	42.36	AVG	No Limit
3	2483.5000	37.45	8.97	46.42	74.00	-27.58	Peak	
4	2483.5000	29.63	8.97	38.60	54.00	-15.40	AVG	

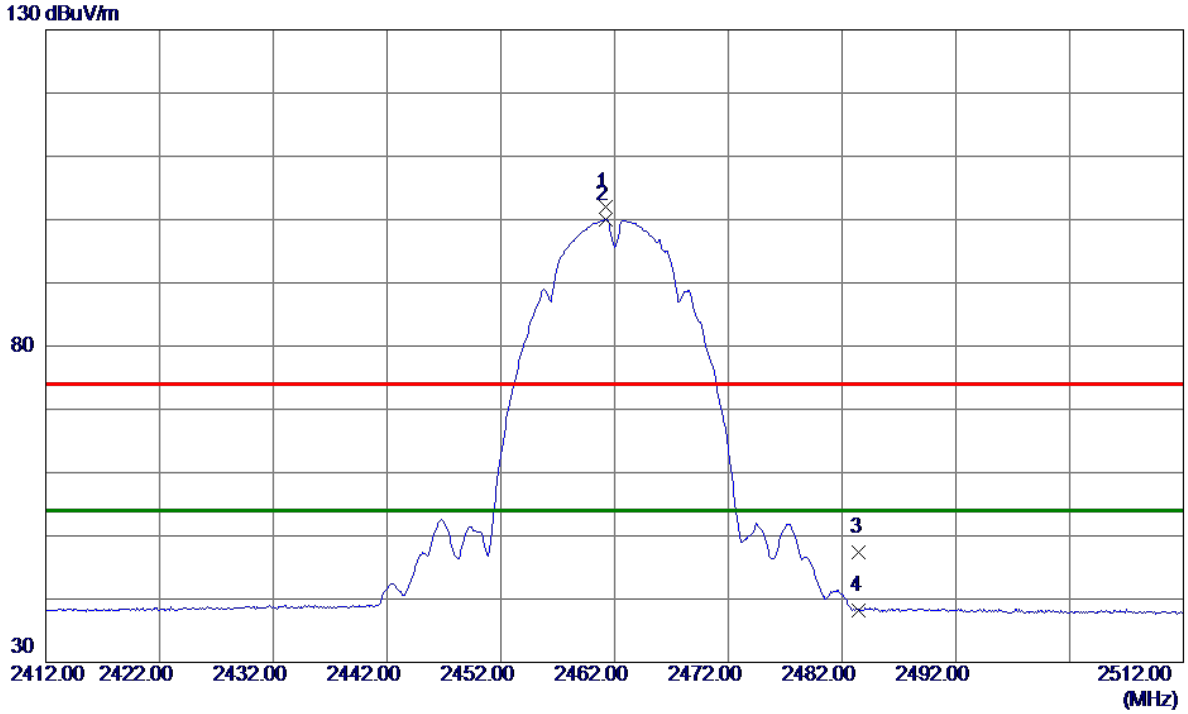
Orthogonal Axis :	X
Test Mode :	TX B MODE 2462MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4923.8400	24.22	6.03	30.25	54.00	-23.75	AVG	
2	4923.9450	35.99	6.03	42.02	74.00	-31.98	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	2461.2000	92.99	8.98	101.97	74.00	27.97	Peak	No Limit
2 *	2461.2000	91.02	8.98	100.00	54.00	46.00	AVG	No Limit
3	2483.5000	38.39	8.97	47.36	74.00	-26.64	Peak	
4	2483.5000	29.29	8.97	38.26	54.00	-15.74	AVG	

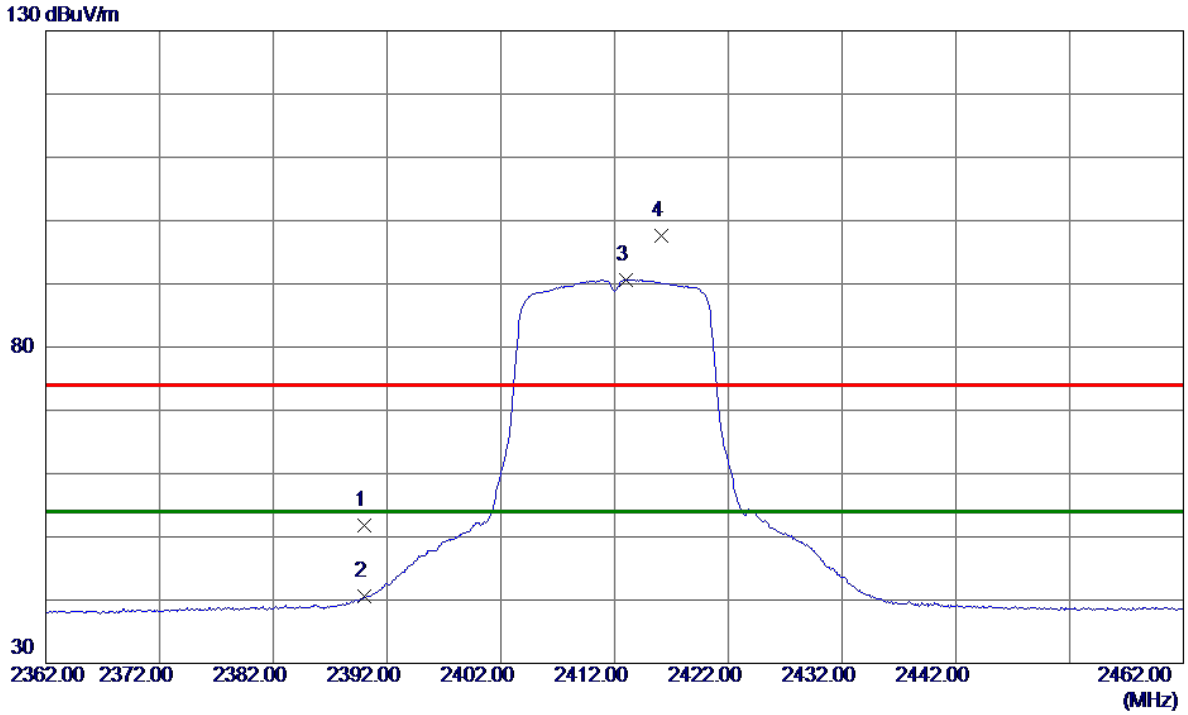
Orthogonal Axis :	X
Test Mode :	TX B MODE 2462MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4921.9800	24.03	6.02	30.05	54.00	-23.95	AVG	
2	4924.2950	35.90	6.03	41.93	74.00	-32.07	Peak	

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	42.77	9.00	51.77	74.00	-22.23	Peak	
2	2390.0000	31.52	9.00	40.52	54.00	-13.48	AVG	
3 *	2413.0000	81.64	8.99	90.63	54.00	36.63	AVG	No Limit
4	2416.1000	88.69	8.99	97.68	74.00	23.68	Peak	No Limit

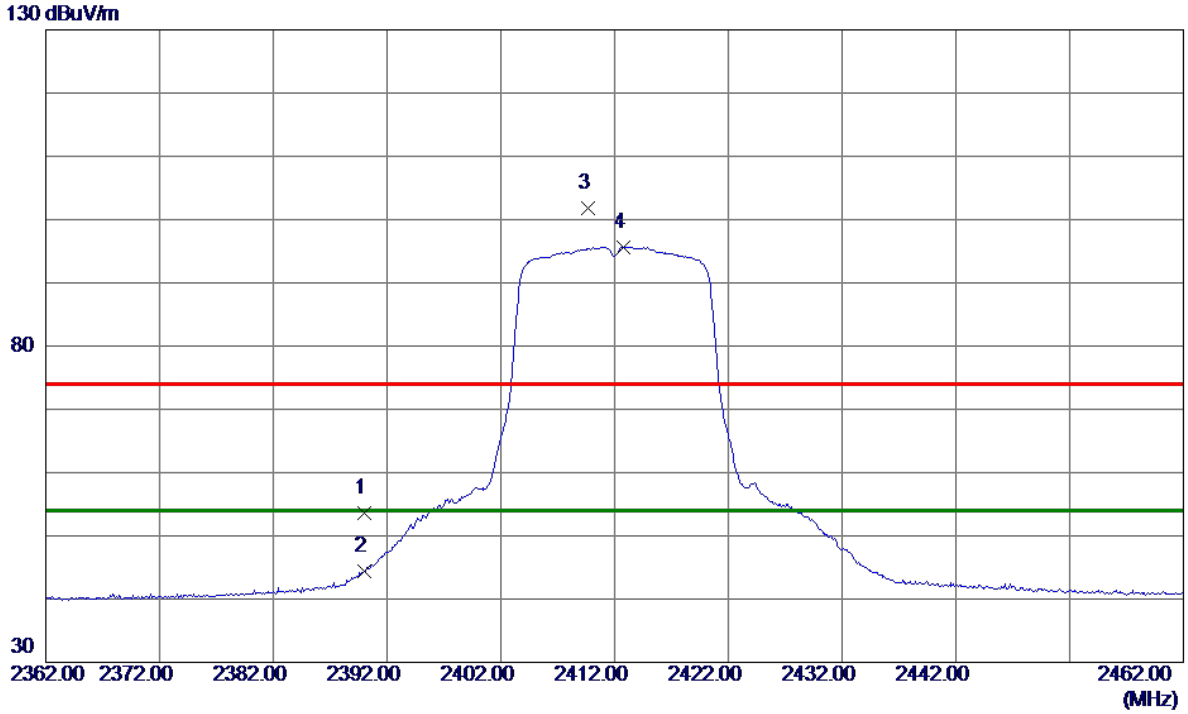
Orthogonal Axis :	X
Test Mode :	TX G MODE 2412MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4824.8650	36.10	5.78	41.88	74.00	-32.12	Peak	
2 *	4826.2000	24.43	5.79	30.22	54.00	-23.78	AVG	

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	44.65	9.00	53.65	74.00	-20.35	Peak	
2	2390.0000	35.48	9.00	44.48	54.00	-9.52	AVG	
3	2409.7000	92.86	9.00	101.86	74.00	27.86	Peak	No Limit
4 *	2412.8000	86.70	8.99	95.69	54.00	41.69	AVG	No Limit

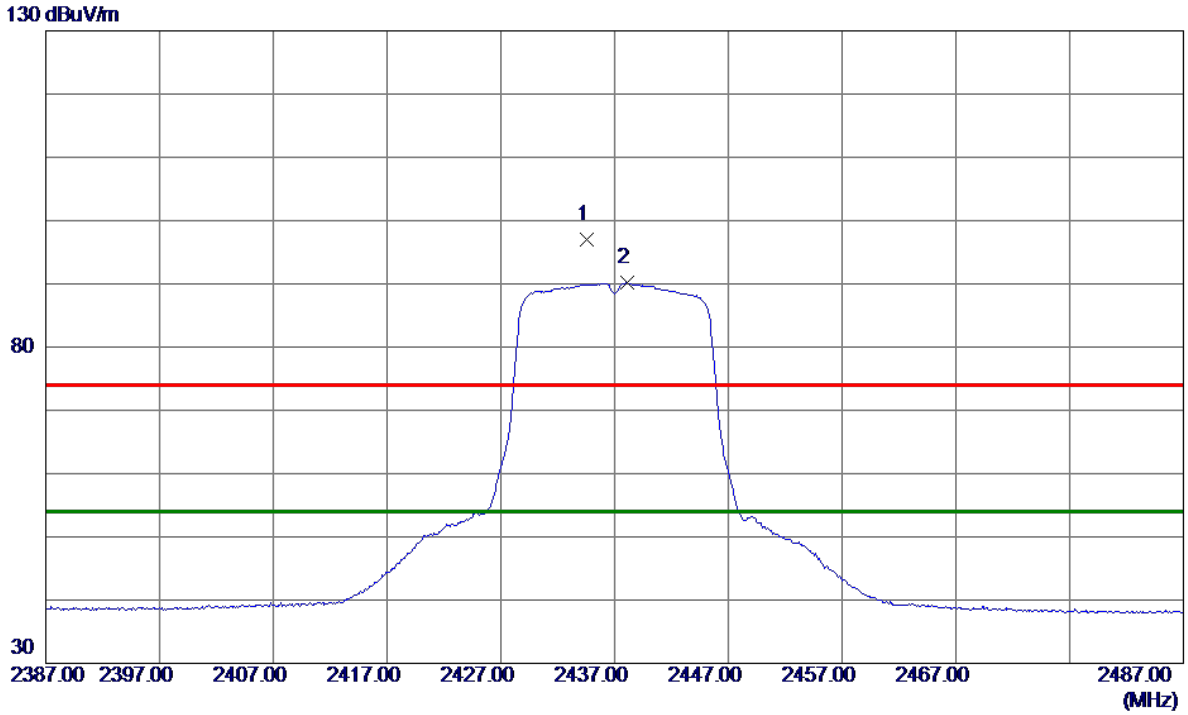
Orthogonal Axis :	X
Test Mode :	TX G MODE 2412MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4825.2900	24.42	5.78	30.20	54.00	-23.80	AVG	
2	4825.4300	35.63	5.78	41.41	74.00	-32.59	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	2434.6000	87.92	8.99	96.91	74.00	22.91	Peak	No Limit
2 *	2438.1000	81.15	8.98	90.13	54.00	36.13	AVG	No Limit

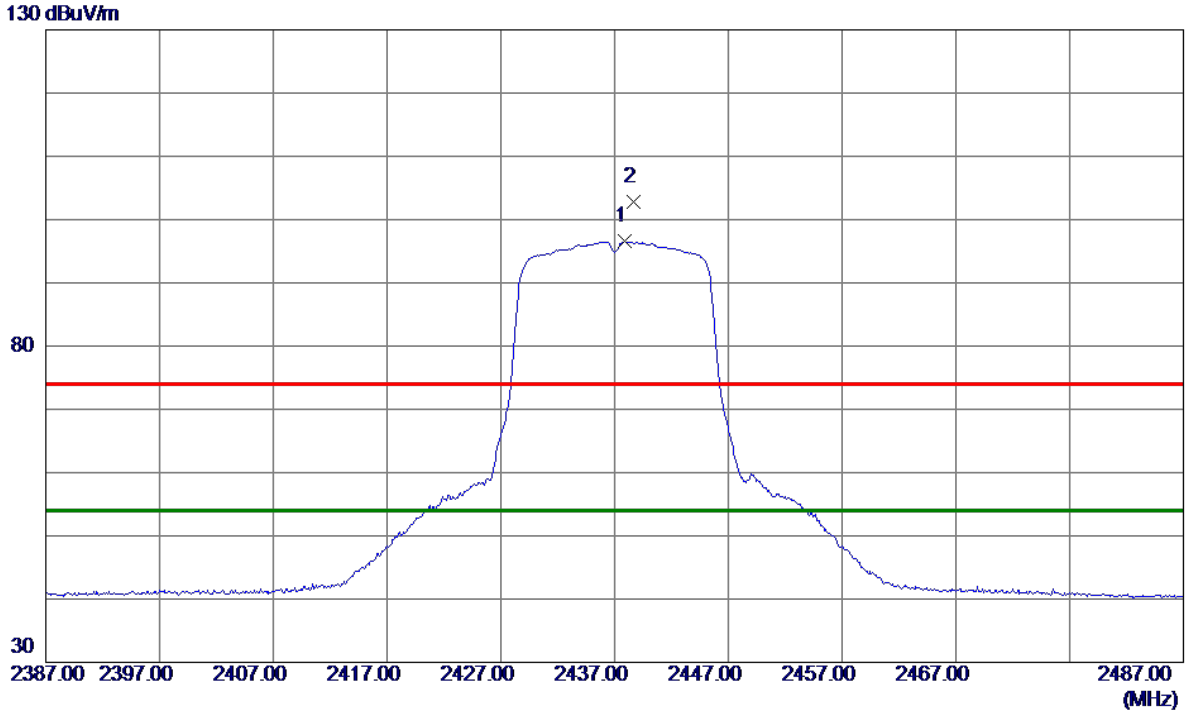
Orthogonal Axis :	X
Test Mode :	TX G MODE 2437MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4875.1000	35.57	5.91	41.48	74.00	-32.52	Peak	
2 *	4875.7400	24.24	5.91	30.15	54.00	-23.85	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 *	2437.9000	87.53	8.98	96.51	54.00	42.51	AVG	No Limit
2	2438.7000	93.88	8.98	102.86	74.00	28.86	Peak	No Limit

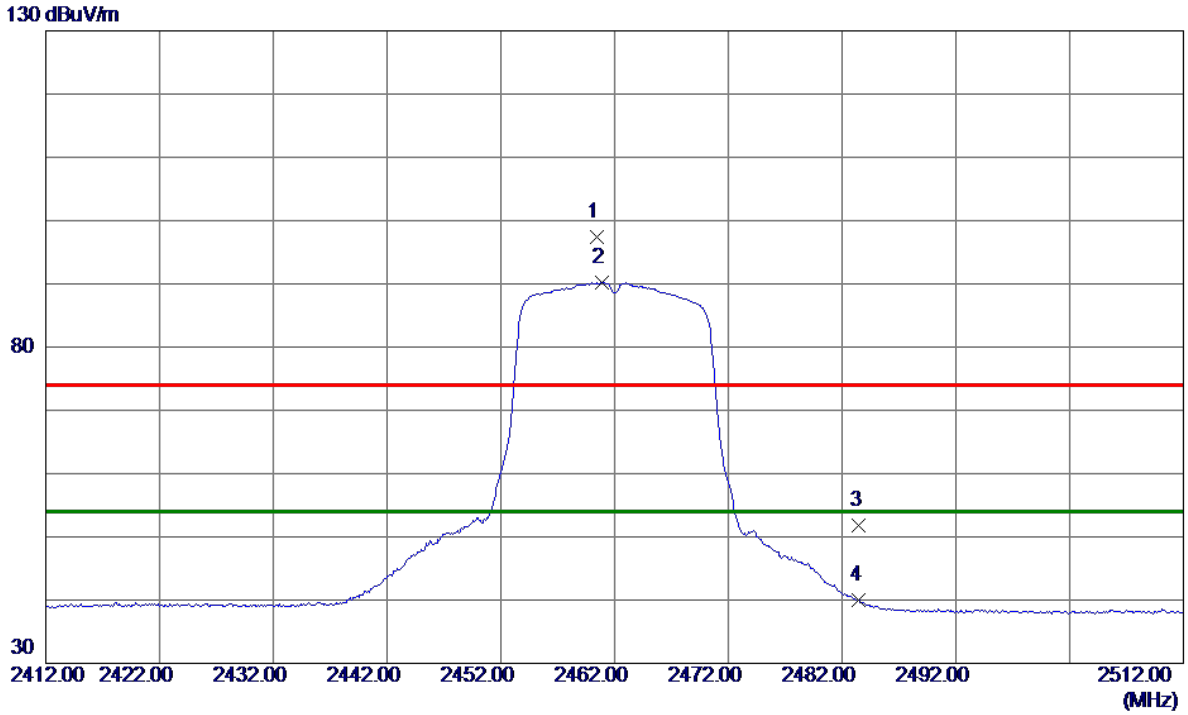
Orthogonal Axis :	X
Test Mode :	TX G MODE 2437MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4875.9600	24.15	5.91	30.06	54.00	-23.94	AVG	
2	4875.9850	35.53	5.91	41.44	74.00	-32.56	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	2460.4000	88.47	8.98	97.45	74.00	23.45	Peak	No Limit
2 *	2460.9000	81.19	8.98	90.17	54.00	36.17	AVG	No Limit
3	2483.5000	42.75	8.97	51.72	74.00	-22.28	Peak	
4	2483.5000	30.96	8.97	39.93	54.00	-14.07	AVG	

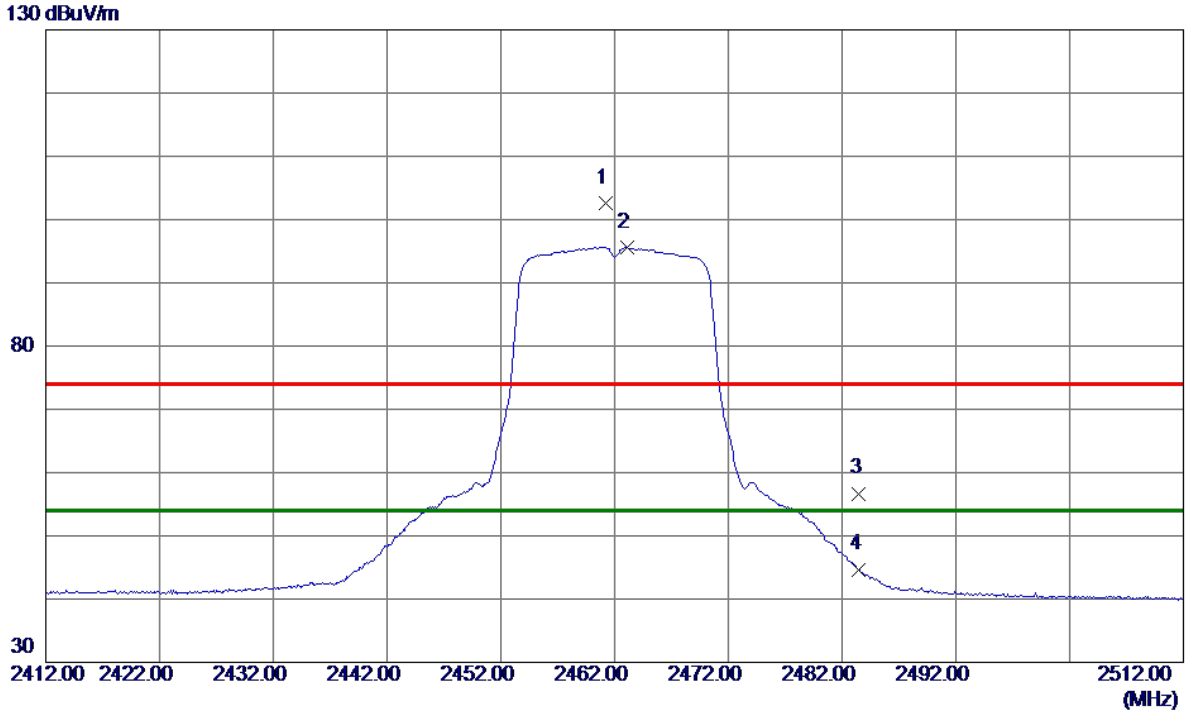
Orthogonal Axis :	X
Test Mode :	TX G MODE 2462MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4923.5250	23.98	6.03	30.01	54.00	-23.99	AVG	
2	4924.3250	35.24	6.03	41.27	74.00	-32.73	Peak	

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	2461.2000	93.71	8.98	102.69	74.00	28.69	Peak	No Limit
2 *	2463.1000	86.64	8.97	95.61	54.00	41.61	AVG	No Limit
3	2483.5000	47.73	8.97	56.70	74.00	-17.30	Peak	
4	2483.5000	35.73	8.97	44.70	54.00	-9.30	AVG	

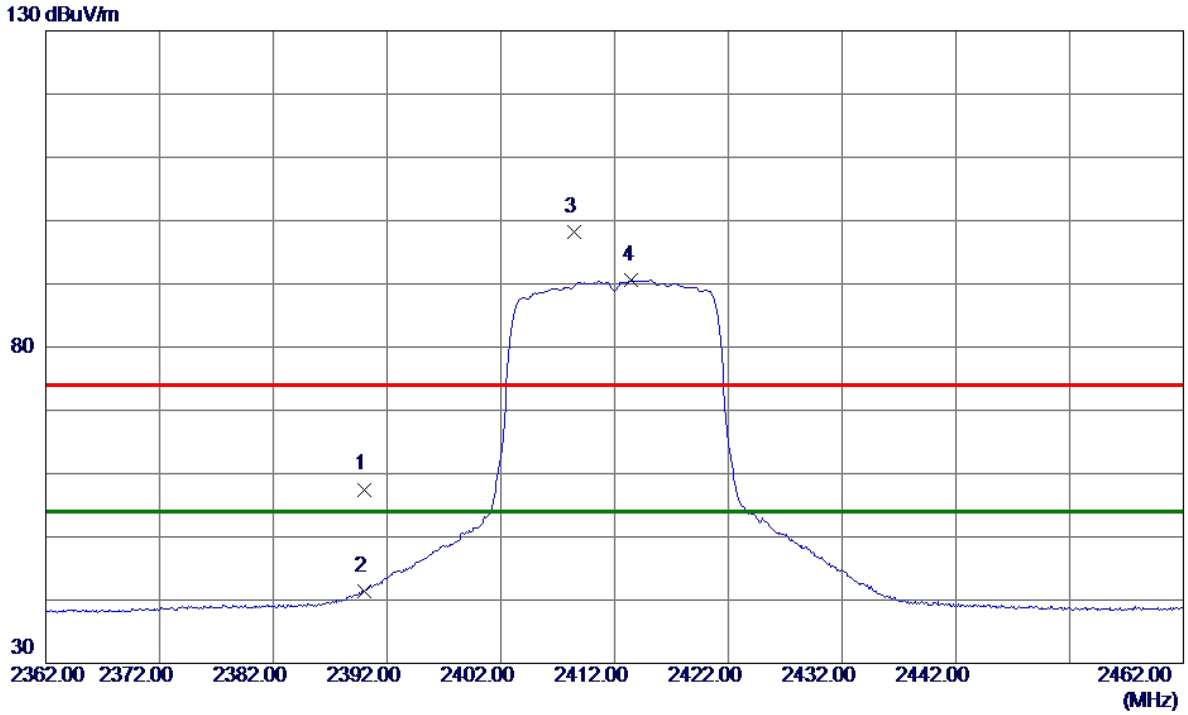
Orthogonal Axis :	X
Test Mode :	TX G MODE 2462MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4921.9650	35.81	6.02	41.83	74.00	-32.17	Peak	
2 *	4923.9250	24.18	6.03	30.21	54.00	-23.79	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	48.50	9.00	57.50	74.00	-16.50	Peak	
2	2390.0000	32.47	9.00	41.47	54.00	-12.53	AVG	
3	2408.4000	89.23	9.00	98.23	74.00	24.23	Peak	No Limit
4 *	2413.5000	81.53	8.99	90.52	54.00	36.52	AVG	No Limit

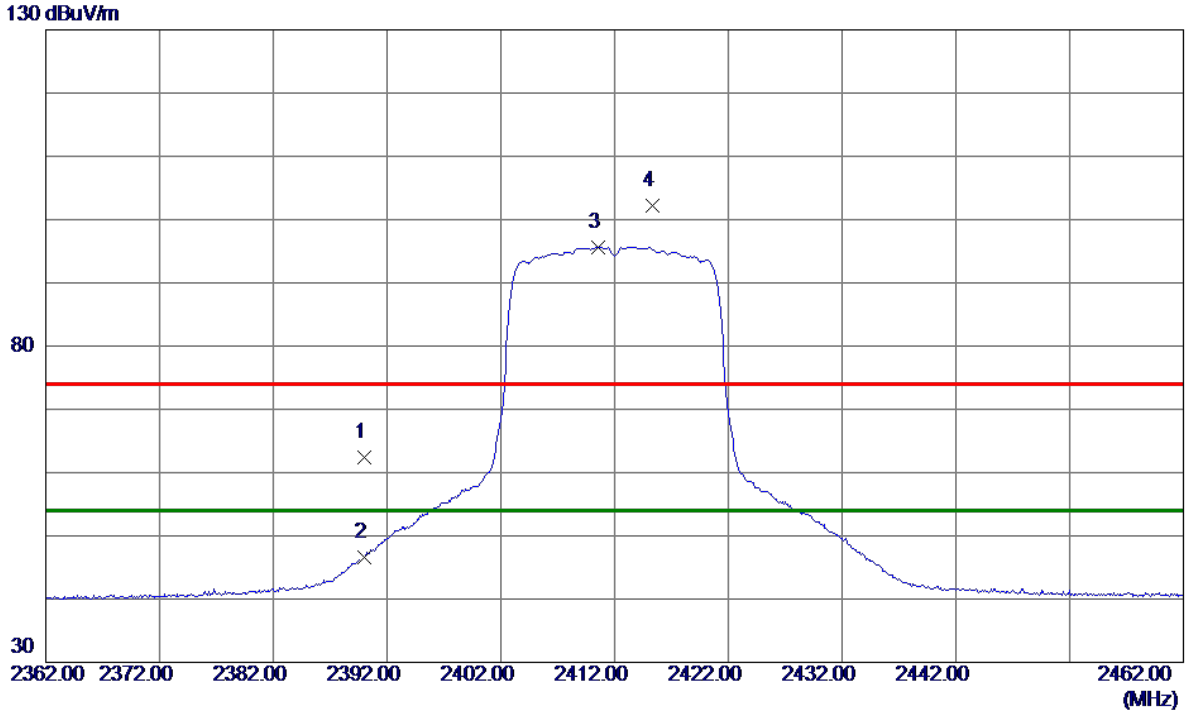
Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2412MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4823.7750	35.73	5.78	41.51	74.00	-32.49	Peak	
2 *	4824.2450	24.50	5.78	30.28	54.00	-23.72	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	53.38	9.00	62.38	74.00	-11.62	Peak	
2	2390.0000	37.63	9.00	46.63	54.00	-7.37	AVG	
3 *	2410.6000	86.64	9.00	95.64	54.00	41.64	AVG	No Limit
4	2415.3000	93.24	8.99	102.23	74.00	28.23	Peak	No Limit

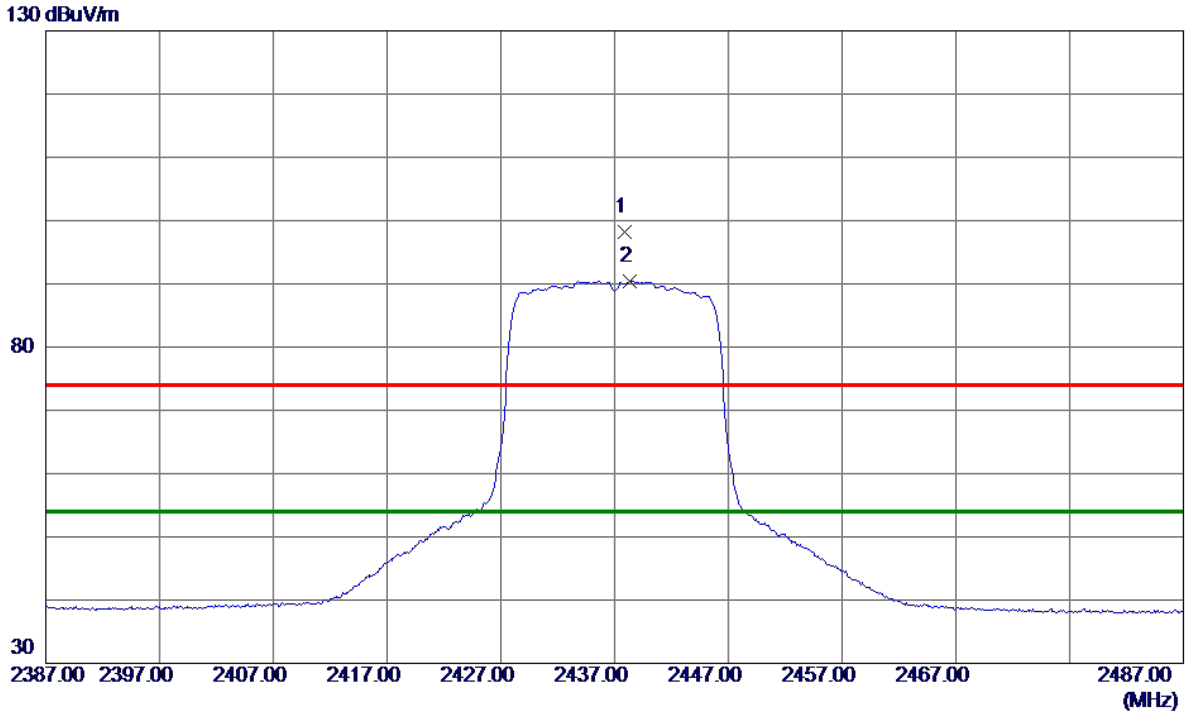
Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2412MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4824.4450	24.55	5.78	30.33	54.00	-23.67	AVG	
2	4825.2700	36.18	5.78	41.96	74.00	-32.04	Peak	

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	2437.9000	89.20	8.98	98.18	74.00	24.18	Peak	No Limit
2 *	2438.3000	81.42	8.98	90.40	54.00	36.40	AVG	No Limit

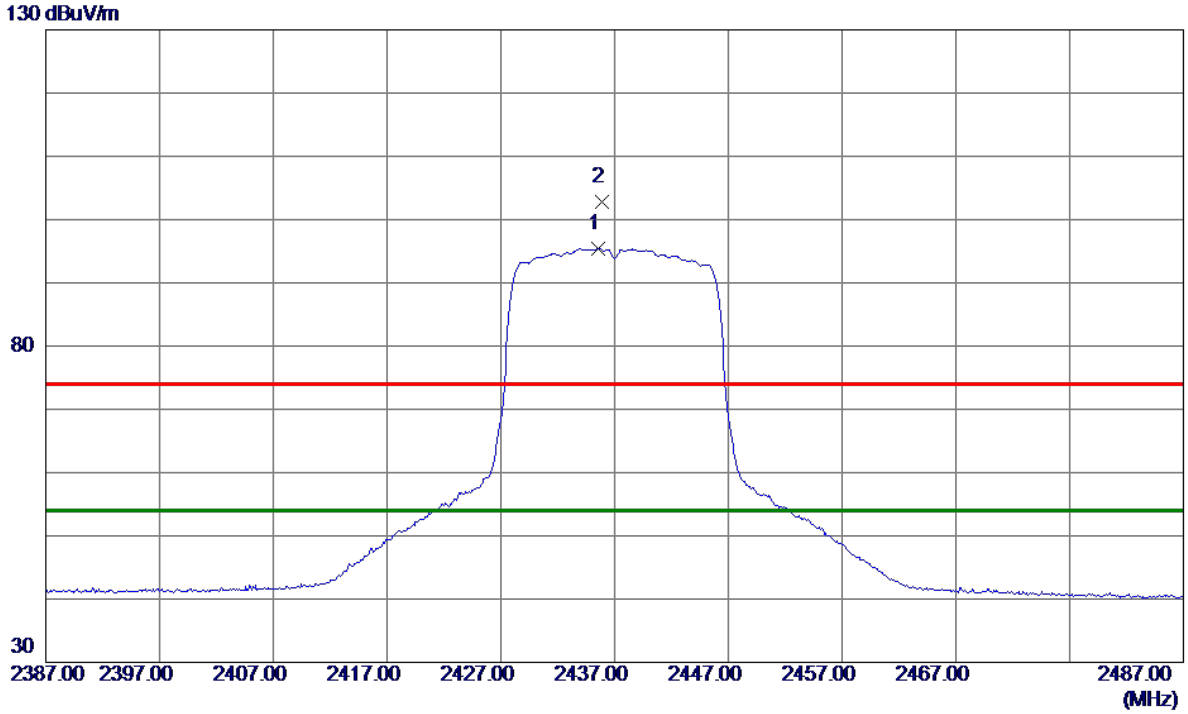
Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2437MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4872.1900	24.12	5.90	30.02	54.00	-23.98	AVG	
2	4876.2500	35.84	5.91	41.75	74.00	-32.25	Peak	

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 *	2435.6000	86.39	8.99	95.38	54.00	41.38	AVG	No Limit
2	2435.9000	93.89	8.99	102.88	74.00	28.88	Peak	No Limit

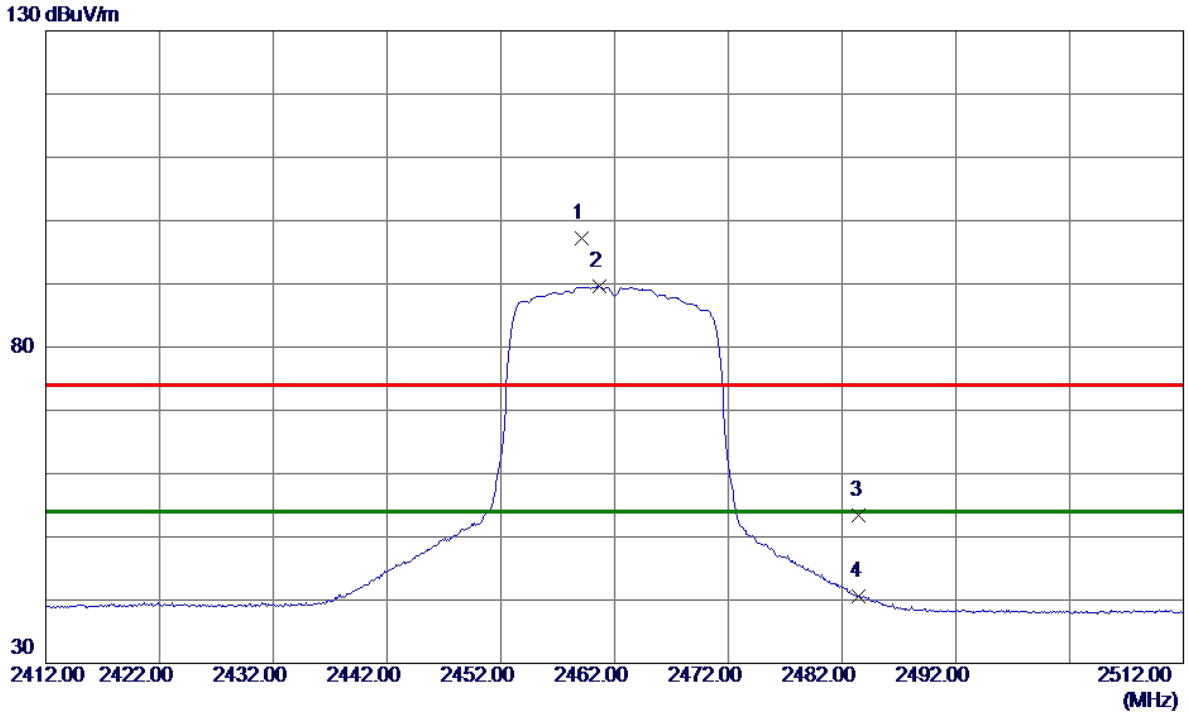
Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2437MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.6100	35.77	5.90	41.67	74.00	-32.33	Peak	
2 *	4874.8150	24.20	5.91	30.11	54.00	-23.89	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	2459.1000	88.31	8.98	97.29	74.00	23.29	Peak	No Limit
2 *	2460.7000	80.61	8.98	89.59	54.00	35.59	AVG	No Limit
3	2483.5000	44.47	8.97	53.44	74.00	-20.56	Peak	
4	2483.5000	31.72	8.97	40.69	54.00	-13.31	AVG	

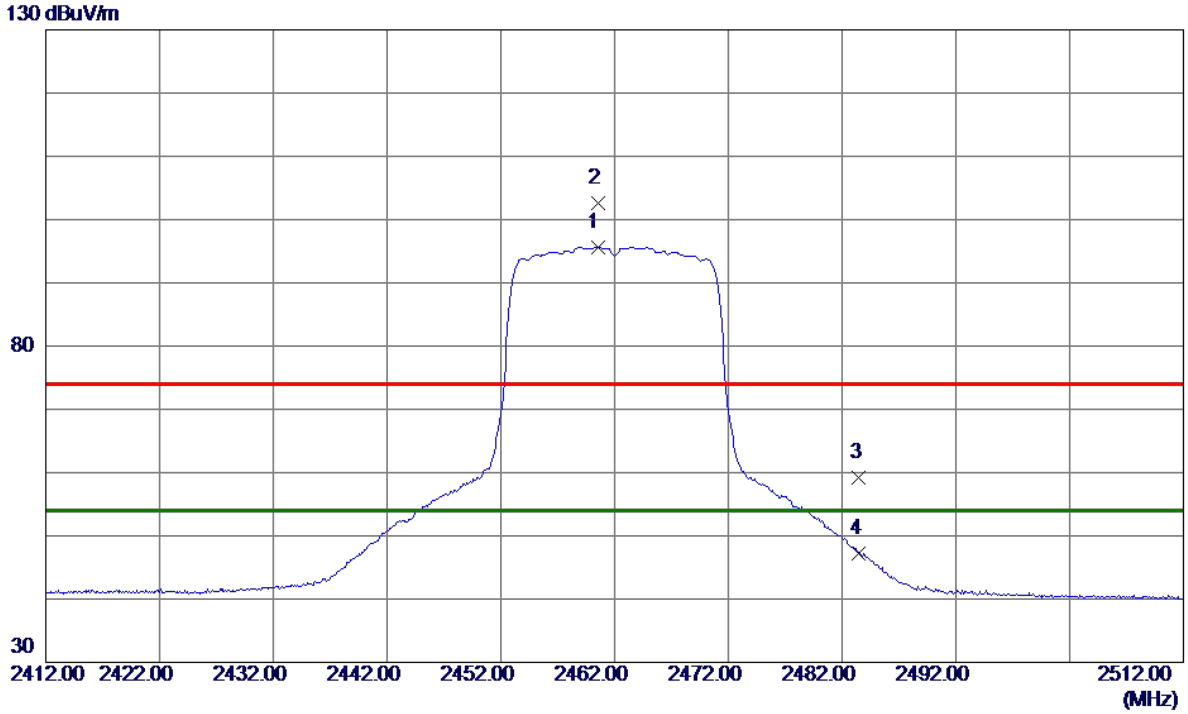
Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2462MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4922.5299	24.16	6.03	30.19	54.00	-23.81	AVG	
2	4924.4550	35.31	6.03	41.34	74.00	-32.66	Peak	

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 *	2460.5000	86.66	8.98	95.64	54.00	41.64	AVG	No Limit
2	2460.6000	93.64	8.98	102.62	74.00	28.62	Peak	No Limit
3	2483.5000	50.16	8.97	59.13	74.00	-14.87	Peak	
4	2483.5000	38.23	8.97	47.20	54.00	-6.80	AVG	

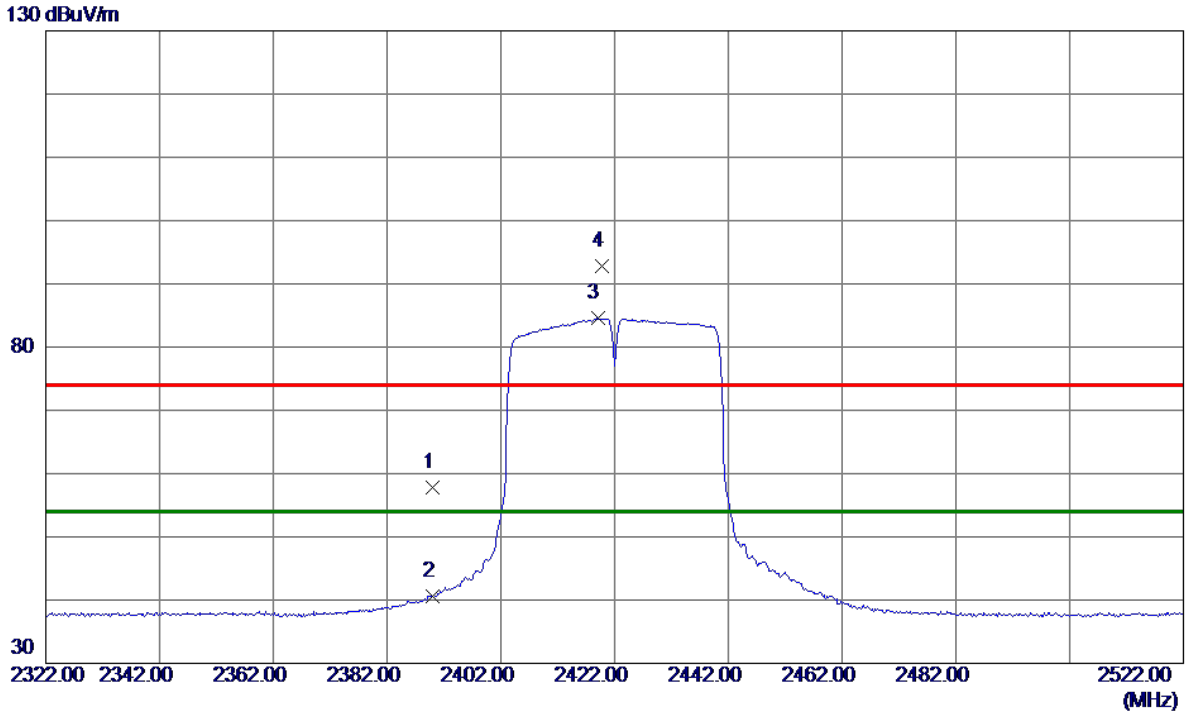
Orthogonal Axis :	X
Test Mode :	TX N-20M MODE 2462MHz

Horizontal

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4921.9800	35.80	6.02	41.82	74.00	-32.18	Peak	
2 *	4923.6050	23.95	6.03	29.98	54.00	-24.02	AVG	

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

Vertical



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	48.73	9.00	57.73	74.00	-16.27	Peak	
2	2390.0000	31.63	9.00	40.63	54.00	-13.37	AVG	
3 *	2419.0000	75.53	8.99	84.52	54.00	30.52	AVG	No Limit
4	2419.8000	83.79	8.99	92.78	74.00	18.78	Peak	No Limit

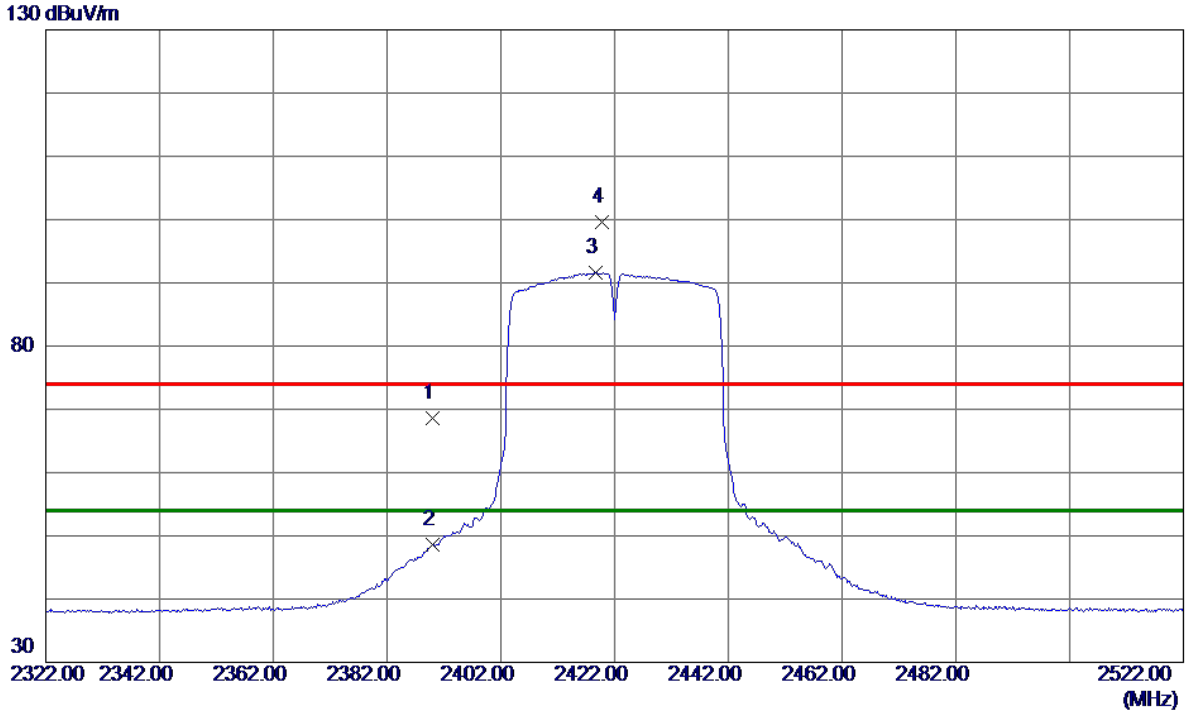
Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2422MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	4844.5800	24.31	5.83	30.14	54.00	-23.86	AVG	
2	4844.9550	35.54	5.83	41.37	74.00	-32.63	Peak	

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

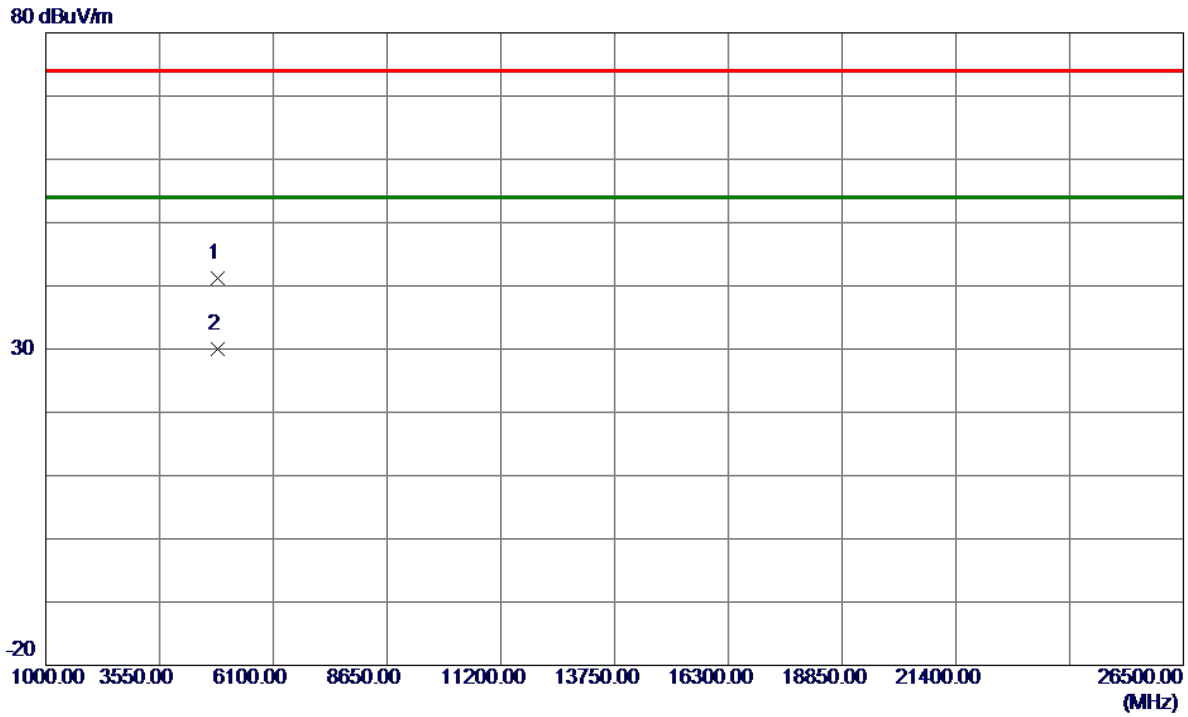
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	2390.0000	59.65	9.00	68.65	74.00	-5.35	Peak	
2	2390.0000	39.69	9.00	48.69	54.00	-5.31	AVG	
3 *	2418.6000	82.67	8.99	91.66	54.00	37.66	AVG	No Limit
4	2419.8000	90.61	8.99	99.60	74.00	25.60	Peak	No Limit

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

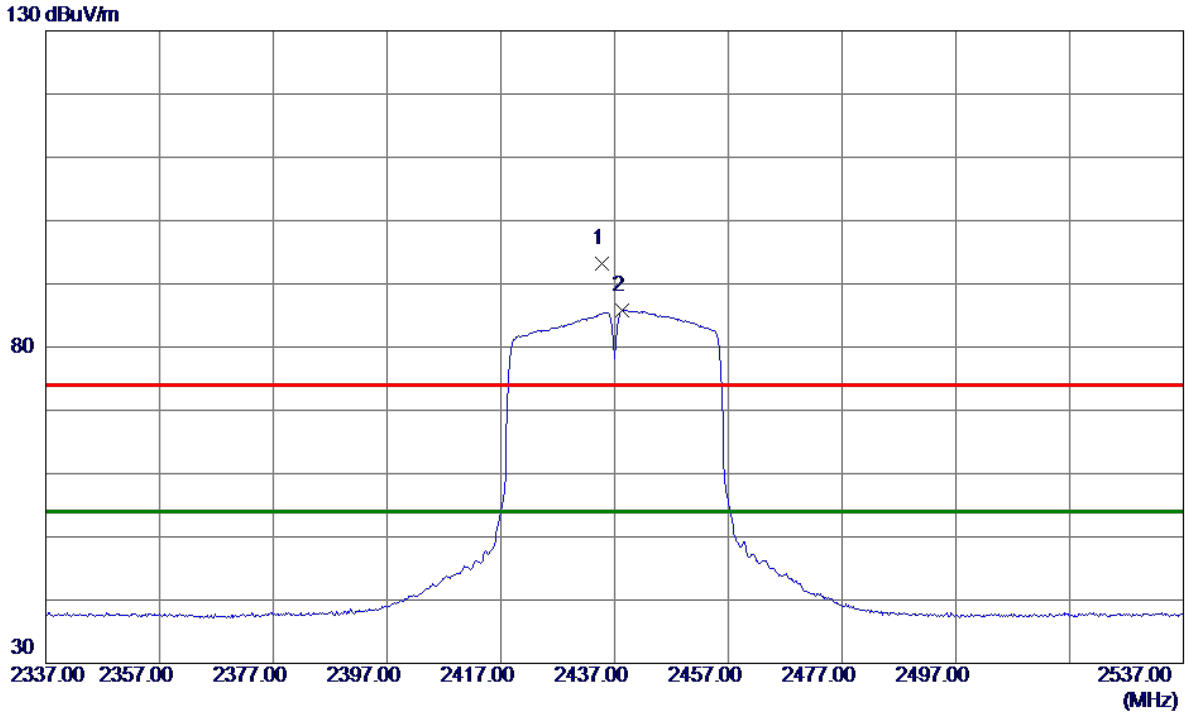
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4842.7700	35.28	5.83	41.11	74.00	-32.89	Peak	
2 *	4842.8900	24.25	5.83	30.08	54.00	-23.92	AVG	

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	2434.8000	84.29	8.99	93.28	74.00	19.28	Peak	No Limit
2 *	2438.4000	76.86	8.98	85.84	54.00	31.84	AVG	No Limit

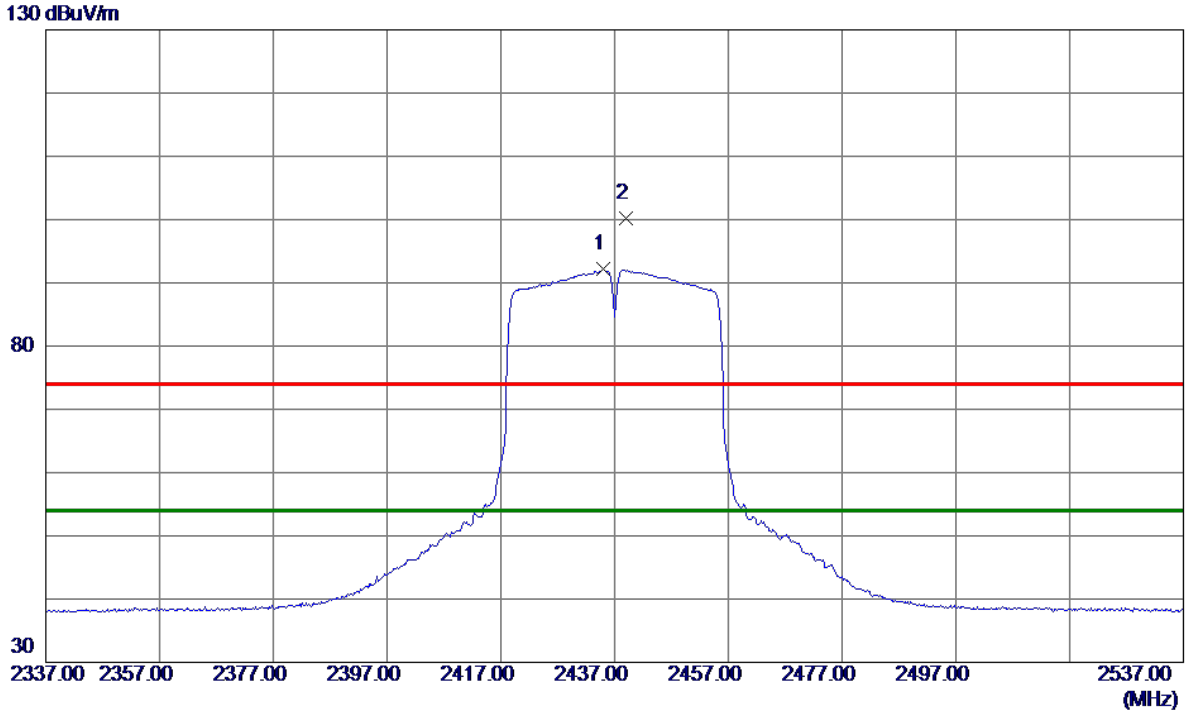
Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2437MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4875.5750	36.29	5.91	42.20	74.00	-31.80	Peak	
2 *	4875.7650	24.17	5.91	30.08	54.00	-23.92	AVG	

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

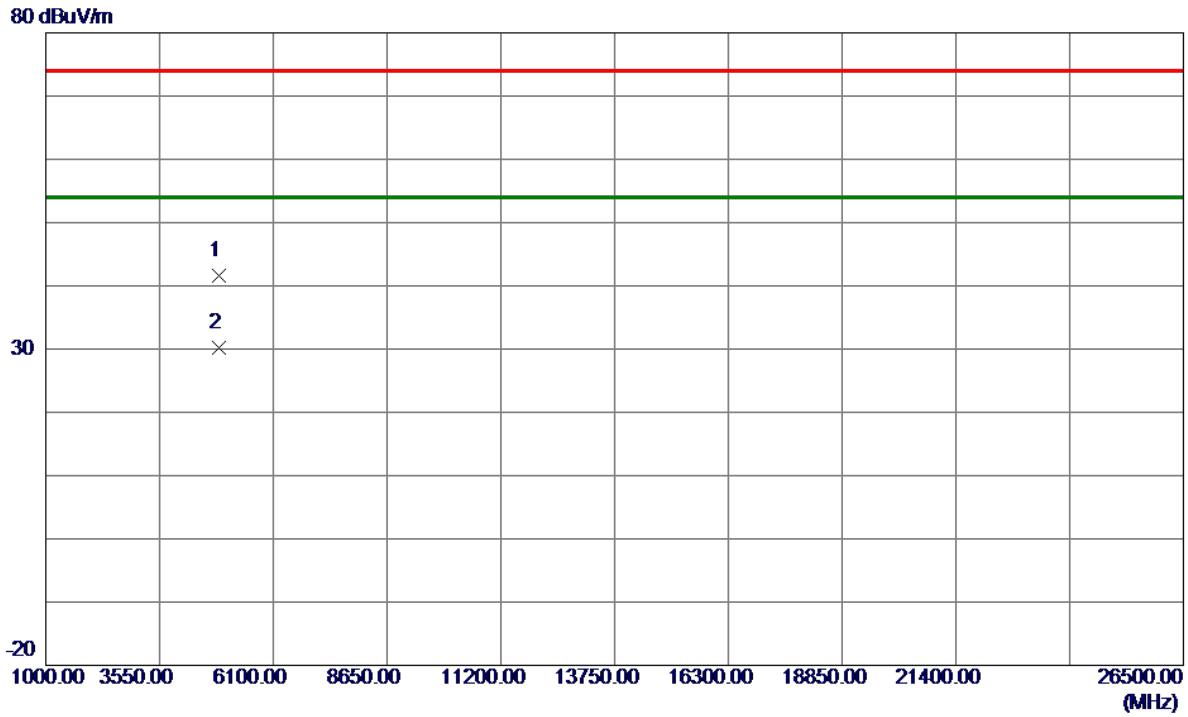
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1 *	2435.0000	83.19	8.99	92.18	54.00	38.18	AVG	No Limit
2	2439.0000	91.22	8.98	100.20	74.00	26.20	Peak	No Limit

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

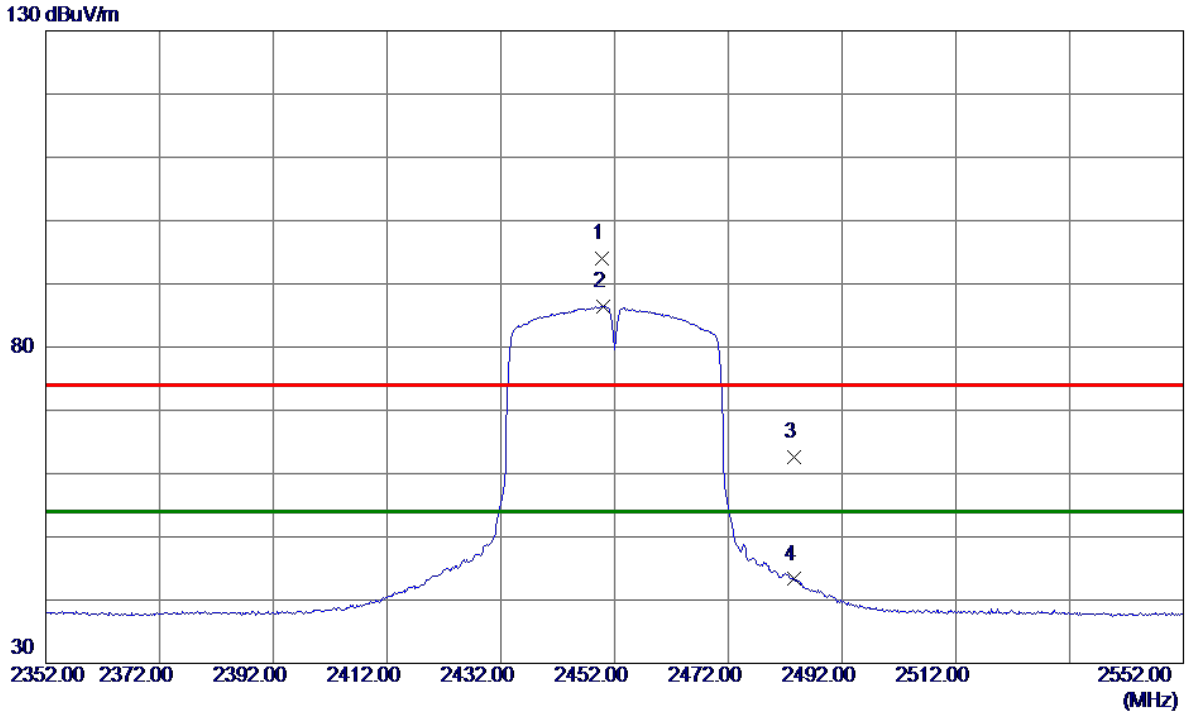
Horizontal



No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4873.9150	35.77	5.90	41.67	74.00	-32.33	Peak	
2 *	4876.0099	24.30	5.91	30.21	54.00	-23.79	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	2449.8000	85.06	8.98	94.04	74.00	20.04	Peak	No Limit
2 *	2450.0000	77.38	8.98	86.36	54.00	32.36	AVG	No Limit
3	2483.5000	53.68	8.97	62.65	74.00	-11.35	Peak	
4	2483.5000	34.33	8.97	43.30	54.00	-10.70	AVG	

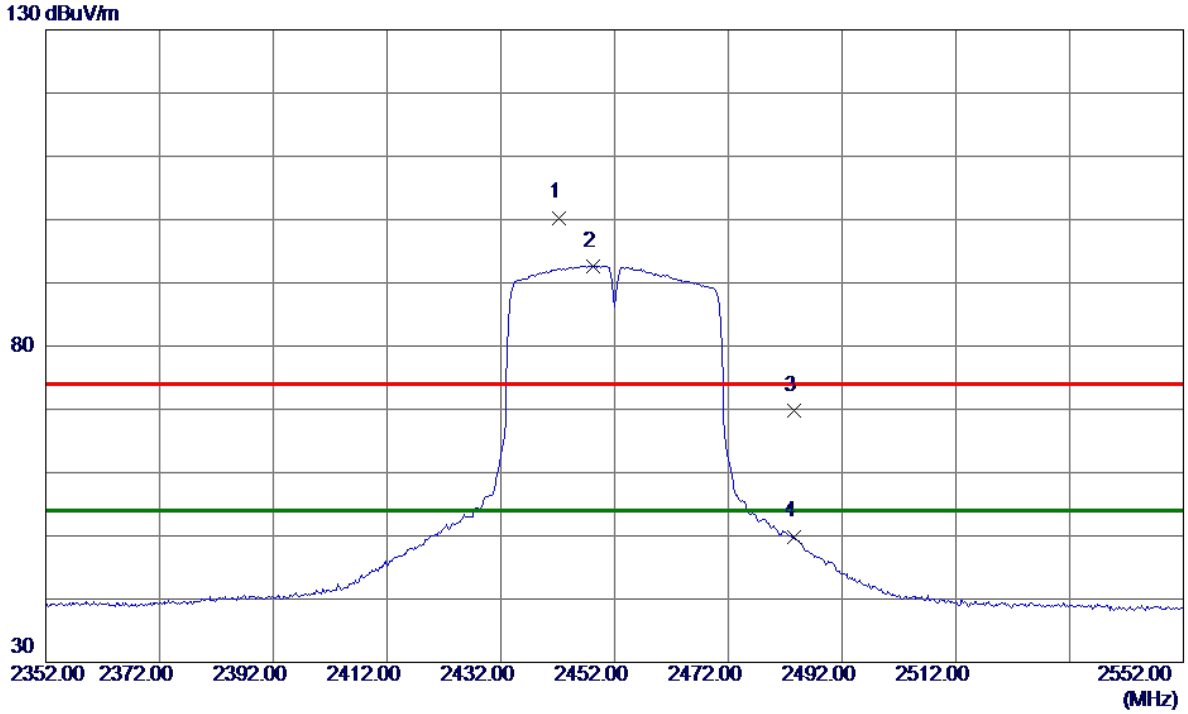
Orthogonal Axis :	X
Test Mode :	TX N-40M MODE 2452MHz

Vertical

No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4902.4900	35.26	5.98	41.24	74.00	-32.76	Peak	
2 *	4905.0350	24.37	5.98	30.35	54.00	-23.65	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	2442.2000	91.32	8.98	100.30	74.00	26.30	Peak	No Limit
2 *	2448.2000	83.69	8.98	92.67	54.00	38.67	AVG	No Limit
3	2483.5000	60.89	8.97	69.86	74.00	-4.14	Peak	
4	2483.5000	40.93	8.97	49.90	54.00	-4.10	AVG	

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

Horizontal

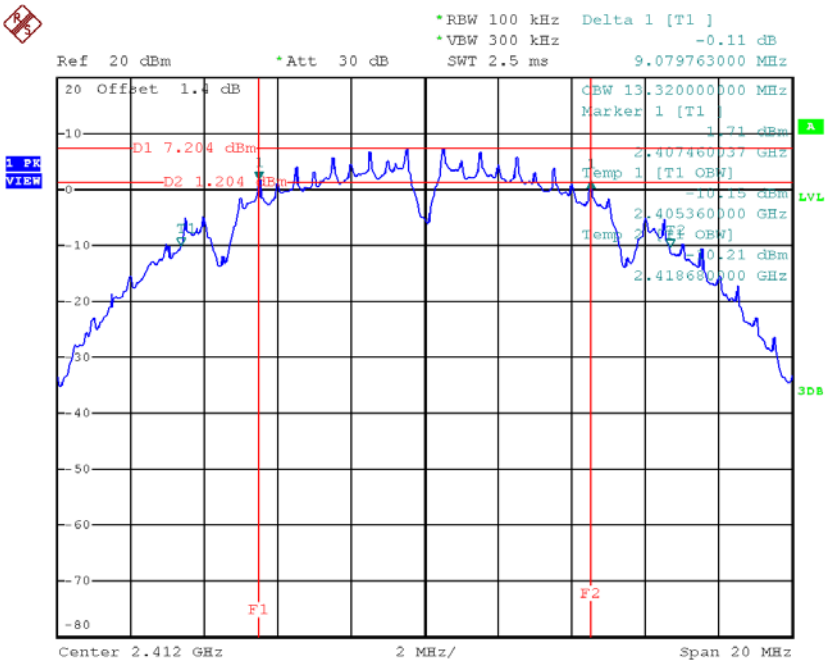
No.	Freq.	Reading Level	Correct Factor	Measure ment	Limit	Margin		
	MHz	dBuV/m	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	4906.0400	34.97	5.98	40.95	74.00	-33.05	Peak	
2 *	4906.3600	23.89	5.99	29.88	54.00	-24.12	AVG	

APPENDIX E - BANDWIDTH

Test Mode : TX B Mode_CH01/06/11

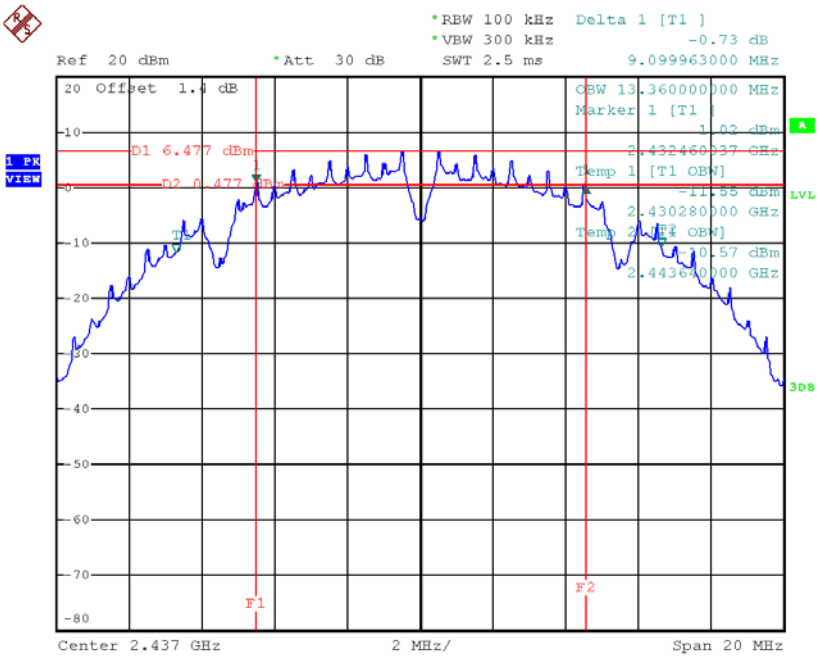
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	9.08	13.32	500	Complies
2437	9.10	13.36	500	Complies
2462	9.08	13.32	500	Complies

TX CH01



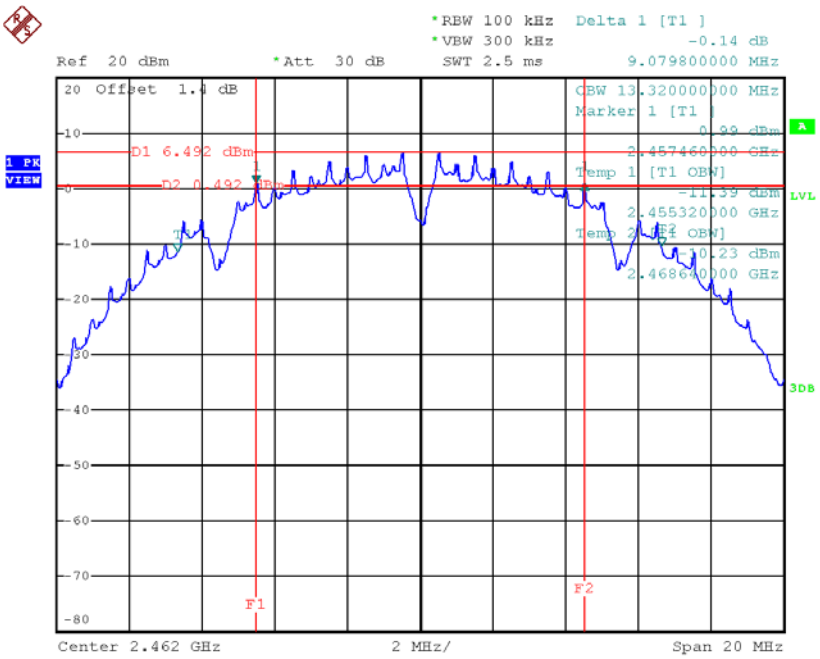
Date: 21.APR.2018 11:38:07

TX CH06



Date: 21.APR.2018 11:48:29

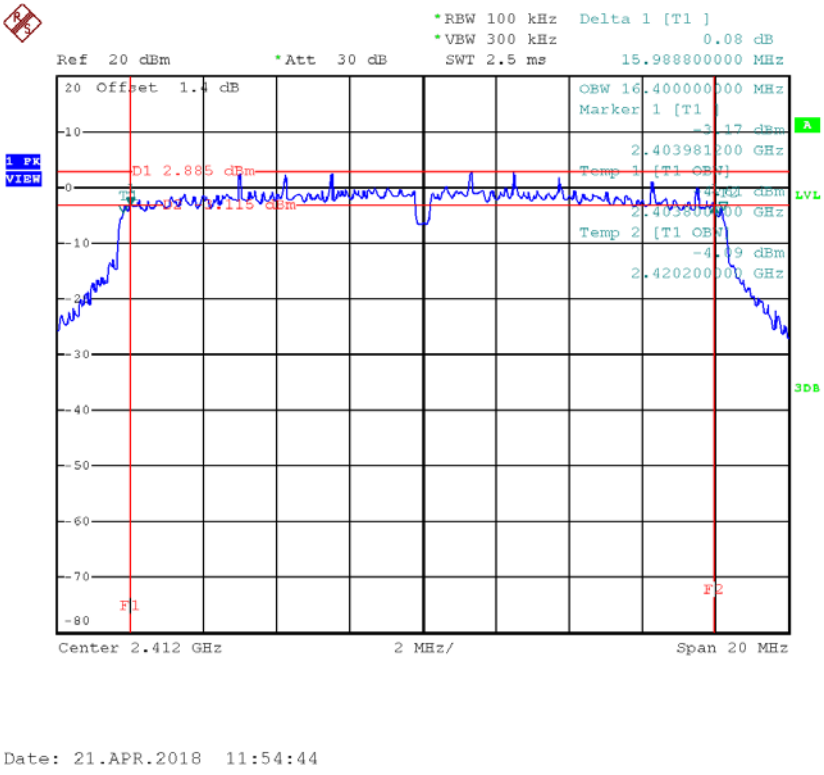
TX CH11



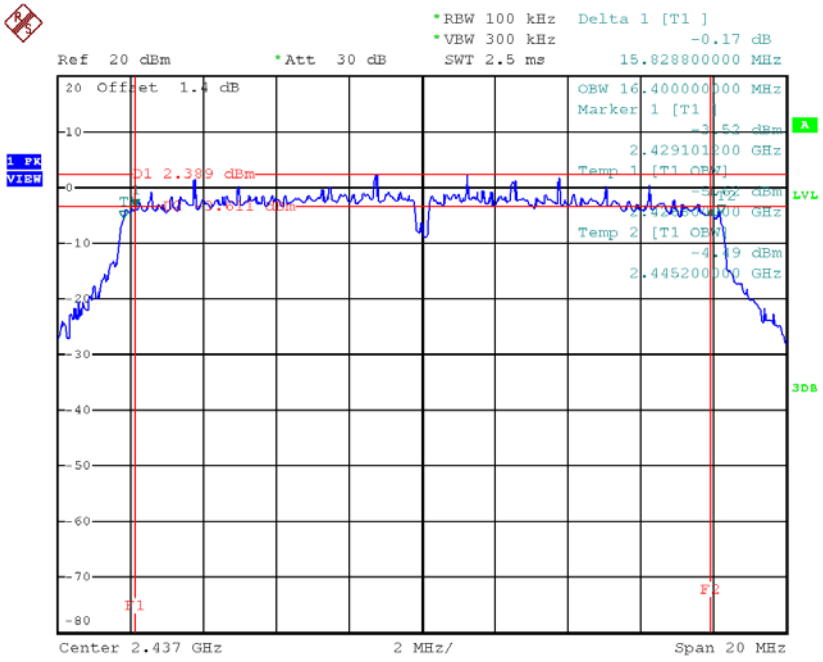
Date: 21.APR.2018 11:50:37

Test Mode: TX G Mode_CH01/06/11				
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	15.99	16.4	500	Complies
2437	15.83	16.4	500	Complies
2462	15.52	16.4	500	Complies

TX CH01

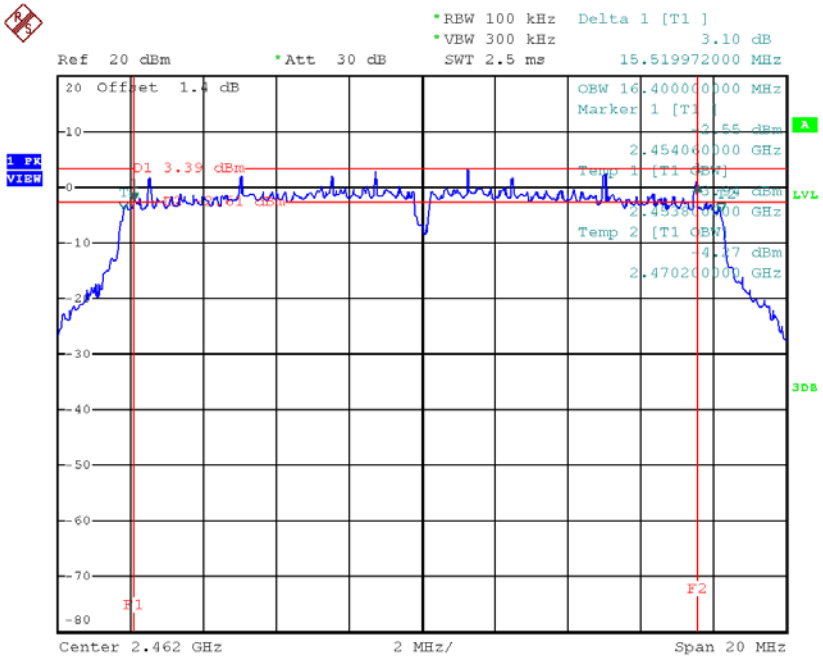


TX CH06



Date: 21.APR.2018 13:37:32

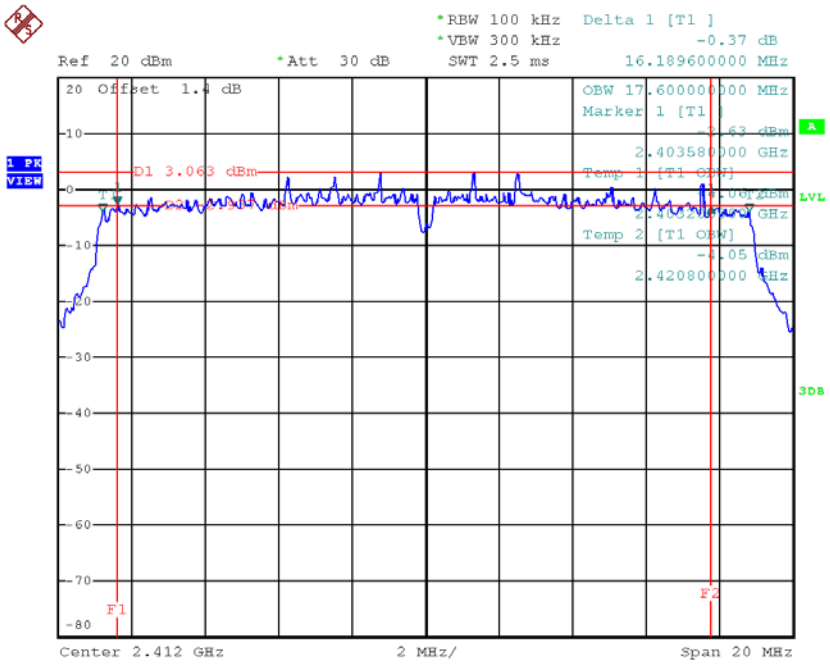
TX CH11



Date: 21.APR.2018 13:39:13

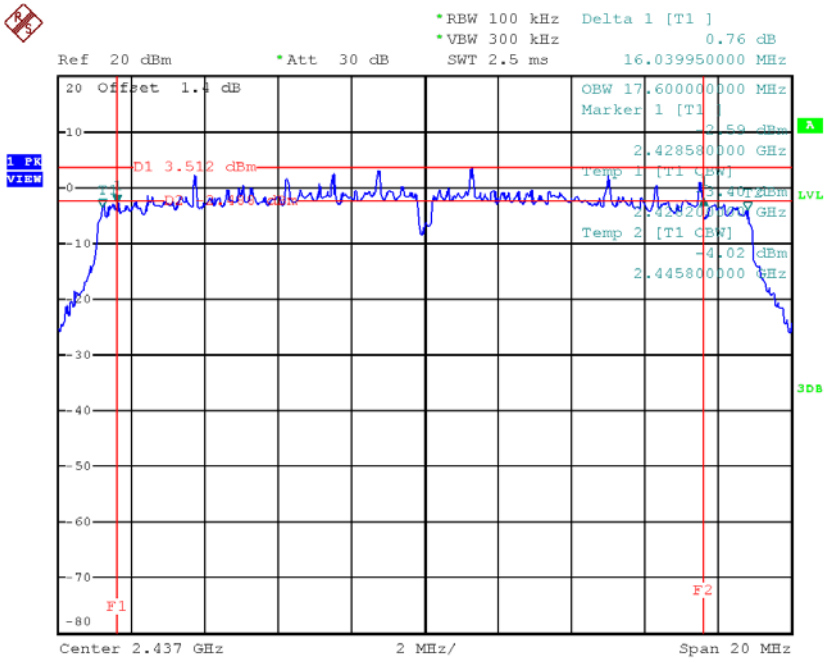
Test Mode : TX N-20MHz Mode_CH01/06/11				
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2412	16.19	17.6	500	Complies
2437	16.04	17.6	500	Complies
2462	17.19	17.6	500	Complies

TX CH01



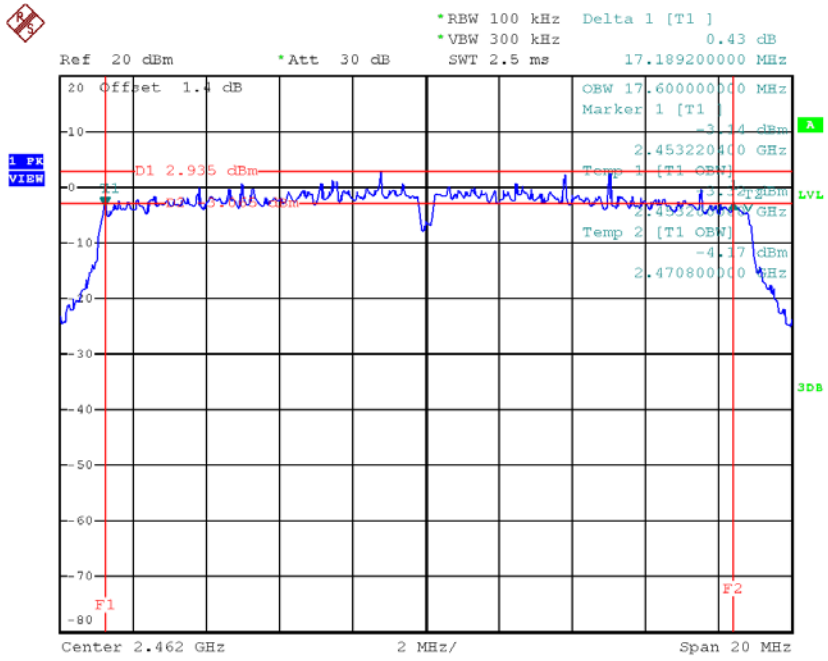
Date: 21.APR.2018 13:40:58

TX CH06



Date: 21.APR.2018 13:42:21

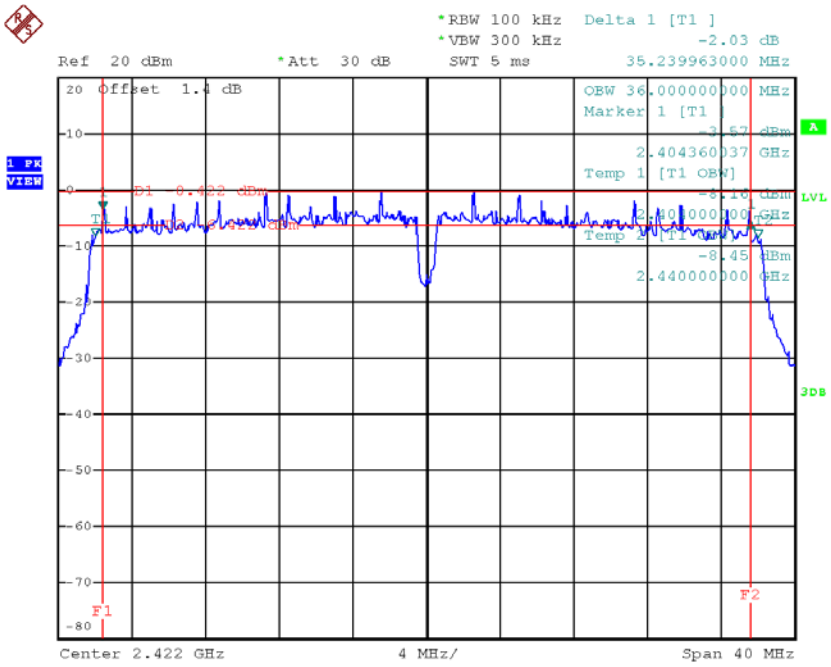
TX CH11



Date: 21.APR.2018 13:43:51

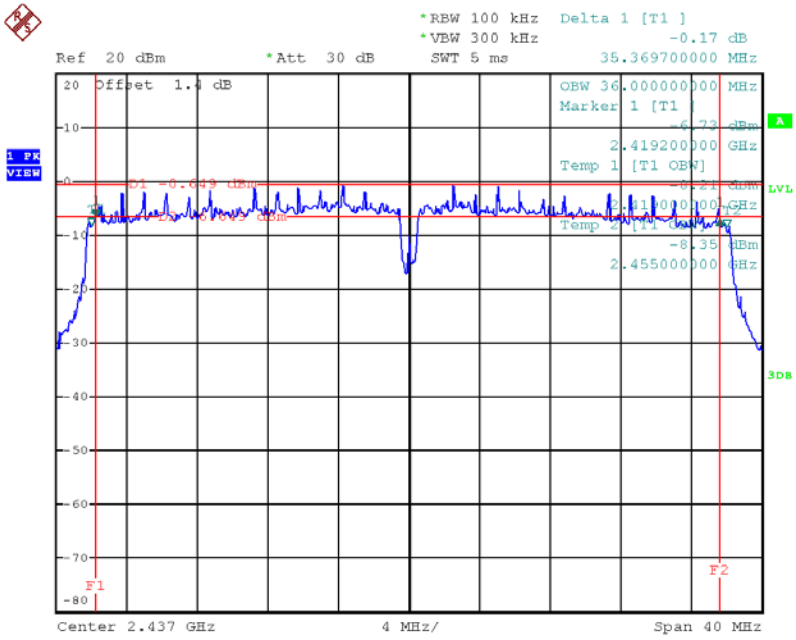
Test Mode : TX N-40MHz Mode_CH03/06/09				
Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied BW (MHz)	Min. Limit (kHz)	Test Result
2422	35.24	36	500	Complies
2437	35.37	36	500	Complies
2452	35.44	36	500	Complies

TX CH03



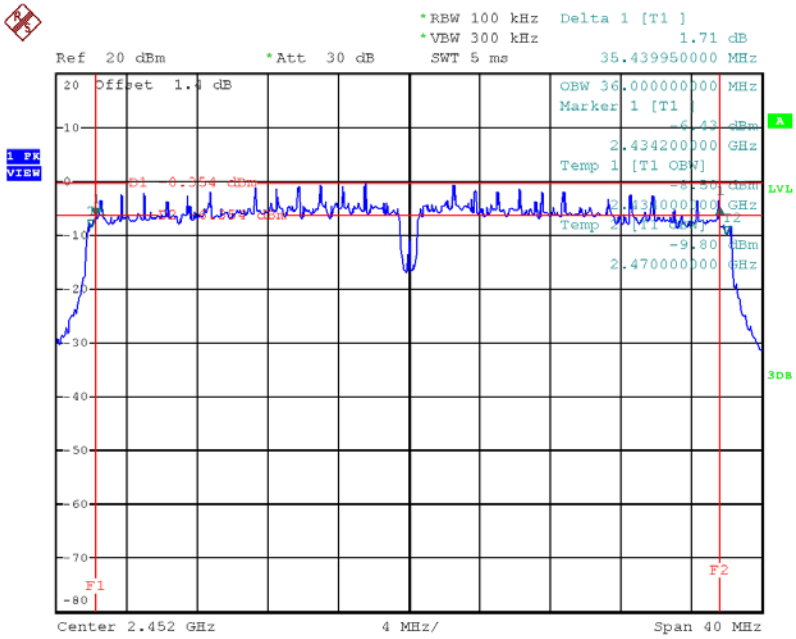
Date: 21.APR.2018 13:49:40

TX CH06



Date: 21.APR.2018 13:50:59

TX CH09



Date: 21.APR.2018 13:52:20

APPENDIX 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	18.27	0.07	30.00	1.00	Complies
2437	18.49	0.07	30.00	1.00	Complies
2462	18.51	0.07	30.00	1.00	Complies

Test Mode :TX G Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	23.88	0.24	30.00	1.00	Complies
2437	23.73	0.24	30.00	1.00	Complies
2462	23.76	0.24	30.00	1.00	Complies

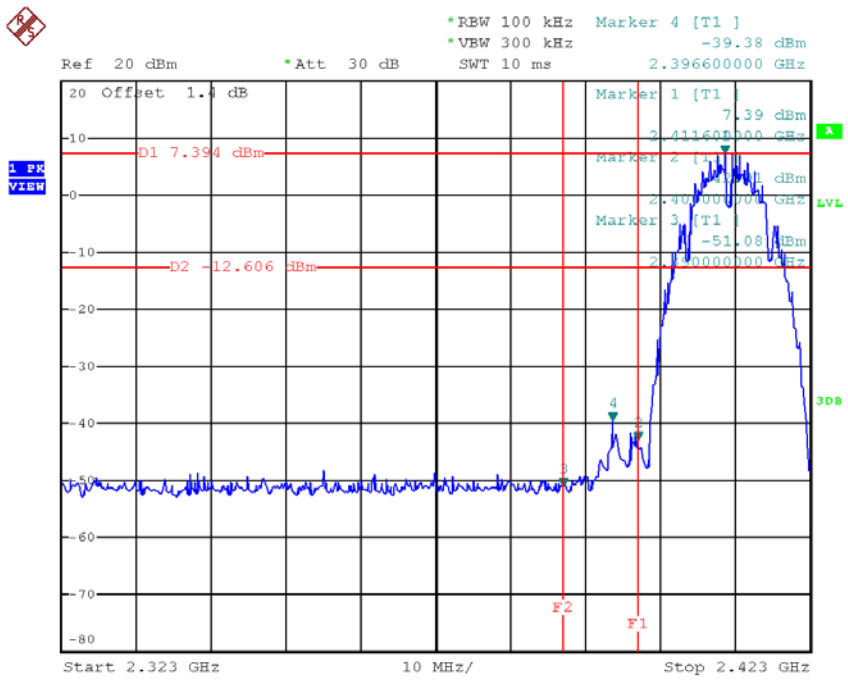
Test Mode :TX N20 Mode_CH01/06/11					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2412	24.53	0.28	30.00	1.00	Complies
2437	24.56	0.29	30.00	1.00	Complies
2462	24.58	0.29	30.00	1.00	Complies

Test Mode :TX N40 Mode_CH03/06/09					
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Result
2422	23.32	0.21	30.00	1.00	Complies
2437	23.34	0.22	30.00	1.00	Complies
2452	23.65	0.23	30.00	1.00	Complies

APPENDIX G - ANTENNA CONDUCTED SPURIOUS EMISSION

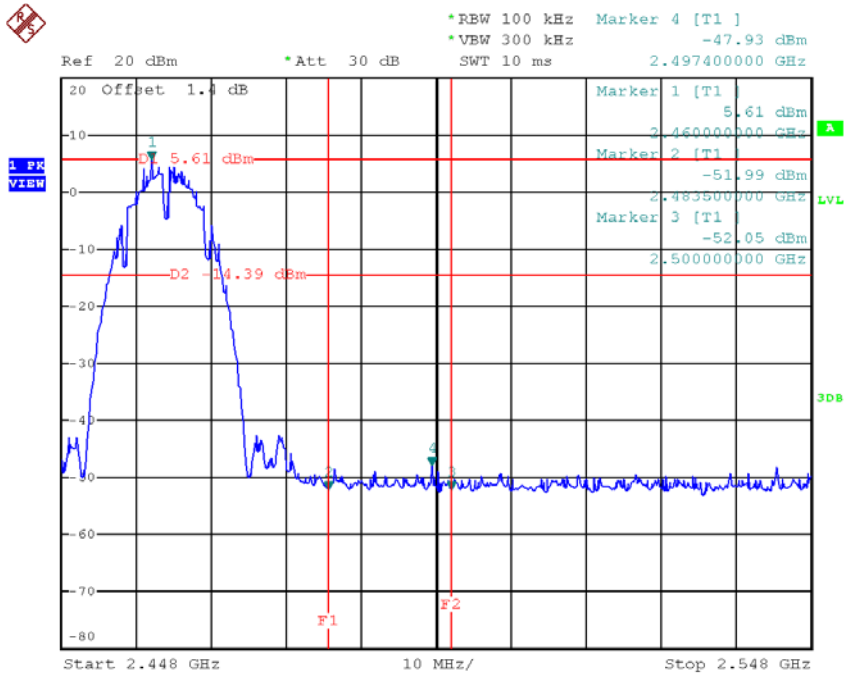
Test Mode :	TX B Mode

TX B mode CH01



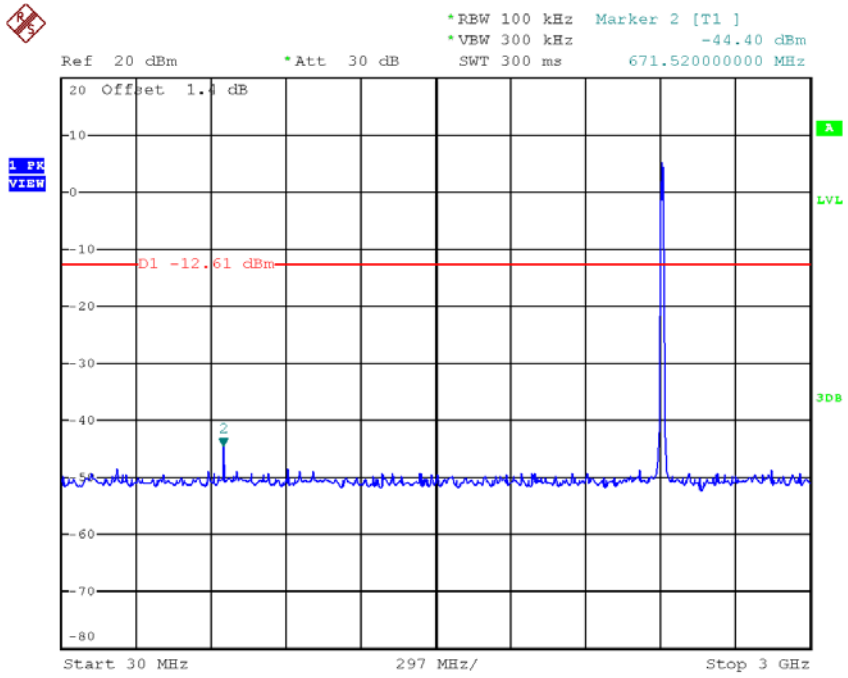
Date: 21.APR.2018 11:38:15

TX B mode CH11

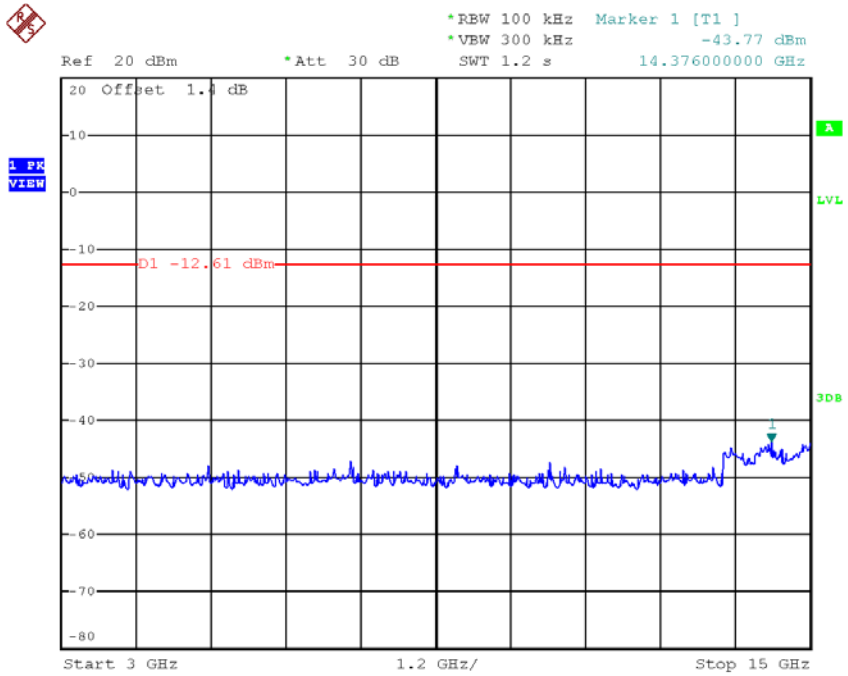


Date: 21.APR.2018 11:50:45

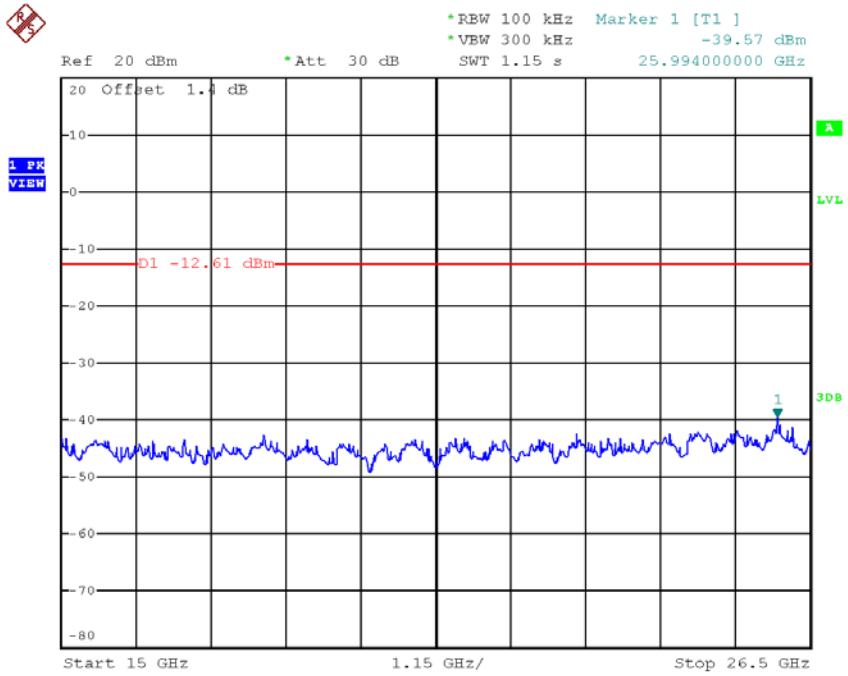
TX B mode CH01 (10 Harmonic of the frequency)



Date: 21.APR.2018 11:38:29

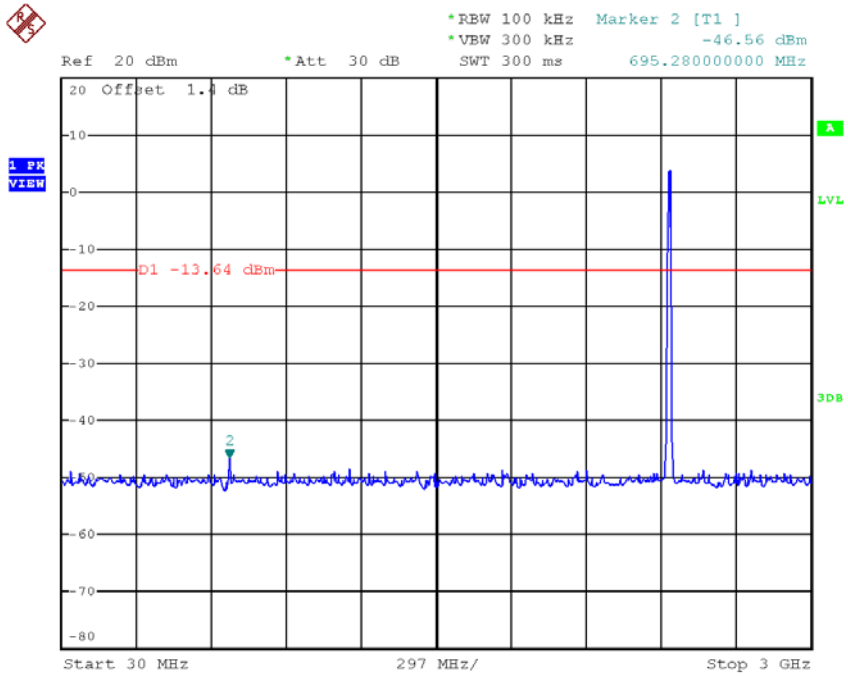


Date: 21.APR.2018 11:38:37

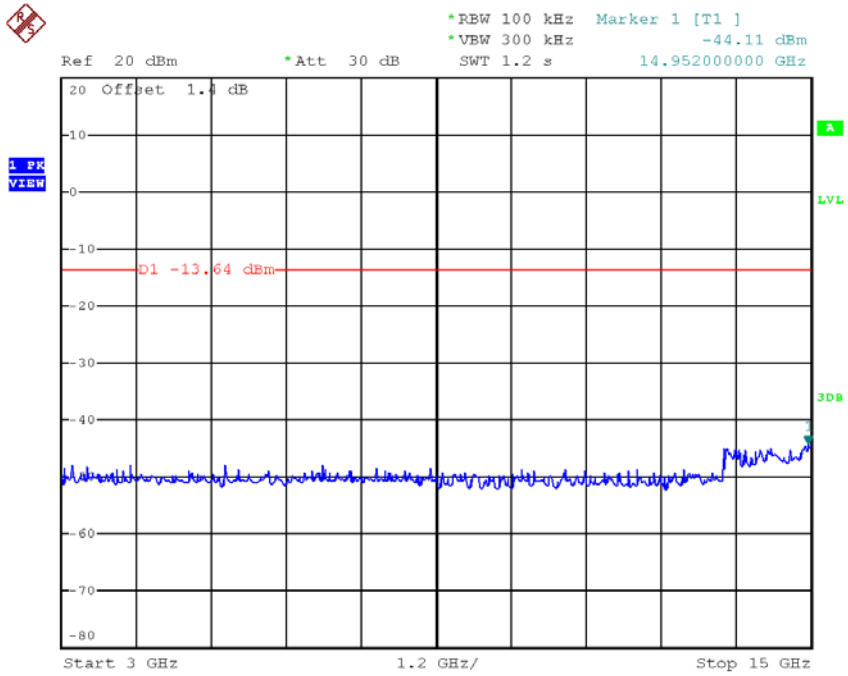


Date: 21.APR.2018 11:38:45

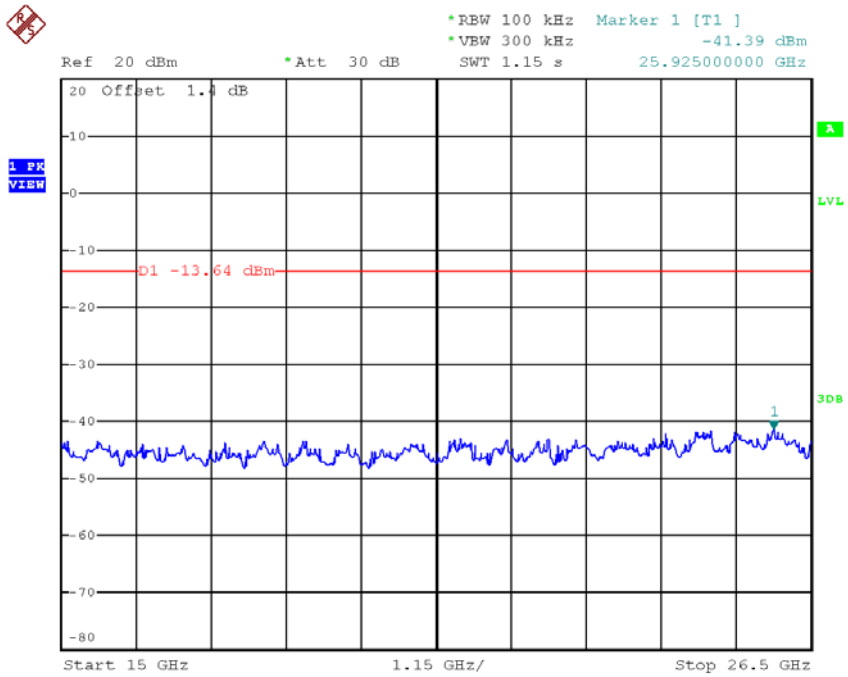
TX B mode CH06 (10 Harmonic of the frequency)



Date: 21.APR.2018 11:48:51

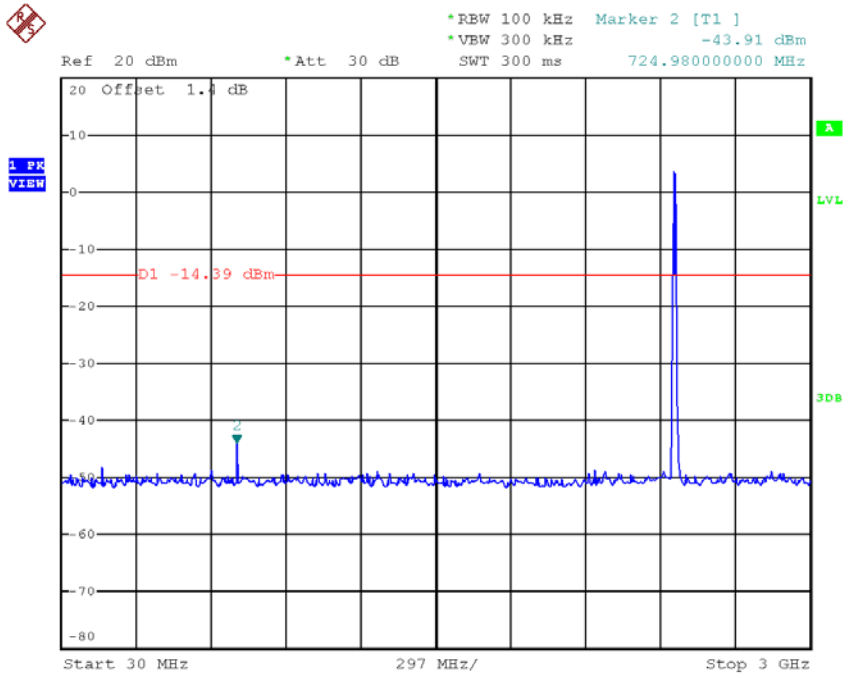


Date: 21.APR.2018 11:48:59

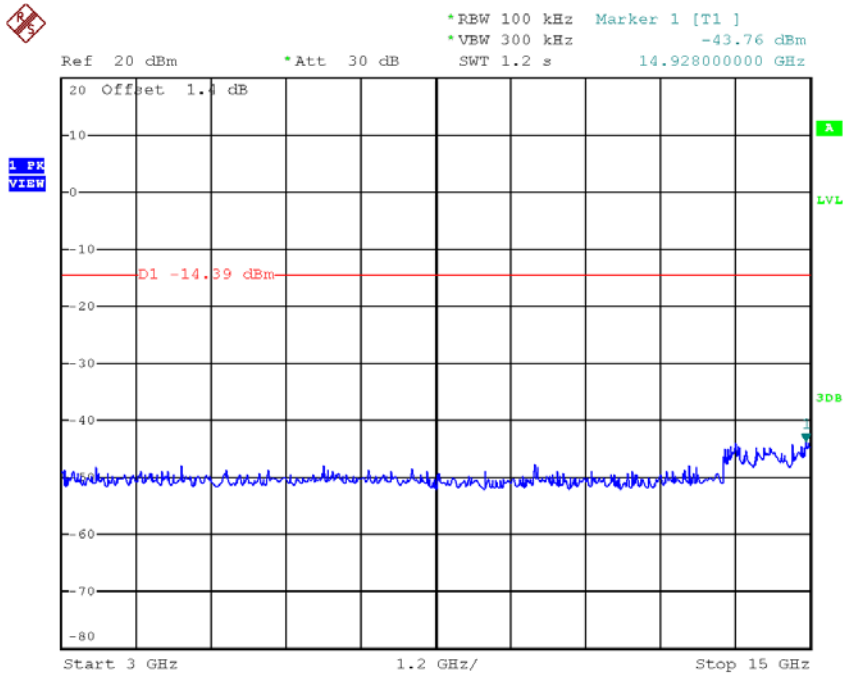


Date: 21.APR.2018 11:49:07

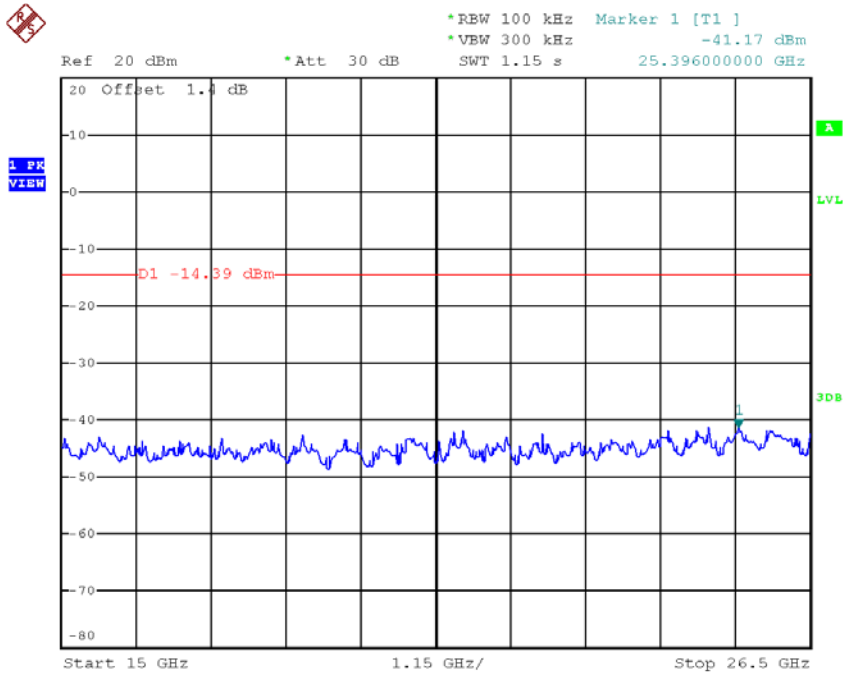
TX B mode CH11 (10 Harmonic of the frequency)



Date: 21.APR.2018 11:50:59



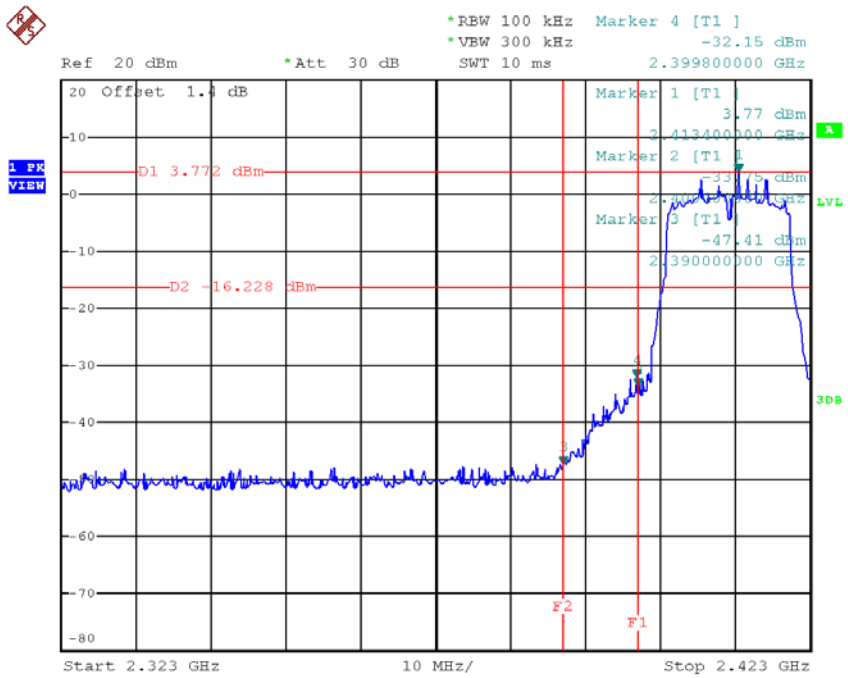
Date: 21.APR.2018 11:51:07



Date: 21.APR.2018 11:51:15

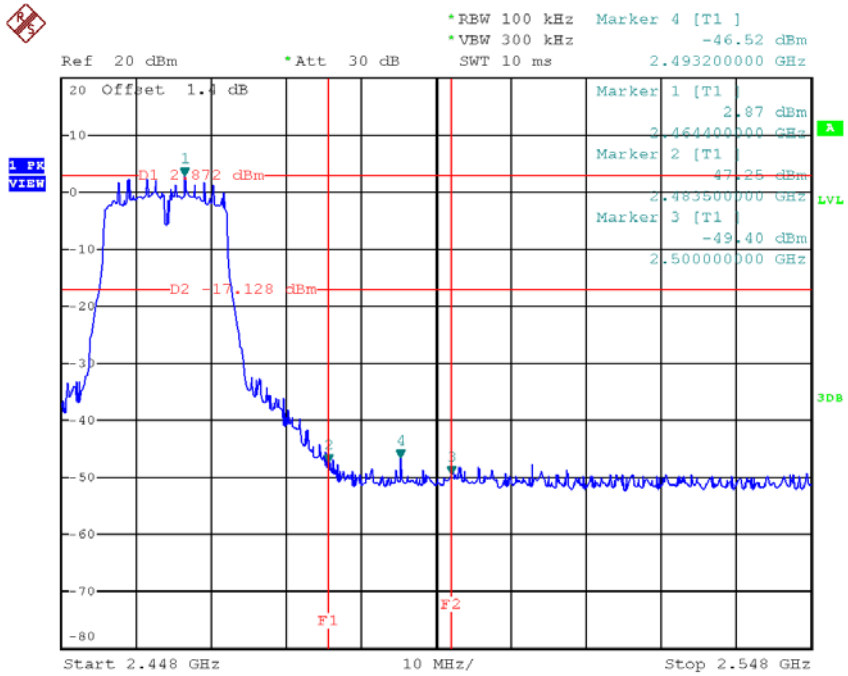
Test Mode :	TX G Mode

TX G mode CH01



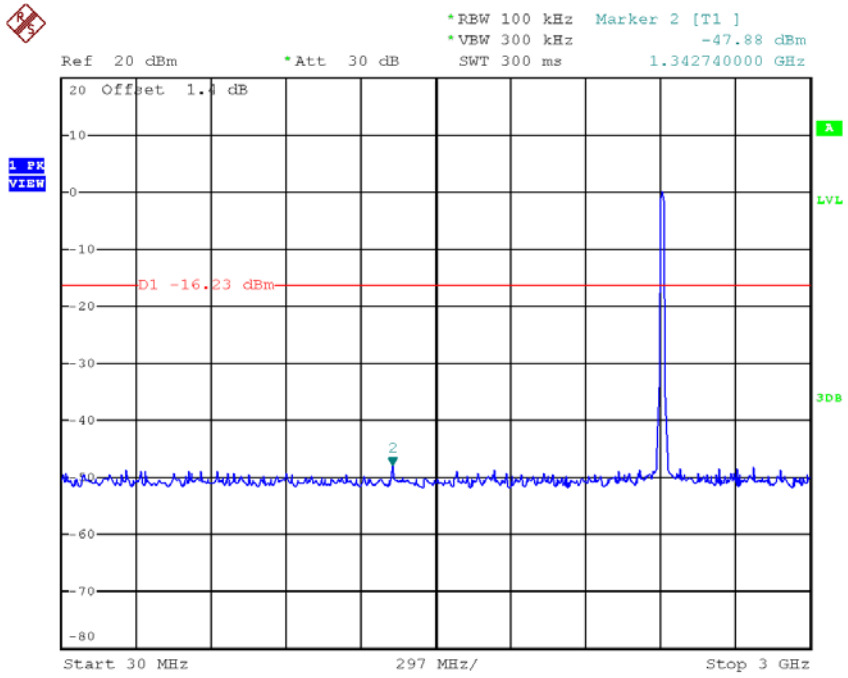
Date: 21.APR.2018 11:54:52

TX G mode CH11

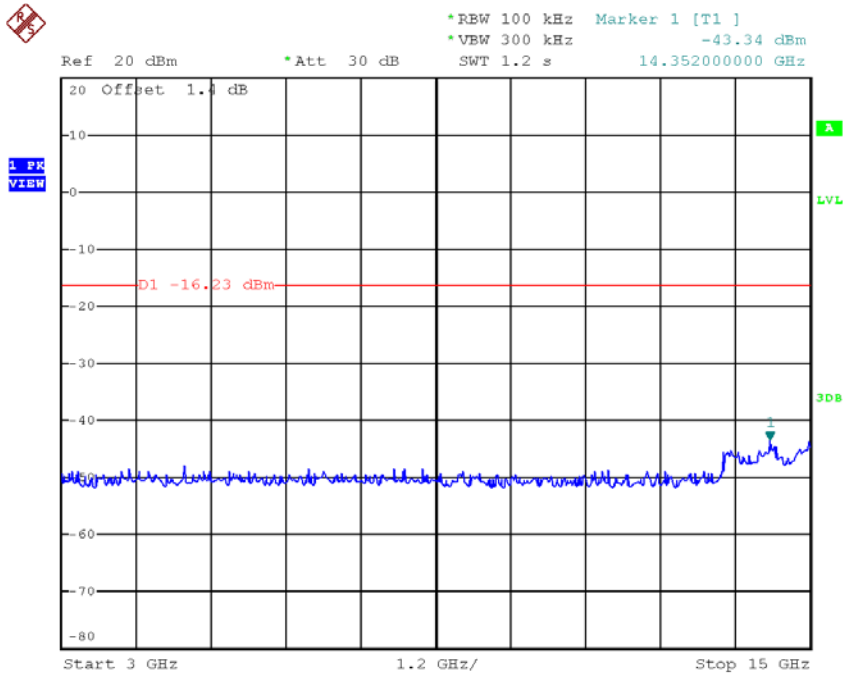


Date: 21.APR.2018 13:39:21

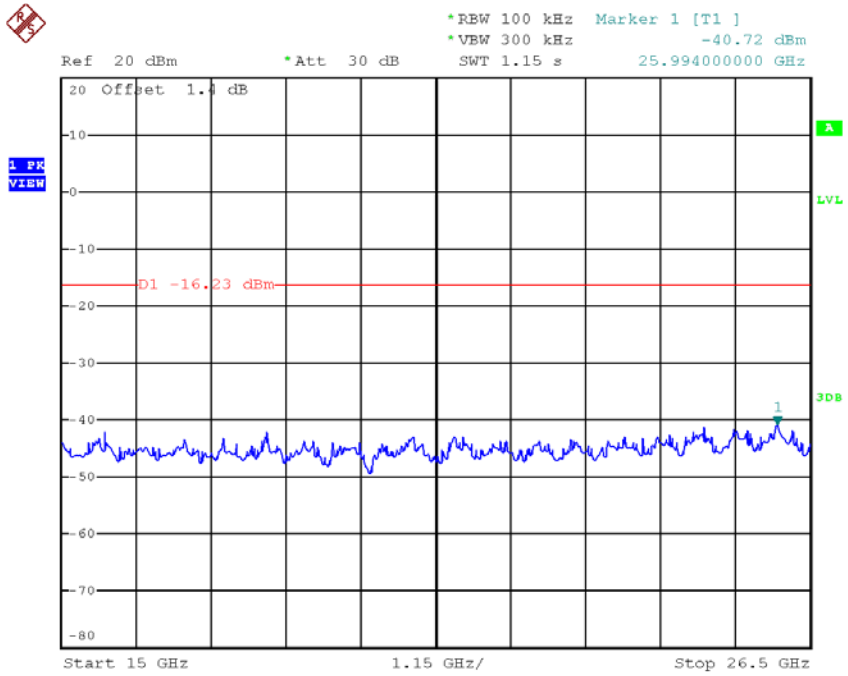
TX G mode CH01 (10 Harmonic of the frequency)



Date: 21.APR.2018 11:55:06

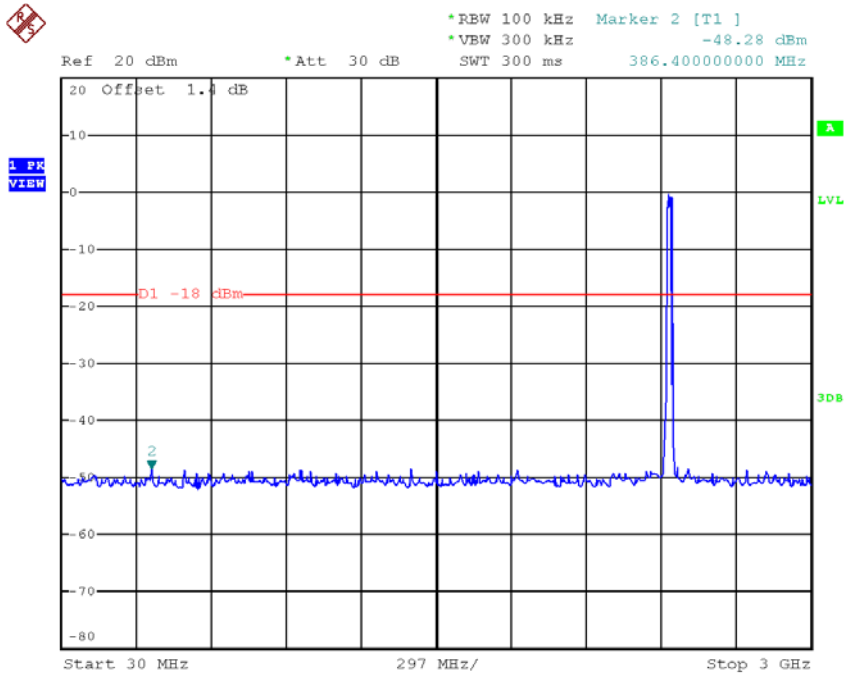


Date: 21.APR.2018 11:55:14

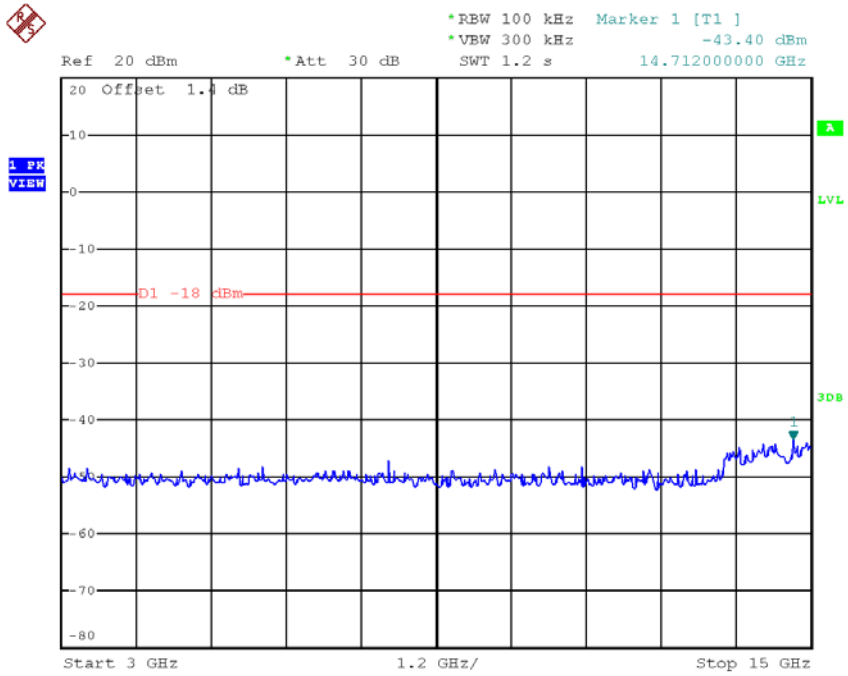


Date: 21.APR.2018 11:55:22

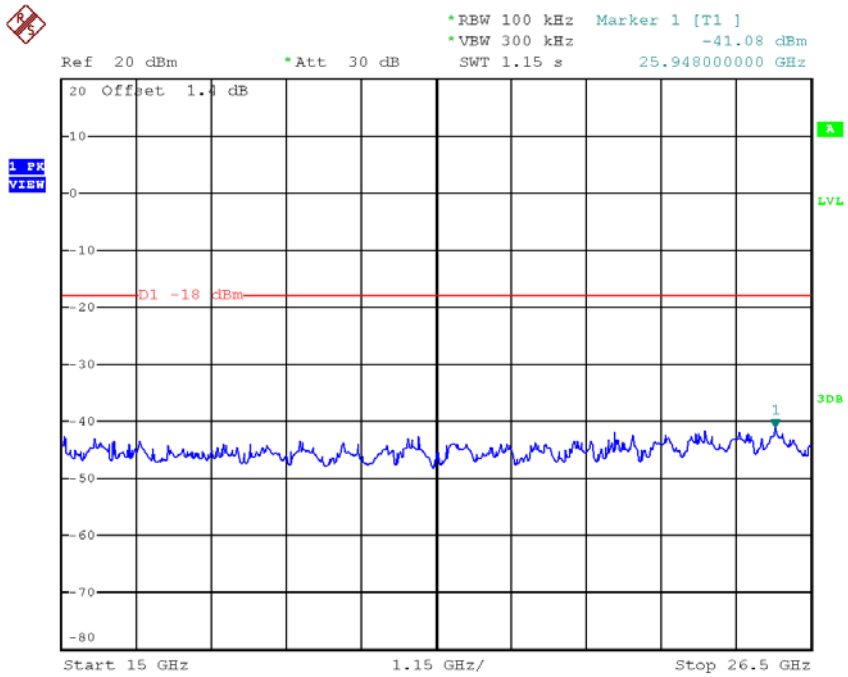
TX G mode CH06 (10 Harmonic of the frequency)



Date: 21.APR.2018 13:37:54

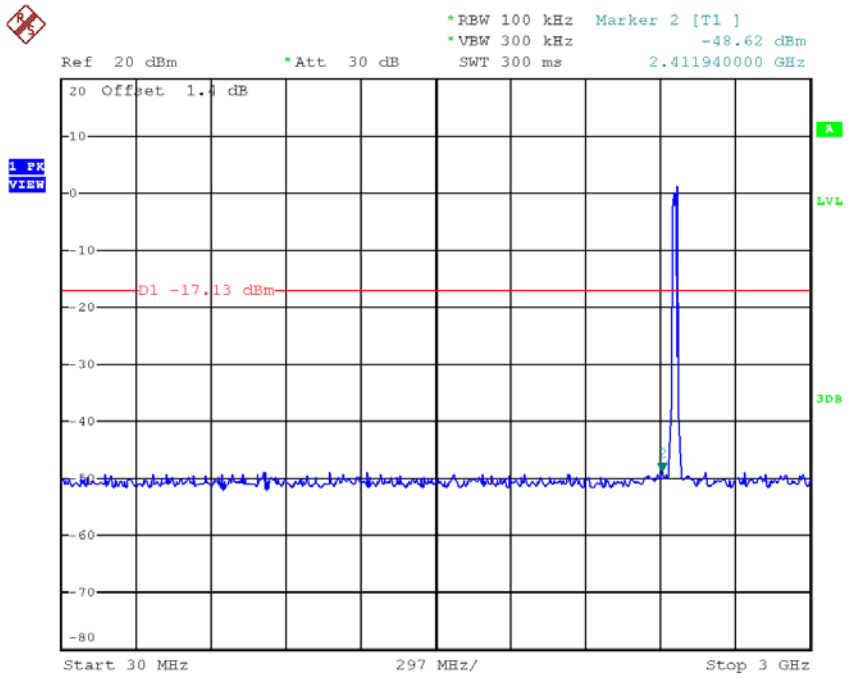


Date: 21.APR.2018 13:38:02

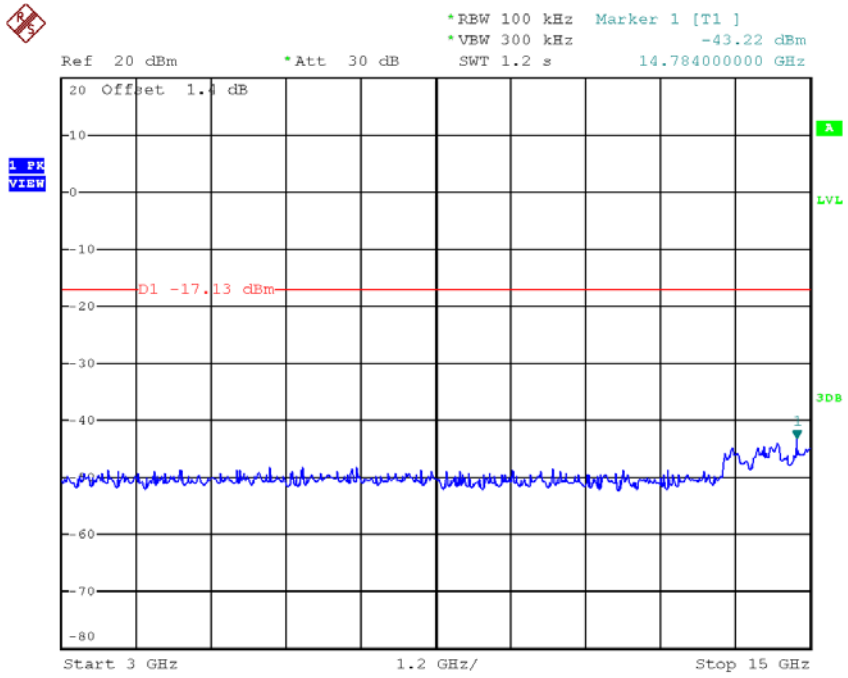


Date: 21.APR.2018 13:38:10

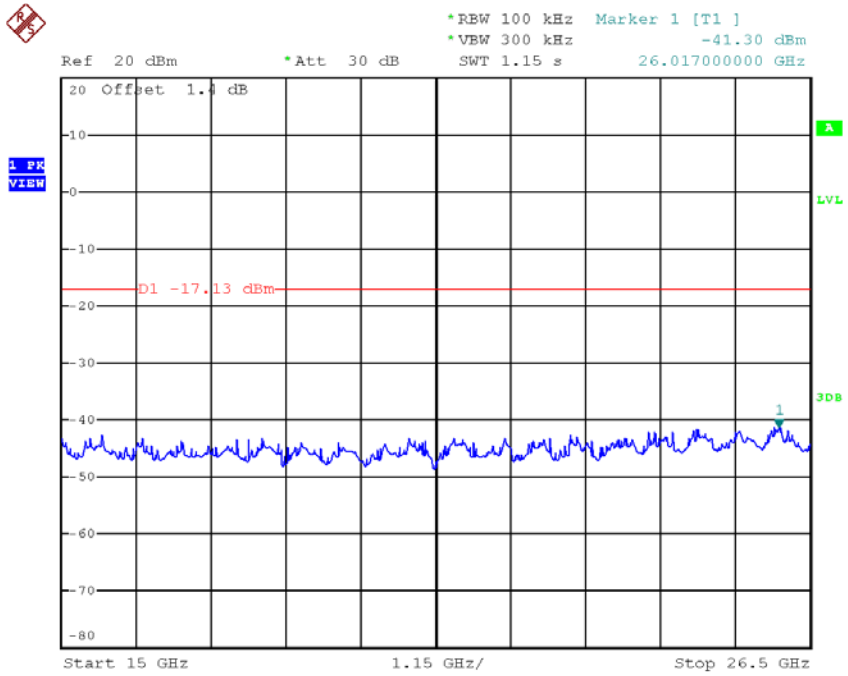
TX G mode CH11 (10 Harmonic of the frequency)



Date: 21.APR.2018 13:39:35



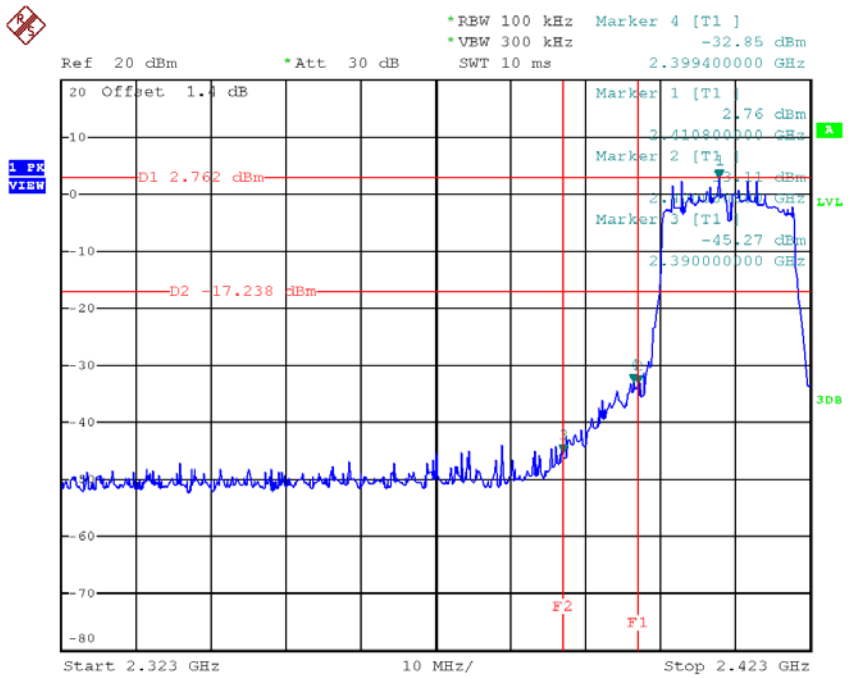
Date: 21.APR.2018 13:39:43



Date: 21.APR.2018 13:39:51

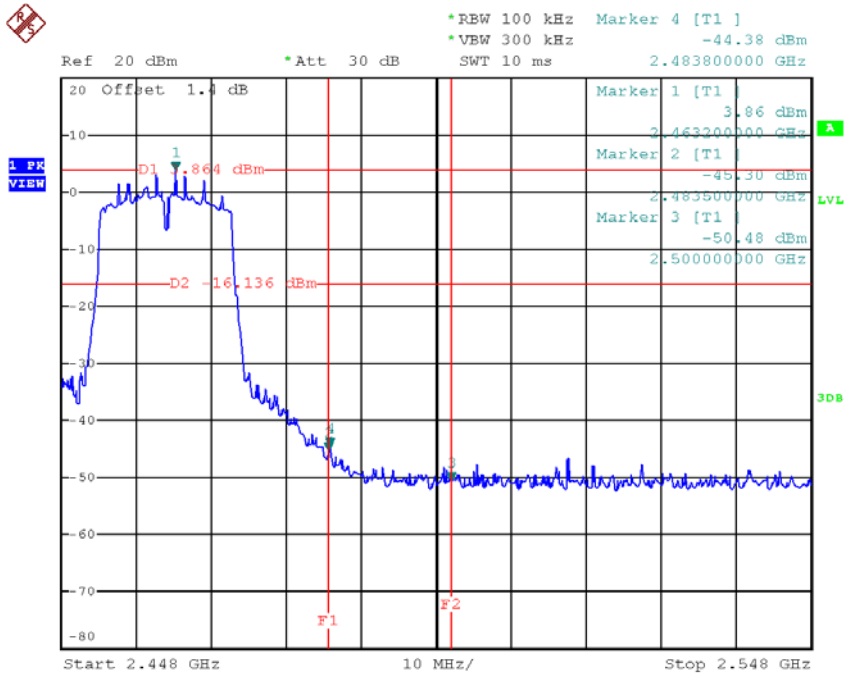
Test Mode :	TX N-20M Mode

TX HT20 mode CH01



Date: 21.APR.2018 13:41:07

TX HT20 mode CH11



Date: 21.APR.2018 13:43:59