FCC Radio Test Report

FCC ID: T58WF2780R

This report concerns (check one): ■ **Original Grant** □ **Class II Change**

Issued Date : Apr. 10, 2014
Project No. : 1402C047
Equipment : AC1200 Wireless Dual Band Gigabit Router
Model Name : WF2780
Applicant : NETIS SYSTEMS CO., LTD
Address : 4F&5F R&D Building, Oriental Cyberport, High-Tech Industrial Park, Nanshan, Shenzhen, China.

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Feb. 17, 2014
Date of Test: Feb. 17, 2014~ Apr. 09, 2014

Testing Engineer : (David Mao)

Technical Manager : (Leo Hung)

Authorized Signatory : (Steven Lu)

Neutron Engineering Inc.
No.3,Jinshagang 1st Road, ShiXia,
Dalang Town, Dong Guan, China.
TEL: 0769-8318-3000
FAX: 0769-8319-6000

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

Neutron'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. **Neutron** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **Neutron** issued reports.

Neutron's reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

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

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

Limitation

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

Table of Contents Page

1 . CERTIFICATION 6

2 . SUMMARY OF TEST RESULTS 7

2.1 TEST FACILITY 8

2.2 MEASUREMENT UNCERTAINTY 8

3 . GENERAL INFORMATION 9

3.1 GENERAL DESCRIPTION OF EUT 9

3.2 DESCRIPTION OF TEST MODES 11

3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING 12

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED 13

3.5 DESCRIPTION OF SUPPORT UNITS 13

4 . EMC EMISSION TEST 14

4.1 CONDUCTED EMISSION MEASUREMENT 14

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS 14

4.1.2 TEST PROCEDURE 14

4.1.3 DEVIATION FROM TEST STANDARD 14

4.1.4 TEST SETUP 15

4.1.5 EUT OPERATING CONDITIONS 15

4.1.6 EUT TEST CONDITIONS 15

4.1.7 TEST RESULTS 15

4.2 RADIATED EMISSION MEASUREMENT 18

4.2.1 RADIATED EMISSION LIMITS 18

4.2.2 TEST PROCEDURE 19

4.2.3 DEVIATION FROM TEST STANDARD 19

4.2.4 TEST SETUP 20

4.2.5 EUT OPERATING CONDITIONS 21

4.2.6 EUT TEST CONDITIONS 21

4.2.7 TEST RESULTS (9K~ 30MHZ) 22

4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHZ) 23

4.2.9 TEST RESULTS (ABOVE 1000 MHZ) 30

5 . BANDWIDTH TEST 59

5.1 APPLIED PROCEDURES 59

5.1.1 TEST PROCEDURE 59

5.1.2 DEVIATION FROM STANDARD 59

5.1.3 TEST SETUP 59

5.1.4 EUT OPERATION CONDITIONS 59

5.1.5 EUT TEST CONDITIONS 59

5.1.6 TEST RESULTS 60

Table of Contents Page

6 . MAXIMUM OUTPUT POWER TEST 68

6.1 APPLIED PROCEDURES / LIMIT 68

6.1.1 TEST PROCEDURE 68

6.1.2 DEVIATION FROM STANDARD 68

6.1.3 TEST SETUP 68

6.1.4 EUT OPERATION CONDITIONS 68

6.1.5 EUT TEST CONDITIONS 68

6.1.6 TEST RESULTS 69

7 . ANTENNA CONDUCTED SPURIOUS EMISSION 72

7.1 APPLIED PROCEDURES / LIMIT 72

7.1.1 TEST PROCEDURE 72

7.1.2 DEVIATION FROM STANDARD 72

7.1.3 TEST SETUP 72

7.1.4 EUT OPERATION CONDITIONS 72

7.1.5 EUT TEST CONDITIONS 72

7.1.6 TEST RESULTS 73

8 . POWER SPECTRAL DENSITY TEST 103

8.1 APPLIED PROCEDURES / LIMIT 103

8.1.1 TEST PROCEDURE 103

8.1.2 DEVIATION FROM STANDARD 103

8.1.3 TEST SETUP 103

8.1.4 EUT OPERATION CONDITIONS 103

8.1.5 EUT TEST CONDITIONS 103

8.1.6 TEST RESULTS 104

9 . MEASUREMENT INSTRUMENTS LIST 118

10 . EUT TEST PHOTO 120

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
NEI-FCCP-1-1402C047	Original Issue.	Apr. 10, 2014

1. CERTIFICATION

Equipment	:	AC1200 Wireless Dual Band Gigabit Router
Brand Name	:	netis
Model Name	:	WF2780
Applicant	:	NETIS SYSTEMS CO., LTD
Manufacturer	:	Shenzhen Netcore Industrial Ltd.
Address	:	4F&5F R&D Building, Oriental Cyberport, High-Tech Industrial Park, Nanshan, Shenzhen, China.
Factory	:	Dongguan City Netcore Network Technology Co.,Ltd.
Address	:	No. 10-1, Sankeng Road, Qinghutou, Tangxia Town, Dongguan City
Date of Test	:	Feb. 17, 2014~ Apr. 09, 2014
Test Item	:	ENGINEERING SAMPLE
Standard(s)	:	FCC Part15, Subpart C(15.247) / ANSI C63.4-2009

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1402C047) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

Test result included in this report is only for the 2.4GHz part of the product.

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 **FCC**	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247(d)	Antenna conducted Spurious Emission	PASS	
15.247(a)(2)	6dB Bandwidth	PASS	
15.247(b)(3)	Peak Output Power	PASS	
15.247(e)	Power Spectral Density	PASS	
15.203	Antenna Requirement	PASS	
15.209/15.205	Transmitter Radiated Emissions	PASS	

NOTE:

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

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r01 (Measurement Guidelines of DTS)

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town, Dong Guan, China.523792
Neutron's test firm number for FCC: 319330

2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U，(dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	AC1200 Wireless Dual Band Gigabit Router	
Brand Name	netis	
Model Name	WF2780	
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: 13.77 dBm 802.11g: 13.95 dBm 802.11n(20MHz): 15.79 dBm 802.11n(40MHz): 15.44 dBm
Power Source	DC voltage supplied from AC/DC adapter Brand / Model: tenpao / NT12V1AUL	
Power Rating	I/P AC 100-240V~0.3A 50/60Hz O/P DC 12V 1A	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the User's Manual.

2. CH 01 – CH 11 for 802.11b, 802.11g, 802.11n(20MHz)
   CH 03 – CH 09 for 802.11n(40MHz)

Channel List							
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.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	RF link	RF21C00072A	Dipole	N/A	5.42	TX/RX
2	RF link	RF21C00002A	Dipole	N/A	4.96	TX/RX

Note:
(1) The EUT incorporates a MIMO function. Physically, the EUT provides two completed two transmitters and two receivers (2T2R), all transmit signals are completely uncorrelated.

4.

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

3.2 DESCRIPTION OF TEST MODES

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

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

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

For Conducted Test	
Final Test Mode	Description
Mode 5	TX MODE

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

Note:

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

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

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

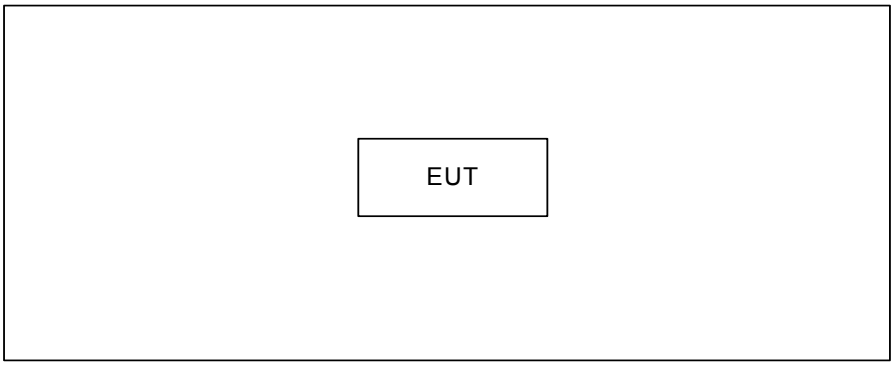
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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	Duck_1_1-9		
Frequency	**2412 MHz**	**2437 MHz**	**2462 MHz**
IEEE 802.11b DSSS	26	26	26
IEEE 802.11g OFDM	20	19	19

Test software version	Duck_1_1-9		
Frequency (MHz)	**2412 MHz**	**2437 MHz**	**2462 MHz**
IEEE 802.11n (20MHz)	22	22	21
Frequency (MHz)	**2422 MHz**	**2437 MHz**	**2452 MHz**
IEEE 802.11n (40MHz)	22	22	22

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/IC	Series No.	Note
-	-	-	-	-	-	

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

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

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

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

4.1.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

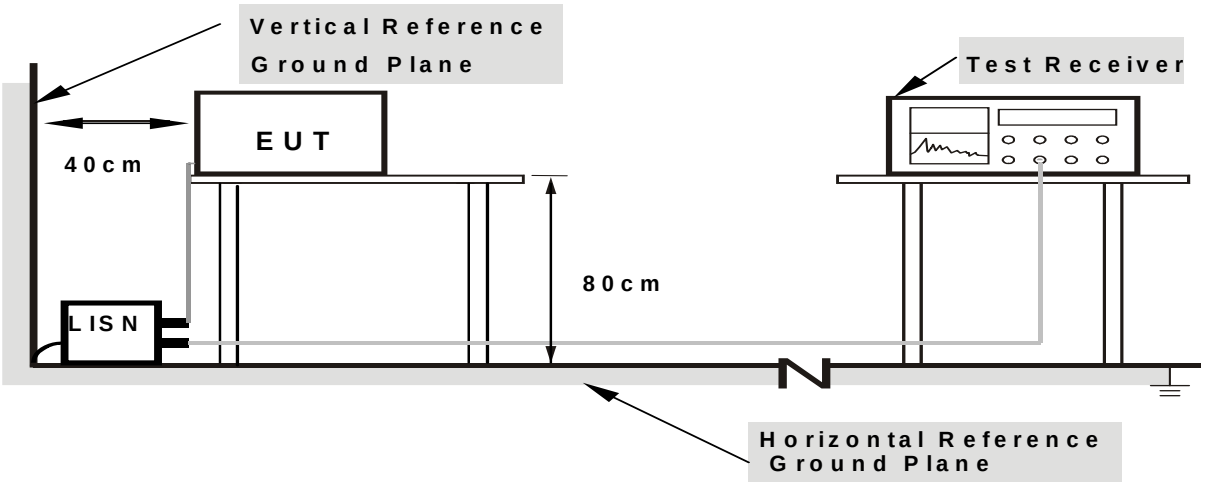
d. LISN at least 80 cm from nearest part of EUT chassis.

e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.1.3 DEVIATION FROM TEST STANDARD

No deviation

4.1.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

4.1.6 EUT TEST CONDITIONS

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

4.1.7 TEST RESULTS

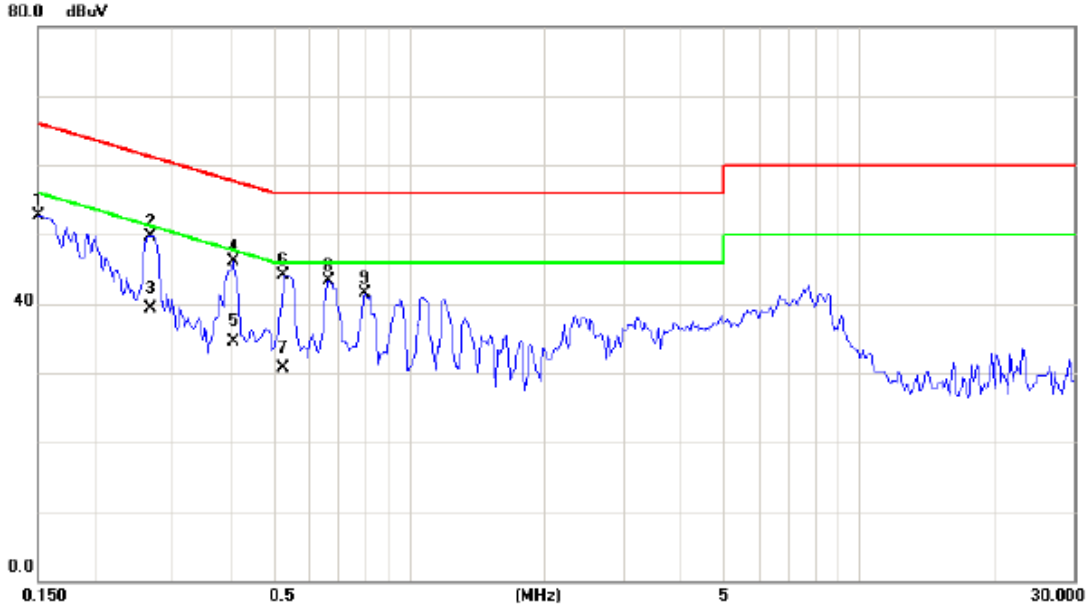
Remark:

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

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

Test Mode :	TX MODE

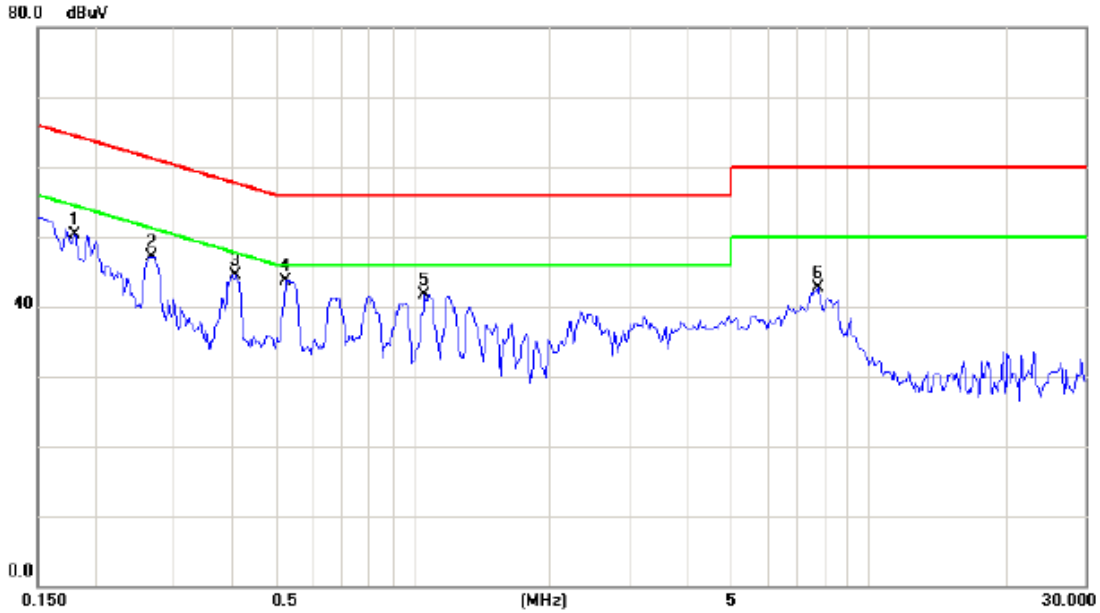
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	43.24	9.49	52.73	66.00	-13.27	peak	
2	*	0.2672	40.12	9.52	49.64	61.20	-11.56	peak	
3		0.2672	29.80	9.52	39.32	51.20	-11.88	AVG	
4		0.4078	36.46	9.56	46.02	57.69	-11.67	peak	
5		0.4078	24.90	9.56	34.46	47.69	-13.23	AVG	
6		0.5290	34.54	9.59	44.13	56.00	-11.87	peak	
7		0.5290	21.10	9.59	30.69	46.00	-15.31	AVG	
8		0.6617	33.70	9.61	43.31	56.00	-12.69	peak	
9		0.7984	31.94	9.62	41.56	56.00	-14.44	peak	

Test Mode :	TX MODE

Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1811	40.80	9.51	50.31	64.44	-14.13	peak	
2		0.2671	37.62	9.52	47.14	61.21	-14.07	peak	
3		0.4077	34.96	9.56	44.52	57.70	-13.18	peak	
4	*	0.5290	34.04	9.59	43.63	56.00	-12.37	peak	
5		1.0640	32.02	9.65	41.67	56.00	-14.33	peak	
6		7.7460	32.78	9.96	42.74	60.00	-17.26	peak	

4.2 RADIATED EMISSION MEASUREMENT

4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz-1000MHz)

20dB in any 100 KHz bandwidth outside the operating frequency band. 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.

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).

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

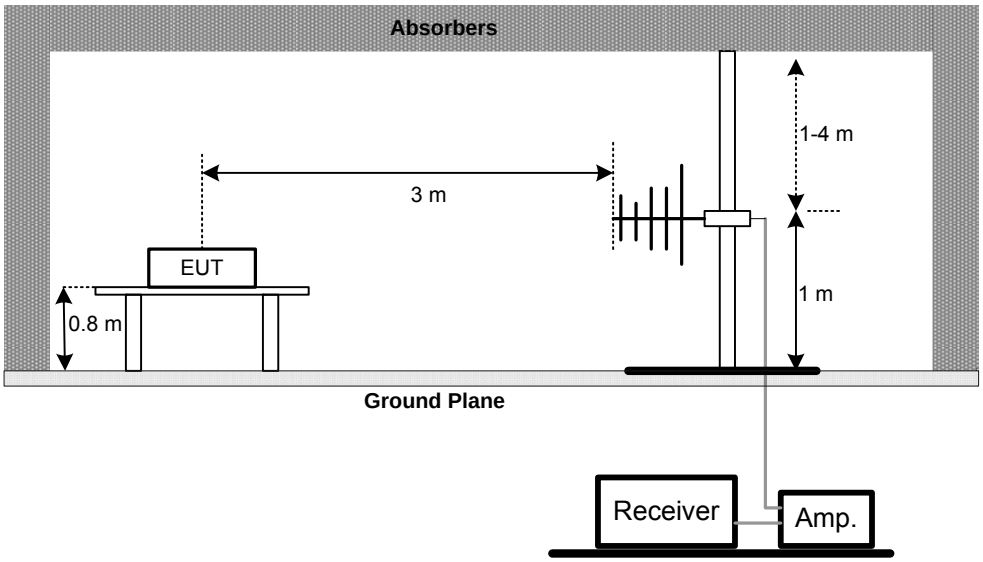
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter fully-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 0.8 m; 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. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

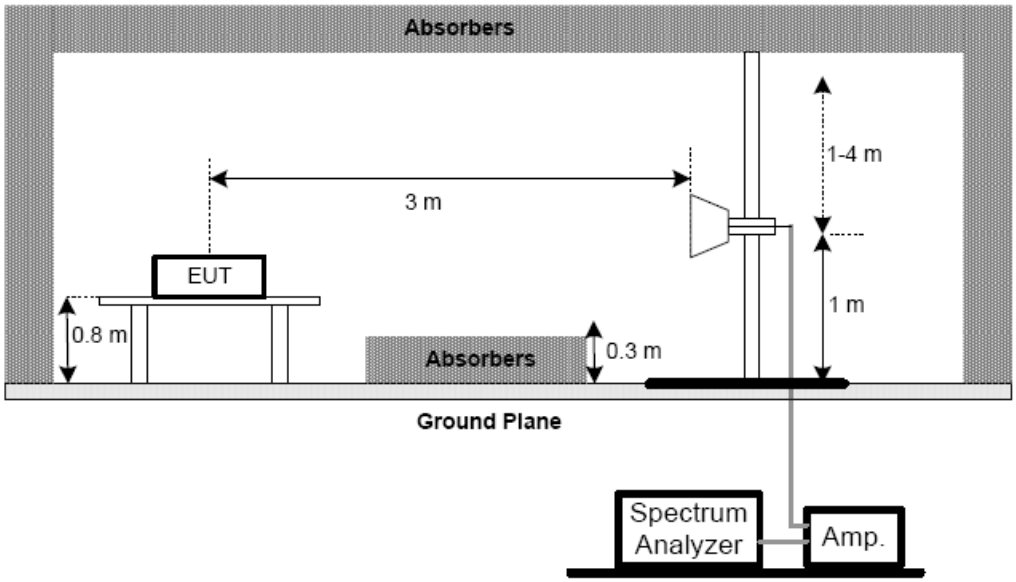
No deviation

4.2.4 TEST SETUP

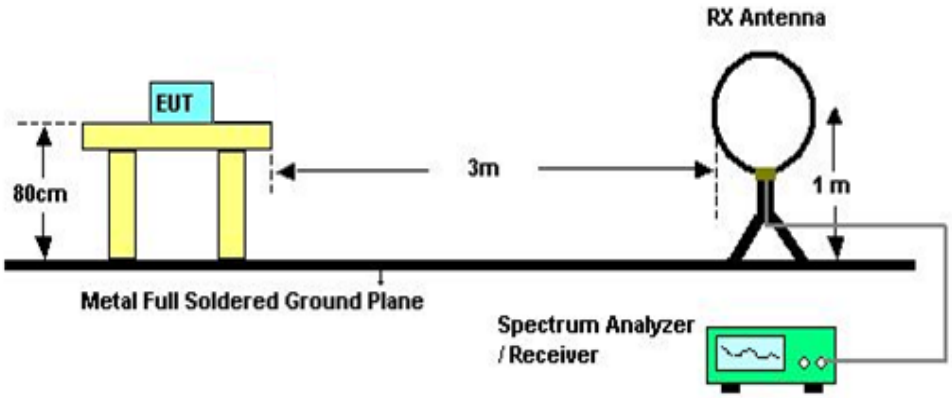
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



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



(C) For radiated emissions below 30MHz



4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

4.2.6 EUT TEST CONDITIONS

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

4.2.7 TEST RESULTS (9K~ 30MHZ)

Test Mode :	TX Mode 2412MHz

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0094	0°	68.34	24.30	92.64	128.10	-35.46	AV
0.0094	0°	72.31	24.30	96.61	148.10	-51.49	PK
0.0132	0°	70.37	24.30	94.67	125.19	-30.52	AV
0.0132	0°	79.33	24.30	103.63	145.19	-41.56	PK
0.0246	0°	56.36	24.01	80.37	119.79	-39.42	AV
0.0246	0°	60.12	24.01	84.13	139.79	-55.66	PK
0.0328	0°	61.37	23.49	84.86	117.29	-32.43	AV
0.0328	0°	65.34	23.49	88.83	137.29	-48.46	PK
0.5633	0°	18.76	20.00	38.76	72.59	-33.83	AVG
1.7556	0°	18.94	19.52	38.46	69.54	-31.08	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0094	90°	76.27	24.30	100.57	128.18	-27.61	AVG
0.0094	90°	82.33	24.30	106.63	148.18	-41.55	PK
0.0238	90°	56.54	24.06	80.60	120.07	-39.47	AVG
0.0238	90°	59.79	24.06	83.85	140.07	-56.22	PK
0.0317	90°	57.26	23.56	80.82	117.58	-36.76	AVG
0.0317	90°	58.38	23.56	81.94	137.58	-55.64	PK
0.0425	90°	59.47	22.88	82.35	115.04	-32.69	AVG
0.0425	90°	63.22	22.88	86.10	135.04	-48.94	PK
0.4918	90°	17.84	19.82	37.66	73.77	-36.11	AVG
1.7153	90°	18.56	19.53	38.09	69.54	-31.45	QP

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 (BETWEEN 30 – 1000 MHZ)

Remark:

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.

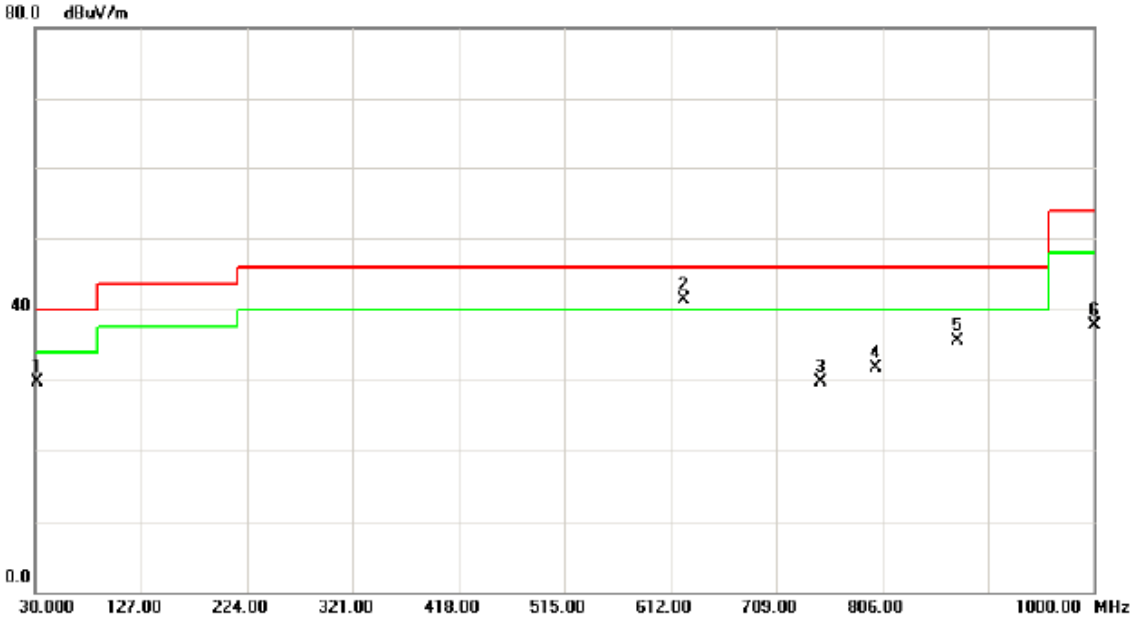
(2) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn‘t perform.

(3) Measuring frequency range from 30MHz to 1000MHz.

(4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

Test Mode:	TX B MODE CHANNEL 01

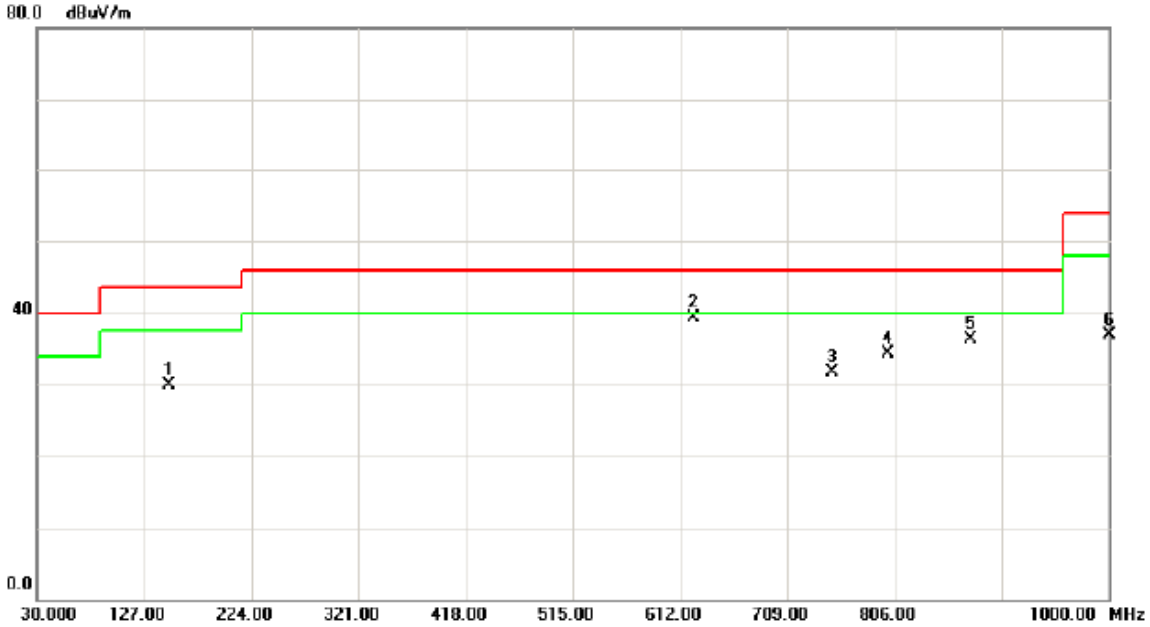
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		31.9400	44.53	-14.86	29.67	40.00	-10.33	peak	
2	*	624.6100	48.35	-7.06	41.29	46.00	-4.71	peak	
3		749.7400	35.06	-5.30	29.76	46.00	-16.24	peak	
4		800.1800	33.31	-1.62	31.69	46.00	-14.31	peak	
5		874.8700	37.28	-1.78	35.50	46.00	-10.50	peak	
6		1000.000	38.19	-0.54	37.65	54.00	-16.35	peak	

Test Mode:	TX B MODE CHANNEL 01

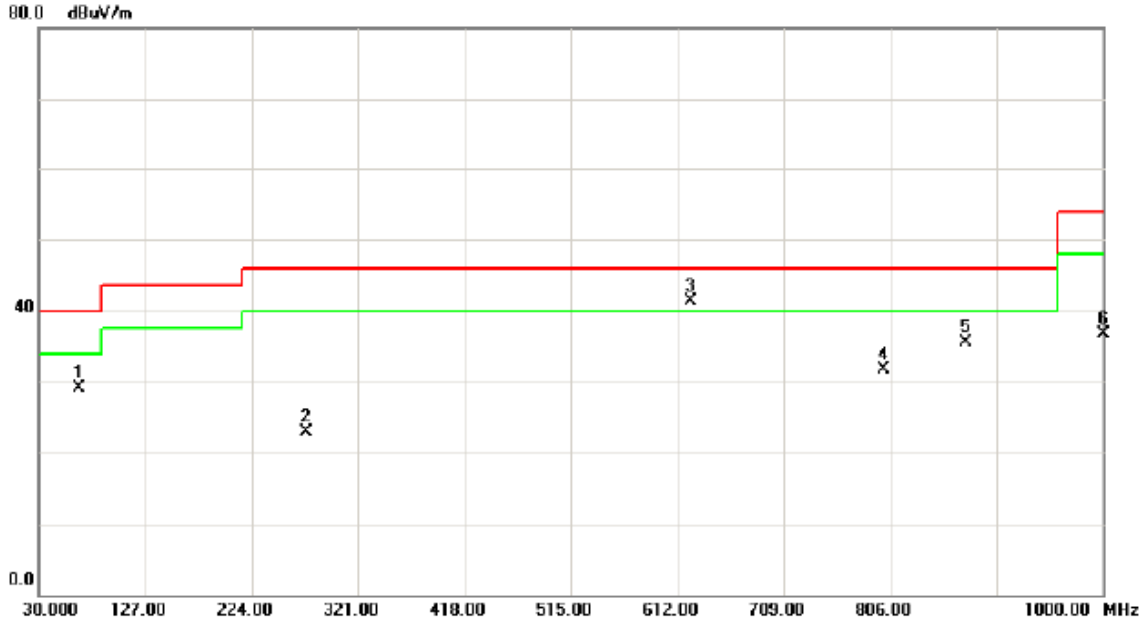
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		149.3100	43.42	-13.61	29.81	43.50	-13.69	peak	
2	*	624.6100	46.28	-7.06	39.22	46.00	-6.78	peak	
3		749.7400	36.97	-5.30	31.67	46.00	-14.33	peak	
4		800.1800	36.01	-1.62	34.39	46.00	-11.61	peak	
5		874.8700	38.03	-1.78	36.25	46.00	-9.75	peak	
6		1000.000	37.39	-0.54	36.85	54.00	-17.15	peak	

Test Mode:	TX B MODE CHANNEL 06

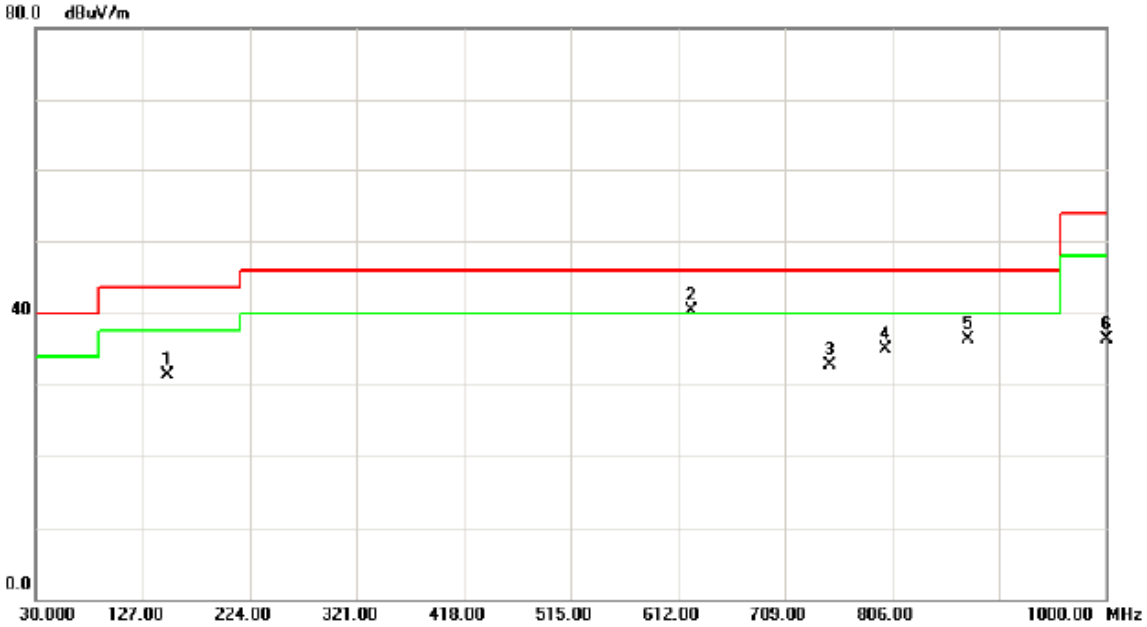
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		66.8600	44.40	-15.35	29.05	40.00	-10.95	peak	
2		273.4700	36.44	-13.55	22.89	46.00	-23.11	peak	
3	*	624.6100	48.35	-7.06	41.29	46.00	-4.71	peak	
4		800.1800	33.31	-1.62	31.69	46.00	-14.31	peak	
5		874.8700	37.28	-1.78	35.50	46.00	-10.50	peak	
6		1000.000	37.19	-0.54	36.65	54.00	-17.35	peak	

Test Mode:	TX B MODE CHANNEL 06

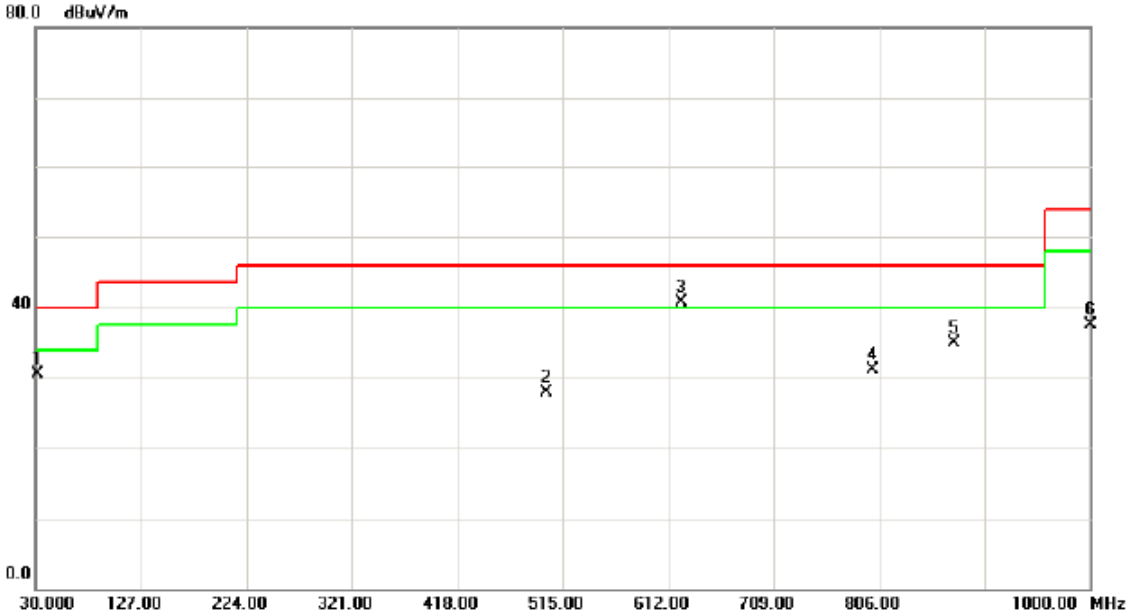
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		149.3100	44.93	-13.61	31.32	43.50	-12.18	peak	
2	*	624.6100	47.28	-7.06	40.22	46.00	-5.78	peak	
3		749.7400	37.97	-5.30	32.67	46.00	-13.33	peak	
4		800.1800	36.51	-1.62	34.89	46.00	-11.11	peak	
5		874.8700	38.03	-1.78	36.25	46.00	-9.75	peak	
6		1000.000	36.89	-0.54	36.35	54.00	-17.65	peak	

Test Mode:	TX B MODE CHANNEL 11

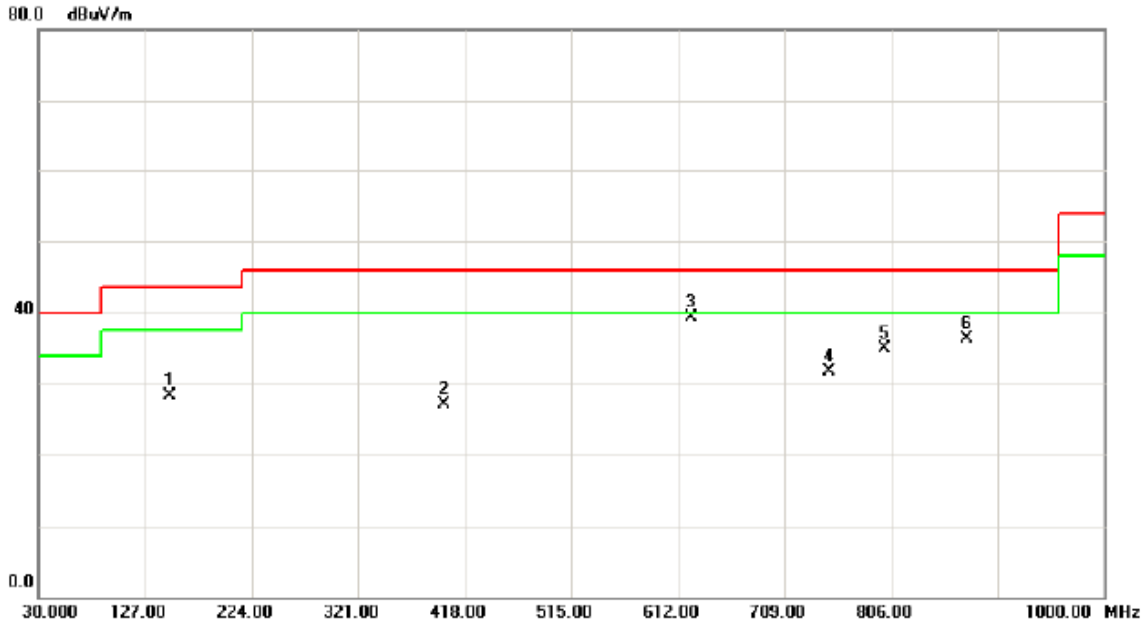
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		31.9400	45.42	-14.86	30.56	40.00	-9.44	peak	
2		500.4500	38.40	-10.50	27.90	46.00	-18.10	peak	
3	*	624.6100	47.75	-7.06	40.69	46.00	-5.31	peak	
4		800.1800	32.71	-1.62	31.09	46.00	-14.91	peak	
5		874.8700	36.68	-1.78	34.90	46.00	-11.10	peak	
6		1000.000	38.08	-0.54	37.54	54.00	-16.46	peak	

Test Mode:	TX B MODE CHANNEL 11

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		149.3100	41.93	-13.61	28.32	43.50	-15.18	peak	
2		398.6000	36.90	-9.82	27.08	46.00	-18.92	peak	
3	*	624.6100	46.28	-7.06	39.22	46.00	-6.78	peak	
4		749.7400	36.97	-5.30	31.67	46.00	-14.33	peak	
5		800.1800	36.51	-1.62	34.89	46.00	-11.11	peak	
6		874.8700	38.03	-1.78	36.25	46.00	-9.75	peak	

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Remark:

(1) 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.

(2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. ”F” denotes fundamental frequency; ”H” denotes spurious frequency; ”E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)

(3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.

(4) Data of measurement within this frequency range shown ” * ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

(5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

(6) EUT Orthogonal Axis:
”X” - denotes Laid on Table; ”Y” - denotes Vertical Stand; ”Z” - denotes Side Stand

(7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna

Test Mode :	TX B MODE 2412MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	22.10	11.99	34.09	56.19	46.08	74.00	54.00	X/E
2411.20	**V**	**66.27**	**64.42**	**34.16**	**100.43**	**98.58**			**X/F**
4824.00	V	43.83	42.19	6.43	50.26	48.62	74.00	54.00	X/H

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	21.14	11.95	34.09	55.23	46.04	74.00	54.00	X/E
2411.20	**H**	**60.76**	**58.88**	**34.16**	**94.92**	**93.04**			**X/F**
4824.00	H	39.77	37.26	6.43	46.20	43.69	74.00	54.00	X/H

Test Mode :	TX B MODE 2437MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2436.20	**V**	**66.04**	**64.20**	**34.23**	**100.27**	**98.43**			**X/F**
4874.01	V	47.74	42.07	6.58	54.32	48.65	74.00	54.00	X/H

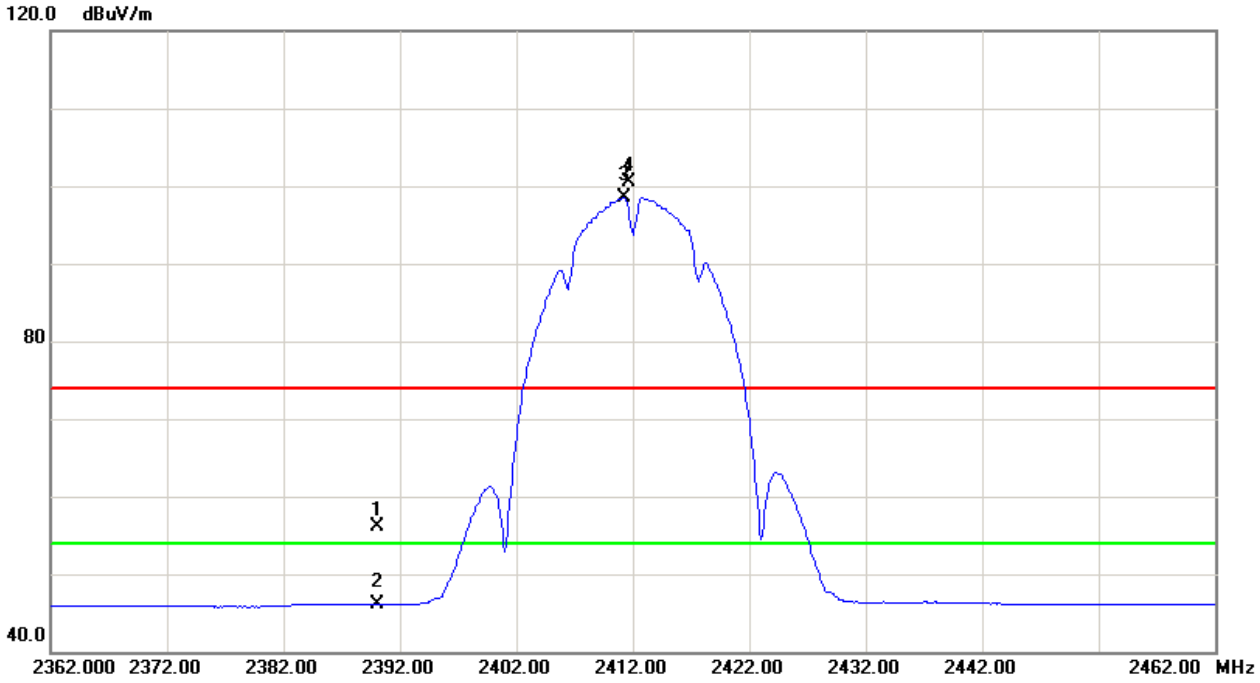
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2437.80	**H**	**60.78**	**58.86**	**34.23**	**95.01**	**93.09**			**X/F**
4874.01	H	49.33	43.01	6.58	55.91	49.59	74.00	54.00	X/H

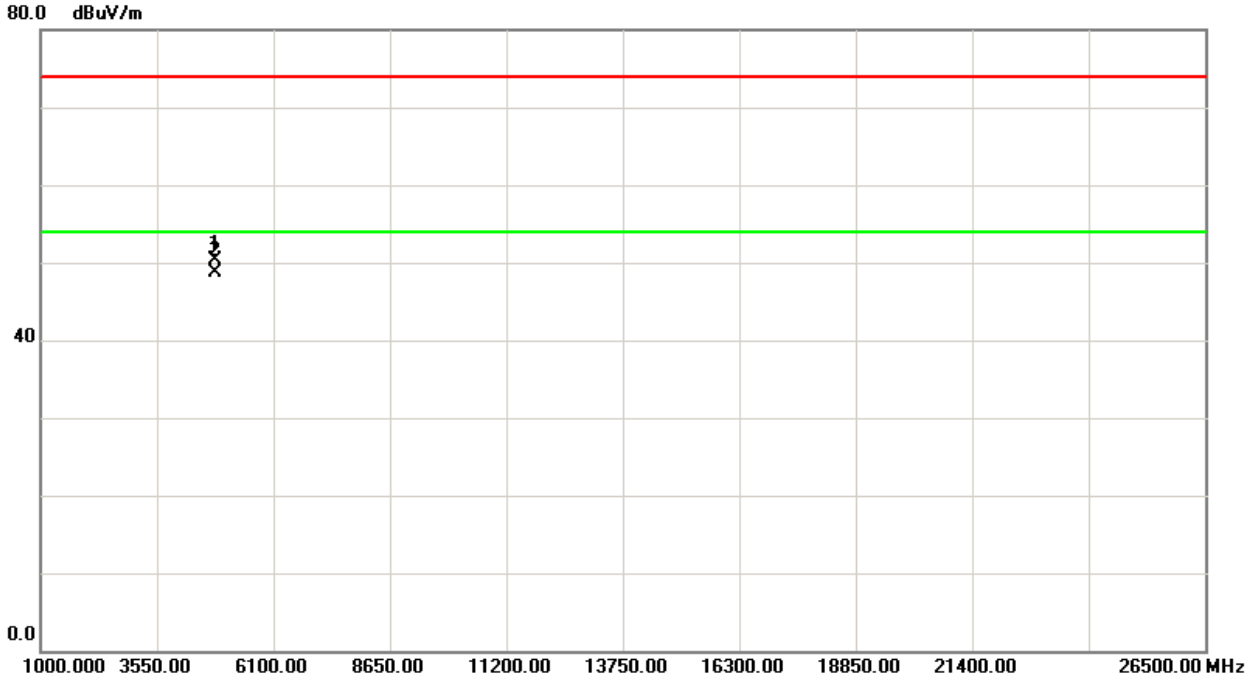
Test Mode :	TX B MODE 2462MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2461.10	**V**	**64.14**	**62.21**	**34.31**	**98.45**	**96.52**			**X/F**
2483.50	V	21.52	11.66	34.37	55.89	46.03	74.00	54.00	X/E
4924.13	V	48.14	42.63	6.72	54.86	49.35	74.00	54.00	X/H

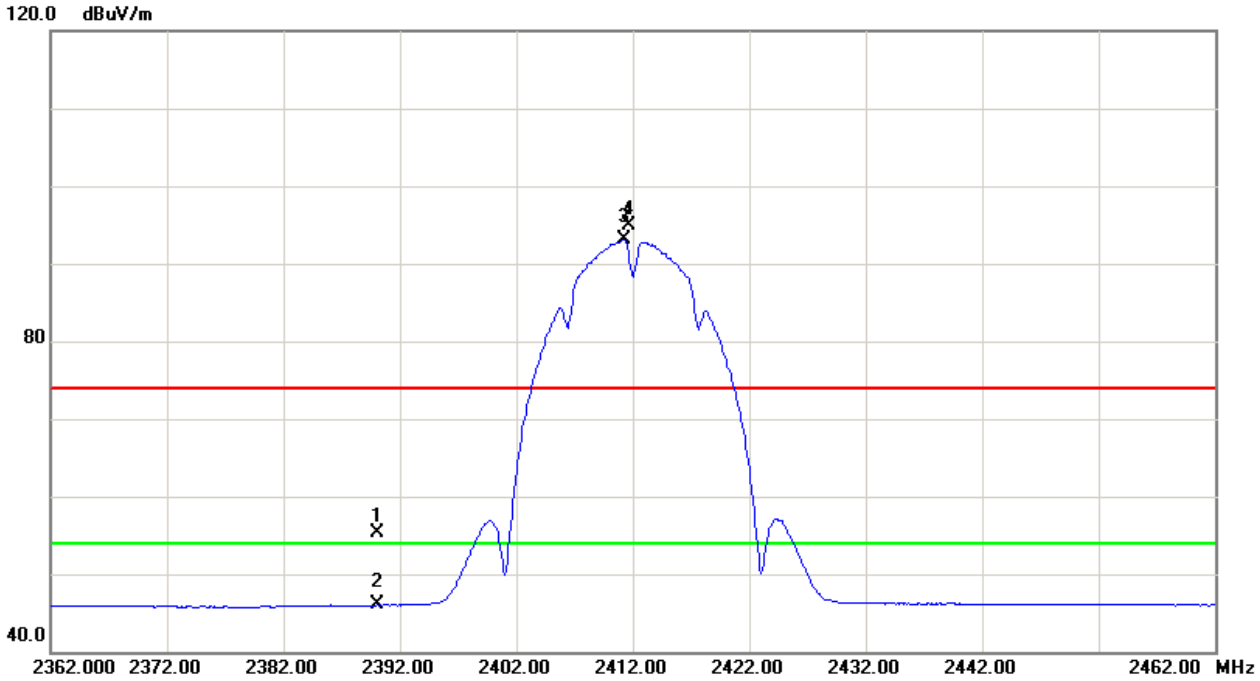
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2461.20	**H**	**60.55**	**58.63**	**34.31**	**94.86**	**92.94**			**X/F**
2483.50	H	20.08	11.66	34.37	54.45	46.03	74.00	54.00	X/E
4924.05	H	48.24	44.32	6.72	54.96	51.04	74.00	54.00	X/H

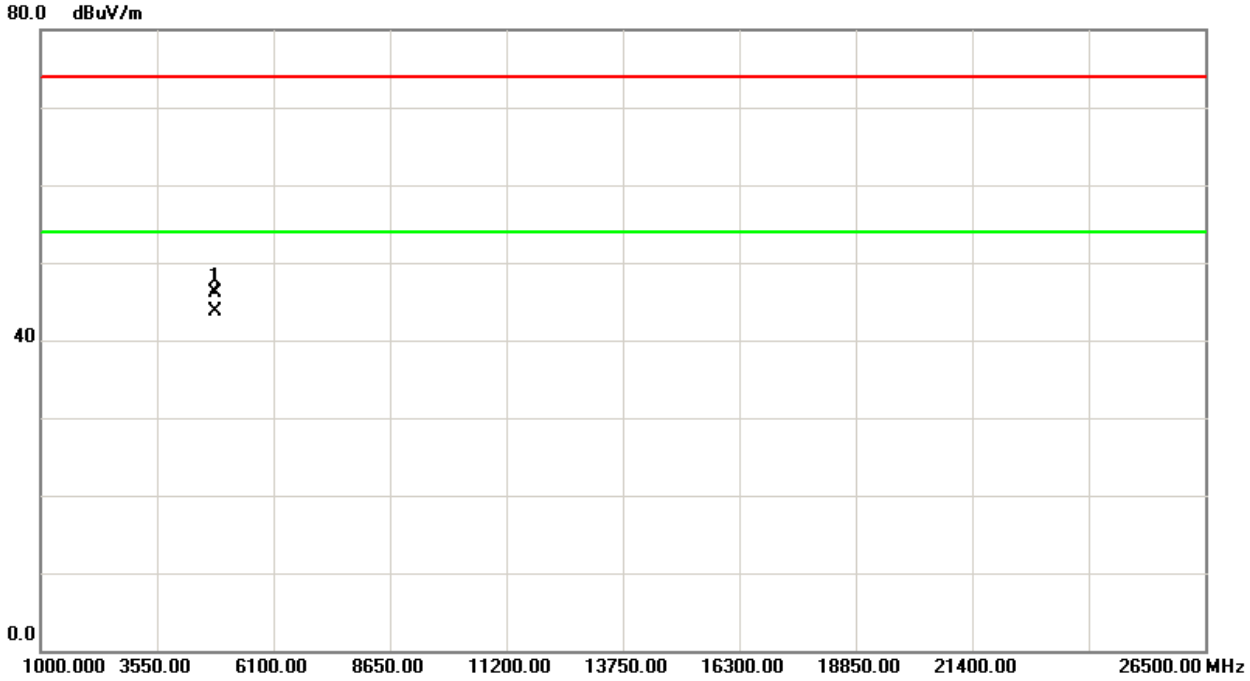
TX CH01 (Above 1000 MHz, Vertical)



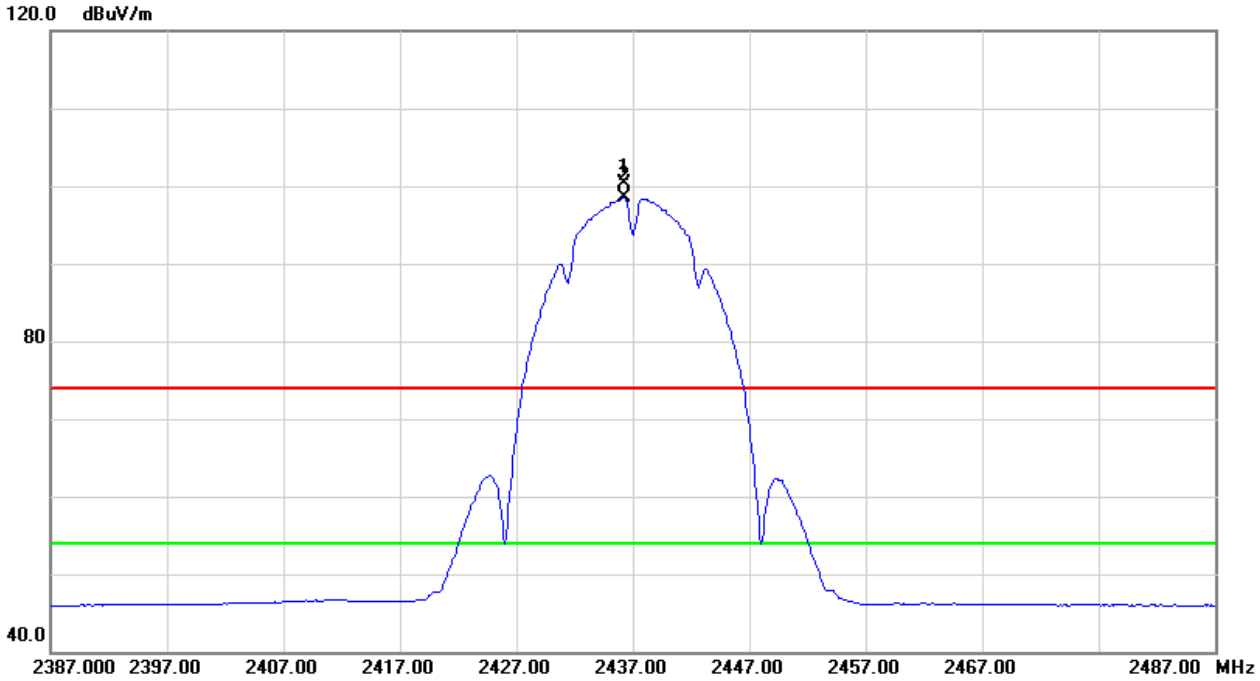


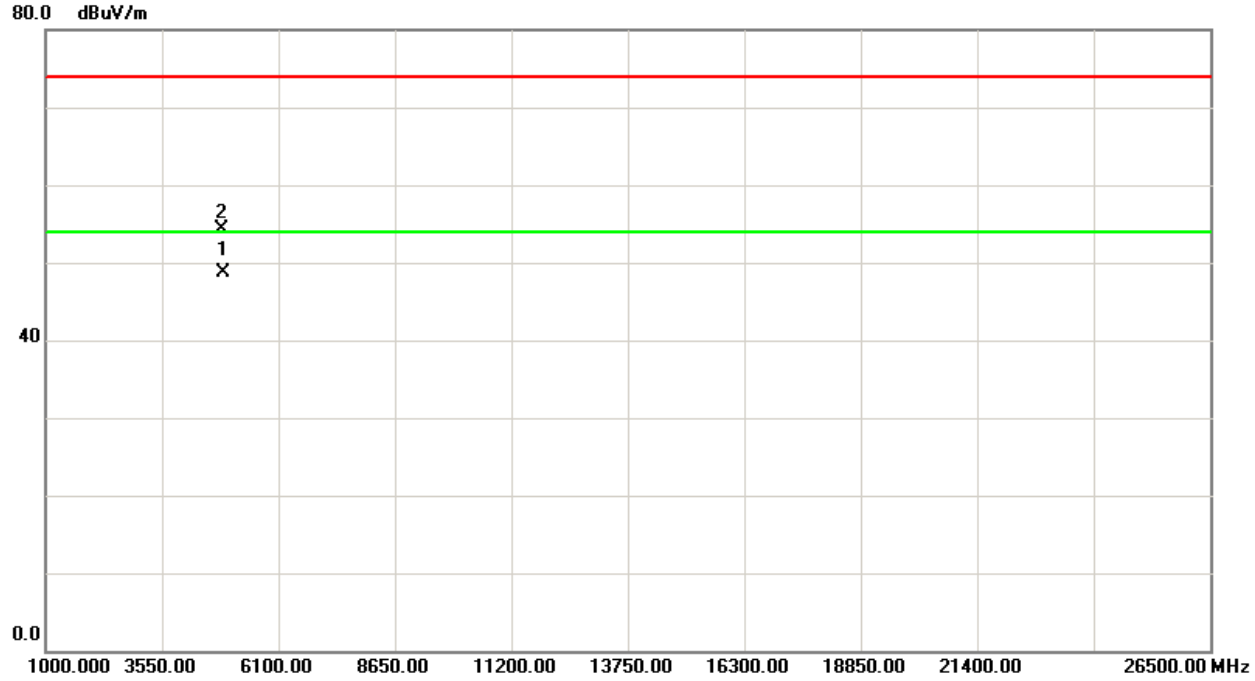
TX CH01 (Above 1000 MHz, Horizontal)



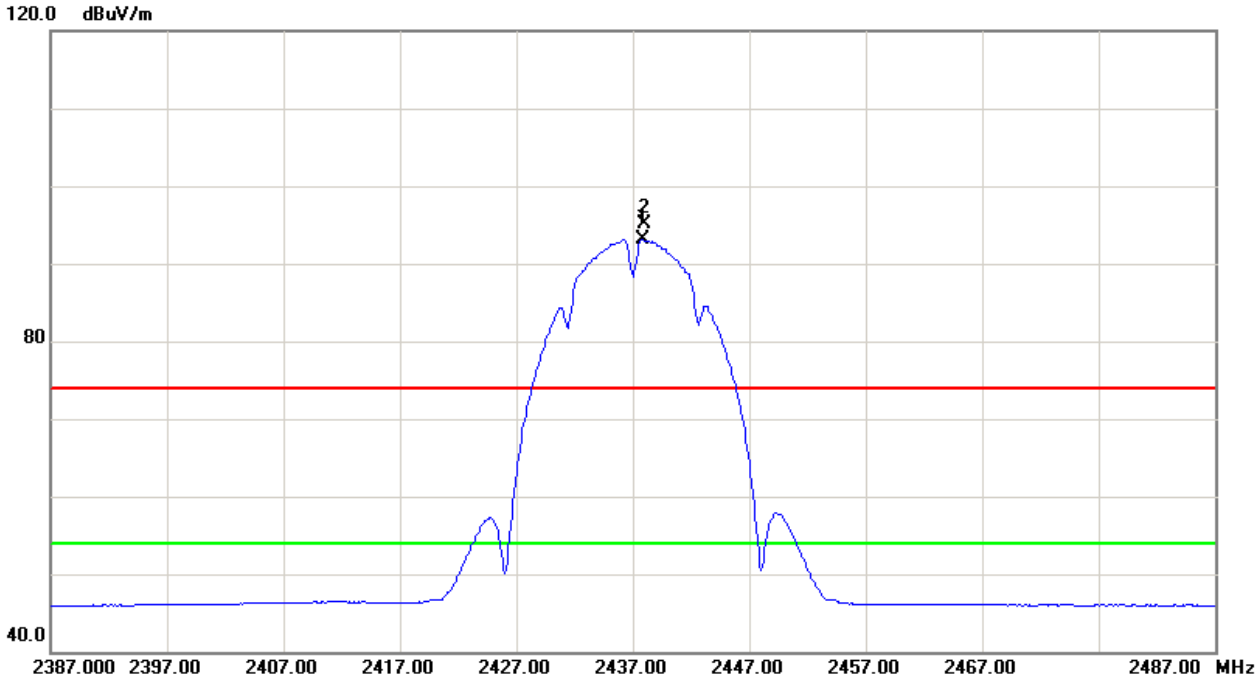


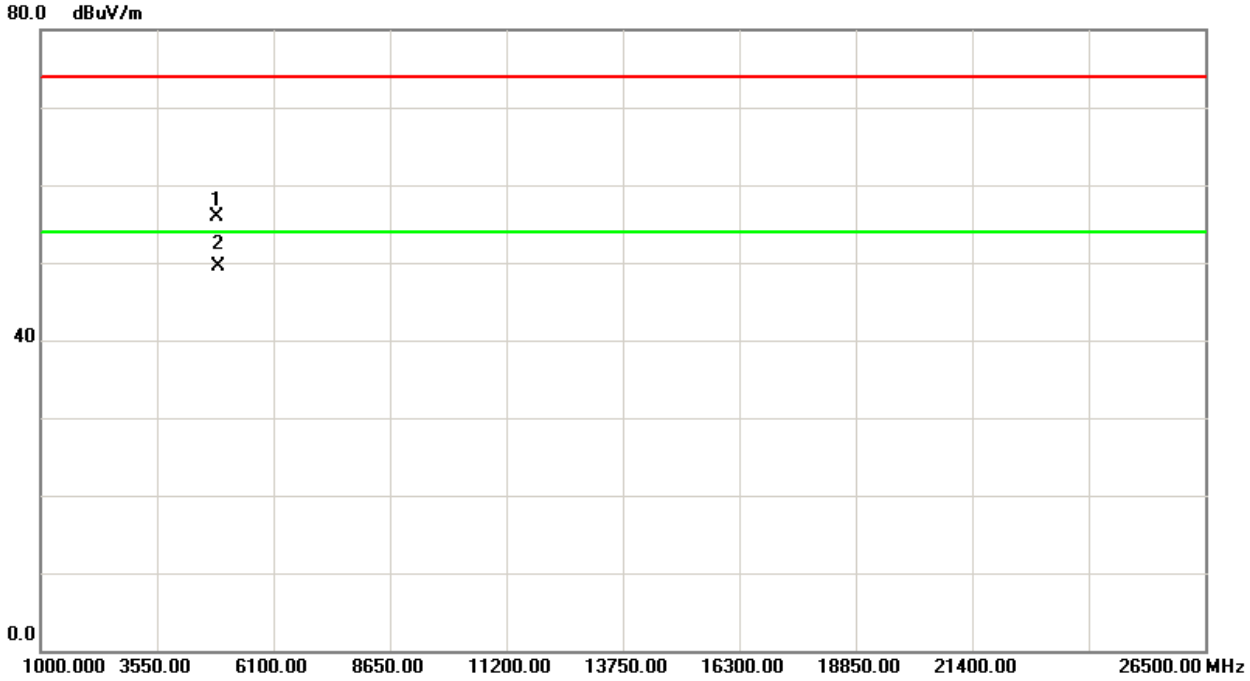
TX CH06 (Above 1000 MHz, Vertical)



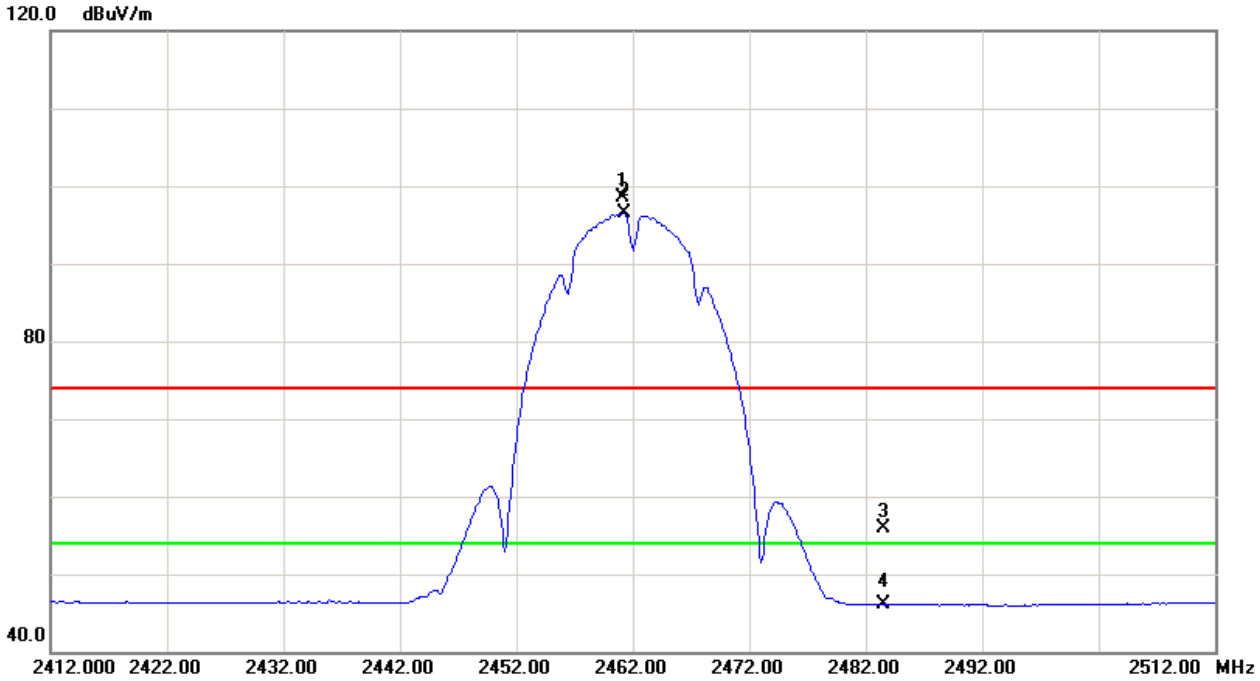


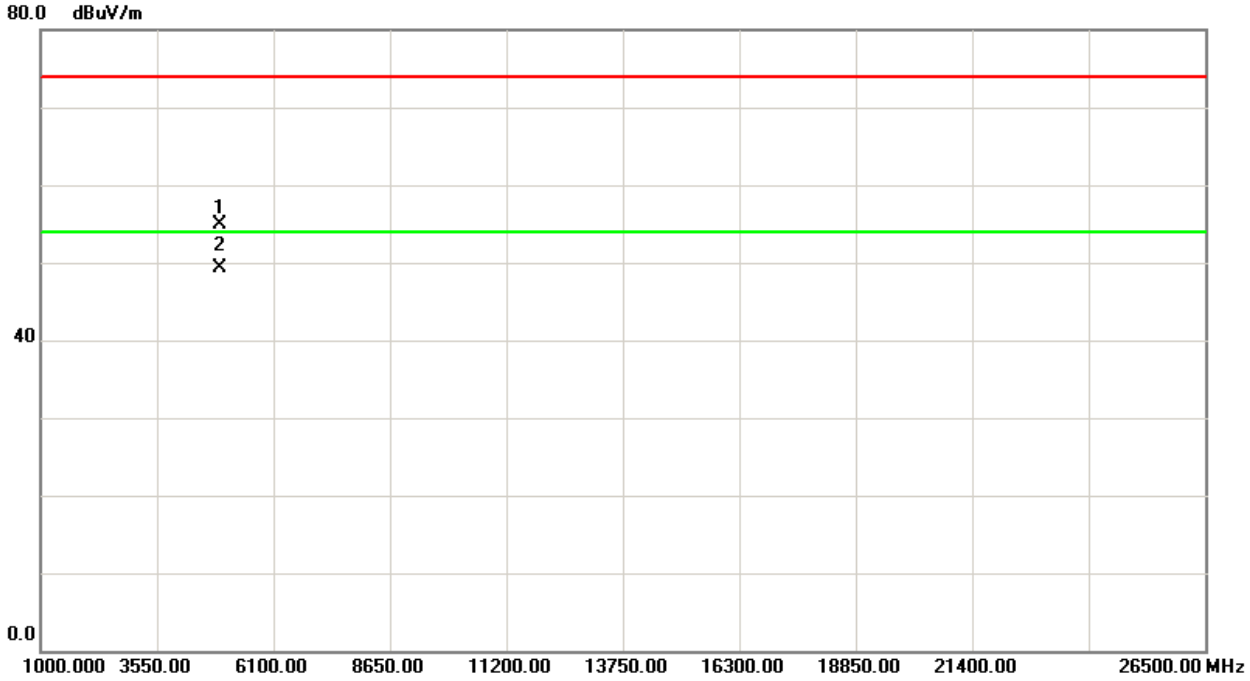
TX CH06 (Above 1000 MHz, Horizontal)



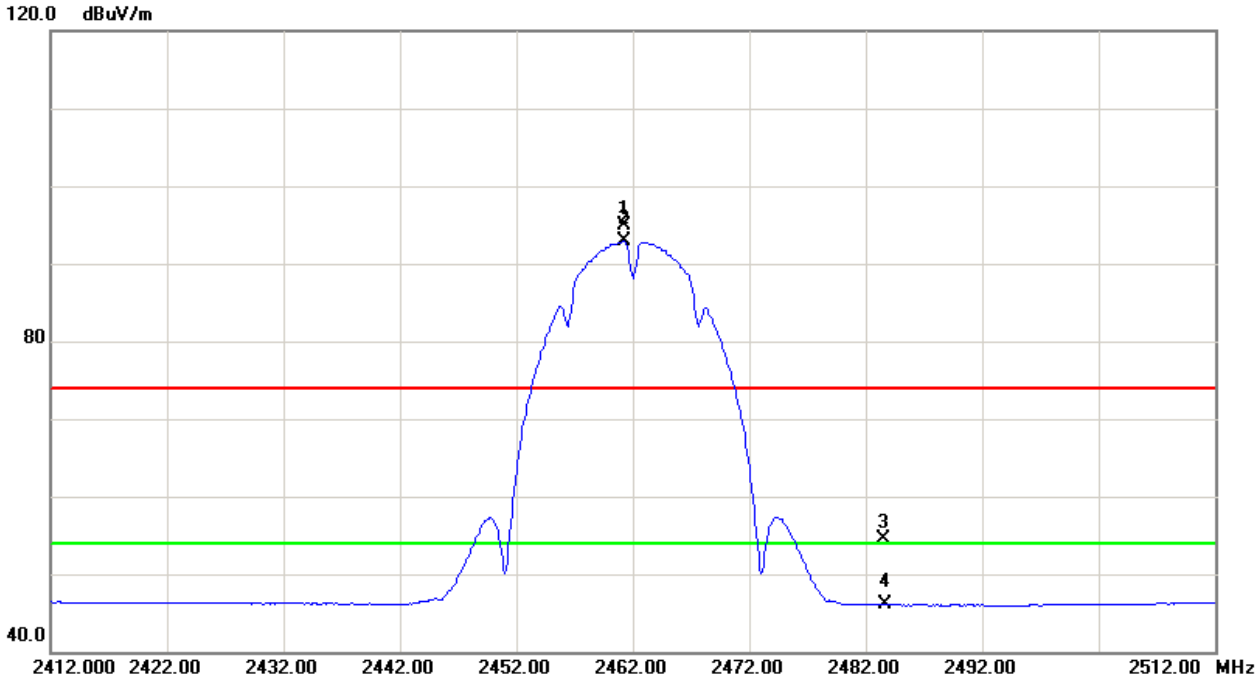


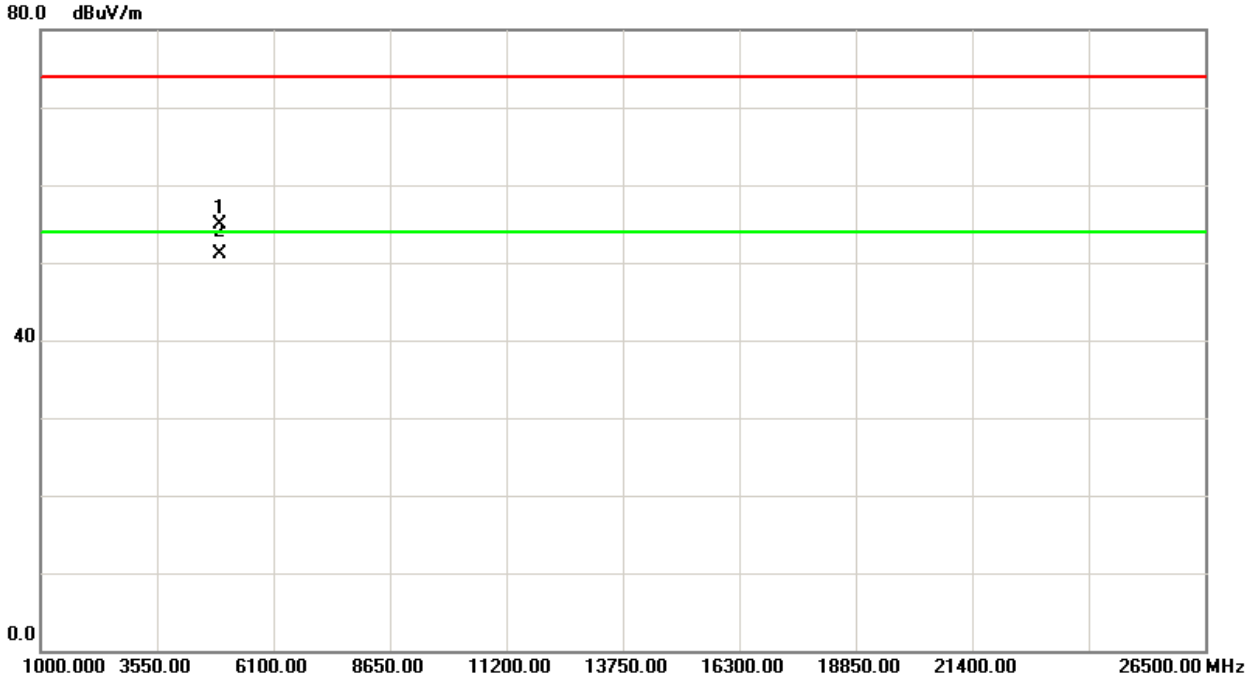
TX CH11 (Above 1000 MHz, Vertical)





TX CH11 (Above 1000 MHz, Horizontal)





Test Mode :	TX G MODE 2412MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	22.53	11.99	34.09	56.62	46.08	74.00	54.00	X/E
2411.10	**V**	**60.63**	**52.93**	**34.16**	**94.79**	**87.09**			**X/F**
4824.02	V	49.27	45.15	6.43	55.70	51.58	74.00	54.00	X/H

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	21.14	11.91	34.09	55.23	46.00	74.00	54.00	X/E
2413.50	**H**	**55.22**	**47.69**	**34.16**	**89.38**	**81.85**			**X/F**
4824.00	H	49.32	44.37	6.43	55.75	50.80	74.00	54.00	X/H

Test Mode :	TX G MODE 2437MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2430.80	**V**	**59.84**	**52.31**	**34.21**	**94.05**	**86.52**			**X/F**
4874.19	V	47.24	41.45	6.58	53.82	48.03	74.00	54.00	X/H

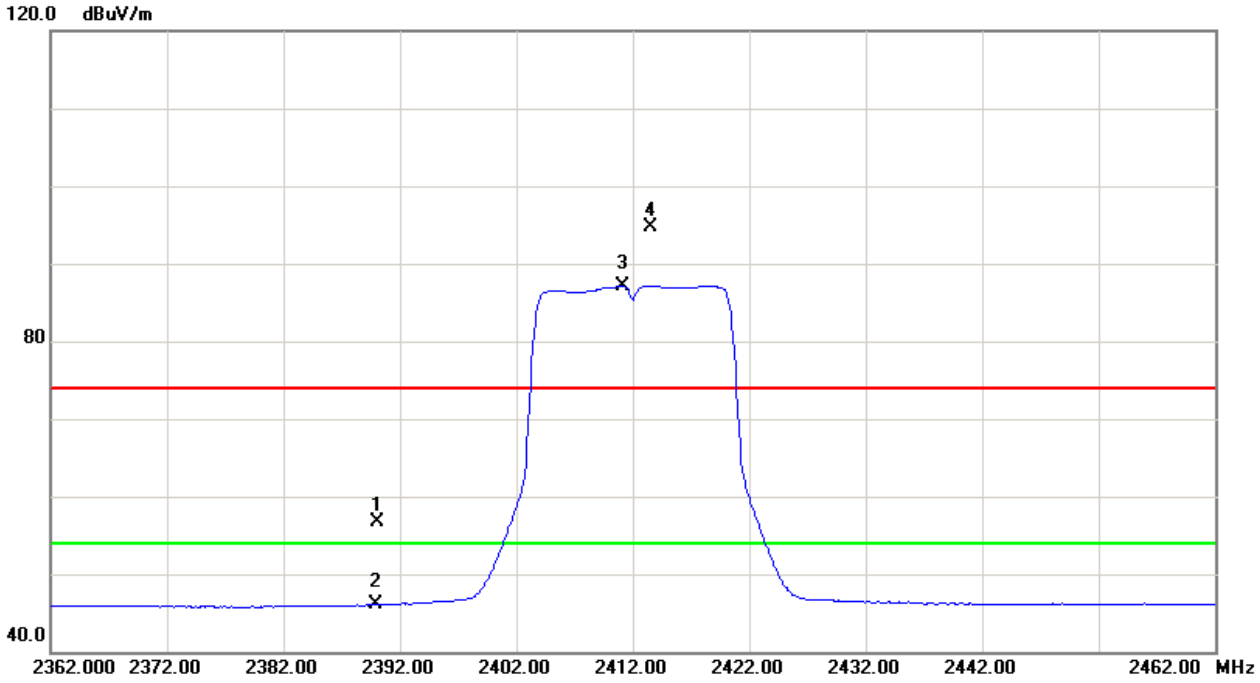
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2438.40	**H**	**54.97**	**47.39**	**34.23**	**89.20**	**81.62**			**X/F**
4874.11	H	49.07	43.53	6.58	55.65	50.11	74.00	54.00	X/H

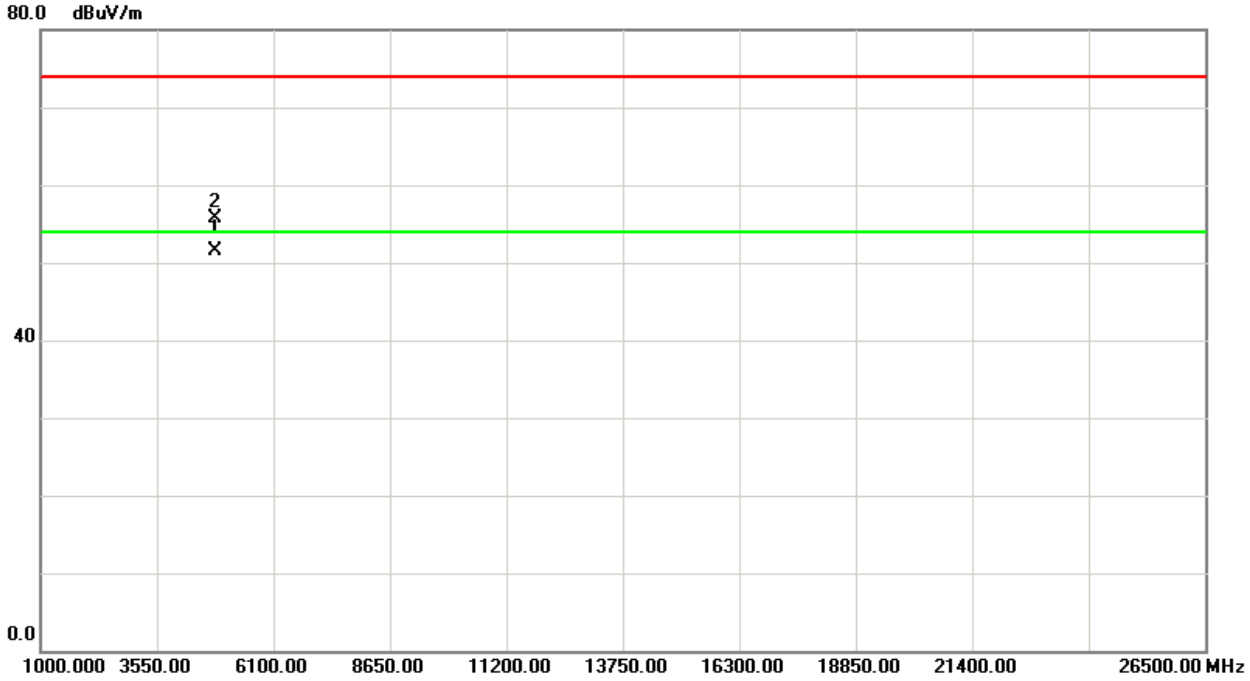
Test Mode :	TX G MODE 2462MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2455.60	**V**	**58.68**	**51.32**	**34.29**	**92.97**	**85.61**			**X/F**
2483.50	V	20.18	11.64	34.37	54.55	46.01	74.00	54.00	X/E
4924.09	V	49.55	42.07	6.72	56.27	48.79	74.00	54.00	X/H

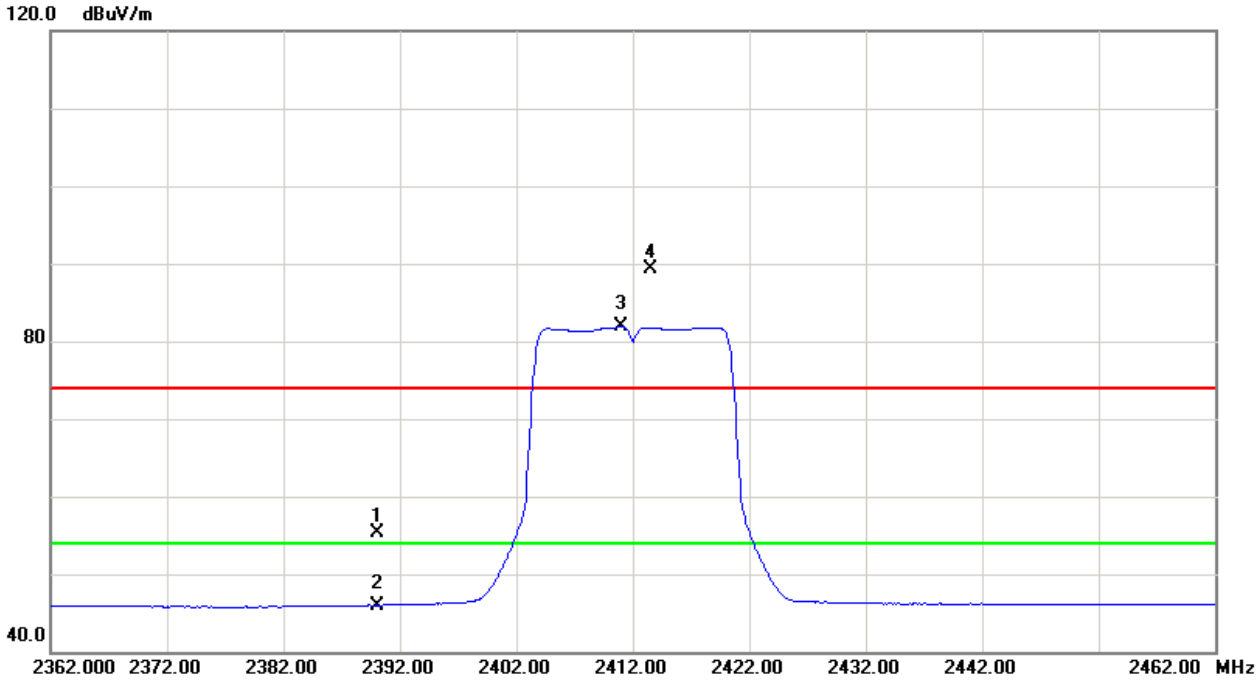
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2455.80	**H**	**53.22**	**46.97**	**34.29**	**87.51**	**81.26**			**X/F**
2483.50	H	21.88	11.64	34.37	56.25	46.01	74.00	54.00	X/E
4924.04	H	49.17	44.36	6.72	55.89	51.08	74.00	54.00	X/H

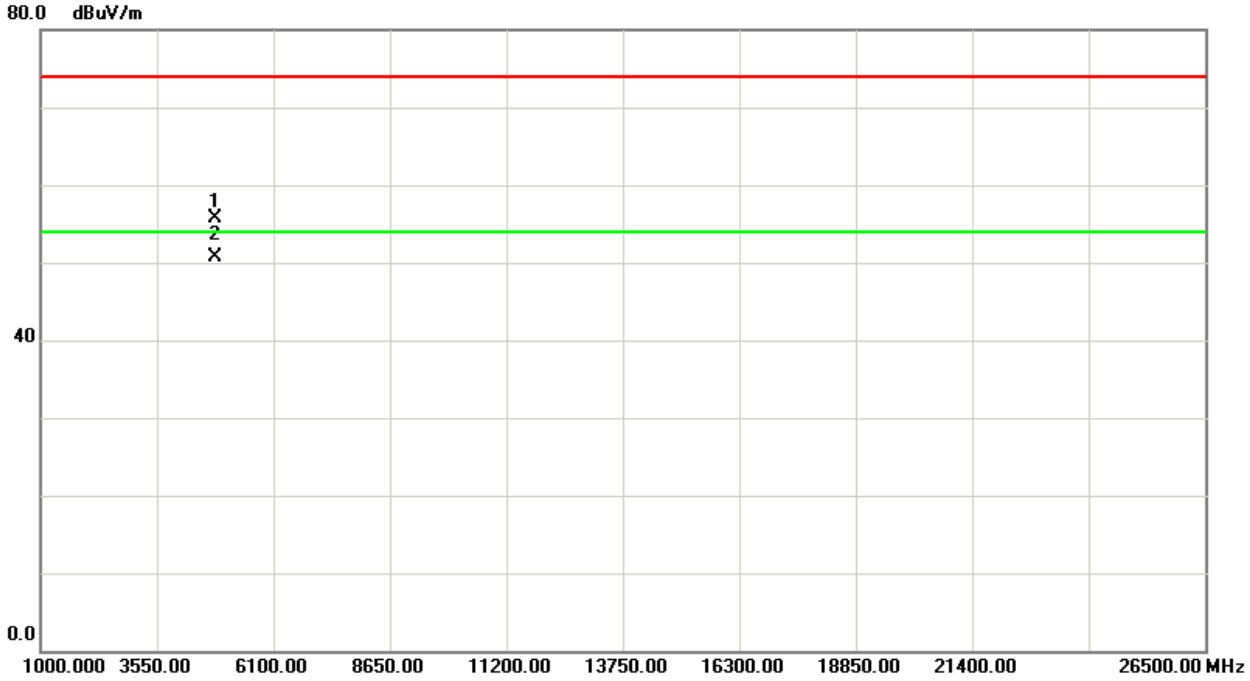
TX CH01 (Above 1000 MHz, Vertical)



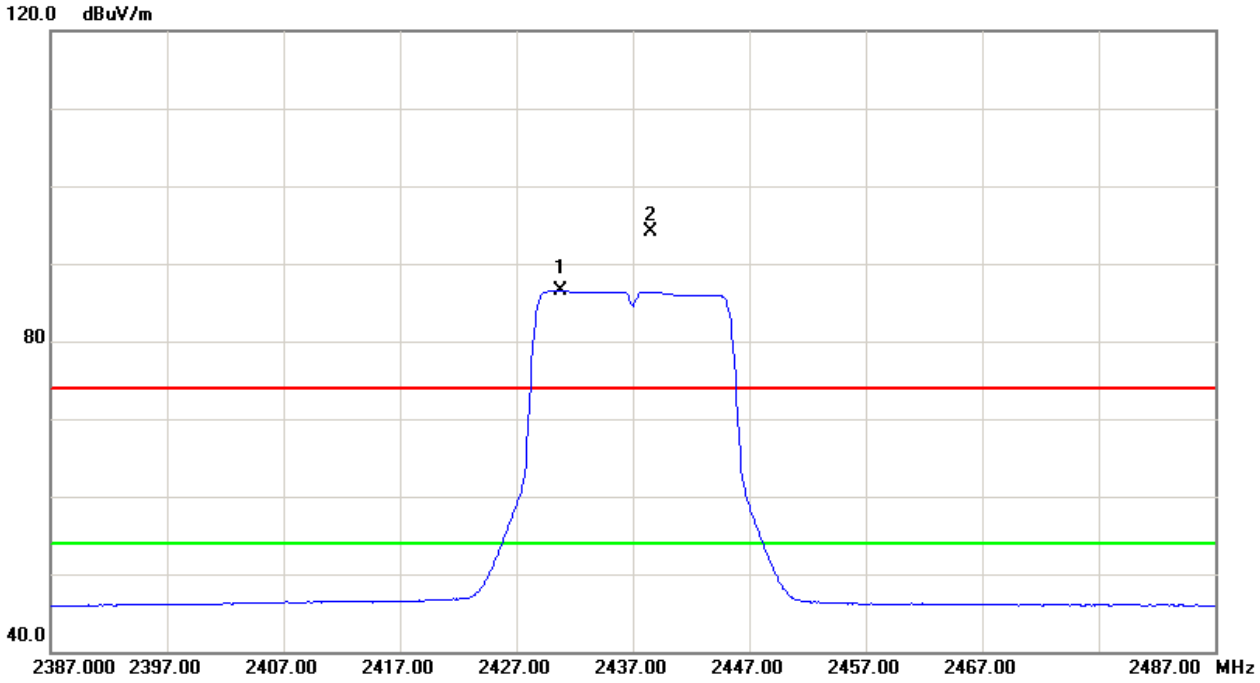


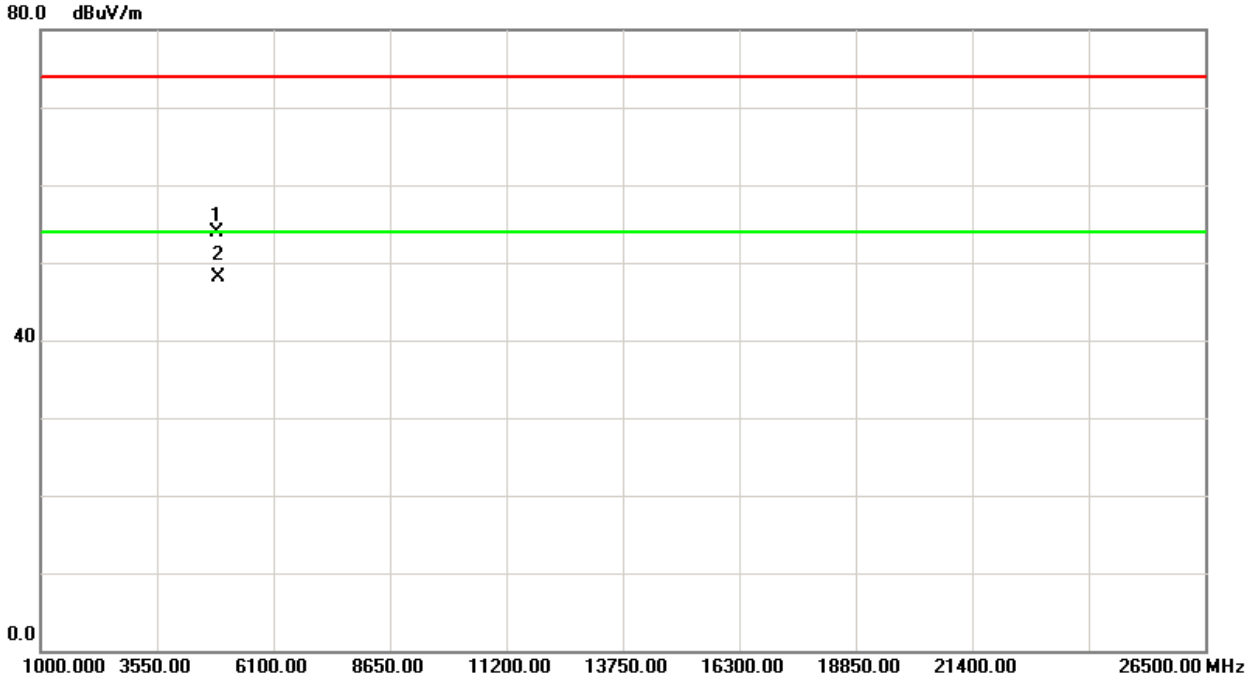
TX CH01 (Above 1000 MHz, Horizontal)



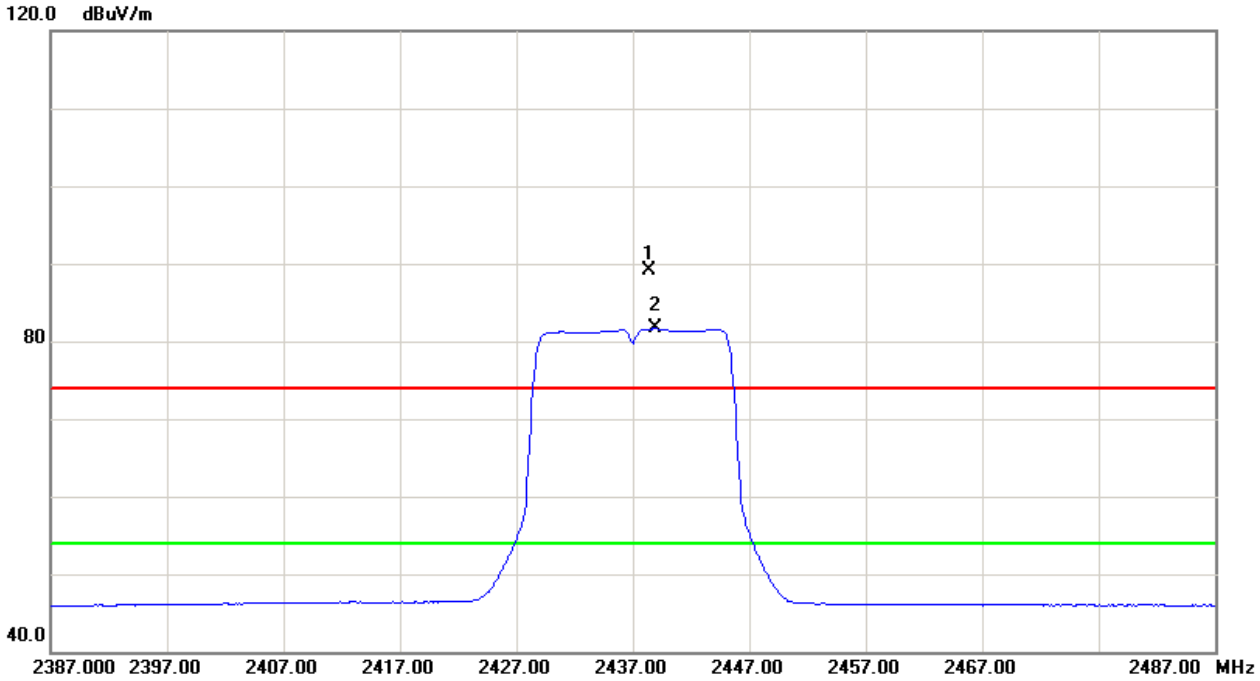


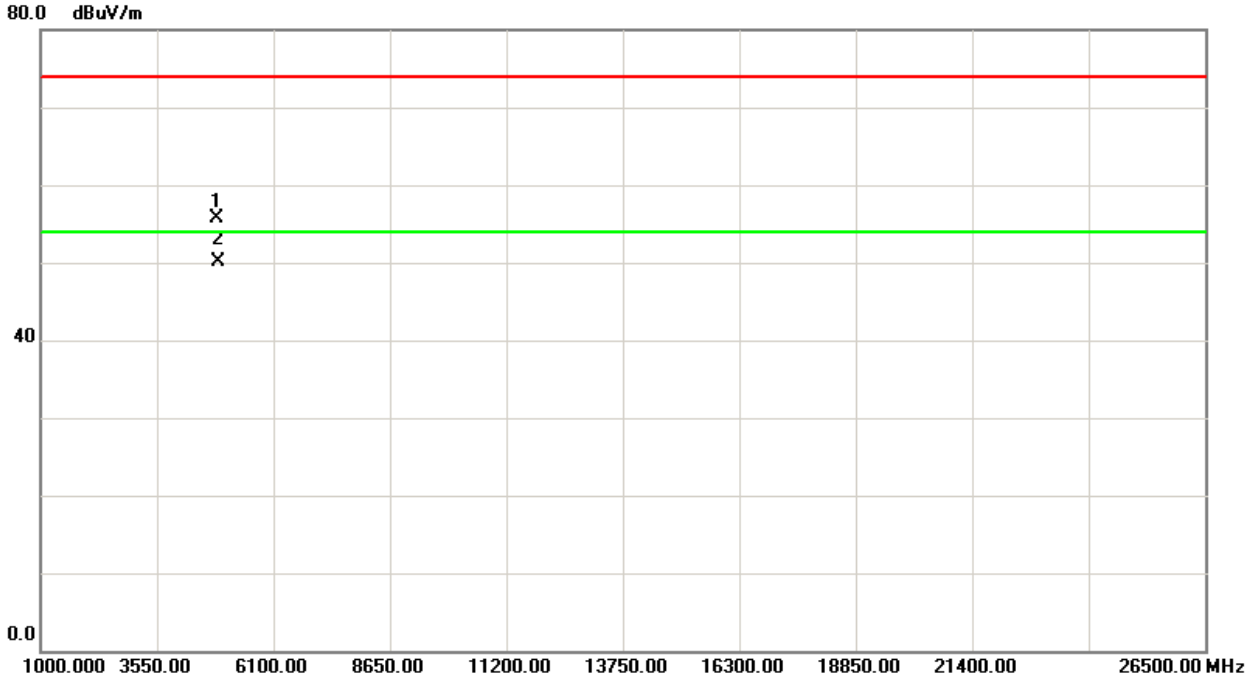
TX CH06 (Above 1000 MHz, Vertical)



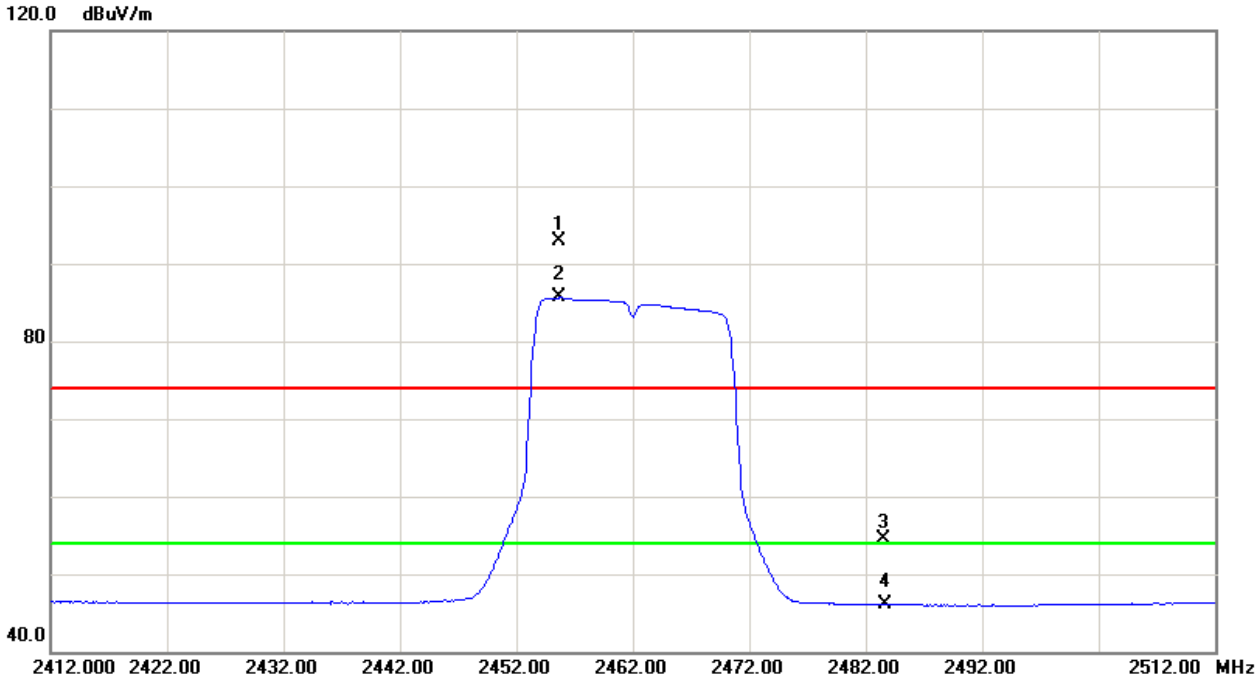


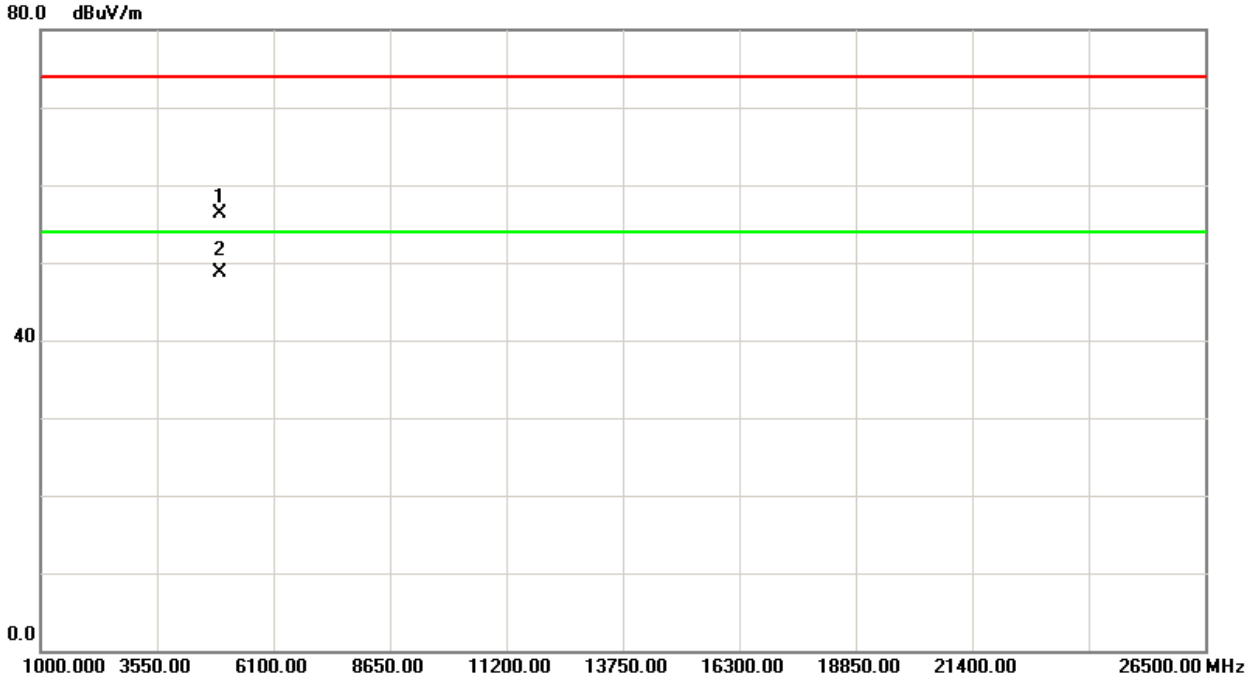
TX CH06 (Above 1000 MHz, Horizontal)



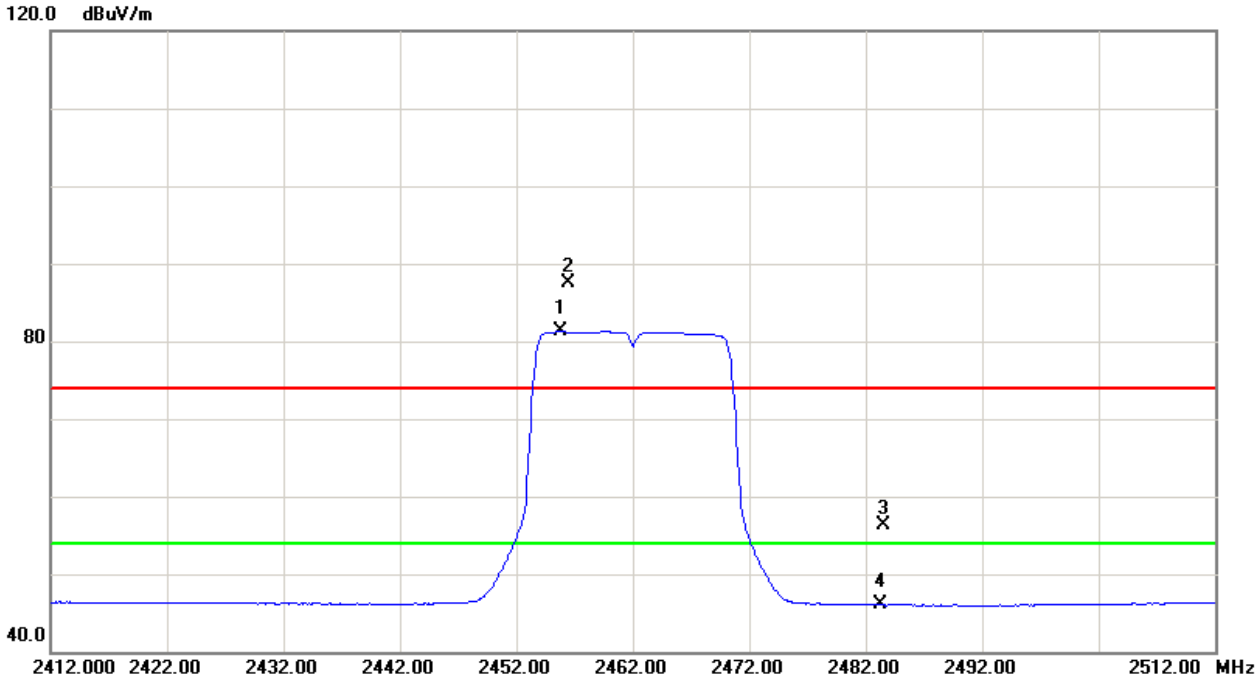


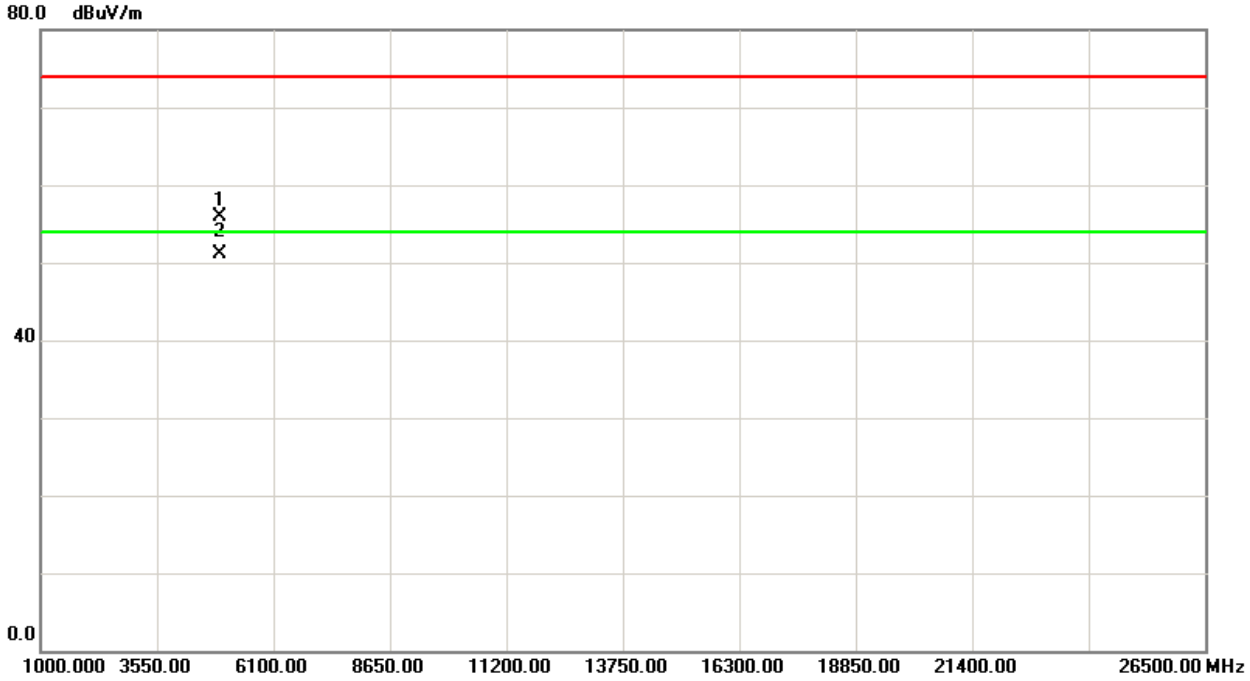
TX CH11 (Above 1000 MHz, Vertical)





TX CH11 (Above 1000 MHz, Horizontal)





Test Mode :	TX N-20M MODE 2412MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	22.95	12.03	34.09	57.04	46.12	74.00	54.00	X/E
2405.10	**V**	**61.73**	**52.32**	**34.14**	**95.87**	**86.46**			**X/F**
4824.15	V	46.35	41.82	6.43	52.78	48.25	74.00	54.00	X/H

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	20.89	11.98	34.09	54.98	46.07	74.00	54.00	X/E
2410.30	**H**	**59.07**	**49.54**	**34.15**	**93.22**	**83.69**			**X/F**
4824.12	H	48.11	42.43	6.43	54.54	48.86	74.00	54.00	X/H

Test Mode :	TX N-20M MODE 2437MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2438.20	**V**	**62.09**	**52.17**	**34.23**	**96.32**	**86.40**			**X/F**
4874.07	V	44.13	39.25	6.58	50.71	45.83	74.00	54.00	X/H

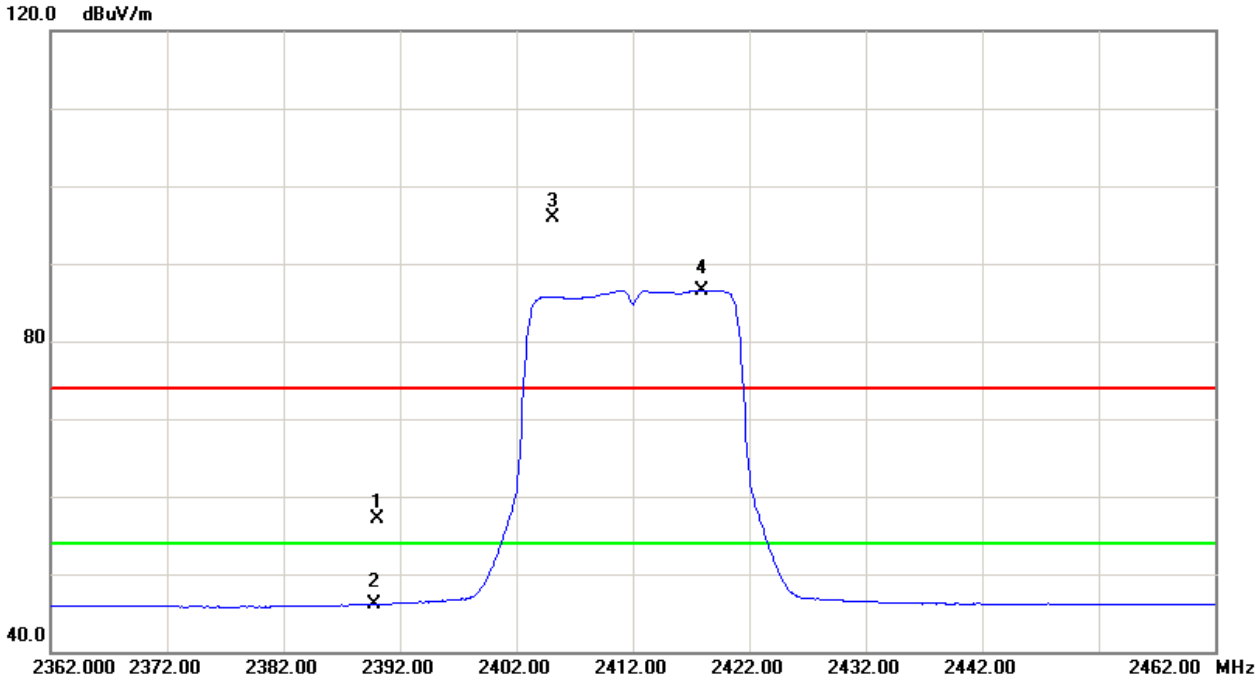
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2431.30	**H**	**58.99**	**49.19**	**34.21**	**93.20**	**83.40**			**X/F**
4874.12	H	46.55	42.23	6.58	53.13	48.81	74.00	54.00	X/H

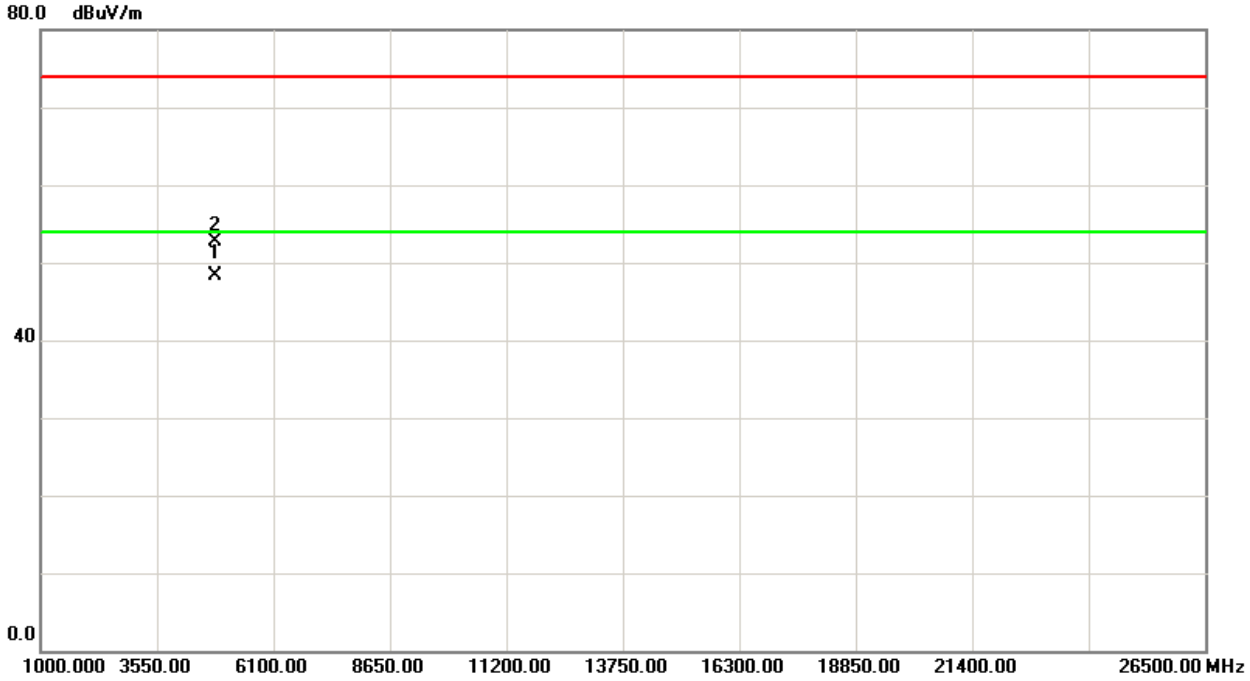
Test Mode :	TX N-20M MODE 2462MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2454.80	**V**	**60.38**	**50.96**	**34.29**	**94.67**	**85.25**			**X/F**
2483.50	V	20.83	11.68	34.37	55.20	46.05	74.00	54.00	X/E
4924.15	V	46.38	40.52	6.72	53.10	47.24	74.00	54.00	X/H

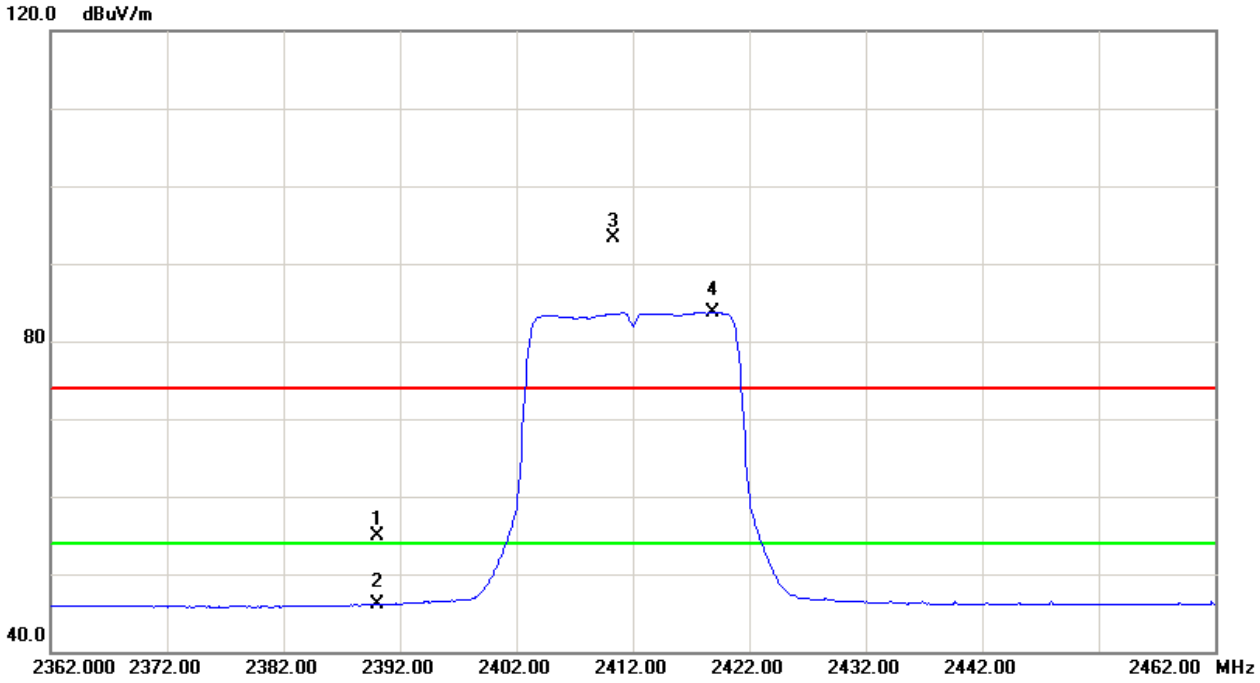
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2459.20	**H**	**58.23**	**48.35**	**34.29**	**92.52**	**82.64**			**X/F**
2483.50	H	21.40	11.70	34.37	55.77	46.07	74.00	54.00	X/E
4924.21	H	47.23	42.44	6.72	53.95	49.16	74.00	54.00	X/H

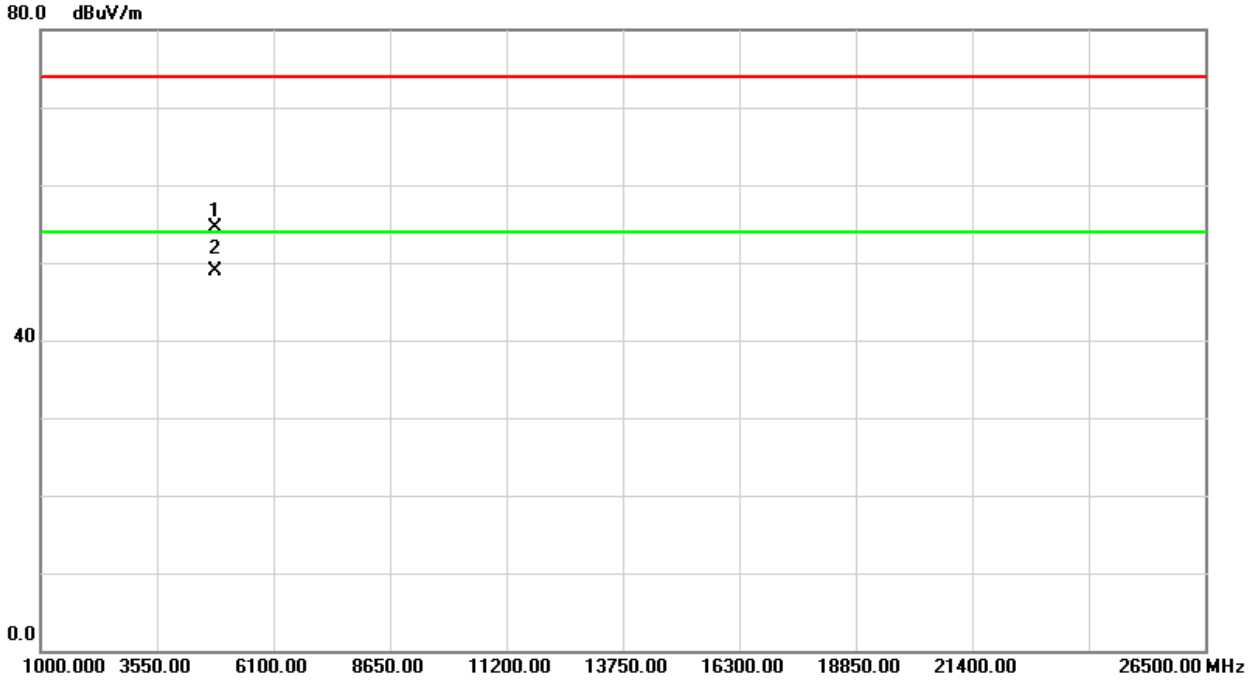
TX CH01 (Above 1000 MHz, Vertical)



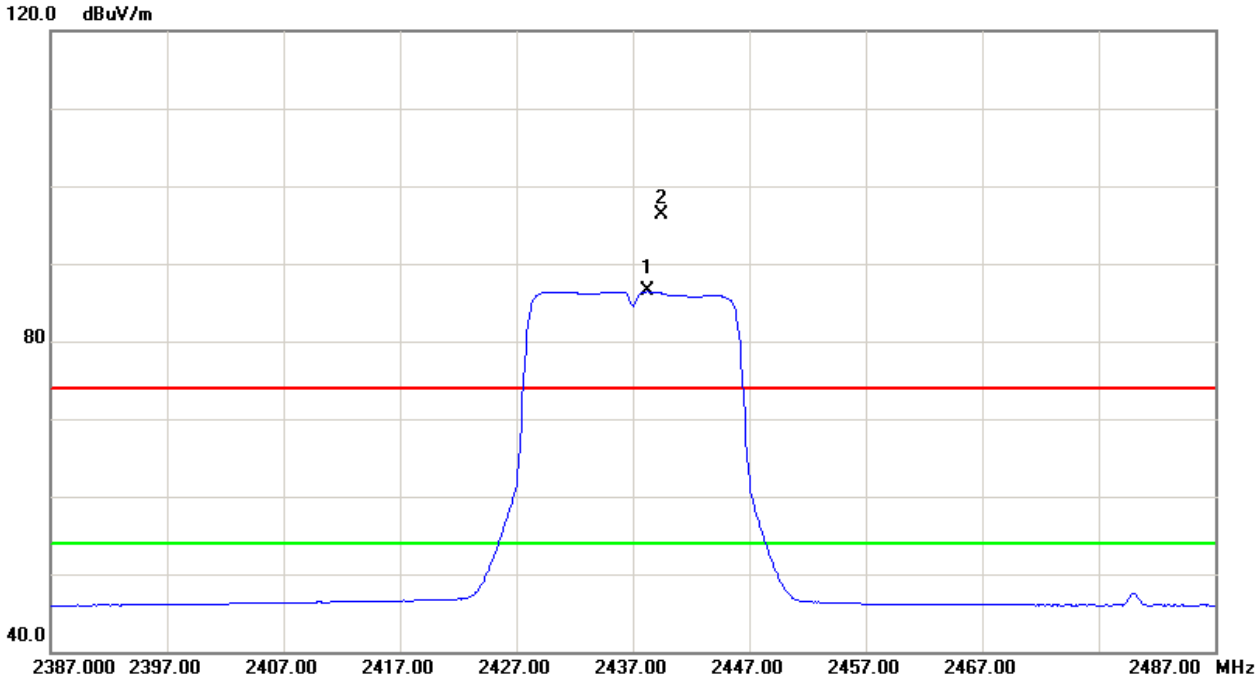


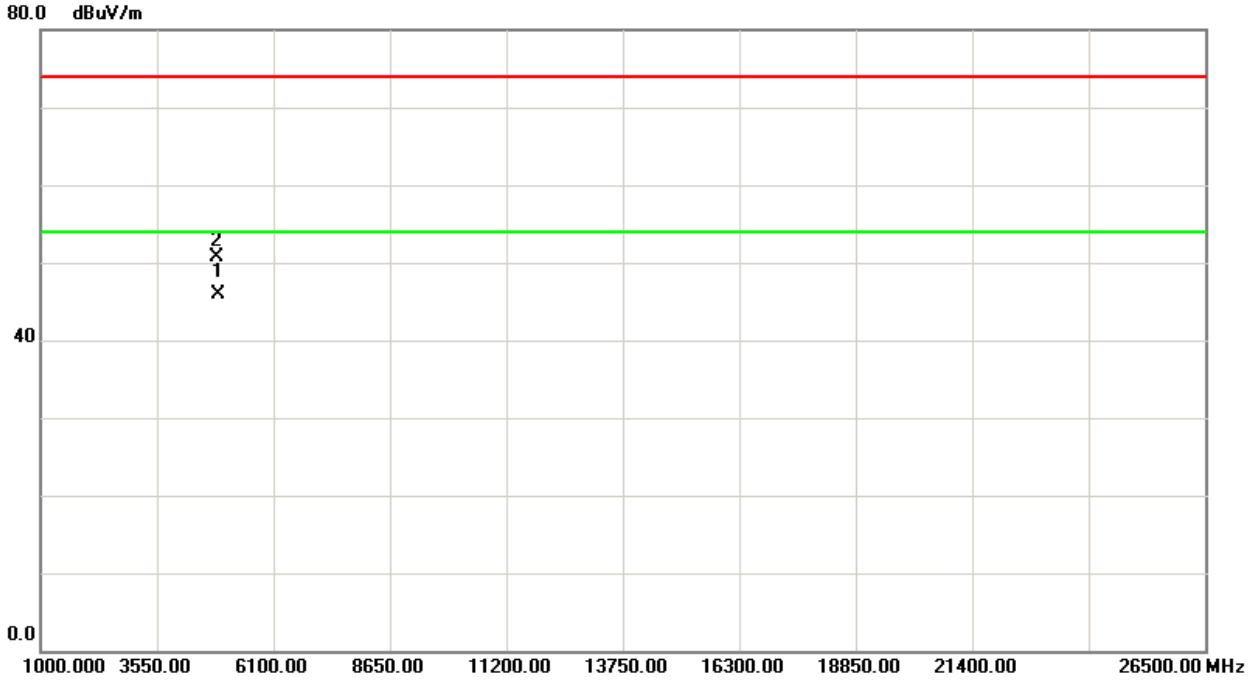
TX CH01 (Above 1000 MHz, Horizontal)



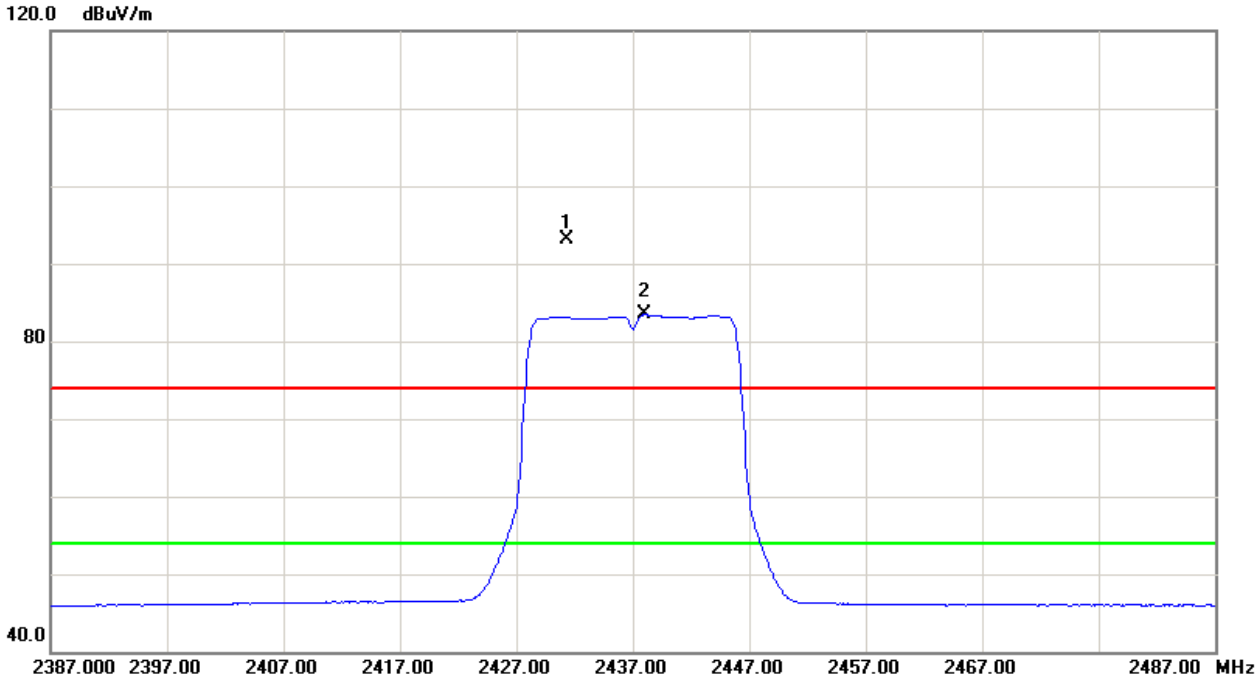


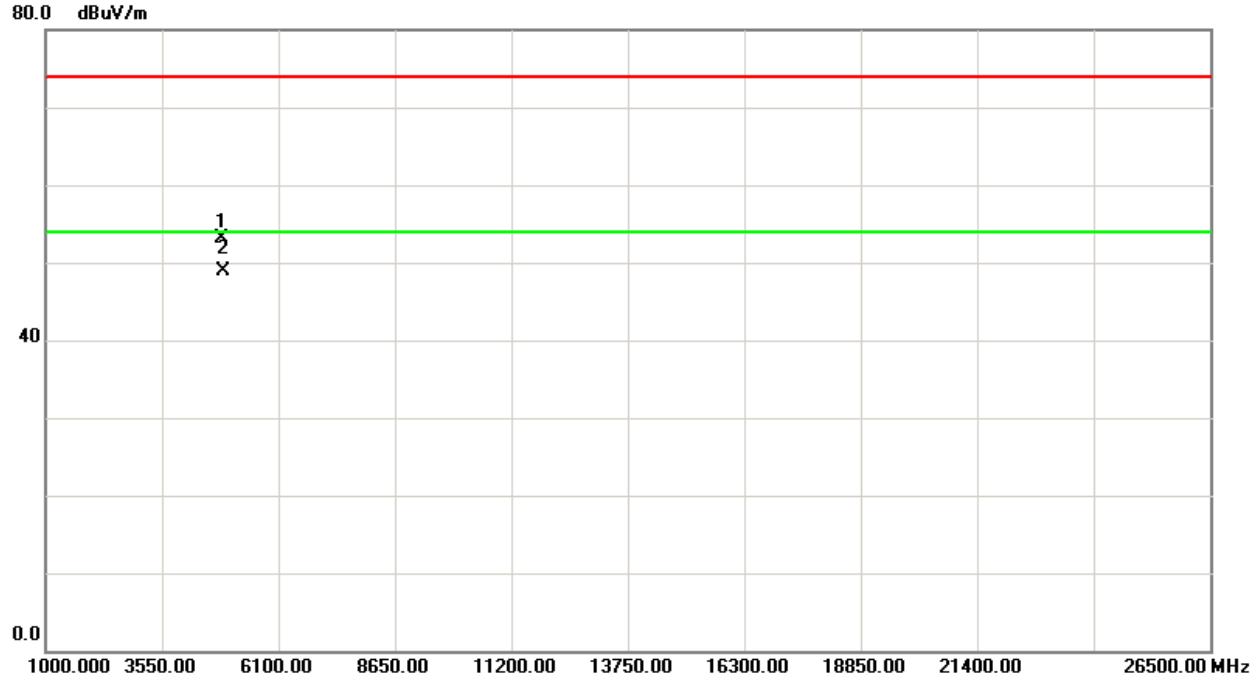
TX CH06 (Above 1000 MHz, Vertical)



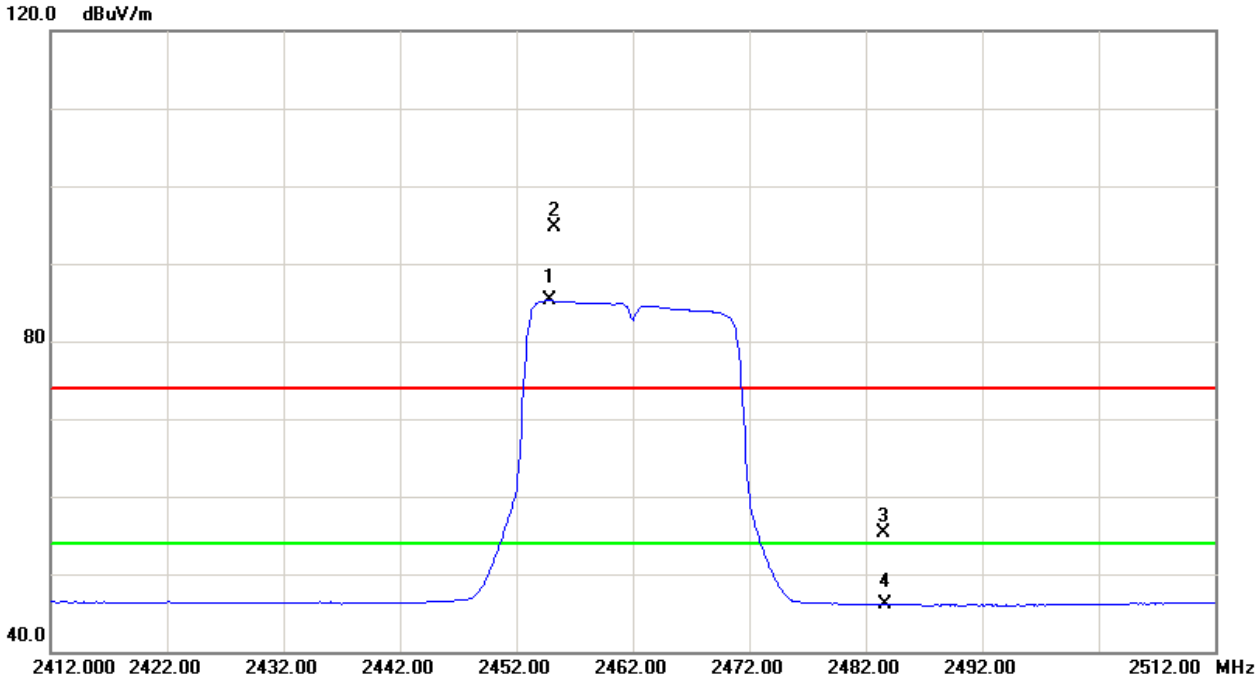


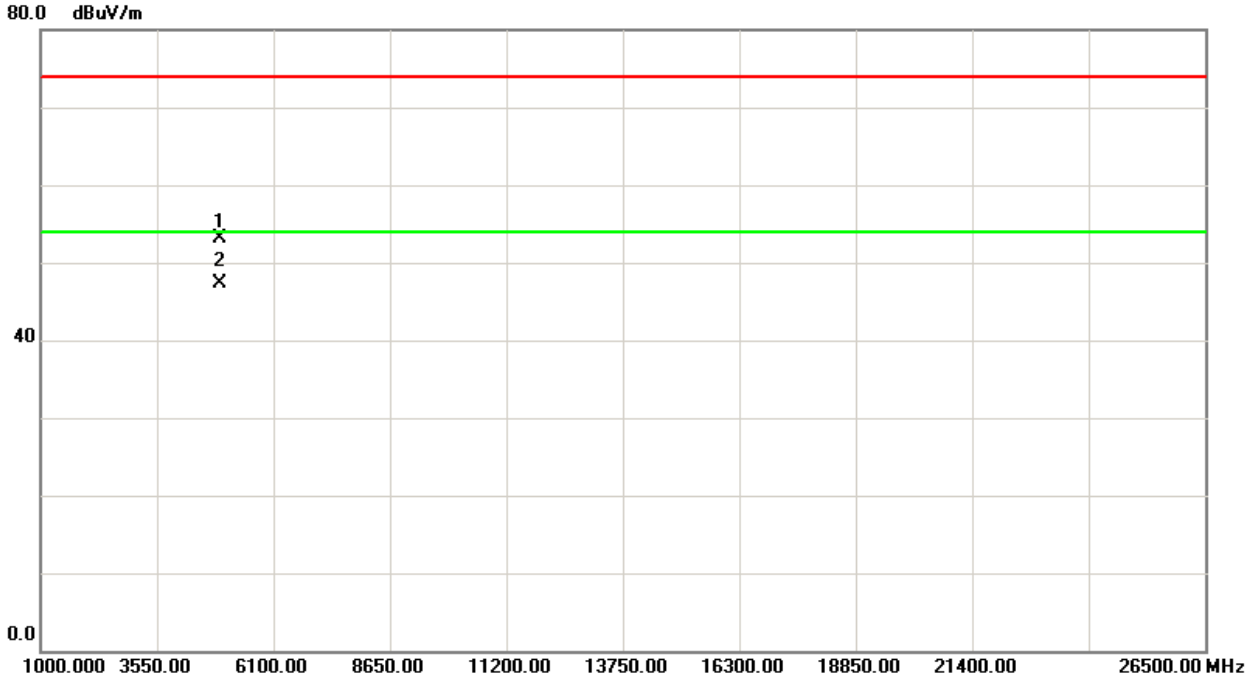
TX CH06 (Above 1000 MHz, Horizontal)



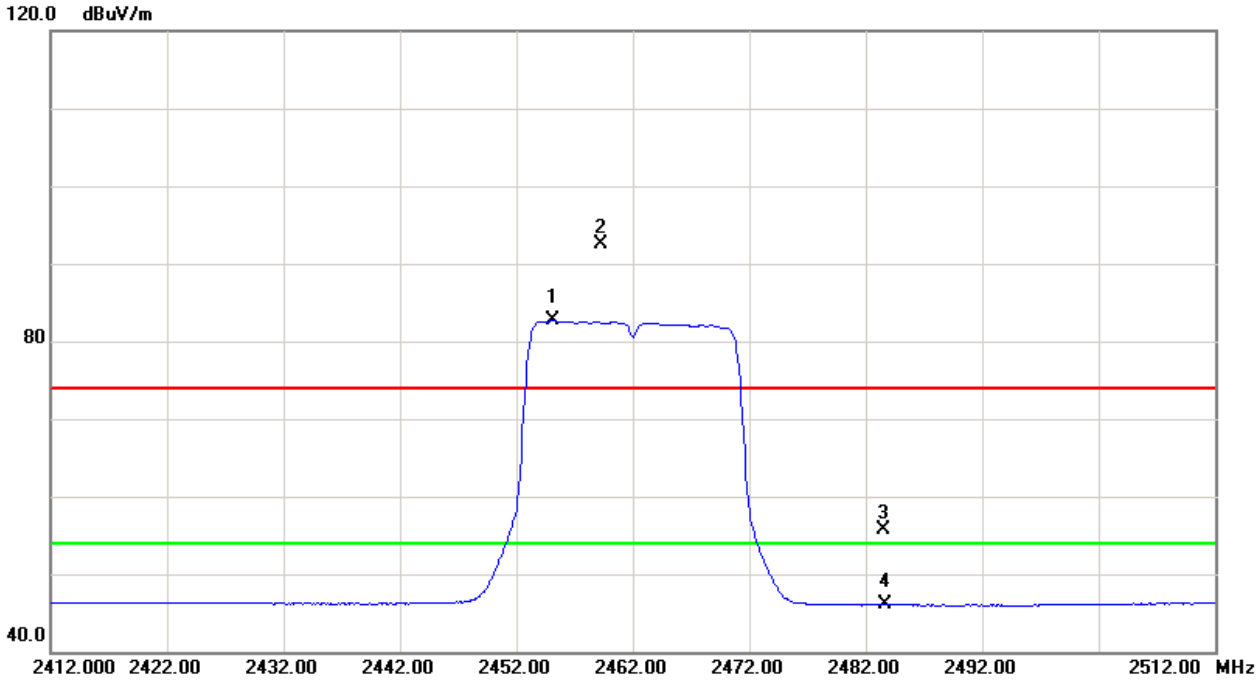


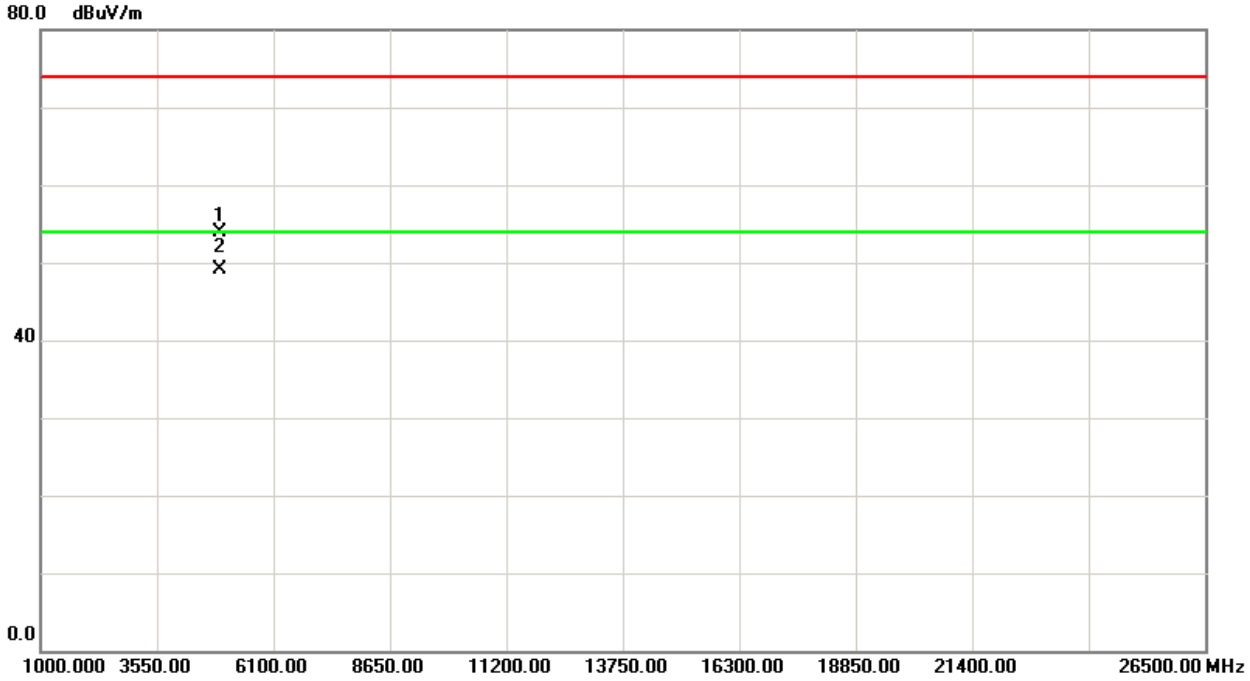
TX CH11 (Above 1000 MHz, Vertical)





TX CH11 (Above 1000 MHz, Horizontal)





Test Mode :	TX N-40M MODE 2422MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	V	21.70	12.05	34.09	55.79	46.14	74.00	54.00	X/E
2417.80	**V**	**58.16**	**48.62**	**34.17**	**92.33**	**82.79**			**X/F**
4843.92	V	46.52	40.47	6.50	53.02	46.97	74.00	54.00	X/H

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2390.00	H	21.89	12.02	34.09	55.98	46.11	74.00	54.00	X/E
2417.80	**H**	**54.69**	**45.92**	**34.17**	**88.86**	**80.09**			**X/F**
4843.94	H	46.14	41.52	6.50	52.64	48.02	74.00	54.00	X/H

Test Mode :	TX N-40M MODE 2437MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2432.40	**V**	**58.28**	**48.50**	**34.22**	**92.50**	**82.72**			**X/F**
4874.04	V	46.51	39.44	6.58	53.09	46.02	74.00	54.00	X/H

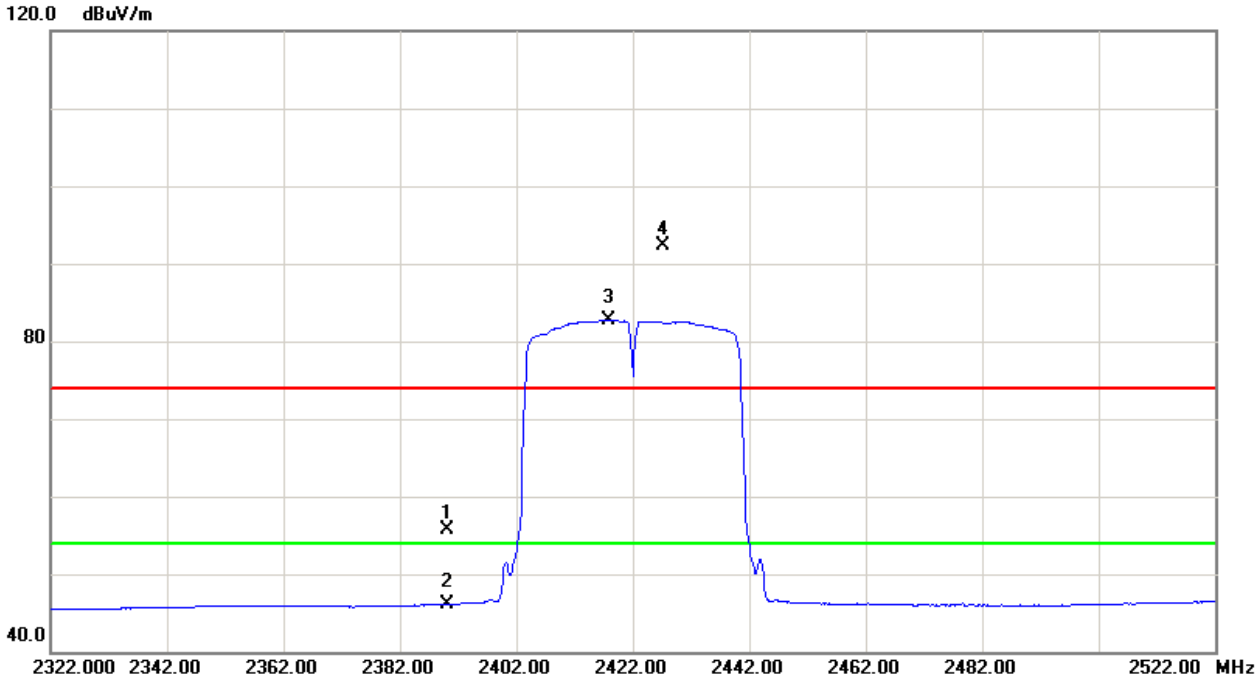
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2426.20	**H**	**54.41**	**45.58**	**34.20**	**88.61**	**79.78**			**X/F**
4874.14	H	47.23	42.05	6.58	53.81	48.63	74.00	54.00	X/H

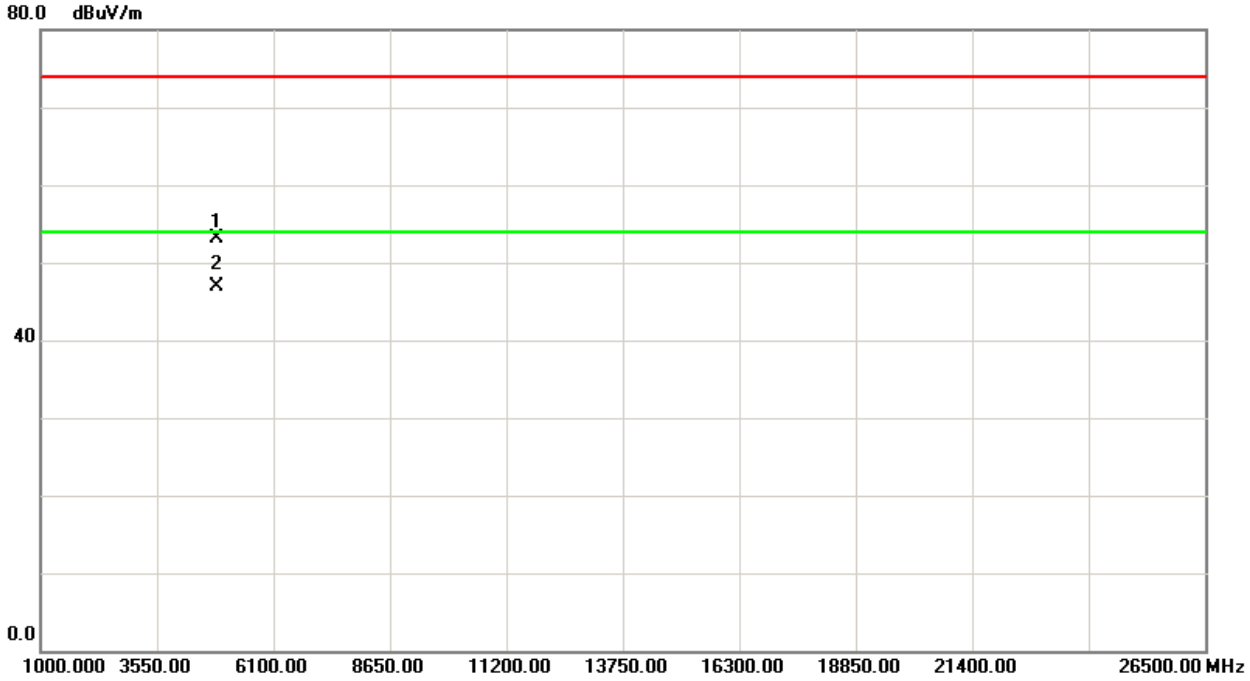
Test Mode :	TX N-40M MODE 2452MHz

Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2447.40	**V**	**57.76**	**48.00**	**34.27**	**92.03**	**82.27**			**X/F**
2483.50	V	21.46	11.68	34.37	55.83	46.05	74.00	54.00	X/E
4903.91	V	47.35	40.41	6.67	54.02	47.08	74.00	54.00	X/H

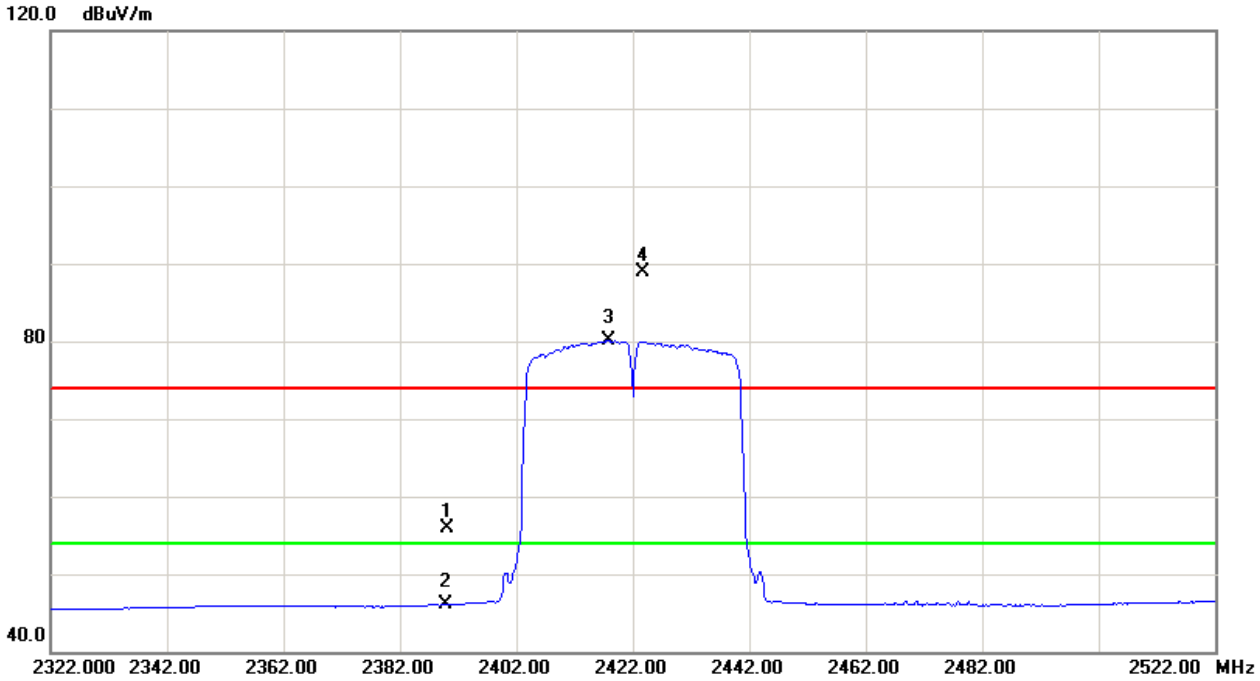
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2447.60	**H**	**55.48**	**45.98**	**34.27**	**89.75**	**80.25**			**X/F**
2483.50	H	21.13	11.70	34.37	55.50	46.07	74.00	54.00	X/E
4904.09	H	46.52	41.21	6.67	53.19	47.88	74.00	54.00	X/H

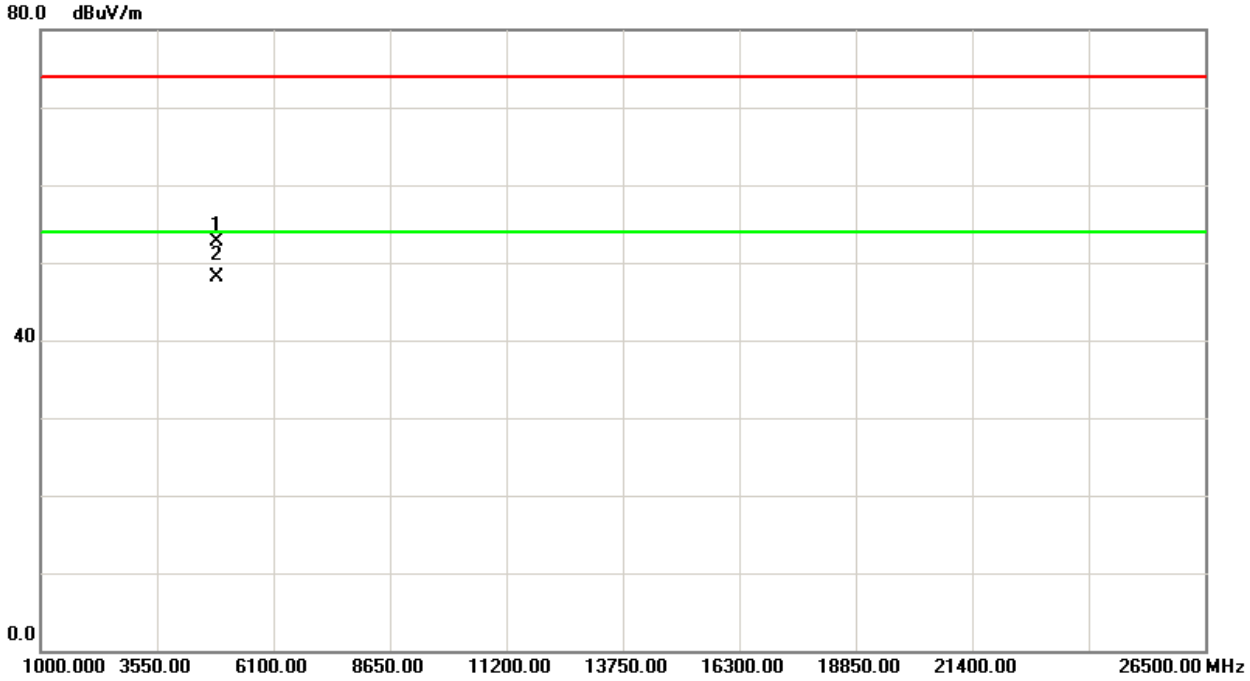
TX CH03 (Above 1000 MHz, Vertical)



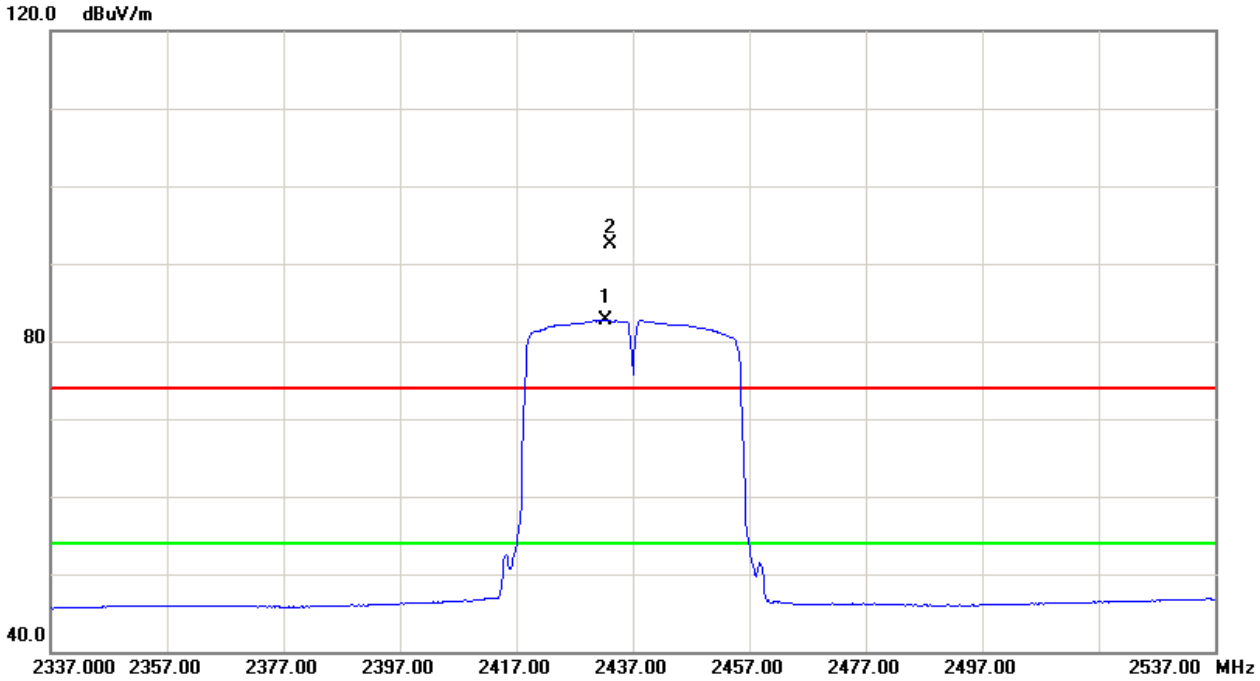


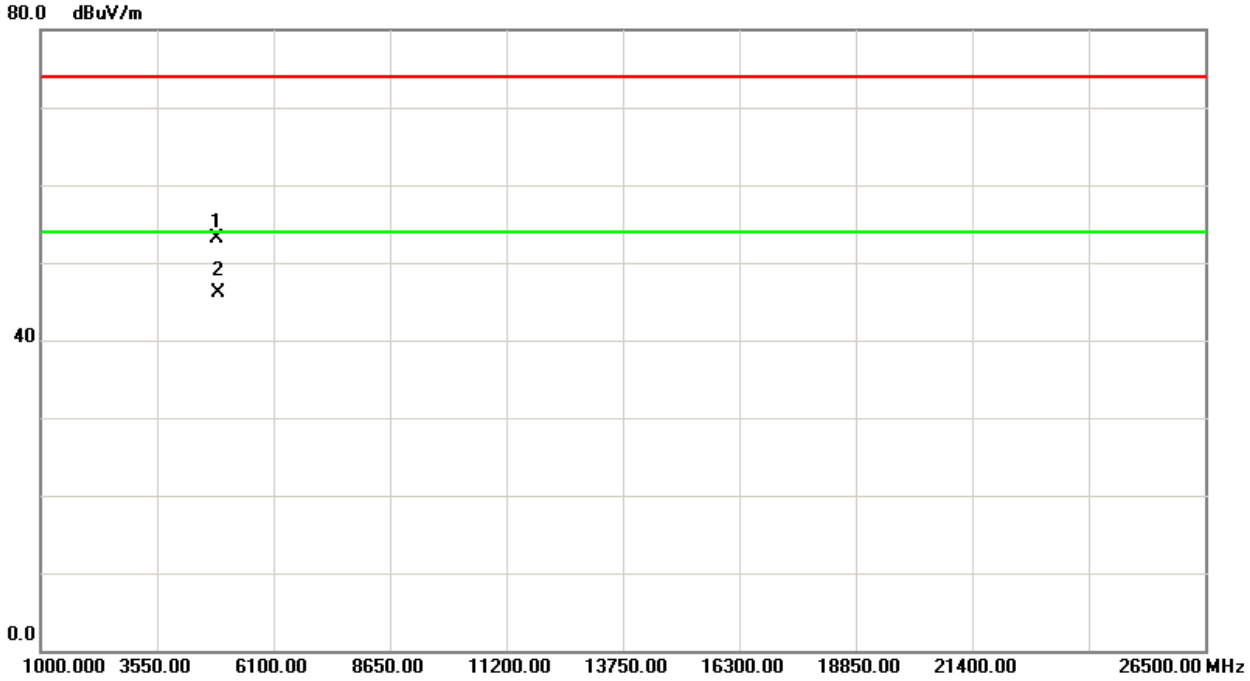
TX CH03 (Above 1000 MHz, Horizontal)



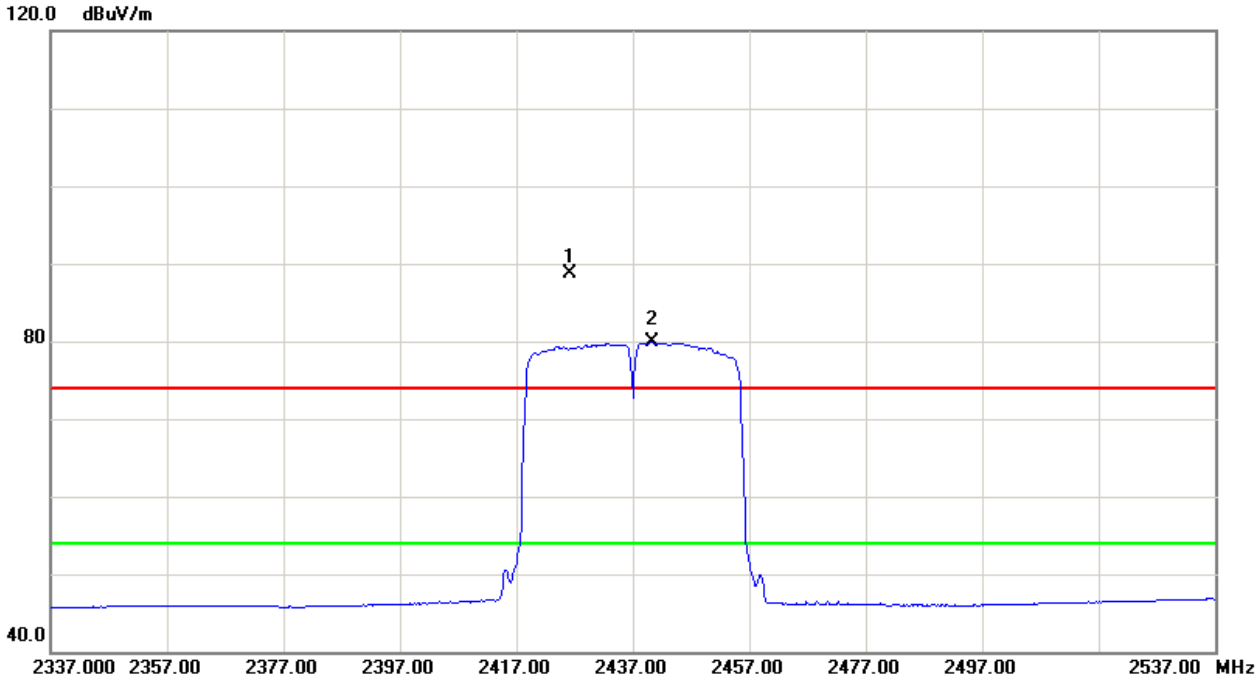


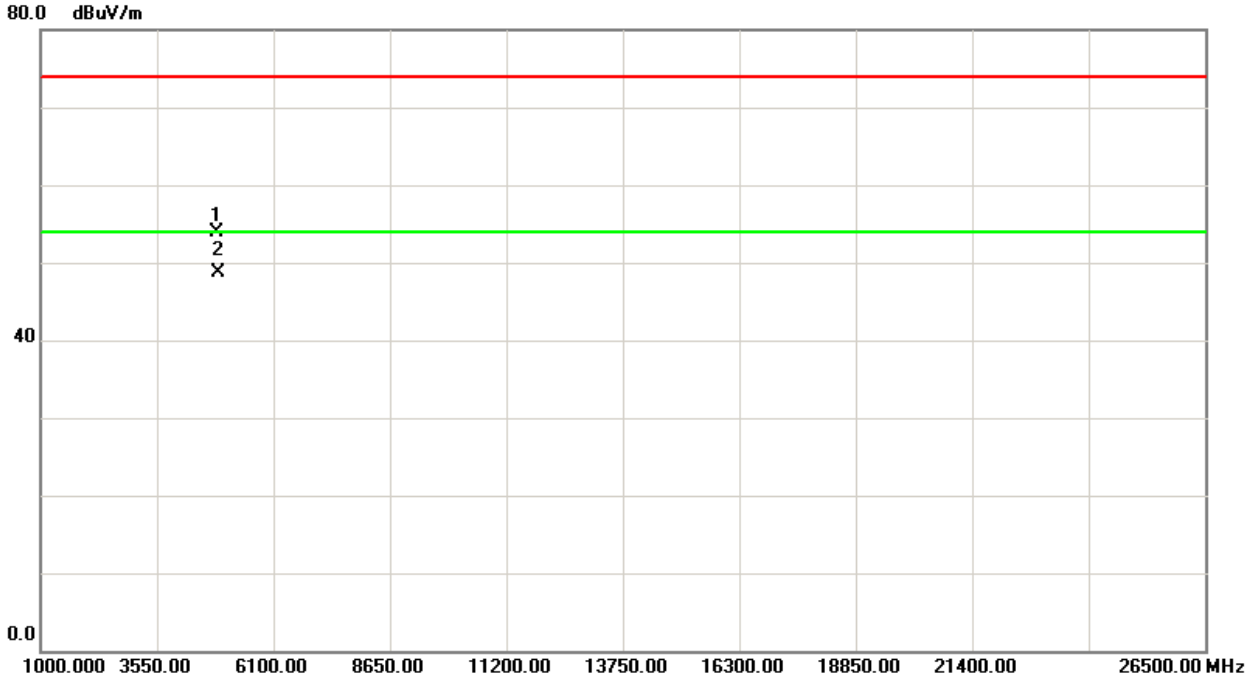
TX CH06 (Above 1000 MHz, Vertical)



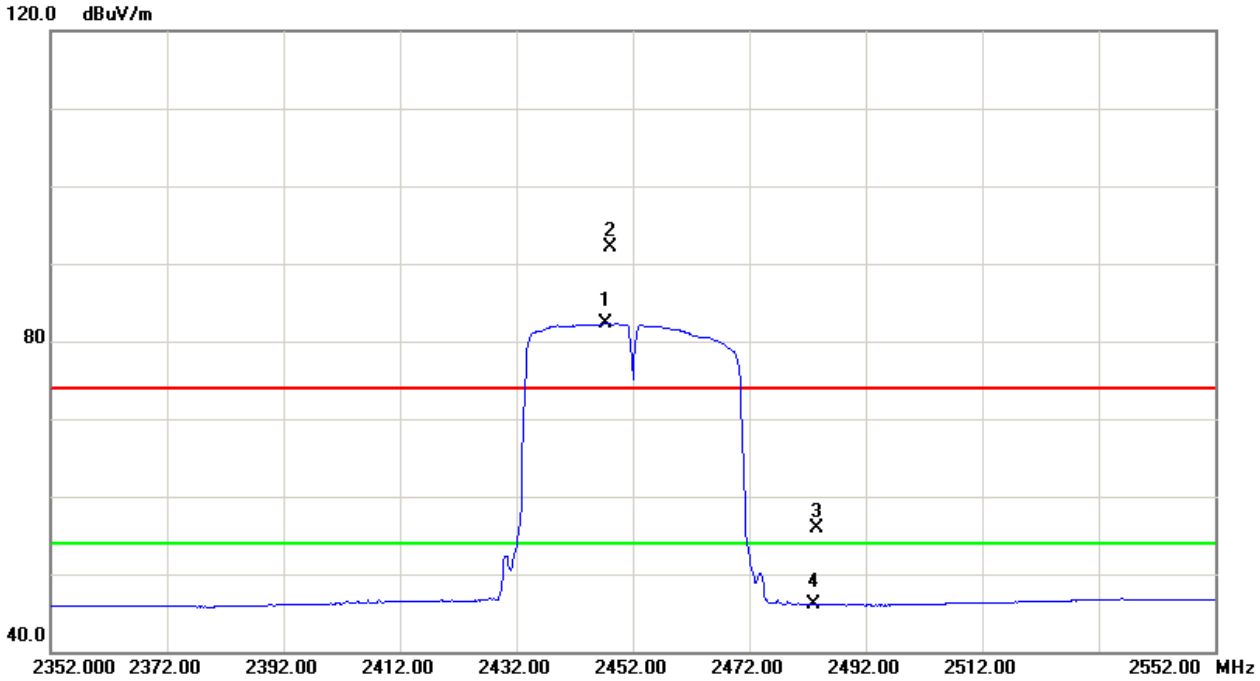


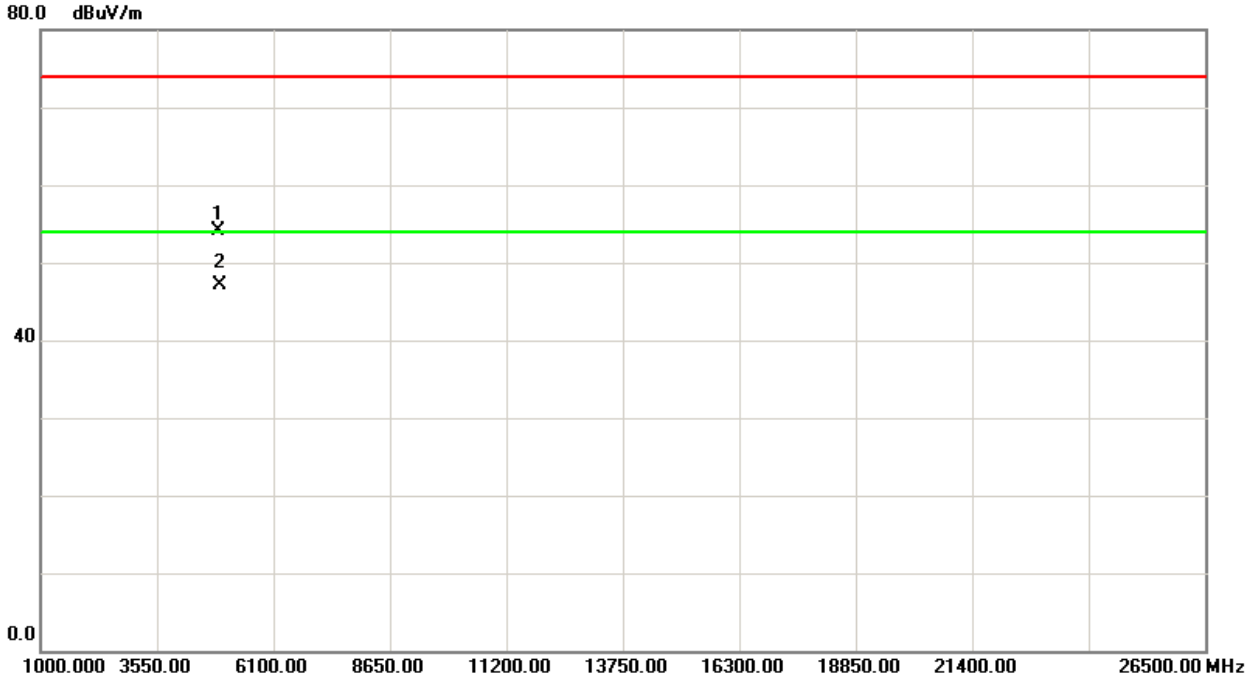
TX CH06 (Above 1000 MHz, Horizontal)



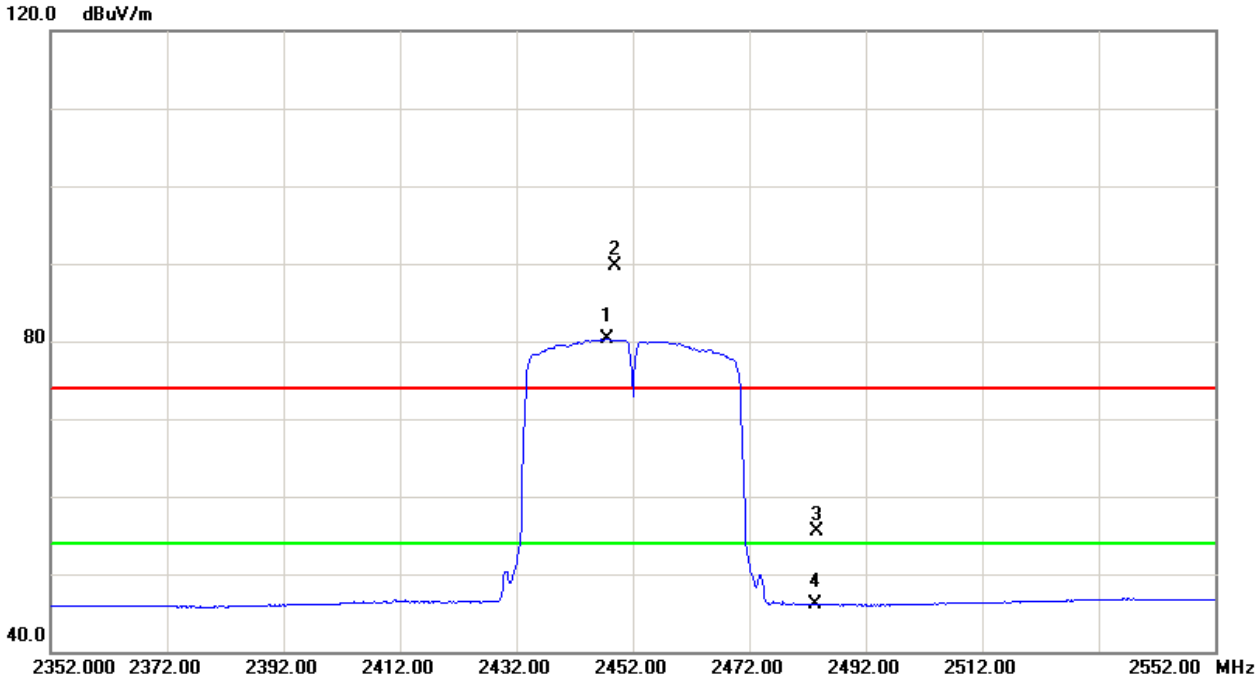


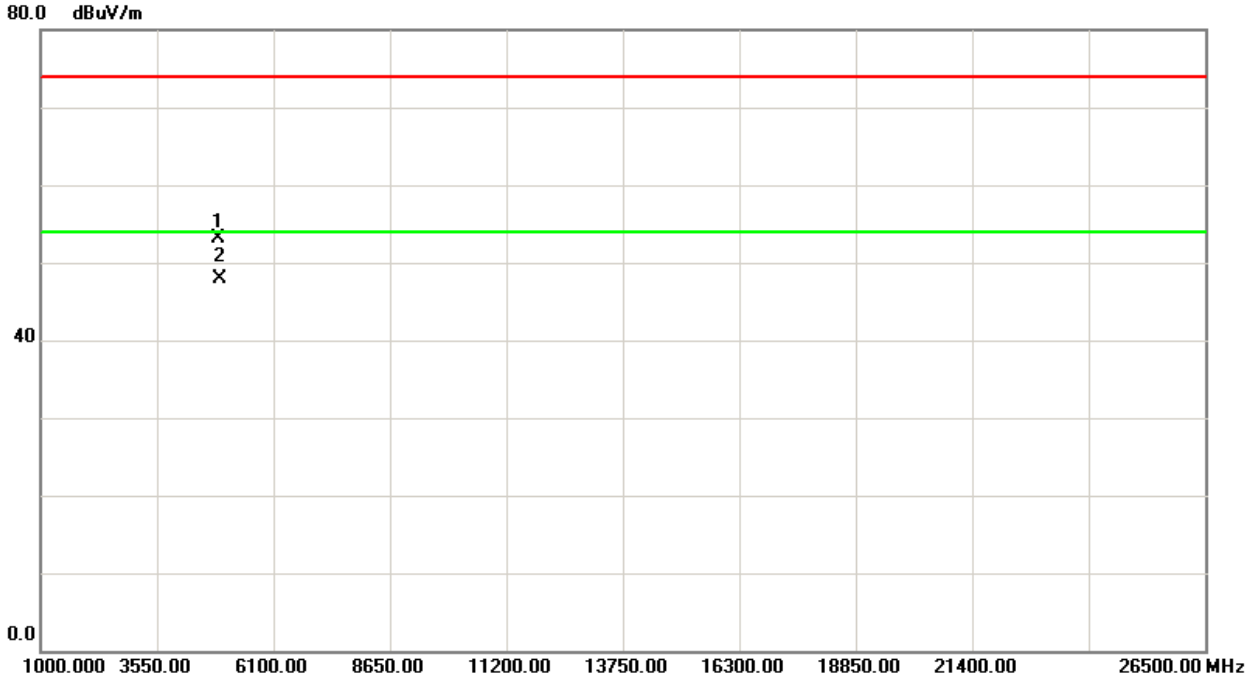
TX CH09 (Above 1000 MHz, Vertical)





TX CH09 (Above 1000 MHz, Horizontal)





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

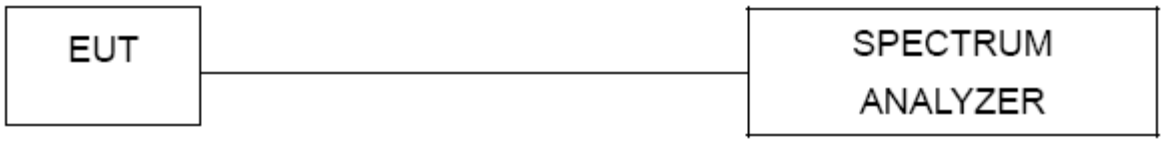
5.1.1 TEST PROCEDURE

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 tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

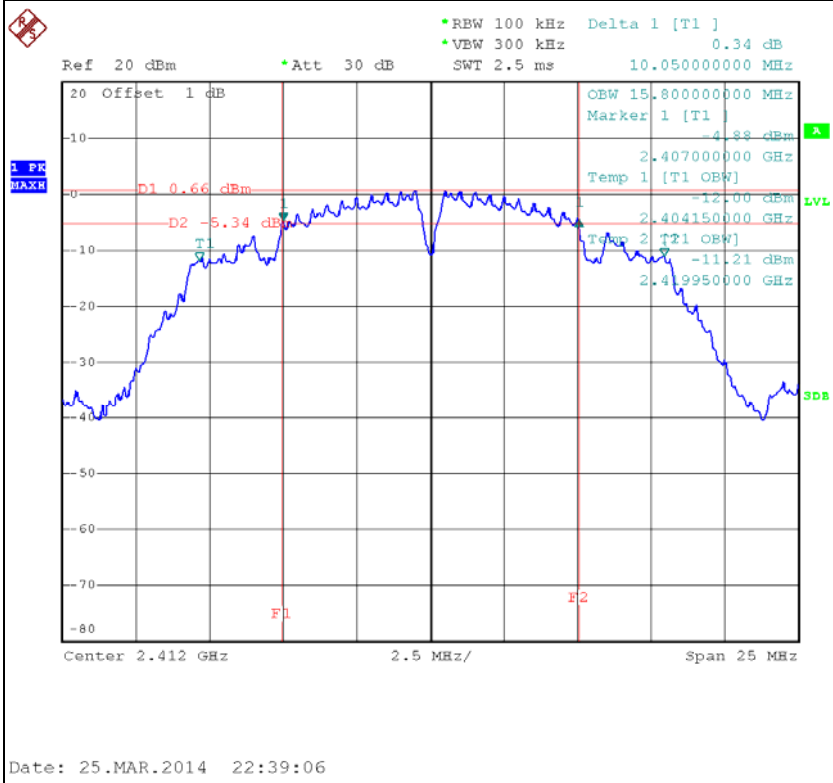
5.1.5 EUT TEST CONDITIONS

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

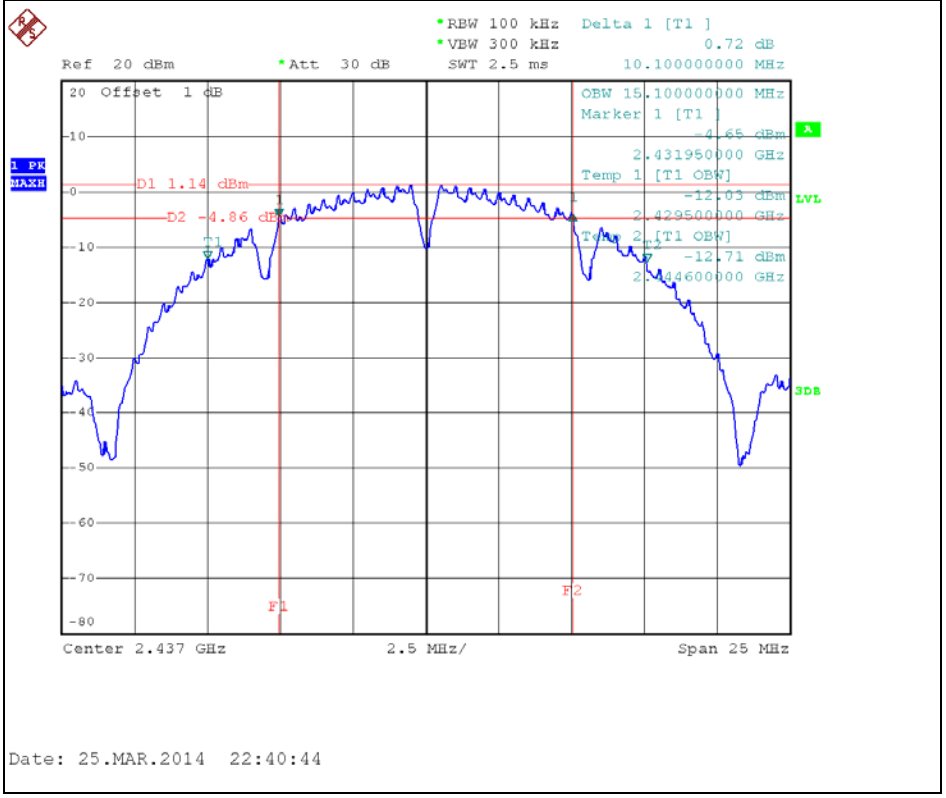
5.1.6 TEST RESULTS

Test Mode : TX B Mode_CH01/06/11

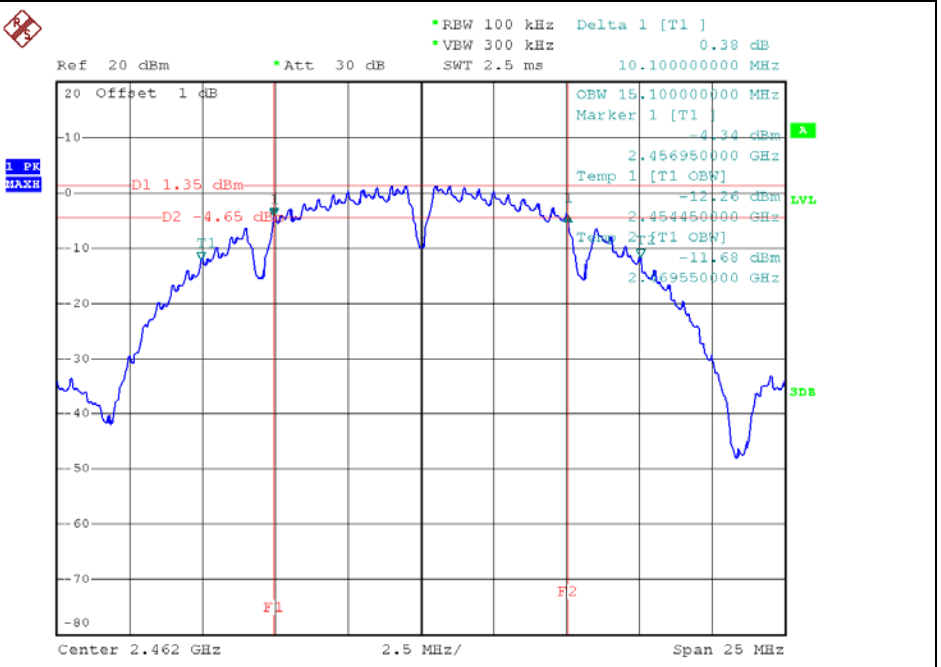
TX CH 01



TX CH 06

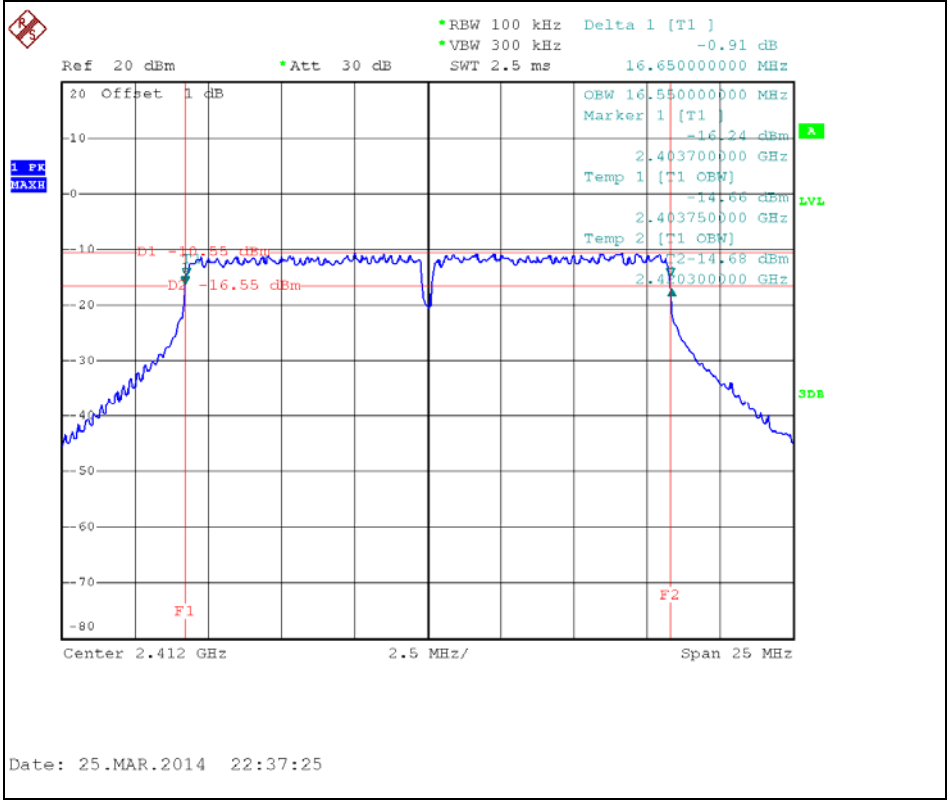


TX CH 11

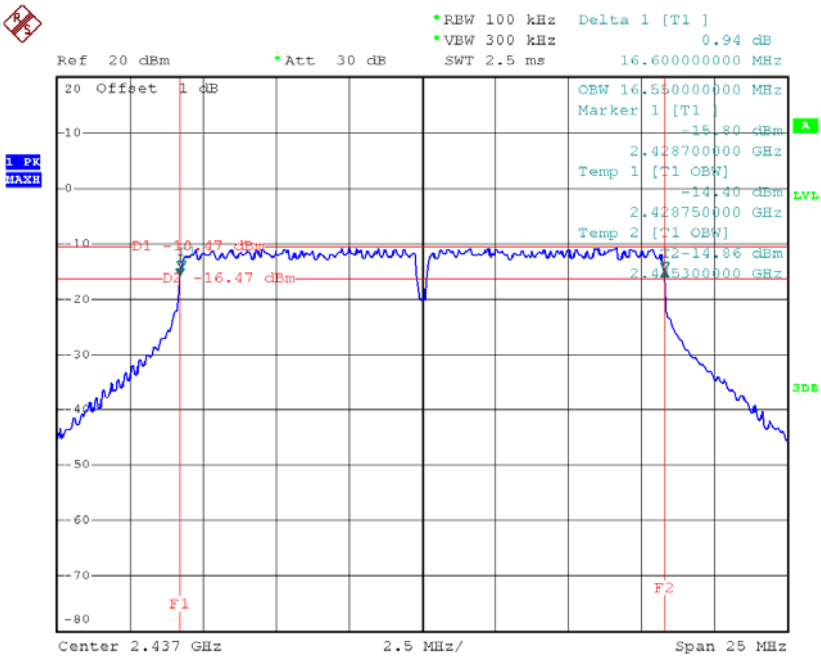


Test Mode: TX G Mode_CH01/06/11

TX CH 01

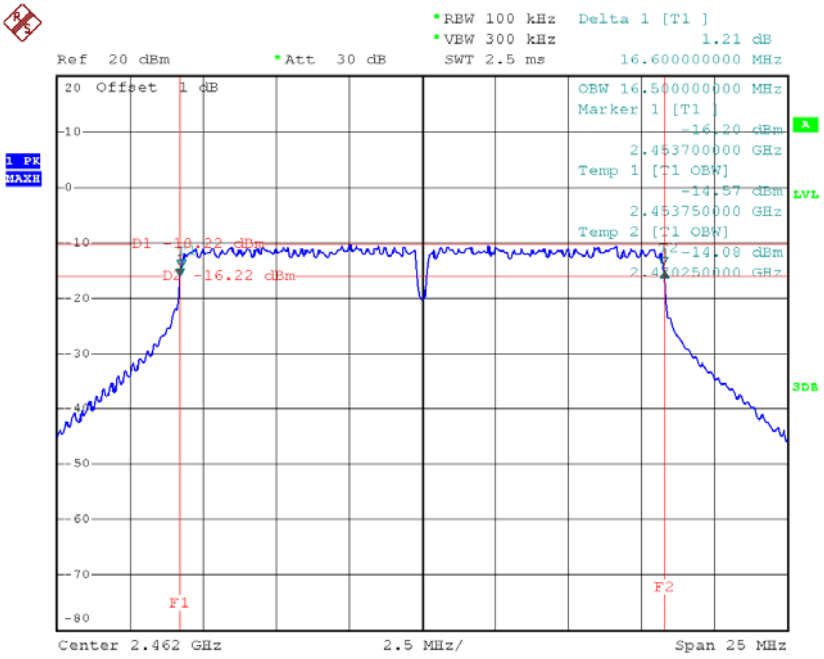


TX CH 06



Date: 25.MAR.2014 22:31:26

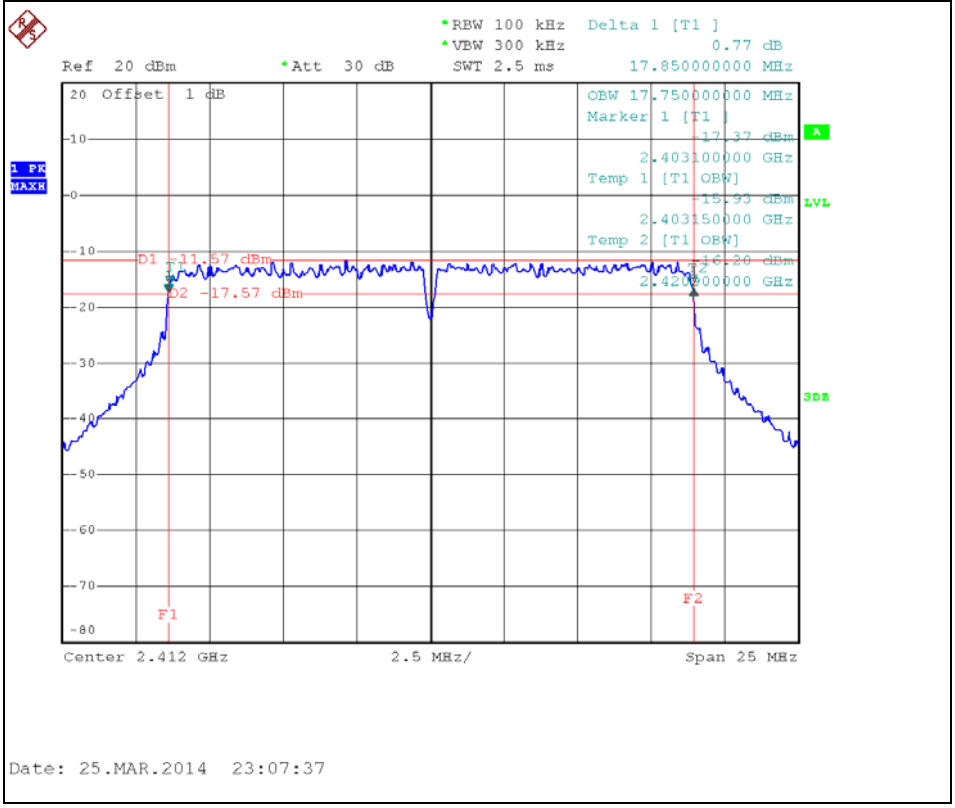
TX CH 11



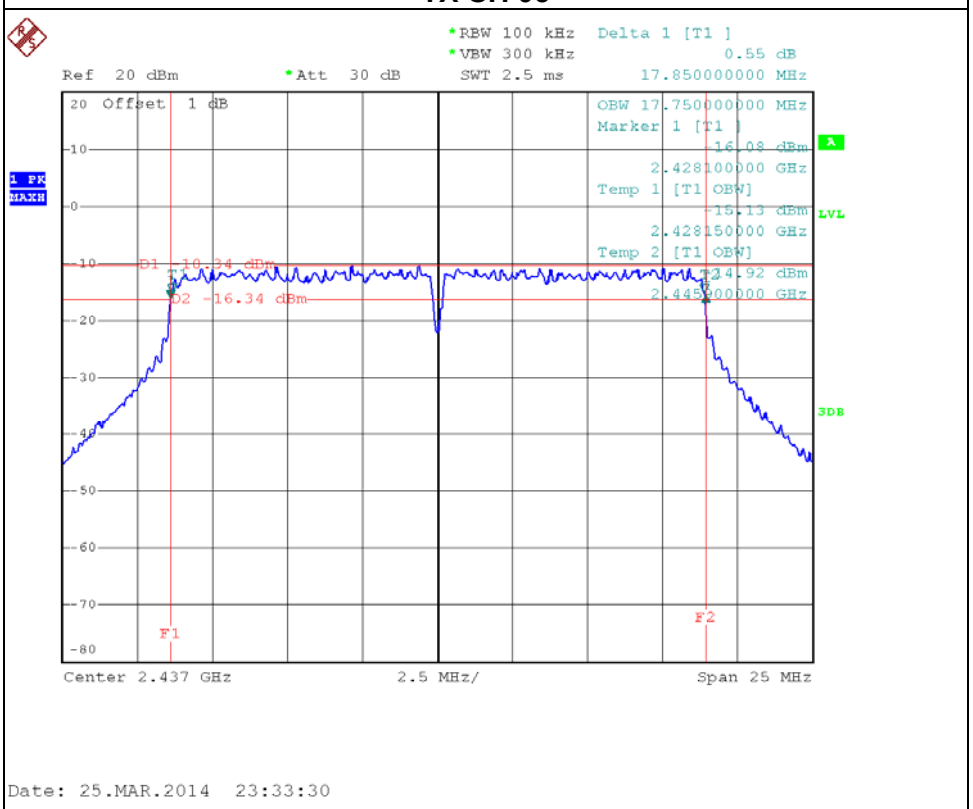
Date: 25.MAR.2014 22:35:16

Test Mode : TX N-20MHz Mode_CH01/06/11_ANT 1

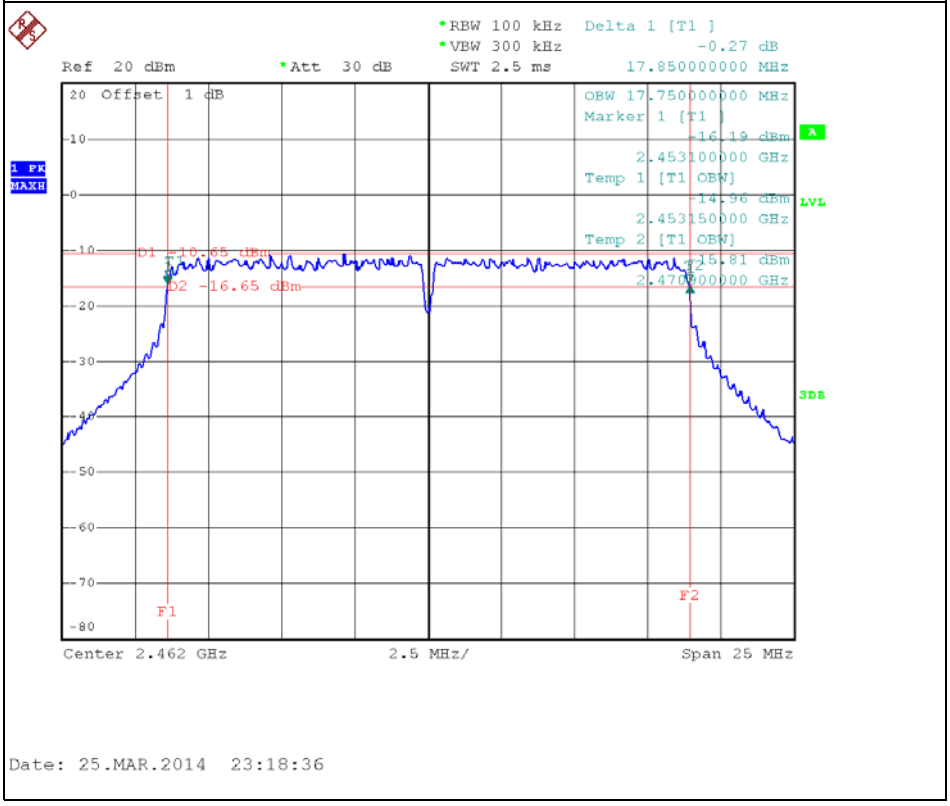
TX CH 01



TX CH 06

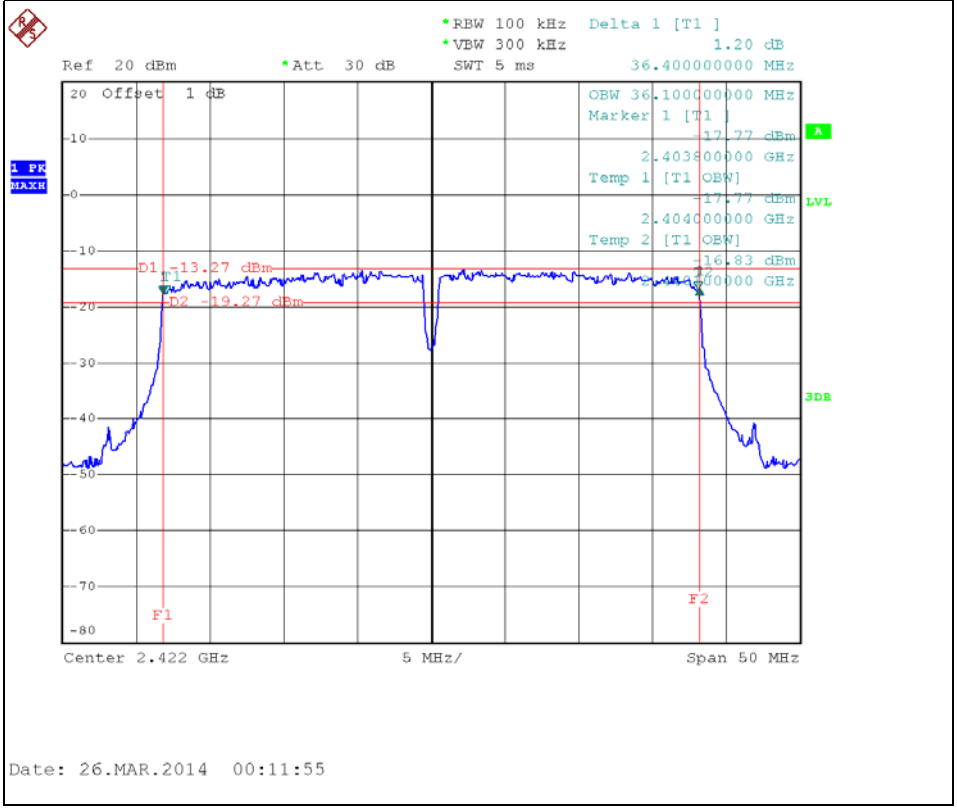


TX CH 11

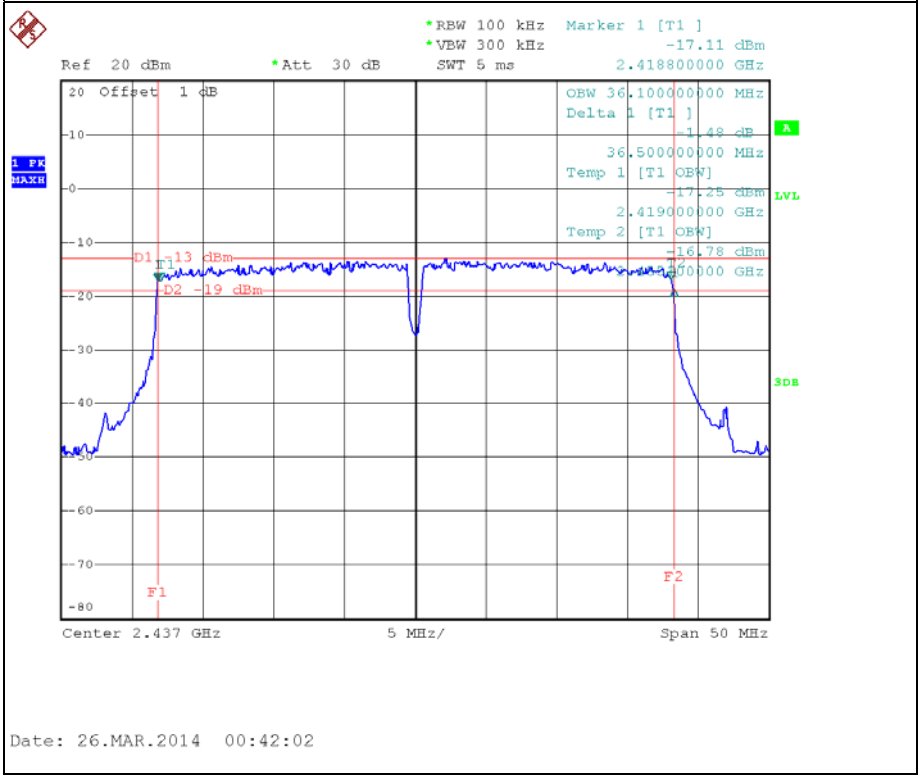


Test Mode : TX N-40MHz Mode_CH03/06/09_ANT 1

TX CH 03

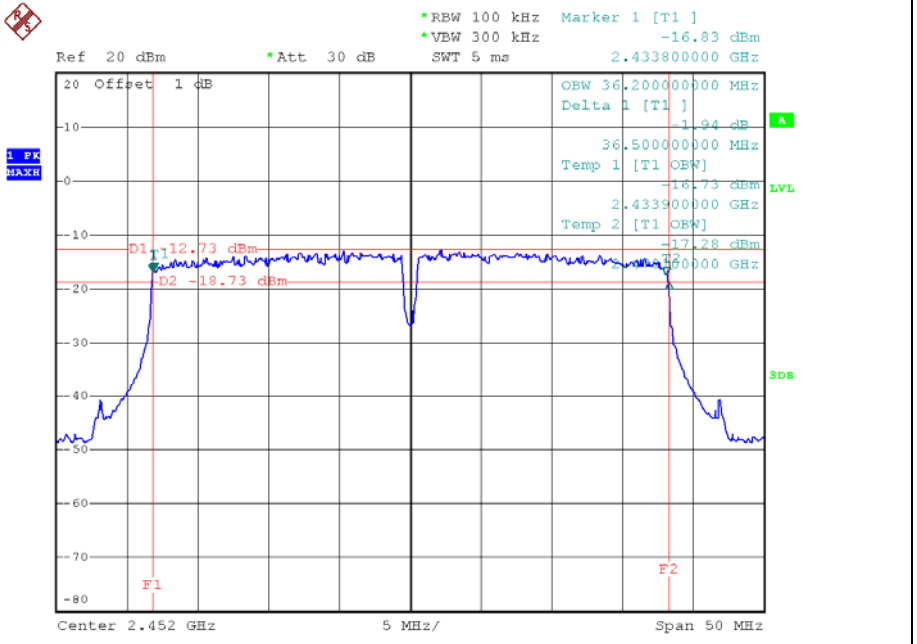


TX CH 06



Date: 26.MAR.2014 00:42:02

TX CH 09



Date: 26.MAR.2014 00:37:33

6. MAXIMUM OUTPUT POWER TEST

6.1 Applied procedures / limit

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

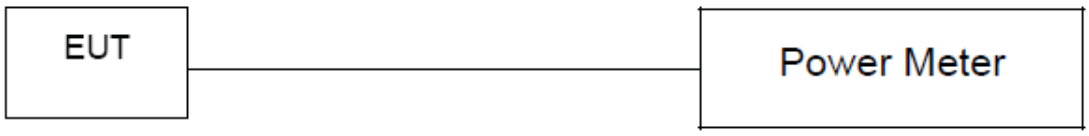
6.1.1 TEST PROCEDURE

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 9.1.3 of FCC KDB 558074 D01 DTS Meas Guidance v03r01.

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.
Transmit output power was measured while the host equipment supply voltage was varied from 85 % to 115 % of the nominal rated supply voltage. No change in transmit output power was observed.

6.1.5 EUT TEST CONDITIONS

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

6.1.6 TEST RESULTS

Test Mode : TX B Mode				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH01	2412	13.56	30	1
CH06	2437	13.77	30	1
CH11	2462	13.54	30	1

Test Mode : TX G Mode				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH01	2412	13.95	30	1
CH06	2437	13.72	30	1
CH11	2462	13.45	30	1

Test Mode : TX N-20M Mode_ANT 1				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH01	2412	12.94	30	1
CH06	2437	12.34	30	1
CH11	2462	12.95	30	1

Test Mode : TX N-20M Mode_ANT 2				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH01	2412	12.61	30	1
CH06	2437	12.68	30	1
CH11	2462	12.43	30	1

Test Mode : TX N-20M Mode_Total				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH01	2412	15.7884	30	1
CH06	2437	15.5236	30	1
CH11	2462	15.7081	30	1

Test Mode : TX N-40M Mode_ANT 1				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH03	2422	12.4100	30	1
CH06	2437	12.4700	30	1
CH09	2452	12.4500	30	1

Test Mode : TX N-40M Mode_ANT 2				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH03	2422	12.27	30	1
CH06	2437	12.39	30	1
CH09	2452	12.34	30	1

Test Mode : TX N-40M Mode_Total				
Test Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH03	2422	15.3509	30	1
CH06	2437	15.4405	30	1
CH09	2452	15.4056	30	1

7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 Applied procedures / limit

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

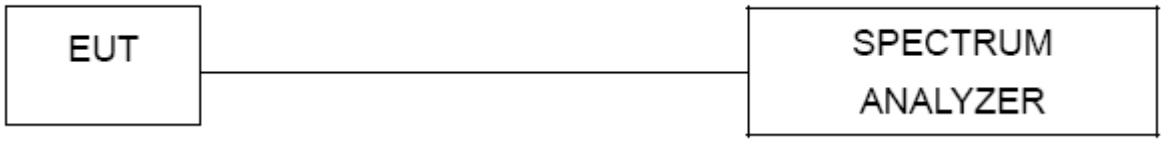
7.1.1 TEST PROCEDURE

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.

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



7.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

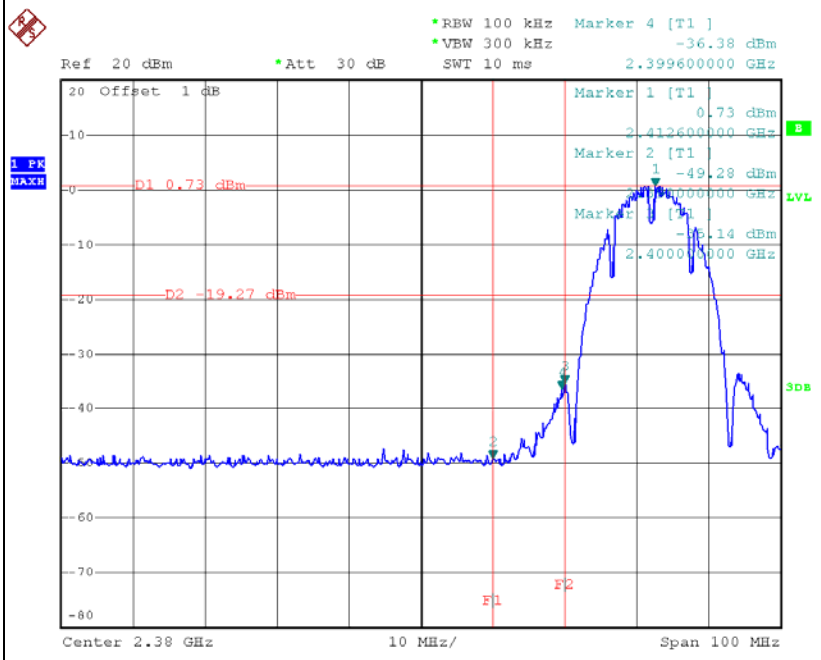
7.1.5 EUT TEST CONDITIONS

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

7.1.6 TEST RESULTS

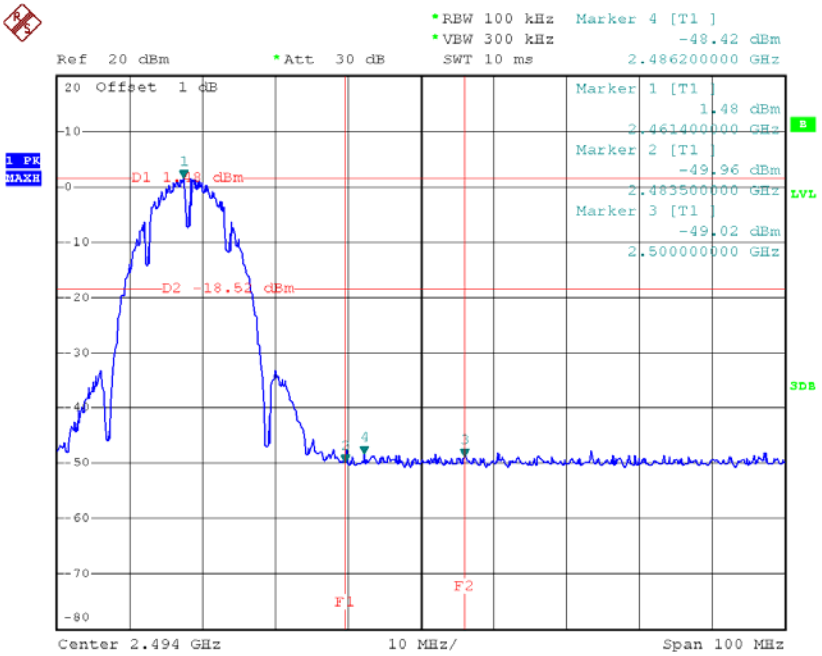
Test Mode :	**TX B Mode**

TX B mode CH01



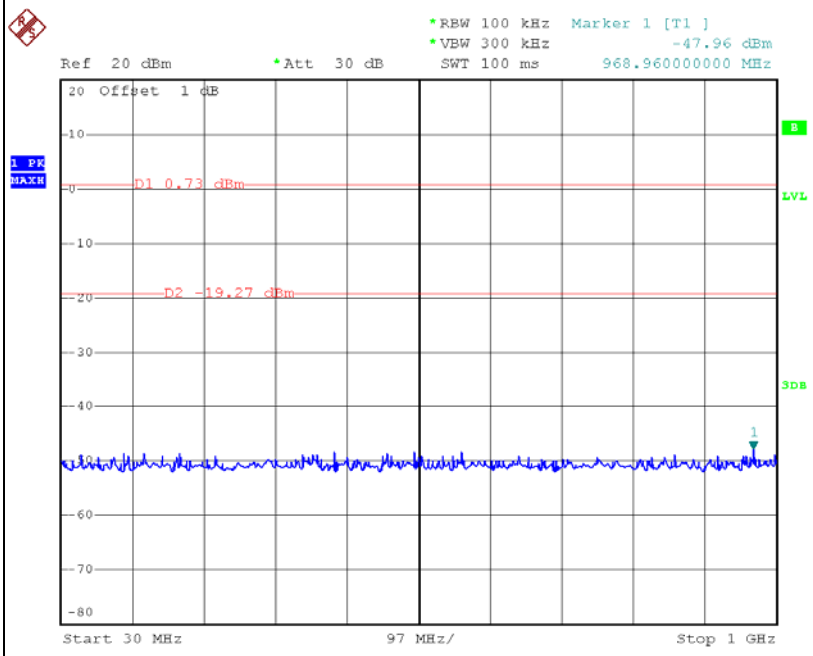
Date: 25.MAR.2014 22:04:18

TX B mode CH11



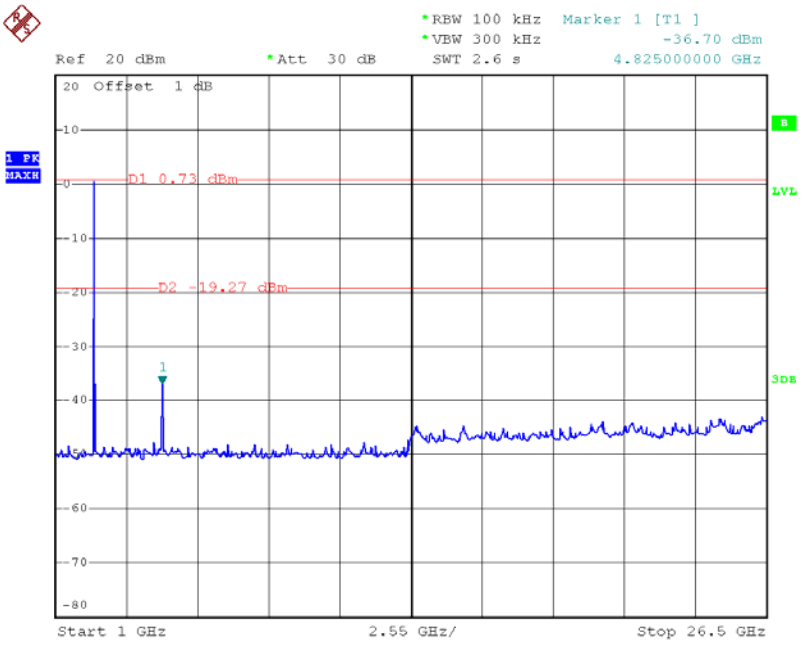
Date: 25.MAR.2014 22:07:51

TX B mode CH01 (30M~1000MHz)



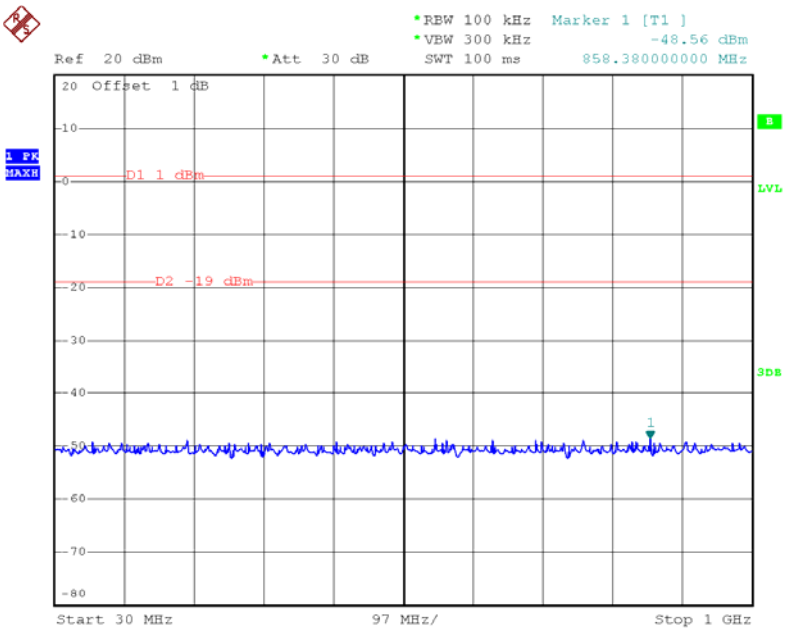
Date: 25.MAR.2014 22:05:17

TX B mode CH01 (1000MHz~10th Harmonic)



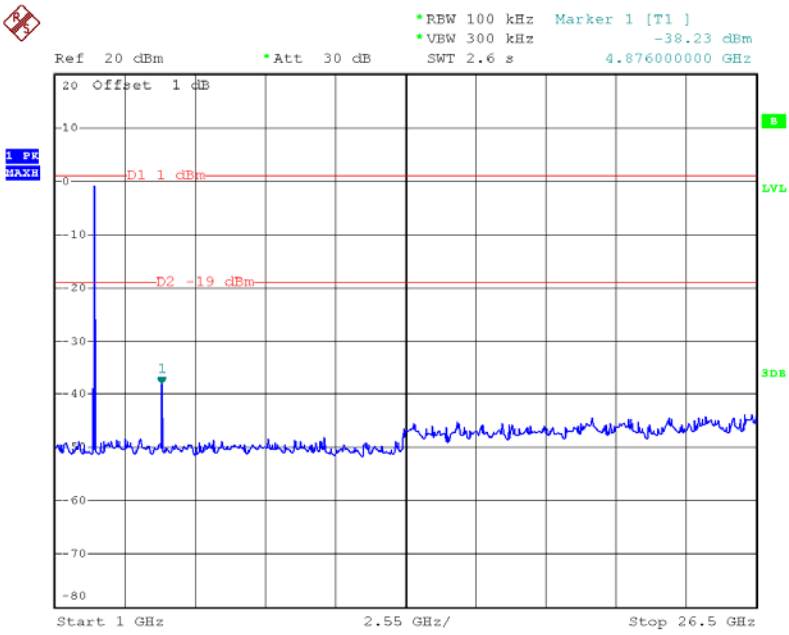
Date: 25.MAR.2014 22:05:38

TX B mode CH06 (30M~1000MHz)



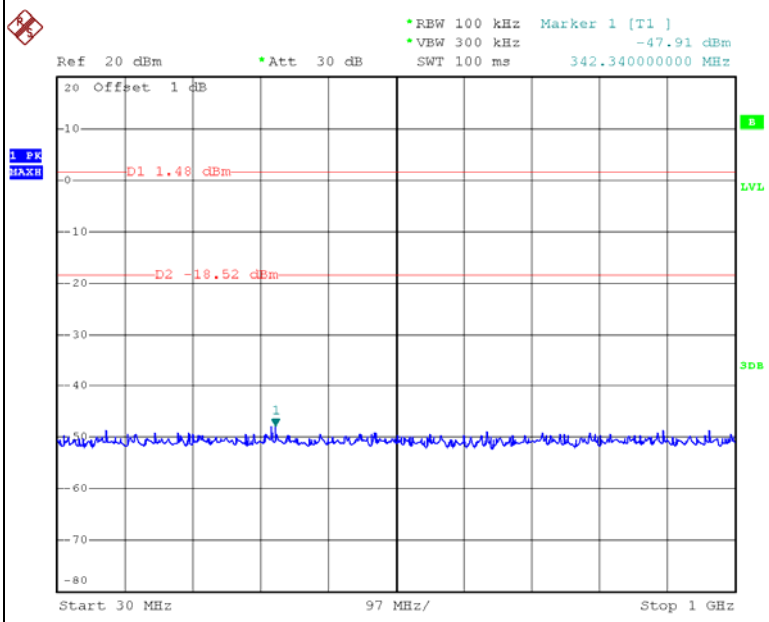
Date: 25.MAR.2014 22:13:21

TX B mode CH06 (1000MHz~10th Harmonic)



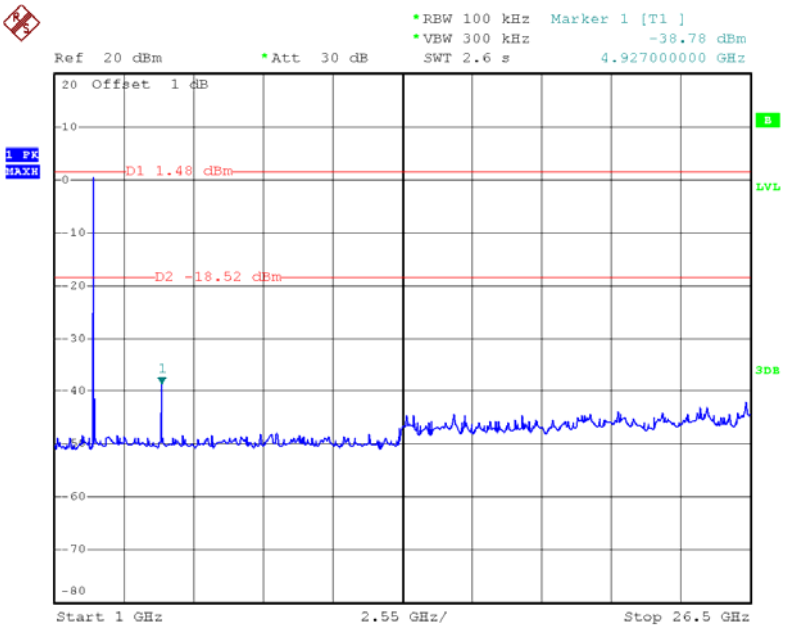
Date: 25.MAR.2014 22:13:34

TX B mode CH11 (30M~1000MHz)



Date: 25.MAR.2014 22:08:16

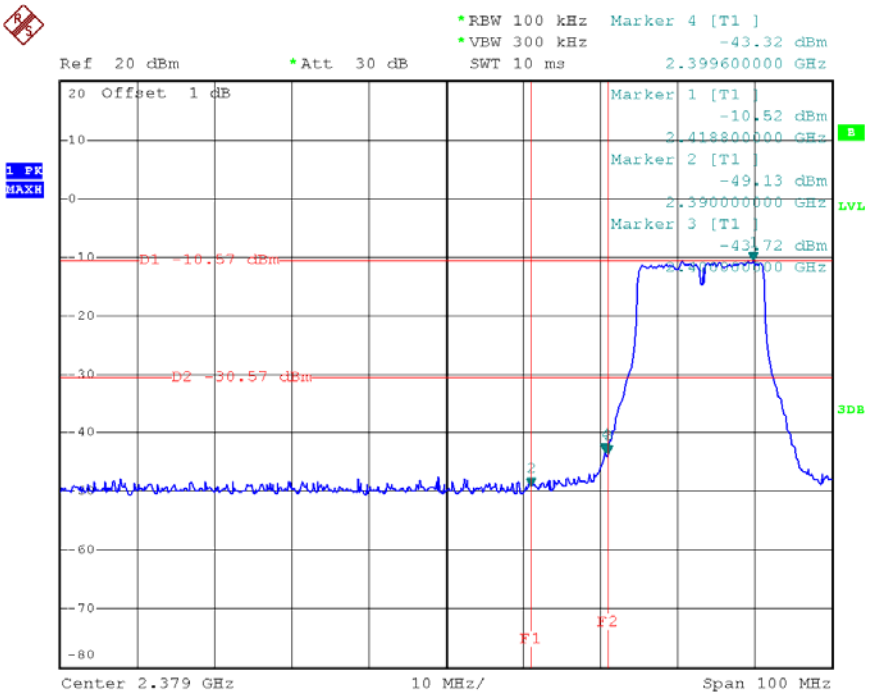
TX B mode CH11 (1000MHz~10th Harmonic)



Date: 25.MAR.2014 22:08:49

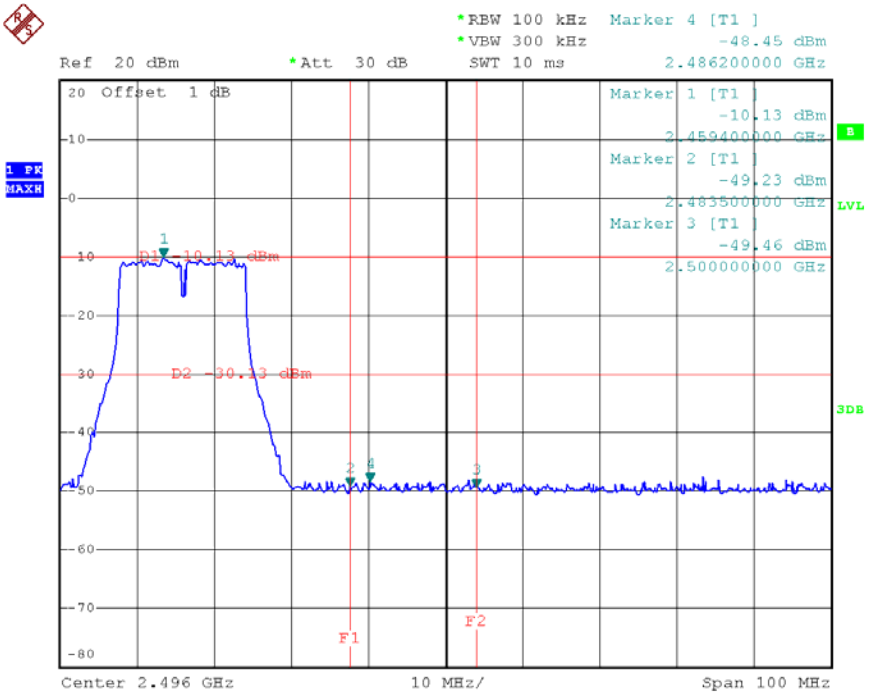
Test Mode :	**TX G Mode**

TX G mode CH01



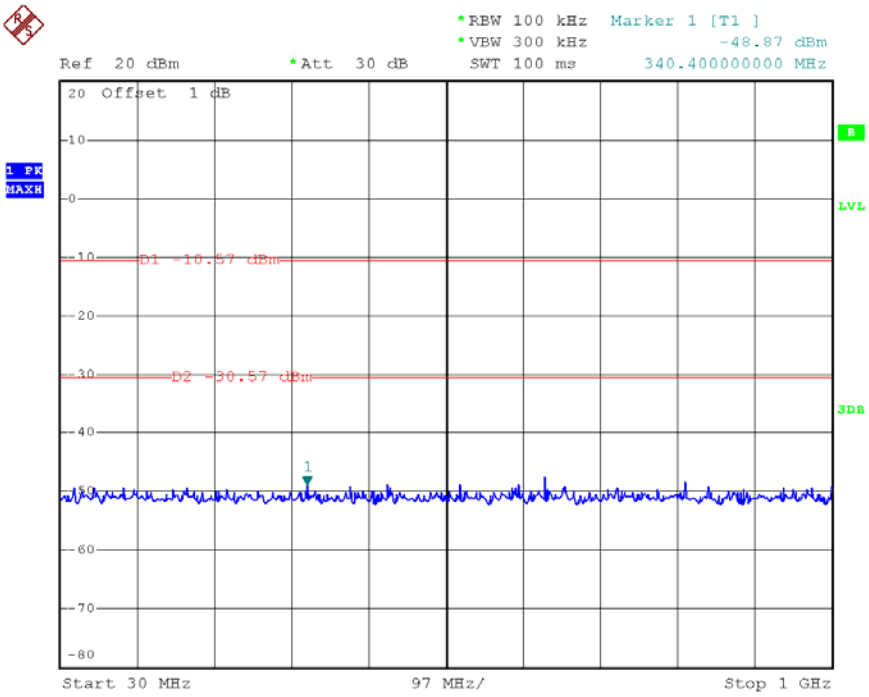
Date: 25.MAR.2014 22:19:34

TX G mode CH11



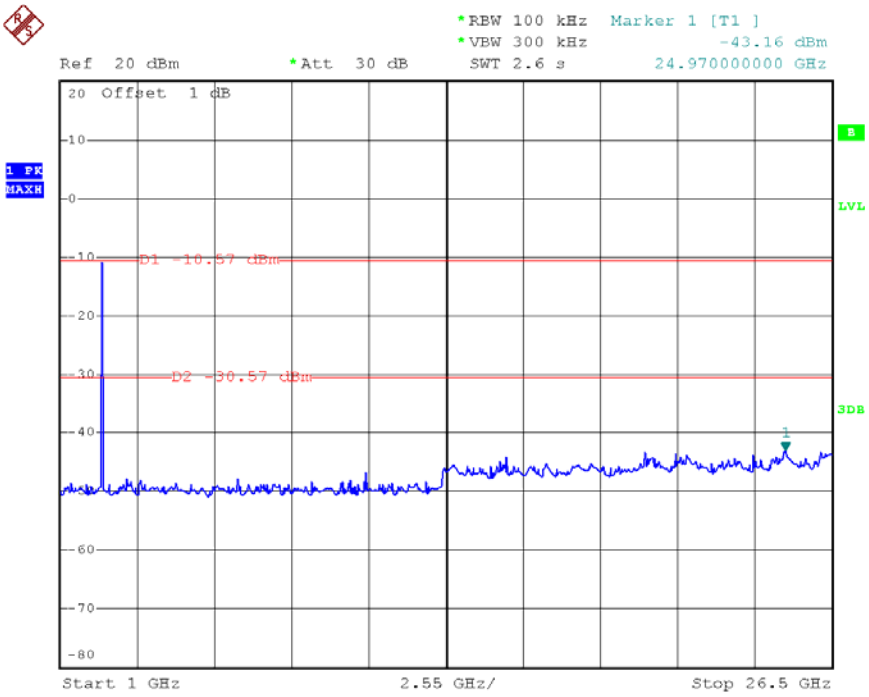
Date: 25.MAR.2014 22:24:30

TX G mode CH01 (30M~1000MHz)



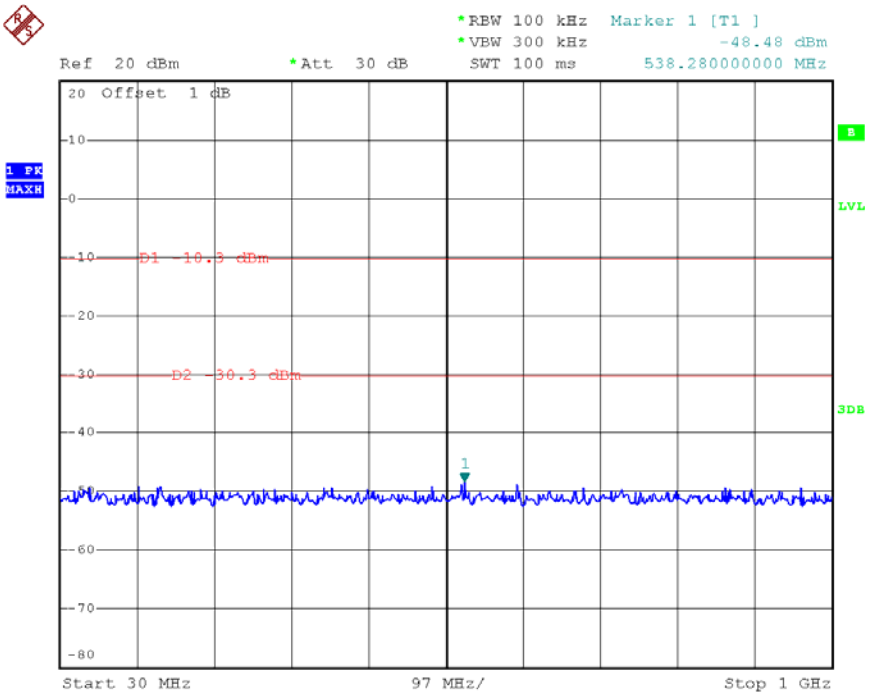
Date: 25.MAR.2014 22:19:55

TX G mode CH01 (1000MHz~10th Harmonic)



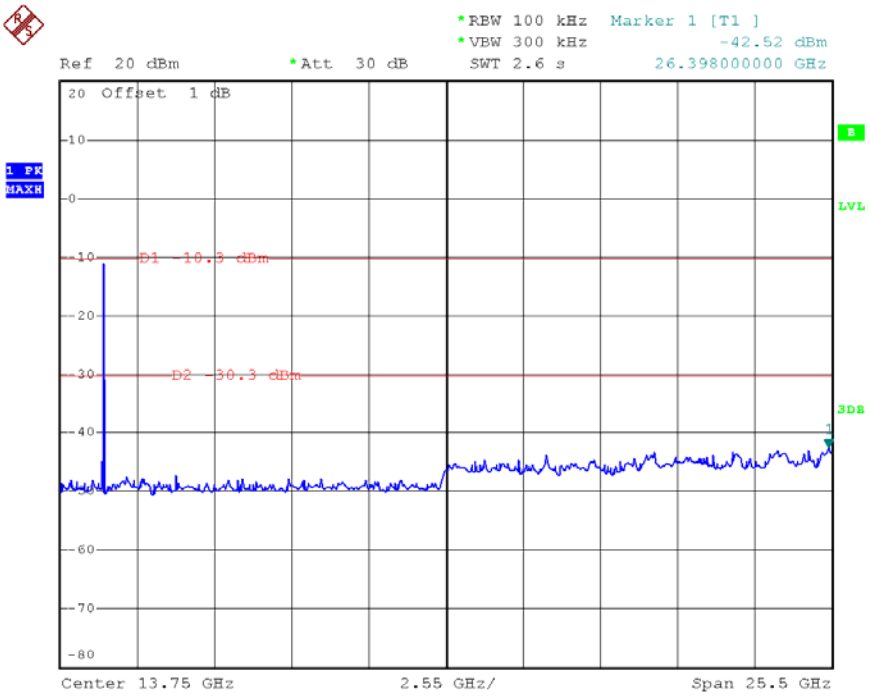
Date: 25.MAR.2014 22:20:42

TX G mode CH06 (30M~1000MHz)



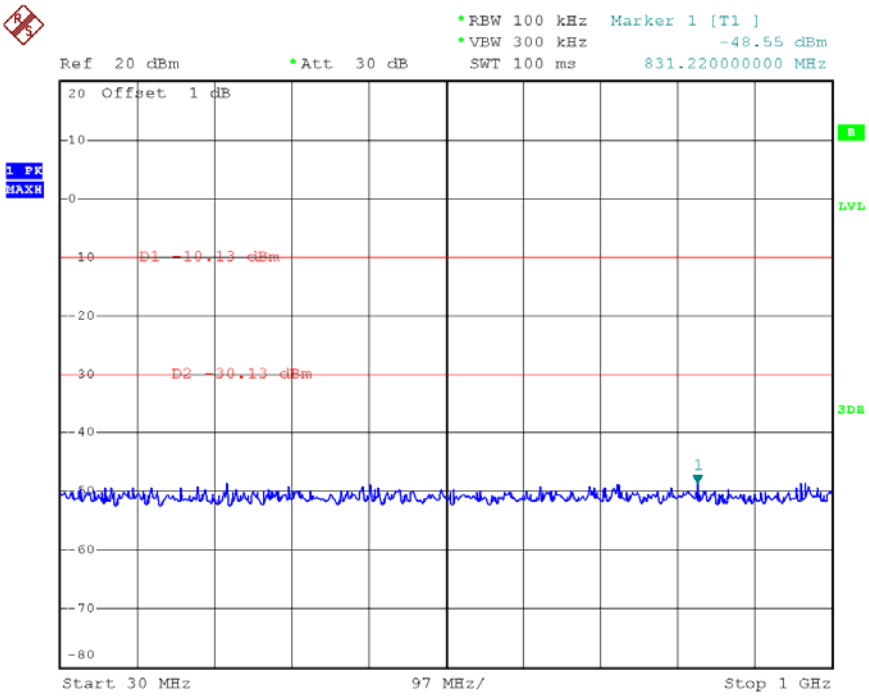
Date: 25.MAR.2014 22:32:27

TX G mode CH06 (1000MHz~10th Harmonic)



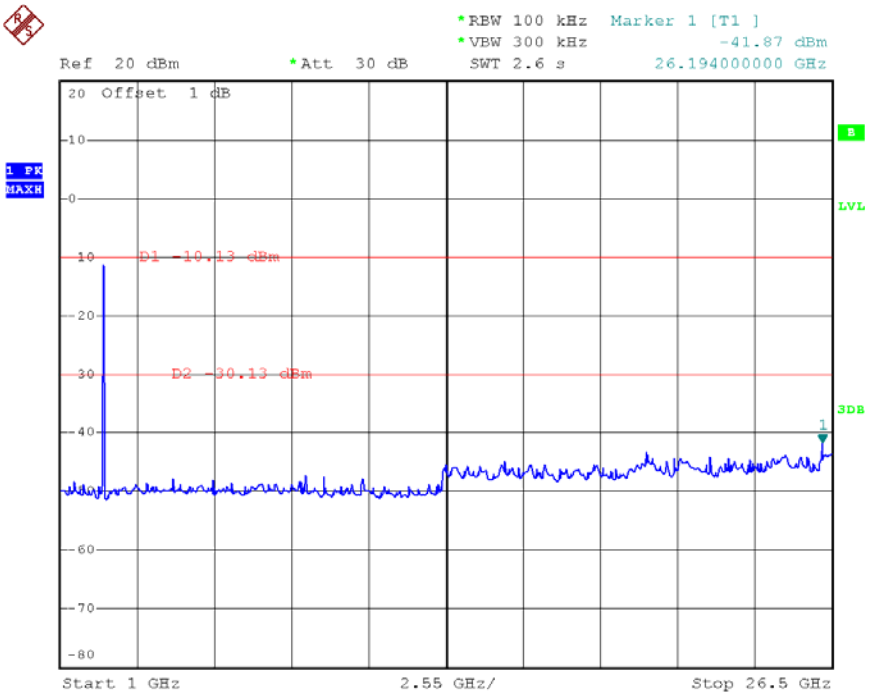
Date: 25.MAR.2014 22:32:17

TX G mode CH11 (30M~1000MHz)



Date: 25.MAR.2014 22:24:49

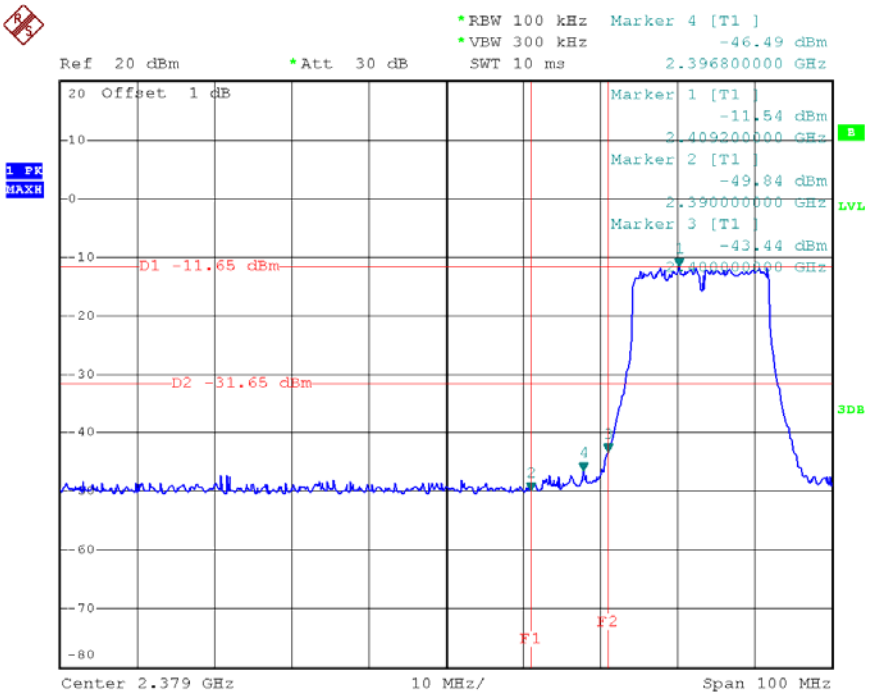
TX G mode CH11 (1000MHz~10th Harmonic)



Date: 25.MAR.2014 22:25:06

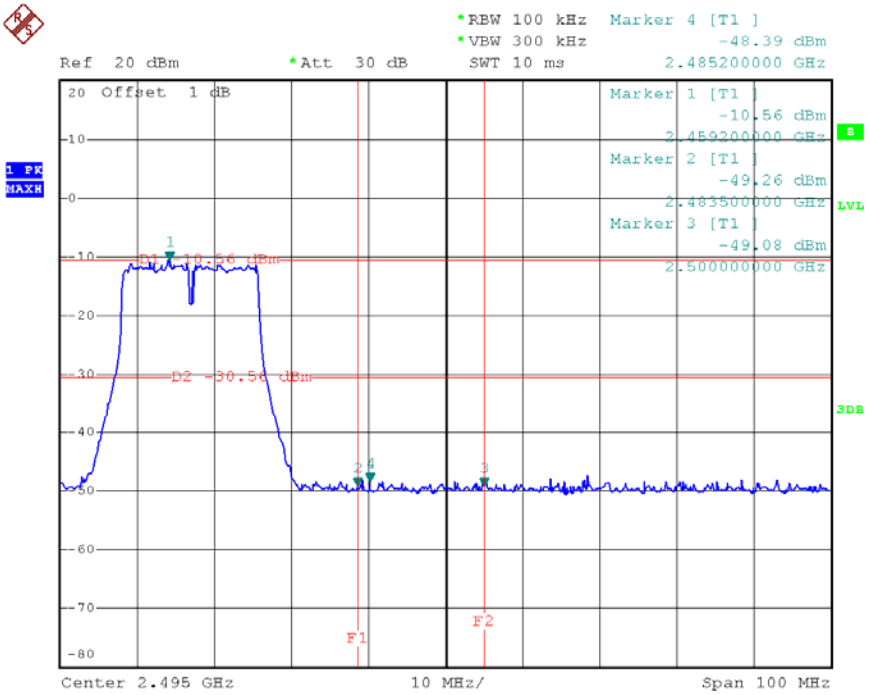
Test Mode :	**TX N-20M Mode_ANT 1**

TX HT20 mode CH01



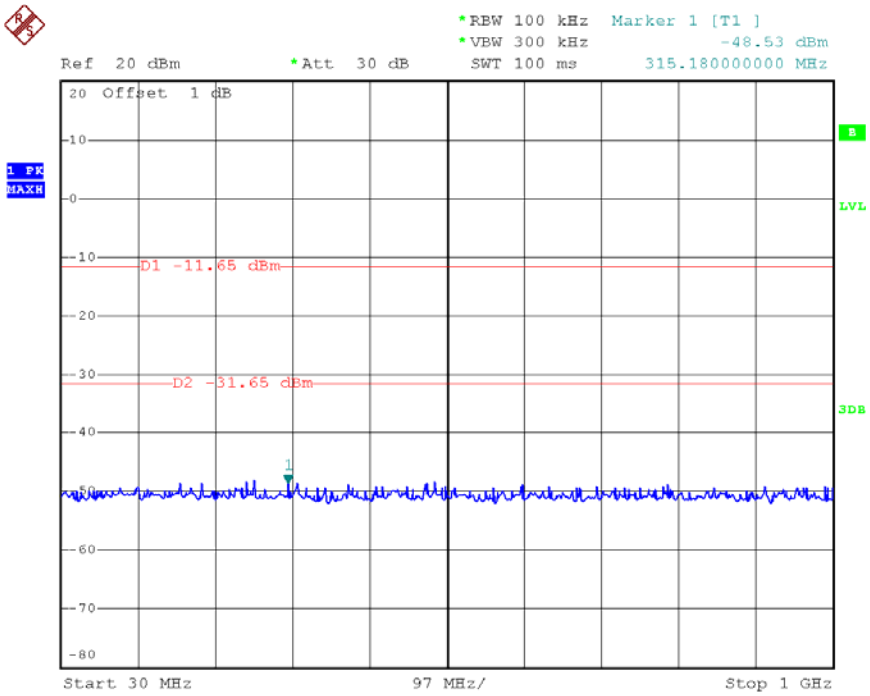
Date: 25.MAR.2014 23:09:47

TX HT20 mode CH11



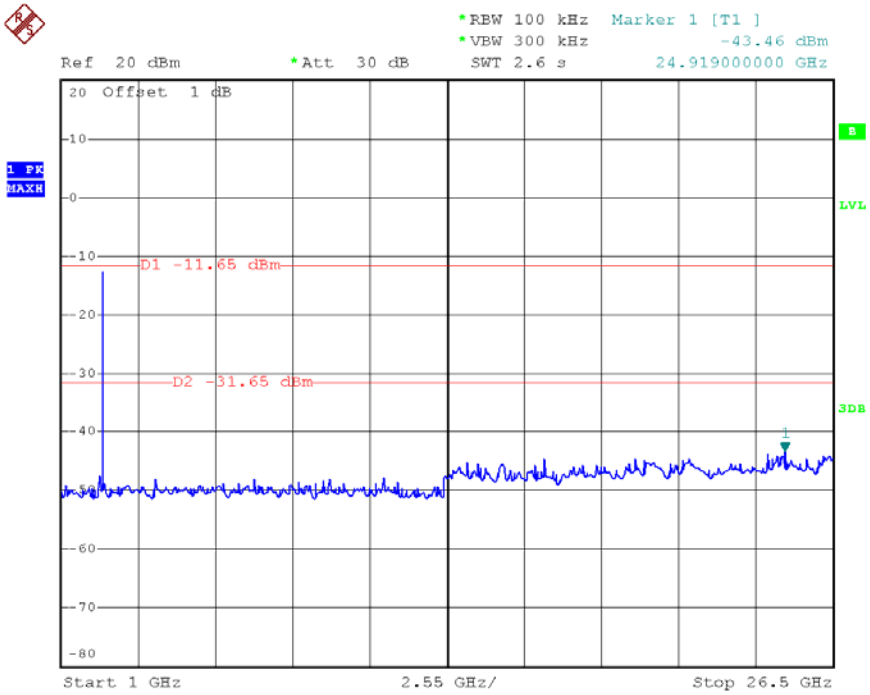
Date: 25.MAR.2014 23:14:09

TX HT20 mode CH01 (30M~1000MHz)



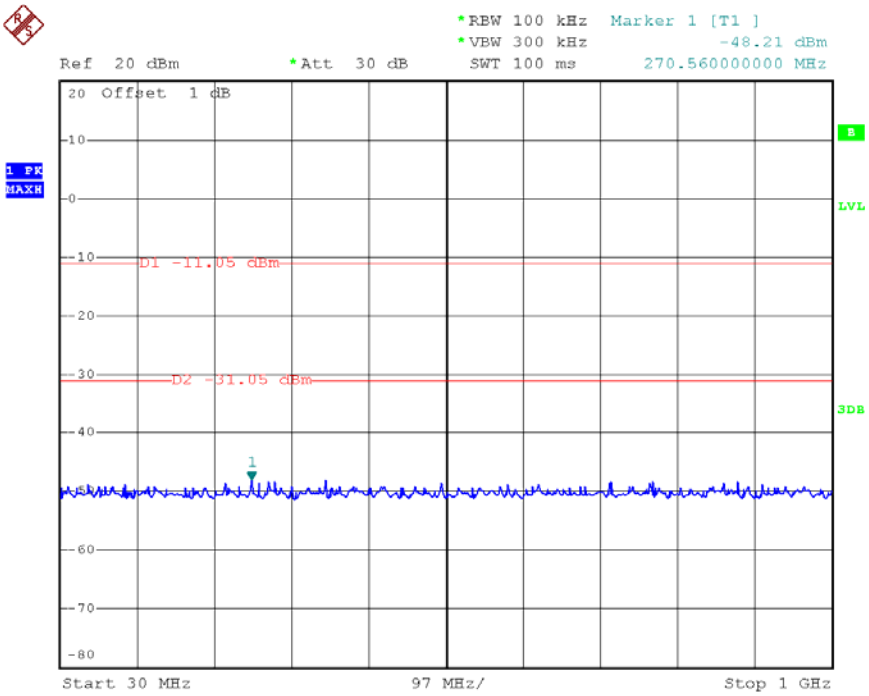
Date: 25.MAR.2014 23:10:33

TX HT20 mode CH01 (1000MHz~10th Harmonic)



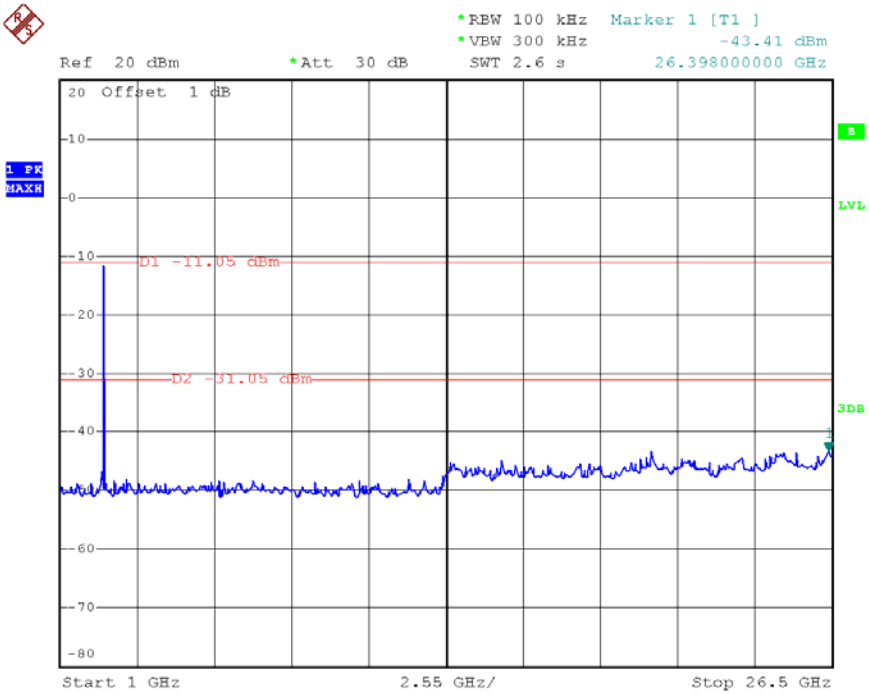
Date: 25.MAR.2014 23:10:49

TX HT20 mode CH06 (30M~1000MHz)



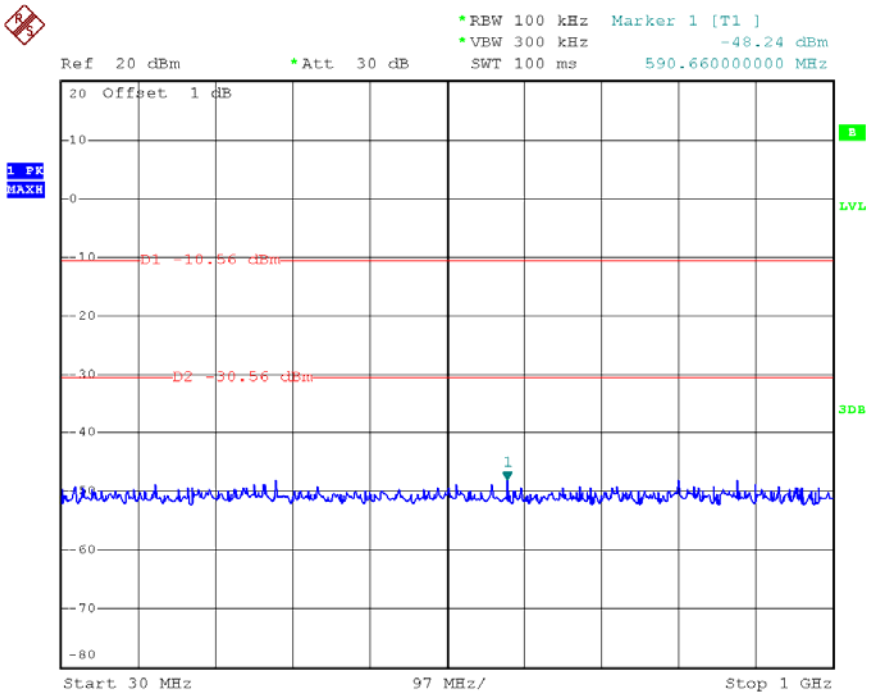
Date: 25.MAR.2014 23:35:01

TX HT20 mode CH06 (1000MHz~10th Harmonic)



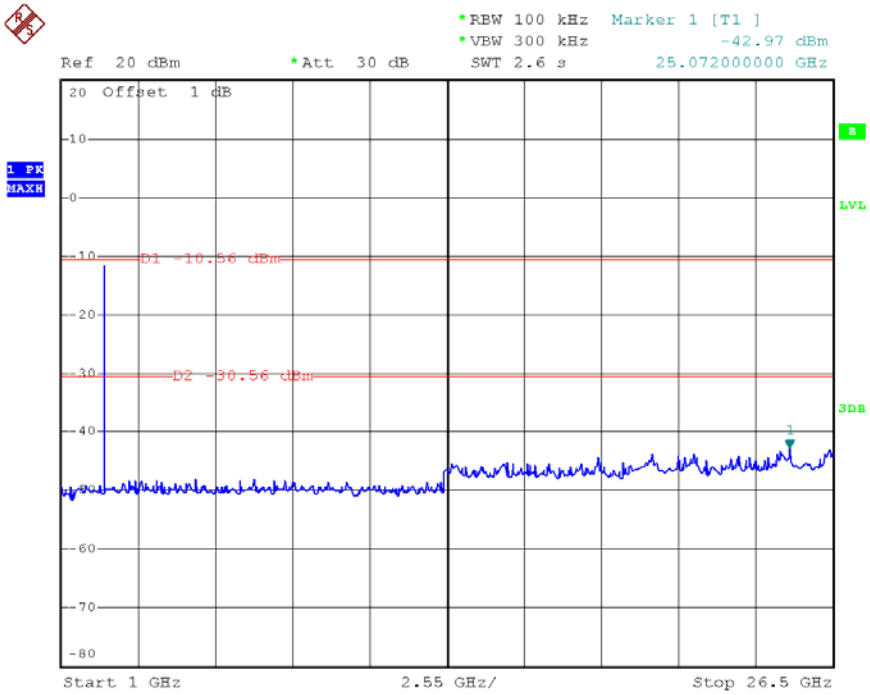
Date: 25.MAR.2014 23:35:18

TX HT20 mode CH11 (30M~1000MHz)



Date: 25.MAR.2014 23:14:40

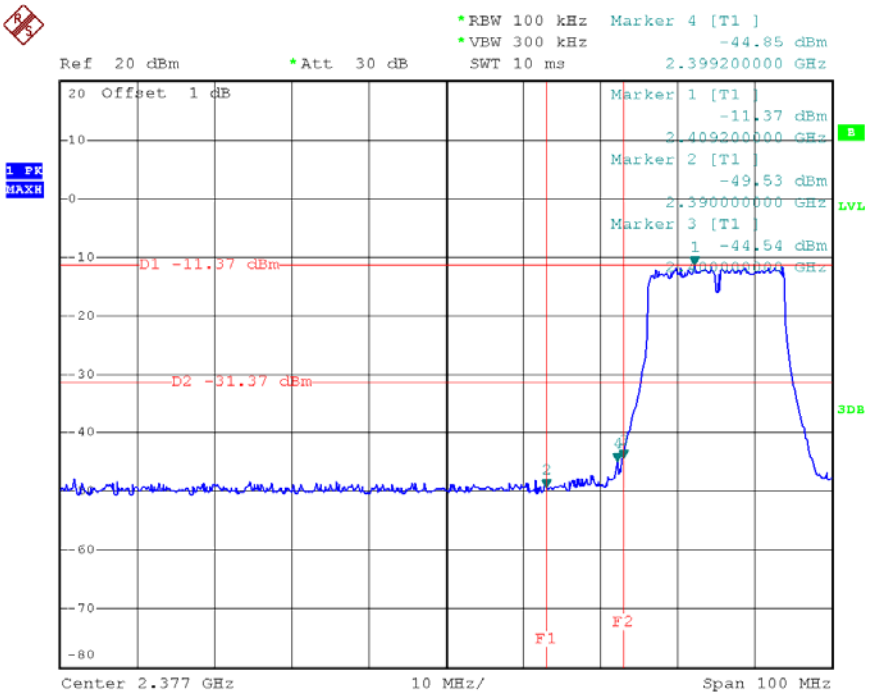
TX HT20 mode CH11 (1000MHz~10th Harmonic)



Date: 25.MAR.2014 23:14:57

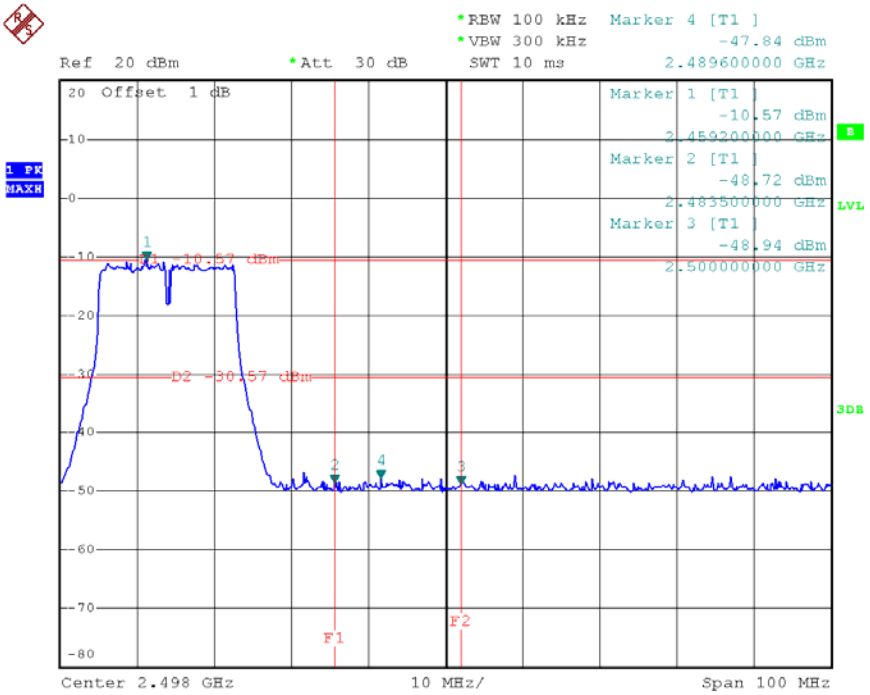
Test Mode :	**TX N-20M Mode_ANT 2**

TX HT20 mode CH01



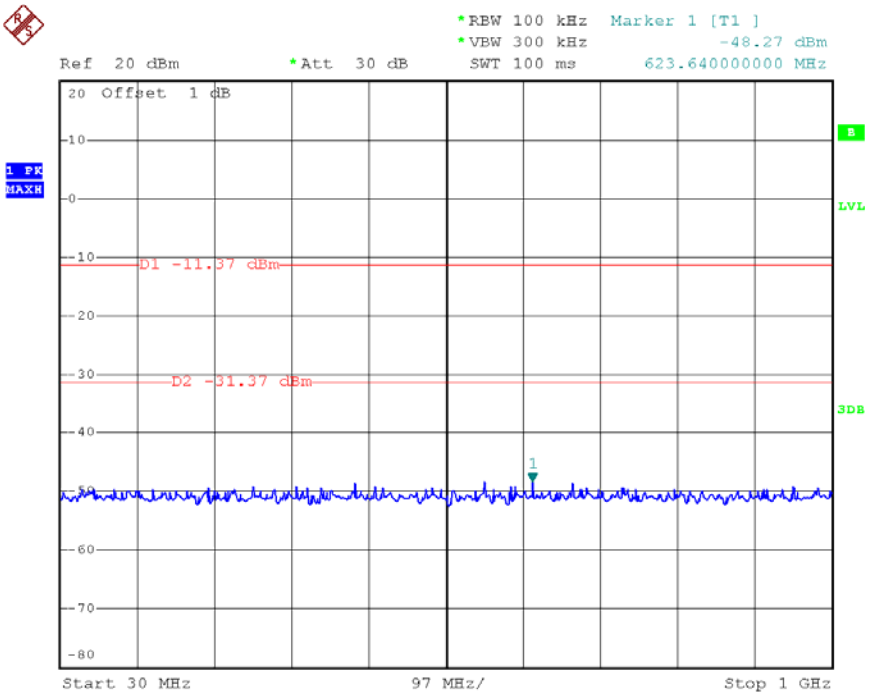
Date: 25.MAR.2014 23:38:48

TX HT20 mode CH11



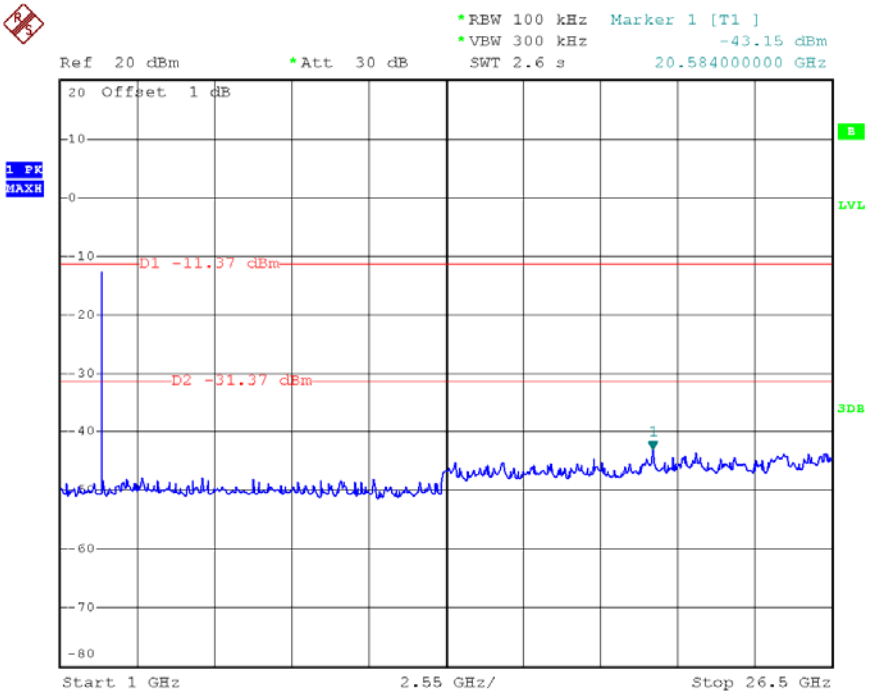
Date: 25.MAR.2014 23:47:03

TX HT20 mode CH01 (30M~1000MHz)



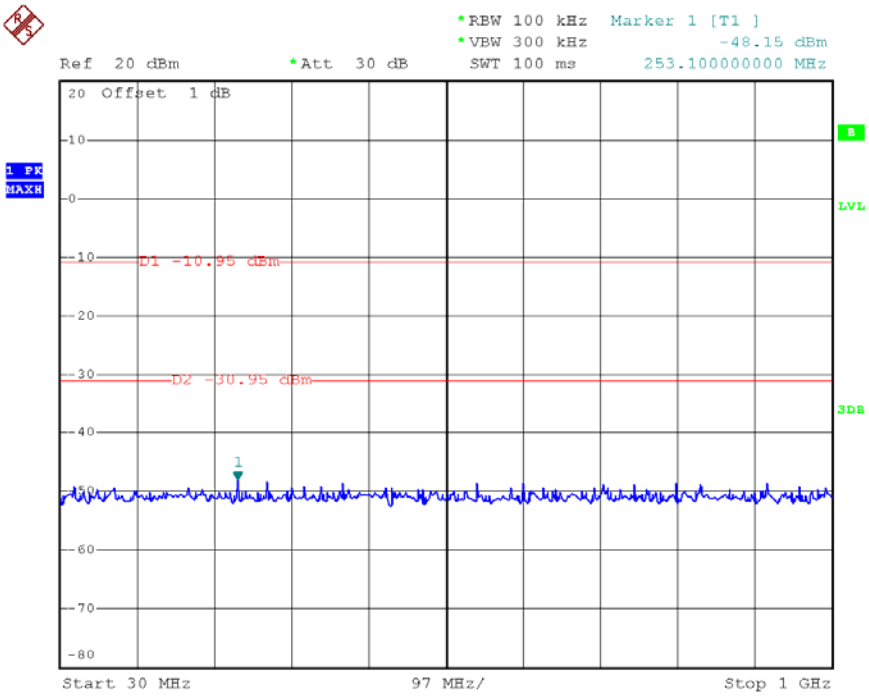
Date: 25.MAR.2014 23:40:15

TX HT20 mode CH01 (1000MHz~10th Harmonic)



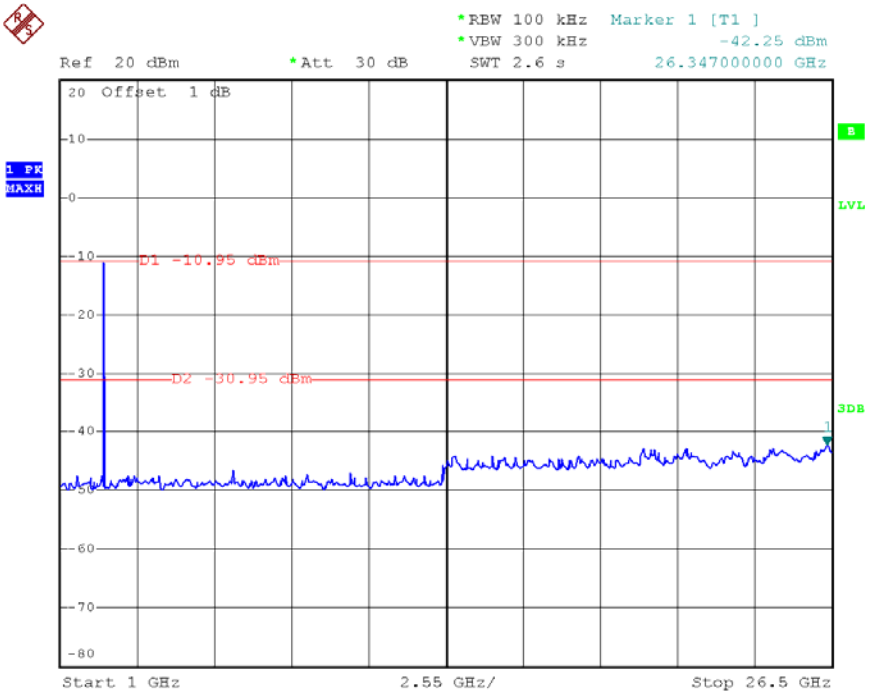
Date: 25.MAR.2014 23:40:32

TX HT20 mode CH06 (30M~1000MHz)



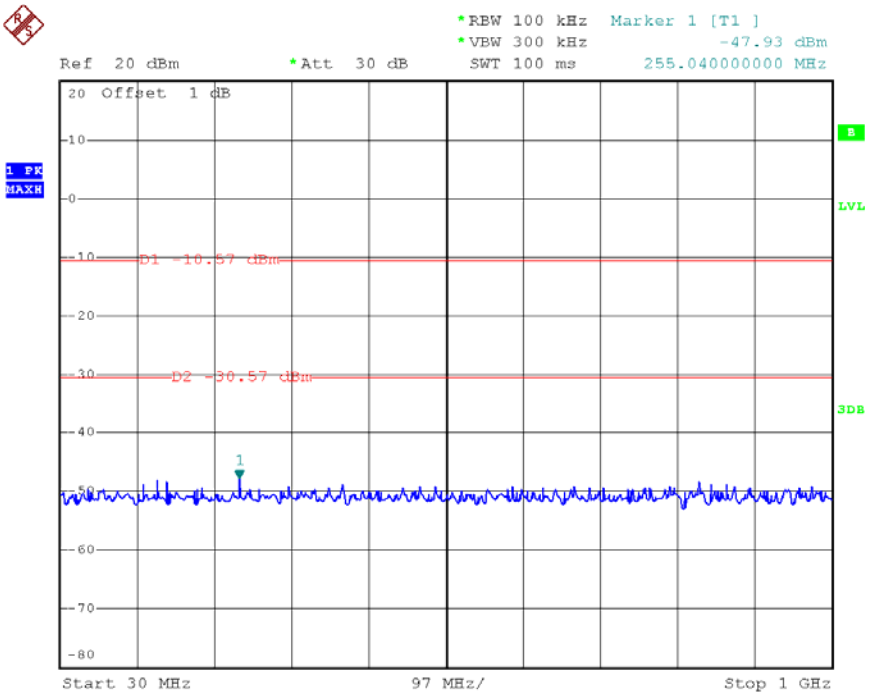
Date: 25.MAR.2014 23:49:55

TX HT20 mode CH06 (1000MHz~10th Harmonic)



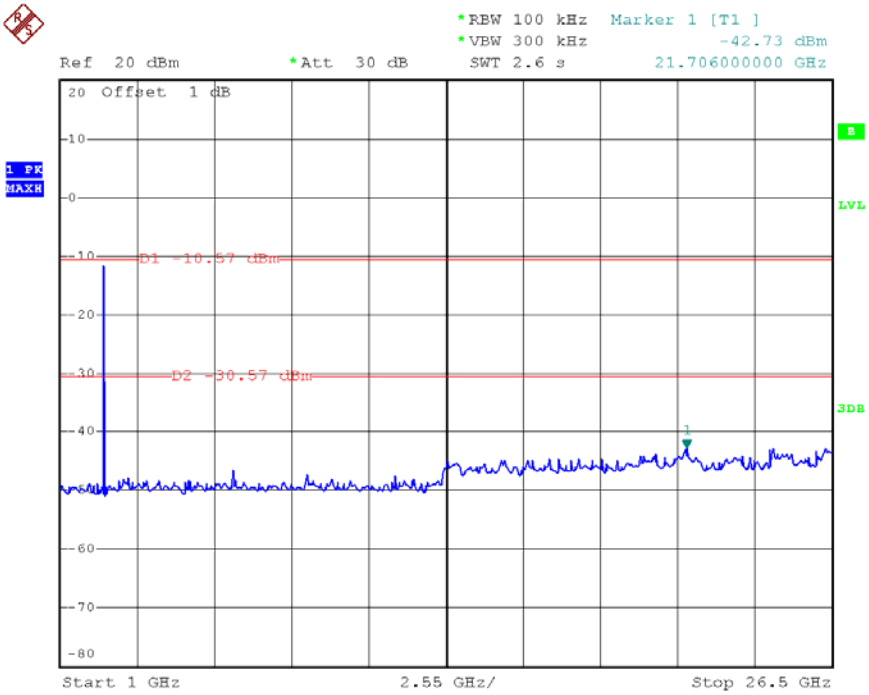
Date: 25.MAR.2014 23:49:37

TX HT20 mode CH11 (30M~1000MHz)



Date: 25.MAR.2014 23:47:24

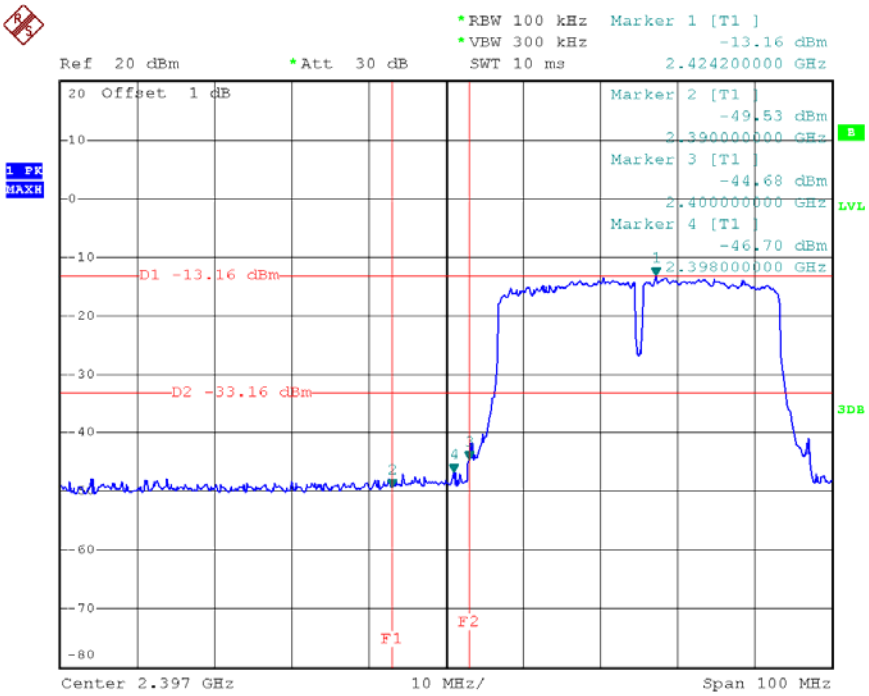
TX HT20 mode CH11 (1000MHz~10th Harmonic)



Date: 25.MAR.2014 23:48:02

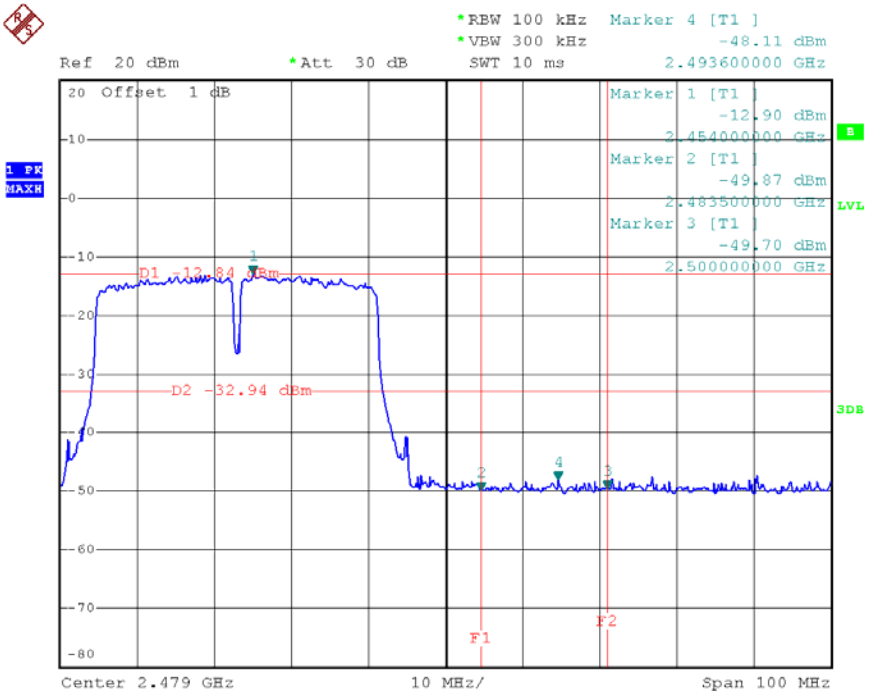
Test Mode :	**TX N-40M Mode_ANT 1**

TX HT40 mode CH03



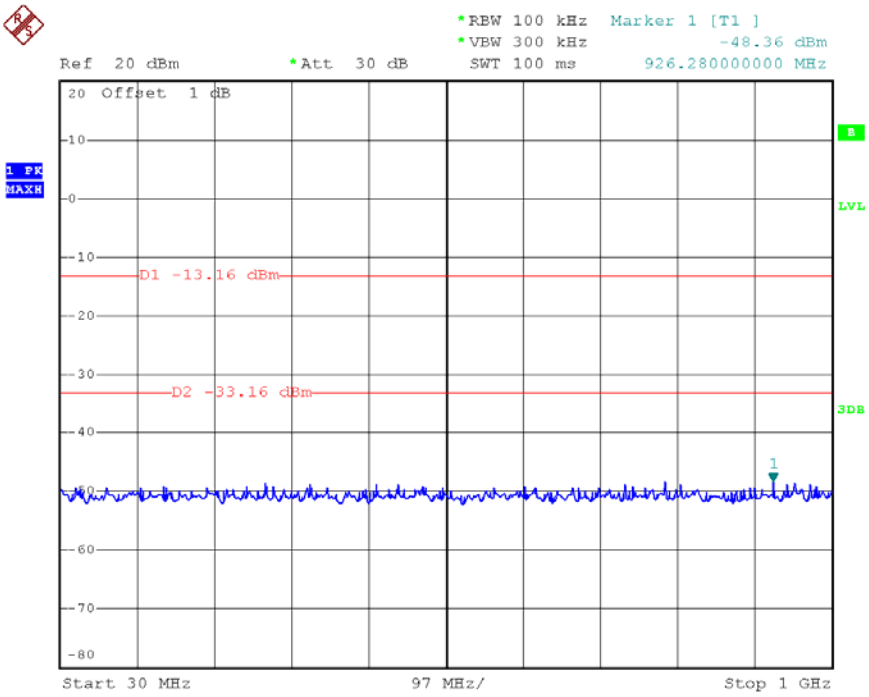
Date: 26.MAR.2014 00:14:39

TX HT40 mode CH09



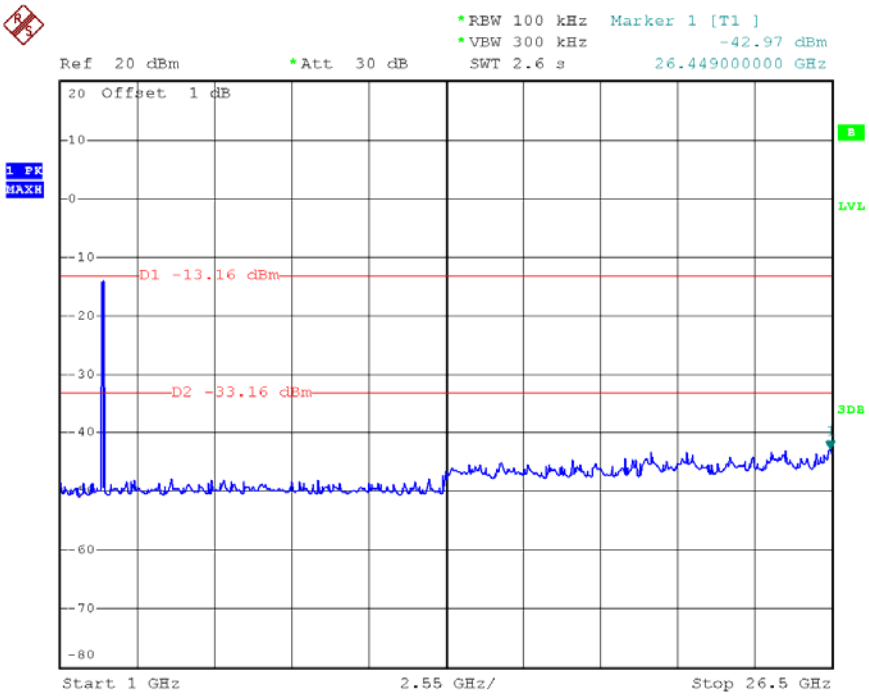
Date: 26.MAR.2014 00:21:22

TX HT40 mode CH03 (30M~1000MHz)



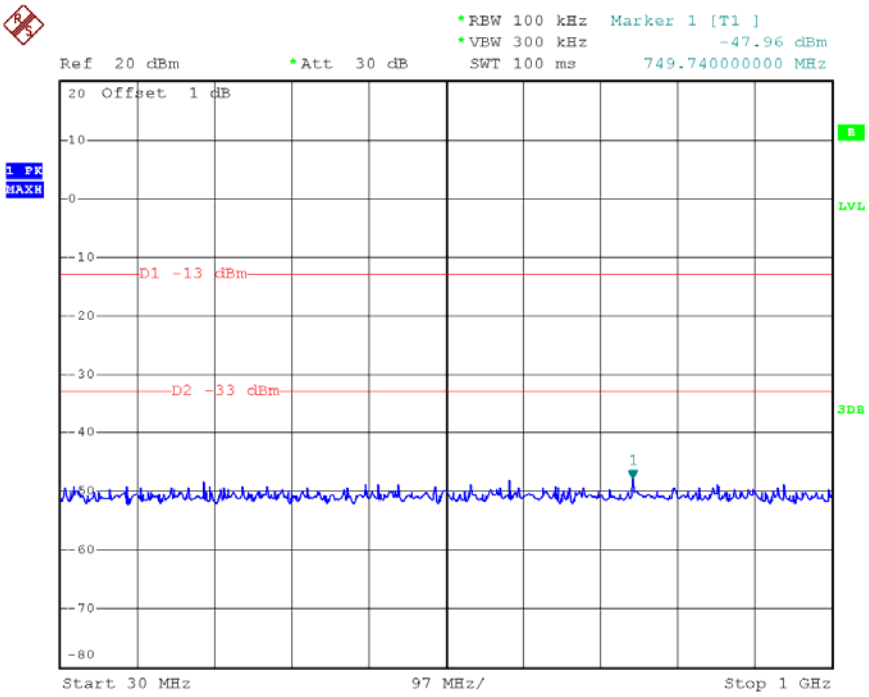
Date: 26.MAR.2014 00:15:23

TX HT40 mode CH03 (1000MHz~10th Harmonic)



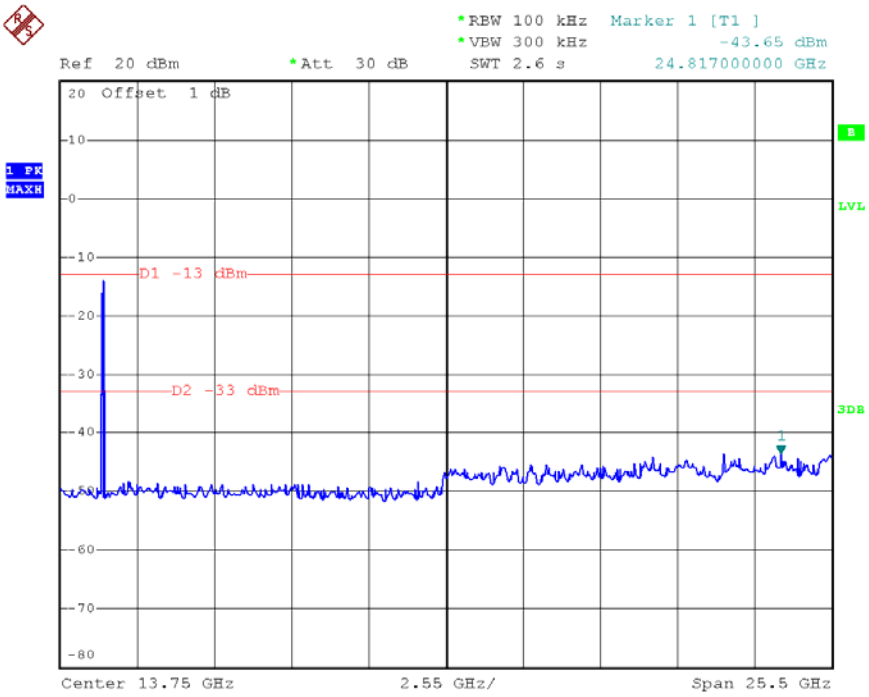
Date: 26.MAR.2014 00:18:43

TX HT40 mode CH06 (30M~1000MHz)



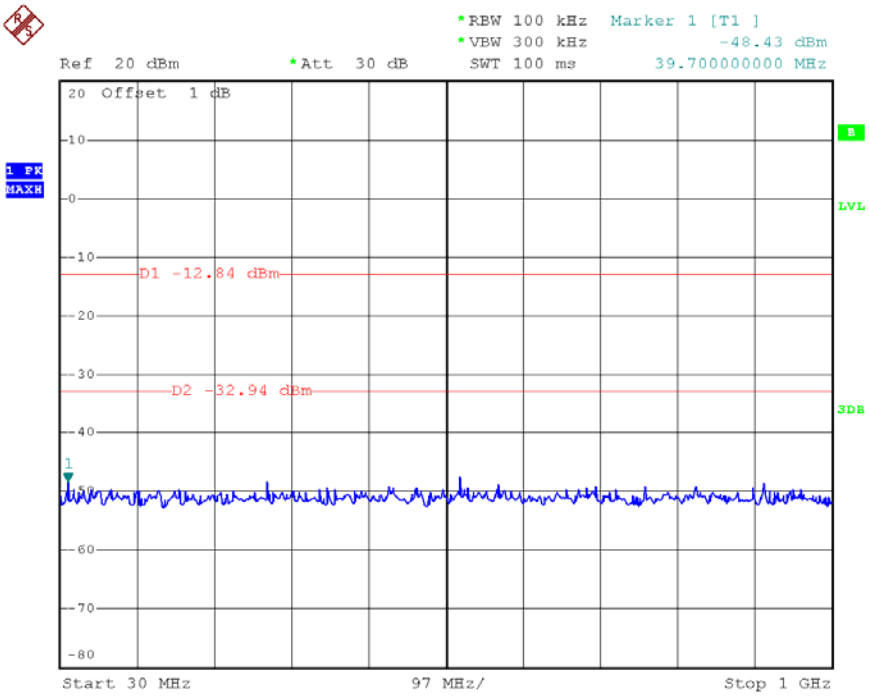
Date: 26.MAR.2014 00:44:24

TX HT40 mode CH06 (1000MHz~10th Harmonic)



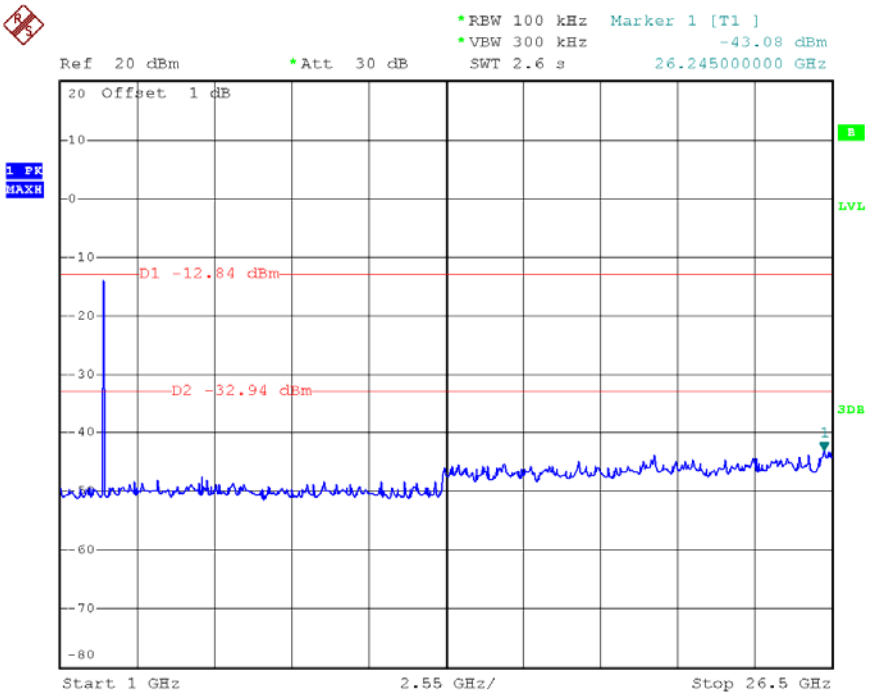
Date: 26.MAR.2014 00:43:21

TX HT40 mode CH09 (30M~1000MHz)



Date: 26.MAR.2014 00:21:49

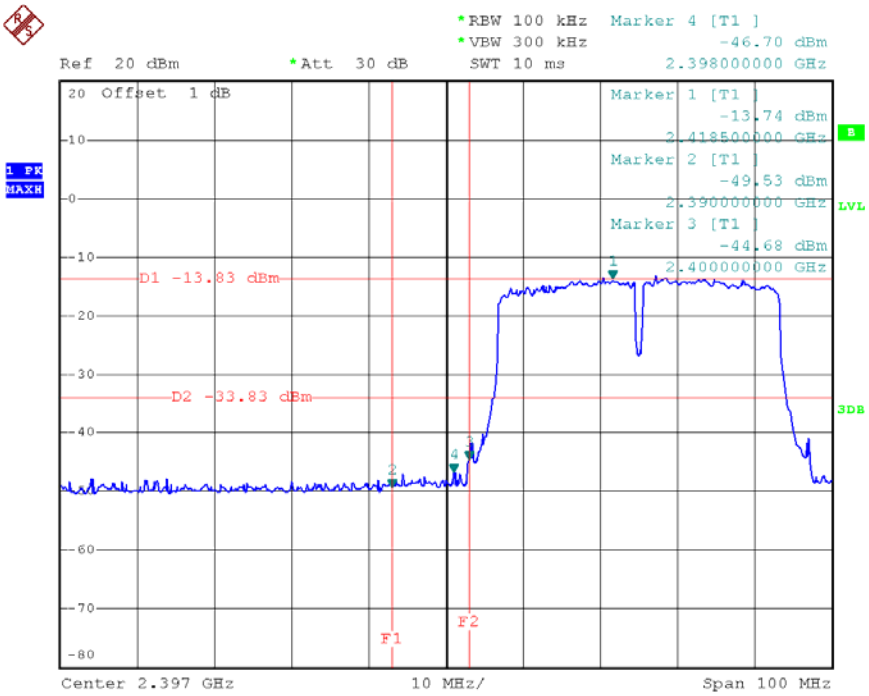
TX HT40 mode CH09 (1000MHz~10th Harmonic)



Date: 26.MAR.2014 00:22:06

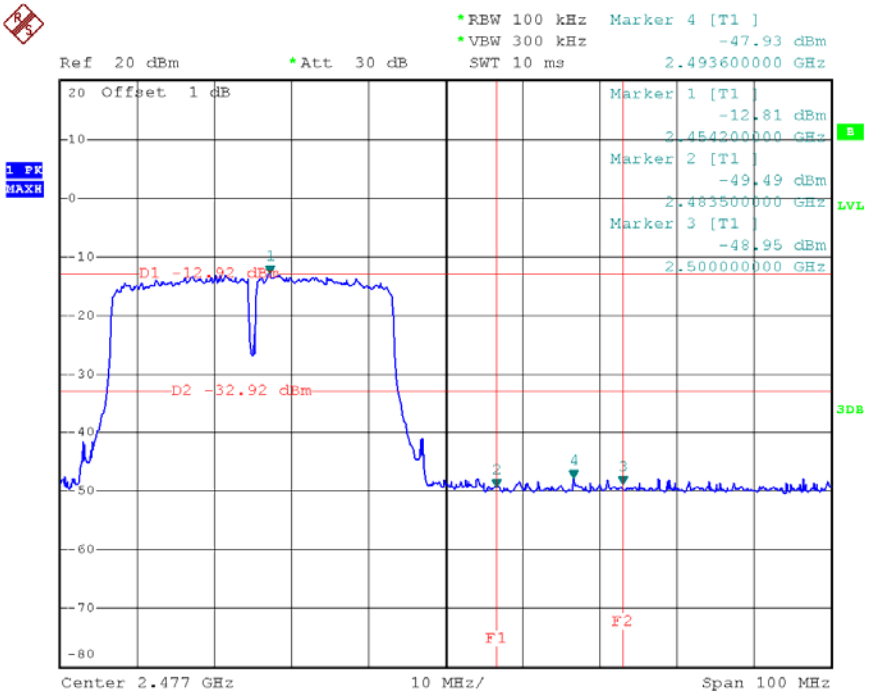
Test Mode :	**TX N-40M Mode_ANT 2**

TX HT40 mode CH03



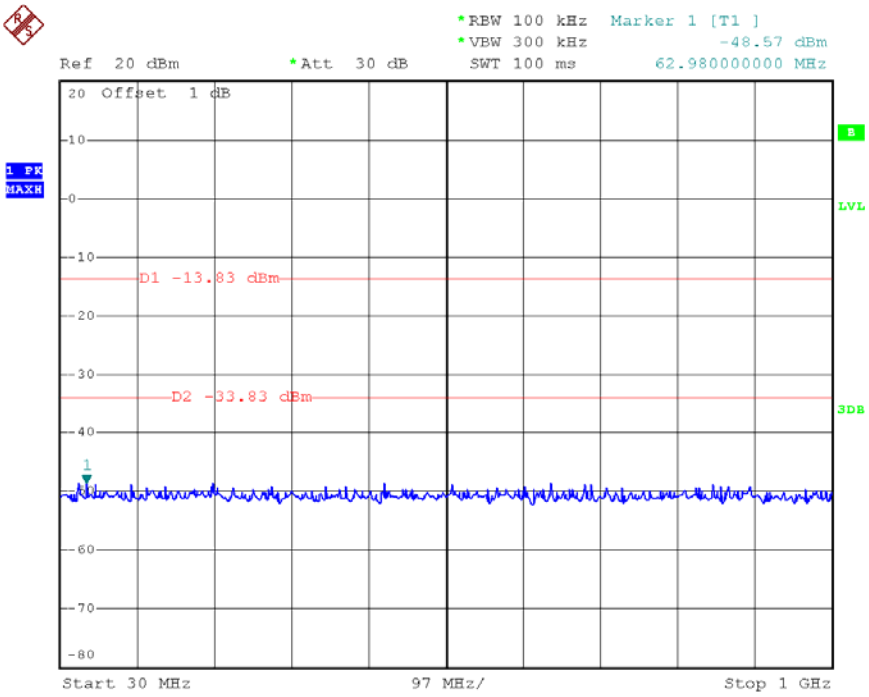
Date: 26.MAR.2014 00:14:10

TX HT40 mode CH09



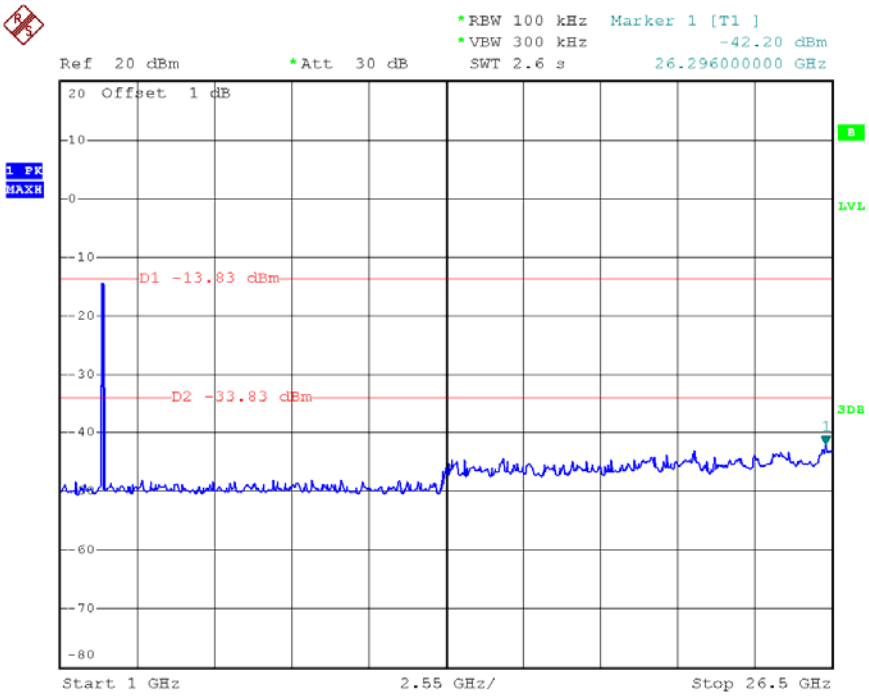
Date: 26.MAR.2014 00:24:35

TX HT40 mode CH03 (30M~1000MHz)



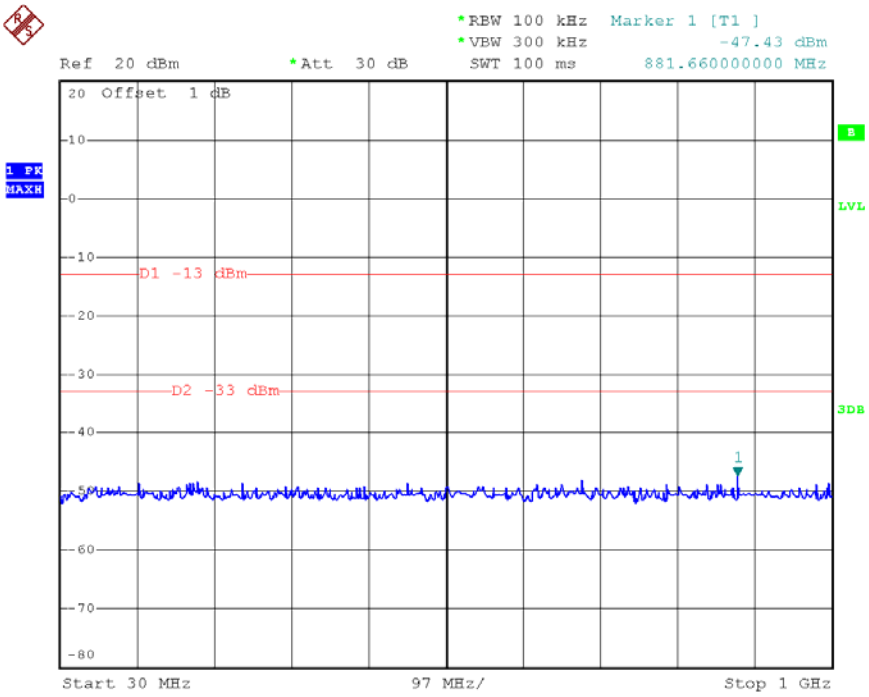
Date: 26.MAR.2014 00:16:14

TX HT40 mode CH03 (1000MHz~10th Harmonic)



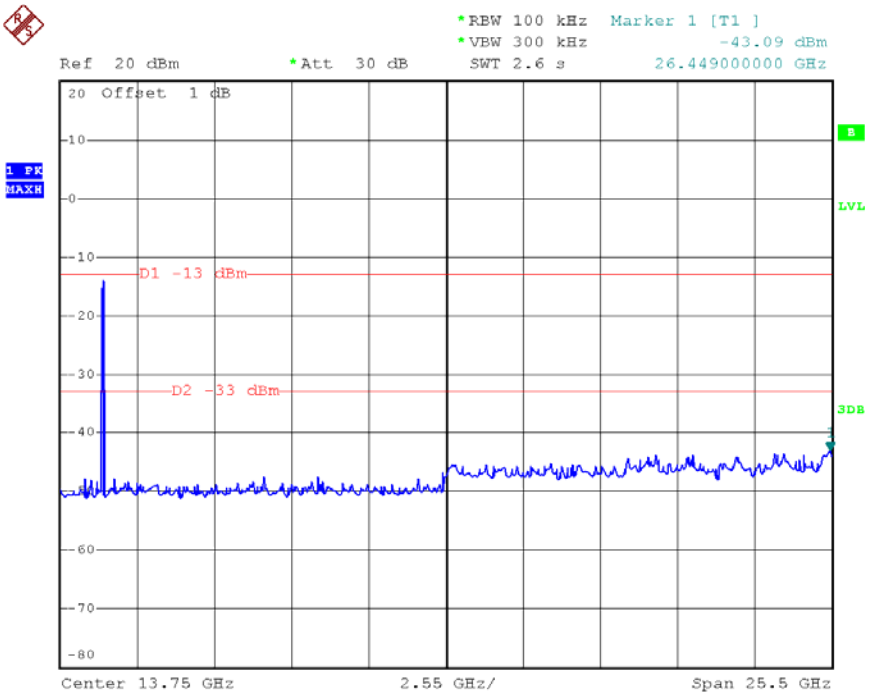
Date: 26.MAR.2014 00:17:33

TX HT40 mode CH06 (30M~1000MHz)



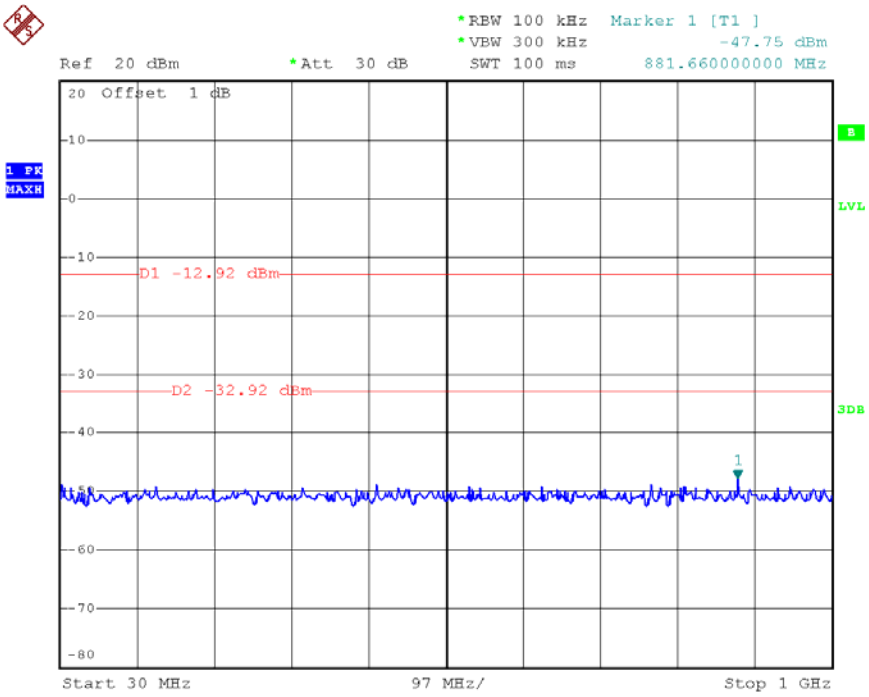
Date: 26.MAR.2014 00:43:59

TX HT40 mode CH06 (1000MHz~10th Harmonic)



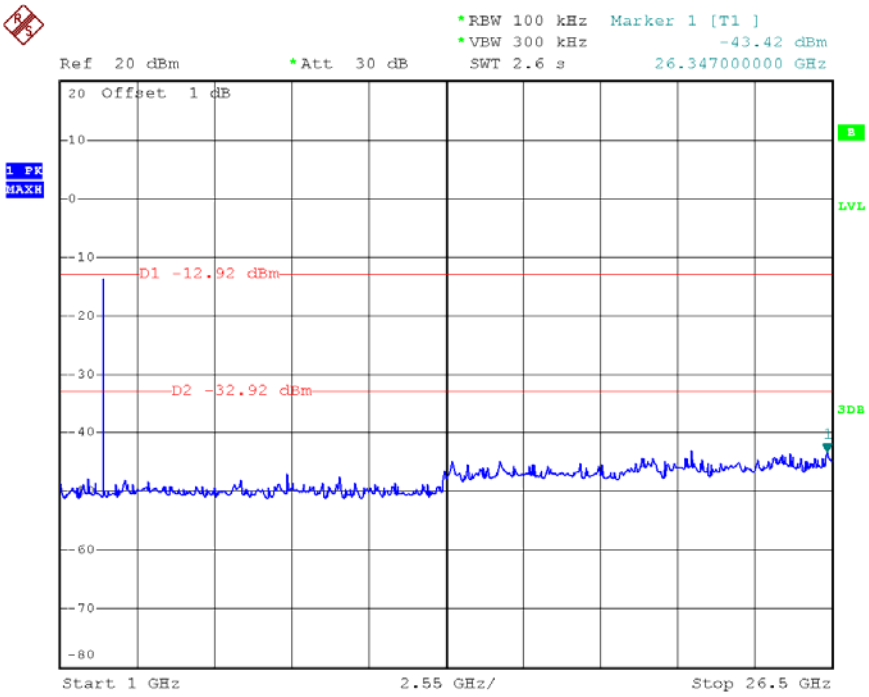
Date: 26.MAR.2014 00:43:08

TX HT40 mode CH09 (30M~1000MHz)



Date: 26.MAR.2014 00:24:55

TX HT40 mode CH09 (1000MHz~10th Harmonic)



Date: 26.MAR.2014 00:25:11

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

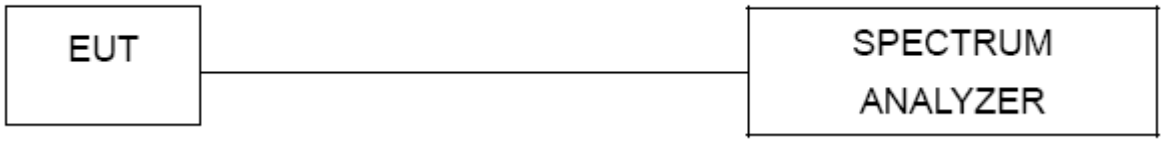
8.1.1 TEST PROCEDURE

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 tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

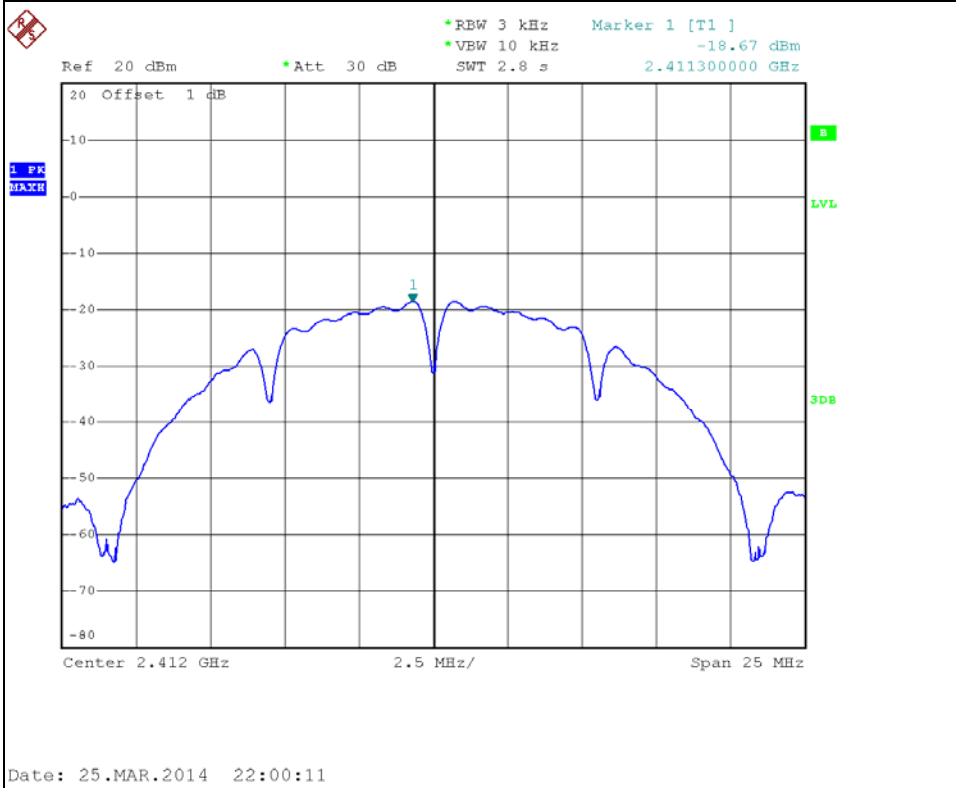
8.1.5 EUT TEST CONDITIONS

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

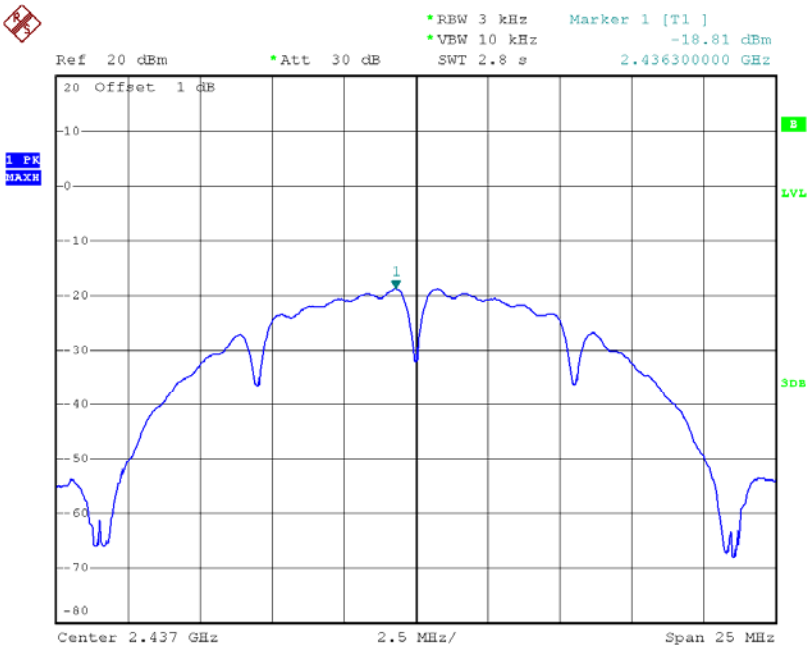
8.1.6 TEST RESULTS

Test Mode :TX B Mode_CH01/06/11

TX CH01

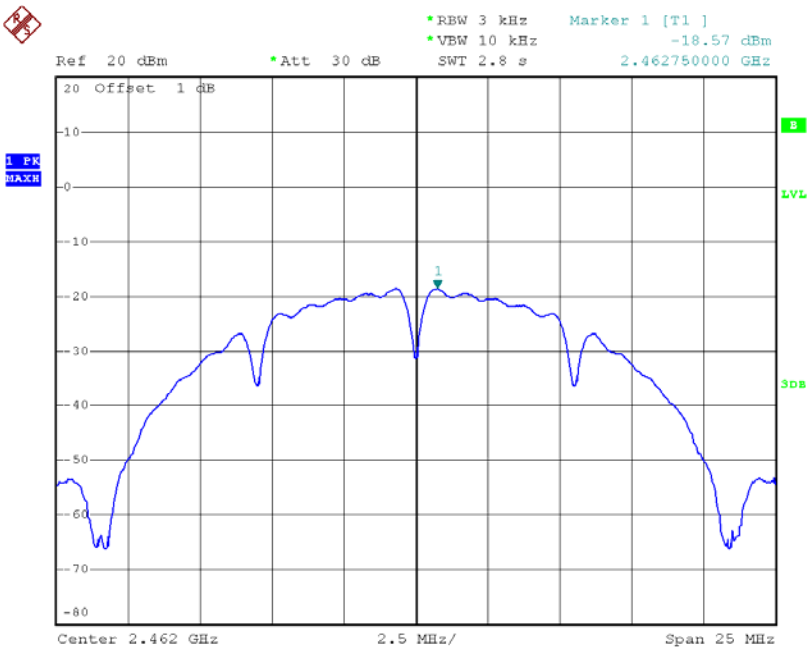


TX CH06



Date: 25.MAR.2014 22:12:29

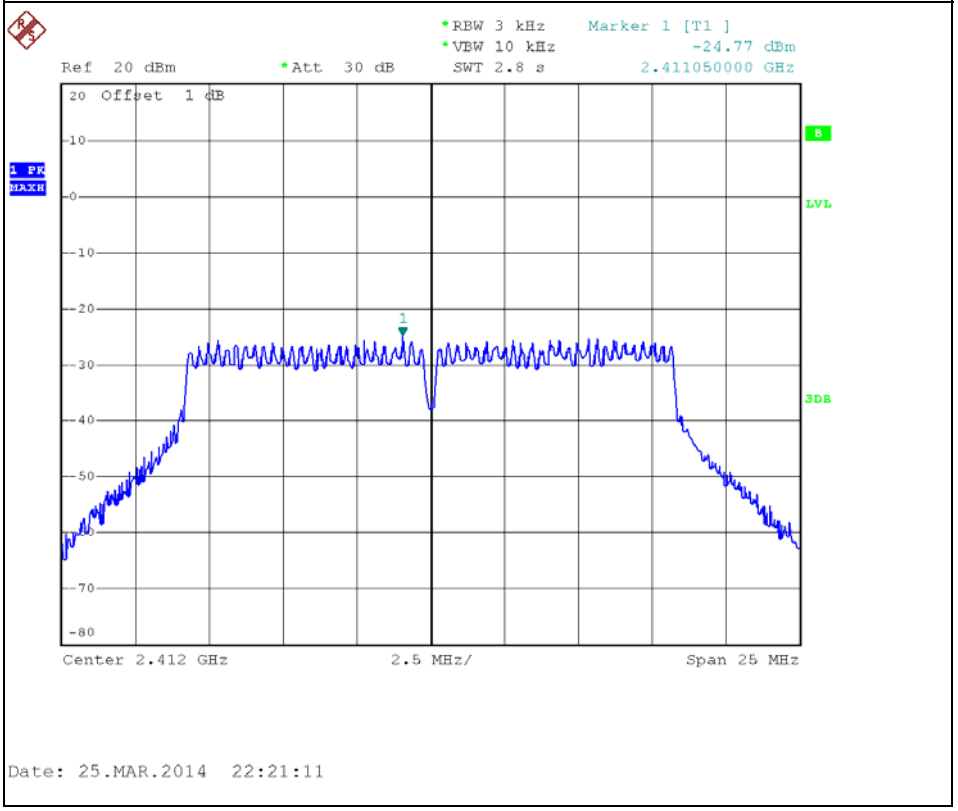
TX CH11



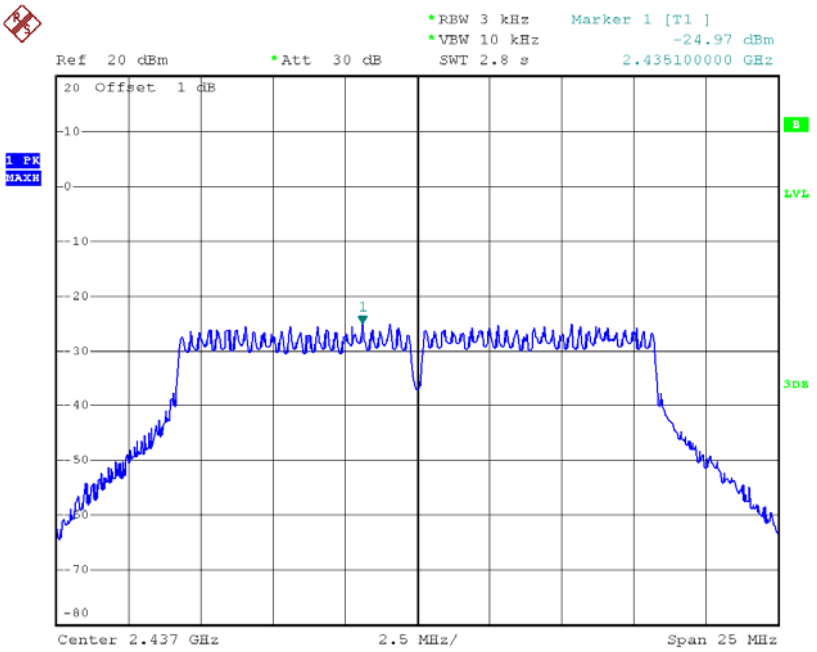
Date: 25.MAR.2014 22:10:47

Test Mode :TX G Mode_CH01/06/11

TX CH01

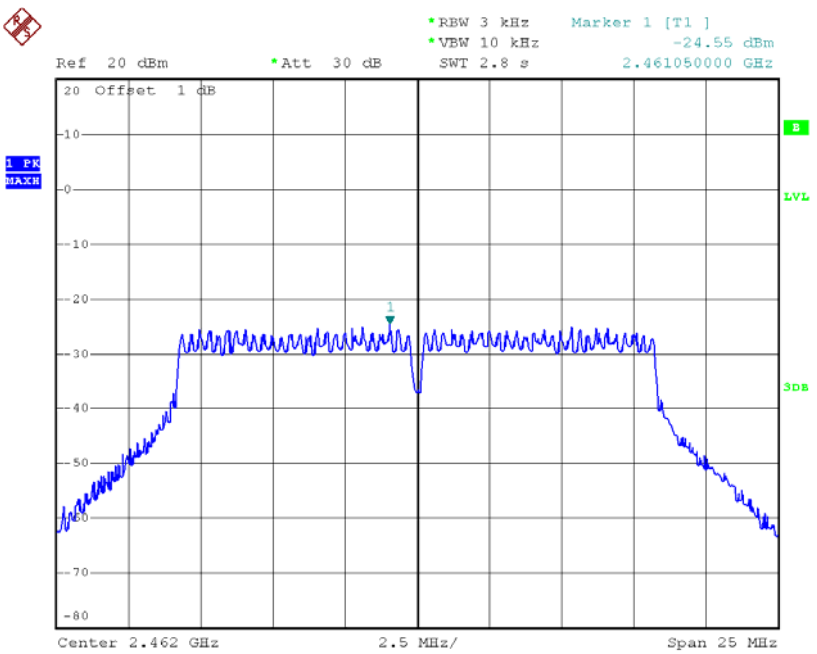


TX CH06



Date: 25.MAR.2014 22:33:10

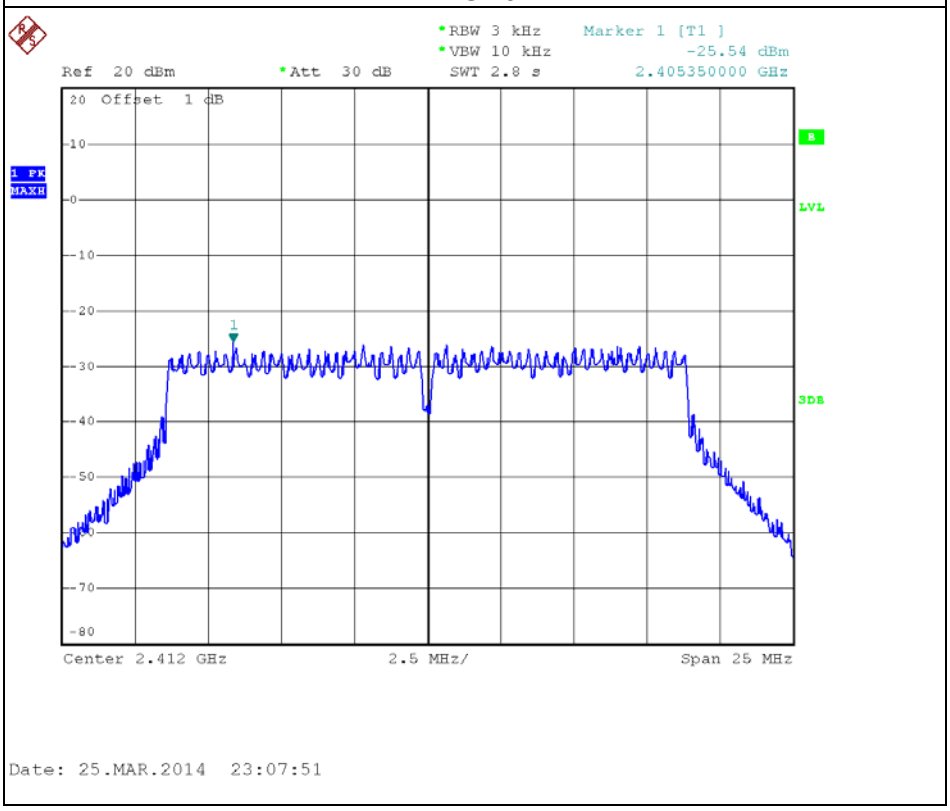
TX CH11



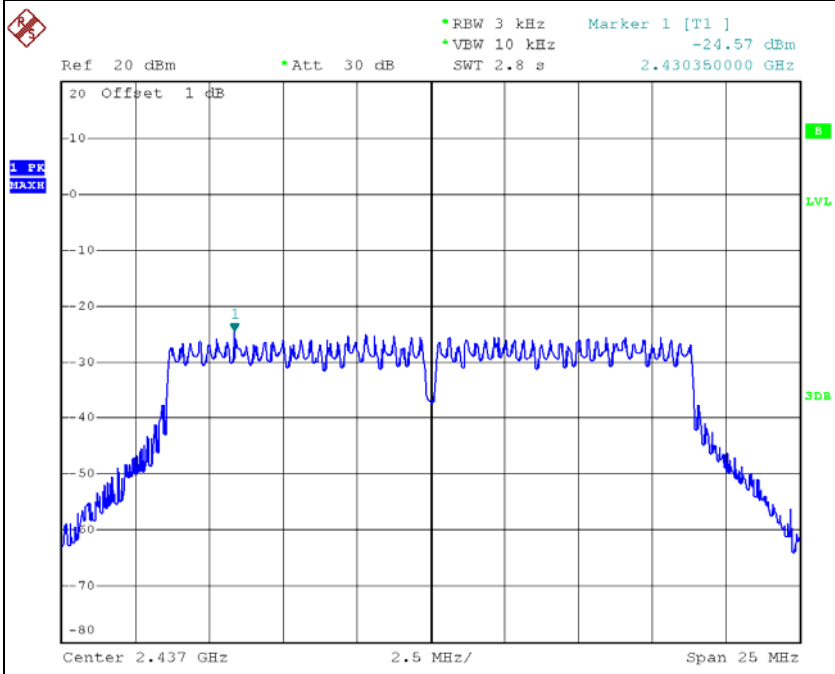
Date: 25.MAR.2014 22:22:41

Test Mode : TX N-20M Mode_CH01/06/11_ANT 1

TX CH01

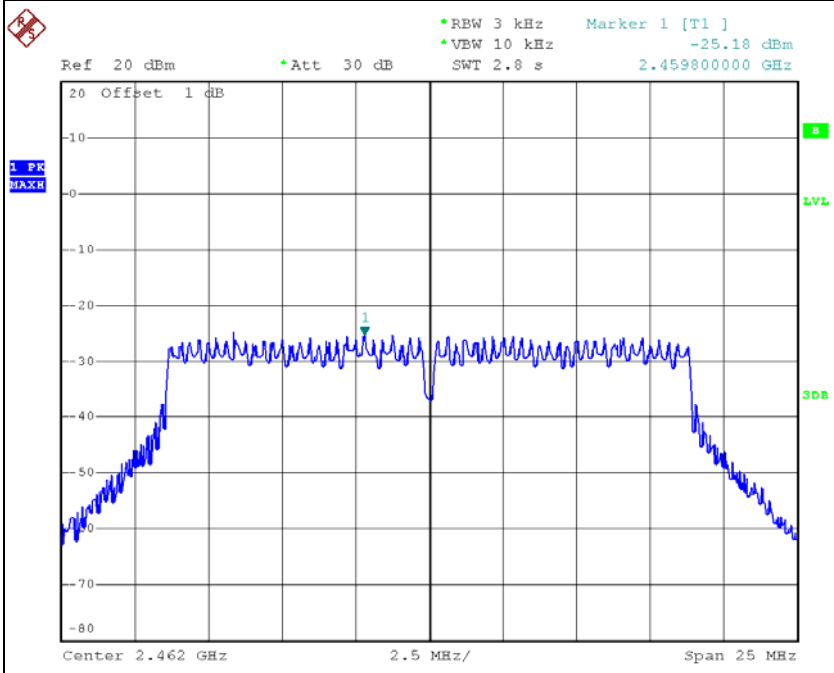


TX CH06



Date: 25.MAR.2014 23:33:52

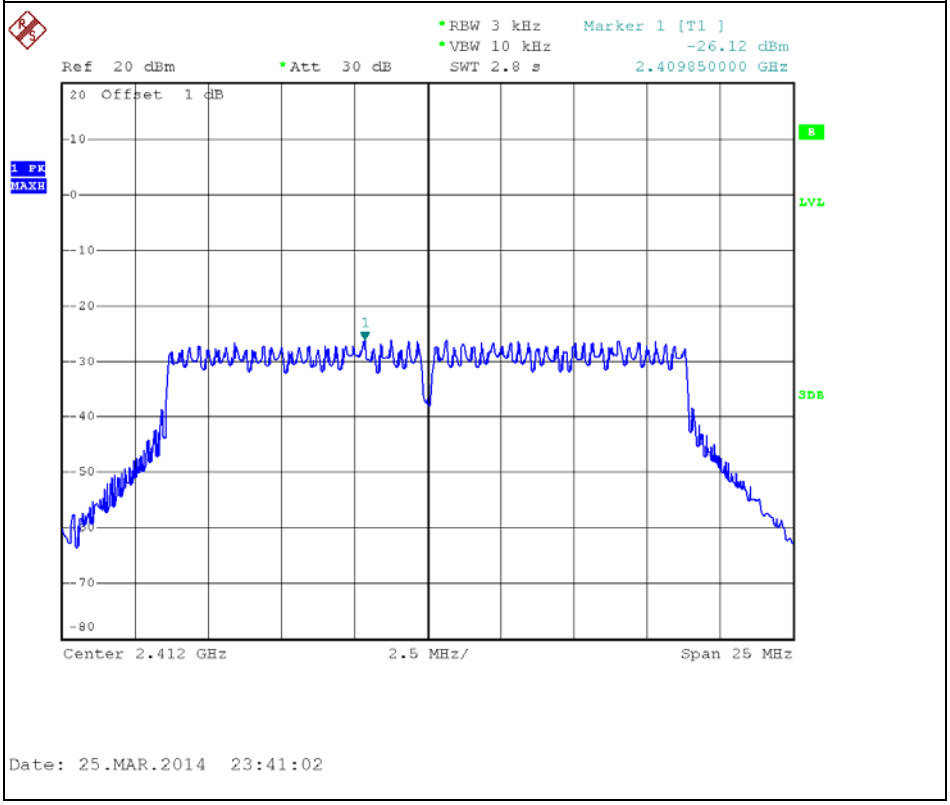
TX CH11



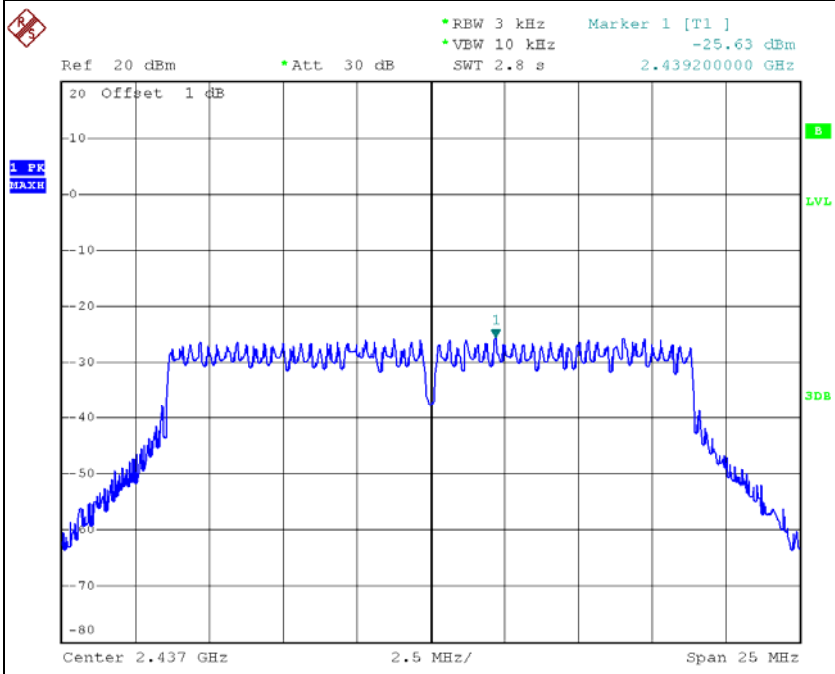
Date: 25.MAR.2014 23:15:56

Test Mode : TX N-20M Mode_CH01/06/11_ANT 2

TX CH01

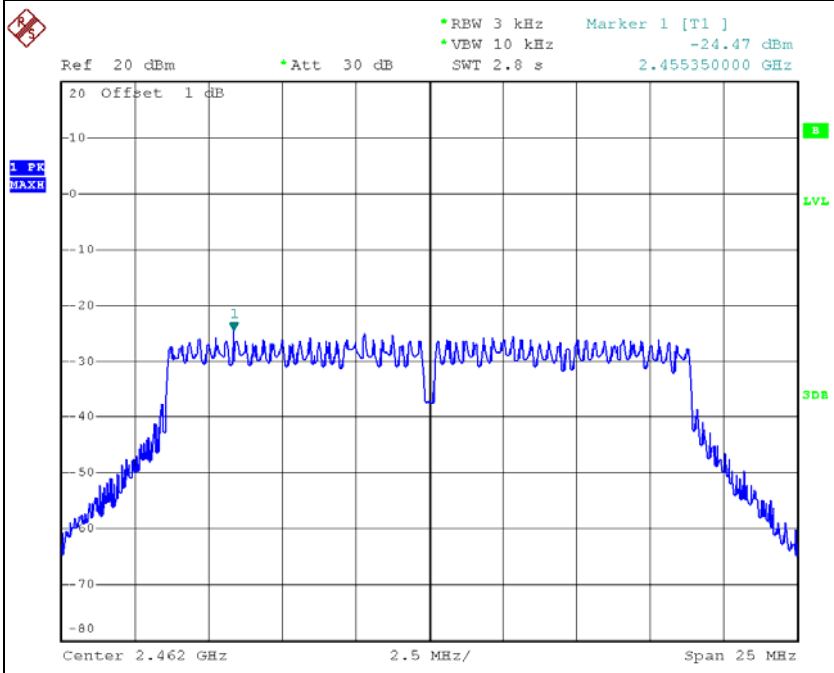


TX CH06



Date: 25.MAR.2014 23:50:19

TX CH11

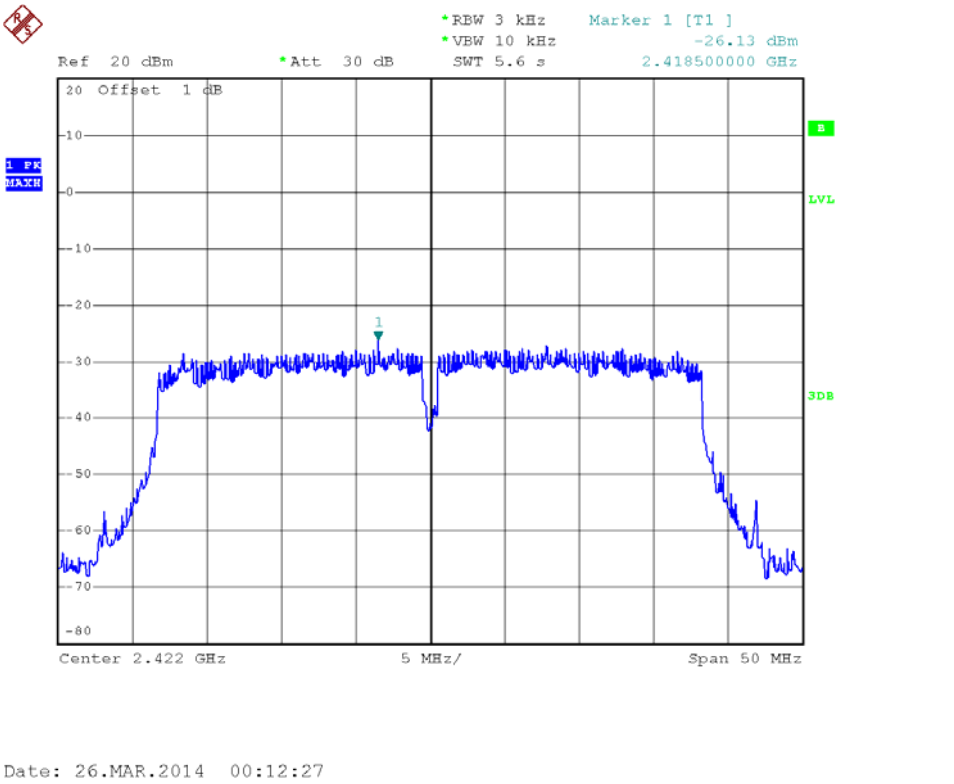


Date: 25.MAR.2014 23:44:07

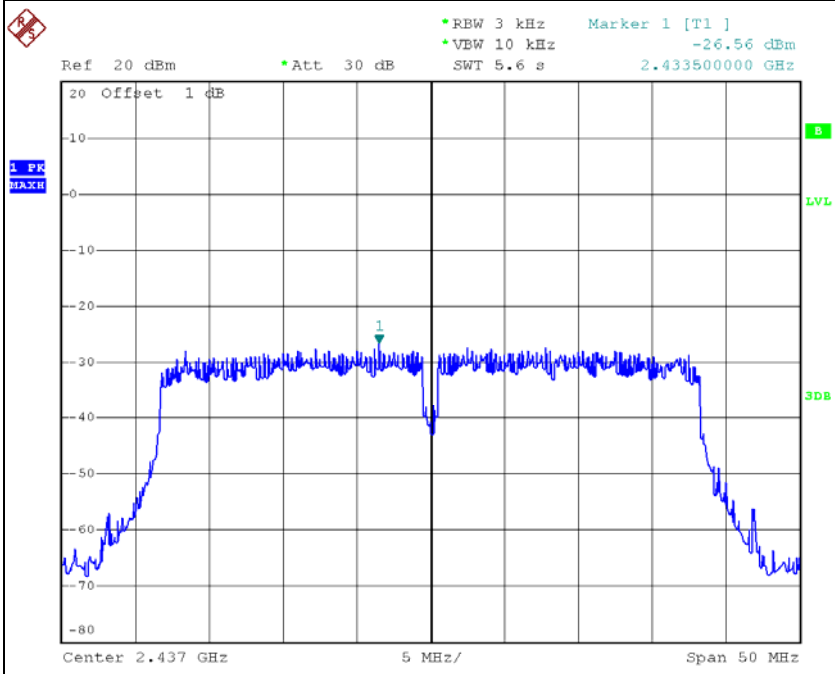
Test Mode : TX N-20M Mode_CH01/06/11_Total			
Test Channel	Frequency (MHz)	Power Density (dBm)	Limit (dBm)
CH01	2412	-22.81	8
CH06	2437	-22.06	8
CH11	2462	-21.80	8

Test Mode : TX N-40M Mode_CH03/06/09_ANT 1

TX CH03

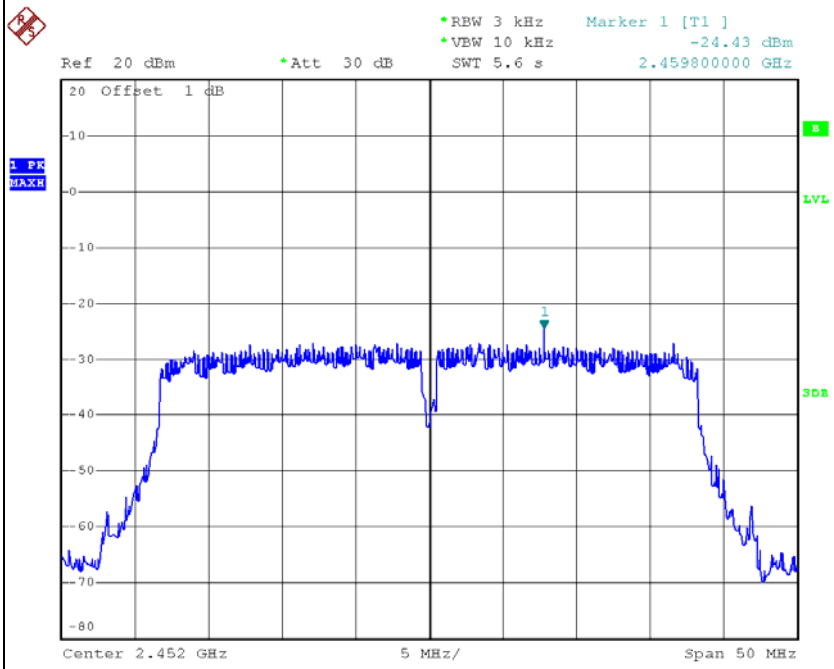


TX CH06



Date: 26.MAR.2014 00:45:25

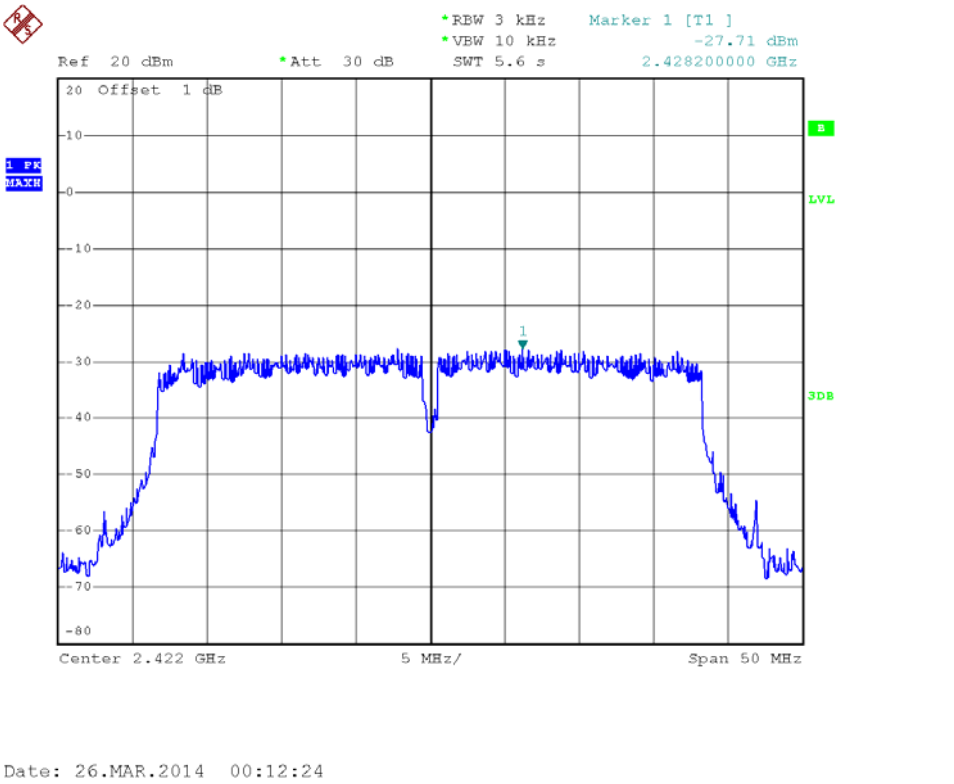
TX CH09



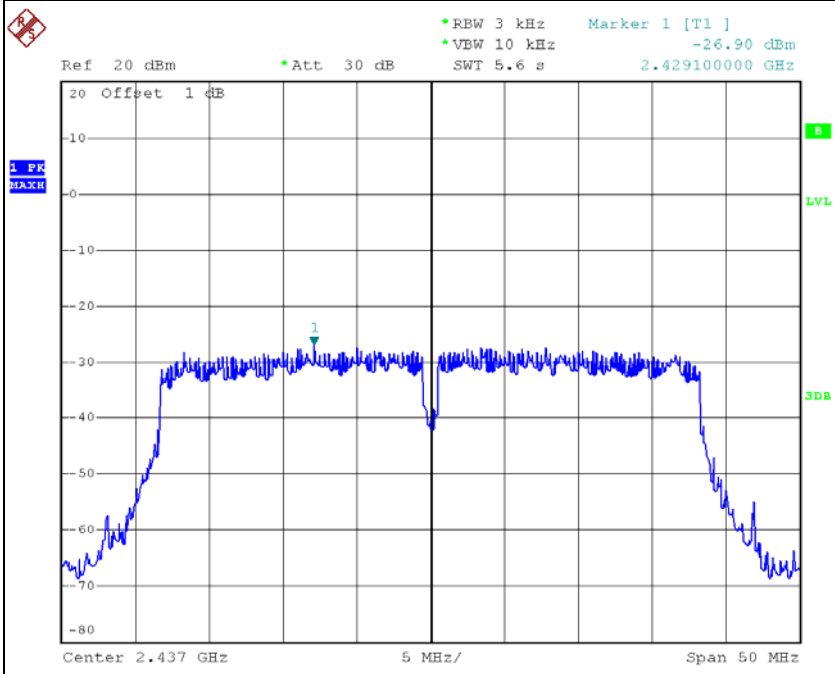
Date: 26.MAR.2014 00:46:29

Test Mode : TX N-40M Mode_CH03/06/09_ANT 2

TX CH03

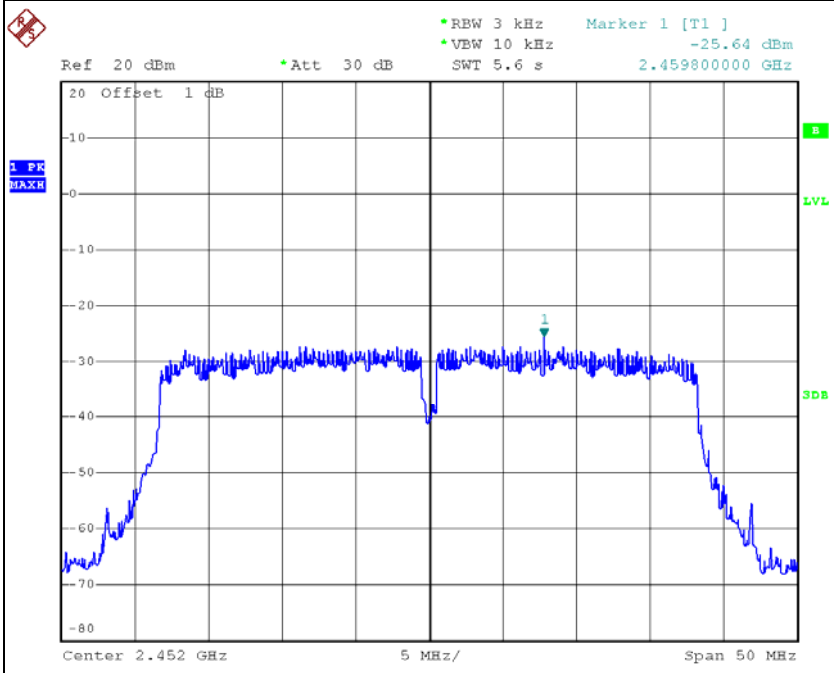


TX CH06



Date: 26.MAR.2014 00:45:12

TX CH11



Date: 26.MAR.2014 00:46:09

Test Mode : TX N-40M Mode_CH03/06/09_Total			
Test Channel	Frequency (MHz)	Power Density (dBm)	Limit (dBm)
CH03	2422	-23.84	8
CH06	2437	-23.72	8
CH09	2452	-21.98	8

9. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	Apr. 25, 2014
2	LISN	R&S	ENV216	100087	Nov. 11, 2014
3	Test Cable	N/A	C_17	N/A	Mar.14, 2015
4	EMI TEST RECEIVER	R&S	ESCS30	826547/022	Apr. 25, 2014
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Apr. 25, 2014

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Apr. 25, 2014
2	Amplifier	HP	8447D	2944A09673	Apr. 25, 2014
3	Test Receiver	R&S	ESCI	100382	Apr. 25, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 02, 2014
5	Antenna	ETS	3115	00075789	Apr. 25, 2014
6	Amplifier	Agilent	8449B	3008A02274	Apr. 25, 2014
7	Spectrum	Agilent	E4408B	US39240143	Nov. 11, 2014
8	Test Cable	HUBER+SUHNER	C-45	N/A	Apr. 30, 2014
9	Controller	CT	SC100	N/A	N/A
10	Horn Antenna	EMCO	3115	9605-4803	Apr. 25, 2014
11	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Apr. 25, 2014
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Oct. 22, 2014

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014

Peak Output Power Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	P-series Power meter	Agilent	N1911A	MY45100473	Apr. 25, 2014
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Apr. 25, 2014

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014

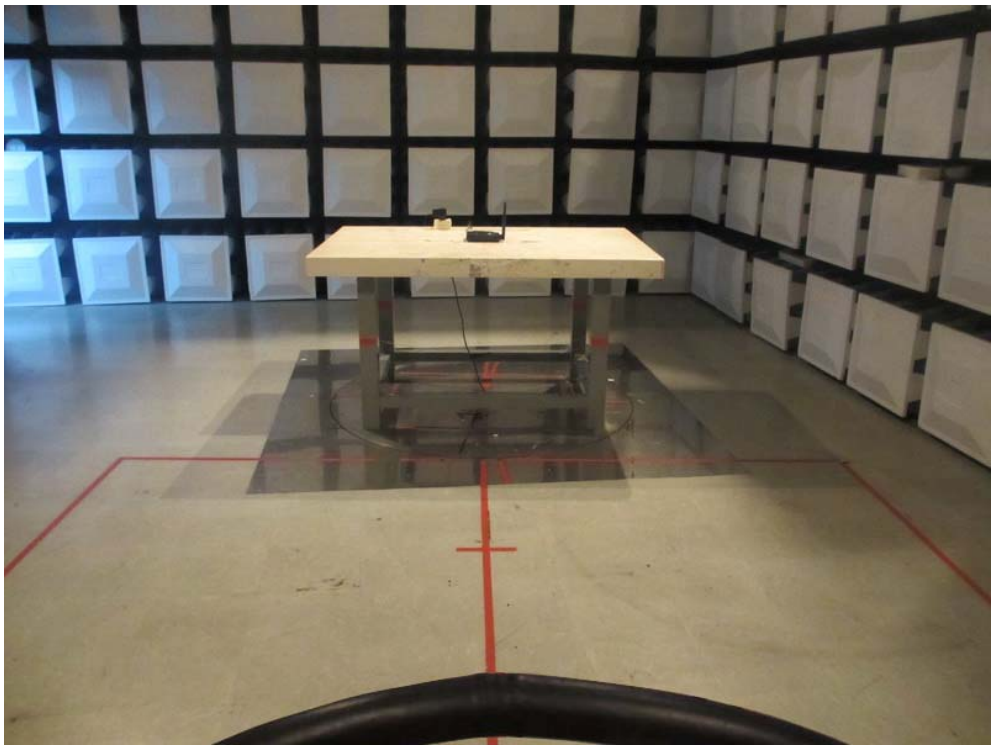
Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 11, 2014

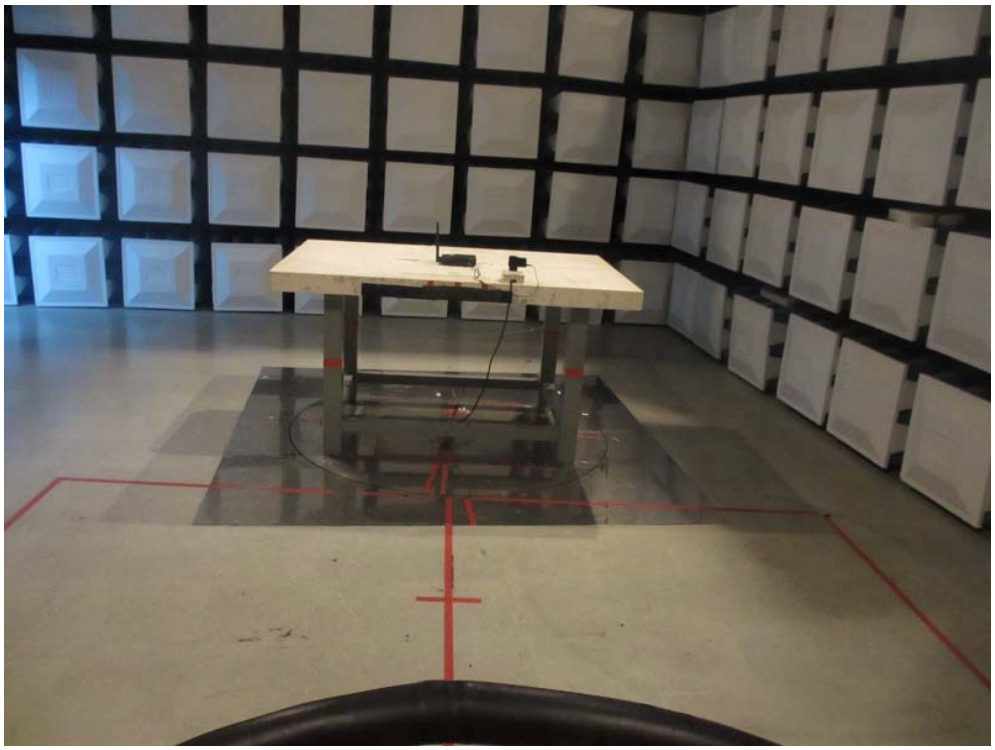
Remark: ”N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

10. EUT TEST PHOTO

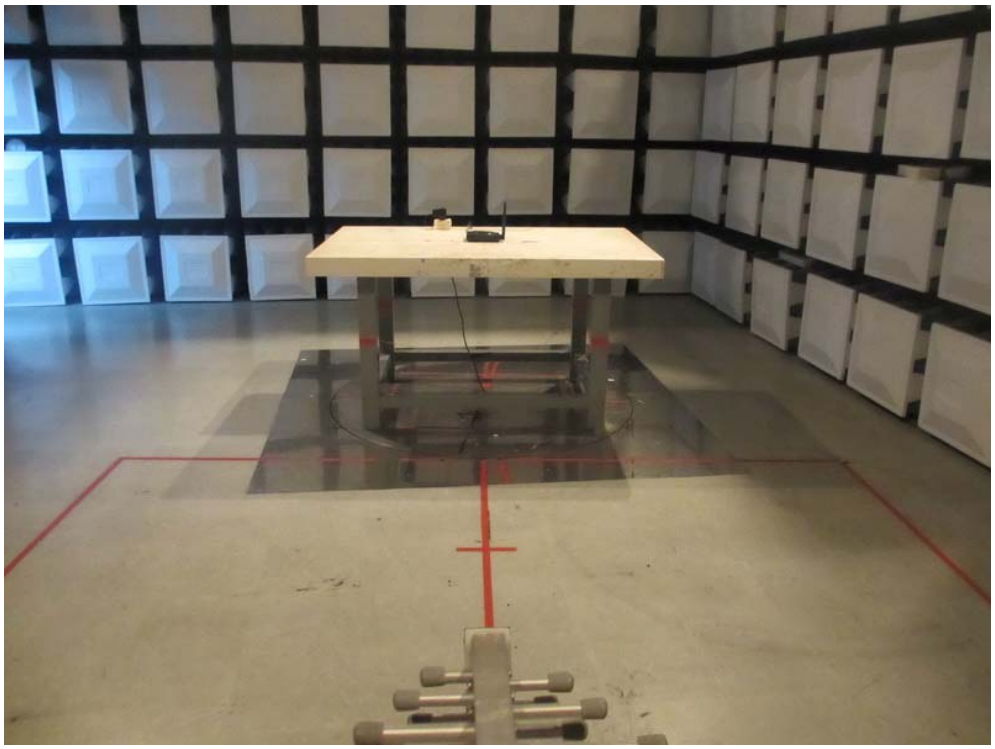
Conducted Measurement Photos

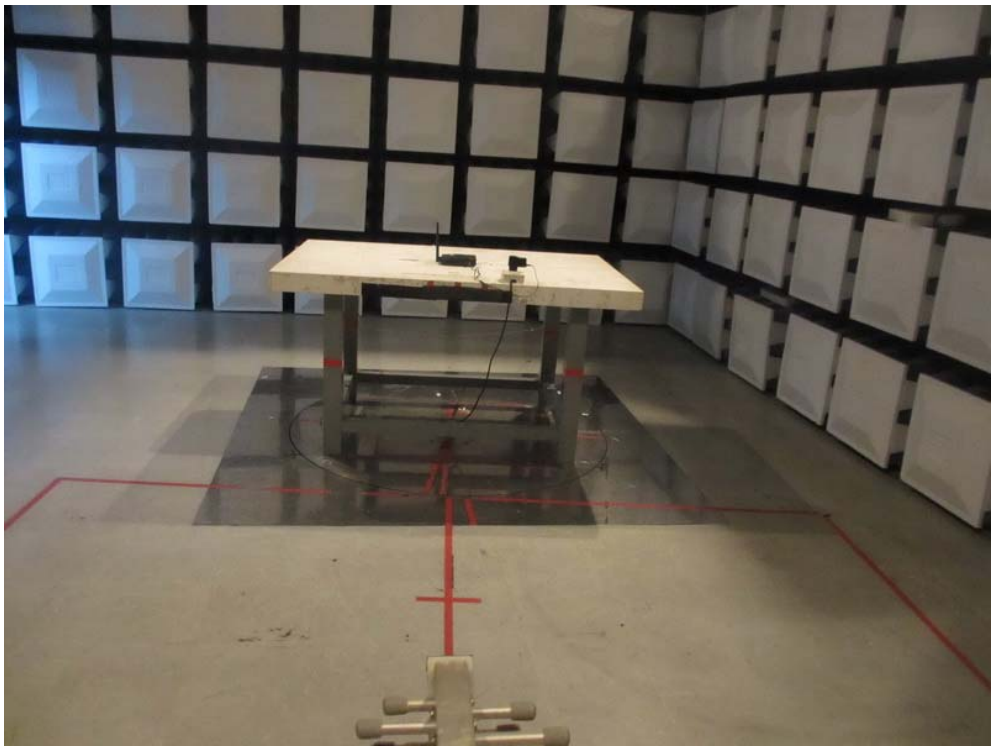
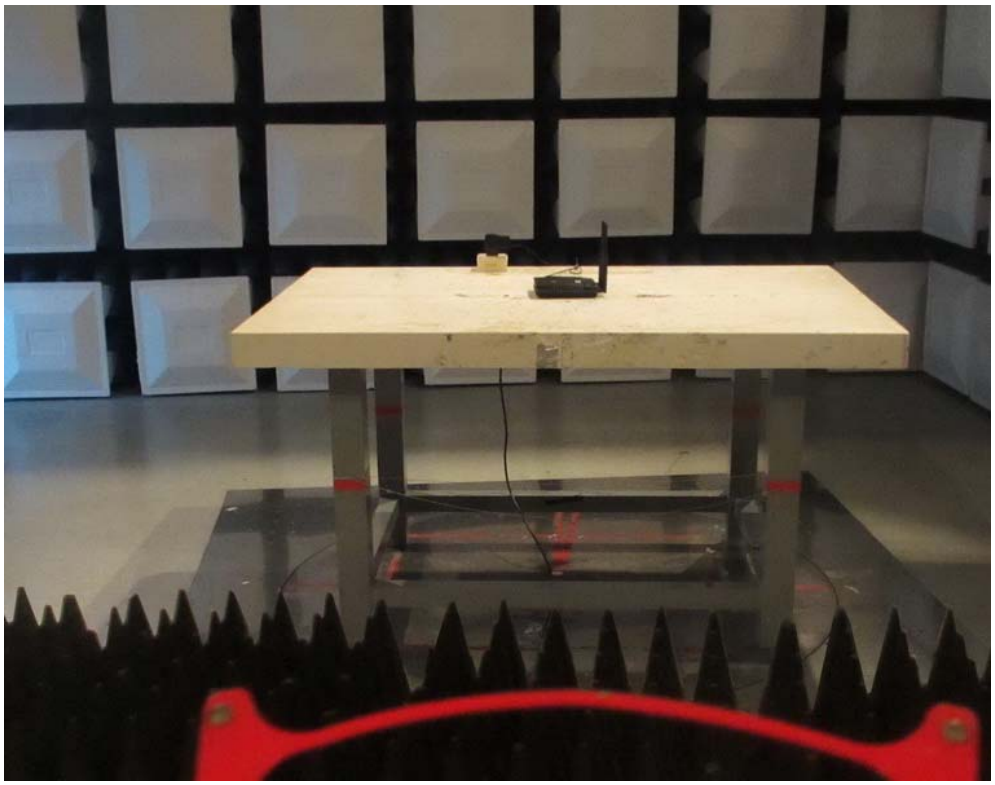
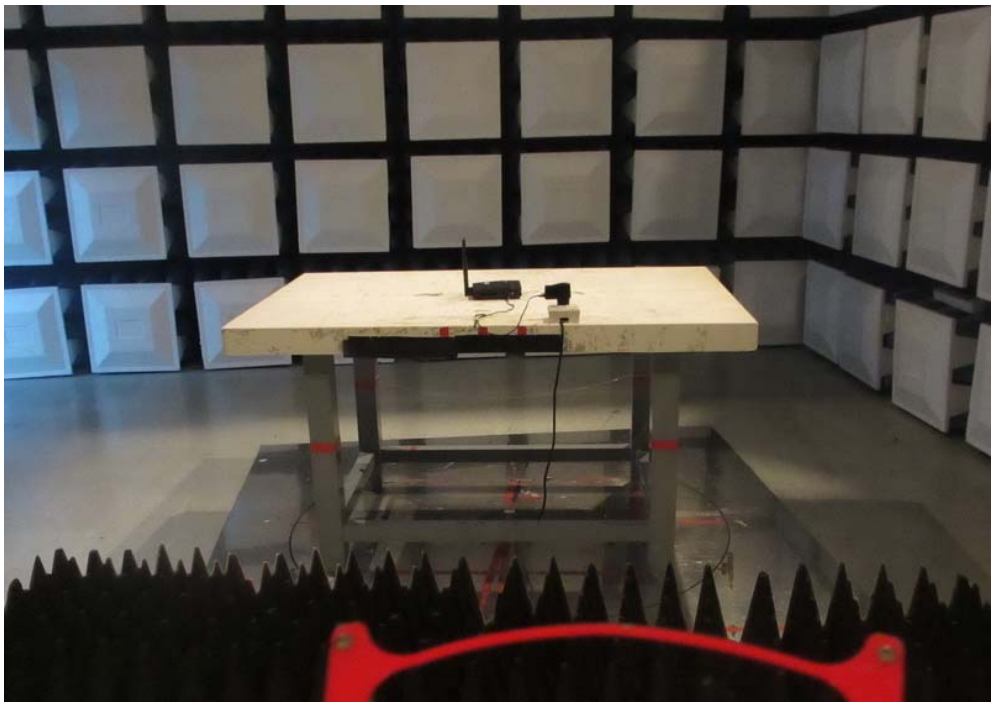
Radiated Measurement Photos
9K~30MHz





Radiated Measurement Photos
30~1000MHz





Radiated Measurement Photos
Above 1000MHz