FCC&IC Radio Test Report

FCC ID: EMOT331

IC: 986B-T331

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

Issued Date	:	Jan. 13, 2014
Project No.	:	1312C273
Equipment	:	Bluetooth Dual Alarm AM/FM Clock Radio
Model Name for FCC	:	T331; T331X("X" denote as color of cabinet)
Model Name for IC		T331
Applicant	:	SDI TECHNOLOGIES INC.
Address	:	1299 Main Street, Rahway, NJ 07065, U.S.A

Tested by: Neutron Engineering Inc. EMC Laboratory
Date of Receipt: Jan. 02, 2014
Date of Test: Jan. 02, 2014~ Jan. 10, 2014

Testing Engineer : David Mao
(David Mao)

Technical Manager : Leo Hung
(Leo Hung)

Authorized Signatory : Steven Lu
(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 **CHINA**, 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

Table of Contents Page

Table of Contents **Page**

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
NEI-FICP-1-1312C273	Original Issue.	Jan. 13, 2014

1. CERTIFICATION

Equipment	:	Bluetooth Dual Alarm AM/FM Clock Radio
Brand Name	:	TIMEX
Model Name for FCC	:	T331; T331X (“X” denote as color of cabinet)
Model Name for IC	:	T331
Applicant	:	SDI TECHNOLOGIES INC.
Manufacturer	:	SDI TECHNOLOGIES INC.
Address	:	1299 Main Street, Rahway, NJ 07065, U.S.A
Date of Test	:	Jan. 02, 2014~ Jan. 10, 2014
Test Item	:	ENGINEERING SAMPLE
Standard(s)	:	FCC Part15, Subpart C : 2012 (15.247) / ANSI C63.4 : 2009 / FCC Public Notice DA 00-705, March 30, 2000. Canada RSS-210:2010 RSS-GEN Issue 3, Dec 2010

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-FICP-1-1312C273) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

Applied Standard(s): 47 CFR Part 15, Subpart C: 2012; Canada RSS-210:2010; RSS-GEN Issue 3, Dec 2010				
Standard(s) Section		Test Item	Judgment	Remark
FCC	IC			
15.207	RSS-GEN Issue 3, Dec 2010 7.2.4	Conducted Emission	PASS	
15.247(d)	RSS-210, Issue 8, Annex 8, A8.5	Antenna conducted Spurious Emission	PASS	
15.247 (a)(1)	RSS-210, Issue 8, Annex 8, A8.1(b)	Hopping Channel Separation	PASS	
15.247 (b)(1)	RSS-210, Issue 8, Annex 8, A8.1(b)	Peak Output Power	PASS	
15.247(d) 15.209	RSS-210, Issue 8, Annex 8, Section 8.5	Radiated Spurious Emission	PASS	
15.247 (a)(1)(iii)	RSS-210, Issue 8, Annex 8, A8.1(d)	Number of Hopping Frequency	PASS	
15.247 (a)(1)(iii)	RSS-210, Issue 8, Annex 8, A8.1(d)	Dwell Time	PASS	
15.205	RSS-GEN Issue 3, Dec 2010 7.2.2	Restricted Bands	PASS	
15.203	-	Antenna Requirement	PASS	

Note:

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

(2) According to FCC Public Notice DA 00-705, March 30, 2000.

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
Neutron's test firm number for IC: 4428B-1

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	Bluetooth Dual Alarm AM/FM Clock Radio	
Brand Name	TIMEX	
Model Name for FCC	T331;T331X	
Model Name for IC	T331	
Model Difference	“X” denote as color of cabinet.	
Output Power (Max.)	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps) π/4-DQPSK(2Mbps) 8-DPSK(3Mbps)
	Bit Rate of Transmitter	
	Output Power Max.	-4.71dBm (1Mbps) -4.80dBm (3Mbps)
Power Source	#1 AC Mains #2 DC voltage supplied from 2AAA battery	
Power Rating	#1 AC120V/60Hz #2 DC 3V	

Note:

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

2.

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3 Table for Filed Antenna

.

Ant.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Printed	N/A	1.3	TX/RX

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 Mode **Note (1)**
Mode 2	Bluetooth

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

For Conducted Emission	
Final Test Mode	Description
Mode 2	Bluetooth

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode **Note (1)**

Note:

(1) The measurements are performed at the high, middle, low available channels.
(2) The measurements for Hopping Channel Separation, Bandwidth and Peak Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.
(3) The EUT system operated these mode (AC mains and battery), were found to be the worst case during the pre-scanning test as AC mains.

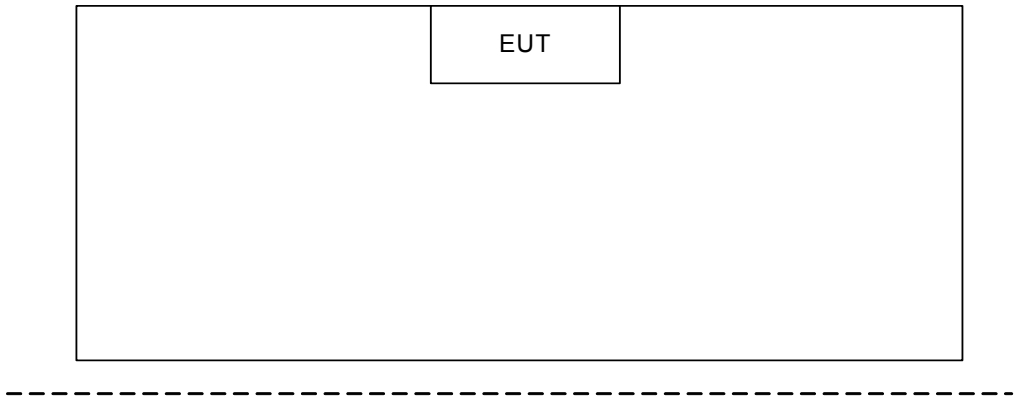
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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 FHSS

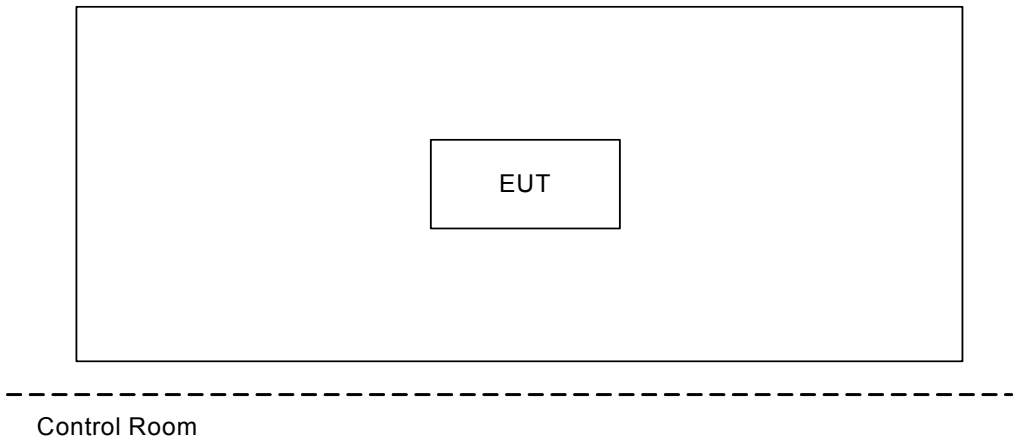
Test software version	Bluetest		
Frequency	2402 MHz	2441 MHz	2480 MHz
Parameters-1Mbps	7	7	7
Parameters-3Mbps	7	7	7

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted TX Mode:



Radiated TX Mode:



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.

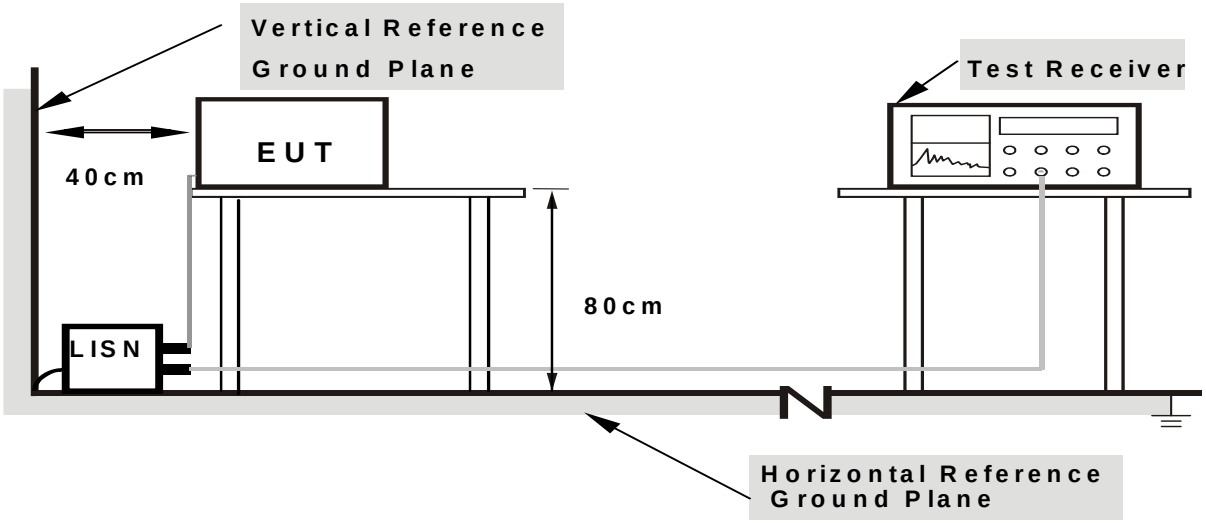
d. LISN at least 80 cm from nearest part of EUT chassis.

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 function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

4.1.6 EUT TEST CONDITIONS

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

4.1.7 TEST RESULTS

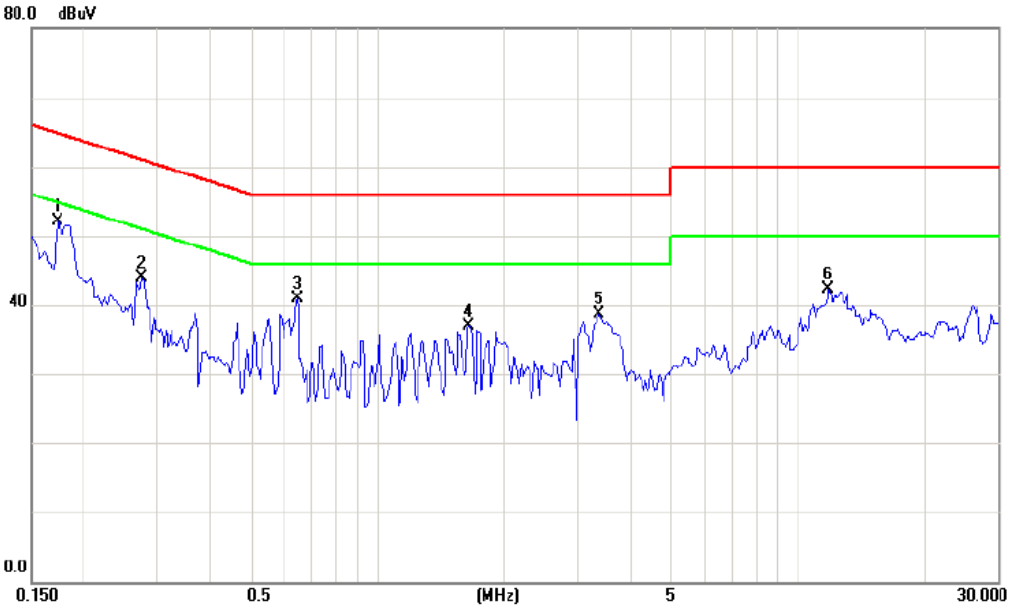
Remark:

(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:	Bluetooth

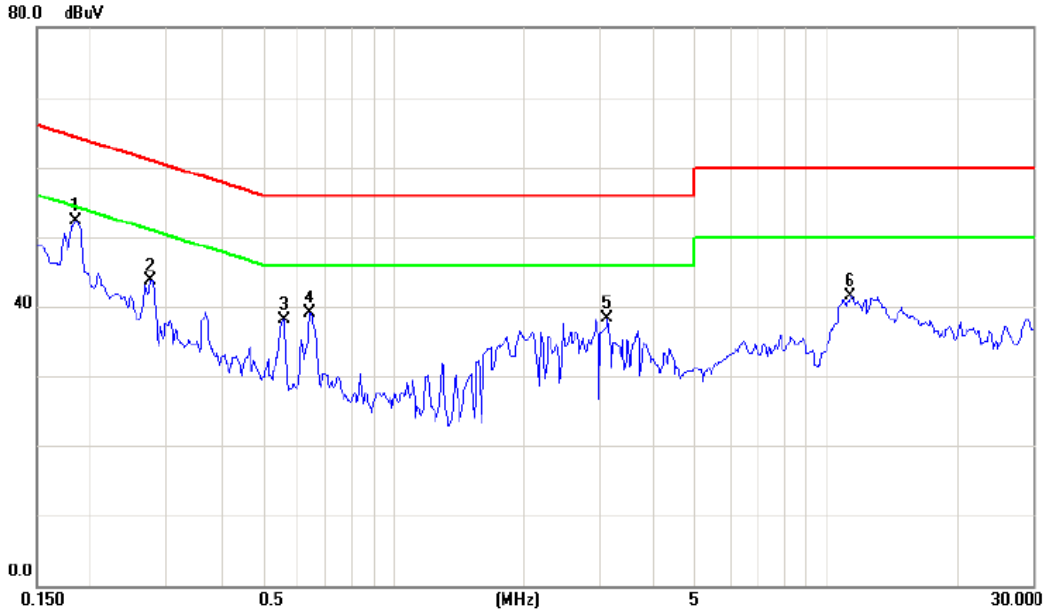
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1734	42.48	9.63	52.11	64.80	-12.69	peak	
2		0.2750	34.15	9.67	43.82	60.97	-17.15	peak	
3		0.6461	31.28	9.72	41.00	56.00	-15.00	peak	
4		1.6617	27.17	9.80	36.97	56.00	-19.03	peak	
5		3.3750	28.80	9.88	38.68	56.00	-17.32	peak	
6		11.9102	32.18	10.17	42.35	60.00	-17.65	peak	

Test Mode:	Bluetooth

Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1852	42.54	9.71	52.25	64.25	-12.00	peak	
2		0.2750	34.05	9.72	43.77	60.97	-17.20	peak	
3		0.5563	28.40	9.74	38.14	56.00	-17.86	peak	
4		0.6422	29.37	9.75	39.12	56.00	-16.88	peak	
5		3.1290	28.42	9.90	38.32	56.00	-17.68	peak	
6		11.4297	31.29	10.28	41.57	60.00	-18.43	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)	dB(uV/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)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Spectrum 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

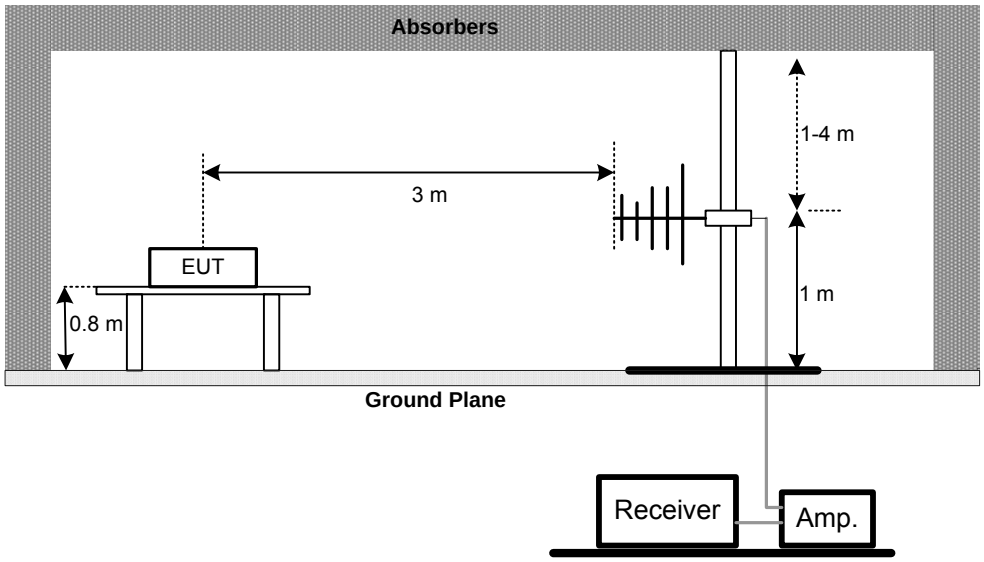
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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 0.8 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

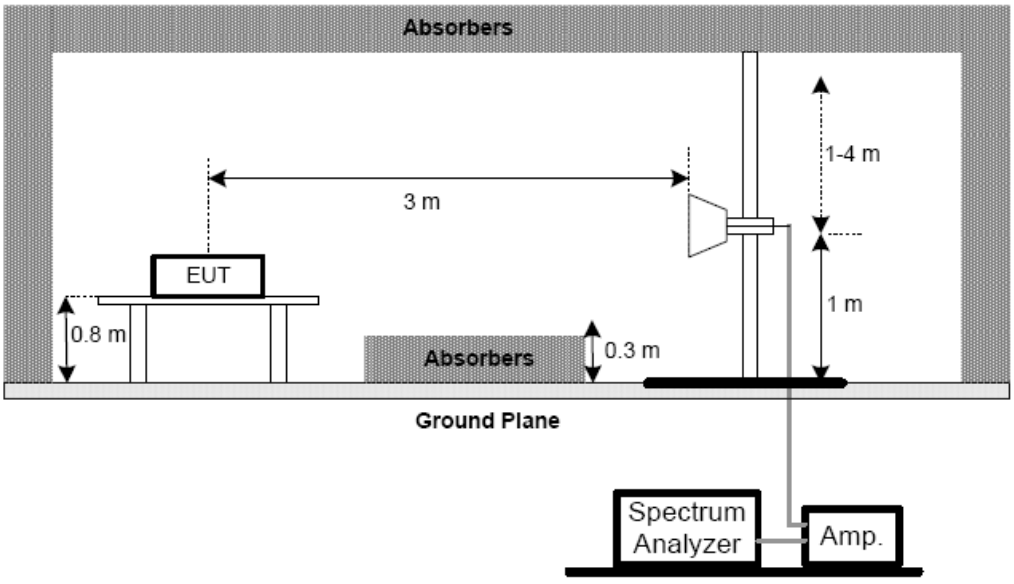
No deviation

4.2.4 TEST SETUP

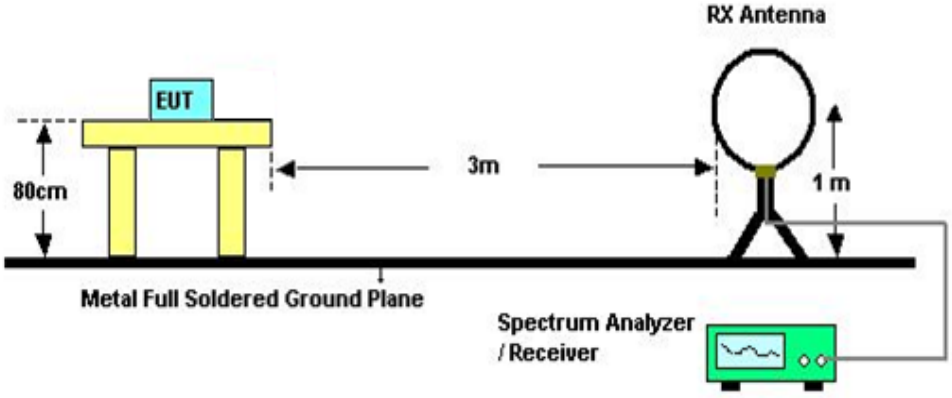
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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 **4.1.5** 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: 120V/60Hz

4.2.7 TEST RESULTS (BELOW 30MHZ)

Test Mode:	TX 2402MHz

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°	16.48	23.10	39.58	128.19	-88.61	AV
0.0094	0°	19.21	23.10	42.31	148.19	-105.88	PK
0.0137	0°	18.89	23.10	41.99	124.87	-82.88	AV
0.0137	0°	20.54	23.10	43.64	144.87	-101.23	PK
0.0245	0°	16.19	24.02	40.21	119.82	-79.62	AV
0.0245	0°	19.75	24.02	43.77	139.82	-96.06	PK
0.0328	0°	18.16	23.49	41.65	117.29	-75.64	AV
0.0328	0°	20.41	23.49	43.90	137.29	-93.39	PK
0.4260	0°	18.64	19.98	38.62	95.02	-56.40	AVG
0.4260	0°	21.91	19.98	41.89	115.02	-73.13	PK
1.5250	0°	18.82	19.55	38.37	63.94	-25.57	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.0093	90°	18.03	24.30	42.33	128.28	-85.95	AVG
0.0093	90°	20.46	24.30	44.76	148.28	-103.52	PK
0.0237	90°	17.55	24.07	41.62	120.11	-78.49	AVG
0.0237	90°	20.33	24.07	44.40	140.11	-95.71	PK
0.0318	90°	18.43	23.55	41.98	117.56	-75.57	AVG
0.0318	90°	20.67	23.55	44.22	137.56	-93.33	PK
0.0429	90°	17.85	22.85	40.70	114.96	-74.26	AVG
0.0429	90°	20.39	22.85	43.24	134.96	-91.72	PK
0.2390	90°	17.45	20.42	37.87	100.04	-62.16	AVG
0.2390	90°	20.72	20.42	41.14	120.04	-78.89	PK
1.6750	90°	18.63	19.53	38.16	63.12	-24.96	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: 30MHZ - 1000MHZ

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.

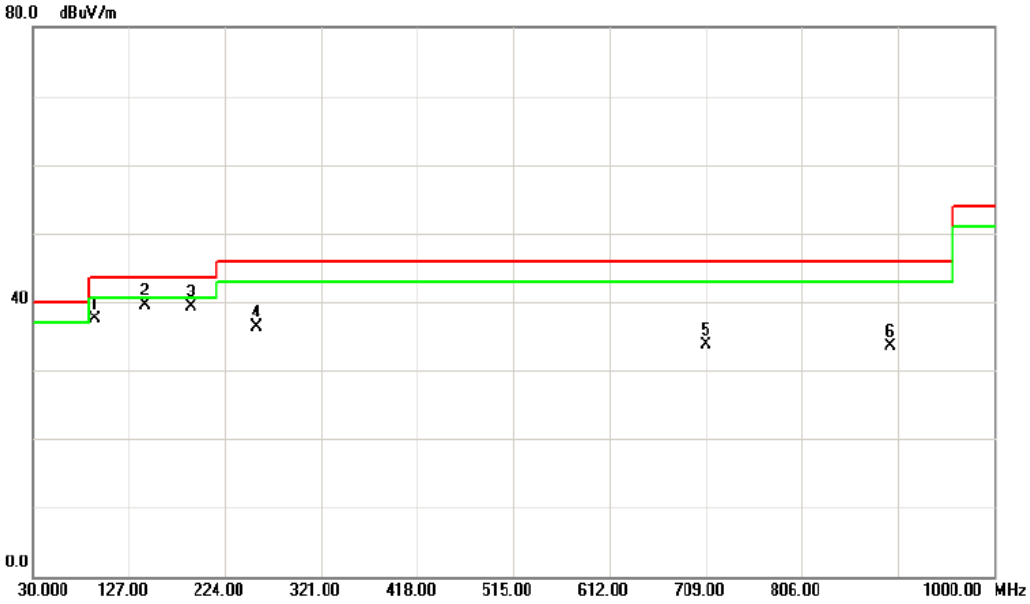
(2) All readings are Peak unless otherwise stated QP in column of『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

(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 2402MHz _CH00_1Mbps

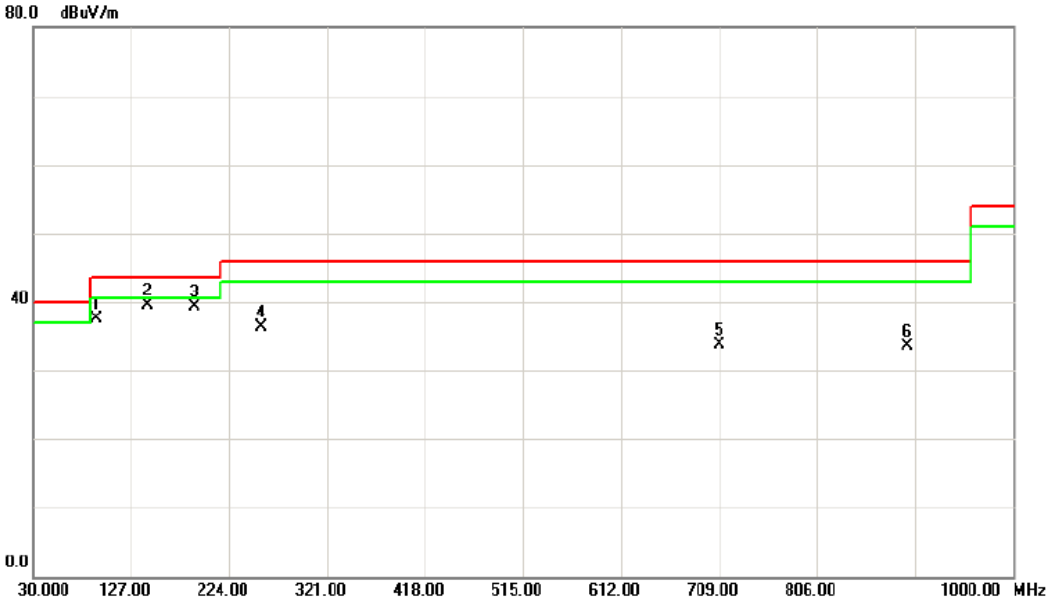
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		93.0500	55.04	-17.60	37.44	43.50	-6.06	peak	
2	*	143.4900	53.32	-13.76	39.56	43.50	-3.94	peak	
3		189.0800	53.47	-14.18	39.29	43.50	-4.21	peak	
4		256.0100	51.06	-14.84	36.22	46.00	-9.78	peak	
5		709.9700	38.55	-4.83	33.72	46.00	-12.28	peak	
6		895.2400	35.08	-1.50	33.58	46.00	-12.42	peak	

Test Mode:	TX 2402MHz _CH00_1Mbps

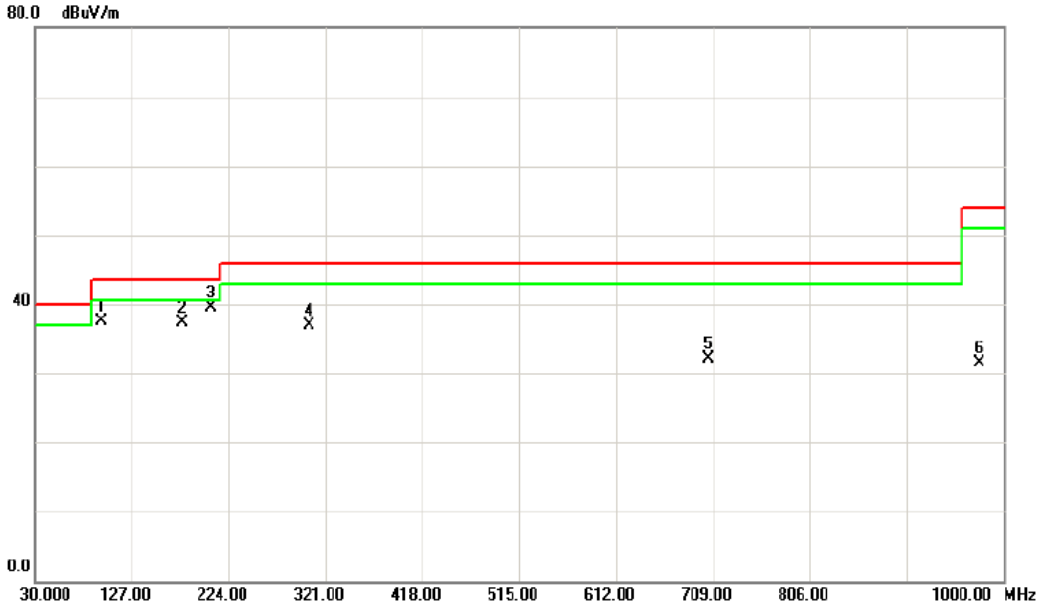
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		93.0500	55.04	-17.60	37.44	43.50	-6.06	peak	
2	*	143.4900	53.32	-13.76	39.56	43.50	-3.94	peak	
3		189.0800	53.47	-14.18	39.29	43.50	-4.21	peak	
4		256.0100	51.06	-14.84	36.22	46.00	-9.78	peak	
5		709.9700	38.55	-4.83	33.72	46.00	-12.28	peak	
6		895.2400	35.08	-1.50	33.58	46.00	-12.42	peak	

Test Mode:	TX 2441MHz _CH39_1Mbps

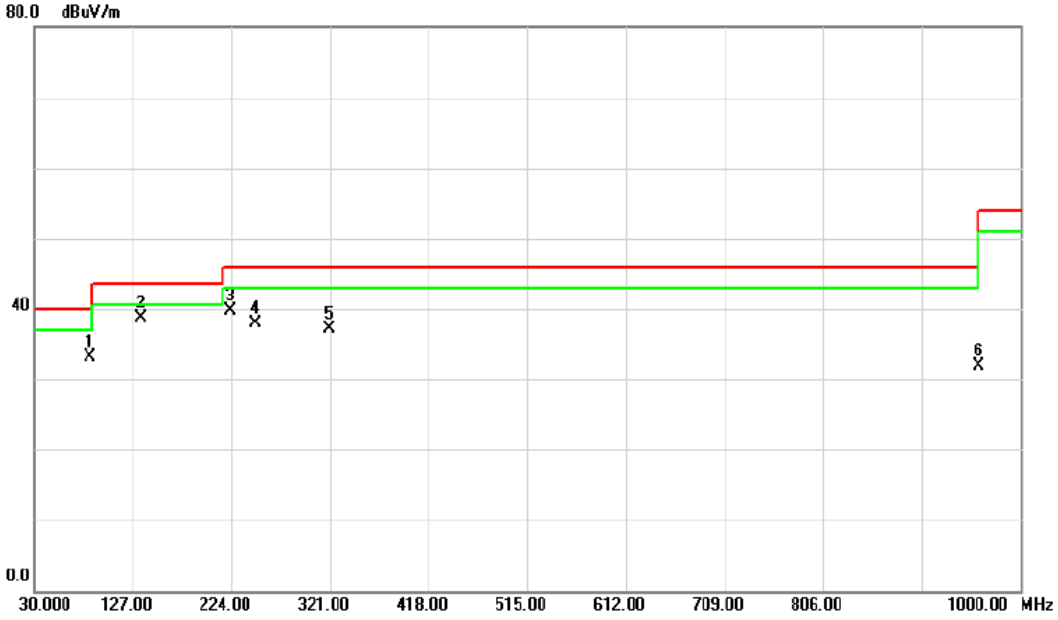
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		96.9300	54.39	-16.86	37.53	43.50	-5.97	peak	
2		178.4100	50.12	-12.82	37.30	43.50	-6.20	peak	
3	*	206.5400	54.68	-15.24	39.44	43.50	-4.06	peak	
4		304.5100	48.11	-11.27	36.84	46.00	-9.16	peak	
5		704.1500	36.89	-4.81	32.08	46.00	-13.92	peak	
6		975.7500	31.65	-0.12	31.53	54.00	-22.47	peak	

Test Mode:	TX 2441MHz _CH39_1Mbps

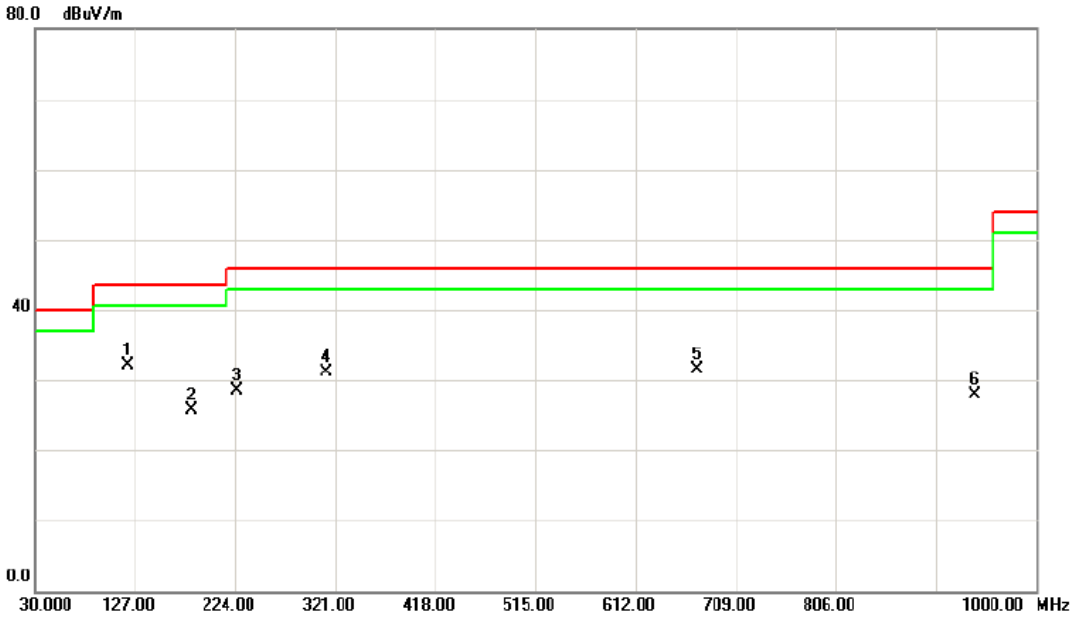
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		84.3200	50.88	-17.82	33.06	40.00	-6.94	peak	
2	*	135.7300	52.26	-13.60	38.66	43.50	-4.84	peak	
3		223.0300	54.49	-14.86	39.63	46.00	-6.37	peak	
4		248.2500	52.77	-14.95	37.82	46.00	-8.18	peak	
5		320.0300	48.40	-11.33	37.07	46.00	-8.93	peak	
6		959.2600	32.29	-0.38	31.91	46.00	-14.09	peak	

Test Mode:	TX 2480MHz _CH78_1Mbps

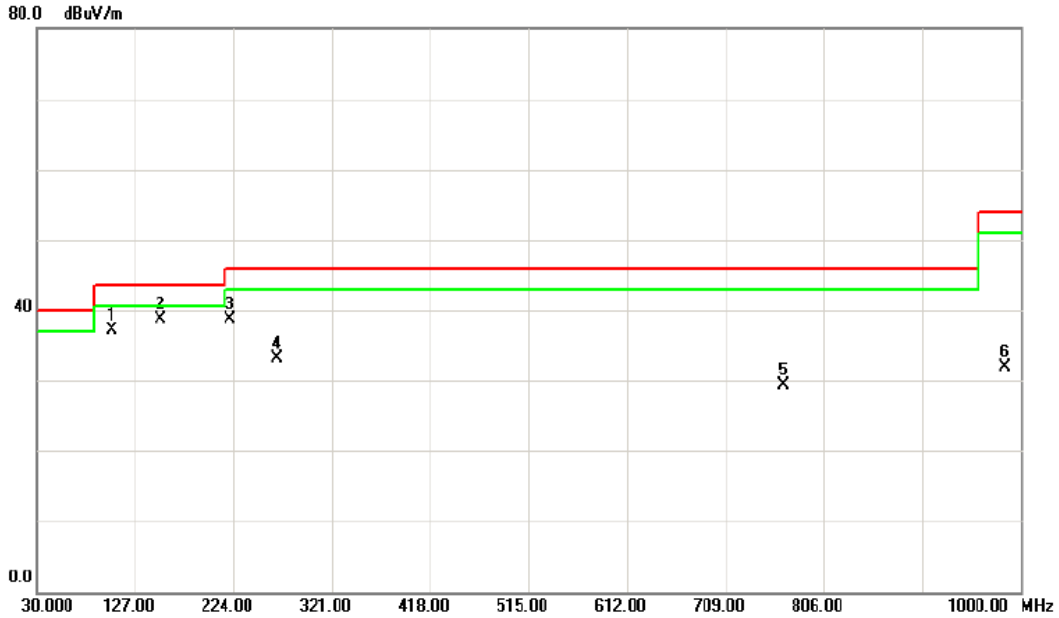
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	119.2400	46.04	-13.95	32.09	43.50	-11.41	peak	
2		182.2900	38.87	-13.18	25.69	43.50	-17.81	peak	
3		225.9400	43.12	-14.69	28.43	46.00	-17.57	peak	
4		312.2700	42.46	-11.30	31.16	46.00	-14.84	peak	
5		672.1400	36.71	-5.23	31.48	46.00	-14.52	peak	
6		940.8300	28.49	-0.66	27.83	46.00	-18.17	peak	

Test Mode:	TX 2480MHz _CH78_1Mbps

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		103.7200	52.80	-15.66	37.14	43.50	-6.36	peak	
2	*	152.2200	52.45	-13.71	38.74	43.50	-4.76	peak	
3		221.0900	53.68	-14.97	38.71	46.00	-7.29	peak	
4		267.6500	47.12	-14.09	33.03	46.00	-12.97	peak	
5		766.2300	33.71	-4.32	29.39	46.00	-16.61	peak	
6		985.4500	31.87	0.02	31.89	54.00	-22.11	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 2402MHz _CH00_1Mbps

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	21.44	11.58	34.09	55.53	45.67	74.00	54.00	X/E
2402.00	**V**	**66.83**	**56.93**	**34.12**	**100.95**	**91.05**			**X/F**
4803.81	V	42.39	30.46	6.38	48.77	36.84	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	21.61	11.60	34.09	55.70	45.69	74.00	54.00	X/E
2402.00	**H**	**66.44**	**56.53**	**34.12**	**100.56**	**90.65**			**X/F**
4803.91	H	40.67	29.55	6.38	47.05	35.93	74.00	54.00	X/H

Test Mode:	TX 2441MHz _CH39_1Mbps

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)	
2441.00	**V**	**66.00**	**56.06**	**34.25**	**100.25**	**90.31**			**X/F**
4881.88	V	41.96	30.16	6.61	48.57	36.77	74.00	54.00	X/H

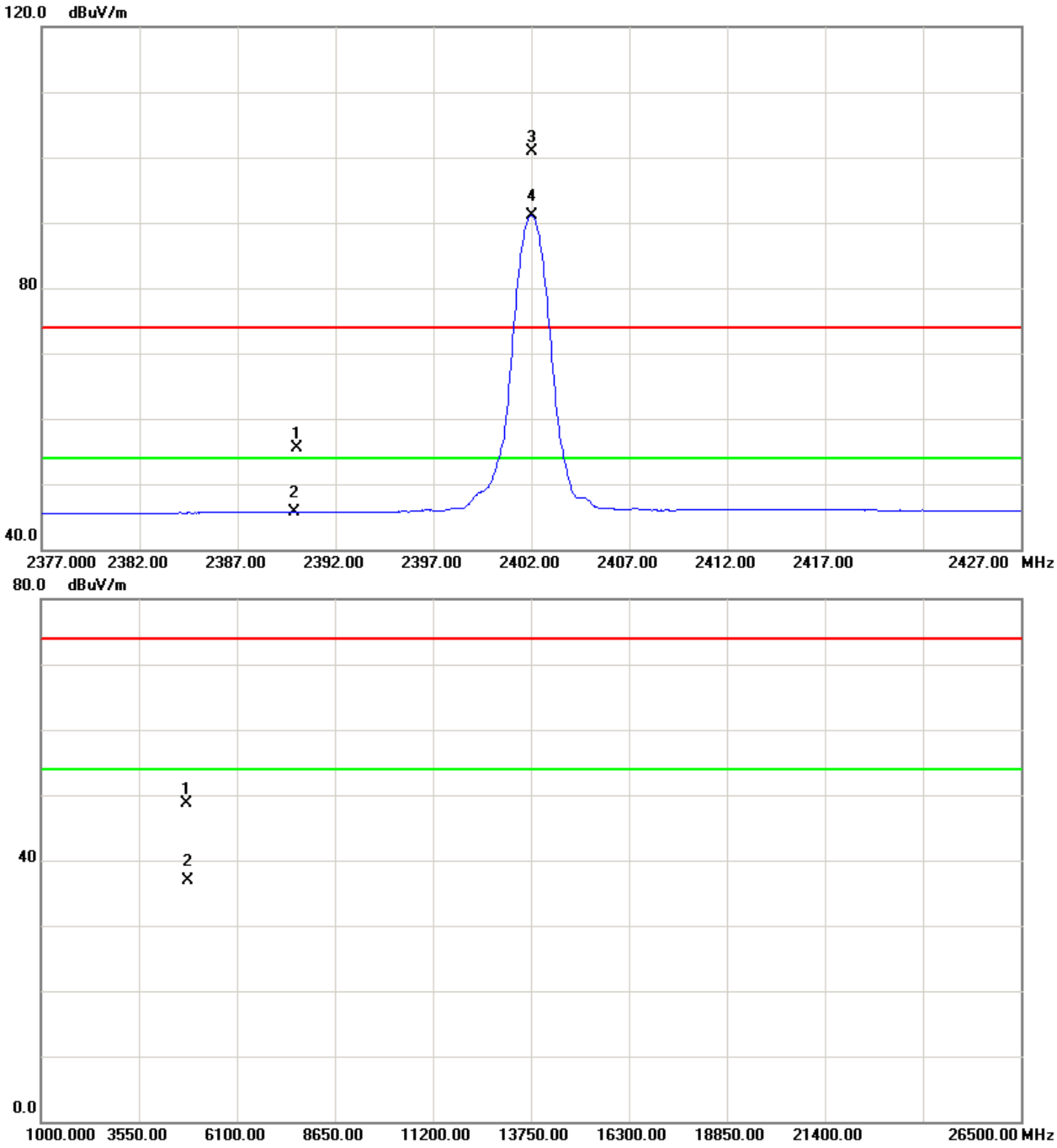
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2441.05	**H**	**71.23**	**61.24**	**34.25**	**105.48**	**95.49**			**X/F**
4882.15	H	43.00	29.51	6.61	49.61	36.12	74.00	54.00	X/H

Test Mode:	TX 2480MHz _CH78_1Mbps

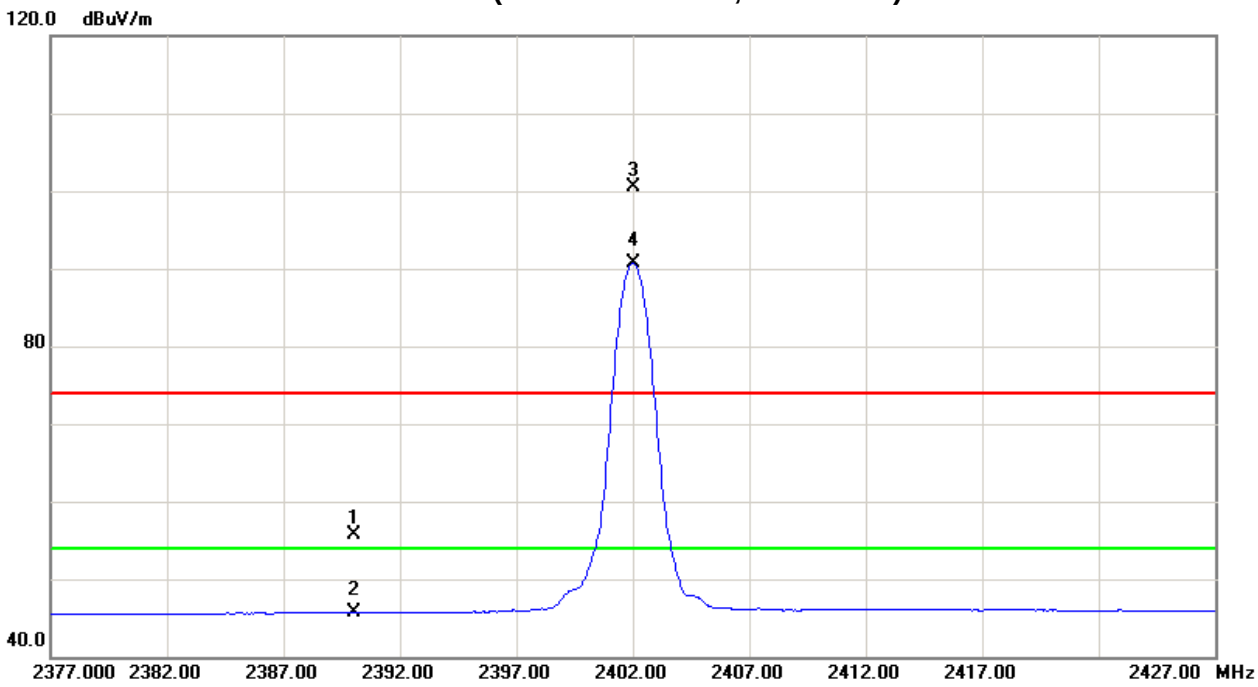
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2479.95	**V**	**63.52**	**53.62**	**34.36**	**97.88**	**87.98**			**X/F**
2483.50	V	24.31	13.55	34.37	58.68	47.92	74.00	54.00	X/E
4960.00	V	43.47	29.38	6.83	50.30	36.21	74.00	54.00	X/H

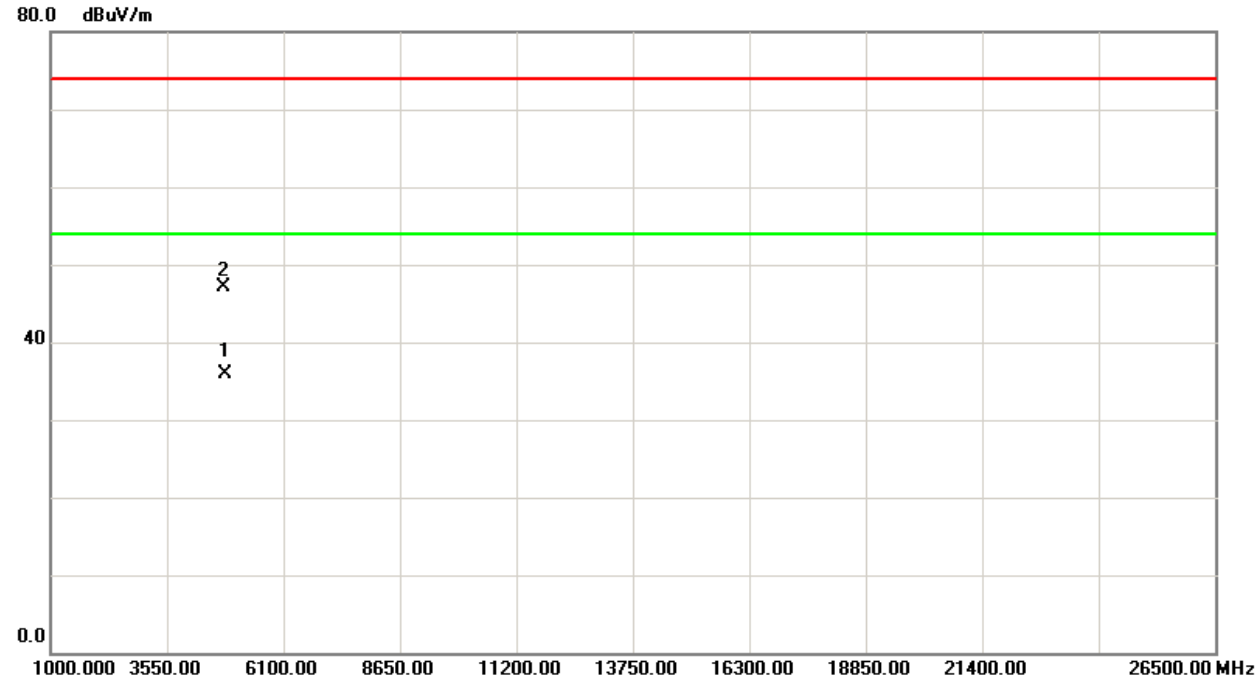
Freq.	Ant.Pol.	Reading		Ant./CF	Act.		Limit		Note
		Peak	AV		Peak	AV	Peak	AV	
(MHz)	H/V	(dBuV)	(dBuV)	CF(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	
2480.00	**H**	**69.11**	**59.20**	**34.36**	**103.47**	**93.56**			**X/F**
2483.50	H	22.81	13.93	34.37	57.18	48.30	74.00	54.00	X/E
4960.17	H	40.54	28.06	6.83	47.37	34.89	74.00	54.00	X/H

TX CH00(Above 1000 MHz, Vertical)

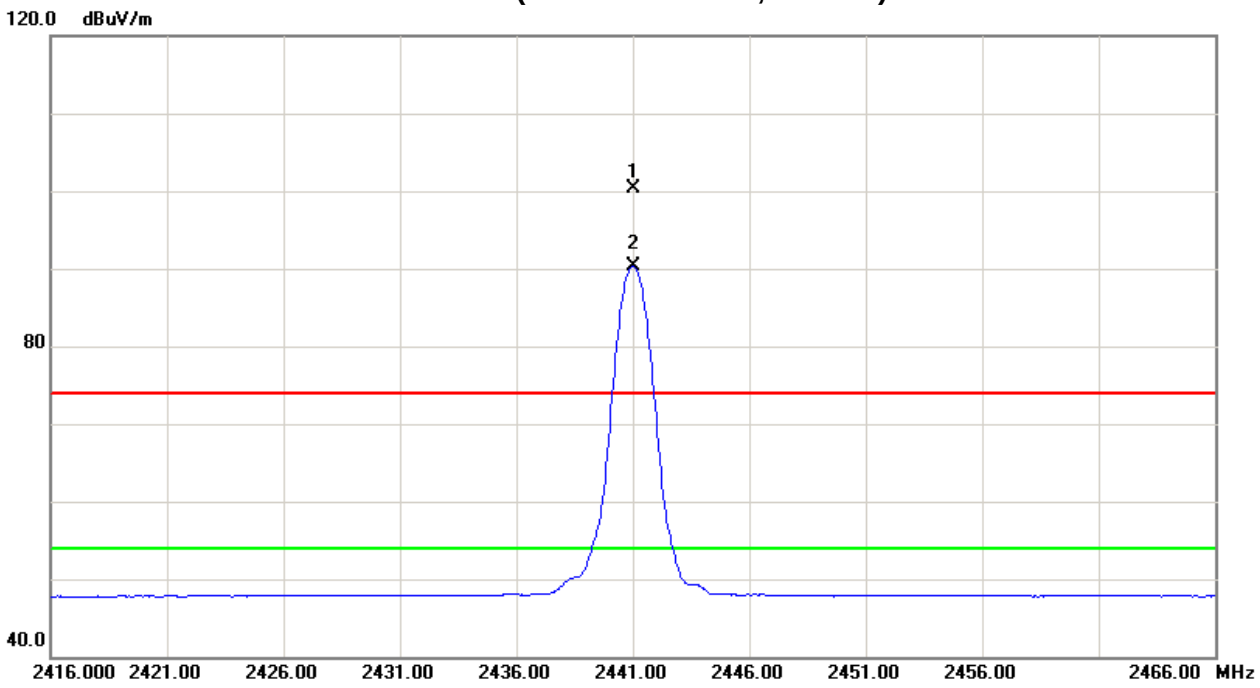


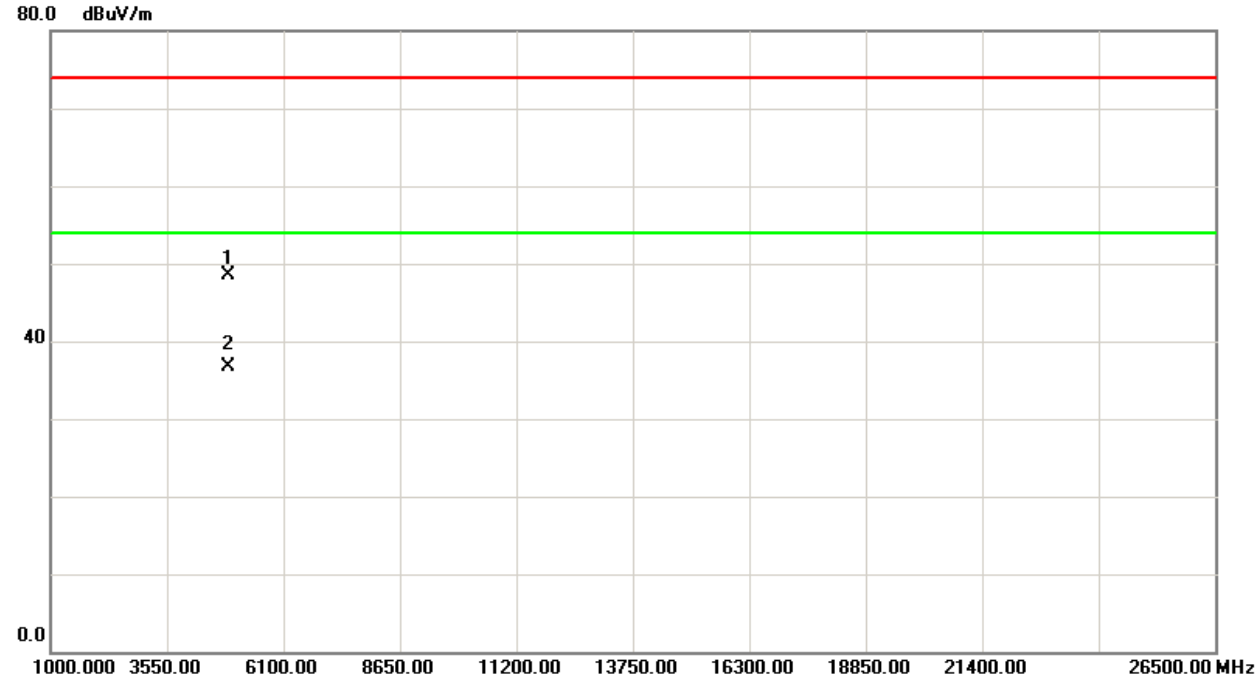
TX CH00(Above 1000 MHz, Horizontal)



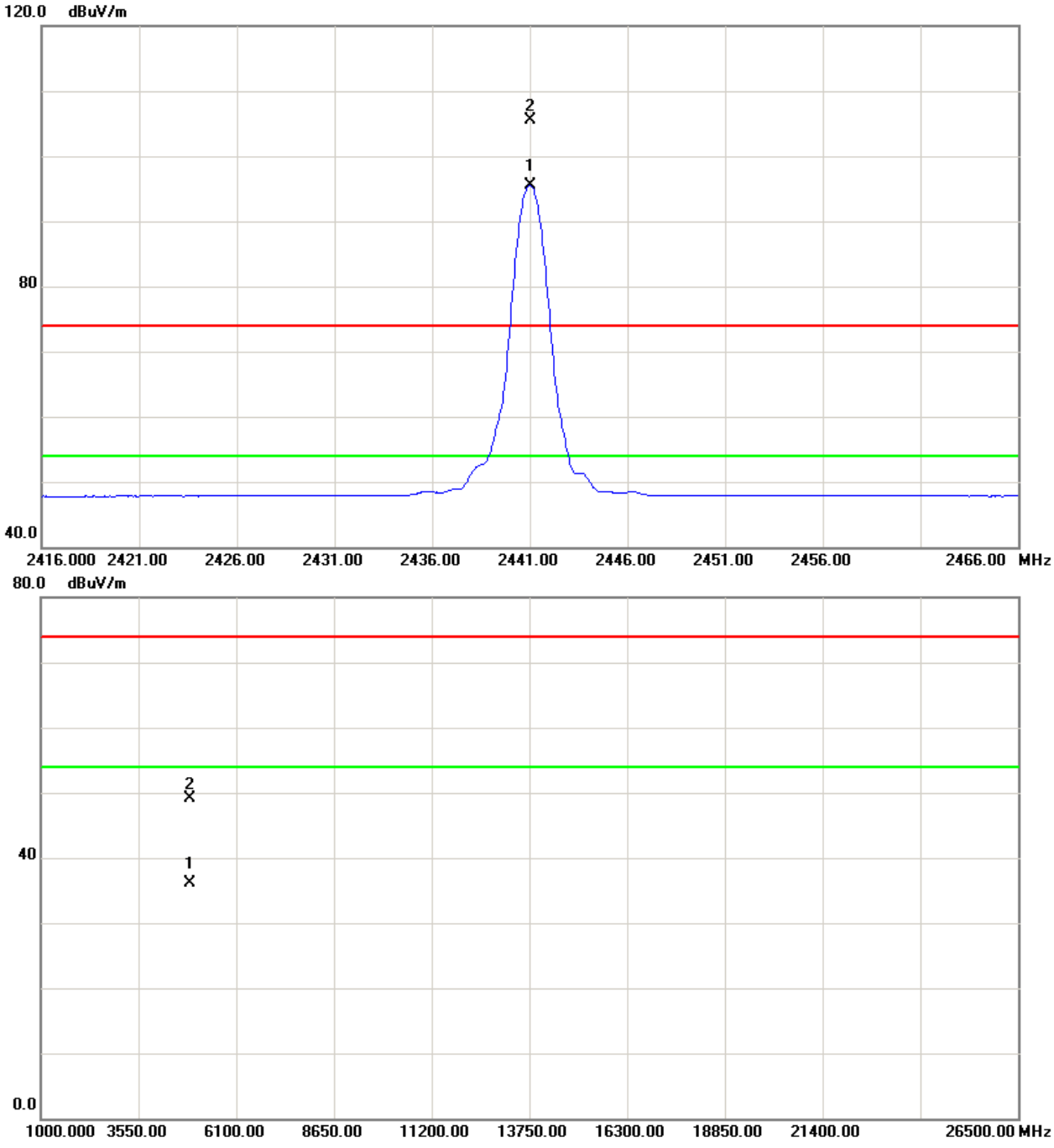


TX CH39 (Above 1000 MHz, Vertical)

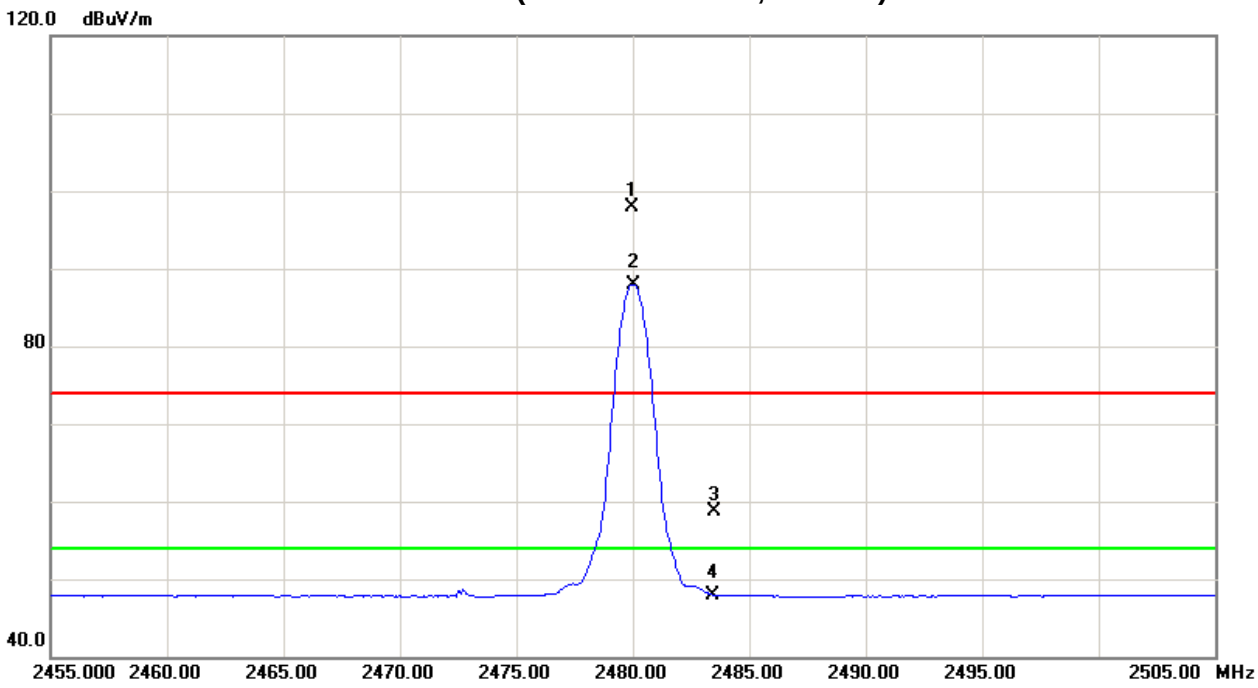


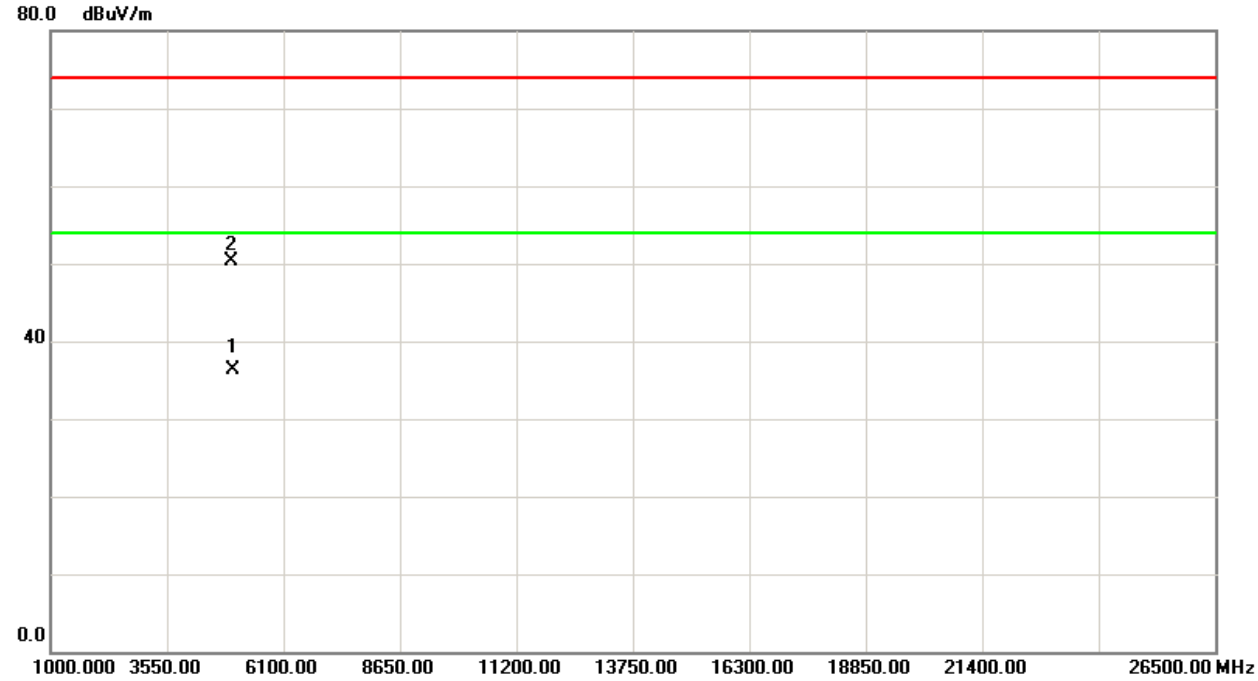


TX CH39 (Above 1000 MHz, Horizontal)

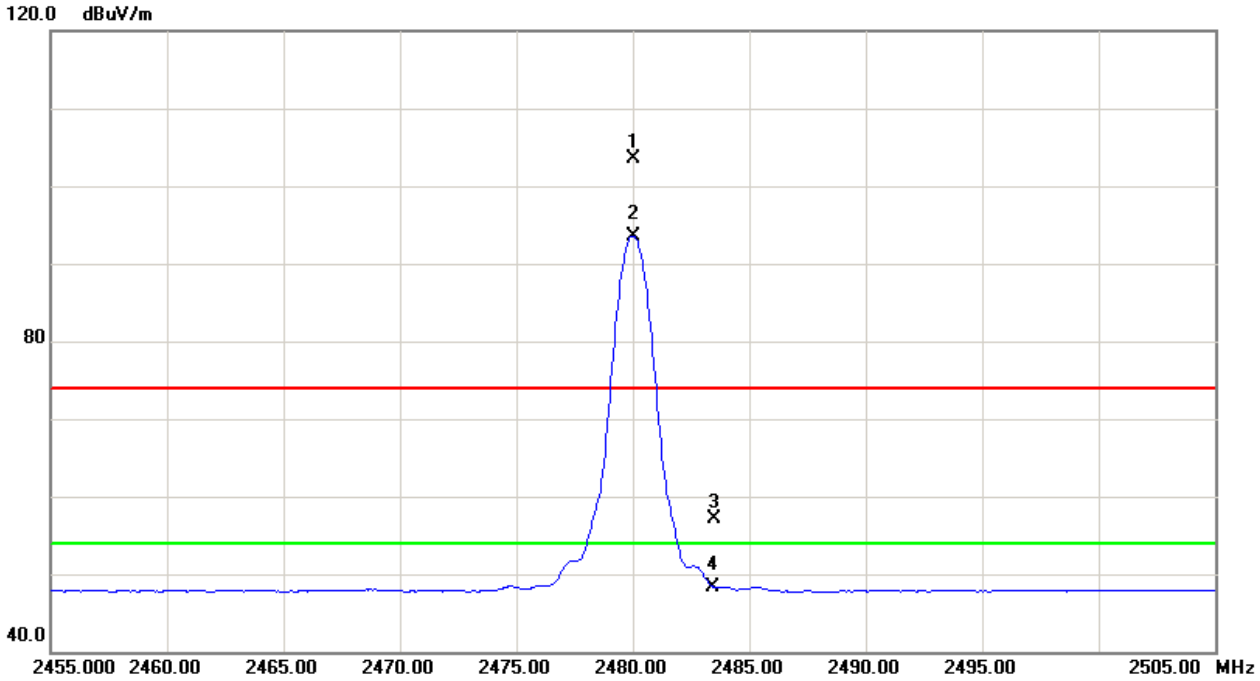


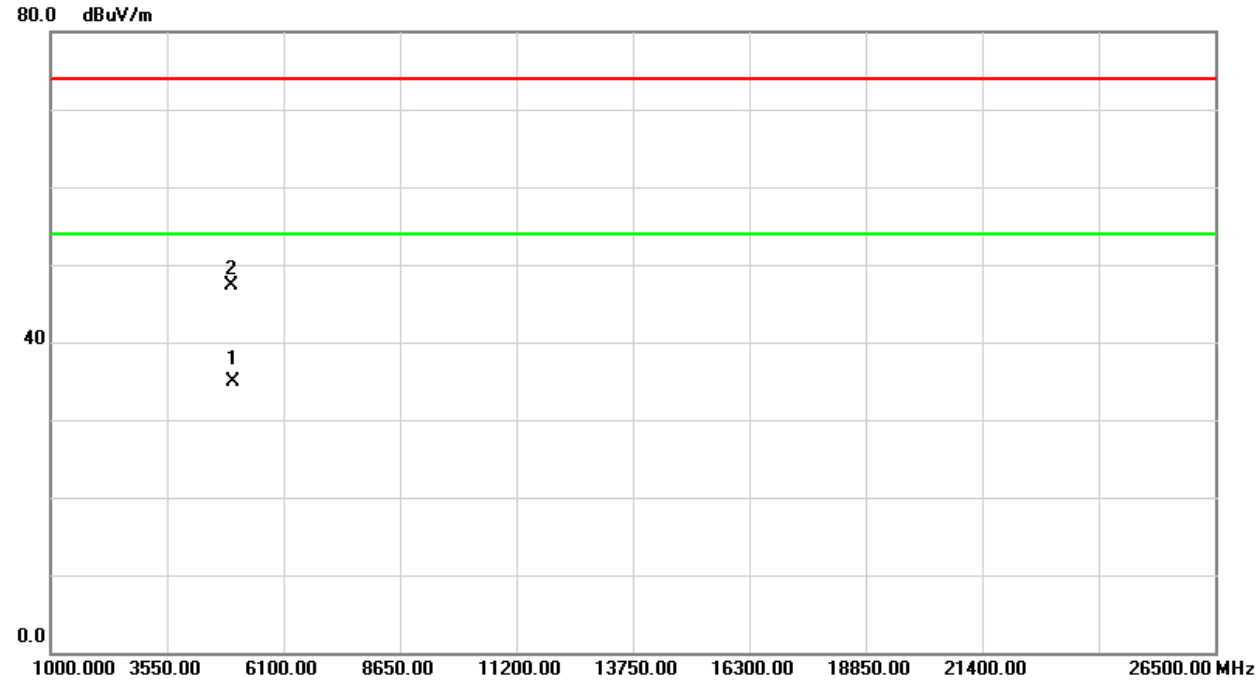
TX CH78 (Above 1000 MHz, Vertical)





TX CH78 (Above 1000 MHz, Horizontal)





Test Mode:	TX 2402MHz _CH00_3Mbps

Freq. (MHz)	Ant.Pol. H/V	Reading Peak (dBuV)	Reading AV (dBuV)	Ant./CF CF(dB)	Act. Peak (dBuV/m)	Act. AV (dBuV/m)	Limit Peak (dBuV/m)	Limit AV (dBuV/m)	Note
2390.00	V	23.36	13.33	34.09	57.45	47.42	74.00	54.00	X/E
2401.95	**V**	**63.47**	**52.27**	**34.12**	**97.59**	**86.39**			**X/F**
4804.95	V	42.78	30.32	6.38	49.16	36.70	74.00	54.00	X/H

Freq. (MHz)	Ant.Pol. H/V	Reading Peak (dBuV)	Reading AV (dBuV)	Ant./CF CF(dB)	Act. Peak (dBuV/m)	Act. AV (dBuV/m)	Limit Peak (dBuV/m)	Limit AV (dBuV/m)	Note
2390.00	H	23.85	13.36	34.09	57.94	47.45	74.00	54.00	X/E
2402.00	**H**	**68.69**	**57.39**	**34.12**	**102.81**	**91.51**			**X/F**
4804.74	H	40.29	29.55	6.38	46.67	35.93	74.00	54.00	X/H

Test Mode:	TX 2441MHz _CH39_3Mbps

Freq. (MHz)	Ant.Pol. H/V	Reading Peak (dBuV)	Reading AV (dBuV)	Ant./CF CF(dB)	Act. Peak (dBuV/m)	Act. AV (dBuV/m)	Limit Peak (dBuV/m)	Limit AV (dBuV/m)	Note
2441.00	**V**	**64.14**	**52.93**	**34.25**	**98.39**	**87.18**			**X/F**
4882.28	V	42.61	30.53	6.61	49.22	37.14	74.00	54.00	X/H

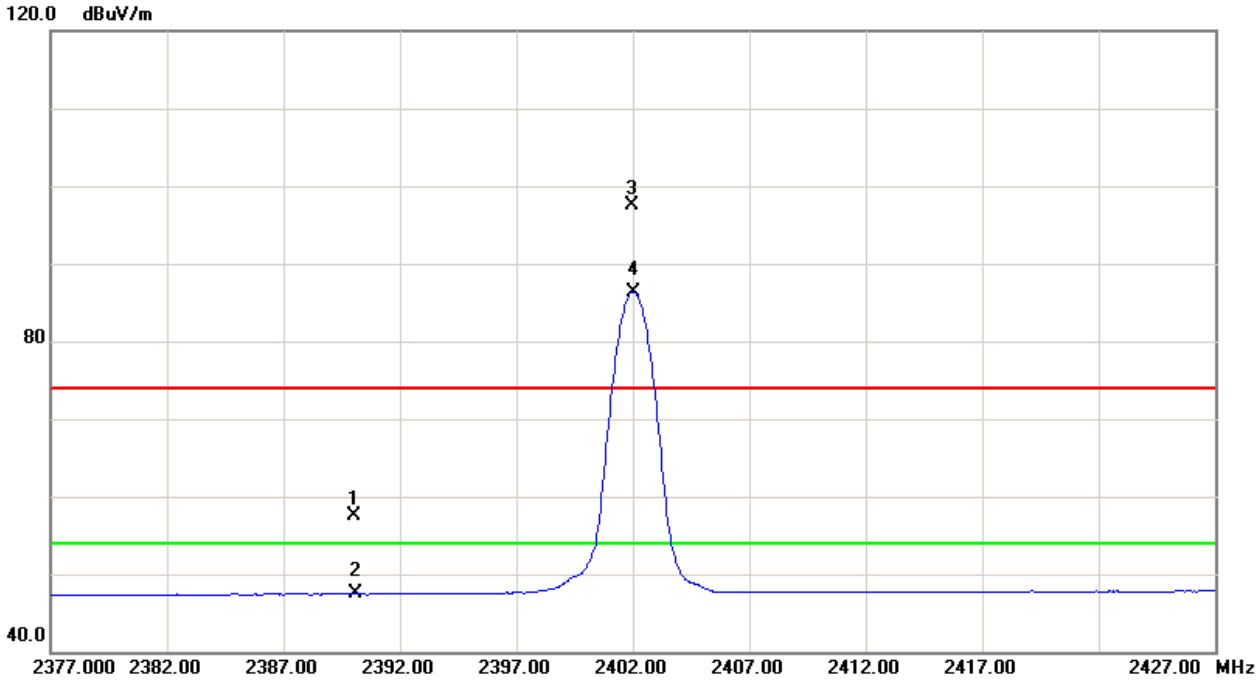
Freq. (MHz)	Ant.Pol. H/V	Reading Peak (dBuV)	Reading AV (dBuV)	Ant./CF CF(dB)	Act. Peak (dBuV/m)	Act. AV (dBuV/m)	Limit Peak (dBuV/m)	Limit AV (dBuV/m)	Note
2441.00	**H**	**69.08**	**57.76**	**34.25**	**103.33**	**92.01**			**X/F**
4882.62	H	42.19	29.39	6.61	48.80	36.00	74.00	54.00	X/H

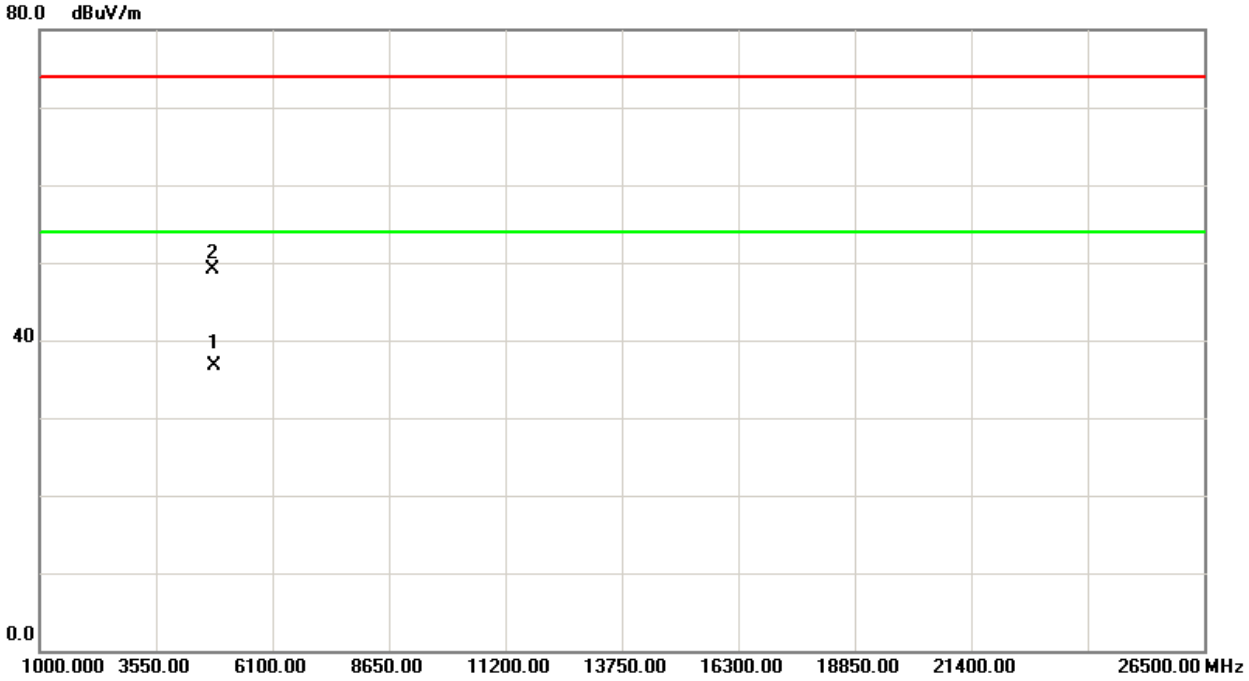
Test Mode:	TX 2480MHz _CH78_3Mbps

Freq. (MHz)	Ant.Pol. H/V	Reading Peak (dBuV)	Reading AV (dBuV)	Ant./CF CF(dB)	Act. Peak (dBuV/m)	Act. AV (dBuV/m)	Limit Peak (dBuV/m)	Limit AV (dBuV/m)	Note
2480.00	**V**	**61.11**	**49.83**	**34.36**	**95.47**	**84.19**			**X/F**
2483.50	V	24.95	13.53	34.37	59.32	47.90	74.00	54.00	X/E
4960.43	V	41.55	29.61	6.83	48.38	36.44	74.00	54.00	X/H

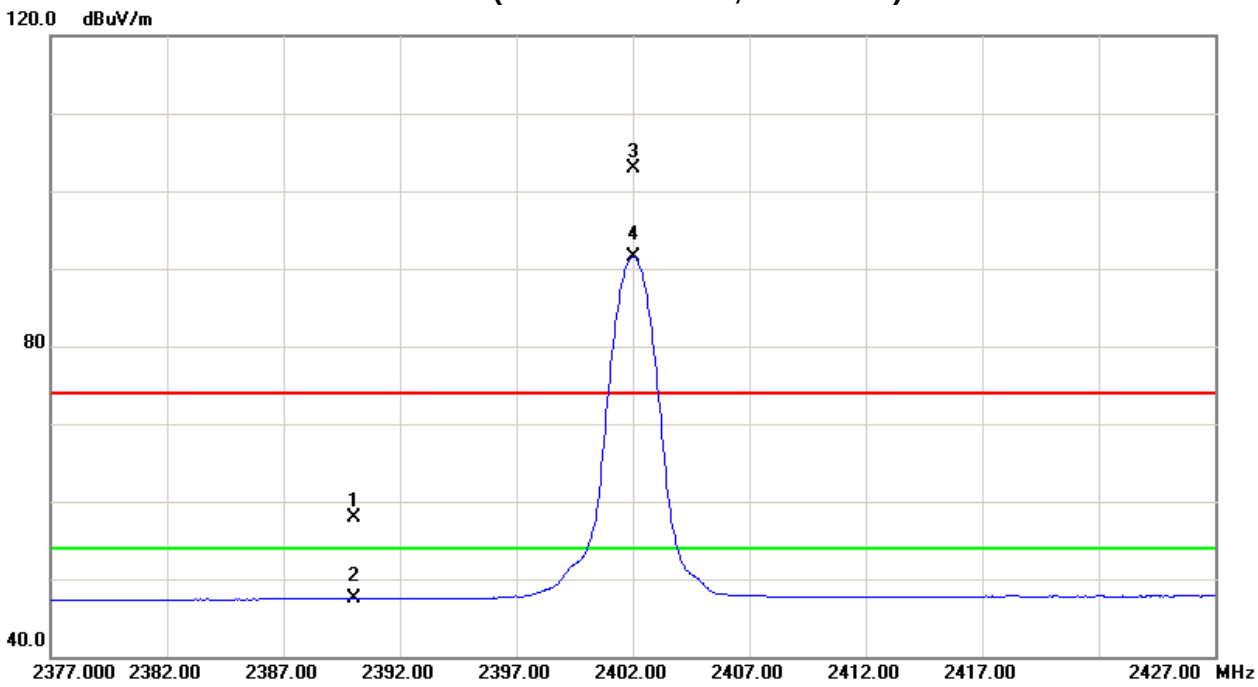
Freq. (MHz)	Ant.Pol. H/V	Reading Peak (dBuV)	Reading AV (dBuV)	Ant./CF CF(dB)	Act. Peak (dBuV/m)	Act. AV (dBuV/m)	Limit Peak (dBuV/m)	Limit AV (dBuV/m)	Note
2480.00	**H**	**66.96**	**55.64**	**34.36**	**101.32**	**90.00**			**X/F**
2483.50	H	25.11	13.91	34.37	59.48	48.28	74.00	54.00	X/E
4960.27	H	40.37	30.94	6.83	47.20	37.77	74.00	54.00	X/H

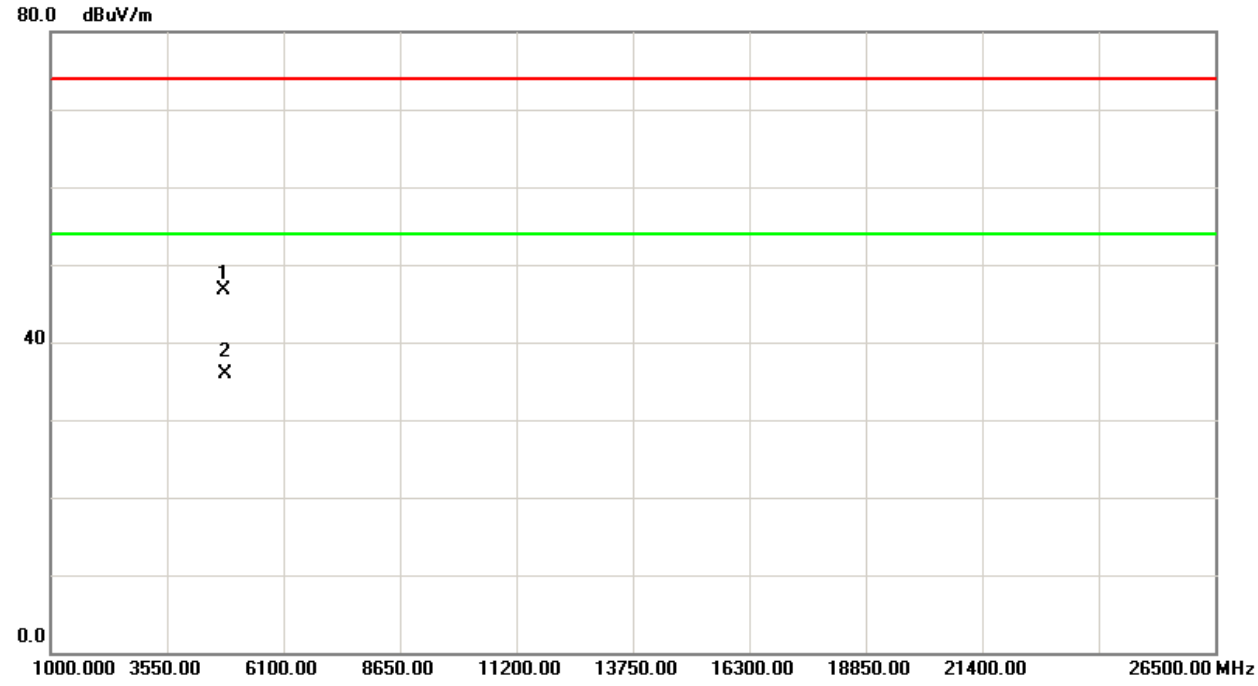
TX CH00(Above 1000 MHz, Vertical)



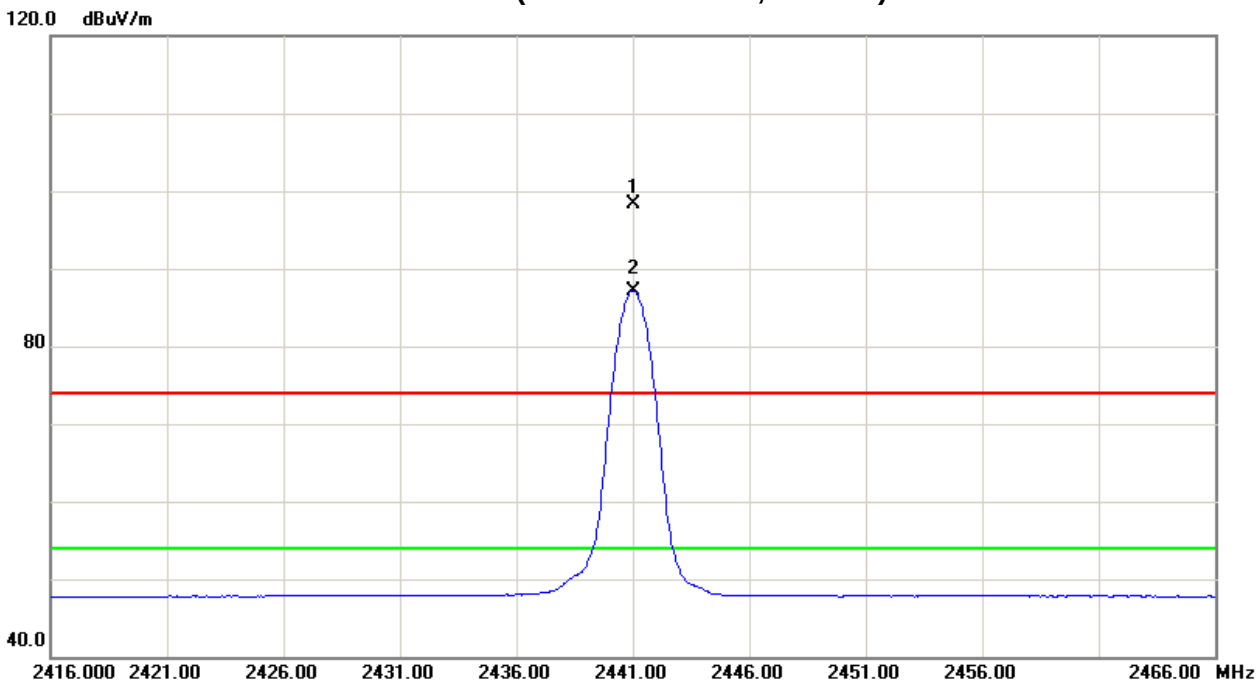


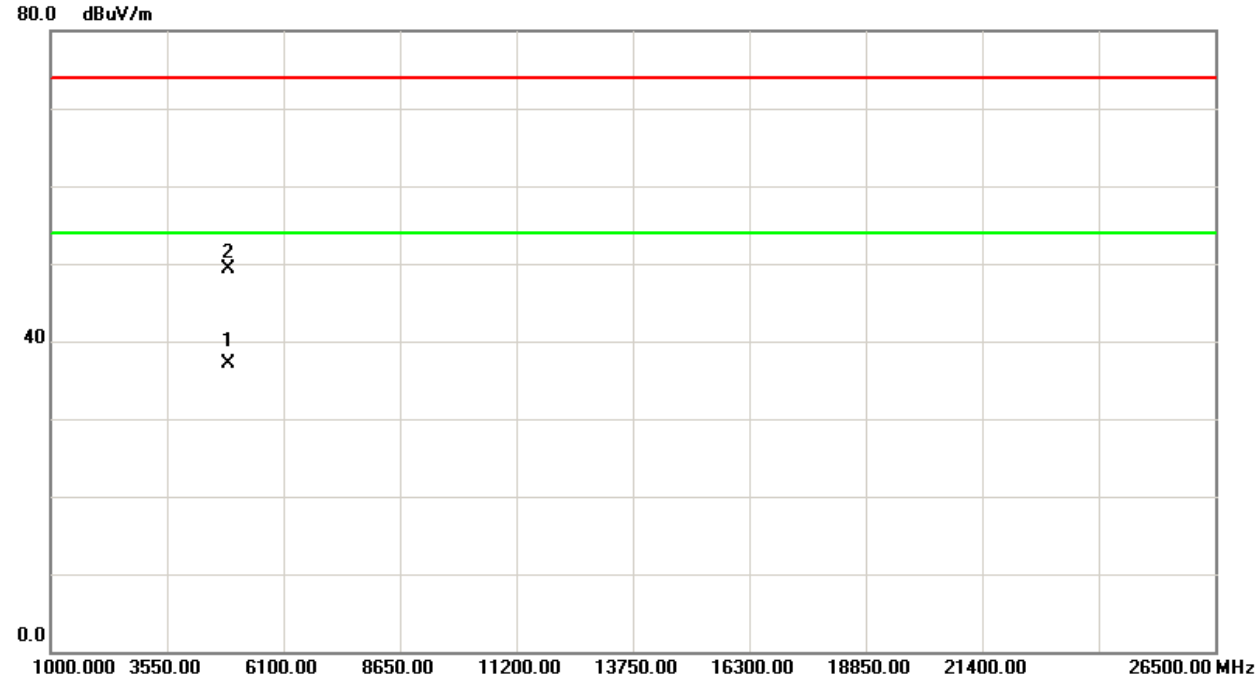
TX CH00(Above 1000 MHz, Horizontal)



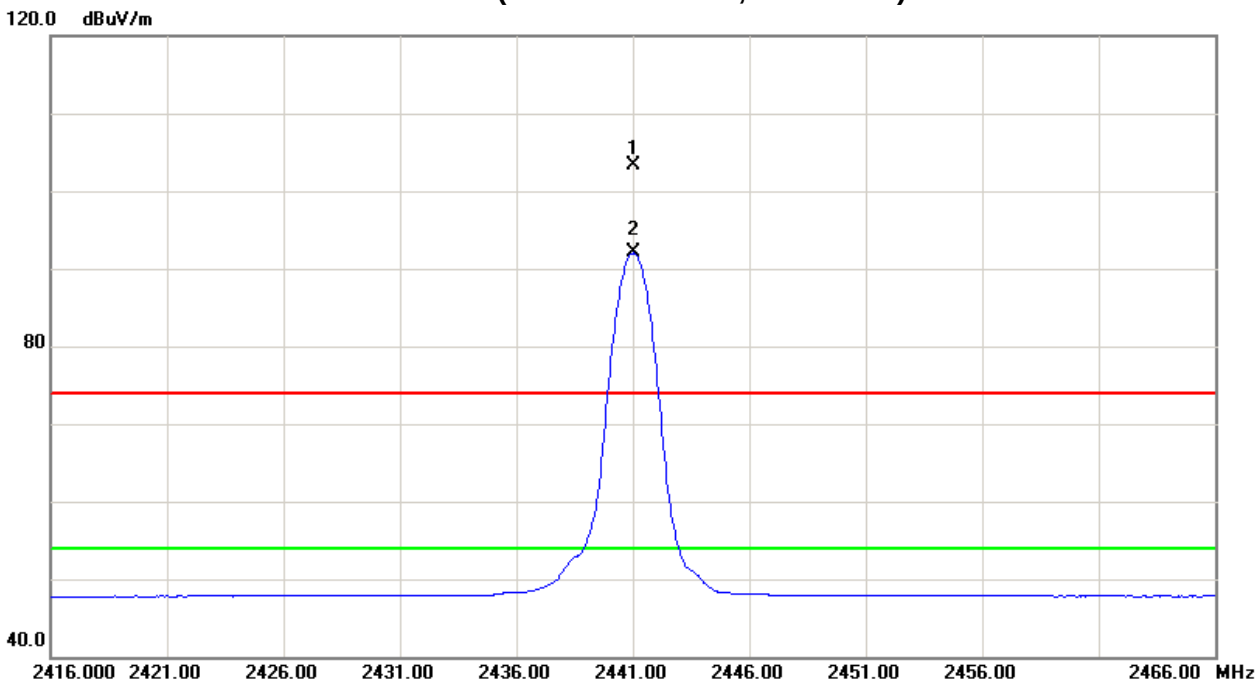


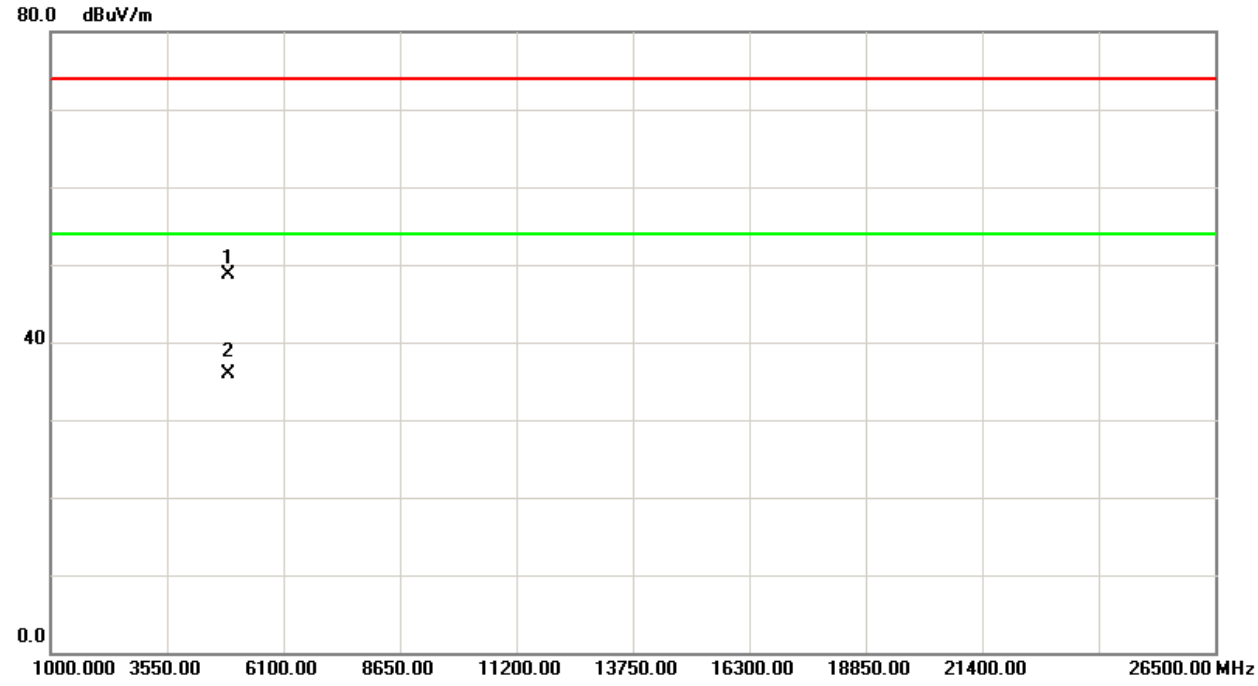
TX CH39 (Above 1000 MHz, Vertical)



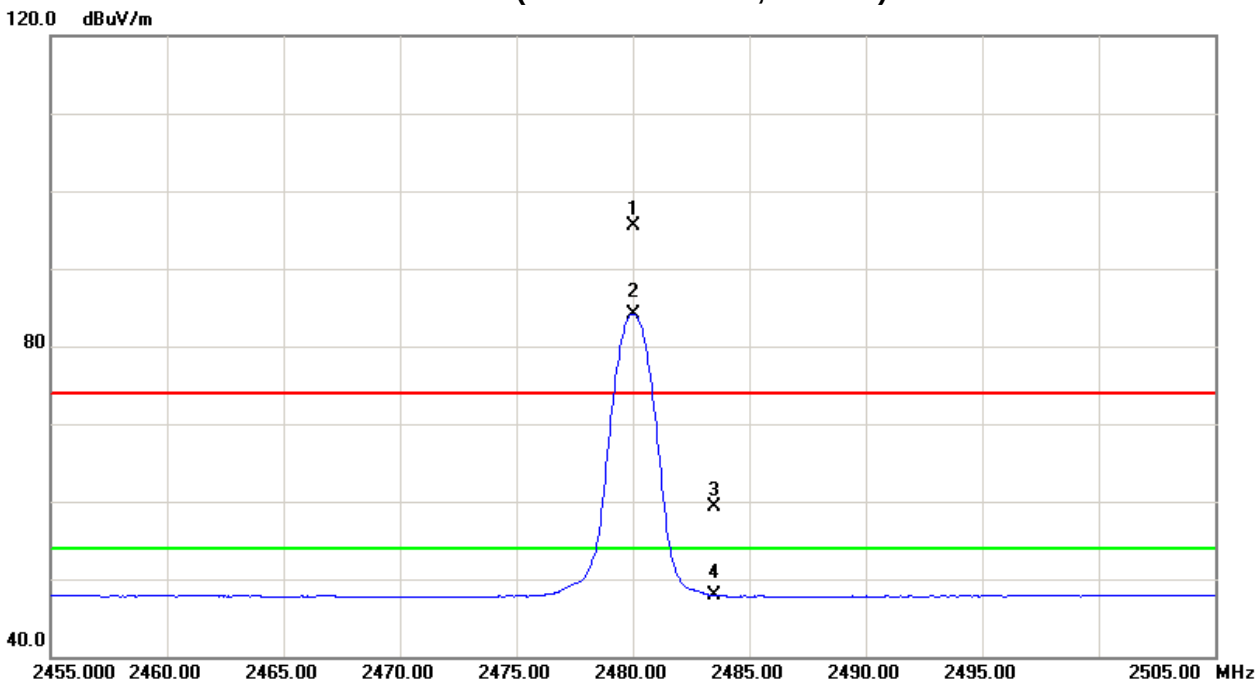


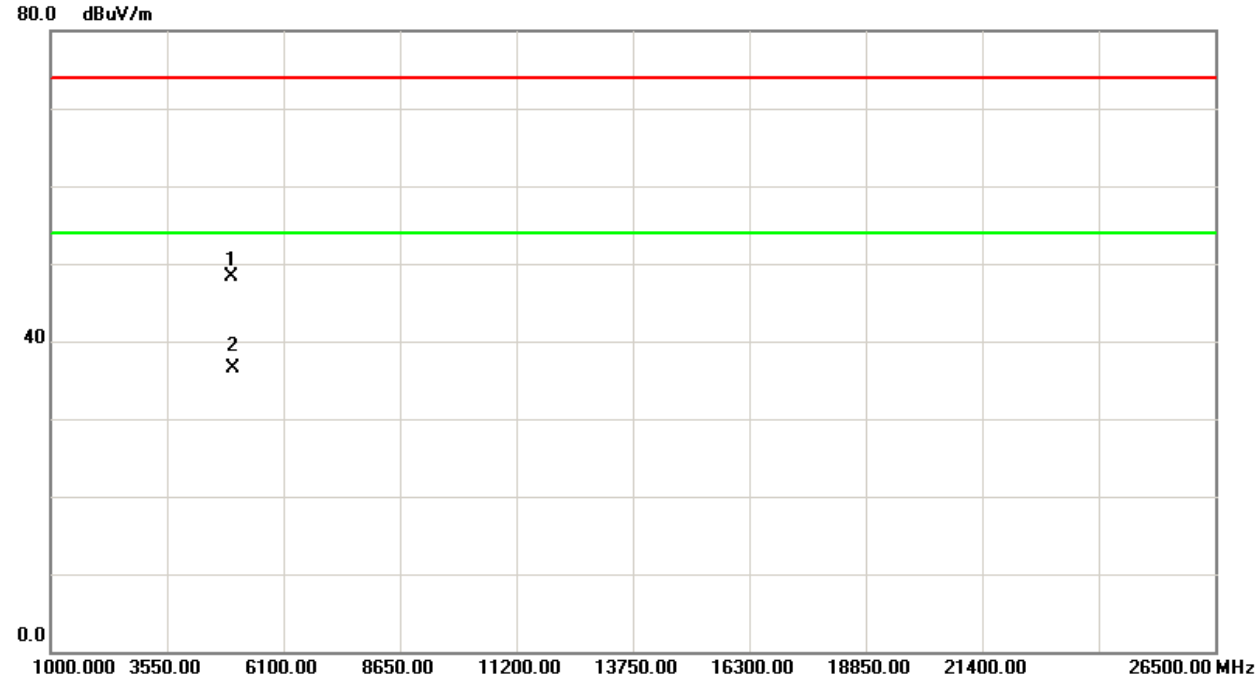
TX CH39 (Above 1000 MHz, Horizontal)



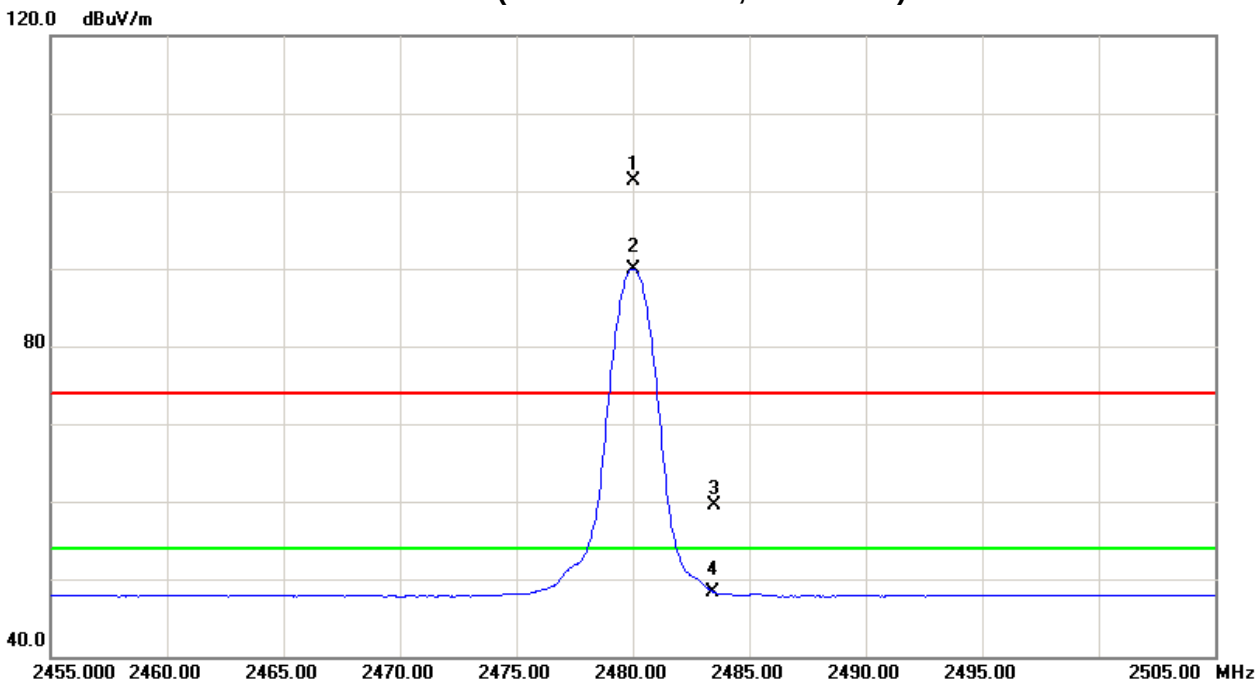


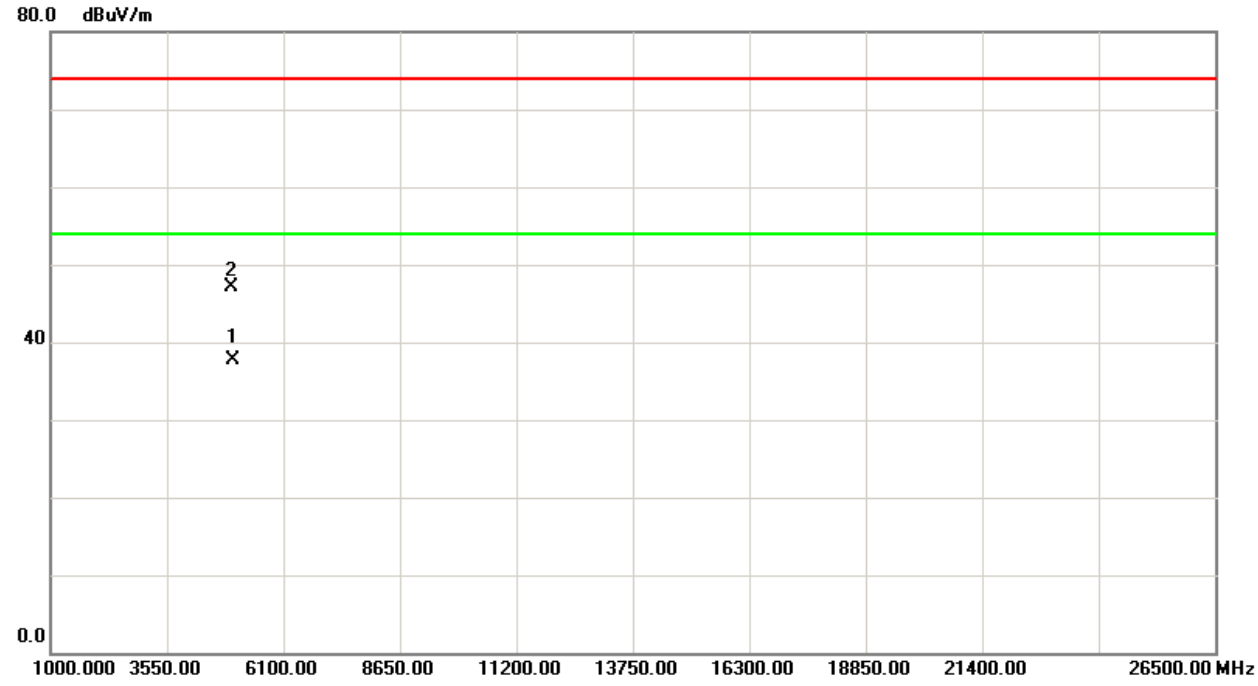
TX CH78 (Above 1000 MHz, Vertical)





TX CH78 (Above 1000 MHz, Horizontal)





5. NUMBER OF HOPPING CHANNEL

5.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii) RSS-210, Issue 8, Annex 8, A8.1(d)	Number of Hopping Channel	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

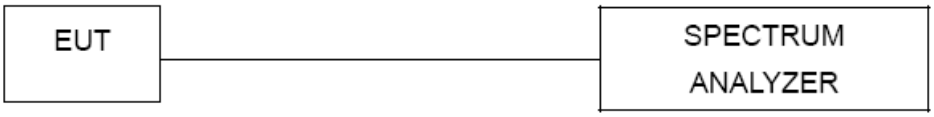
5.1.1 TEST PROCEDURE

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=100KHz, Sweep time = Auto.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



5.1.4 EUT OPERATION CONDITIONS

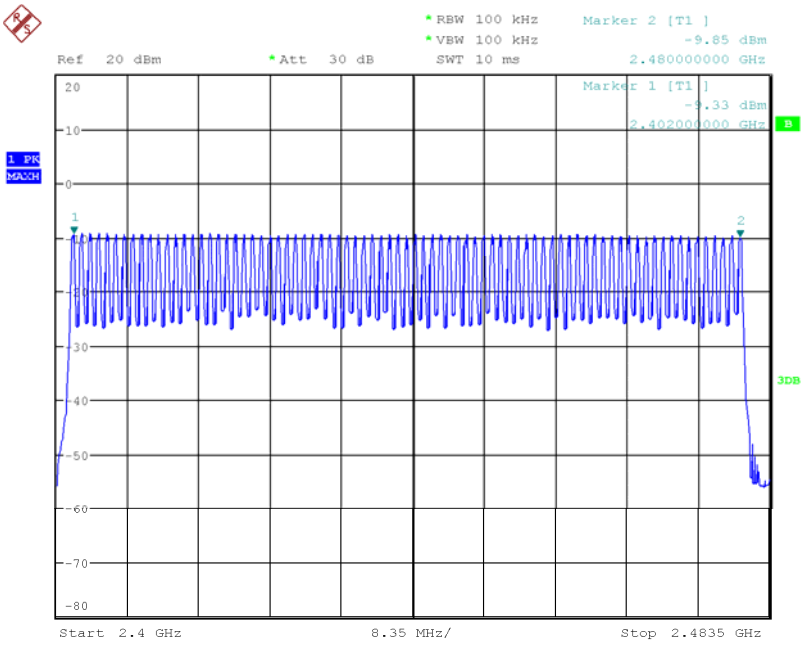
The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 EUT TEST CONDITIONS

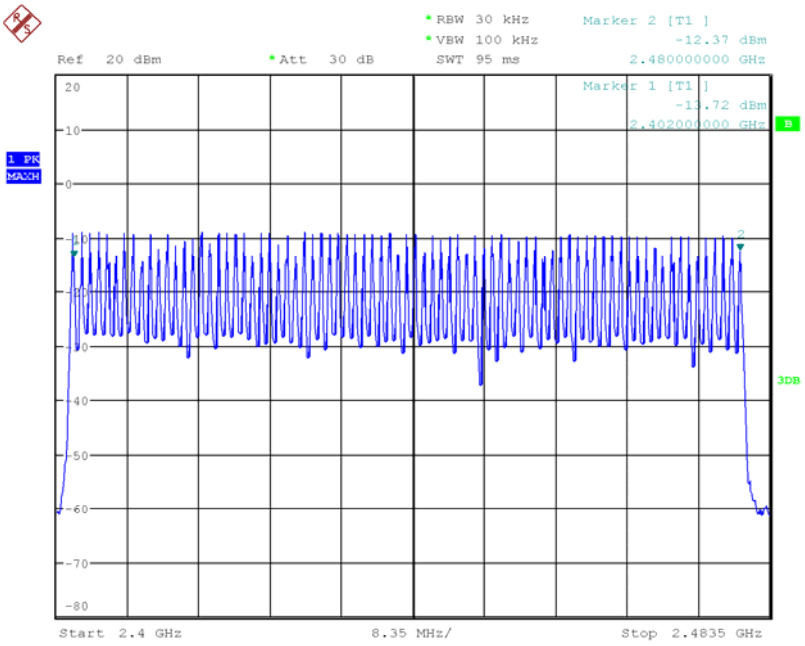
Temperature: 25°C
Relative Humidity: 55%
Test Voltage: 120V/60Hz

5.1.6 TEST RESULTS

Test Mode	Hopping Mode_1Mbps
Number of Hopping Channel	79



Test Mode	Hopping Mode_3Mbps
Number of Hopping Channel	79



6. AVERAGE TIME OF OCCUPANCY

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(iii) RSS-210, Issue 8, Annex 8, A8.1(d)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

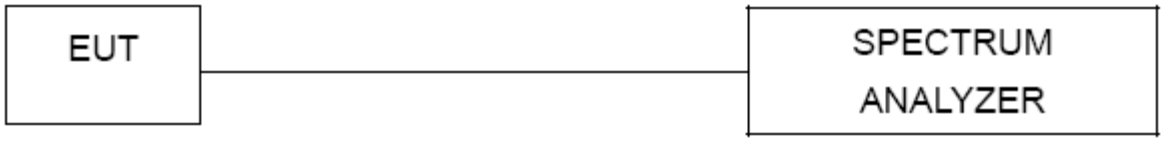
6.1.1 TEST PROCEDURE

a. The transmitter output (antenna port) was connected to the spectrum analyzer
b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
d. Sweep Time is more than once pulse time.
e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
f. Measure the maximum time duration of one single pulse.
g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
h. Measure the maximum time duration of one single pulse.
i. DH5 Packet permit maximum 1600/ 79 / 6 = 3.37 hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 3.37 x 31.6 = 106.6 within 31.6 seconds.
j. DH3 Packet permit maximum 1600 / 79 / 4 = 5.06 hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 5.06 x 31.6 = 160 within 31.6 seconds.
k. DH1 Packet permit maximum 1600 / 79 /2 = 10.12 hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times 10.12 x 31.6 = 320 within 31.6 seconds.

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 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 EUT TEST CONDITIONS

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

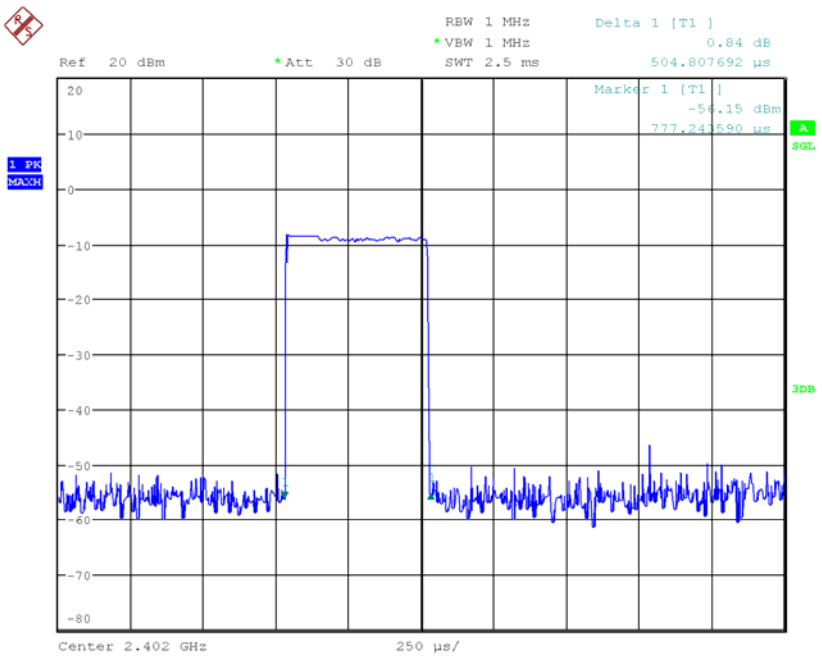
6.1.6 TEST RESULTS

Test Mode: CH00_1Mbps				
Data Packet	**Frequency (MHz)**	**Pulse Duration (ms)**	**Dwell Time (s)**	**Limits (s)**
DH5	2402	3.0360	0.3238	0.4000
DH3	2402	1.7860	0.2858	0.4000
DH1	2402	0.5040	0.1613	0.4000

Test Mode: CH39_1Mbps				
Data Packet	**Frequency (MHz)**	**Pulse Duration (ms)**	**Dwell Time (s)**	**Limits (s)**
DH5	2441	3.0360	0.3238	0.4000
DH3	2441	1.7700	0.2832	0.4000
DH1	2441	0.5200	0.1664	0.4000

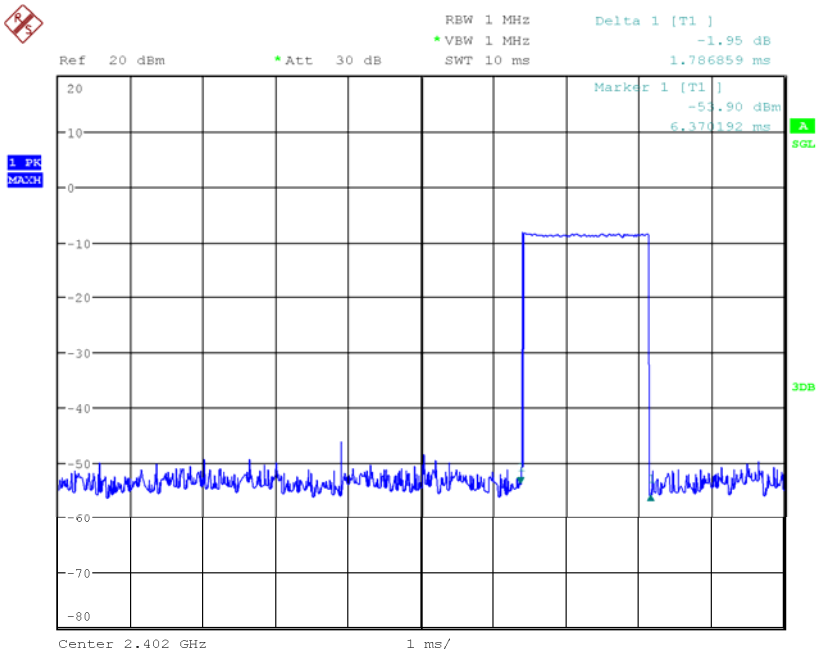
Test Mode: CH78_1Mbps				
Data Packet	**Frequency (MHz)**	**Pulse Duration (ms)**	**Dwell Time (s)**	**Limits (s)**
DH5	2480	3.0370	0.3239	0.4000
DH3	2480	1.7860	0.2858	0.4000
DH1	2480	0.5040	0.1613	0.4000

CH00-DH1



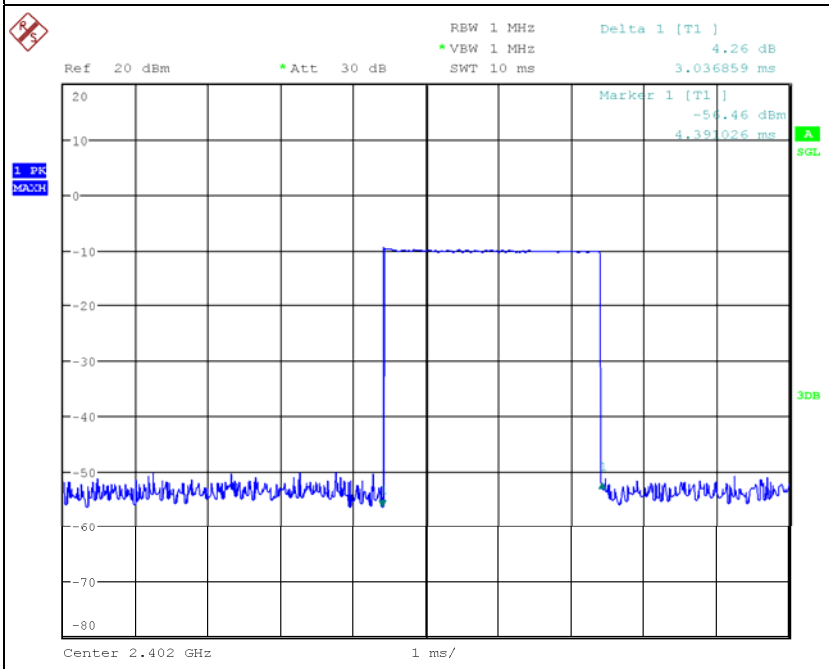
Date: 11.JAN.2014 14:05:51

CH00-DH3



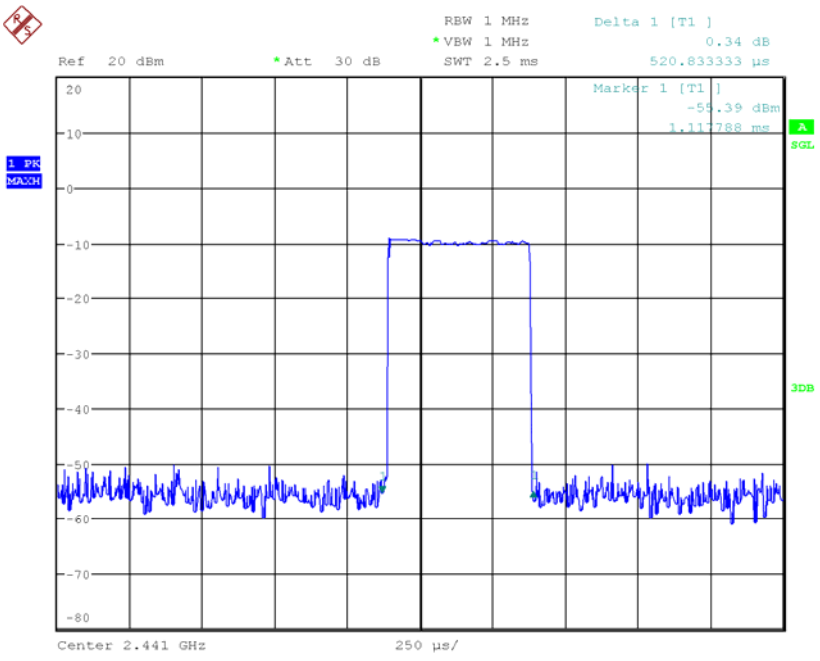
Date: 11.JAN.2014 14:07:39

CH00-DH5



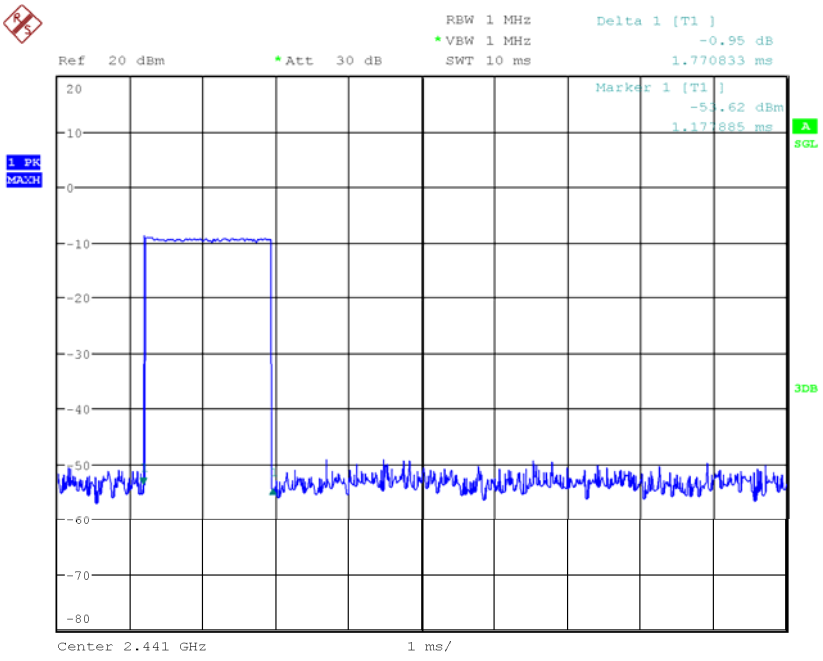
Date: 11.JAN.2014 15:37:47

CH39-DH1



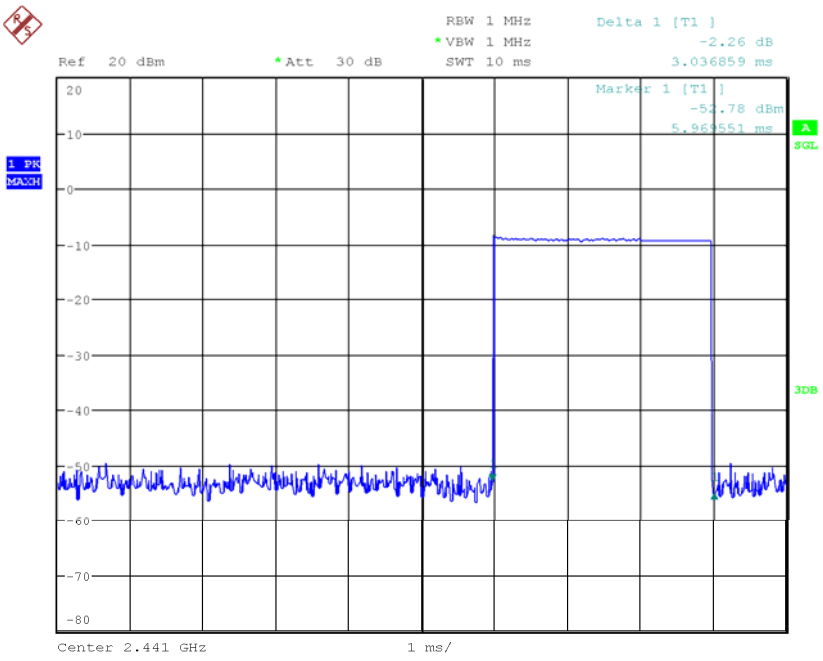
Date: 11.JAN.2014 15:41:55

CH39-DH3



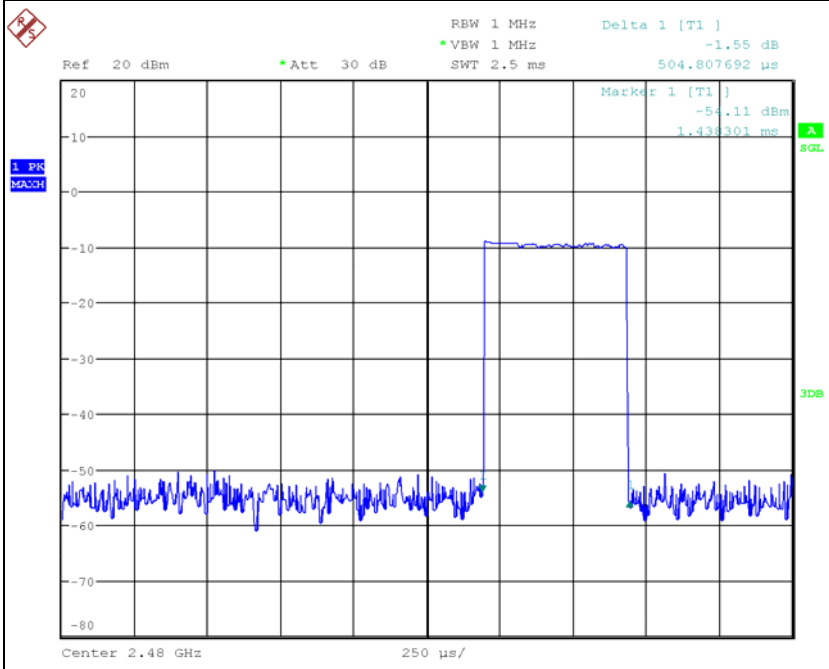
Date: 11.JAN.2014 14:13:15

CH39-DH5



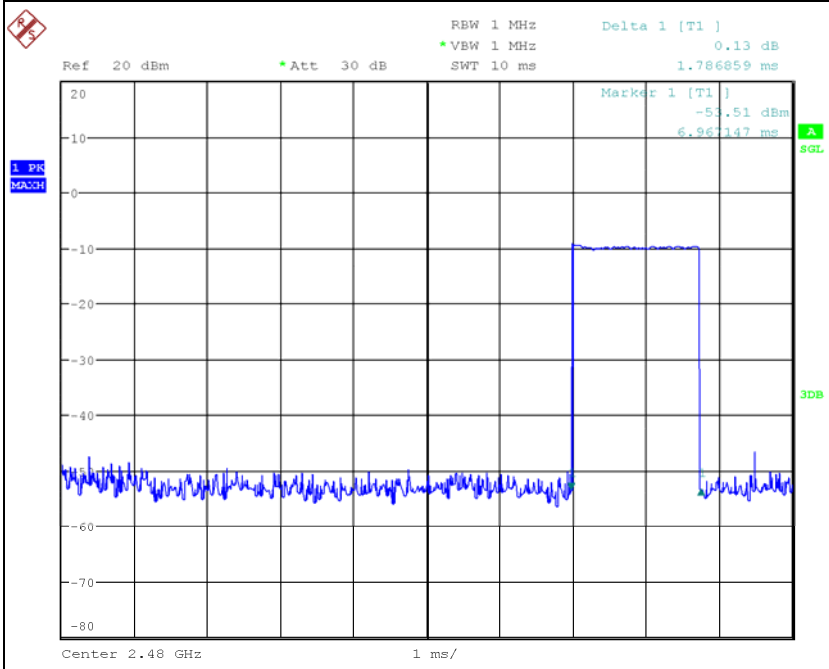
Date: 11.JAN.2014 14:12:08

CH78-DH1



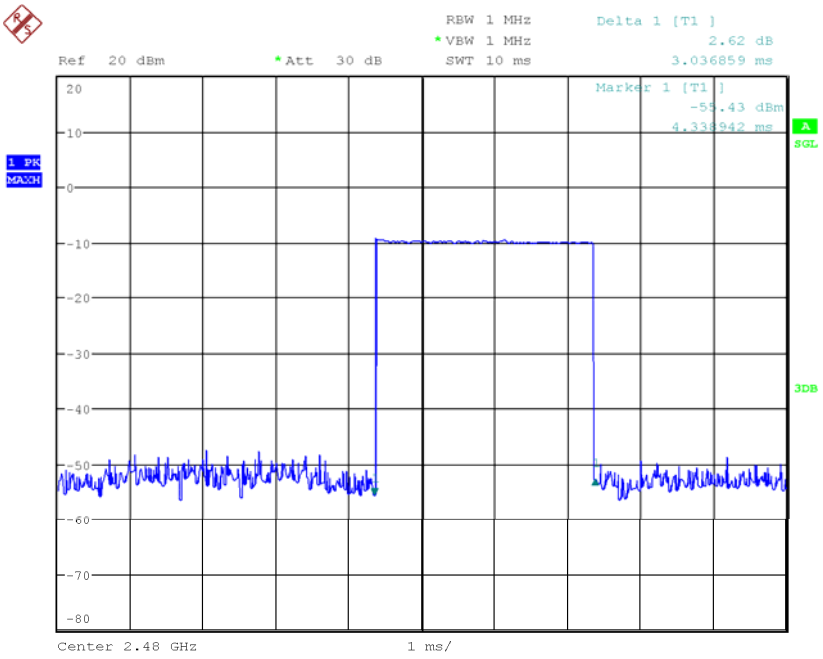
Date: 11.JAN.2014 14:16:40

CH78-DH3



Date: 11.JAN.2014 15:46:47

CH78-DH5

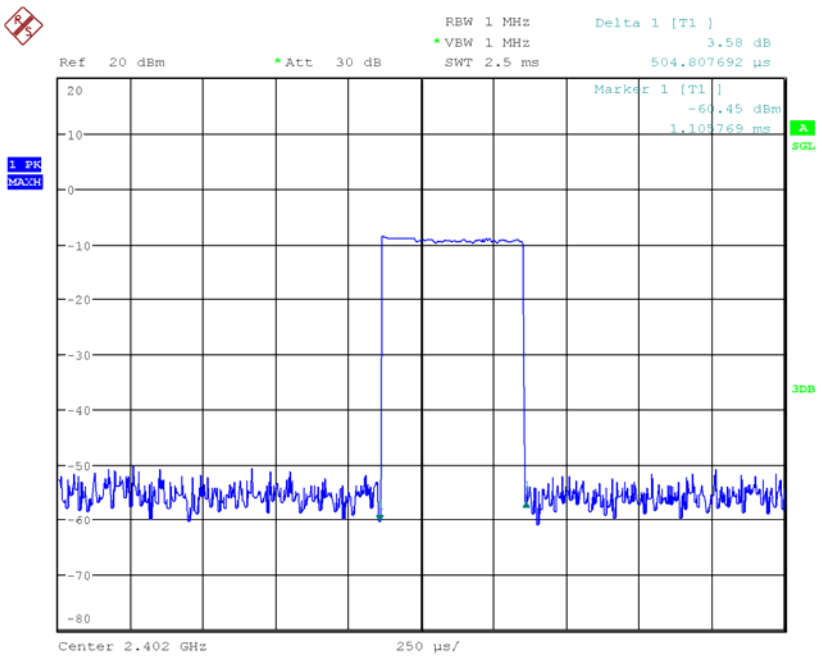

RBW 1 MHz
VBW 1 MHz
SWT 10 ms
Delta 1 [T1]
2.62 dB
3.036859 ms
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-55.43 dBm
4.338942 ms
1 PK
MAXH
A
SGL
3DB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
1 ms/
Date: 11.JAN.2014 14:20:06

Test Mode: CH00_3Mbps				
Data Packet	**Frequency (MHz)**	**Pulse Duration (ms)**	**Dwell Time (s)**	**Limits (s)**
DH5	2402	3.0560	0.3260	0.4000
DH3	2402	1.7748	0.2840	0.4000
DH1	2402	0.5048	0.1615	0.4000

Test Mode: CH39_3Mbps				
Data Packet	**Frequency (MHz)**	**Pulse Duration (ms)**	**Dwell Time (s)**	**Limits (s)**
DH5	2441	3.0408	0.3244	0.4000
DH3	2441	1.7908	0.2865	0.4000
DH1	2441	0.5088	0.1628	0.4000

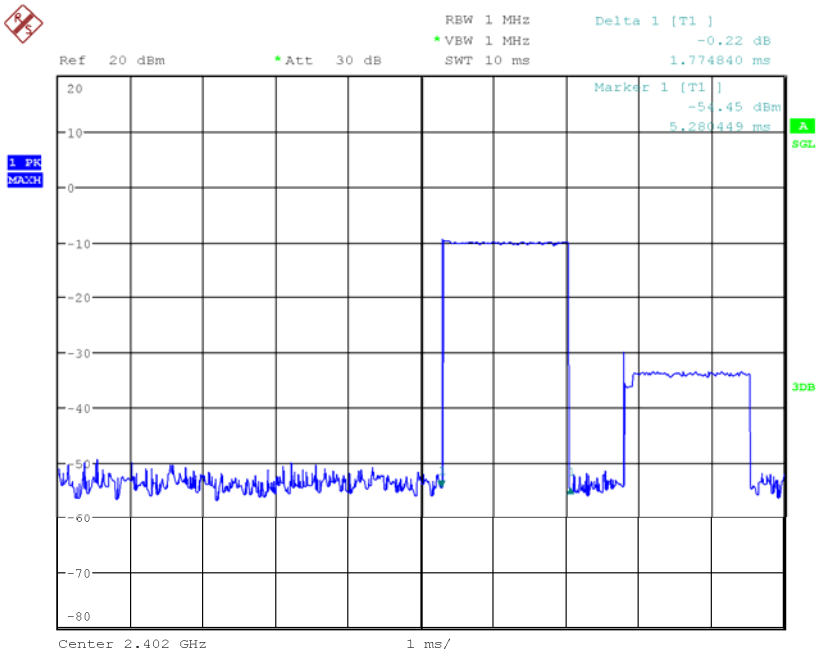
Test Mode: CH78_3Mbps				
Data Packet	**Frequency (MHz)**	**Pulse Duration (ms)**	**Dwell Time (s)**	**Limits (s)**
DH5	2480	3.0368	0.3239	0.4000
DH3	2480	1.7868	0.2859	0.4000
DH1	2480	0.5128	0.1641	0.4000

CH00-DH1



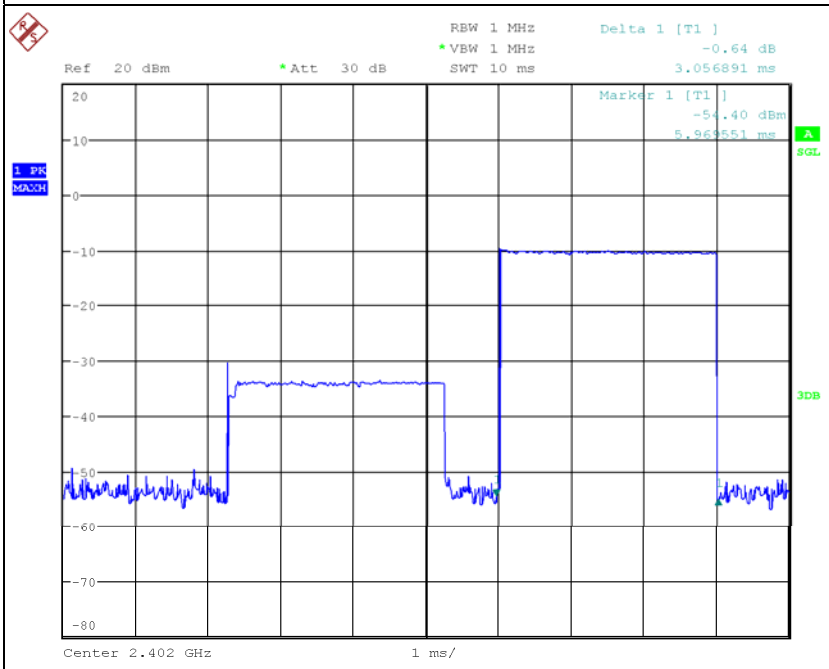
Date: 11.JAN.2014 14:37:25

CH00-DH3



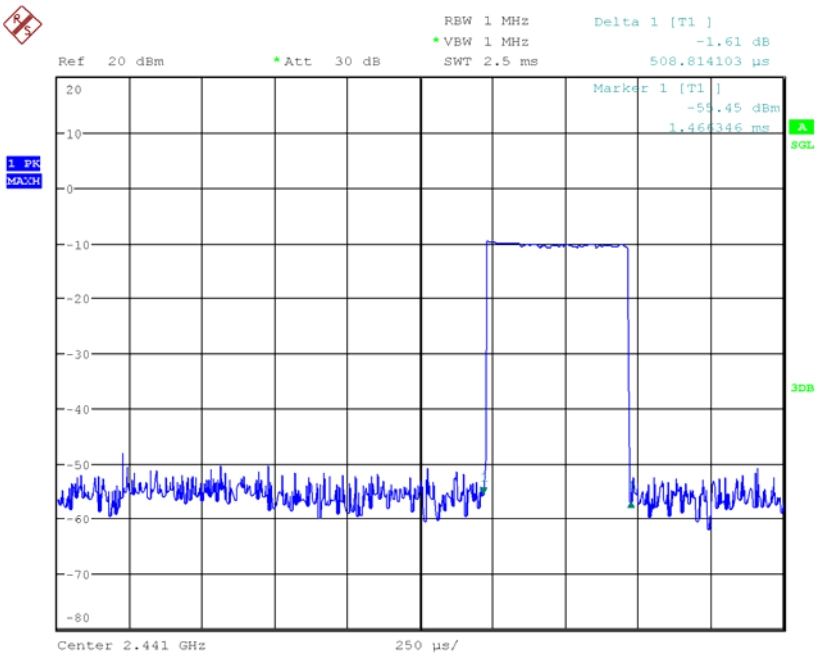
Date: 11.JAN.2014 14:35:53

CH00-DH5



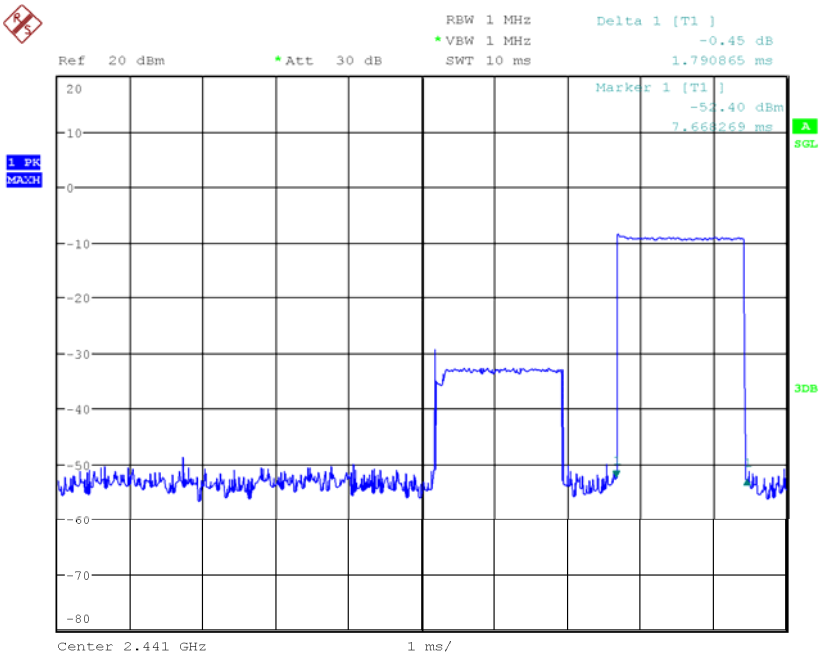
Date: 11.JAN.2014 14:34:56

CH39-DH1



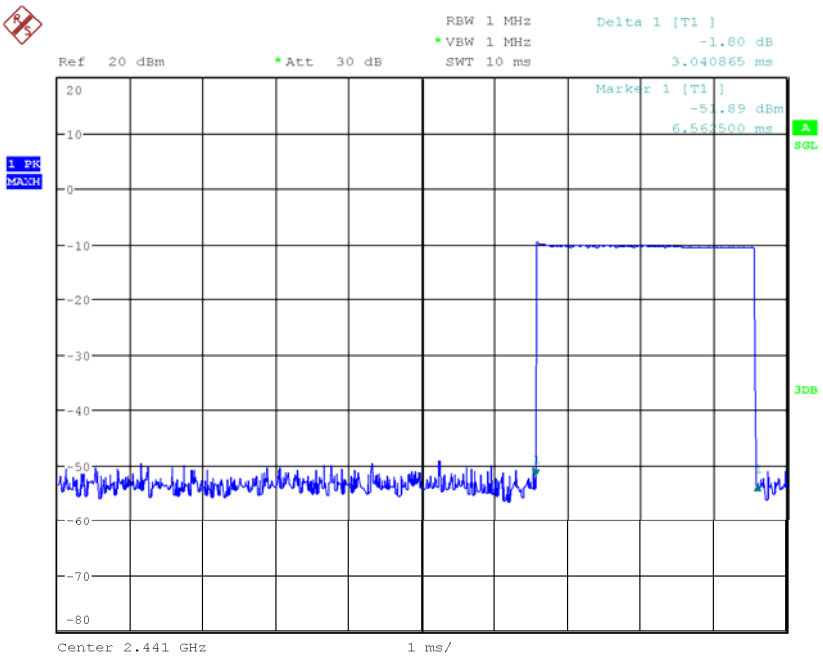
Date: 11.JAN.2014 14:28:46

CH39-DH3



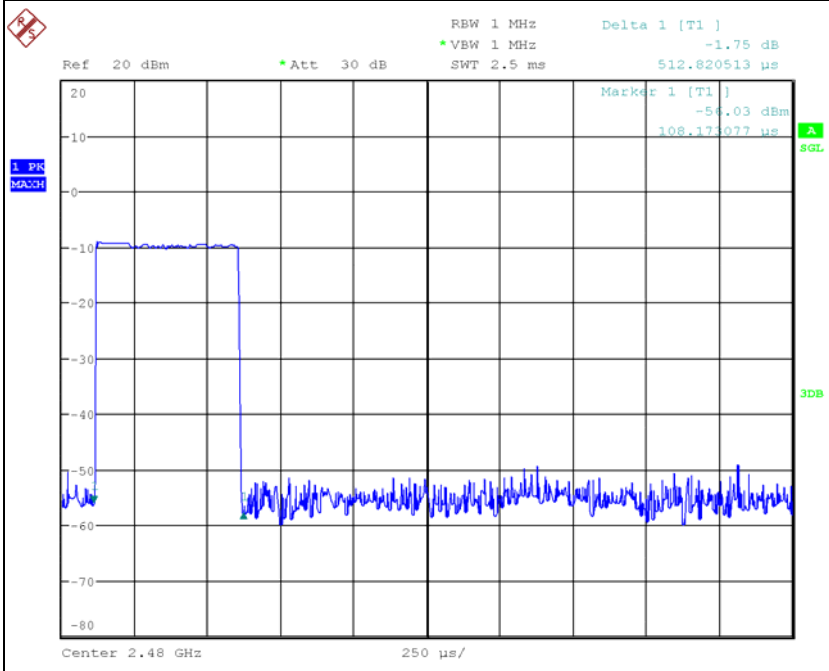
Date: 11.JAN.2014 14:30:50

CH39-DH5

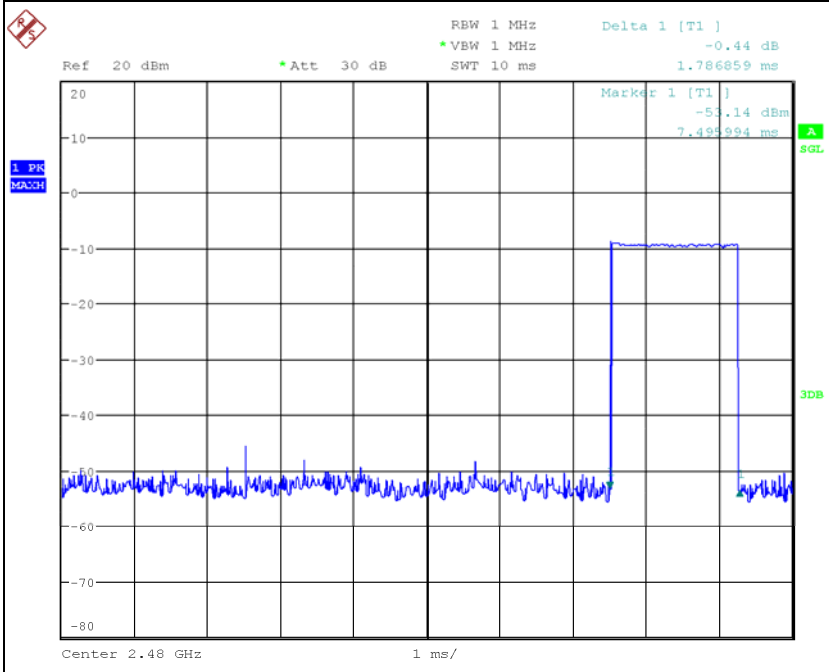


Date: 11.JAN.2014 14:32:14

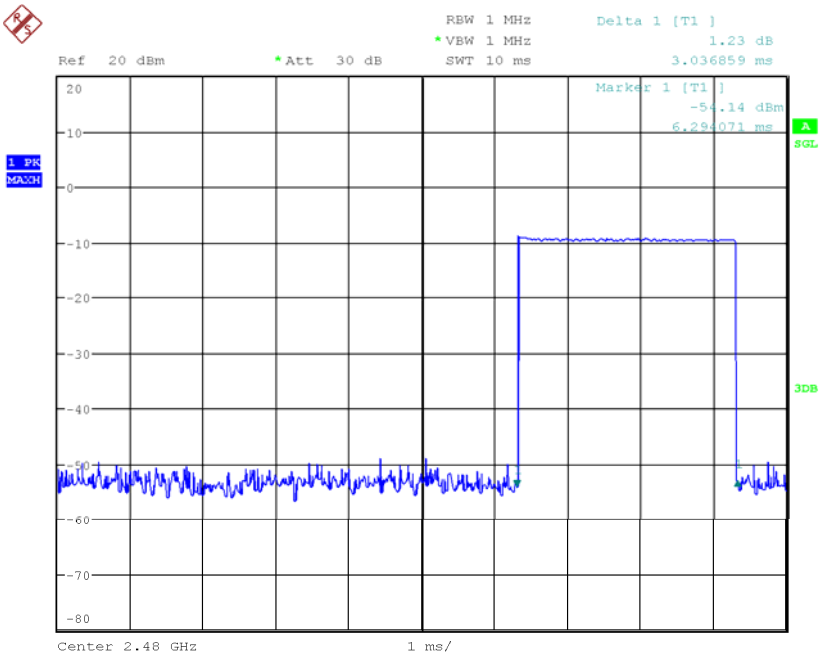
CH78-DH1



CH78-DH3



CH78-DH5


RBW 1 MHz
VBW 1 MHz
SWT 10 ms
Delta 1 [T1]
1.23 dB
3.036859 ms
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-54.14 dBm
6.294071 ms
1 PK
MAXH
A
SGL
3DB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.48 GHz
1 ms/
Date: 11.JAN.2014 14:23:32

7. HOPPING CHANNEL SEPARATION MEASUREMENT

7.1 APPLIED PROCEDURES / LIMIT

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 KHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

7.1.1 TEST PROCEDURE

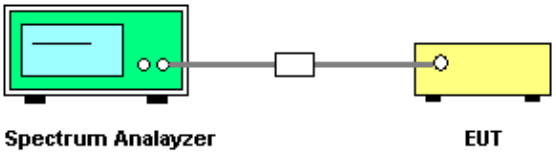
a. The EUT must have its hopping function enabled

b. Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
Video (or Average) Bandwidth (VBW) ≥ RBW
Sweep = Auto
Detector function = Peak
Trace = Max Hold

7.1.2 DEVIATION FROM STANDARD

No deviation.

7.1.3 TEST SETUP



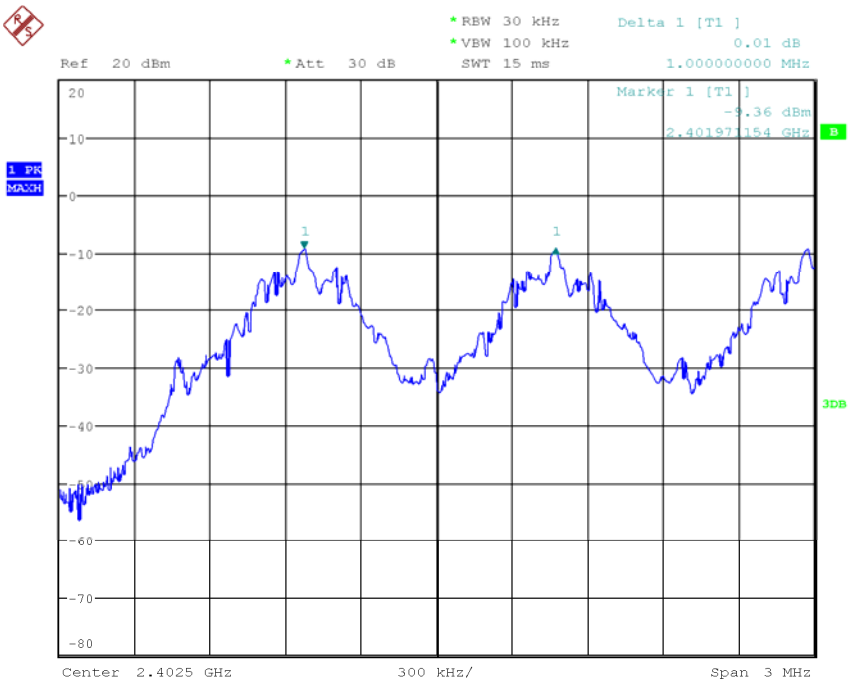
7.1.4 EUT TEST CONDITIONS

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

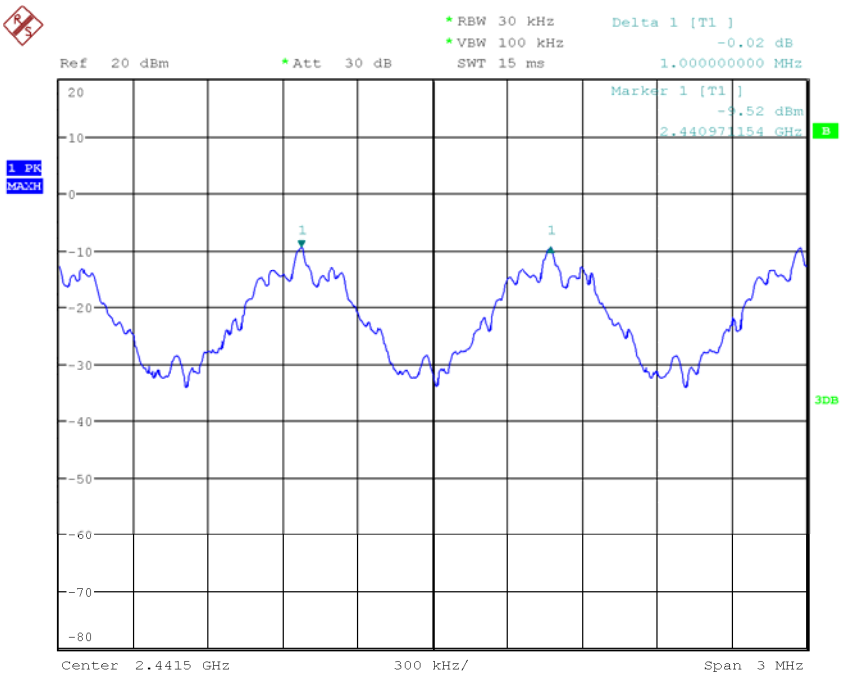
7.1.5 TEST RESULTS

Test Mode: Hopping on_1Mbps			
Frequency (MHz)	**Ch. Separation (MHz)**	**2/3 of the 20 dB bandwidth (MHz)**	**Result**
2402	1.000	0.7158	**Complies**
2441	1.000	0.7051	**Complies**
2480	0.995	0.6998	**Complies**

CH00

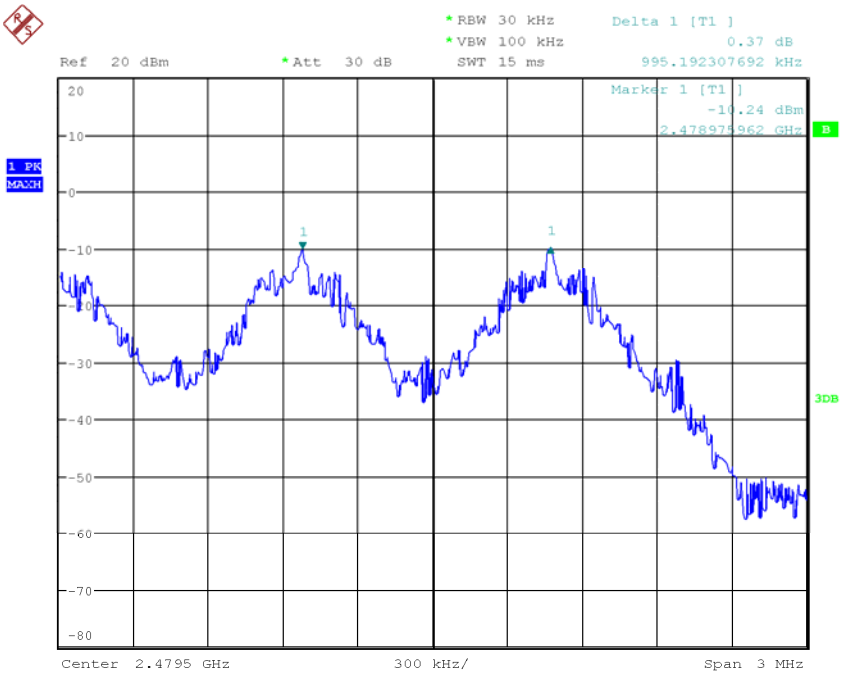


CH39



Date: 11.JAN.2014 14:59:19

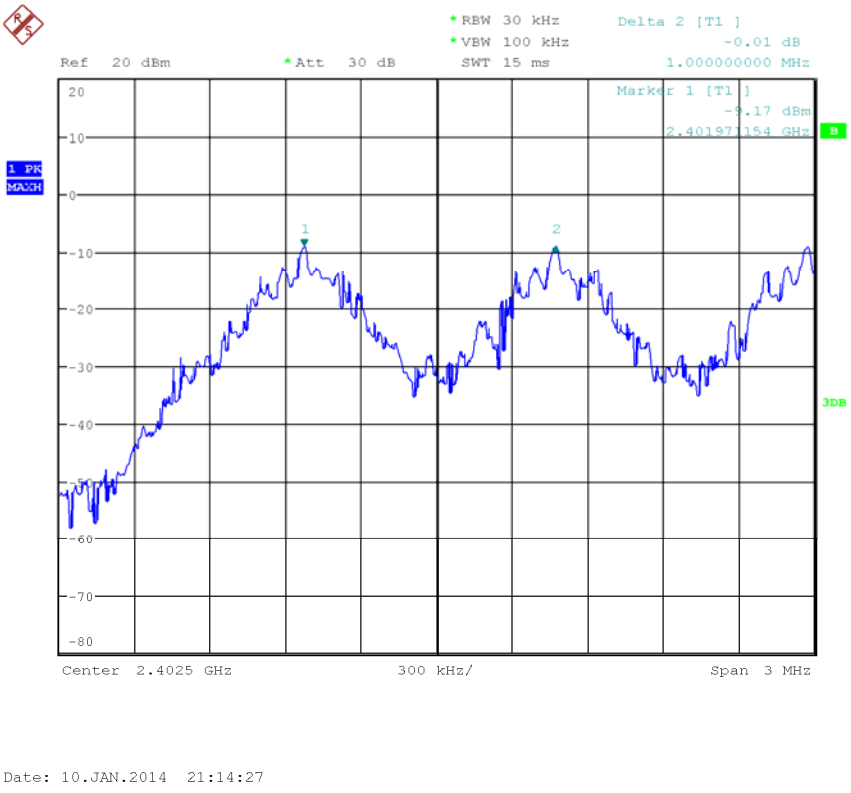
CH78



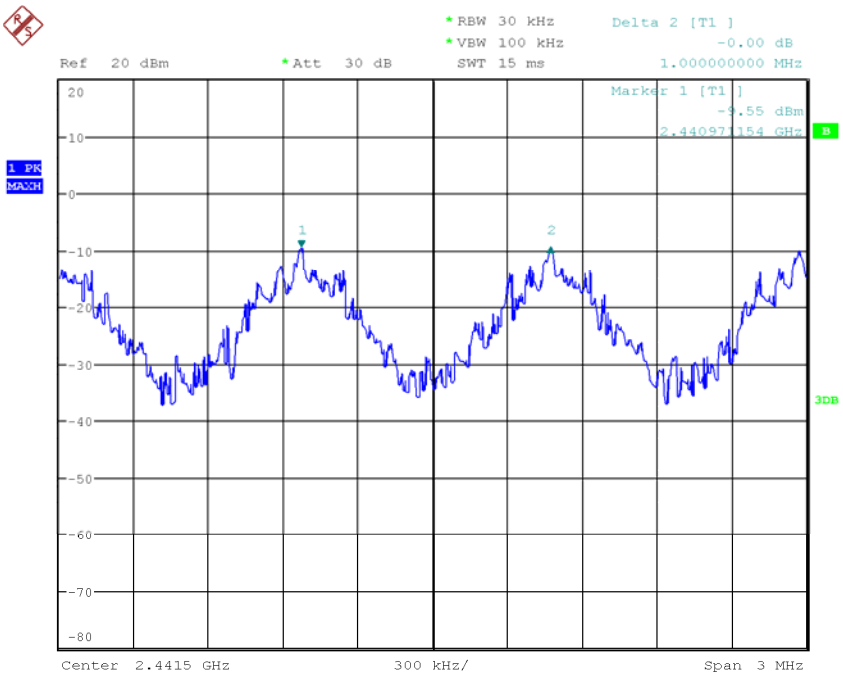
Date: 11.JAN.2014 15:01:11

Test Mode: Hopping on_3Mbps			
Frequency (MHz)	**Ch. Separation (MHz)**	**2/3 of the 20 dB bandwidth (MHz)**	**Result**
2402	1.000	0.7105	**Complies**
2441	1.000	0.7051	**Complies**
2480	1.000	0.6998	**Complies**

CH00

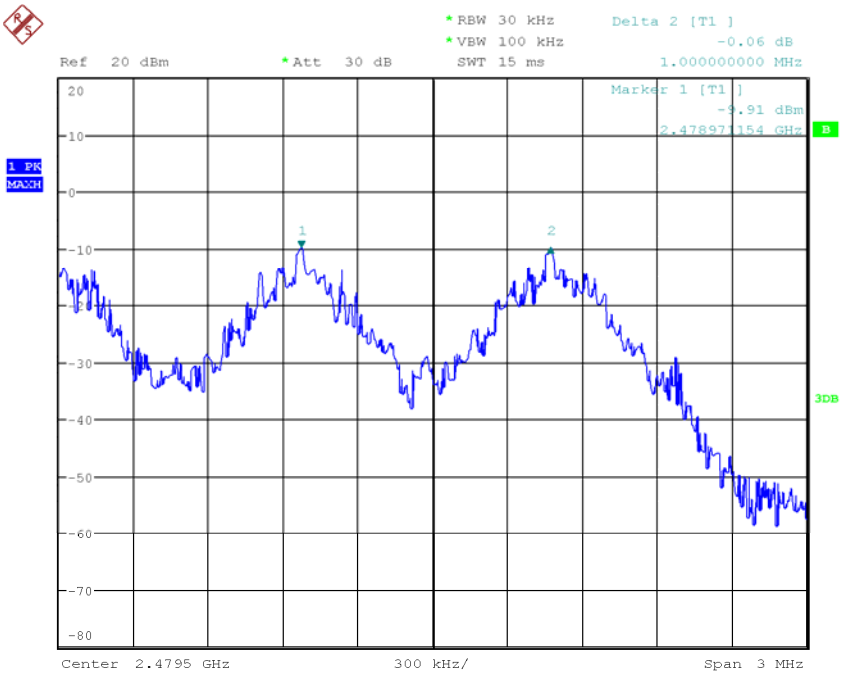


CH39



Date: 10.JAN.2014 21:15:42

CH78



Date: 10.JAN.2014 21:17:22

8. BANDWIDTH TEST

8.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210		
Section	Test Item	Frequency Range (MHz)
15.247(a)(2) RSS-GEN section 4.6.1 RSS-210, Issue 8, Annex 8, A8.1(b)	Bandwidth	2400-2483.5

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

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= 30KHz, VBW=100KHz, 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 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

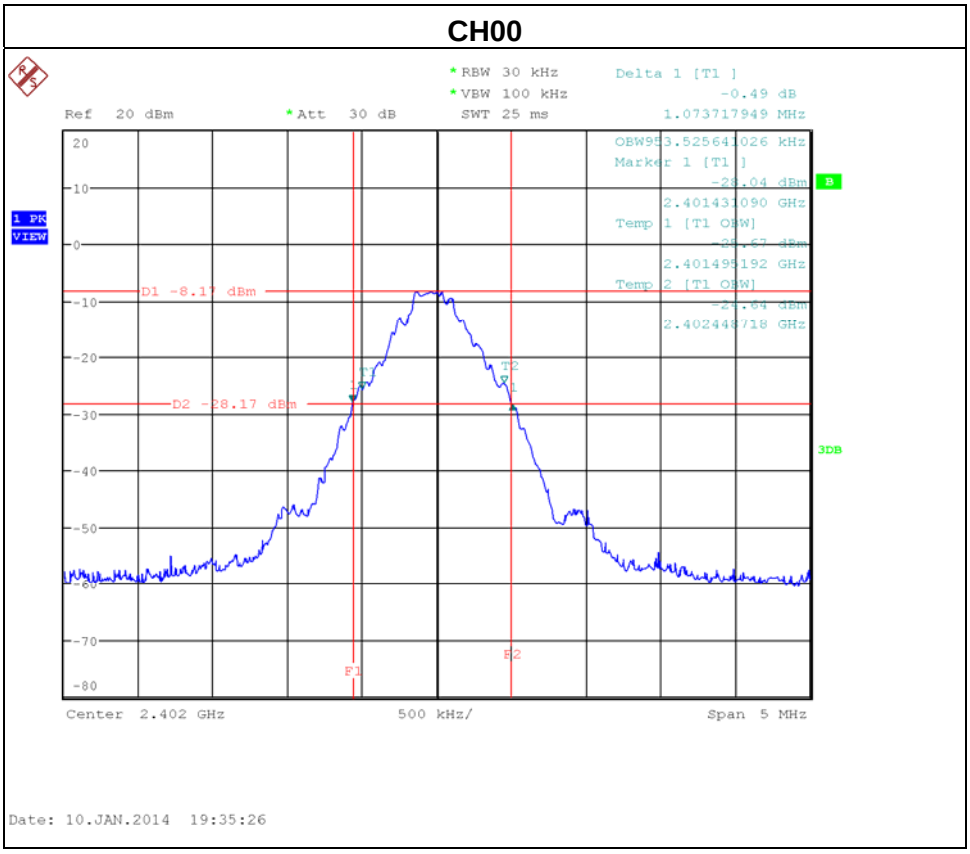
8.1.5 EUT TEST CONDITIONS

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

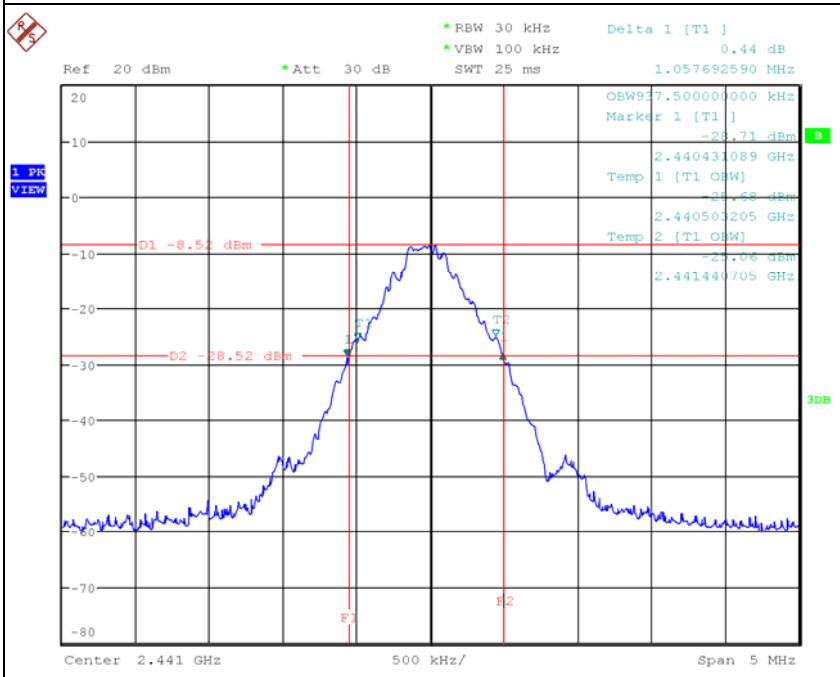
8.1.6 TEST RESULTS

Test Mode: 1Mbps				
Test Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**	**99% Occupied Bandwidth (MHz)**	**Result**
CH00	2402	1.0737	0.9535	**PASS**
CH39	2441	1.0577	0.9375	**PASS**
CH78	2480	1.0497	0.9295	**PASS**

CH00

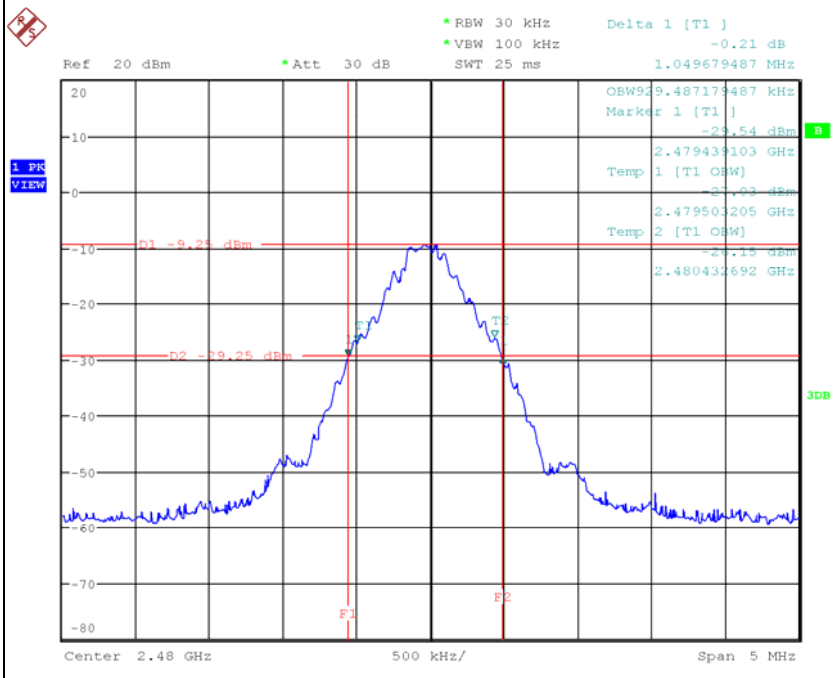


CH39



Date: 10.JAN.2014 19:33:04

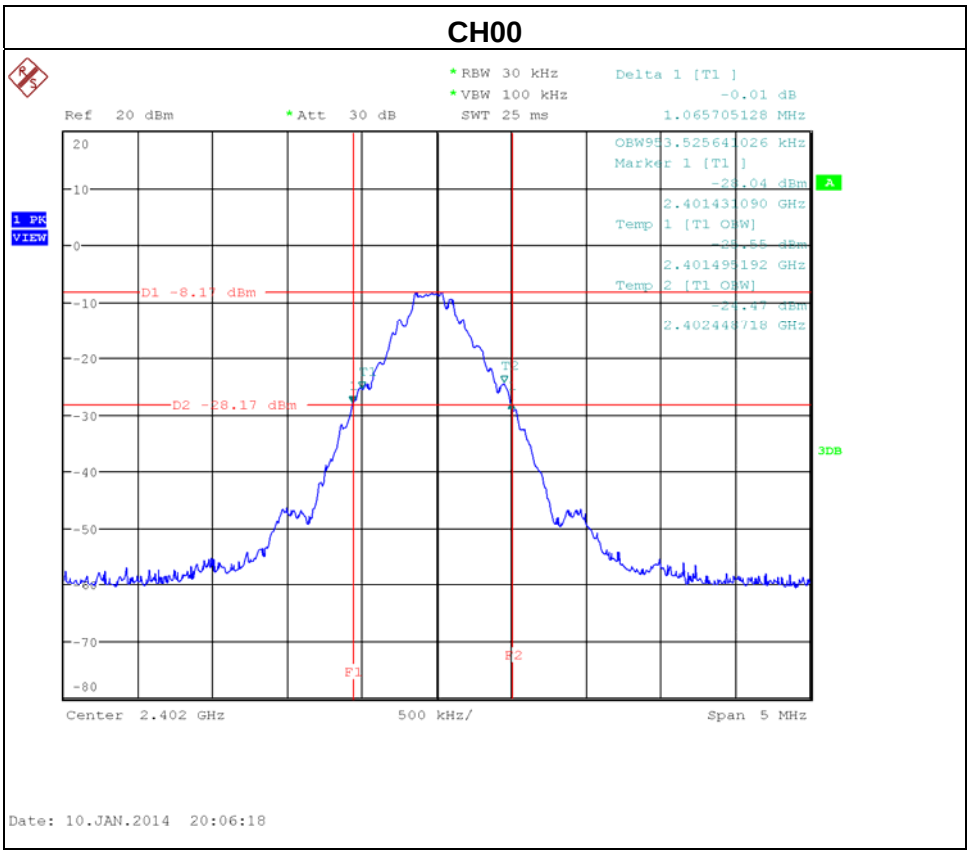
CH78



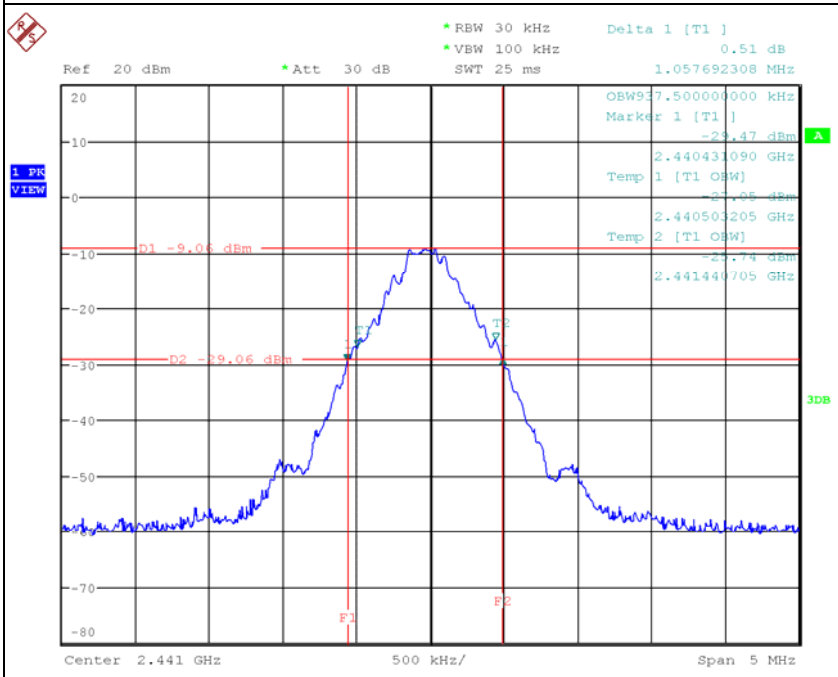
Date: 10.JAN.2014 19:30:26

Test Mode: 3Mbps				
Test Channel	**Frequency (MHz)**	**20dB Bandwidth (MHz)**	**99% Occupied Bandwidth (MHz)**	**Result**
CH00	2402	1.0657	0.9535	**PASS**
CH39	2441	1.0577	0.9375	**PASS**
CH78	2480	1.0497	0.9215	**PASS**

CH00

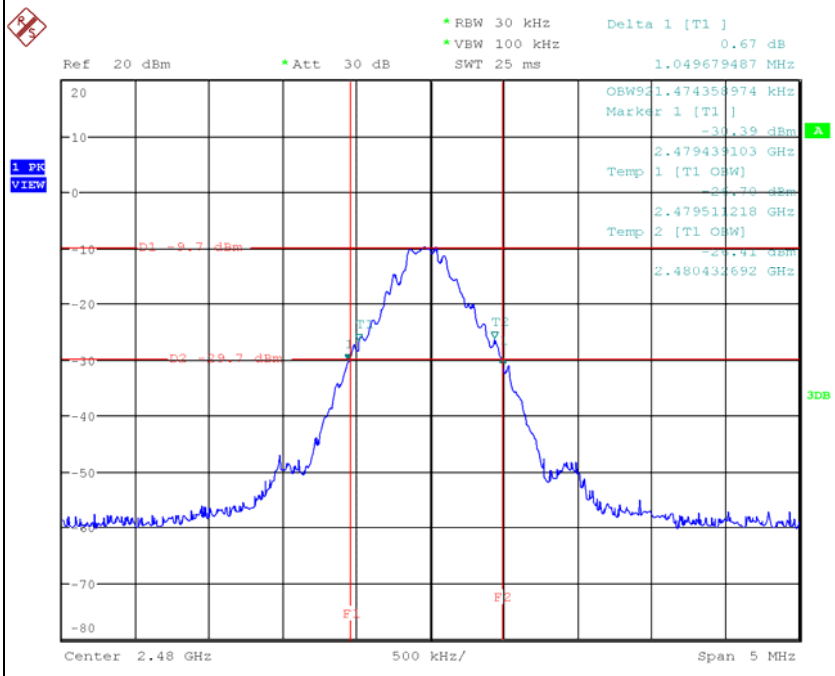


CH39



Date: 10.JAN.2014 20:08:57

CH78



Date: 10.JAN.2014 20:14:01

9. PEAK OUTPUT POWER TEST

9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1) RSS-GEN section 4.8 RSS-210, Issue 8, Annex 8, A8.1(b)	Peak Output Power	0.125 Watt or 21dBm	2400-2483.5	PASS

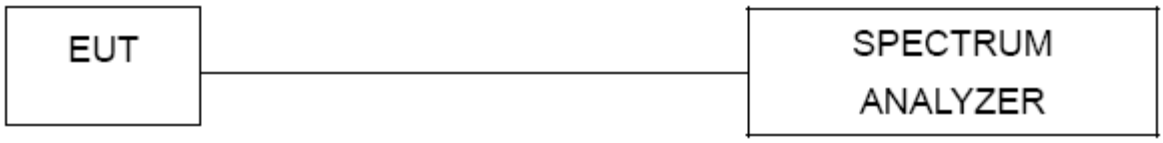
9.1.1 TEST PROCEDURE

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= 1MHz/3MHz, VBW= 1MHz/3MHz, Sweep time = Auto.

9.1.2 DEVIATION FROM STANDARD

No deviation.

9.1.3 TEST SETUP



9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

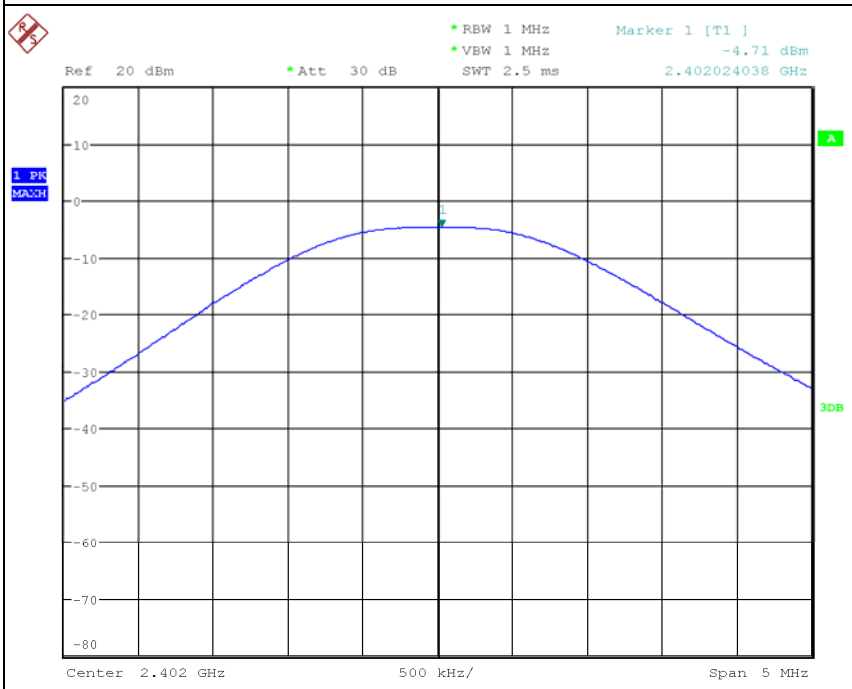
9.1.5 EUT TEST CONDITIONS

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

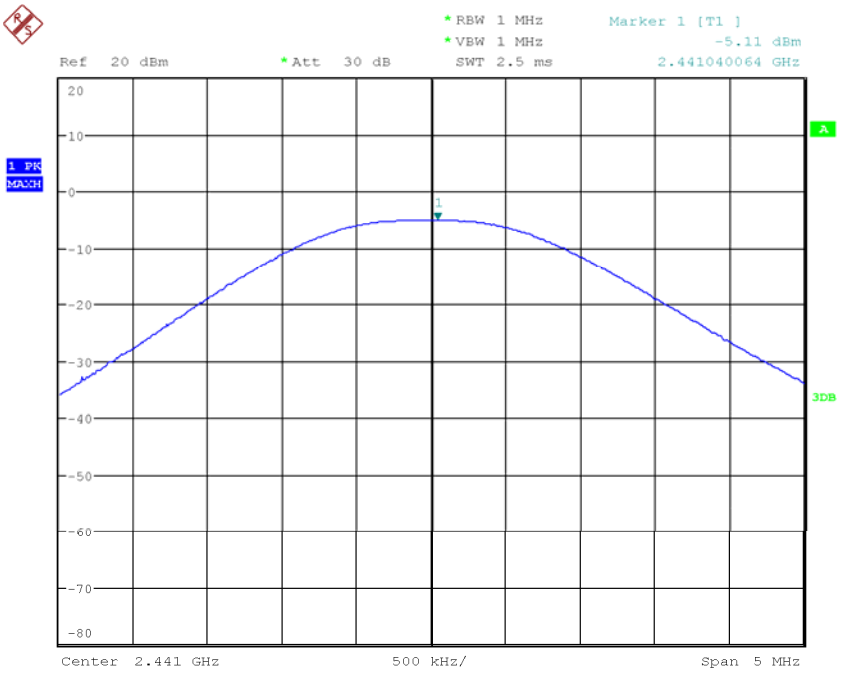
9.1.6 TEST RESULTS

Test Mode: 1Mbps				
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH00	2402	-4.71	21	0.125
CH39	2441	-5.1	21	0.125
CH78	2480	-5.94	21	0.125

CH00

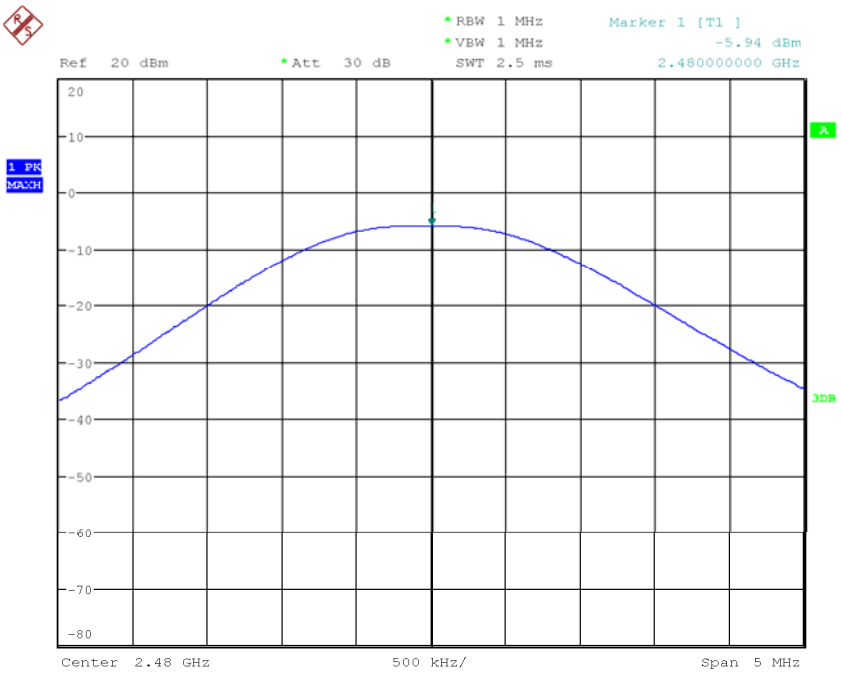


CH39



Date: 10.JAN.2014 19:22:55

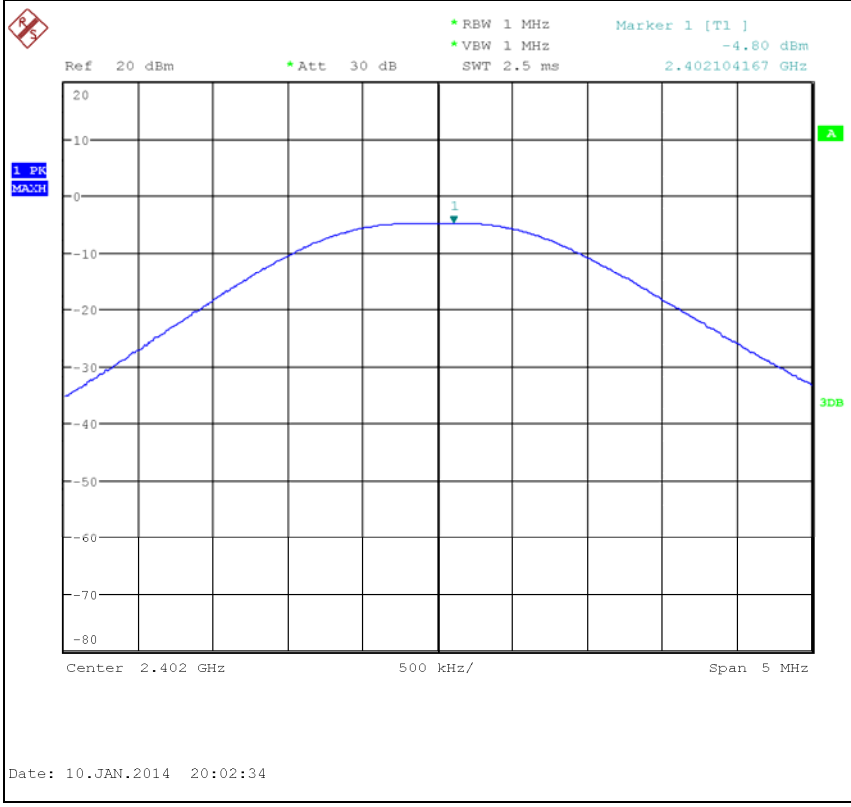
CH78



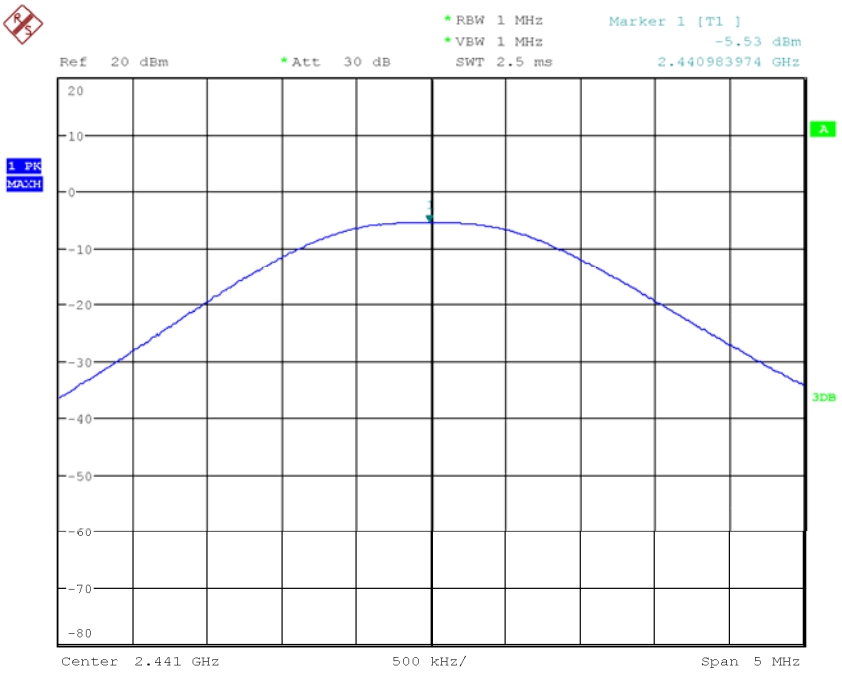
Date: 10.JAN.2014 19:24:08

Test Mode: 3Mbps				
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Limit (Watt)
CH00	2402	-4.80	21	0.125
CH39	2441	-5.58	21	0.125
CH78	2480	-6.47	21	0.125

CH00

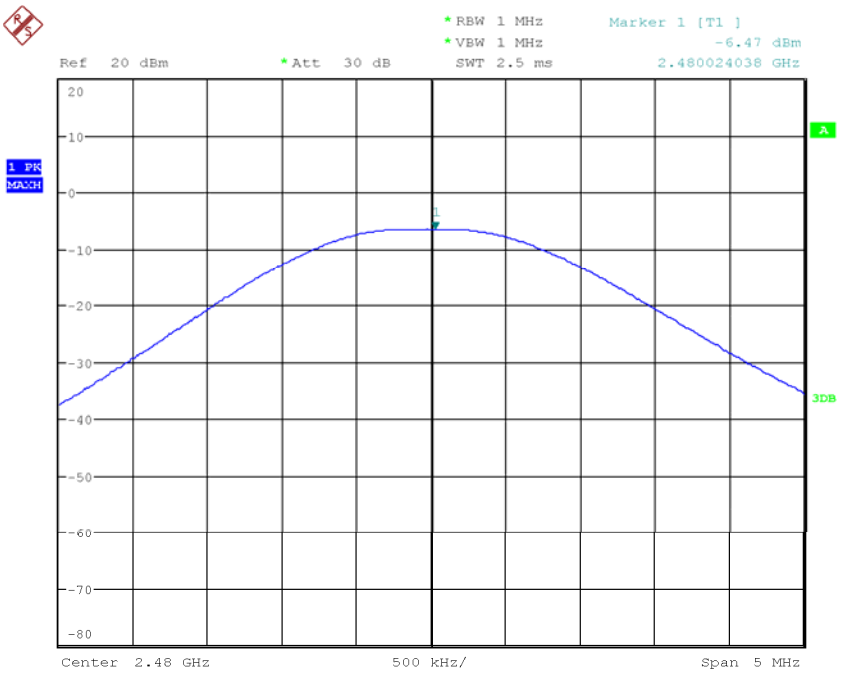


CH39



Date: 10.JAN.2014 20:01:44

CH78



Date: 10.JAN.2014 20:01:14

10. ANTENNA CONDUCTED SPURIOUS EMISSION

10.1 APPLIED PROCEDURES / LIMIT

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) & RSS-210 section 2.2& Annex 8, A8.5, then the 15.209(a) & RSS-GEN 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

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

10.1.1 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=100KHz, Sweep time = Auto.

10.1.2 DEVIATION FROM STANDARD

No deviation.

10.1.3 TEST SETUP

10.1.4 EUT OPERATION CONDITIONS

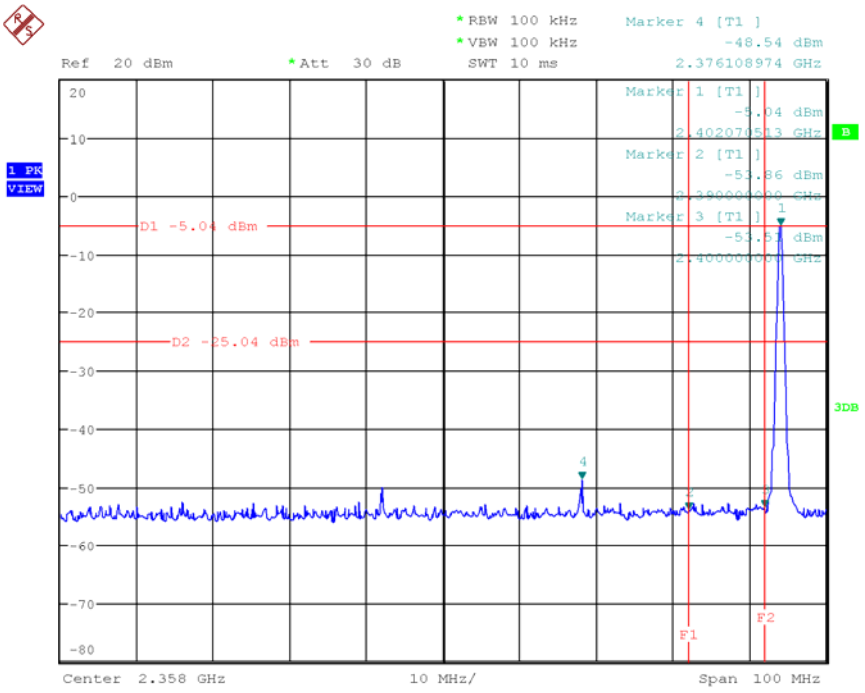
The EUT tested system was configured as the statements of 4.1.5 Unless otherwise a special operating condition is specified in the follows during the testing.

10.1.5 EUT TEST CONDITIONS

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

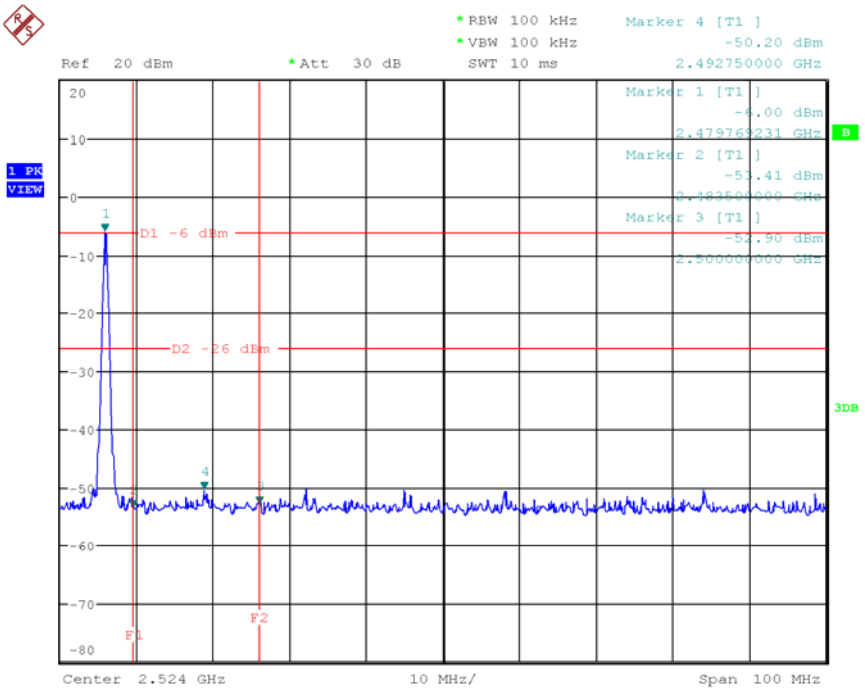
10.1.6 TEST RESULTS

CH00 (Lower)_1Mbps



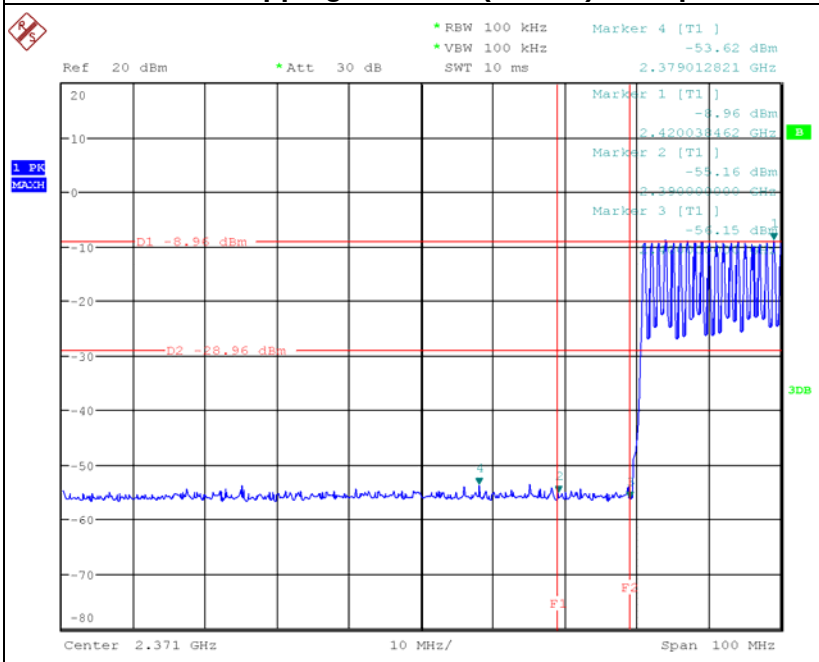
Date: 10.JAN.2014 19:41:11

CH 78 (Upper) _1Mbps

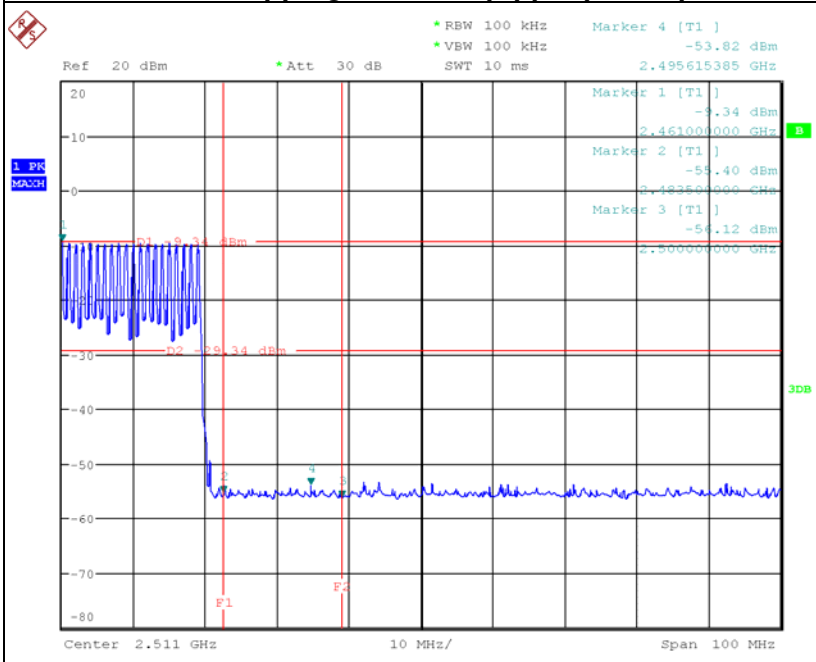


Date: 10.JAN.2014 19:49:59

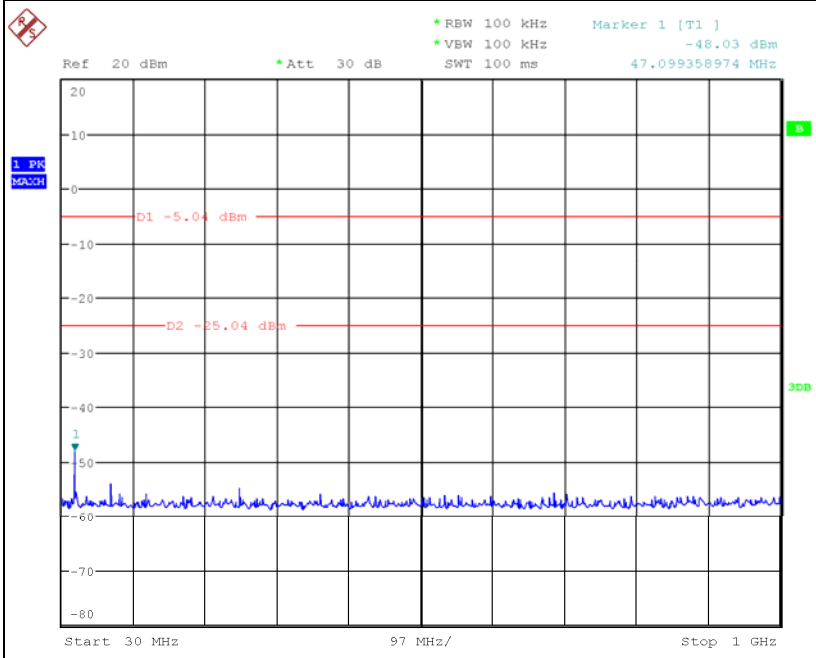
Hopping on mode (Lower) _1Mbps



Hopping on mode (Upper) _1Mbps

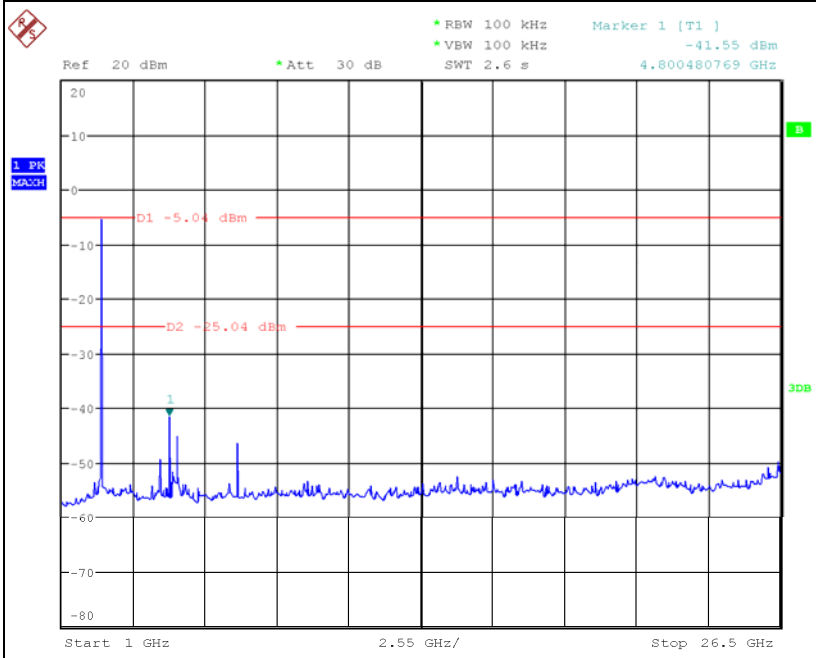


CH00 (30MHz~1GHz) _1Mbps



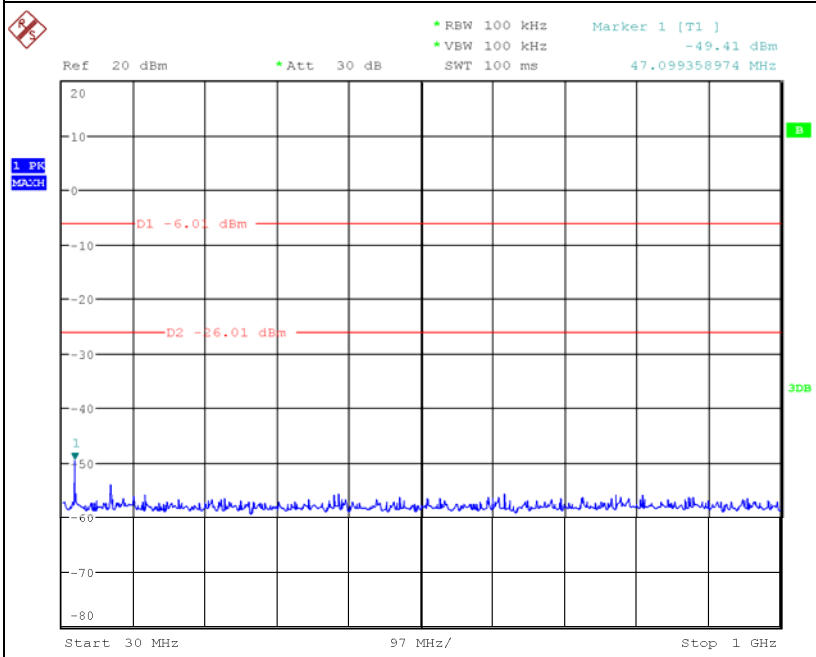
Date: 10.JAN.2014 19:42:21

CH00 (1GHz～10th Harmonic) _1Mbps



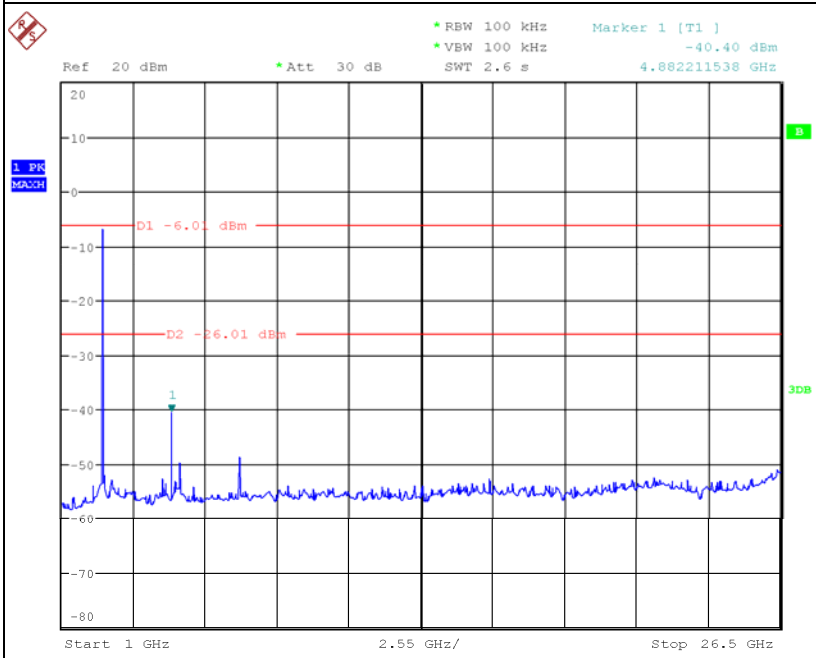
Date: 10.JAN.2014 19:43:33

CH39 (30MHz~1GHz) _1Mbps



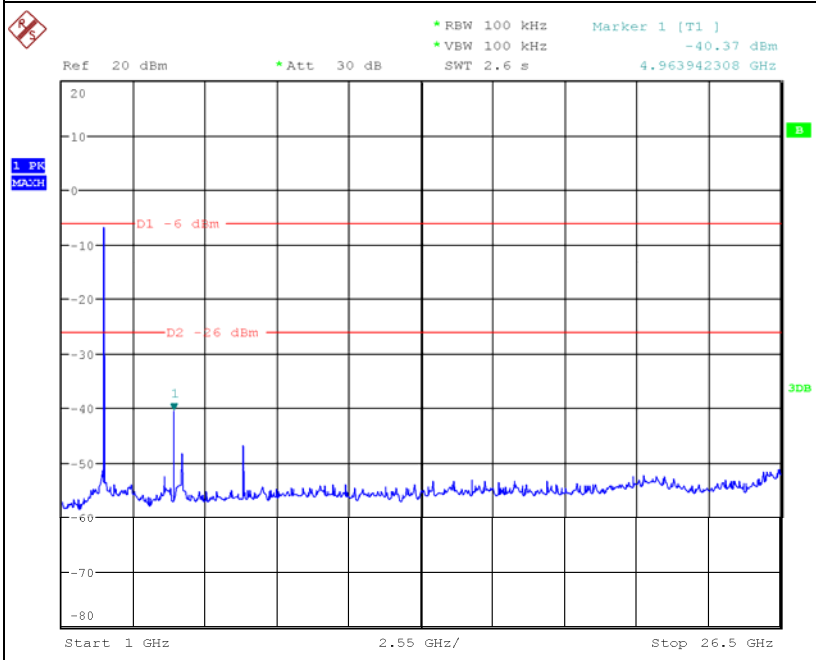
Date: 10.JAN.2014 19:46:23

CH39 (1GHz～10th Harmonic) _1Mbps



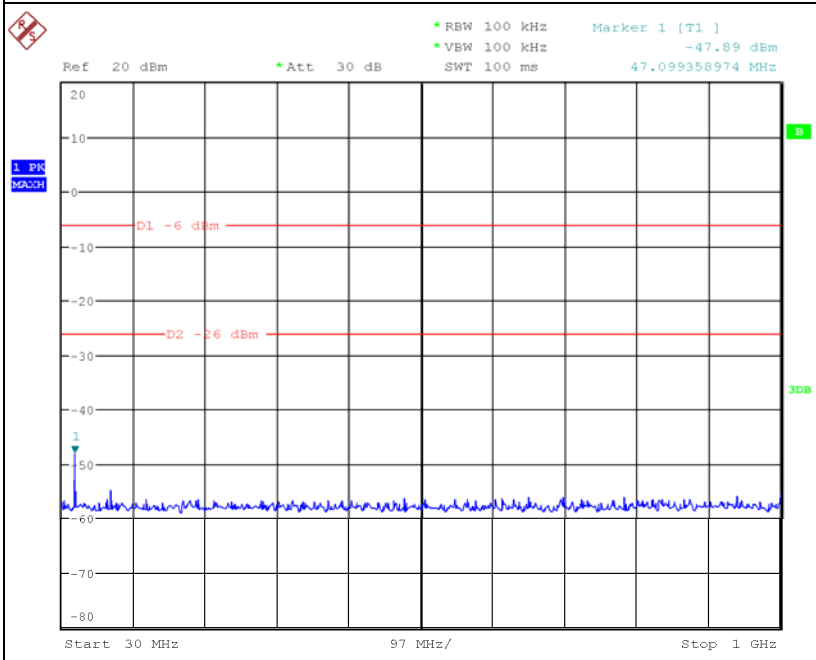
Date: 10.JAN.2014 19:46:52

CH78 (30MHz~1GHz) _1Mbps



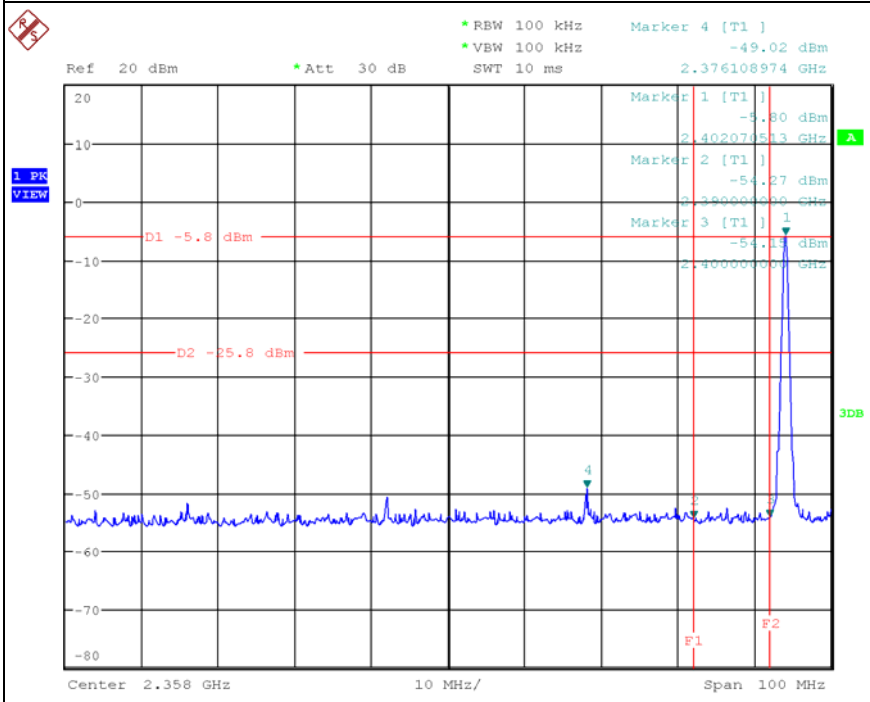
Date: 10.JAN.2014 19:51:28

CH78 (1GHz～10th Harmonic) _1Mbps



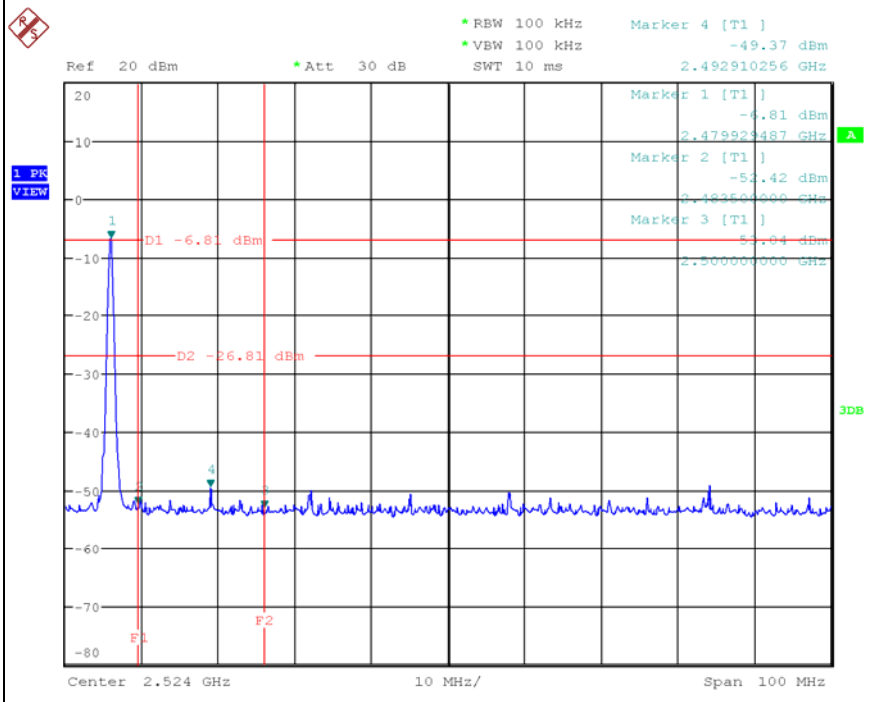
Date: 10.JAN.2014 19:50:50

CH00 (Lower) _3Mbps



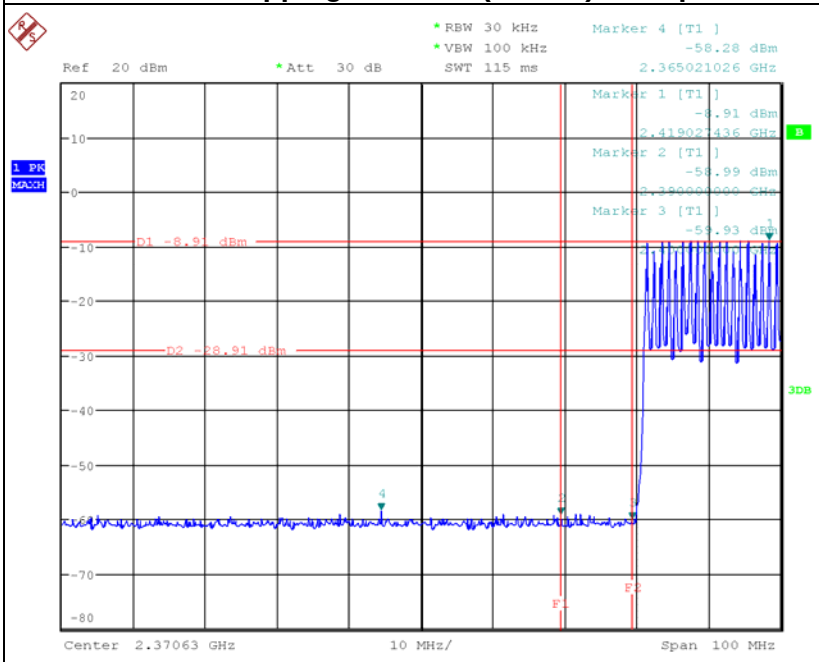
Date: 10.JAN.2014 20:28:15

CH 78 (Upper) _3Mbps



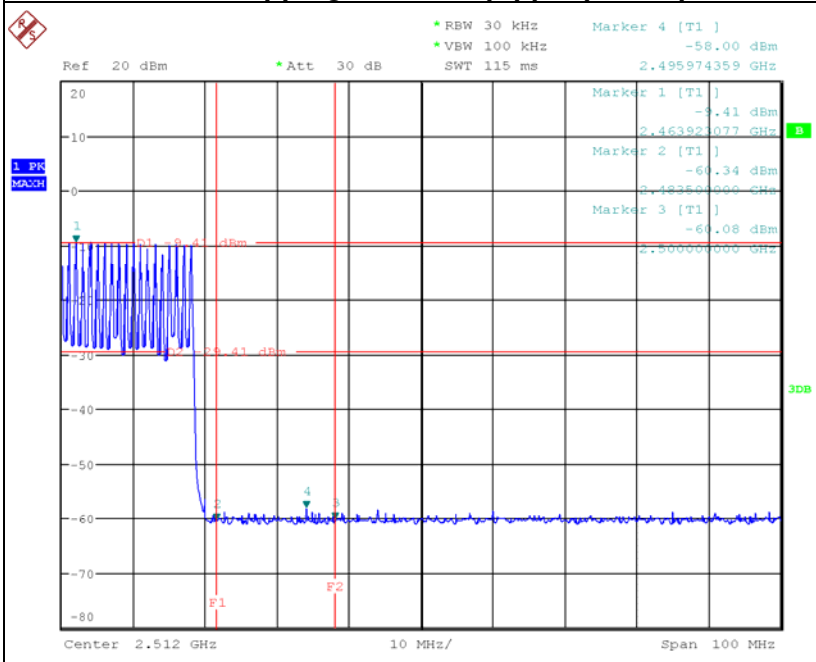
Date: 10.JAN.2014 20:18:36

Hopping on mode (Lower) _3Mbps



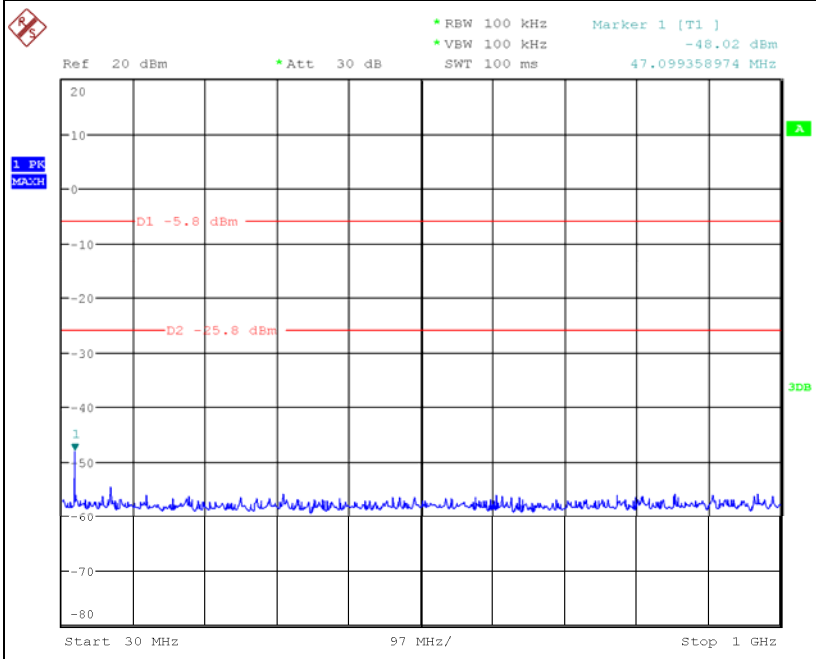
Date: 10.JAN.2014 21:29:47

Hopping on mode (Upper) _3Mbps

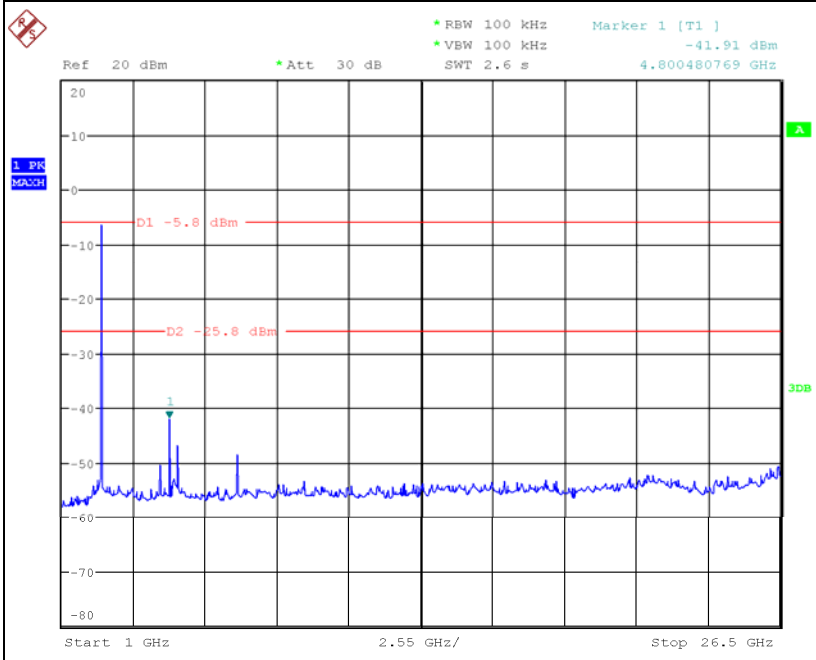


Date: 10.JAN.2014 21:37:09

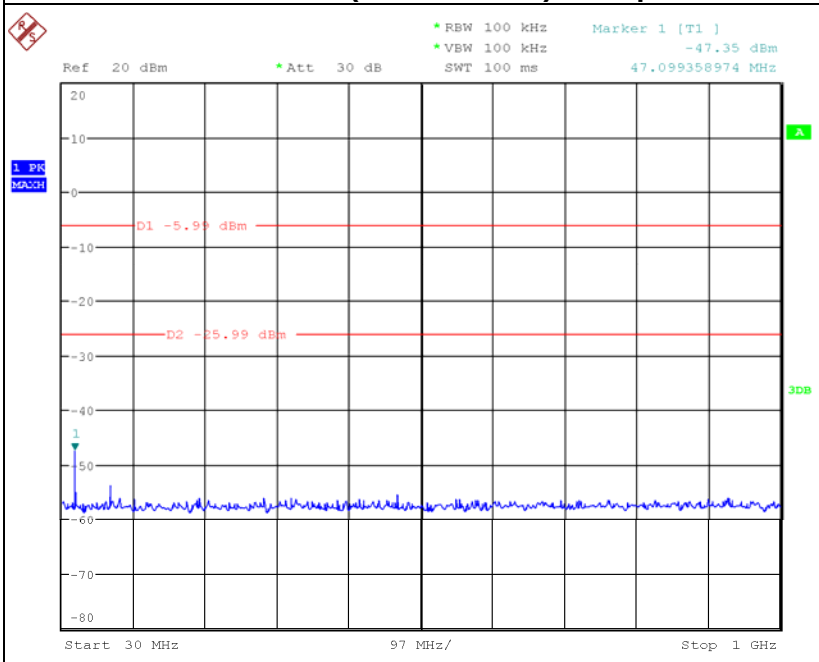
CH00 (30MHz~1GHz) _3Mbps



CH00 (1GHz～10th Harmonic) _3Mbps

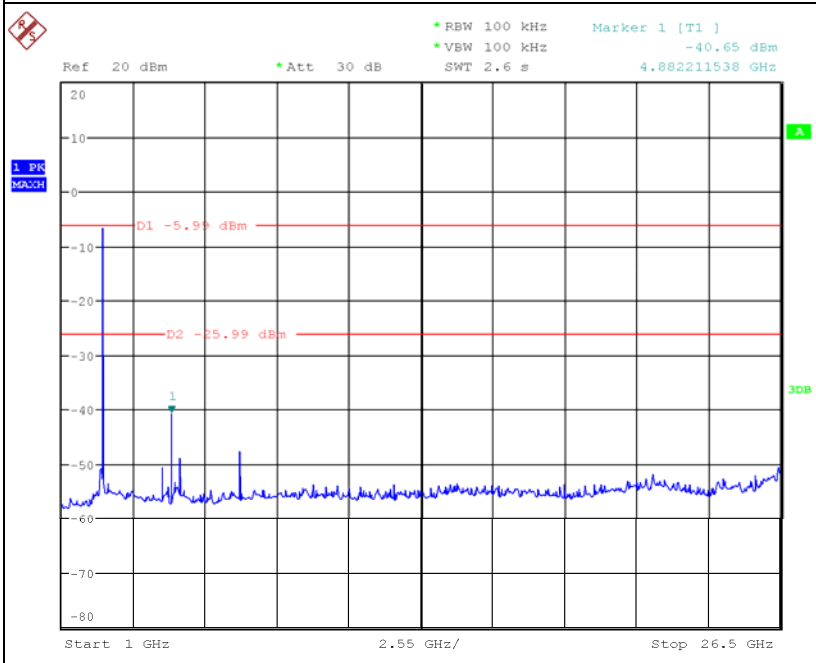


CH39 (30MHz~1GHz) _3Mbps



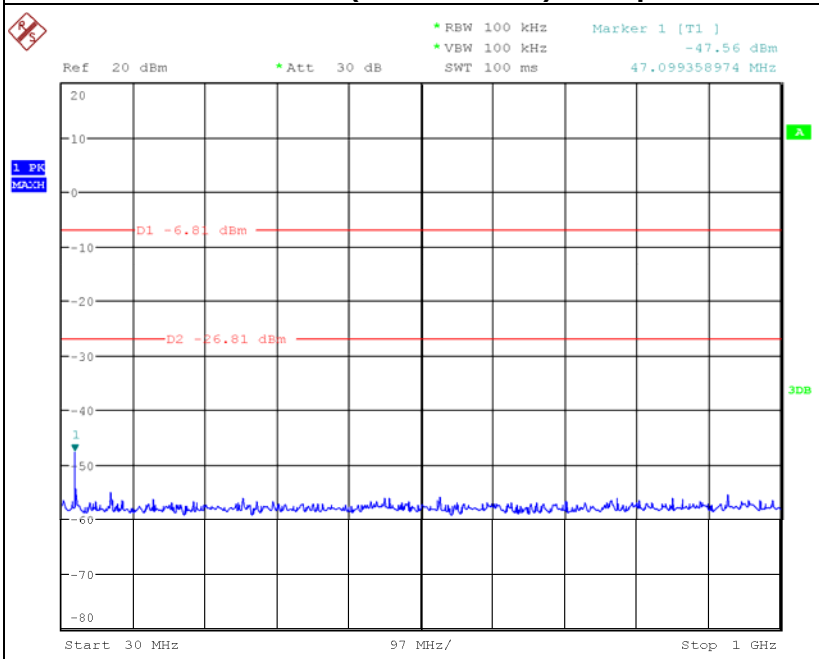
Date: 10.JAN.2014 20:24:13

CH39 (1GHz～10th Harmonic) _3Mbps



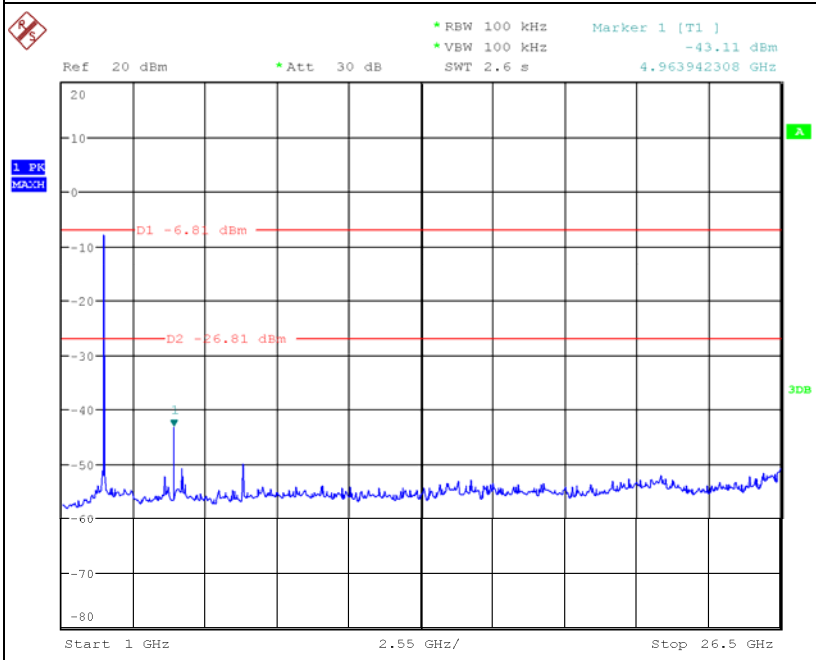
Date: 10.JAN.2014 20:24:41

CH78 (30MHz~1GHz) _3Mbps



Date: 10.JAN.2014 20:19:20

CH78 (1GHz～10th Harmonic) _3Mbps



Date: 10.JAN.2014 20:19:55

11. MEASUREMENT INSTRUMENTS LIST AND SETTING

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.09, 2014
3	Test Cable	N/A	C_17	N/A	Mar.15, 2014
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. 09, 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

Number of Hopping Channel					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

Average Time of Occupancy					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

Hopping Channel Separation Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

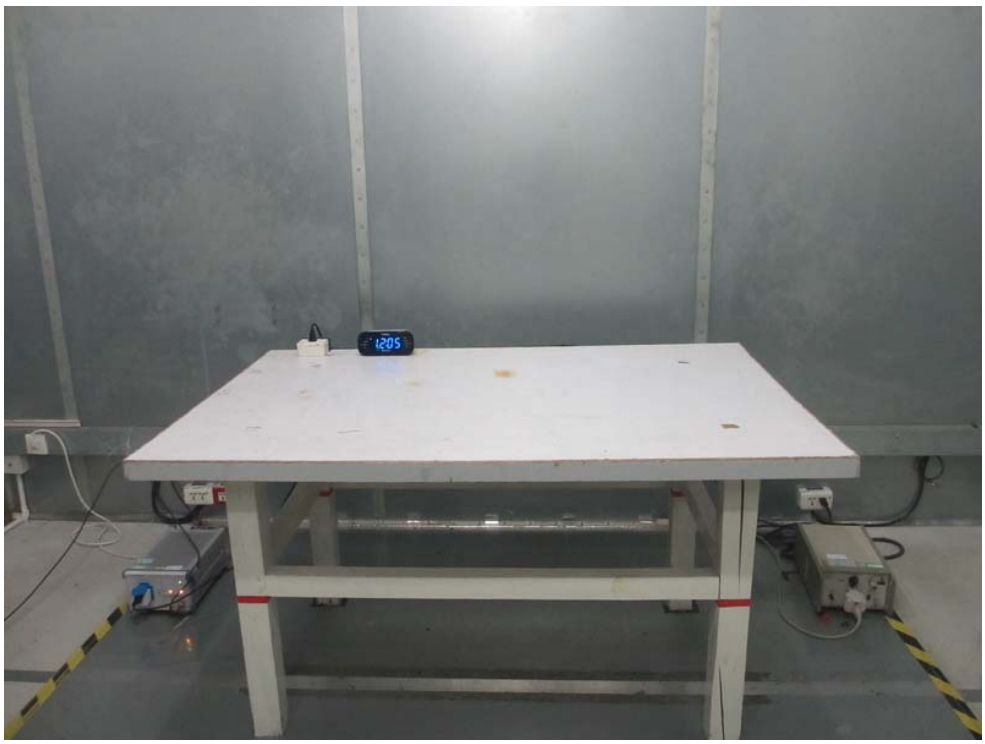
Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

Antenna Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 09, 2014

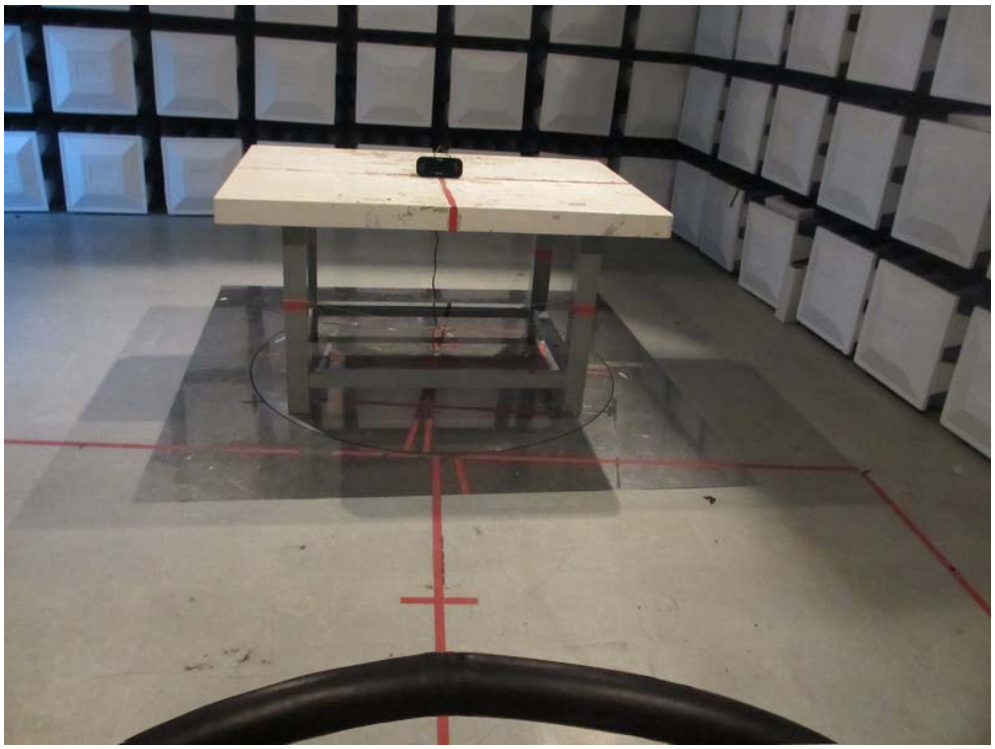
Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

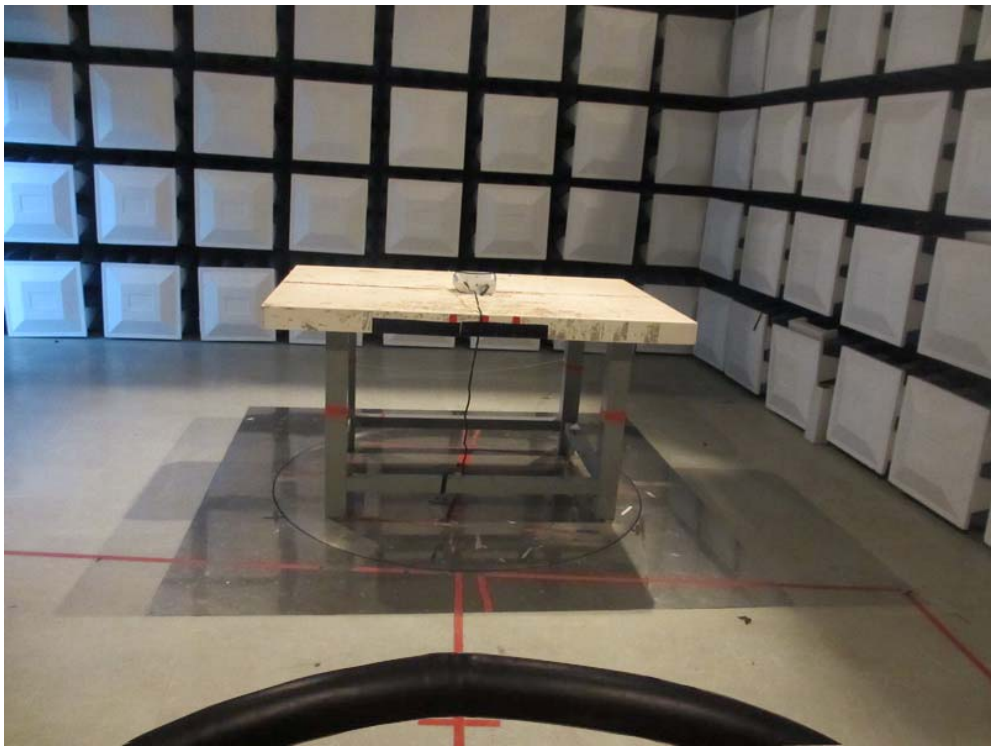
12. EUT TEST PHOTO

Conducted Measurement Photos

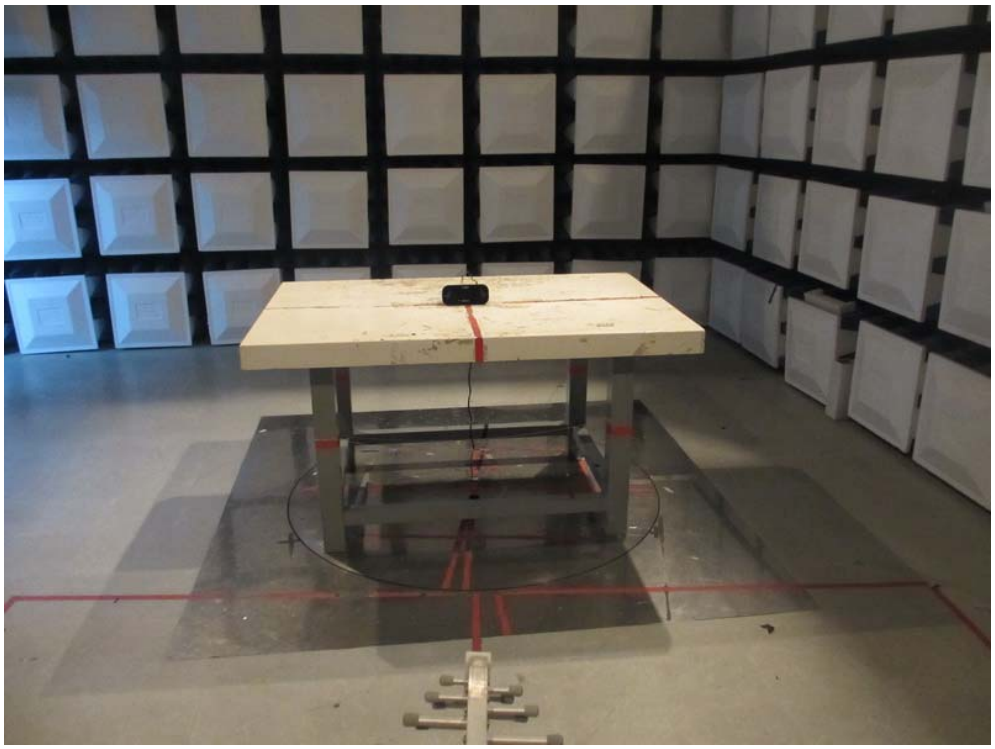


Radiated Measurement Photos
9K~30MHz





Radiated Measurement Photos
30~1000MHz



Radiated Measurement Photos
Above 1000MHz