FCC Radio Test Report

FCC ID: 2ACIDTIANJIN-OBACC

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

Project No.	:	1403C258
Equipment	:	Hando Smart Wristband
Model Name	:	HB1
Applicant	:	Tianjin Obacc Technology Limited
Address	:	Tianjin Obacc Technology Limited Muning Road 53#.TEDA Tianjin 300457 P.R. China

Tested by: BTL Inc. EMC Laboratory
Date of Receipt: May 07, 2014
Date of Test: May 07, 2014~May 27, 2014
Issued Date: May 28, 2014

Testing Engineer : David Mao
(David Mao)

Technical Manager : Leo Hung
(Leo Hung)

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(Steven Lu)

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Declaration

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

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Limitation

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Table of Contents Page

Table of Contents Page

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
NEI-FCCP-1-1403C258	Original Issue.	May 28, 2014

1. CERTIFICATION

Equipment	:	Hando Smart Wristband
Brand Name	:	Hando; Coverbank & Innowatt & Hando
Model Name	:	HB1
Applicant	:	Tianjin Obacc Technology Limited
Manufacturer	:	Tianjin Obacc Technology Limited
Address	:	Tianjin Obacc Technology Limited Muning Road 53#.TEDA Tianjin 300457 P.R. China
Factory	:	Tianjin Obacc Technology Limited
Address	:	2, 2nd Donghuan Road, 10th Yousong Industrial District, Longhua, Baoan, Shenzhen, Guangdong, China 518109
Date of Test	:	May 07, 2014~May 27, 2014
Test Item	:	ENGINEERING SAMPLE
Standard(s)	:	FCC Part15, Subpart C :2013 (15.247) / ANSI C63.4-2009

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc. EMC Laboratory.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FCCP-1-1403C258) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

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

NOTE:

(1)" N/A" denotes test is not applicable to this device.

(2) The test follows FCC KDB Publication No. 558074 D01 DTS Meas Guidance v03r02 (Measurement Guidelines of DTS)

2.1 TEST FACILITY

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

2.2 MEASUREMENT UNCERTAINTY

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

The 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. 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	Hando Smart Wristband	
Brand Name	Hando; Coverbank & Innowatt & Hando	
Model Name	HB1	
Model Difference	N/A	
Product Description	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps)
	Bit Rate of Transmitter	
	Output Power (Max.)	2.48 dBm (1Mbps)
Power Source	#1 DC voltage supplied from Lithium coin battery #2 DC voltage supplied from USB	
Power Rating	#1 DC 3.7V 45mAh #2 DC5V	

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)
00	2402	20	2442
01	2404	21	2444
02	2406	22	2446
03	2408	23	2448
04	2410	24	2450
05	2412	25	2452
06	2414	26	2454
07	2416	27	2456
08	2418	28	2458
09	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

3. Table for Filed Antenna

Ant.	Manufacturer	Model Name	Antenna Type	Connector	Gain (dBi)
1	Tianjin Obacc Technology Limited	N/A	monople	N/A	1.52

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	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 2	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX Mode **NOTE (1)**

Note:

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

(2) Both battery and USB power supply evaluated; battery found to be worst case and recorded int the report.

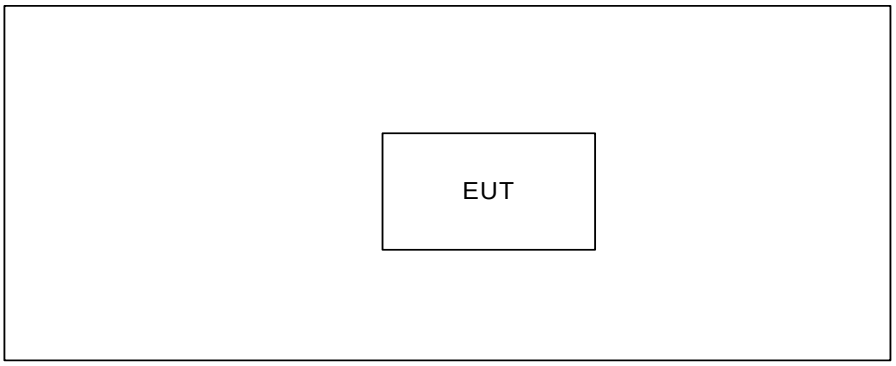
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

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	N/A		
Frequency	**2402MHz**	**2440 MHz**	**2480MHz**
GFSK-1Mbps	N/A	N/A	N/A

3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

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	Series No.	Note
-	-	-	-	-	-	-

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

Note:

(1) For detachable type I/O cable should be specified the length in m in『Length』column.

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.

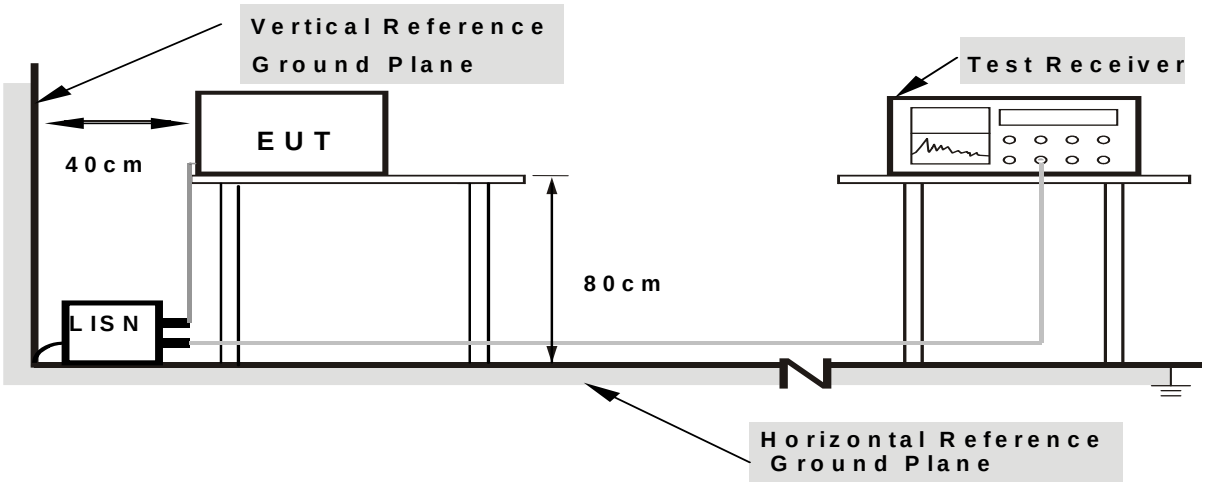
d. LISN at least 80 cm from nearest part of EUT chassis.

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: DC 3.7V

4.1.7 TEST RESULTS

Please refer to the Attachment A.

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.
(3) " N/A" denotes test is not applicable to this device.

4.2 RADIATED EMISSION MEASUREMENT

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

20dBc 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.

Frequencies (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

Section 15.33 Frequency range of radiated measurements.

Unless otherwise noted in the specific rule section under which the equipment operates for an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules

(4) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a)(1)-(a)(3) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this Section, whichever is the higher frequency range of investigation.

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

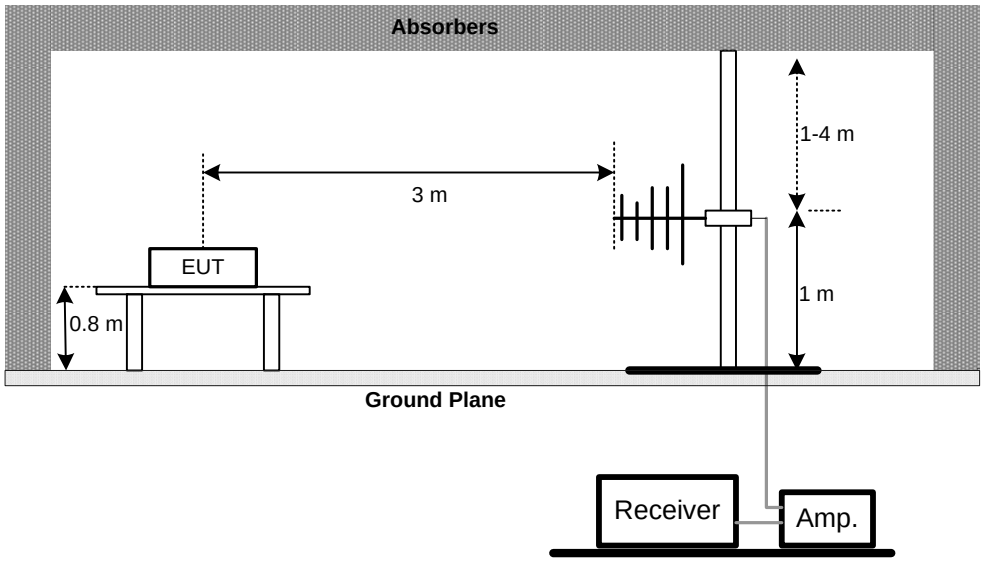
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a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

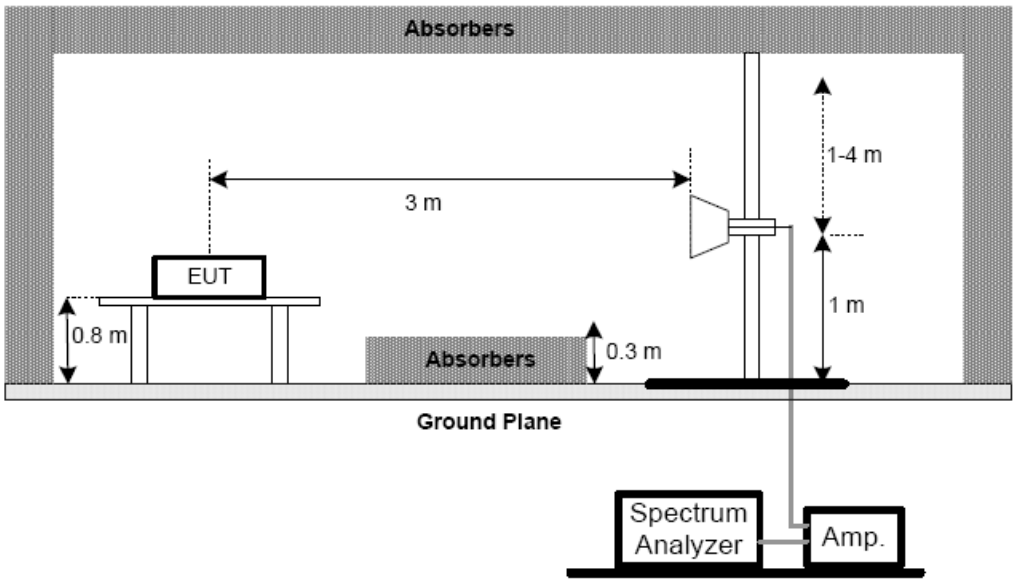
No deviation

4.2.4 TEST SETUP

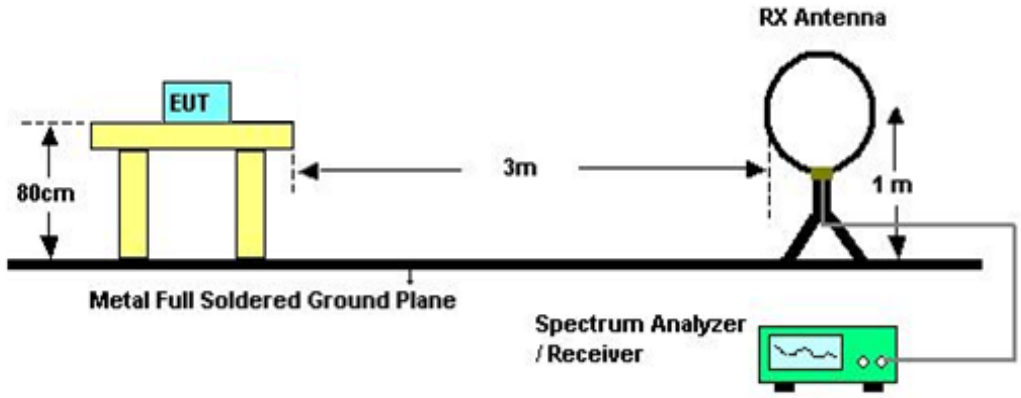
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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: DC 3.7V

4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment B

Remark:

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

4.2.8 TEST RESULTS-BETWEEN 30MHZ AND 1000MHZ

Please refer to the Attachment C.

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

4.2.9 TEST RESULTS (ABOVE 1000 MHZ)

Please refer to the Attachment D.

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

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

(4) EUT Orthogonal Axis:
"X" - denotes Laid on Table；"Y" - denotes Vertical Stand；"Z" - denotes Side Stand
Testing was performed in each of the three orthogonal positions; Axis X found to be the worst case and recorded into the report.

(5) 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

5. BANDWIDTH TEST

5.1 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)(2) RSS-GEN section 4.6.1 RSS-210 Annex 8 (A8.2(a))	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

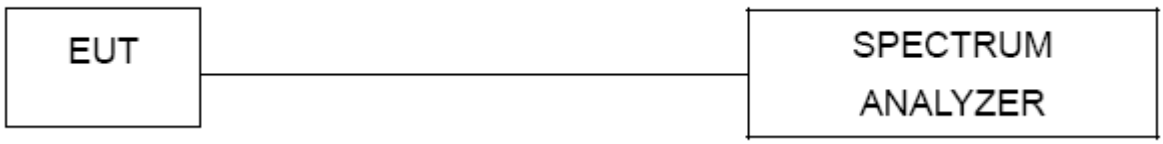
5.1.1 TEST PROCEDURE

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: DC 3.7V

5.1.6 TEST RESULTS

Please refer to the Attachment D.

6. MAXIMUM OUTPUT POWER TEST

6.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C/ RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3) RSS-210 Annex 8.4(4)	Maximum Output Power	1 watt or 30dBm	2400-2483.5	PASS

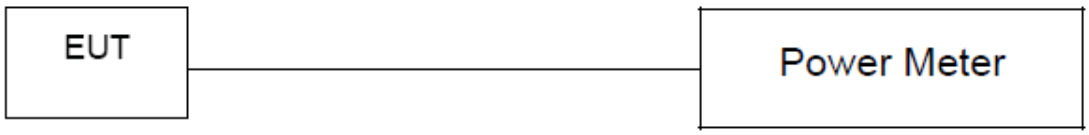
6.1.1 TEST PROCEDURE

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 9.3.1 of FCC KDB 558074

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: DC 3.7V

6.1.6 TEST RESULTS

Please refer to the Attachment E.

7. ANTENNA CONDUCTED SPURIOUS EMISSION

7.1 Applied procedures / limit

20dB in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified 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

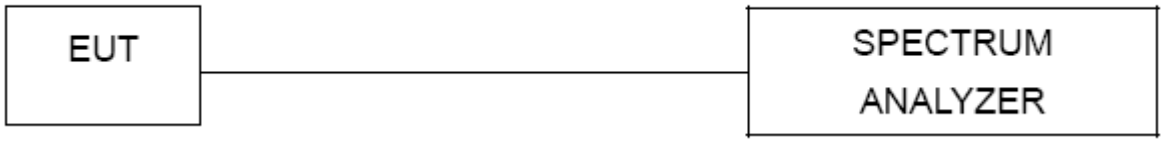
7.1.1 TEST PROCEDURE

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 = 10 ms.

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 OPERATION CONDITIONS

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

7.1.6 TEST RESULTS

Please refer to the Attachment F.

8. POWER SPECTRAL DENSITY TEST

8.1 Applied procedures / limit

FCC Part15 (15.247) , Subpart C / RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(e) RSS-210 Annex 8(A8.2(b))	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

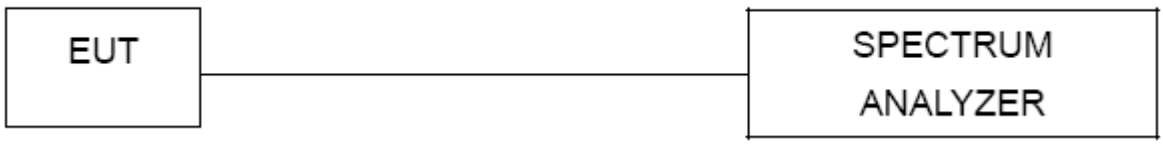
8.1.1 TEST PROCEDURE

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=10 KHz, 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: DC 3.7V

8.1.6 TEST RESULTS

Please refer to the Attachment G.

9. MEASUREMENT INSTRUMENTS LIST

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 29, 2015
2	Amplifier	HP	8447D	2944A09673	Mar. 29, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Aug. 24, 2014
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 02, 2014
5	Controller	CT	SC100	N/A	N/A
6	Antenna	ETS	3115	00075789	Mar. 29, 2015
7	Amplifier	Agilent	8449B	3008A02274	Mar. 29, 2015
8	Receiver	AGILENT	N9038A	MY52130039	Aug. 24, 2014
9	Test Cable	HUBER+SUHNER	C-48	N/A	Apr. 30, 2015
10	Controller	CT	SC100	N/A	N/A
11	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Feb. 22, 2015
12	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Mar. 29, 2015

6dB Bandwidth Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSL 6	100423	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	Mar. 29, 2015
2	Wireband Power sensor	Agilent	N1921A	MY51100041	Mar. 29, 2015

Antenna Conducted Spurious Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSL 6	100423	Nov. 11, 2014

Power Spectral Density Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSL 6	100423	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

Radiated Measurement Photos

9K-30 MHz

Radiated Measurement Photos

30M~1000MHz

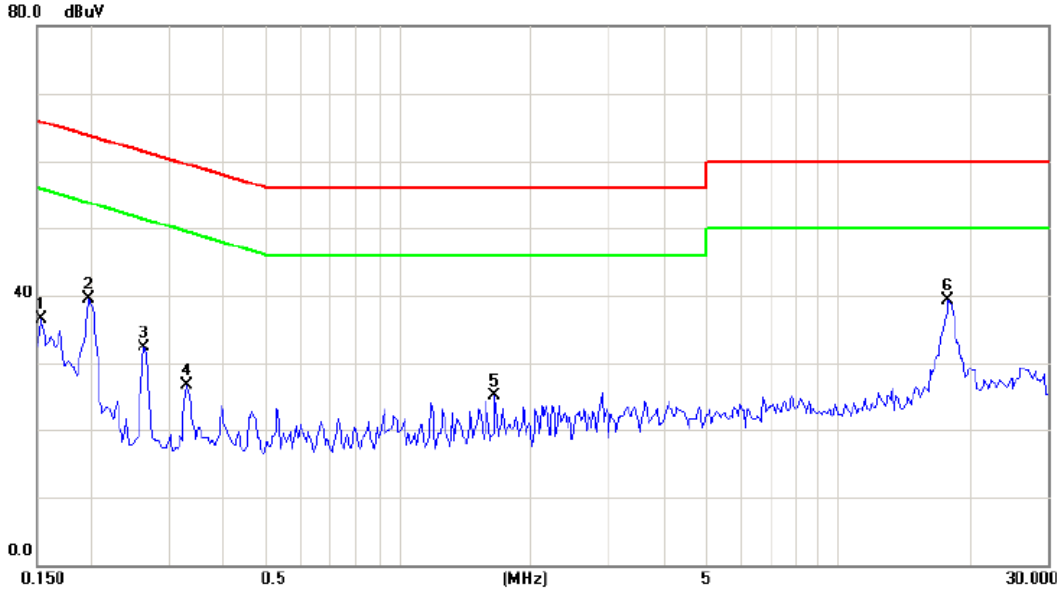
Radiated Measurement Photos

Above 1000MHz

ATTACHMENT A - CONDUCTED EMISSION

Test Mode :	TX MODE

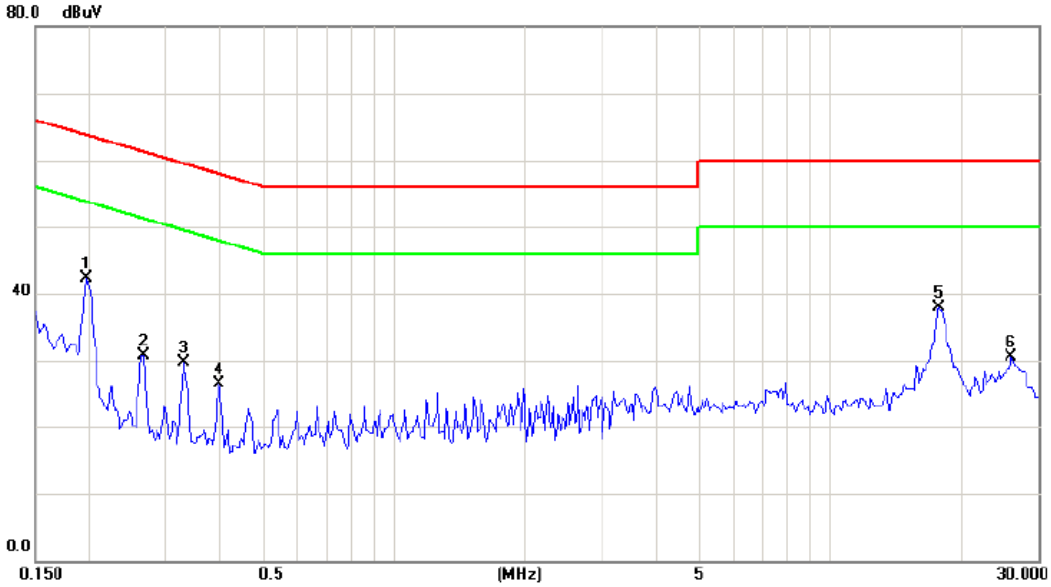
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	26.90	9.52	36.42	65.78	-29.36	peak	
2		0.1968	29.89	9.54	39.43	63.74	-24.31	peak	
3		0.2632	22.76	9.58	32.34	61.33	-28.99	peak	
4		0.3296	17.10	9.61	26.71	59.46	-32.75	peak	
5		1.6540	15.35	9.71	25.06	56.00	-30.94	peak	
6	*	17.7812	28.98	10.36	39.34	60.00	-20.66	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	*	0.1968	32.62	9.61	42.23	63.74	-21.51	peak	
2		0.2671	21.15	9.62	30.77	61.21	-30.44	peak	
3		0.3296	20.12	9.62	29.74	59.46	-29.72	peak	
4		0.3960	16.89	9.63	26.52	57.94	-31.42	peak	
5		17.7968	27.51	10.37	37.88	60.00	-22.12	peak	
6		26.0545	19.59	10.87	30.46	60.00	-29.54	peak	

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

Test Mode:	TX Mode 2402MHz

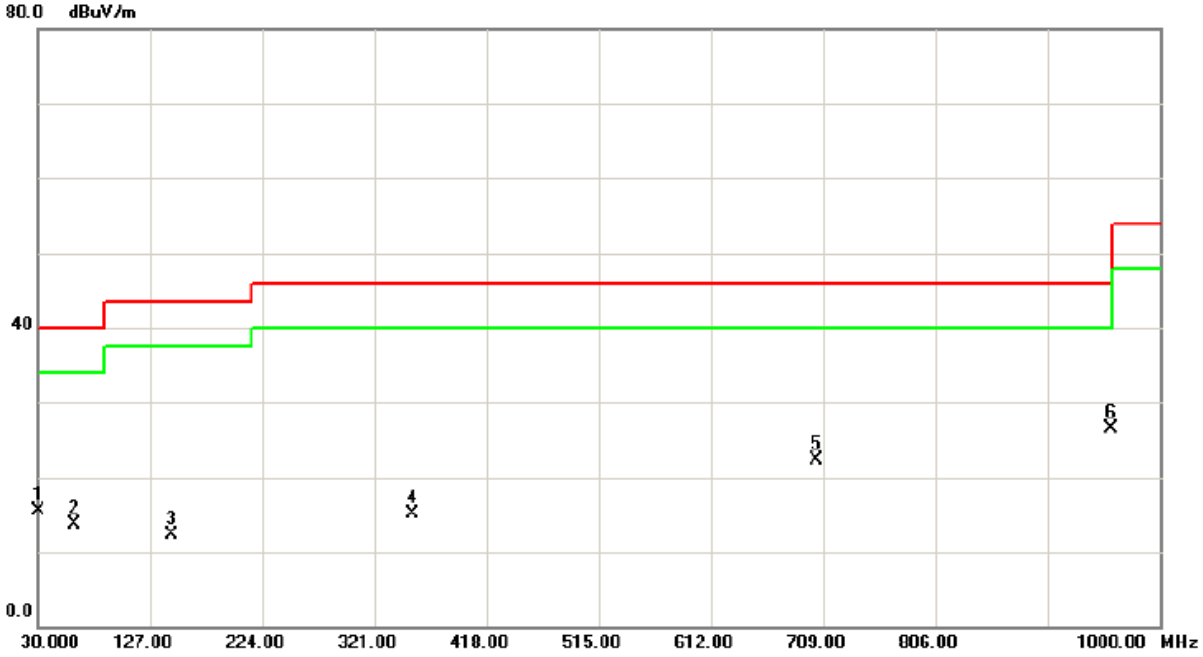
Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.00954	0°	68.35	24.30	92.65	128.01	-35.36	AVG
0.00954	0°	72.35	24.30	96.65	148.01	-51.36	PEAK
0.0186	0°	70.35	24.30	94.65	122.21	-27.56	AVG
0.0186	0°	79.35	24.30	103.65	142.21	-38.56	PEAK
0.0261	0°	56.36	23.91	80.27	119.27	-39.00	AVG
0.0261	0°	60.12	23.91	84.03	139.27	-55.24	PEAK
0.0366	0°	61.36	23.25	84.61	116.33	-31.72	AVG
0.0366	0°	65.38	23.25	88.63	136.33	-47.70	PEAK
0.595	0°	18.72	20.10	38.82	72.11	-33.29	QP
1.8235	0°	18.95	19.52	38.47	69.54	-31.07	QP

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.00948	90°	76.35	24.30	100.65	128.07	-27.42	AVG
0.00948	90°	82.36	24.30	106.66	148.07	-41.41	PEAK
0.0235	90°	56.38	24.08	80.46	120.18	-39.72	AVG
0.0235	90°	59.35	24.08	83.43	140.18	-56.75	PEAK
0.0324	90°	57.35	23.51	80.86	117.39	-36.53	AVG
0.0324	90°	58.35	23.51	81.86	137.39	-55.53	PEAK
0.0433	90°	59.35	22.82	82.17	114.87	-32.70	AVG
0.0433	90°	63.35	22.82	86.17	134.87	-48.70	PEAK
0.4917	90°	17.45	19.82	37.27	73.77	-36.50	QP
1.7278	90°	18.63	19.53	38.16	69.54	-31.38	QP

ATTACHMENT C - RADIATED EMISSION BETWEEN 30MHZ AND 1000MHZ)

Test Mode:	TX 2402MHz -CH00 -1Mbps

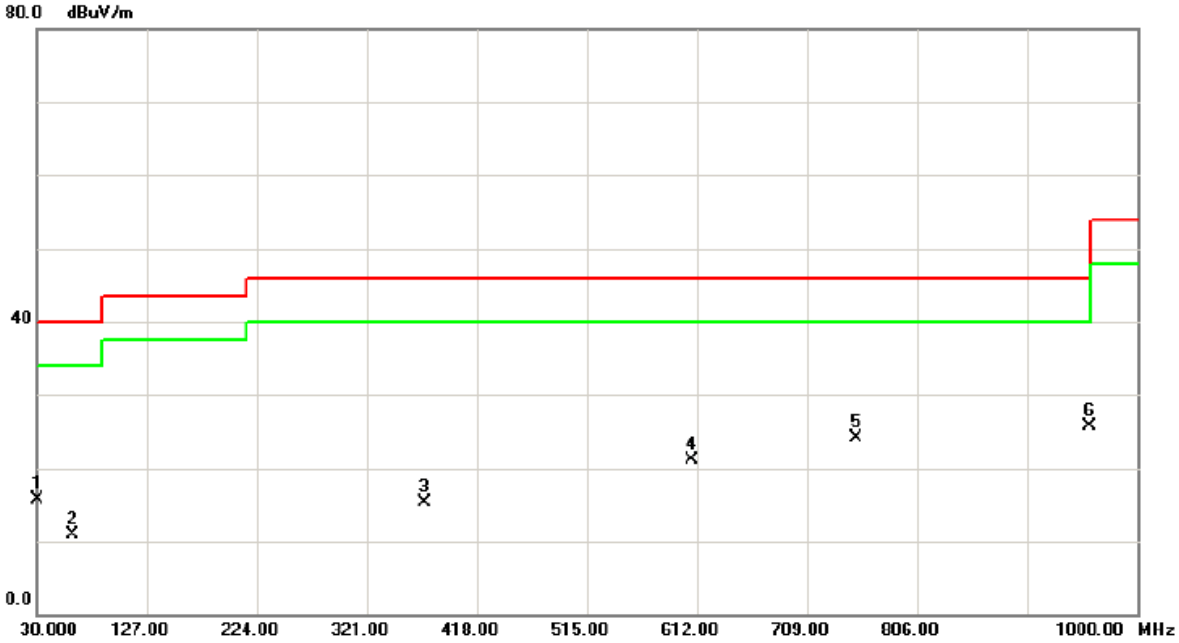
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.0000	27.42	-12.00	15.42	40.00	-24.58	peak	
2		61.0400	36.94	-23.14	13.80	40.00	-26.20	peak	
3		145.4300	34.52	-22.18	12.34	43.50	-31.16	peak	
4		353.9800	29.29	-14.14	15.15	46.00	-30.85	peak	
5		703.1800	28.71	-6.32	22.39	46.00	-23.61	peak	
6	*	958.2900	29.84	-3.42	26.42	46.00	-19.58	peak	

Test Mode:	TX 2402MHz -CH00 -1Mbps

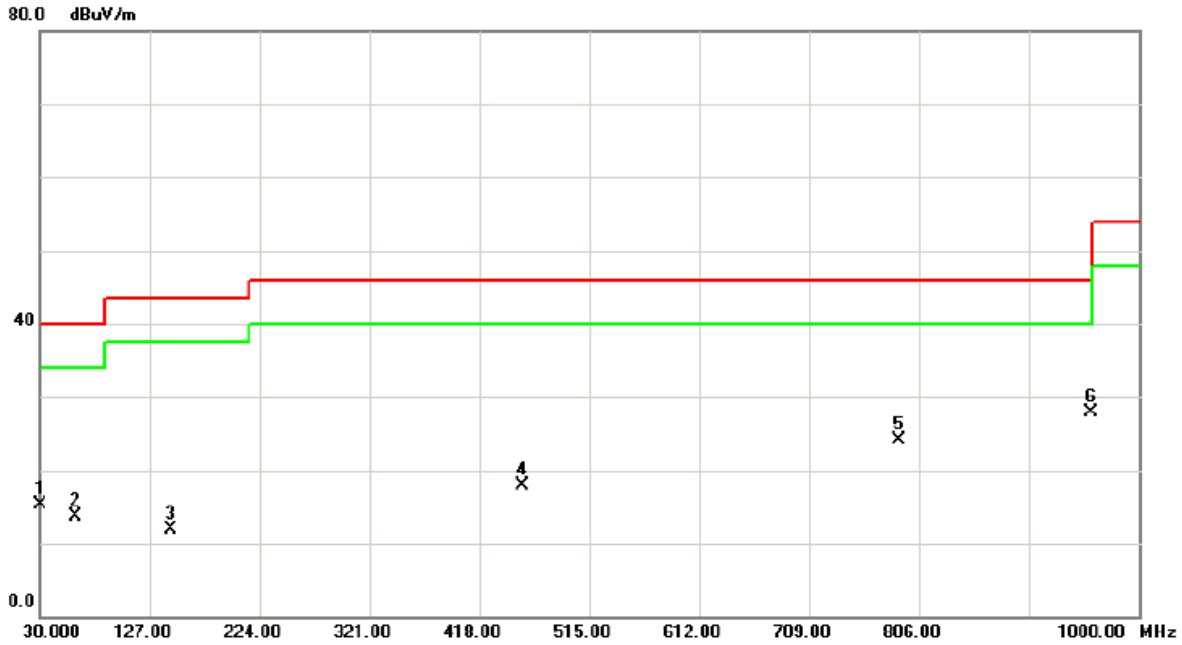
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.0000	27.63	-12.00	15.63	40.00	-24.37	peak	
2		61.0400	34.05	-23.14	10.91	40.00	-29.09	peak	
3		372.4100	28.87	-13.51	15.36	46.00	-30.64	peak	
4		607.1500	29.83	-8.66	21.17	46.00	-24.83	peak	
5		751.6800	30.62	-6.49	24.13	46.00	-21.87	peak	
6	*	958.2900	29.18	-3.42	25.76	46.00	-20.24	peak	

Test Mode:	TX 2440MHz -CH19 -1Mbps

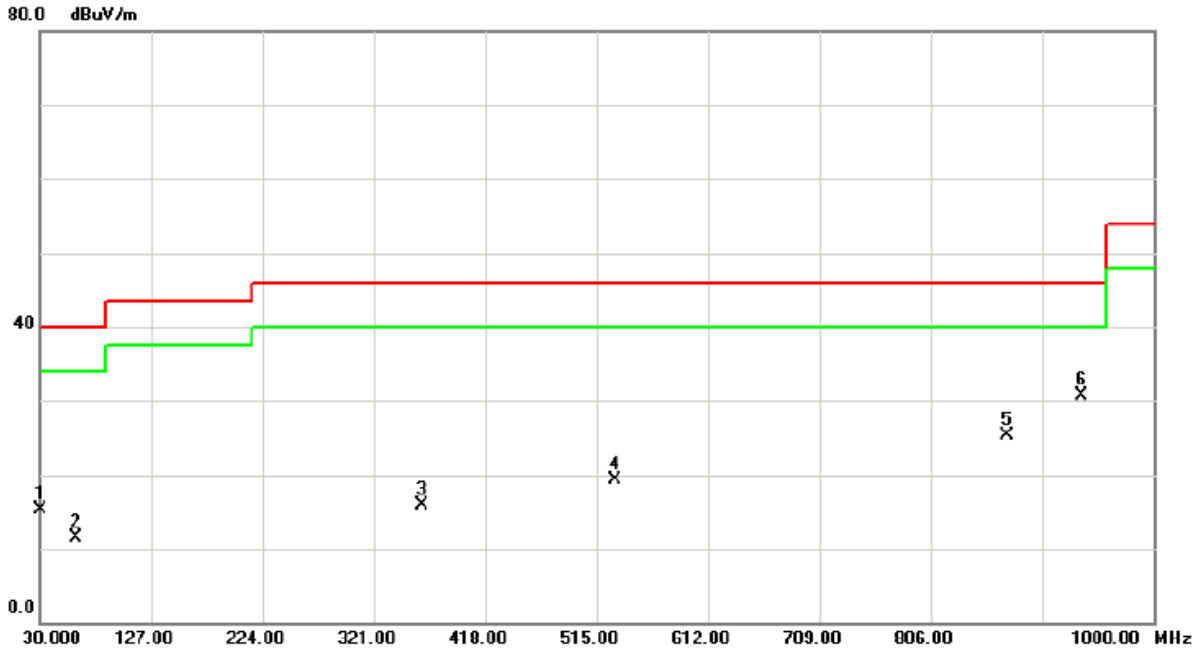
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.9700	27.82	-12.58	15.24	40.00	-24.76	peak	
2		61.0400	36.94	-23.14	13.80	40.00	-26.20	peak	
3		145.4300	34.03	-22.18	11.85	43.50	-31.65	peak	
4		455.8300	30.63	-12.76	17.87	46.00	-28.13	peak	
5		788.5400	30.44	-6.37	24.07	46.00	-21.93	peak	
6	*	958.2900	31.23	-3.42	27.81	46.00	-18.19	peak	

Test Mode:	TX 2440MHz -CH19 -1Mbps

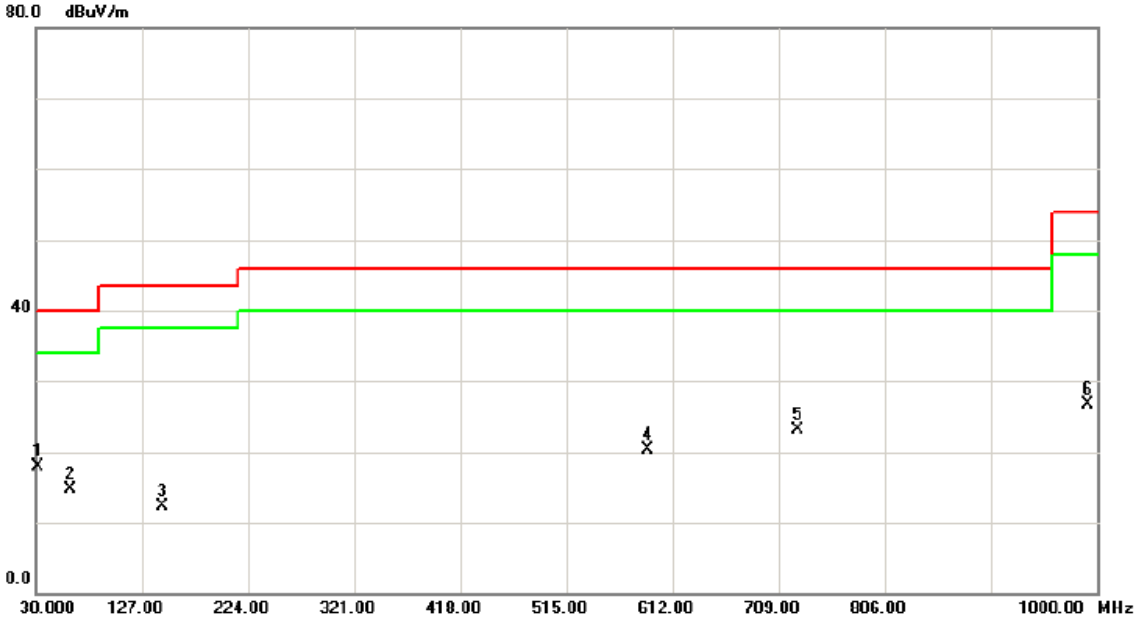
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.0000	27.22	-12.00	15.22	40.00	-24.78	peak	
2		61.0400	34.61	-23.14	11.47	40.00	-28.53	peak	
3		362.7100	29.61	-13.79	15.82	46.00	-30.18	peak	
4		530.5200	30.07	-10.86	19.21	46.00	-26.79	peak	
5		871.9600	30.21	-4.90	25.31	46.00	-20.69	peak	
6	*	936.9500	34.52	-3.86	30.66	46.00	-15.34	peak	

Test Mode:	TX 2480MHz -CH39 -1Mbps

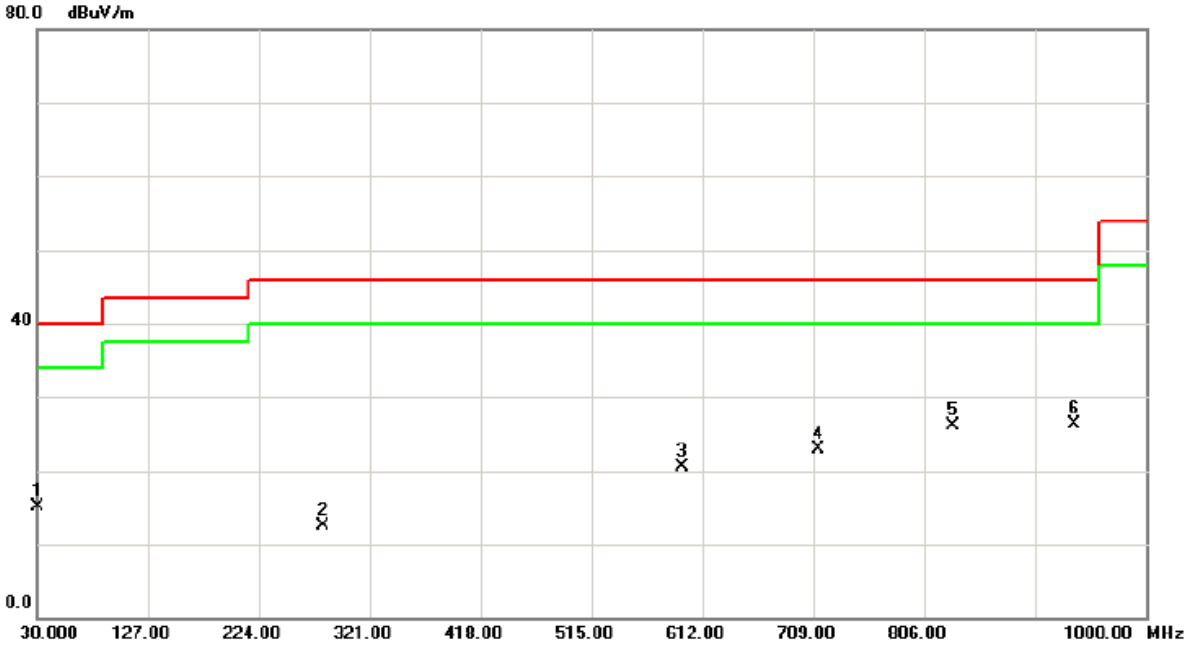
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	31.9400	30.96	-13.15	17.81	40.00	-22.19	peak	
2		61.0400	37.77	-23.14	14.63	40.00	-25.37	peak	
3		145.4300	34.47	-22.18	12.29	43.50	-31.21	peak	
4		589.6900	29.32	-9.08	20.24	46.00	-25.76	peak	
5		726.4600	29.43	-6.40	23.03	46.00	-22.97	peak	
6		991.2700	29.91	-3.14	26.77	54.00	-27.23	peak	

Test Mode:	TX 2480MHz -CH39 -1Mbps

Horizontal

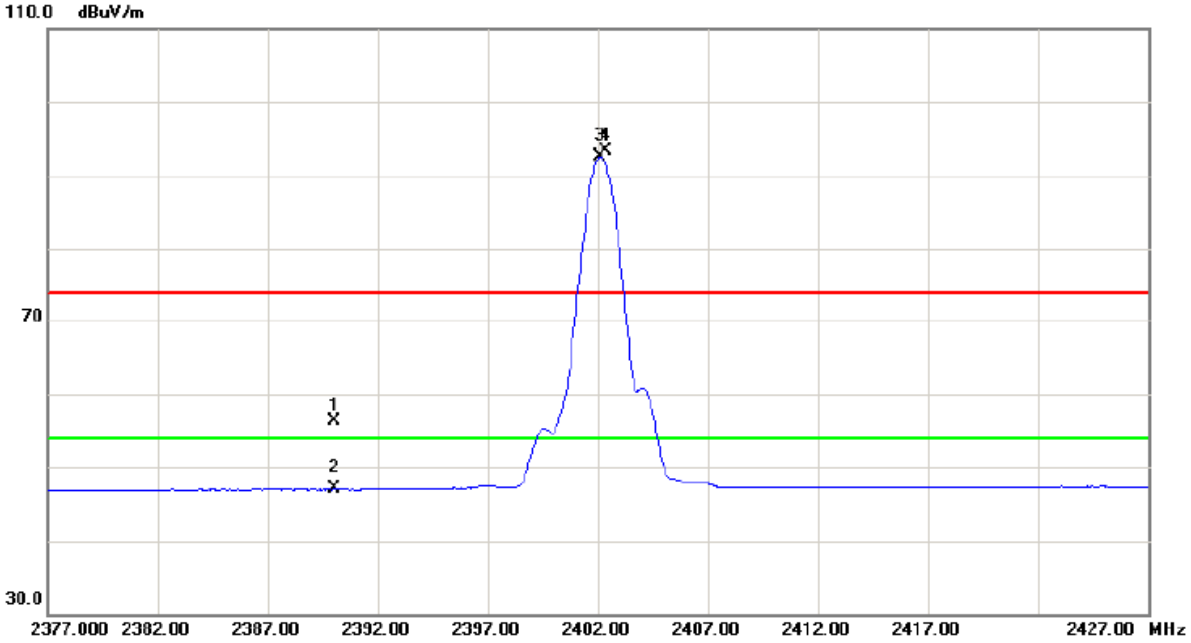


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		30.0000	27.12	-12.00	15.12	40.00	-24.88	peak	
2		280.2600	29.31	-16.85	12.46	46.00	-33.54	peak	
3		594.5400	29.32	-8.91	20.41	46.00	-25.59	peak	
4		712.8800	29.21	-6.35	22.86	46.00	-23.14	peak	
5		831.2200	31.45	-5.43	26.02	46.00	-19.98	peak	
6	*	936.9500	30.18	-3.86	26.32	46.00	-19.68	peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

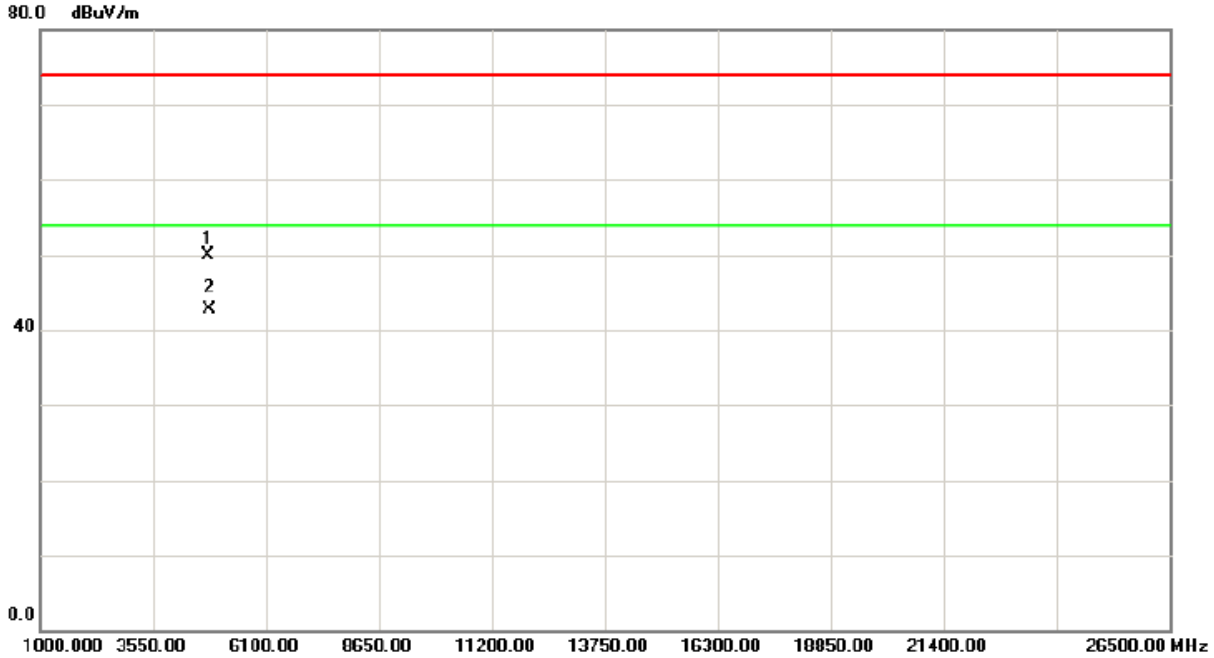
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.98	33.38	56.36	74.00	-17.64	peak	
2		2390.000	13.64	33.38	47.02	54.00	-6.98	AVG	
3	*	2402.100	59.06	33.41	92.47	54.00	38.47	AVG	Fundamental frequency, no limit
4	X	2402.350	59.81	33.41	93.22	74.00	19.22	peak	Fundamental frequency, no limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

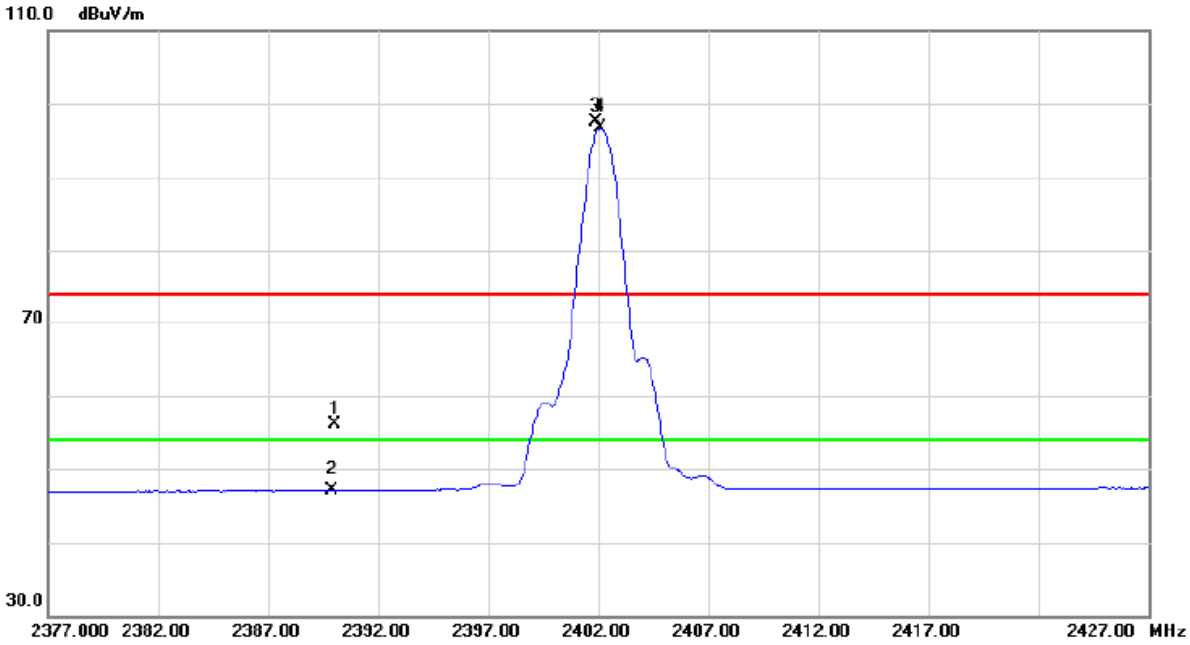
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.400	43.43	6.39	49.82	74.00	-24.18	peak	
2	*	4804.800	36.37	6.39	42.76	54.00	-11.24	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

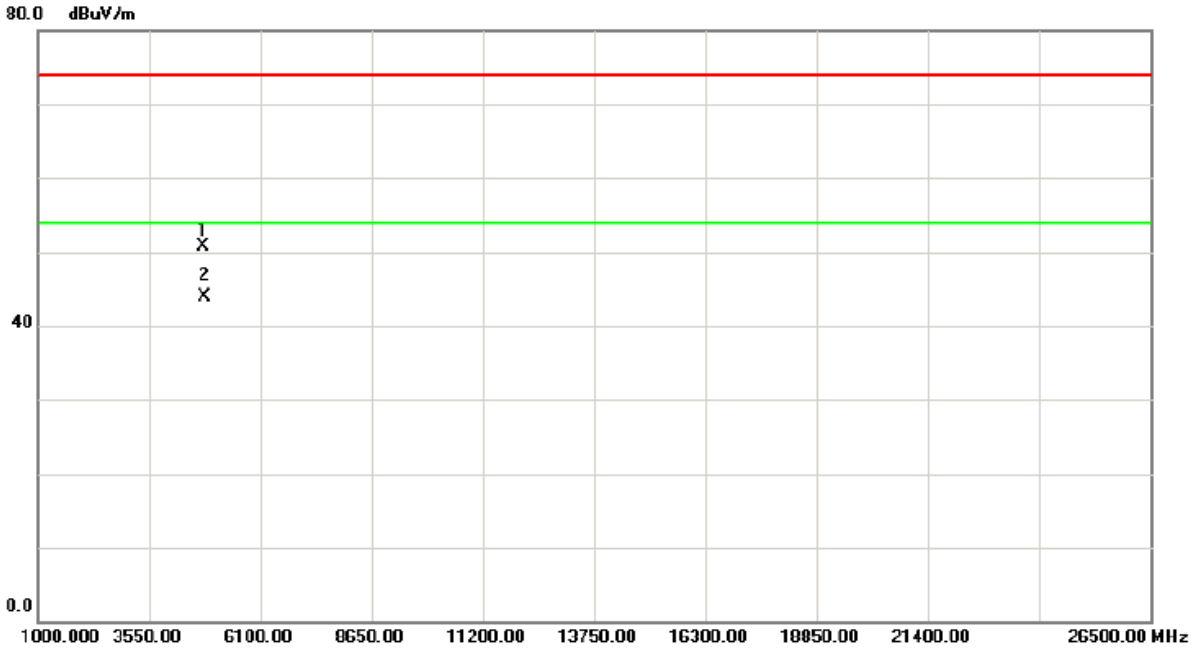
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	22.73	33.38	56.11	74.00	-17.89	peak	
2		2390.000	13.66	33.38	47.04	54.00	-6.96	AVG	
3	X	2401.900	64.19	33.41	97.60	74.00	23.60	peak	Fundamental frequency. no limit
4	*	2402.100	63.33	33.41	96.74	54.00	42.74	AVG	Fundamental frequency. no limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

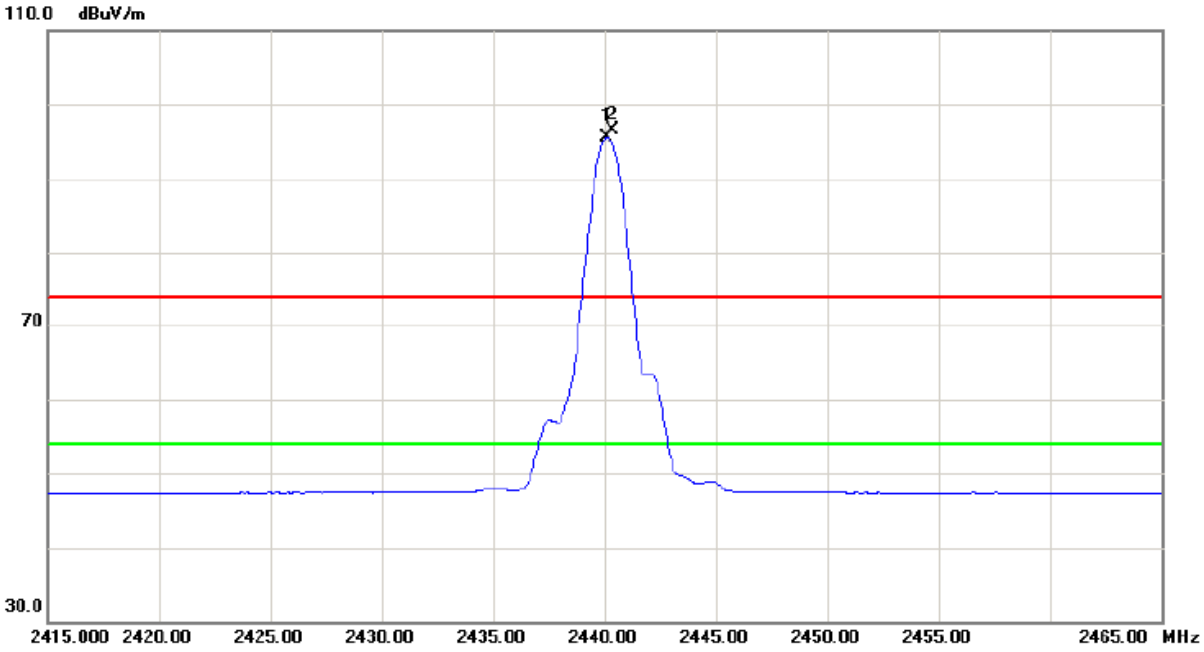
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.000	44.22	6.39	50.61	74.00	-23.39	peak	
2	*	4804.000	37.42	6.39	43.81	54.00	-10.19	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

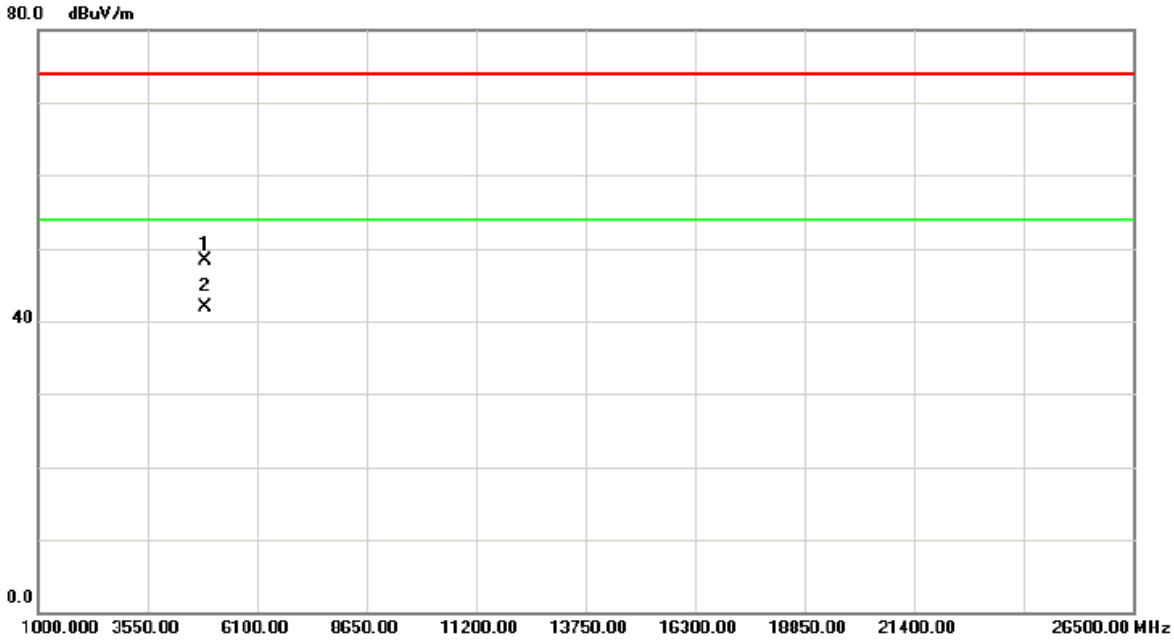
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2440.100	62.08	33.51	95.59	54.00	41.59	AVG	Fundamental frequency. no limit
2	X	2440.350	63.05	33.51	96.56	74.00	22.56	peak	Fundamental frequency. no limit

Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

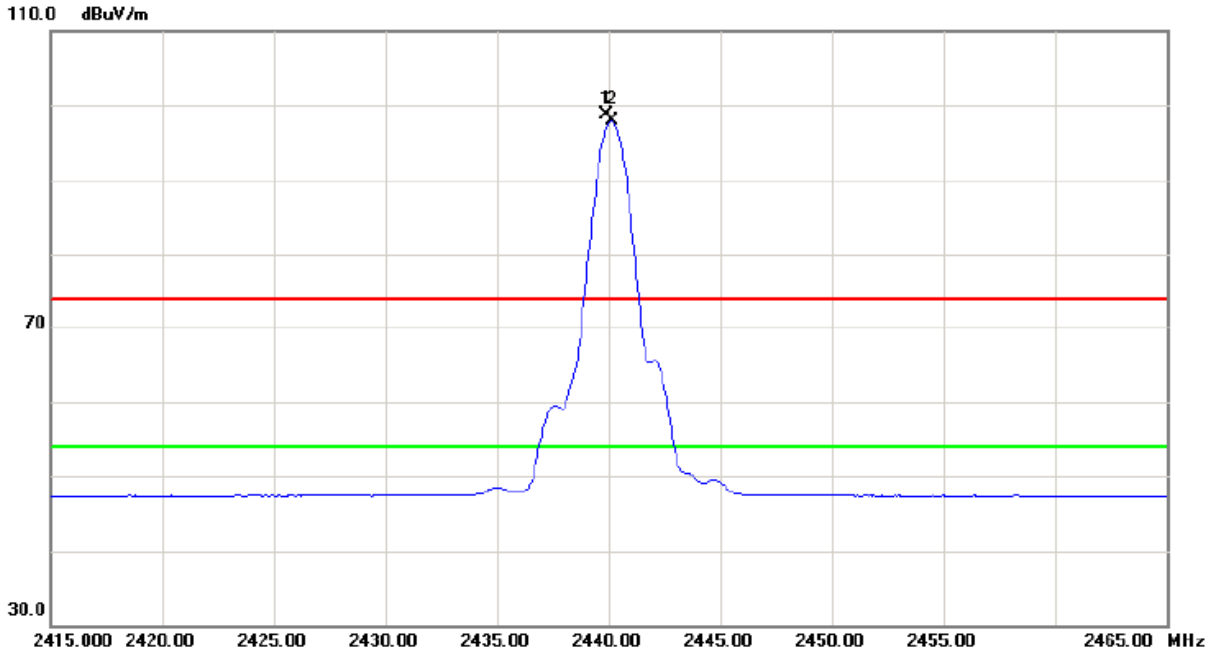
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4880.100	41.71	6.57	48.28	74.00	-25.72	peak	
2	*	4880.100	35.37	6.57	41.94	54.00	-12.06	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

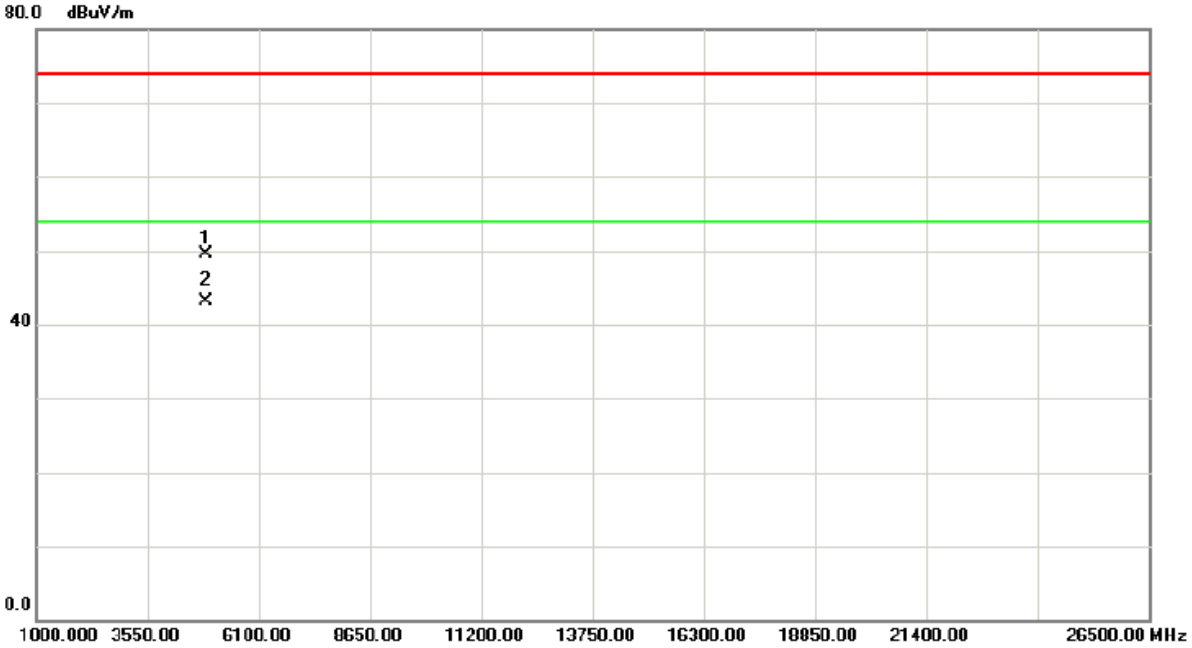
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2439.900	65.23	33.51	98.74	74.00	24.74	peak	Fundamental frequency. no limit
2	*	2440.150	64.33	33.51	97.84	54.00	43.84	AVG	Fundamental frequency. no limit

Orthogonal Axis :	X
Test Mode :	TX 2440MHz _CH19_1Mbps

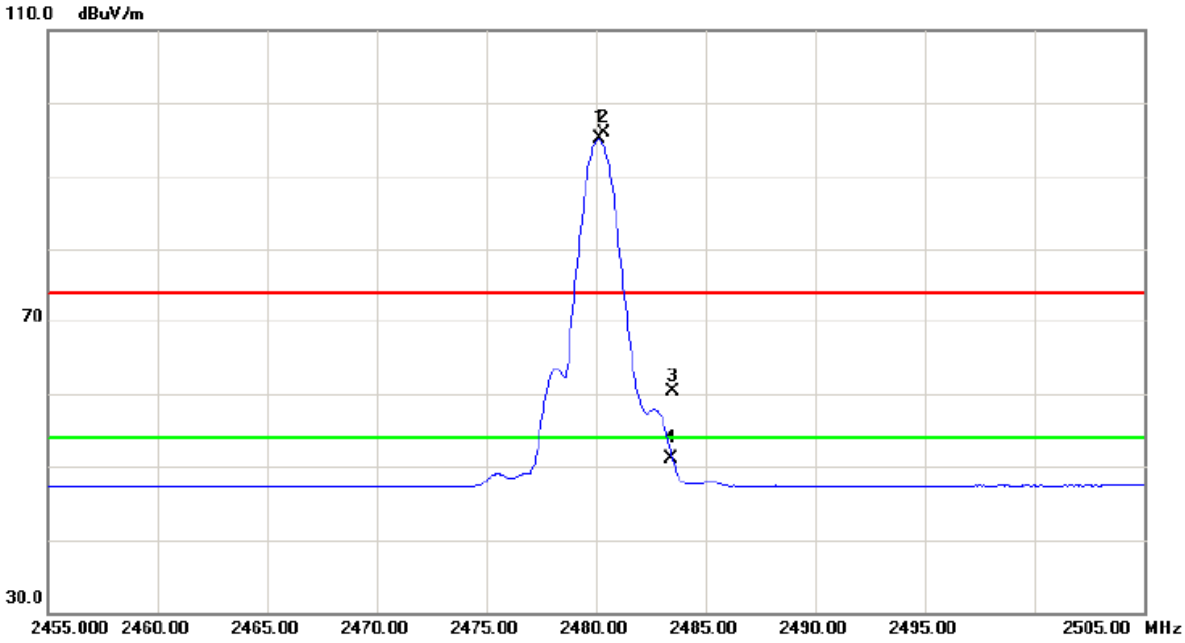
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4880.100	42.84	6.57	49.41	74.00	-24.59	peak	
2	*	4880.100	36.50	6.57	43.07	54.00	-10.93	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH39_1Mbps

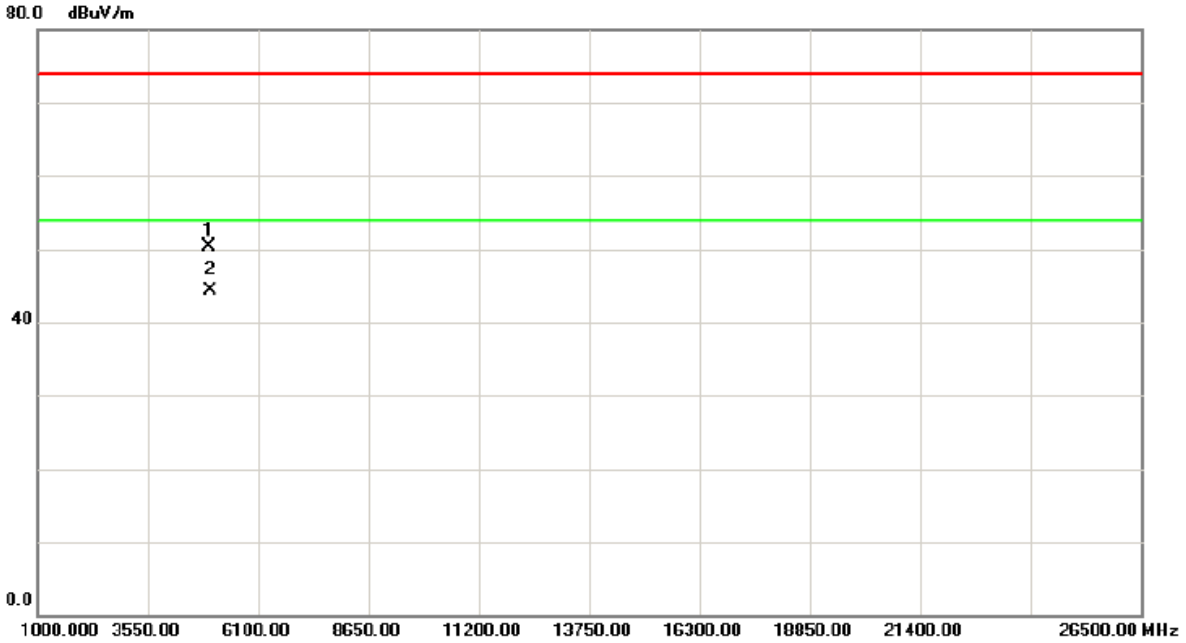
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2480.150	61.42	33.61	95.03	54.00	41.03	AVG	Fundamental frequency. no limit
2	X	2480.350	62.33	33.61	95.94	74.00	21.94	peak	Fundamental frequency. no limit
3		2483.500	26.60	33.62	60.22	74.00	-13.78	peak	
4		2483.500	17.44	33.62	51.06	54.00	-2.94	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH39_1Mbps

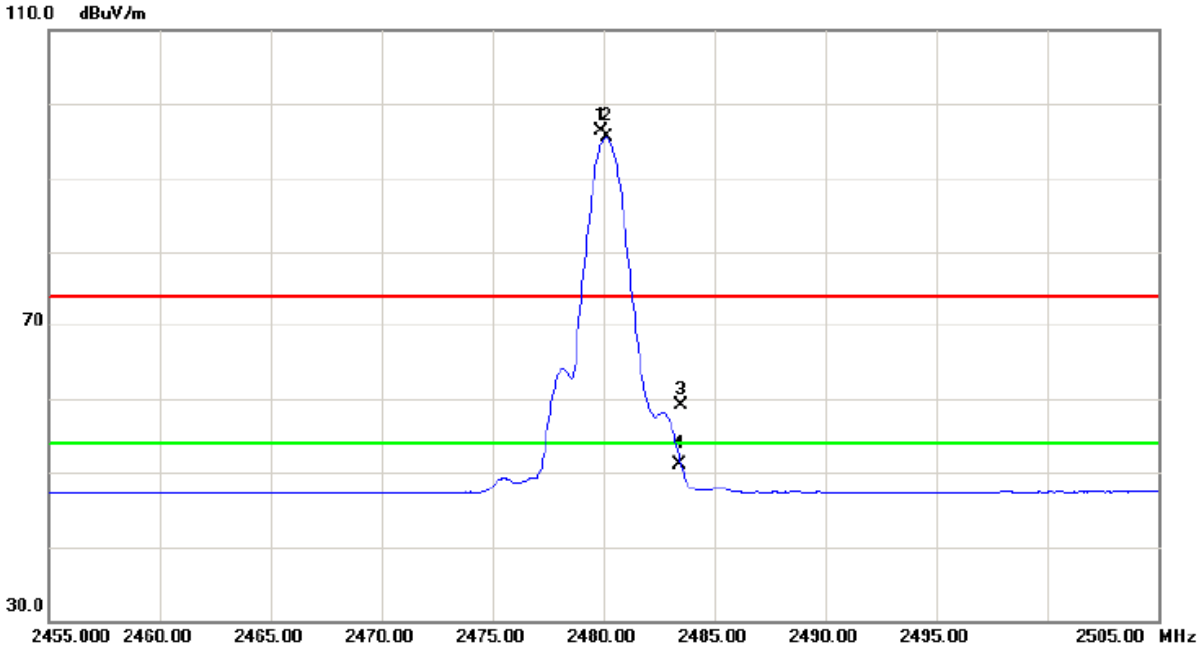
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.150	43.58	6.74	50.32	74.00	-23.68	peak	
2	*	4960.150	37.57	6.74	44.31	54.00	-9.69	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH39_1Mbps

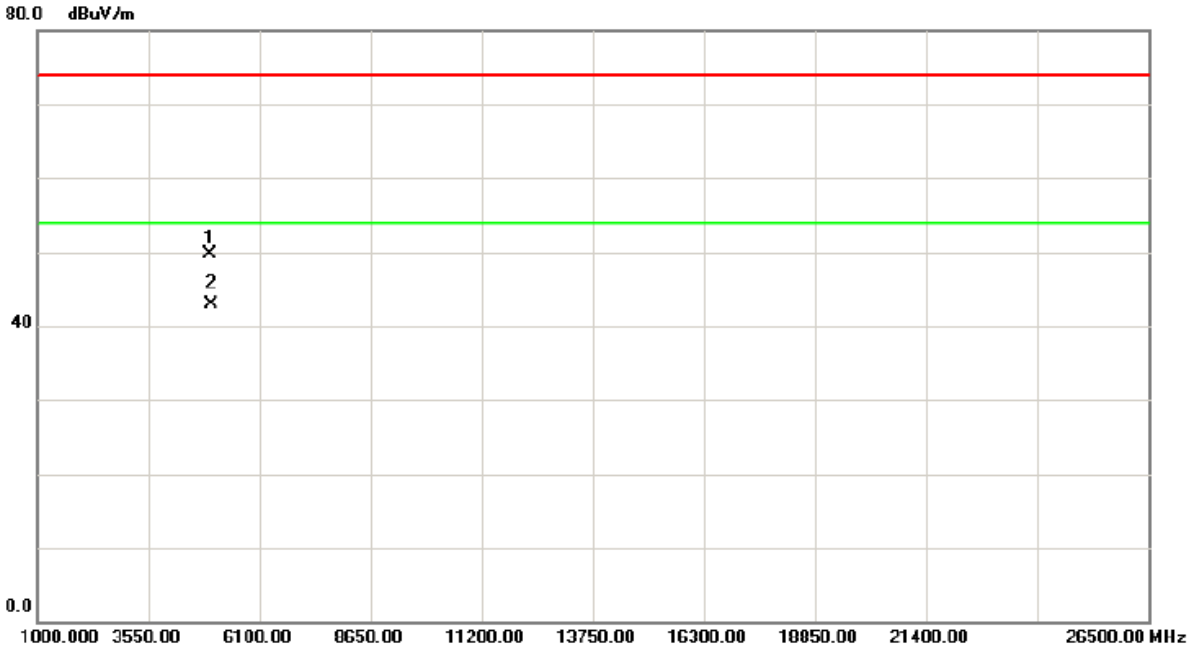
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2479.900	62.72	33.61	96.33	74.00	22.33	peak	Fundamental frequency. no limit
2	*	2480.150	61.82	33.61	95.43	54.00	41.43	AVG	Fundamental frequency. no limit
3		2483.500	25.49	33.62	59.11	74.00	-14.89	peak	
4		2483.500	17.52	33.62	51.14	54.00	-2.86	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH39_1Mbps

Horizontal

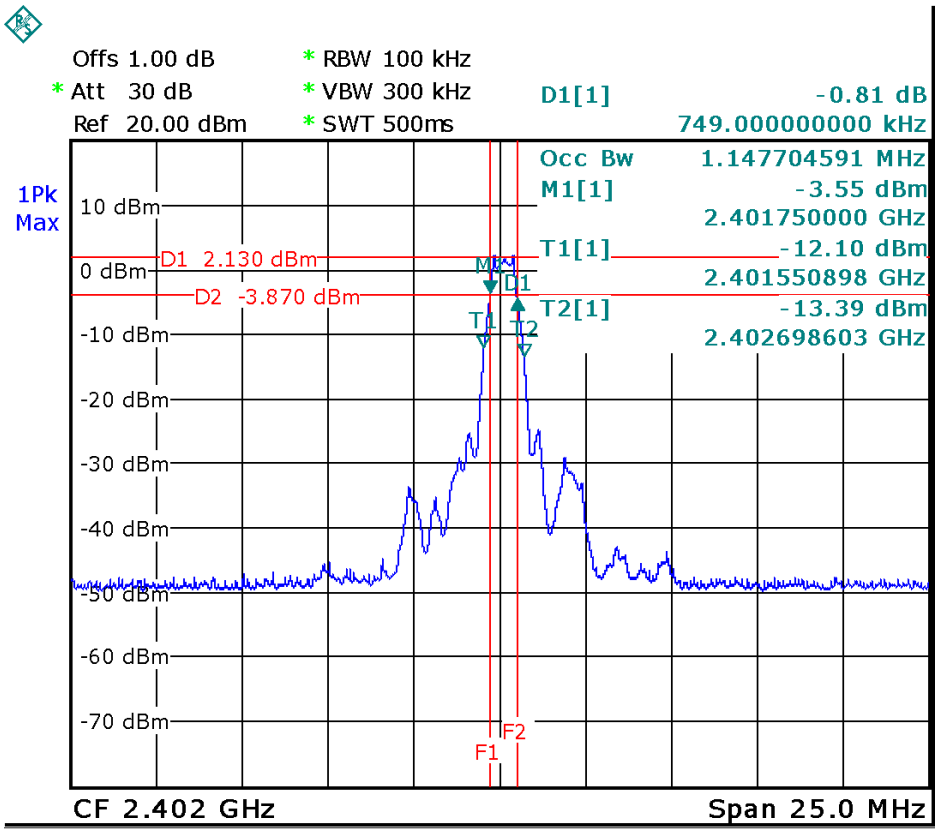


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.150	42.88	6.74	49.62	74.00	-24.38	peak	
2	*	4960.150	36.14	6.74	42.88	54.00	-11.12	AVG	

ATTACHMENT E - BANDWIDTH

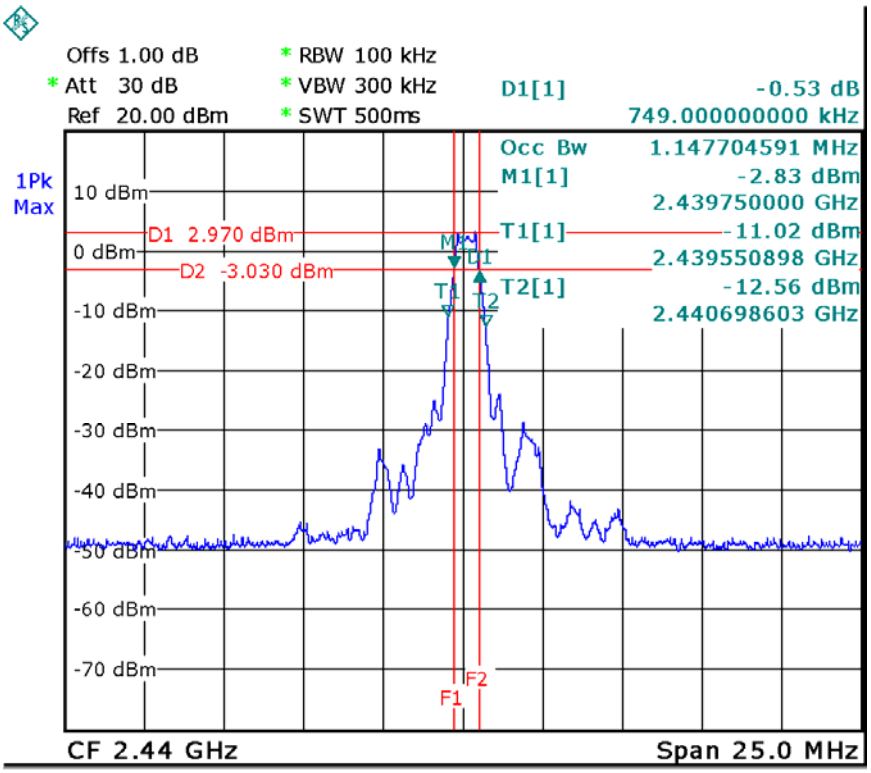
CH00, CH19, CH39 - 1Mbps				
Test Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% OBW (MHz)	LIMIT (KHz)
CH00	2402	0.75	1.15	>=500KHz
CH19	2440	0.75	1.15	>=500KHz
CH39	2480	0.75	1.15	>=500KHz

TX CH00



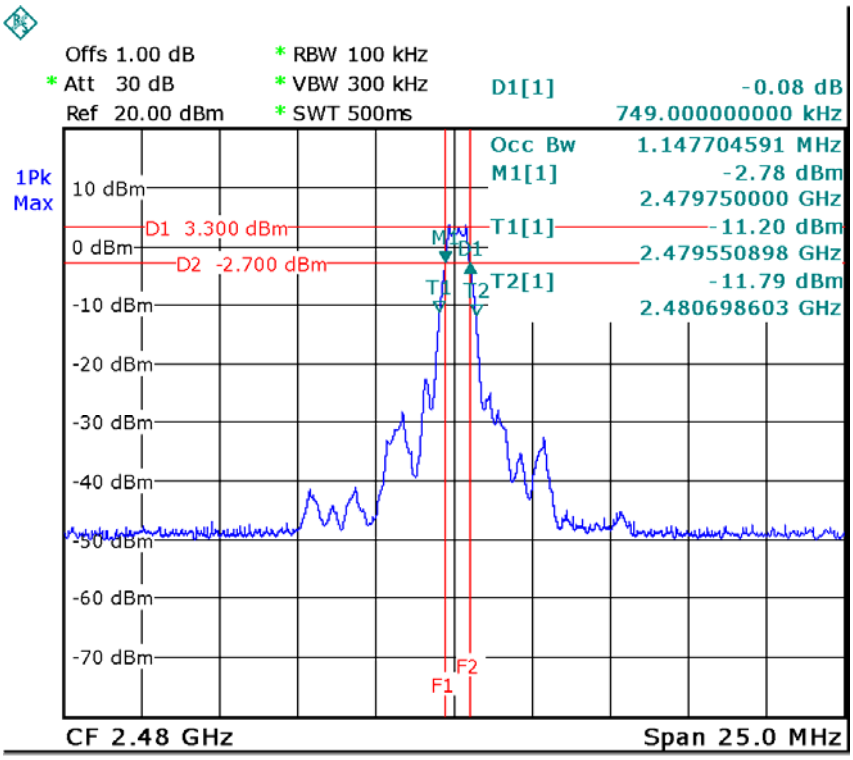
Date: 22.MAY.2014 13:37:52

TX CH19



Date: 22.MAY.2014 13:39:10

TX CH39



Date: 22.MAY.2014 13:35:31

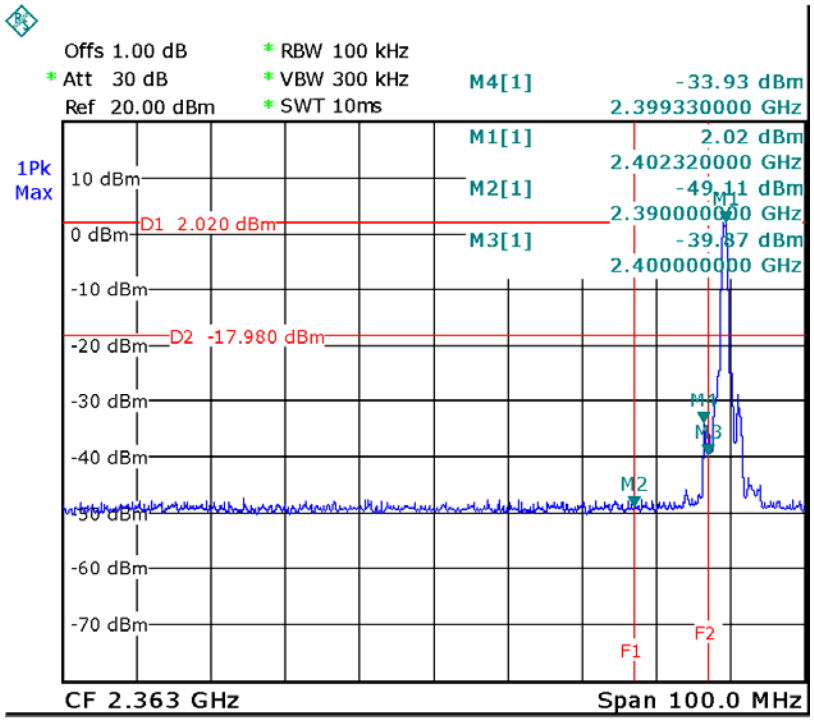
ATTACHMENT F - MAXIMUM OUTPUT POWER TEST

Test Mode : CH00, CH19, CH39 - 1Mbps				
Test Channel	Frequency (MHz)	Peak Output Power (dBm)	LIMIT (dBm)	LIMIT (W)
CH00	2402	2.13	30	1
CH19	2440	2.43	30	1
CH39	2480	2.48	30	1

ATTACHMENT G - ANTENNA CONDUCTED SPURIOUS EMISSION

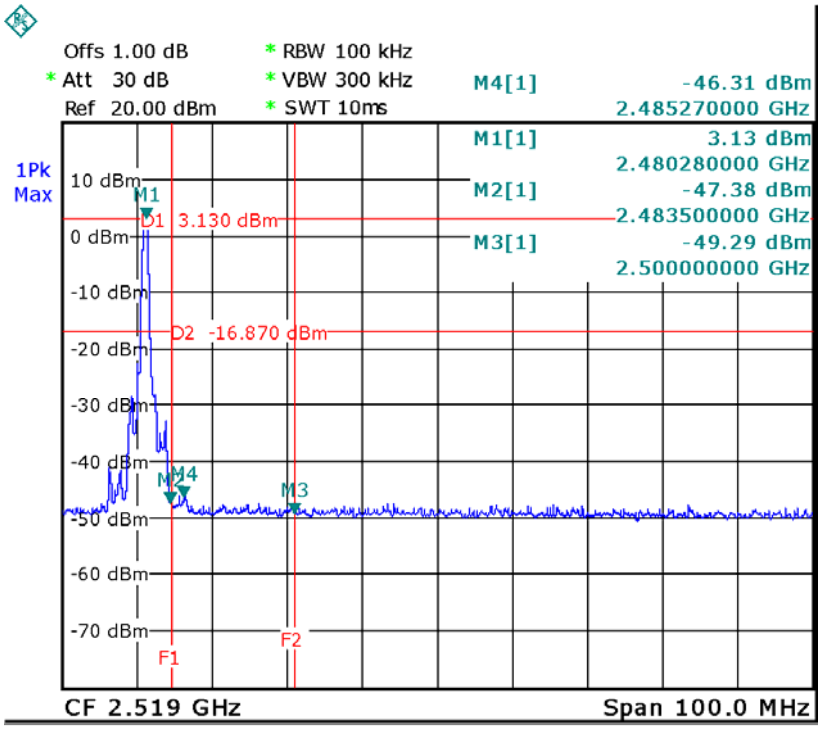
Test Mode :	CH00, CH19 , CH39 - 1Mbps

CH00 (Lower) - 1Mbps



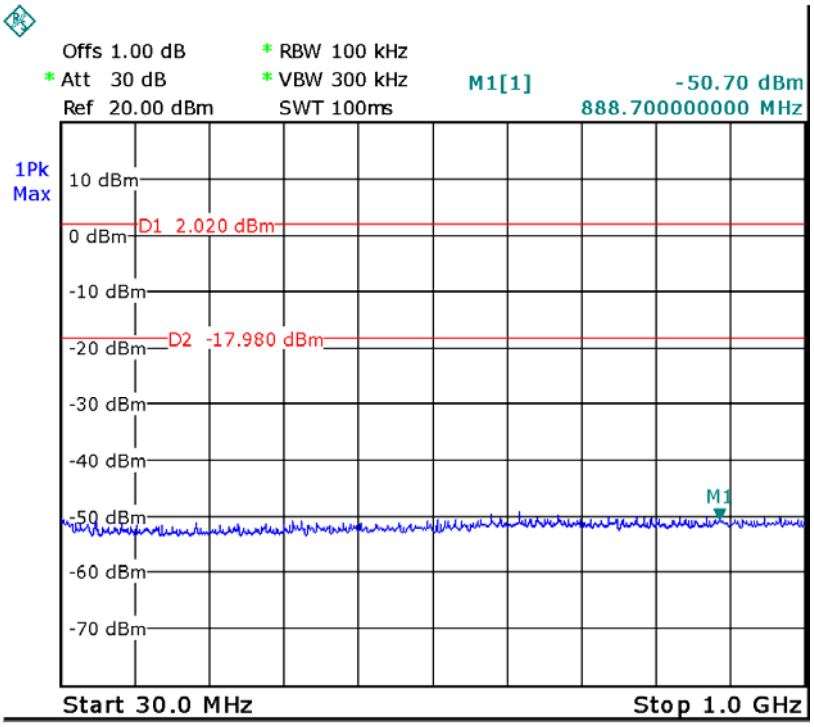
Date: 22.MAY.2014 13:49:27

CH39 (upper) - 1Mbps



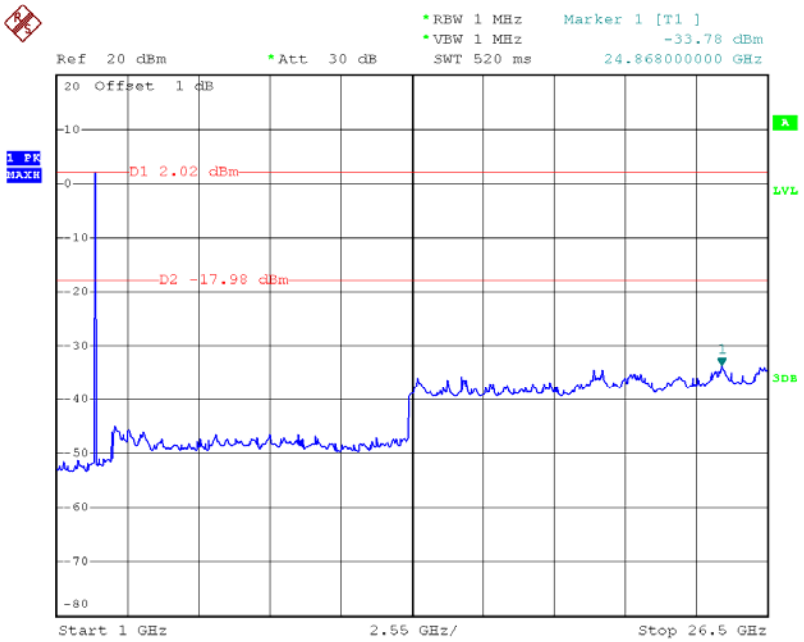
Date: 22.MAY.2014 13:46:40

CH00 (30MHz to 1GHz)



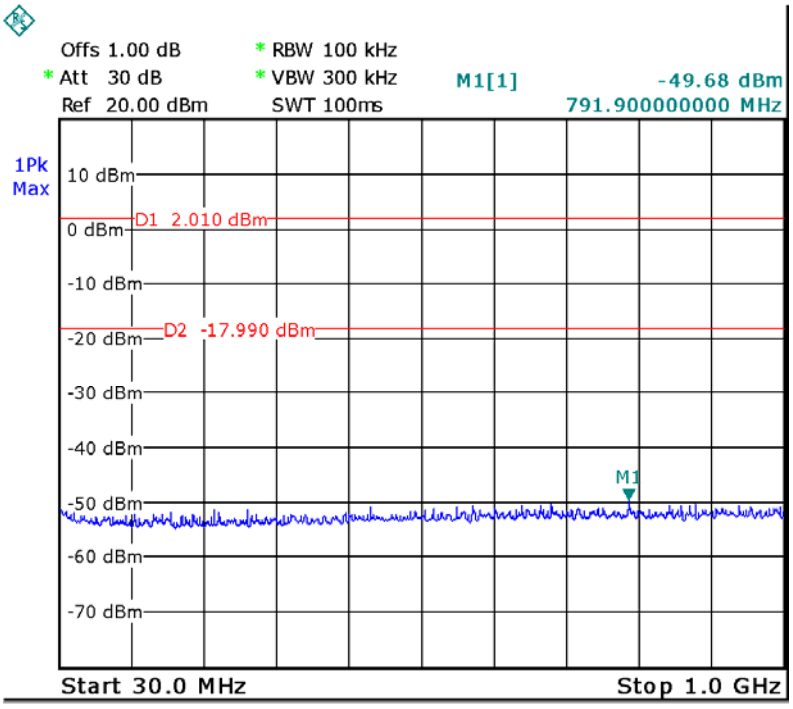
Date: 22.MAY.2014 13:58:03

CH00 (1GHz to 10th Harmonic)



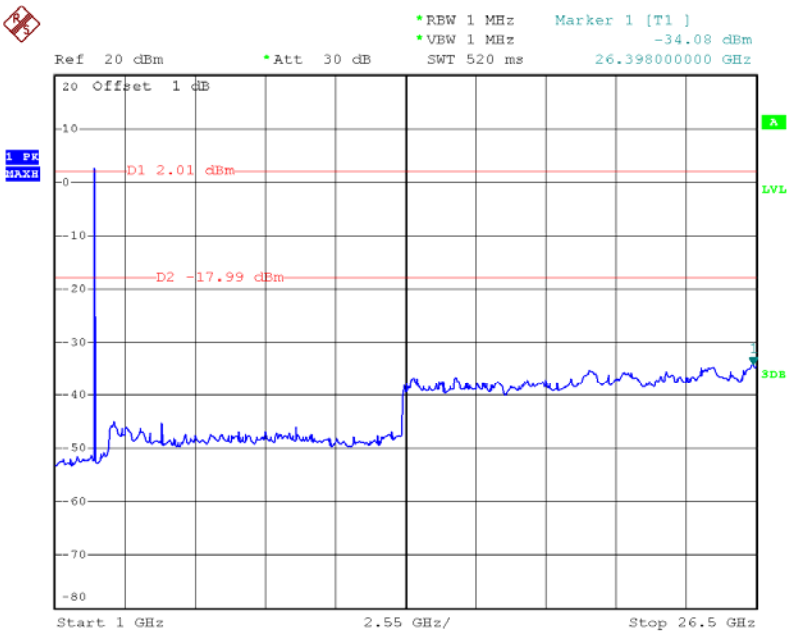
Date: 23.MAY.2014 11:40:46

CH19 (30MHz to 1GHz)



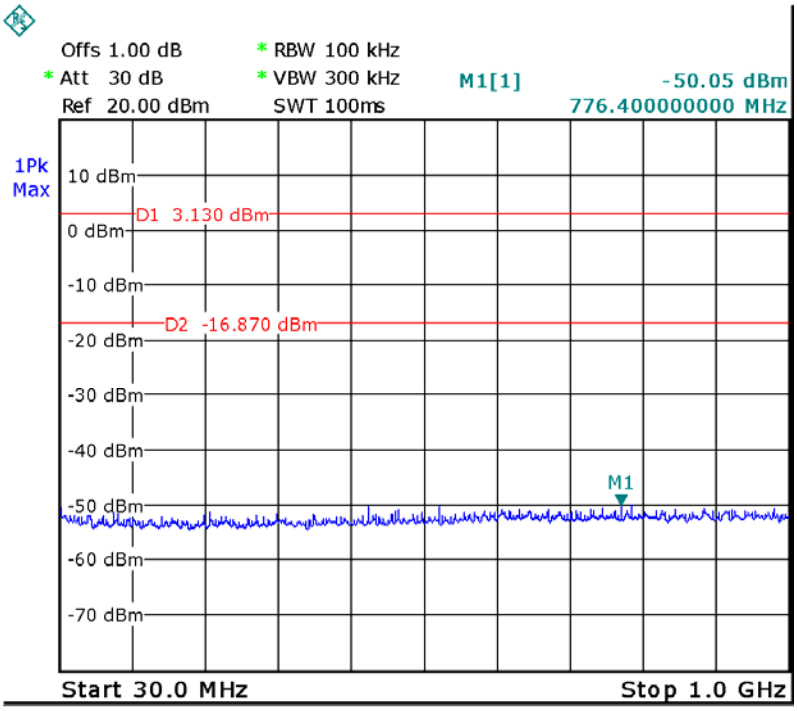
Date: 22.MAY.2014 13:59:46

CH19 (1GHz to 10th Harmonic)



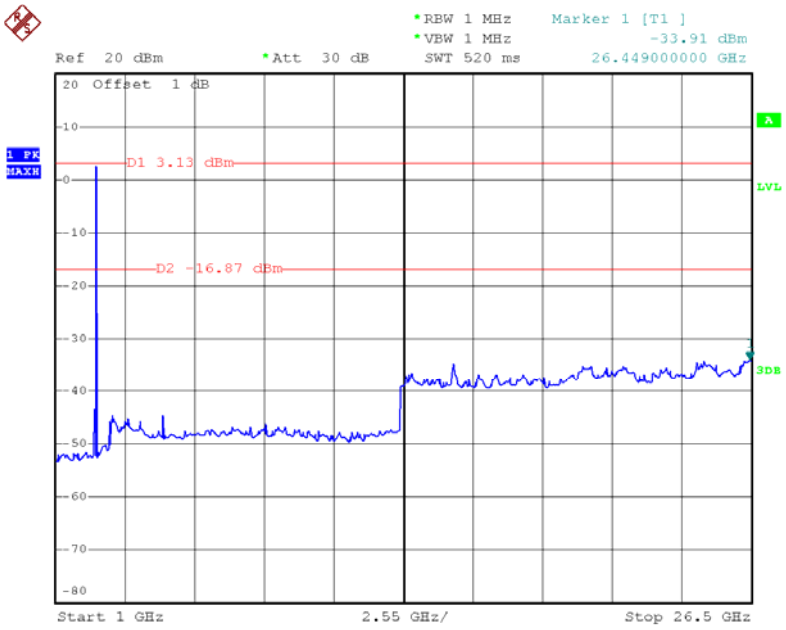
Date: 23.MAY.2014 11:42:23

CH39 (30MHz to 1GHz)



Date: 22.MAY.2014 14:01:07

CH39 (1GHz to 10th Harmonic)

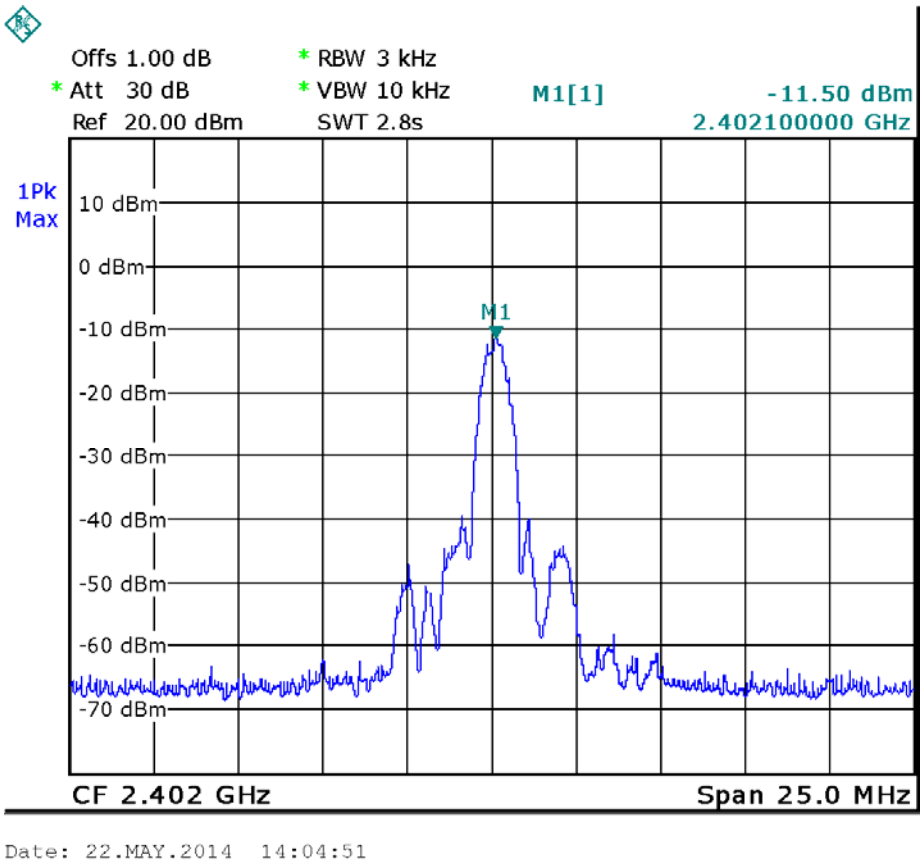


Date: 23.MAY.2014 11:44:10

ATTACHMENT H - POWER SPECTRAL DENSITY TEST

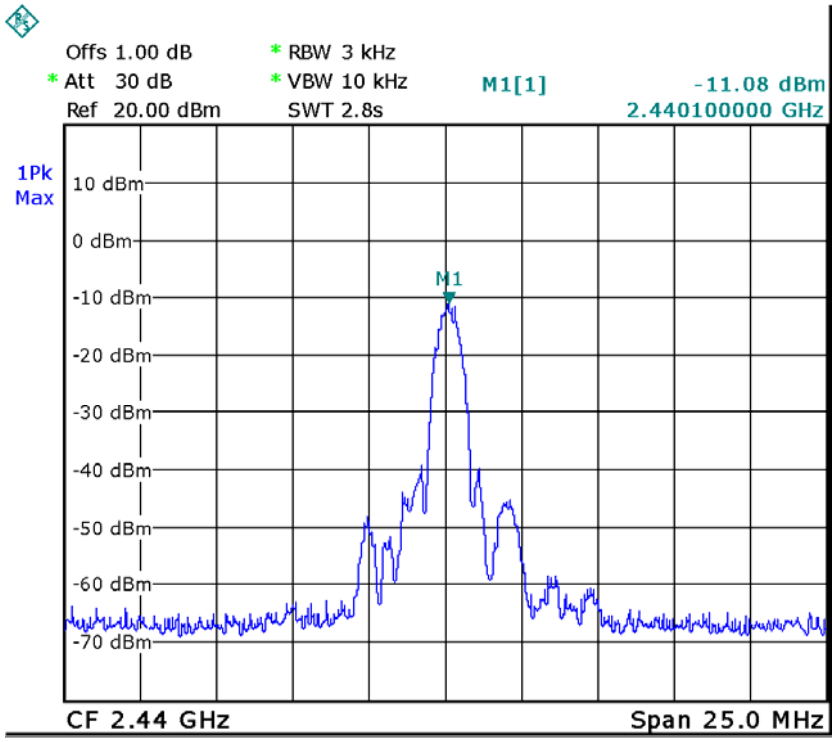
Test Mode : CH00, CH19, CH39 -1Mbps			
Test Channel	Frequency (MHz)	Power Density (dBm)	LIMIT (dBm)
CH00	2402	-11.50	8
CH19	2440	-11.08	8
CH39	2480	-9.34	8

TX CH00



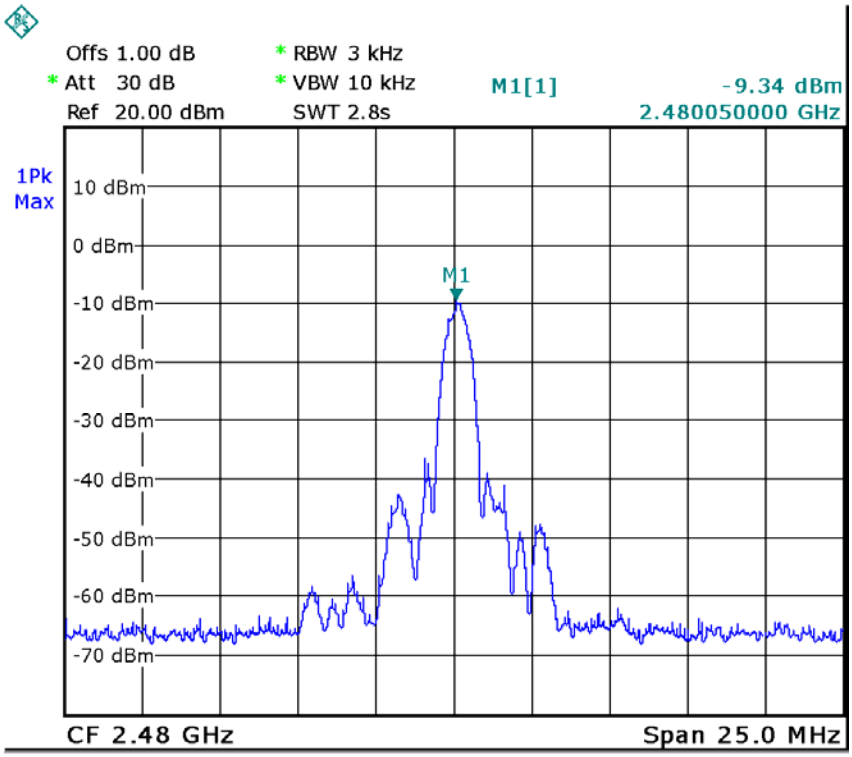
Date: 22.MAY.2014 14:04:51

TX CH19



Date: 22.MAY.2014 14:05:18

TX CH39



Date: 22.MAY.2014 14:04:11