

EMC TEST REPORT

Report No. : EME-070794

Model No. : M01004-M

Issued Date : Aug. 14, 2007

Applicant : ACCO BRANDS, INC
333 Twin Dolphin Drive, Sixth Floor, Redwood Shores,
CA94065, USA

Test By : Intertek Testing Services Taiwan Ltd.
No. 11, Lane 275, Ko-Nan 1 Street, Chia-Tung Li,
Shiang-Shan District, Hsinchu City, Taiwan

This test report consists of 37 pages in total. It may be duplicated completely for legal use with the allowance of the applicant. It shall not be reproduced except in full, without the written approval of Intertek Laboratory. The test result(s) in this report only applies to the tested sample(s).

Project Engineer



Jimmie Liu

Reviewed By



Kevin Chen

Table of Contents

Summary of Tests	3
1. General information	4
1.1 Identification of the EUT	4
1.2 Additional information about the EUT.....	4
1.3 Antenna description.....	4
2. Test specifications	5
2.1 Test standard.....	5
2.2 Operation mode	5
2.3 Test equipment	6
3. Minimum 6dB Bandwidth test	7
3.1 Operating environment.....	7
3.2 Test setup & procedure.....	7
3.3 Measured data of Minimum 6dB Bandwidth test results.....	7
4. Maximum Output Power test	11
4.1 Operating environment.....	11
4.2 Test setup & procedure.....	11
4.3 Measured data of Maximum Output Power test results	11
5. RF Antenna Conducted Spurious test.....	12
5.1 Operating environment.....	12
5.2 Test setup & procedure.....	12
5.3 Measured data of the highest RF Antenna Conducted Spurious test result	12
6. Radiated Emission test	22
6.1 Operating environment.....	22
6.2 Test setup & procedure.....	22
6.3 Emission limits.....	23
6.4 Radiated spurious emission test data.....	24
6.4.1 Measurement results: frequencies equal to or less than 1 GHz.....	24
6.4.2 Measurement results: frequency above 1GHz	25
7. Power Spectrum Density test	28
7.1 Operating environment.....	28
7.2 Test setup & procedure.....	28
7.3 Measured data of Power Spectrum Density test results	28
8. Emission on the band edge.....	32
8.1 Operating environment.....	32
8.2 Test setup & procedure.....	32
8.3 Test Result	33




Summary of Tests

Kensington® SlimBlade™ Media Mouse -Model: M01004-M
FCC ID: GV3M01004-M

Test	Reference	Results
Minimum 6dB Bandwidth test	15.247(a)(2)	Pass
Maximum Output Power test	15.247(b)	Pass
RF Antenna Conducted Spurious test	15.247(d)	Pass
Radiated Spurious Emission test	15.205, 15.209	Pass
Power Spectrum Density test	15.247(e)	Pass
Emission on the Band Edge test	15.247(d)	Pass

1. General information

1.1 Identification of the EUT

Applicant	: ACCO BRANDS, INC
Product	:  Kensington® SlimBlade™ Media Mouse
Model No.	: M01004-M
FCC ID.	: GV3M01004-M
Frequency Range	: 2402~2474MHz
Channel Number	: 13Channels
Frequency of Each Channel	: 2402+6k, k=0~12
Type of Modulation	: GFSK
Rated Power	: 1.5Vdc from battery
Power Cord	: N/A
Sample Received	: Jul. 24, 2007
Test Date(s)	: Aug. 08, 2007~ Aug. 09, 2007

1.2 Additional information about the EUT

The EUT is a  Kensington® SlimBlade™ Media Mouse and was defined as information technology equipment.

For more detail features, please refer to User's manual as file name "Installation guide.pdf"

1.3 Antenna description

The EUT uses a permanently connected antenna.

Antenna Gain: -1.15dBi max

Antenna Type: PCB Printed antenna

Connector Type: N/A

2. Test specifications

2.1 Test standard

The EUT was performed according to the procedures in FCC Part 15 Subpart C Section § 15.205, §15.207, §15.209, §15.247 and ANSI C63.4/2003.

The test of radiated measurements according to FCC Part15 Section 15.33(a) had been conducted and the field strength of this frequency band were all meet limit requirement, thus we evaluate the EUT pass the specified test.

2.2 Operation mode

The EUT was supplied with 1.5Vdc from battery and it was running in modulation test mode.

The EUT was transmitted continuously during the test.

2.3 Test equipment

Equipment	Brand	Frequency range	Model No.	Intertek ID No.	Next Cal. Date
EMI Test Receiver	Rohde & Schwarz	9kHz~2.75GHz	ESCS 30	EC303	04/17/2008
Spectrum Analyzer	Rohde & Schwarz	9kHz~30GHz	FSP 30	EC353	08/06/2008
Spectrum Analyzer	Rohde & Schwarz	20Hz~40GHz	FSEK 30	EC365	11/12/2007
Horn Antenna	SCHWARZBECK	1GHz~18GHz	BBHA 9120 D	EC371	03/04/2008
Horn Antenna	SCHWARZBECK	14GHz~40GHz	BBHA 9170	EC351	08/08/2008
Bilog Antenna	SCHWARZBECK	25MHz~2GHz	VULB 9168	EC347	12/23/2007
Pre-Amplifier	MITEQ	100MHz~26.5GHz	919981	EC373	03/18/2009
Wideband Peak Power Meter/ Sensor	Anritsu	100MHz~18GHz	ML2497A/ MA2491A	EC396	11/12/2007
Controller	HDGmbH	N/A	CM 100	EP346	N/A
Antenna Tower	HDGmbH	N/A	MA 240	EP347	N/A
LISN	Rohde & Schwarz	9KHz~30MHz	ESH3-Z5	EC344	03/30/2008

Note: The above equipments are within the valid calibration period.



3. Minimum 6dB Bandwidth test

3.1 Operating environment

Temperature: 25
Relative Humidity: 54 %
Atmospheric Pressure: 1023 hPa

3.2 Test setup & procedure


The minimum 6dB bandwidth per FCC §15.247(a)(2) was measured using a 50 ohm spectrum analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 100kHz, and the SPAN>>RBW. The test was performed at 3 channels (lowest, middle and highest channel). The minimum 6-dB modulation bandwidth is in the following Table.

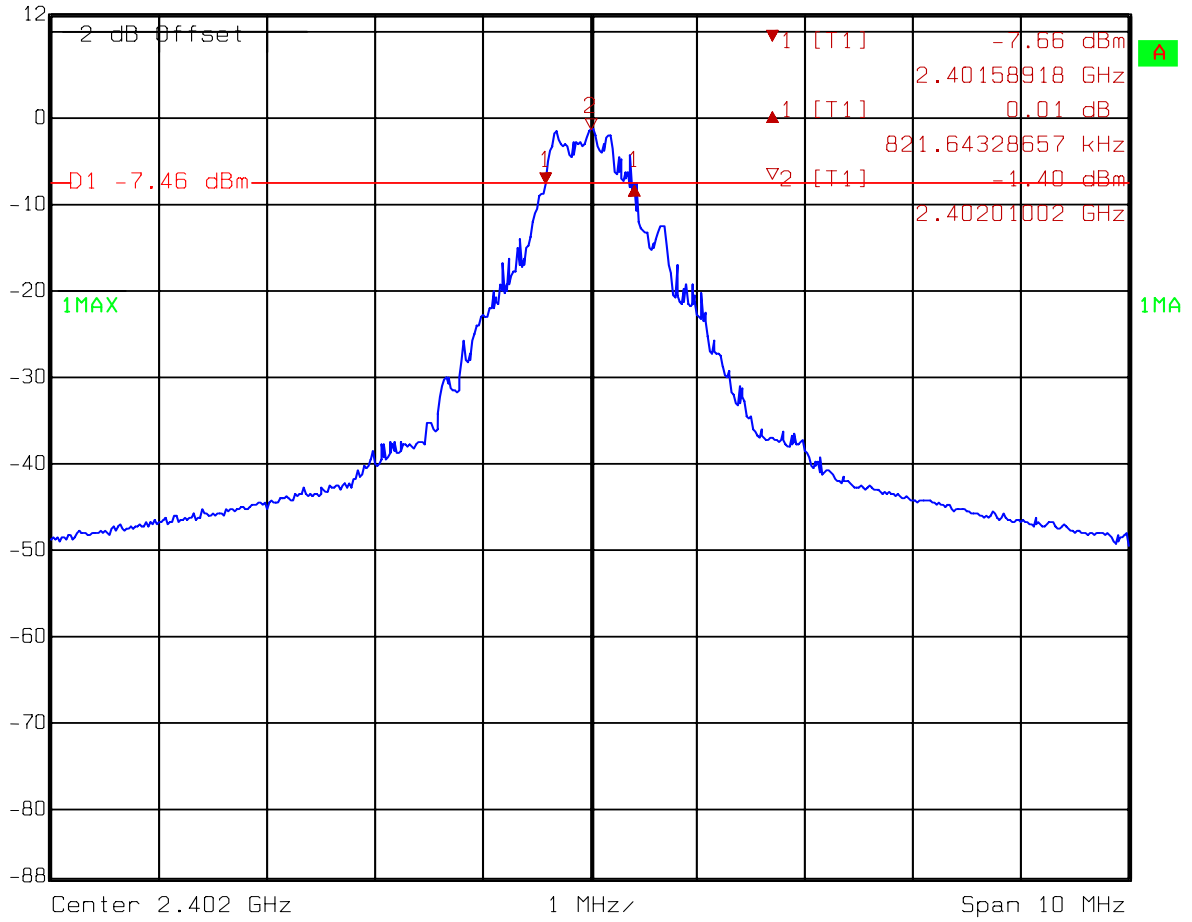
3.3 Measured data of Minimum 6dB Bandwidth test results

Channel	Frequency (MHz)	Bandwidth (kHz)	Limit
0 (lowest)	2402	821.64	> 500kHz
6 (middle)	2438	821.64	> 500kHz
12 (highest)	2474	841.68	> 500kHz

Please see the plot below.


Test mode: CH0

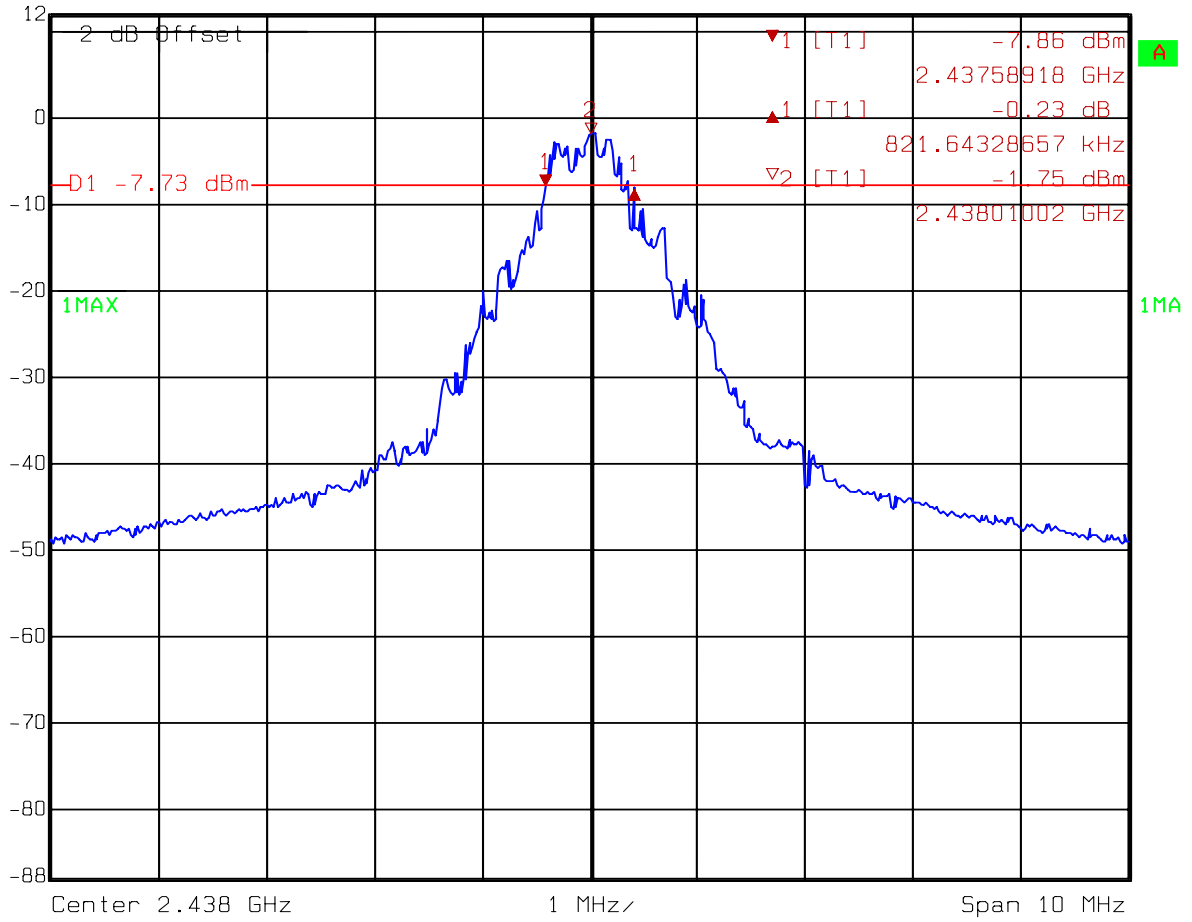
	Delta 1 [T1]	RBW	100 kHz	RF Att	20 dB
	Ref Lvl	0.01 dB	VBW	100 kHz	
	12 dBm	821.64328657 kHz	SWT	5 ms	Unit



Title: 6dB Band-Width
 Comment A: CH 0
 Date: 08.AUG.2007 14:53:27


Test mode: CH6

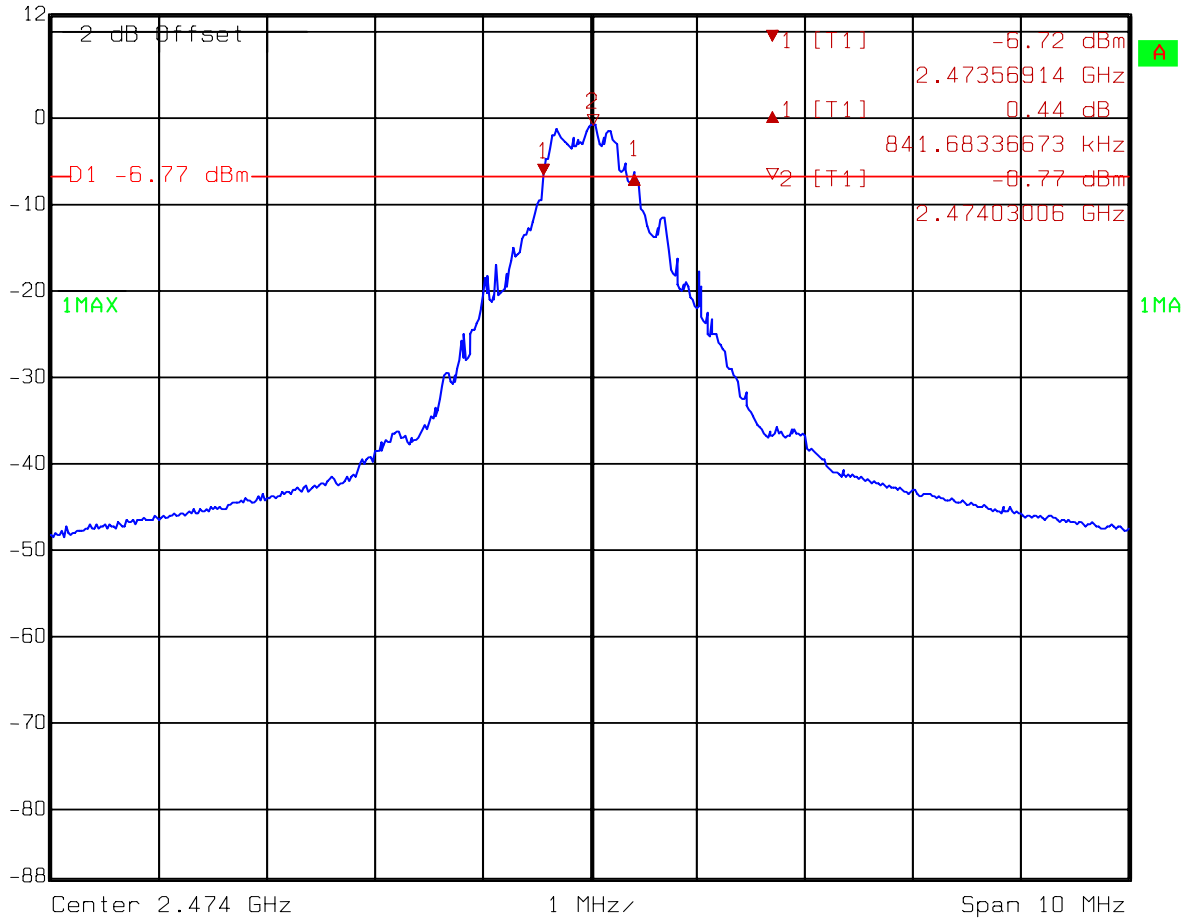
	Delta 1 [T1]	RBW	100 kHz	RF Att	20 dB
	Ref Lvl	-0.23 dB	VBW	100 kHz	
	12 dBm	821.64328657 kHz	SWT	5 ms	Unit



Title: 6dB Band-Width
 Comment A: CH 6
 Date: 08.AUG.2007 15:08:56

Test mode: CH12

 Delta 1 [T1] RBW 100 kHz RF Att 20 dB
Ref Lvl 0.44 dB VBW 100 kHz
12 dBm 841.68336673 kHz SWT 5 ms Unit dBm



Title: 6dB Band-Width
Comment A: CH 12
Date: 08.AUG.2007 14:43:22

4. Maximum Output Power test

4.1 Operating environment

Temperature: 25
Relative Humidity: 56 %
Atmospheric Pressure: 1023 hPa

4.2 Test setup & procedure

The power output per FCC §15.247(b) was measured on the EUT using a 50 ohm SMA cable connected to peak power meter via power sensor. Power was read directly and cable loss correction (2 dB) was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel).

4.3 Measured data of Maximum Output Power test results

Channel	Freq. (MHz)	C.L. (dB)	Reading (dBm)	Conducted Peak Output Power		Limit (W)
				(dBm)	(mW)	
0	25	2	-3.29	-1.29	0.74	1
6	25	2	-3.43	-1.43	0.97	1
12	25	2	-2.52	-0.52	0.99	1

Remark:

Conducted Peak Output Power = Reading + C.L.

5. RF Antenna Conducted Spurious test

5.1 Operating environment

Temperature: 25
Relative Humidity: 58 %

5.2 Test setup & procedure

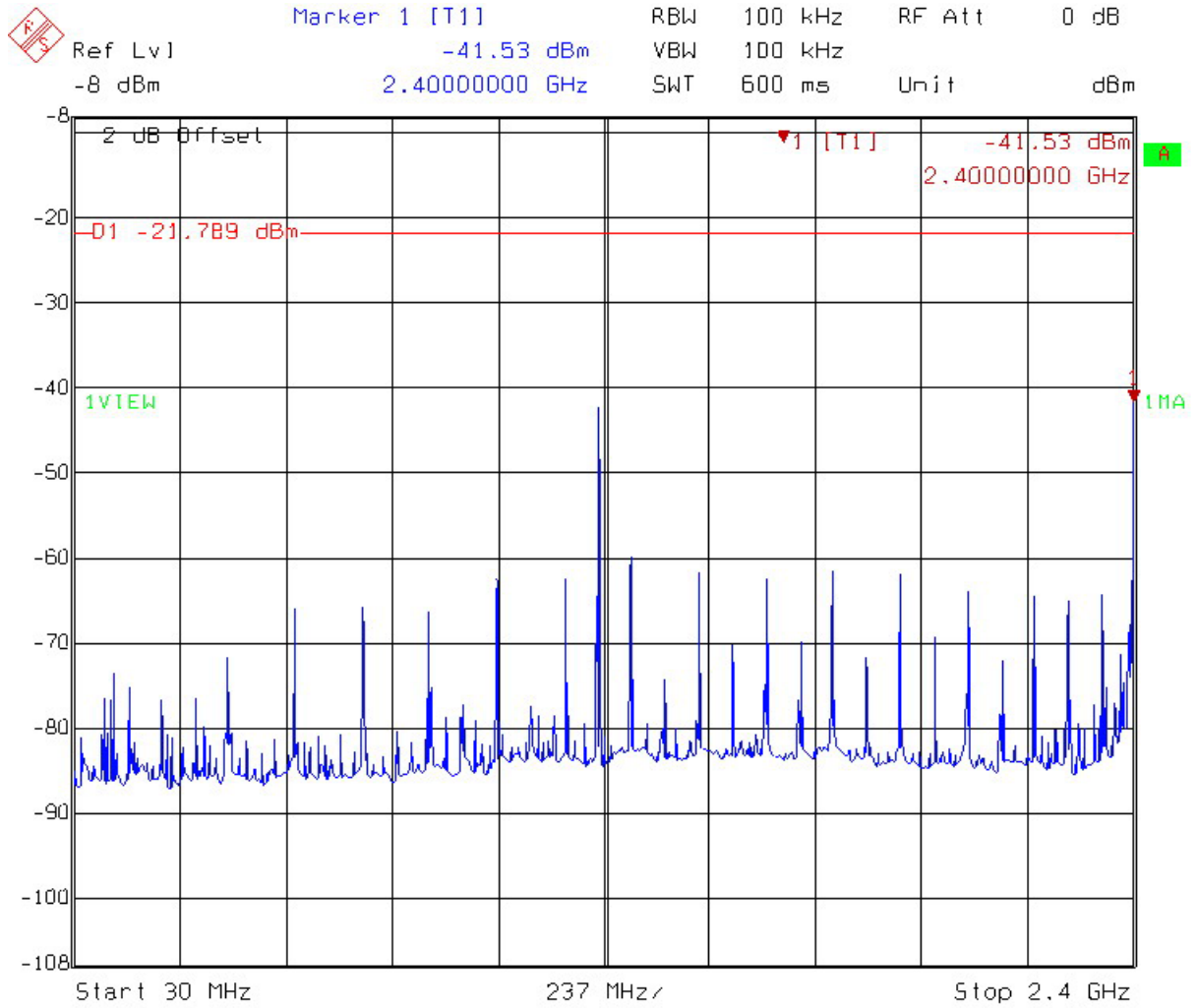
The measurements were performed from 30MHz to 25GHz RF antenna conducted per FCC 15.247 (d) was measured from the EUT antenna port using a 50ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz.

Harmonics and spurious noise must be at least 20dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel.

5.3 Measured data of the highest RF Antenna Conducted Spurious test result

The test results please see the plot below.

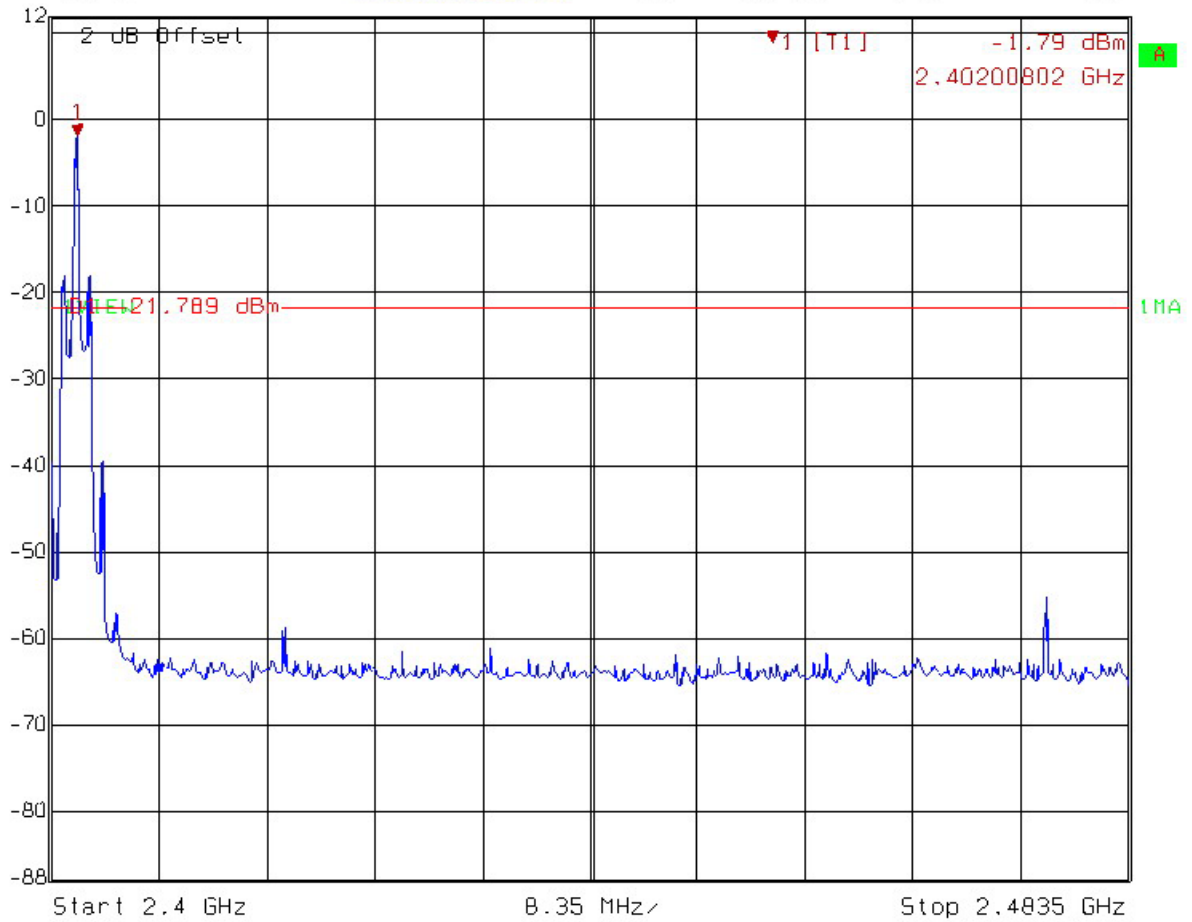
Test mode: CH0



Title: Spurious
Comment A: CH 0 at 30MHz~2400MHz
Date: 08.AUG.2007 13:00:50

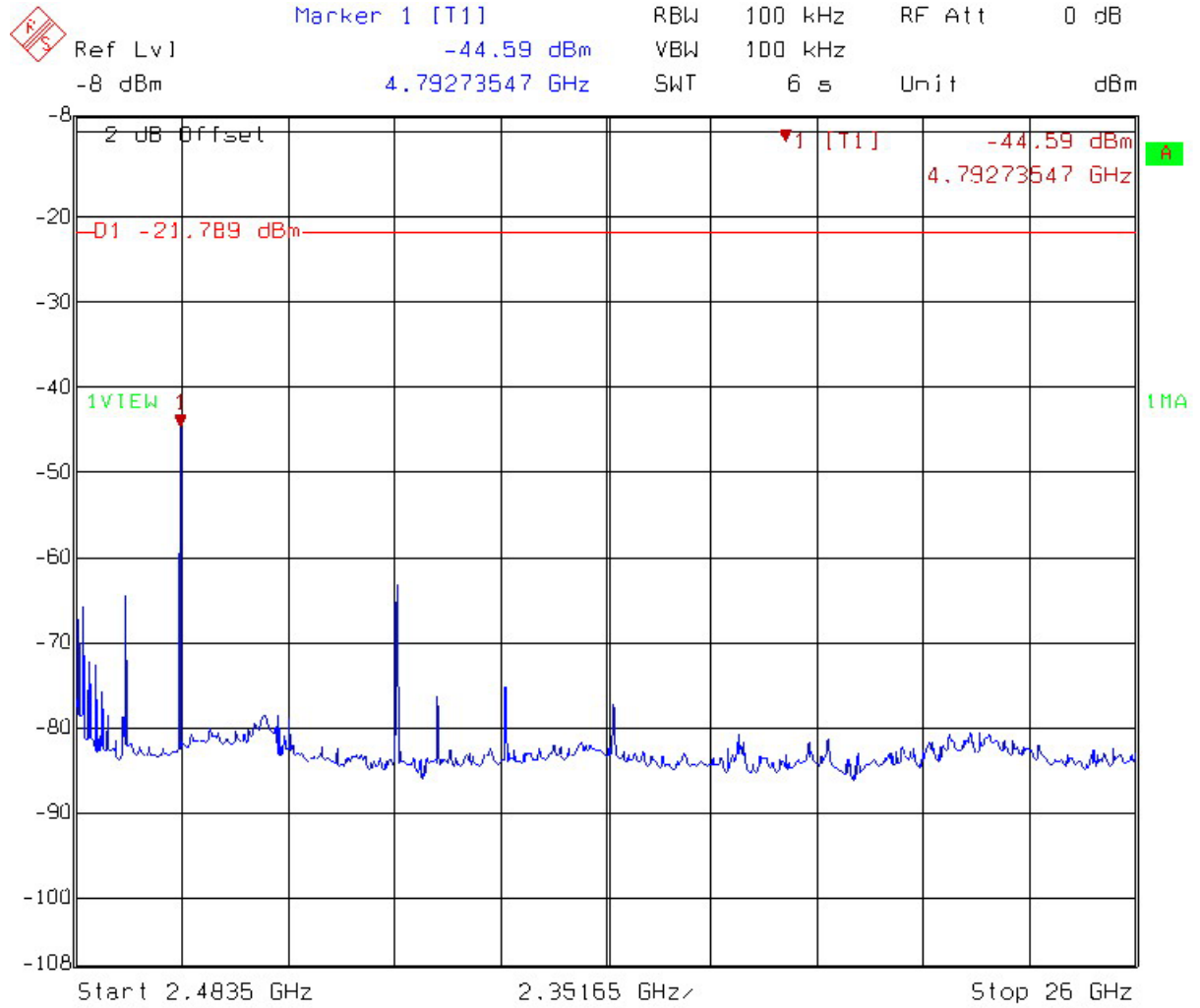
Test mode: CH0

	Ref Lvl	Marker 1 [T1]	RBW	100 kHz	RF Att	20 dB
	12 dBm	-1.79 dBm	VBW	100 kHz		
		2.40200802 GHz	SWT	21 ms	Unit	dBm



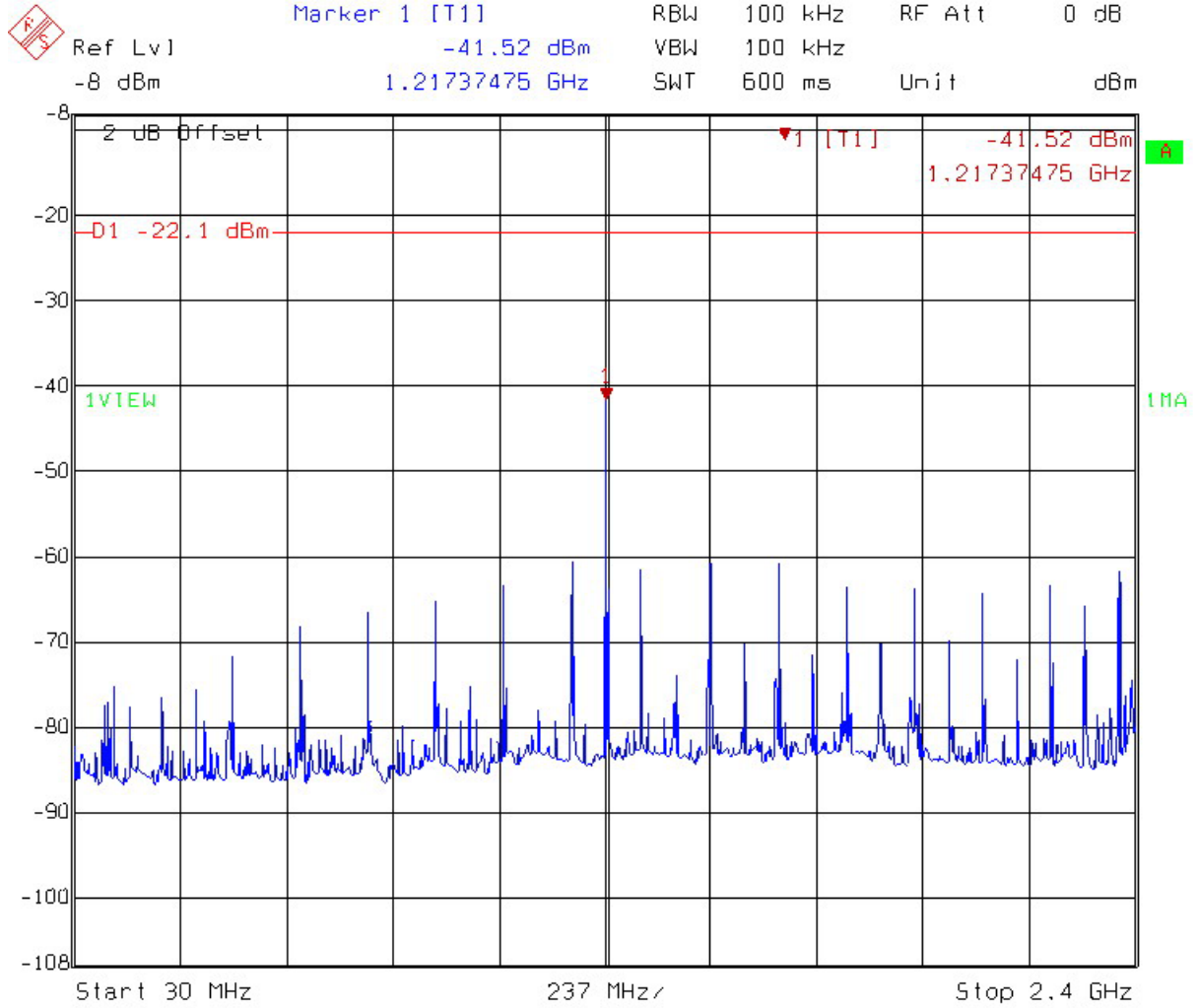
Title: Spurious
 Comment A: CH 0 at 2400MHz~2483.5MHz
 Date: 08.AUG.2007 13:00:28

Test mode: CH0



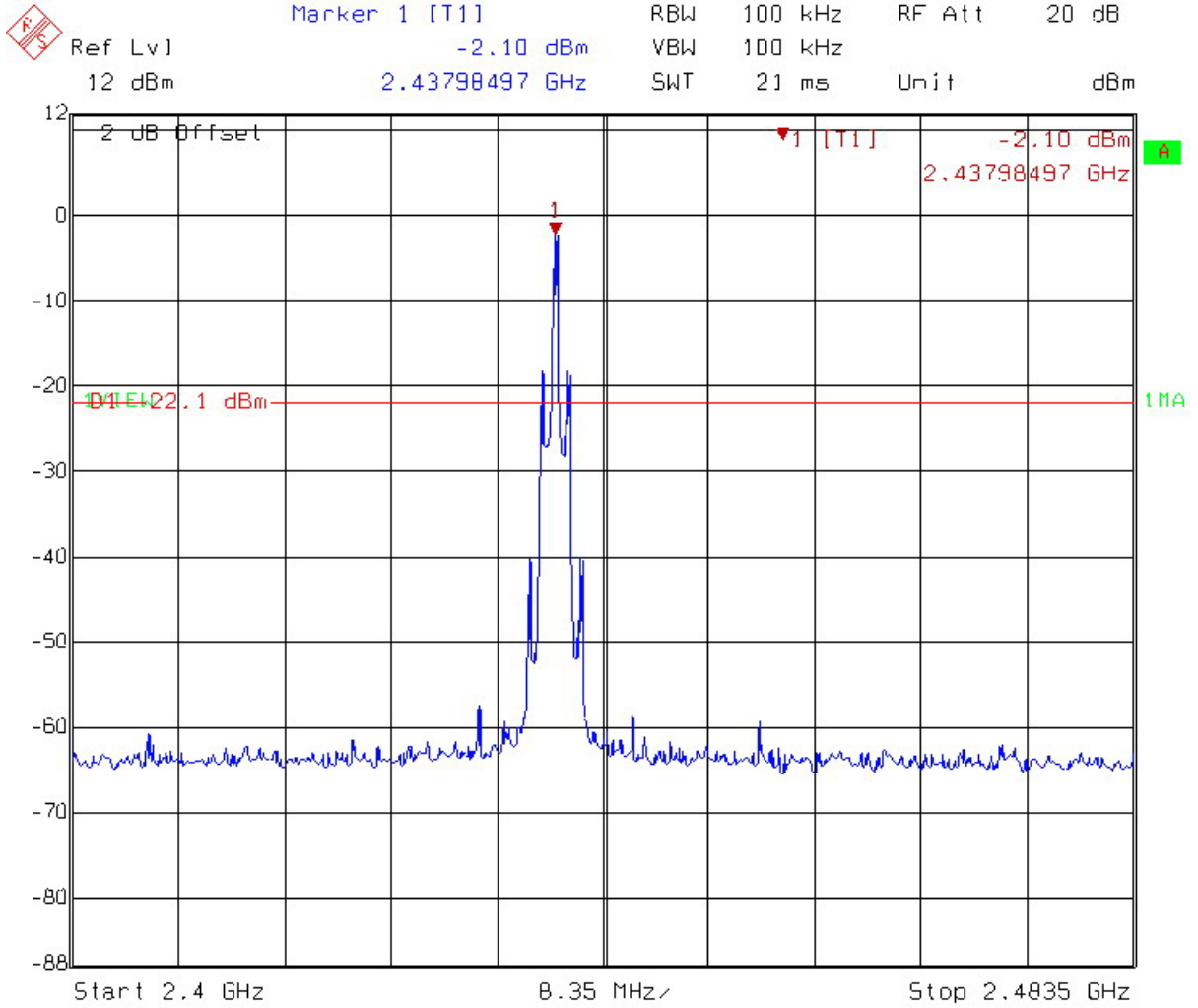
Title: Spurious
 Comment A: CH 0 at 2483.5MHz~26000MHz
 Date: 08.AUG.2007 13:01:18

Test mode: CH6



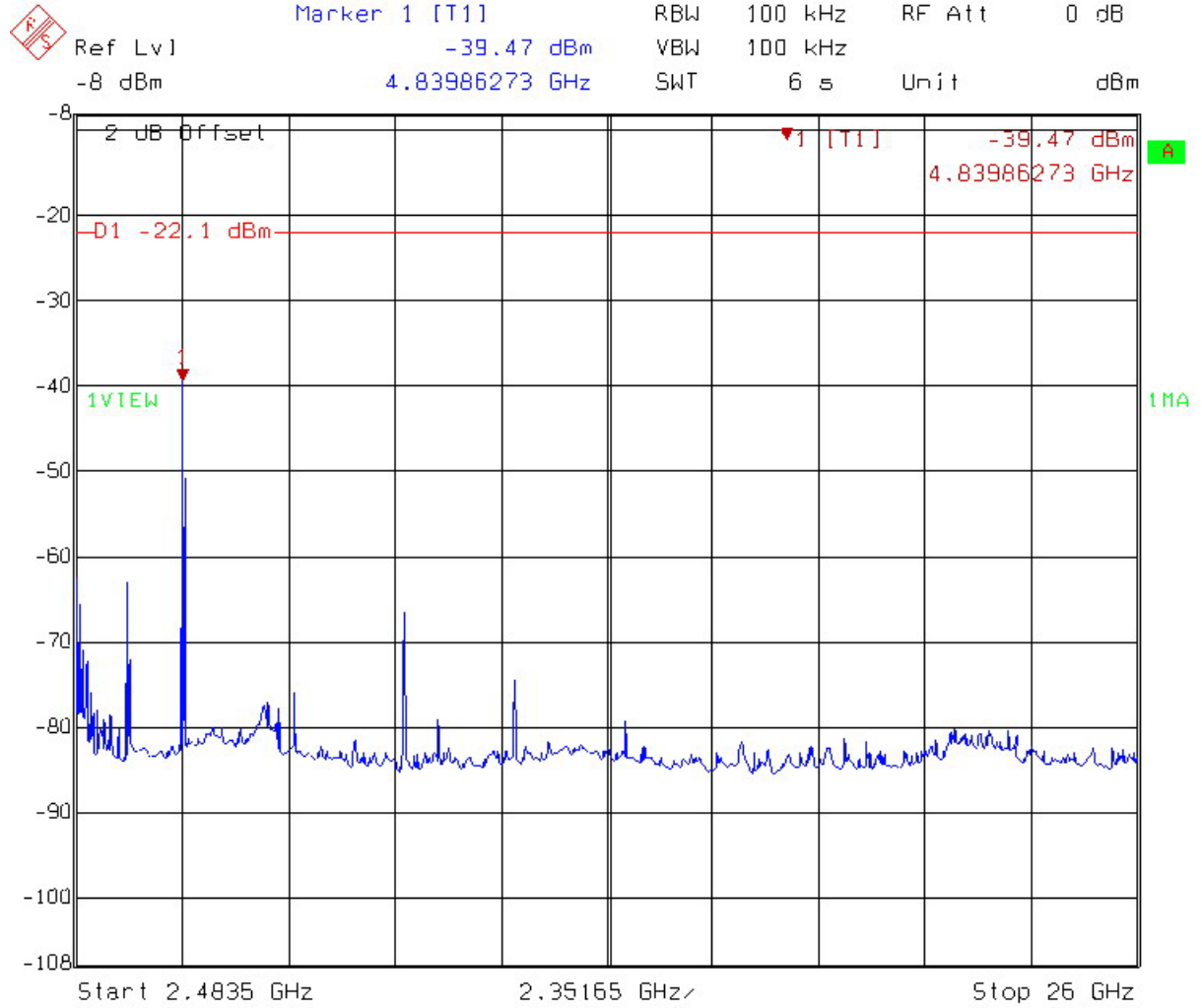
Title: Spurious
Comment A: CH 6 at 30MHz~2400MHz
Date: 08.AUG.2007 13:05:25

Test mode: CH6



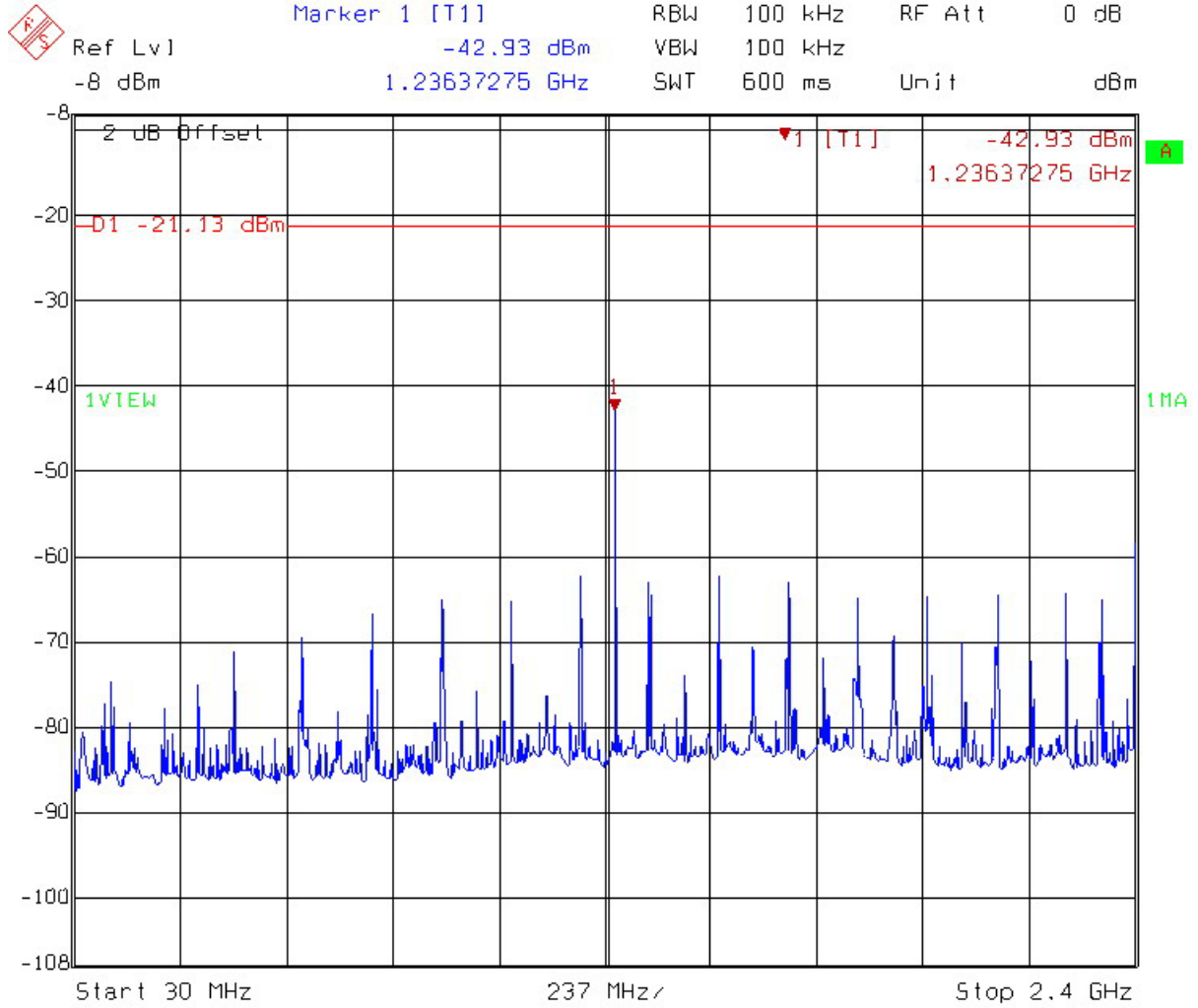
Title: Spurious
 Comment A: CH 6 at 2400MHz~2483.5MHz
 Date: 08.AUG.2007 13:05:04

Test mode: CH6



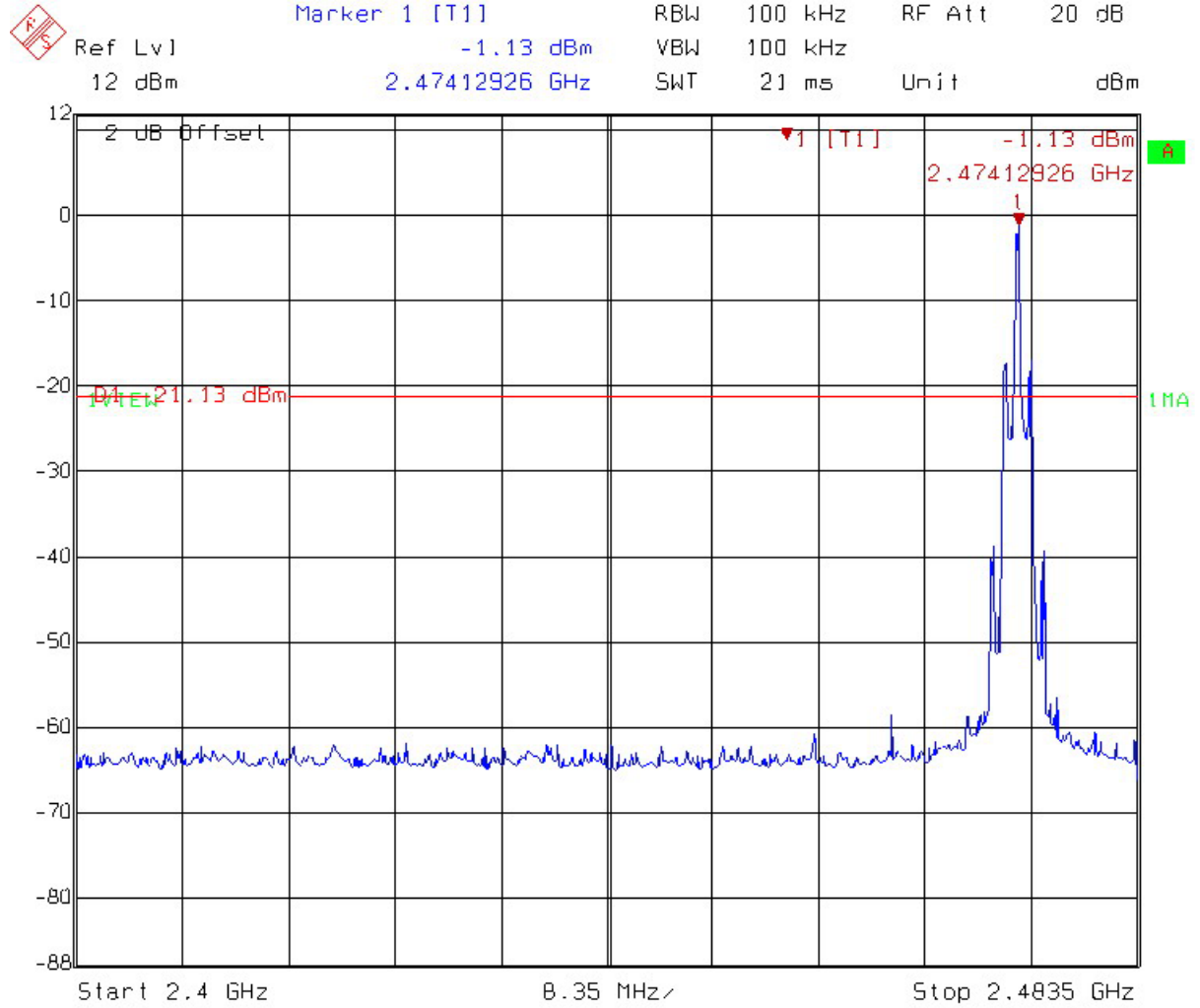
Title: Spurious
 Comment A: CH 6 at 2483.5MHz~26000MHz
 Date: 08.AUG.2007 13:05:54

Test mode: CH12



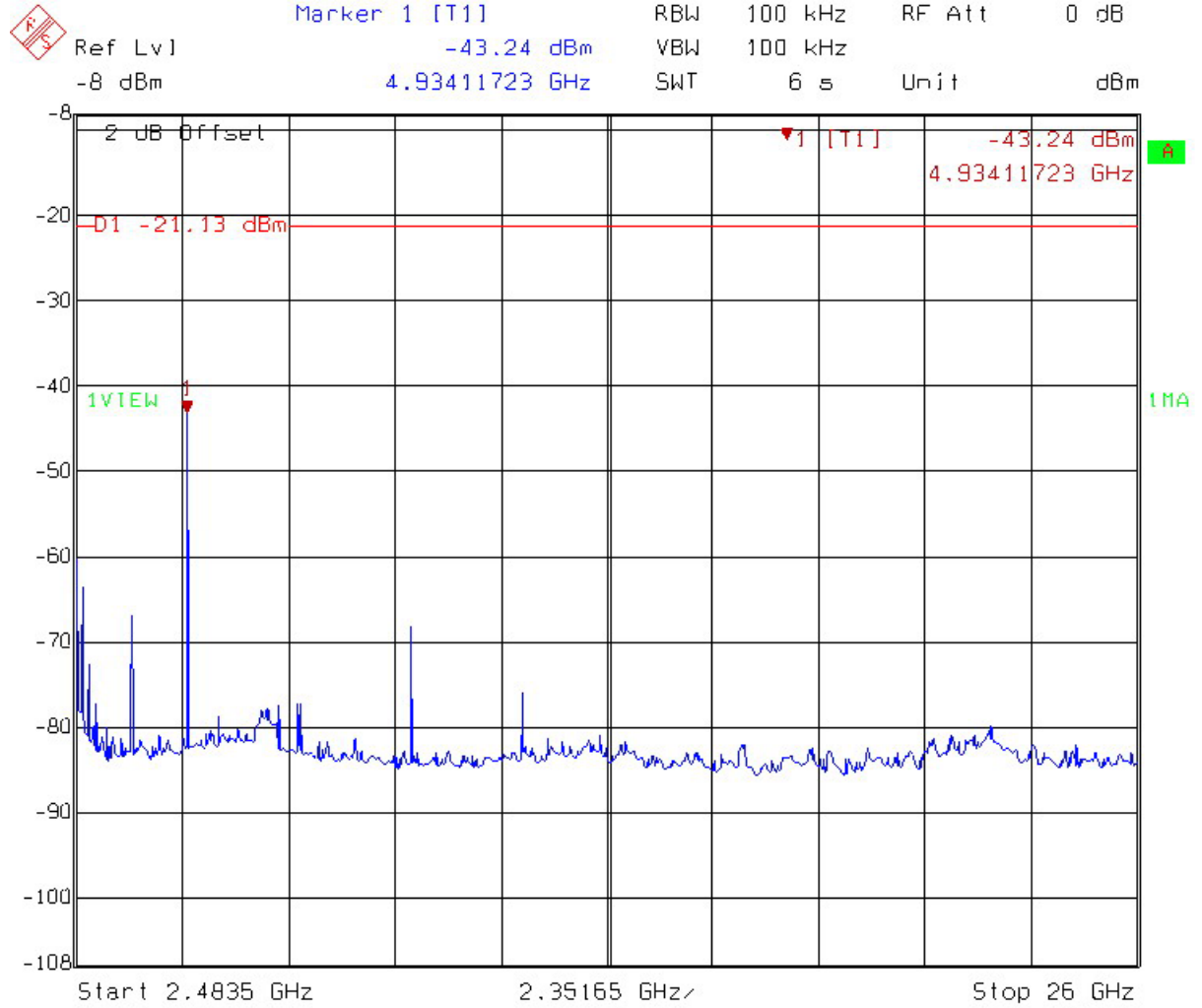
Title: Spurious
Comment A: CH 12 at 30MHz~2400MHz
Date: 08.AUG.2007 13:07:42

Test mode: CH12



Title: Spurious
 Comment A: CH 12 at 2400MHz~2483.5MHz
 Date: 08.AUG.2007 13:07:20

Test mode: CH12



Title: Spurious
 Comment A: CH 12 at 2483.5MHz~26000MHz
 Date: 08.AUG.2007 13:08:10

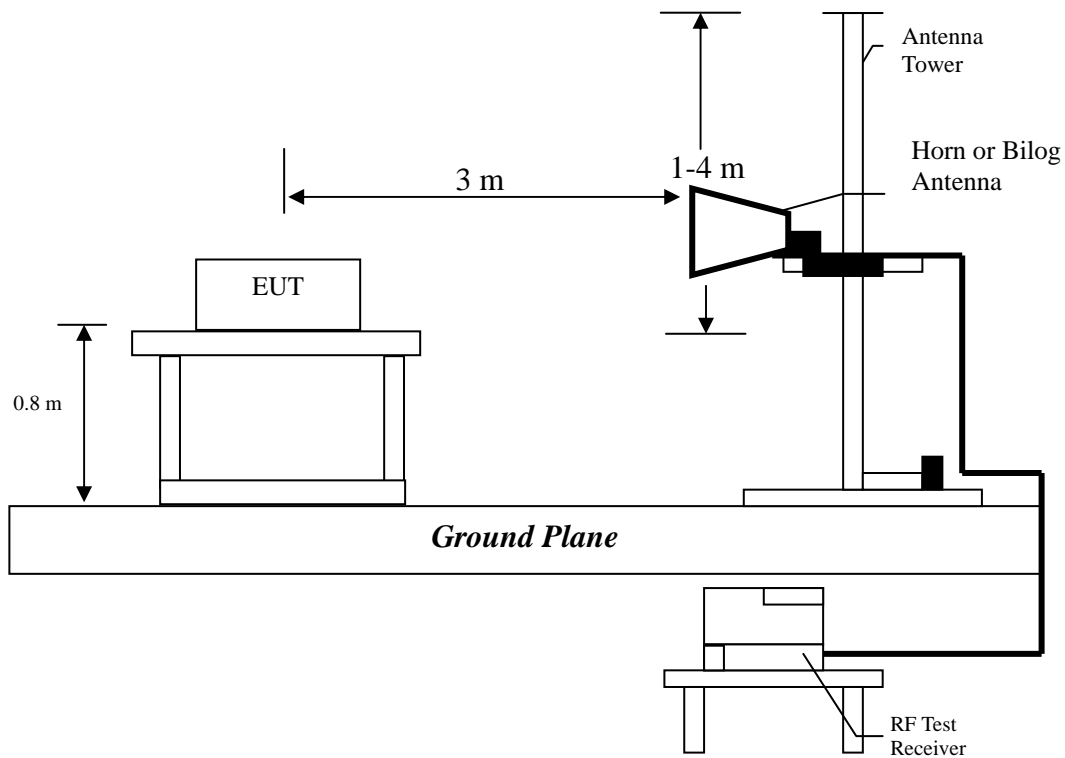
6. Radiated Emission test

6.1 Operating environment

Temperature: 25
 Relative Humidity: 55 %
 Atmospheric Pressure: 1023 hPa

6.2 Test setup & procedure

The Diagram below shows the test setup, which is utilized to make these measurements.



The frequency range from 30MHz to 1000MHz using Bilog Antenna.
 The frequency range over 1GHz using Horn Antenna.

Radiated emissions were investigated cover the frequency range from 30MHz to 1000MHz using a receiver RBW of 120kHz record QP reading, and the frequency over 1GHz using a spectrum analyzer RBW of 1MHz and 10Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1MHz RBW/VBW) recorded also on the report.
 The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meter reading using inverse scaling with distance.

The EUT configuration please refer to the “Spurious set-up photo.pdf”.

6.3 Emission limits

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Limits (dB μ V/m@3m)
30-88	40
88-216	43.5
216-960	46
Above 960	54

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Uncertainty was calculated in accordance with NAMAS NIS 81.

Expanded uncertainty (k=2) of radiated emission measurement is ± 4.98 dB.

6.4 Radiated spurious emission test data

6.4.1 Measurement results: frequencies equal to or less than 1 GHz

The test was performed on EUT under continuously transmitting mode. Channel 0, 6, 12 were verified. The worst case occurred at Tx channel 0.

EUT : M01004-M
 Worst Case : Tx at channel 0

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	153.190	QP	15.83	3.95	19.78	43.50	-23.72
V	275.410	QP	13.24	5.16	18.40	46.00	-27.61
V	580.960	QP	20.71	5.32	26.03	46.00	-19.97
H	142.520	QP	13.24	5.46	18.70	43.50	-24.81
H	199.750	QP	11.27	6.28	17.55	43.50	-25.96
H	515.000	QP	18.77	5.28	24.05	46.00	-21.95

Remark:

1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

6.4.2 Measurement results: frequency above 1GHz

EUT : M01004-M

Test Condition : Tx at channel 0

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4804.00	PK	V	36.07	37.77	43.27	44.97	54	-9.03

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is :

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV

EUT : M01004-M
 Test Condition : Tx at channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4876.00	PK	V	36.07	37.77	44.46	46.16	54	-7.84

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz. The data value listed above which is higher than the noise floor, the others please refer to noise floor level.

Noise floor level is:

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV



EUT : M01004-M
Test Condition : Tx at channel 12

No spurious emission was found above the spectrum analyzer's noise floor

Noise floor level is:

For PK:

1GHz-3GHz: 20dBuV

3GHz-14GHz: 27dBuV

14GHz-26.5GHz: 39dBuV

For AV:

1GHz-3GHz: 10dBuV

3GHz-14GHz: 16dBuV

14GHz-26.5GHz: 28dBuV

7. Power Spectrum Density test

7.1 Operating environment

Temperature: 25
Relative Humidity: 56 %
Atmospheric Pressure 1023 hPa

7.2 Test setup & procedure


The power spectrum density per FCC §15.247(e) was measured from the antenna port of the EUT using a 50ohm spectrum analyzer with the resolution bandwidth set at 3kHz, the video bandwidth set at 10kHz, a span of 1.5MHz, and the sweep time set at 500 seconds. Power Density was read directly correction was added to the reading to obtain power at the EUT antenna terminals. The test was performed at 3 channels (lowest, middle and highest channel). The Power Spectral Density measured result is in the following table.

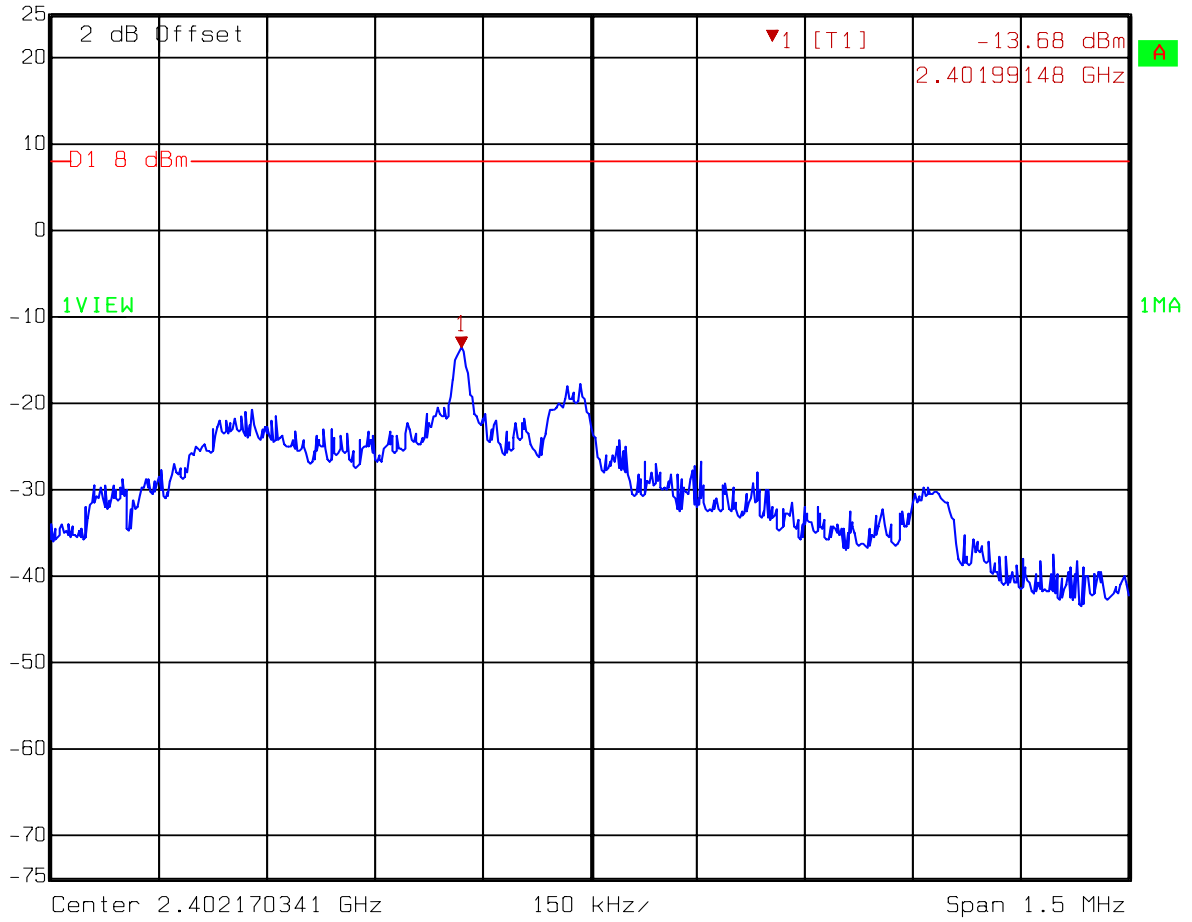
7.3 Measured data of Power Spectrum Density test results

Channel	Frequency (MHz)	Cable loss (dB)	Power spectrum density (dBm)	Limit (dBm)
0 (lowest)	2402	2	-13.68	8
6 (middle)	2438	2	-13.83	8
12 (highest)	2474	2	-13.19	8

Please see the plot below.


Test mode: CH0

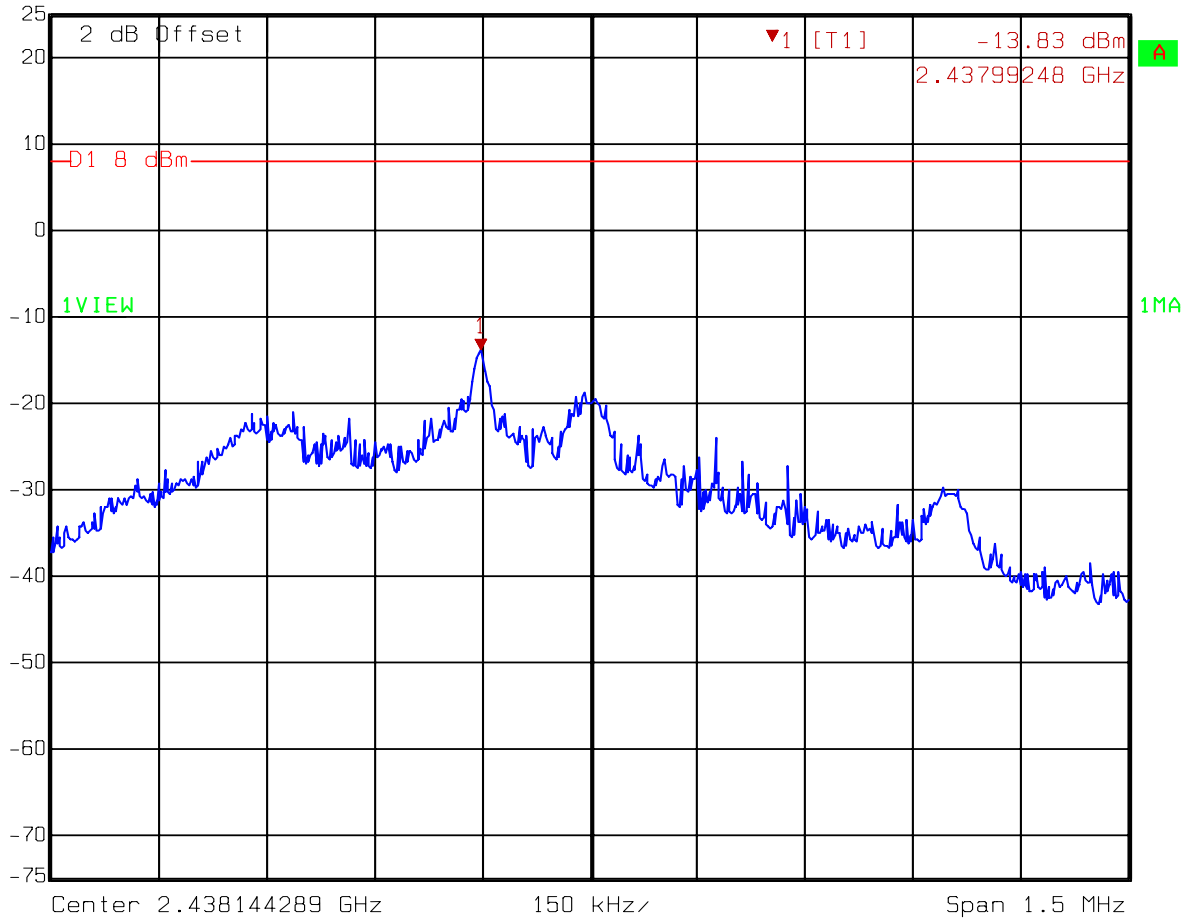
	Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	25 dBm	-13.68 dBm	VBW	10 kHz		
		2.40199148 GHz	SWT	500 s	Unit	dBm



Title: Power density
 Comment A: CH 0 2402MHz
 Date: 08.AUG.2007 13:37:03


Test mode: CH6

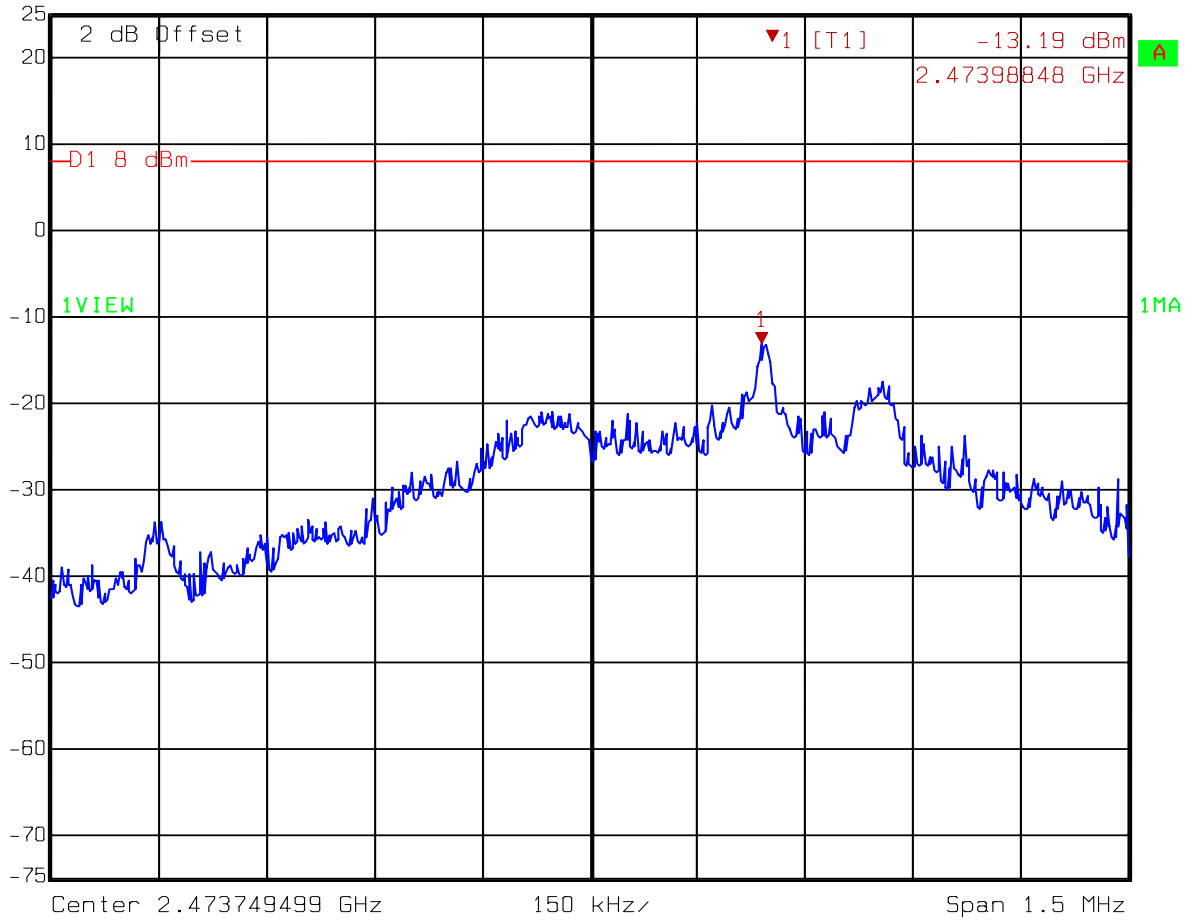
	Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	25 dBm	-13.83 dBm	VBW	10 kHz		
		2.43799248 GHz	SWT	500 s	Unit	dBm



Title: Power density
 Comment A: CH 6 2438MHz
 Date: 08.AUG.2007 13:52:04

Test mode: CH12

	Ref Lvl	Marker 1 [T1]	RBW	3 kHz	RF Att	50 dB
	25 dBm	-13.19 dBm	VBW	10 kHz		
		2.47398848 GHz	SWT	500 s	Unit	dBm



Title: Power density
 Comment A: CH 12 2474MHz
 Date: 08.AUG.2007 13:25:17

8. Emission on the band edge

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 KHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Radiated emissions, which fall in the restricted band, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a).

8.1 Operating environment

Temperature:	25	
Relative Humidity:	56	%
Atmospheric Pressure	1023	hPa

8.2 Test setup & procedure

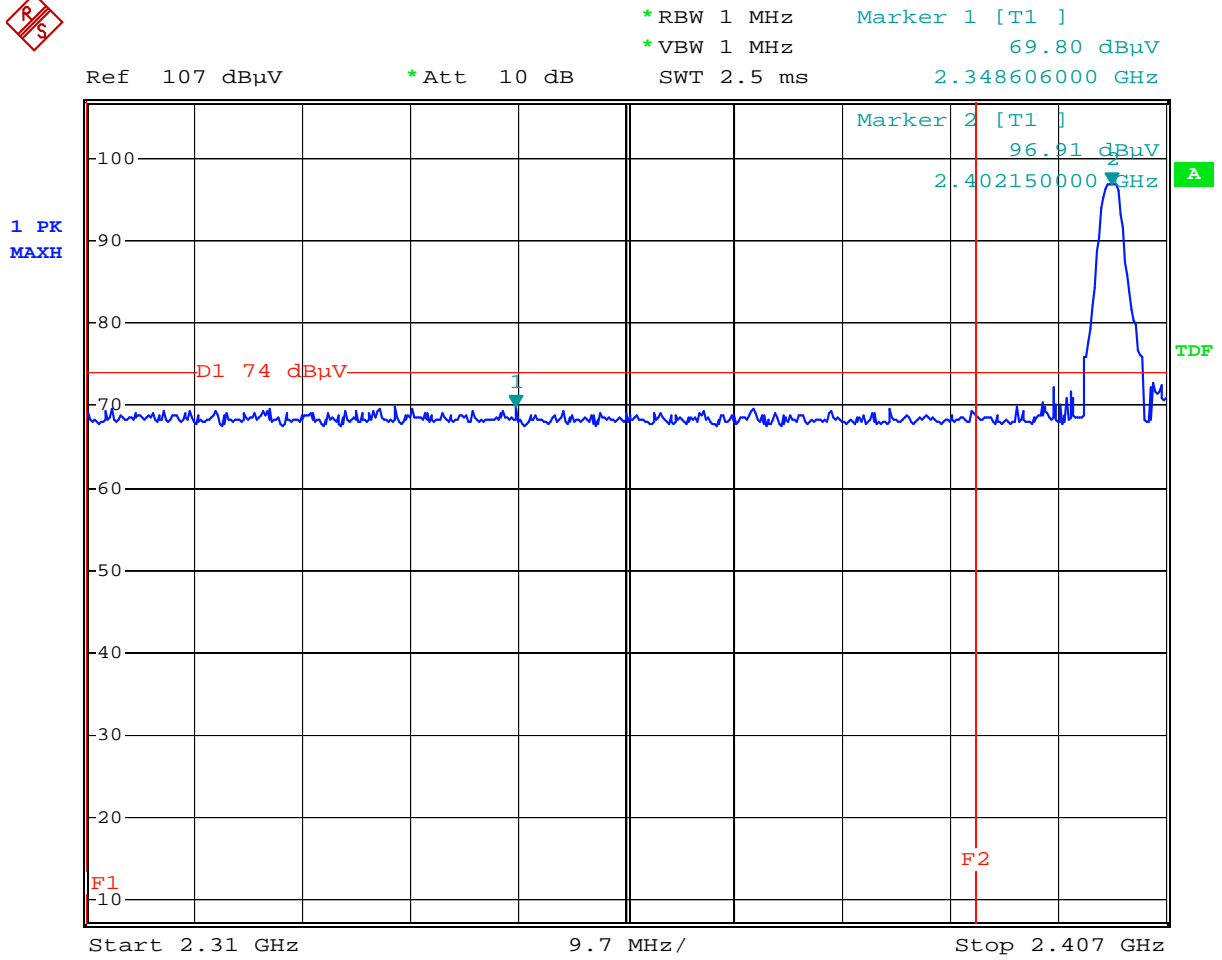
Please refer to the clause 6.2 of this report.

8.3 Test Result

Channel	Measurement Freq.Band (MHz)	Detector	The Max. Field Strength in Restrict Band (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
1 (lowest)	2310-2390	PK	69.80	74	-4.2
		AV	47.59	54	-6.41
12 (highest)	2483.5-2500	PK	72.04	74	-1.96
		AV	47.85	54	-6.15

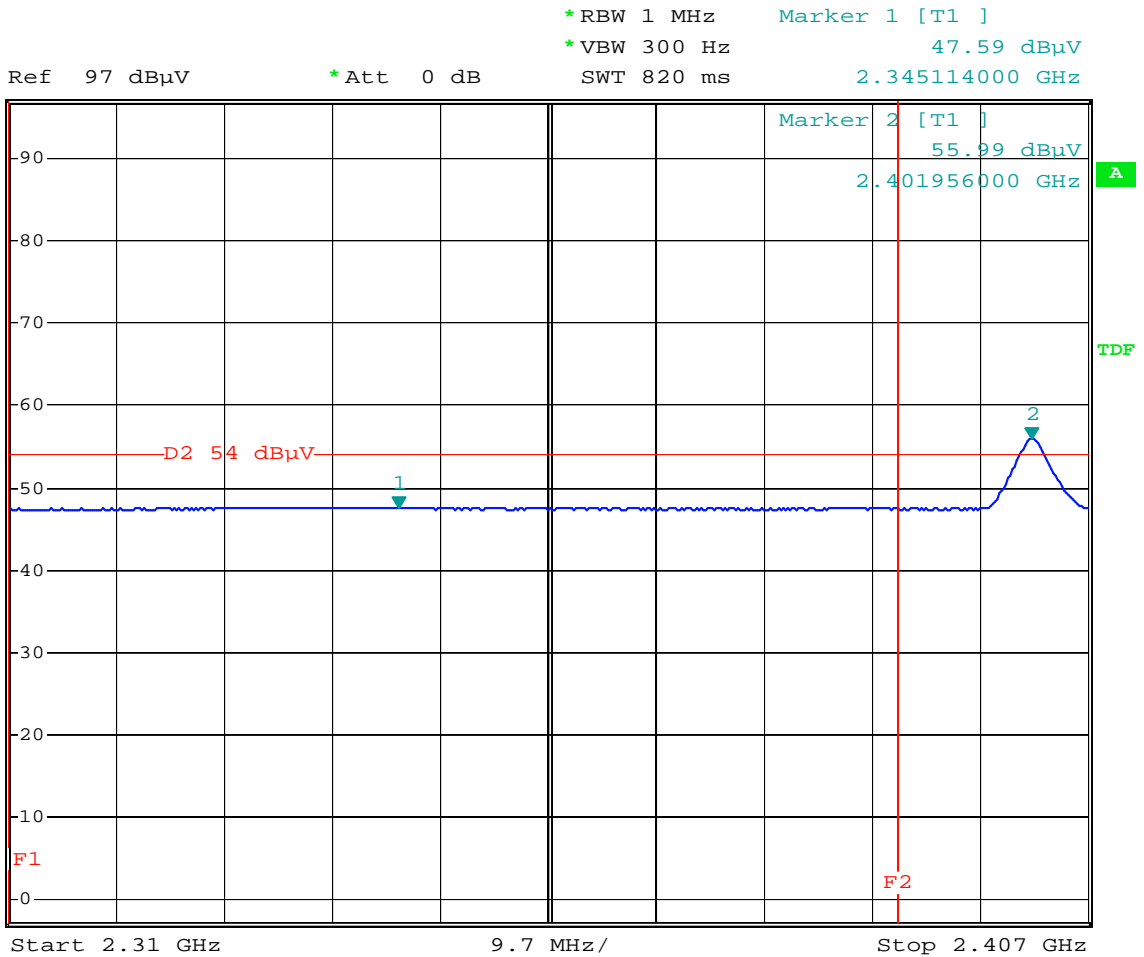
Note: Please see the plot below.

Test mode: CH0 PK



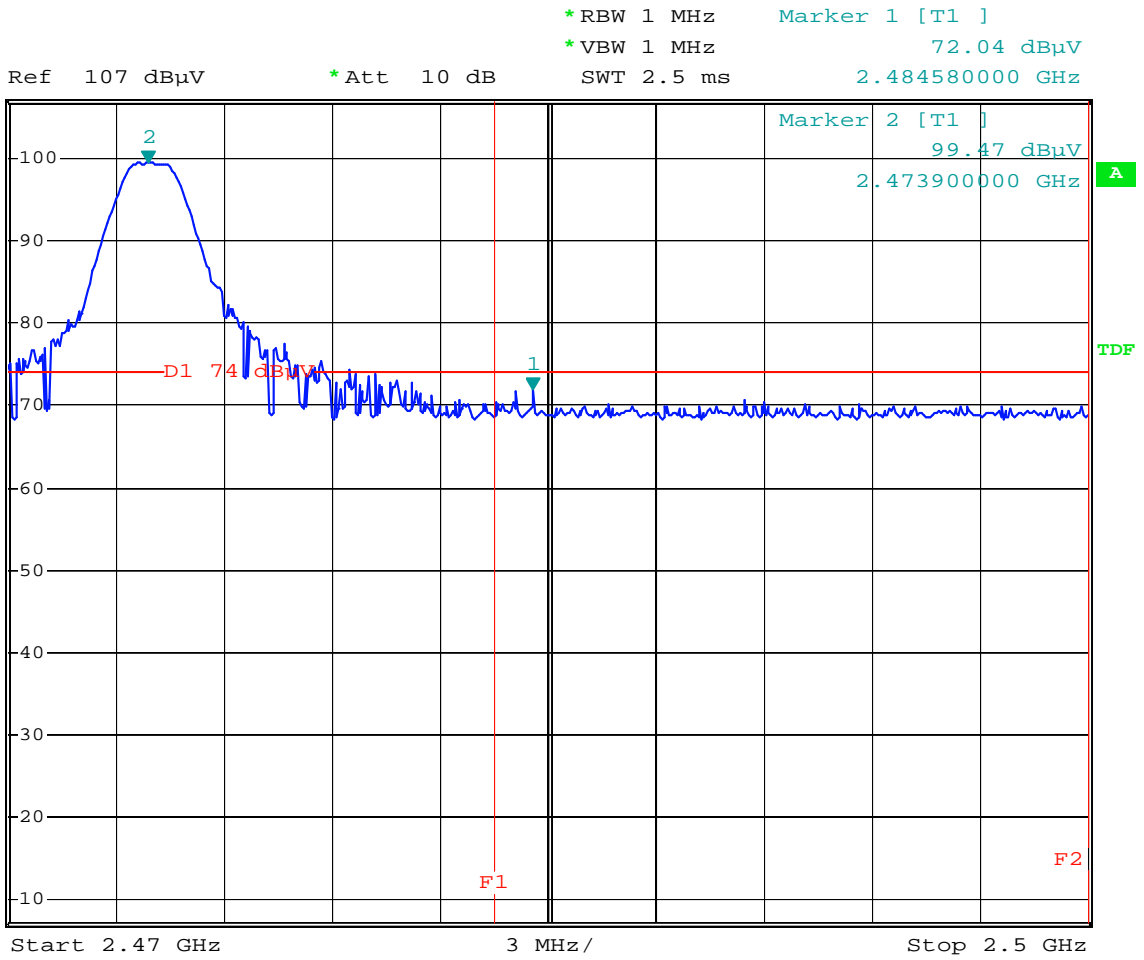
Comment: band edge 2402 PK
Date: 8.AUG.2007 10:04:19

Test mode: CH0 AV



Comment: band edge 2402 AV
Date: 8.AUG.2007 09:59:30

Test mode: CH12 PK

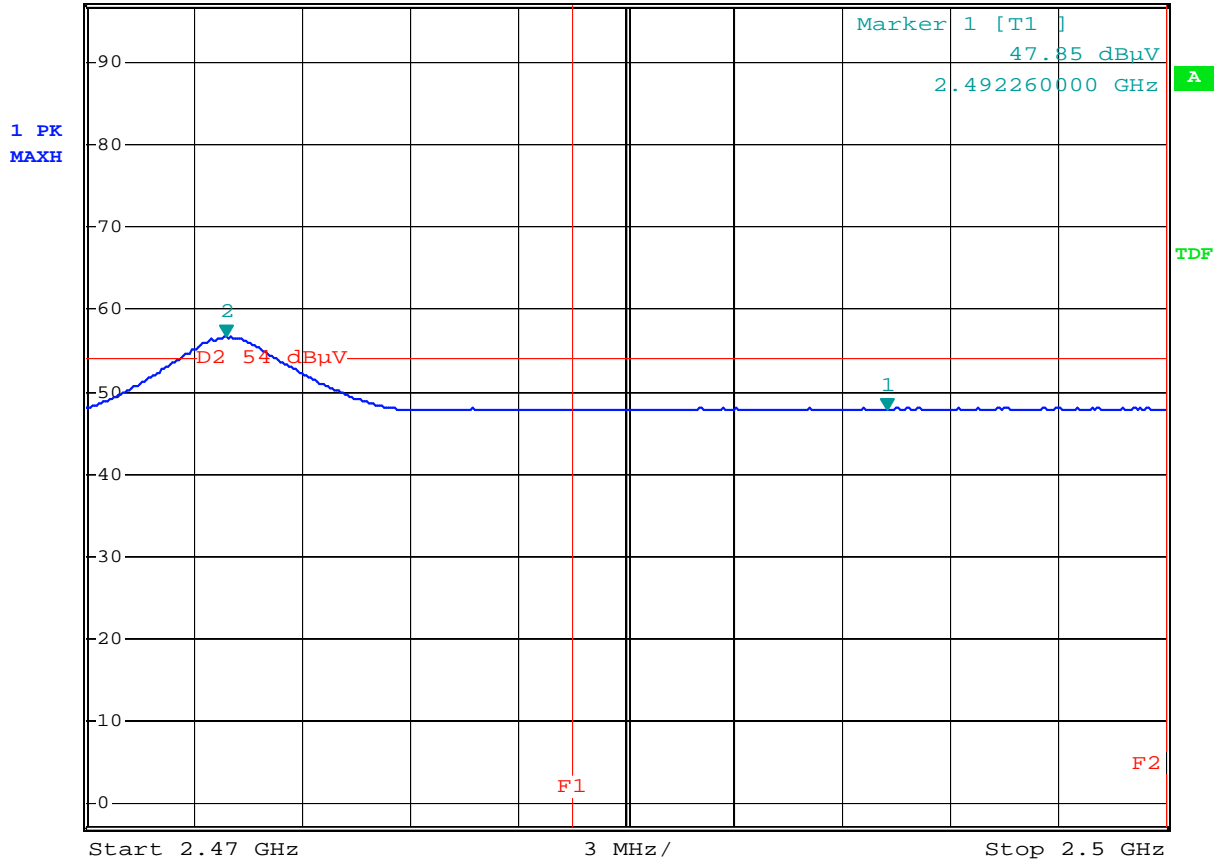


Comment: band edge 2474 PK
 Date: 8.AUG.2007 10:21:26

Test mode: CH12 AV



Ref 97 dB μ V *Att 0 dB *RBW 1 MHz Marker 2 [T1]
 *VBW 300 Hz 56.70 dB μ V
 SWT 250 ms 2.473900000 GHz



Comment: band edge 2474 AV
 Date: 8.AUG.2007 10:11:34