




**Nemko Test Report:** 10949Rev1

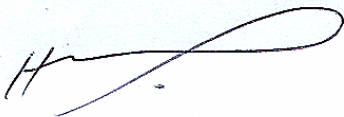
**Applicant:** Crane WMS Signal Technology  
1829 Preston Park, Blvd.  
Suite 2800  
Plano, TX 75093

**Equipment Under Test:  
(E.U.T.)** RTV2400 Radio Module

**In Accordance With:** **FCC Part 15, Subpart C, 15.247**  
Digital Transmission System Transmitter

**Tested By:** Nemko USA, Inc.  
802 N. Kealy  
Lewisville, Texas 75057-3136

**TESTED BY:**  **DATE:** 3 June, 2008  
Tom Tidwell

  
**APPROVED BY:** **DATE:** 3 June, 2008  
Harry Ward

**Number of Pages: 45**

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### REVISION HISTORY

Rev. No.	Description	Date
1	Added CE data. Added data for 2405 MHz and 2475 MHz	3 June, 2008

**Section 1. Summary of Test Results**

Manufacturer: Crane WMS Signal Technology

Model No.: RTV2400

Serial No.: 95-190185-01-P 000013

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C, Paragraph 15.247 for Digital Transmission Systems. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.



New Submission (Modular)



Production Unit



Class II Permissive Change



Pre-Production Unit

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See "Summary of Test Data".



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**Summary Of Test Data**

NAME OF TEST	PARA. NO.	IC Para. No.	RESULT
Powerline Conducted Emissions	15.207(a)	RSS Gen., 7.2.2	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	RSS 210, A8.2(1)	Complies
Maximum Peak Power Output	15.247(b)(3)	RSS 210, A8.4(4)	Complies
Spurious Emissions (Antenna Conducted)	15.247(d)	RSS 210, A8.5	Complies
Spurious Emissions (Restricted Bands)	15.247(d)/15.209(a)	RSS 210, 2.2	Complies
Peak Power Spectral Density	15.247(e)	RSS 210, A8.2(2)	Complies
Receiver Spurious Emissions	-	RSS Gen. 6(b)	Complies

**Footnotes:**

*EQUIPMENT:* RTV2400 Radio Module

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## **Section 2. Equipment Under Test (E.U.T.)**

### **General Equipment Information**

<b>Frequency Band (MHz):</b>	902-928	2400-2483.5	5725-5850
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

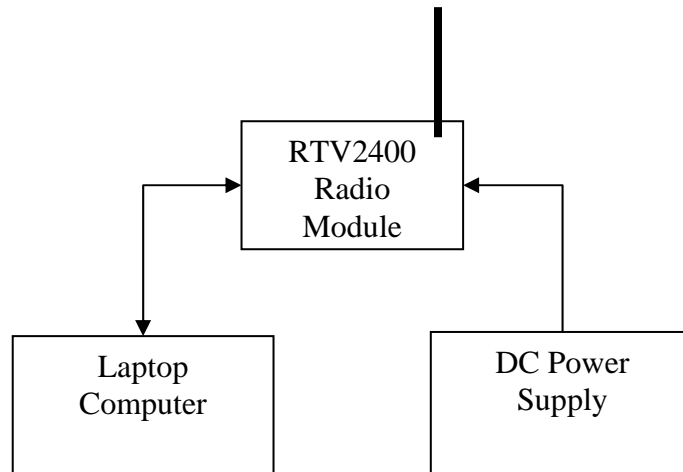
**Operating Frequency of Test Sample:** 2405 – 2475 MHz (center of lowest chan. To center of highest chan.)

**Channel Spacing:** 1 MHz

**User Frequency Adjustment:** Not user controllable

**Description of EUT**

The EUT is a radio module that is intended to be installed in an end product for the transmission and reception of data. A typical end-use would be in a vending machine.

**System Diagram**

The EUT was controlled using a test firmware. This allowed the test engineer to select operating channel and rf power. The EUT was tested at three frequencies with maximum rf power while transmitting a pseudo-random bit stream.

**Section 3. Powerline Conducted Emissions**

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY: A. Ruvalcaba	DATE: 3 June, 2008

**Test Results:** Complies. The worst-case emission level is 0.2 dB below the Average limit when measured with a Quasi-Peak detector.

**Measurement Data:** See data following

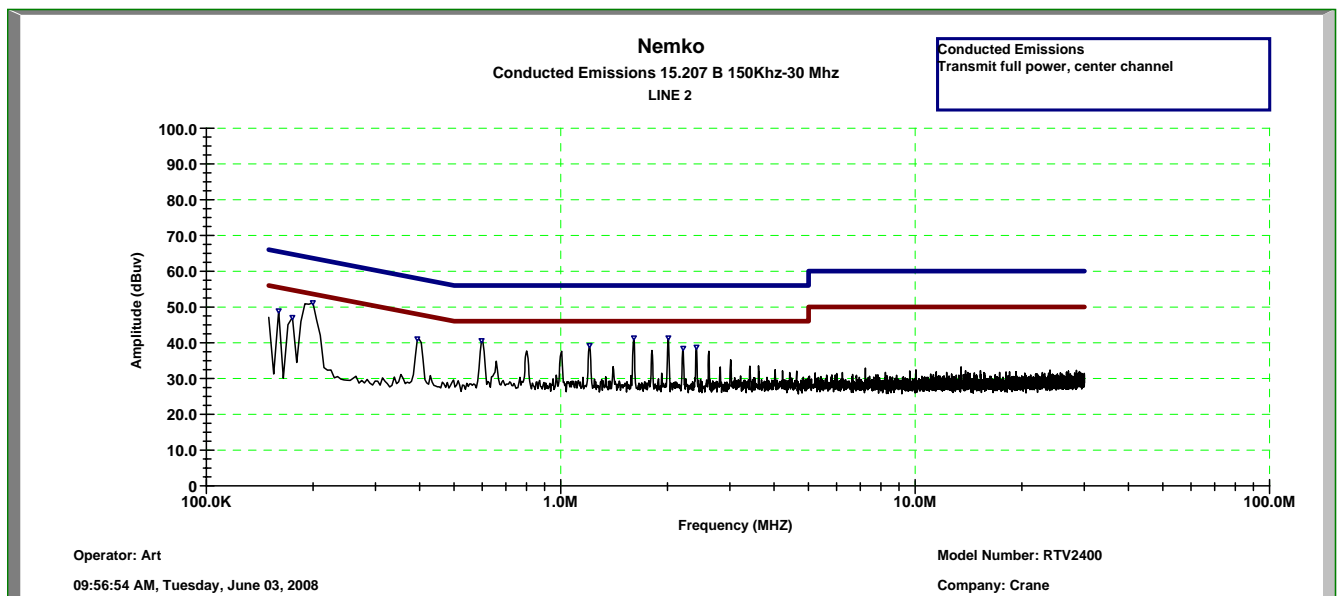
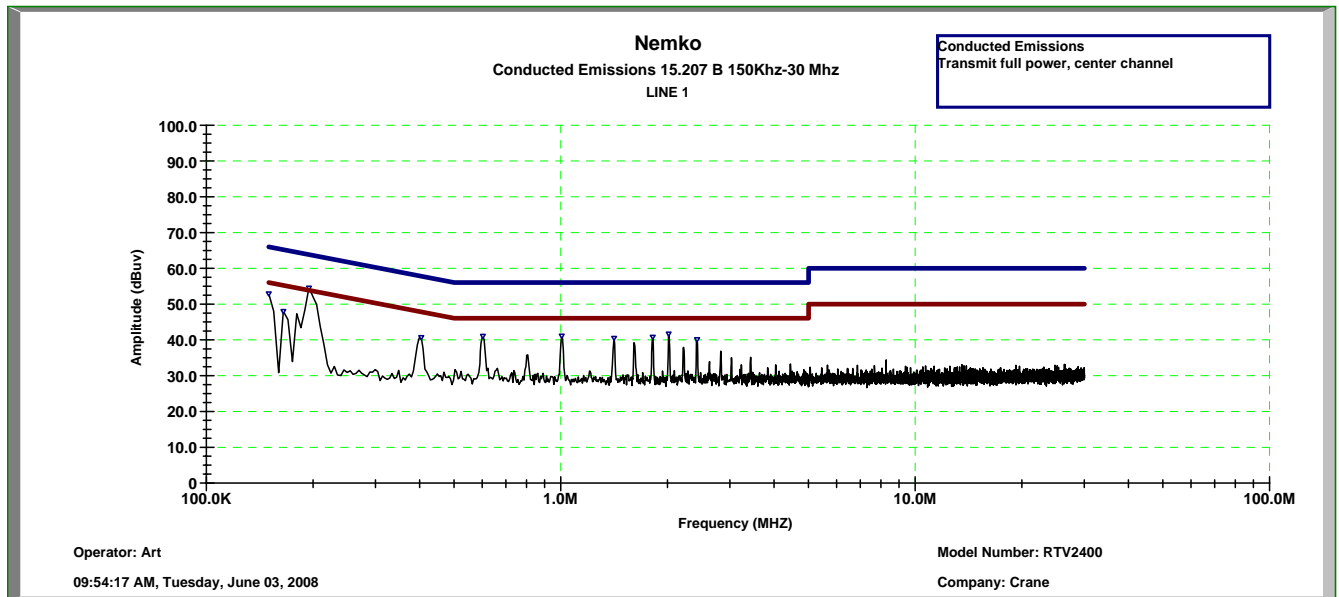
**Test Conditions:** 27 %RH  
23 °C

**Measurement Uncertainty:** +/-1.6 dBuV

**Test Equipment Used:** 674, 1284, 1555, 1278, 1283, 969

EQUIPMENT: RTV2400 Radio Module

## Peak Powerline Conducted Emissions





**Quasi-Peak Powerline Conducted Emissions**

<p style="text-align: right;">Nemko USA, Inc.</p> <p>CFR 47 15.207 B Conducted Emissions</p> <p>Line 1 Peak Emission Measurements</p> <p>Model Number: RTV2400</p> <p>Operator: Art Ruvalcaba</p> <p>Signal Technologies</p> <p>Tuesday June 03 2008</p>					
Frequency MHz	QPk Level (dBuV)	15.207 Avg. Limit (dBuV)	15.207 QPk Limit (dBuV)	Avg Margin (dB)	QPk Margin (dB)
0.150	52.9	56.0	66.0	-3.1	-13.1
0.165	48.0	55.6	65.6	-7.6	-17.6
0.195	54.5	54.7	64.7	-0.2	-10.2
0.404	40.7	48.8	58.8	-8.1	-18.1
0.603	41.0	46.0	56.0	-5.0	-15.0
1.006	41.1	46.0	56.0	-4.9	-14.9
1.414	40.5	46.0	56.0	-5.5	-15.5
1.817	40.8	46.0	56.0	-5.2	-15.2
2.016	41.7	46.0	56.0	-4.3	-14.3
2.424	40.1	46.0	56.0	-5.9	-15.9

**Section 4. Occupied Bandwidth**

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(2)
TESTED BY: T. Tidwell	DATE: 17 April, 2008

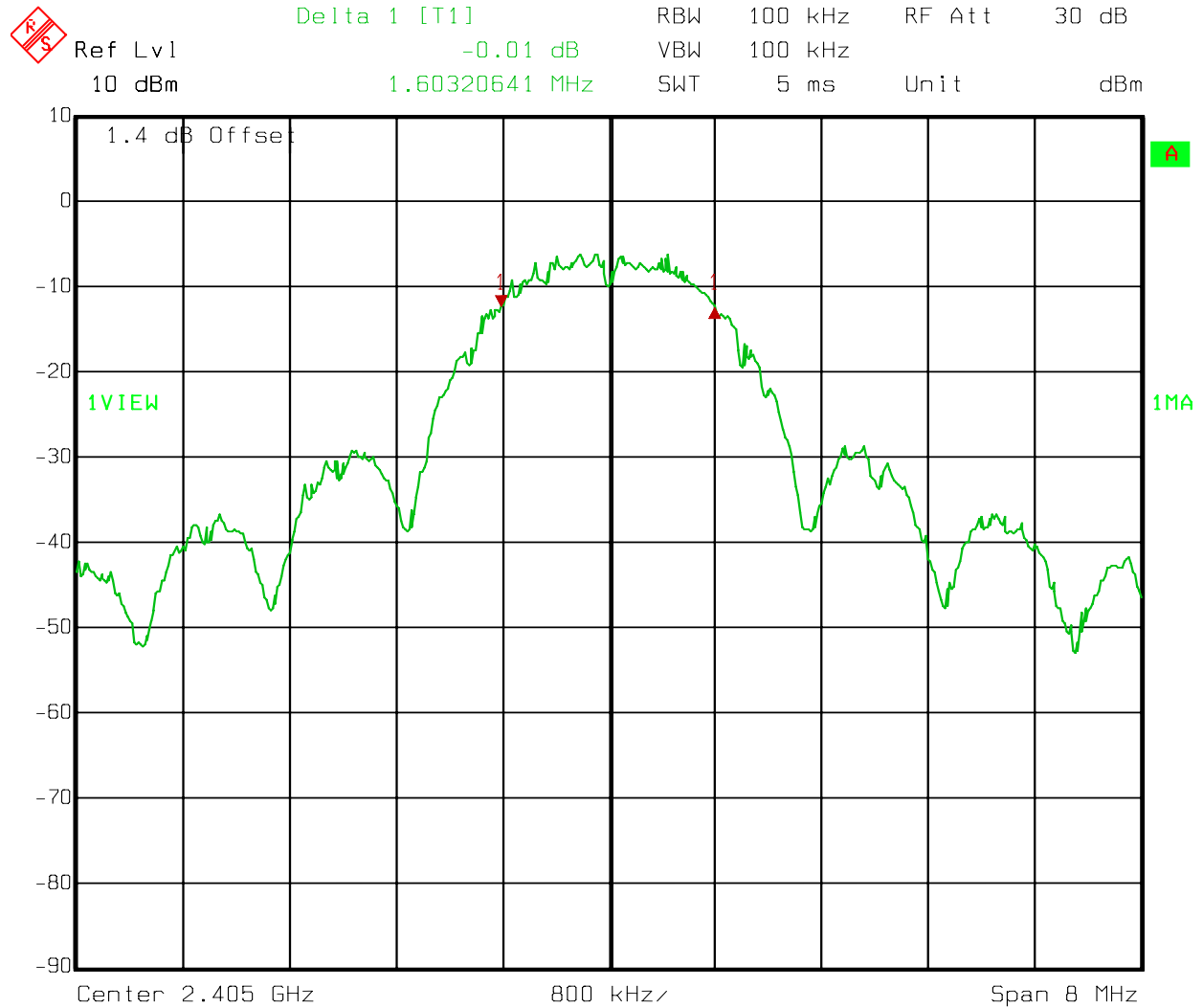
**Test Results:** Complies.**Measurement Data:** See 6 dB BW plots

Measured 6 dB bandwidth: 1.52 MHz

**Test Conditions:** 27 %RH  
23 °C**Measurement Uncertainty:**  $\pm 1 \times 10^{-7}$  ppm**Test Equipment Used:** 1036, 1629

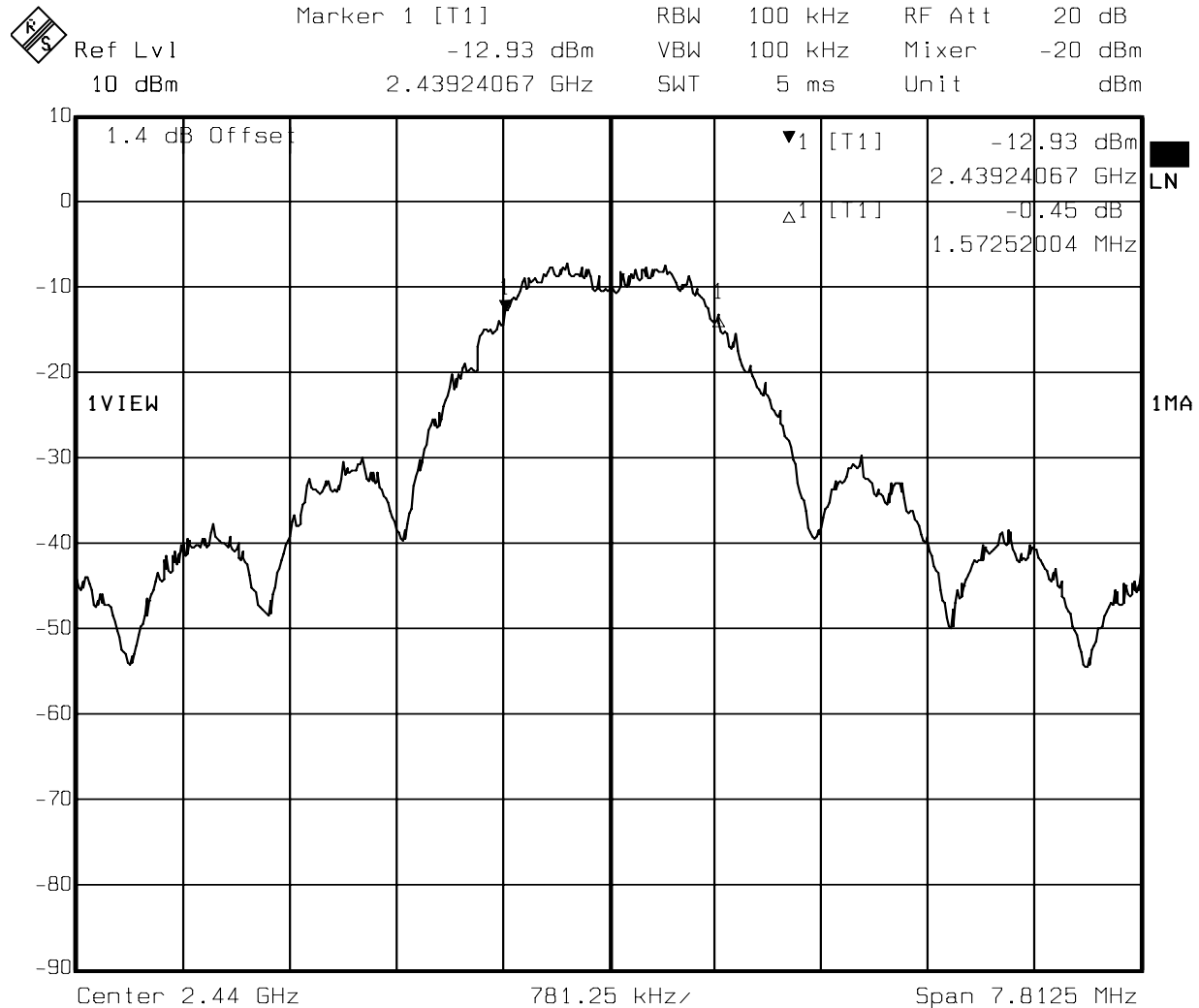
EQUIPMENT: RTV2400 Radio Module

### Test Data – Occupied Bandwidth



EQUIPMENT: RTV2400 Radio Module

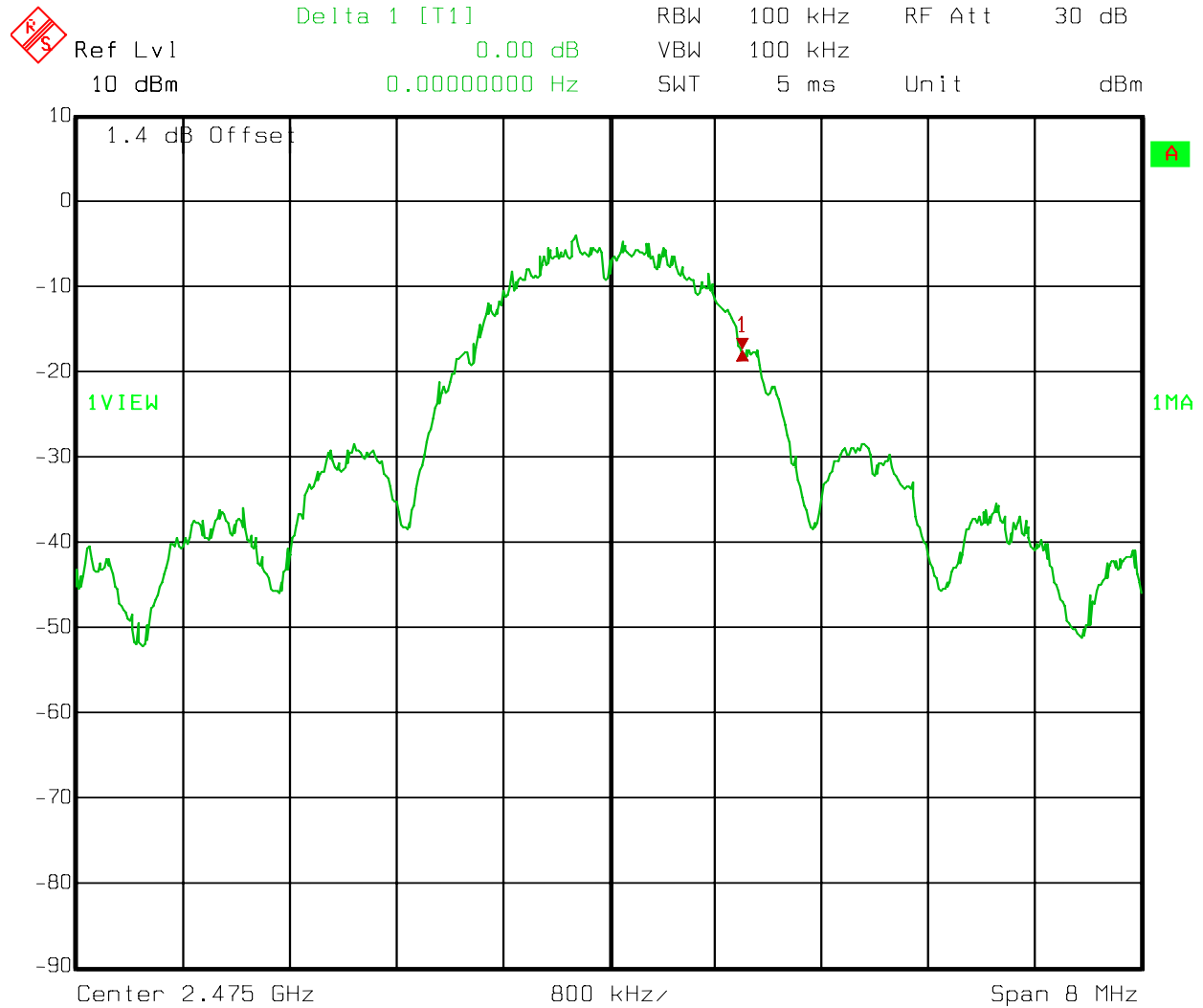
Test Data – Occupied Bandwidth



Date: 17.APR.2008 07:15:13

EQUIPMENT: RTV2400 Radio Module

Test Data – Occupied Bandwidth



**Section 5. Maximum Peak Output Power**

NAME OF TEST: Maximum Peak Output power	PARA. NO.: 15.247(b)(3)
TESTED BY: T. Tidwell	DATE: 17 April, 2008

**Test Results:** Complies.

**Measurement Data:** Refer to attached data

**Test Conditions:** 27 %RH  
23 °C

**Measurement Uncertainty:** +/-1.7 dB

**Test Equipment Used:** 1036, 1629

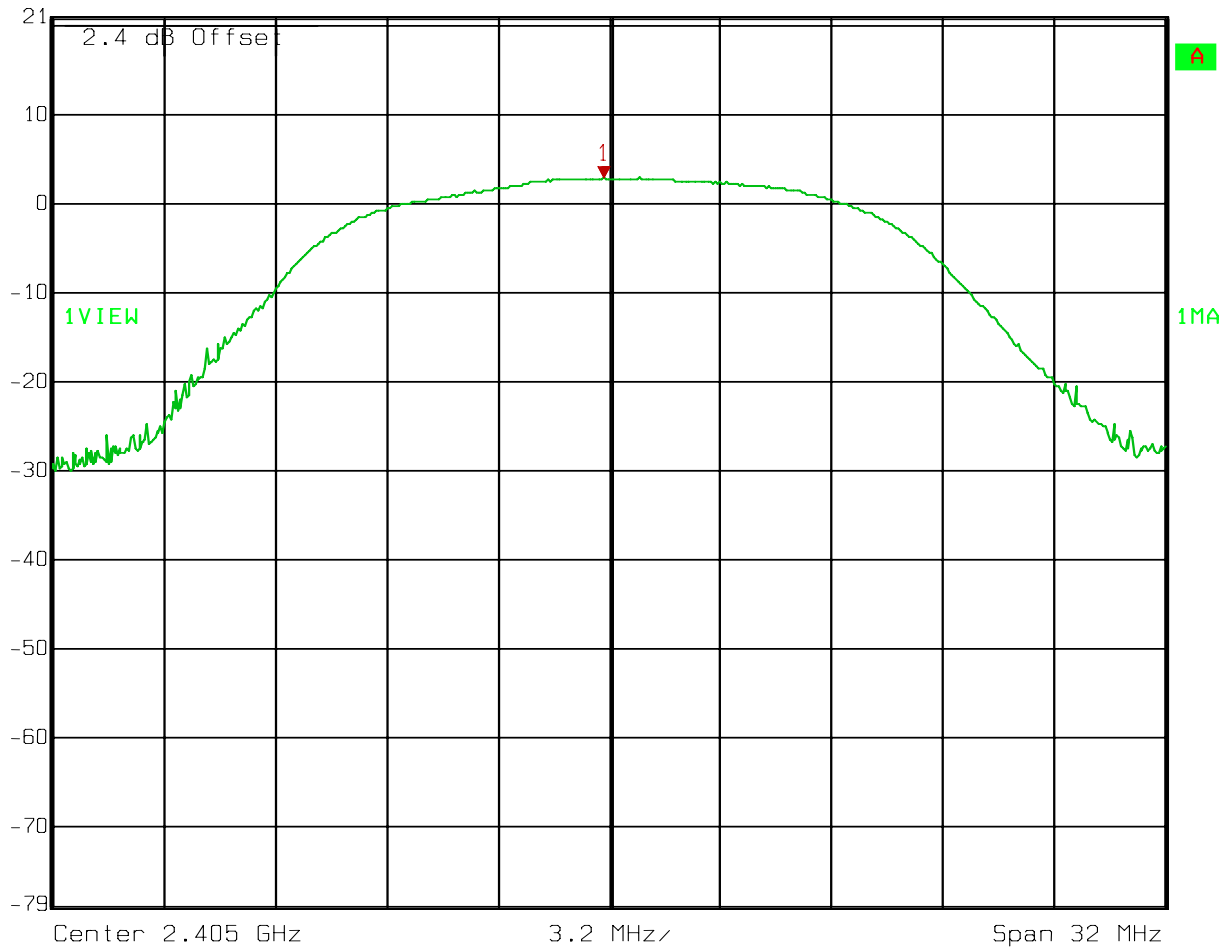
- ☒ This device was tested at +/- 15% input power per 15.31(e), with no variation in output power.
- ☐ For battery powered equipment, the device was tested with a fresh battery per 15.31(e).
- ☒ The device was tested on three channels per 15.31(l).
- ☐ This test was performed radiated.

EQUIPMENT: RTV2400 Radio Module

Test Data – Peak Power



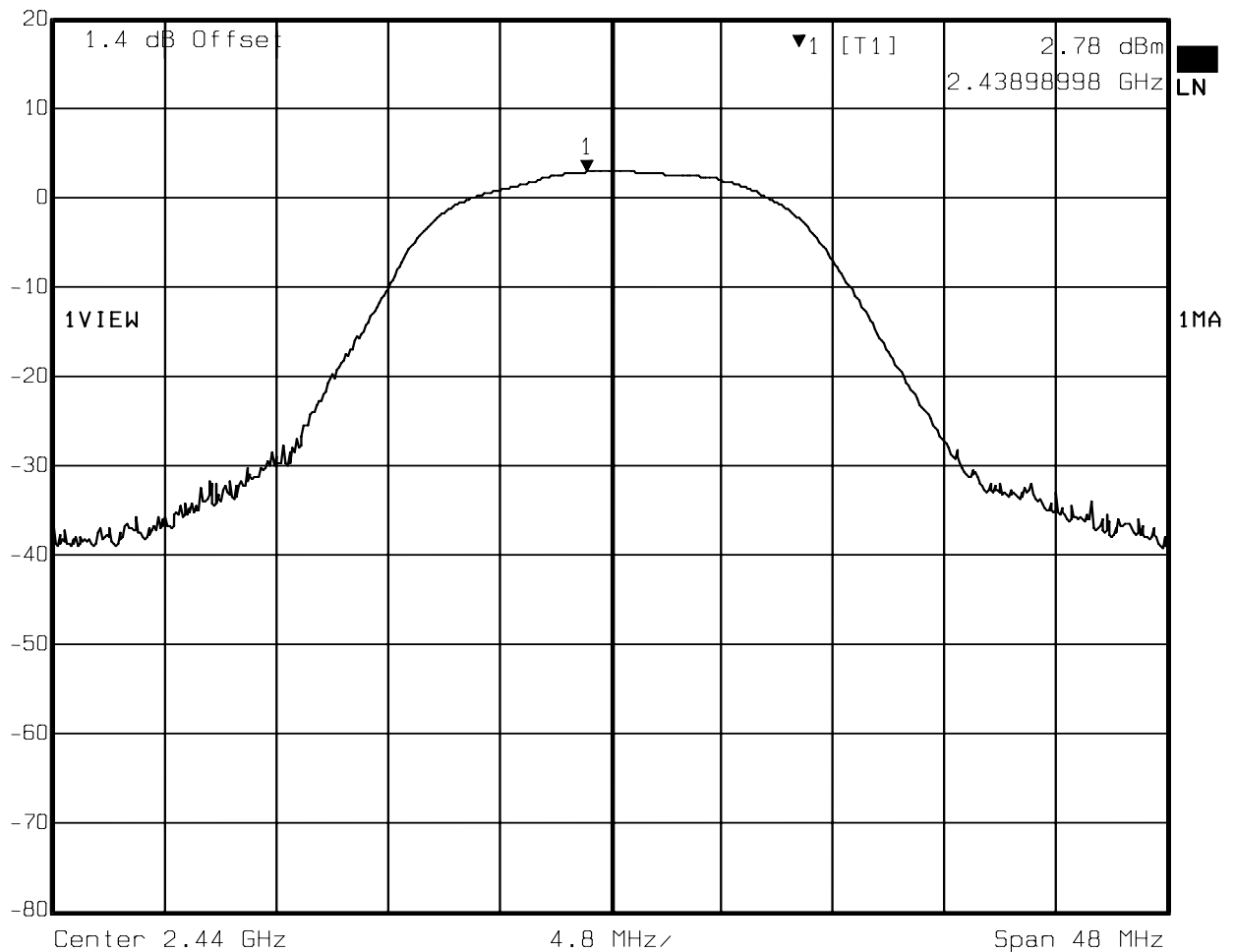
Marker 1 [T1] RBW 10 MHz RF Att 40 dB  
Ref Lvl 21 dBm 2.78 dBm VBW 10 MHz  
2.40483968 GHz SWT 5 ms Unit dBm



## Test Data – Peak Power



Ref Lvl	Marker 1 [T1]	RBW	10 MHz	RF Att	30 dB
20 dBm	2.78 dBm	VBW	10 MHz	Mixer	-20 dBm
	2.43898998 GHz	SWT	5 ms	Unit	dBm



Date: 17.APR.2008 10:13:24

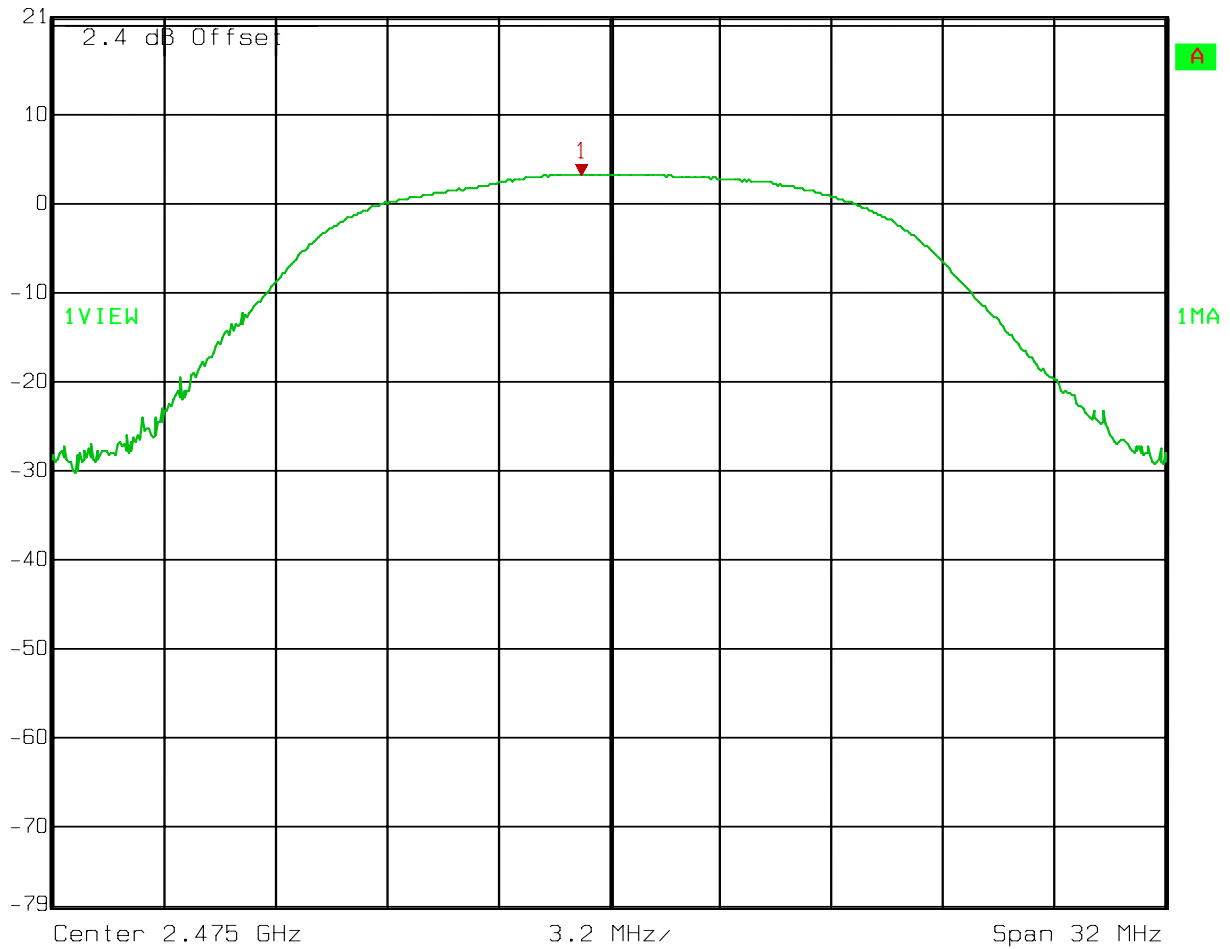


EQUIPMENT: RTV2400 Radio Module

Test Data – Peak Power



Marker 1 [T1] RBW 10 MHz RF Att 40 dB  
Ref Lvl 3.17 dBm VBW 10 MHz  
21 dBm 2.47419840 GHz SWT 5 ms Unit dBm



## **Section 6          Spurious Emissions at Antenna Terminals**

NAME OF TEST: Spurious Emissions at Antenna Terminals	PARA. NO.: 15.247 (d)
TESTED BY: T. Tidwell	DATE: 17 April, 2008

**Test Results:**          Complies.

**Measurement Data:**    See attached plots.

**Test Conditions:**      27          %RH  
                                 23          °C

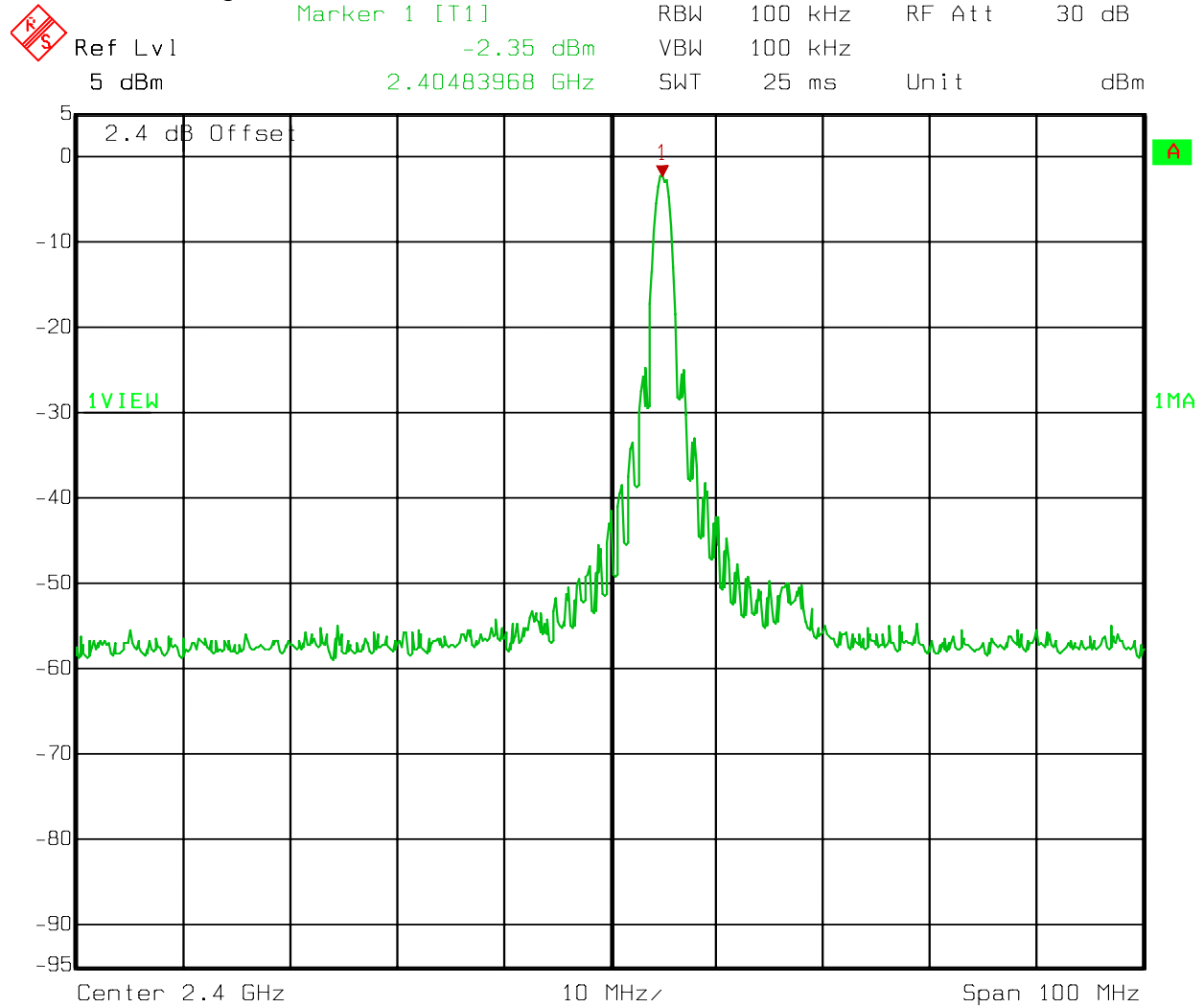
**Measurement Uncertainty:**    +/-1.7    dB

**Test Equipment Used:**    1036, 1629

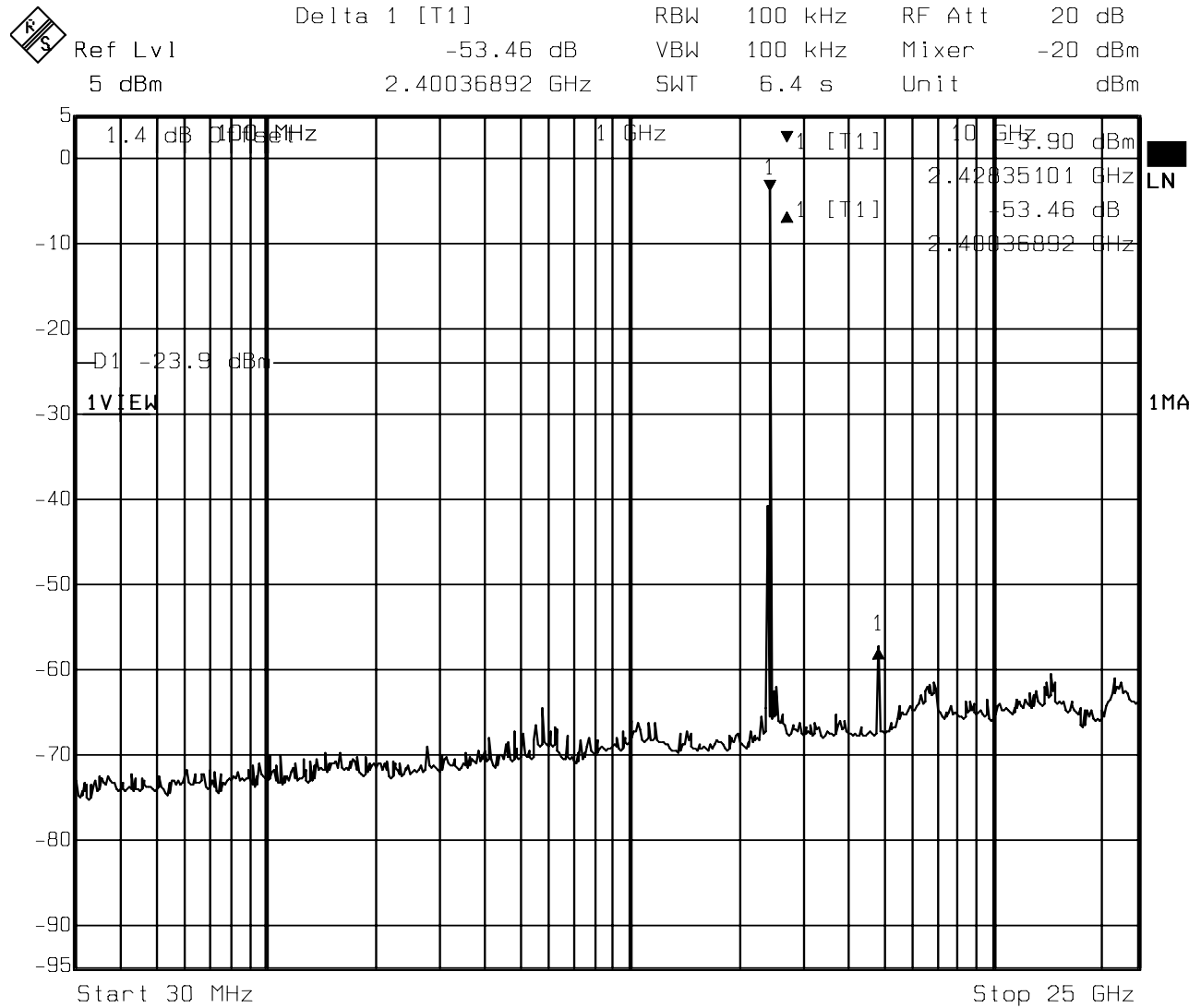
EQUIPMENT: RTV2400 Radio Module

# Test Data – Spurious Emissions at Antenna Terminals

## Lower Band Edge

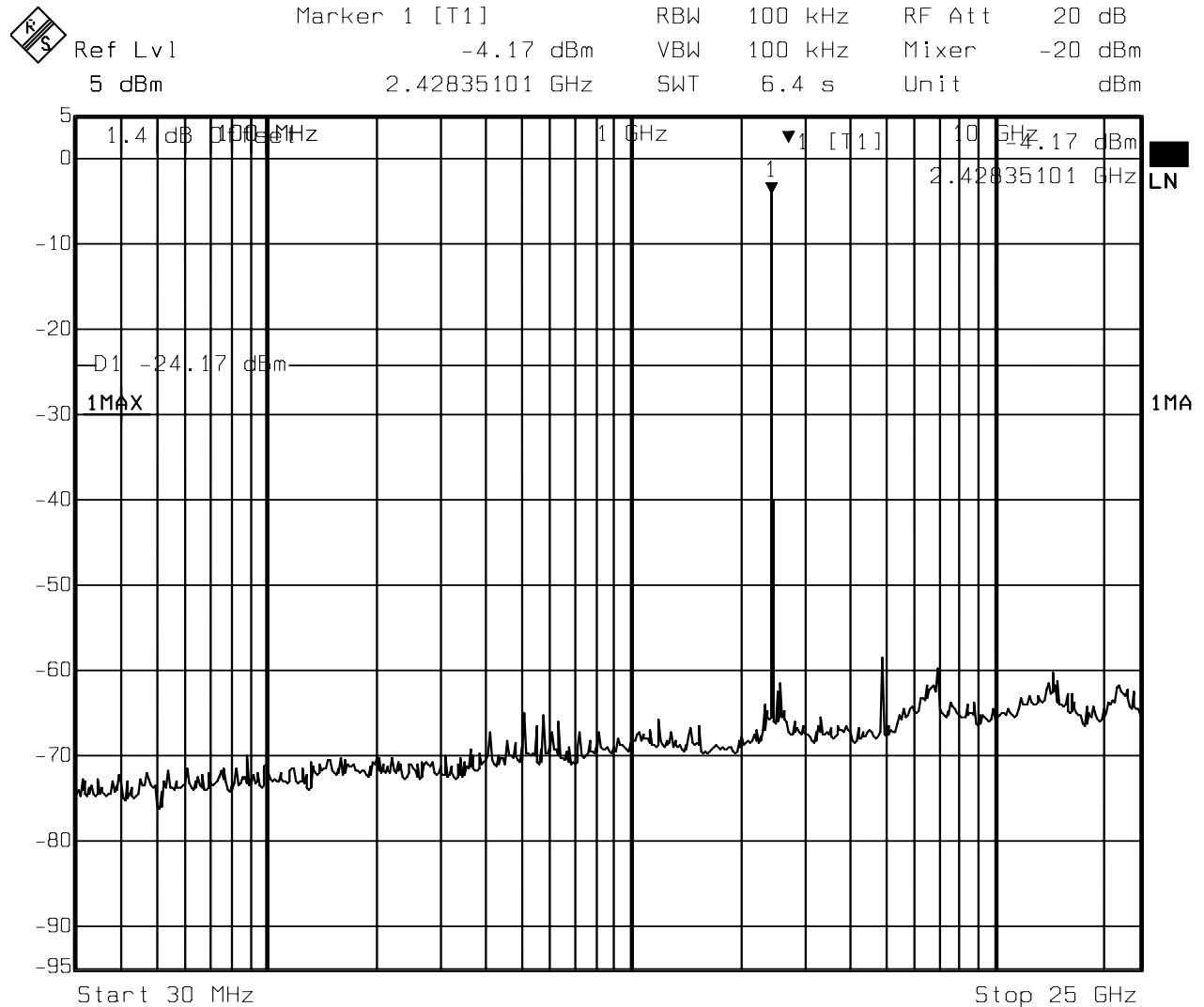


## Test Data – Spurious Emissions at Antenna Terminals



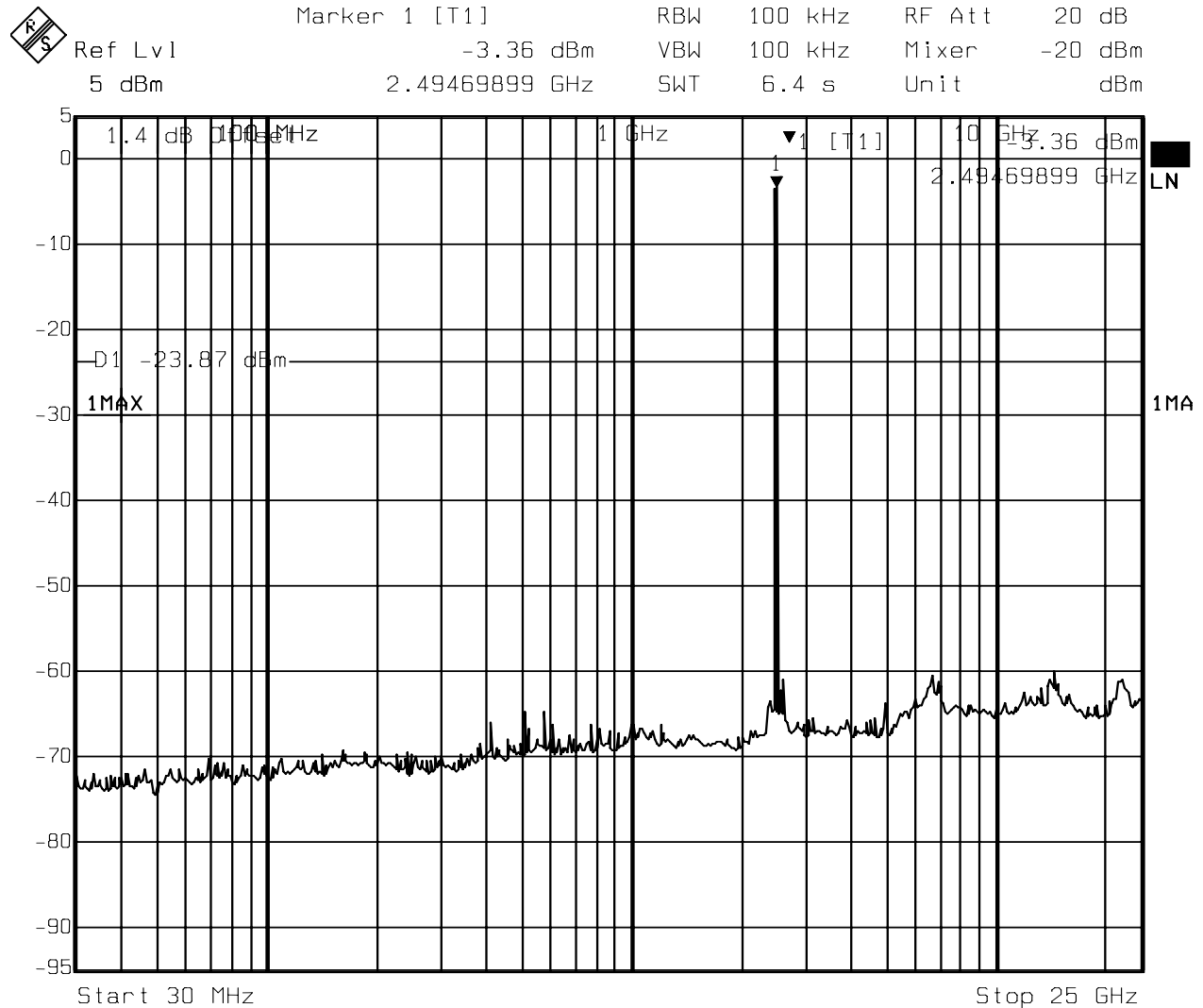
Date: 17.APR.2008 07:33:09

## Test Data – Spurious Emissions at Antenna Terminals



Date: 17.APR.2008 07:31:18

## Test Data – Spurious Emissions at Antenna Terminals



Date: 17.APR.2008 07:30:01

**Section 7. Radiated Emissions**

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.247 (d)
TESTED BY: T. Tidwell	DATE: 17 April, 2008

**Test Results:** Complies.

**Measurement Data:** See attached table.

**Test Conditions:** 27 %RH  
23 °C

**Measurement Uncertainty:** +/-1.7 dB

**Test Equipment Used:** 1766, 1482, 1033, 1767, 1763, 1016

Notes:

- ☒ The EUT was tested on three orthogonal axis'
- ☒ The device was tested from 30 MHz to the tenth harmonic of the highest fundamental frequency per 15.33
- ☒ The device was tested on three channels per 15.31(l).
- ☒ No emissions were detected within 20 dB of the specification limit therefore none are reported per 15.31(o). Band edge data is presented below.

RBW=VBW=100 kHz below 1000 MHz  
RBW=VBW=1 MHz above 1000 MHz (Peak)  
RBW= 1 MHz VBW=10Hz (Average)

**NOTE: The EUT radiated spurious was evaluated for use with 3 antennas:**

- 1. HG2405RD-RSP 5.5dBi (Measured data for this antenna was worst-case)**
- 2. ANT-2.4-WRT-RPS 0dBi**
- 3. MTOC24003PTRPSMA 3dBi**

## Radiated Emissions



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Tel: (972) 436-9600

Fax: (972) 436-2667

## Radiated Emissions

Page 1 of 1

Job No.: 10949 Date: 17 April, 2008  
 Specification: 15.247/15.205 Temperature(°C): 23  
 Tested By: Tom Tidwell Relative Humidity(%) 27  
 E.U.T.: RTV2400 Radio Module  
 Configuration: Low, Mid, and High channels (2410 MHz, 2440 MHz, and 2480 MHz), Max rf power, Data Stream  
 Sample Number: 1  
 Location: AC 3 RBW: 1 MHz  
 Detector Type: Peak VBW: 1 MHz  
 Average VBW: 10 Hz (RBW 1 MHz)

## Test Equipment Used

Antenna: 993 Directional Coupler: #N/A  
 Pre-Amp: 1016 Cable #1: 1484  
 Filter: #N/A Cable #2: 1485  
 Receiver: 1036 Cable #3: #N/A  
 Attenuator #1: #N/A Cable #4: #N/A  
 Attenuator #2: #N/A Mixer: #N/A  
 Measurement Uncertainty: +/- 3.6 dB

Frequency (GHz)	Meter Reading (dBuV)	Antenna Factor (dB)	Cable Loss (dB)	Pre-Amp Gain (dB)	Corrected Reading (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Detector / Polarity
2.484	14.7	29.0	3.1	0.0	46.8	74	54	Peak/Vertical
2.484	12.9	29.0	3.1	0.0	45.0	74	54	Peak/Horizontal
4.820	19.7	33.8	4.3	32.6	25.2	74	54	Noise floor
4.880	19.7	33.8	4.3	32.6	25.2	74	54	Noise floor
4.960	20.0	33.8	4.3	32.6	25.5	74	54	Noise floor
7.230	21.0	35.8	5.2	32.3	29.7	74	54	Noise floor
7.320	21.0	35.8	5.2	32.4	29.6	74	54	Noise floor
7.440	21.2	35.9	5.2	32.5	29.8	74	54	Noise floor
9.640	21.1	37.1	5.7	36.1	27.8	74	54	Noise floor
9.760	21.0	37.1	5.7	36.0	27.8	74	54	Noise floor
9.920	21.0	37.2	5.7	35.5	28.4	74	54	Noise floor
16.870	17.2	41.0	6.2	33.9	30.5	74	54	Noise floor
17.080	17.6	41.5	6.3	33.7	31.7	74	54	Noise floor
17.360	17.6	43.0	6.3	33.6	33.3	74	54	Noise floor
24.100	11.7	46.0	8.4	32.0	34.1	74	54	Noise floor
24.400	11.7	46.0	8.4	32.0	34.1	74	54	Noise floor
24.800	11.7	46.0	8.7	32.0	34.4	74	54	Noise floor



**Radiated Photograph**



*EQUIPMENT:* RTV2400 Radio Module

## **Section 8. Peak Power Spectral Density**

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.247(e)
TESTED BY: T. Tidwell	DATE: 17 April, 2008

**Test Results:** Complies.

**Measurement Data:** See attached data..

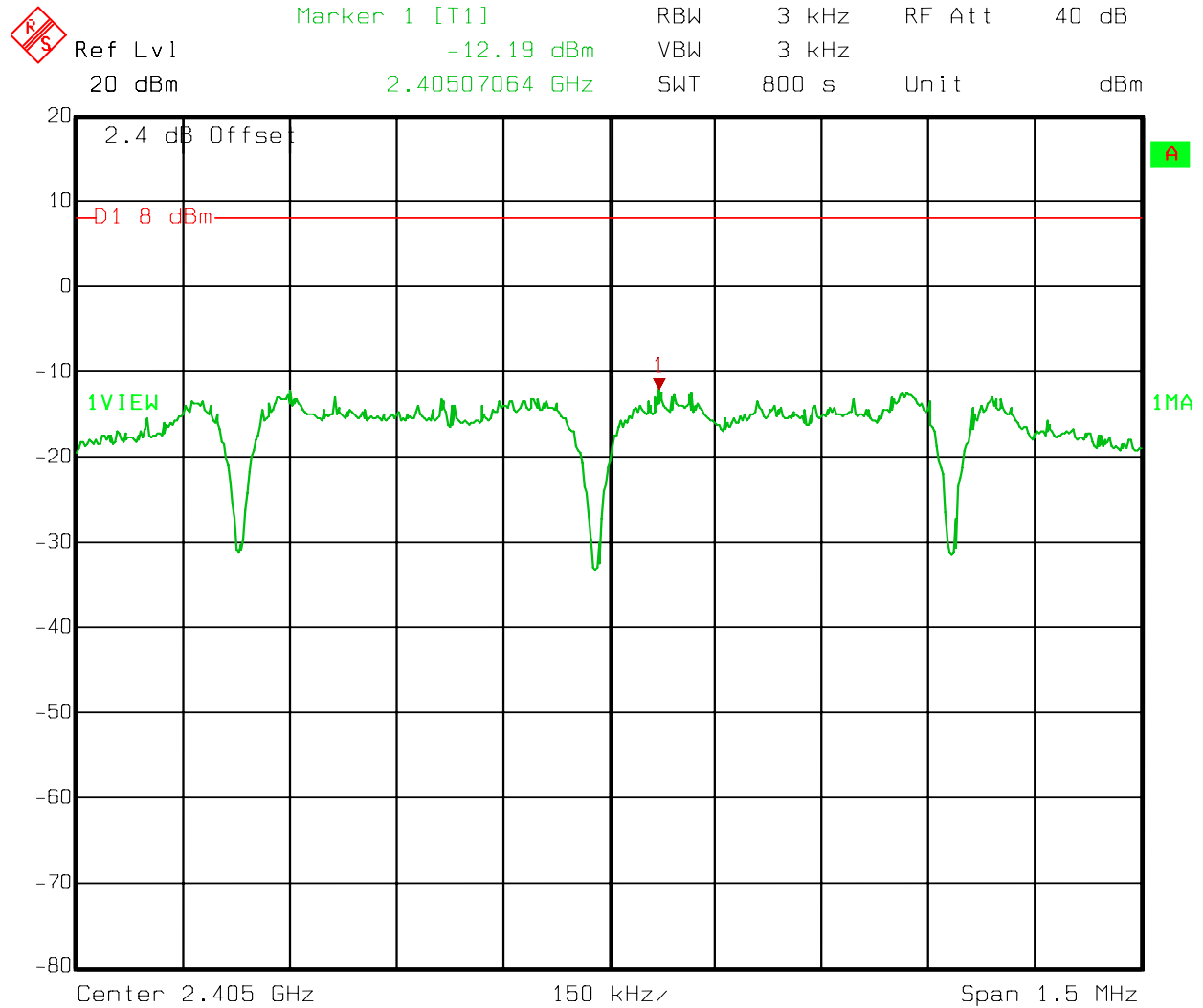
**Test Conditions:** 27 %RH  
23 °C

**Measurement Uncertainty:** +/-1.7 dB

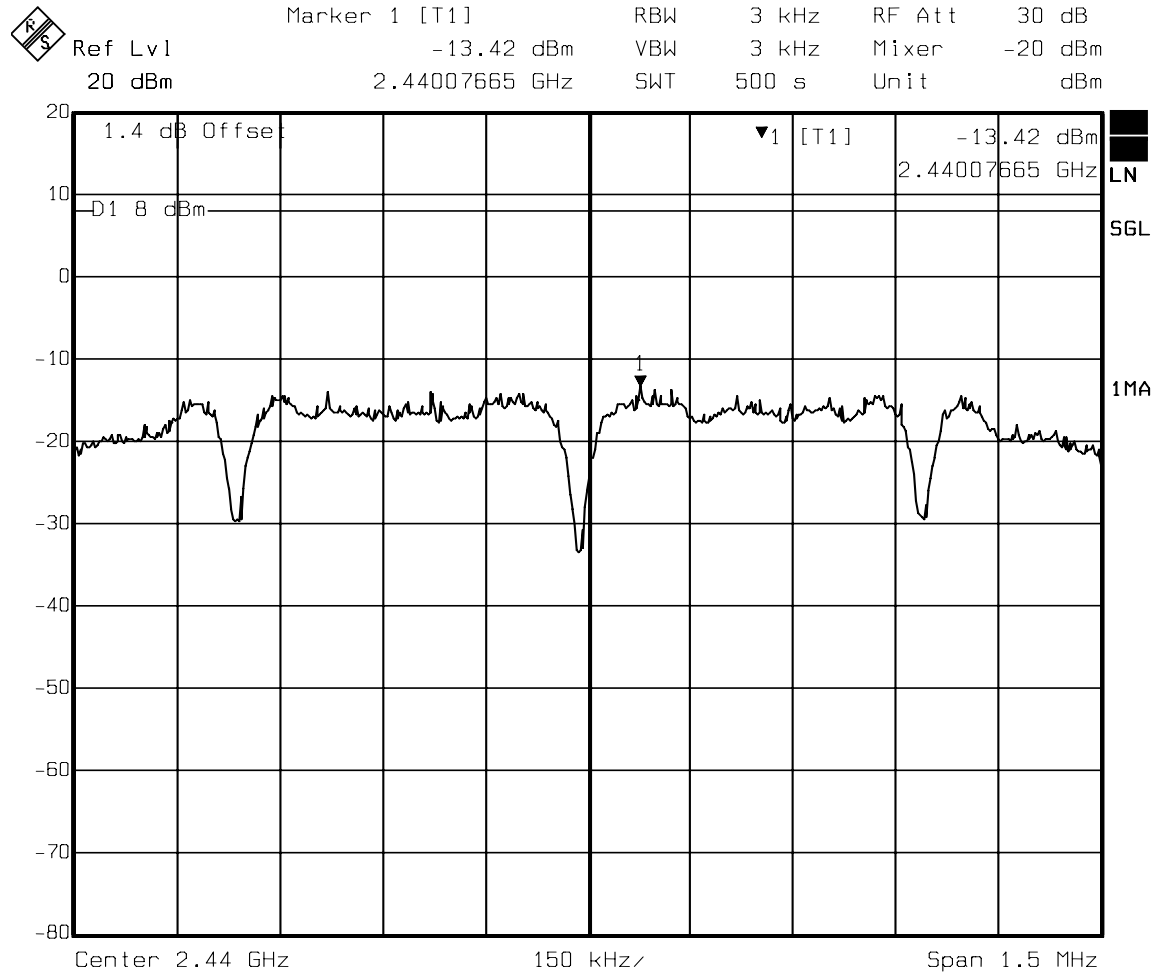
**Test Equipment Used:** 1036, 1629

EQUIPMENT: RTV2400 Radio Module

### Peak Power Spectral Density



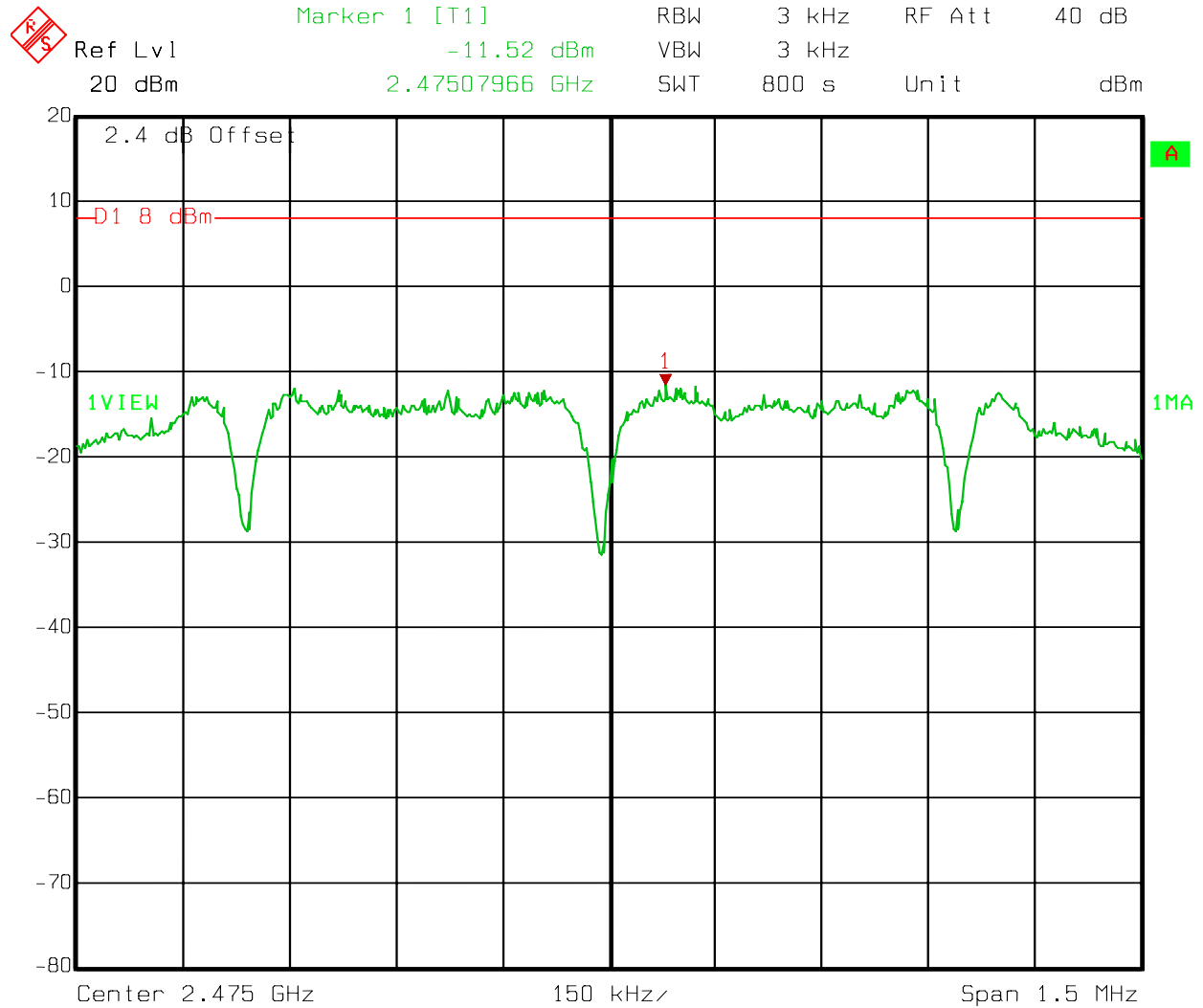
# Peak Power Spectral Density



Date: 17.APR.2008 08:21:37

EQUIPMENT: RTV2400 Radio Module

### Peak Power Spectral Density



**Section 9. Receiver Spurious Emissions**

NAME OF TEST: Receiver Spurious Emissions	PARA. NO.:
TESTED BY: T. Tidwell	DATE: 17 April, 2008

**Test Results:** Complies.

**Measurement Data:** See attached plots.

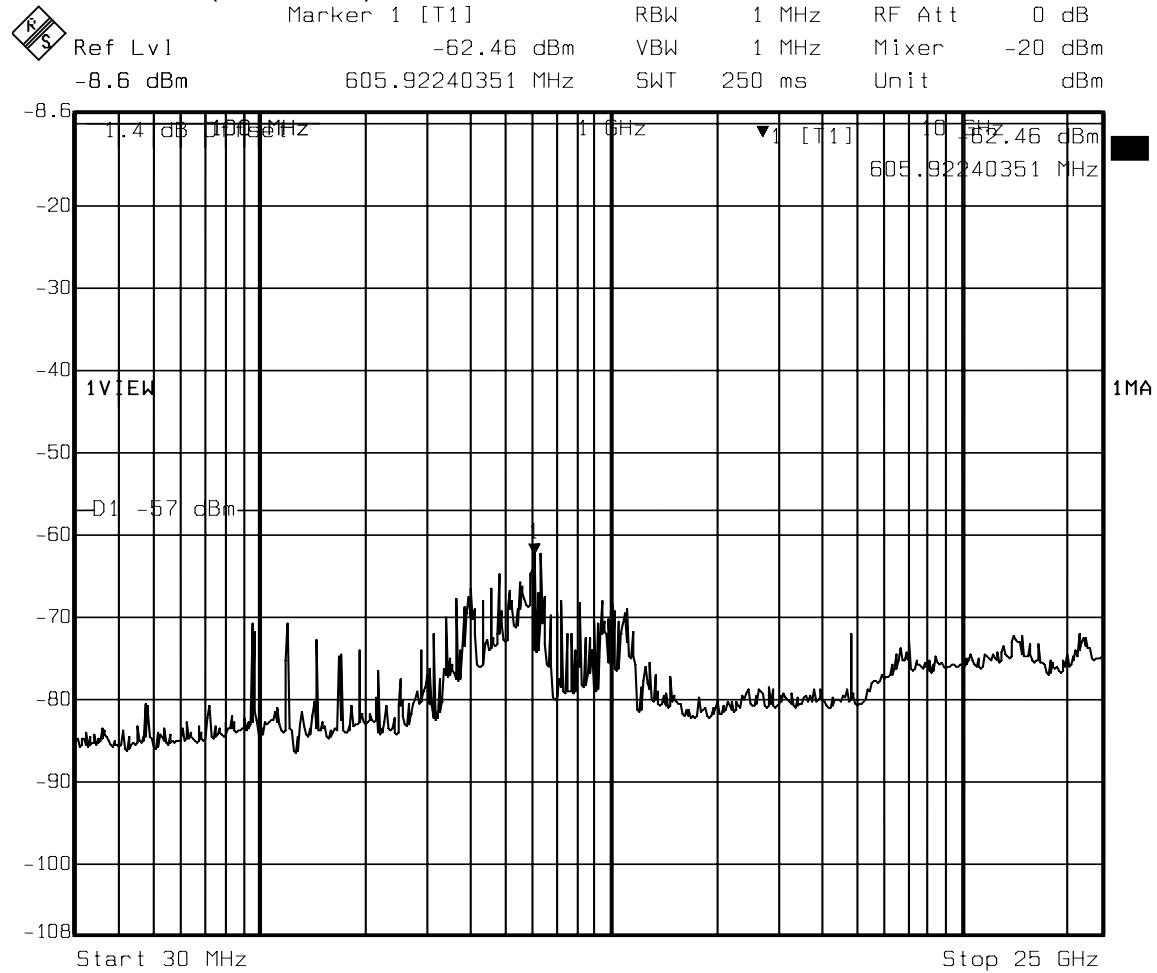
**Measurement Uncertainty:** +/- 1.7 dB

**Test Conditions:** 27 %RH  
23 °C

**Measurement Uncertainty:** +/-1.7 dB

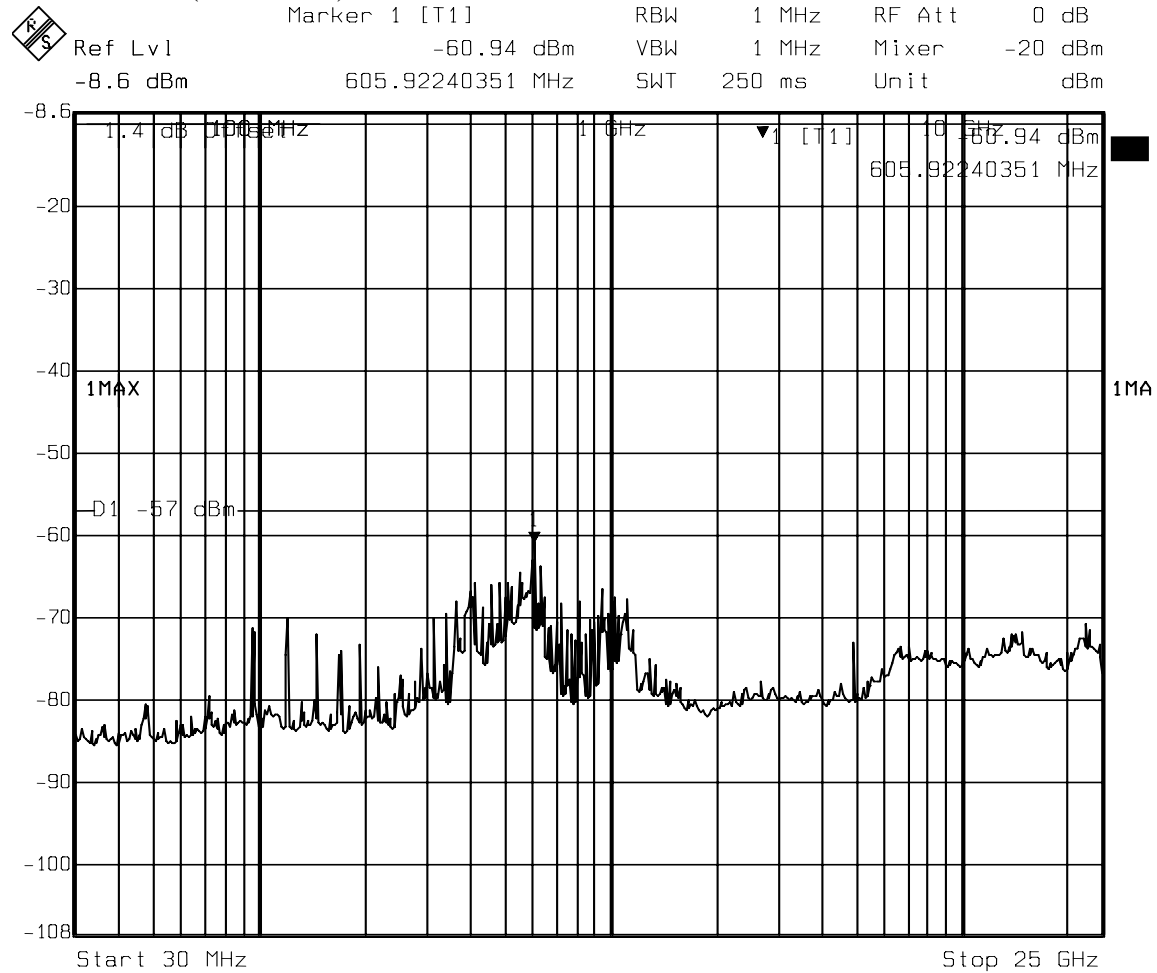
**Test Equipment Used:** 1036, 1629

Low Channel (2405 MHz)



Date: 17.APR.2008 10:18:37

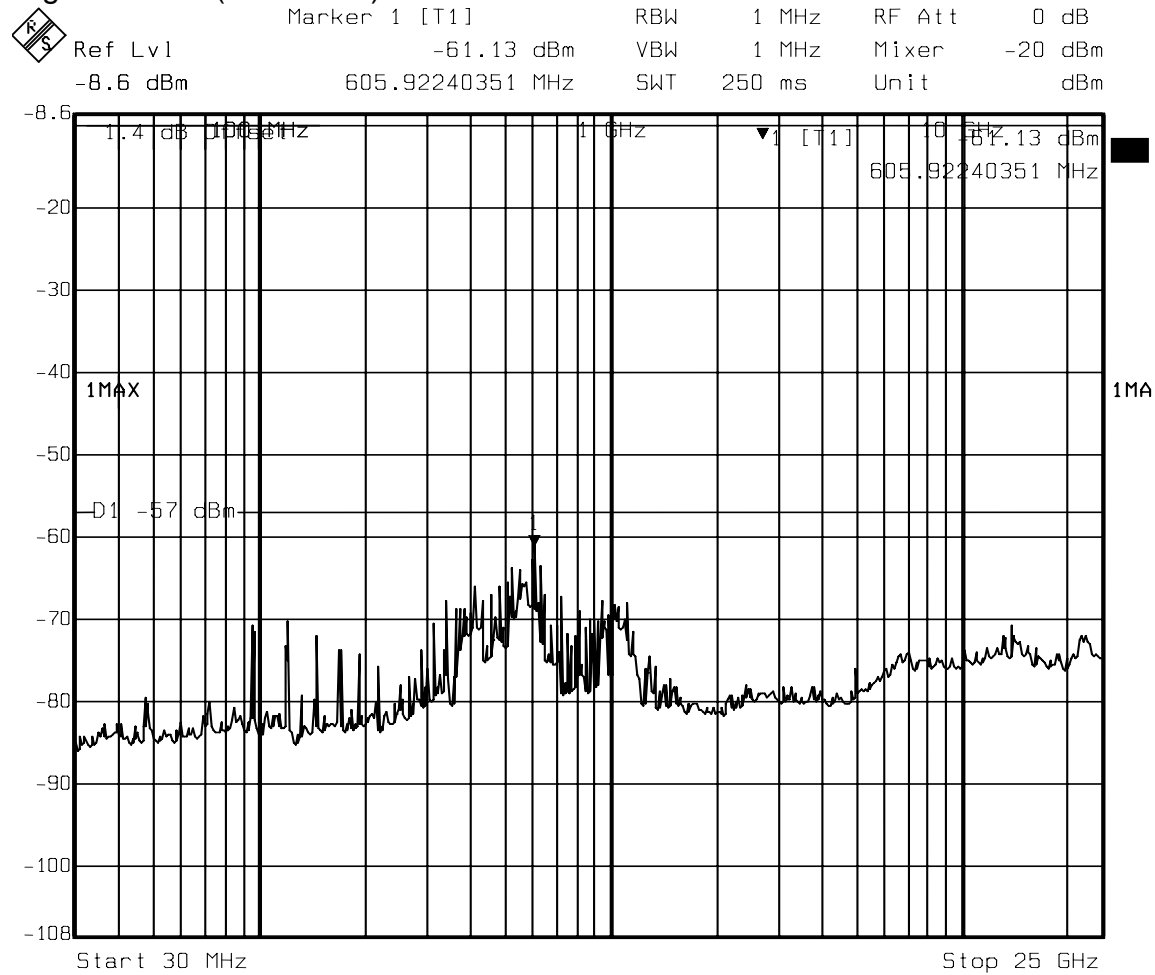
Mid Channel (2440 MHz)



Date: 17.APR.2008 10:19:40



### High Channel (2475 MHz)



Date: 17.APR.2008 10:20:30

## Section 10. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	05/26/06	05/26/08
1629	CABLE, 6 ft	MEGAPHASE 10311 1GVT4	N/A	CBU	N/A
1766	Band Reject filter	Microtronics BRM50702	41	CBU	N/A
1482	Band Pass Filter	K & L 11SH10-4000/T12000-0/0	2	Cal B4 Use	N/A
0993	Antenna horn	A. H. Systems SAS-200/571	XXX	08/31/07	08/30/08
1763	Bilog Antenna	Schaffner CBL 6111D	22926	09/21/07	09/20/08
1016	Preamplifier	Hewlett Packard	8449A 2749A00159	5/1/07	4/30/08
1484	Cable	Storm PR90-010-072	N/A	05/02/07	05/01/08
1485	Cable	Storm PR90-010-216	N/A	05/02/07	05/01/08
674	LIMITER	HP 11947A	3107A02200	04/19/06	04/19/09
1284	Quasi-Peak Adapter	Hewlett Packard 8566B	1811A00223	04/08/08	04/08/09
1555	Filter high pass 5KHz	Solar Electronics 7930-5.0	933125	04/20/06	04/20/09
1278	SPECTRUM ANALYZER	HEWLETT PACKARD 8566B	2618A02843	04/07/08	04/07/09
1283	Spectrum analyzer display	HEWLETT PACKARD 85650A	2521A00769	04/07/08	04/07/09
969	LISN	Schwarzbeck NNLA 8120	8120281	04/02/08	04/01/09

## **ANNEX A - TEST DETAILS**

NAME OF TEST: Powerline Conducted Emissions

PARA. NO.: 15.207(a)

**Minimum Standard:** §15.207 Conducted limits.

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 mH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of Conducted Emission (MHz)	Limit (dBmV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

(b) The limit shown in paragraph (a) of this section shall not apply to carrier current systems operating as intentional radiators on frequencies below 30 MHz. In lieu thereof, these carrier current systems shall be subject to the following standards:

(1) For carrier current systems containing their fundamental emission within the frequency band 535-1705 kHz and intended to be received using a standard AM broadcast receiver: no limit on conducted emissions.

(2) For all other carrier current systems: 1000 mV within the frequency band 535-1705 kHz, as measured using a 50 mH/50 ohms LISN.

(3) Carrier current systems operating below 30 MHz are also subject to the radiated emission limits as provided in §15.205 and §§15.209, 15.221, 15.223, 15.225 or 15.227, as appropriate.

(c) Measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines. Devices that include, or make provision for, the use of battery chargers which permit operating while charging, AC adaptors or battery eliminators or that connect to the AC power lines indirectly, obtaining their power through another device which is connected to the AC power lines, shall be tested to demonstrate compliance with the conducted limits.

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(2)
----------------------------------	-------------------------

**Minimum Standard:** The minimum 6 dB bandwidth shall be at least 500 kHz

NAME OF TEST: Maximum Peak Output Power

PARA. NO.: 15.247(b)(3)

**Minimum Standard:** The maximum peak output power shall not exceed 1 watt.

If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point to point operation may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceed 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operation may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

**Direct Measurement Method For Detachable Antennas:**

If the antenna is detachable, a peak power meter is used to measure the power output with the transmitter operating into a 50 ohm load. The dBi gain of the antenna(s) employed shall be reported.

**Substitution Antenna Method for Integral Antennas:**

The peak field strength of the carrier is measured in a worst-case configuration with a RBW > 5 times the occupied bandwidth of the transmitted waveform. For cases where the RBW of the test instrument is not sufficient, the power is measured using a peak power meter instead of the spectrum analyzer.

The RBW of the spectrum analyzer shall be set to a value greater than the measured 6 dB occupied bandwidth of the E.U.T.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 15.247(a)(2)

**Minimum Standard:**

Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

**Method Of Measurement:**

The spectrum analyzer is set as follows:

RBW = VBW = 100 kHz.

Span: Sufficient to display 6 dB bandwidth

LOG dB/div.: 10 dB

Sweep: Auto

**Number of channels tested:**

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Spurious Emissions(conducted)

PARA. NO.: 15.247(d)

**Minimum Standard:**

In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

**THE SPECTRUM IS SEARCHED TO THE 10th HARMONIC OF THE HIGHEST FREQUENCY GENERATED IN THE EUT.**

**Method Of Measurement:**

30 MHz - 10th harmonic plot

RBW: 100 kHz

VBW: 300 kHz

Sweep: Auto

Display line: -20 dBc

Lower Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 902 MHz, 2400 MHz, or 5725 MHz

Marker: Peak of fundamental emission

Marker  $\Delta$ : Peak of highest spurious level below center frequency.

Upper Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 928 MHz, 2483.5 MHz, or 5850 MHz

Marker: Peak of fundamental emission

Marker  $\Delta$ : Peak of highest spurious level above center frequency.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom



NAME OF TEST: Radiated Spurious Emissions

PARA. NO.: 15.247(c)

**Minimum Standard:** In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits:

**Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:**

Frequency (MHz)	Field Strength ( $\mu\text{V/m}$ @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

**THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC**

#### 15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.09-0.11	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.125-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41	1718		

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Transmitter Power Density

PARA. NO.: 15.247(d)

**Minimum Standard:** The transmitted power density averaged over any 1 second interval shall not be greater than +8 dBm in any 3 kHz bandwidth.

**Method Of Measurement:** The spectrum analyzer is set as follows:

RBW: 3 kHz

VBW: &gt;3 kHz

Span: =&gt; measured 6 dB bandwidth

Sweep: Span(kHz)/3 (i.e. for a span of 1.5 MHz the sweep rate is  $1500/3 = 500$  sec.

LOG dB/div.: 2 dB

**Note:** For devices with spectrum line spacing  $\leq 3$  kHz, the RBW of the analyzer is reduced until the spectral lines are resolved. The measurement data is normalized to 3 kHz by summing the power of all the individual spectral lines within a 3 kHz band in linear power units.

**For Devices With Integral Antenna:**

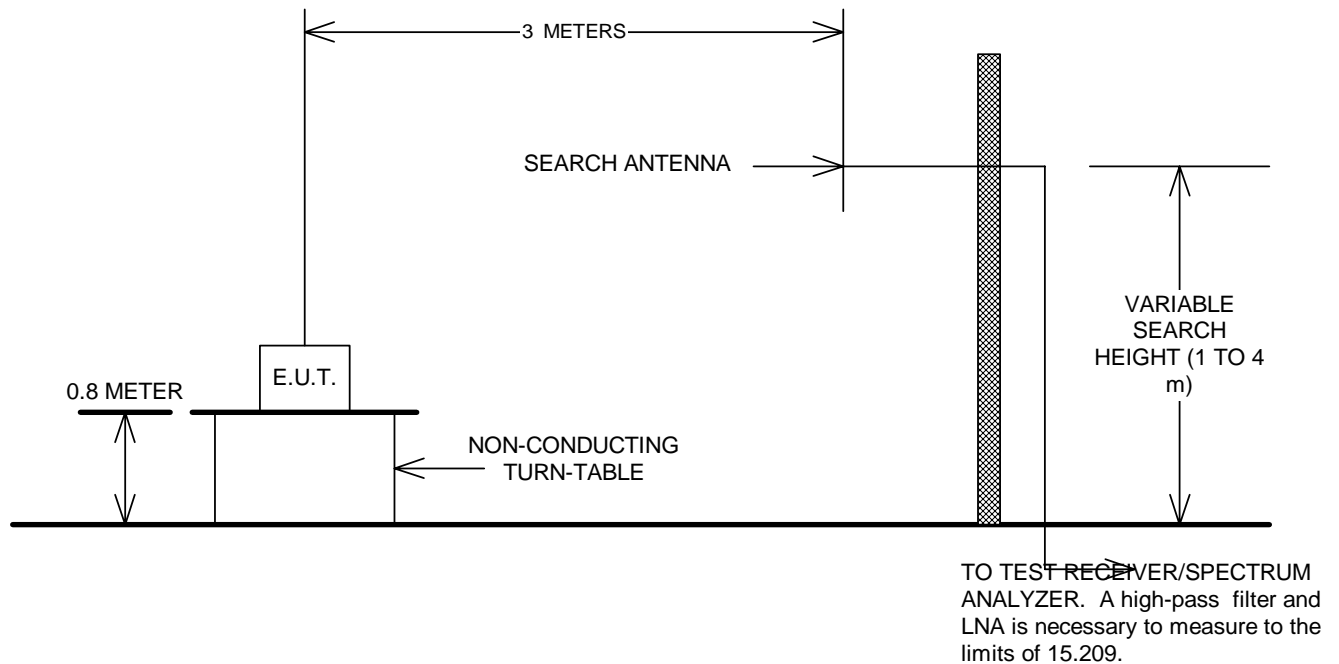
For devices with non-detachable antennas, the received field strength is peaked and the spectrum analyzer is set as above. The peak emission level is then measured and converted to a field strength by adding the appropriate antenna factor and cable loss. This field strength is then converted to an equivalent isotropic radiated power using the same method as described for Peak Power output.

Number of channels tested:

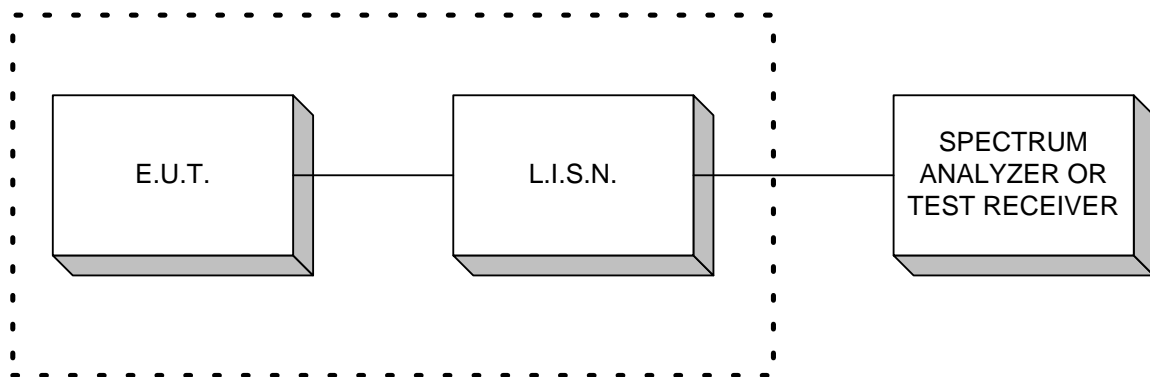
Tuning Range	Number Of Channels Tested	Channel Location In Band
1 MHz or Less	1	Middle
1 to 10 MHz	2	Top And Bottom
More Than 10 MHz	3	Top, Middle, Bottom

## **ANNEX B - TEST DIAGRAMS**

## Test Site For Radiated Emissions



## Conducted Emissions



*EQUIPMENT:* RTV2400 Radio Module

**Peak Power At Antenna Terminals**



**Minimum 6 dB Bandwidth  
Peak Power Spectral Density  
Spurious Emissions (conducted)**

