



*Nemko USA, Inc.  
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Phone (858) 755-5525 Fax (858) 452-1810*

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**CERTIFICATION TEST REPORT  
PART 15.247C  
IC RSS-210**

**For The Handheld CAREt  
Model: 200524-01**

**FCC ID: R9M-IDOT-002  
IC: 7701A-IDOT002**

**PREPARED FOR:**

**IntelliDOT Corporation  
13520 Evening Creek Drive North Suite 400  
San Diego, CA 92128**

**Prepared on: February 26, 2009**

**Report Number: 2008 02105106-FCC**

**Project Number: 12951-1**

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**Total Pages: 39**

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## DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	February 26, 2009	Prepared By: Alan Laudani
-	February 26, 2009	Initial Release: Alan Laudani
A	June 9, 2009	Added "Mode G" Alan Laudani

NOTE: Nemko USA, Inc. hereby makes the following statements so as to conform to Chapter 10 (Test Reports) Requirements of ANSI C63.4 (2003) "Methods and Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz":

- o The unit described in this report was received at Nemko USA, Inc.'s facilities on May 6, 2008.
- o Testing was performed on the unit described in this report on May 6, 2008 to February 25, 2009.
- o The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- o This report does not imply the endorsement of the Federal Communications Commission (FCC), Industry Canada, NVLAP or any other government agency.

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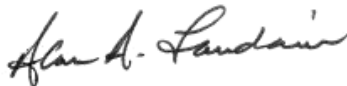
## CERTIFICATION

Nemko USA, Inc., an independent Electromagnetic Compatibility (EMC) Test Laboratory, produced this Test Report and performed the Radio Frequency Interference (RFI) testing and data evaluation contained herein.

Nemko USA, Inc.'s measurement facility is currently registered with the United States Federal Communications Commission (FCC) in accordance with the provisions of 47 United States Code (CFR) Part 2, Subpart I, Section 2.948(a). A current description of Nemko USA, Inc.'s measurement facility is on file with the FCC. Nemko USA Inc. has additionally satisfied the FCC that it complies with the requirements set forth in 47 CFR Part 2, Subpart I, Section 2.948(d) regarding the accreditation of EMC laboratories.

The RFI testing, test data collection and test data evaluation were accomplished in accordance with the ANSI C63.4-2003 Standard, and in accordance with the applicable sections of the FCC rules (47 CFR Parts 2 and 15). The testing was also accomplished in accordance with Industry Canada's ICES-003 standard for unintentional radiating device per EMCAB-3, Issue 3 (May 1998). The administrative summary of this test report provides a description of the test sample.

I hereby certify that the test data, test data evaluation, and equipment configurations used to compile this test report are a true and accurate representation of the test sample's radio frequency interference characteristics as of the test date(s), and, for the design of the test sample.




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Alan Laudani  
EMC Engineer

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## 1.ADMINISTRATIVE DATA AND TEST SUMMARY

### 1.1. Administrative Data

CLIENT: IntelliDOT Corporation  
13520 Evening Creek Drive North Suite 400  
San Diego, CA 92128

CONTACT: Trace Funderburk  
E-Mail: tfunderburk@intellidot.net

DATE (S) OF TEST: May 6, 2008.

EQUIPMENT UNDER TEST (EUT): Handheld CAREt

MODEL: 200524-01  
Serial Number: NA

CONDITION UPON RECEIPT: Suitable for Test

TEST SPECIFICATION: FCC, Part 15.247, Subpart C Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0-24.25 GHz bands and RSS 210 (Issue 7, June 2007) Annex 8 - Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

### 1.2. Test Summary

<i>Specification</i>	<i>Frequency Range</i>	<i>Compliance Status</i>
FCC, CFR 47, Section 15.207	0.15 MHz - 30.00 MHz	NA <sup>1</sup>
FCC, CFR 47, Section 15.209	30 MHz – 10 <sup>th</sup> Harmonic	PASS
FCC CFR 47, §15.247 Plus Bandedge	2412– 2462 MHz	PASS
RSS-210 - Low Power License Exempt Radio-communication Devices (All Frequency Bands)	2412– 2462 MHz	PASS

<sup>1</sup>Conductive emissions were not required as this was a battery powered device.

*Refer to the test results section for further details.*

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EMC Engineer

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## 2. SYSTEM CONFIGURATION

### 2.1. Description and Method of Exercising the EUT

The 200524-01 is a module to be placed into a Handheld CAREt wireless bedside medication information administration device. Its function is to provide wireless, point of care, communication. It is used to verify the identity of the patient, medication and doctor or nurse administering the medication.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.

The hand held device that contains the 802.11b and 802.11g radio is part of a patient care application used by nurses. The hand held communicates periodically through access points with a database server that is connected to the hospital's wired network. This traffic allows the hand held device to stay synchronized with the other patient care systems within the hospital.

The hand held initiates all communication on a scheduled 30 second interval. On the interval, the system uses the transmitter for less than one half second on average. During the typical session, less than 1 Kbyte of data is transferred. This resulting transmit duty cycle is <1.7%. The transmitter is on < 1 minute per hour and less than 6 seconds per 6 minutes.

Model 01 and 02 are identical in their radio construction, configuration and operation. Model 01 and 02 differ in the keypad configuration and the model of display used.

In normal use, the hand held is picked up by a nurse at the bedside for medication safety checking and documentation of treatment. The nurse holds the handheld device in her hand at the end of her extended bent arm to scan barcodes and confirm software prompts on the display. This activity is for data gathering only and no data transmission occurs. When the activity is complete, the nurse scans her ID band and returns the hand held to its standby position on a countertop or a transport tray. Data transmission resumes on the scheduled 30 second interval after the unit enters standby.

Also in normal use the nurse will handle the device so as to be able to read the display. Since the antenna's are located at the very end of the product the distance from the user to the antennas is greater than 2.5cm.

### 2.2. System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - Handheld CAREt	IntelliDOT Corporation Model: 200524-01 Serial #: NA	None- Battery powered

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### 2.3. Device Interconnection and I/O Cables

Connection	I/O Cable
EUT to Wireless Access Point	None - wireless

### 2.4. Design Modifications for Compliance

The following design modifications were made to the EUT during testing.

No design modifications were made to the EUT during testing.

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## 2.5. Technical Specifications of the EUT

<b>Manufacturer:</b>	IntelliDOT Corporation
<b>Operating Frequency:</b>	2412 MHz to 2462 MHz in the 2400-2483.5 MHz Band
<b>Rated Power:</b>	76 mW
<b>Modulation:</b>	Digital
<b>Antenna:</b>	Antonova Mica 2.4 GHz SMD antenna 1.8 dBi gain
<b>Antenna Connector:</b>	Circuit Internal from radio board to antenna –cannot be accessed by user
<b>Power Source:</b>	3 V battery



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### 3.DESCRPTION OF TEST SITE AND ENVIRONMENT

#### 3.1. Description of Test Site

The test site is located at 11696 Sorrento Valley Road, Suite F, San Diego, CA 92121. The site is physically located 18 miles Northwest of downtown San Diego. The general area is a valley 1.5 miles east of the Pacific Ocean. This particular part of the valley tends to minimize ambient levels, i.e. radio and TV broadcast stations and land mobile communications. The three and ten-meter Open Area Test Site (OATS) is located behind the office/lab building. It conforms to the normalized site attenuation limits and construction specifications as set in the EN 55022 (1987), CISPR 16 and 22 (1985) and ANSI C63.4-2001 documents. The OATS normalized site attenuation characteristics are verified for compliance every year, and registered with the Federal Communications Commission under Registration Number 90579 and Industry Canada under 2040B-1 and 2040B-2.

#### 3.2. Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	17 – 22 °C
Humidity range	:	25 - 50%
Pressure range	:	87 - 105 kPa
Power supply range	:	3 V battery

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## **4.DESCRPTION OF TESTING METHODS**

### **4.1. Introduction**

As required in 47 CFR, Parts 2 and 15, the methods employed to test the radiated and conducted emissions (as applicable) of the EUT are those contained within the American National Standards Institute (ANSI) document ANSI C63.4-2003, titled "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz." All applicable FCC Rule Sections that provide further guidance for performance of such testing are also observed.

For General Test Configuration please refer to Figure 1 on the following page.

Digital devices sold in Canada are required to comply with the Interference Causing Equipment Standard for Digital Apparatus, ICES-003. These test methods and limits are specified in the Canadian Standards Association's (CSA) Standard C108.8-M1983 (1-1-94 version) and are "essentially equivalent" with FCC, Part 15 and CISPR 22 (EN55022) rules for unintentional radiators per EMCAB-3, Issue 3 (May 1998). No further testing is required for compliance to ICES-003.

### **4.2. Configuration and Methods of Measurements for Conducted Emissions**

Section 7 of ANSI C63.4 determines the general configuration of the EUT and associated equipment, as well as the test platform for conducted emissions testing. Tabletop devices are placed on a non-conducting surface 80 centimeters above the ground plane floor and 40 centimeters from the ground plane wall. The EUT and associated system are configured to operate continuously, representing a "normally operating" mode. The EUT is powered via a Line Impedance Stabilization Network (LISN). The emissions are recorded using the required bandwidth of 9 kHz in the quasi-peak mode. The average amplitude is also observed employing a 10 kHz bandwidth to determine the presence of broadband RFI. When such interference is caused by broadband sources (as defined by the FCC and ANSI Rules), the deviation guidelines contained in Section 11.3.1 of ANSI C63.4 are employed, which allows a correction factor of 13 dB to be subtracted from the quasi-peak reading. The emission levels are then compared to the applicable FCC limits to determine compliance.

### **4.3. Configuration and Methods of Measurements for Frequency Identification**

When performing all testing of equipment, the actual emissions of the EUT are segregated from ambient signals present within the laboratory or the open-field test range. Preliminary testing is performed to ensure that ambient signals are sufficiently low to allow for proper observation of the emissions from the EUT. Incoming power lines are filtered using a 120 dB, 30-ampere; 115/208-volt filter to assist in reducing ambient signals for tests of levels of conducted emissions. Ambients within the laboratory are compared to those noted at the nearby open-field site to discriminate between signals produced from the EUT and ambient signals. In the event that a significant emission is produced by the EUT at a frequency which is also demonstrating significant ambient signals, the spectrum analyzer is placed in the peak mode, the bandwidth is narrowed, the EUT's signal is centered on the analyzer, the scan width is expanded to 50 kHz while monitoring the audio to ensure that only the EUT signal is present, the analyzer is switched to quasi-peak mode, and the level of the EUT signal is recorded.

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#### 4.4. Configuration and Methods of Measurements for Radiated Emissions

Section 8 of ANSI C63.4 determines the general configuration and procedures for measuring the radiated emissions of equipment under test. Initially, the primary emission frequencies are identified inside the test lab by positioning a broadband receive antenna one meter from the EUT to locate frequencies of significant radiation. Next, the EUT and associated system are placed on a turntable on a ten meter open area test site (registered with the FCC in accord with its Rules and ANSI C63.4) and the receive antenna is located at a distance of ten meters from the EUT.

The EUT and associated system are configured to operate continuously, representing a “normally operating” mode. All significant radiated emissions are recorded when maximum radiation on each frequency is observed, in accordance with part 8 of ANSI C63.4–2003 and Section 15.33 of the FCC Rules. To ensure that the maximum emission at each discrete frequency of interest is observed, the receive antenna is varied in height from one to four meters and rotated to horizontal and vertical polarities, and the turntable is also rotated to determine the worst emitting configuration. The numerical results of the test are included herein to demonstrate compliance.

The numerical results that are applied to the emissions limits are arrived at by the following method:

Example:  $A = RR + CL + AF$

A = Amplitude dBuV/m

RR = Receiver Reading dBuV

CL = cable loss dB

AF = antenna factor dB/m

Example Frequency = 110MHz

18.5 dBuV (spectrum analyzer reading)

+3.0 dB (cable loss @ frequency)

21.5 dBuV

+15.4 dB/m (antenna factor @ frequency)

36.9 dBuV/m Final adjusted value

The final adjusted value is then compared to the appropriate emission limit to determine compliance.

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## 5. Test Results

### 5.1. Conducted Emissions

Part 15.207(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  $\mu$ H/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.

7.2.2 The purpose of this test is to measure unwanted radio frequency currents induced in any AC conductor external to the equipment which could conduct interference to other equipment via the AC electrical network. Except when the requirements applicable to a given device state otherwise, for any licence-exempt radiocommunication device equipped to operate from the public utility AC power supply, either directly or indirectly, the radio frequency voltage that is conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown below. The tighter limit applies at the frequency range boundaries. The conducted emissions shall be measured with a 50 ohm/50 microhenry line impedance stabilization network

Frequency Range (MHz)	Conducted Limit (dBuV)	
	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.

#### Test Results:

**Not tested as device is battery powered.**

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### 5.3 Radiated Emissions Test Data

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:		
Frequency (MHz)	Field Strength (uV/meter)	Measurement Distance (meter)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

<b>Model:</b>	200524-01	<b>Temperature:</b>	58°F
<b>Date:</b>	5/6/08	<b>Humidity:</b>	44%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	SOATS

#### Test Results:

Emissions were searched over a range of 30 MHz to 25000 MHz  
No emissions evident other than intentional radio emissions.

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## 5.2. Bandwidth

### RSS-Gen 4.6.1

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

<b>Model:</b>	200524-01	<b>Temperature:</b>	73°F
<b>Date:</b>	4/29/08 & 2/25/09	<b>Humidity:</b>	44%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Shielded Room 2

### 15.247(a)(1)

Measurements were made at 3 meters. Each channel investigated was maximized in the OATS before any reading was made. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level. The bandwidth was determined from where the channel output spectrum intersected the display line.

### Test Results:

20 dB Bandwidth			
Mode	Low Channel	Mid Channel	High Channel
B	14.7 MHz	15.9 MHz	15.6 MHz
G	17.2 MHz	19.2 MHz	17.2 MHz

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**Low Channel, B mode**

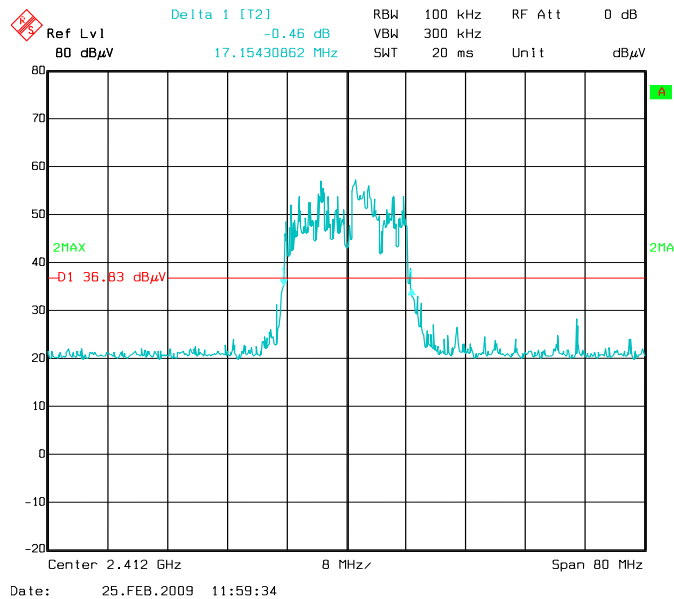


**Mid Channel, B mode**

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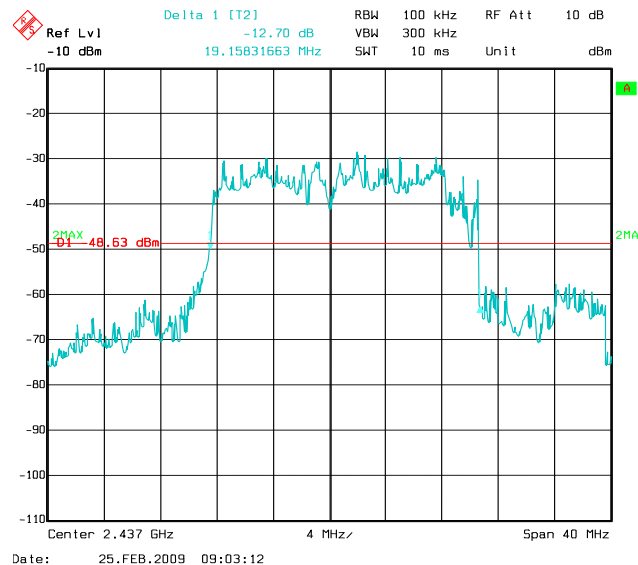
### Highest Channel, B mode



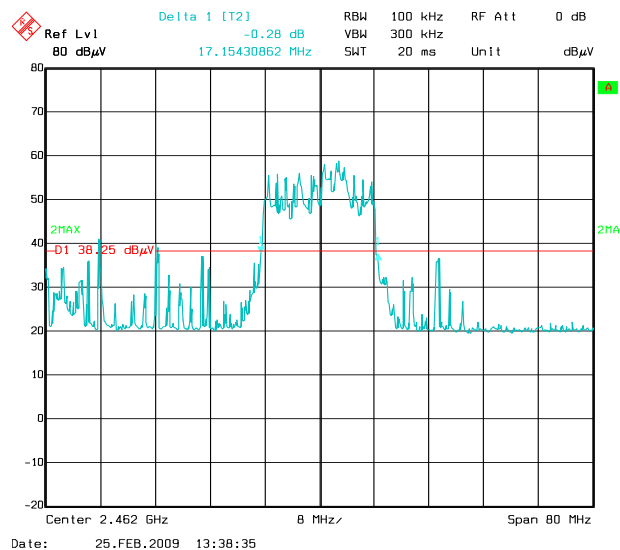
### Lowest Channel, G mode



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### Mid Channel, G mode



### Highest Channel, G mode

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### 5.3. Out-of-band Emissions / Radiated Emissions within Restricted Bands

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/meter)	Measurement Distance (meter)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Sec. 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a) (see Sec. 15.205(c)).

### A8.5 Out-of-band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

<b>Model:</b>	200524-01	<b>Temperature:</b>	23°C
<b>Date:</b>	4/29/08	<b>Humidity:</b>	43%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	SOATS

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**Test Results: EUT complies. No Emissions other than the Fundamental were evident. Bandedge are noise floor measurements.**

**Additional Observations:**

- The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic, 25000 MHz. There are no emissions found that do not comply to the restricted bands defined in **FCC Part 15 Subpart C, 15.205** or **Part 15.247(d)**.
- Radiated Measurements below 1GHz were performed at 3m with a Quasi-Peak detector (RBW 120kHz/VBW 300kHz) while Radiated Peak (RBW 1MHz/VBW 3MHz) and Average was calculated as Peak + Duty Cycle Factor.
- Emissions measuring greater than 20 dB from the limit were not included in the table below.
- The EUT was measured on three orthogonal axes.
- The device has an integral antenna with no conducted measurement capability.
- The Spectrum Analyzer's 10 dB attenuation was removed to show noise floor at band edge frequencies.
- Peak hold measurements are shown below.

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## Duty Cycle Factor

On time = 0.717 ms (see second plot below)

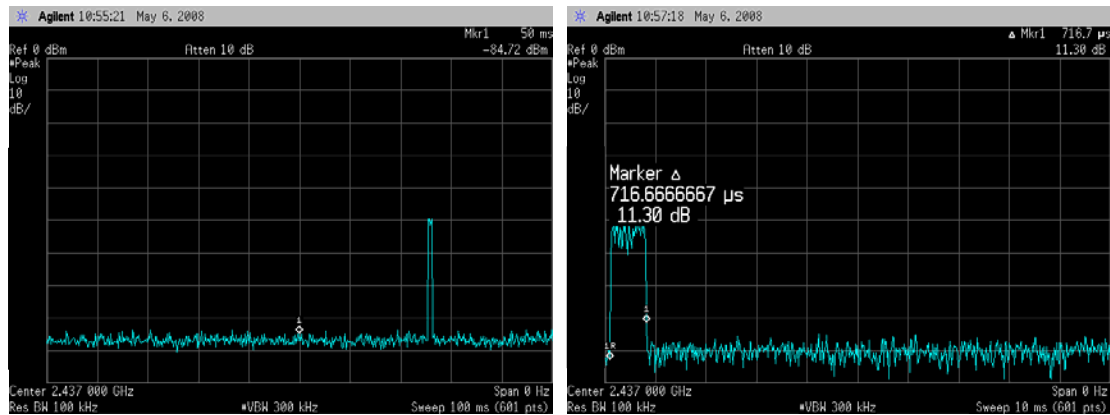
Duty Cycle = 0.717ms / 100 ms = 0.007

Duty Cycle Factor =  $20 \times \text{Log}(\text{Duty Cycle}) = 20 \times \text{log}(0.007)$

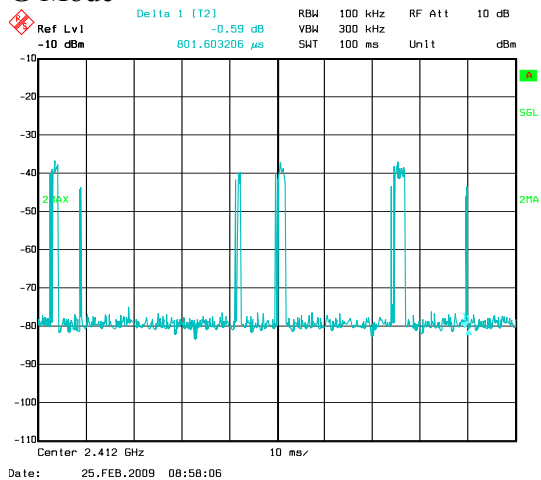
The FCC restricts minimum duty cycle to 0.1

So Duty Cycle Factor =  $20 \times \text{log}(0.1) = -20 \text{ dB}$

## B Mode



## G Mode



Emissions Summed, left to right:

$2.00\text{ms} + 0.60\text{ms} + 1.60\text{ms} + 2.60\text{ms} + 3.01\text{ms} + 0.80\text{ms} = 10.61\text{ms}$

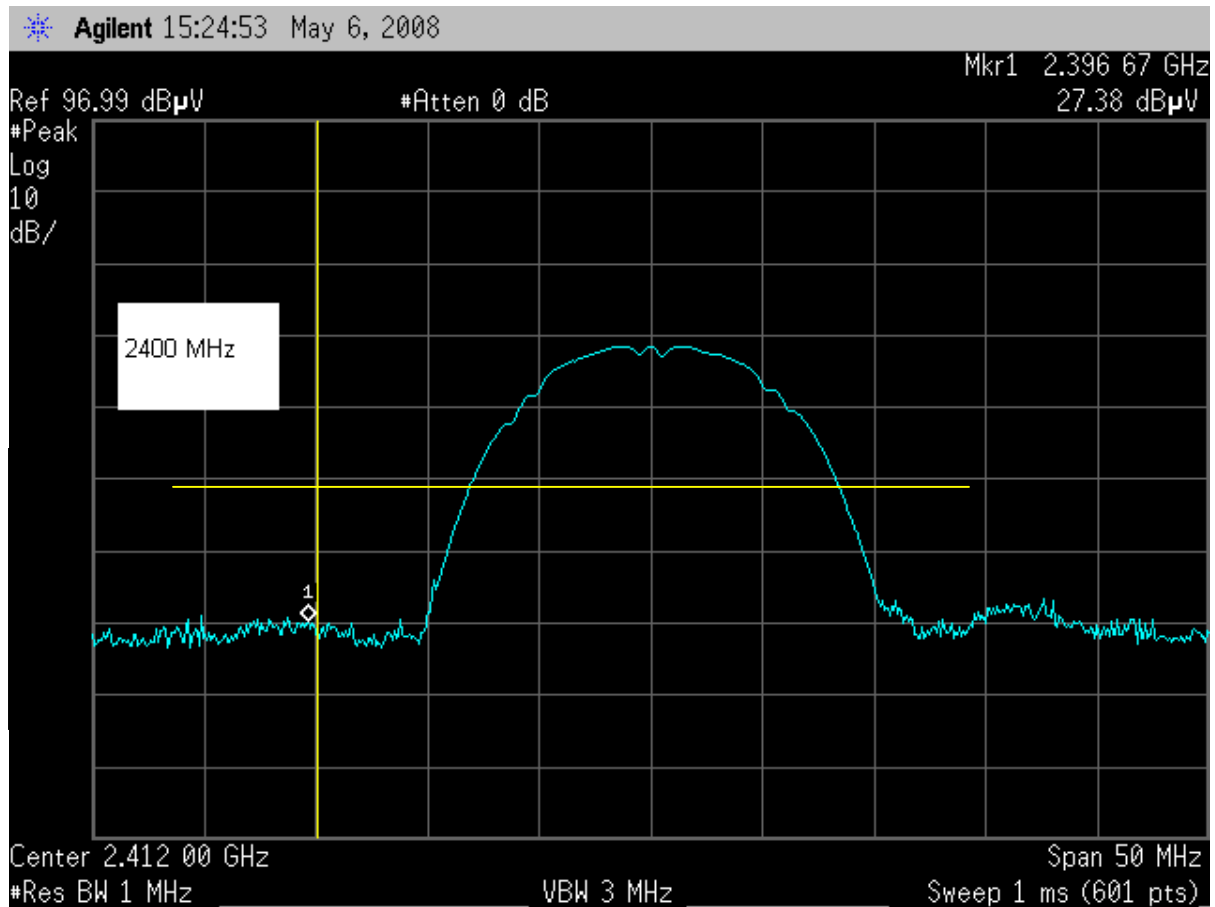
Duty Cycle =  $10.61\text{ms} / 100 \text{ ms} = 0.106$

Duty Cycle Factor =  $20 \times \text{Log}(\text{Duty Cycle}) = 20 \times \text{log}(0.106)$

So Duty Cycle Factor = -19.5 dB

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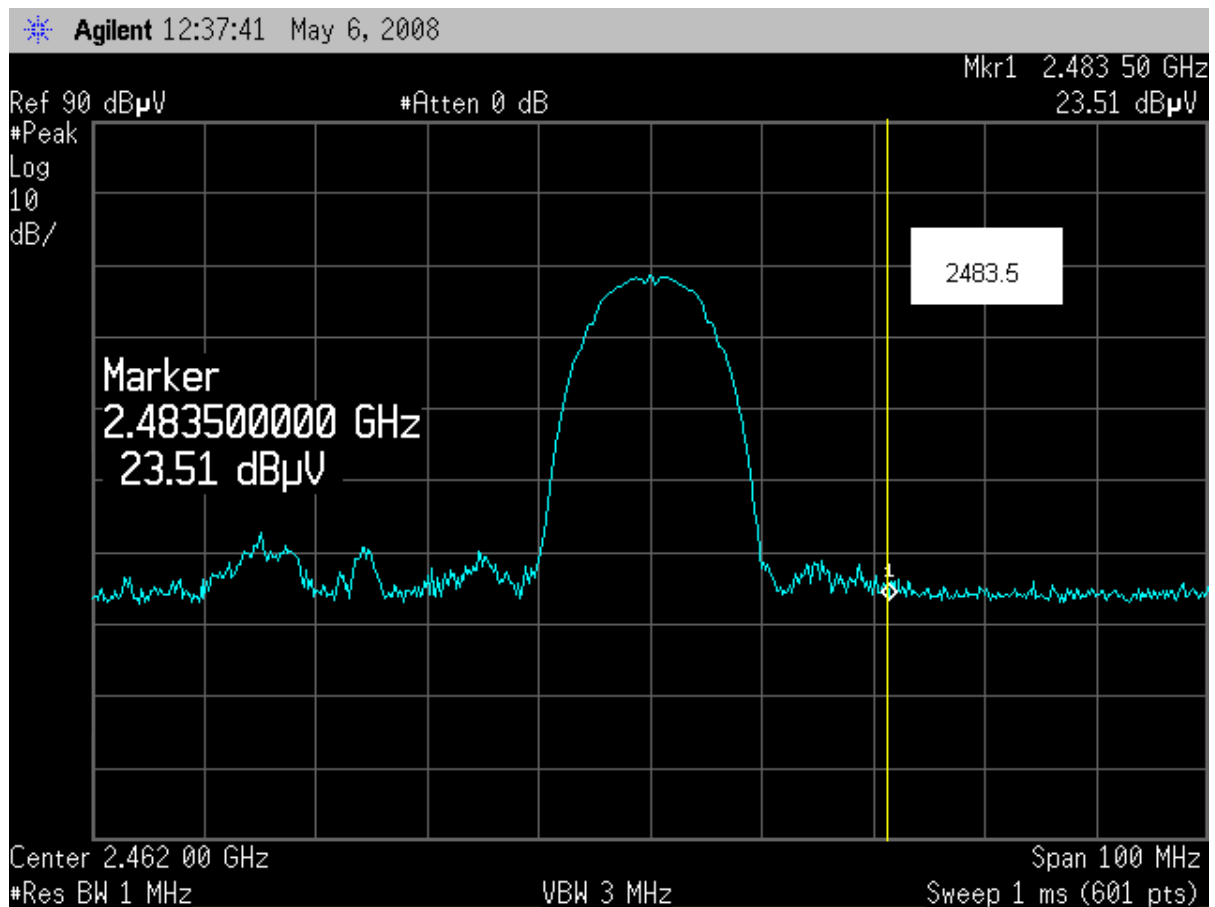
#### 5.4. Bandedge Measurements B Mode



#### Low Channel 2412 MHz (Peak Hold Measurement)

Frequency line is 2400 MHz  
Limit used is 20dB from peak  
Average = Peak + (-20dB)  
Peak complies.  
Average complies.

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**High Channel 2462 MHz (Peak Hold Measurement)**  
**Frequency line is 2483.5 MHz**

**Limit used is 74 dB per 15.209 and 15.205**  
**Limit used is 54 dB per 15.209 and 15.205**

Emissions calculation example:

Frequency 2483.5 MHz Peak

Maximum measured vertically = 23.5 dBμV

Add 28.4 dB/m for antenna factor = 51.9 dBμV/m

Add 5.9 dB for cable loss = 57.8 dBμV/m

Result is 16.2 below limit of 15.209, therefore Peak complies.

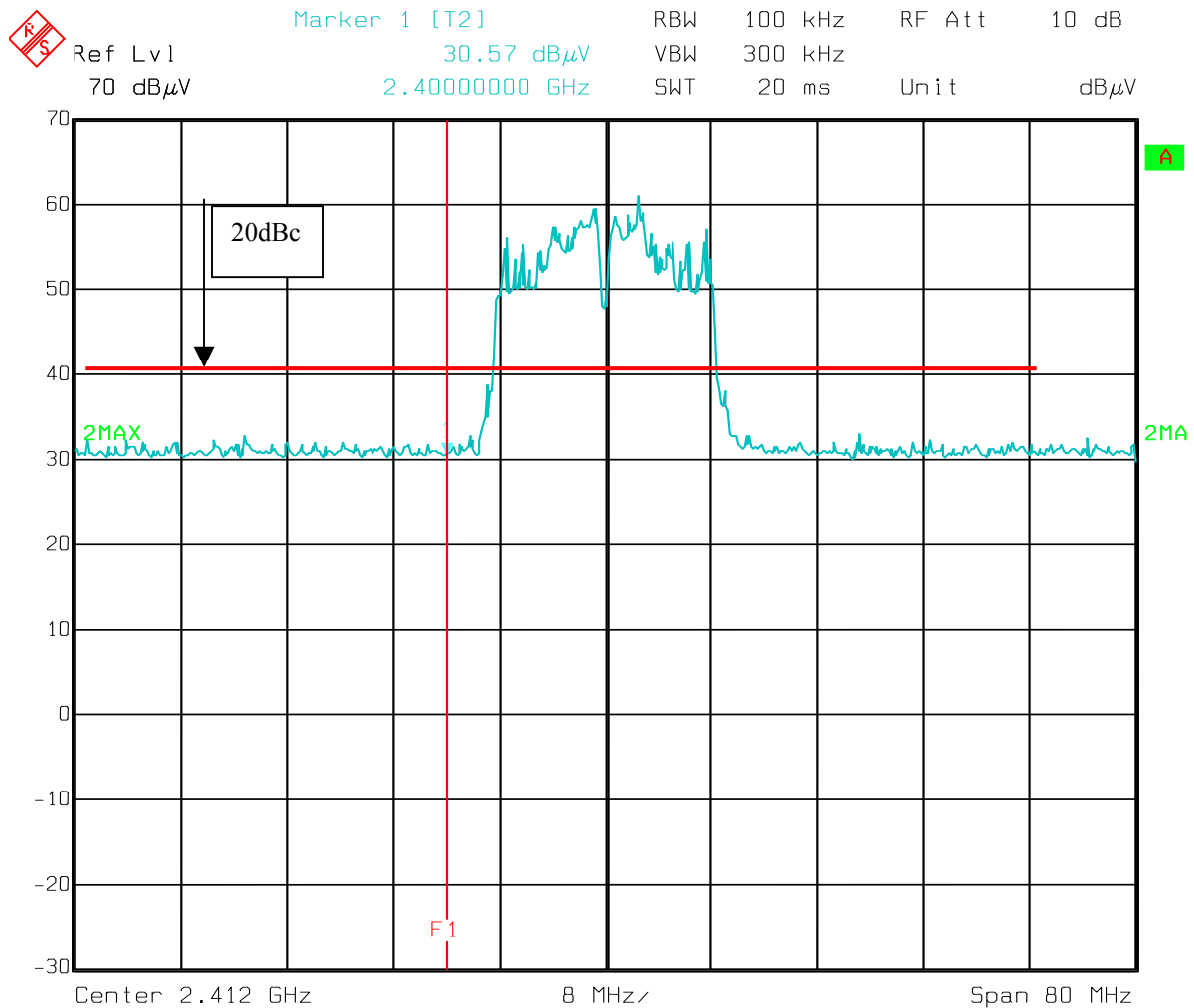
Average = Peak + (-20dB)

Average = 57.8 -20 = 37.8 dBμV/m

Result is 16.2 below limit of 15.209, Average complies.

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## 5.5. Bandedge Measurements G Mode

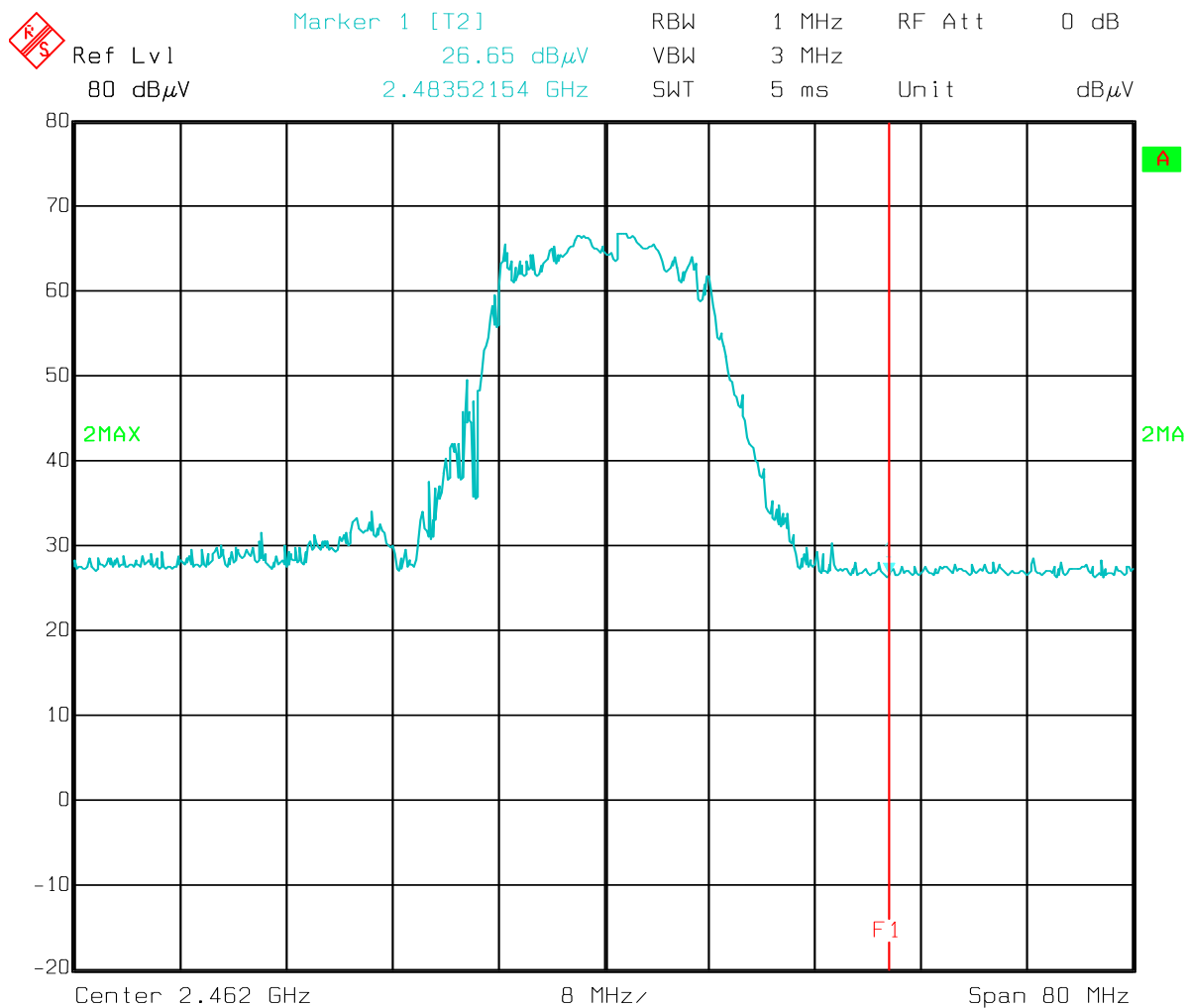


Date: 25.FEB.2009 11:23:50

### Low Channel 2412 MHz (Peak Hold Measurement)

Frequency line is 2400 MHz  
 Limit used is 20dB from peak  
 Average = Peak + (-20dB)  
 Peak complies.  
 Average complies.

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Date: 25.FEB.2009 13:25:37

### High Channel 2462 MHz (Peak Hold Measurement)

Frequency line is 2483.5 MHz

Limit used is 74 dB per 15.209 and 15.205

Limit used is 54 dB per 15.209 and 15.205

Emissions calculation example:

Frequency 2483.5 MHz Peak

Maximum measured vertically = 26.6 dBμV

Add 28.3 dB/m for antenna factor = 54.9 dBμV/m

Add 5.9 dB for cable loss = 60.8 dBμV/m

Result is 13.2 below limit of 15.209, therefore Peak complies.

Average = Peak + (-19.5dB)

Average = 60.8 - 19.5 = 41.3 dBμV/m

Result is 12.7 below limit of 15.209, Average complies.



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## 5.6. Out-of-band Emissions / Conducted Emissions

15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Sec. 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a) (see Sec. 15.205(c)).

### A8.5 Out-of-band Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

<b>Model:</b>	200524-01	<b>Temperature:</b>	73°F
<b>Date:</b>	4/29/08	<b>Humidity:</b>	44%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Shielded Room 2

**Test Results:** EUT has no provision for conducted measurements, see Radiated Emissions.

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## 5.7. Minimum 6dB RF Bandwidth

(a)(2) 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.

A8.2 (a) The minimum 6 dB bandwidth shall be at least 500 kHz.

<b>Model:</b>	200524-01	<b>Temperature:</b>	73°F
<b>Date:</b>	4/29/08 & 2/25/09	<b>Humidity:</b>	44%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Shielded Room 2

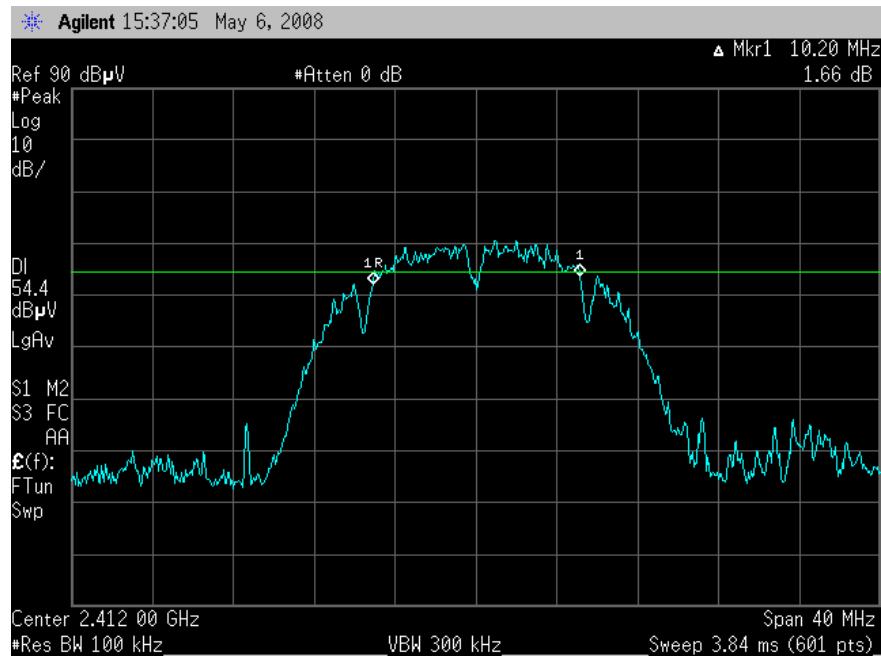
## Test Results: EUT Complies.

### 6dB Bandwidth:

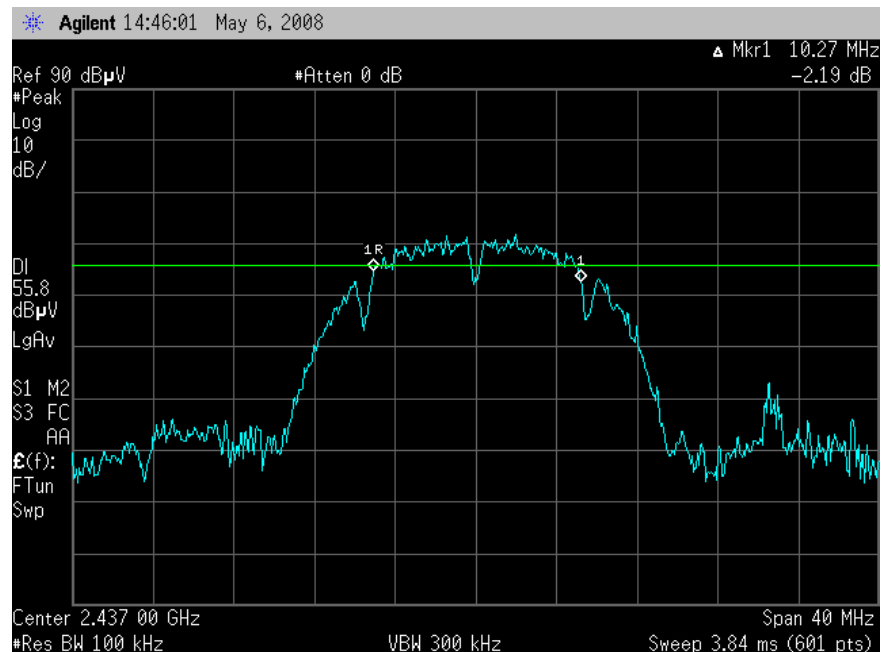
Measurements were made at 3 meters. Each channel investigated was maximized in the OATS before any reading was made. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line. During Band Edge measurements, it was determined that the highest channel was to be reduced in power requirements, therefore the next to highest channel was included in data collection.

Channel Range	6dB Bandwidth B Mode	6dB Bandwidth G Mode
Low (2412 MHz)	10.2 MHz	15.2 MHz
Mid (2437 MHz)	10.3 MHz	18.2 MHz
High (2462 MHz)	10.2 MHz	12.8 MHz

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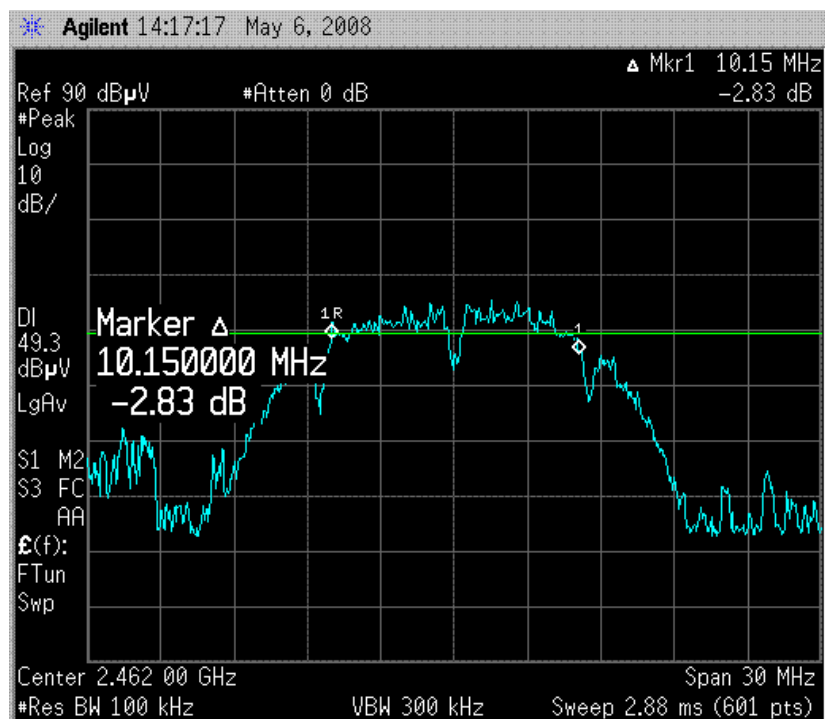


LOW Channel, Mode B

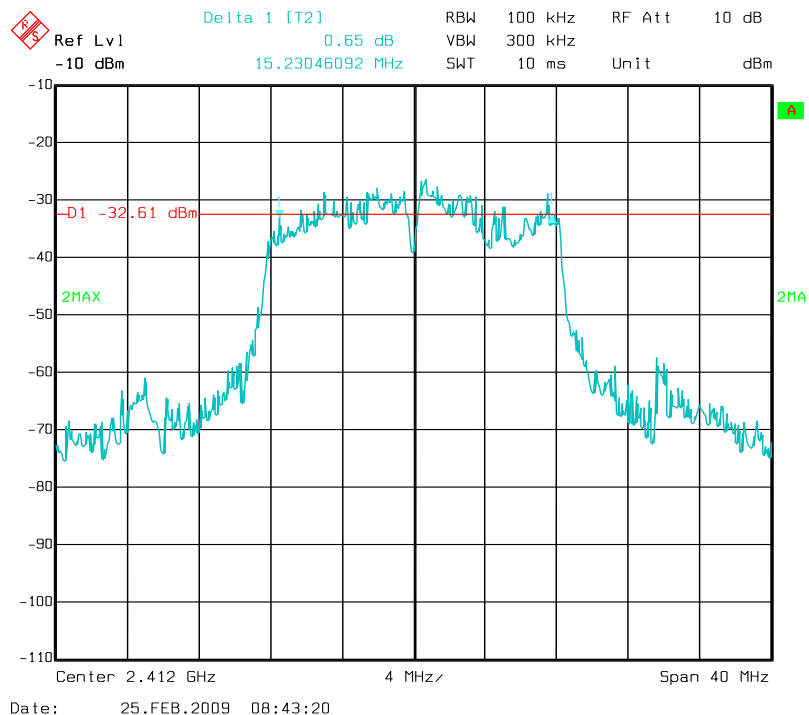


MID Channel, Mode B

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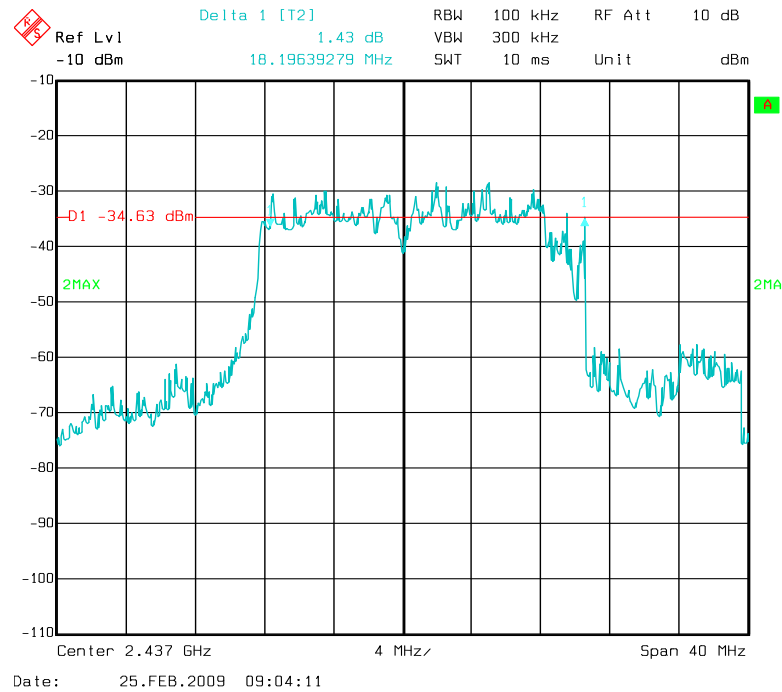


HIGH Channel , Mode B

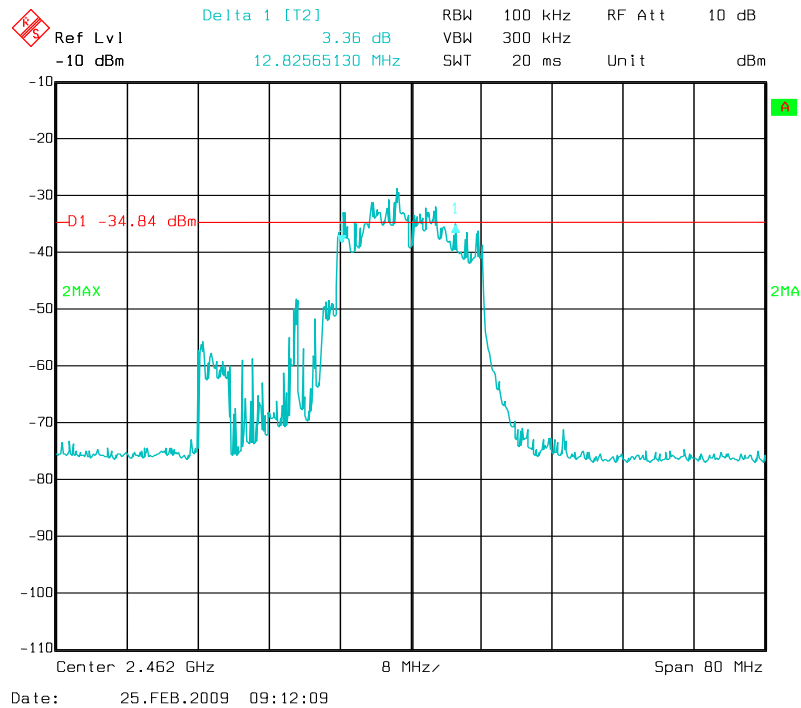


LOW Channel, Mode G

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**MID Channel, Mode B**



**HIGH Channel , Mode G**

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## 5.8. Maximum peak output power

(b) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

### A8.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under Section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required.

<b>Model:</b>	200524-01	<b>Temperature:</b>	14°C
<b>Date:</b>	6/6/08 & 2/25/09	<b>Humidity:</b>	91%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Shielded Room 2

## Test Results: Mode B

Frequency (MHz)	Measured Output Power dBμV/m	Corrected Measured Output Power dBμV/m	Calculated Output EIRP Power (dBm)	Antenna Gain (dB)	Calculated Conducted Power (dBm)	Calculated Conducted Power (W)
2412	110.2	112.8	17.6	1.8	15.8	0.038
2437	110.9	113.9	18.7	1.8	16.9	0.049
2462	112.9	115.8	20.6	1.8	18.8	0.076

- **Measurement Resolution Bandwidth is less than the 20 dB bandwidth therefore the following bandwidth correction factor was used.**

$$BWCF = 10 \times \text{Log} (20 \text{ dB bandwidth/measurement bandwidth})$$

$$BWCF_{2412} = 10 \times \text{Log} (14.73/8.0) = +2.6\text{dB}$$

$$BWCF_{2437} = 10 \times \text{Log} (15.87/8.0) = +3.0\text{dB}$$

$$BWCF_{2462} = 10 \times \text{Log} (15.60/8.0) = +2.9\text{dB}$$

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### Test Results: Mode G

Frequency (MHz)	Measured Output Power dB $\mu$ V/m	Corrected Measured Output Power dB $\mu$ V/m	Calculated Output EIRP Power (dBm)	Antenna Gain (dB)	Calculated Conducted Power (dBm)	Calculated Conducted Power (W)
2412	112.7	115.1	19.9	1.8	18.1	0.064
2437	111.1	113.9	18.7	1.8	16.9	0.049
2462	111.9	114.3	19.1	1.8	17.3	0.053

- **Measurement Resolution Bandwidth is less than the 20 dB bandwidth therefore the following bandwidth correction factor was used.**

BWCF = 10 x Log (20 dB bandwidth/measurement bandwidth)

BWCF<sub>2412</sub> = 10 x Log (17.2/10.0) = +2.4dB

BWCF<sub>2437</sub> = 10 x Log (19.2/10.0) = +2.8dB

BWCF<sub>2462</sub> = 10 x Log (17.2/10.0) = +2.4dB

### Additional Observations:

- **Peak Hold Analyzer Readings. Measurements were made at 3 meters. Each channel investigated was maximized in the OATS before any reading was made.**
- **Measurements were made with a fresh battery.**
- **The peak level measured was converted to V/m and Peak power computed using the formula:**

$$P = (E \times d)^2 / (30 \times G)$$

$$0.616\text{V/m} = 10^{((115.8-120)/20)}$$

$$0.114\text{W} = (0.616 \times 3)^2 / (30 \times 1)$$

$$10 \times \log(0.114) + 30 = 20.6 \text{ dBm}$$

$$(\text{check: } 115.8 - 20.6 = 95.2)$$

Where: P = Power in watts

E = measured maximum field strength in V/m

d = distance in meters during measurement

G = numeric gain of the transmitting antenna , 1 assumed for calculation.

## Mode B

Job # :	22951-1	Date :	5/6/08	Page	1	of	1
NEX #:	106635	Time :	1000 am				
		Staff :	aal				
Client Name :	IntelliDot						
EUT Name :							
EUT PART # :							
EUT Serial # :	NA						
EUT Config. :	transmitting Mode B						
Specification :	CFR47 Part 15, Subpart C, 15.247						
Loop Ant. #:	NA		Temp. (°C) :	14			
Bicon Ant.#:	114		Humidity (%) :	91			
Log Ant.#:	110		Spec An#:	911			
DRG Ant. #	529		Spec An. Display #:	911			
Cable LF#:	SOATS		QP #:	911			
Cable HF#:	40ft		PreSelect#:	NA			
Preamp LF#:	901						
Preamp HF#	919						

EUT Voltage :	
EUT Frequency :	
Phase:	
NOATS	
SOATS	
Distance < 1000 MHz:	
Distance > 1000 MHz:	

Quasi-Peak	Valid
Peak	Valid
Average	Valid

Measurements below 1 GHz are Quasi-Peak  
Measurements above 1 GHz are Average

[illegible]



## Mode G

Job # : 12951-1      Date : 2-25-09      Page 1 of 1  
NEX #: 106635      Time : 1000 am  
Staff : aal

EUT Voltage :	3 VDC
EUT Frequency :	Battery
Phase:	-
NOATS	-
SOATS	X
Distance < 1000 MHz:	3 m
Distance > 1000 MHz:	3 m

Quasi-Peak	RBW: 120 kHz
	Video Bandwidth 300 kHz
Peak	RBW: 1 MHz
	Video Bandwidth 3 MHz
Average	RBW: 1 MHz
	Video Bandwidth 10 Hz

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.

[illegible]

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## 5.9. Power Spectral Density

(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

A8.2(b) The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0-second duration. This power spectral density shall be determined in accordance with the provisions of Section A8.4(4); (i.e. the power spectral density shall be determined using the same method for determining the conducted output power).

<b>Model:</b>	200524-01	<b>Temperature:</b>	73°F
<b>Date:</b>	4/29/08 & 2/25/09	<b>Humidity:</b>	44%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Shielded Room 2

### Additional Observations:

- **Peak Hold Analyzer Readings:** RES BW was set to 3 kHz and VBW to 10 kHz; Span = 1.5 MHz, Sweep = 500 seconds.
- **Measurements were made at 3 meters. Each channel investigated was maximized in the OATS before any reading was made.**
- **Measurements were made with a fresh battery.**
- **Spectrum analyzer plots show measurement directly as an offset was put in for Antenna Factor (28.5 dB typical) and Cable loss (5.9dB).**

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## Test Results:

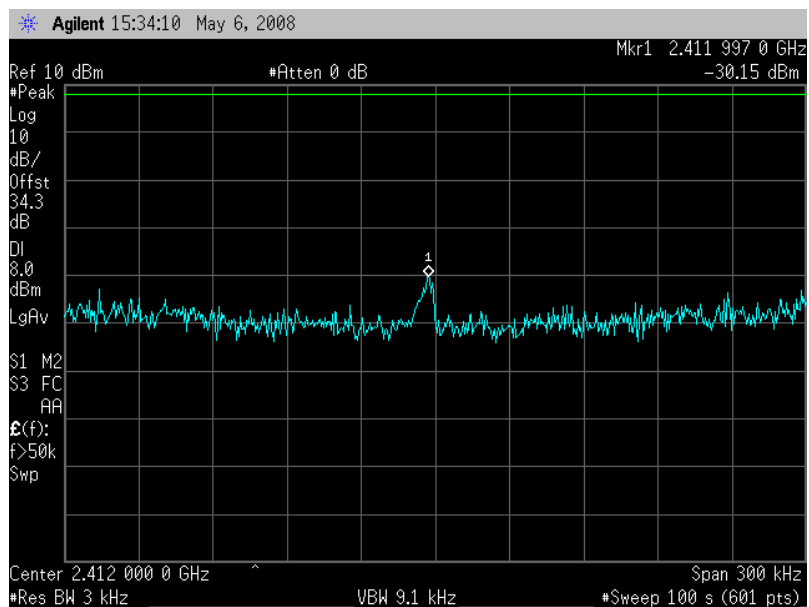
### Mode B

<b>Channel (MHz)</b>	<b>Measured Frequency (MHz)</b>	<b>RF Power Level in 3KHz BW (dBm)</b>	<b>Maximum Limit (dBm)</b>	<b>PASS/FAIL</b>
2412	2411.997	-30.15	8	Pass
2437	2438.996	-25.03	8	Pass
2462	2464.496	-31.14	8	Pass

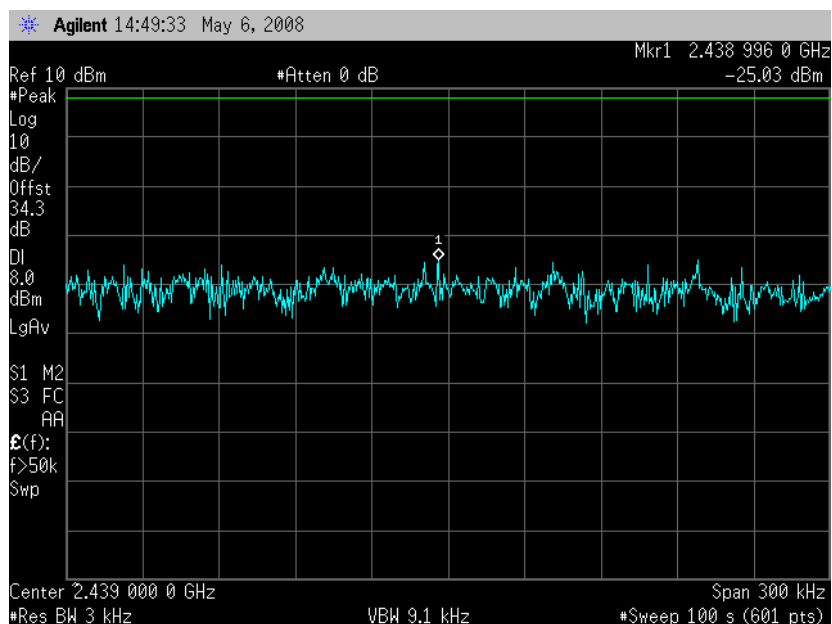
### Mode G

<b>Channel (MHz)</b>	<b>Measured Frequency (MHz)</b>	<b>RF Power Level in 3KHz BW (dBm)</b>	<b>Maximum Limit (dBm)</b>	<b>PASS/FAIL</b>
2412	2414.113	-26.18	8	Pass
2437	2439.115	-28.86	8	Pass
2462	2460.115	-26.57	8	Pass

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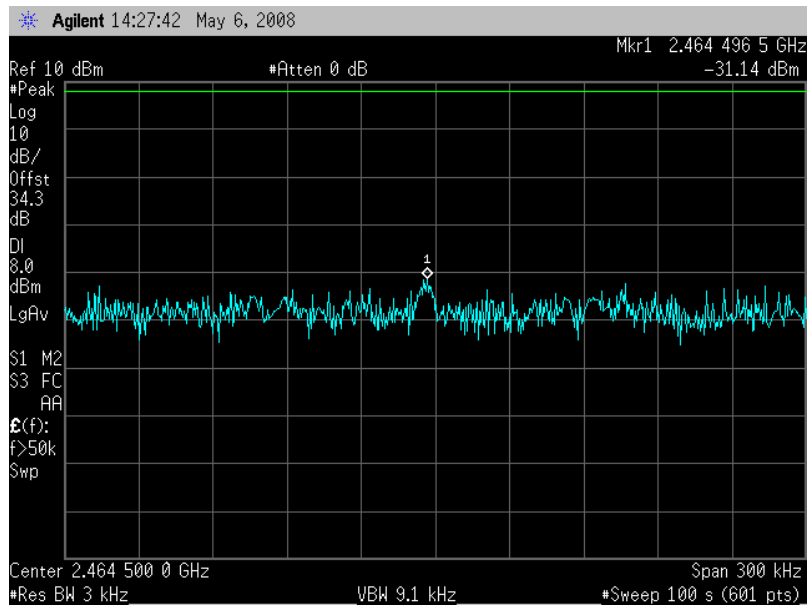


**Low Channel, Mode B**

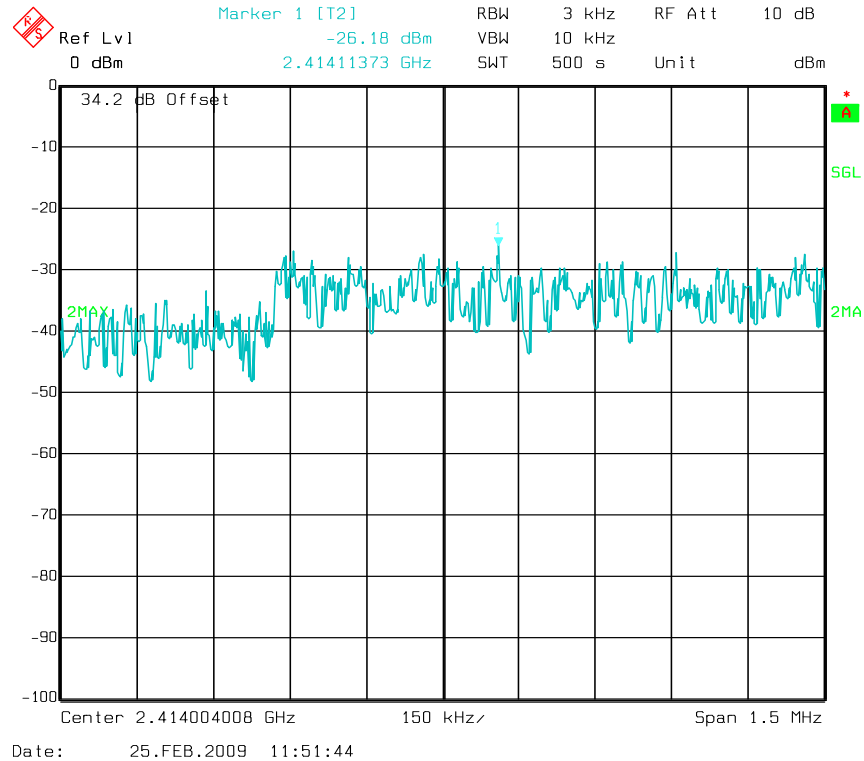


**Mid Channel, Mode B**

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February 26, 2009	MT-200 Certification Test Report FCC ID: R9M-IDOT-002 IC: 7701A-IDOT002	2008 02105106-FCC	37 of 39

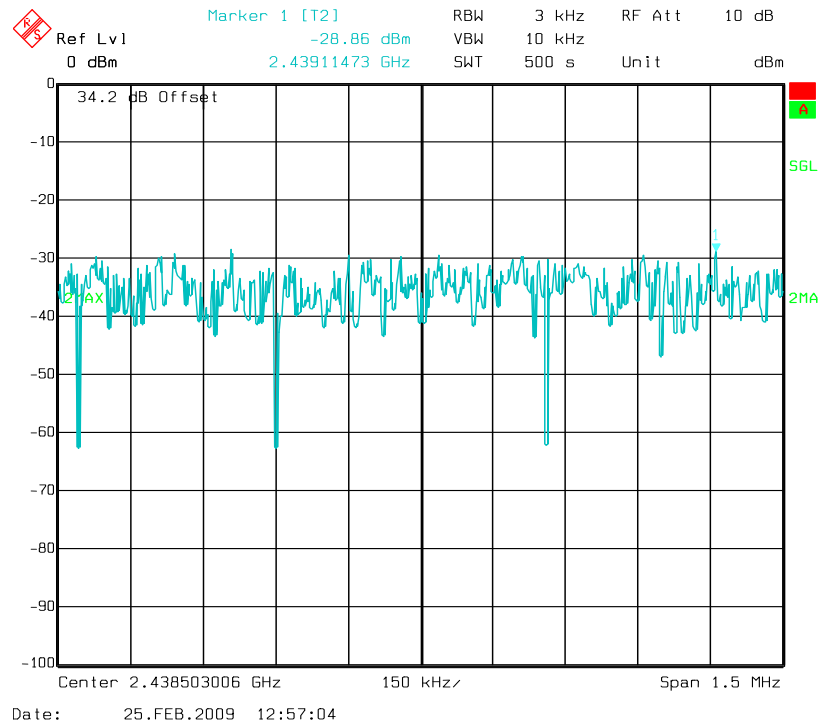


### Highest Channel, Mode B

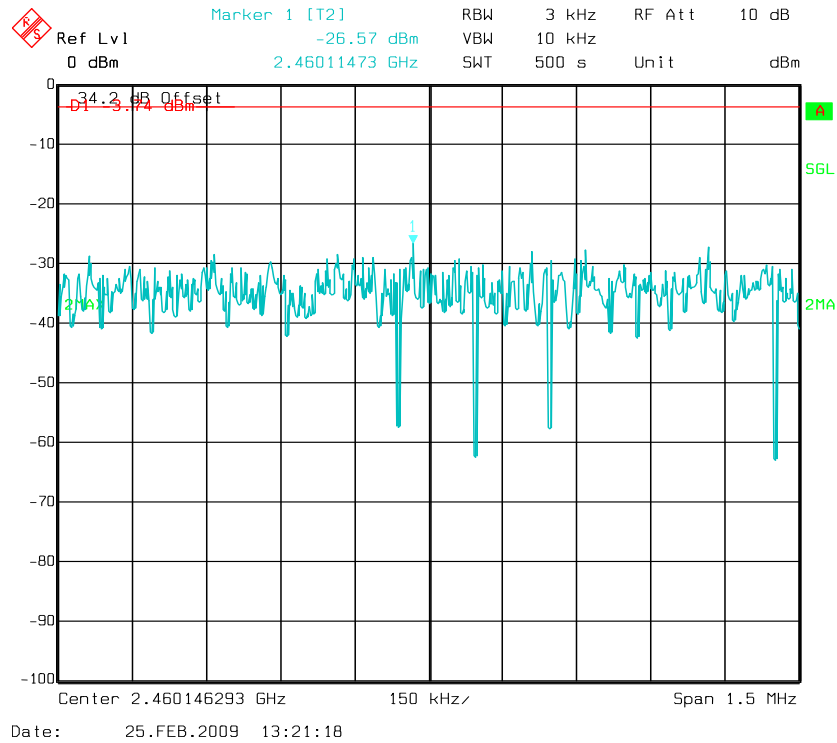


### Low Channel, Mode G

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**Mid Channel, Mode G**



**Highest Channel, Mode G**

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## 5.10. Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
110	Antenna, LPA	EMCO	3146	1217	10-Jan-08	10-Jan-09
114	Antenna, Bicon	EMCO	3104	2997	10-Jan-08	10-Jan-09
317	Preamplifier	HP	8449A	2749A00167	31-Mar-08	31-Mar-09
529	Antenna, DRWG	EMCO	3115	2505	27-Aug-07	27-Aug-08
625	Antenna, Dbl Ridge Horn	EMCO	3116	2325	01-Apr-08	01-Apr-09
674	Spectrum Analyzer	HP	8568B	2007A00910	11-Apr-08	11-Apr-09
675	Spectrum Analyzer Display	HP	85662A	2005A01282	11-Apr-08	11-Apr-09
676	Quasi-Peak Adapter	HP	85650A	2430A00576	11-Apr-08	11-Apr-09
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	27-Jun-08	27-Jun-09
911	Spectrum Analyzer	Agilent	E4440A	US41421266	18-Mar-08	18-Mar-09
919	Preamplifier	Spacek Labs MM-Wave Technology	100MHz to 40GHz	3M12 ,3M13	12-Mar-08	12-Mar-10