Nemko USA, Inc.
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CERTIFICATION TEST REPORT
PART 15.247C
IC RSS-210

For The Wireless Exit Controller
Model: WXC

FCC ID: WEF-WXC
IC: 7713A-WXC

PREPARED FOR:

Stanley Security Solutions
6161 E. 75th Street
Indianapolis, IN 46250

Prepared on: July 17, 2008

Report Number: 2008 07110482 FCC

Project Number: 14150-1

NEx Number: 110482

Total Pages: 49

DOCUMENT HISTORY

REVISION	DATE	COMMENTS
-	July 17, 2008	Prepared By: Ferdinand Custodio
-	July 17, 2008	Initial Release: 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":

- The unit described in this report was received at Nemko USA, Inc.'s facilities on July 15, 2008.
- Testing was performed on the unit described in this report on July 15 to July 17, 2008
- The Test Results reported herein apply only to the Unit actually tested, and to substantially identical Units.
- 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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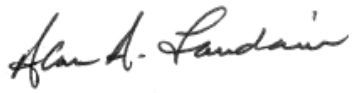
CERTIFICATION

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.



Alan Laudani
EMC Engineer

1. ADMINISTRATIVE DATA AND TEST SUMMARY

1.1. Administrative Data

CLIENT:	Stanley Security Solutions 6161 E. 75th Street Indianapolis, IN 46250
CONTACT: E-Mail:	Troy Brown tbrown2@stanleyworks.com
DATE (S) OF TEST:	July 15 to July 17, 2008
EQUIPMENT UNDER TEST (EUT):	Wireless Exit Controller
MODEL: Serial Number:	WXC 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

Specification	*Frequency Range*	*Compliance Status*
FCC, CFR 47, Section 15.207	0.15 MHz - 30.00 MHz	NA[1]
FCC, CFR 47, Section 15.209	30 MHz – 10th Harmonic	PASS[2]
FCC, CFR 47, Section 15.109	30 MHz – 5th Harmonic	PASS[2]
FCC CFR 47, §15.247 Plus Bandedge	2405– 2480 MHz	PASS
RSS-210 - Low Power License Exempt Radio-communication Devices (All Frequency Bands)	2405– 2480 MHz	PASS

[1]Conductive emissions were not required as this was a battery powered device.
[2]Testing was started at 30 MHz as there are no RF signals generated below this frequency.
Refer to the test results section for further details.

Ferdinand S. Custodio
EMC Test Engineer

2. SYSTEM CONFIGURATION

2.1. Description and Method of Exercising the EUT

The WXC is a Wireless Exit Controller. Its function is to control the security of a doorway and open the door's lock. The EUT was exercised by putting the transmitter into continuous transmit mode on a selected channel. In normal functioning of the device, transmitting does not occur until the keyboard is operated or a interrogating signal from the security system's radio polls for status of the lock..

2.2. System Components and Power Cables

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - Wireless Exit Controller	Stanley Security Solutions Model: WXC Serial #: NA	

2.3. Device Interconnection and I/O Cables

Connection	I/O Cable
No Connections	

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.

2.5. Technical Specifications of the EUT

Manufacturer:	**Stanley Security Solutions**
Operating Frequency:	2405 MHz to 2480 MHz in the 2400-2483.5 MHz Band
Rated Power:	23.5 mW
Modulation:	Digital
Antenna:	Internal to enclosure: Southwest Antennas PN 1055-036 Gain 5 dBi
Antenna Connector:	Internal from radio board to antenna –cannot be accessed by user
Power Source:	(4) 1.5 V AA batteries in series

3. DESCRIPTION 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	:	18.8 – 25 ^{o}C
Humidity range	:	52 - 93%
Pressure range	:	87 - 105 kPa
Power supply range	:	Fresh batteries

4. DESCRIPTION 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.

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.

5. Test Results

5.1. 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.

Model:	**WXC**	**Temperature:**	25°C
Date:	July 15, 2008	**Humidity:**	57%
Modification State:	Lo/Mid/High Channels	**Tester:**	**Ferdinand Custodio**
		Laboratory:	Shielded Room 2

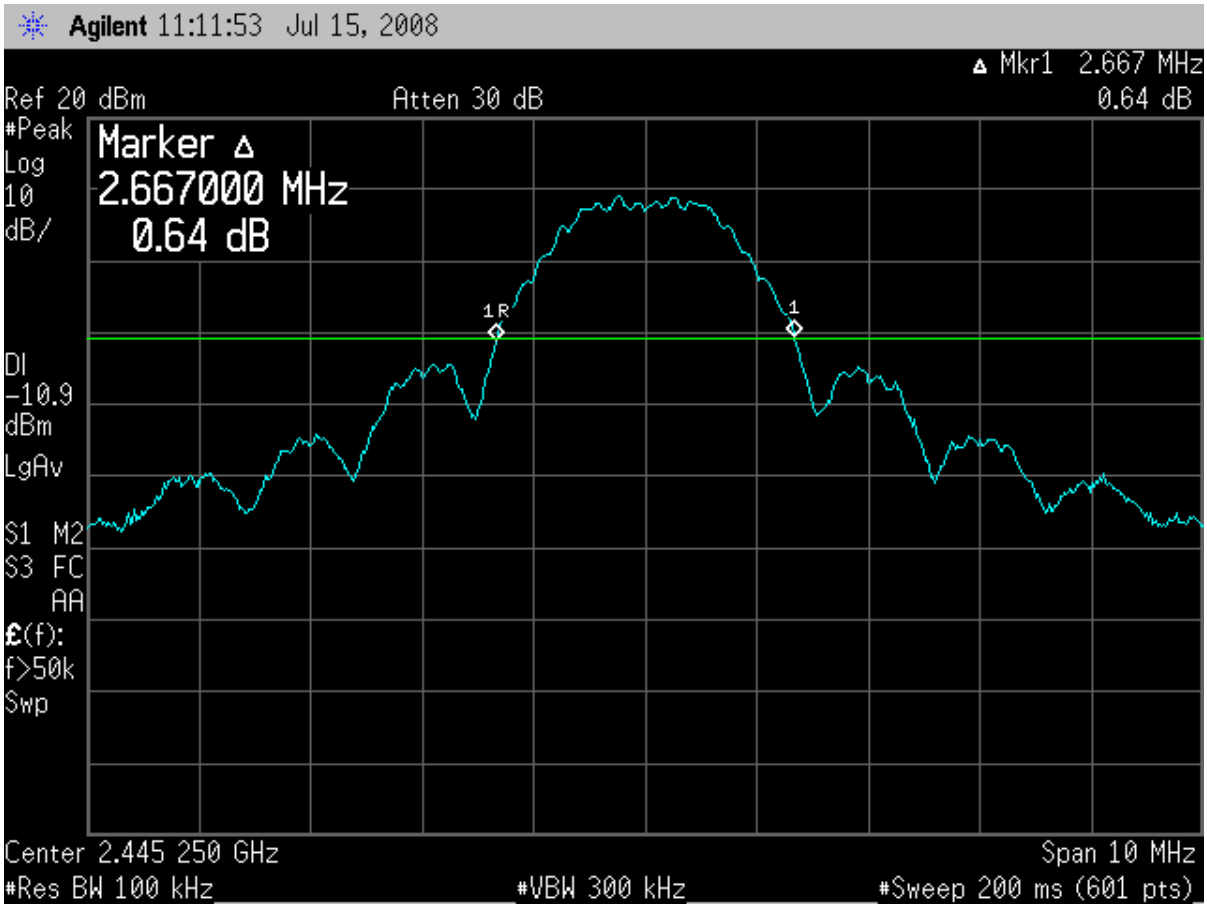
15.247(a)(1)
Measurements were done conductively. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level. The bandwidth was determined from where the channel output spectrum intersected the display line.

Test Results:

20 dB Bandwidth		
Low Channel	**Mid Channel**	**High Channel**
2.683 MHz	2.667 MHz	2.683 MHz


Agilent 11:08:02 Jul 15, 2008
Ref 20 dBm
Atten 30 dB
Mkr1 2.683 MHz
0.87 dB
#Peak
Log
10
dB/
Marker Δ
2.683000 MHz
0.87 dB
1R
1
Dl
-10.4
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
f>50k
Swp
Center 2.405 300 GHz
Span 10 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 200 ms (601 pts)

Low Channel


Agilent 11:11:53 Jul 15, 2008
Ref 20 dBm
Atten 30 dB
Mkr1 2.667 MHz
0.64 dB
#Peak
Log
10
dB/
Marker Δ
2.667000 MHz
0.64 dB
1R
1
Dl
-10.9
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
f>50k
Swp
Center 2.445 250 GHz
Span 10 MHz
#Res BW 100 kHz
#VBW 300 kHz
#Sweep 200 ms (601 pts)

Mid Channel

High Channel

5.2. 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.

Model:	**WXC**	**Temperature:**	18.8°C
Date:	July 16, 2008	**Humidity:**	93%
Modification State:	Lo/Mid/High Channels	**Tester:**	**Ferdinand Custodio**
		Laboratory:	SOATS

Test Results: EUT complies.

Additional Observations:

- The Spectrum was searched from 30MHz to the 10th 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 (RBW 1MHz/VBW 10Hz) measurements conducted above 1GHz.
- Emissions measuring greater than 20 dB from the limit were not included in the table presented.
- Radiated Measurement Scans were done from 30 MHz to 12,500 MHz while the EUT was in normal mode with no attempt to initiate a transmission (awaiting polling from signal from the security system). No emissions are evident in this mode.

Emissions calculation example:
Frequency 4890 MHz average
Maximum measured vertically = 44.8 dBµV
Add 32.7 dB/m for antenna factor = 77.5 dBµV/m
Add 8.5 dB for cable loss = 86.0 dBµV/m
Subtract 35.4 dB for preamplifier gain = 50.6 dBµV/m
Result is 3.4 below limit of 15.209, therefore frequency emission passes.

NEMKO USA, Inc.

San Diego Headquarters:
11696 Sorrento Valley Rd.
San Diego, CA 92121
Tel: (858) 755-5525
Fax: (858) 452-1810

Radiated Emissions Data

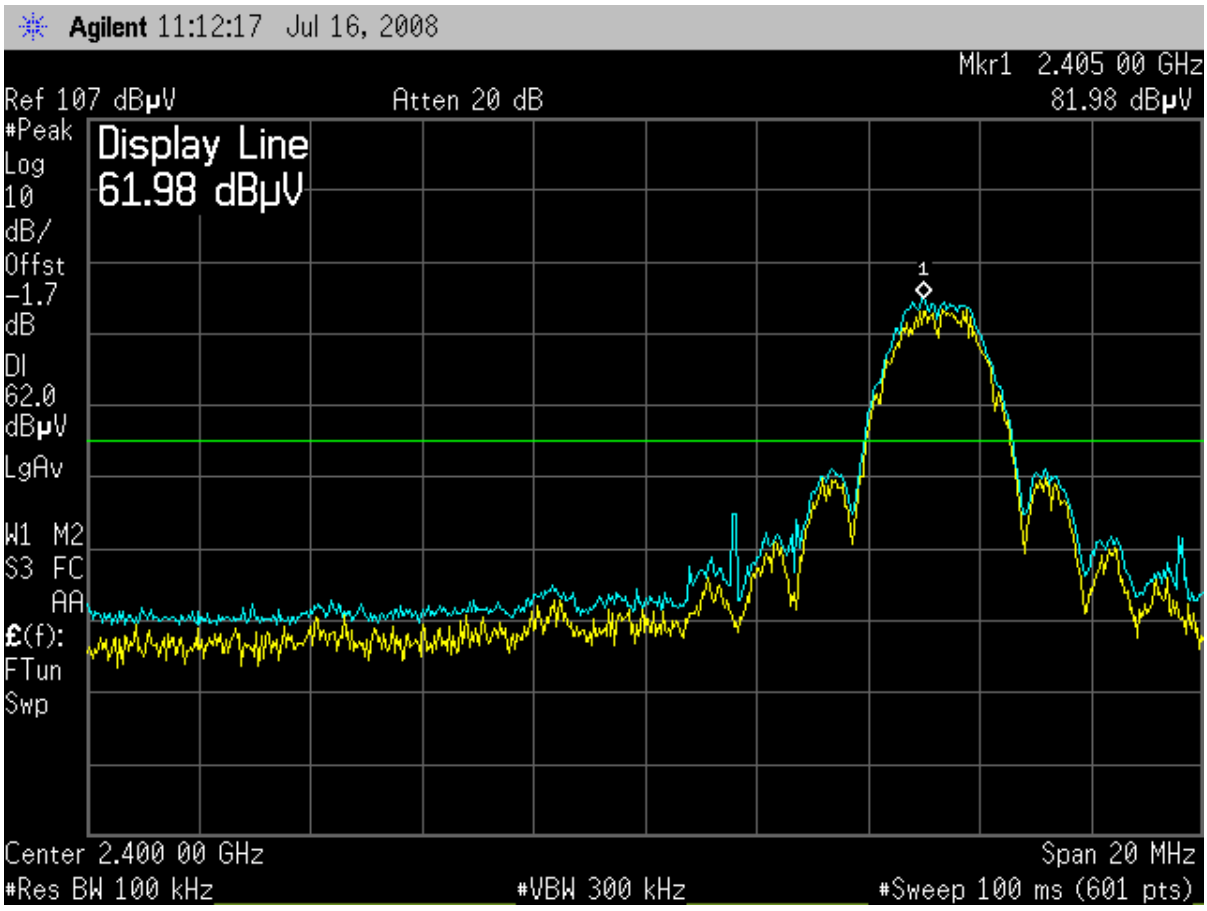
Complete: YES — Job # : 110482 — Test # : 1
Preliminary: — Page 1 of 1

Client Name : Stanley Security Solutions
EUT Name : Wireless Exit Controller
EUT Model # : WXC
EUT ANTENNA Part # :
EUT Serial # :
EUT Config. : Transmit max power (level 15) modulated
FCC Part 15.247
Specification : FCC Part 15.209 (a)

Rod. Ant. #:	N/A	Temp. (deg. C) :	18.8	Date :	7/16/2008
Bicon Ant.#:	N/A	Humidity (%) :	93	Time :	8AM
Log Ant.#:	N/A	EUT Voltage :	N/A	Staff :	FSC
DRG Ant. #	529	EUT Frequency :	N/A	Photo ID:	
Dipole Ant.#:	NA	Phase:	1	Peak Res Bandwidth:	1 MHz
Cable#:	40ft	Location:	SOATS	Peak Video Bandwidth	1 MHz
Preamp#:	317	Distance:	3 m	AVE Res Bandwidth:	1 MHz
Spec An.#:	911	Duty Cycle Factor	N/A	AVE Video Bandwidth	10 Hz
QP #:	N/A				

Meas. Freq. (MHz)	Vertical (dBuV) pk	Vertical (dBuV) av	Horizontal (dBuV) pk	Horizontal (dBuV) av	CF (db)	Max Level (dBuV/m) pk	Max Level (dBuV/m) av	Spec. Limit (dBuV/m) pk	Spec. Limit (dBuV/m) av	Margin dB pk	Margin dB av	EUT Rotation	Ant. Height	Pass Fail Unc.	Comment
2405.00															
4810.00	52.6	39.6	52.8	40.5	5.8	58.6	46.3	74.0	54.0	-15.4	-7.7	B	1.0	Pass	
7215.00	48.6	34.8	51.6	38.5	14.5	66.1	53.0	74.0	54.0	-7.9	-1.0	B	1.0	Pass	
9620.00	46.2	31.8	47.7	33.8	19.3	67.0	53.1	74.0	54.0	-7.0	-0.9	B	1.0	Pass	
12025.00	42.6		42.6		24.5	67.1	24.5	74.0	54.0	-6.9	-29.5	B	1.0	Pass	Noise Floor
2445.00															
4890.00	56.2	44.8	53.1	41.9	5.8	62.0	50.6	74.0	54.0	-12.0	-3.4	B	1.0	Pass	
7335.00	48.4	33.5	49.0	35.8	14.6	63.7	50.4	74.0	54.0	-10.3	-3.6	B	1.0	Pass	
9780.00	46.5	31.4	36.9	31.7	19.4	65.9	51.2	74.0	54.0	-8.1	-2.8	B	1.0	Pass	
12225.00	42.6		42.6		24.5	67.0	24.5	74.0	54.0	-7.0	-29.5	B	1.0	Pass	Noise Floor
2480.00															
4960.00	58.0	46.9	55.7	44.0	6.0	64.0	52.9	74.0	54.0	-10.0	-1.1	B	1.0	Pass	
7440.00	46.2	32.8	47.9	34.9	14.9	62.7	49.7	74.0	54.0	-11.3	-4.3	B	1.0	Pass	
9920.00	44.0	29.6	45.5	30.8	19.6	65.1	50.4	74.0	54.0	-8.9	-3.6	B	1.0	Pass	
12400.00	42.6		42.6		24.0	66.6	24.0	74.0	54.0	-7.4	-30.0	B	1.0	Pass	Noise Floor

5.3. Bandedge Measurements

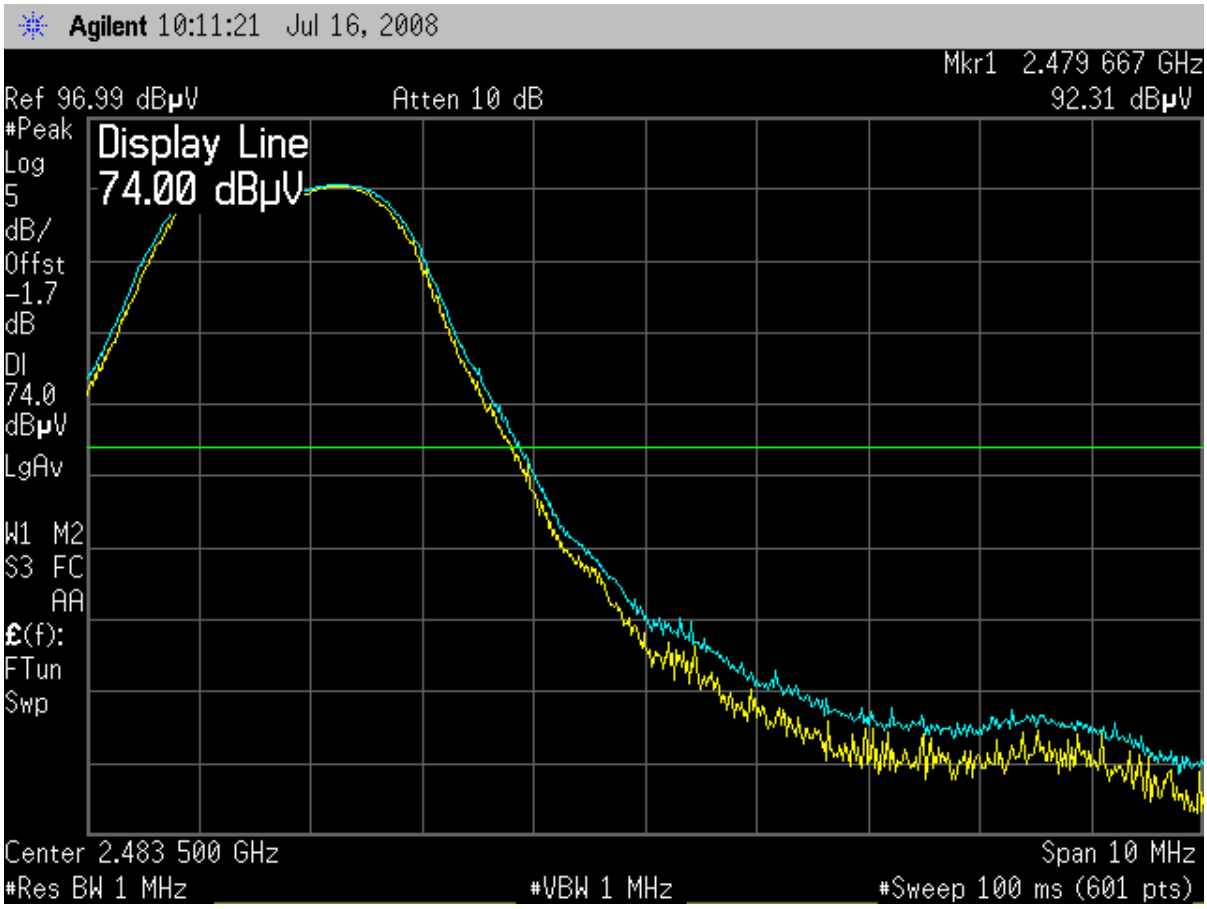


Low Channel 2405 MHz (Peak Measurement)

Center frequency is 2400MHz
Limit used is 20dB from peak
-1.7 offset for antenna (28.4), cable loss (5.9) and preamp gain (-36)

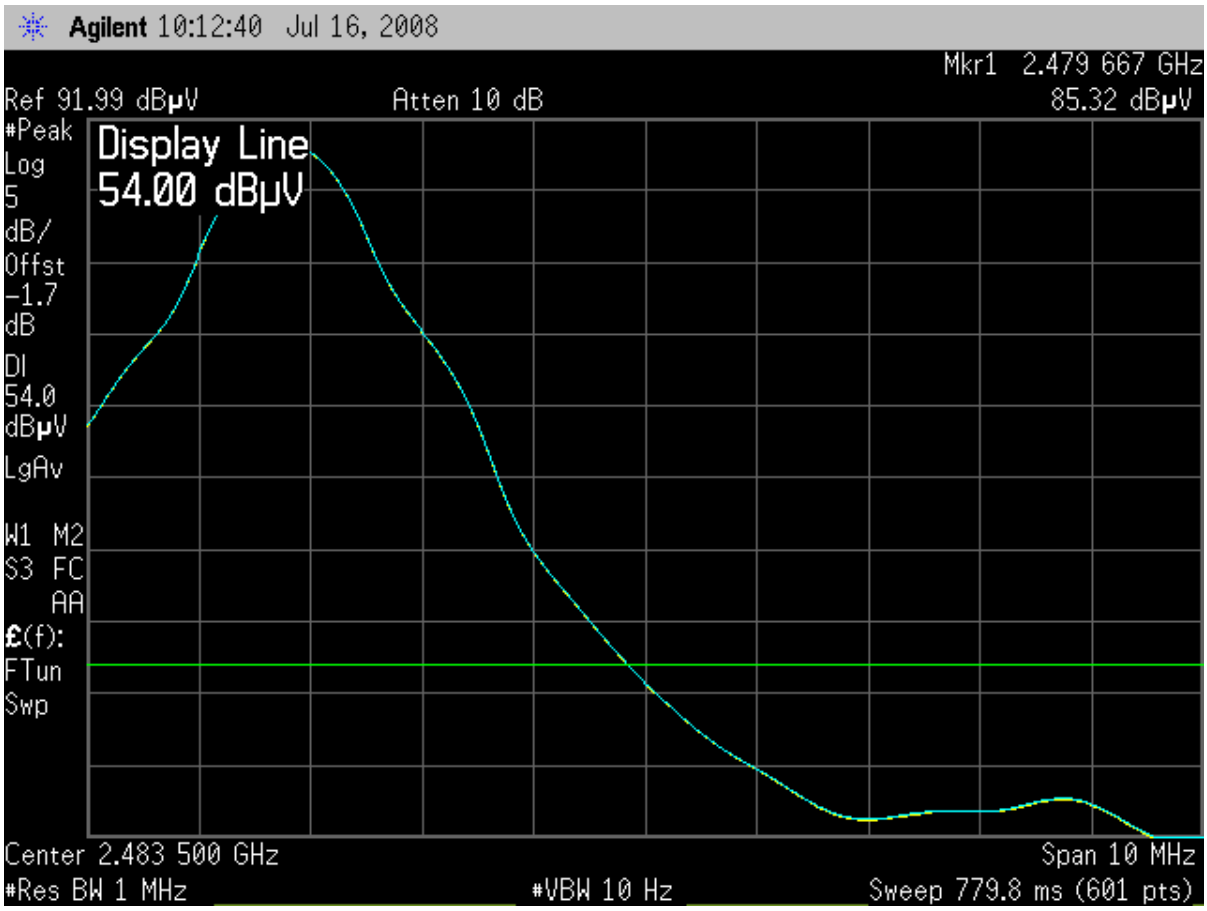
Low Channel 2405 MHz (Average Measurement)

Center frequency is 2400MHz
Limit used is 20dB from peak
-1.7 offset for antenna (28.4), cable loss (5.9) and preamp gain (-36)



High Channel 2480 MHz (Peak Measurement)

Center frequency is 2483.5 MHz
Limit used is 74 dB per 15.209 and 15.205
-1.7 offset for antenna (28.4), cable loss (5.9) and preamp gain (-36)



High Channel 2480 MHz (Average Measurement)

Center frequency is 2483.5 MHz
Limit used is 54 dB per 15.209 and 15.205
-1.7 offset for antenna (28.4), cable loss (5.9) and preamp gain (-36)

5.4. 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.

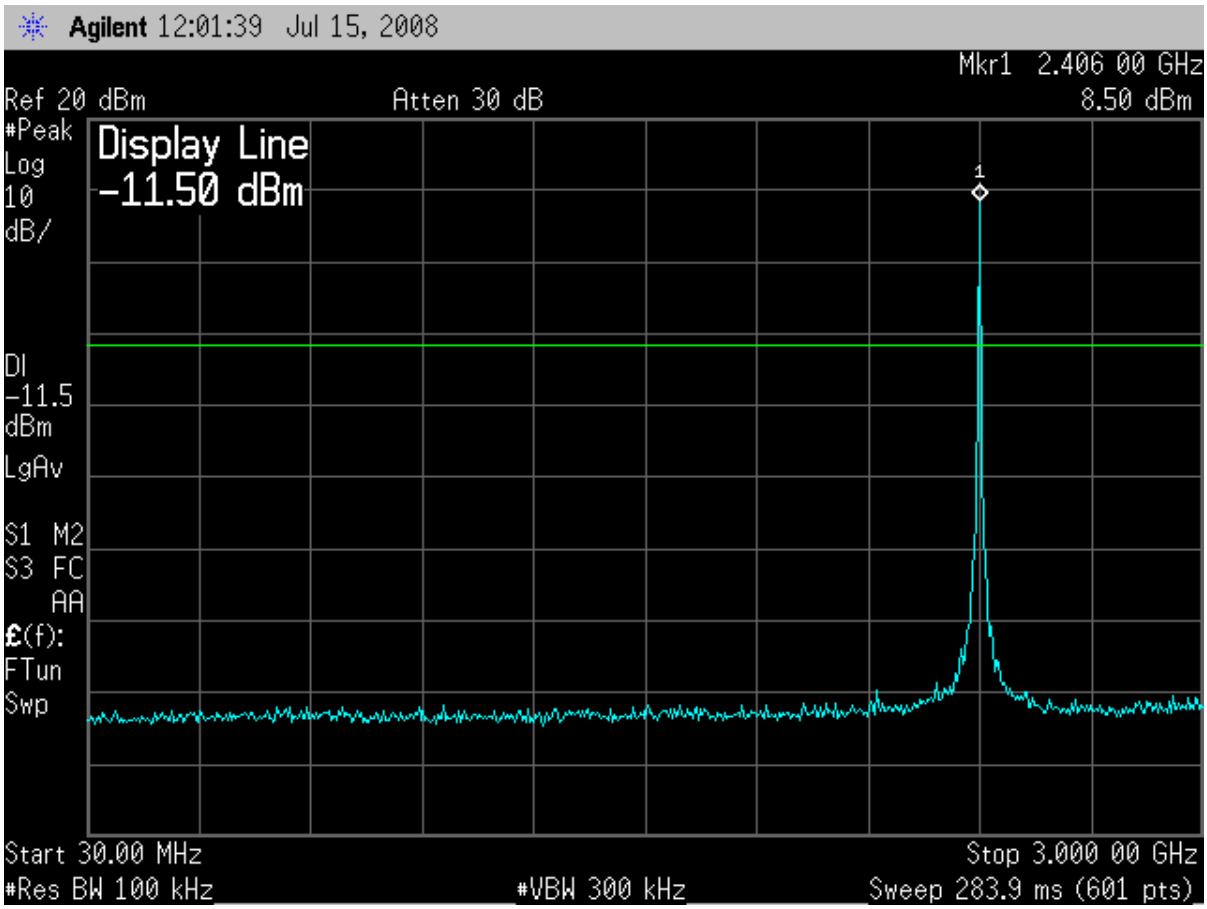
Model:	**WXC**	**Temperature:**	25°F
Date:	July 15, 2008	**Humidity:**	57%
Modification State:	Lo/Mid/High Channels	**Tester:**	**Ferdinand Custodio**
		Laboratory:	Shielded Room 2

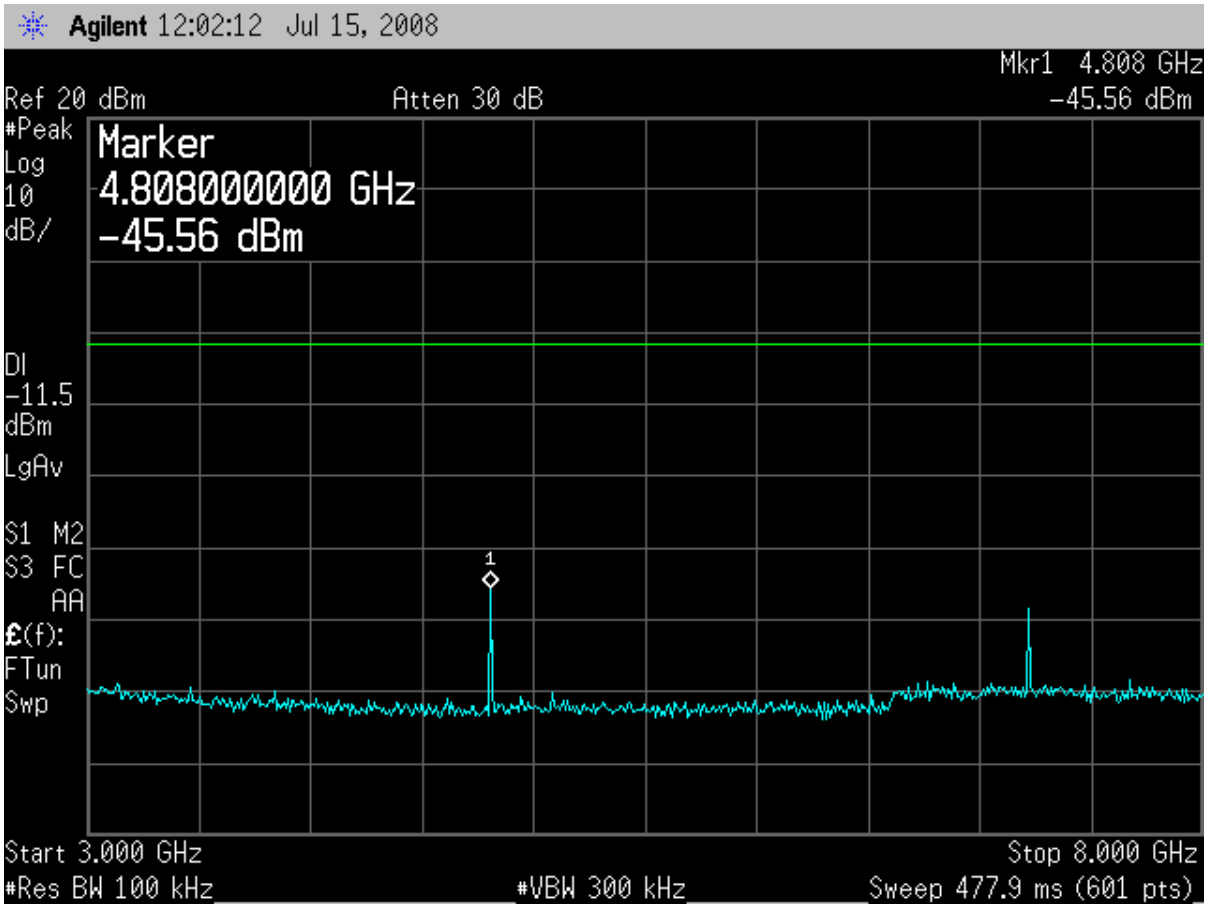
15.247(a)(1)
Measurements were done conductively. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 20 dB lower than PEAK level. Data presented from 30 MHz to 25,000 MHz. Max peak hold detector.

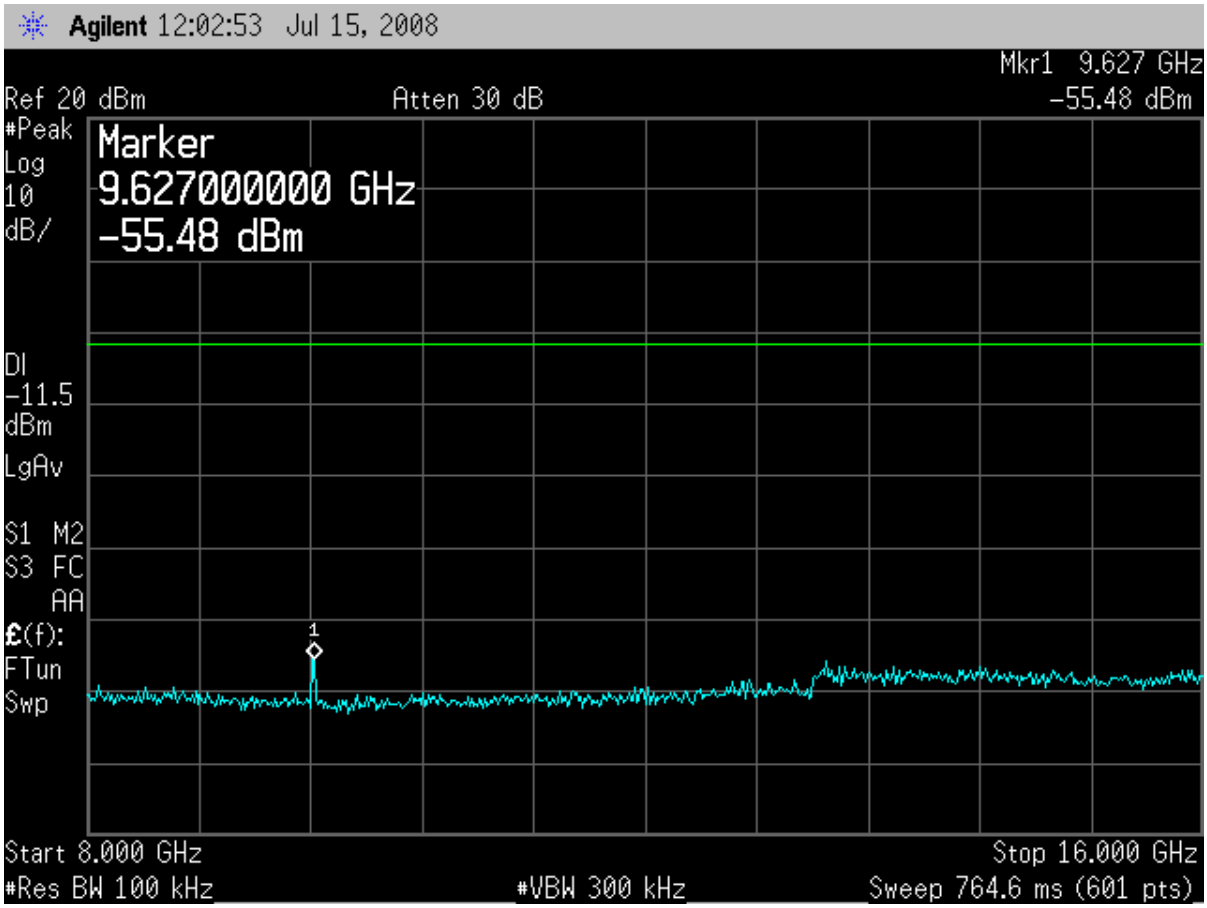
Test Results: EUT complies.

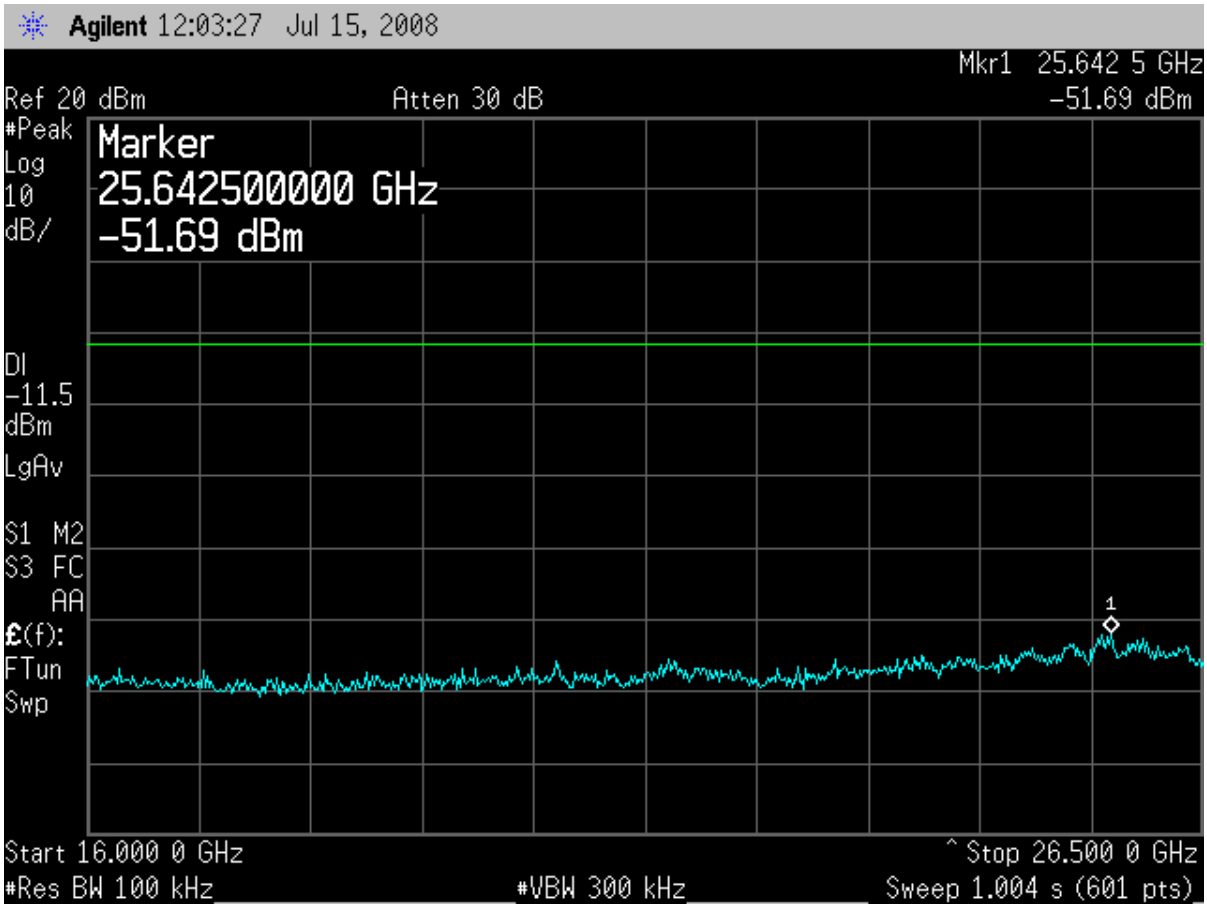
See attached Plots:

Low Channel

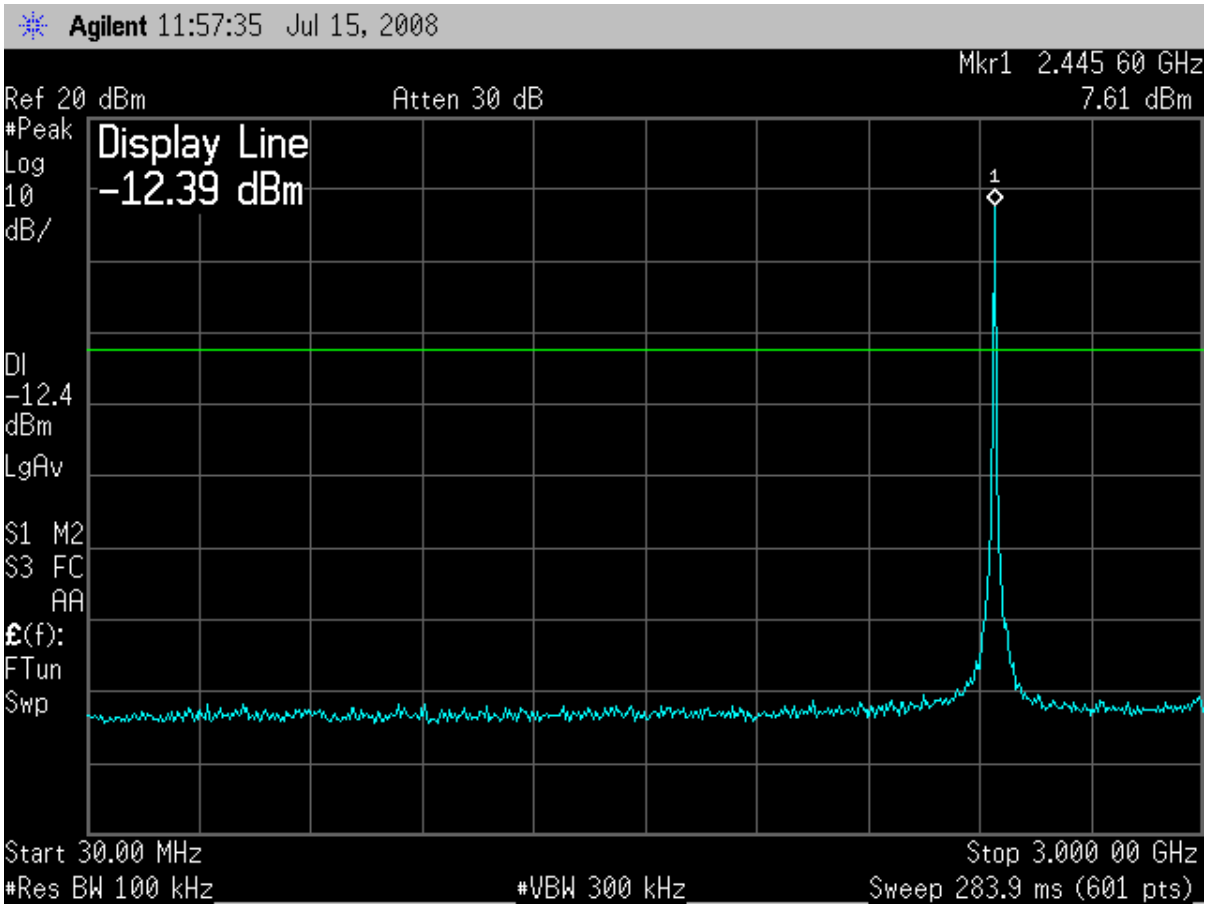

Agilent 12:01:39 Jul 15, 2008
Mkr1 2.406 00 GHz
Ref 20 dBm
Atten 30 dB
8.50 dBm
#Peak
Log
10
dB/
Display Line
-11.50 dBm
1
Dl
-11.5
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
Start 30.00 MHz
Stop 3.000 00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 283.9 ms (601 pts)

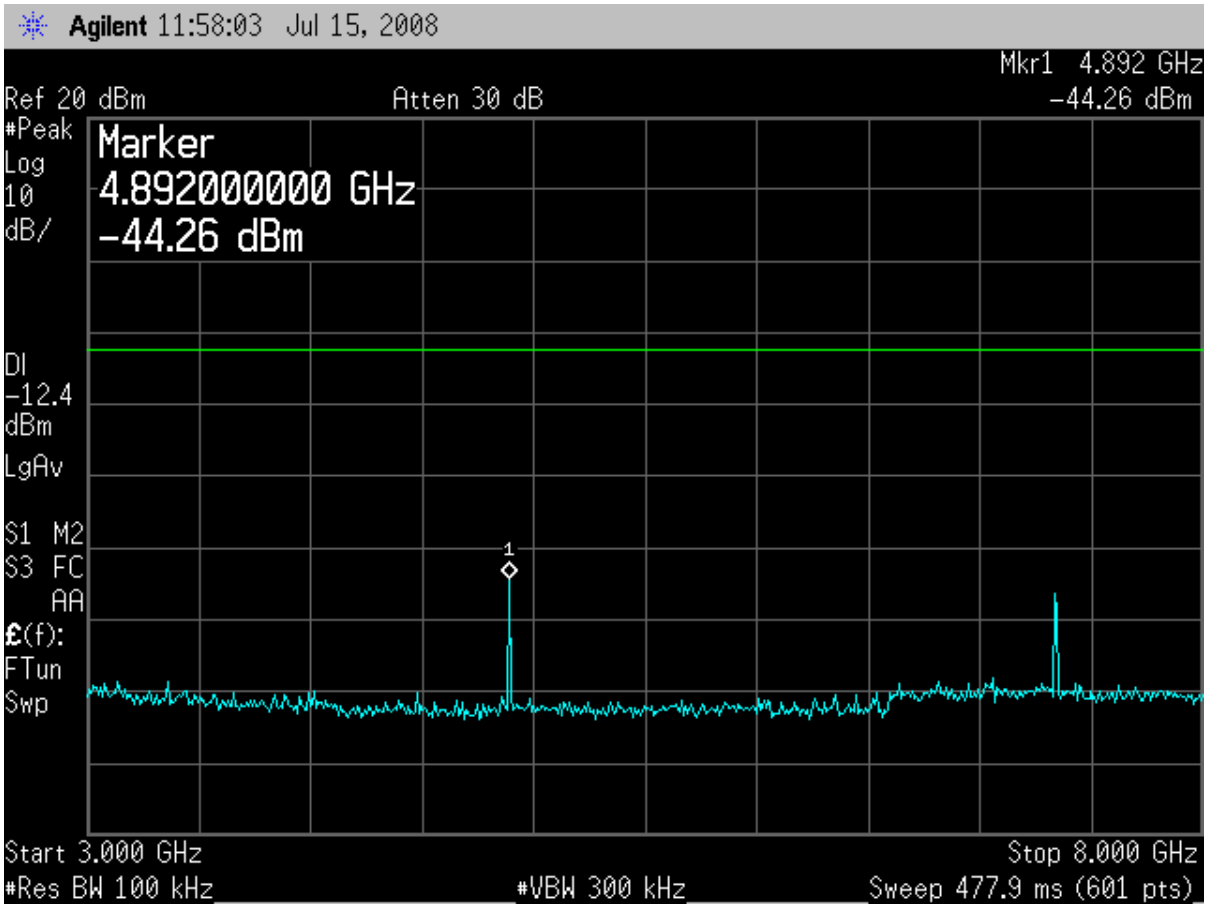

Agilent 12:02:12 Jul 15, 2008
Mkr1 4.808 GHz
-45.56 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Marker
4.808000000 GHz
-45.56 dBm
Dl
-11.5
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 3.000 GHz
Stop 8.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 477.9 ms (601 pts)

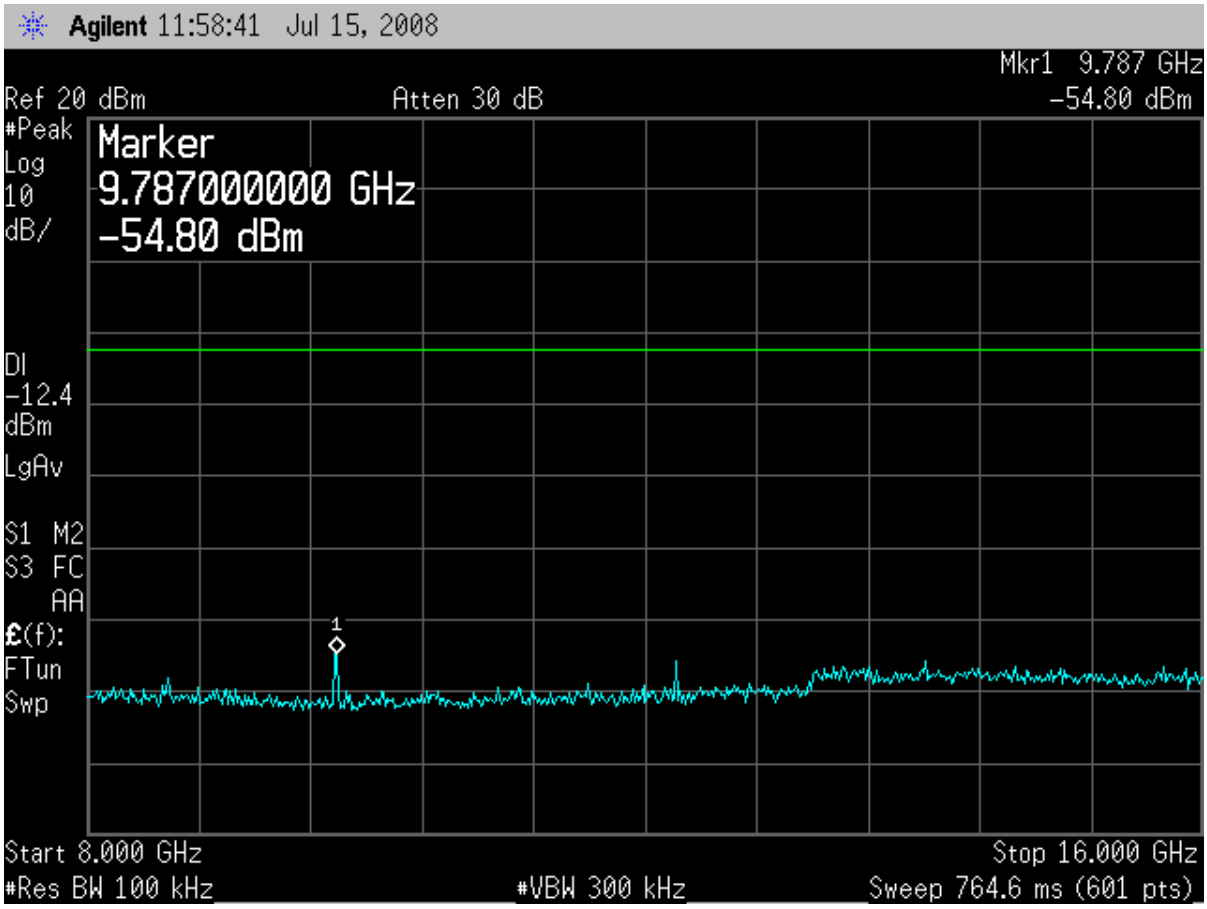

Agilent 12:02:53 Jul 15, 2008
Mkr1 9.627 GHz
-55.48 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Marker
9.627000000 GHz
-55.48 dBm
Dl
-11.5
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 8.000 GHz
Stop 16.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)

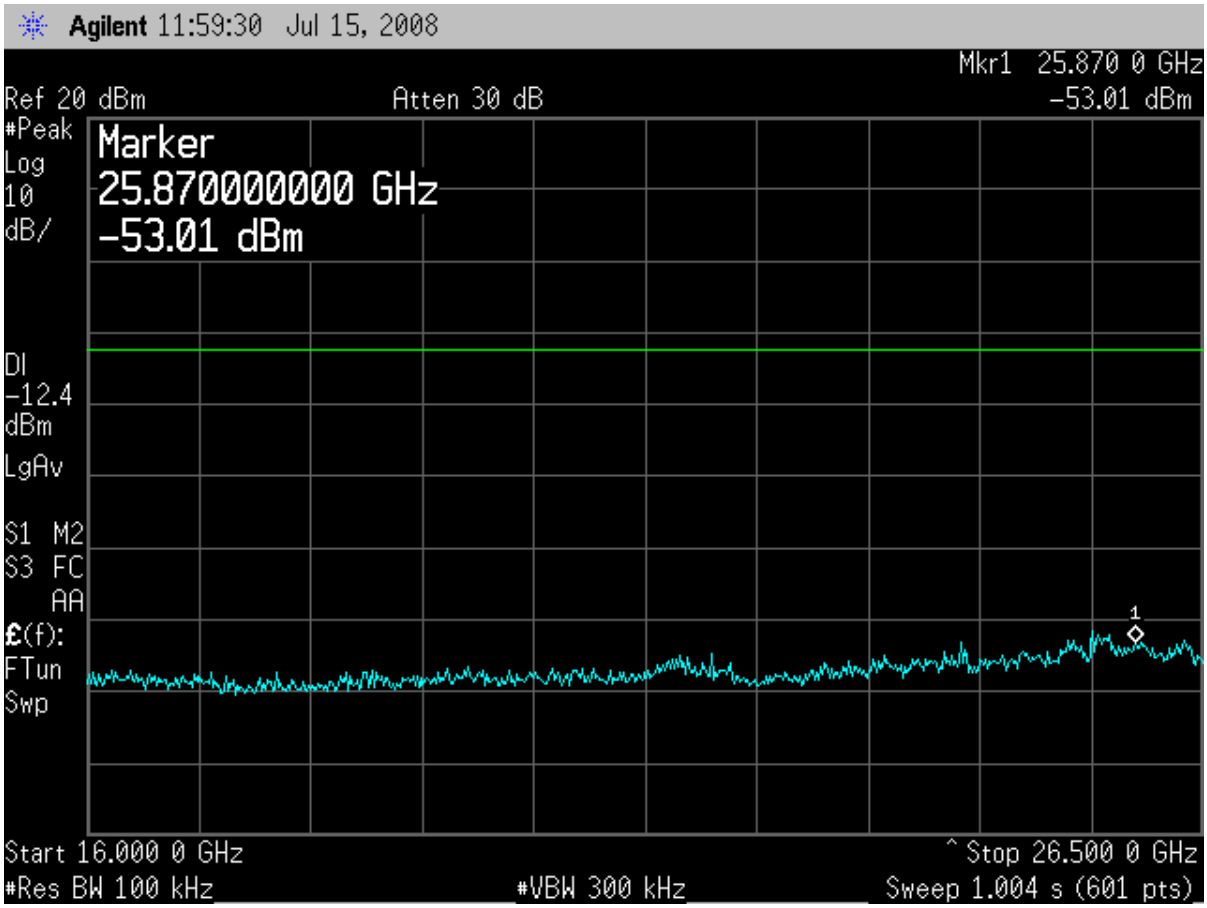

Agilent 12:03:27 Jul 15, 2008
Mkr1 25.642 5 GHz
-51.69 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Marker
25.642500000 GHz
-51.69 dBm
Dl
-11.5
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 16.000 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
^Stop 26.500 0 GHz
Sweep 1.004 s (601 pts)

Mid Channel

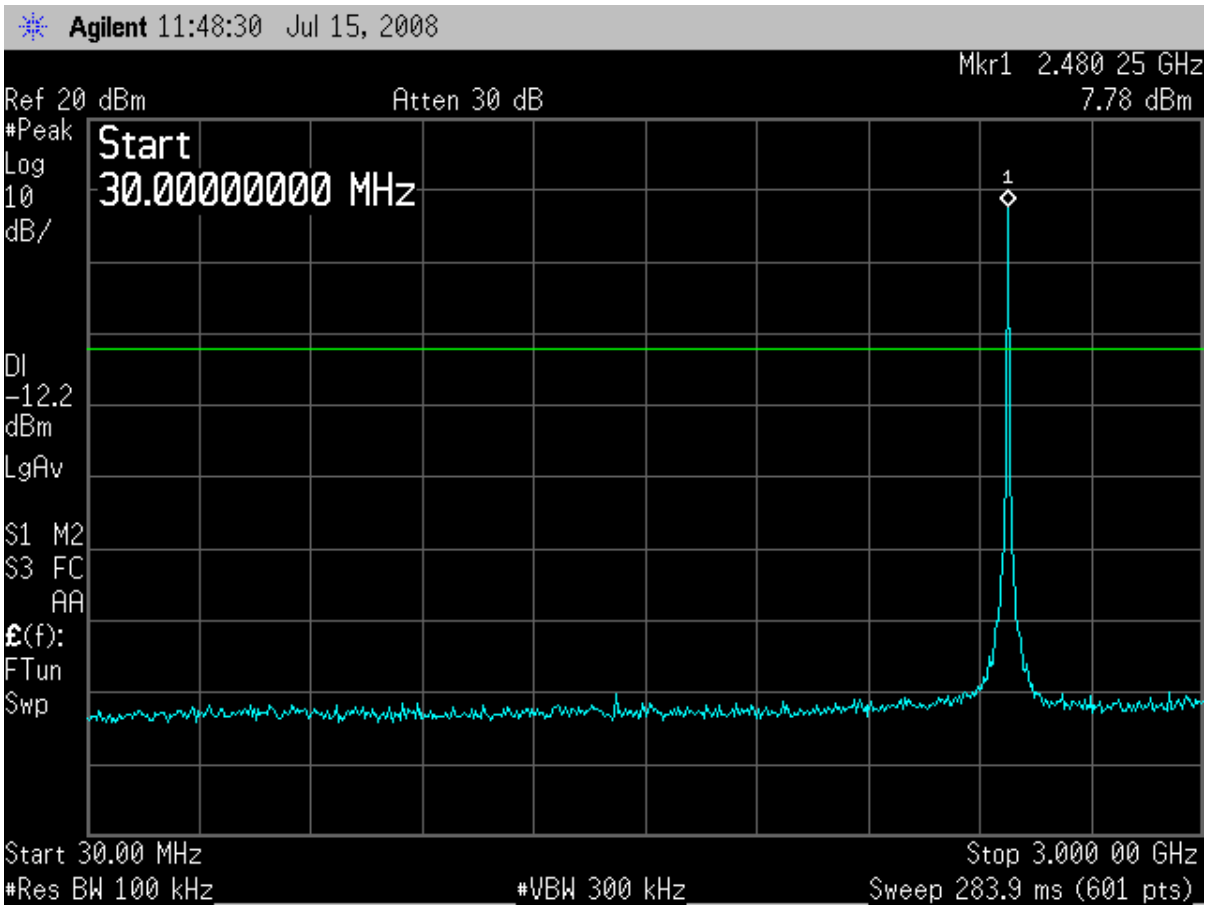

Agilent 11:57:35 Jul 15, 2008
Mkr1 2.445 60 GHz
Ref 20 dBm
Atten 30 dB
7.61 dBm
#Peak
Log
10
dB/
Display Line
-12.39 dBm
1
Dl
-12.4
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
Start 30.00 MHz
Stop 3.000 00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 283.9 ms (601 pts)

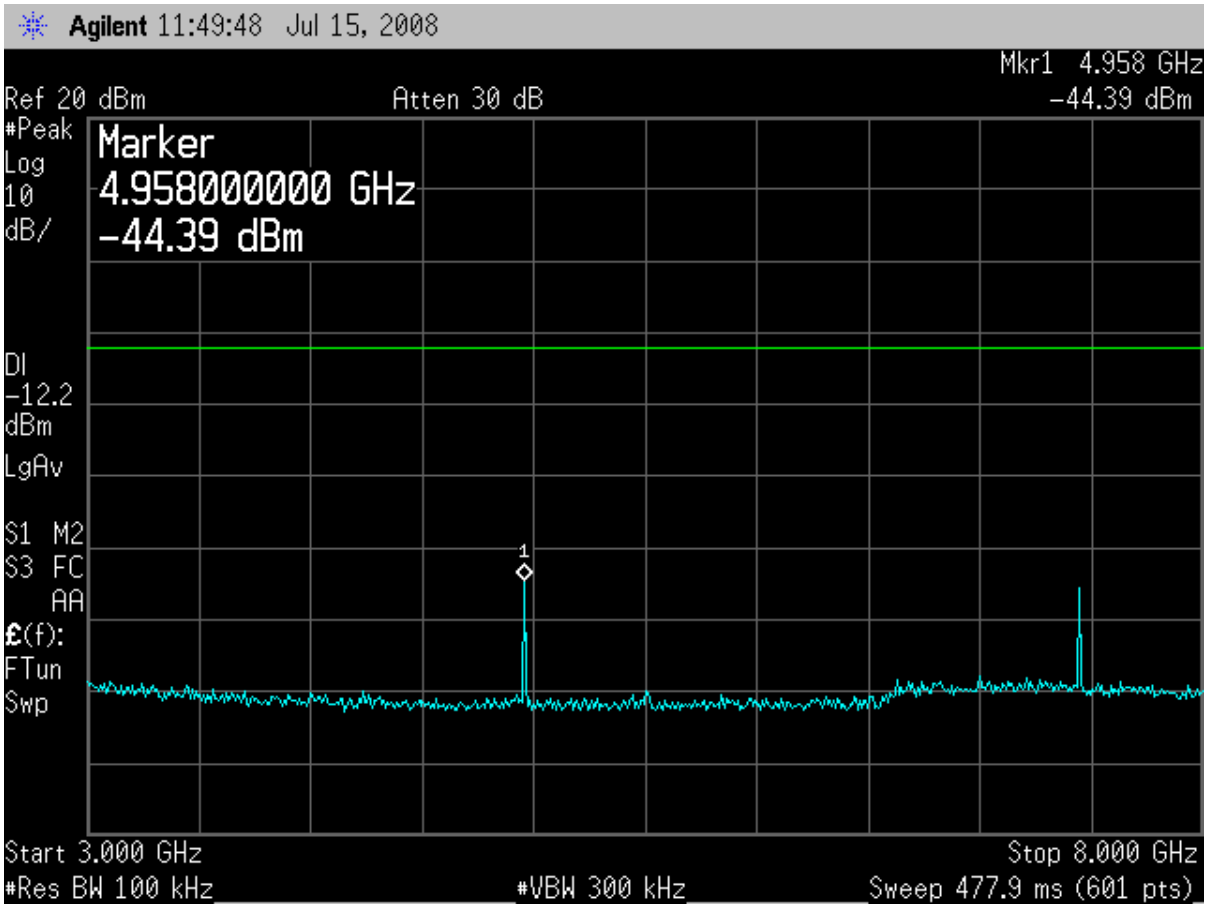

Agilent 11:58:03 Jul 15, 2008
Mkr1 4.892 GHz
-44.26 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Marker
4.892000000 GHz
-44.26 dBm
Dl
-12.4
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 3.000 GHz
Stop 8.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 477.9 ms (601 pts)

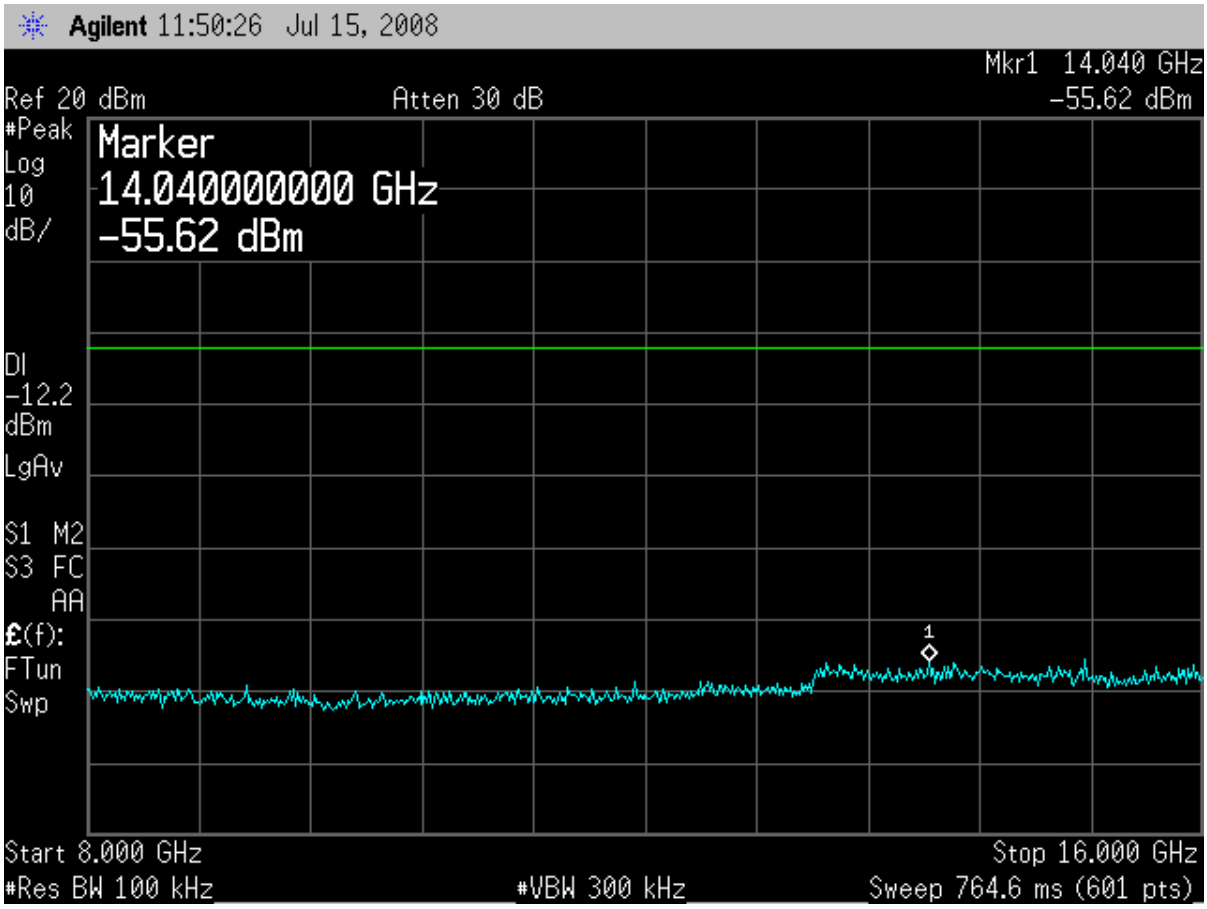

Agilent 11:58:41 Jul 15, 2008
Mkr1 9.787 GHz
Ref 20 dBm
Atten 30 dB
-54.80 dBm
#Peak
Log
10
dB/
Marker
9.787000000 GHz
-54.80 dBm
Dl
-12.4
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 8.000 GHz
Stop 16.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)

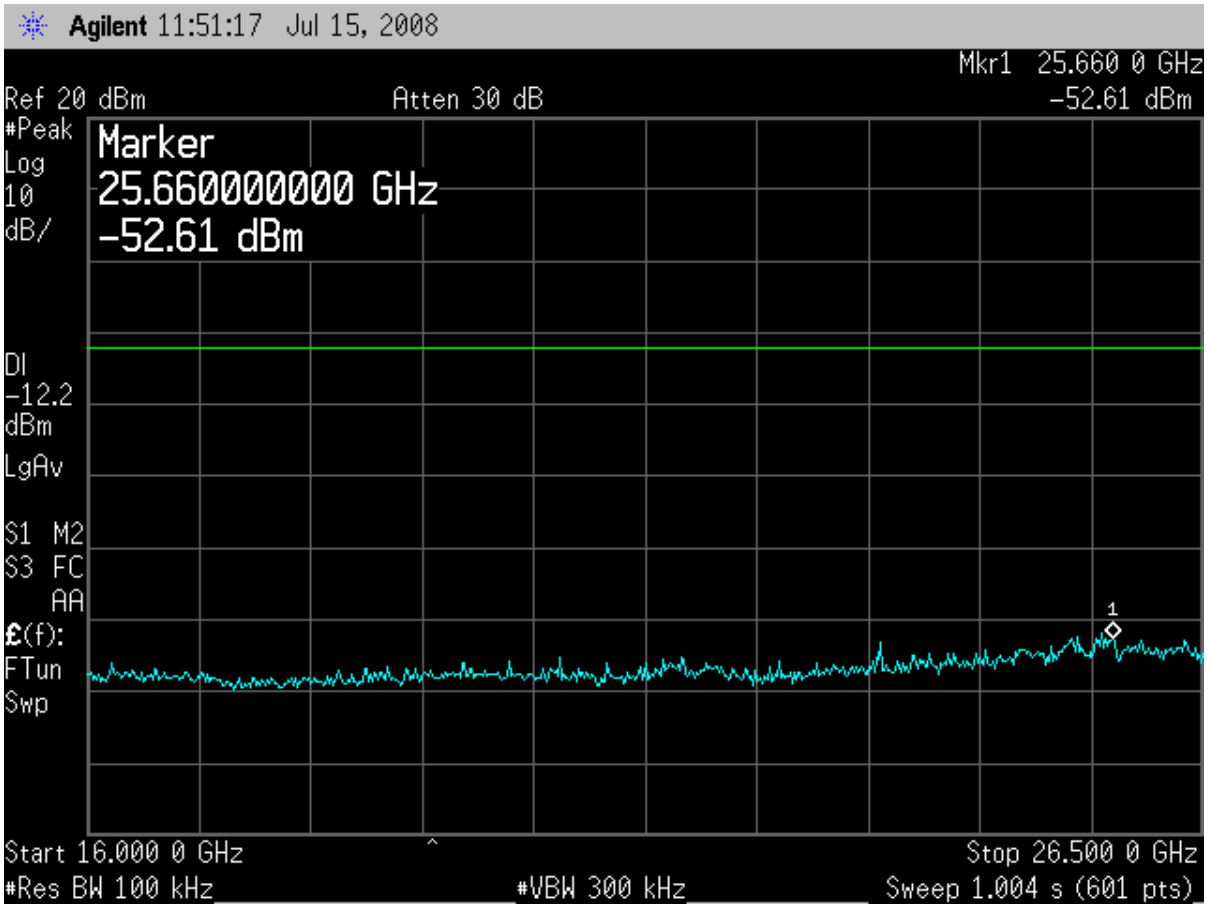

Agilent 11:59:30 Jul 15, 2008
Mkr1 25.870 0 GHz
Ref 20 dBm
Atten 30 dB
-53.01 dBm
#Peak
Log
10
dB/
Marker
25.870000000 GHz
-53.01 dBm
Dl
-12.4
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 16.000 0 GHz
^Stop 26.500 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.004 s (601 pts)

High Channel




Agilent 11:49:48 Jul 15, 2008
Mkr1 4.958 GHz
Ref 20 dBm
Atten 30 dB
-44.39 dBm
#Peak
Log
10
dB/
Marker
4.958000000 GHz
-44.39 dBm
Dl
-12.2
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 3.000 GHz
Stop 8.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 477.9 ms (601 pts)


Agilent 11:50:26 Jul 15, 2008
Mkr1 14.040 GHz
Ref 20 dBm
Atten 30 dB
-55.62 dBm
#Peak
Log
10
dB/
Marker
14.040000000 GHz
-55.62 dBm
Dl
-12.2
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 8.000 GHz
Stop 16.000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 764.6 ms (601 pts)


Agilent 11:51:17 Jul 15, 2008
Mkr1 25.660 0 GHz
-52.61 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Marker
25.660000000 GHz
-52.61 dBm
Dl
-12.2
dBm
LgAv
S1 M2
S3 FC
AA
£(f):
FTun
Swp
1
Start 16.000 0 GHz
Stop 26.500 0 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 1.004 s (601 pts)

5.5. 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.

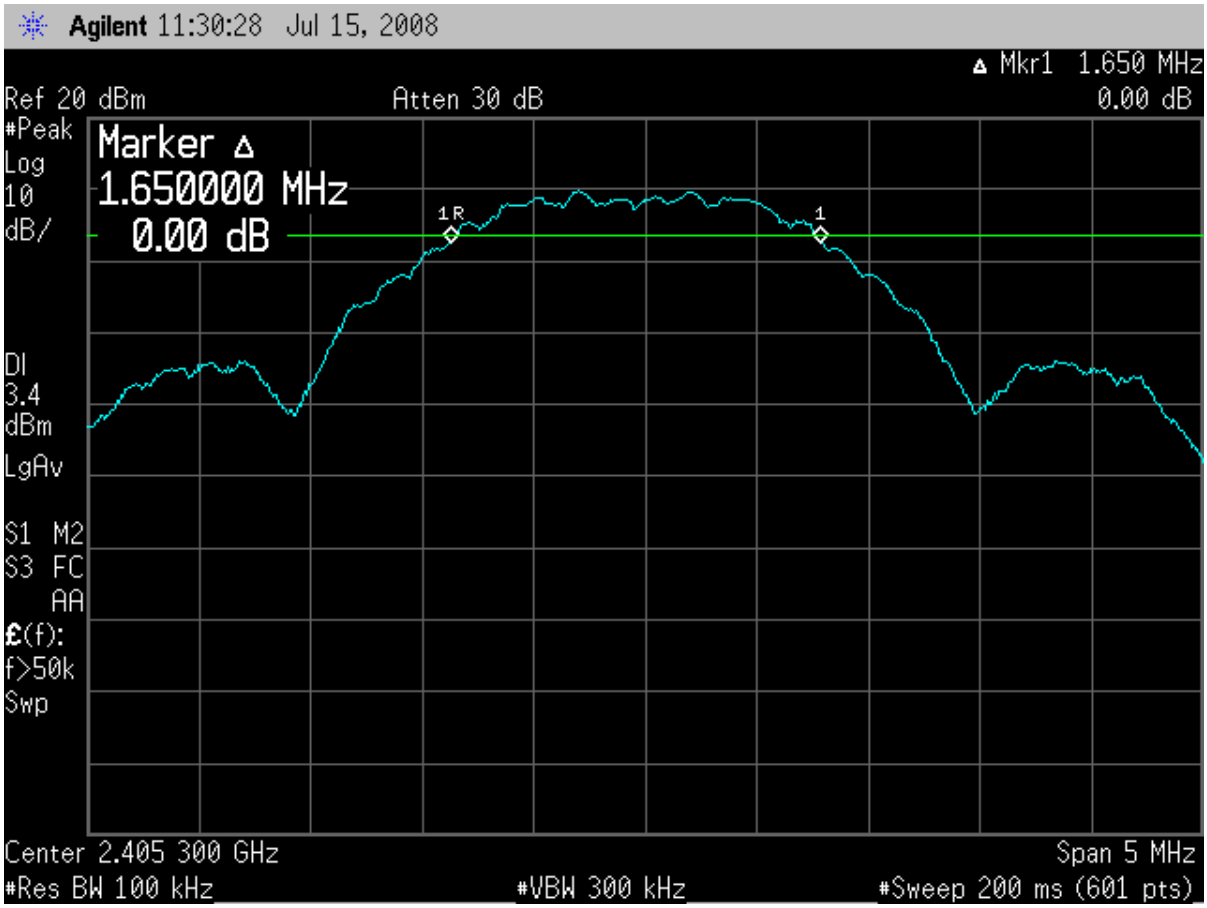
Model:	**WXC**	**Temperature:**	25°C
Date:	July 15, 2008	**Humidity:**	57%
Modification State:	Lo/Mid/High Channels	**Tester:**	**Ferdinand Custodio**
		Laboratory:	Shielded Room 2

Test Results: EUT Complies.

6dB Bandwidth:

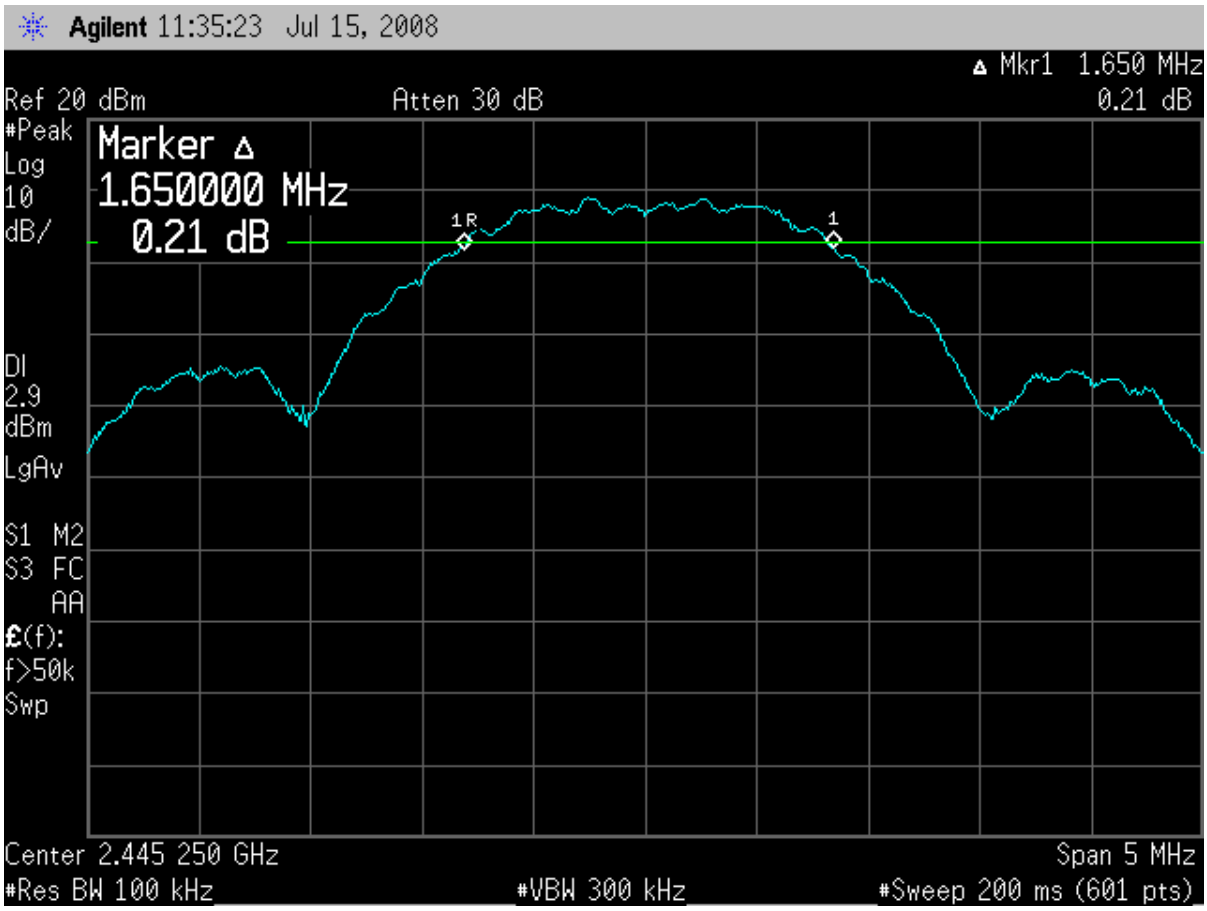
Measurements were done conductively. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

Channel Range	6 dB Bandwidth
Low (2405 MHz)	1.65 MHz
Mid (2445 MHz)	1.65 MHz
High (2480 MHz)	1.675 MHz

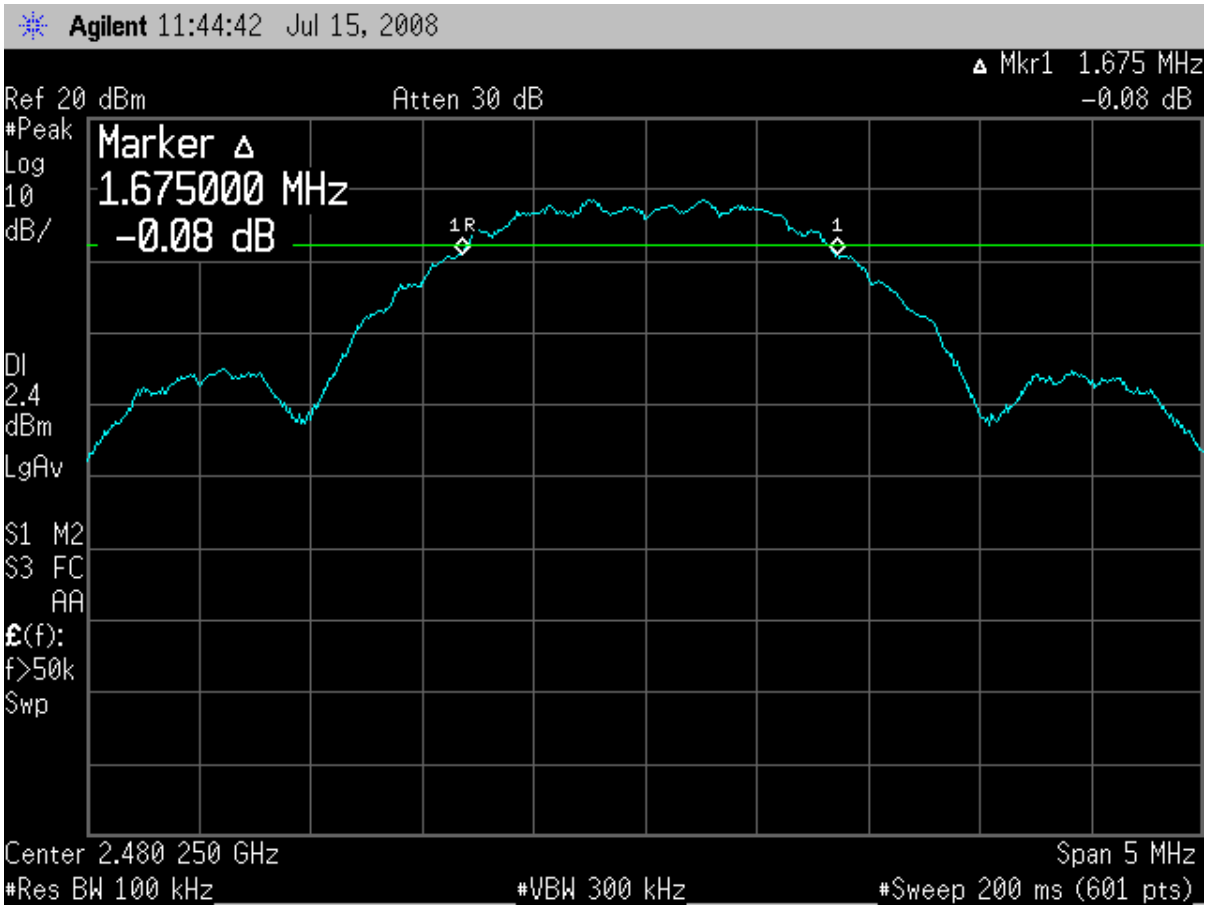


LOW Channel (2405 MHz)

Delta 1.62 MHz



MID Channel (2445 MHz)



HIGH Channel (2480 MHz)

5.6. 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 signaling 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.

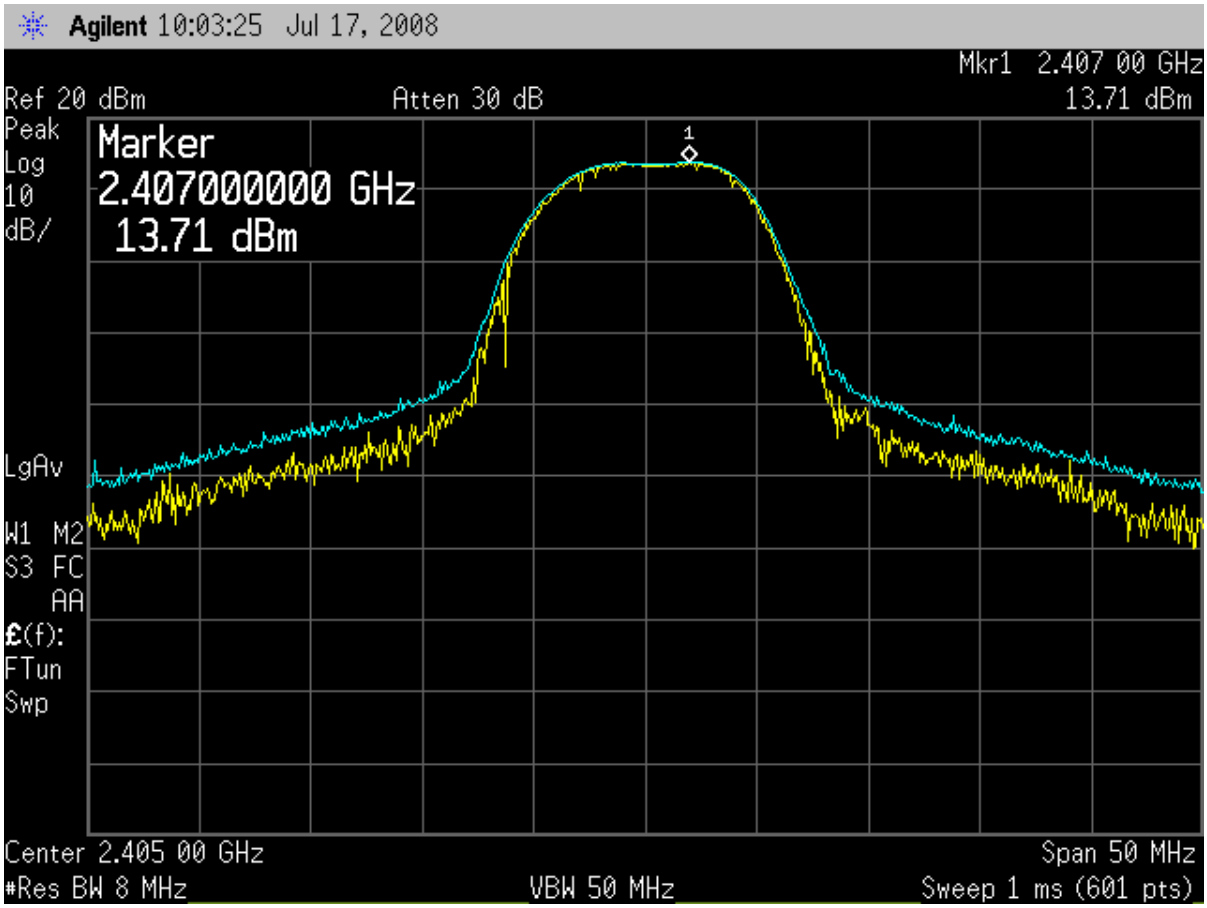
A8.5
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, 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.

Model:	**WXC**	**Temperature:**	25.5°C
Date:	July 15, 2008	**Humidity:**	52%
Modification State:	Lo/Mid/High Channels	**Tester:**	**Ferdinand Custodio**
		Laboratory:	Shielded Room 2

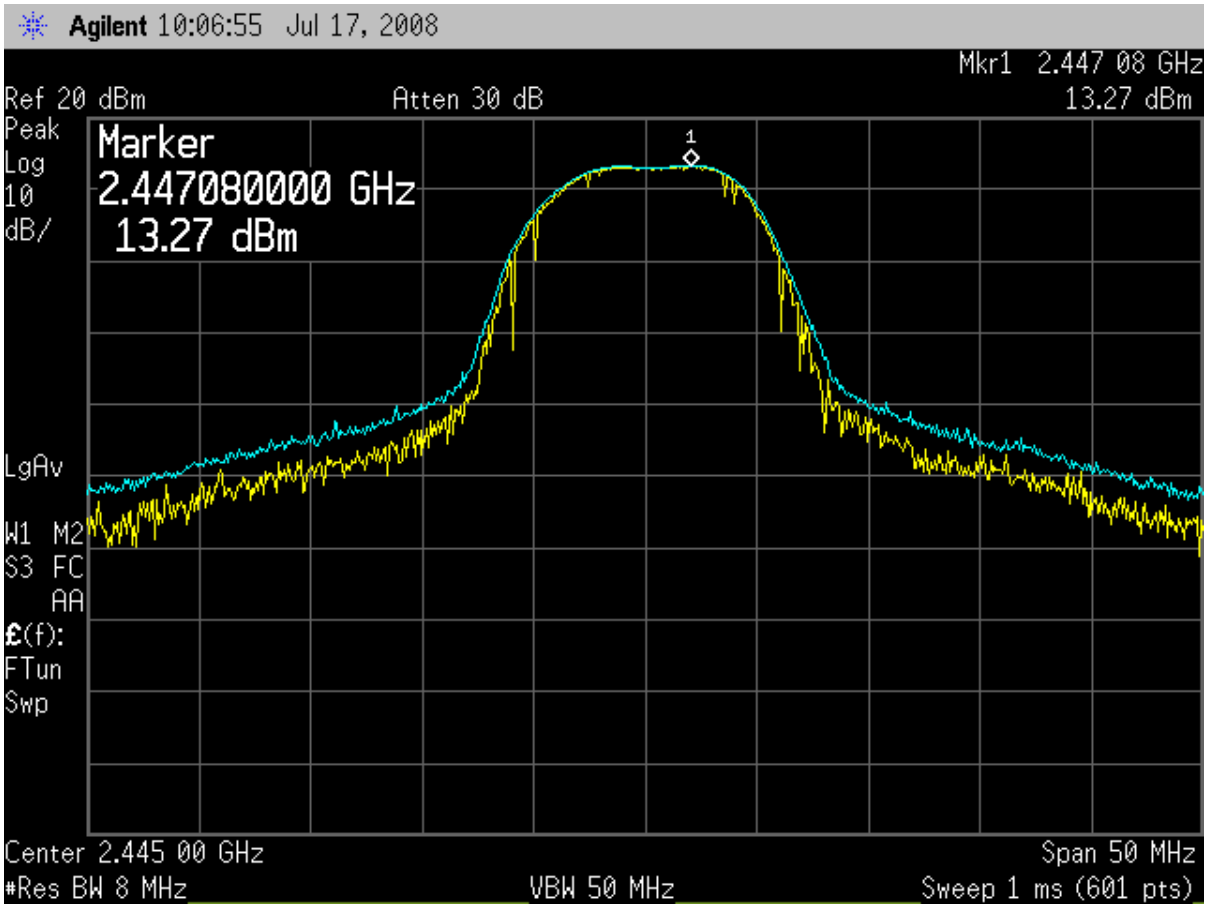
Test Results:
Additional Observations:

- **Peak Hold Analyzer Readings, RES BW was set to 8 MHz. 8 MHz > 20% BW.**
- **Measurements were made with a fresh battery.**

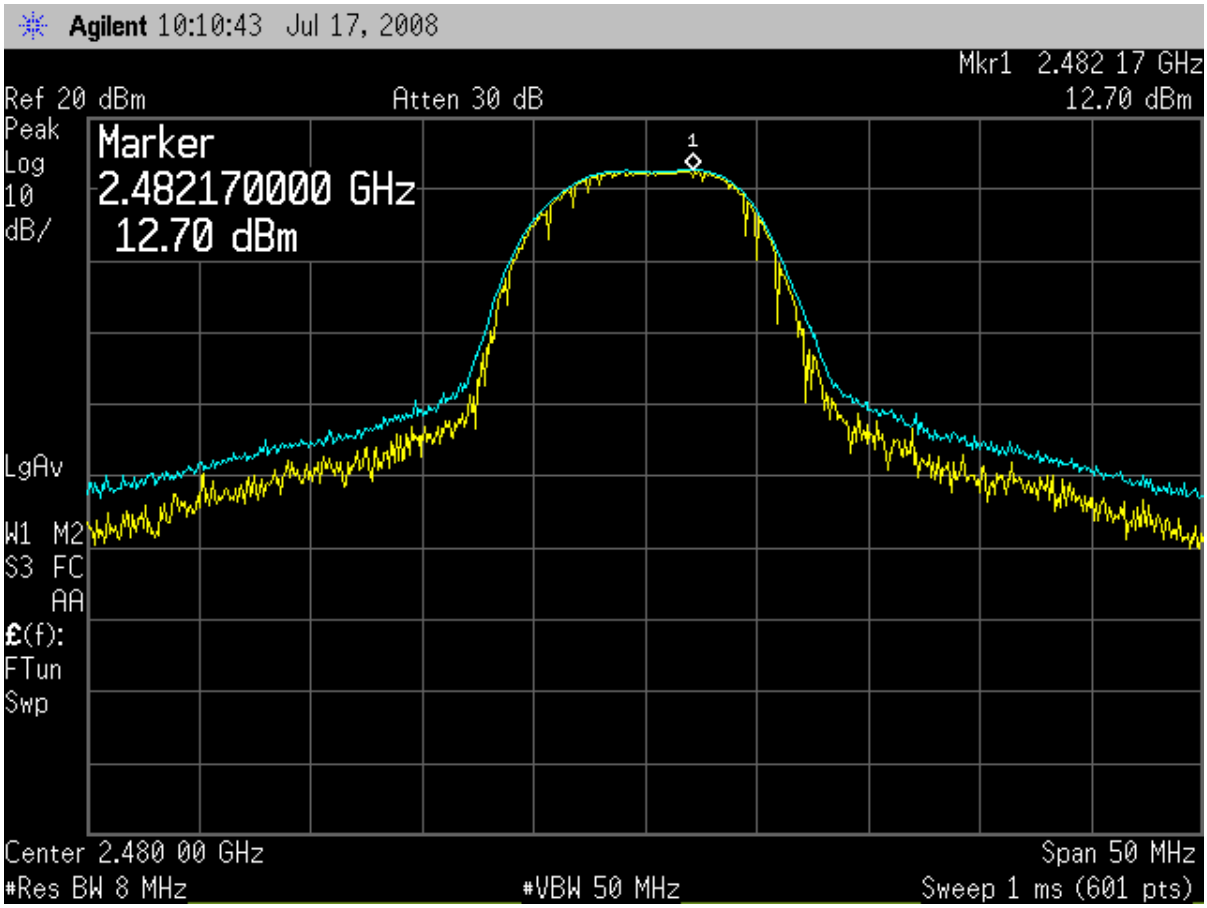
Channel	Frequency (MHz)	Measured Output Power (dBm)	Measured Output Power (mW)
Low	2405	13.71	23.5
Mid	2445	13.27	21.2
High	2480	12.70	18.6


Agilent 10:03:25 Jul 17, 2008
Mkr1 2.407 00 GHz
13.71 dBm
Ref 20 dBm
Atten 30 dB
Peak
Log
10
dB/
Marker
2.407000000 GHz
13.71 dBm
LgAv
W1 M2
S3 FC
AA
£(f):
FTun
Swp
Center 2.405 00 GHz
#Res BW 8 MHz
VBW 50 MHz
Span 50 MHz
Sweep 1 ms (601 pts)

Low Channel.


Agilent 10:06:55 Jul 17, 2008
Mkr1 2.447 08 GHz
13.27 dBm
Ref 20 dBm
Atten 30 dB
Peak
Log
10
dB/
Marker
2.447080000 GHz
13.27 dBm
1
LgAv
W1 M2
S3 FC
AA
£(f):
FTun
Swp
Center 2.445 00 GHz
#Res BW 8 MHz
VBW 50 MHz
Span 50 MHz
Sweep 1 ms (601 pts)

Mid Channel.



Highest Channel.

5.7. Power Spectral Density

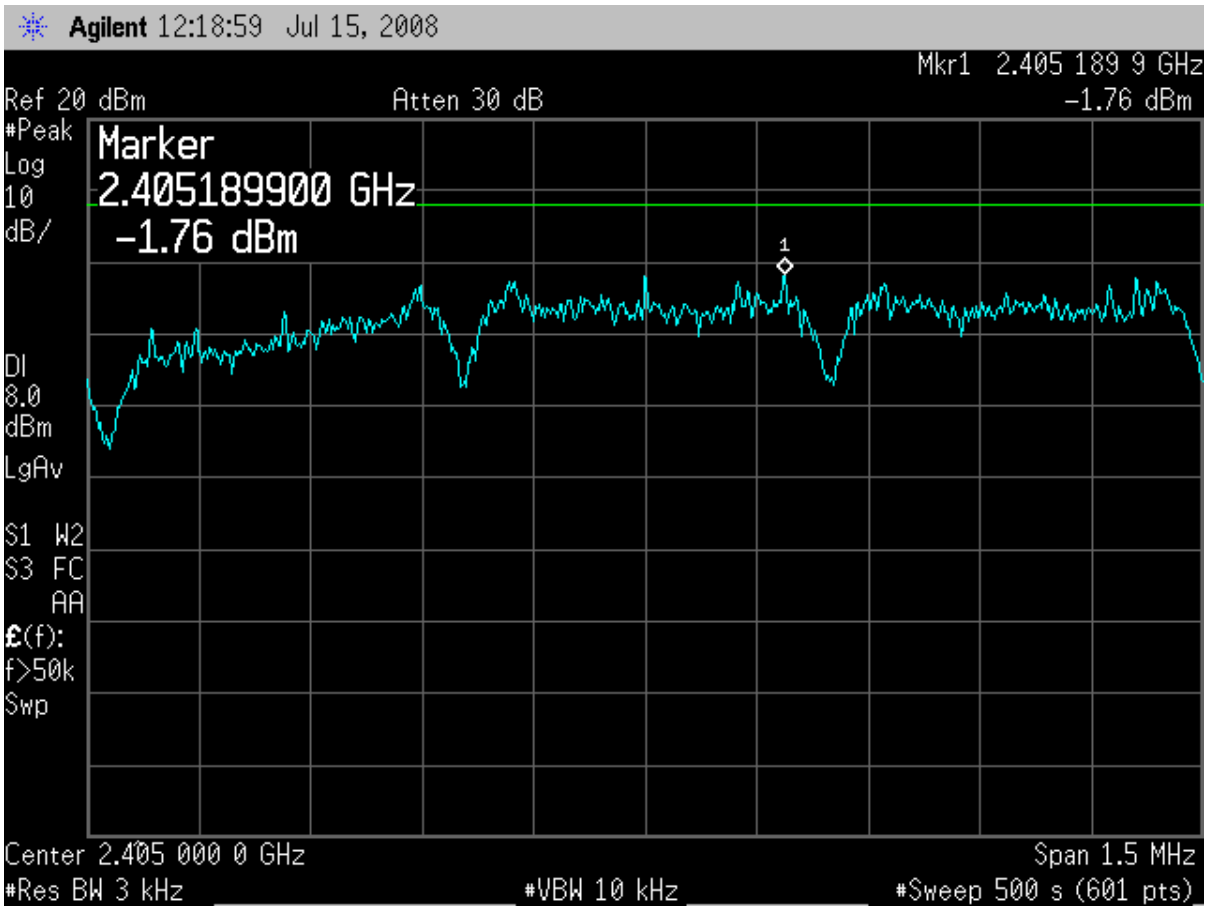
(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions 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).

Model:	**WXC**	**Temperature:**	25°C
Date:	July 15, 2008	**Humidity:**	57%
Modification State:	Lo/Mid/High Channels	**Tester:**	**Ferdinand Custodio**
		Laboratory:	Shielded Room 2

Test Results:
Additional Observations:

- **Conductive Peak Analyzer Readings: RES BW was set to 3 kHz and VBW to 10 kHz; Span = 1.5 MHz, Sweep = 500 seconds.**
- **Measurements were made with a fresh battery.**

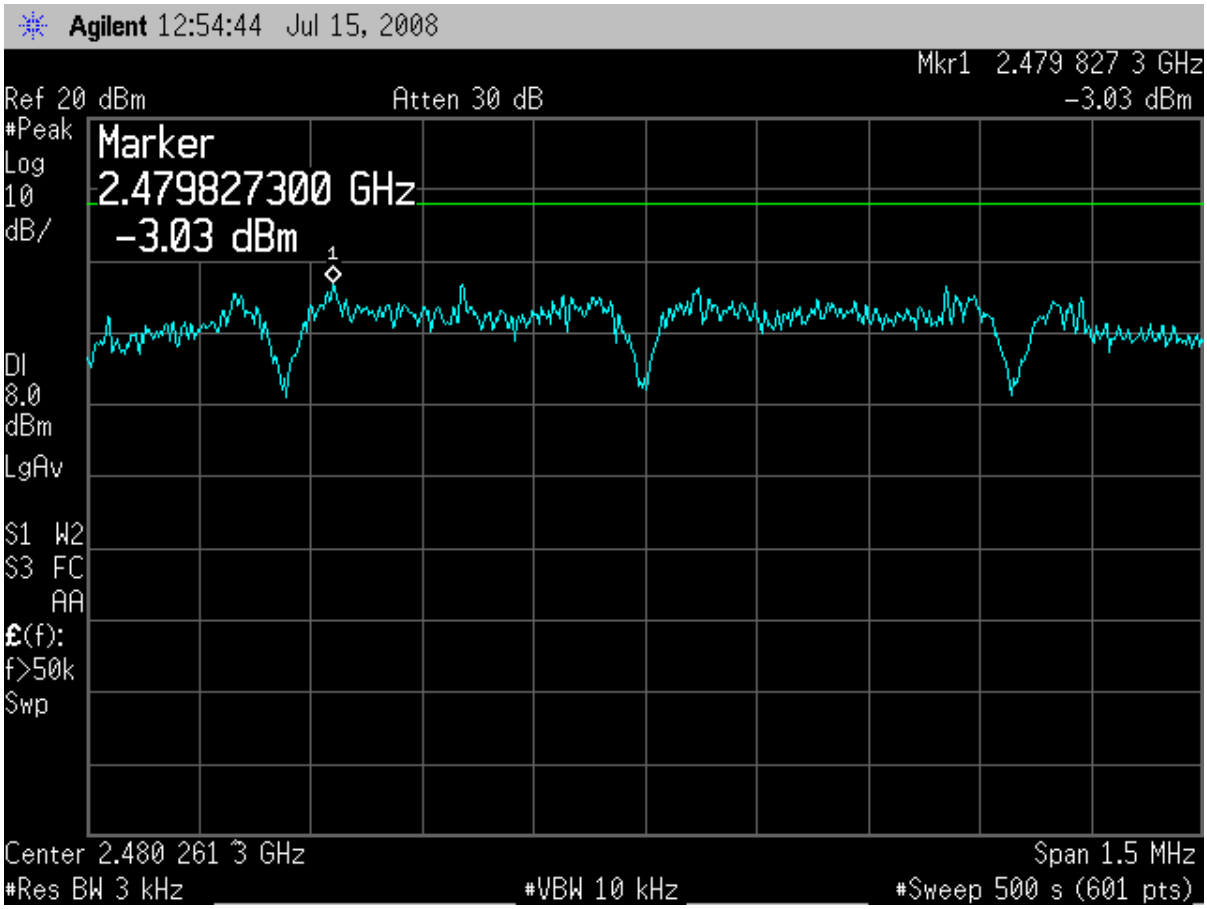
Channel	Channel Frequency (MHz)	RF Power Level in 3KHz BW (dBm)	Maximum Limit (dBm)	PASS/FAIL
LO	2405	-1.76	8	Pass
MID	2445	-2.62	8	Pass
HIGH	2480	-3.03	8	Pass


Agilent 12:18:59 Jul 15, 2008
Mkr1 2.405 189 9 GHz
Ref 20 dBm
Atten 30 dB
-1.76 dBm
#Peak
Log
10
dB/
Marker
2.405189900 GHz
-1.76 dBm
1
Dl
8.0
dBm
LgAv
S1 W2
S3 FC
AA
£(f):
f>50k
Swp
Center 2.405 000 0 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)

Low Channel


Agilent 12:31:12 Jul 15, 2008
Mkr1 2.445 004 6 GHz
-2.62 dBm
Ref 20 dBm
Atten 30 dB
#Peak
Log
10
dB/
Marker
2.445004600 GHz
-2.62 dBm
1
Dl
8.0
dBm
LgAv
S1 W2
S3 FC
AA
£(f):
f>50k
Swp
Center 2.445 275 4 GHz
Span 1.5 MHz
#Res BW 3 kHz
#VBW 10 kHz
#Sweep 500 s (601 pts)

Mid Channel



High Channel

5.8. Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
529	Antenna, DRWG	EMCO	3115	2505	27-Aug-07	27-Aug-08
115	Antenna, Bicon	EMCO	3104	3020	28-Aug-07	28-Aug-08
110	Antenna, LPA	Electrometrics	LPA-25	1217	10-Jan-08	10-Jan-09
911	Spectrum Analyzer	Agilent	E4440A	US41421266	18-Mar-08	18-Mar-09
901	pre amp	Sonoma	310 N	130607	13-Mar-08	13-Mar-09
317	Preamplifier	HP	8449A	2749A00167	31-Mar-08	31-Mar-09