

Nemko Test Report: 5117RUS1


Applicant: Motorola
1475 W. Shure Drive
Arlington Heights, IL 60004
USA

Equipment Under Test: WAP25400-1 MOTOwi4™ Diversity Access

In Accordance With: **FCC PART 27, Subpart M**
Broadband Radio Service and Educational Broadband
Service

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

TESTED BY:  DATE: 20 June 2007
David Light, Senior Wireless Engineer

APPROVED BY:  DATE: 22 June 2007
Harry Ward, Verifier

Total Number of Pages: 34



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Section 1. Summary of Test Results

Manufacturer: Motorola

Model No.: WAP25400-1 MOTOwi4™ Diversity Access Point

Serial No.: 170ZH01WR

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 FCC Part 27,

New Submission

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. NONE

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This report applies only to the items tested.

Summary Of Test Data

NAME OF TEST	PARA. NO.	SPEC. LIMIT	RESULT
RF Power Output	2.1046	33 dBW + 10log(X/Y) dBW	Complies
Occupied Bandwidth	2.1049	Not Specified	Complies
Spurious Emissions @ Antenna Terminals	2.1051	-13 dBm	Complies
Field Strength of Spurious Radiation	2.1053	-13 dBm	Complies
Frequency Stability	2.1055	Must remain within authorized bandwidth	Complies Note 1

Note 1: Frequency Stability data provided in separate exhibit

Section 2. General Equipment Specification

Power Supply -48 Vdc

Frequency Range: 2496 to 2690 MHz

Operating Frequencies 2498.5 to 2687.5 MHz (5MHz carrier)
2498.75 MHz to 2687.25MHz (5.5 MHz carrier)
2499.00 MHz to 2687.00 MHz (6 MHz carrier)
2501 to 2685 MHz (10 MHz carrier)

Type(s) of Modulation:	F3E (Voice)	F1D	F2D	W7D	F9W
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Emission Designator 5M5W7D, 5M0W7D, 6MW7D and 10M0W7D

Output Impedance: 50 ohms

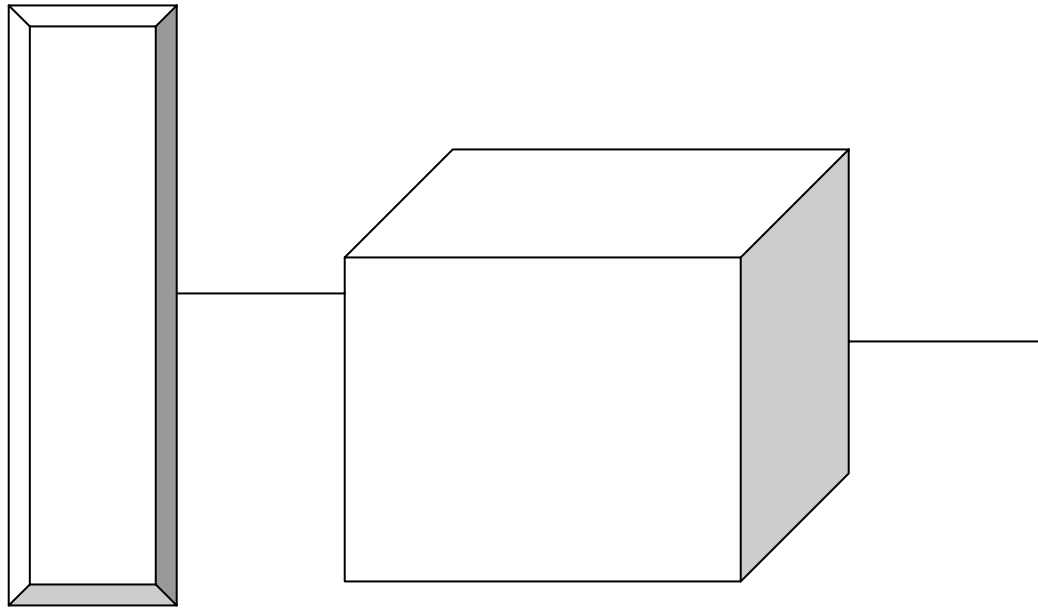
RF Power Output: 33dBm Conducted (5.5 and 6.0 MHz carriers)
30.25 dBm Conducted (5.0 and 10.0 carriers)

Duty Cycle: 75% (max)

Description of EUT

The WAP25400-1 MOTOwi4™ Diversity Access Point is a Base station transceiver.

System Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 06 June 2007

Test Results: Complies

Measurement Data: See Tables.

Test Equipment: 1082-1064-1065-Agilent E4440A Spectrum analyzer

MAX RF POWER OUTPUT

5.5 MHz Mode

Frequency (MHz)	Average Power (dBm)	Average Power (Watts)
2498.75	33.15	2.07
2597.25	33.06	2.02
2687.25	33.15	2.07

6 MHz Mode

Frequency (MHz)	Average Power (dBm)	Average Power (Watts)
2499	32.89	1.95
2597	32.80	1.91
2687	32.90	1.95

5 MHz Mode

Frequency (MHz)	Average Power (dBm)	Average Power (Watts)
2498.5	30.19	1.04
2597.5	30.20	1.05
2687.5	30.06	1.01

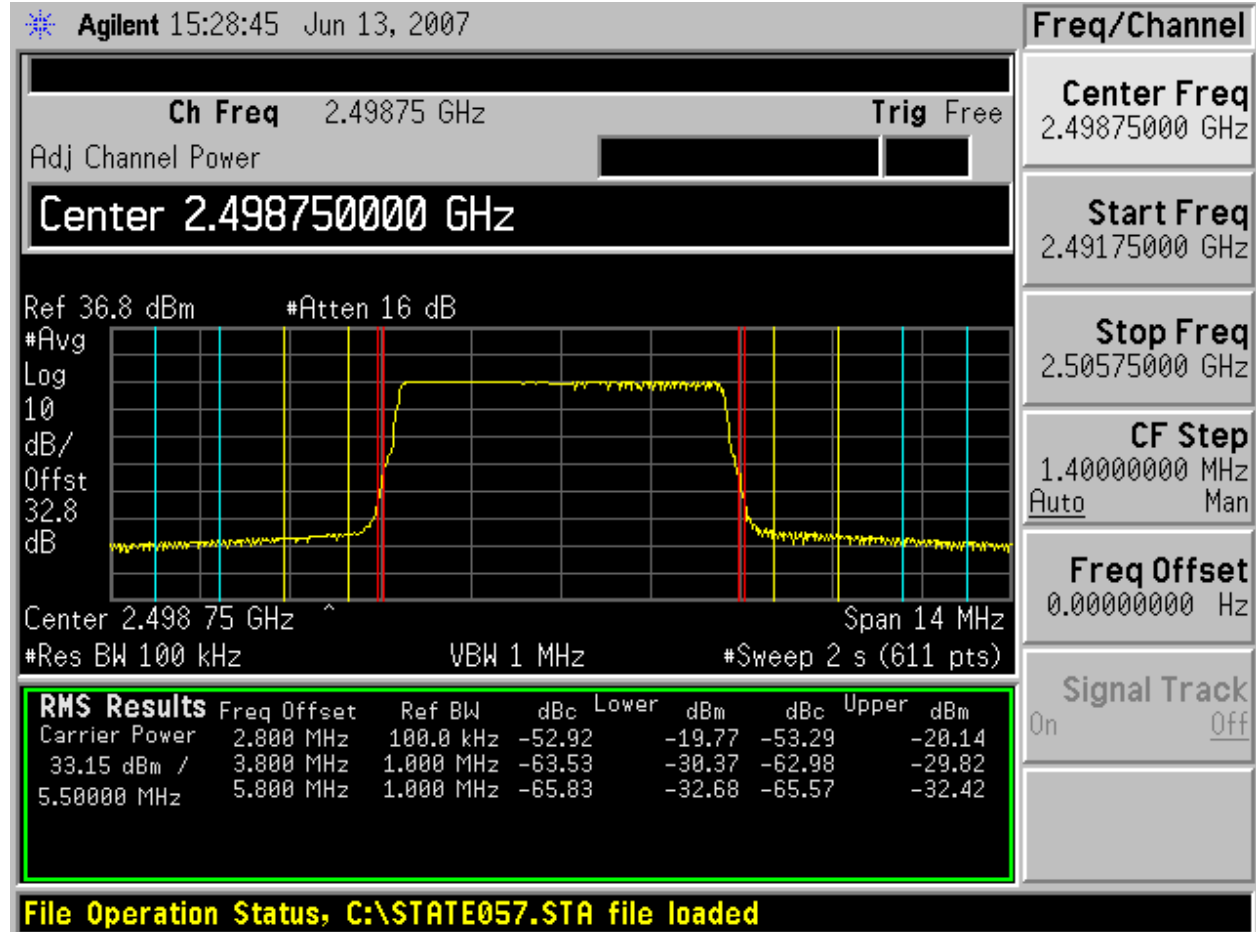
10 MHz Mode

Frequency (MHz)	Average Power (dBm)	Average Power (Watts)
2501.0	30.33	1.08
2595.0	30.22	1.05
2685.0	30.07	1.02

RBW=100 kHz
 VBW= 1 MHz
 Average detector
 Power integrated across the carrier band width

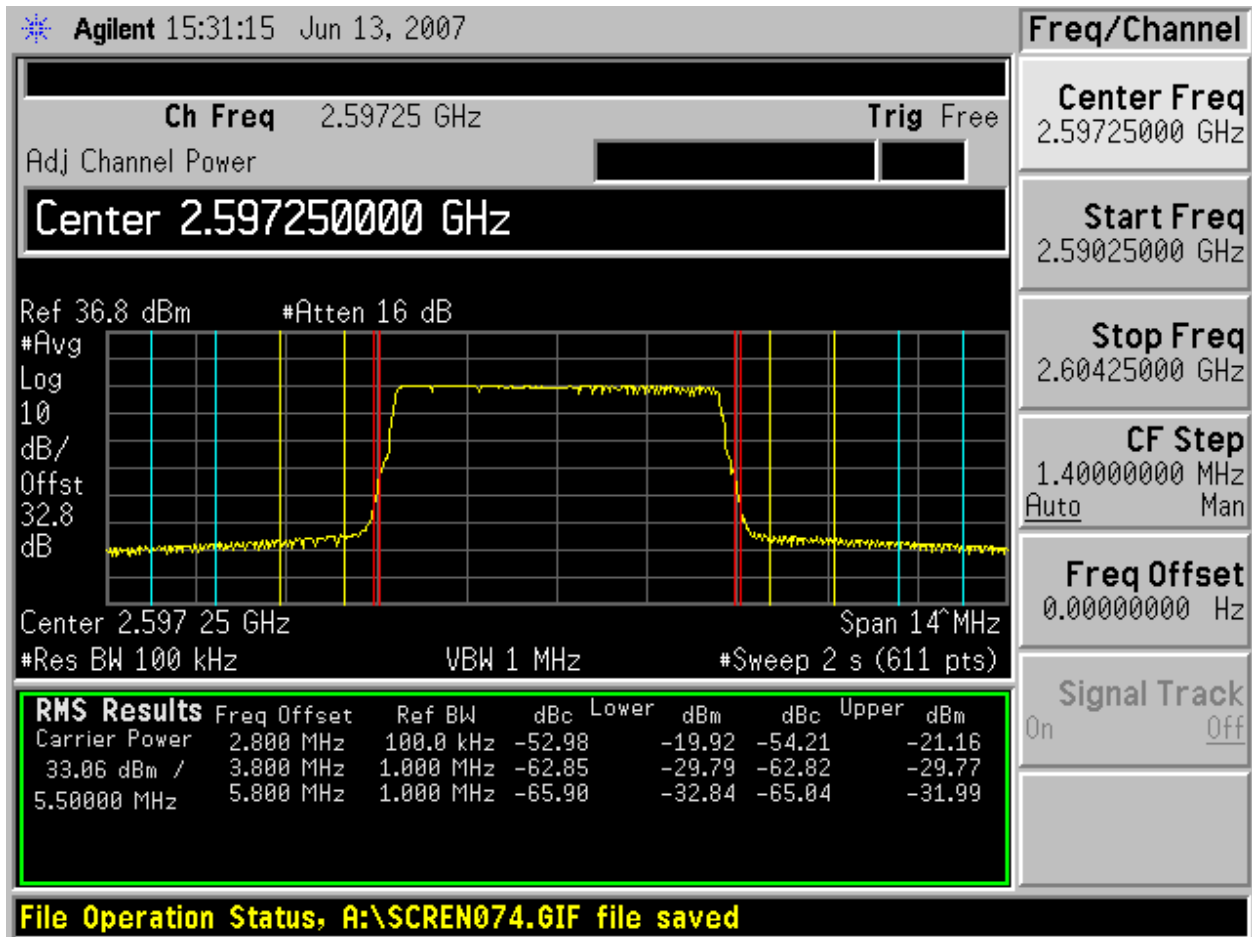
Test Data – RF Power

5.5 MHz



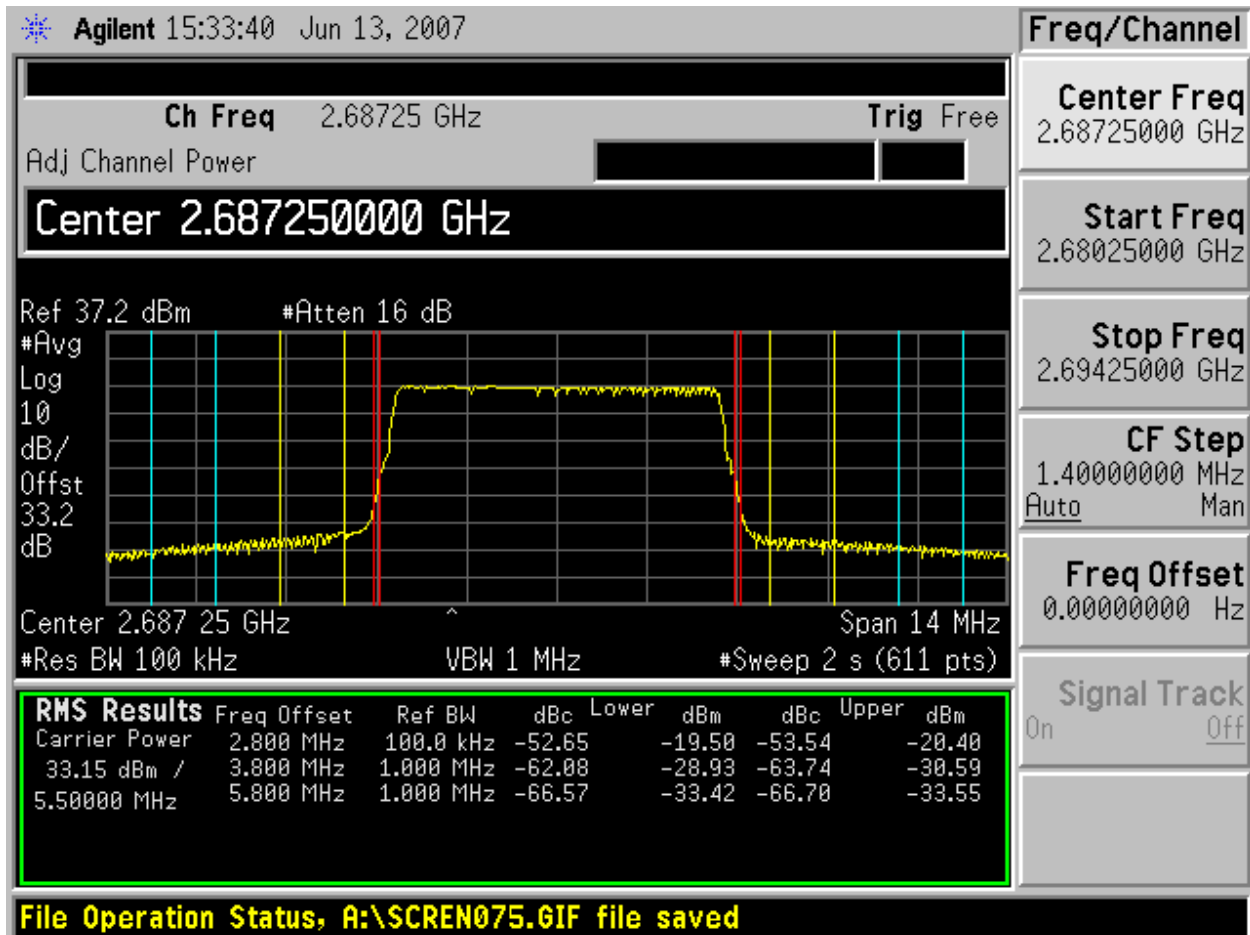
Test Data – RF Power

5.5 MHz



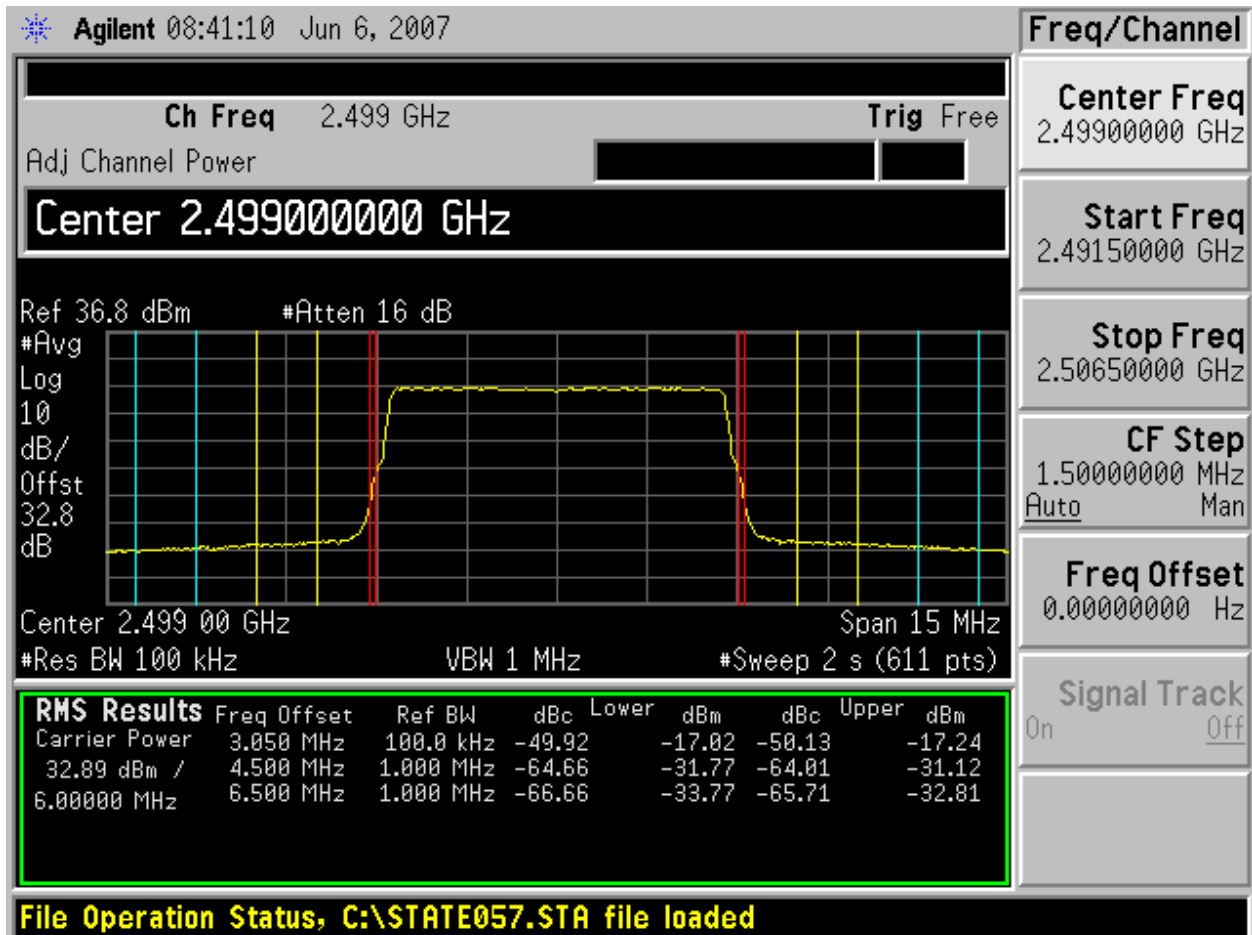
Test Data – RF Power

5.5 MHz



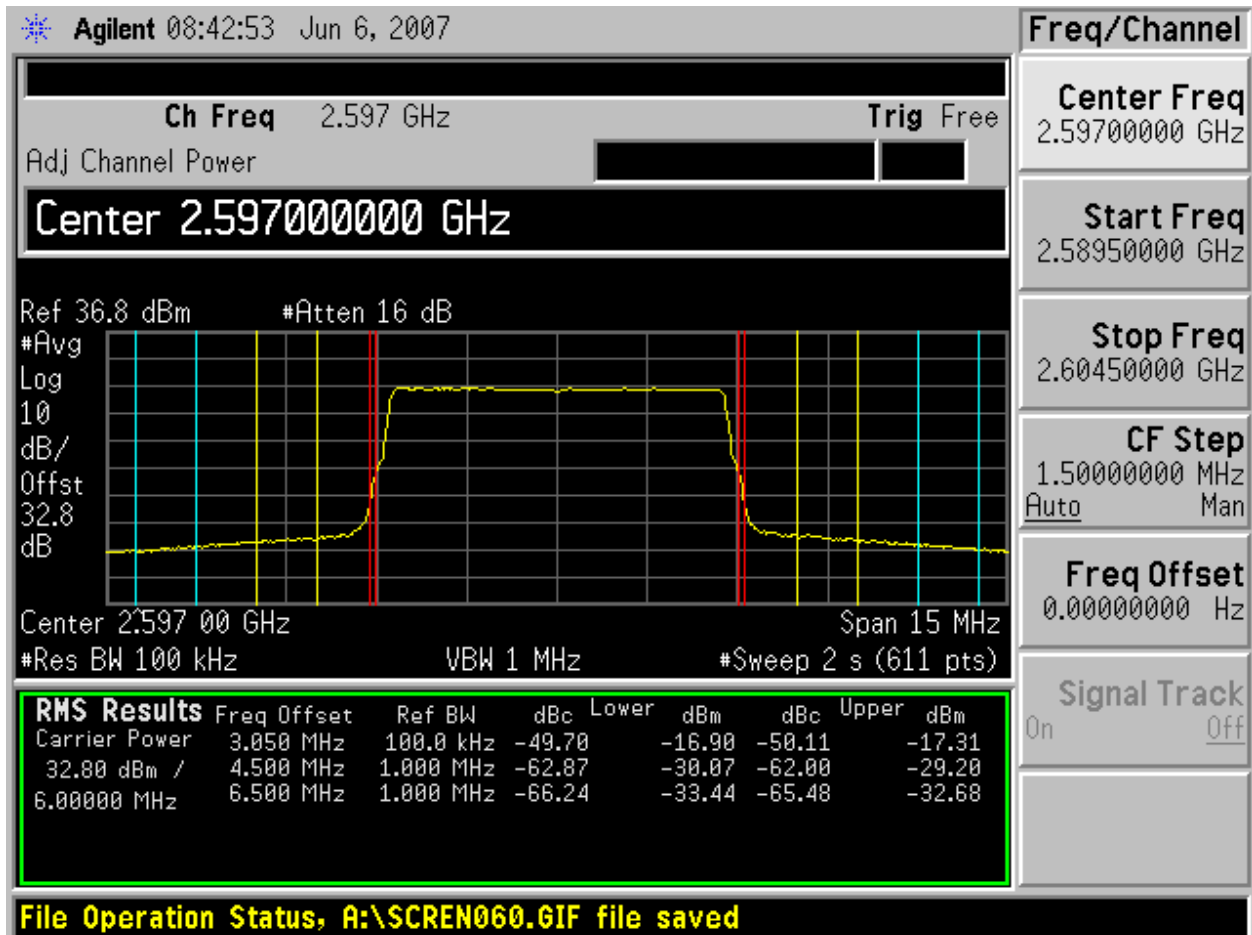
Test Data – RF Power

6 MHz



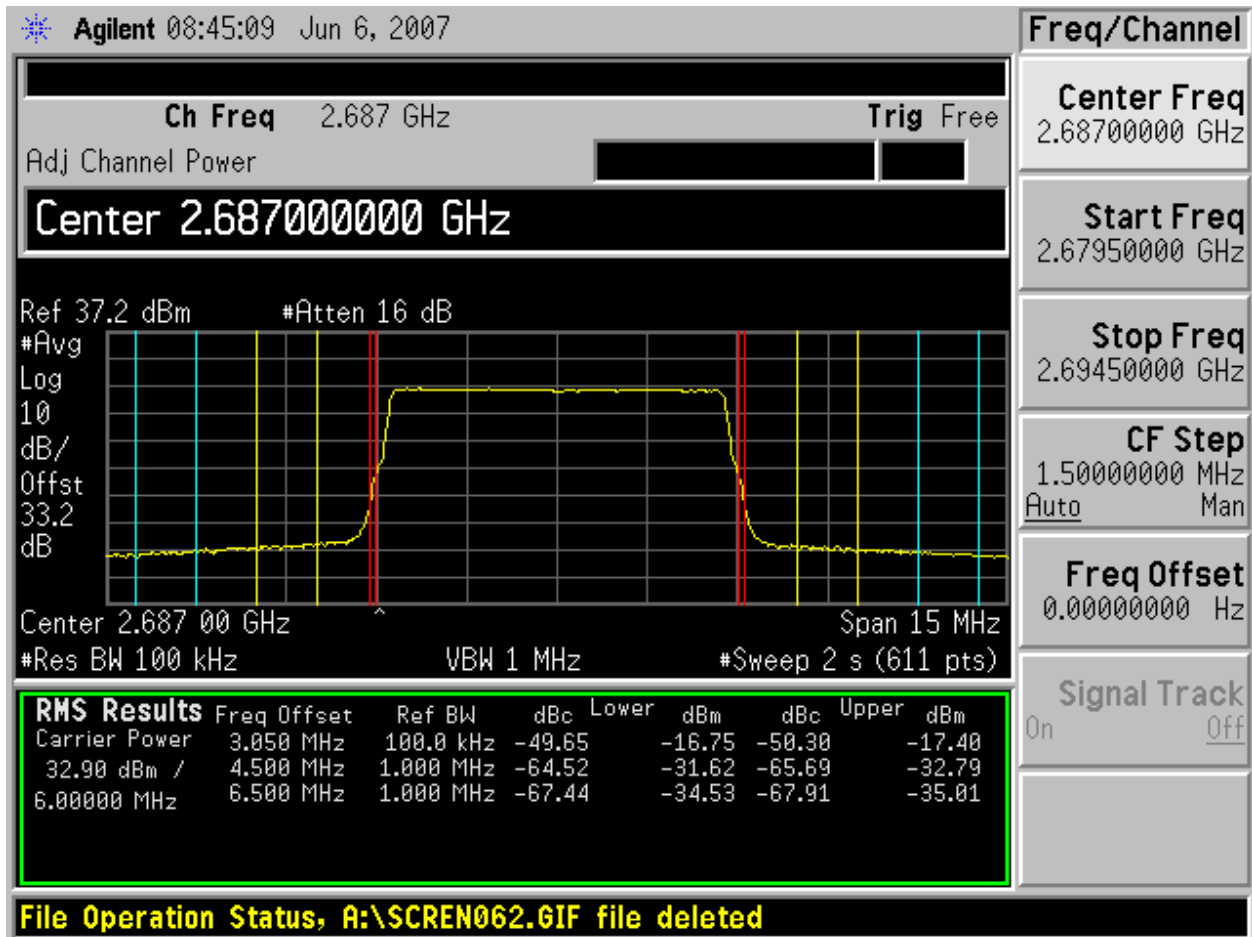
Test Data – RF Power

6 MHz



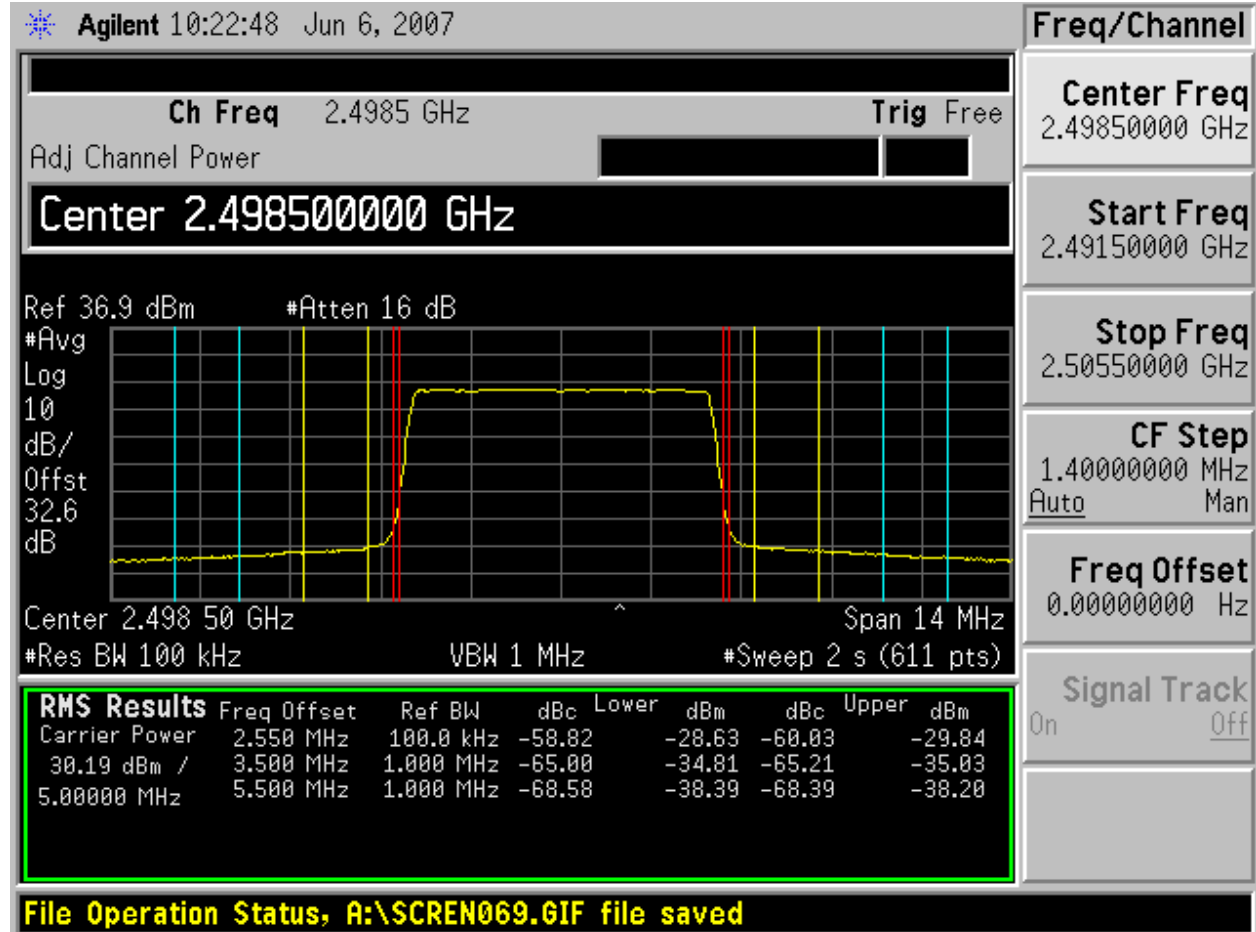
Test Data – RF Power

6 MHz



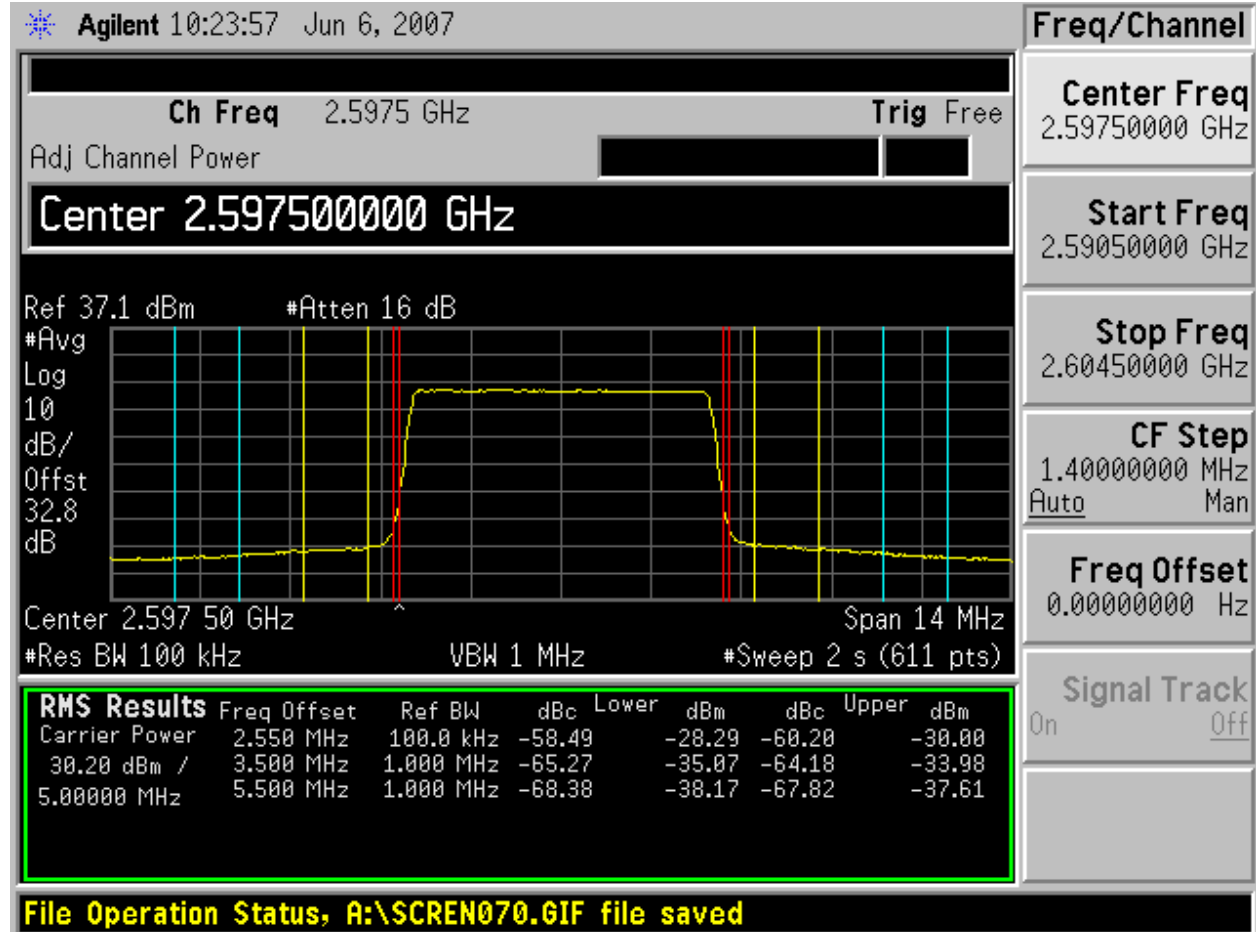
Test Data – RF Power

5 MHz



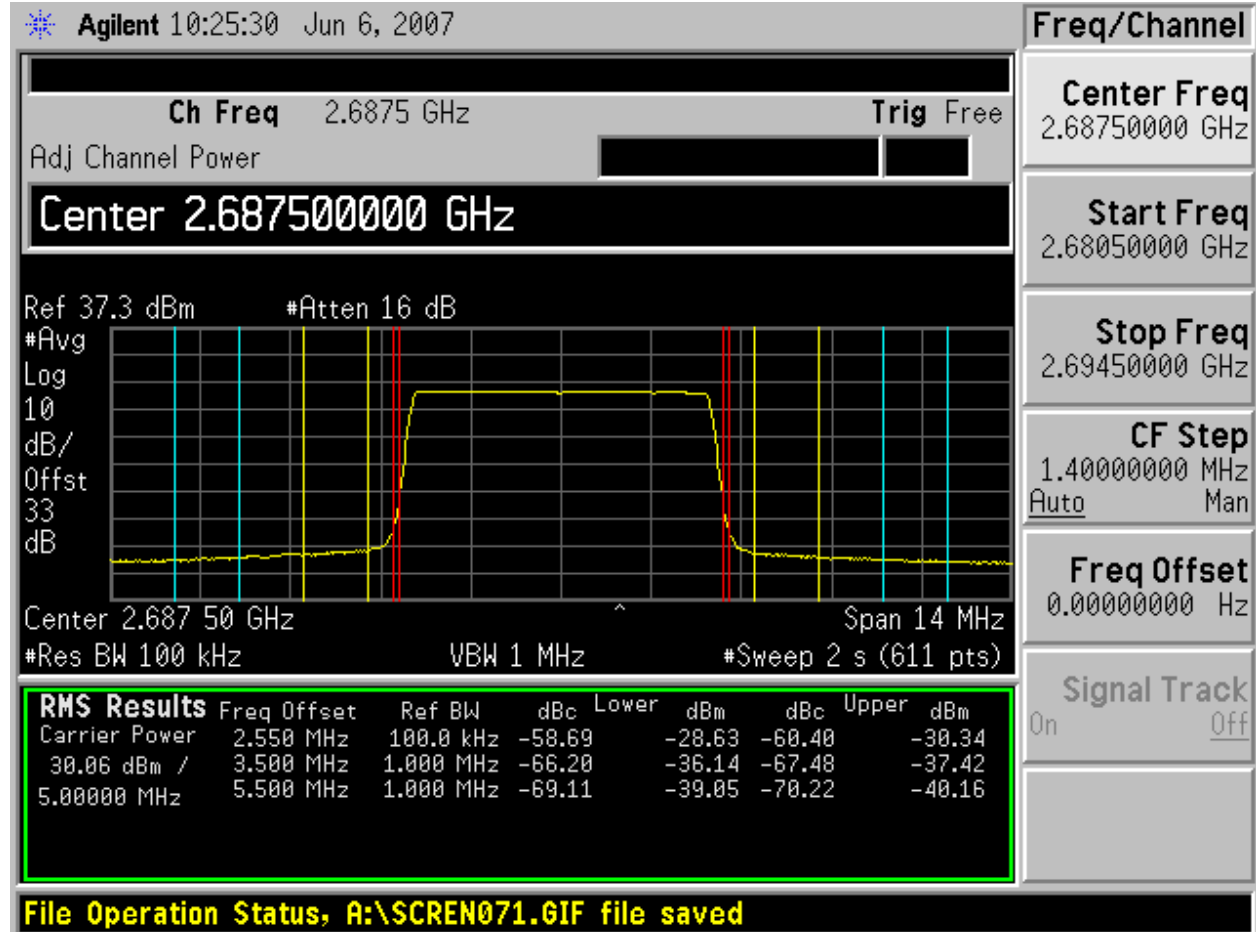
Test Data – RF Power

5 MHz



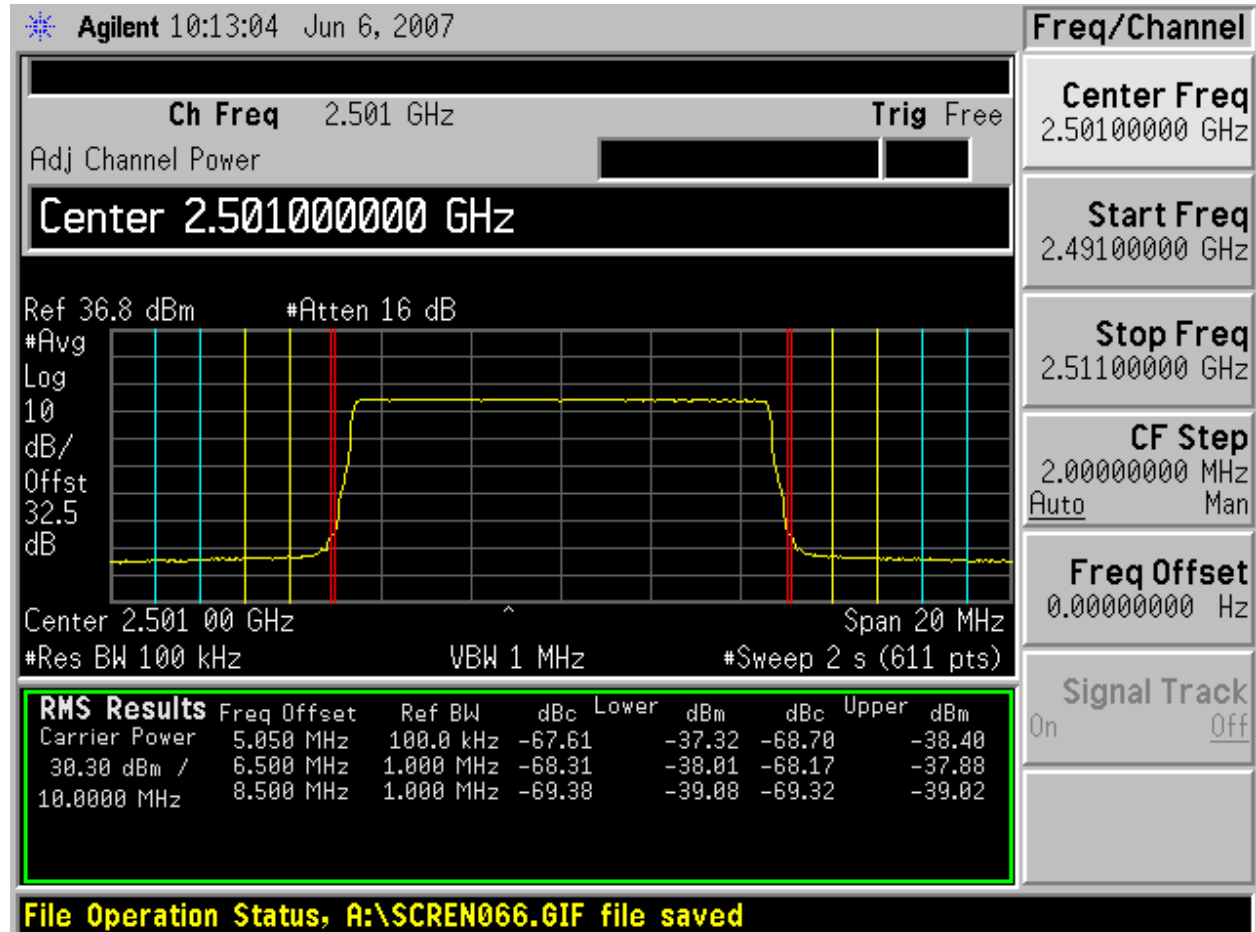
Test Data – RF Power

5 MHz



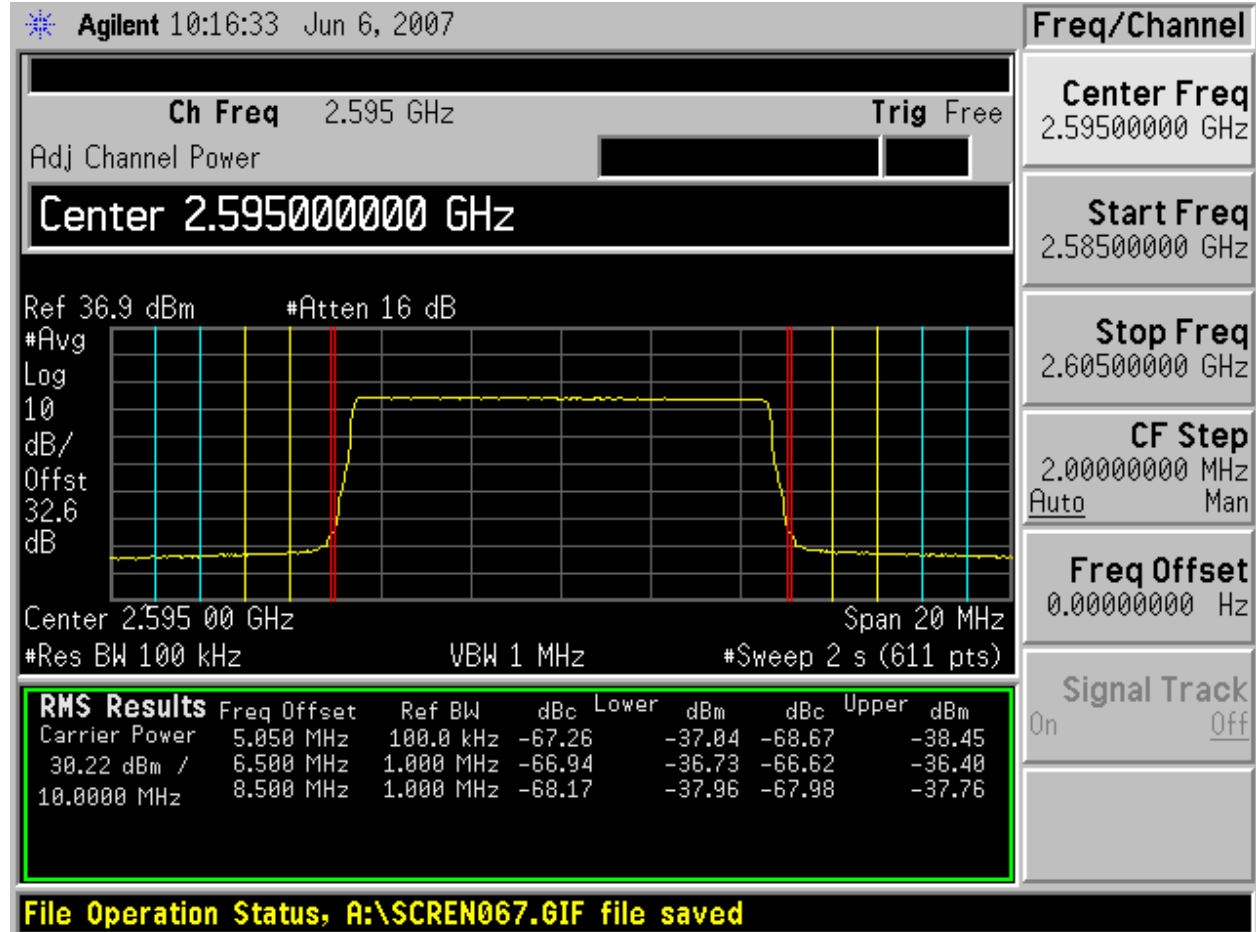
Test Data – RF Power

10 MHz



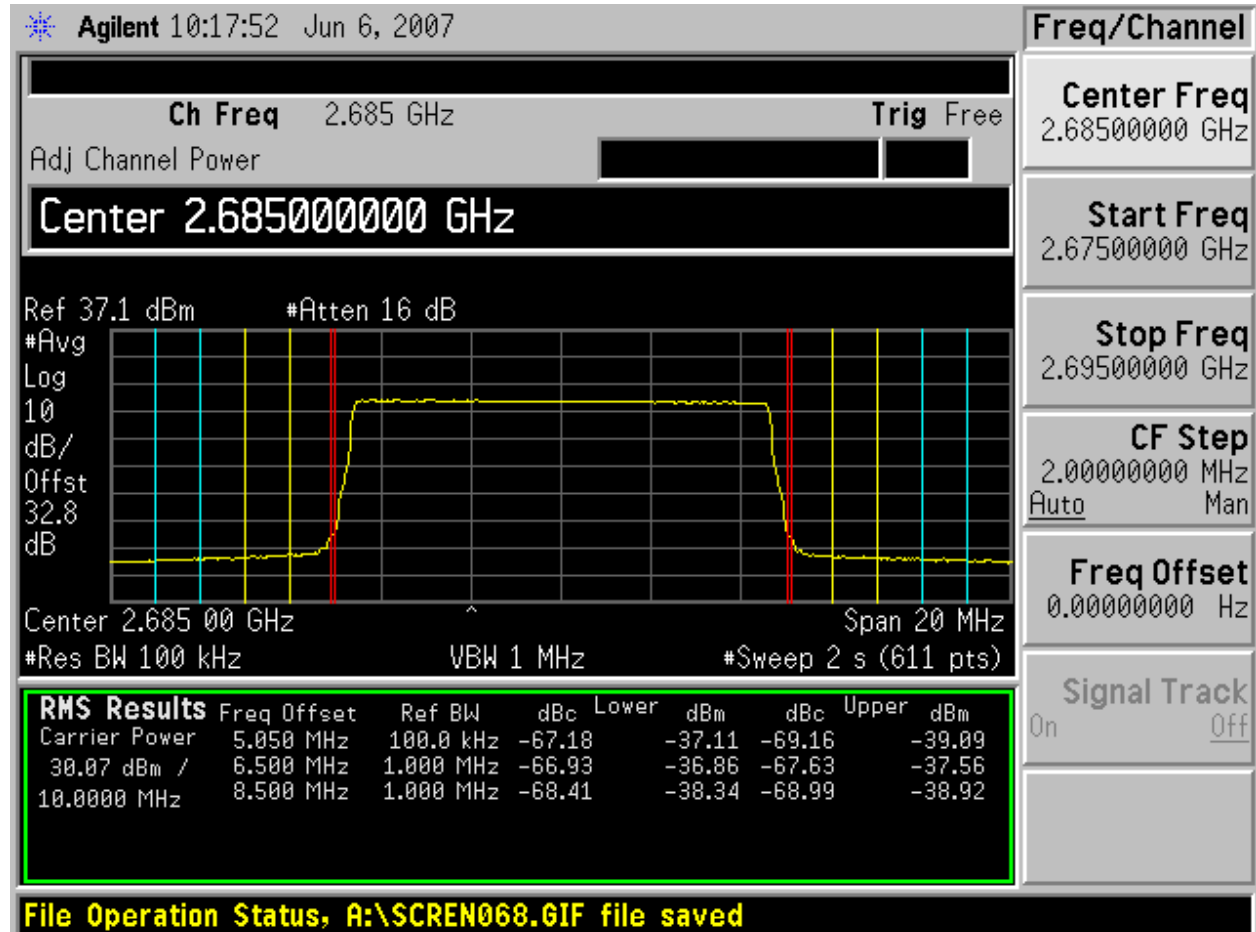
Test Data – RF Power

10 MHz



Test Data – RF Power

10 MHz



Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 06 June 2007

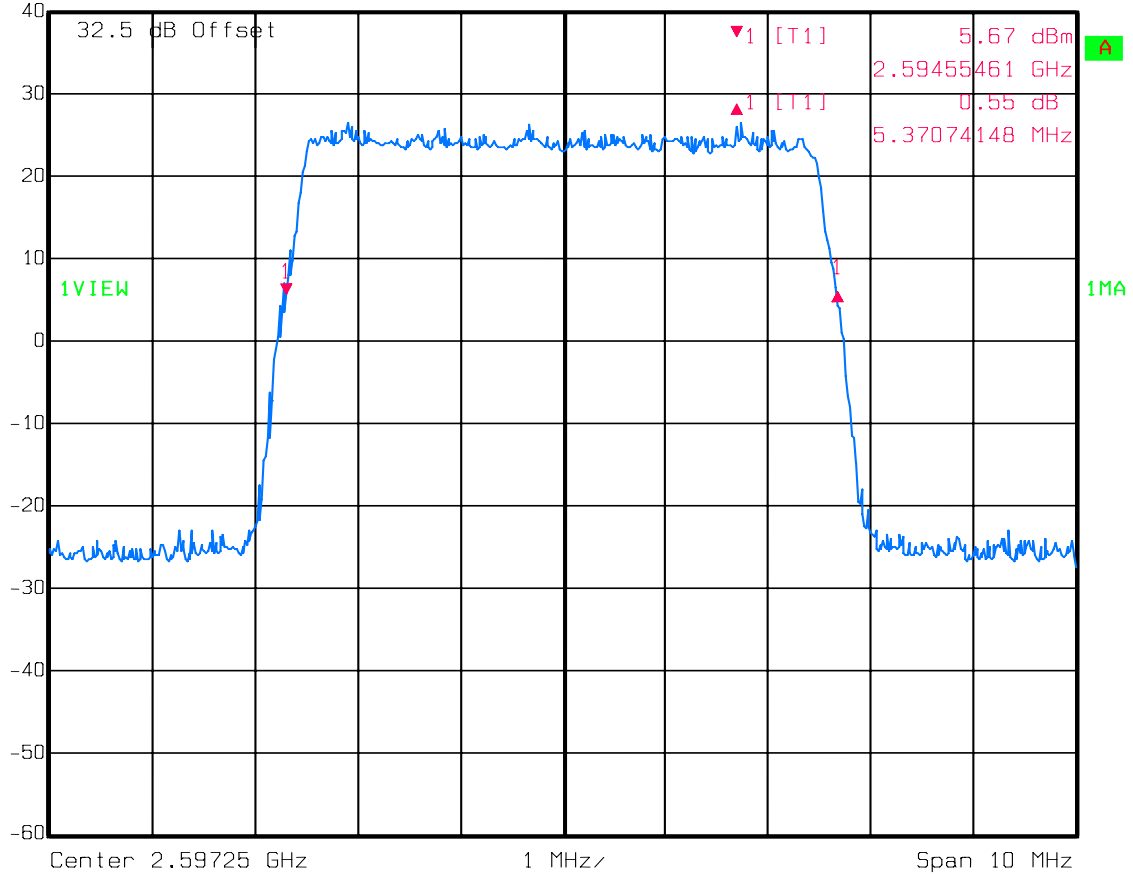
Test Results: Complies

Measurement Data: See attached plots.

Test Equipment: 1036-1082-1064-1065

Test Data – 99% Occupied Bandwidth

 Delta 1 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl 0.55 dB VBW 100 kHz
40 dBm 5.37074148 MHz SWT 2 s Unit dBm

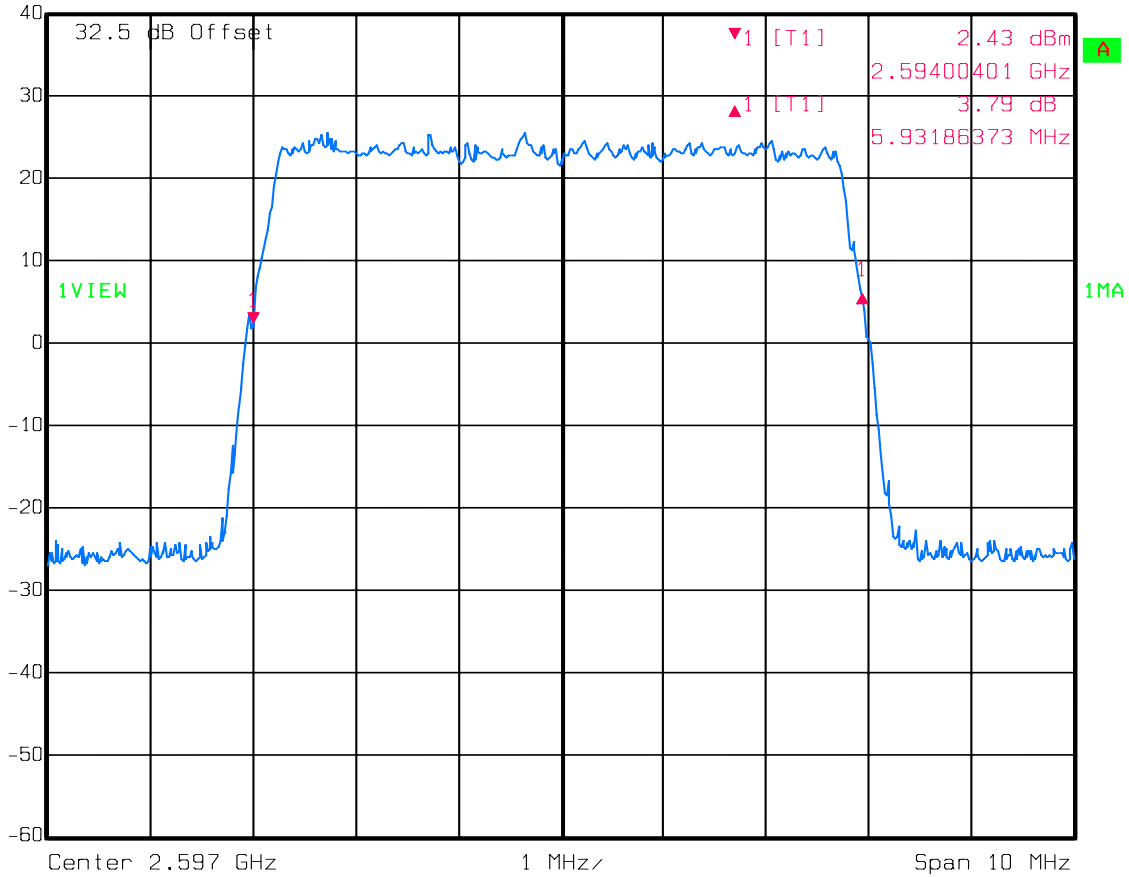


Date: 06.JUN.2007 09:38:11

Test Data – 99% Occupied Bandwidth

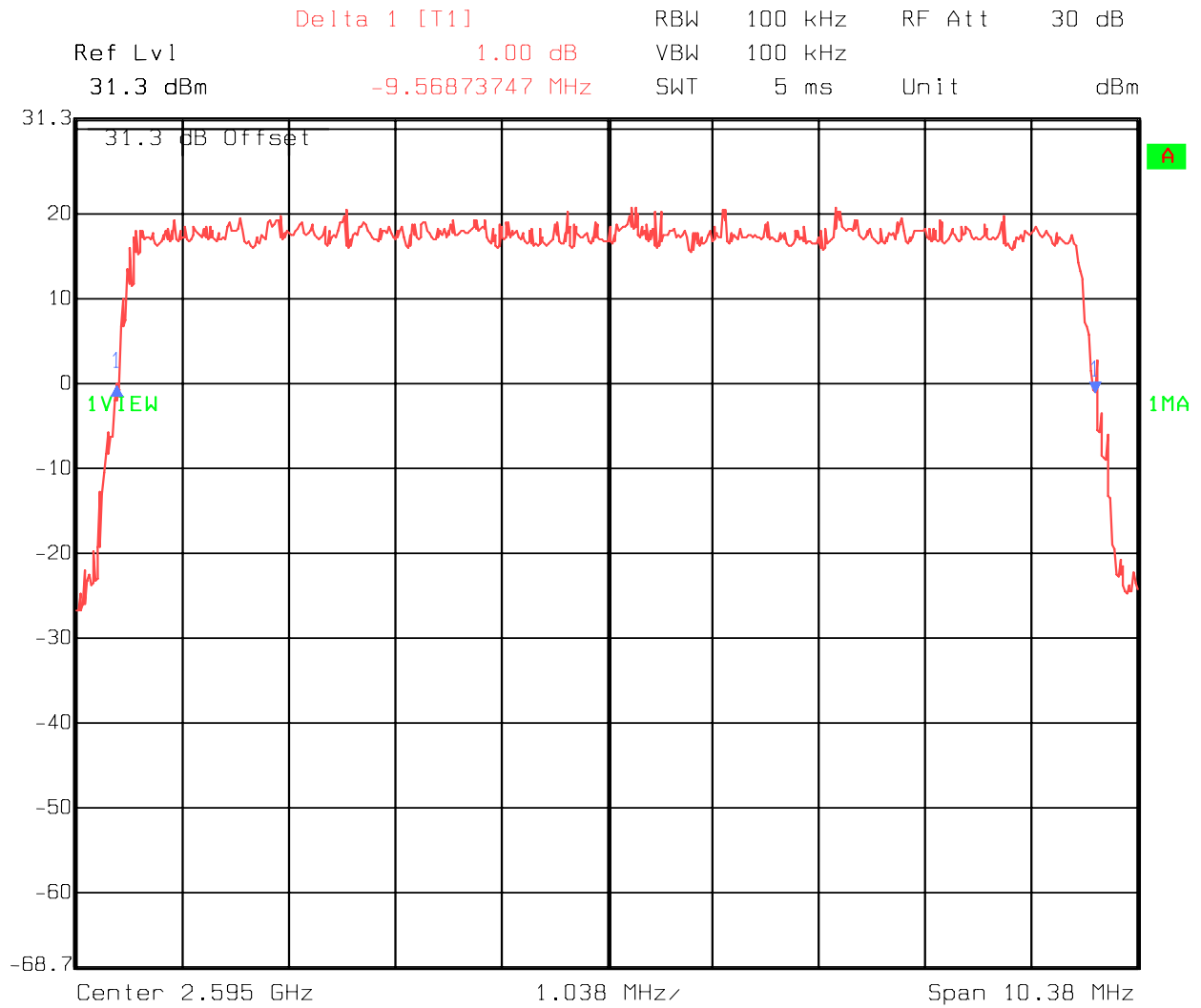


Ref Lvl	Delta 1 [T1]	RBW	100 kHz	RF Att	30 dB
40 dBm	3.79 dB	VBW	100 kHz	Unit	dBm
	5.93186373 MHz	SWT	2 s		



Date: 06.JUN.2007 09:15:14

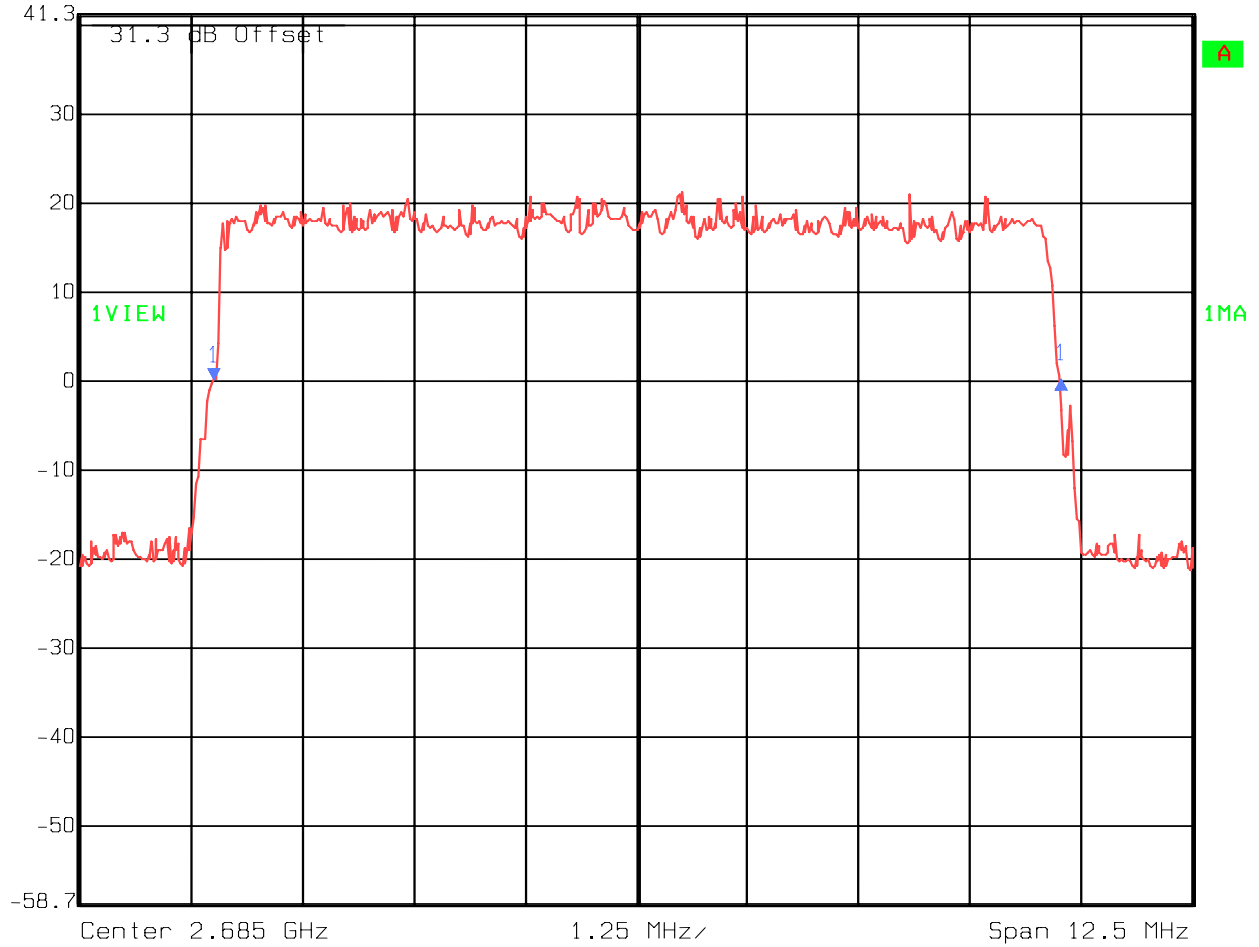
Test Data – 99% Occupied Bandwidth



Date: 24.OCT.2006 15:14:23

Test Data – 99% Occupied Bandwidth

Delta 1 [T1] RBW 100 kHz RF Att 40 dB
Ref Lvl 0.16 dB VBW 100 kHz
41.3 dBm 9.51903808 MHz SWT 5 ms Unit dBm



Date: 24.OCT.2006 15:23:06

Section 5. Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions @ Antenna Terminals	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 06 June 2007

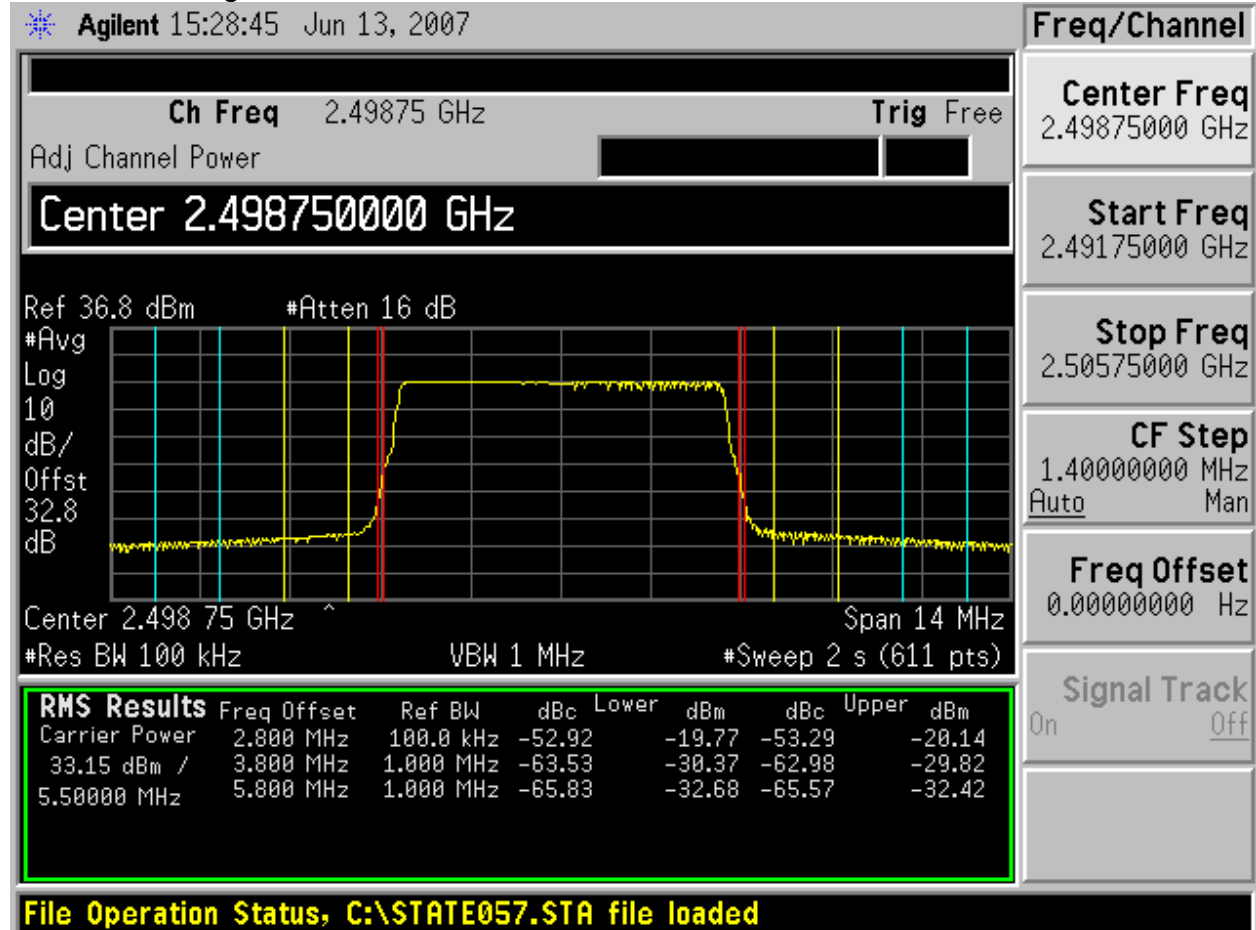
Test Results: Complies

Measurement Data: See attached plots.

Test Equipment: 1082-1064-1065-1036-Agilent E4440A Spectrum analyzer

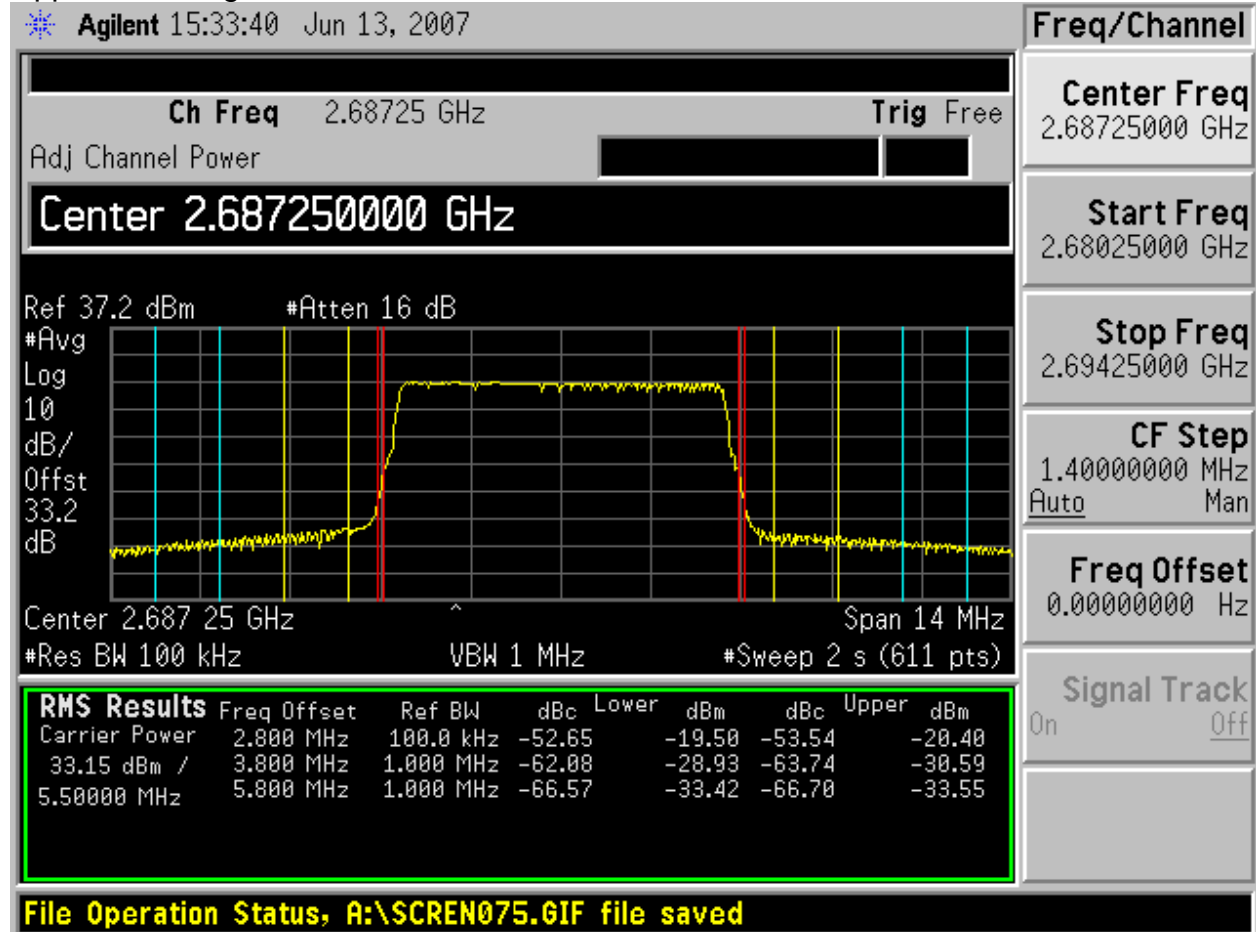
Test Data – Spurious Emissions at Antenna Terminals

Lower band edge 5.5 MHz



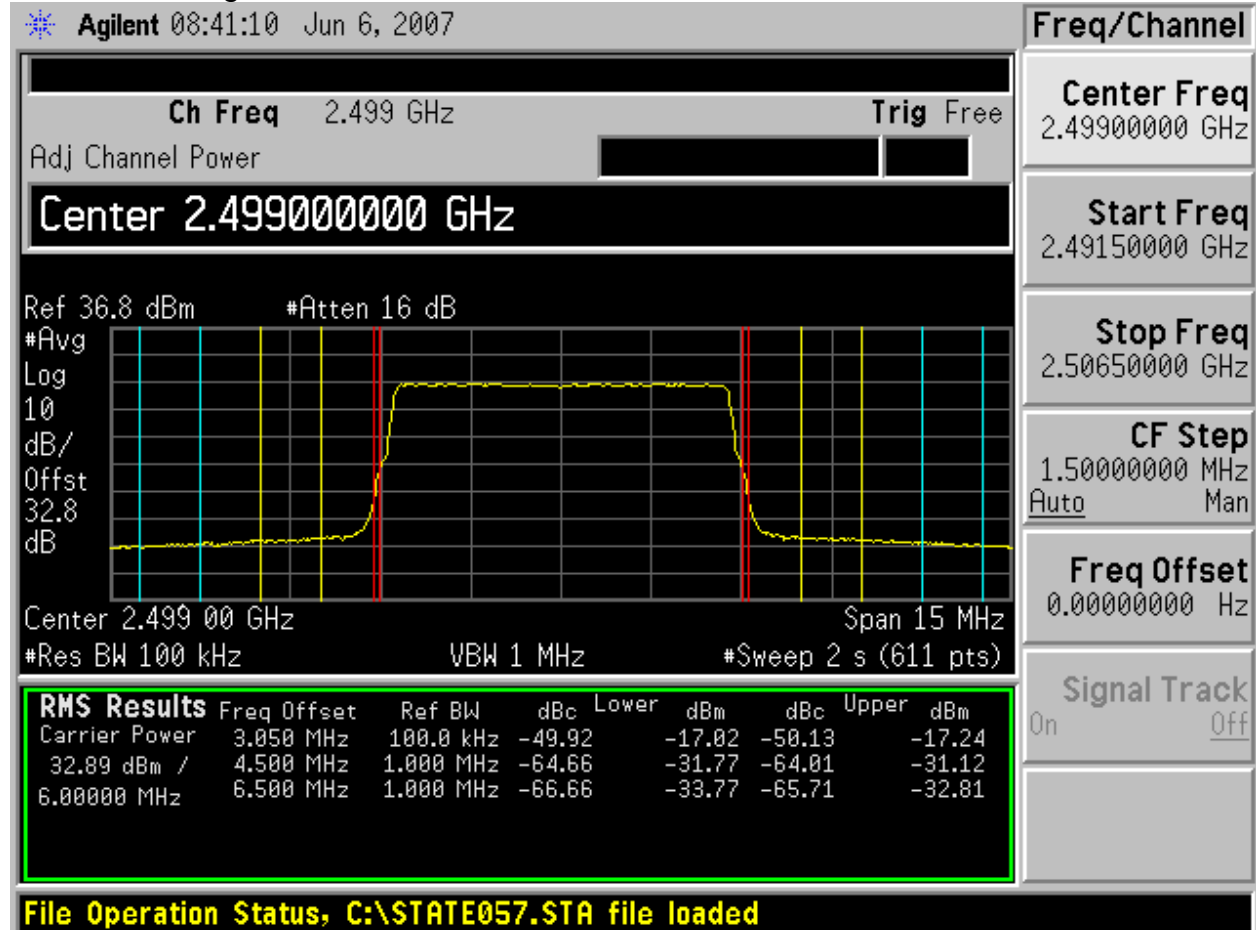
Test Data – Spurious Emissions at Antenna Terminals

Upper band edge 5.5 MHz



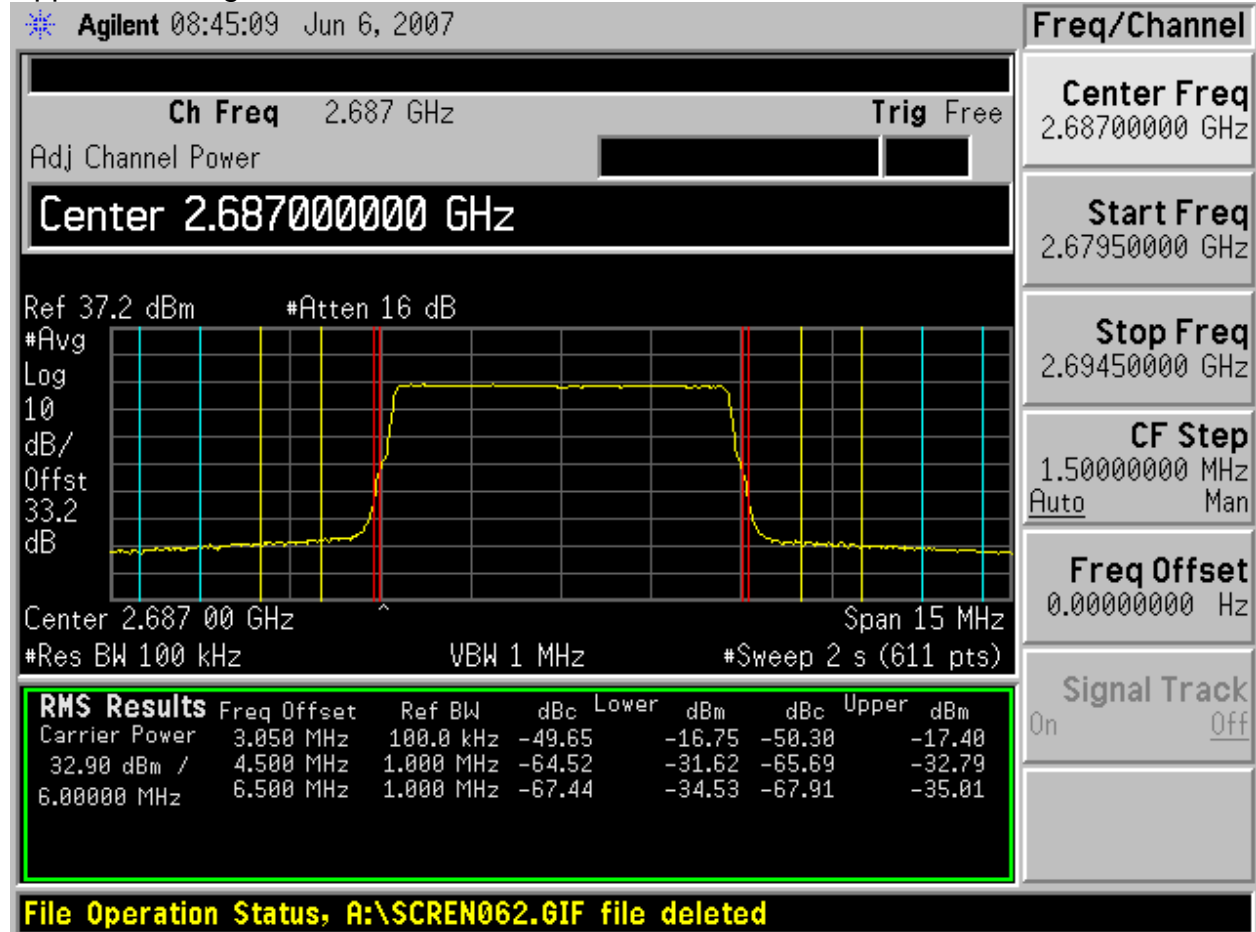
Test Data – Spurious Emissions at Antenna Terminals

Lower band edge 6 MHz



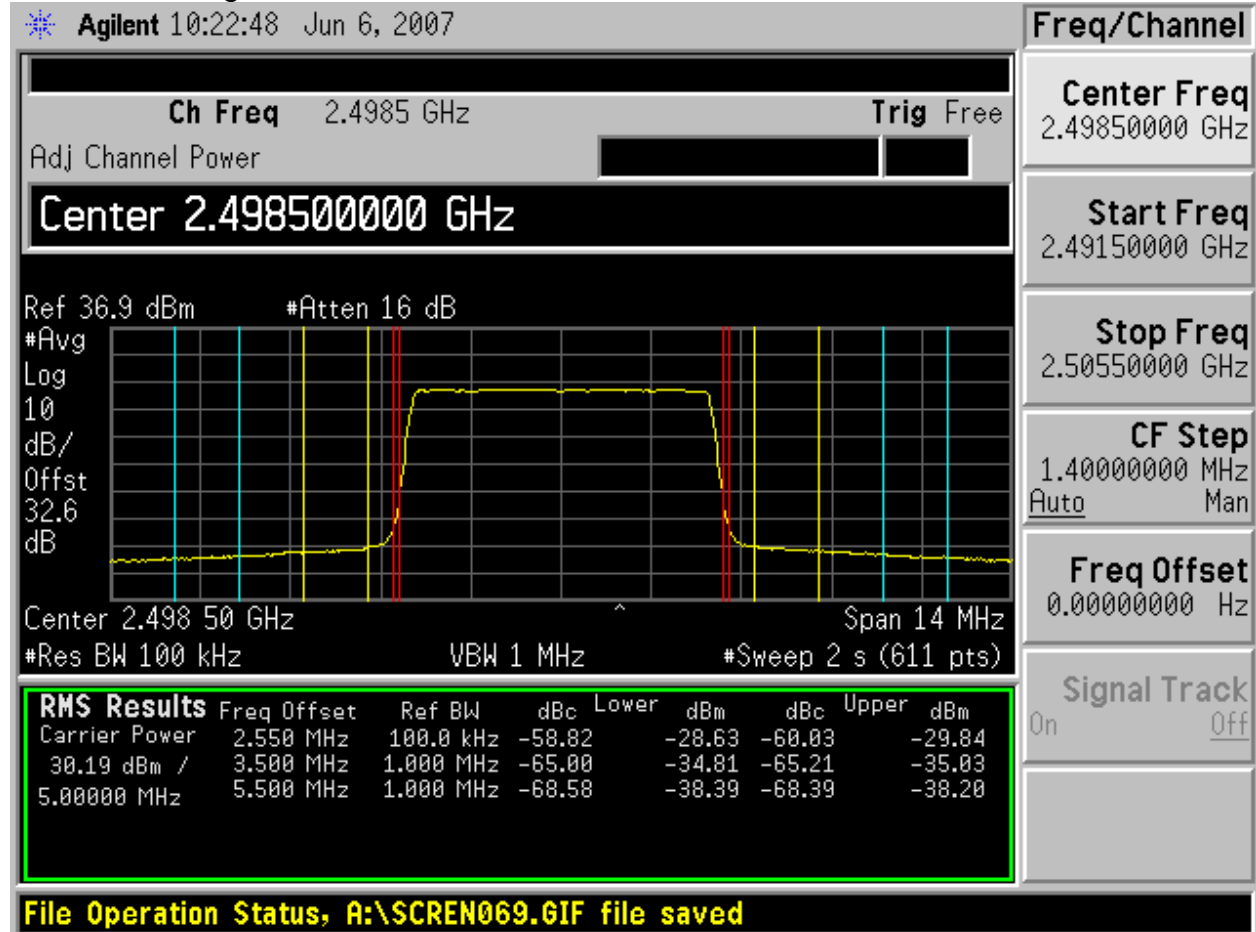
Test Data – Spurious Emissions at Antenna Terminals

Upper band edge 6 MHz



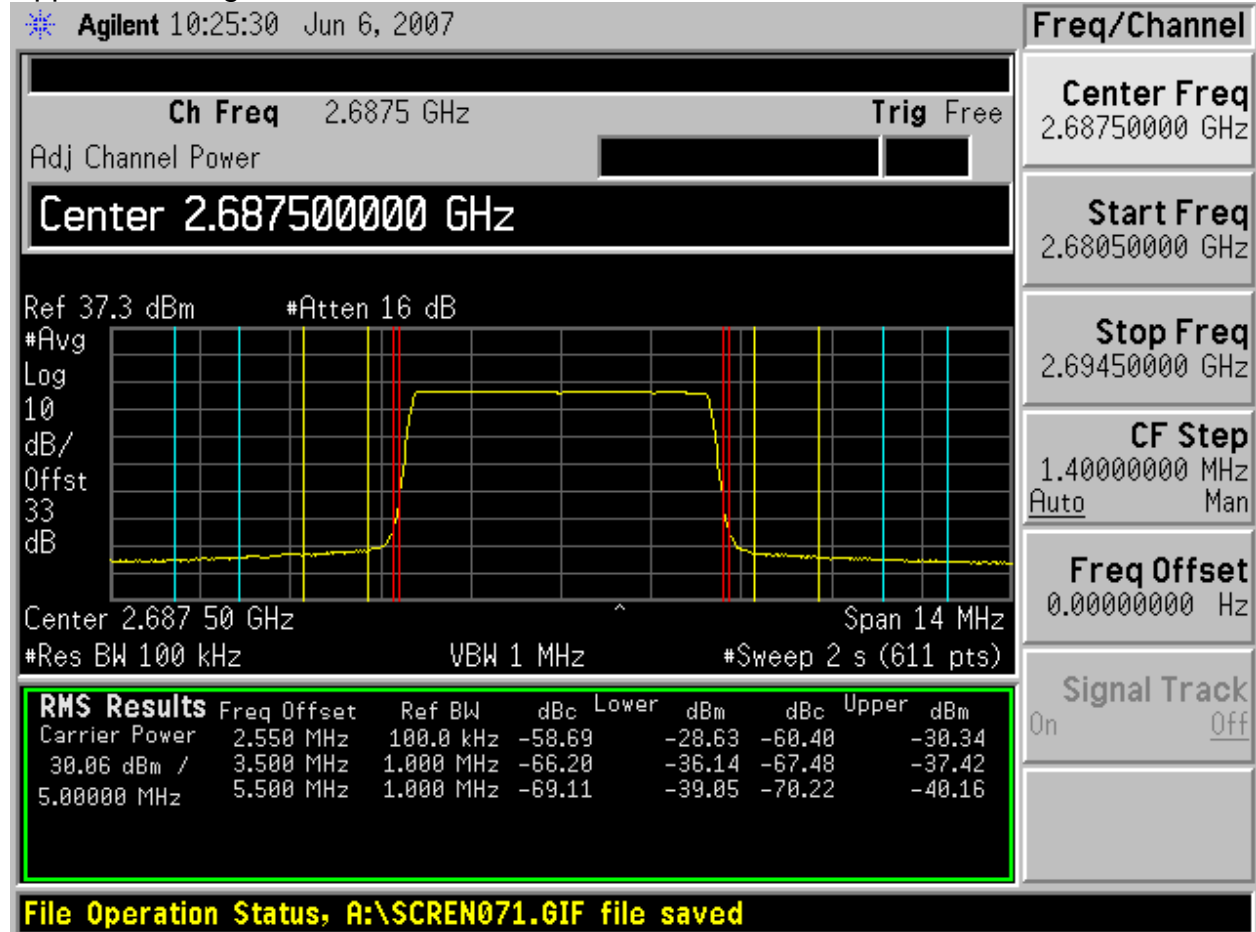
Test Data – Spurious Emissions at Antenna Terminals

Lower band edge 5 MHz



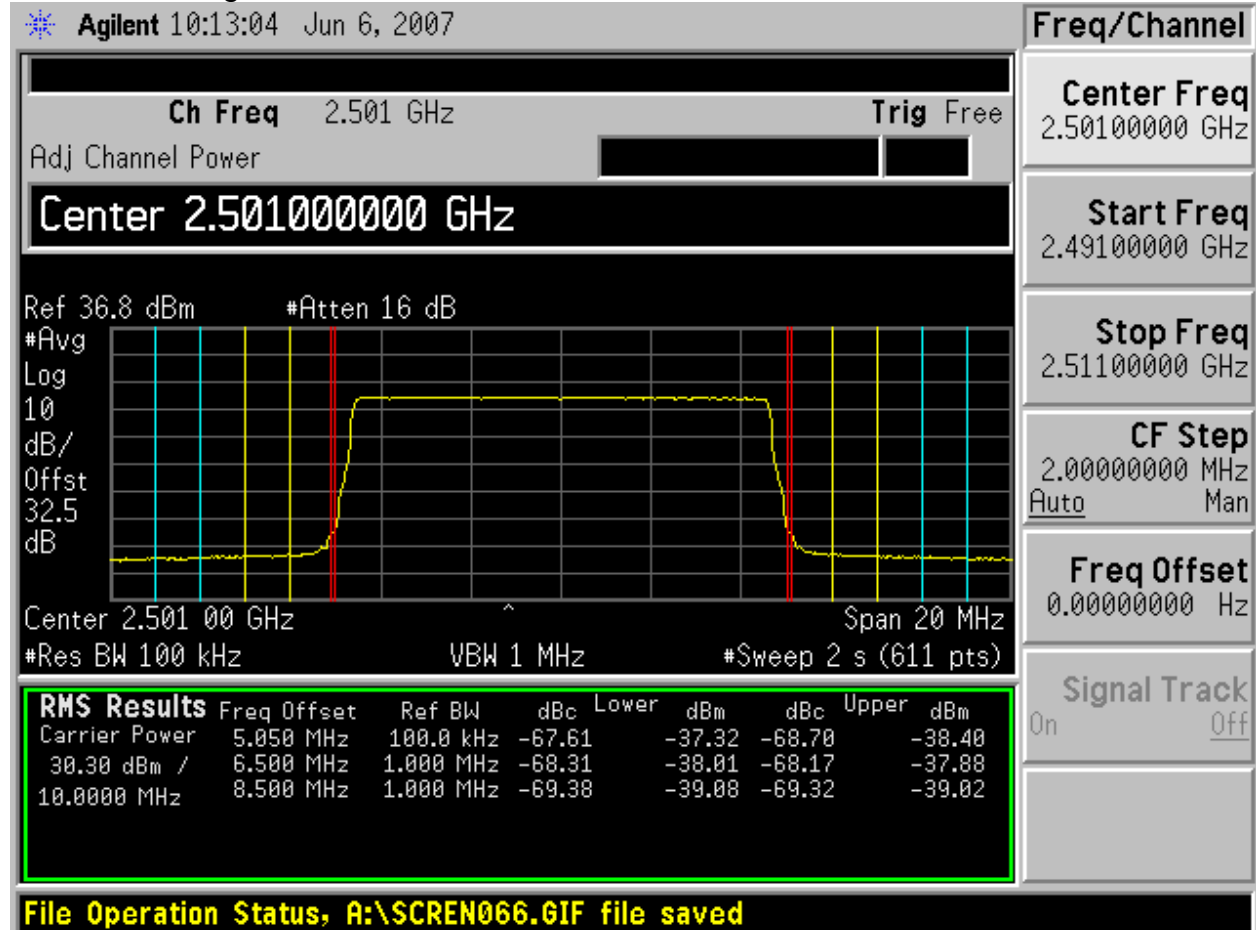
Test Data – Spurious Emissions at Antenna Terminals

Upper band edge 5 MHz



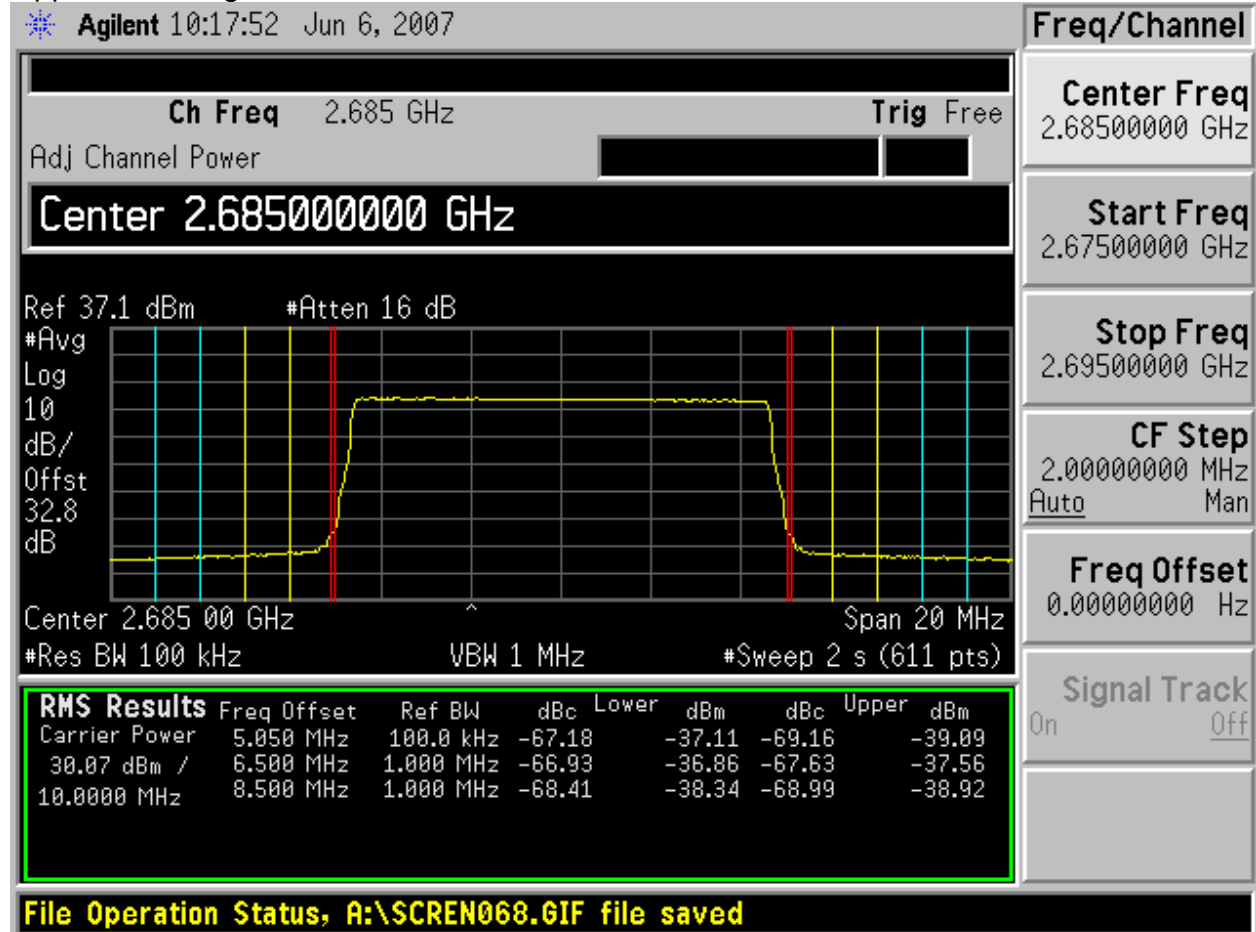
Test Data – Spurious Emissions at Antenna Terminals

Lower band edge 10 MHz

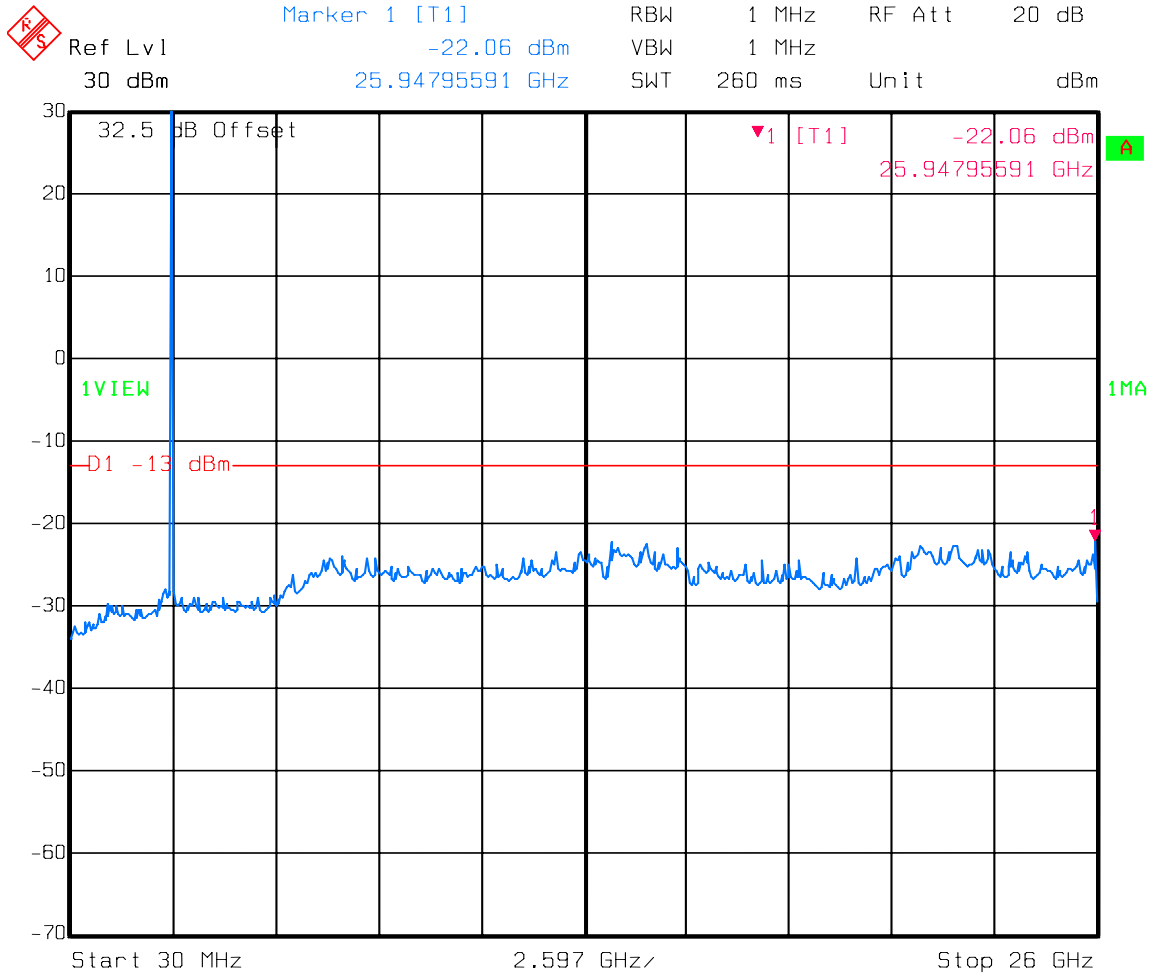


Test Data – Spurious Emissions at Antenna Terminals

Upper band edge 10 MHz



Test Data – Spurious Emissions at Antenna Terminals



Date: 06.JUN.2007 09:39:12

The spectrum was investigated on three channels and on all modulation widths. The noise floor data presented at 6 MHz bandwidth on center channel is representative of all conditions tested.

Section 6. Field Strength of Spurious

NAME OF TEST: Field Strength of Spurious Emissions	PARA. NO.: 2.1053
TESTED BY: David Light	DATE: 06 June 2007

Test Results: Complies.

Measurement Data: No Emissions were detected within 20db of the limit. All emissions within 20 dB of the specification limit are reported per 2.1057(c).

Test Equipment: 1484-1485-993-1016-791-759-1479-1464

The spectrum was searched from 30 MHz to the 10th harmonic of the carrier.

RBW = VBW =1 MHz, Peak detector

Section 7. 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
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	CBU	N/A
1064	ATTENUATOR	NARDA 776B-20	NONE	CBU	N/A
1065	ATTENUATOR	NARDA 776B-10	NONE	CBU	N/A
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
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/24/07	01/24/09
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/01/05	08/02/07
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	05/01/07	04/30/08
791	PREAMP, 25dB	Nemko USA, Inc. LNA25	398	05/01/07	04/30/08
759	ANTENNA, LOG PERIODIC	A.H. SYSTEMS SAS-200/510	556	03/30/07	03/29/08
1479	Bi Conical Antenna 20-330 Mhz	A. H. Systems SAS-200/540	496	07/27/06	07/27/07
Motorola	PSA Series Spectrum Analyzer	Agilent E4440A	US45303133	10/01/07	10/01/08

Nemko USA, Inc.

FCC PART 27, SUBPART M

Broadband Radio Service and Educational Broadband Service

EQUIPMENT: WAP25400-1 MOTOwi4™ Diversity Access Point PROJECT NO.:5117RUS1

ANNEX A - TEST DETAILS

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
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Method Of Measurement:

Antenna Conducted:

The AVG power at antenna terminals is measured using a Spectrum Analyzer or Power Meter. Power output is measured with the maximum rated input level.

E.I.R.P.:

If the antenna is not detachable from the circuit then the Peak Power Output is derived from the peak radiated field strength of the fundamental emission by using the plane wave relation $GP/4\pi R^2 = E^2/120\pi$ and proceeding as follows:

$$P = \frac{E^2 R^2}{30G} = \frac{E^2 3^2}{30G}$$

where,

P = the equivalent isotropic radiated power in watts

E = the maximum measured field strength in V/m

R = the measurement range (3 meters)

G = the numeric gain of the transmit antenna in relation to an isotropic radiator

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
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Method Of Measurement:

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of at least 1% of the bandwidth of the transmitted signal. The resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform.

The appropriate bandwidth mask is applied to the output waveform to verify compliance.

NAME OF TEST: Spurious Emission at Antenna Terminals PARA. NO.: 2.1051

Antenna Conducted:

A portion of the transmitted signal is coupled to a Spectrum Analyzer with a resolution bandwidth of ≥ 1 MHz for emissions above 1 GHz. Below 1 GHz the resolution bandwidth is chosen so as not to reduce the peak level of the measured waveform.

The appropriate limit line is applied to the output waveform to verify compliance.

NAME OF TEST: Field Strength of Spurious Radiation	PARA. NO.: 2.1053
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The antenna substitution method was used to determine the equivalent radiated power at spurious frequencies. The spurious emissions were measured at a distance of 3 meters. The EUT was then replaced with a reference substitution antenna with a known gain referenced to a dipole. This antenna was fed with a signal at the spurious frequency. The level of the signal was adjusted to repeat the previously measured level. The resulting erp is the signal level fed to the reference antenna corrected for gain referenced to a dipole.

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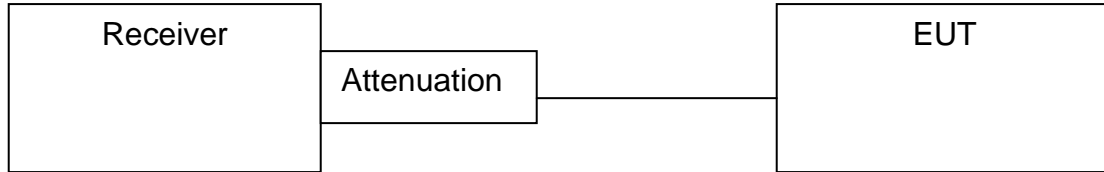
FCC PART 27, SUBPART M

Broadband Radio Service and Educational Broadband Service

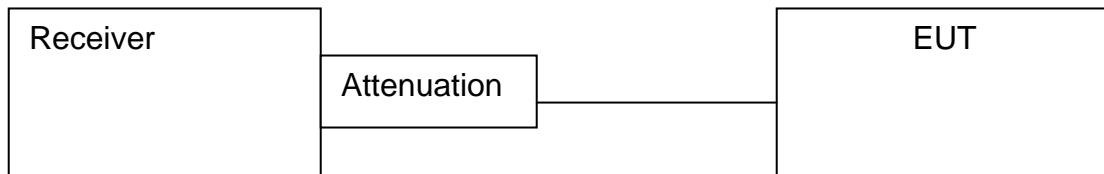
EQUIPMENT: WAP25400-1 MOTOWi4™ Diversity Access Point PROJECT NO.:5117RUS1

ANNEX B - TEST DIAGRAMS

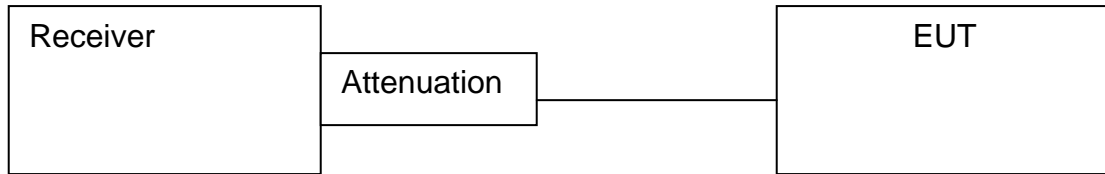
Para. No. 2.1046 - R.F. Power Output



Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Radiation

