



Nemko Test Report: 13366RUS1

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

Equipment Under Test: WAP25450 MOTOwi4™ Diversity Access Point

FCC ID: IHET7JC1

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:

David Light, Senior Wireless Engineer

DATE

:

17 September, 2008

APPROVED BY:

Tom Tidwell, Telecom Direct

DATE

:

22 September, 2008

Total Number of Pages: 32



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Section 1. Summary of Test Results

Manufacturer: Motorola

Model No.: WAP25450 MOTOwi4™ Diversity Access Point

Serial No.: 170Z8N04RY

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

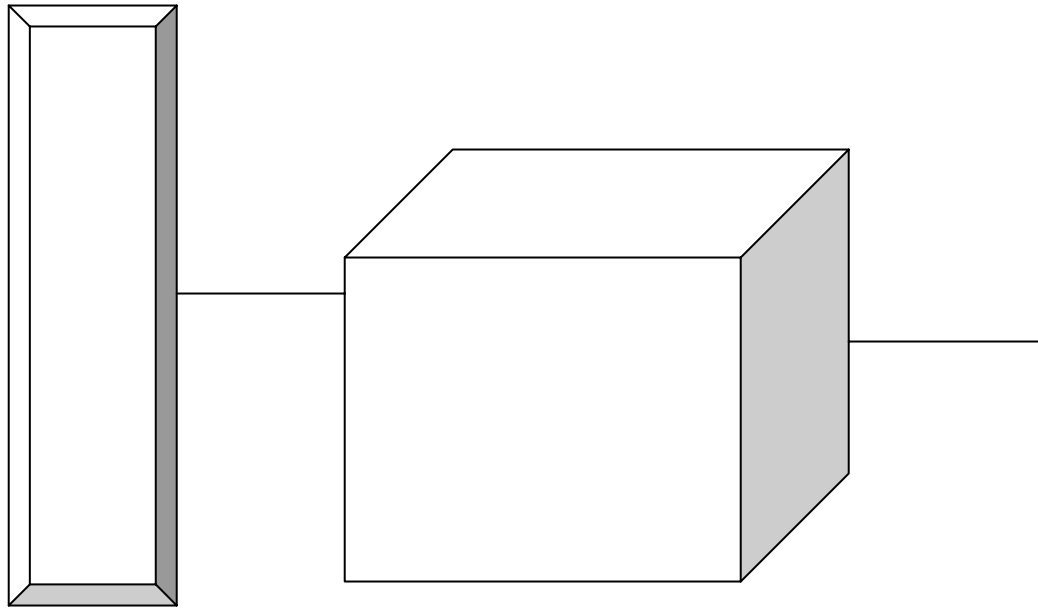
Section 2. General Equipment Specification

Power Supply	27 Vdc										
Frequency Range:	2496 to 2690 MHz										
Operating Frequencies	2498.5 to 2687.5 MHz (5MHz carrier) 2501 to 2685 MHz (10 MHz carrier)										
Type(s) of Modulation:	<table><tr><td>F3E (Voice)</td><td>F1D</td><td>F2D</td><td>W7D (OFDMA)</td><td>F9W</td></tr><tr><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input checked="" type="checkbox"/></td><td><input type="checkbox"/></td></tr></table>	F3E (Voice)	F1D	F2D	W7D (OFDMA)	F9W	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
F3E (Voice)	F1D	F2D	W7D (OFDMA)	F9W							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>							
Emission Designator	5M0W7D and 10M0W7D										
Output Impedance:	50 ohms										
RF Power Output:	37 dBm (5 Watts) Conducted (all carriers)										
Duty Cycle:	75% (max)										

Description of EUT

The WAP25450 MOTOwi4™ Diversity Access Point is a Base station transceiver. The device is used with either a 5 MHz or 10 MHz channel filter, a 20 MHz band-pass filter or a 195 MHz full band filter depending on the customer needs.

System Diagram



Section 3. RF Power Output

NAME OF TEST: RF Power Output	PARA. NO.: 2.1046
TESTED BY: David Light	DATE: 16 September 2008

Test Results: Complies

Measurement Data: See Tables.

Test Equipment: Weinschel 30 dB attenuator model 24-30-43, s/n AV3525
Huber Suhner cable s/n 206757-008
Agilent E4440A Spectrum analyzer

Test Conditions:

Temperature (°C): 22

Relative Humidity(%): 35

MAX RF POWER OUTPUT

Mode	Frequency (MHz)	Average Power (dBm)	Average Power (Watts)
5 MHz	2498.5	37.3	5.37
5 MHz	2597.5	37.2	5.25
5 MHz	2687.5	36.8	4.79
10 MHz	2501.0	37.2	5.25
10 MHz	2595.0	37.3	5.37
10 MHz	2685.0	36.9	4.90

RBW=100 kHz

VBW= 1 MHz

Average detector

Power integrated across the carrier bandwidth

Gated Measurement

Section 4. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 2.1049
TESTED BY: David Light	DATE: 16 September 2008

Test Results: Complies

Measurement Data: See attached plots.

Test Equipment: Weinschel 30 dB attenuator model 24-30-43, s/n AV3525
Huber Suhner cable s/n 206757-008
Nemko Asset #1659

Test Conditions:

Temperature (°C): 22

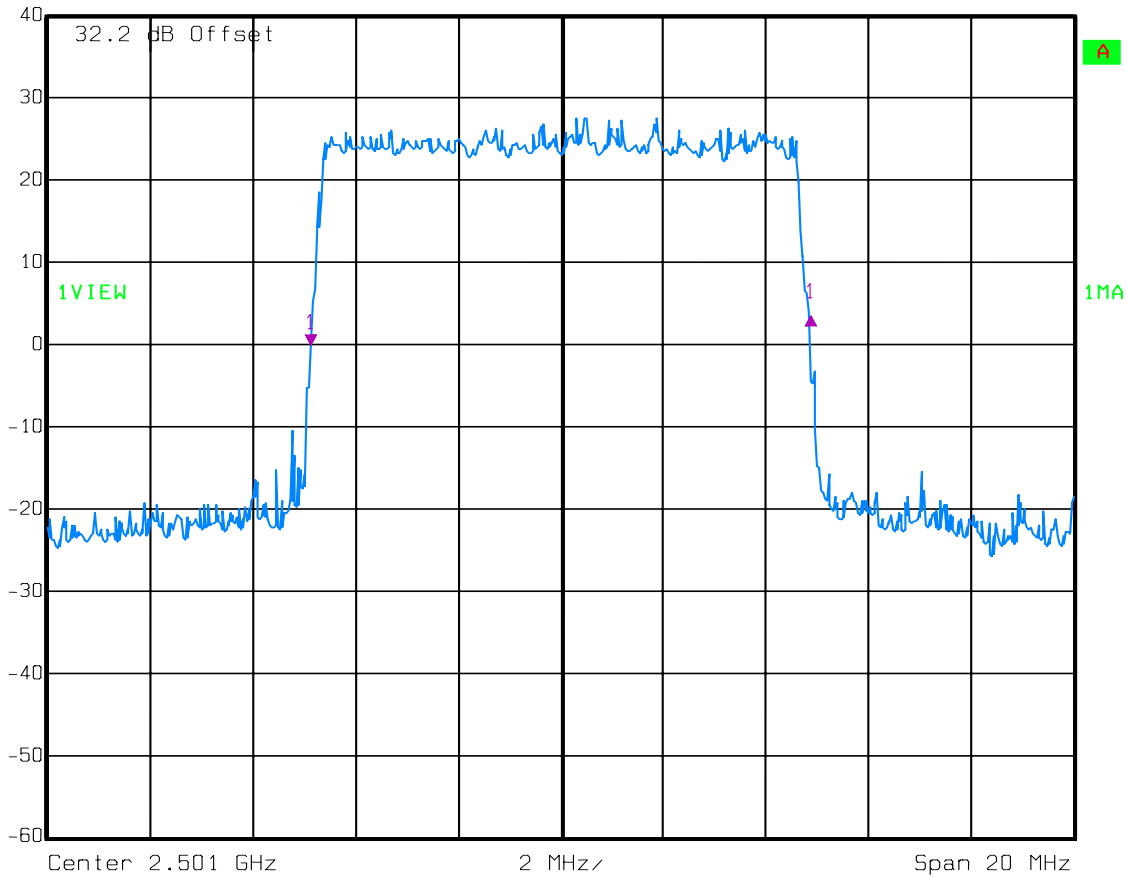
Relative Humidity(%): 35

Test Data – 99% Occupied Bandwidth

Low Channel
10 MHz Carrier



Delta 1 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl 3.59 dB VBW 100 kHz
40 dBm 9.73947896 MHz SWT 5 ms Unit dBm



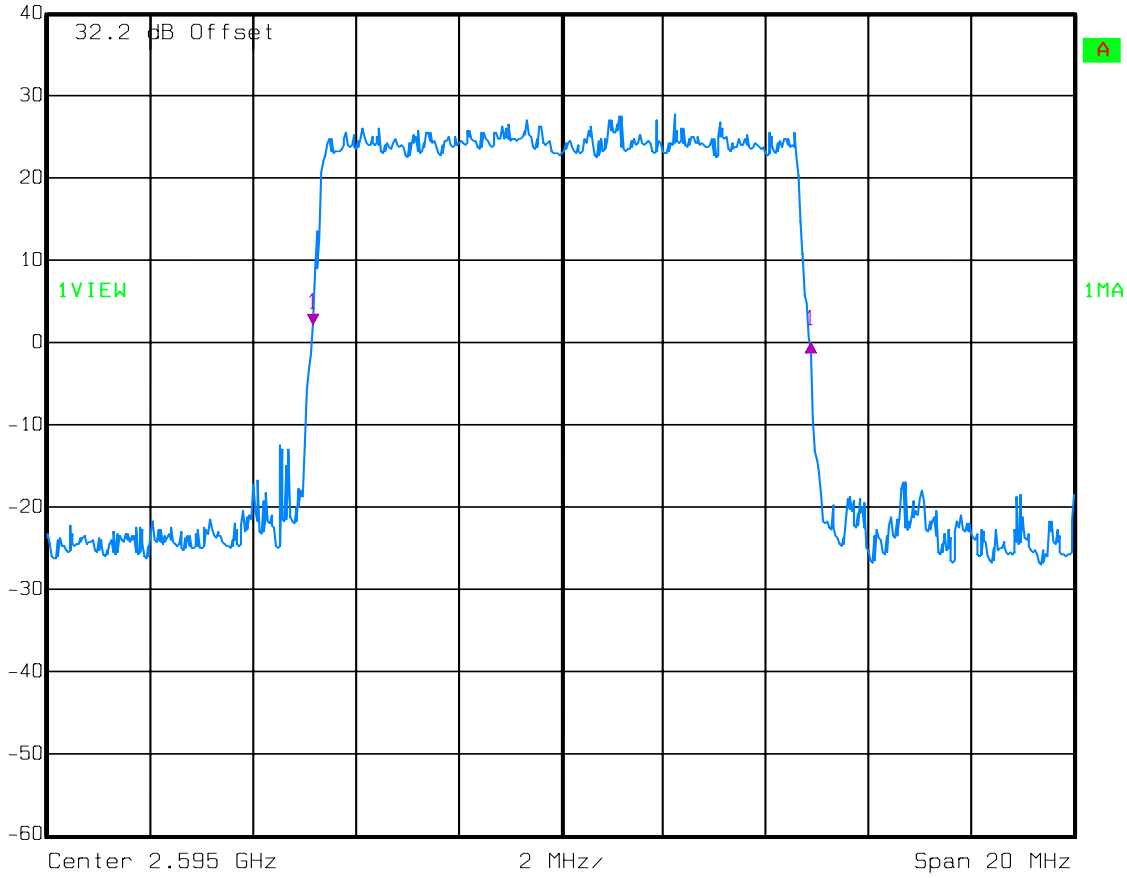
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Test Data – 99% Occupied Bandwidth

Mid Channel
10 MHz Carrier



Delta 1 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl -2.08 dB VBW 100 kHz
40 dBm 9.69939880 MHz SWT 5 ms Unit dBm



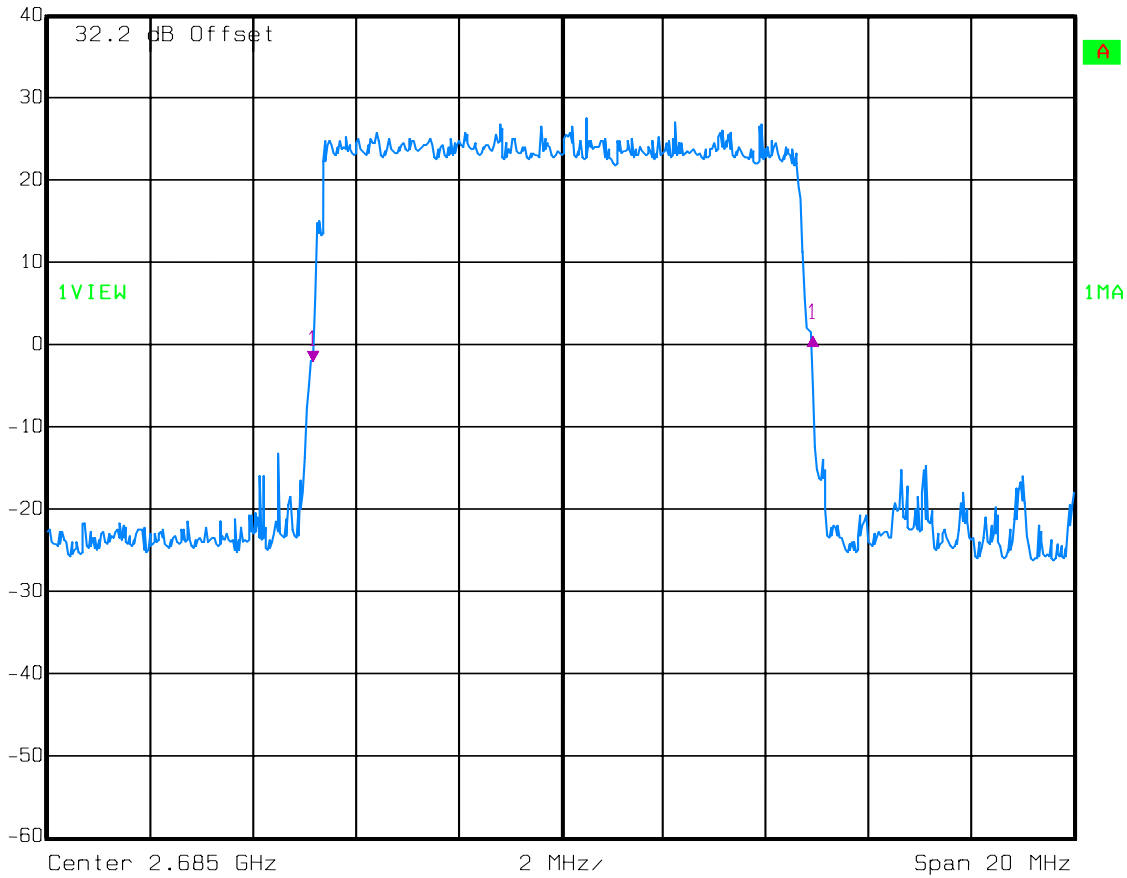
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Test Data – 99% Occupied Bandwidth

High Channel
10 MHz Carrier



Delta 1 [T1] RBW 100 kHz RF Att 30 dB
Ref Lvl 3.19 dB VBW 100 kHz
40 dBm 9.73947896 MHz SWT 5 ms Unit dBm



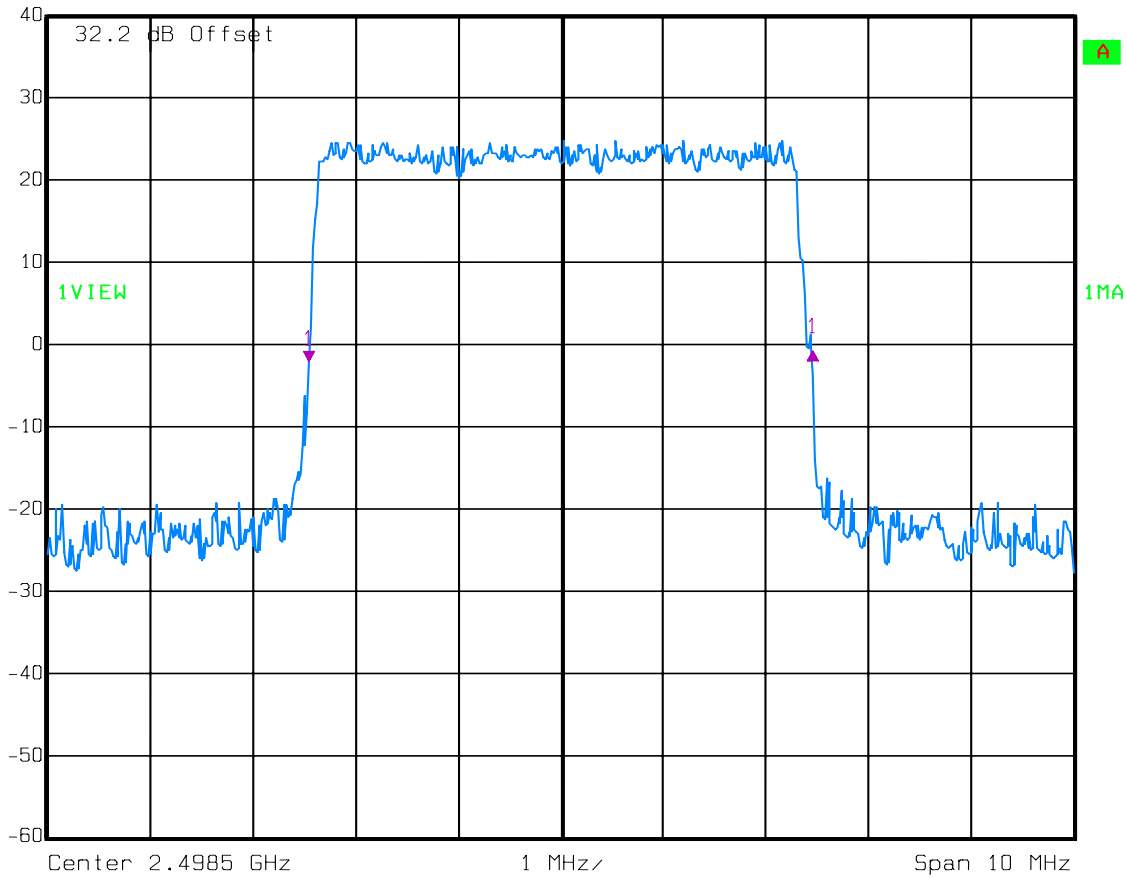
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Test Data – 99% Occupied Bandwidth

Low Channel
5 MHz Carrier



Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl 1.38 dB VBW 50 kHz
40 dBm 4.90981964 MHz SWT 10 ms Unit dBm



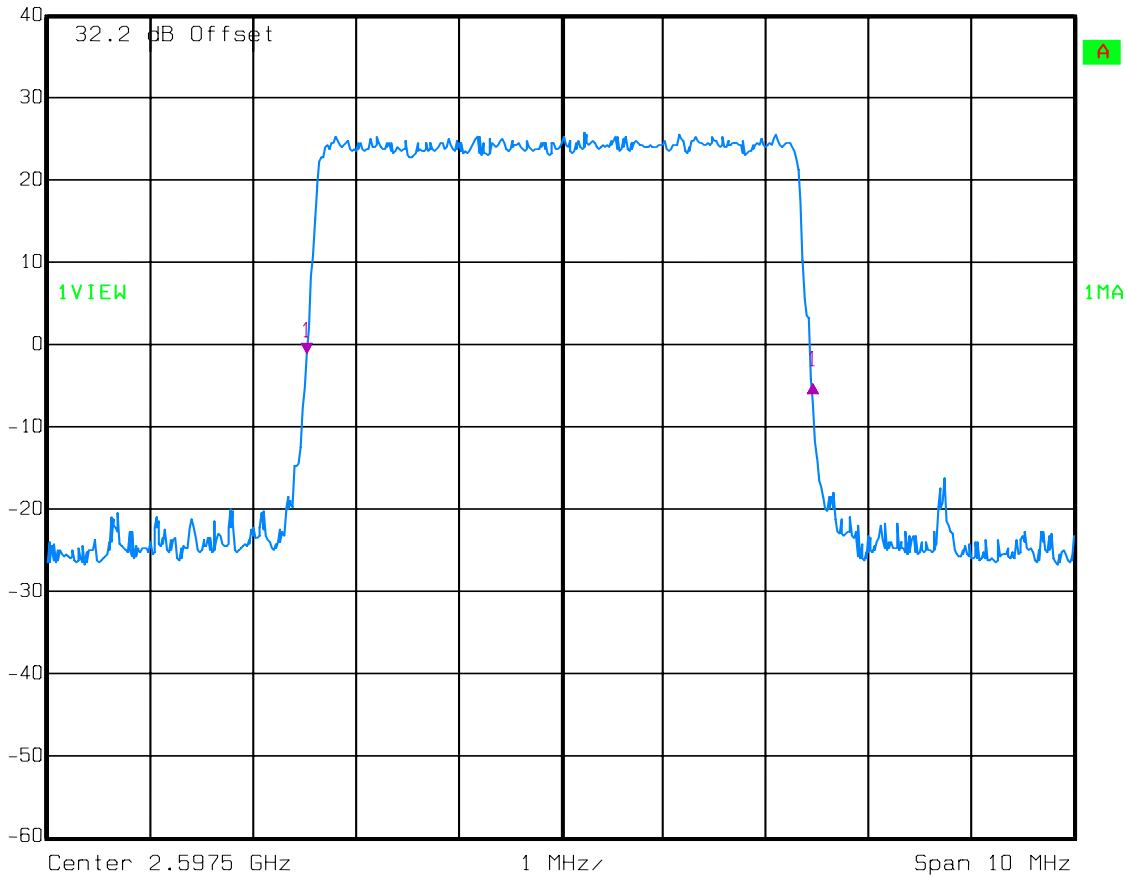
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Test Data – 99% Occupied Bandwidth

Mid Channel
5 MHz Carrier



Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl -3.34 dB VBW 50 kHz
40 dBm 4.92985972 MHz SWT 10 ms Unit dBm



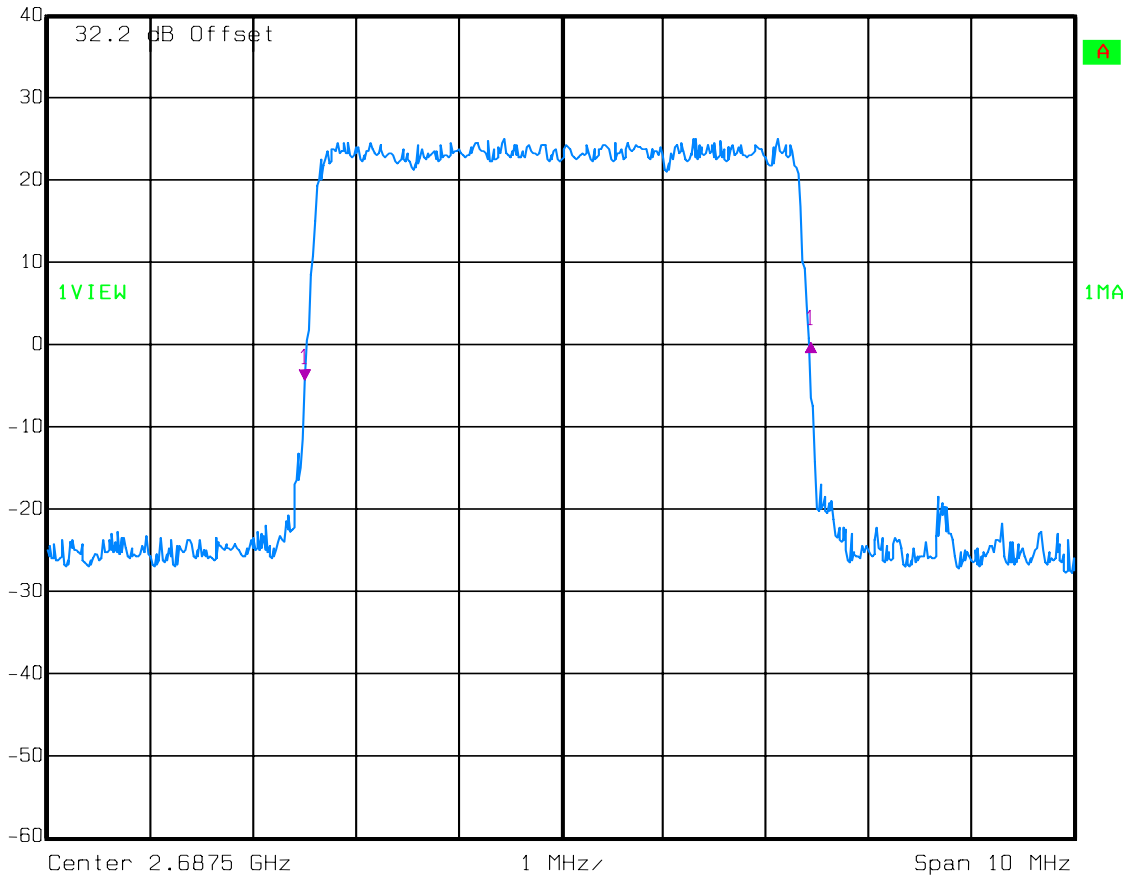
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Test Data – 99% Occupied Bandwidth

High Channel
5 MHz Carrier



Delta 1 [T1] RBW 50 kHz RF Att 30 dB
Ref Lvl 4.74 dB VBW 50 kHz
40 dBm 4.92985972 MHz SWT 10 ms Unit dBm



Date: 16.SEP.2008 09:57:45

Section 5. Conducted Spurious Emissions

NAME OF TEST: Conducted Spurious Emissions	PARA. NO.: 2.1051
TESTED BY: David Light	DATE: 16 September 2008

Test Results: Complies

Measurement Data: See attached plots.

Test Equipment: Weinschel 30 dB attenuator model 24-30-43, s/n AV3525
Huber Suhner cable s/n 206757-008
Agilent E4440A Spectrum analyzer
Nemko Asset #1659

Test Conditions:

Temperature (°C): 22

Relative Humidity(%): 35

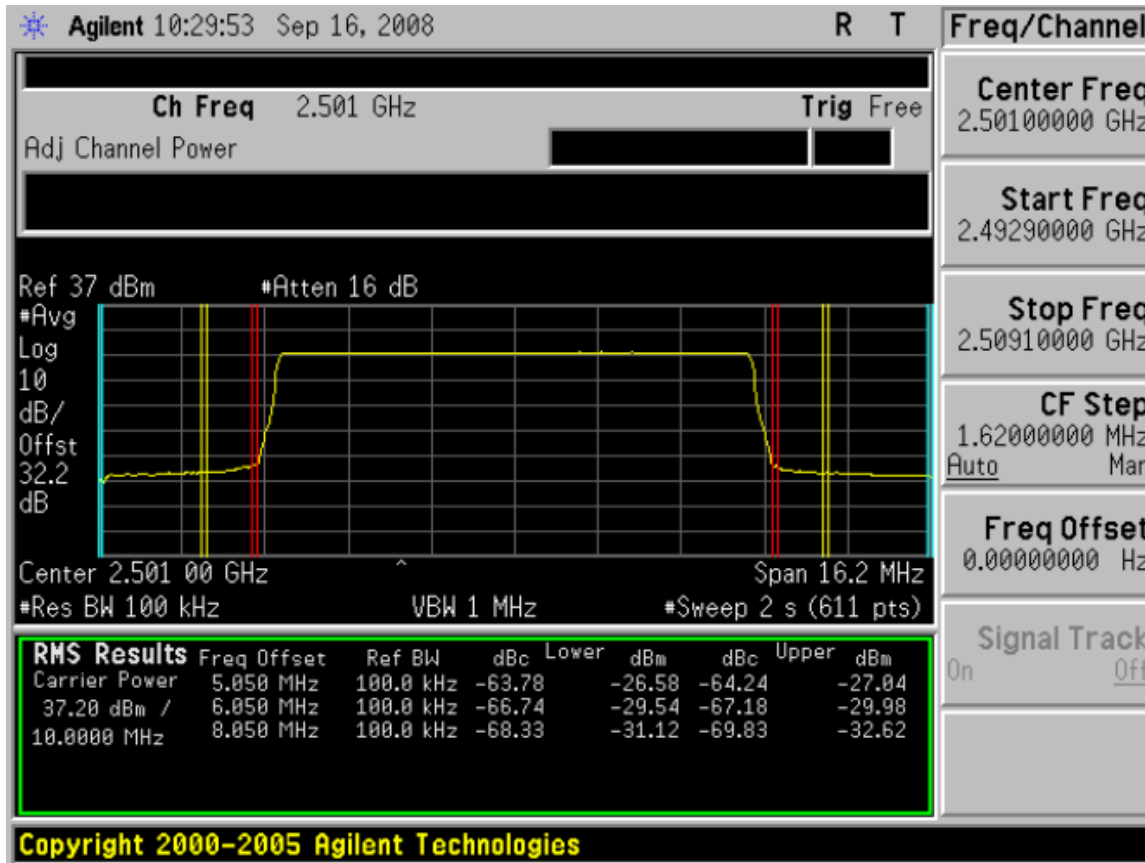
All tests were performed using Motorola full band filter part number 9115188A01
s/n Y4098HZ183

Fc 2592.50 MHz BW 195 MHz

Test Data – Spurious Emissions at Antenna Terminals

Lower Band Edge

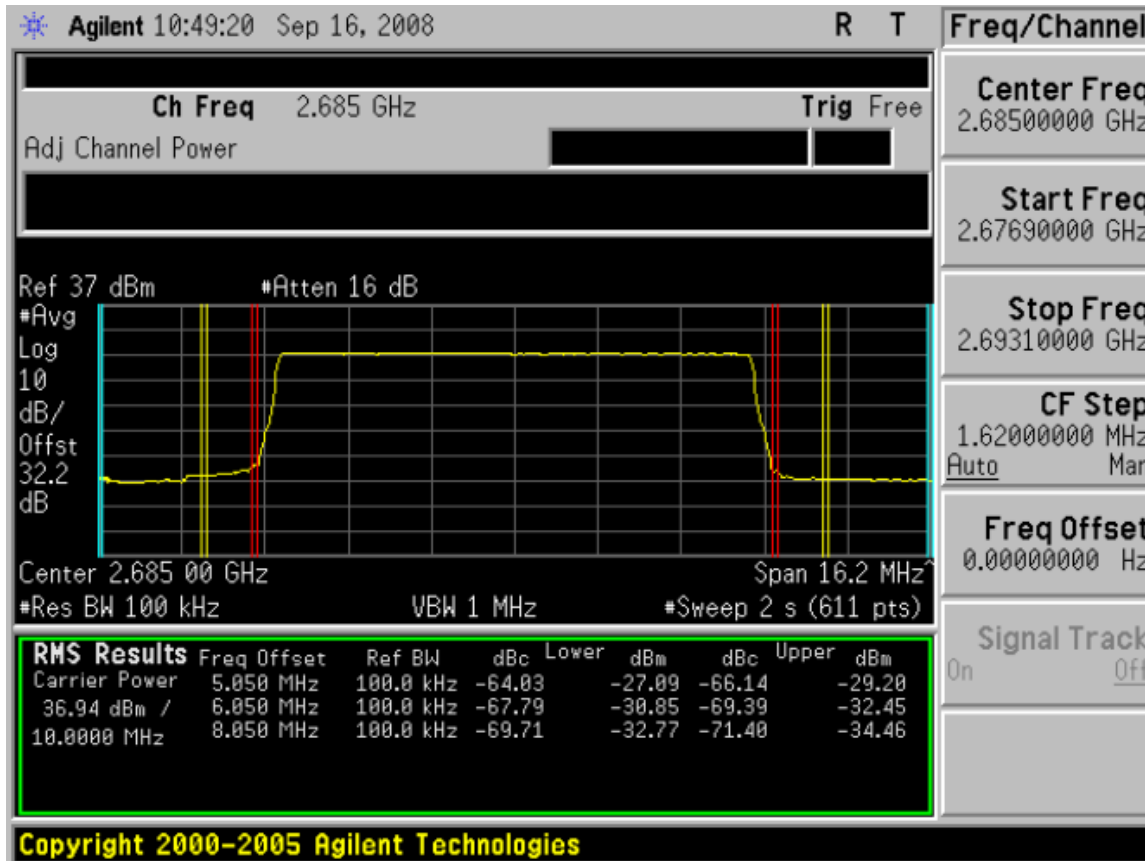
10 MHz Channel



Test Data – Spurious Emissions at Antenna Terminals

Upper Band Edge

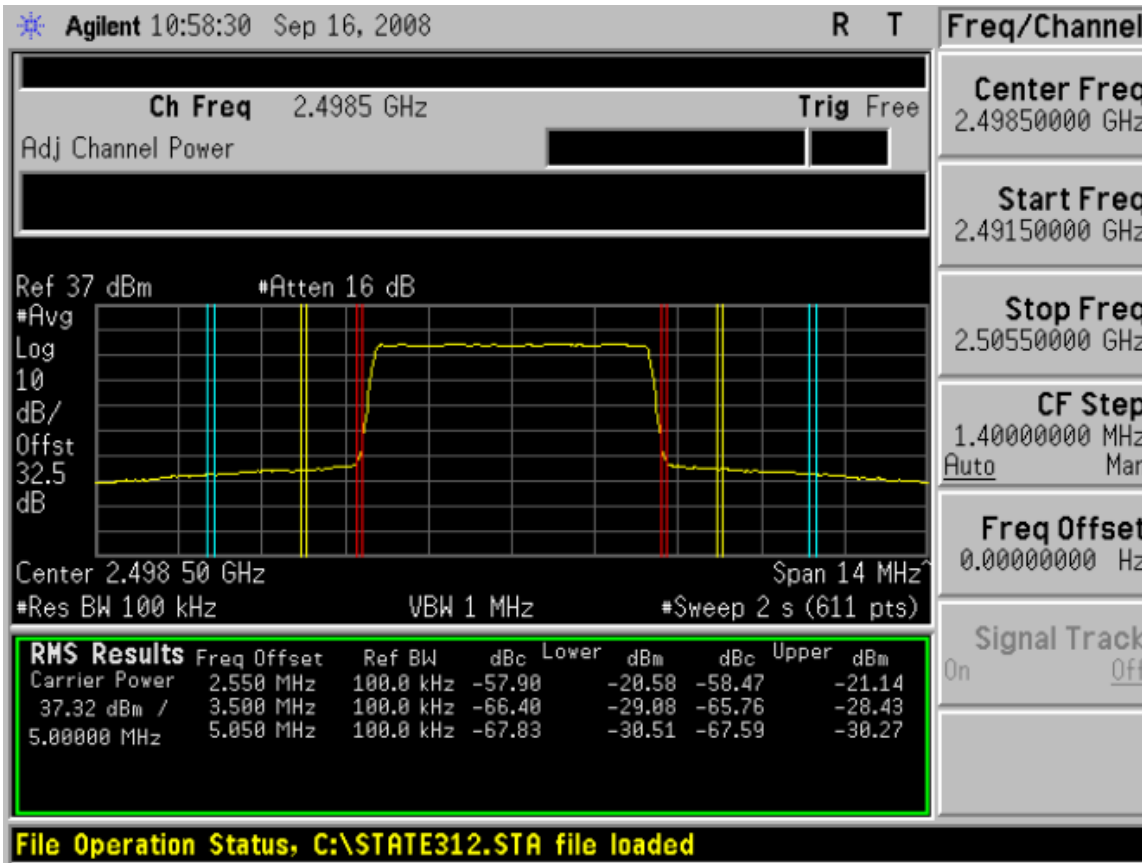
10 MHz Carrier



Test Data – Spurious Emissions at Antenna Terminals

Lower Band Edge

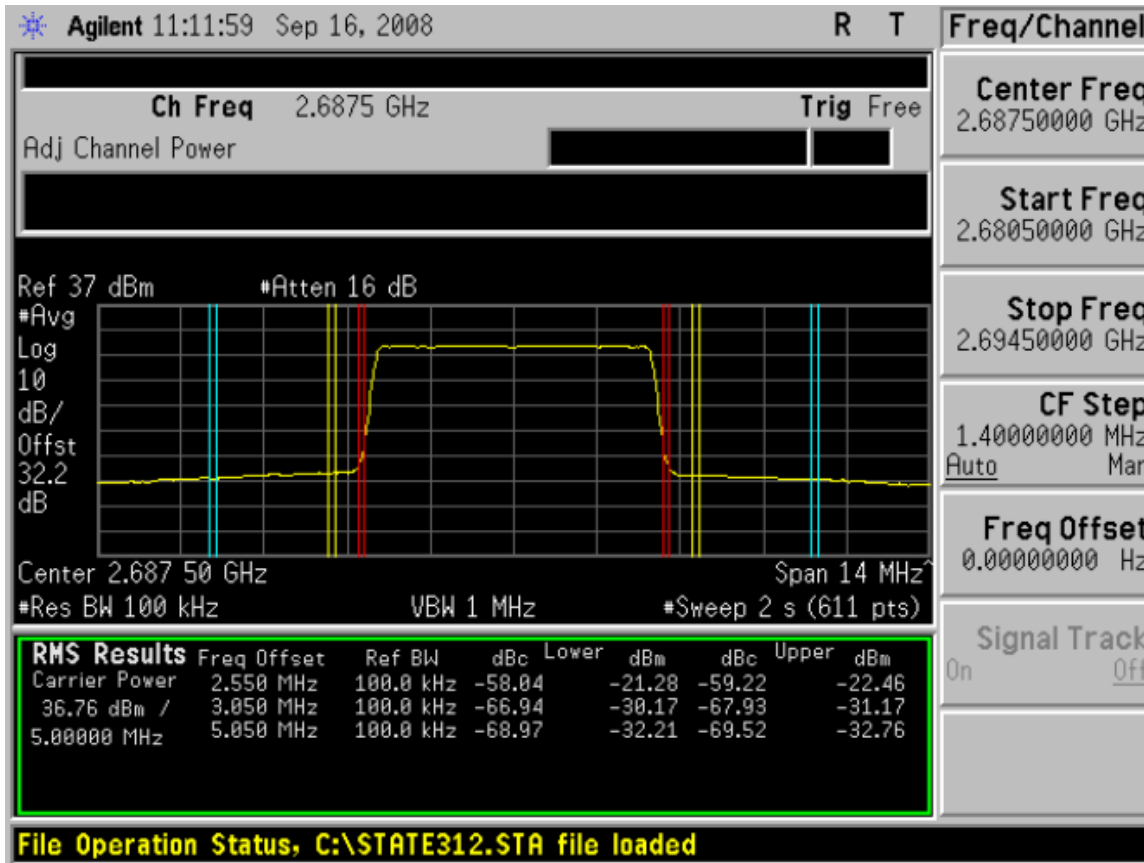
5 MHz Channel



Test Data – Spurious Emissions at Antenna Terminals

Upper Band Edge

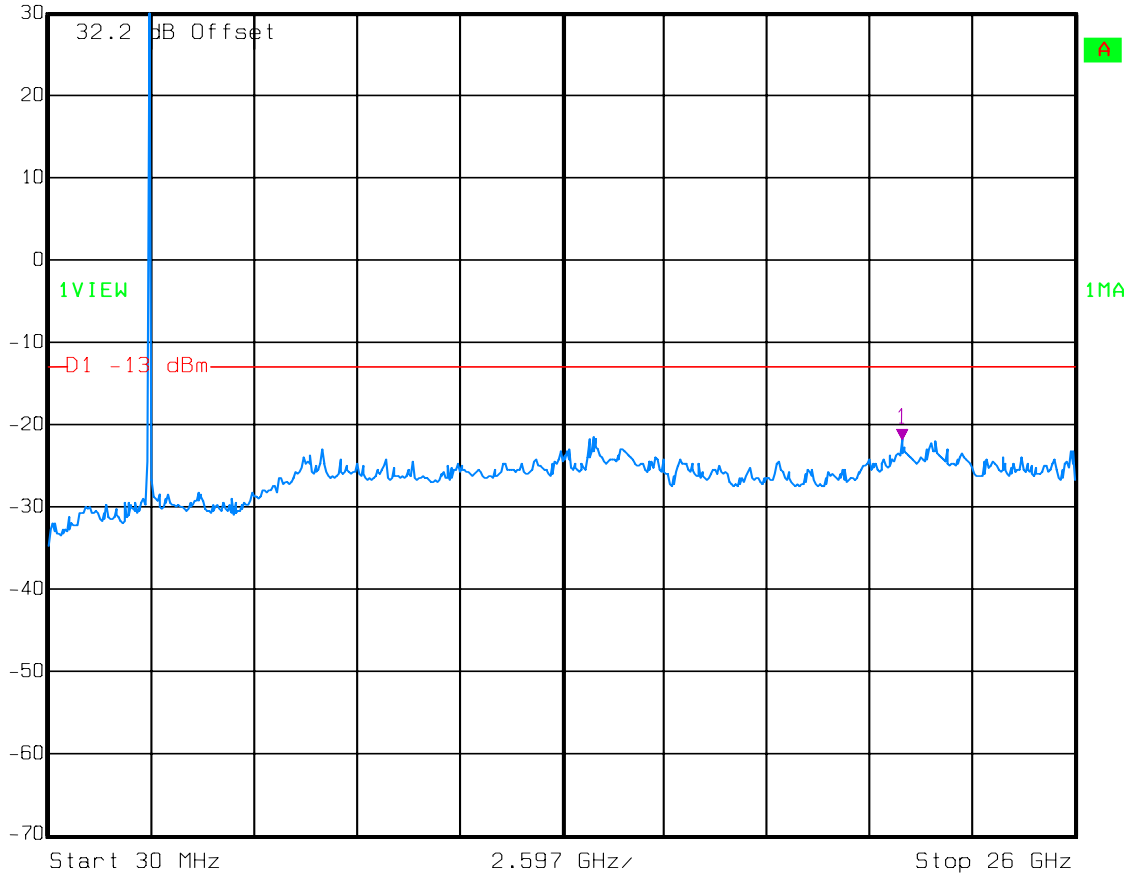
5 MHz Carrier



Test Data – Spurious Emissions at Antenna Terminals

Spurs
Mid Channel
10 MHz Carrier

Marker 1 [T1] RBW 1 MHz RF Att 20 dB
Ref Lvl -21.80 dBm VBW 1 MHz
30 dBm 21.62829659 GHz SWT 260 ms Unit dBm



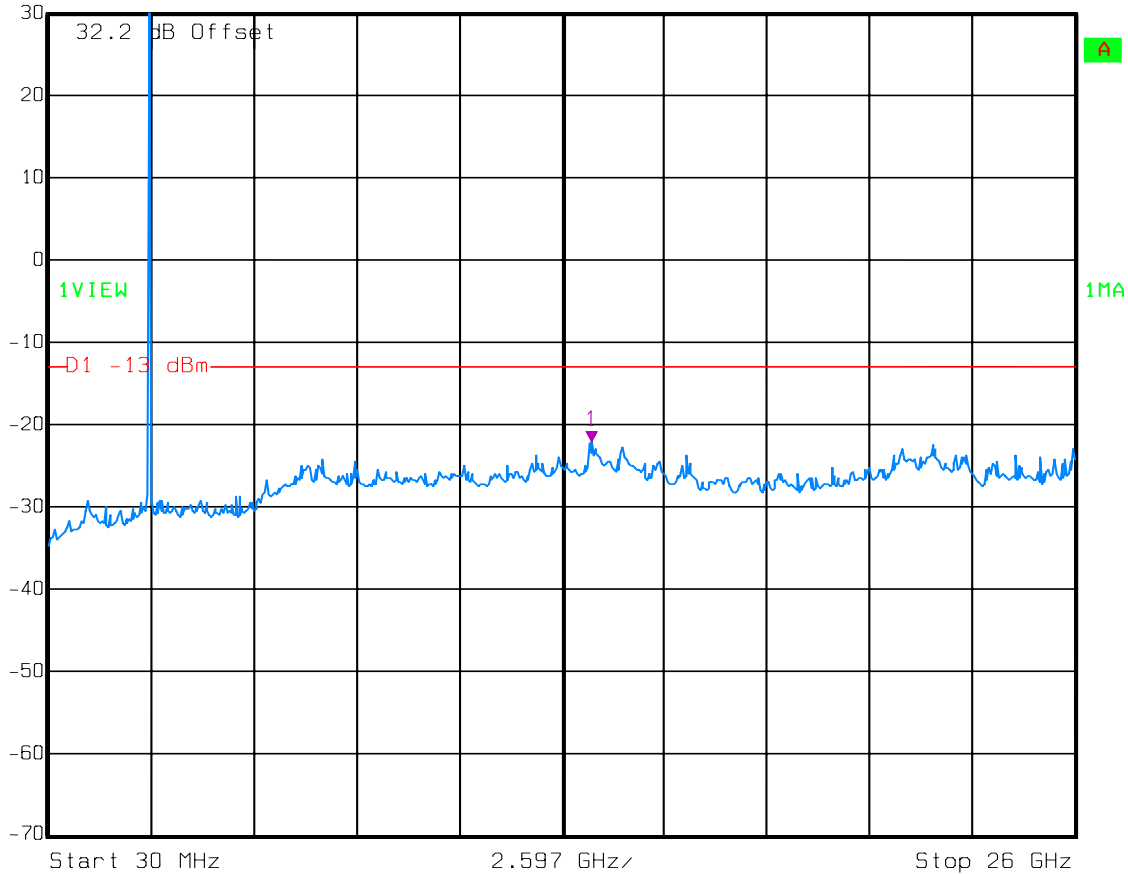
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The spectrum was investigated on three channels. The noise floor data presented at center channel is representative of all conditions tested.

Test Data – Spurious Emissions at Antenna Terminals

Spurs
Mid Channel
5 MHz Carrier

Marker 1 [T1] RBW 1 MHz RF Att 20 dB
Ref Lvl -22.21 dBm VBW 1 MHz
30 dBm 13.76963928 GHz SWT 260 ms Unit dBm



Date: 16.SEP.2008 09:53:36

The spectrum was investigated on three channels. The noise floor data presented at 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: 16 September 2008

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: 1484-1485-993-1016-791-759-801-1464

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
Motorola	Spectrum Analyzer	Agilent E4440A	US45303133	10/01/07	10/01/08
Motorola	30 dB Attenuator	Weinschel 24-30-43	AV3525	CBU	NA
Motorola	Cable	huber-Suhner Sucoflex 104	206757-008	CBU	NA
1659	Spectrum Analyzer	Rhode & Schwarz FSP	973353	01/24/07	01/24/09
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/24/07	01/24/09
1484	Cable	Storm PR90-010-072	N/A	05/07/08	05/07/09
1485	Cable	Storm PR90-010-216	N/A	05/07/08	05/07/09
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	05/07/08	05/07/09
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/31/07	08/30/09
791	PREAMP, 25dB	Nemko USA, Inc. LNA25	398	05/07/08	05/07/09
759	ANTENNA, LOG PERIODIC	A.H. SYSTEMS SAS-200/510	556	05/29/08	05/29/09
801	ANTENNA, BICON	A.H. SYSTEMS SAS-200/542	702	05/30/08	05/30/09

Nemko USA, Inc.

FCC PART 27, SUBPART M

Broadband Radio Service and Educational Broadband Service

EQUIPMENT: WAP25450 MOTOwi4™ Diversity Access Point

PROJECT NO.:13366RUS1

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 with power measurement user function. The spectrum analyzer integrates the power across the channel bandwidth.

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.

Nemko USA, Inc.

FCC PART 27, SUBPART M

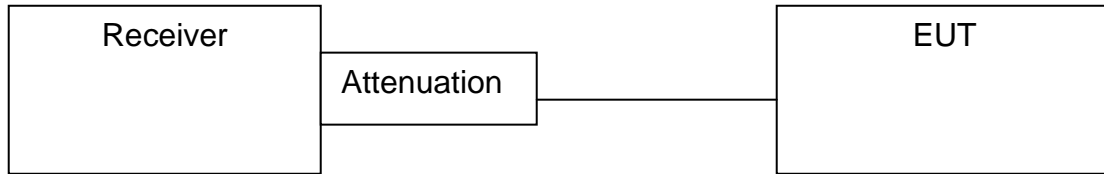
Broadband Radio Service and Educational Broadband Service

EQUIPMENT: WAP25450 MOTOwi4™ Diversity Access Point

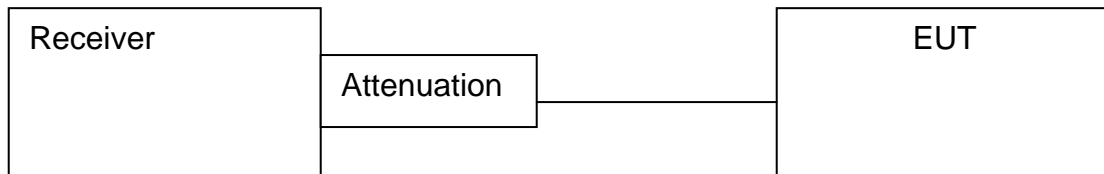
PROJECT NO.:13366RUS1

ANNEX B - TEST DIAGRAMS

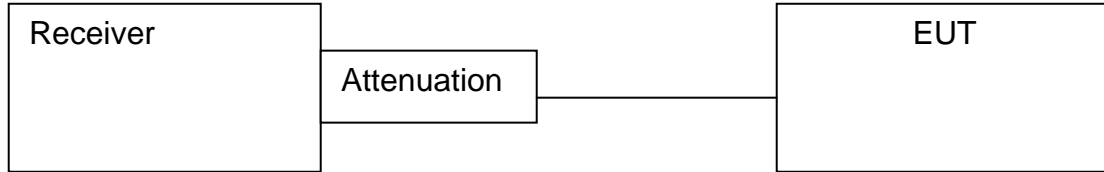
Para. No. 2.1046 - R.F. Power Output



Para. No. 2.1049 - Occupied Bandwidth



Para. No. 2.1051 - Spurious Emissions at Antenna Terminals



Para. No. 2.1053 - Field Strength of Radiation

