



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola, Inc.
Model Tested: 5200AL
Report Number: 13187

FCC Rules and Regulations / Intentional Radiators

Unlicensed National Information Infrastructure Devices

Part 15, Subpart E, Section 15.407

THE FOLLOWING **"MEETS"** THE ABOVE TEST SPECIFICATION

Formal Name: Canopy 5200 with Lense Antenna

Kind of Equipment: Wireless Digital FSK Transceiver

Test Configuration: The Canopy Radio (AP/SM/BH) is connected to a 24V power supply via Ethernet cable. (Tested at 120 vac, 60 Hz)

Model Number(s): 52XXxx

Model(s) Tested: 5200

Serial Number(s): 0A003E037DD7

Date of Tests: April 20, 2007

Test Conducted For: Motorola, Inc.
1299 E. Algonquin Road
Schaumburg, Illinois 60196

NOTICE: "This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Additional Description of Equipment Under Test" page listed inside of this report.

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SIGNATURE PAGE

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EMC-001375-NE

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Motorola, Inc.



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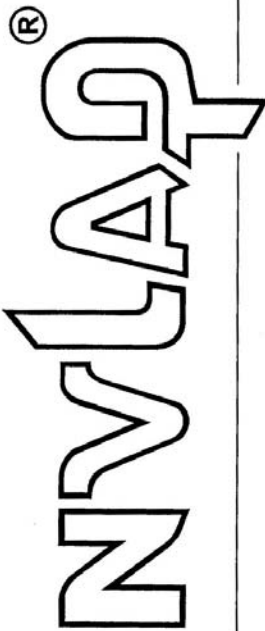
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United States Department of Commerce
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Certificate of Accreditation to ISO/IEC 17025:1999

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
Wheeling, IL

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ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

2006-10-01 through 2007-09-30

Effective dates



Dolly A. Bruce
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2005-05-19)



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1.0 SUMMARY OF TEST REPORT

It was found that the Canopy 5200, Model Number(s) 5200, "**meets**" the radio interference conducted and radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart E, Section 15.407 Unlicensed National Information Infrastructure devices for operational in the 5.250-5.350 GHz Band. See the FCC ID: ABZ89FC3789 report for the conducted emissions test data.

2.0 INTRODUCTION

On April 17, 2007, a series of radio frequency interference measurements was performed on Canopy 5200, Model Number(s) 5200, Serial Number: 0A003E037DD7. The tests were performed according to the procedures of the FCC as stated in the "Methods of Measurement of Radio-Noise Emissions for Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz" found in the American National Standards Institute, ANSI C63.4-2003. Tests were performed by personnel of D.L.S. Electronic Systems, Inc. who are responsible to Donald L. Sweeney, Senior EMC Engineer.

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

3.0 OBJECT

The purpose of this series of tests was to determine if the test sample could meet the radio frequency interference emission requirements of the FCC "Rules and Regulations", Part 15, Subpart E, Sections 15.407 (a-2), 15.407 (b-3), (b-5), (b-6), (b-7) & (b-8) for Unlicensed National Information Infrastructure Devices operating in the Band 5.250-5.350 GHz.



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4.0 TEST SET-UP

All emission tests were performed at D.L.S. Electronic Systems, Inc. and set up according to the American National Standards Institute, ANSI C63.4-2003, Section 8, (Figures 11a and 11b). The conducted tests were performed with the test item placed on a non-conductive table (table top equipment), located in the test room. Equipment normally operated on the floor was tested by placing it on the metal ground plane. The ground plane has an electrical isolation layer over its surface approximately 7mm thick. The power line supplied was connected to a dual line impedance stabilization network electrically bonded to the ground plane, located on the floor. The networks were constructed per the requirements of the American National Standards Institute, ANSI C63.4-2003, Section 4, (Figure 2).

All radiated emissions tests were performed with the test item placed on a 80 cm high rotating non-conductive table, located in the test room. Equipment normally operated on the floor was placed on a metal covered turntable which is flush with the surrounding conducting ground plane. The ground plane has an electrical isolation layer over its surface approximately 7 mm thick. The EUT is separated from the turntable ground plane by a non-conductive layer. The equipment under test was set up according to ANSI C63.4-2003, Sections 6 and 8.

5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the HP Spectrum Analyzer or ESI 26/40 Fixed Tuned Receiver. The data was taken using Peak, Quasi-Peak or the Average Detector Functions as required. This information was then used to determine the frequencies of maximum emissions. Above 1000 MHz, final data was taken using the Average Detector.

Below 1000 MHz, final data was taken using the HP Spectrum Analyzer and/or ESI 26/40 Fixed Tuned Receiver. These plots were made using the Peak or Quasi-Peak Detector functions, with manual measurements performed on the questionable frequencies using the Quasi-Peak or the Average Detector Function of the Analyzer or ESI 26/40 Fixed Tuned Receiver as required. Above 1000 MHz, final data was taken using the Average Detector on the Spectrum Analyzer.

The bandwidths shown below are specified by ANSI C63.4-2003, Section 4.2.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

A list of the equipment used can be found in Table 1. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.



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6.0 AMBIENT MEASUREMENTS

For emissions measurements, broadband antennas and an EMI Test Receiver with a panoramic spectrum display are used. First the frequency range is scanned and displayed on the test receiver display. Next the scanned frequency range is divided into smaller ranges, and then it is manually tuned through to determine the emissions from the EUT. A headset or loudspeaker is connected to the test receiver's AM/FM demodulated output as an aid in detecting ambient signals and finding frequencies of significant emission from the EUT. If there is any doubt as to the source of the emission, it is further investigated by rotating the EUT, or by disconnecting the power from the EUT.

The EUT is set up in its typical configuration and operated in its various modes. For tabletop systems, cables are manipulated within the range of likely configurations. For floor-standing equipment, the cables are located in the same manner as the user would install them and no further manipulation is made. If the manner of cable installation is not known, or if it changes with each installation, cables or wires for floor-standing equipment shall be manipulated to the extent possible to produce the maximum level of emissions. For each mode of operation, the frequency spectrum is monitored. Variations in antenna height, antenna polarization, EUT azimuth, and cable or wire placement (each variable within bounds specified elsewhere) are explored to produce the emissions that have the highest amplitude relative to the limit. These methods are performed to the specifications in MP-5 or ANSI C63.4-2003, as appropriate.



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7.0 DESCRIPTION OF TEST SAMPLE: (See also Paragraph 8.0)

7.1 Description:

The Canopy 5200 Advanced Logic Wireless Digital FSK Radio is designed for use in the 5.2GHz Band (5250MHz-5350MHz) with 3 separate 20MHz channels. The radio works in conjunction with a 24vDC power supply. It has DFS capability. Canopy is a point to multi-point wireless Ethernet distribution system. The back hauls (BH) are point to point links used for connecting multi-point access points (AP) to wired Ethernet feeds (Internet Service Providers points of presence, ISP POP).

7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 2.75" x Width: 8" x Height: 0.6" x

7.3 LINE FILTER USED:

NA

7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

150 kHz, 132 kHz

Clock Frequencies:

20 MHz, 25 MHz, 40 MHz, 80 MHz and 160 MHz

7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

1. Radio

PN: 84-71276n02 iss.P1

2. Power Supply

PN: ACPSSW-02 ~~02~~ ⁷

3. Lense Antenna

PN: AN500



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8.0 ADDITIONAL DESCRIPTION OF TEST SAMPLE:
(See also Paragraph 7.0)

1: There were no additional descriptions noted at the time of test.

I certify that the above, as described in paragraph 7.0, describes the equipment tested and will be manufactured as stated.

By: _____
Signature Title

For: _____
Company Date



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9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 Canopy 5200

Model Number: 5200 Serial Number: 0A003E037DD7

Lense Antenna

PN: AN500

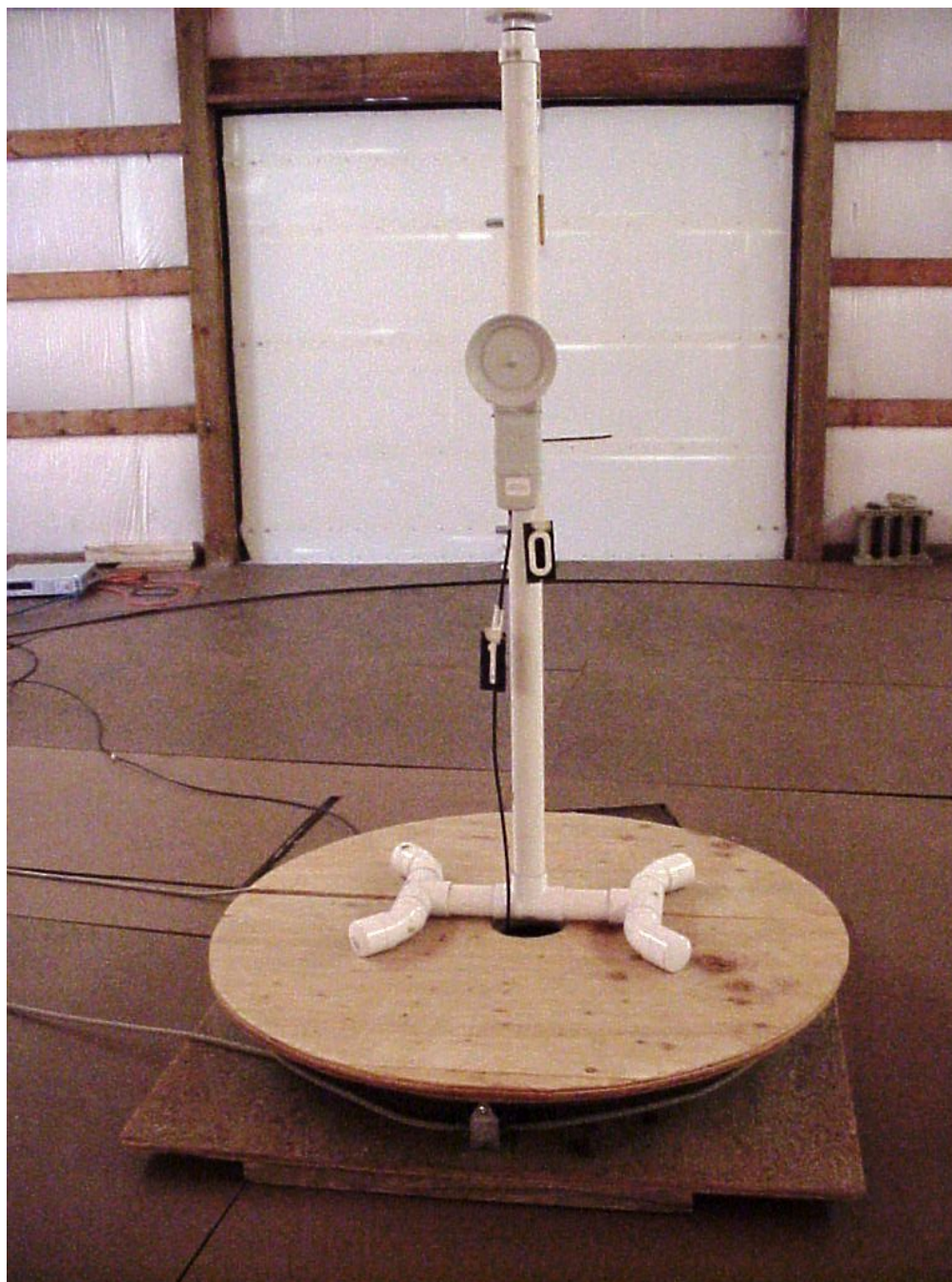
Item 1 Shielded CAT 5 Ethernet Cable with Metal Shells. 100'



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10.0 RADIATED PHOTOS TAKEN DURING TESTING

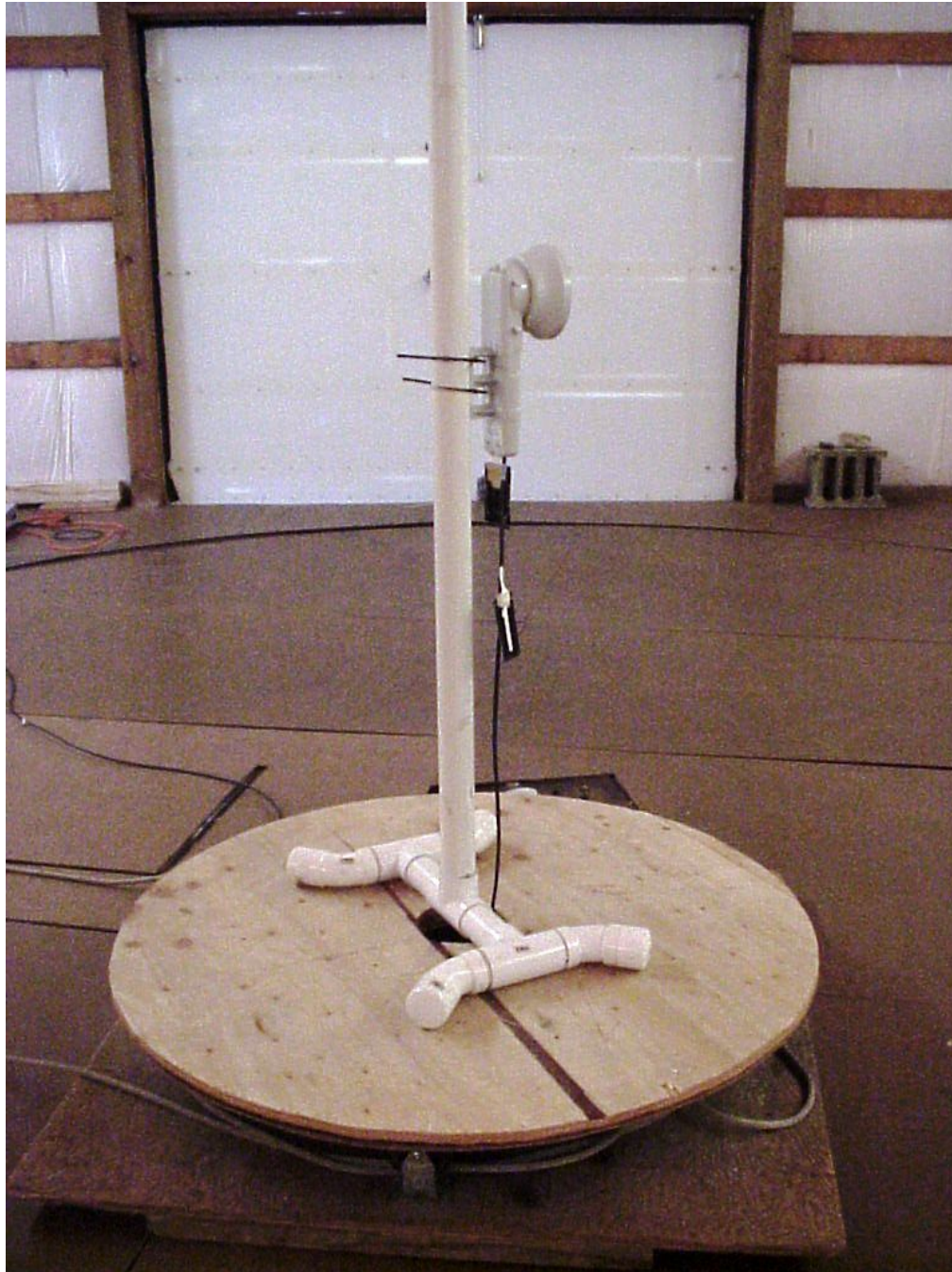




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10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)





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10.0 RESULTS OF TESTS

The radio interference emission charts results can be seen on the pages at the end of this report. Data sheets indicating the test measurements taken during testing can also be found at the end of this report. Points on the emission charts shown with a yellow mark are background frequencies that were verified during testing.

11.0 CONCLUSION

It was found that the Canopy 5200, Model Number(s) 5200 "meets" the radio interference radiated emission requirements of the FCC "Rules and Regulations", Part 15, Subpart E, Section 15.407 Unlicensed National Information Infrastructure devices for operational in the 5.250-5.350 GHz Band. See the FCC ID: ABZ89FC3789 report for the conducted emissions test data.



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TABLE 1 – EQUIPMENT LIST 

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	11/07
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	12/07
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	12/07
Antenna	EMCO	3104C	00054891	20 MHz – 200 MHz	2/07
Antenna	Electrometrics	LPA-25	1114	200 MHz – 1 GHz	3/07
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3/07
Antenna	Electrometrics	3146	1205	200 MHz – 1 GHz	3/07
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	2/07
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	3/07
Antenna	EMCO	3115	2479	1 GHz – 18 GHz	8/07
Antenna	EMCO	3115	99035731	1 GHz – 18 GHz	4/07
Antenna	Rohde & Schwarz	HUF-Z1	829381001	20 MHz – 1 GHz	2/07
Antenna	Rohde & Schwarz	HUF-Z1	829381005	20 MHz – 1 GHz	8/07

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.



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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
LISN	Solar	8012-50-R-24-BNC	8305116	10 MHz – 30 MHz	8/07
LISN	Solar	8012-50-R-24-BNC	814548	10 MHz – 30 MHz	8/07
LISN	Solar	9252-50-R-24-BNC	961019	10 MHz – 30 MHz	12/07
LISN	Solar	9252-50-R-24-BNC	971612	10 MHz – 30 MHz	10/07
LISN	Solar	9252-50-R-24-BNC	92710620	10 MHz – 30 MHz	7/07

All primary equipment is calibrated against known reference standards with a verified traceable path to NIST.



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APPENDIX A

TEST PROCEDURE

Part 15, Subpart E, Section 15.407 a(2), b(3), b(5), b(6),
b(7) & b(8)

OPERATION WITHIN THE BAND 5470-5725 MHz



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DATA AND GRAPH(S) TAKEN SHOWING THE
RESTRICTED BAND COMPLIANCE

PART 15.407 b(7)



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Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance – 1 GHz to 18 GHz

Tested at a 1 Meter Distance – 18 GHz to 40 GHz

EUT: Canopy 5200
Manufacturer: Motorola
Operating Condition: 70 deg F; 30% R.H.
Test Site: Site 2
Operator: Craig Brandt
Test Specification: FCC Part 15 Subpart E; FCC Part 15.205
Comment: Continuous Transmit
Date: 04/17/2007

Notes: All other restricted band emissions at least 20 dB under the limit.

Channel: Low (5275 MHz)

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant. Height (m)	EUT Angle (deg)	Comment
15.825	Average	Vert	45.10	37.91	-33.7	49.3	---	49.3	54	4.7	1.10	0	Res. Band
15.825	Max Peak	Vert	52.73	37.91	-33.7	56.9	---	56.9	74	17.1	1.10	0	Res. Band
15.825	Average	Horz	40.19	37.91	-33.7	44.4	---	44.4	54	9.6	1.10	0	Res. Band
15.825	Max Peak	Horz	50.58	37.91	-33.7	54.8	---	54.8	74	19.2	1.10	0	Res. Band
21.100	Average	Vert	NF										
21.100	Max Peak	Vert	NF										
21.100	Average	Horz	NF										
21.100	Max Peak	Horz	NF										
31.650	Average	Vert	54.98	47.42	-46.3	57.1	---	57.1	64	6.9	1.30	0	Res. Band
31.650	Max Peak	Vert	62.83	47.42	-46.3	64.0	---	64.0	84	10.0	1.30	0	Res. Band
31.650	Average	Horz	54.18	47.42	-46.3	55.3	---	55.3	64	8.7	1.10	0	Res. Band
31.650	Max Peak	Horz	66.76	47.42	-46.3	67.9	---	67.9	84	16.1	1.10	0	Res. Band



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Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance – 1 GHz to 18 GHz

Tested at a 1 Meter Distance – 18 GHz to 40 GHz

EUT: Canopy 5200
Manufacturer: Motorola
Operating Condition: 70 deg F; 30% R.H.
Test Site: Site 2
Operator: Craig Brandt
Test Specification: FCC Part 15 Subpart E; FCC Part 15.205
Comment: Continuous Transmit
Date: 04/17/2007

Notes: All other restricted band emissions at least 20 dB under the limit.

Channel: Mid (5300 MHz)

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant. Height (m)	EUT Angle (deg)	Comment
10.600	Average	Vert	39.05	38.38	-32.7	44.7	---	44.7	54	9.3	1.00	225	Res. Band
10.600	Max Peak	Vert	49.36	38.38	-32.7	55.0	---	55.0	74	19.0	1.00	225	Res. Band
10.600	Average	Horz	38.83	38.38	-32.7	44.5	---	44.5	54	9.5	1.20	0	Res. Band
10.600	Max Peak	Horz	49.21	38.38	-32.7	54.9	---	54.9	74	19.1	1.20	0	Res. Band
15.900	Average	Vert	42.50	37.86	-34.1	46.3	---	46.3	54	7.7	1.00	0	Res. Band
15.900	Max Peak	Vert	52.16	37.86	-34.1	56.0	---	56.0	74	18.0	1.00	0	Res. Band
15.900	Average	Horz	40.46	37.86	-34.1	44.3	---	44.3	54	9.7	1.00	0	Res. Band
15.900	Max Peak	Horz	50.71	37.86	-34.1	54.5	---	54.5	74	19.5	1.00	0	Res. Band
21.200	Average	Vert	NF										
21.200	Max Peak	Vert	NF										
21.200	Average	Horz	NF										
21.200	Max Peak	Horz	NF										
31.800	Average	Vert	55.09	47.54	-46.2	56.4	---	56.4	64	7.6	1.00	0	Res. Band
31.800	Max Peak	Vert	66.67	47.54	-46.2	68.0	---	68.0	84	16.0	1.00	0	Res. Band
31.800	Average	Horz	53.77	47.54	-46.2	55.1	---	55.1	64	8.9	1.00	340	Res. Band
31.800	Max Peak	Horz	65.68	47.54	-46.2	67.0	---	67.0	84	17.0	1.00	340	Res. Band



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Radiated Spurious Emissions in Restricted Bands

Tested at a 3 Meter Distance – 1 GHz to 18 GHz

Tested at a 1 Meter Distance – 18 GHz to 40 GHz

EUT: Canopy 5200
Manufacturer: Motorola
Operating Condition: 70 deg F; 30% R.H.
Test Site: Site 2
Operator: Craig Brandt
Test Specification: FCC Part 15 Subpart E; FCC Part 15.205
Comment: Continuous Transmit
Date: 04/17/2007

Notes: All other restricted band emissions at least 20 dB under the limit.

Channel: High (5325 MHz)

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Ant. Height (m)	EUT Angle (deg)	Comment
10.650	Average	Vert	37.97	38.37	-32.7	43.7	---	43.7	54	10.3	1.00	20	Res. Band
10.650	Max Peak	Vert	48.41	38.37	-32.7	54.1	---	54.1	74	19.9	1.00	20	Res. Band
10.650	Average	Horz	40.03	38.37	-32.7	45.7	---	45.7	54	8.3	1.10	0	Res. Band
10.650	Max Peak	Horz	49.79	38.37	-32.7	55.5	---	55.5	74	18.5	1.10	0	Res. Band
15.975	Average	Vert	41.61	37.82	-34.4	45.0	---	45.0	54	9.0	1.00	0	Res. Band
15.975	Max Peak	Vert	52.02	37.82	-34.4	55.4	---	55.4	74	18.6	1.00	0	Res. Band
15.975	Average	Horz	41.57	37.82	-34.4	45.0	---	45.0	54	9.0	1.30	270	Res. Band
15.975	Max Peak	Horz	52.16	37.82	-34.4	55.6	---	55.6	74	18.4	1.30	270	Res. Band
21.300	Average	Vert	NF										
21.300	Max Peak	Vert	NF										
21.300	Average	Horz	NF										
21.300	Max Peak	Horz	NF										



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APPENDIX A

4.0 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION MEASUREMENTS (SECTIONS 15.407 a (2) and b(6))

The radiated measurements made at D.L.S. Electronic Systems, Inc., for the Canopy 5200, Model Number: 5200, are shown in tabulated and graph form. Preliminary radiation measurements were performed at a 3 meter test distance with the limits adjusted linearly when required. The frequency range from 30 MHz to over 960 MHz, depending upon the fundamental frequency as stated in Part 15.33a, was automatically scanned and plotted at various angles.

Measurements for the Canopy 5200 were made up to 40000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 5325 MHz. For intentional radiators, the frequency range to be investigated is determined by the lowest radio frequency generated by the device without going below 30 MHz, up to at least the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. At those frequencies where significant signals were detected, measurements were made over the entire frequency range specified in FCC Part 15, Subpart C, Section 15.407 at the open field test site, located at Genoa City, Wisconsin, FCC file number **31040/SIT**. When required, levels were extrapolated from 10 meters to 3 meters using a linear extrapolation.

All signals in the frequency range of 30 MHz to 2000 MHz were measured with a Biconical Antenna or tuned dipoles and from 200 MHz to 1000 MHz, a Log Periodic or Tuned Dipoles were used. From 1000 MHz to 40 GHz Horn Antennas were used. During the test the equipment was rotated and the antenna was raised and lowered from 1 meter to 4 meters to find the maximum level of emissions. In order to find maximum emissions, the cables were moved through all the positions the equipment would be expected to experience in the field. The EUT, peripheral equipment and cables were configured to meet the conditions in ANSI C63.4-2003, Clauses 6 & 8. Tests were made with the receive antenna(s) in both the horizontal and vertical planes of polarization. In each case, the table was rotated to find the maximum emissions.



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4.0 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION MEASUREMENTS (CON'T)

For operation in the bands 5470-5725 MHz the field strength of any emissions within this band shall not exceed the field strength levels specified in the following table as stated in FCC, Part 15, Section 15.407 a(2). All emissions outside the 5275-5325 MHz band shall not exceed -27 dBm/MHz as stated in FCC, Part 15, Section 15.407 b(3) .

Frequency range in MHz	Field Strength of Fundamental mWatts	Field Strength of Spurious Emissions dBm/MHz
30 -5250	250 (1W w/Antenna)	-27
5250-5350		
5350-40000		-27

Field strength limits are at a distance of 3 meters. The emission limits shown are based on measurement instrumentation employing an average detector.

Emissions radiated below 1 GHz must comply to the general radiated emission limits in Section 15.209.

Preliminary radiated emission measurements were performed at a 3 meter or 1 meter test distance. The frequency range from 30 MHz to 40 GHz was automatically scanned and plotted at various angles.

NOTE:

All radiated emissions measurements were made at a test room temperature of **68°F** at **33%** relative humidity and **70°F** at **30%** relative humidity.



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RADIATED DATA TAKEN FOR FUNDAMENTAL

EIRP EMISSION MEASUREMENTS

PART 15.407 a(2)



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DLS Electronic Systems, Inc.

Company: Motorola
Operator: Craig Brandt
Date of test: 04-17-2007
Temperature: 68 deg. F
Humidity: 30% R.H.

Power set to A0

EIRP - Substitution Method

Model: Canopy 5200								
Channel: Low								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [EIRP] (mW)
5275 vertical	127.72	21.78	3.13	10.45	29.10	29.98	0.88	812.83
5275 horizontal	118.25	12.28	3.13	10.45	19.60	29.98	10.38	91.20

EIRP = Signal generator output - cable loss + antenna gain

ERP_(ref. to 1/2λ dipole) = Signal generator output - cable loss + antenna gain - 2.15



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola, Inc.
Model Tested: 5200AL
Report Number: 13187

DLS Electronic Systems, Inc.

Company: Motorola
Operator: Craig Brandt
Date of test: 04-17-2007
Temperature: 68 deg. F
Humidity: 30% R.H.

Power set to A0

EIRP - Substitution Method

Model: Canopy 5200								
Channel: Mid								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [EIRP] (mW)
5300 vertical	128.30	22.59	3.14	10.44	29.89	29.98	0.09	974.99
5300 horizontal	118.84	13.19	3.14	10.44	20.49	29.98	9.49	111.94

EIRP = Signal generator output - cable loss + antenna gain

$ERP_{(ref. to \frac{1}{2}\lambda \text{ dipole})} = \text{Signal generator output} - \text{cable loss} + \text{antenna gain} - 2.15$



Company: Motorola, Inc.
 Model Tested: 5200AL
 Report Number: 13187

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola
 Operator: Craig Brandt
 Date of test: 04-17-2007
 Temperature: 68 deg. F
 Humidity: 30% R.H.

Power set to A0

EIRP - Substitution Method

Model: Canopy 5200								
Channel: High								
Frequency and Polarization (MHz)	Max. Field Strength of EUT @ 3 meters (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)	Strength of emission [EIRP] (mW)
5325 vertical	128.21	22.16	3.15	10.44	29.45	29.98	0.53	881.05
5325 horizontal	118.21	12.46	3.15	10.44	19.75	29.98	10.23	94.41

EIRP = Signal generator output - cable loss + antenna gain

ERP_(ref. to 1/2λ dipole) = Signal generator output - cable loss + antenna gain - 2.15



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola, Inc.
Model Tested: 5200AL
Report Number: 13187

RADIATED DATA TAKEN FOR

FIELD STRENGTH

EIRP SPURIOUS EMISSION MEASUREMENTS

PART 15.407 b(3)



Company: Motorola, Inc.
Model Tested: 5200AL
Report Number: 13187

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola
Operator: Craig Brandt
Date of test: 04-17-2007
Temperature: 70 deg. F
Humidity: 30% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Spurious Emissions - EIRP - Substitution Method

Model: Canopy 5200							
Channel: Low - 5275 MHz							
Frequency and Polarization (GHz)	Max. Field Strength of EUT (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)
10.550 vertical	44.9	-63.3	1.5	12.3	-52.4	-27.0	25.4
10.550 horizontal	44.5	-65.7	1.5	12.3	-54.9	-27.0	27.9
15.825 vertical	49.3	-55.7	1.6	16.7	-40.7	-27.0	13.7
15.825 horizontal	44.4	-62.9	1.6	16.7	-47.9	-27.0	20.9
21.100 vertical	NF						
21.100 horizontal	NF						
26.375 vertical	56.2	-48.7	7.2	12.0	-43.9	-27.0	16.9
26.375 horizontal	58.7	-44.6	7.2	12.0	-39.8	-27.0	12.8
31.650 vertical	55.3	-55.7	9.2	11.8	-53.1	-27.0	26.1
31.650 horizontal	61.1	-48.6	9.2	11.8	-46.0	-27.0	19.0

EIRP = Signal generator output - cable loss + antenna gain

ERP_(ref. to ½λ dipole) = Signal generator output - cable loss + antenna gain - 2.15



Company: Motorola, Inc.
 Model Tested: 5200AL
 Report Number: 13187

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola
 Operator: Craig Brandt
 Date of test: 04-17-2007
 Temperature: 70 deg. F
 Humidity: 30% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Spurious Emissions - EIRP - Substitution Method

Model: Canopy 5200							
Channel: Mid - 5300 MHz							
Frequency and Polarization (GHz)	Max. Field Strength of EUT (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)
10.600 vertical	44.7	-62.4	1.5	12.4	-51.5	-27.0	24.5
10.600 horizontal	44.5	-64.1	1.5	12.4	-53.2	-27.0	26.2
15.900 vertical	46.3	-60.2	1.6	16.8	-45.0	-27.0	18.0
15.900 horizontal	44.3	-64.6	1.6	16.8	-49.4	-27.0	22.4
21.200 vertical	NF						
21.200 horizontal	NF						
26.500 vertical	56.1	-48.5	7.9	12.0	-44.4	-27.0	17.4
26.500 horizontal	58.0	-44.7	7.9	12.0	-40.6	-27.0	13.6
31.800 vertical	55.4	-56.5	9.2	11.6	-54.1	-27.0	27.1
31.800 horizontal	55.1	-58.1	9.2	11.6	-55.7	-27.0	28.7

EIRP = Signal generator output - cable loss + antenna gain

ERP_(ref. to ½λ dipole) = Signal generator output - cable loss + antenna gain - 2.15



Company: Motorola, Inc.
 Model Tested: 5200AL
 Report Number: 13187

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola
 Operator: Craig Brandt
 Date of test: 04-17-2007
 Temperature: 70 deg. F
 Humidity: 30% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Spurious Emissions - EIRP - Substitution Method

Model: Canopy 5200							
Channel: High - 5325 MHz							
Frequency and Polarization (GHz)	Max. Field Strength of EUT (dBuV/m)	Output of Signal Generator when field strength equals that of EUT (dBm)	Correction factor for cable between Signal Gen. and subst. antenna (dB)	Gain of subst. antenna (dBi)	Strength of emission [EIRP] (dBm)	Limit (dBm)	Margin (dB)
10.650 vertical	43.7	-63.1	1.5	9.2	-55.4	-27.0	28.4
10.650 horizontal	45.7	-63.6	1.5	9.2	-55.9	-27.0	28.9
15.975 vertical	45.0	-60.4	1.7	17.0	-45.1	-27.0	18.1
15.975 horizontal	45.0	-59.9	1.7	17.0	-44.6	-27.0	17.6
21.300 vertical	NF						
21.300 horizontal	NF						
26.625 vertical	52.8	-52.2	7.9	12.1	-48.0	-27.0	21.0
26.625 horizontal	51.9	-53.0	7.9	12.1	-48.8	-27.0	21.8
31.950 vertical	56.4	-55	9.31	11.4	-52.9	-27.0	25.9
31.950 horizontal	60.4	-51.2	9.3	11.4	-49.1	-27.0	22.1

EIRP = Signal generator output - cable loss + antenna gain

ERP_(ref. to 1/2λ dipole) = Signal generator output - cable loss + antenna gain - 2.15



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola, Inc.
Model Tested: 5200AL
Report Number: 13187

RADIATED DATA AND GRAPH(S) TAKEN FOR

FIELD STRENGTH OF

SPURIOUS EMISSION MEASUREMENTS

PART 15.109

FCC Part 15 Class B

Electric Field Strength

EUT: Canopy 5200
Manufacturer: Motorola
Operating Condition: 68 degF; 31% R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B
Test Specification: Transmit and Receive modes
Comment: Low, Mid and High channels
Date: 04/18/2007

TEXT: "Site 2 MidV 3M"

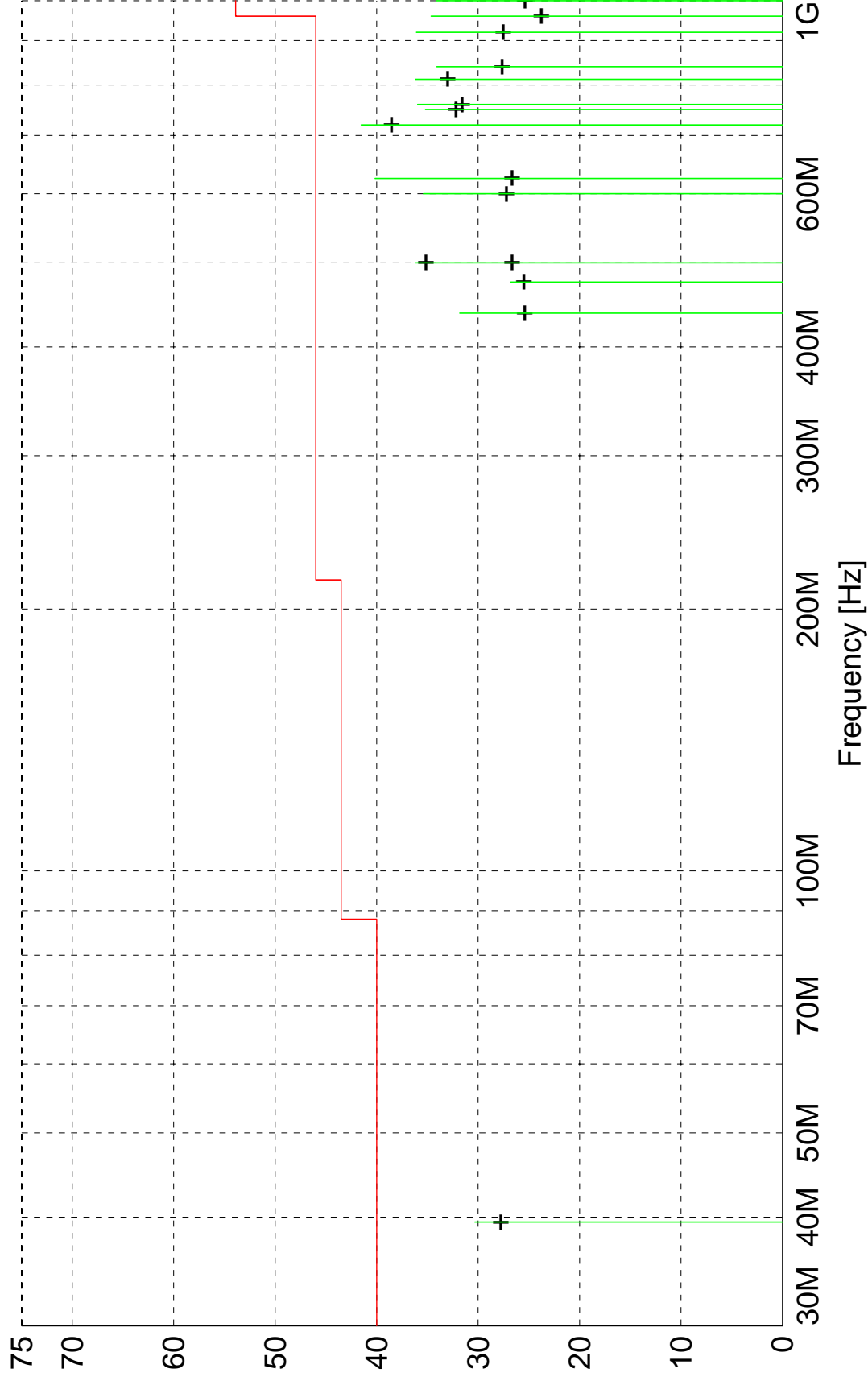
Short Description: Test Set-up Vert30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 26 SN: 837460/002

Antennas ---
Biconical -- EMCO 3104C SN: 0005-4892
Log Periodic -- Electro Metrics LPA-25 SN: 1205

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/004

TEST SET-UP: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Level [dBμV/m]



MES A4182_F1V_Quasi-Peak
+ · MES A4182_F1V_Peak_List
— LIM FCC ClassB F QP/AV

Voltage Amplitude FCC Class B

MEASUREMENT RESULT: "A4182_FIV_Final"

4/18/2007 9:55AM		Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
	MHz	dBuV		Factor	Loss	Level	dBuV/m	dB	Ant.	Angle	Detector	
				dBuV/m	dB	dBuV/m	dBuV/m	dB	m	deg		
	719.980000	39.56		21.09	-19.1	41.5	46.0	4.5	2.00	190	QUASI-PEAK	None
	624.980000	40.78		19.17	-19.8	40.2	46.0	5.8	1.50	180	QUASI-PEAK	None
	39.485000	43.77		10.95	-24.4	30.3	40.0	9.7	1.00	315	QUASI-PEAK	None
	812.490000	33.12		21.37	-18.3	36.2	46.0	9.8	1.10	135	QUASI-PEAK	None
	499.980000	39.54		17.64	-21.0	36.2	46.0	9.8	1.00	180	QUASI-PEAK	None
	919.980000	31.22		22.51	-17.6	36.1	46.0	9.9	1.00	180	QUASI-PEAK	None
	759.980000	33.50		21.06	-18.6	36.0	46.0	10.0	2.00	190	QUASI-PEAK	None
	500.000000	39.28		17.64	-21.0	35.9	46.0	10.1	1.00	190	QUASI-PEAK	None
	599.980000	36.43		18.84	-19.9	35.4	46.0	10.6	1.60	170	QUASI-PEAK	None
	749.990000	33.28		20.60	-18.7	35.2	46.0	10.8	1.20	170	QUASI-PEAK	None
	959.980000	29.07		22.90	-17.3	34.6	46.0	11.4	1.40	190	QUASI-PEAK	None
	839.980000	30.52		21.89	-18.3	34.1	46.0	11.9	1.00	180	QUASI-PEAK	None
	437.490000	37.11		15.91	-21.2	31.8	46.0	14.2	1.00	180	QUASI-PEAK	None
	475.000000	30.99		16.95	-21.2	26.8	46.0	19.2	1.00	200	QUASI-PEAK	None
	999.990000	27.48		23.66	-17.0	34.1	53.9	19.8	1.40	175	QUASI-PEAK	None

FCC Part 15 Class B

Electric Field Strength

EUT: Canopy 5200
Manufacturer: Motorola
Operating Condition: 68 degF; 31% R.H.
Test Site: D.L.S. O.F. Site 2
Operator: Craig B
Test Specification: Transmit and Receive modes
Comment: Low, Mid and High channels
Date: 04/18/2007

TEXT: "Site 2 MidH 3M"

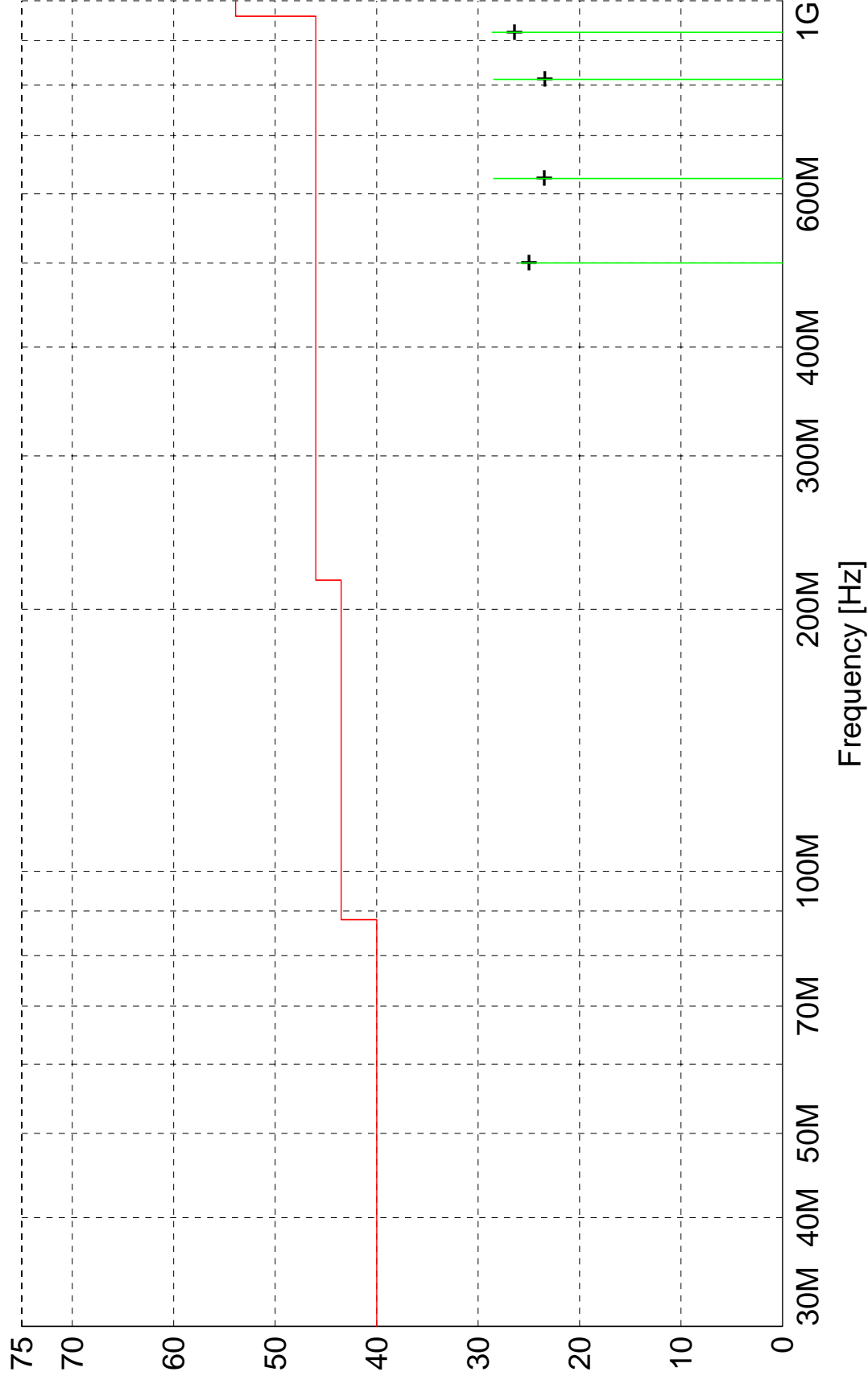
Short Description: Test Set-up Horz30-1000MHz
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 26 SN: 837460/002

Antennas ---
Biconical -- EMCO 3104C SN: 0005-4892
Log Periodic -- Electro Metrics LPA-25 SN: 1205

Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/004

TEST SET-UP: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Level [dBμV/m]



MES A4182_F1H_Quasi-Peak

+ · MES A4182_F1H_Peak_List

— LIM FCC ClassB F QP/AV

Voltage Amplitude FCC Class B

MEASUREMENT RESULT: "A4182_F1H_Final"

4/18/2007 9:34AM

Frequency MHz	Level dBμV	Antenna Factor dBμV/m	System Loss dB	Total Level dBμV/m	Limit dBμV/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
919.990000	23.76	22.51	-17.6	28.6	46.0	17.4	2.50	315	QUASI-PEAK	None
624.980000	29.10	19.17	-19.8	28.5	46.0	17.5	2.80	90	QUASI-PEAK	None
812.480000	25.38	21.37	-18.3	28.5	46.0	17.5	2.80	135	QUASI-PEAK	None
499.980000	29.32	17.64	-21.0	25.9	46.0	20.1	1.30	0	QUASI-PEAK	None