



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

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 DUSAL
Kind of Equipment:	Digital Transmission Transceiver
Frequency Range:	5275 MHz to 5325 MHz
Test Configuration:	Philhong 29.5V power Supply PSA 15R (Tested at 120 vac, 60 Hz)
Model Number(s):	5200SMG, 5200APG, 5200BHG
Model(s) Tested:	5200XLG connectorized, 5200XLG (single patch)
Serial Number(s):	Patch: 0A003E04A464;Connectorized:0A003E04A46A
Date of Tests:	January 28, March 3, 4, 5
Test Conducted For:	Motorola 1299 E. Algonquin Road Schaumburg, IL 60193

**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

Report By:

Arnom C. Rowe  
Test Engineer  
EMC-001375-NE

Reviewed By:

William Stumpf  
OATS Manager

Approved By:

Brian Mattson  
General Manager



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United States Department of Commerce  
National Institute of Standards and Technology



## Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

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

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,  
listed on the Scope of Accreditation, for:*

### **ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS**

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality  
management system (refer to joint ISO-ILAC-IAF Communiqué dated 18 June 2005).*

2008-10-01 through 2009-09-30

*Effective dates*



*Dolly S. Bruce*  
For the National Institute of Standards and Technology

NVLAP-01C (REV. 2006-09-13)



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## 1.0 SUMMARY OF TEST REPORT

It was found that the Canopy 5200 DUSAL, Model Number(s) 5200XLG connectorized, 5200XLG (single patch), **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 5.25 – 5.35 GHz Band.

## 2.0 INTRODUCTION

On January 28, March 3, 4, 5, a series of radio frequency interference measurements was performed on Canopy 5200 DUSAL, Model Number(s) 5200XLG connectorized, 5200XLG (single patch), Serial Number: Patch: 0A003E04A464;Connectorized: 0A003E04A46A. 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.

### **Main Test Facility:**

D.L.S. Electronic Systems, Inc.  
1250 Peterson Drive  
Wheeling, Illinois 60090

### **O.A.T.S. Test Facility:**

D.L.S. Electronic Systems, Inc.  
166 S. Carter Street  
Genoa City, Wisconsin 53128  
FCC Registration Number: 334127

## 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 5.25 – 5.35 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 ANSI C63.4-2003, Annex H. 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 ANSI C63.4-2003, Annex H.

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.



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## 5.0 TEST EQUIPMENT (Bandwidths and Detector Function)

All preliminary data below 1000 MHz was automatically plotted using the 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 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 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 ANSI C63.4-2003.



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

7.1 Description:

5.2GHz UNII transciever Canopy FSK Radio.

7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

Length: 12" x Width: 3 x Height: 1"

7.3 LINE FILTER USED:

N/A

7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

200 kHz

Clock Frequencies:

20 MHz & 25MHz

7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

- |   |                      |
|---|----------------------|
| 1. DUSAL 5200 w/ Integrated Patch Antenna | PN: 8415505A01 issB  |
| 2. DUSAL 5200 w/ Connector                | PN: 8415505A01 iss B |
| 3. Cable for Connectorized Antenna        | PN: 3089544D01       |



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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.

### NOTE:

Continuous transmit and continuous receive modes.  
Low, Mid, and High channels.  
2 and 4 level FSK modulation.

## 9.0 PHOTO INFORMATION AND TEST SET-UP

Item 0 Canopy 5200 DUSAL

Model Number: 5200XLG connectorized, 5200XLG (single patch)

Serial Number: Patch: 0A003E04A464;Connectorized:0A003E04A46A

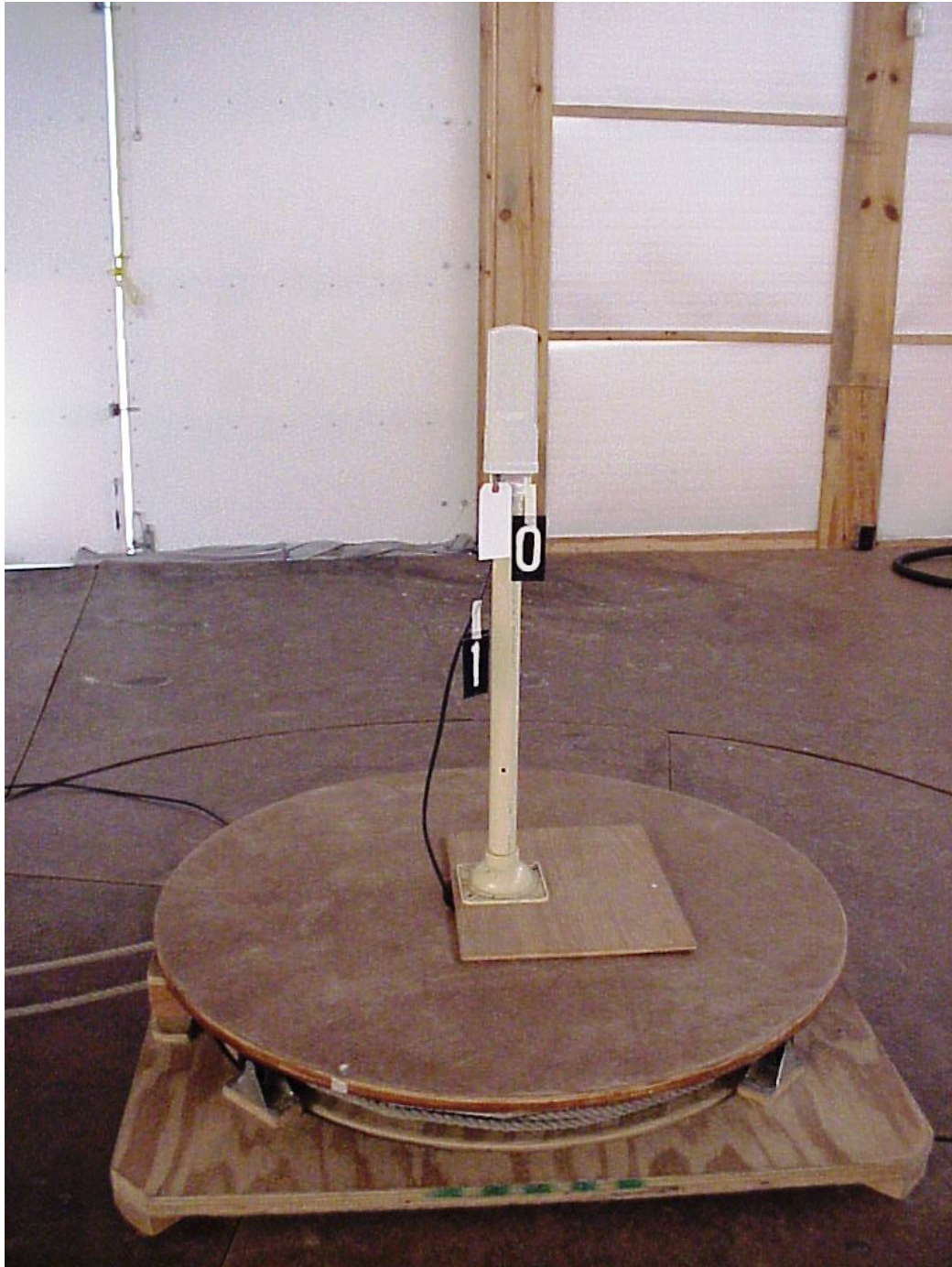
Item 1 300 ft. shielded communications cable with metal connectors.



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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING





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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)



OUTPUT POWER AND TRANSMIT POWER CONTROL

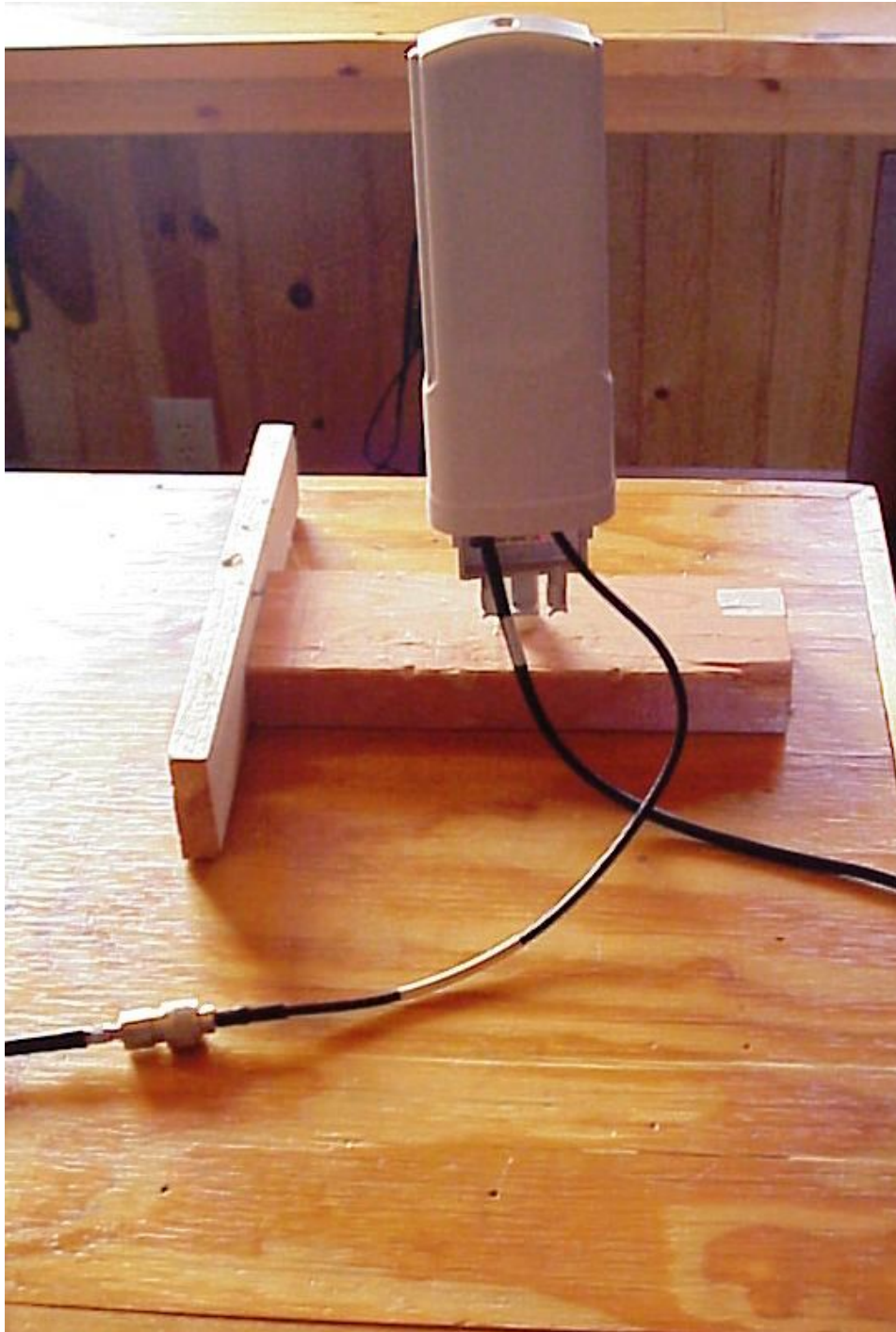




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## 10.0 RADIATED PHOTOS TAKEN DURING TESTING (CON'T)



RF CONDUCTED



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## 10.0 CONDUCTED PHOTOS TAKEN DURING TESTING



AC LINE CONDUCTED FRONT





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## 10.0 CONDUCTED PHOTOS TAKEN DURING TESTING (CON'T)







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## 11.0 RESULTS OF TESTS

The radio interference emission charts 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.

## 12.0 CONCLUSION

It was found that the Canopy 5200 DUSAL, Model Number(s) 5200XLG connectorized, 5200XLG (single patch) **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 5.25 – 5.35 GHz Band.



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TABLE 1 – EQUIPMENT LIST

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Frequency Range</b>	<b>Cal Due Dates</b>
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	12/09
LISN	Solar	9252-50-R-24-BNC	961019	10 kHz – 30 MHz	7/09
Filter- High-Pass	SOLAR	7930-10	921541	12 kHz	1/10
Limiter	Electro-Metrics	EM-7600	706	10 kHz – 30 MHz	1/10
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7/09
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	3/09
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	5/10
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	5/10
Preamp	Miteq	AMF-6D-100200-50	313936	1 GHz-10 GHz	5/09
Preamp	Miteq	AMF-6D-010100-50	213976	10 GHz-18 GHz	5/09
Horn Antenna	EMCO	3115	9903-5731	1-18 GHz	6/09
Horn Antenna	EMCO	3115	6204	1-18 GHz	5/09
Signal Generator	Rhode & Schwarz	SMR40	100092	1-40 GHz	12/09
High Pass Filter	Planar	HP8G-7G8-CD-SFF	PF1226/0728	7-26 GHz	7/09

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



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TABLE 1 – EQUIPMENT LIST

<b>Test Equipment</b>	<b>Manufacturer</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Frequency Range</b>	<b>Cal Due Dates</b>
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18 GHz-26 GHz	10/09
Horn Antenna	EMCO	3116	2549	18 – 40 GHz	5/09
Horn Antenna	ETS Lindgren	3116	00062917	18 – 40 GHz	11/09
High Pass Filter	Planar	CL22500-9000-CD-SS	PF1229/0728	15-40 GHz	7/09
Preamp	R&S	TS-PR40	052002/025	26 GHz-40 GHz	10/09

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(2), b(5), b(6), b(7) & b(8)

OPERATION WITHIN THE BAND 5250 – 5350 MHz



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## APPENDIX A

### 1.0 AC POWER LINE CONDUCTED EMISSION MEASUREMENTS 15.407 b(6)

The AC Power Line Conducted emissions were measured over the frequency range from 150 kHz to 30 MHz in accordance with the power line measurements as specified in FCC Part 15, Subpart C, Section 15.207 & ANSI C63.4-2003. Since the device is operated from the public utility lines, the 120 Vac, 60 Hz power leads, high (hot) and low (neutral) sides, were measured by connecting the measuring equipment to the appropriate meter terminal of the LISN. During the test, the cables were placed and items moved (when appropriate) to maximize emissions. All signals were then recorded. The allowed levels for Intentional Radiators which is designed to connected to the public utility (AC) power line cannot exceed the following:

Frequency of Emissions (MHz)	Conducted Limits (dBuV)	
	Quasi Peak	Average
.15 to .5	66 to 56	56 to 46
.5 to 5	56	46
5 to 30	60	50

#### **NOTE:**

All test measurements were made at a screen room temperature of 70°F at 24% relative humidity.



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# AC POWER LINE CONDUCTED DATA AND GRAPH(S) TAKEN DURING TESTING

PART 15.407 b(6)

PART 15.207

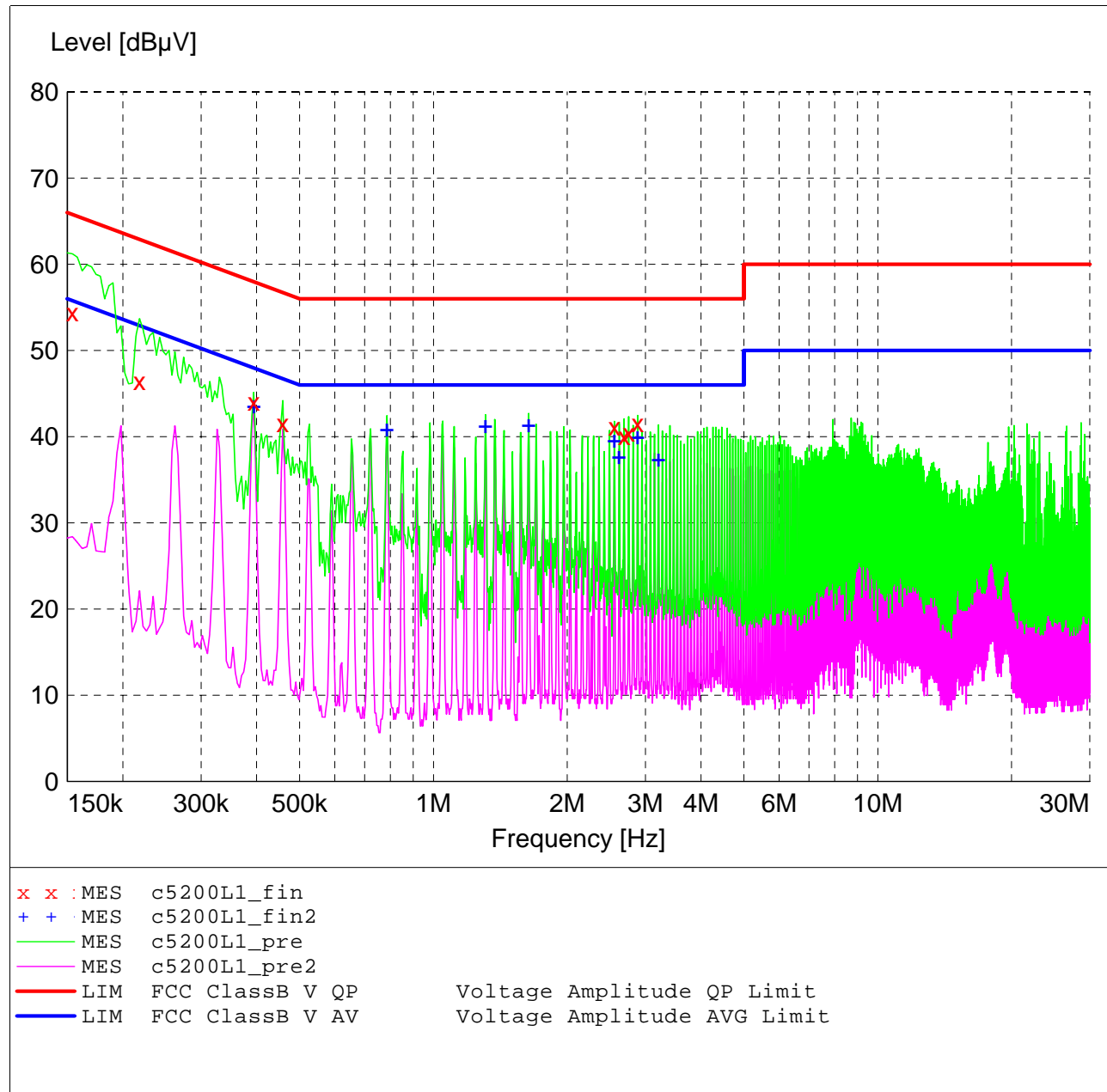
# FCC Part 15 Class B

## Voltage Mains Test

EUT: Canopy 5200  
Manufacturer: Motorola  
Operating Condition: 70 deg. F, 24% R.H.  
Test Site: DLS O.F. Site 1 (Screenroom)  
Operator: Craig B  
Test Specification: 120 V 60 Hz  
Comment: Line 1  
Date: 03-05-2009

### SCAN TABLE: "Line Cond Scrn RmFin"

Short Description:			Line Conducted Emissions			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128
CISPR AV						



**MEASUREMENT RESULT: "c5200L1\_fin"**

3/5/2009 11:05AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.154000	54.40	13.9	66	11.4	QP	---	---
0.218000	46.40	12.7	63	16.5	QP	---	---
0.394000	44.00	11.7	58	14.0	QP	---	---
0.458000	41.50	11.6	57	15.2	QP	---	---
2.554000	41.10	11.1	56	14.9	QP	---	---
2.686000	40.00	11.1	56	16.0	QP	---	---
2.750000	40.50	11.1	56	15.5	QP	---	---
2.882000	41.50	11.1	56	14.5	QP	---	---

**MEASUREMENT RESULT: "c5200L1\_fin2"**

3/5/2009 11:05AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.394000	43.60	11.7	48	4.4	CAV	---	---
0.786000	40.90	11.2	46	5.1	CAV	---	---
1.310000	41.30	11.0	46	4.7	CAV	---	---
1.638000	41.40	11.1	46	4.6	CAV	---	---
2.554000	39.70	11.1	46	6.3	CAV	---	---
2.618000	37.80	11.1	46	8.2	CAV	---	---
2.882000	40.00	11.1	46	6.0	CAV	---	---
3.210000	37.50	11.1	46	8.5	CAV	---	---



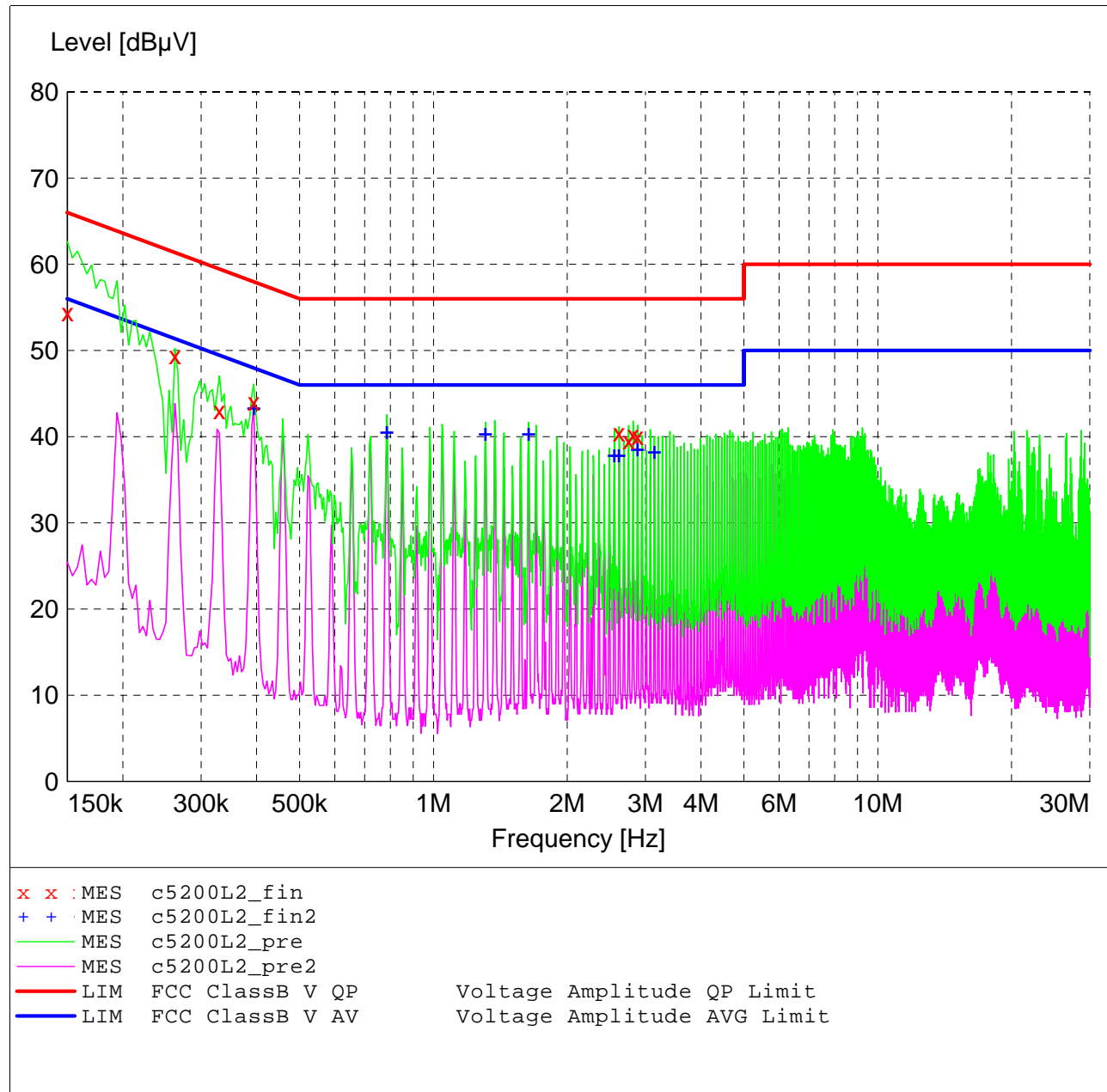
# FCC Part 15 Class B

## Voltage Mains Test

EUT: Canopy 5200  
Manufacturer: Motorola  
Operating Condition: 70 deg. F, 24% R.H.  
Test Site: DLS O.F. Site 1 (Screenroom)  
Operator: Craig B  
Test Specification: 120 V 60 Hz  
Comment: Line 2  
Date: 03-05-2009

### SCAN TABLE: "Line Cond Scrn RmFin"

Short Description:			Line Conducted Emissions			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak	2.0 s	9 kHz	LISN DLS#128
CISPR AV						



**MEASUREMENT RESULT: "c5200L2\_fin"**

3/5/2009 11:11AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	54.40	14.0	66	11.6	QP	---	---
0.262000	49.40	12.3	61	12.0	QP	---	---
0.330000	43.00	12.0	60	16.5	QP	---	---
0.394000	44.00	11.7	58	14.0	QP	---	---
2.618000	40.40	11.1	56	15.6	QP	---	---
2.750000	39.50	11.1	56	16.5	QP	---	---
2.814000	40.20	11.1	56	15.8	QP	---	---
2.882000	40.10	11.1	56	15.9	QP	---	---

**MEASUREMENT RESULT: "c5200L2\_fin2"**

3/5/2009 11:11AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.394000	43.40	11.7	48	4.6	CAV	---	---
0.786000	40.60	11.2	46	5.4	CAV	---	---
1.310000	40.50	11.0	46	5.5	CAV	---	---
1.638000	40.50	11.1	46	5.5	CAV	---	---
2.554000	38.00	11.1	46	8.0	CAV	---	---
2.618000	38.00	11.1	46	8.0	CAV	---	---
2.882000	38.70	11.1	46	7.3	CAV	---	---
3.142000	38.30	11.1	46	7.7	CAV	---	---



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## APPENDIX A

### 2.0 ANTENNA CONNECTOR – 15.203

As stated in 15.203 the Canopy 5200 DUSAL was designed to ensure that no antenna other than that furnished by Motorola Inc. will be used with the EUT. The use of a permanently attached antenna or antenna that uses an unique coupling to the intentional radiator was considered to comply with section 15.203.

### 3.0 CONDUCTED OUTPUT POWER AT ANTENNA TERMINALS – PART 15.407 a(2)

Conducted Output Power emissions were measured at the antenna terminals with a wide band power meter. Measurements were made at low, mid and high of the 5250 – 5350 MHz frequency band.

The allowed emissions for transmitters operating in the the 5250 – 5350 MHz MHz band for Canopy 5200 DUSAL equipment are found under Part 15, Section 15.407 a(2).

**NOTE: See the following pages for the data taken:**



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## MAXIMUM CONDUCTED OUTPUT POWER DATA

PART 15.407 a(2)



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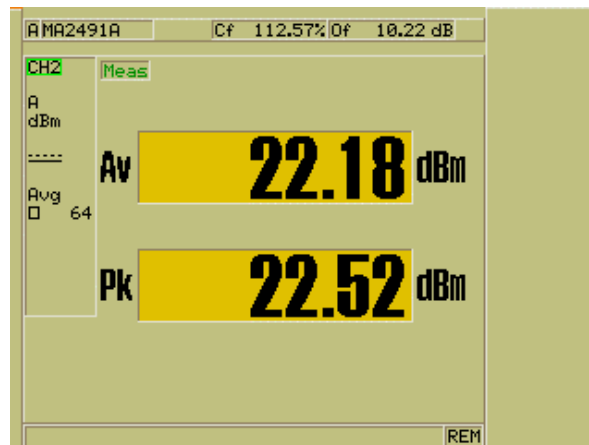
Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Low - 5275 MHz  
Modulation: 2-level  
Power setting: EC

Limit = 250 mW = 24 dBm

Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Average Output Power = **22.18 dBm**





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Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

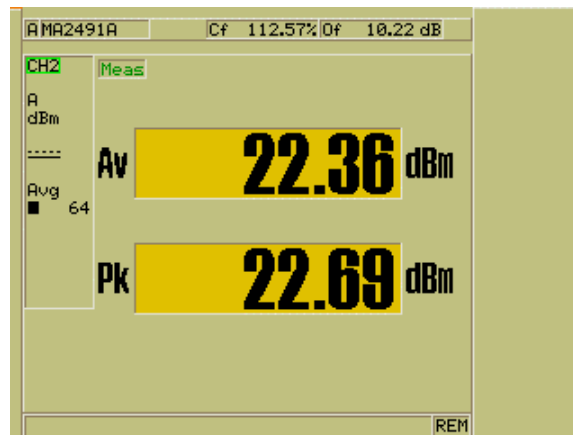
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Low - 5275 MHz  
Modulation: 4-level  
Power setting: EC

Limit = 250 mW = 24 dBm  
Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Average Output Power = **22.36 dBm**





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

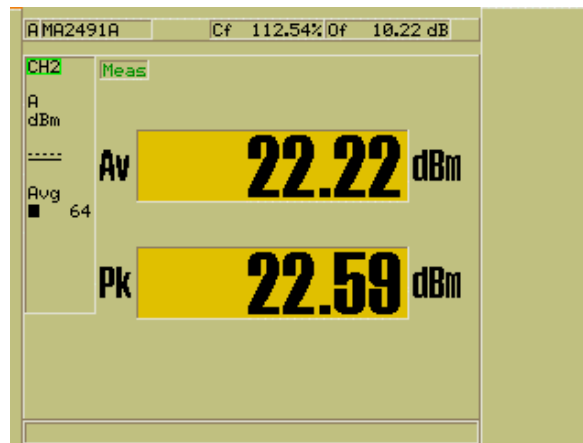
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Mid – 5300 MHz  
Modulation: 2-level  
Power setting: EC

Limit = 250 mW = 24 dBm  
Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Average Output Power = **22.22 dBm**





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

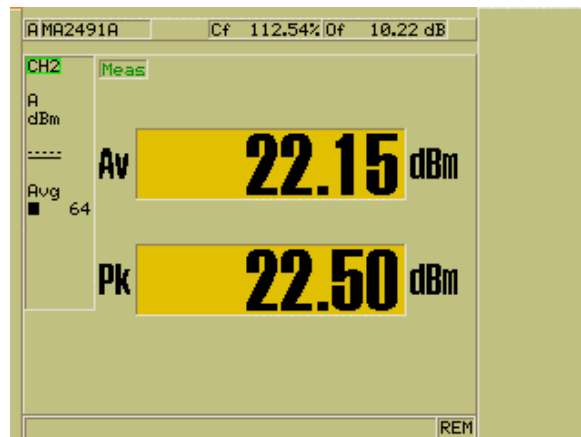
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Mid – 5300 MHz  
Modulation: 4-level  
Power setting: EC

Limit = 250 mW = 24 dBm  
Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Average Output Power = **22.15 dBm**







Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

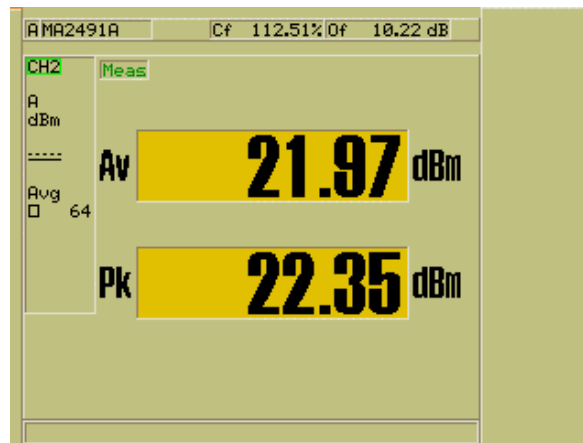
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: High - 5325 MHz  
Modulation: 2-level  
Power setting: EC

Limit = 250 mW = 24 dBm  
Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Average Output Power = **21.97 dBm**





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

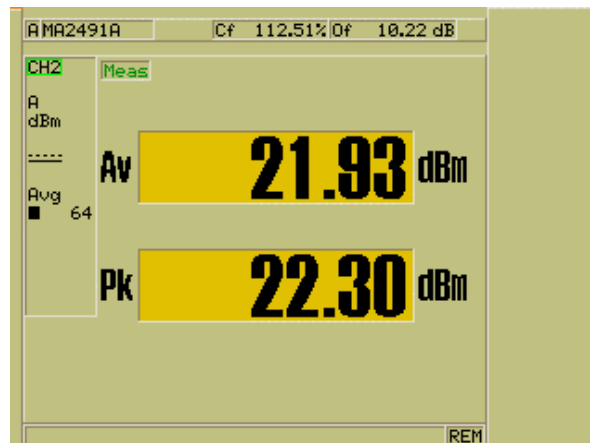
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: High - 5325 MHz  
Modulation: 4-level  
Power setting: EC

Limit = 250 mW = 24 dBm  
Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Average Output Power = **21.93 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

## E.I.R.P. SUBSTITUTION METHOD DATA

### PART 15.407 a(2)



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-03-2009  
Temperature: 70 deg. F  
Humidity: 22% R.H.

Power set to EC  
Limit = 24 dBm + 6dBi for antenna gain = 30 dBm

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	127.04	21.40	2.80	10.89	29.49	30.00	0.51	889.20
5275 horizontal	120.65	14.38	2.80	10.89	22.47	30.00	7.53	176.60

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-03-2009  
Temperature: 70 deg. F  
Humidity: 22% R.H.

Power set to EC

Limit = 24 dBm + 6dBi for antenna gain = 30 dBm

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	127.28	21.41	2.82	10.88	29.47	30.00	0.53	885.12
5300 horizontal	120.06	13.76	2.82	10.88	21.82	30.00	8.18	152.05

EIRP = Signal generator output - cable loss + antenna gain

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



Company: Motorola  
 Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
 Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
 Operator: Craig B  
 Date of test: 03-03-2009  
 Temperature: 70 deg. F  
 Humidity: 22% R.H.

Power set to EC

Limit = 24 dBm + 6dBi for antenna gain = 30 dBm

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	126.57	20.91	2.84	10.87	28.94	30	1.06	783.43
5325 horizontal	120.13	13.89	2.84	10.87	21.92	30	8.08	155.60

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

## 26 dB BANDWIDTH DATA AND GRAPH(S)

PART 15.407 a(2)

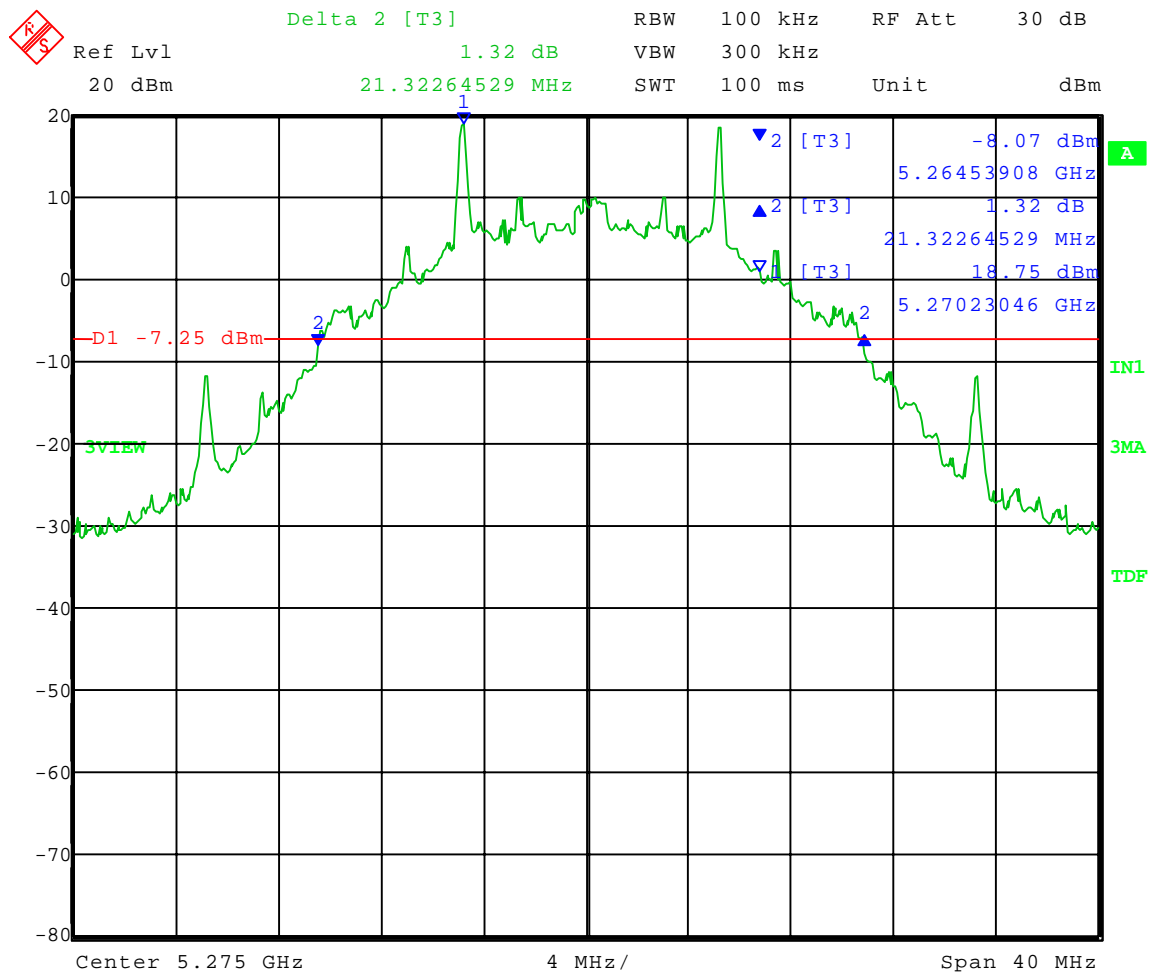


Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-05-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Low Channel: Frequency – 5275 MHz  
Modulation: FSK; 2-level

26 dB Bandwidth = 21.3 MHz



Date: 5.MAR.2009 09:52:31



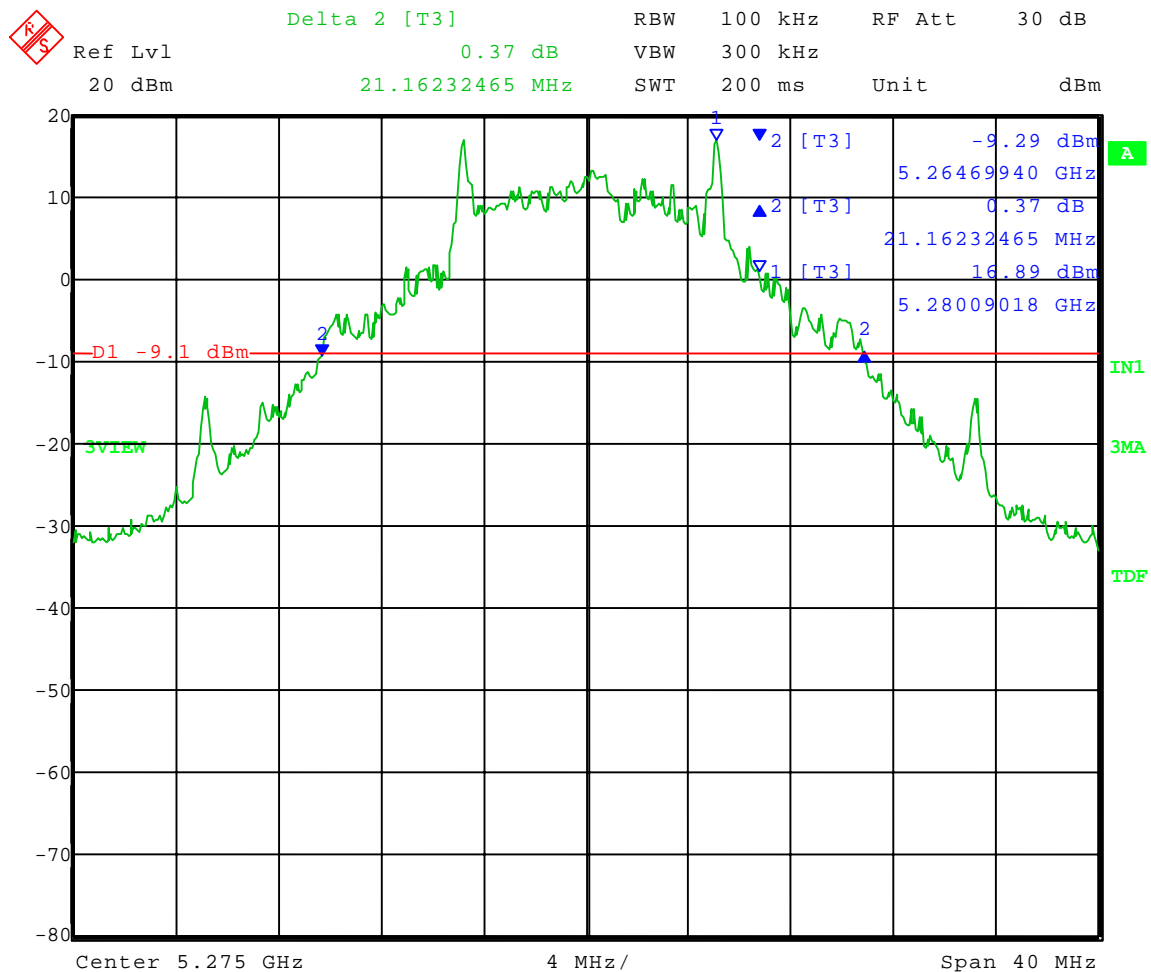


Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-05-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Low Channel: Frequency – 5275 MHz  
Modulation: FSK; 4-level

26 dB Bandwidth = 21.2 MHz



Date: 5.MAR.2009 09:59:59

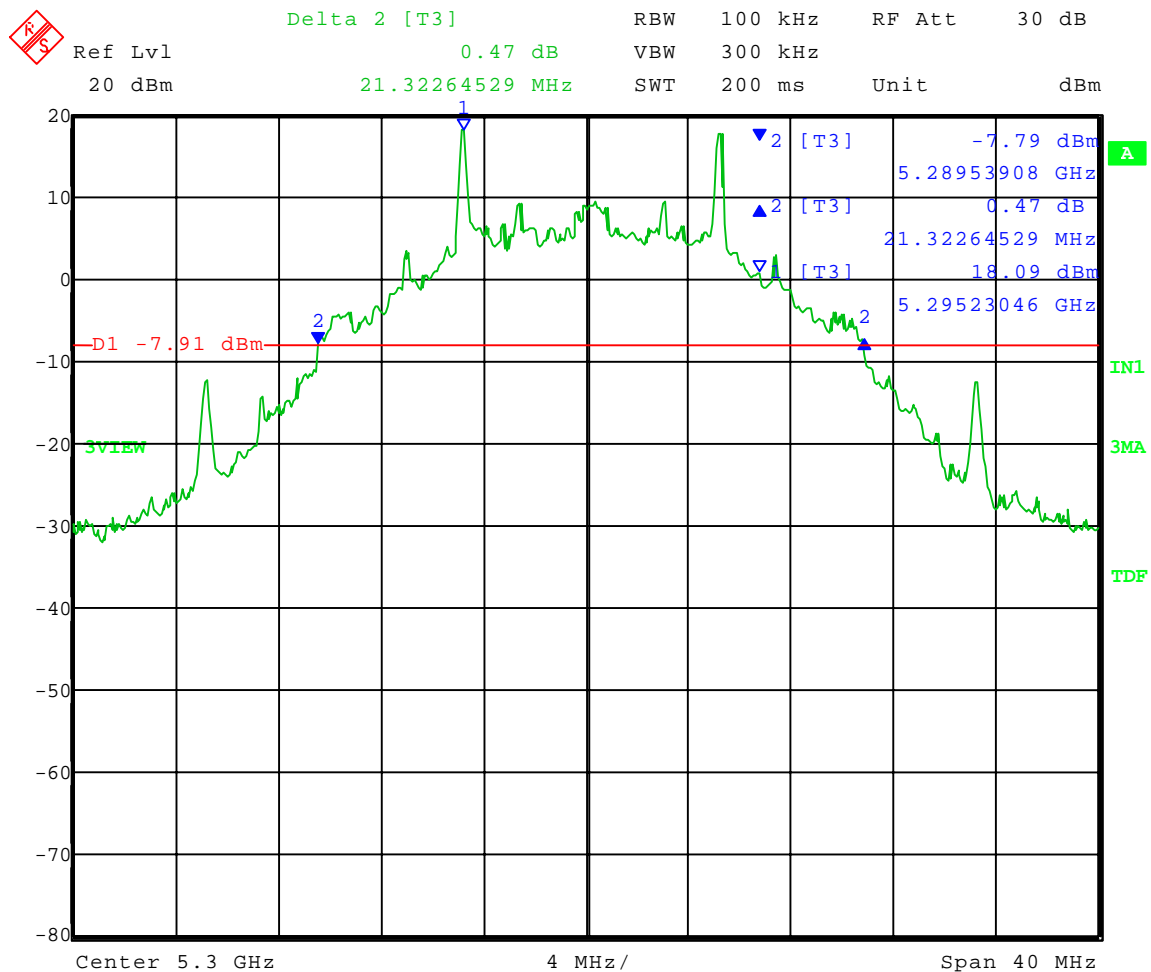


Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-05-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Mid Channel: Frequency – 5300 MHz  
Modulation: FSK; 2-level

26 dB Bandwidth = 21.3 MHz



Date: 5.MAR.2009 10:04:41

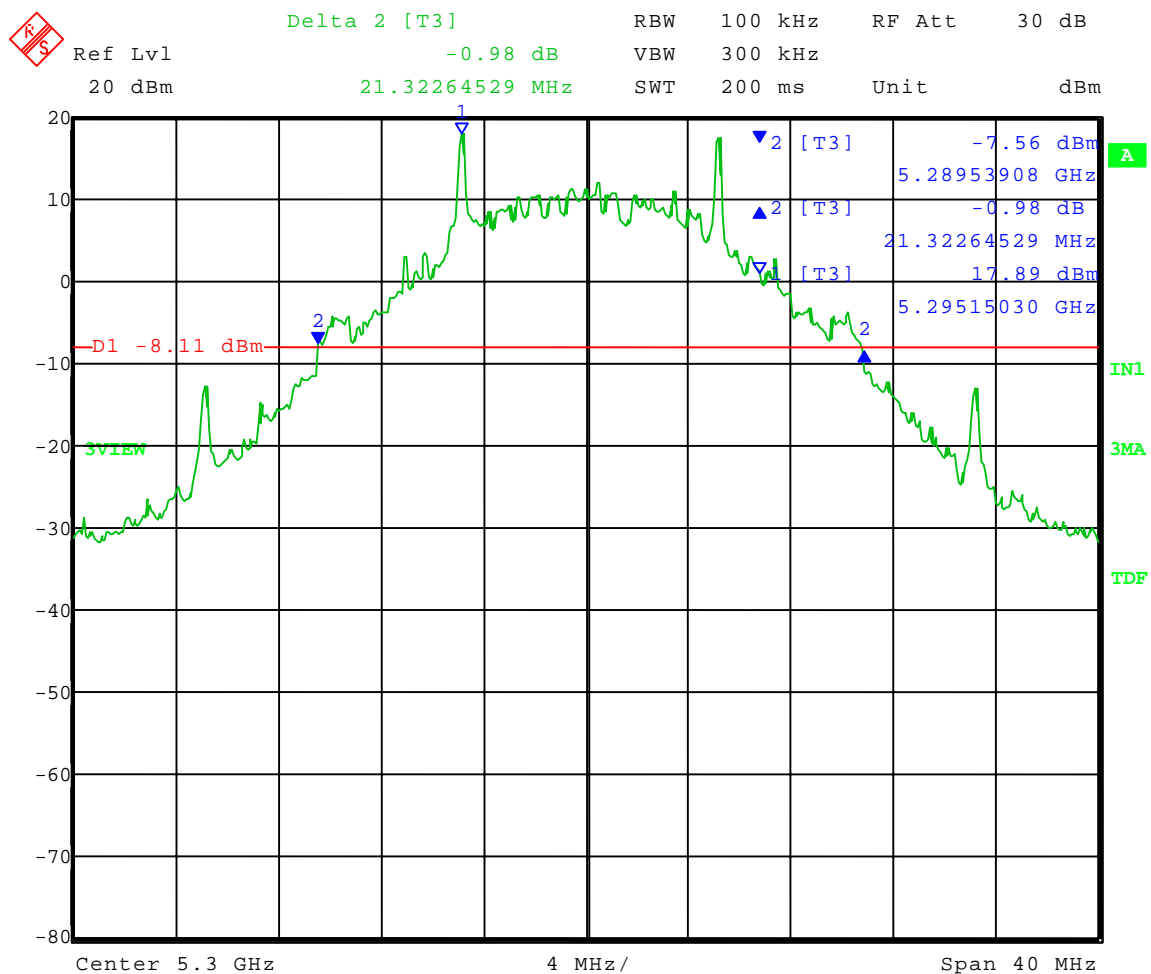


Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-05-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Mid Channel: Frequency – 5300 MHz  
Modulation: FSK; 4-level

26 dB Bandwidth = 21.3 MHz



Date: 5.MAR.2009 10:09:48

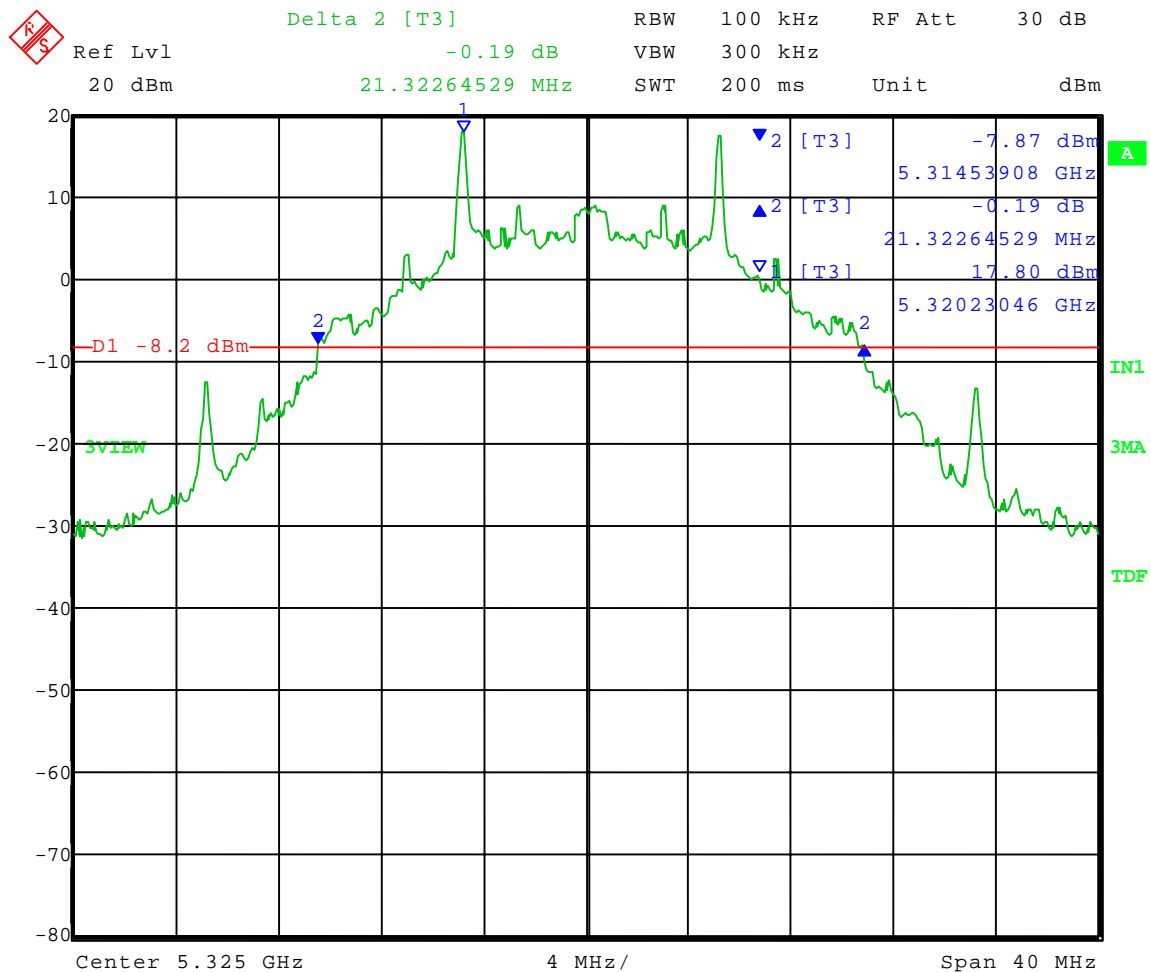


Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-05-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: **High Channel**: Frequency – **5325 MHz**  
Modulation: FSK; 2-level

26 dB Bandwidth = 21.3 MHz



Date: 5.MAR.2009 10:16:38

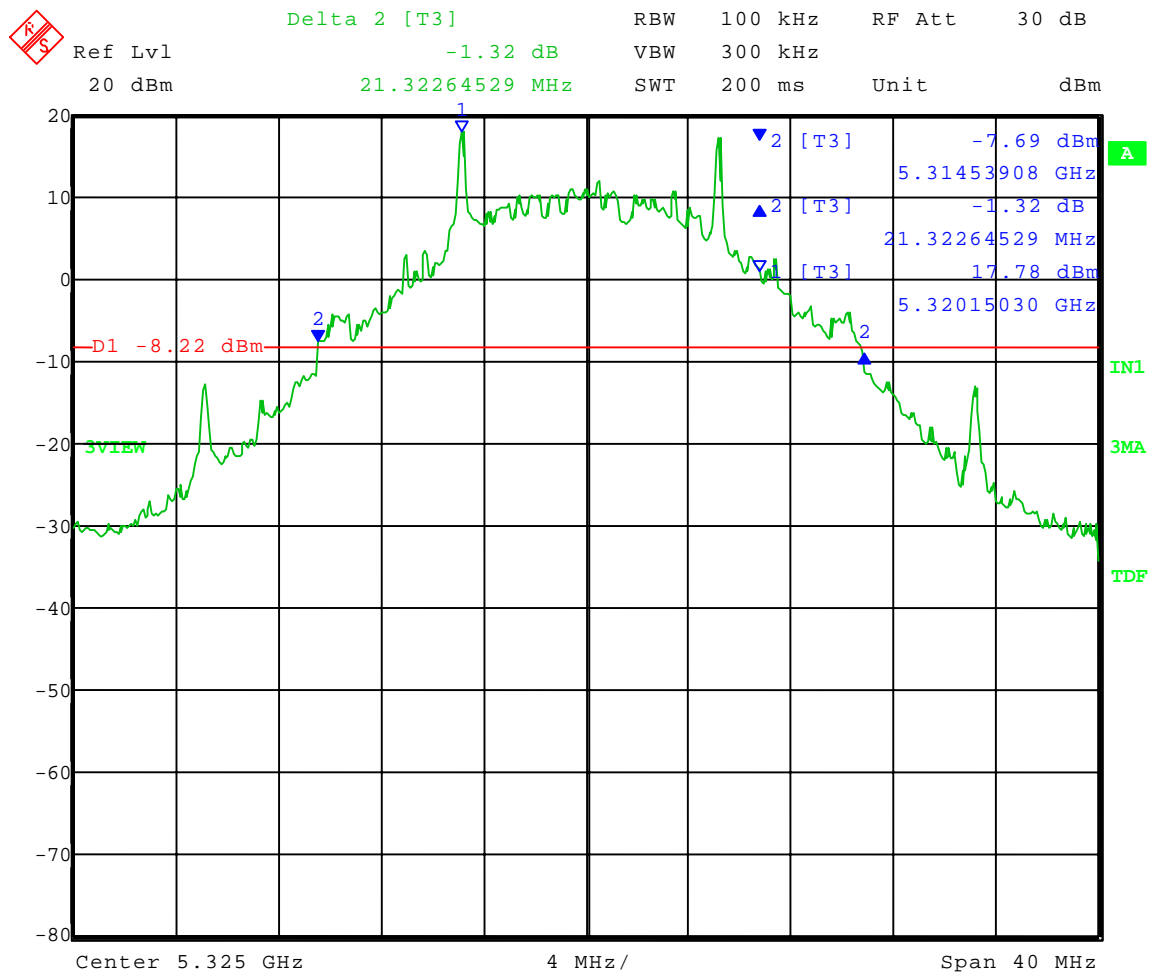


Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 03-05-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: **High Channel**: Frequency – **5325 MHz**  
Modulation: FSK; 4-level

26 dB Bandwidth = 21.3 MHz



Date: 5.MAR.2009 10:30:44



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

## PEAK POWER SPECTRAL DENSITY DATA

PART 15.407 a(2)



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Low channel** (5275 MHz); **2-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5264.5	-5.61	0.275
5265.0	-3.83	0.414
5265.5	-2.83	0.521
5266.0	-2.19	0.604
5266.5	-1.12	0.773
5267.0	0.51	1.125
5267.5	2.01	1.589
5268.0	2.90	1.950
5268.5	4.28	2.679
5269.0	8.40	6.918
5269.5	13.70	23.442
5270.0	16.10	40.738
5270.5	16.10	40.738
5271.0	13.83	24.155
5271.5	9.87	9.705
5272.0	8.57	7.194
5272.5	8.80	7.586
5273.0	8.80	7.586
5273.5	8.49	7.063
5274.0	8.98	7.907
5274.5	9.72	9.376
5275.0	9.89	9.750
5275.5	9.90	9.772
5276.0	9.65	9.226
5276.5	8.86	7.691
5277.0	8.35	6.839
5277.5	8.83	7.638
5278.0	8.83	7.638
5278.5	8.56	7.178



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Low channel** (5275 MHz); **2-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5279.0	9.65	9.226
5279.5	13.58	22.803
5280.0	15.55	35.892
5280.5	15.54	35.810
5281.0	12.82	19.143
5281.5	7.62	5.781
5282.0	4.08	2.559
5282.5	2.75	1.884
5283.0	1.80	1.514
5283.5	0.28	1.067
5284.0	-1.33	0.736
5284.5	-2.43	0.571
5285.0	-3.15	0.484
5285.5	-4.29	0.372

Total Power in 20 MHz channel (mW) = 405.264  
Average total power (mW) = 9.884  
Average power (dBm) = 9.950

Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain) = 10 dBm  
Margin (dB) = 0.05

Note: Non-standard FCC test methods were used. The Power Density measurements were made with a 1MHz resolution band-width and were averaged over a 20MHz channel band-width. D.L.S. Electronic Systems, Inc. cannot claim compliance of the EUT using these test methods.





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Low channel** (5275 MHz); **4-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5264.5	-7.45	0.180
5265.0	-5.69	0.270
5265.5	-4.85	0.327
5266.0	-4.09	0.390
5266.5	-2.83	0.521
5267.0	-1.43	0.719
5267.5	0.09	1.021
5268.0	1.69	1.476
5268.5	3.43	2.203
5269.0	6.42	4.385
5269.5	10.73	11.830
5270.0	12.87	19.364
5270.5	12.29	16.943
5271.0	11.72	14.859
5271.5	11.01	12.618
5272.0	11.08	12.823
5272.5	11.07	12.794
5273.0	11.35	13.646
5273.5	12.12	16.293
5274.0	12.86	19.320
5274.5	13.16	20.701
5275.0	12.86	19.320
5275.5	13.03	20.091
5276.0	12.73	18.750
5276.5	12.08	16.144
5277.0	11.44	13.932
5277.5	11.38	13.740
5278.0	11.18	13.122
5278.5	10.71	11.776



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Low channel** (5275 MHz); **4-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5279.0	10.21	10.495
5279.5	10.99	12.560
5280.0	11.70	14.791
5280.5	11.50	14.125
5281.0	8.70	7.413
5281.5	5.07	3.214
5282.0	2.99	1.991
5282.5	1.12	1.294
5283.0	-0.81	0.830
5283.5	-2.80	0.525
5284.0	-4.09	0.390
5284.5	-5.03	0.314
5285.0	-5.84	0.261
5285.5	-6.70	0.214

Total Power in 20 MHz channel (mW) = 377.583  
Average total power (mW) = 9.209  
Average power (dBm) = 9.642

Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain) = 10 dBm  
Margin (dB) = 0.36

Note: Non-standard FCC test methods were used. The Power Density measurements were made with a 1MHz resolution band-width and were averaged over a 20MHz channel band-width. D.L.S. Electronic Systems, Inc. cannot claim compliance of the EUT using these test methods.



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Mid channel** (5300 MHz); **2-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5289.5	-6.39	0.230
5290.0	-4.70	0.339
5290.5	-3.67	0.430
5291.0	-3.20	0.479
5291.5	-2.16	0.608
5292.0	-0.59	0.873
5292.5	0.90	1.230
5293.0	1.56	1.432
5293.5	2.67	1.849
5294.0	7.06	5.082
5294.5	12.77	18.923
5295.0	15.60	36.308
5295.5	15.63	36.559
5296.0	13.95	24.831
5296.5	10.47	11.143
5297.0	8.85	7.674
5297.5	8.92	7.798
5298.0	8.90	7.762
5298.5	8.53	7.129
5299.0	8.90	7.762
5299.5	9.56	9.036
5300.0	9.77	9.484
5300.5	9.77	9.484
5301.0	9.56	9.036
5301.5	8.76	7.516
5302.0	8.51	7.096
5302.5	8.93	7.816
5303.0	8.94	7.834
5303.5	8.79	7.568



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Mid channel** (5300 MHz); **2-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5304.0	9.96	9.908
5304.5	13.40	21.878
5305.0	14.99	31.550
5305.5	14.95	31.261
5306.0	11.87	15.382
5306.5	6.13	4.102
5307.0	2.52	1.786
5307.5	1.30	1.349
5308.0	0.54	1.132
5308.5	-0.85	0.822
5309.0	-2.29	0.590
5309.5	-3.26	0.472
5310.0	-3.98	0.400
5310.5	-5.14	0.306

Total Power in 20 MHz channel (mW) = 373.717  
Average total power (mW) = 9.115  
Average power (dBm) = 9.598

Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain) = 10 dBm  
Margin (dB) = 0.40

Note: Non-standard FCC test methods were used. The Power Density measurements were made with a 1MHz resolution band-width and were averaged over a 20MHz channel band-width. D.L.S. Electronic Systems, Inc. cannot claim compliance of the EUT using these test methods.



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)

**Mid channel (5300 MHz); 4-Level modulation;** power setting **E8**

Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5289.5	-7.16	0.192
5290.0	-5.45	0.285
5290.5	-4.56	0.350
5291.0	-3.73	0.424
5291.5	-2.40	0.575
5292.0	-1.02	0.791
5292.5	0.59	1.146
5293.0	2.24	1.675
5293.5	4.02	2.523
5294.0	6.91	4.909
5294.5	11.00	12.589
5295.0	12.85	19.275
5295.5	12.84	19.231
5296.0	11.41	13.836
5296.5	10.64	11.588
5297.0	10.66	11.641
5297.5	10.73	11.830
5298.0	10.91	12.331
5298.5	11.65	14.622
5299.0	12.42	17.458
5299.5	12.71	18.664
5300.0	12.73	18.750
5300.5	12.66	18.450
5301.0	12.36	17.219
5301.5	11.68	14.723
5302.0	11.06	12.764
5302.5	10.99	12.560
5303.0	10.77	11.940
5303.5	10.34	10.814



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**Mid channel (5300 MHz); 4-Level modulation;** power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5304.0	9.90	9.772
5304.5	10.83	12.106
5305.0	11.66	14.655
5305.5	11.57	14.355
5306.0	9.01	7.962
5306.5	5.55	3.589
5307.0	3.47	2.223
5307.5	1.69	1.476
5308.0	-0.21	0.953
5308.5	-2.26	0.594
5309.0	-3.69	0.428
5309.5	-4.77	0.333
5310.0	-5.60	0.275
5310.5	-6.51	0.223

Total Power in 20 MHz channel (mW) = 361.686  
Average total power (mW) = 8.822  
Average power (dBm) = 9.455

Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain) = 10 dBm  
Margin (dB) = 0.54

Note: Non-standard FCC test methods were used. The Power Density measurements were made with a 1MHz resolution band-width and were averaged over a 20MHz channel band-width. D.L.S. Electronic Systems, Inc. cannot claim compliance of the EUT using these test methods.



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**High channel** (5325 MHz); **2-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5314.5	-5.96	0.254
5315.0	-4.28	0.373
5315.5	-3.20	0.479
5316.0	-2.59	0.551
5316.5	-1.47	0.713
5317.0	0.12	1.028
5317.5	1.67	1.469
5318.0	2.53	1.791
5318.5	3.98	2.500
5319.0	7.94	6.223
5319.5	13.30	21.380
5320.0	15.74	37.497
5320.5	15.76	37.670
5321.0	13.52	22.491
5321.5	9.47	8.851
5322.0	8.17	6.561
5322.5	8.31	6.776
5323.0	8.32	6.792
5323.5	8.04	6.368
5324.0	8.52	7.112
5324.5	9.25	8.414
5325.0	9.44	8.790
5325.5	9.44	8.790
5326.0	9.22	8.356
5326.5	8.46	7.015
5327.0	8.03	6.353
5327.5	8.37	6.871
5328.0	8.38	6.887
5328.5	8.09	6.442



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**High channel** (5325 MHz); **2-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5329.0	9.08	8.091
5329.5	13.15	20.654
5330.0	15.09	32.285
5330.5	15.10	32.359
5331.0	12.39	17.338
5331.5	7.13	5.164
5332.0	3.67	2.328
5332.5	2.30	1.698
5333.0	1.33	1.358
5333.5	-0.23	0.948
5334.0	-1.97	0.635
5334.5	-3.02	0.499
5335.0	-3.75	0.422
5335.5	-4.95	0.320

Total Power in 20 MHz channel (mW) = 368.323  
Average total power (mW) = 8.983  
Average power (dBm) = 9.534

Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain) = 10 dBm  
Margin (dB) = 0.47

Note: Non-standard FCC test methods were used. The Power Density measurements were made with a 1MHz resolution band-width and were averaged over a 20MHz channel band-width. D.L.S. Electronic Systems, Inc. cannot claim compliance of the EUT using these test methods.





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**High channel** (5325 MHz); **4-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5314.5	-7.79	0.166
5315.0	-6.17	0.242
5315.5	-5.56	0.278
5316.0	-4.63	0.344
5316.5	-3.32	0.466
5317.0	-1.97	0.635
5317.5	-0.32	0.929
5318.0	1.23	1.327
5318.5	2.93	1.963
5319.0	5.71	3.724
5319.5	10.18	10.423
5320.0	12.42	17.458
5320.5	12.43	17.498
5321.0	11.38	13.740
5321.5	10.55	11.350
5322.0	10.62	11.535
5322.5	10.62	11.535
5323.0	10.88	12.246
5323.5	11.65	14.622
5324.0	12.38	17.298
5324.5	12.67	18.493
5325.0	12.66	18.450
5325.5	12.52	17.865
5326.0	12.24	16.749
5326.5	11.58	14.388
5327.0	10.98	12.531
5327.5	10.88	12.246
5328.0	10.66	11.641
5328.5	10.20	10.471



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-05-2009  
Temperature: 72 deg. F.  
Humidity: 24% R.H.  
Test: Peak Power Spectral Density FCC 15.407(a)(2)

RBW: 1 MHz VBW: 3 MHz  
Detector: RMS SPAN: 500 kHz  
Sweep time: 5 sec.

Model: Canopy 5200 (7 dBi antenna)  
**High channel** (5325 MHz); **4-Level modulation**; power setting **E8**  
Power Density averaged over 20 MHz channel

Center frequency of 500 kHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5329.0	9.71	9.354
5329.5	10.48	11.169
5330.0	11.20	13.183
5330.5	11.04	12.706
5331.0	8.17	6.561
5331.5	4.64	2.911
5332.0	2.55	1.799
5332.5	0.64	1.159
5333.0	-1.27	0.746
5333.5	-3.26	0.472
5334.0	-4.62	0.345
5334.5	-5.59	0.276
5335.0	-6.47	0.225
5335.5	-7.34	0.185

Total Power in 20 MHz channel (mW) = 341.355  
Average total power (mW) = 8.326  
Average power (dBm) = 9.204

Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain) = 10 dBm  
Margin (dB) = 0.80

Note: Non-standard FCC test methods were used. The Power Density measurements were made with a 1MHz resolution band-width and were averaged over a 20MHz channel band-width. D.L.S. Electronic Systems, Inc. cannot claim compliance of the EUT using these test methods.



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

## APPENDIX A

### 4.0 RESTRICTED BAND COMPLIANCE Part 15.407 b(7)

The field strength of any emissions appearing outside the 5250 – 5350 MHz band shall not exceed the general radiated emissions limits as stated Section 15.209. The fundamental from the Canopy 5200 DUSAL transmitter shall not fall inside the restricted bands 4500 to 5250 MHz and 5350 to 5450 MHz.

As stated in Section 15.205a, the fundamental emission from the Canopy 5200 DUSAL shall not fall within any of the bands listed below:

Frequency in MHz	Frequency in MHz	Frequency in MHz	Frequency in GHz
.0900 to .1100	162.0125 to 167.17	2310.0 to 2390	9.30 to 9.50
.4900 to .5100	167.7200 to 173.20	2483.5 to 2500	10.60 to 12.70
2.1735 to 2.1905	240.000 to 285.00	2655.0 to 2900	13.25 to 13.40
8.362 to 8.3660	322.200 to 335.40	3260.0 to 3267	14.47 to 14.50
13.36 to 13.410	399.900 to 410.00	3332.0 to 3339	15.35 to 16.20
25.50 to 25.670	608.000 to 614.00	3345.8 to 3358	17.70 to 21.40
37.50 to 38.250	960.000 to 1240.00	3600.0 to 4400	22.01 to 23.13
73.00 to 75.500	1300.000 to 1427.00	4500.0 to 5250	23.60 to 24.00
108.00 to 121.94	1435.000 to 1626.50	5350.0 to 5450	31.20 to 31.80
123.00 to 138.00	1660.000 to 1710.00	7250.0 to 7750	36.43 to 36.50
149.90 to 150.00	1718.800 to 1722.20	8025.0 to 8500	ABOVE 38.60
156.70 to 156.90	2200.000 to 2300.00	9000.0 to 9200	

#### NOTE:

The noise floor within the Restricted Bands for the EMC Receiver and HP Spectrum Analyzer will typically lay 20 dB below the limit.

See the following page (s) for the graph (s) made showing compliance for Restricted Band: Also see the table of measurements made for the Fundamental and Spurious emissions in paragraph 3 of this section.



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

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

PART 15.407 b(7)



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

### 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; 22% R.H.  
Test Site: Site 3  
Operator: Craig B  
Test Specification: FCC Part 15 Subpart E; FCC Part 15.205  
Comment: Continuous Transmit Power set to EC  
2-Level modulation  
Date: 03/03/2009

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	35.23	37.27	-26.3	46.2	---	46.2	54	7.8	1.1	350	Res. Band
15.825	Max Peak	Vert	49.00	37.27	-26.3	60.0	---	60.0	74	14.0	1.1	350	Res. Band
15.825	Average	Horz	36.03	37.27	-26.3	47.0	---	47.0	54	7.0	1.1	290	Res. Band
15.825	Max Peak	Horz	47.08	37.27	-26.3	58.1	---	58.1	74	16.0	1.1	290	Res. Band
21.100	Average	Vert	43.81	47.06	-32.4	58.5	---	58.5	63.5	5.0	1.2	0	Res. Band
21.100	Max Peak	Vert	54.81	47.06	-32.4	69.5	---	69.5	83.5	14.0	1.2	0	Res. Band
21.100	Average	Horz	45.23	47.06	-32.4	59.9	---	59.9	63.5	3.6	1.1	350	Res. Band
21.100	Max Peak	Horz	55.78	47.06	-32.4	70.4	---	70.4	83.5	13.1	1.1	350	Res. Band
31.650	Average	Vert	52.11	47.55	-43.0	56.7	---	56.7	63.5	6.8	1.3	45	Res. Band
31.650	Max Peak	Vert	64.88	47.55	-43.0	69.4	---	69.4	83.5	14.1	1.3	45	Res. Band
31.650	Average	Horz	51.87	47.55	-43.0	56.4	---	56.4	63.5	7.1	1.2	150	Res. Band
31.650	Max Peak	Horz	64.42	47.55	-43.0	69.0	---	69.0	83.5	14.5	1.2	150	Res. Band



Company: Motorola  
 Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
 Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

**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; 22% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15 Subpart E; FCC Part 15.205  
**Comment:** Continuous Transmit  
**Date:** 03/03/2009; **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	35.06	38.66	-26.7	47.0	---	47.0	54	7.0	1.1	0	Res. Band
10.600	Max Peak	Vert	47.25	38.66	-26.7	59.2	---	59.2	74	14.8	1.1	0	Res. Band
10.600	Average	Horz	36.75	38.66	-26.7	48.7	---	48.7	54	5.3	1.0	330	Res. Band
10.600	Max Peak	Horz	47.83	38.66	-26.7	59.8	---	59.8	74	14.2	1.0	330	Res. Band
15.900	Average	Vert	35.27	37.24	-26.2	46.3	---	46.3	54	7.7	1.1	0	Res. Band
15.900	Max Peak	Vert	47.78	37.24	-26.2	58.8	---	58.8	74	15.2	1.1	0	Res. Band
15.900	Average	Horz	35.64	37.24	-26.2	46.7	---	46.7	54	7.3	1.0	40	Res. Band
15.900	Max Peak	Horz	47.93	37.24	-26.2	59.0	---	59.0	74	15.0	1.0	40	Res. Band
21.200	Average	Vert	44.49	47.02	-32.6	58.9	---	58.9	63.5	4.6	1.2	340	Res. Band
21.200	Max Peak	Vert	55.17	47.02	-32.6	69.6	---	69.6	83.5	13.9	1.2	340	Res. Band
21.200	Average	Horz	44.01	47.02	-32.6	58.4	---	58.4	63.5	5.1	1.1	340	Res. Band
21.200	Max Peak	Horz	55.21	47.02	-32.6	69.6	---	69.6	83.5	13.9	1.1	340	Res. Band
31.800	Average	Vert	53.10	47.70	-43.8	57.0	---	57.0	63.5	6.5	1.2	40	Res. Band
31.800	Max Peak	Vert	65.92	47.70	-43.8	69.8	---	69.8	83.5	13.7	1.2	40	Res. Band
31.800	Average	Horz	52.93	47.70	-43.8	56.8	---	56.8	63.5	6.7	1.2	100	Res. Band
31.800	Max Peak	Horz	65.33	47.70	-43.8	69.2	---	69.2	83.5	14.3	1.2	100	Res. Band



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

**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; 22% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15 Subpart E; FCC Part 15.205  
**Comment:** Continuous Transmit  
**Date:** 03/03/2009

**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	34.77	38.74	-26.7	46.8	---	46.8	54	7.2	1.1	0	Res. Band
10.650	Max Peak	Vert	47.39	38.74	-26.7	59.4	---	59.4	74	14.6	1.1	0	Res. Band
10.650	Average	Horz	35.37	38.74	-26.7	47.4	---	47.4	54	6.6	1.0	330	Res. Band
10.650	Max Peak	Horz	47.88	38.74	-26.7	59.9	---	59.9	74	14.1	1.0	330	Res. Band
15.975	Average	Vert	35.68	37.21	-26.2	46.7	---	46.7	54	7.3	1.1	0	Res. Band
15.975	Max Peak	Vert	49.16	37.21	-26.2	60.2	---	60.2	74	13.8	1.1	0	Res. Band
15.975	Average	Horz	36.12	37.21	-26.2	47.1	---	47.1	54	6.9	1.1	340	Res. Band
15.975	Max Peak	Horz	47.62	37.21	-26.2	58.6	---	58.6	74	15.4	1.1	340	Res. Band
21.300	Average	Vert	44.14	46.98	-33.0	58.1	---	58.1	63.5	5.4	1.2	0	Res. Band
21.300	Max Peak	Vert	55.40	46.98	-33.0	69.4	---	69.4	83.5	14.1	1.2	0	Res. Band
21.300	Average	Horz	45.69	46.98	-33.0	59.7	---	59.7	63.5	3.8	1.1	180	Res. Band
21.300	Max Peak	Horz	56.51	46.98	-33.0	70.5	---	70.5	83.5	13.0	1.1	180	Res. Band



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

## APPENDIX A

# DATA AND GRAPH(S) TAKEN SHOWING THE LOWER AND UPPER BAND-EDGE COMPLIANCE

## PART 15.407 b(7)





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

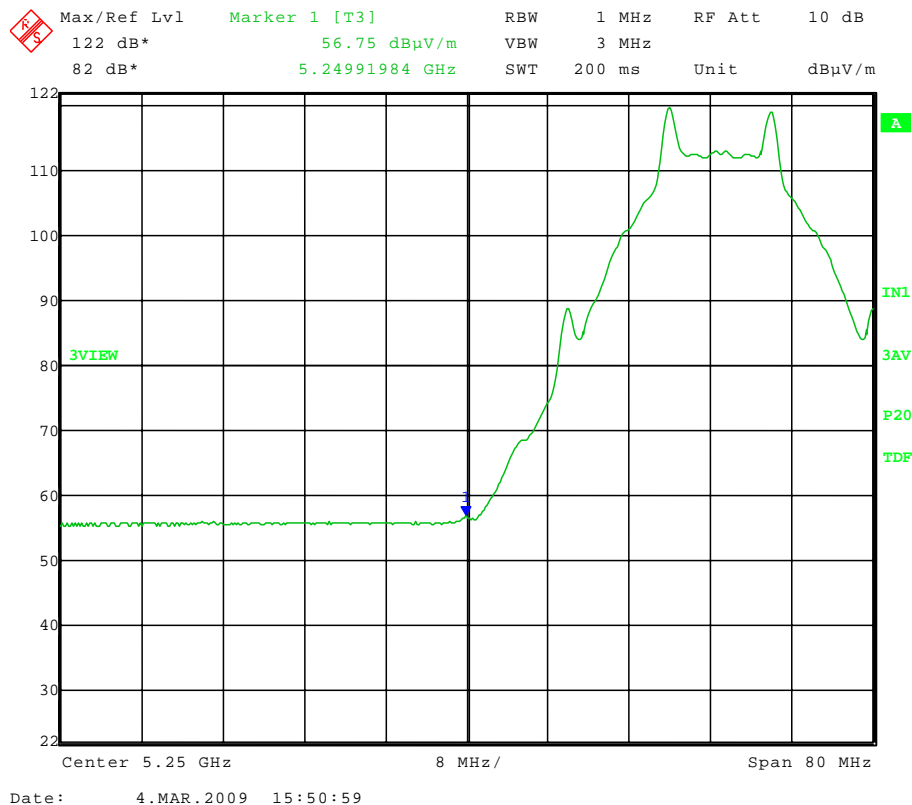
1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Lower Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: **Low Channel**: Frequency – 5275 MHz  
Modulation: FSK, 2-Level

Band-Edge Frequency: 5.25 GHz  
Band-Edge Limit: -27 dBm/MHz EIRP

Frequency and Polarization (GHz)	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)	Margin (dB)
5.25 vertical	56.75	-48.88	2.80	10.89	-40.79	13.79





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

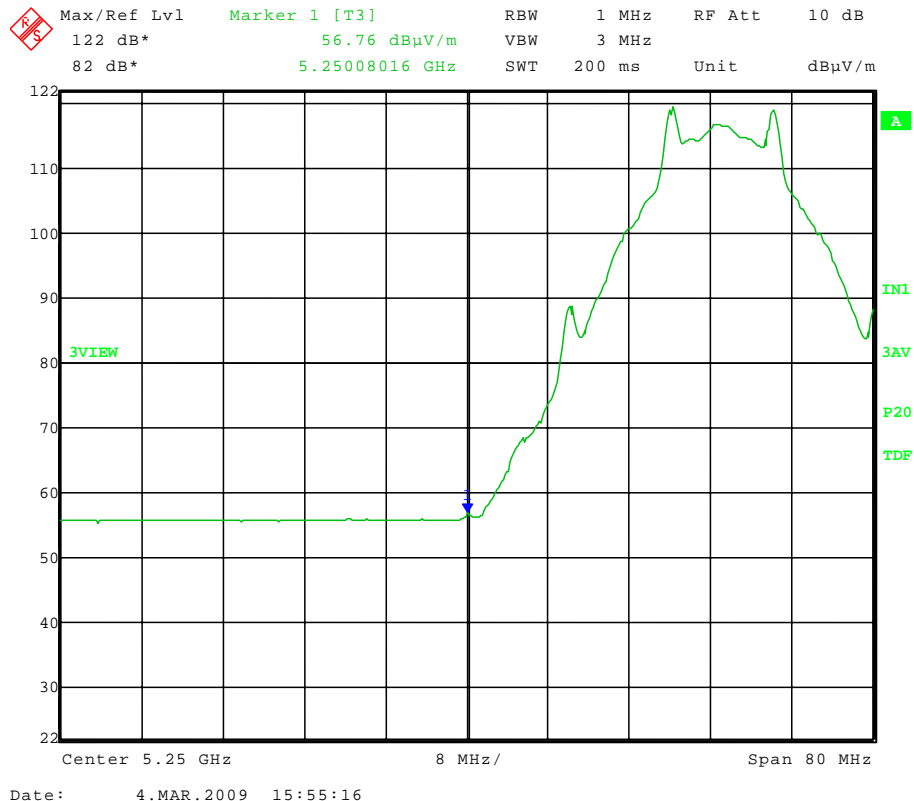
1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Lower Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: **Low Channel**: Frequency – 5275 MHz  
Modulation: FSK, 4-Level

Band-Edge Frequency: 5.25 GHz  
Band-Edge Limit: -27 dBm/MHz EIRP

Frequency and Polarization (GHz)	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)	Margin (dB)
5.25 vertical	56.76	-48.87	2.80	10.89	-40.78	13.78





Company: Motorola  
 Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
 Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

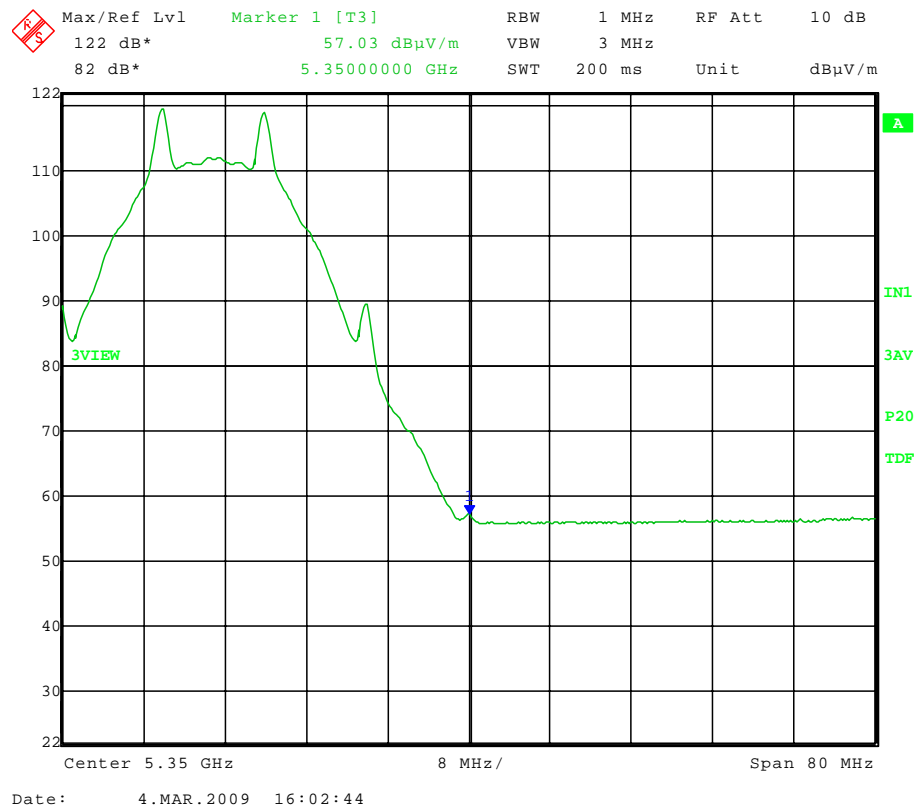
Test Date: 03-04-2009  
 Company: Motorola  
 EUT: Canopy 5200  
 Test: Upper Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
 Operator: Craig B  
 Comment: **High Channel**: Frequency – 5325 MHz

Modulation: FSK, 2-Level

Band-Edge Frequency: 5.35 GHz

Band-Edge Limit: -27 dBm/MHz EIRP

Frequency and Polarization (GHz)	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)	Margin (dB)
5.35 vertical	57.03	-48.63	2.84	10.87	-40.60	13.60





Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

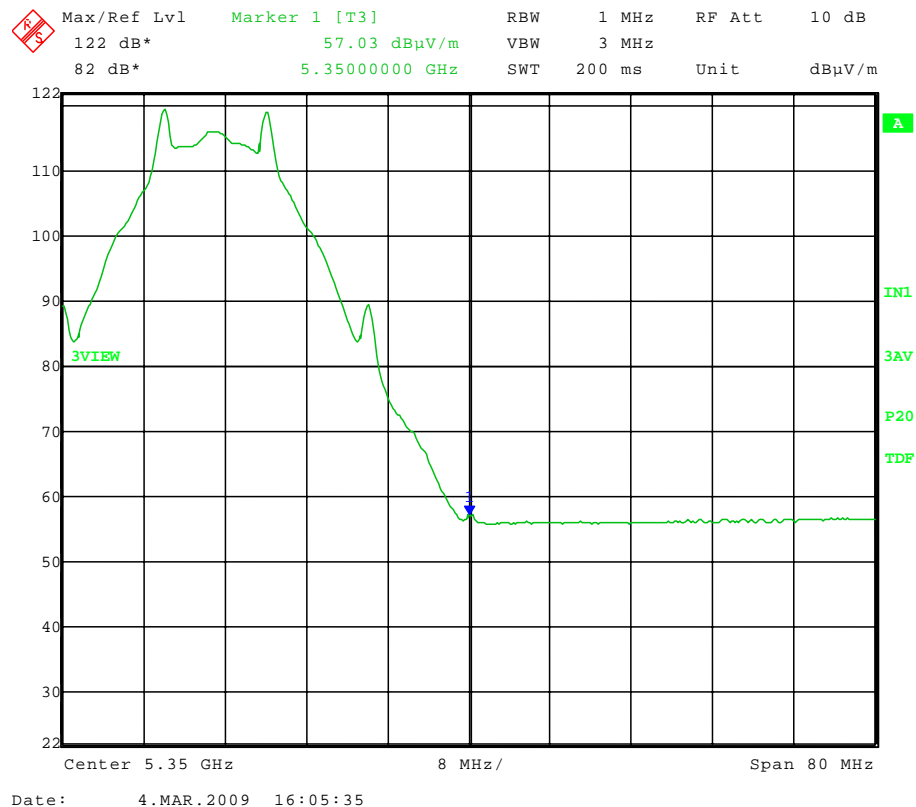
Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Upper Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: **High Channel**: Frequency – 5325 MHz

Modulation: FSK, 4-Level

Band-Edge Frequency: 5.35 GHz

Band-Edge Limit: -27 dBm/MHz EIRP

Frequency and Polarization (GHz)	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)	Margin (dB)
5.35 vertical	57.03	-48.63	2.84	10.87	-40.60	13.60





1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

## APPENDIX A

### 5.0 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 DUSAL, Model Number: 5200XLG connectorized, 5200XLG (single patch), 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 DUSAL were made up to 40,000 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.



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

## APPENDIX A

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

For operation in the bands 5250 – 5350 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 5250 – 5350 MHz band shall not exceed –27 dBm/MHz as stated in FCC, Part 15, Section 15.407 b(2) .

Frequency range in MHz	Field Strength of Fundamental mWatts	Field Strength of Spurious Emissions dBm/MHz
30 -5470	250	-27
5470-5725		-27
5725-40000		

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 70°F at 22% relative humidity.**



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

# RADIATED DATA TAKEN FOR FUNDAMENTAL EIRP EMISSION MEASUREMENTS

## PART 15.407 b(2)



Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-03-2009  
Temperature: 70 deg. F  
Humidity: 22% R.H.

Power set to EC  
Limit = 24 dBm + 6dBi for antenna gain = 30 dBm

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	127.04	21.40	2.80	10.89	29.49	30.00	0.51	889.20
5275 horizontal	120.65	14.38	2.80	10.89	22.47	30.00	7.53	176.60

EIRP = Signal generator output - cable loss + antenna gain

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





Company: Motorola  
 Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
 Report Number: 15162

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
 Operator: Craig B  
 Date of test: 03-03-2009  
 Temperature: 70 deg. F  
 Humidity: 22% R.H.

Power set to EC

Limit = 24 dBm + 6dBi for antenna gain = 30 dBm

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	127.28	21.41	2.82	10.88	29.47	30.00	0.53	885.12
5300 horizontal	120.06	13.76	2.82	10.88	21.82	30.00	8.18	152.05

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
 Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
 Report Number: 15162

DLS Electronic Systems, Inc.

Company: Motorola  
 Operator: Craig B  
 Date of test: 03-03-2009  
 Temperature: 70 deg. F  
 Humidity: 22% R.H.

Power set to EC

Limit = 24 dBm + 6dBi for antenna gain = 30 dBm

EIRP - Substitution Method

Model: <b>Canopy 5200</b>								
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	126.57	20.91	2.84	10.87	28.94	30	1.06	783.43
5325 horizontal	120.13	13.89	2.84	10.87	21.92	30	8.08	155.60

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company:	Motorola
Model Tested:	5200XLG connectorized, 5200XLG (single patch)
Report Number:	15162

# RADIATED DATA TAKEN FOR SPURIOUS EMISSION MEASUREMENTS

## PART 15.407 b(6) UNWANTED EMISSIONS BELOW 1 GHz

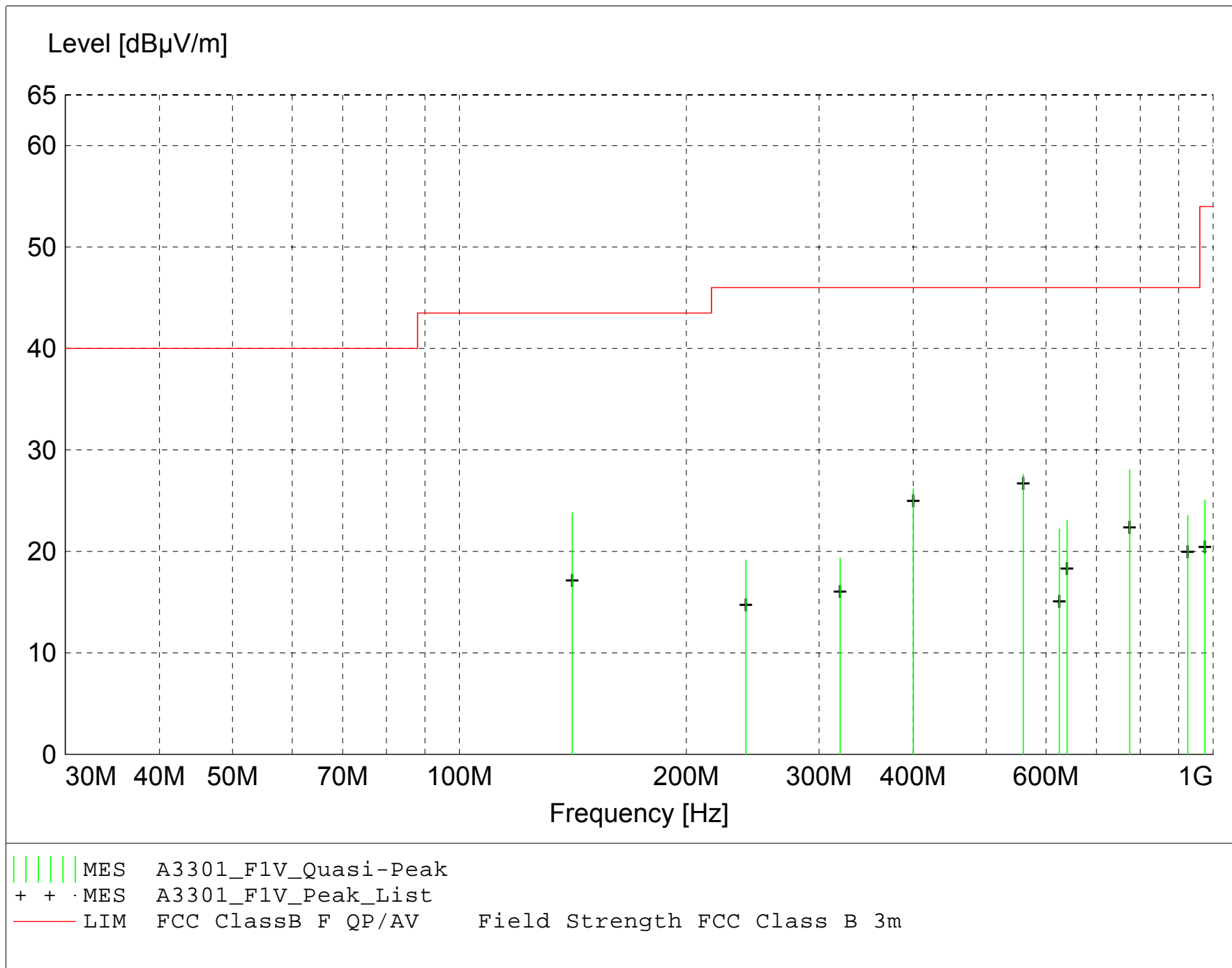
**FCC Part 15 Class B**

**Electric Field Strength**

EUT: Canopy 5200  
Manufacturer: Motorola  
Operating Condition: 70 deg. F; 22% R.H.  
Test Site: DLS O.F. Site 3  
Operator: Craig B  
Test Specification:  
Comment: Transmit and Receive; Low, Mid, and High channels  
Date: 03-04-2009

**TEXT: "Site 3 MidV 3M"**

Short Description: Test Set-up Vert30-1000MHz  
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005  
  
Antennas ---  
Biconical -- EMCO 3104C SN: 9701-4785  
Log Periodic -- EMCO 3146 SN: 9702-4895  
  
Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/005  
  
TEST SET-UP: EUT Measured at 3 Meters with VERTICAL Antenna Polarization



**MEASUREMENT RESULT: "A3301\_F1V\_Final"**

3/4/2009 1:52PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
774.980000	25.74	21.36	-19.0	28.1	46.0	17.9	1.20	135	QUASI-PEAK	None
559.990000	30.17	18.48	-21.0	27.6	46.0	18.4	1.00	135	QUASI-PEAK	None
141.160000	35.13	11.94	-23.2	23.8	43.5	19.7	1.00	235	QUASI-PEAK	None
399.980000	31.73	16.06	-21.6	26.2	46.0	19.8	1.20	140	QUASI-PEAK	None
924.990000	19.53	22.61	-18.6	23.6	46.0	22.4	1.00	135	QUASI-PEAK	None
639.980000	24.19	19.58	-20.7	23.1	46.0	22.9	1.00	135	QUASI-PEAK	None
624.990000	23.68	19.28	-20.8	22.2	46.0	23.8	1.00	135	QUASI-PEAK	None
319.980000	25.84	15.55	-22.0	19.4	46.0	26.6	1.00	0	QUASI-PEAK	None
239.980000	29.46	12.09	-22.4	19.2	46.0	26.8	1.00	0	QUASI-PEAK	None
974.980000	19.35	23.49	-17.8	25.1	54.0	28.9	1.00	180	QUASI-PEAK	None

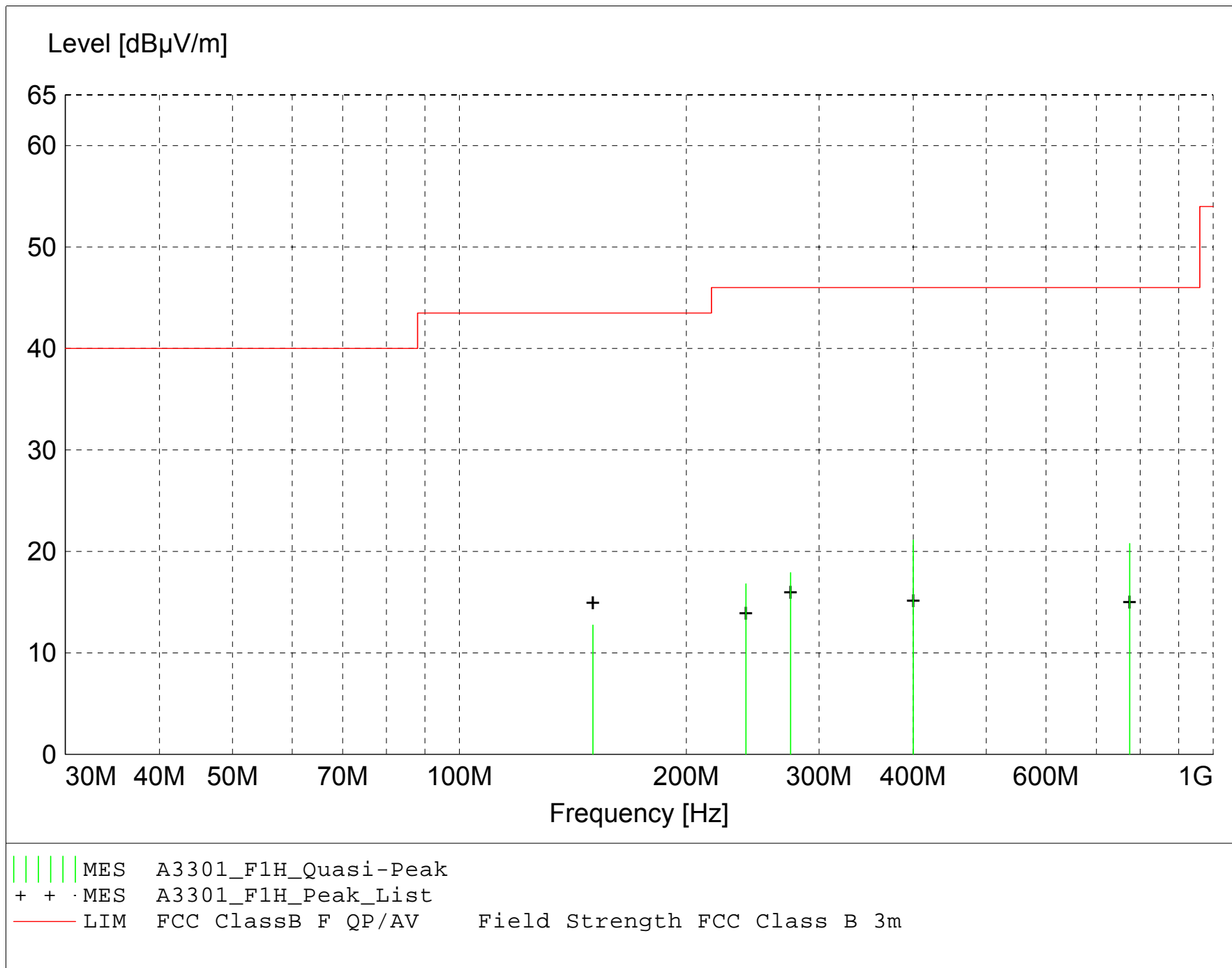
**FCC Part 15 Class B**

**Electric Field Strength**

EUT: Canopy 5200  
Manufacturer: Motorola  
Operating Condition: 70 deg. F; 22% R.H.  
Test Site: DLS O.F. Site 3  
Operator: Craig B  
Test Specification:  
Comment: Transmit and Receive; Low, Mid, and High channels  
Date: 03-04-2009

**TEXT: "Site 3 MidH 3M"**

Short Description: Test Set-up Horz30-1000MHz  
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005  
  
Antennas ---  
Biconical -- EMCO 3104C SN: 9701-4785  
Log Periodic -- EMCO 3146 SN: 9702-4895  
  
Pre-Amp --- Rohde&Schwarz TS-PR10 SN: 032001/005  
  
TEST SET-UP: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization





**MEASUREMENT RESULT: "A3301\_F1H\_Final"**

3/4/2009 2:16PM

Frequency	Level	Antenna	System	Total	Limit	Margin	Height	EuT	Final	Comment
MHz	dBμV	Factor	Loss	Level			Ant.	Angle	Detector	
		dBμV/m	dB	dBμV/m	dBμV/m	dB	m	deg		
400.000000	26.67	16.06	-21.6	21.1	46.0	24.9	1.00	135	QUASI-PEAK	None
774.990000	18.47	21.36	-19.0	20.8	46.0	25.2	1.20	90	QUASI-PEAK	None
274.980000	26.78	13.34	-22.2	17.9	46.0	28.1	1.00	135	QUASI-PEAK	None
239.980000	27.11	12.09	-22.4	16.8	46.0	29.2	1.00	225	QUASI-PEAK	None
150.335000	23.75	12.15	-23.1	12.7	43.5	30.8	2.20	90	QUASI-PEAK	None



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

RADIATED DATA TAKEN FOR  
FIELD STRENGTH  
EIRP SPURIOUS EMISSION MEASUREMENTS  
PART 15.407 b(3)



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-03-2009  
Temperature: 70 deg. F  
Humidity: 22% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Average Detector

Unmodulated

FCC Pt. 15.407(b)(2)

Spurious Emissions - EIRP - Substitution Method

Model: <b>Canopy 5200</b>							
Channel: <b>Low</b> - 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	51.90	-54.8	3.9	12.2	-46.6	-27.0	19.6
10.550 horizontal	54.04	-52.5	9.9	12.2	-50.2	-27.0	23.2
15.825 vertical	52.02	-54.1	4.9	16.4	-42.7	-27.0	15.7
15.825 horizontal	53.79	-53.1	4.9	16.4	-41.6	-27.0	14.6
21.100 vertical	63.36	-50.3	7.7	10.5	-47.5	-27.0	20.5
21.100 horizontal	68.14	-43.5	7.7	10.5	-40.7	-27.0	13.7
26.375 vertical	66.03	-47.3	8.7	11.2	-44.7	-27.0	17.7
26.375 horizontal	61.61	-52.4	8.7	11.2	-49.8	-27.0	22.8
31.650 vertical	58.75	-56.9	9.8	12.3	-54.4	-27.0	27.4
31.650 horizontal	59.68	-54.8	9.8	12.3	-52.3	-27.0	25.3
36.925 vertical	56.06	-55.3	11.9	15.4	-51.7	-27.0	24.7
36.925 horizontal	60.01	-51.4	11.9	15.4	-47.9	-27.0	20.9

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-03-2009  
Temperature: 70 deg. F  
Humidity: 22% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Average Detector

Unmodulated

FCC Pt. 15.407(b)(2)

Spurious Emissions - EIRP - Substitution Method

Model: <b>Canopy 5200</b>							
Channel: <b>Mid</b> - 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	50.68	-56.1	3.9	12.2	-47.8	-27.0	20.8
10.600 horizontal	53.87	-52.5	3.9	12.2	-44.2	-27.0	17.2
15.900 vertical	50.90	-56.3	4.9	16.4	-44.8	-27.0	17.8
15.900 horizontal	51.95	-56.0	4.9	16.4	-44.5	-27.0	17.5
21.200 vertical	66.38	-47.2	7.7	10.6	-44.3	-27.0	17.3
21.200 horizontal	66.46	-45.5	7.7	10.6	-42.6	-27.0	15.6
26.500 vertical	59.45	-54.4	8.8	11.3	-51.9	-27.0	24.9
26.500 horizontal	57.68	-56.0	8.8	11.3	-53.6	-27.0	26.6
31.800 vertical	60.39	-54.7	9.9	11.9	-52.7	-27.0	25.7
31.800 horizontal	59.56	-54.9	9.9	11.9	-52.9	-27.0	25.9
37.100 vertical	59.04	-53.4	12.0	15.4	-50.0	-27.0	23.0
37.100 horizontal	65.59	-46.5	12.0	15.4	-43.1	-27.0	16.1

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 03-03-2009  
Temperature: 70 deg. F  
Humidity: 22% R.H.

Test Distance: 3 meters from 1 to 18 GHz  
Test Distance: 1 meter from 18 to 40 GHz  
Average Detector  
Unmodulated  
FCC Pt. 15.407(b)(2)

Spurious Emissions - EIRP - Substitution Method

Model: <b>Canopy 5200</b>							
Channel: <b>High</b> - 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	50.84	-55.3	3.9	12.3	-47.0	-27.0	20.0
10.650 horizontal	51.57	-53.4	3.9	12.3	-45.1	-27.0	18.1
15.975 vertical	52.35	-53.2	4.9	16.4	-41.7	-27.0	14.7
15.975 horizontal	53.05	-54.6	4.9	16.4	-43.1	-27.0	16.1
21.300 vertical	67.29	-46.8	7.7	10.6	-43.9	-27.0	16.9
21.300 horizontal	67.46	-45.5	7.7	10.6	-42.6	-27.0	15.6
26.625 vertical	58.30	-54.8	8.9	11.3	-52.4	-27.0	25.4
26.625 horizontal	54.88	-59.4	8.9	11.3	-57.0	-27.0	30.0
31.950 vertical	55.71	-59.2	9.9	11.4	-57.8	-27.0	30.8
31.950 horizontal	55.91	-58.8	9.9	11.4	-57.3	-27.0	30.3
37.275 vertical	58.77	-54.4	12.1	15.6	-50.9	-27.0	23.9
37.275 horizontal	65.23	-47.5	12.1	15.6	-44.0	-27.0	17.0

EIRP = Signal generator output - cable loss + antenna gain

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



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

# TRANSMIT POWER CONTROL MEASUREMENTS

## PART 15.407 h(1)



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

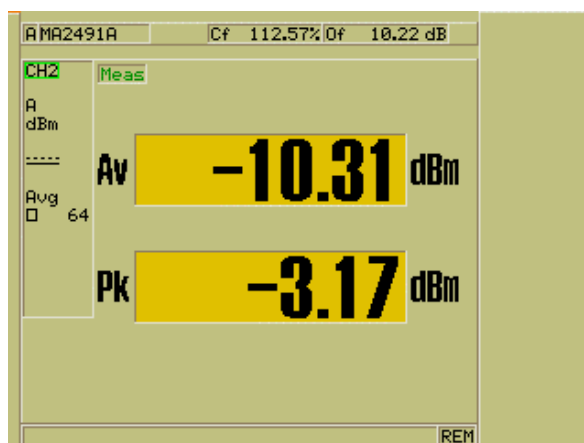
Channel: **Low** – 5275 MHz  
Modulation: 2-level  
Power setting: 00

Output Power Limit = 250 mW = 24 dBm

Output Power Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Transmit Power Control power limit: At least 6 dB below 23 dBm = 17 dBm

Average Output Power = **-10.31 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

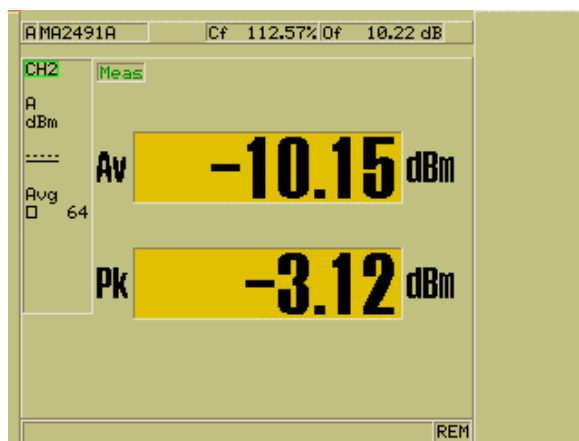
Channel: **Low** – 5275 MHz  
Modulation: 4-level  
Power setting: 00

Output Power Limit = 250 mW = 24 dBm

Output Power Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Transmit Power Control power limit: At least 6 dB below 23 dBm = 17 dBm

Average Output Power = **-10.15 dBm**







1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

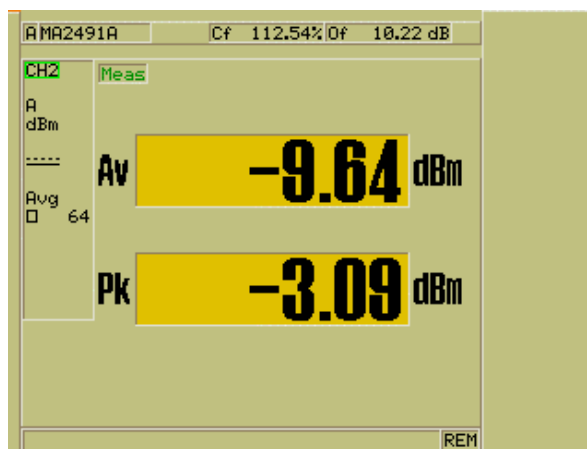
Channel: **Mid** – 5300 MHz  
Modulation: 2-level  
Power setting: 00

Output Power Limit = 250 mW = 24 dBm

Output Power Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Transmit Power Control power limit: At least 6 dB below 23 dBm = 17 dBm

Average Output Power = **-9.64 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

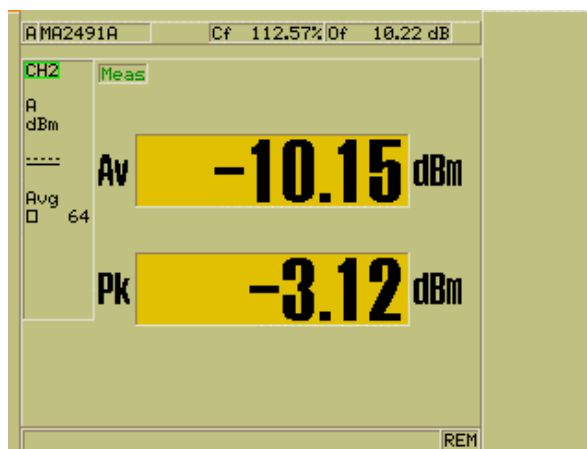
Channel: **Mid** – 5300 MHz  
Modulation: 4-level  
Power setting: 00

Output Power Limit = 250 mW = 24 dBm

Output Power Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Transmit Power Control power limit: At least 6 dB below 23 dBm = 17 dBm

Average Output Power = **-10.15 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

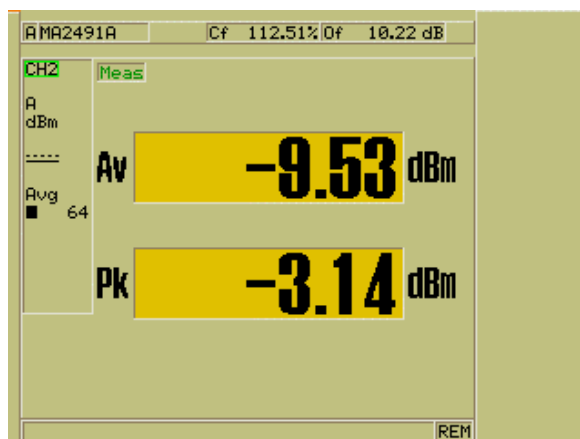
Channel: **High** – 5325 MHz  
Modulation: 2-level  
Power setting: 00

Output Power Limit = 250 mW = 24 dBm

Output Power Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Transmit Power Control power limit: At least 6 dB below 23 dBm = 17 dBm

Average Output Power = **-9.53 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5200XLG connectorized, 5200XLG (single patch)  
Report Number: 15162

Test Date: 03-04-2009  
Company: Motorola  
EUT: Canopy 5200  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: **High** – 5325 MHz  
Modulation: 4-level  
Power setting: 00

Output Power Limit = 250 mW = 24 dBm

Output Power Limit reduced by 1 dB (antenna has a gain of 7 dBi) = 23 dBm

Transmit Power Control power limit: At least 6 dB below 23 dBm = 17 dBm

Average Output Power = **-9.78 dBm**

