



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

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: DUSAL 5400  
Kind of Equipment: Digital Transmission Transceiver  
Frequency Range: 5495 MHz - 5705 MHz  
Test Configuration: Phihong 29.5V power Supply PSA 15R (Tested at 120 vac, 60 Hz)  
Model Number(s): 5400SMG, 5400APG, 5400BHG  
Model(s) Tested: 5400XLG connectorized, 5400XLG (single patch)  
Serial Number(s): Patch: 0A003E53FAC9; Connectorized: 0A003E53FB66  
Date of Tests: January 28, 29, 30, & February 3, 2009  
Test Conducted For: Motorola  
1299 E. Algonquin Road  
Schaumburg, Illinois 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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Model Tested:  
Report Number:

Motorola  
5400XLG connectorized, 5400XLG (single patch)  
15047

### SIGNATURE PAGE

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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 Communique dated 18 June 2005).*



2008-10-01 through 2009-09-30

*Effective dates*

*Sally 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 DUSAL 5400, Model Number(s) 5400XLG connectorized, 5400XLG (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 5.47-5.725 GHz Band.

## 2.0 INTRODUCTION

On January 28, 29, 30, & February 3, 2009, a series of radio frequency interference measurements was performed on DUSAL 5400, Model Number(s) 5400XLG connectorized, 5400XLG (single patch), Serial Number: Patch: 0A003E53FAC9; Connectorized: 0A003E53FB66. 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 5.47-5.725 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.

#### 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:

5.4GHz UNII transceiver Canopy FSK Radio.

### 7.2 PHYSICAL DIMENSIONS OF EQUIPMENT UNDER TEST

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

### 7.3 LINE FILTER USED:

N/A

### 7.4 INTERNAL CLOCK FREQUENCIES:

Switching Power Supply Frequencies:

150 kHz

Clock Frequencies:

20 MHz & 25 MHz

### 7.5 DESCRIPTION OF ALL CIRCUIT BOARDS:

- |                                           |                        |
|-------------------------------------------|------------------------|
| 1. DUSAL 5400 w/ Integrated Patch Antenna | PN: 8415506A01 issue A |
| 2. DUSAL 5400 w/ Connector                | PN: 8415506A01 issue A |
| 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:

The DUSAL 5400 was tested as follows:

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 DUSAL 5400

Model Number: 5400XLG connectorized, 5400XLG (single patch) Serial Number: Patch: 0A003E53FAC9; Connectorized: 0A003E53FB66

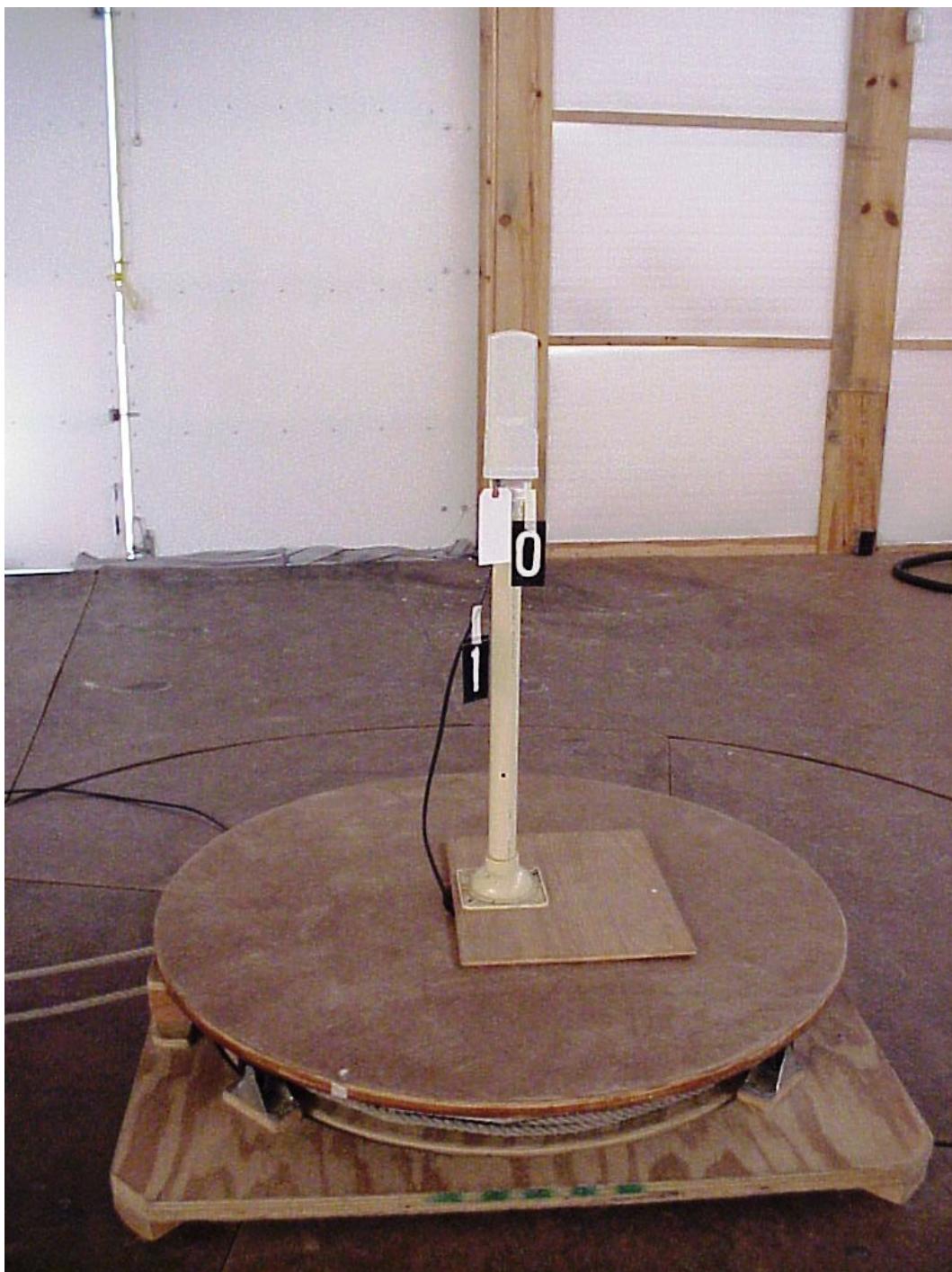
Item 1 300 ft. shielded communications cable with metal connectors.



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#### 10.0 ID PHOTOS TAKEN DURING TESTING

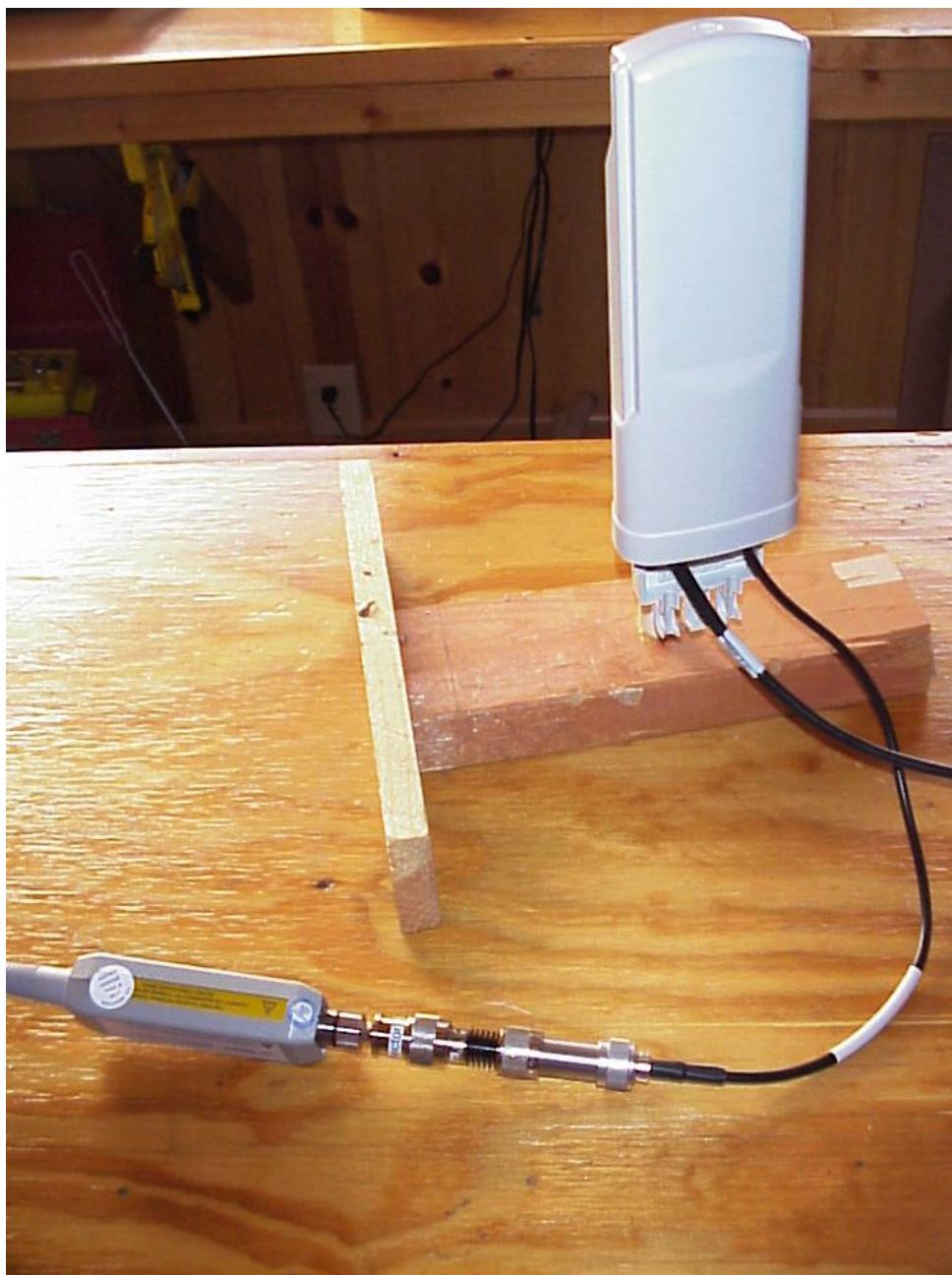




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#### 10.0 RADIATED PHOTOS TAKEN DURING TESTING



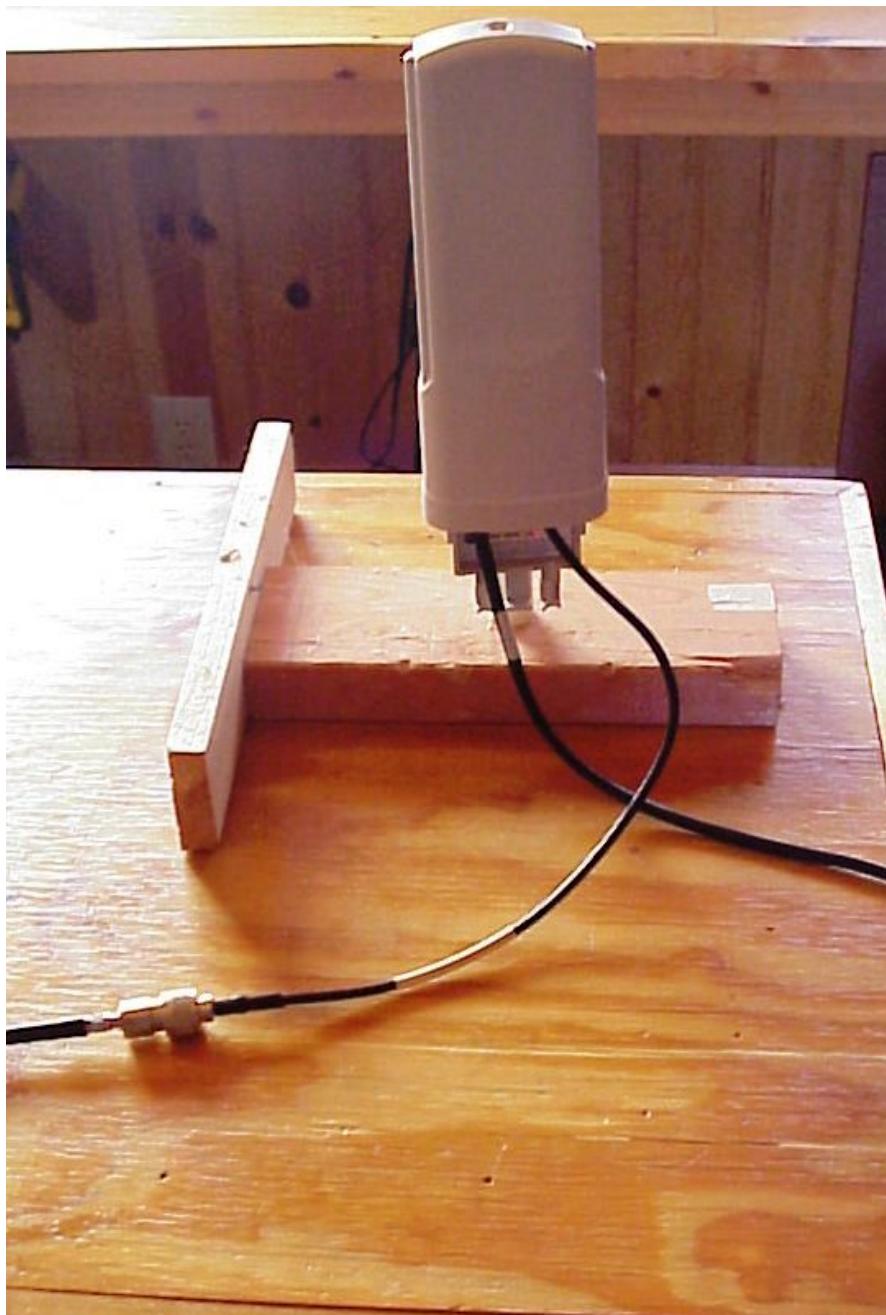
#### OUTPUT POWER AND TRANSMIT POWER CONTROL



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#### 10.0 RADIATED PHOTOS TAKEN DURING TESTING



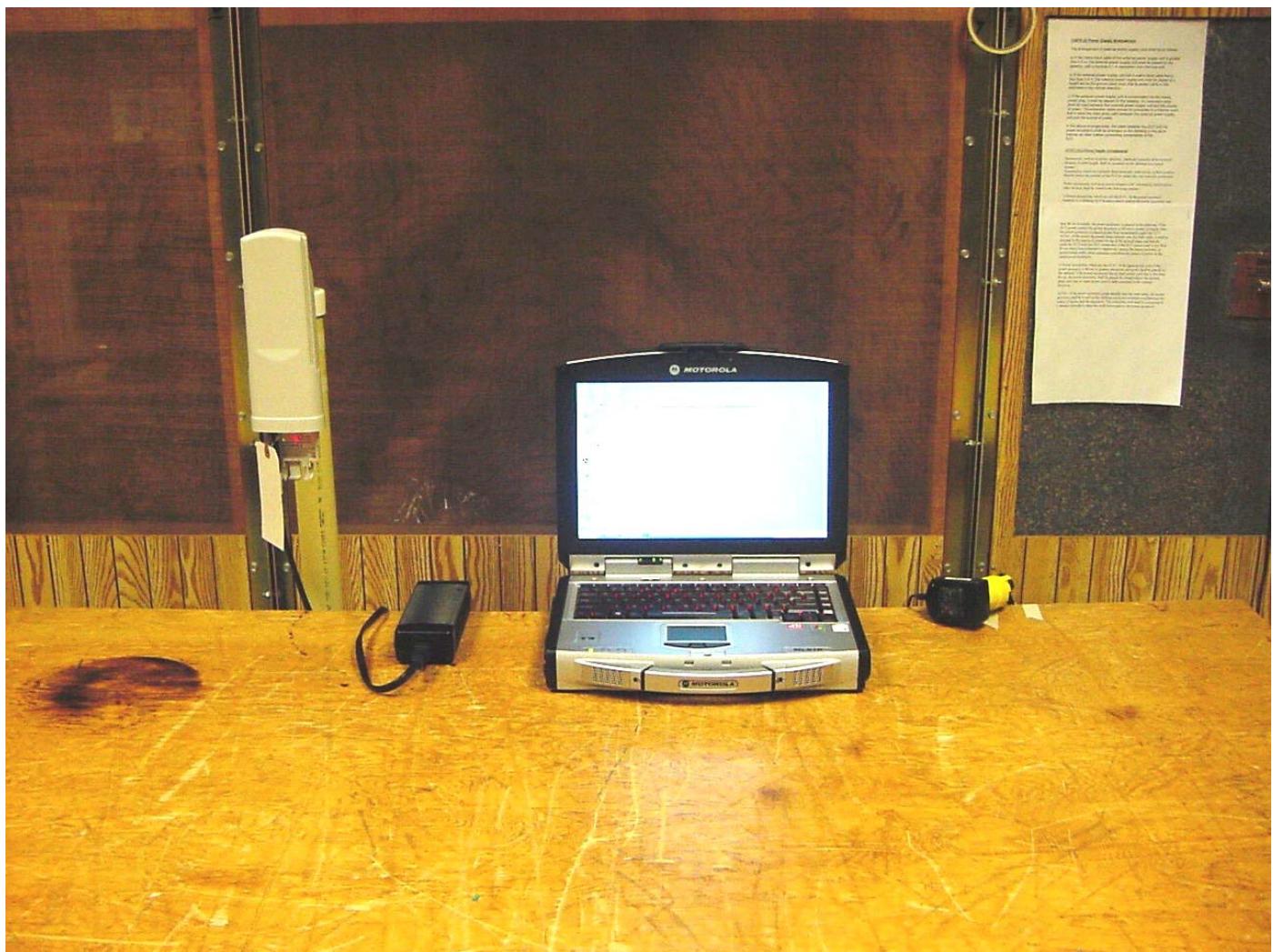
RF CONDUCTED



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## 10.0 CONDUCTED PHOTOS TAKEN DURING TESTING





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## 10.0 CONDUCTED PHOTOS TAKEN DURING TESTING





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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 DUSAL 5400, Model Number(s) 5400XLG connectorized, 5400XLG (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 5.47-5.725 GHz Band.



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TABLE 1 – EQUIPMENT LIST

Test Equipment	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Due Dates
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	1-18GHz	6/09
Horn Antenna	EMCO	3115	6204	1-18GHz	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
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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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	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

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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## APPENDIX

### 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 **23%** relative humidity.



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

**PART 15.407 b(6)**

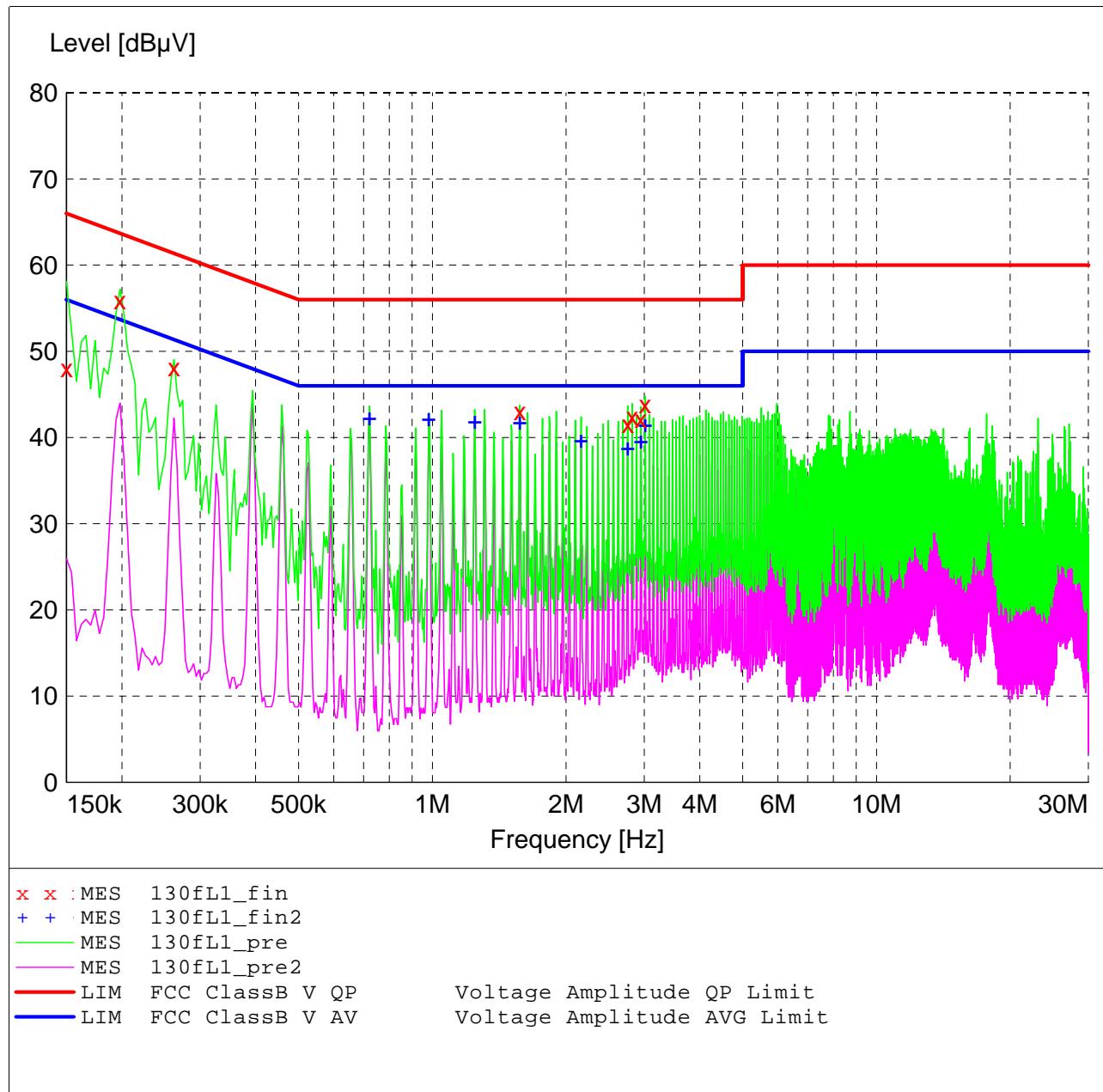
**PART 15.207**

**Voltage Mains Test**

EUT: Canopy 5400  
 Manufacturer: Motorola  
 Operating Condition: 70 deg. F, 23% R.H.  
 Test Site: DLS O.F. Site 1 (Screenroom)  
 Operator: Craig B  
 Test Specification: 120 V 60 Hz  
 Comment: Line 1  
 Date: 01-30-2009

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

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



**MEASUREMENT RESULT: "130fL1\_fin"**

1/30/2009 10:58AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.150000	48.00	12.0	66	18.0	QP	---	---
0.198000	55.90	11.5	64	7.8	QP	---	---
0.262000	48.10	11.1	61	13.3	QP	---	---
1.574000	43.00	10.9	56	13.0	QP	---	---
2.754000	41.50	11.1	56	14.5	QP	---	---
2.818000	42.40	11.1	56	13.6	QP	---	---
2.950000	42.10	11.1	56	13.9	QP	---	---
3.014000	43.80	11.2	56	12.2	QP	---	---

**MEASUREMENT RESULT: "130fL1\_fin2"**

1/30/2009 10:58AM

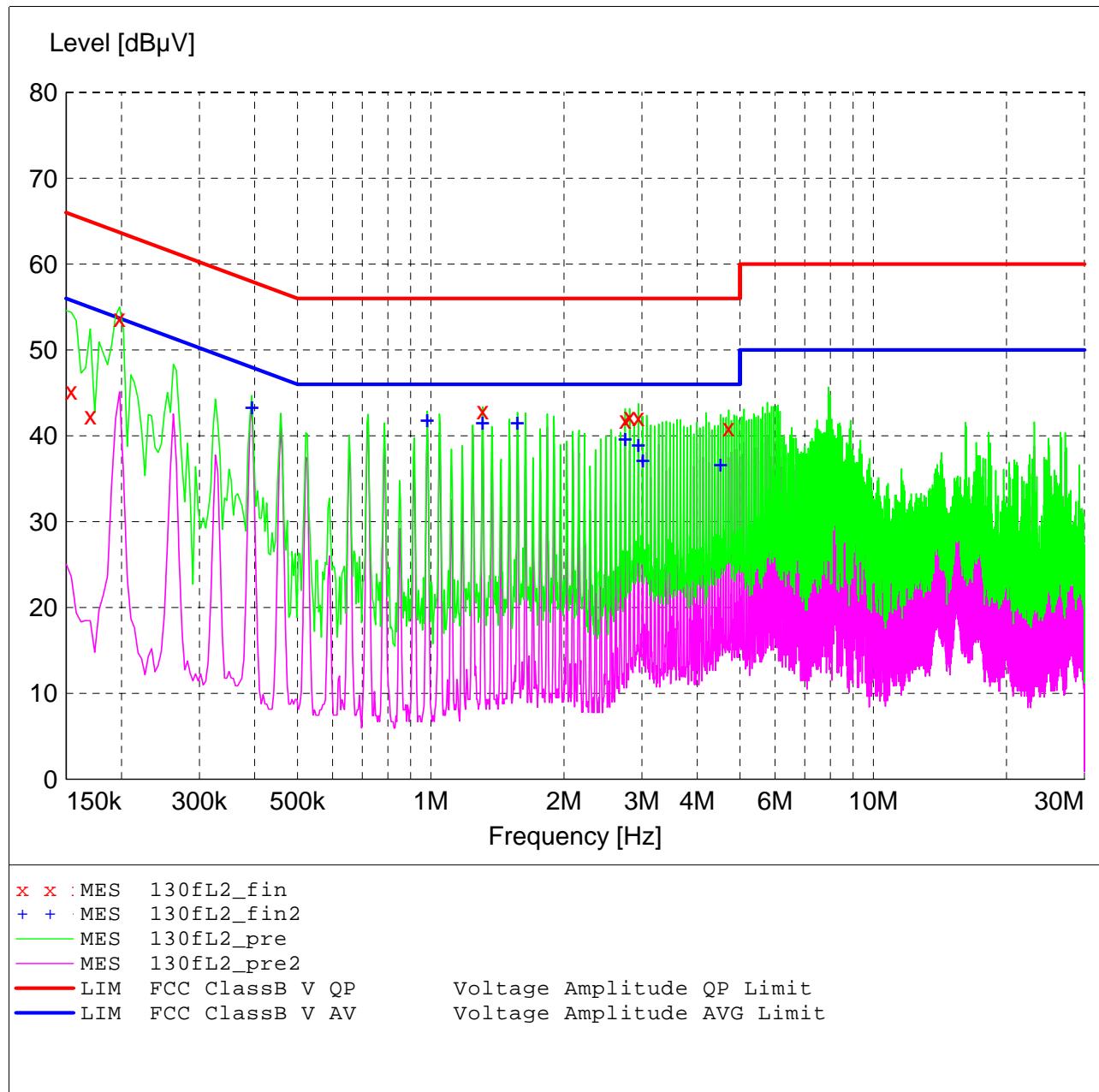
Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.722000	42.30	10.7	46	3.7	CAV	---	---
0.982000	42.20	10.7	46	3.8	CAV	---	---
1.246000	41.90	10.8	46	4.1	CAV	---	---
1.574000	41.80	10.9	46	4.2	CAV	---	---
2.162000	39.80	11.1	46	6.2	CAV	---	---
2.754000	38.80	11.1	46	7.2	CAV	---	---
2.950000	39.70	11.1	46	6.3	CAV	---	---
3.014000	41.50	11.2	46	4.5	CAV	---	---

**Voltage Mains Test**

EUT: Canopy 5400  
 Manufacturer: Motorola  
 Operating Condition: 70 deg. F, 23% R.H.  
 Test Site: DLS O.F. Site 1 (Screenroom)  
 Operator: Craig B  
 Test Specification: 120 V 60 Hz  
 Comment: Line 2  
 Date: 01-30-2009

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

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



**MEASUREMENT RESULT: "130fL2\_fin"**

1/30/2009 11:04AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.154000	45.20	11.9	66	20.6	QP	---	---
0.170000	42.30	11.8	65	22.7	QP	---	---
0.198000	53.70	11.5	64	10.0	QP	---	---
1.310000	42.90	10.8	56	13.1	QP	---	---
2.750000	41.80	11.1	56	14.2	QP	---	---
2.814000	42.20	11.1	56	13.8	QP	---	---
2.946000	42.10	11.1	56	13.9	QP	---	---
4.714000	41.00	11.1	56	15.0	QP	---	---

**MEASUREMENT RESULT: "130fL2\_fin2"**

1/30/2009 11:04AM

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Detector	Line	PE
0.394000	43.40	10.8	48	4.6	CAV	---	---
0.982000	41.90	10.7	46	4.1	CAV	---	---
1.310000	41.60	10.8	46	4.4	CAV	---	---
1.570000	41.60	10.9	46	4.4	CAV	---	---
2.750000	39.80	11.1	46	6.2	CAV	---	---
2.946000	39.00	11.1	46	7.0	CAV	---	---
3.014000	37.30	11.2	46	8.7	CAV	---	---
4.518000	36.80	11.0	46	9.2	CAV	---	---



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## APPENDIX A

### 2.0 MAXIMUM CONDUCTED OUTPUT POWER – 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 5470-5725 MHz frequency band.

The allowed emissions for transmitters operating in the 5470-5725 MHz band for DUSAL 5400 equipment are found under Part 15, Section 15.407 a(2).

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



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## APPENDIX A

# MAXIMUM CONDUCTED OUTPUT POWER DATA

## PART 15.407 a(2)



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## APPENDIX A

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Low - 5495 MHz  
Modulation: 2-level  
Power setting: D4

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

Average Output Power = **22.38 dBm**





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## APPENDIX A

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Mid - 5600 MHz  
Modulation: 2-level  
Power setting: D4

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

Average Output Power = **22.83 dBm**





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: High - **5705 MHz**  
Modulation: **2-level**  
Power setting: D4

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

Average Output Power = **22.50 dBm**





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Low - 5495 MHz  
Modulation: 4-level  
Power setting: D4

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

Average Output Power = **22.38 dBm**





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: Mid - 5600 MHz  
Modulation: 4-level  
Power setting: D4

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

Average Output Power = **22.83 dBm**





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

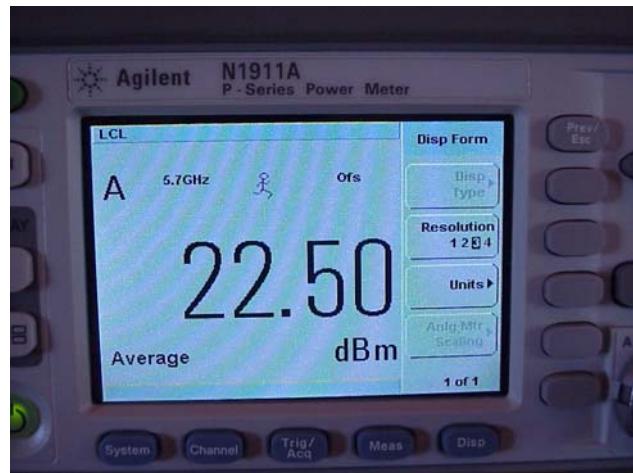
## APPENDIX A

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Output Power - Conducted (FCC 15.407(a)(2))  
Operator: Craig B

Channel: High – 5705 MHz  
Modulation: 4-level  
Power setting: D4

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

Average Output Power = **22.50 dBm**





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

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

### PART 15.407 a(2)



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 01-28-2009  
Temperature: 68 deg. F  
Humidity: 22% R.H.

Limit: 250 mW = 24 dBm

Corrected Limit = 24 dBm + 7 dBi Antenna Gain - 1 dB (gain over 6 dBi) = 30 dBm

Power set to D4

EIRP - Substitution Method (FCC 15.407(a)(2))

Model: <b>Canopy 5400</b>						
Channel: Low - 5495 MHz						
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)
5495 vertical	127.04	27.62	9.08	11.00	29.54	30.00
5495 horizontal	119.48	20.00	9.08	11.00	21.92	30.00

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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 01-28-2009  
Temperature: 68 deg. F  
Humidity: 22% R.H.

Limit: 250 mW = 24 dBm

Corrected Limit = 24 dBm + 7 dBi Antenna Gain - 1 dB (gain over 6 dBi) = 30 dBm

Power set to D4

EIRP - Substitution Method (FCC 15.407(a)(2))

Model: <b>Canopy 5400</b>						
Channel: Mid - 5600 MHz						
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)
5600 vertical	126.02	26.17	9.10	11.12	28.19	30.00
5600 horizontal	121.05	22.60	9.10	11.12	24.62	30.00

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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 01-28-2009  
Temperature: 68 deg. F  
Humidity: 22% R.H.

Limit: 250 mW = 24 dBm

Corrected Limit = 24 dBm + 7 dBi Antenna Gain - 1 dB (gain over 6 dBi) = 30 dBm

Power set to D4

### EIRP - Substitution Method (FCC 15.407(a)(2))

Model: <b>Canopy 5400</b>						
Channel: High - 5705 MHz						
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)
5705 vertical	125.22	24.73	9.16	11.25	26.82	30.00
5705 horizontal	120.54	21.20	9.16	11.25	23.29	30.00

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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## 26 dB BANDWIDTH DATA AND GRAPH(S)

PART 15.407 a(2)

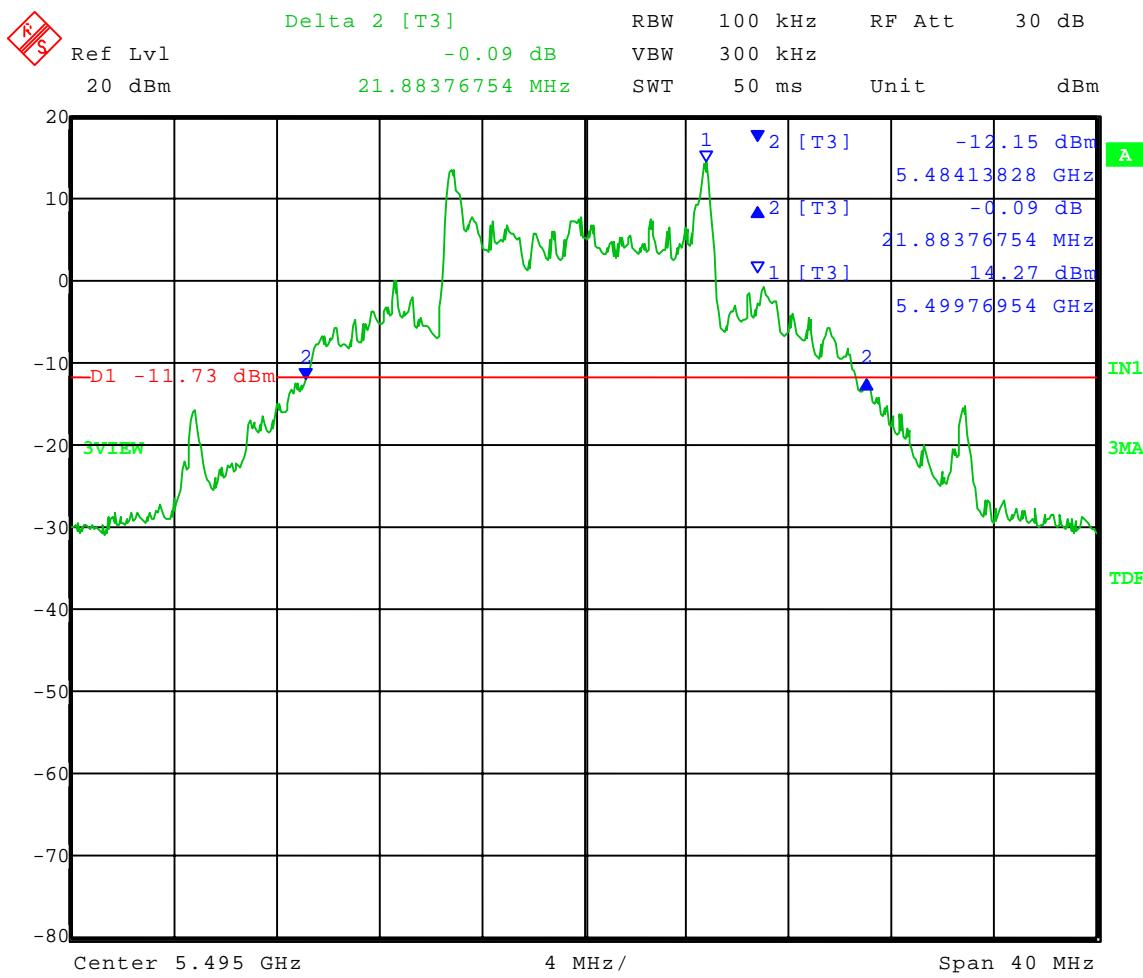


Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Low Channel: Frequency – 5495 MHz  
Modulation: FSK; 2-level

26 dB Bandwidth = 21.9 MHz



Date: 3.FEB.2009 14:19:52

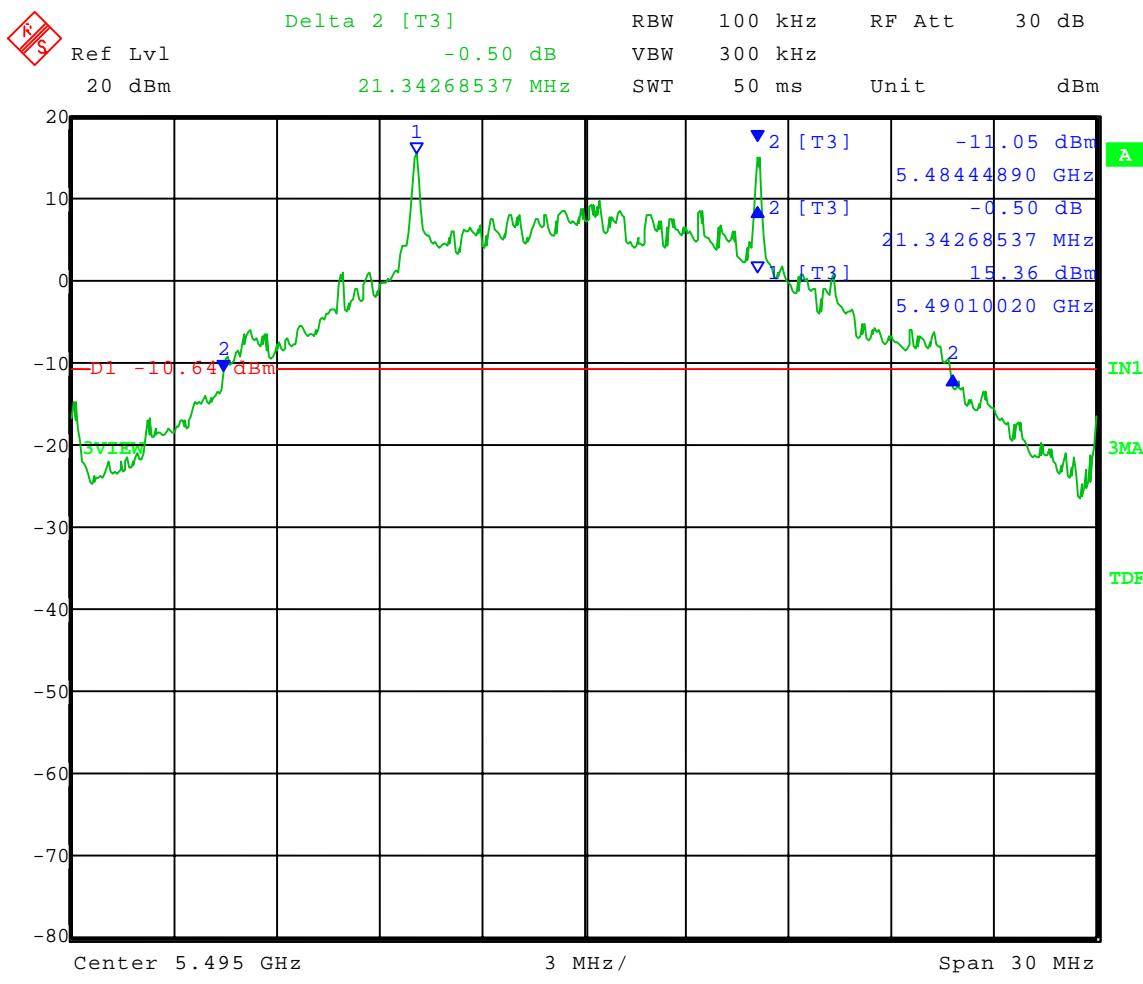


Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Low Channel: Frequency – 5495 MHz  
Modulation: FSK; 4-level

26 dB Bandwidth = 21.3 MHz



Date: 3.FEB.2009 14:26:18

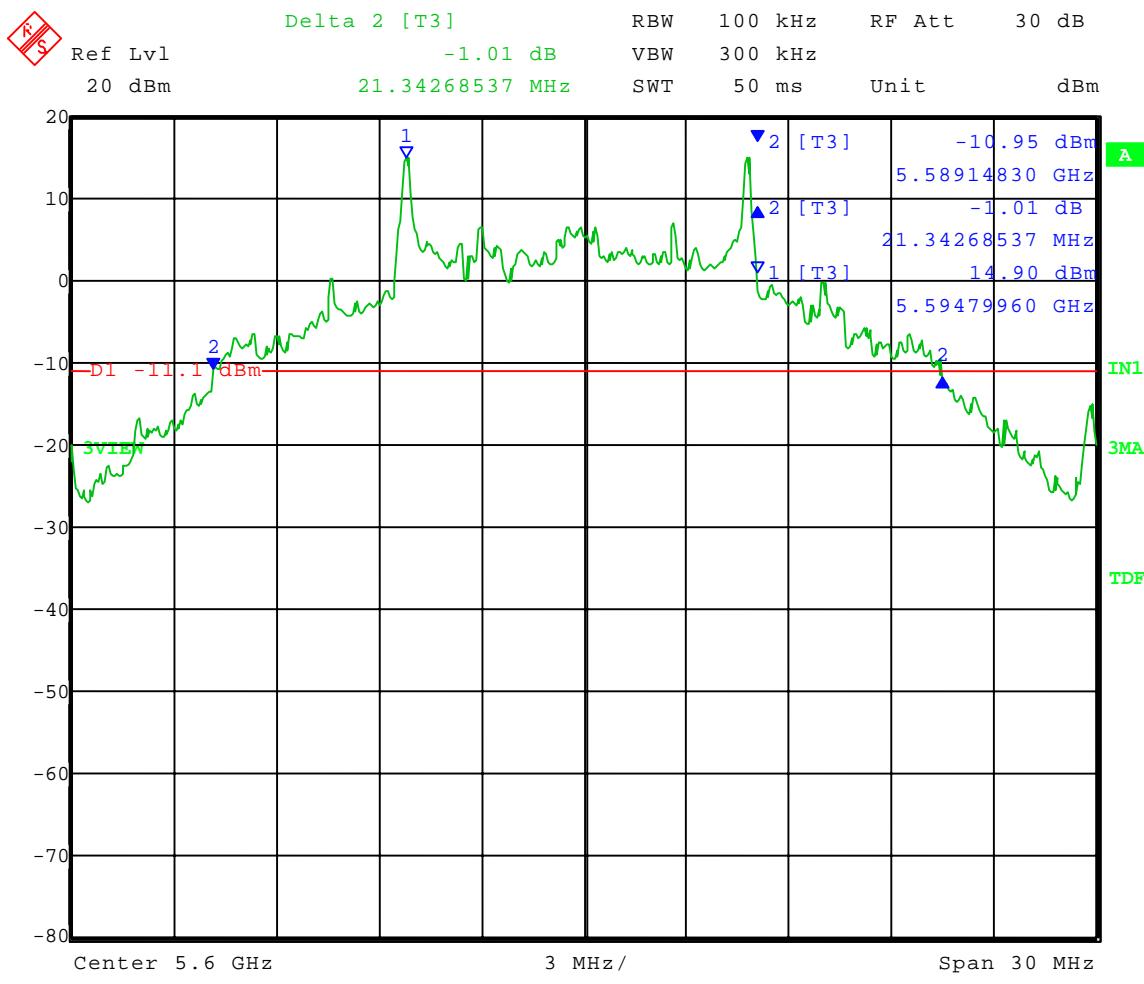


Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: Mid Channel: Frequency – 5600 MHz  
Modulation: FSK; 2-level

26 dB Bandwidth = 21.3 MHz



Date: 3.FEB.2009 14:29:24

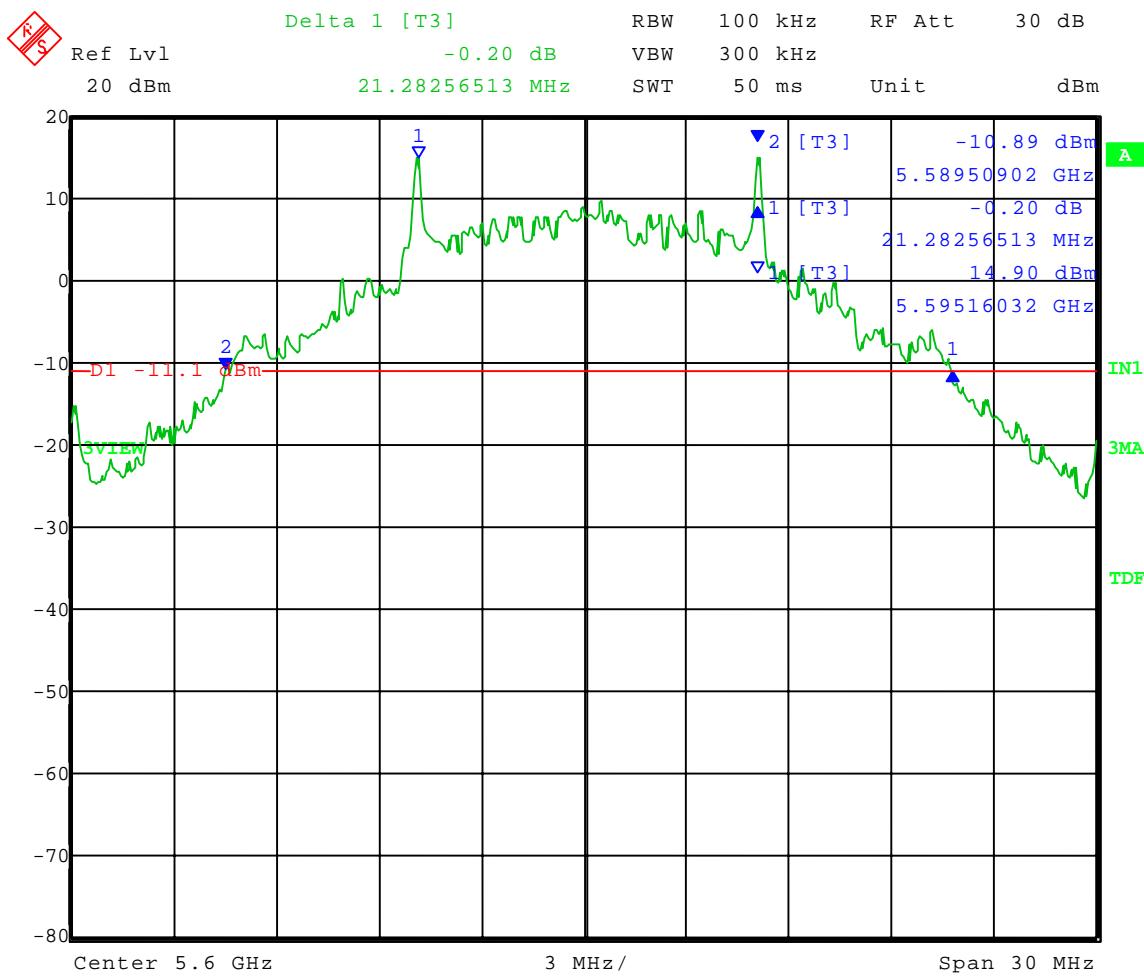


Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: 26 dB Bandwidth  
Operator: Craig B  
Comment: Mid Channel: Frequency – 5600 MHz  
Modulation: FSK; 4-level

26 dB Bandwidth = 21.3 MHz



Date: 3.FEB.2009 14:33:17

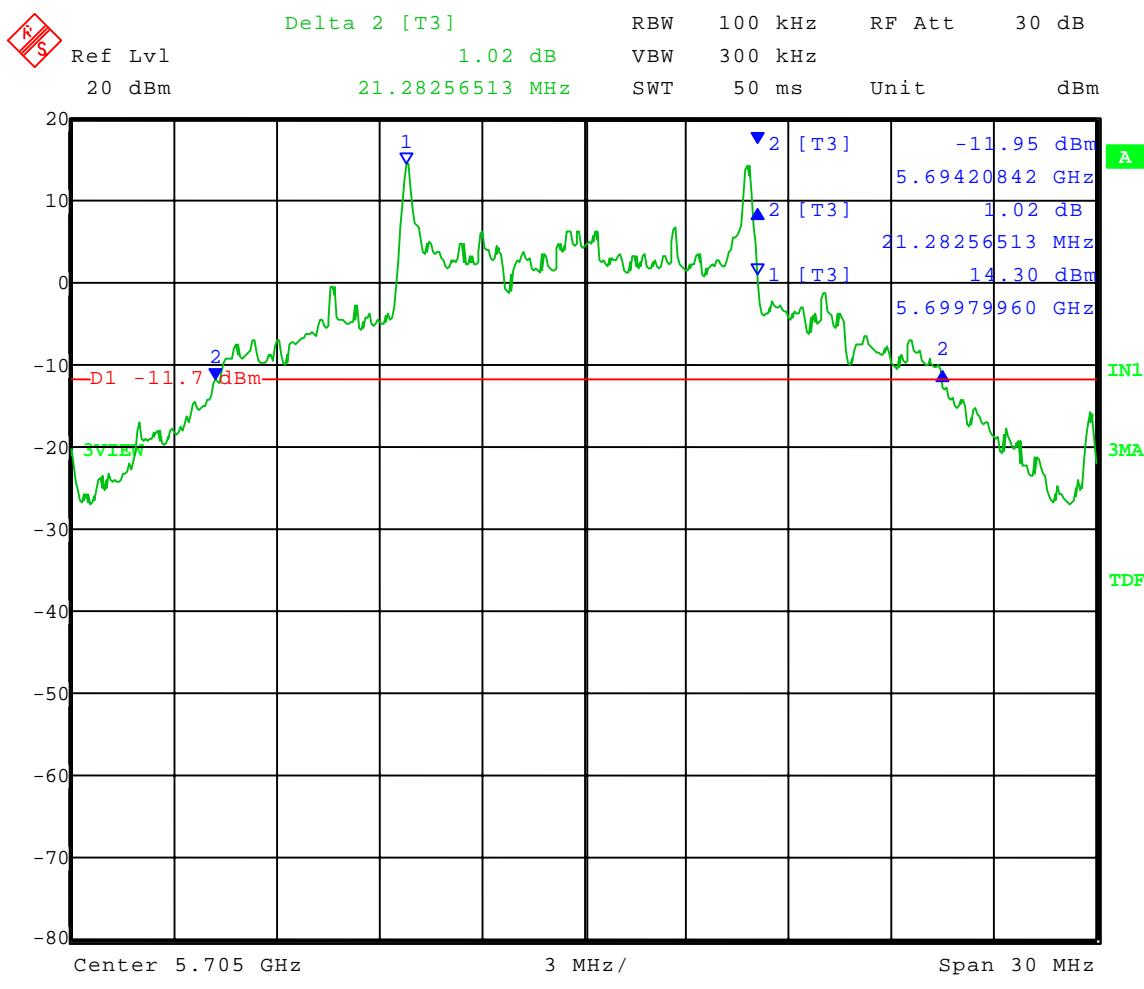


Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

**1250 Peterson Dr., Wheeling, IL 60090**

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: High Channel: Frequency – 5705 MHz  
Modulation: FSK; 2-level

26 dB Bandwidth = 21.3 MHz



Date: 3.FEB.2009 14:36:06

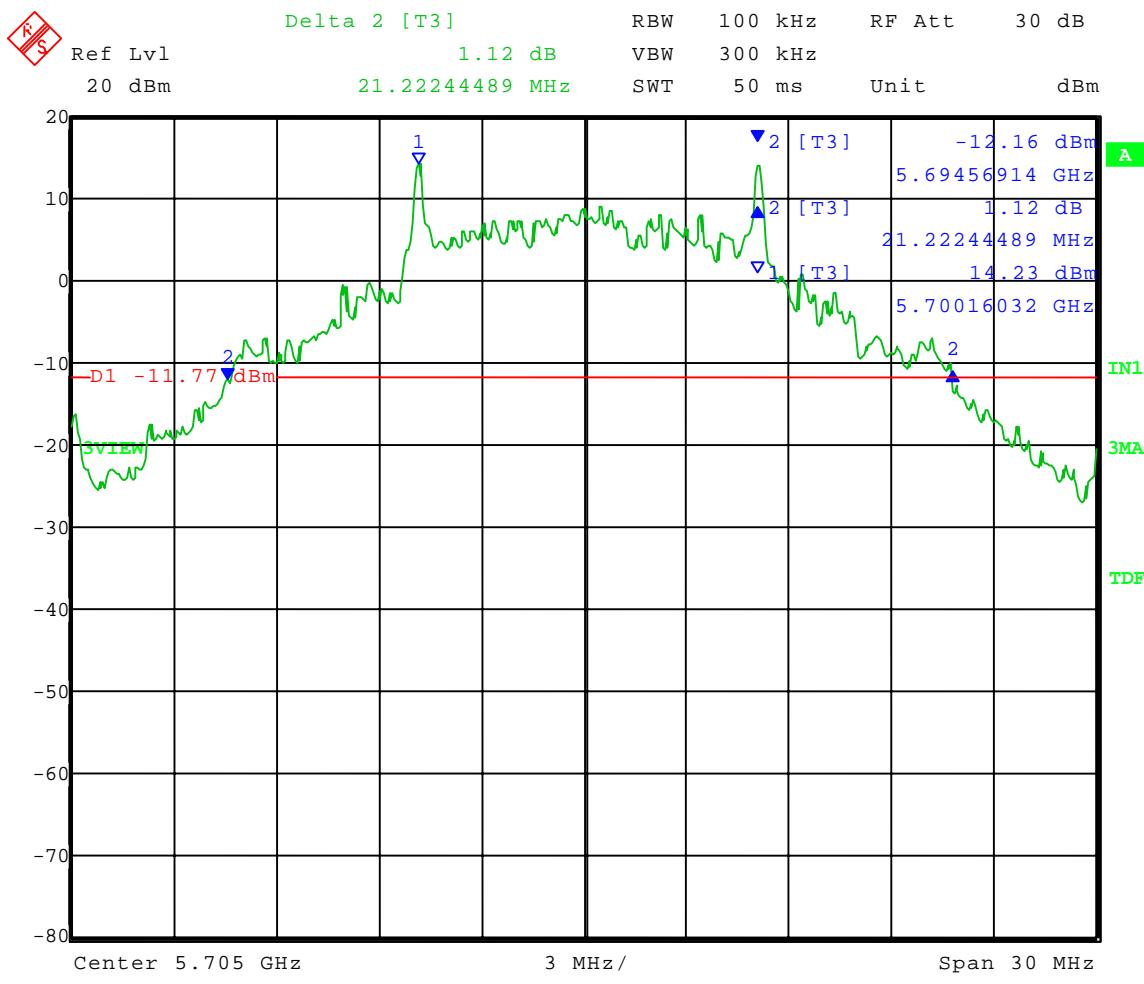


Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: 26 dB Bandwidth (FCC 15.407(a)(2))  
Operator: Craig B  
Comment: High Channel: Frequency – 5705 MHz  
Modulation: FSK; 4-level

26 dB Bandwidth = 21.2 MHz



Date: 3.FEB.2009 14:40:00



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## PEAK POWER SPECTRAL DENSITY DATA

### PART 15.407 a(2)

Company: Motorola

Operator: Craig B

Date of test: 01-30-2009

Temperature: 73 deg. F.

Humidity: 22% R.H.

Test:

**Peak Power Spectral Density FCC 15.407(a)(2)**

RBW: 1 MHz

VBW: 3 MHz

Detector: RMS

SPAN: 1 MHz

Sweep time: 5 sec.

Model: Canopy 5400 (7 dBi antenna)

**Low channel (5495 MHz); FSK 2-Level modulation; power setting D4**

Power Density averaged over 20 MHz channel

Center frequency of 1 MHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5484.5	-5.33	0.293
5485.0	-4.05	0.394
5485.5	-3.73	0.424
5486.0	-2.93	0.509
5486.5	-1.44	0.718
5487.0	-0.17	0.962
5487.5	0.10	1.023
5488.0	0.81	1.205
5488.5	4.34	2.716
5489.0	10.19	10.447
5489.5	13.81	24.044
5490.0	13.92	24.660
5490.5	12.75	18.836
5491.0	9.58	9.078
5491.5	7.66	5.834
5492.0	7.11	5.140
5492.5	7.02	5.035
5493.0	6.58	4.550
5493.5	6.74	4.721
5494.0	7.38	5.470
5494.5	7.66	5.834
5495.0	7.41	5.508
5495.5	7.61	5.768
5496.0	6.90	4.898
5496.5	6.59	4.560
5497.0	7.17	5.212
5497.5	7.23	5.284
5498.0	7.20	5.248
5498.5	8.32	6.792
5499.0	11.65	14.622

5499.5	13.15	20.654
5500.0	13.52	22.491
5500.5	10.56	11.376
5501.0	4.98	3.148
5501.5	1.12	1.294
5502.0	0.24	1.057
5502.5	-0.31	0.931
5503.0	-1.36	0.731
5503.5	-2.64	0.545
5504.0	-3.62	0.435
5504.5	-4.37	0.366
5505.0	-5.33	0.293
5505.5	-6.83	0.207

Total Power in 20 MHz channel (mW) = 252.813

Average total power (mW) = 6.166

Average power (dBm) = 7.9

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

Margin (dB) = 2.1

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 cannot claim compliance of the EUT using these test methods.

Company: Motorola

Operator: Craig B

Date of test: 02-03-2009

Temperature: 72 deg. F.

Humidity: 23% R.H.

Test:

**Peak Power Spectral Density FCC 15.407(a)(2)**

RBW: 1 MHz

VBW: 3 MHz

Detector: RMS

SPAN: 1 MHz

Sweep time: 5 sec.

Model: Canopy 5400 (7 dBi antenna)

**Low channel (5495 MHz); FSK 4-Level modulation; power setting D4**

Power Density averaged over 20 MHz channel

Center frequency of 1 MHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5484.5	-7.60	0.174
5485.0	-6.42	0.228
5485.5	-5.88	0.258
5486.0	-4.86	0.327
5486.5	-3.63	0.434
5487.0	-2.19	0.604
5487.5	-0.68	0.855
5488.0	0.80	1.202
5488.5	2.77	1.892
5489.0	6.57	4.539
5489.5	10.00	10.000
5490.0	10.58	11.429
5490.5	10.57	11.402
5491.0	10.33	10.789
5491.5	9.37	8.650
5492.0	9.00	7.943
5492.5	8.96	7.870
5493.0	9.46	8.831
5493.5	10.22	10.520
5494.0	10.75	11.885
5494.5	10.81	12.050
5495.0	10.81	12.050
5495.5	10.82	12.078
5496.0	10.63	11.561
5496.5	10.16	10.375
5497.0	9.35	8.610
5497.5	9.17	8.260
5498.0	9.14	8.204
5498.5	8.81	7.603
5499.0	8.59	7.228

5499.5	9.38	8.670
5500.0	9.38	8.670
5500.5	9.37	8.650
5501.0	7.73	5.929
5501.5	4.33	2.710
5502.0	1.83	1.524
5502.5	0.17	1.040
5503.0	-1.62	0.689
5503.5	-3.48	0.449
5504.0	-5.04	0.313
5504.5	-6.08	0.247
5505.0	-6.94	0.202
5505.5	-7.69	0.170

Total Power in 20 MHz channel (mW) = 246.771

Average total power (mW) = 6.02

Average power (dBm) = 7.795

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

Margin (dB) = 2.2

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 cannot claim compliance of the EUT using these test methods.

Company: Motorola  
 Operator: Craig B  
 Date of test: 01-30-2009  
 Temperature: 73 deg. F.  
 Humidity: 22% R.H.

Test:

**Peak Power Spectral Density FCC 15.407(2)**

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

Model: Canopy 5400 (7 dBi antenna)

**Mid channel (5600 MHz); FSK 2-Level modulation; power setting D4**

Power Density averaged over 20 MHz channel

Center frequency of 1 MHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5589.5	-4.18	0.382
5590.0	-3.59	0.438
5590.5	-3.19	0.480
5591.0	-2.43	0.571
5591.5	-0.94	0.805
5592.0	0.59	1.146
5592.5	1.33	1.358
5593.0	1.95	1.567
5593.5	4.89	3.083
5594.0	10.24	10.568
5594.5	14.07	25.527
5595.0	14.22	26.424
5595.5	12.86	19.320
5596.0	8.85	7.674
5596.5	6.74	4.721
5597.0	6.52	4.487
5597.5	6.55	4.519
5598.0	6.26	4.227
5598.5	6.42	4.385
5599.0	7.20	5.248
5599.5	7.55	5.689
5600.0	7.58	5.728
5600.5	7.20	5.248
5601.0	6.81	4.797
5601.5	6.23	4.198
5602.0	6.71	4.688
5602.5	6.46	4.426
5603.0	6.68	4.656
5603.5	7.41	5.508
5604.0	11.13	12.972

<b>Center frequency of 1 MHz span (MHz)</b>	<b>Highest level measured within span (dBm)</b>	<b>dBm converted to mW (mW)</b>
5604.5	13.89	24.491
5605.0	13.93	24.717
5605.5	11.62	14.521
5606.0	6.87	4.864
5606.5	2.94	1.968
5607.0	1.62	1.452
5607.5	0.97	1.250
5608.0	-0.20	0.955
5608.5	-1.65	0.684
5609.0	-2.80	0.525
5609.5	-3.38	0.459
5610.0	-4.57	0.349
5610.5	-5.95	0.254

Total Power in 20 MHz channel (mW) = 260.692

Average total power (mW) = 6.358

Average power (dBm) = 8.03

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

Margin (dB) = 1.97

**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 cannot claim compliance of the EUT using these test methods.

Company: Motorola

Operator: Craig B

Date of test: 02-03-2009

Temperature: 72 deg. F.

Humidity: 23% R.H.

Test:

**Peak Power Spectral Density FCC 15.407(a)(2)**

RBW: 1 MHz

VBW: 3 MHz

Detector: RMS

SPAN: 1 MHz

Sweep time: 5 sec.

Model: Canopy 5400 (7 dBi antenna)

**Mid channel (5600 MHz); FSK 4-Level modulation; power setting D4**

Power Density averaged over 20 MHz channel

Center frequency of 1 MHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5589.5	-8.07	0.156
5590.0	-6.91	0.204
5590.5	-6.30	0.234
5591.0	-5.31	0.294
5591.5	-4.01	0.397
5592.0	-2.61	0.548
5592.5	-1.05	0.785
5593.0	0.49	1.119
5593.5	2.43	1.750
5594.0	6.23	4.198
5594.5	9.63	9.183
5595.0	10.19	10.447
5595.5	10.18	10.423
5596.0	9.95	9.886
5596.5	8.82	7.621
5597.0	8.58	7.211
5597.5	8.59	7.228
5598.0	9.05	8.035
5598.5	9.83	9.616
5599.0	10.38	10.914
5599.5	10.48	11.169
5600.0	10.48	11.169
5600.5	10.52	11.272
5601.0	10.34	10.814
5601.5	9.89	9.750
5602.0	9.20	8.318
5602.5	9.00	7.943
5603.0	8.98	7.907
5603.5	8.67	7.362
5604.0	8.45	6.998

5604.5	9.31	8.531
5605.0	9.31	8.531
5605.5	9.31	8.531
5606.0	7.86	6.109
5606.5	4.37	2.735
5607.0	1.80	1.514
5607.5	0.10	1.023
5608.0	-1.64	0.685
5608.5	-3.63	0.434
5609.0	-5.15	0.305
5609.5	-6.13	0.244
5610.0	-7.04	0.198
5610.5	-7.76	0.167

Total Power in 20 MHz channel (mW) = 231.637

Average total power (mW) = 5.65

Average power (dBm) = 7.52

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

Margin (dB) = 2.48

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 cannot claim compliance of the EUT using these test methods.

Company: Motorola

Operator: Craig B

Date of test: 01-30-2009

Temperature: 73 deg. F.

Humidity: 22% R.H.

Test: **Peak Power Spectral Density FCC 15.407(a)(2)**

RBW: 1 MHz

VBW: 3 MHz

Detector: RMS

SPAN: 1 MHz

Sweep time: 5 sec.

Model: Canopy 5400 (7 dBi antenna)

**High channel (5705 MHz); FSK 2-Level modulation; power setting D4**

Power Density averaged over 20 MHz channel

Center frequency of 1 MHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5694.5	-6.47	0.225
5695.0	-5.13	0.307
5695.5	-4.77	0.333
5696.0	-4.08	0.391
5696.5	-2.76	0.530
5697.0	-1.45	0.716
5697.5	-0.97	0.800
5698.0	-0.97	0.800
5698.5	2.16	1.644
5699.0	8.28	6.730
5699.5	12.42	17.458
5700.0	13.16	20.701
5700.5	12.25	16.788
5701.0	10.28	10.666
5701.5	8.18	6.577
5702.0	7.51	5.636
5702.5	7.30	5.370
5703.0	6.72	4.699
5703.5	6.72	4.699
5704.0	7.19	5.236
5704.5	7.48	5.598
5705.0	7.25	5.309
5705.5	7.45	5.559
5706.0	6.75	4.732
5706.5	6.60	4.571
5707.0	7.25	5.309
5707.5	7.10	5.129
5708.0	7.45	5.559
5708.5	8.34	6.823
5709.0	11.15	13.032

5709.5	12.73	18.750
5710.0	12.70	18.621
5710.5	9.99	9.977
5711.0	3.99	2.506
5711.5	-0.45	0.902
5712.0	-1.44	0.718
5712.5	-1.61	0.690
5713.0	-2.57	0.553
5713.5	-3.75	0.422
5714.0	-4.64	0.344
5714.5	-5.51	0.281
5715.0	-6.46	0.226
5715.5	-7.71	0.169

Total Power in 20 MHz channel (mW) = 225.690

Average total power (mW) = 5.505

Average power (dBm) = 7.41

Limit (dBm) = 10.00

(Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain)

Margin (dB) = 2.59

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 cannot claim compliance of the EUT using these test methods.

Company: Motorola

Operator: Craig B

Date of test: 02-03-2009

Temperature: 72 deg. F.

Humidity: 23% R.H.

Test: **Peak Power Spectral Density FCC 15.407(a)(2)**

RBW: 1 MHz

VBW: 3 MHz

Detector: RMS

SPAN: 1 MHz

Sweep time: 5 sec.

Model: Canopy 5400 (7 dBi antenna)

**High channel (5705 MHz); FSK 4-Level modulation; power setting D4**

Power Density averaged over 20 MHz channel

Center frequency of 1 MHz span (MHz)	Highest level measured within span (dBm)	dBm converted to mW (mW)
5694.5	-9.13	0.122
5695.0	-7.88	0.163
5695.5	-7.24	0.189
5696.0	-6.30	0.234
5696.5	-5.00	0.316
5697.0	-3.59	0.438
5697.5	-2.03	0.627
5698.0	-0.56	0.879
5698.5	1.39	1.377
5699.0	5.22	3.327
5699.5	8.79	7.568
5700.0	9.47	8.851
5700.5	9.47	8.851
5701.0	9.33	8.570
5701.5	8.36	6.855
5702.0	8.05	6.383
5702.5	8.03	6.353
5703.0	8.50	7.079
5703.5	9.27	8.453
5704.0	9.81	9.572
5704.5	9.89	9.750
5705.0	9.89	9.750
5705.5	9.92	9.817
5706.0	9.70	9.333
5706.5	9.33	8.570
5707.0	8.59	7.228
5707.5	8.33	6.808
5708.0	8.28	6.730
5708.5	8.03	6.353
5709.0	7.65	5.821

5709.5	8.40	6.918
5710.0	8.41	6.934
5710.5	8.41	6.934
5711.0	6.93	4.932
5711.5	3.37	2.173
5712.0	0.73	1.183
5712.5	-0.98	0.798
5713.0	-2.81	0.524
5713.5	-4.64	0.344
5714.0	-6.08	0.247
5714.5	-7.18	0.191
5715.0	-8.07	0.156
5715.5	-8.78	0.132

Total Power in 20 MHz channel (mW) = 197.579

Average total power (mW) = 4.819

Average power (dBm) = 6.83

Limit (dBm) = 10.00

(Limit = 11 dBm - 1 dBm (due to 7 dBi antenna gain)

Margin (dB) = 3.17

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 cannot claim compliance of the EUT using these test methods.



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

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

The field strength of any emissions appearing outside the 5470-5725 MHz band shall not exceed the general radiated emissions limits as stated Section 15.209. The fundamental from the DUSAL 5400 transmitter shall not be inside the restricted band 5350 to 5450 MHz.

As stated in Section 15.205a, the fundamental emission from the DUSAL 5400 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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

**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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

## Radiated Spurious Emissions in Restricted Bands 1 GHz to 40 GHz

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

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

**EUT:** Canopy 5400  
**Manufacturer:** Motorola  
**Operating Condition:** 68 deg F; 22% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15.407(b)(7); FCC Part 15.205  
**Comment:** Continuous Transmit - FSK 2-Level modulation  
Power set to D4  
**Date:** 01-30-2009

**Notes:** (1) All other restricted band emissions at least 20 dB under the limit.

**Channel:** Low – 5495 MHz



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

### Radiated Spurious Emissions in Restricted Bands 1 GHz to 40 GHz

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

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

**EUT:** Canopy 5400  
**Manufacturer:** Motorola  
**Operating Condition:** 68 deg F; 22% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15.407(b)(7); FCC Part 15.205  
**Comment:** Continuous Transmit - FSK 2-Level modulation  
Power set to D4  
**Date:** 01-30-2009

**Notes:** (1) All other restricted band emissions at least 20 dB under the limit.

**Channel:** Mid – 5600 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)	Comment
11.200	Average	Vert	36.08	39.90	-26.7	49.3	---	49.3	54	4.7	Res. Band
11.200	Max Peak	Vert	47.47	39.90	-26.7	60.7	---	60.7	74	13.3	Res. Band
11.200	Average	Horz	35.88	39.90	-26.7	49.1	---	49.1	54	4.9	Res. Band
11.200	Max Peak	Horz	48.50	39.90	-26.7	61.7	---	61.7	74	12.3	Res. Band
22.400	Average	Vert	52.08	46.40	-35.2	63.3	---	63.3	63.54	0.3	Res. Band
22.400	Max Peak	Vert	63.40	46.40	-35.2	74.6	---	74.6	83.54	8.9	Res. Band
22.400	Average	Horz	52.01	46.40	-35.2	63.2	---	63.2	63.54	0.3	Res. Band
22.400	Max Peak	Horz	61.76	46.40	-35.2	73.0	---	73.0	83.54	10.6	Res. Band



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Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

### Radiated Spurious Emissions in Restricted Bands 1 GHz to 40 GHz

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

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

**EUT:** Canopy 5400  
**Manufacturer:** Motorola  
**Operating Condition:** 68 deg F; 22% R.H.  
**Test Site:** Site 3  
**Operator:** Craig B  
**Test Specification:** FCC Part 15.407(b)(7); FCC Part 15.205  
**Comment:** Continuous Transmit - FSK 2-Level modulation  
Power set to D4  
**Date:** 01-30-2009

**Notes:** (1) All other restricted band emissions at least 20 dB under the limit.

**Channel:** High – 5705 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)	Comment
11.410	Average	Vert	35.00	40.53	-27.2	48.3	---	48.3	54	5.7	Res. Band
11.410	Max Peak	Vert	46.20	40.53	-27.2	59.5	---	59.5	74	14.5	Res. Band
11.410	Average	Horz	34.94	40.53	-27.2	48.3	---	48.3	54	5.7	Res. Band
11.410	Max Peak	Horz	46.20	40.53	-27.2	59.5	---	59.5	74	14.5	Res. Band
22.820	Average	Vert	48.27	46.40	-35.4	59.3	---	59.3	63.54	4.3	Res. Band
22.820	Max Peak	Vert	60.76	46.40	-35.4	71.8	---	71.8	83.54	11.8	Res. Band
22.820	Average	Horz	45.25	46.40	-35.4	56.3	---	56.3	63.54	7.3	Res. Band
22.820	Max Peak	Horz	57.55	46.40	-35.4	68.6	---	68.6	83.54	15.0	Res. Band



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

## APPENDIX A

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

PART 15.407 b(7)



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

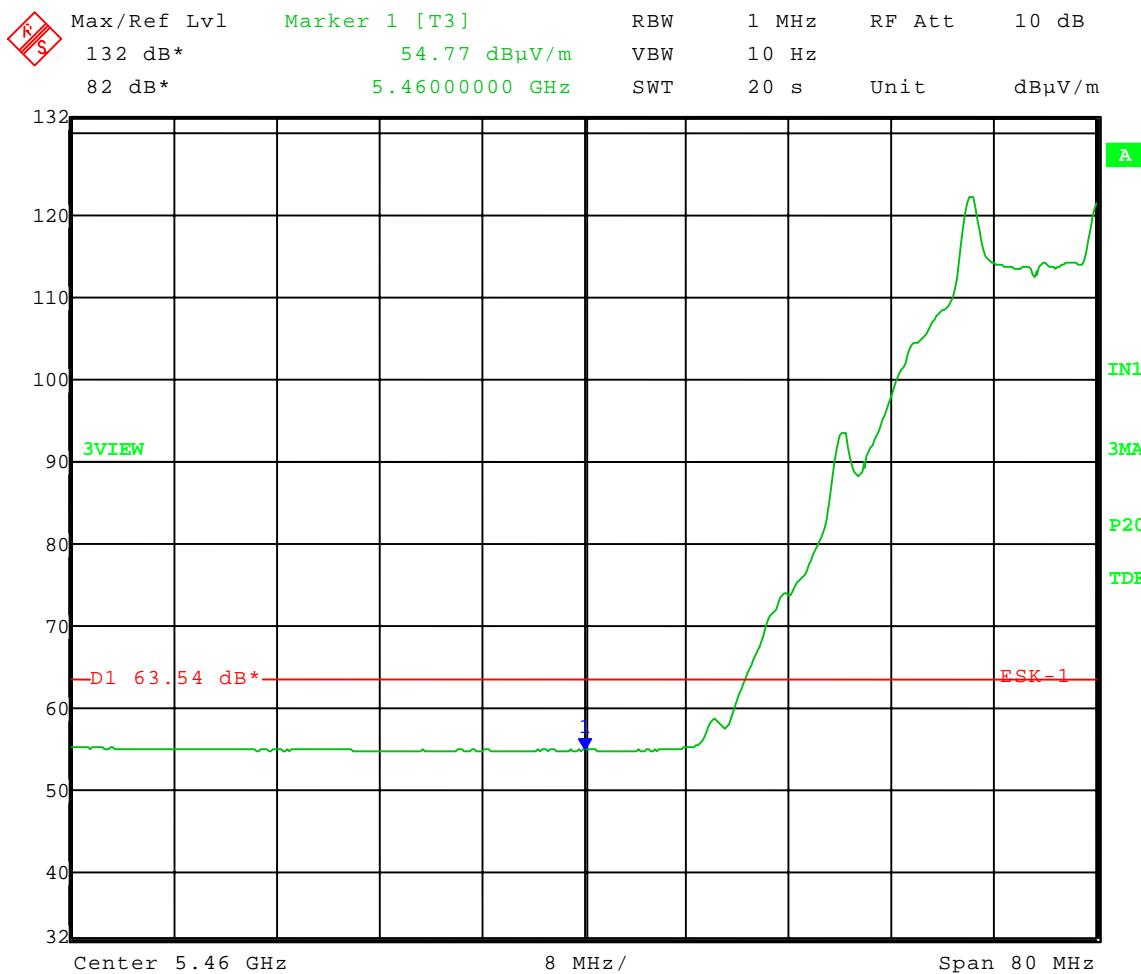
1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – AVG  
(FCC 15.407(b)(7))  
Operator: Craig B  
Comment: Because the lower operating band edge falls near a restricted band, a radiated lower band edge measurement was made to show compliance with the restricted band limit.  
Low Channel: Frequency – 5495 MHz  
Modulation: FSK, 2-Level

Restricted Band-Edge Frequency: 5.46 GHz

Band-Edge Limit: 63.54 dB $\mu$ V/m AVERAGE at a test distance of 1 meter.





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

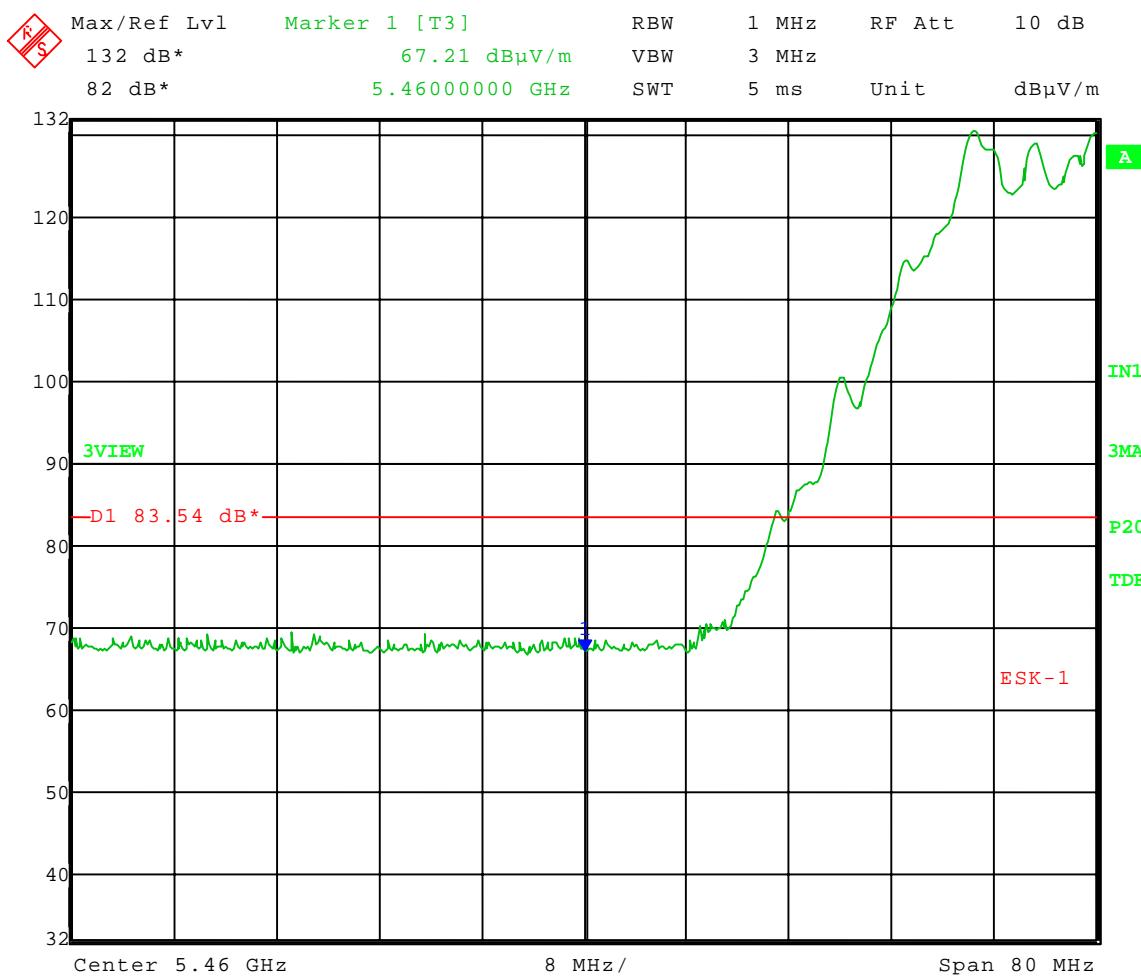
1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – PEAK  
(FCC 15.407(b)(7))  
Operator: Craig B  
Comment: Because the lower operating band edge falls near a restricted band, a radiated lower band edge measurement was made to show compliance with the restricted band limit.  
Low Channel: Frequency – 5495 MHz  
Modulation: FSK, 2-Level

Restricted Band-Edge Frequency: 5.46 GHz

Band-Edge Limit: 83.54 dB $\mu$ V/m PEAK at a test distance of 1 meter.



Date: 29.JAN.2009 10:05:46



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

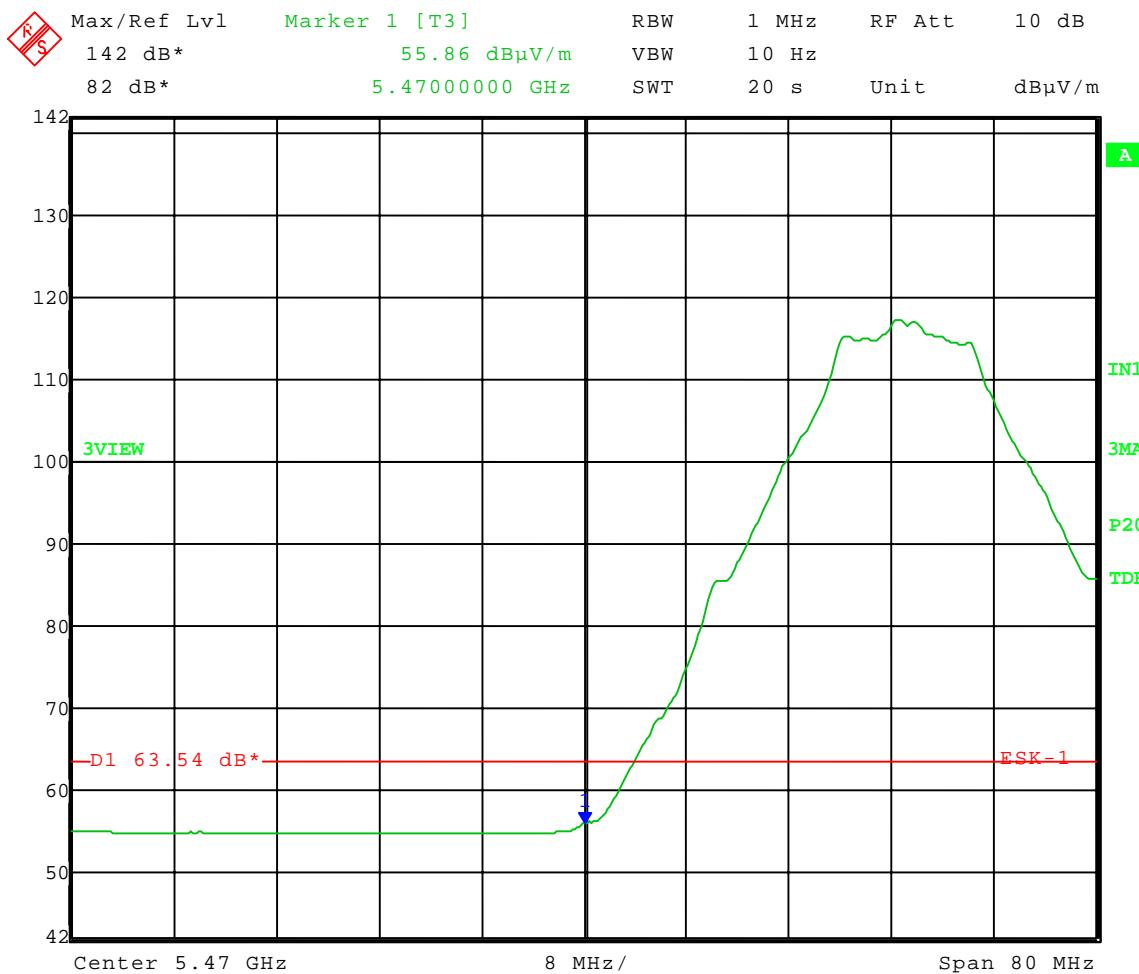
1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) - AVG  
(FCC 15.407(b)(7))  
Operator: Craig B  
Comment: Because the lower operating band edge falls near a restricted band, a radiated lower band edge measurement was made to show compliance with the restricted band limit.  
Low Channel: Frequency - 5495 MHz  
Modulation: FSK, 4-Level

Restricted Band-Edge Frequency: 5.46 GHz

Band-Edge Limit: 63.54 dB $\mu$ V/m AVERAGE at a test distance of 1 meter.



Date: 29.JAN.2009 10:21:25



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

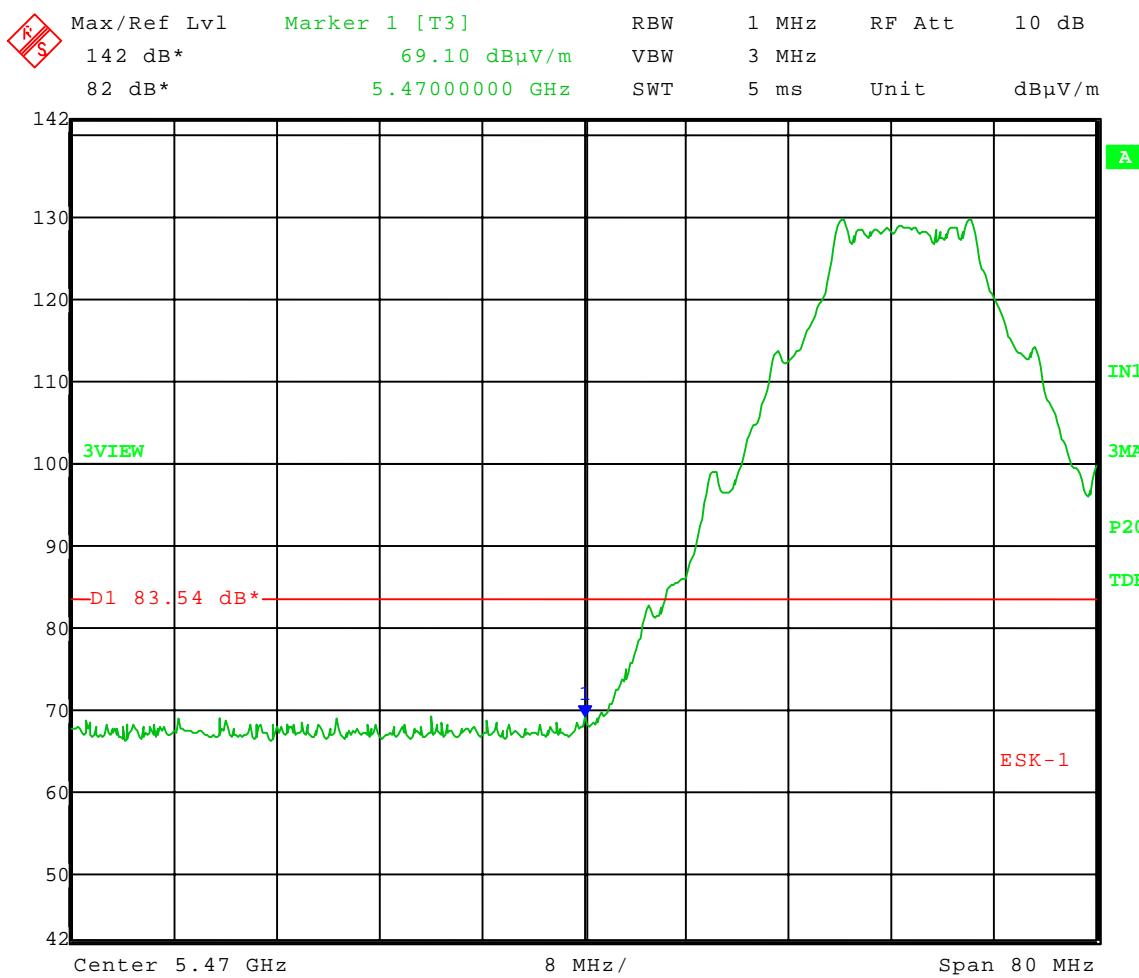
1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – PEAK  
(FCC 15.407(b)(7))  
Operator: Craig B  
Comment: Because the lower operating band edge falls near a restricted band, a radiated lower band edge measurement was made to show compliance with the restricted band limit.  
Low Channel: Frequency – 5495 MHz  
Modulation: FSK, 4-Level

Restricted Band-Edge Frequency: 5.46 GHz

Band-Edge Limit: 83.54 dB $\mu$ V/m PEAK at a test distance of 1 meter.





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 4.0 FIELD STRENGTH OF FUNDAMENTAL AND SPURIOUS EMISSION MEASUREMENTS (SECTIONS 15.407 b(6) & (b3))

The radiated measurements made at D.L.S. Electronic Systems, Inc., for the DUSAL 5400, Model Number: 5400XLG connectorized, 5400XLG (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 DUSAL 5400 were made up to 40000 MHz, in accordance with Section 15.33a for Intentional Radiators with a fundamental frequency of 5705 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.



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

## APPENDIX A

### 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 5470-5725 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 -5470		-27
5470-5725	250	
5725-40000		-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 22% relative humidity.**



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

**RADIATED DATA TAKEN FOR FUNDAMENTAL  
EIRP EMISSION MEASUREMENTS**

**PART 15.407 b(6) & b(3)**



Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

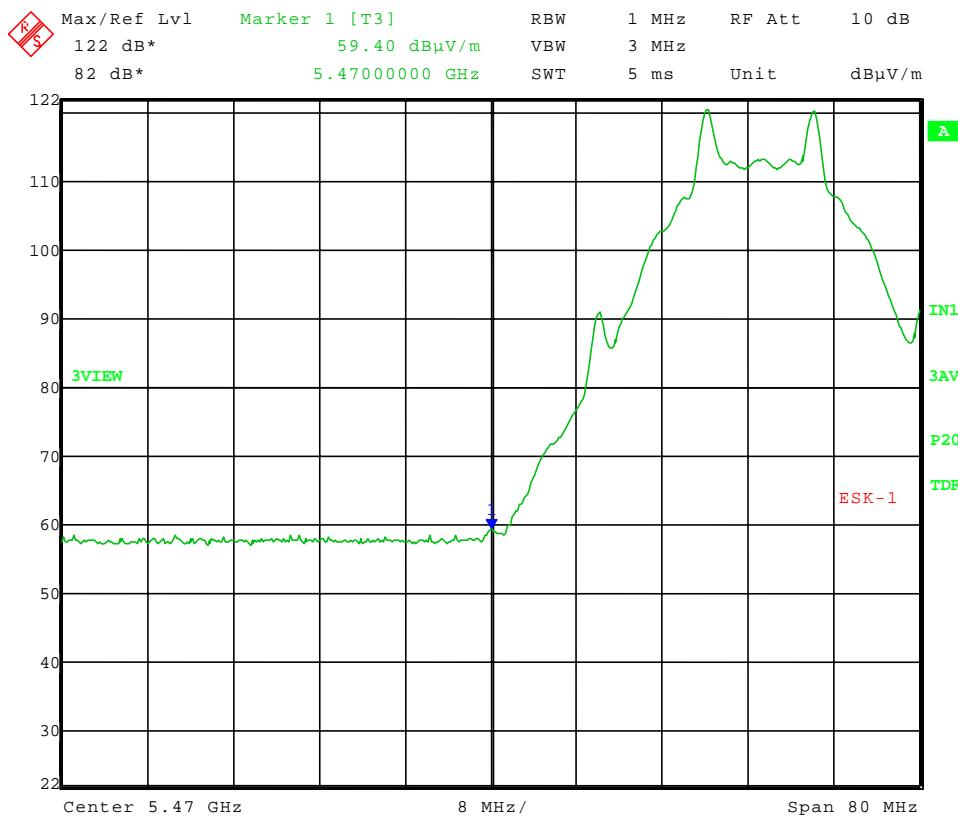
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Lower Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: Low Channel: Frequency – 5495 MHz; Modulation: FSK, 2-Level

Band-Edge Frequency: 5.47 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 (dB)	Strength of emission [EIRP] (dBm)	Margin (dB)
5.47 vertical	59.40	-39.0	9.1	11.0	-37.1	10.1





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

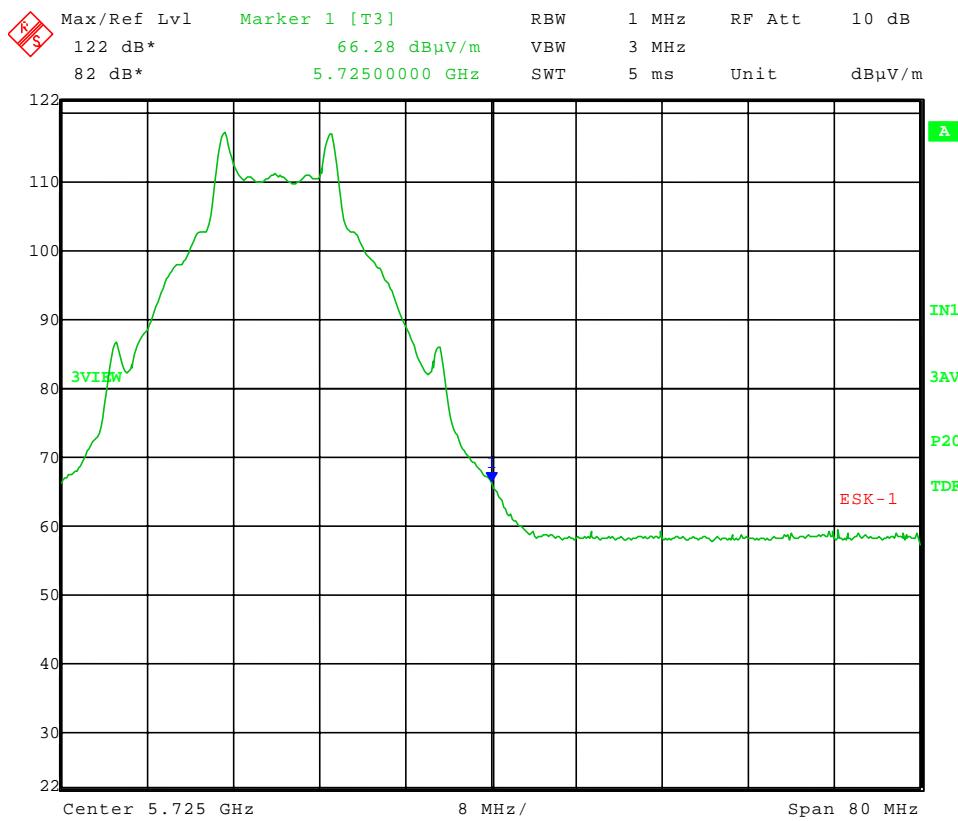
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Upper Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: High Channel: Frequency - **5705 MHz**; Modulation: FSK, 2-Level

Band-Edge Frequency: 5.725 GHz

Band-Edge Limit: -27 dBm/MHz EIRP

Frequency and Polarization (GHz)	Max. Field Strength of EUT @ 3 meters (dB $\mu$ V/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 (dB)	Strength of emission [EIRP] (dBm)	Margin (dB)
5.725 vertical	66.28	-32.9	9.2	11.3	-30.8	3.8





Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

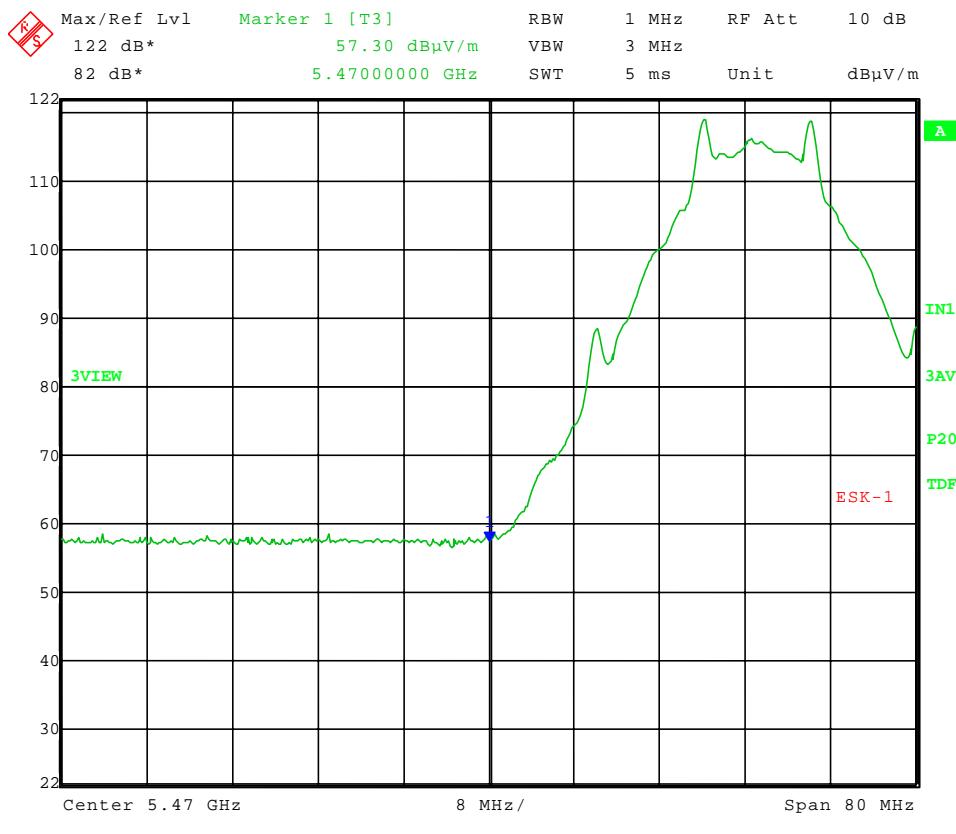
1250 Peterson Dr., Wheeling, IL 60090

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Lower Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: Low Channel: Frequency – 5495 MHz; Modulation: FSK, 4-Level

Band-Edge Frequency: 5.47 GHz

Band-Edge Limit: -27 dBm/MHz EIRP

Frequency and Polarization (GHz)	Max. Field Strength of EUT @ 3 meters (dB $\mu$ V/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)
5.47 vertical	57.30	-41.3	9.1	11.0	-39.4	12.4





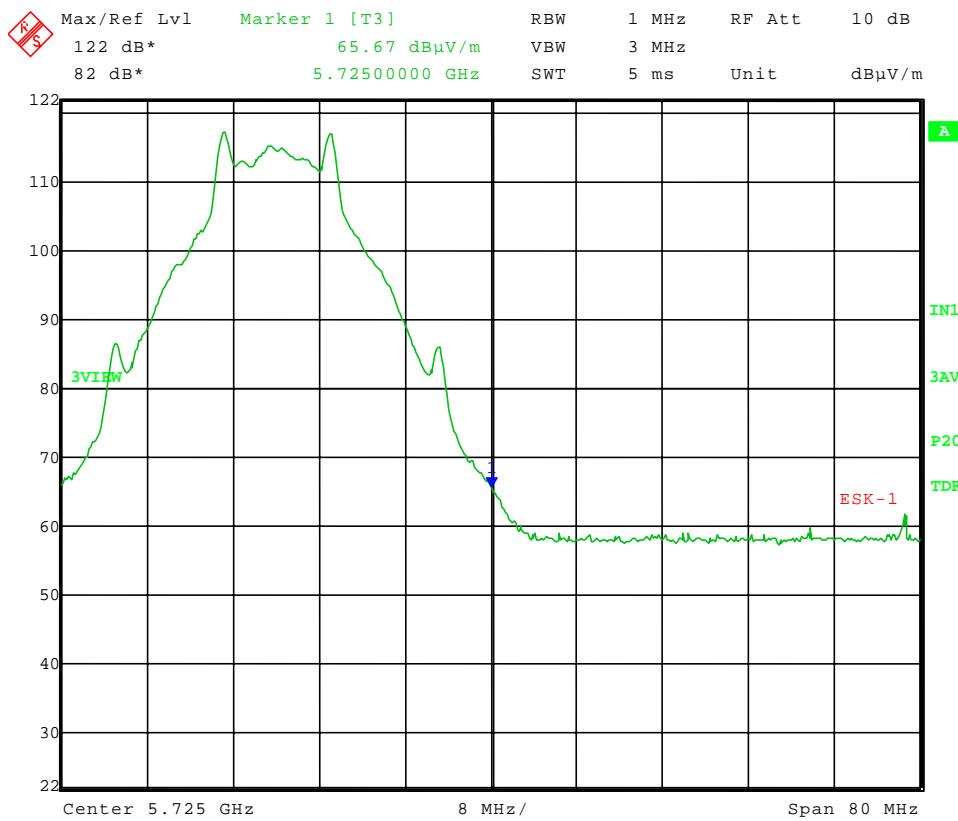
Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

1250 Peterson Dr., Wheeling, IL 60090

Test Date: 01-29-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Upper Band-Edge Compliance - Radiated (FCC 15.407(b)(3))  
Operator: Craig B  
Comment: High Channel: Frequency - 5705 MHz; Modulation: FSK, 4-Level

Band-Edge Frequency: 5.725 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 (dB)	Strength of emission [EIRP] (dBm)	Margin (dB)
5.725 vertical	65.67	-33.6	9.2	11.3	-31.5	4.5





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

**RADIATED DATA TAKEN FOR**  
**SPURIOUS EMISSION MEASUREMENTS**

**PART 15.407 b(6)**

**Electric Field Strength**

EUT: Canopy 5400  
Manufacturer: Motorola  
Operating Condition: 68 deg. F; 22% R.H.  
Test Site: DLS O.F. Site 3  
Operator: Craig B  
Test Specification:  
Comment: Tx and Rx; Low, Mid, and High channels  
Date: 01-30-2009

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

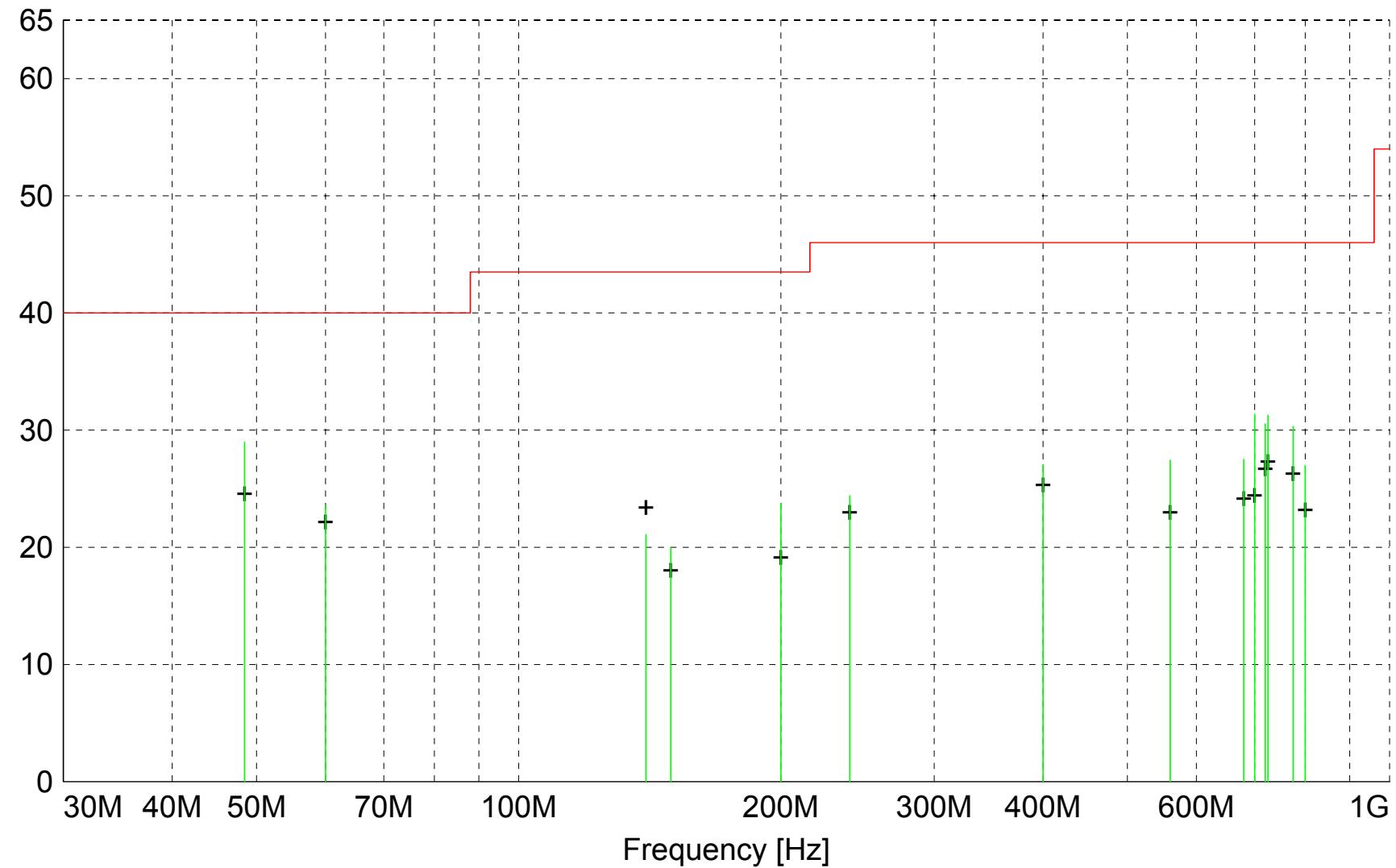
Short Description: Test Set-up Vert30-1000MHz  
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005

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

Level [dB $\mu$ V/m]



	MES	A1291_F1V_Quasi-Peak
++·	MES	A1291_F1V_Peak_List
—	LIM	FCC Class B F QP/AV Field Strength FCC Class B 3m

**MEASUREMENT RESULT: "A1291\_F1V\_Final"**

1/30/2009 8:35AM

Frequency MHz	Level dB $\mu$ V	Antenna Factor dB $\mu$ V/m	System Loss dB	Total Level dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
48.450000	41.93	11.52	-24.5	29.0	40.0	11.0	1.00	0	QUASI-PEAK	None
700.000000	29.44	21.37	-19.5	31.4	46.0	14.6	1.00	225	QUASI-PEAK	None
724.990000	28.26	21.25	-18.2	31.3	46.0	14.7	1.20	240	QUASI-PEAK	None
720.000000	27.69	21.32	-18.5	30.5	46.0	15.5	1.10	250	QUASI-PEAK	None
774.990000	28.01	21.36	-19.0	30.3	46.0	15.7	2.00	180	QUASI-PEAK	None
60.010000	38.70	9.21	-24.3	23.6	40.0	16.4	1.00	135	QUASI-PEAK	None
679.990000	26.75	21.18	-20.4	27.5	46.0	18.5	1.20	240	QUASI-PEAK	None
559.990000	29.99	18.48	-21.0	27.4	46.0	18.6	1.30	135	QUASI-PEAK	None
399.990000	32.62	16.06	-21.6	27.1	46.0	18.9	1.00	225	QUASI-PEAK	None
800.000000	25.00	21.49	-19.5	27.0	46.0	19.0	1.00	135	QUASI-PEAK	None
200.000000	34.43	12.03	-22.7	23.8	43.5	19.7	1.00	270	QUASI-PEAK	None
239.990000	34.71	12.09	-22.4	24.4	46.0	21.6	1.00	270	QUASI-PEAK	None
140.000000	32.44	11.91	-23.3	21.1	43.5	22.4	1.00	90	QUASI-PEAK	None
149.470000	31.00	12.10	-23.2	19.9	43.5	23.6	1.00	180	QUASI-PEAK	None

**Electric Field Strength**

EUT: Canopy 5400  
Manufacturer: Motorola  
Operating Condition: 68 deg. F; 22% R.H.  
Test Site: DLS O.F. Site 3  
Operator: Craig B  
Test Specification:  
Comment: Tx and Rx; Low, Mid, and High channels  
Date: 01-30-2009

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

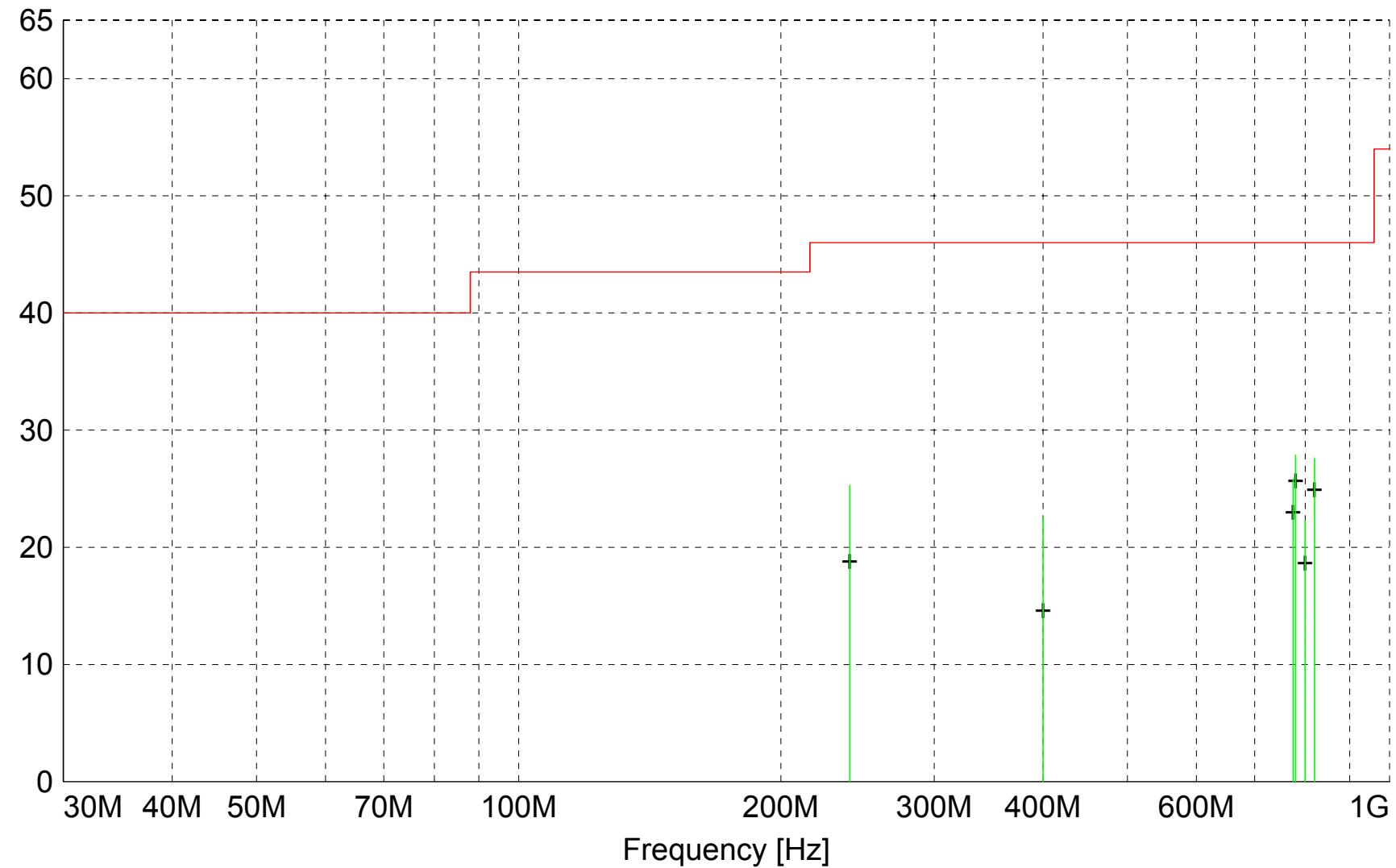
Short Description: Test Set-up Horz30-1000MHz  
TEST EQUIPMENT: Receiver --- Rohde&Schwarz ESI 40 SN: 837808/005

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

Level [dB $\mu$ V/m]



||||| MES A1291\_F1H\_Quasi-Peak  
+ + · MES A1291\_F1H\_Peak\_List  
— LIM FCC ClassB F QP/AV Field Strength FCC Class B 3m

**MEASUREMENT RESULT: "A1291\_F1H\_Final"**

1/30/2009 8:55AM

Frequency MHz	Level dB $\mu$ V	Antenna Factor	System Loss dB	Total dB $\mu$ V/m	Limit dB $\mu$ V/m	Margin dB	Height Ant. m	EuT Angle deg	Final Detector	Comment
									Final Detector	
779.990000	25.73	21.33	-19.2	27.9	46.0	18.1	1.30	45	QUASI-PEAK	None
820.000000	24.94	22.08	-19.4	27.6	46.0	18.4	1.30	60	QUASI-PEAK	None
774.990000	23.52	21.36	-19.0	25.8	46.0	20.2	1.30	35	QUASI-PEAK	None
240.000000	35.61	12.09	-22.4	25.3	46.0	20.7	1.00	30	QUASI-PEAK	None
399.990000	28.14	16.06	-21.6	22.6	46.0	23.4	2.20	225	QUASI-PEAK	None
799.990000	20.31	21.49	-19.5	22.3	46.0	23.7	1.30	225	QUASI-PEAK	None



1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

**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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 01-29-2009  
Temperature: 68 deg. F  
Humidity: 22% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Detector: Average

Power set to D4

Spurious Emissions - EIRP - Substitution Method (FCC 15.407(b)(3))

Model: Canopy 5400							
Channel: Low - 5495 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)
10.990 vertical	60.9	-38.2	11.5	12.7	-37.0	-27.0	10.0
10.990 horizontal	59.4	-38.7	11.5	12.7	-37.5	-27.0	10.5
16.485 vertical	55.4	-41.2	12.9	15.5	-38.6	-27.0	11.6
16.485 horizontal	52.4	-44.7	12.9	15.5	-42.1	-27.0	15.1
21.980 vertical	65.0	-48.6	7.8	11.4	-45.0	-27.0	18.0
21.980 horizontal	65.2	-49.0	7.8	11.4	-45.4	-27.0	18.4
27.475 vertical	62.0	-53.5	9.1	11.9	-50.7	-27.0	23.7
27.475 horizontal	62.7	-54.0	9.1	11.9	-51.2	-27.0	24.2
32.970 vertical	60.2	-54.1	10.1	9.9	-54.3	-27.0	27.3
32.970 horizontal	61.0	-53.3	10.1	9.9	-53.5	-27.0	26.5

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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 01-29-2009  
Temperature: 68 deg. F  
Humidity: 22% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Detector: Average

Power set to D4

Spurious Emissions - EIRP - Substitution Method (FCC 15.407(b)(3))

Model: Canopy 5400							
Channel: Mid - 5600 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)
11.200 vertical	56.6	-42.5	11.6	12.7	-41.4	-27.0	14.4
11.200 horizontal	57.3	-40.6	11.6	12.7	-39.5	-27.0	12.5
16.800 vertical	55.2	-42.5	13.1	14.2	-41.4	-27.0	14.4
16.800 horizontal	54.4	-44.4	13.1	14.2	-43.3	-27.0	16.3
22.400 vertical	66.9	-46.7	7.9	11.5	-43.1	-27.0	16.1
22.400 horizontal	67.3	-47.0	7.9	11.5	-43.4	-27.0	16.4
28.000 vertical	62.4	-53.1	9.1	12.0	-50.2	-27.0	23.2
28.000 horizontal	58.0	-57.6	9.1	12.0	-54.7	-27.0	27.7
33.600 vertical	61.4	-52.6	10.3	9.5	-53.4	-27.0	26.4
33.600 horizontal	60.0	-53.1	10.3	9.5	-53.9	-27.0	26.9

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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

DLS Electronic Systems, Inc.

Company: Motorola  
Operator: Craig B  
Date of test: 01-29-2009  
Temperature: 68 deg. F  
Humidity: 22% R.H.

Test Distance: 3 meters from 1 to 18 GHz

Test Distance: 1 meter from 18 to 40 GHz

Detector: Average

Power set to D4

Spurious Emissions - EIRP - Substitution Method (FCC 15.407(b)(3))

Model: Canopy 5400							
Channel: High - 5705 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)
11.410 vertical	53.1	-46.9	11.6	12.6	-45.9	-27.0	18.9
11.410 horizontal	51.0	-50.0	11.6	12.6	-49.0	-27.0	22.0
17.115 vertical	55.1	-44.9	13.2	12.9	-45.2	-27.0	18.2
17.115 horizontal	56.4	-41.7	13.2	12.9	-42.0	-27.0	15.0
22.820 vertical	63.8	-49.2	8.0	11.6	-45.6	-27.0	18.6
22.820 horizontal	61.1	-51.4	8.0	11.6	-47.8	-27.0	20.8
28.525 vertical	59.4	-54.1	9.2	12.4	-50.9	-27.0	23.9
28.525 horizontal	56.4	-57.9	9.2	12.4	-54.7	-27.0	27.7
34.230 vertical	57.7	-55.0	10.6	10.2	-55.4	-27.0	28.4
34.230 horizontal	59.8	-52.5	10.6	10.2	-52.9	-27.0	25.9

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: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

## TRANSMIT POWER CONTROL MEASUREMENTS

### PART 15.407 h(1)



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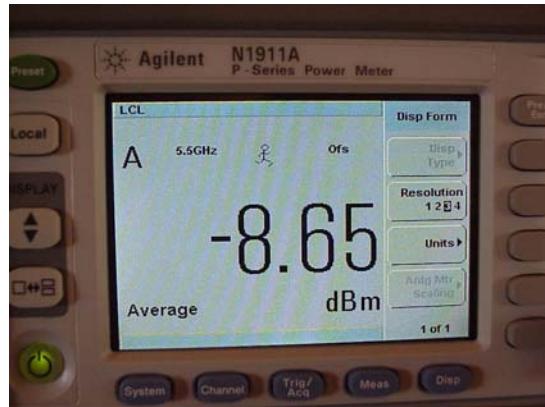
Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: Low - 5495 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 = **-8.65 dBm**





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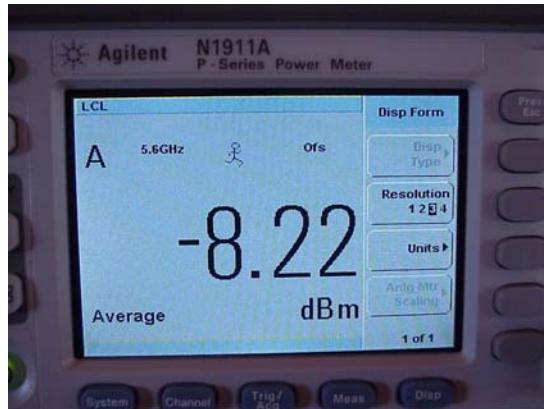
Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: Mid - 5600 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 = **-8.22 dBm**





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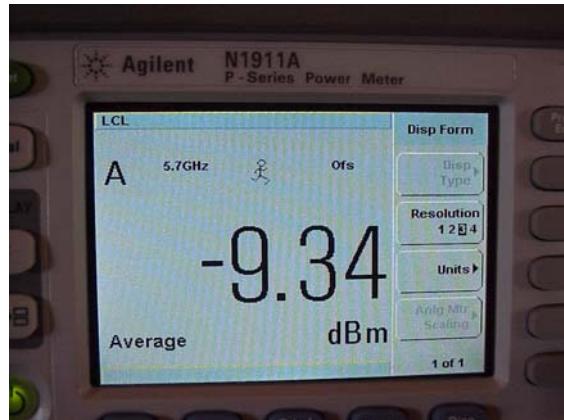
Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: High – **5705 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 = **-9.34 dBm**





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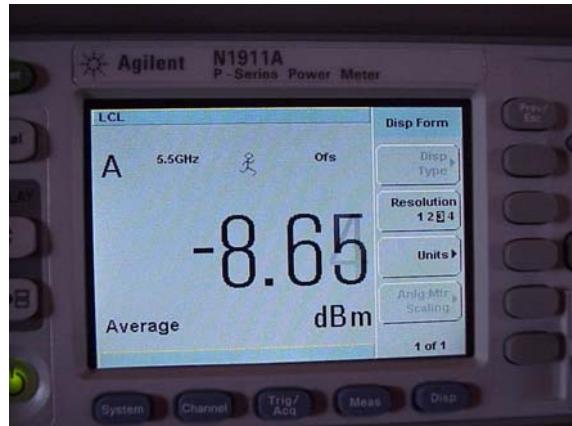
Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: Low - 5495 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 = **-8.65 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: Mid - 5600 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 = **-8.22 dBm**





1250 Peterson Dr., Wheeling, IL 60090

Company: Motorola  
Model Tested: 5400XLG connectorized, 5400XLG (single patch)  
Report Number: 15047

Test Date: 02-03-2009  
Company: Motorola  
EUT: Canopy 5400  
Test: Transmit Power Control - Conducted (FCC 15.407(h)(1))  
Operator: Craig B

Channel: High – **5705 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 = **-9.34 dBm**

