166 South Carter, Genoa City, WI 53128

Company: **Cambium Networks**
Model Tested: Canopy 2400 with Omni antenna
Report Number: 18336

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators
Section 15.247
Operation within the bands 902 - 928 MHz,
2400 - 2483.5 MHz, 5725 - 5875 MHz,
and 24.0 - 24.25 GHz.

Class II Permissive Change

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	Canopy 2400 with Omni antenna
Kind of Equipment:	Wireless Digital 2.4 GHz FSK xcvr connectorized with Omni antenna
Frequency Range:	2415 to 2457.5 MHz
Test Configuration:	Stand-alone
Model Number(s):	2400SM, 2400AP, 2400BH, 2400SMC, 2401SMC, 2450SMC, 2451SMC, 2400APC, 2401APC, 2450APC, 2451APC, 2460APC, 2461APC
Model(s) Tested:	2400APC
Serial Number(s):	0A003E27B442
Date of Tests:	9/25 & 9/26/12, 11/21/12
Test Conducted For:	Cambium Networks 3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA

NOTICE: "This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government". Please see the "Description of Test Sample" page listed inside of this report.

166 South Carter, Genoa City, WI 53128

SIGNATURE PAGE

Tested By:

Craig Brandt
Test Engineer

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

NVLAP®

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 January 2009).

2011-10-01 through 2012-09-30
Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

1.0 Summary of Test Report

It was determined that the Cambium Networks Canopy 2400 with Omni antenna, Model 2400APC, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247 for a Class II Permissive Change for FCC ID: Z8H89FC5808.

Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
15.247 (d)	Unwanted Emissions into Restricted Frequency Bands - Radiated	FCC KDB 558074 D01 DTS Meas Guidance v01/ ANSI C63.10-2009 Sections 6.5 & 6.6	1	Yes
15.247 (d)	Band-Edge Measurements - Radiated	FCC KDB 558074 D01 DTS Meas Guidance v01/ ANSI C63.10-2009	1	Yes

Note 1: Radiated emission measurement.

2.0 Introduction

On September 25th & 26th, 2012 & November 21, 2012 the Canopy 2400 with Omni antenna, Model 2400APC, as provided from Cambium Networks, was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247 for an FCC Class II Permissive Change for FCC ID: Z8H89FC5808. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

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.

Wisconsin Test Facility:
D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:
D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

4.0 Description of Test Sample

Description:

The Canopy 2400 Advanced Logic Wireless Digital FSK Radio is designed for use in the 2.4GHz Band (2415MHz-2457.5MHz) with 3 separate 20MHz channels. The radio works in conjunction with a 24vDC power supply. Canopy is a point to multi-point wireless Ethernet distribution system. The back hauls (BH) are point to points connecting multi-point access points to wired Ethernet feeds (Internet Service Providers points of presence, ISP POP). An external 8.5 dBi OMNI antenna is being added in this Class II Permissive Change for FCC ID: Z8H89FC5808.

Type of Equipment / Frequency Range:

Stand-Alone / 2415 to 2457.5 MHz

Physical Dimensions of Equipment Under Test:

Length: 2.75 in. Width: 8 in. Height: 0.6 in.

Power Source:

29 VDC (Power Over Ethernet to Radio)

Internal Frequencies:

150 kHz, 132 kHz (Switching Power Supply Frequency)
160 MHz, 80 MHz, 40 MHz, 25 MHz, 20 MHz (Clock Frequencies)

Transmit Frequencies Used For Test Purpose:

Low channel: 2415 MHz
Middle channel: 2435 MHz,
High channel: 2457.5 MHz

Type of Modulations:

2-Level & 4-Level

Description of Circuit Board(s), Antennas / Part Number:

Radio SAL 2.4 GHz	8414996E01 Issue B
Wireless Edge Omni Antenna	MT-362017/NV, SN: 00137

5.0 Test Equipment

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

D.L.S. Wisconsin

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
30 – 1000 MHz						
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1-11-12	1-11-13
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	1-11-12	1-11-13
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	8-22-12	8-22-14
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	9-6-12	9-6-14
Low Pass Filter	Mini-Circuits	VLFX-1125	MUU9260	DC – 1 GHz	8-13-12	8-13-13
Additional for 1-18 GHz						
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	2-27-12	2-27-13
Horn Antenna	EMCO	3115	6204	1-18GHz	6-16-11	6-16-13
High Pass Filter	Planar Filter Co.	HP8G-7Q8-CD-SFF	PF1225/0728	7.5 – 18GHz	8-13-12	8-13-13
Additional for 18-26 GHz						
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	8-13-12	8-13-13
Horn Antenna	ETS-Lindgren	3116	62917	18 – 40GHz	10-4-11	10-4-13
High Pass Filter	Planar Filter Co.	CL22600-9000-CD-SS	PF1230/0728	18 - 40GHz	8-13-12	8-13-13

6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

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

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

71°F at 38% RH

Supply Voltage:

29 VDC (Power Over Ethernet to Radio)

8.0 Modifications Made To EUT for Compliance

No modifications made at time of test.

9.0 Additional Descriptions

Tested in continuous transmit mode. Tested with both 2 and 4 level modulation. Tested at the highest output power setting (FC).

10.0 Results

Measurements were performed in accordance with ANSI C63.10-2009. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

The Canopy 2400 with Omni antenna, Model 2400APC, as provided from Cambium Networks tested from September 25th to September 26th, 2012 and November 21, 2012 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247 for an FCC Class II Permissive Change for FCC ID: Z8H89FC5808.

Appendix A – Test Photos

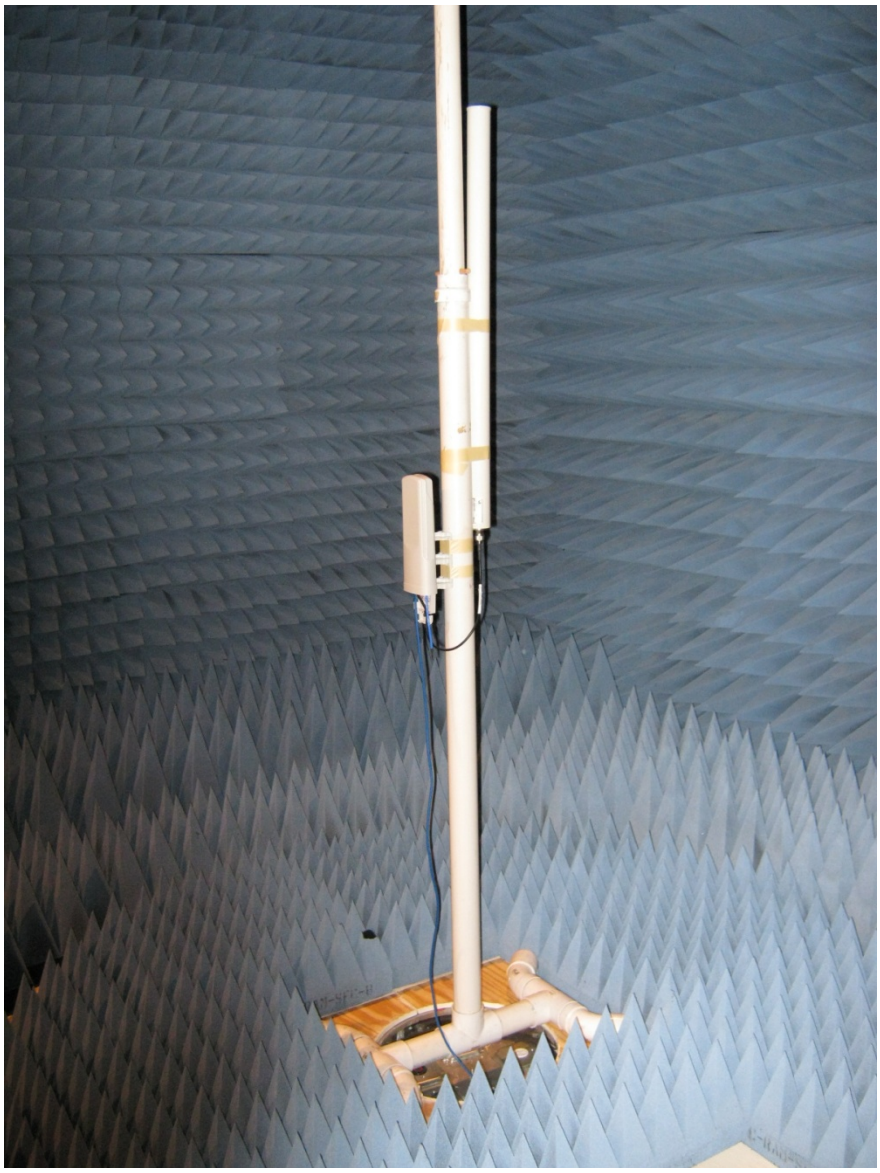
Photo Information and Test Setup:

Item0: Canopy 2400
Item1: Wireless Edge Omni Antenna, Model: MT-362017/NV, S/N: 00137
Item 2: Non-shielded Ethernet cable with power, 20 meters long

Radiated Emissions below 1 GHz

Appendix A

Radiated Emissions above 1 GHz



Appendix B – Measurement Data

A1.0 Maximum Unwanted Emission Levels into Restricted Frequency Bands – Radiated

Rule Section: Section 15.247(d)

Test Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01 – *Guidance for Performing Gompliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247*

Section 5.4.2 – Unwanted Emissions into Restricted Frequency Bands

ANSI C63.10:2009 – Sections 6.5 and 6.6

Description: This test applies to harmonics/spurs that fall in the restricted bands listed in Section 15.205.

Measurements were taken for 2-level and 4-level modulation types, and at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 98% duty cycle at maximum output power setting (FC).

Limit: FCC Part 15.209

Results: Passed

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Manufacturer: Cambium Networks
Operating Condition: 70 deg. F; 43% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: Transmitter Spurious Emissions
Comment: Low,Mid,High channels;Max output power; 2 & 4 level modulation
Date: 09-26-2012

TEXT: "Horz 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

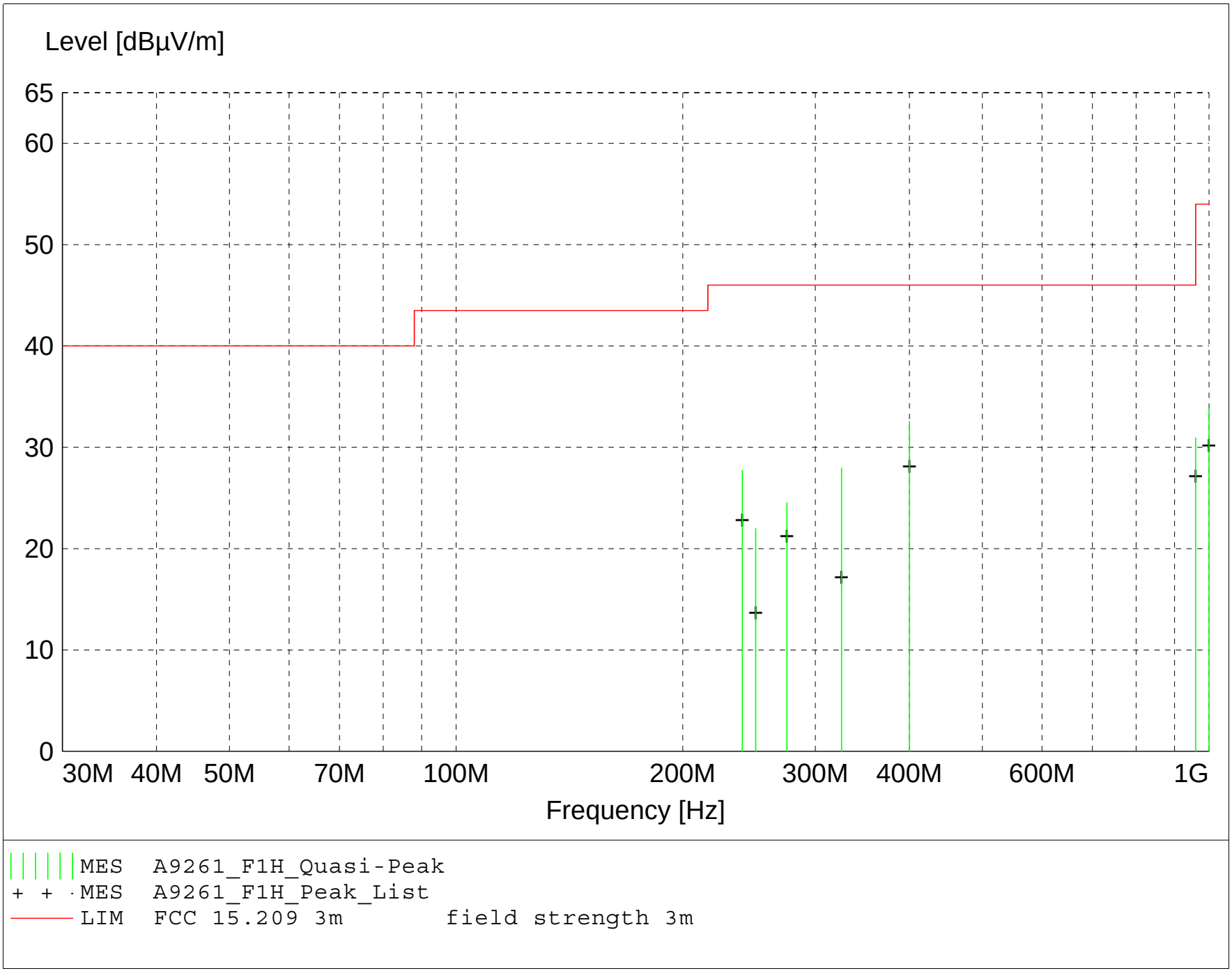
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average dector

Final maximized level using Peak detector


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A9261_F1H_Quasi-Peak
MES A9261_F1H_Peak_List
LIM FCC 15.209 3m field strength 3m

MEASUREMENT RESULT: "A9261_F1H_Final"

9/26/2012 2:34PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
399.990000	37.17	16.10	-20.7	32.6	46.0	13.4	2.10	225	QUASI-PEAK	None
960.000000	23.42	23.90	-16.4	30.9	46.0	15.1	1.00	90	QUASI-PEAK	None
324.990000	34.19	14.70	-20.9	28.0	46.0	18.0	1.00	300	QUASI-PEAK	None
240.000000	37.41	12.00	-21.7	27.7	46.0	18.3	1.00	0	QUASI-PEAK	None
1000.000000	25.42	24.70	-16.3	33.8	54.0	20.2	1.00	0	QUASI-PEAK	None
274.990000	32.59	13.40	-21.5	24.5	46.0	21.5	1.00	80	QUASI-PEAK	None
250.000000	31.24	12.50	-21.8	22.0	46.0	24.0	1.00	230	QUASI-PEAK	None

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Manufacturer: Cambium Networks
Operating Condition: 70 deg. F; 43% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: Transmitter Spurious Emissions
Comment: Low,Mid,High channels;Max output power; 2 & 4 level modulation
Date: 09-26-2012

TEXT: "Vert 3 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

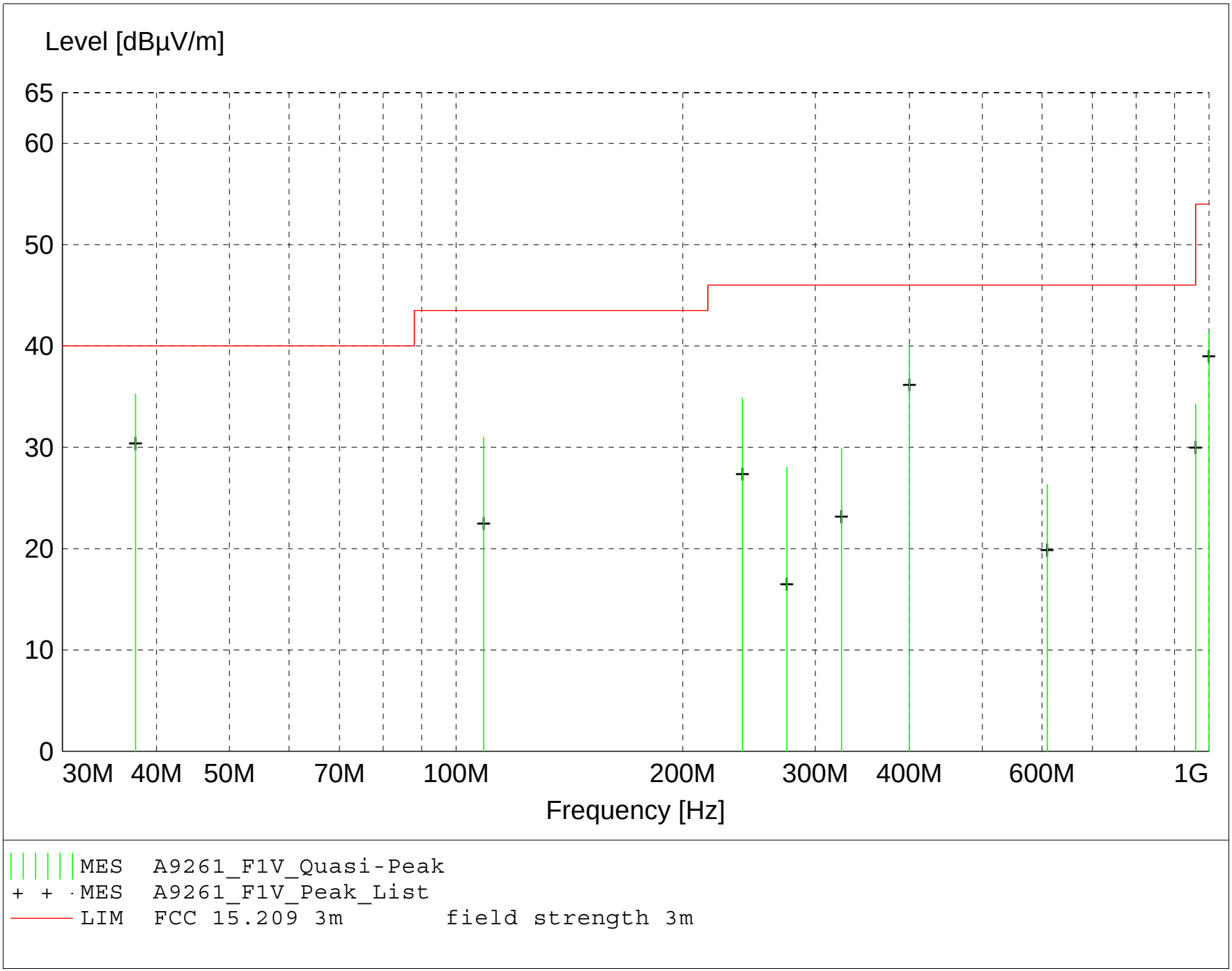
Sample Equations:

Total Level(dBµV/m)	= Level(dBµV)	+ System Loss(dB)	+ Antenna Factor(dBµV/m)
24.6	= 35.51	+ (-22.1)	+ 11.20

Margin(dB)	= Limit(dBµV/m)	- Total Level(dBµV/m)
15.4	= 40	- 24.6

Graph Markers:

+	Frequency marker (Level of marker not related to final level)
|	Final maximized level using Quasi-Peak detector
X	Final maximized level using Average dector
#	Final maximized level using Peak detector


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A9261_F1V_Quasi-Peak
MES A9261_F1V_Peak_List
LIM FCC 15.209 3m field strength 3m

MEASUREMENT RESULT: "A9261_F1V_Final"

9/26/2012 2:44PM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
37.520000	47.59	11.85	-24.2	35.3	40.0	4.7	1.00	45	QUASI-PEAK	None
399.990000	44.79	16.10	-20.7	40.2	46.0	5.8	1.30	0	QUASI-PEAK	None
240.010000	44.53	12.00	-21.7	34.8	46.0	11.2	2.20	0	QUASI-PEAK	None
960.000000	26.75	23.90	-16.4	34.3	46.0	11.7	2.10	280	QUASI-PEAK	None
108.780000	41.98	12.02	-23.0	31.0	43.5	12.5	1.00	180	QUASI-PEAK	None
1000.000000	33.05	24.70	-16.3	41.5	54.0	12.5	1.40	225	QUASI-PEAK	None
324.980000	36.16	14.70	-20.9	29.9	46.0	16.1	2.00	60	QUASI-PEAK	None
274.990000	36.10	13.40	-21.5	28.0	46.0	18.0	1.90	180	QUASI-PEAK	None
609.990000	26.42	19.50	-19.6	26.3	46.0	19.7	1.80	190	QUASI-PEAK	None

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Manufacturer: Cambium Networks
Operating Condition: 71 deg C 34% R.H.
Test Site: DLS O.F. G1
Operator: Craig B
Test Specification: Low,Mid,High channels;Max output power; 2 & 4 level modulation
Comment: Date: 09-25-2012

TEXT: "Horz 3 meters"

Short Description: Test Set-up

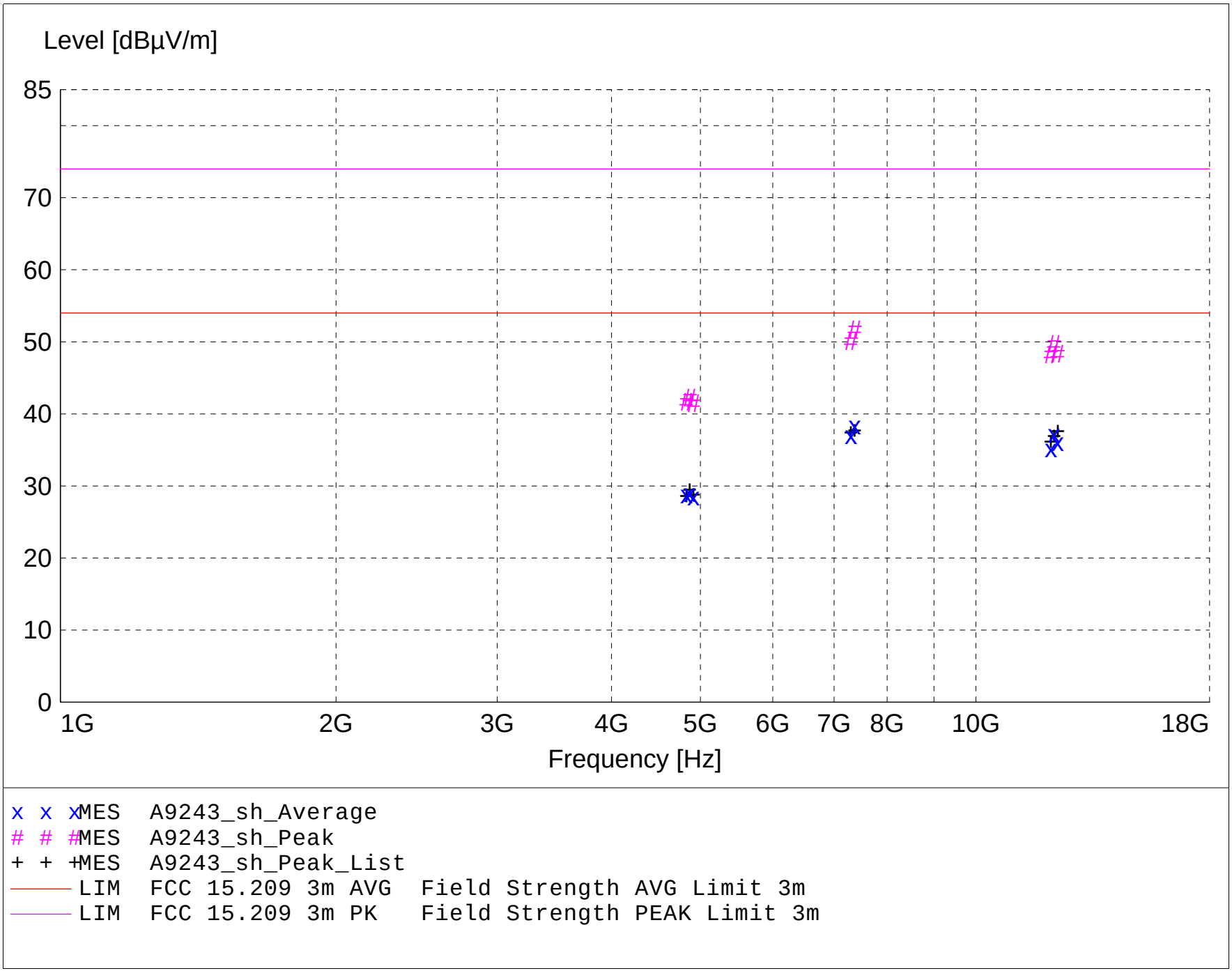
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

Sample Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
15.4 = 40 - 24.6

Graph Markers:

+	Frequency marker (Level of marker not related to final level)
|	Final maximized level using Quasi-Peak detector
X	Final maximized level using Average dector
#	Final maximized level using Peak detector
-	Background Scan Peak Detector (Optional)
-	Background Scan Average Detector (Optional)



x x xMES A9243_sh_Average
#MES A9243_sh_Peak
+ + +MES A9243_sh_Peak_List
——— LIM FCC 15.209 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A9243_sh_Final"

9/25/2012 10:06AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
7372.500000	33.62	36.33	-31.6	38.3	54.0	15.7	1.00	170	AVERAGE	noise floor
12175.000000	34.86	38.93	-36.6	37.2	54.0	16.8	1.20	270	AVERAGE	noise floor
7305.000000	33.80	36.14	-32.9	37.0	54.0	17.0	1.60	0	AVERAGE	noise floor
12287.500000	34.69	38.87	-37.5	36.0	54.0	18.0	1.40	0	AVERAGE	noise floor
12075.000000	34.69	38.99	-38.4	35.2	54.0	18.8	1.40	0	AVERAGE	noise floor
7372.500000	47.00	36.33	-31.6	51.7	74.0	22.3	1.00	170	MAX PEAK	noise floor
7305.000000	46.85	36.14	-32.9	50.1	74.0	23.9	1.60	0	MAX PEAK	noise floor
12175.000000	47.41	38.93	-36.6	49.7	74.0	24.3	1.20	270	MAX PEAK	noise floor
4870.000000	35.10	33.05	-39.1	29.0	54.0	25.0	1.40	180	AVERAGE	noise floor
4830.000000	34.52	32.98	-38.7	28.8	54.0	25.2	1.50	0	AVERAGE	noise floor
4915.000000	34.94	33.12	-39.6	28.5	54.0	25.5	1.50	0	AVERAGE	noise floor
12287.500000	47.00	38.87	-37.5	48.3	74.0	25.7	1.40	0	MAX PEAK	noise floor
12075.000000	47.68	38.99	-38.4	48.2	74.0	25.8	1.40	0	MAX PEAK	noise floor
4870.000000	48.35	33.05	-39.1	42.3	74.0	31.7	1.40	180	MAX PEAK	noise floor
4830.000000	47.41	32.98	-38.7	41.7	74.0	32.3	1.50	0	MAX PEAK	noise floor
4915.000000	47.95	33.12	-39.6	41.5	74.0	32.5	1.50	0	MAX PEAK	noise floor

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Manufacturer: Cambium Networks
Operating Condition: 71 deg C 34% R.H.
Test Site: DLS O.F. G1
Operator: Craig B
Test Specification: Low,Mid,High channels;Max output power; 2 & 4 level modulation
Comment: Date: 09-25-2012

TEXT: "Vert 3 meters"

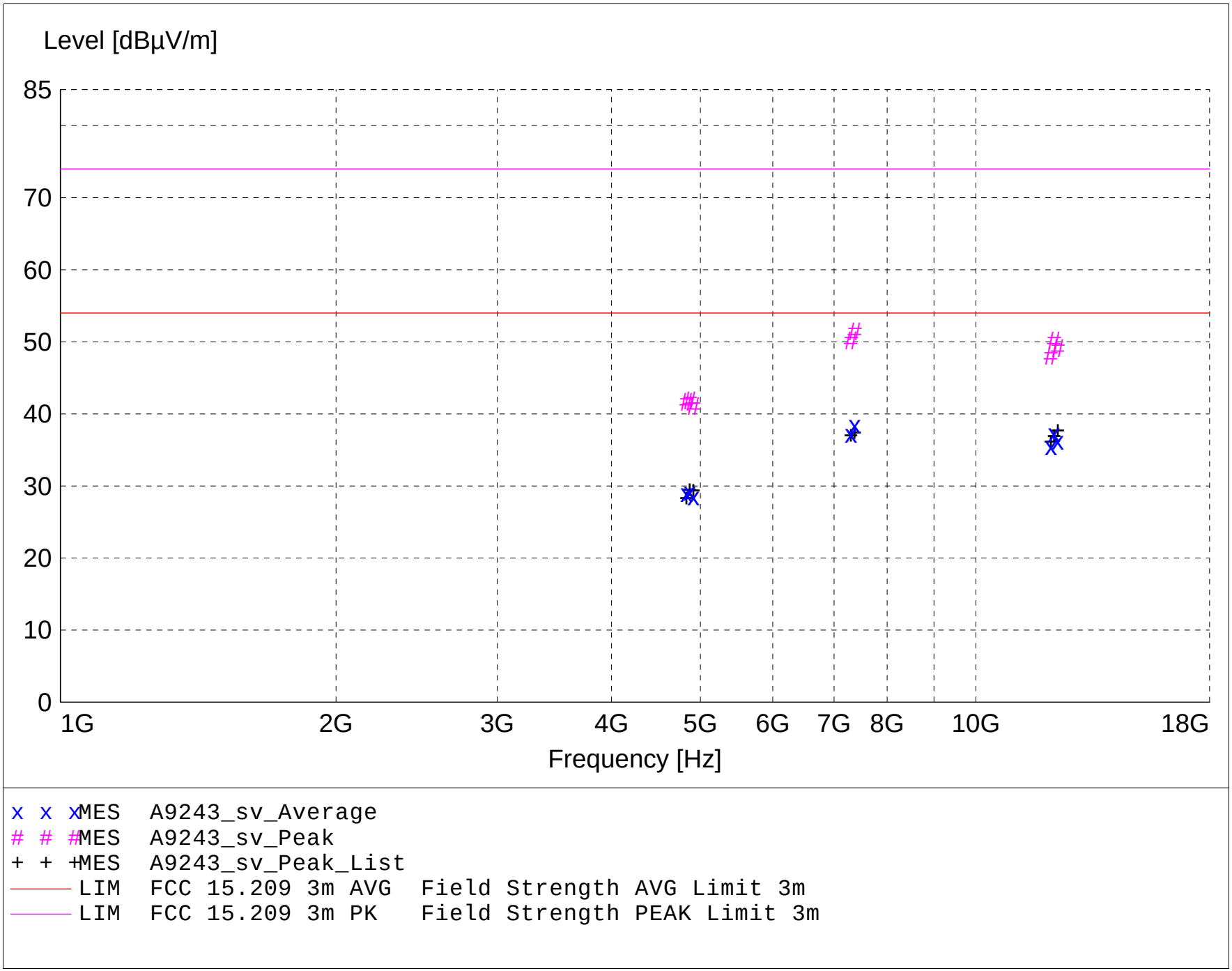
Short Description: Test Set-up

Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

Sample Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)
24.6 = 35.51 + (-22.1) + 11.20

Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)
15.4 = 40 - 24.6

Graph Markers:
+ Frequency marker (Level of marker not related to final level)
| Final maximized level using Quasi-Peak detector
X Final maximized level using Average dector
Final maximized level using Peak detector
- Background Scan Peak Detector (Optional)
- Background Scan Average Detector (Optional)



x x xMES A9243_sv_Average
#MES A9243_sv_Peak
+ + +MES A9243_sv_Peak_List
——— LIM FCC 15.209 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A9243_sv_Final"

9/25/2012 9:18AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
7372.500000	33.80	36.33	-31.6	38.5	54.0	15.5	1.40	315	AVERAGE	noise floor
12175.000000	34.94	38.93	-36.6	37.3	54.0	16.7	1.60	0	AVERAGE	noise floor
7305.000000	33.99	36.14	-32.9	37.2	54.0	16.8	1.50	90	AVERAGE	noise floor
12287.500000	34.94	38.87	-37.5	36.3	54.0	17.7	1.50	0	AVERAGE	noise floor
12075.000000	34.94	38.99	-38.4	35.5	54.0	18.5	1.50	0	AVERAGE	noise floor
7372.500000	46.70	36.33	-31.6	51.4	74.0	22.6	1.40	315	MAX PEAK	noise floor
7305.000000	47.00	36.14	-32.9	50.2	74.0	23.8	1.50	90	MAX PEAK	noise floor
12175.000000	47.82	38.93	-36.6	50.2	74.0	23.8	1.60	0	MAX PEAK	noise floor
4870.000000	35.26	33.05	-39.1	29.2	54.0	24.8	1.40	180	AVERAGE	noise floor
12287.500000	47.82	38.87	-37.5	49.2	74.0	24.8	1.50	0	MAX PEAK	noise floor
4830.000000	34.78	32.98	-38.7	29.0	54.0	25.0	1.20	0	AVERAGE	noise floor
4915.000000	34.94	33.12	-39.6	28.5	54.0	25.5	1.30	270	AVERAGE	noise floor
12075.000000	47.54	38.99	-38.4	48.1	74.0	25.9	1.50	0	MAX PEAK	noise floor
4870.000000	47.95	33.05	-39.1	41.9	74.0	32.1	1.40	180	MAX PEAK	noise floor
4830.000000	47.41	32.98	-38.7	41.7	74.0	32.3	1.20	0	MAX PEAK	noise floor
4915.000000	47.54	33.12	-39.6	41.1	74.0	32.9	1.30	270	MAX PEAK	noise floor

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Manufacturer: Cambium Networks
Operating Condition: 71 deg. F; 38% R.H.
Test Site: DLS Site G1
Operator: Craig B
Test Specification: Transmitter Spurious Emissions
Comment: Low,Mid,High channels;Max output power; 2 & 4 level modulation
Date: 09-26-2012

TEXT: "Horz 1 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 1 Meters with HORIZONTAL Antenna Polarization

Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

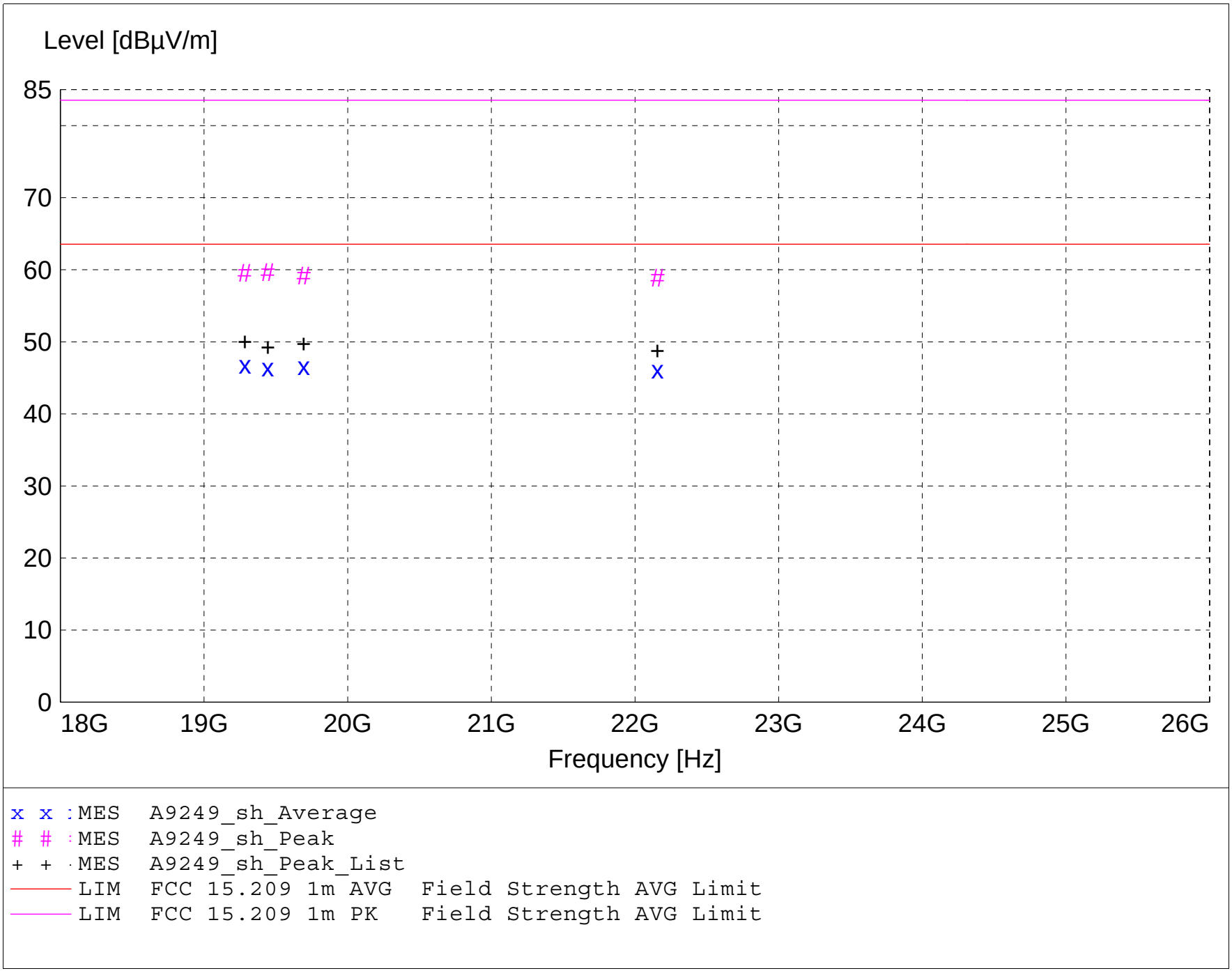
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average dector

Final maximized level using Peak detector


Level [dBµV/m]
85
70
60
50
40
30
20
10
0
18G
19G
20G
21G
22G
23G
24G
25G
26G
Frequency [Hz]
x x :MES A9249_sh_Average
:MES A9249_sh_Peak
+ + :MES A9249_sh_Peak_List
LIM FCC 15.209 1m AVG Field Strength AVG Limit
LIM FCC 15.209 1m PK Field Strength AVG Limit

MEASUREMENT RESULT: "A9249_sh_Final"

9/26/2012 11:06AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
19284.320000	39.78	47.06	-40.0	46.9	63.5	16.7	1.30	0	AVERAGE	noise floor
19694.560000	38.73	47.41	-39.5	46.7	63.5	16.9	1.00	135	AVERAGE	noise floor
19444.140000	39.09	47.22	-39.9	46.4	63.5	17.1	1.10	170	AVERAGE	noise floor
22157.280000	40.28	46.71	-40.8	46.2	63.5	17.4	1.30	0	AVERAGE	noise floor
19444.140000	52.35	47.22	-39.9	59.6	83.5	23.9	1.10	170	MAX PEAK	noise floor
19284.320000	52.49	47.06	-40.0	59.6	83.5	24.0	1.30	0	MAX PEAK	noise floor
19694.560000	51.27	47.41	-39.5	59.2	83.5	24.3	1.00	135	MAX PEAK	noise floor
22157.280000	53.05	46.71	-40.8	58.9	83.5	24.6	1.30	0	MAX PEAK	noise floor

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Manufacturer: Cambium Networks
Operating Condition: 71 deg. F; 38% R.H.
Test Site: DLS Site G1
Operator: Craig B
Test Specification: Transmitter Spurious Emissions
Comment: Low,Mid,High channels;Max output power; 2 & 4 level modulation
Date: 09-26-2012

TEXT: "Vert 1 meters"

Short Description: Test Set-up

Test Set-up: EUT Measured at 1 Meters with VERTICAL Antenna Polarization

Equations: Total Level(dBµV/m) = Level(dBµV) + System Loss(dB) + Antenna Factor(dBµV/m)

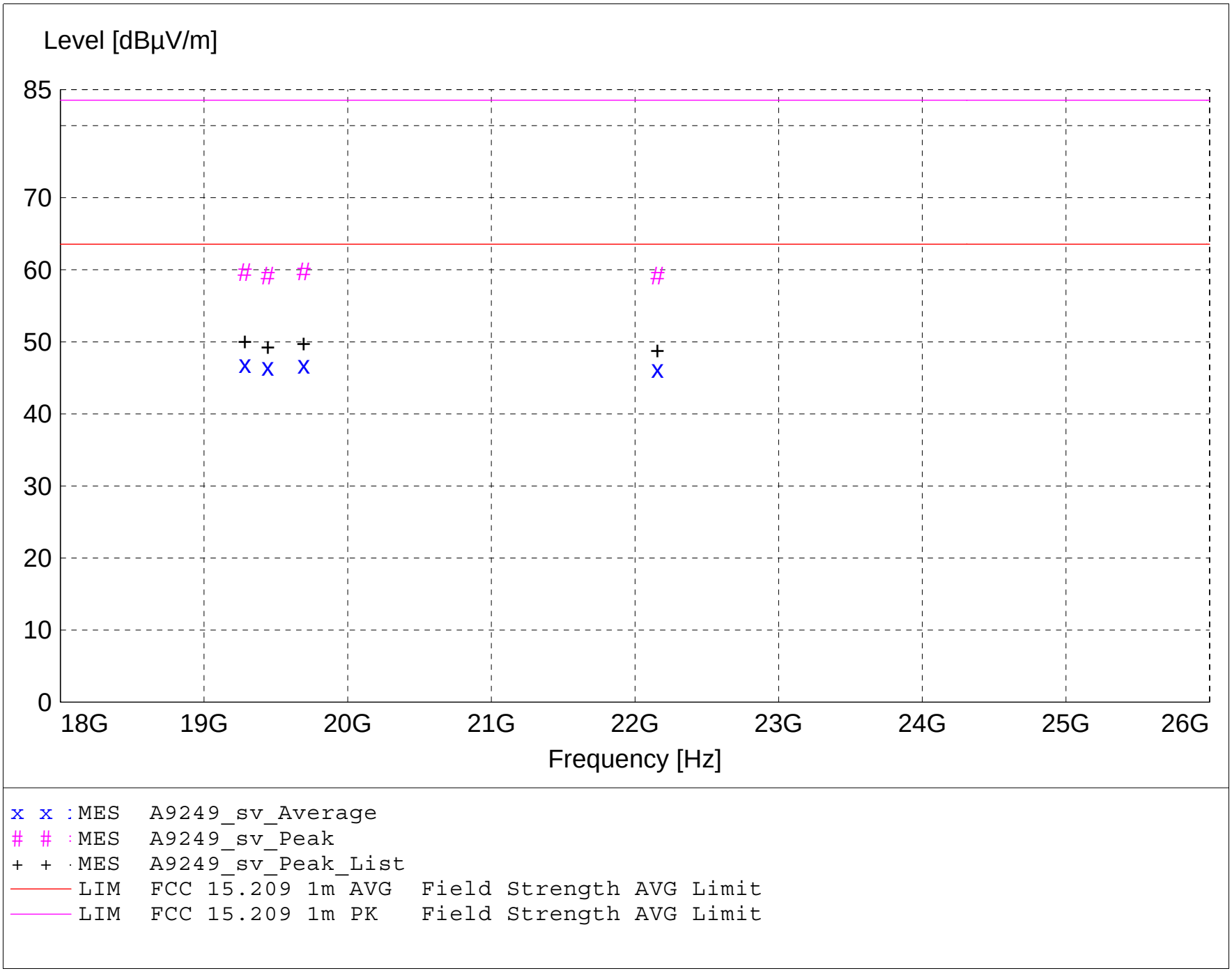
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

Graph Markers: + Frequency marker (Level of marker not related to final level)

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average dector

Final maximized level using Peak detector


Level [dBµV/m]
85
70
60
50
40
30
20
10
0
18G
19G
20G
21G
22G
23G
24G
25G
26G
Frequency [Hz]
x x :MES A9249_sv_Average
:MES A9249_sv_Peak
+ + :MES A9249_sv_Peak_List
LIM FCC 15.209 1m AVG Field Strength AVG Limit
LIM FCC 15.209 1m PK Field Strength AVG Limit

MEASUREMENT RESULT: "A9249_sv_Final"

9/26/2012 10:18AM

Frequency	Level	Antenna Factor	System Loss	Total Level	Limit	Margin	Height Ant.	EuT Angle	Final Detector	Comment
MHz	dBµV	dBµV/m	dB	dBµV/m	dBµV/m	dB	m	deg		
19284.320000	39.82	47.06	-40.0	46.9	63.5	16.6	1.00	0	AVERAGE	noise floor
19694.560000	38.89	47.41	-39.5	46.8	63.5	16.7	1.20	180	AVERAGE	noise floor
19444.140000	39.20	47.22	-39.9	46.5	63.5	17.0	1.20	45	AVERAGE	noise floor
22157.280000	40.37	46.71	-40.8	46.3	63.5	17.3	1.00	30	AVERAGE	noise floor
19694.560000	51.79	47.41	-39.5	59.7	83.5	23.8	1.20	180	MAX PEAK	noise floor
19284.320000	52.63	47.06	-40.0	59.7	83.5	23.8	1.00	0	MAX PEAK	noise floor
19444.140000	51.93	47.22	-39.9	59.2	83.5	24.3	1.20	45	MAX PEAK	noise floor
22157.280000	53.31	46.71	-40.8	59.2	83.5	24.3	1.00	30	MAX PEAK	noise floor

A2.0 Upper Band-Edge Measurement – Radiated

Rule Part:

FCC 15.247(d)
FCC 15.205

Test Procedure:

558074 D01 DTS Meas Guidance v01, 01/18/2012
Unwanted Emissions into Restricted Frequency Bands, Section 5.4.2
Measurement Procedure – ANSI C63.10-2009

Limit:

FCC 15.209(a)

Results:

Compliant

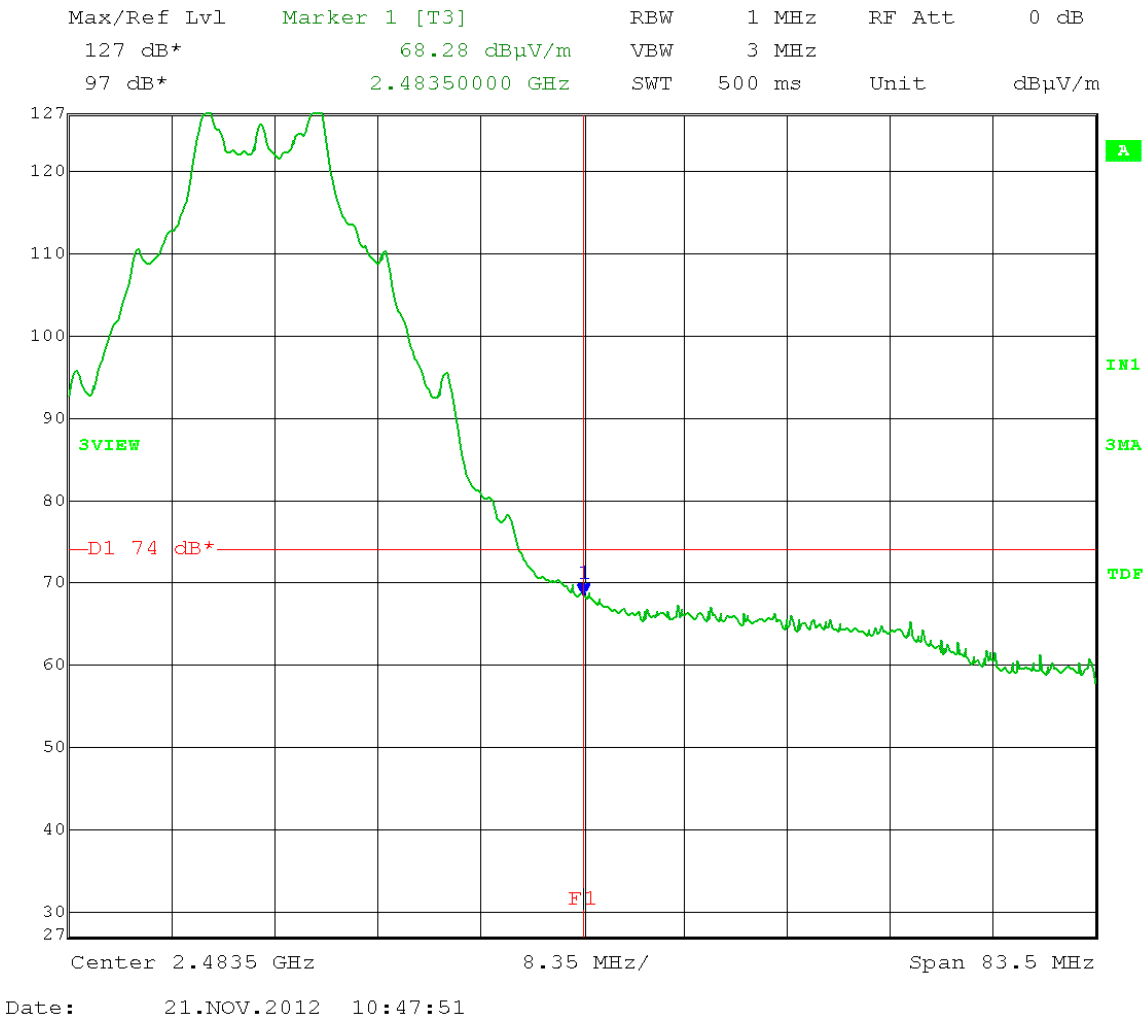
Notes:

This was a radiated measurement. The EUT was set to transmit continuously (98% duty cycle) at its maximum power, with a modulating signal representative of the worst-case signal encountered in a real system operation on the highest channel of operation.

166 South Carter, Genoa City, WI 53128

Test Date: 11-21-2012
Company: Cambium Networks
EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Test: Upper Band-Edge Radiated – 3 meter test distance
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: High Channel: Frequency – 2457.5 MHz
Worst case measurement (2-level modulation; vertical polarization)
Output power setting FC (highest possible)

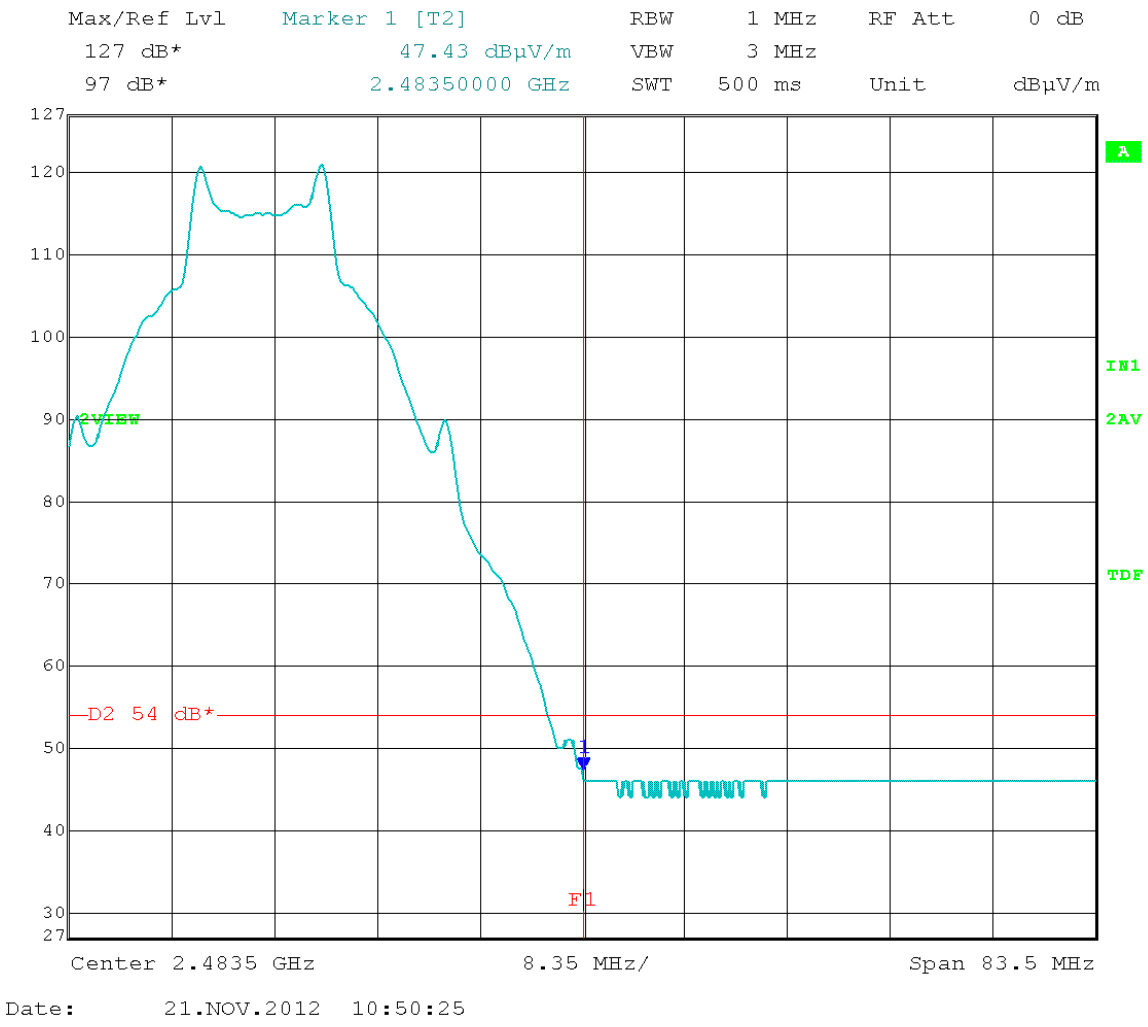
Peak Detector: Peak limit = 74 dBµV/m at 3 meters



166 South Carter, Genoa City, WI 53128

Test Date: 11-21-2012
Company: Cambium Networks
EUT: 2.4 GHz FSK Transceiver (connectorized with Omni antenna)
Test: Upper Band-Edge Radiated – 3 meter test distance
Rule part: FCC Part 15.247(d) and FCC Part 15.205
Operator: Craig B
Comment: High Channel: Frequency – 2457.5 MHz
Worst case measurement (2-level modulation; vertical polarization)
Output power setting FC (highest possible)

Average Detector: Average limit = 54 dBµV/m at 3 meters



END OF REPORT

Revision #	Date	Comments	By
1.0	10-19-2012	Preliminary Release	JS
1.1	11-6-2012	Model numbers added & page 31 corrected	JS
1.2	11-12-2012	Added FCC ID info	JS
1.3	11-21-2012	Replaced Upper Band-Edge data	JS