ELECTRONIC SYSTEMS, INC.
166 South Carter, Genoa City, WI 53128

Company: Cambium Networks
Model Tested: C054045A002A
Report Number: 17898a

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.

And

Industry Canada Spectrum Management and Telecommunications
Radio Standards Specification
RSS-210 Issue 8 December 2010

PART III – FSK Data

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	PMP450AP 5.7 GHz MIMO/Combo Radio	
Kind of Equipment:	Point-to-Multipoint Digital Transmission Transceiver	
Frequency Range:	5730 to 5845 MHz (10 MHz bandwidth)	(in Part I report)
	5735 to 5840 MHz (20 MHz bandwidth)	(in Part II report)
	5740 to 5835 MHz (FSK)	**(in this report)**
Test Configuration:	Stand-alone	
Model Number(s):	C054045A002A	
Model(s) Tested:	C054045A002A	
Serial Number(s):	0A003EA00157 (test unit 1), 0A003EA00154 (test unit 2), 0A003EA00145 (test unit 3)	
Date of Tests:	May 15th to May 31st, 2012	
Test Conducted For:	Cambium Networks 1299 E. Algonquin Road. Schaumburg, IL 60196, 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.

SIGNATURE PAGE

Tested By:

Craig Brandt
Test Engineer

Reviewed By:

William Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

Table of Contents

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 PMP450AP 5.7 GHz MIMO/Combo Radio, Model C054045A002A, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247 and Industry Canada RSS-210 Issue 8. FCC limits & procedures were used to show compliance with Industry Canada regulations.

Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
Informative	26 dB Emission Bandwidth	FCC Publication KDB 558074 D01 DTS Meas Guidance v01 Section 5.1.1	1	NA
15.247(a)(2) & RSS-210 A8.2(a)	6 dB Emission Bandwidth	FCC Publication KDB 558074 D01 DTS Meas Guidance v01 Section 5.1.1	1	Yes
15.247(b)(3) & RSS-210 A8.4(3)(5)	Fundamental Emission Output Power – Average	FCC Publication KDB 558074 D01 DTS Meas Guidance v01 Section 5.2.2.1-AVG1	1	Yes
15.247(e) & RSS-210 A8.2(b)	Maximum Power Spectral Density Level in the Fundamental Emission - Average	FCC Publication KDB 558074 D01 DTS Meas Guidance v01 Section 5.3.2-AVGPSD	1	Yes
15.247(d) & RSS-210 A8.5	Maximum Unwanted Emission Levels – RF Conducted	FCC Publication KDB 558074 D01 DTS Meas Guidance v01 Sections 5.4.1 & 5.4.2	1	Yes
15.247 (d), 15.205 & RSS-210 A8.5 RSS-Gen 7.2.2	Unwanted Emissions into Restricted Frequency Bands - Radiated	ANSI C63.10-2009 Sections 6.5 & 6.6	2	Yes
15.247(d) & RSS-210 A8.5	Band Edge Measurements	FCC Publication KDB 558074 D01 DTS Meas Guidance v01 Sections 5.4.1 & 5.4.2	1	Yes
15.35(c) & RSS-Gen 7.2.3	Duty Cycle of Test Unit	ANSI C63.10-2009 Section 7.5	1	NA
15.207(a) & RSS-Gen 7.2.4	AC Line Conducted Emissions	ANSI C63.10-2009 Section 6.2		Yes

Note 1: RF conducted measurement.
Note 2: Radiated emission measurement.

2.0 Introduction

From May 15th through May 31st, 2012 the PMP450AP 5.7 GHz MIMO/Combo Radio, Model C054045A002A, as provided from Cambium Networks, was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247 and Industry Canada RSS-210 Issue 8. 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:

Point-to-Multipoint 5.7 GHz DTS/UNII Transceiver with either OMNI (13 dBi) or Sector (17 dBi) external antenna with 10 MHz or 20 MHz channel bandwidth. The Sector Antenna housing includes the 17 dBi Dipole Sector Antenna and 10.5 dBi Dual Patch Antenna. The 17 dBi antenna operates with OFDM modulation, and the 10.5 dBi Dual Patch Antenna operates with FSK modulation. An external 10 dBi OMNI antenna can operate with the FSK modulation as well.

Type of Equipment / Frequency Range:

Stand-Alone / 5730 to 5845 MHz (10 MHz bandwidth)	(in Part I report)
5735 to 5840 MHz (20 MHz bandwidth)	(in Part II report)
5740 to 5835 MHz (FSK)	**(in this report)**

Physical Dimensions of Equipment Under Test:

Length: 9 in. Width: 9 in. Height: 3 in.

Power Source:

29 VDC (Power Over Ethernet to Radio)
120 Vac, 60 Hz using Phihong power supply model: PSA15A-295 (MOT)

Internal Frequencies:

150 kHz, 75 kHz (Switching Power Supply Frequencies)
40 MHz, 25 MHz, 20 MHz

Transmit Frequencies Used For Test Purpose:

10 MHz Channel Bandwidth:	Low channel: 5730 MHz, Middle channel: 5800 MHz, High channel: 5845 MHz
20 MHz Channel Bandwidth:	Low channel: 5735 MHz, Middle channel: 5800 MHz, High channel: 5840 MHz
FSK:	**Low channel: 5740 MHz, Middle channel: 5800 MHz, High channel: 5835 MHz (in this report)**

Type of Modulations:

OFDM: QPSK, 16 QAM, & 64 QAM

FSK: 2-level & 4-level (in this report)

Description of Circuit Board(s) / Part Number:

Cambium Networks PC Board	84010120001 Issue A
17 dBi Dipole Sector antenna with 10.5 dBi Dual Patch antenna in antenna housing	SKM540045-17
Connector	09010084001
Cables x 3	30009406002
OMNI 13 dBi antenna	AMO-5G13
OMNI 10 dBi antenna	M26310100015

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
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4/12	4/13
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	1/12	1/13
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	9/10	9/12
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	9/10	9/12
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	2/12	2/13
Horn Antenna	EMCO	3115	9903-5731	1-18GHz	6/11	6/13
Low Pass Filter	Mini-Circuits	VLFX-1125	RUU926000920	DC-1125MHz	8/11	8/12
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	8/11	8/12
Horn Antenna	EMCO	3116	2549	18 – 40GHz	8/10	8/12
High Pass Filter	Planar Filter Co.	HP8G-7G8-CD-SFF	PF1225/0728	7.5 GHz – 18 GHz	8/11	8/12
High Pass Filter	Planar Filter Co.	CL22600-9000-CD-SS	PF1230/0728	16.2 GHz – 40 GHz	8/11	8/12
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	7/11	7/12
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5/12	5/13
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1/12	1/13
Limiter	Electro-Metrics	EM-7600	706	9 kHz – 30 MHz	1/12	1/13
20 dB attenuator	Aeroflex/weinschel	75A-20-12	1071	DC – 40 GHz	6/11	6/12
Preamp	Rohde & Schwarz	TS-PR40	052002/025	26 GHz – 40 GHz	6/11	6/12
50 Ohm Load	Pasternack	PE6039	DLS #527	DC – 18 GHz	NA	NA
50 Ohm Load	Pasternack	PE6095	NA	DC – 18 GHz	NA	NA

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 A – Measurement Data. **See the separate exhibit for 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

RF Conducted Emissions Measurement Arrangement:

All RF conducted emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to FCC Publication KDB 558074 D01 DTS Meas Guidance v01 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix A – Measurement Data. **See the separate exhibit for additional photos of the test set up.**

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

68°F at 44% RH

Supply Voltage:

29 VDC (Power Over Ethernet to Radio)
120 Vac, 60 Hz using Phihong power supply model: PSA15A-295 (MOT)

8.0 Modifications Made To EUT for Compliance

Modifications made for compliance of FSK transmitter:

1. Changed Low channel from 5735 MHz to 5740 MHz.
2. Changed High channel from 5840 to 5835 MHz.
3. Changed the output power setting of the low channel from E4 to E0.
4. Added aluminum tape around FSK connector the full length of the FSK shield and over the top of the circuit board and down the back side of the board by 3/16 inch.
5. Added aluminum tape to cover the area on the circuit board between the OFDM shield and the FSK shield.
6. Added aluminum tape along the inside top, botom, and sides of the enclosure cover.
7. Added aluminum tape (2 inch x 5.5 inch) along the front of the enclosure cover (inside) on the FSK side of the EUT.

See separate exhibit (Test Setup Photos) for photos of these modifications.

9.0 Additional Descriptions

Mode of operation: Measurements were taken for 2-level and 4-level FSK modulation types, and at the lowest, middle, and highest channels of operation. The EUT was set to transmit continuously with 98% duty cycle.

Emission Designators: 10M0X1D, 20M0X1D

10.0 Results

Measurements were performed in accordance with FCC Publication KDB 558074 D01 DTS Meas Guidance v01and ANSI C63.10-2009. Graphical and tabular data can be found in Appendix A at the end of this report.

11.0 Conclusion

The PMP450AP 5.7 GHz MIMO/Combo Radio, Model C054045A002A, as provided from Cambium Networks tested from May 15th to May 31st, 2012 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247 and Industry Canada RSS-210 Issue 8.

Note: FCC limits & procedures were used to show compliance with Industry Canada regulations.

166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A1.0 26 dB Emission Bandwidth - Conducted

Rule Section: Informative

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 5.1.1

Description: RBW = 1-5% of EBW
VBW ≥ 3 x RBW
Detector = Peak
Trace mode = max hold
Sweep = auto couple

Measure the maximum width of the emission between the lower and upper frequencies that measure 26 dB below the maximum level of the in-band emission.

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.

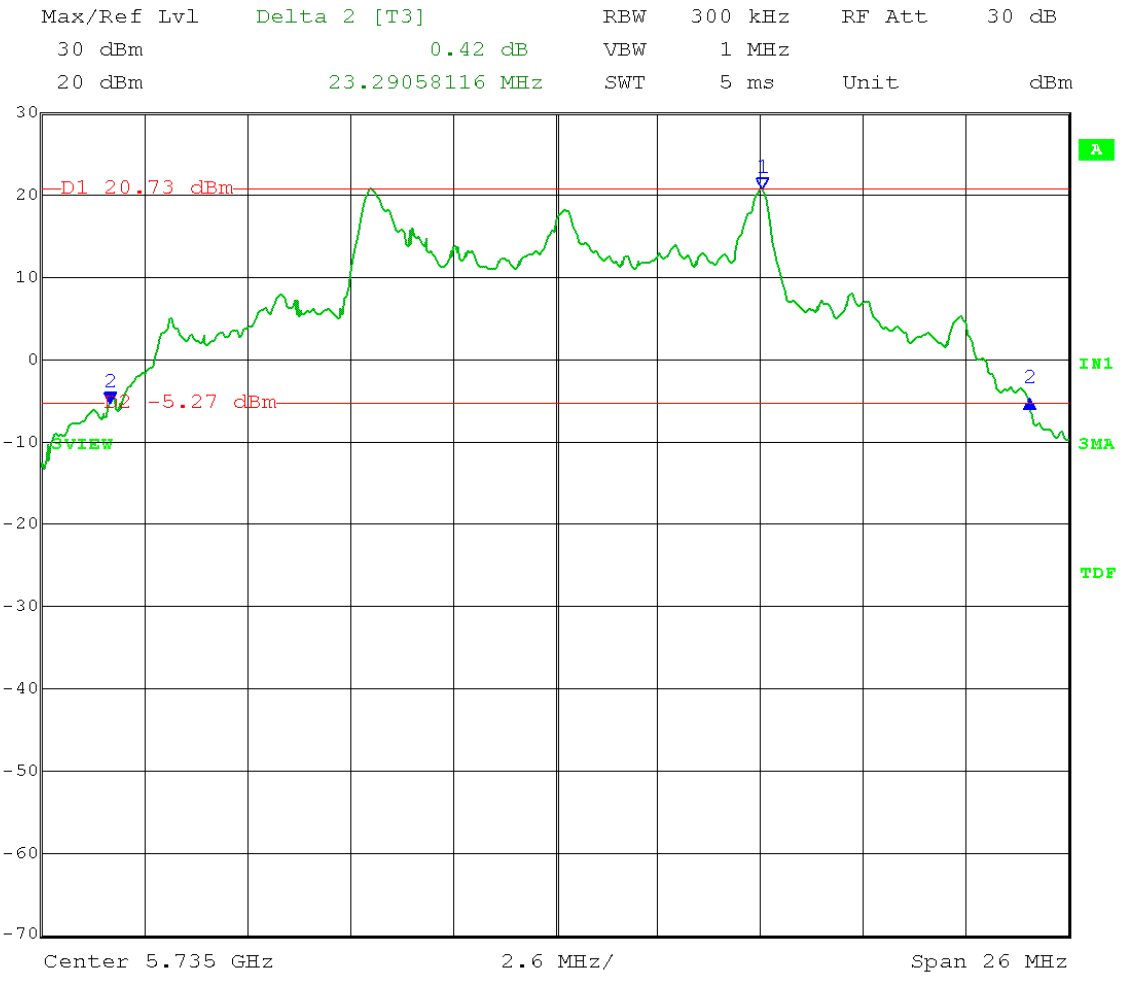
Limit: Informative

Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 26 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.735 GHz
26 dB EBW: 23.3 MHz Modulation Type: 2-level FSK

26 dB Emission Bandwidth = 23.3 MHz



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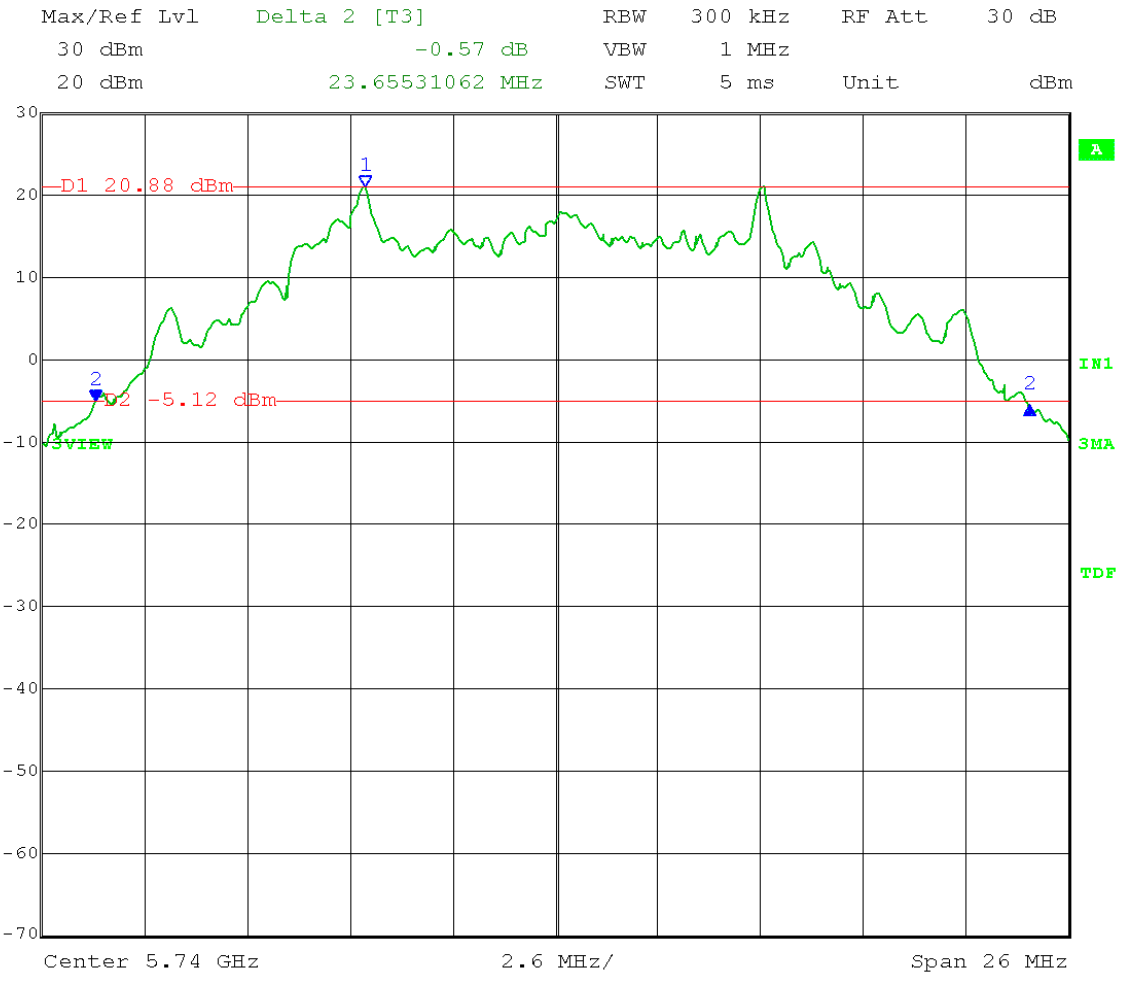
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 26 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
26 dB EBW: 23.7 MHz Modulation Type: 4-level FSK

26 dB Emission Bandwidth = 23.7 MHz



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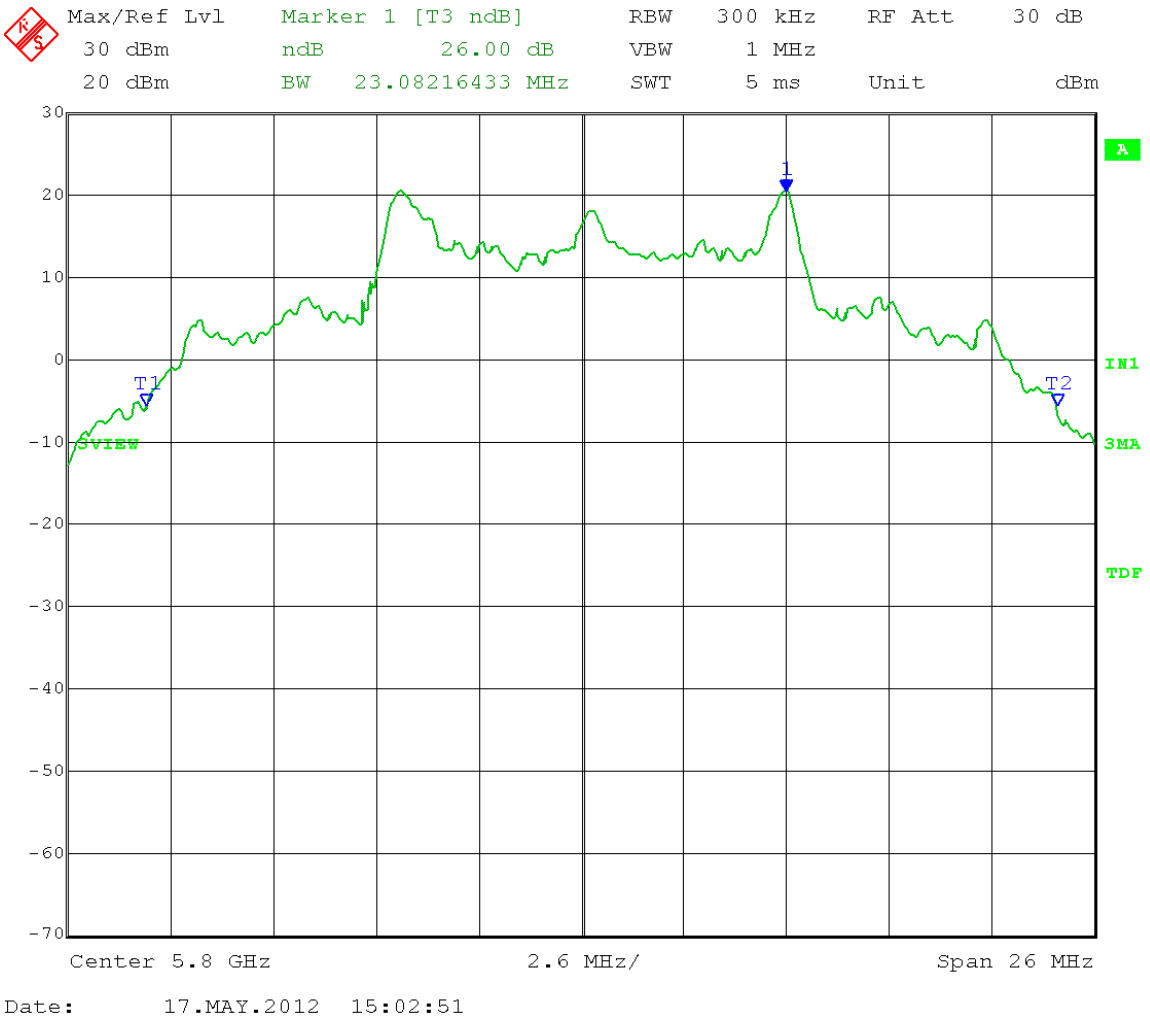
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 26 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
26 dB EBW: 23.08 MHz Modulation Type: 2-level FSK

26 dB Emission Bandwidth = 23.08 MHz



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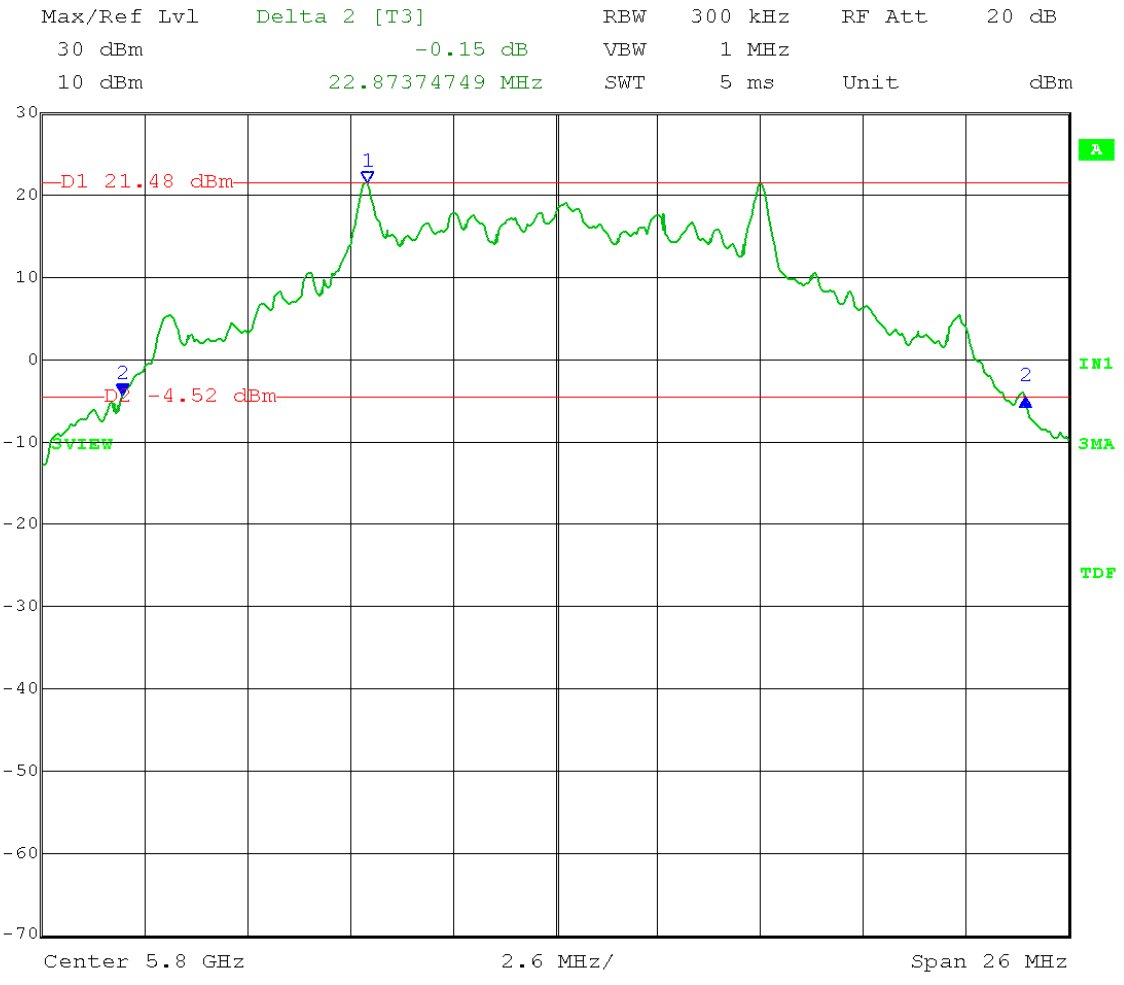
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 26 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
26 dB EBW: 22.9 MHz Modulation Type: 4-level FSK

26 dB Emission Bandwidth = 22.9 MHz



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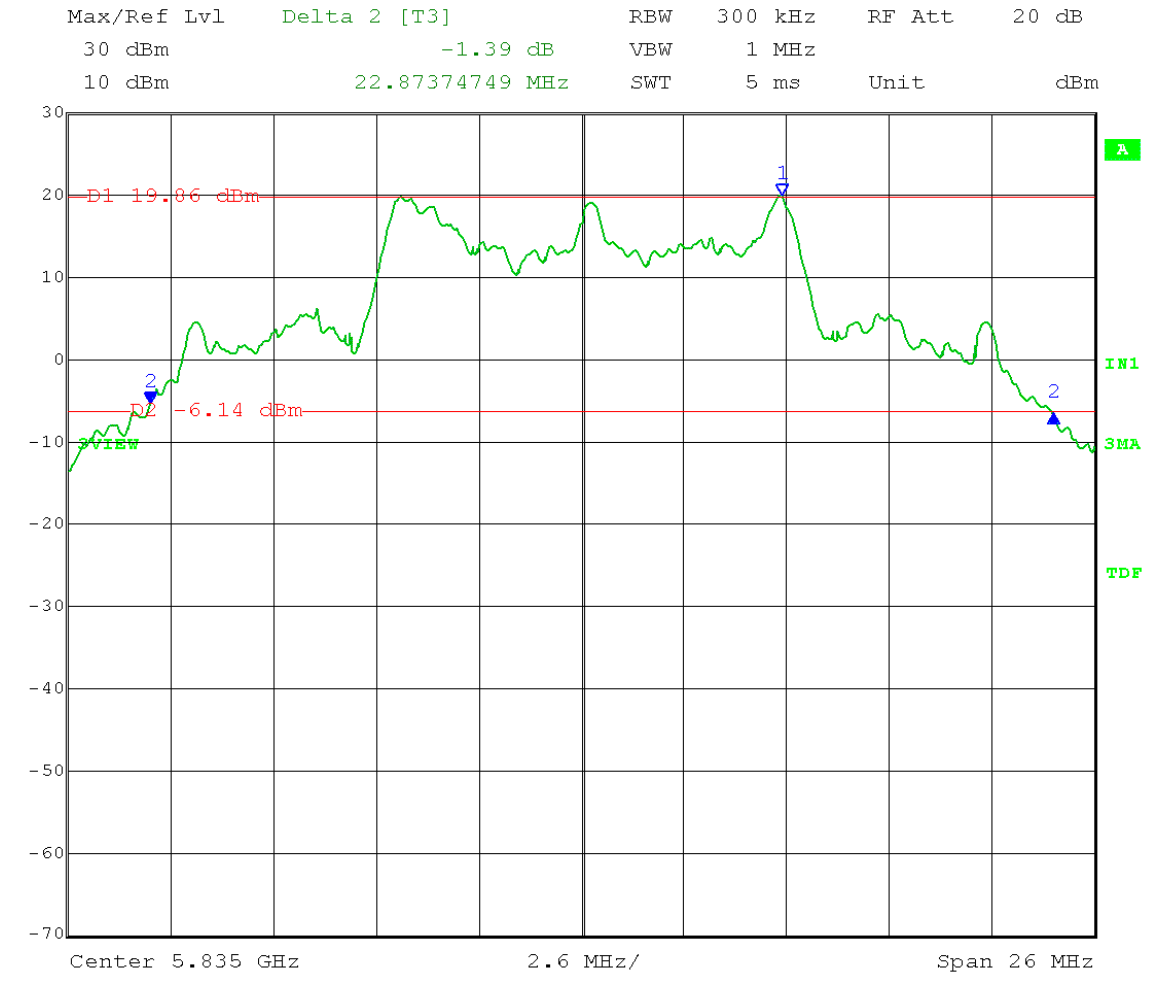
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 26 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
26 dB EBW: 22.9 MHz Modulation Type: 2-level FSK
Reg 7000103C set to 81400000

26 dB Emission Bandwidth = 22.9 MHz



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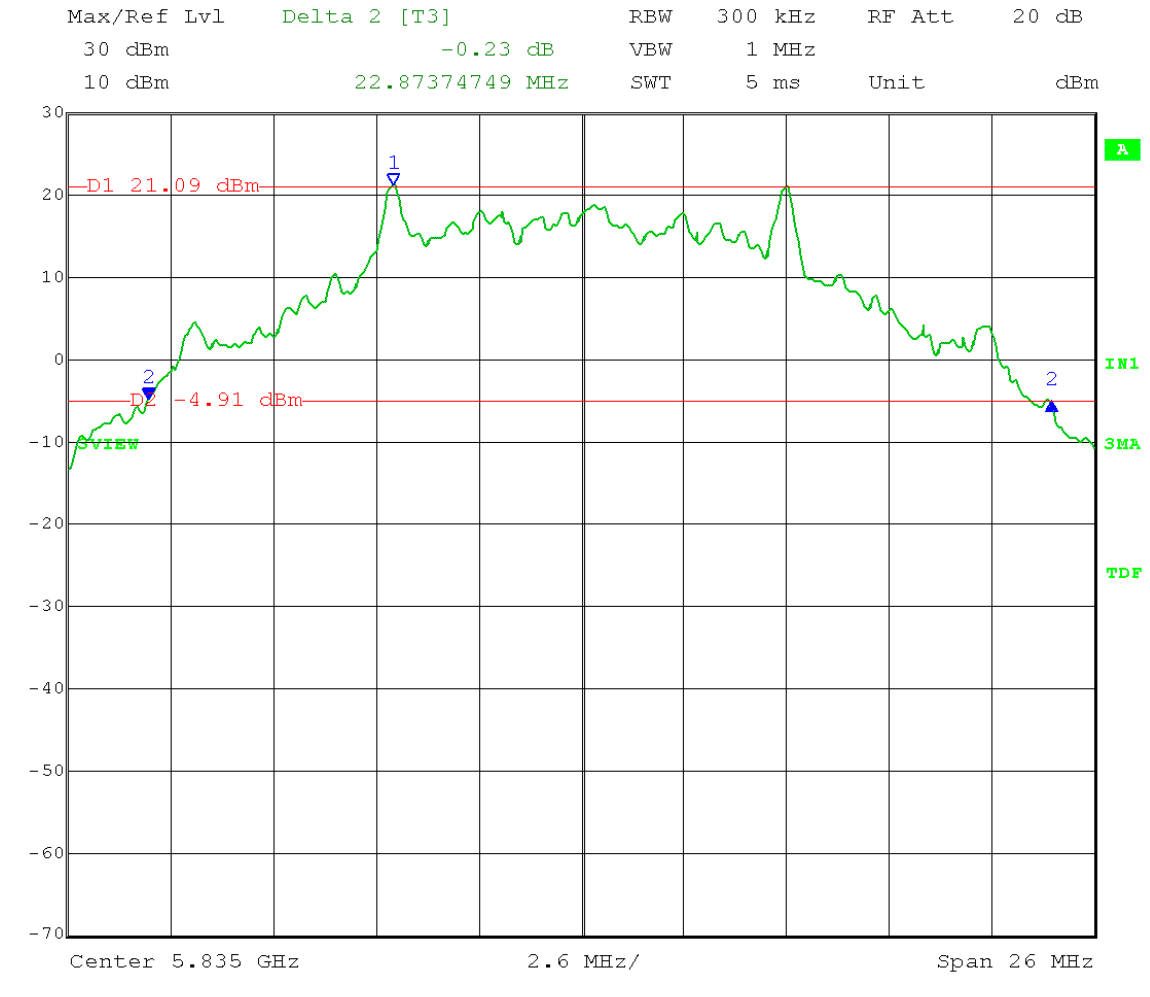
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 26 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
26 dB EBW: 22.9 MHz Modulation Type: 4-level FSK

26 dB Emission Bandwidth = 22.9 MHz



Date: 23.MAY.2012 15:52:25

166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A2.0 Emission Bandwidth – 6 dB bandwidth - Conducted

Rule Section: Section 15.247(a)(2)
RSS-210 A8.2(a)

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 5.1.1

Description: RBW = 1-5% of EBW
VBW ≥ 3 x RBW
Detector = Peak
Trace mode = max hold
Sweep = auto couple

Measure the maximum width of the emission between the lower and upper frequencies that measure 6 dB below the maximum level of the in-band emission.

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.

Limit: 6 dB bandwidth shall be at least 500 kHz

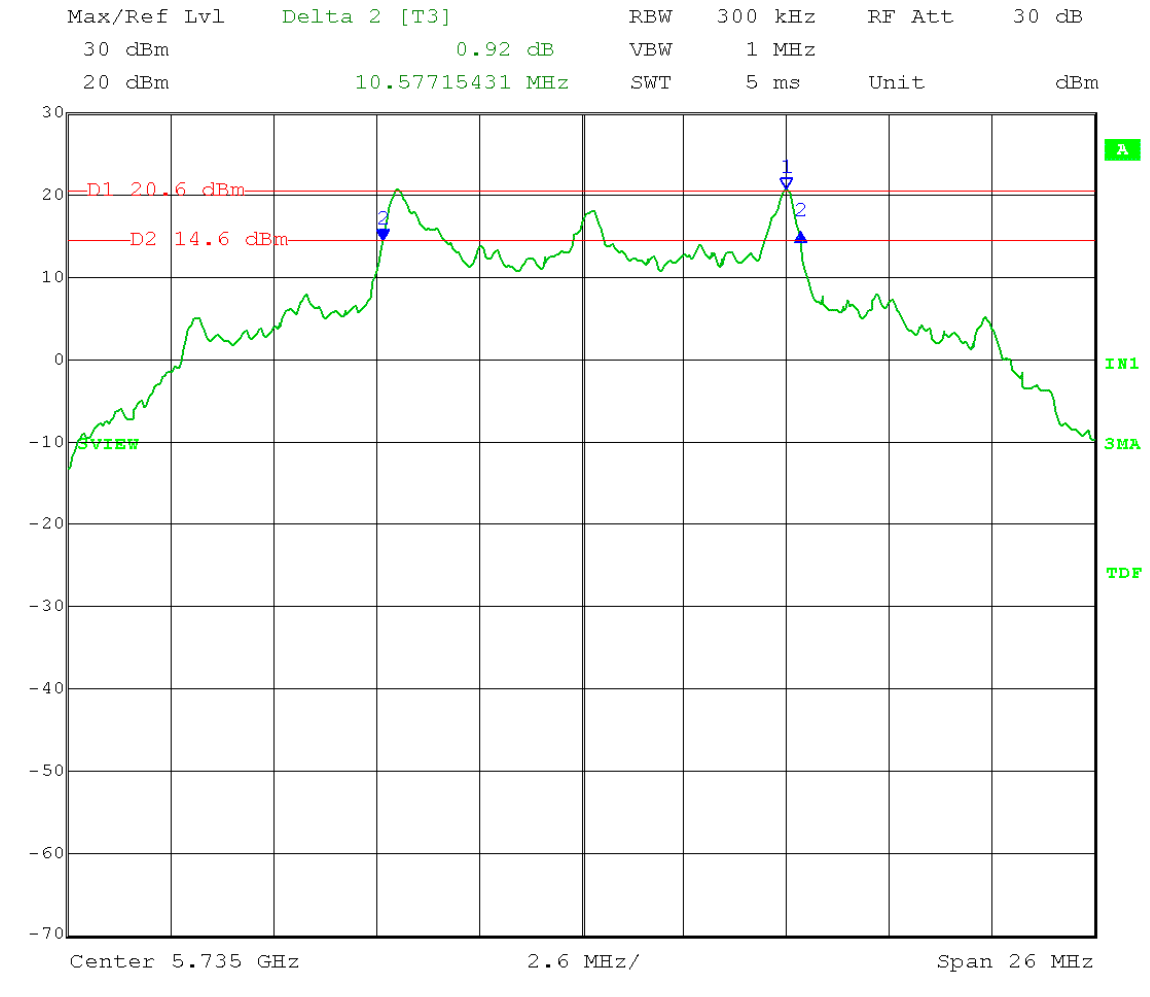
Results: Passed

Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 6 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.735 GHz
26 dB EBW: 23.3 MHz Modulation Type: 2-level FSK

6 dB Emission Bandwidth = 10.58 MHz



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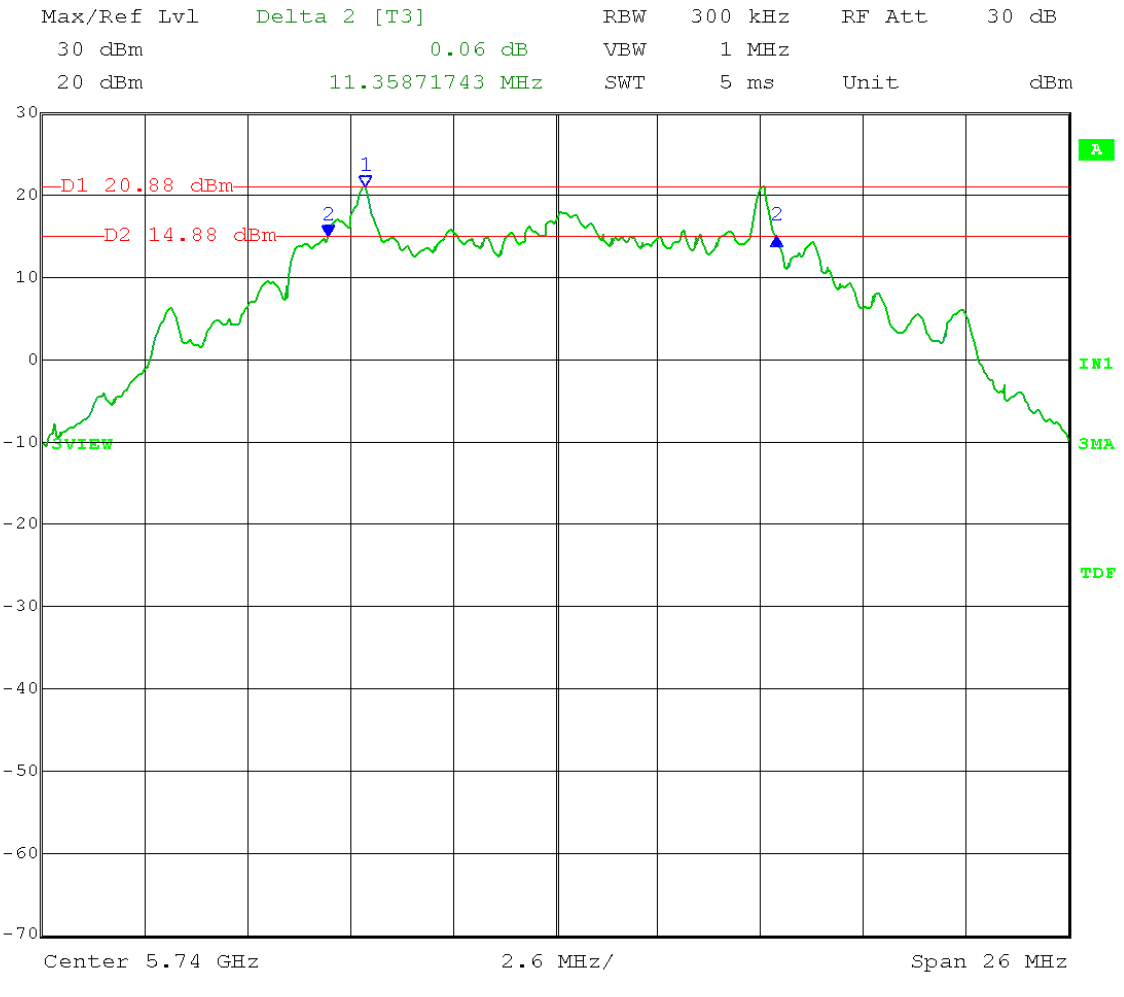
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 6 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
26 dB EBW: 23.7 MHz Modulation Type: 4-level FSK

6 dB Emission Bandwidth = 11.36 MHz



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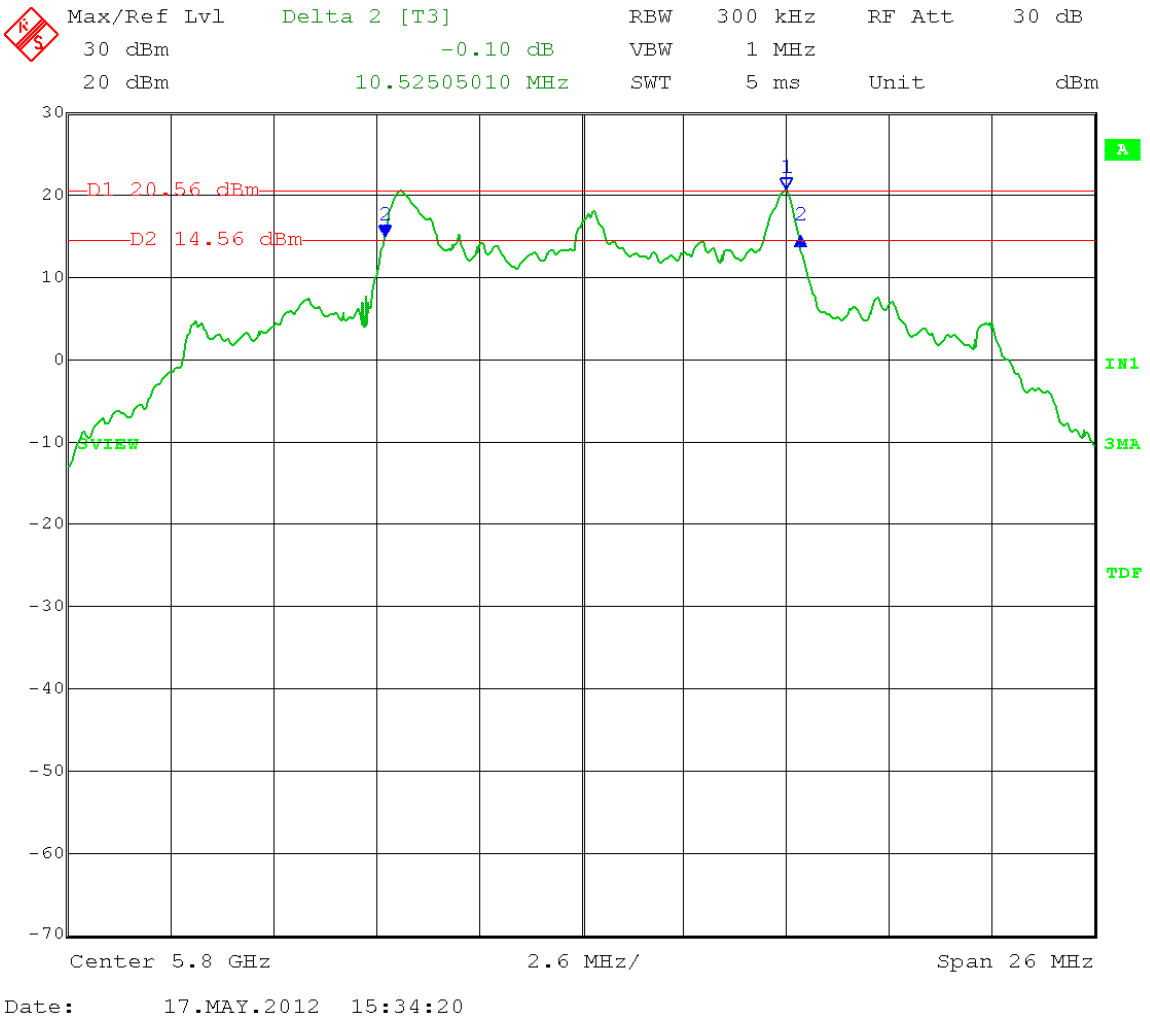
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 6 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
26 dB EBW: 23.08 MHz Modulation Type: 2-level FSK

6 dB Emission Bandwidth = 10.53 MHz



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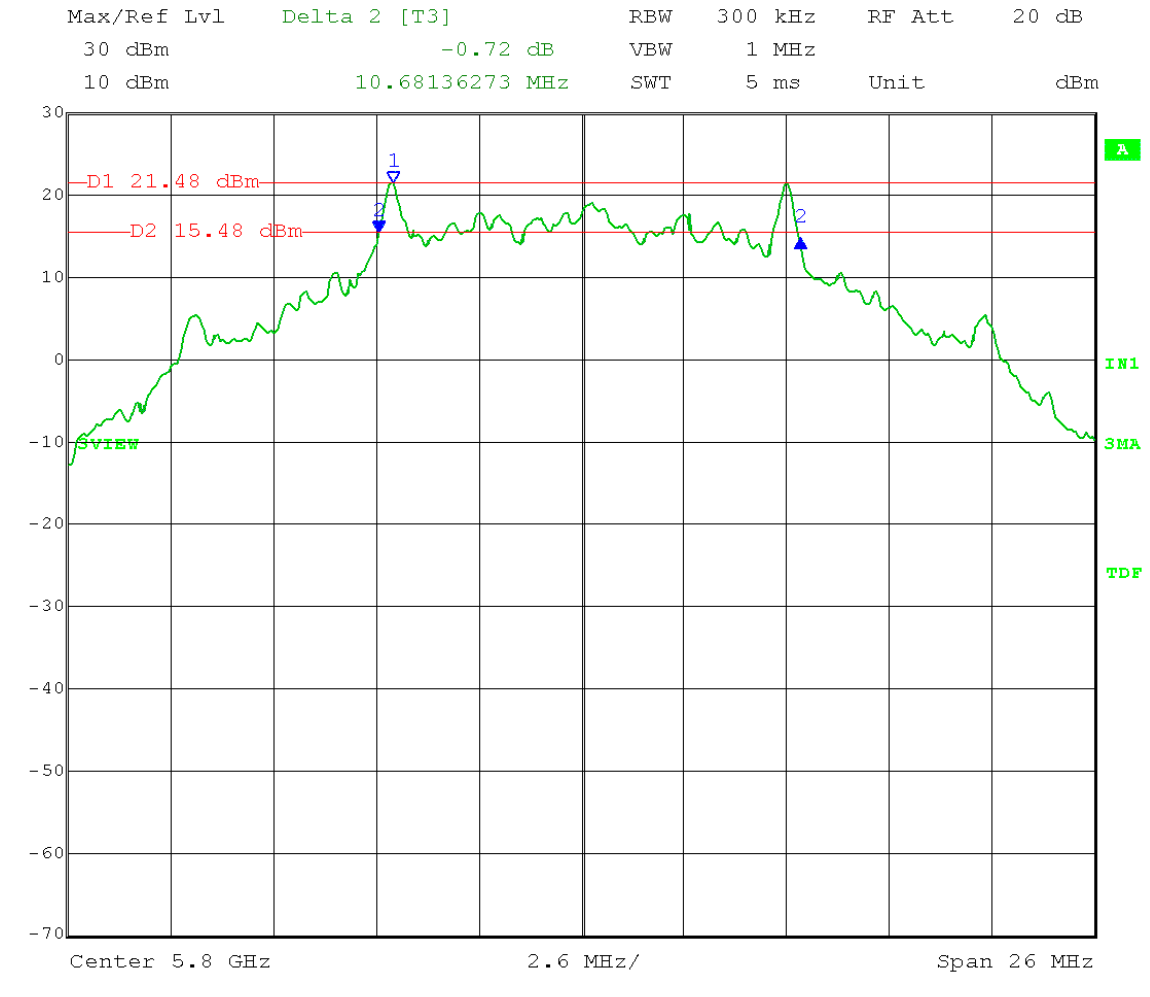
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 6 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
26 dB EBW: 22.9 MHz Modulation Type: 4-level FSK

6 dB Emission Bandwidth = 10.68 MHz



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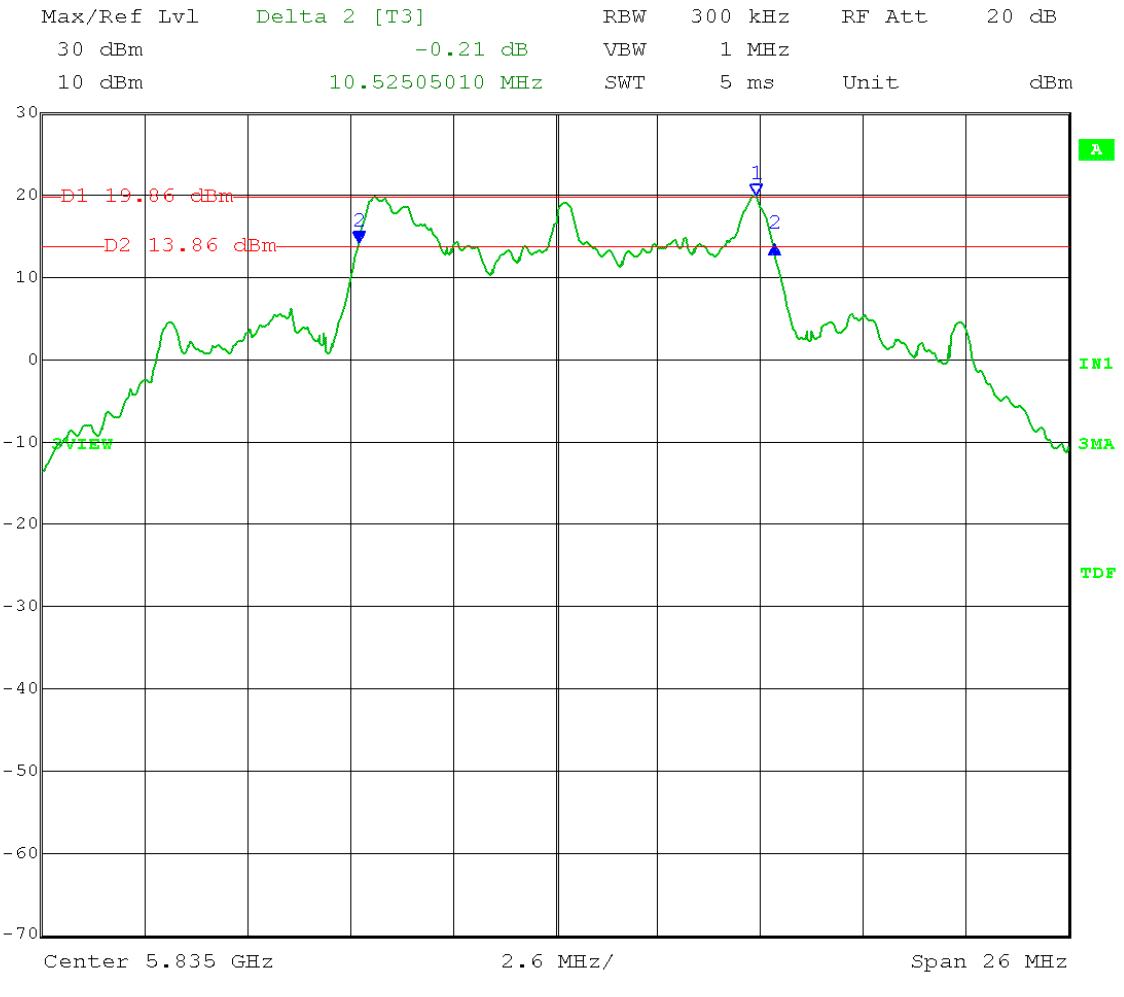
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 6 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
26 dB EBW: 22.9 MHz Modulation Type: 2-level FSK
Reg 7000103C set to 81400000

6 dB Emission Bandwidth = 10.58 MHz



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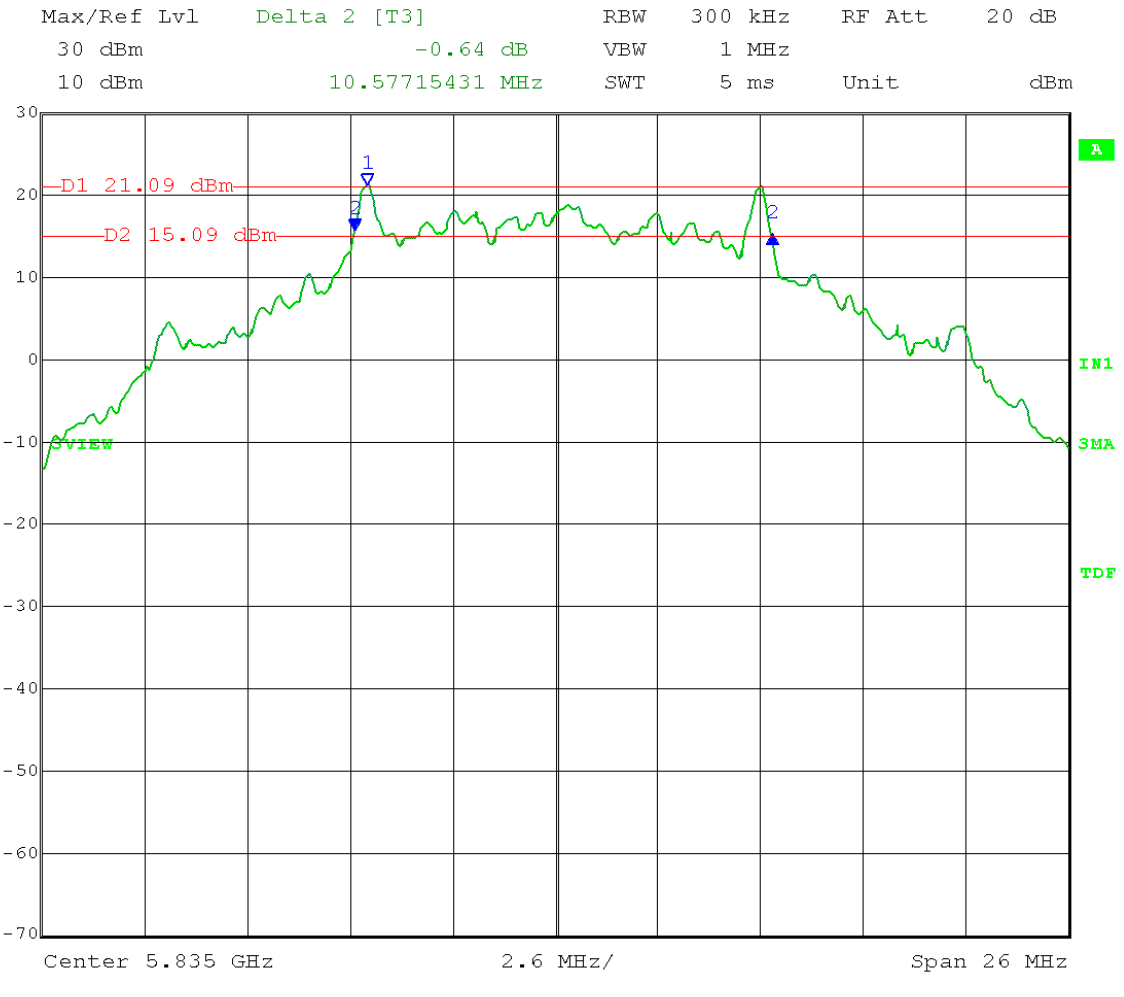
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Emission Bandwidth – 6 dB bandwidth – conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.1.1
Operator: Craig B

RBW = 1-5% of EBW; VBW ≥ 3 x RBW
Detector = Peak; Trace mode = max hold
Sweep = auto couple

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
26 dB EBW: 22.9 MHz Modulation Type: 4-level FSK

6 dB Emission Bandwidth = 10.58 MHz



Date: 23.MAY.2012 15:55:50

Appendix A – Measurement Data

A3.0 Fundamental Emission Output Power - Conducted

Rule Section: Section 15.247(b)(3)
RSS-210 A8.4(3)
RSS-210 A8.4(4) – allowing Average Measurements

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 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)

Description: Span = 5-30% greater than the EBW
RBW = 1 MHz;
Detector = power average (RMS)
VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
Trace mode: single sweep
Use analyzer band power function with band limits set to EBW band edges.

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.

Limit: 1 Watt (30 dBM); **25.5 dBm** (see note below)

Results: Passed

Note: Antenna Gain is 10.5 dBi. Therefore, the RF conducted Power limit was reduced by 4.5 dB (the amount by which the antenna gain exceeds 6 dBi) to 25.5 dBm.

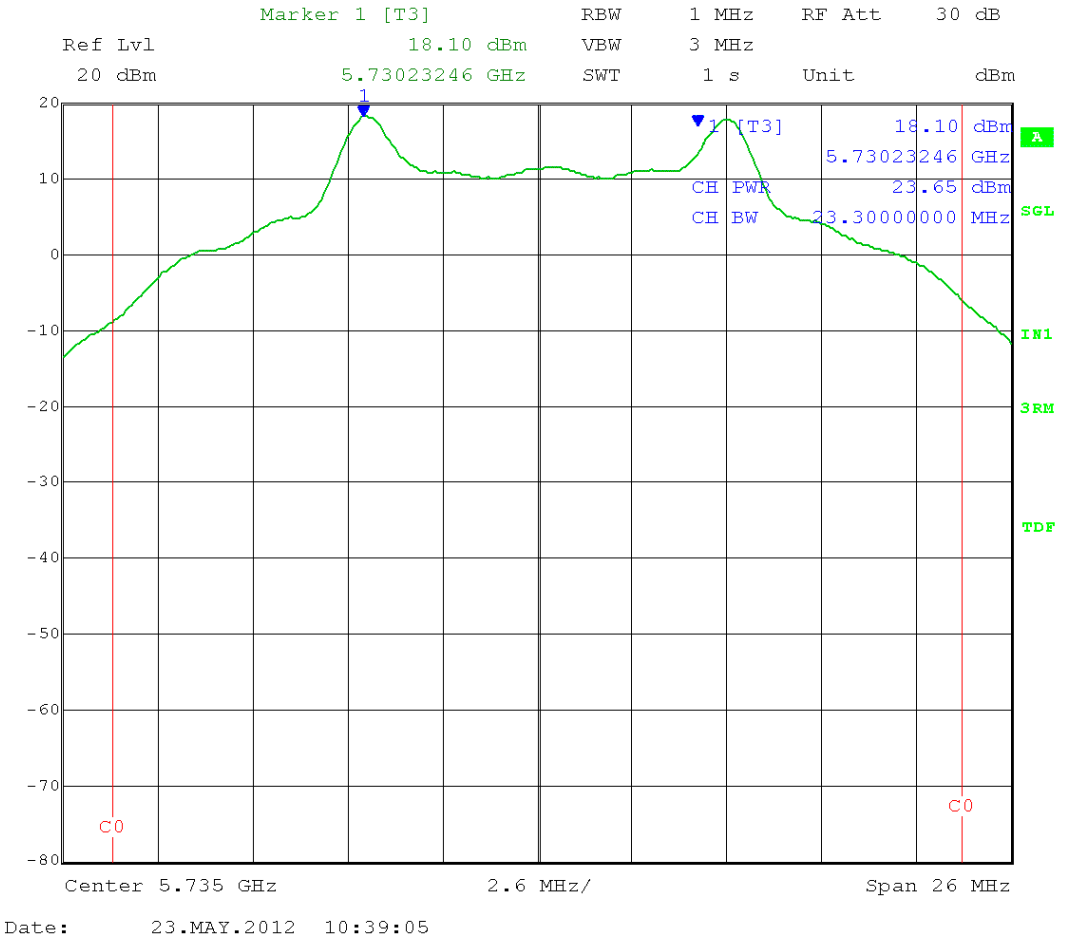
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)
Operator: Craig B

Span = 5-30% greater than the EBW; RBW = 1 MHz
Detector = power average (RMS); VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep
Use band power function with band limits set to EBW band edges.

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Middle Channel Frequency: 5.735 GHz
26 dB EBW: 23.3 MHz Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dBm (1 Watt) – 4.5 dB (antenna gain is 4.5 dB greater than the 6 dB allowed) = 25.5 dBm conducted.

Fundamental Emission AVERAGE Output Power = 23.65 dBm + 1.2 dB for Cambium Networks connectorized cable = 24.85 dBm = **305 mW**



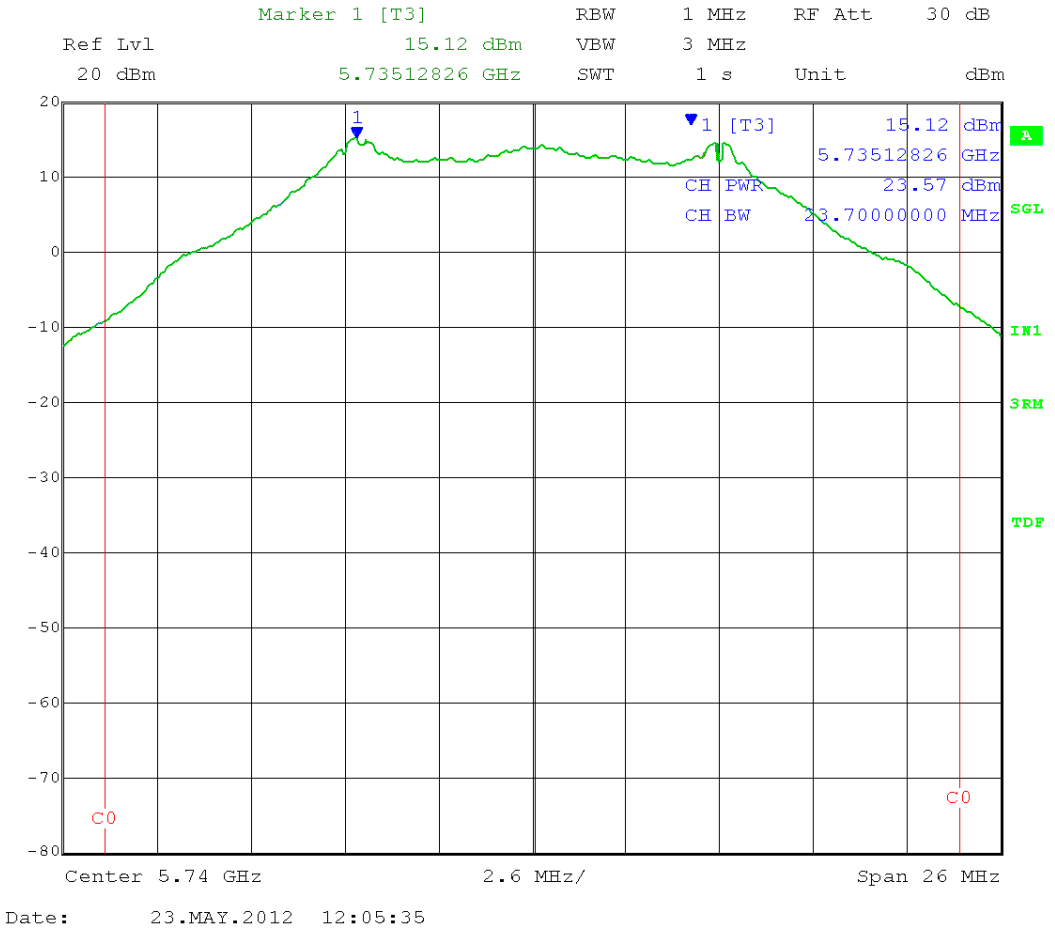
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)
Operator: Craig B

Span = 5-30% greater than the EBW; RBW = 1 MHz
Detector = power average (RMS); VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep
Use band power function with band limits set to EBW band edges.

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
26 dB EBW: 23.7 MHz Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dBm (1 Watt) – 4.5 dB (antenna gain is 4.5 dB greater than the 6 dB allowed) = 25.5 dBm conducted.

Fundamental Emission AVERAGE Output Power = 23.57 dBm + 1.2 dB for Cambium Networks connectorized cable = 24.77 dBm = **300 mW**



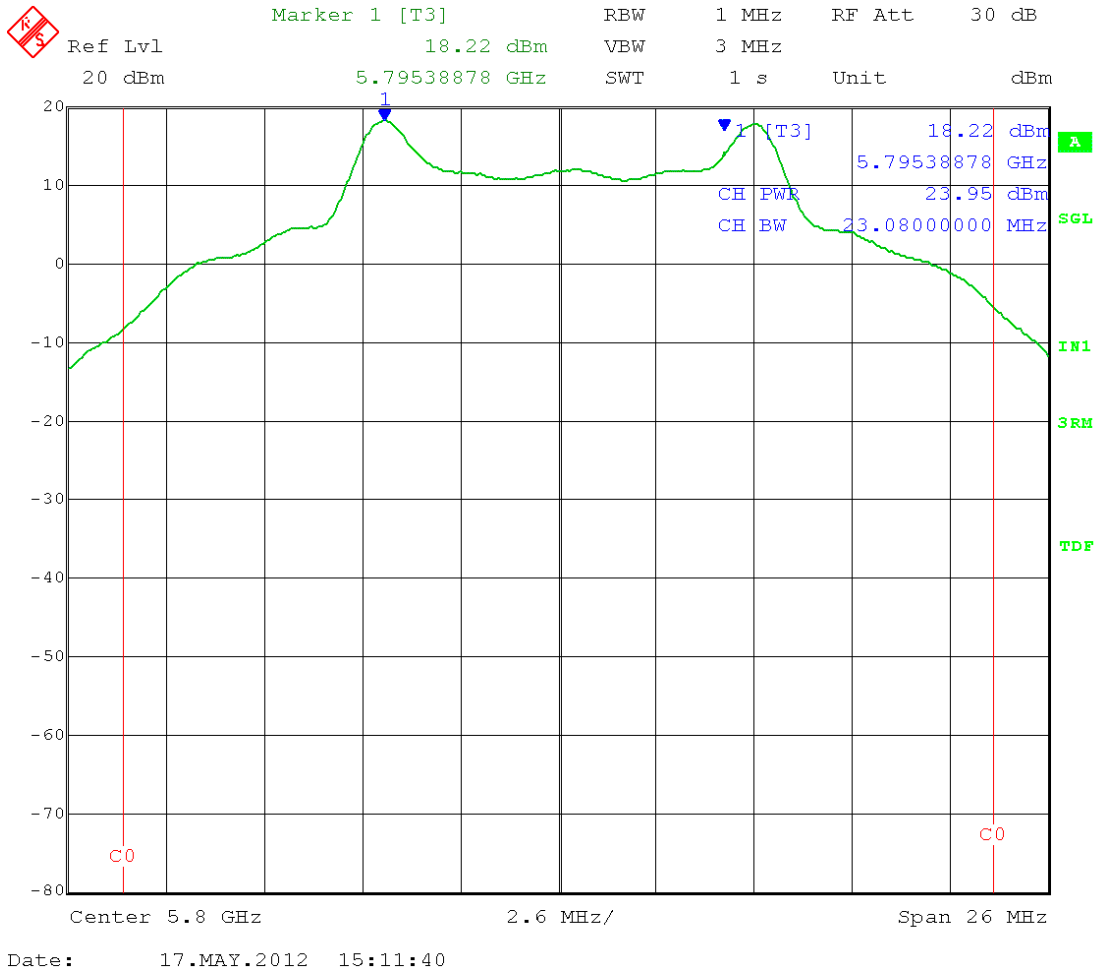
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)
Operator: Craig B

Span = 5-30% greater than the EBW; RBW = 1 MHz
Detector = power average (RMS); VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep
Use band power function with band limits set to EBW band edges.

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
26 dB EBW: 23.08 MHz Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dBm (1 Watt) – 4.5 dB (antenna gain is 4.5 dB greater than the 6 dB allowed) = 25.5 dBm conducted.

Fundamental Emission AVERAGE Output Power = 23.95 dBm + 1.2 dB for Cambium Networks connectorized cable = 25.15 dBm = **327 mW**



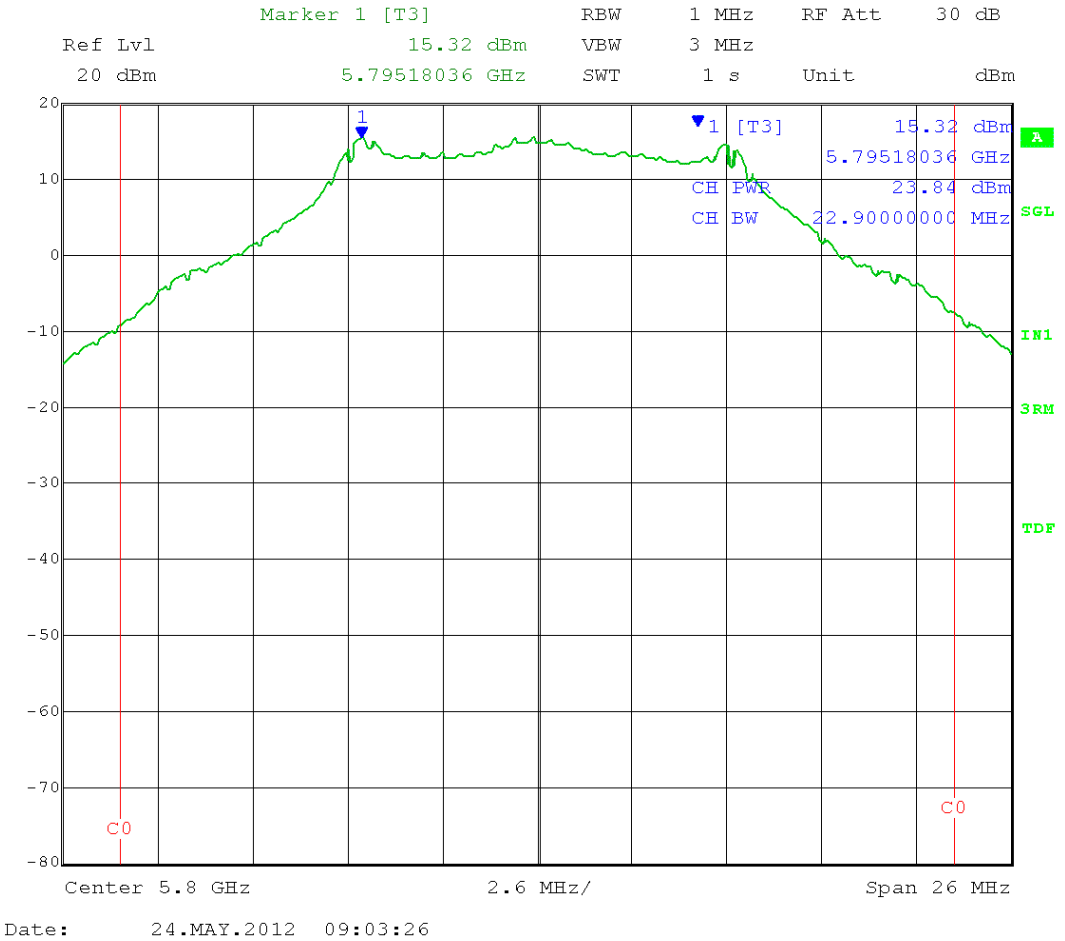
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)
Operator: Craig B

Span = 5-30% greater than the EBW; RBW = 1 MHz
Detector = power average (RMS); VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep
Use band power function with band limits set to EBW band edges.

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
26 dB EBW: 22.9 MHz Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dBm (1 Watt) – 4.5 dB (antenna gain is 4.5 dB greater than the 6 dB allowed) = 25.5 dBm conducted.

Fundamental Emission AVERAGE Output Power = 23.84 dBm + 1.2 dB for Cambium Networks connectorized cable = 25.04 dBm = **319 mW**



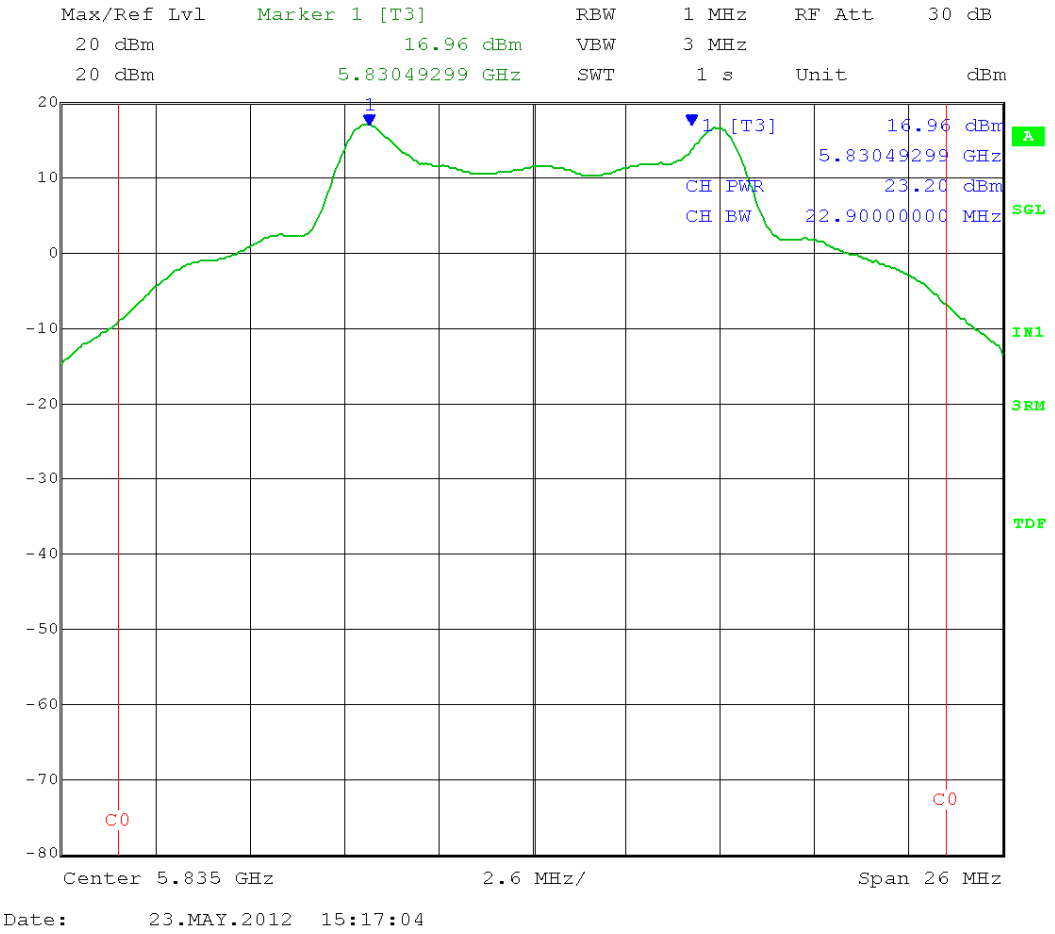
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)
Operator: Craig B

Span = 5-30% greater than the EBW; RBW = 1 MHz
Detector = power average (RMS); VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep
Use band power function with band limits set to EBW band edges.

EUT nominal channel bandwidth: 20 MHz Reg 7000103C set to 81400000
Output power setting: E4; High Channel Frequency: 5.835 GHz
26 dB EBW: 22.9 MHz Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dBm (1 Watt) – 4.5 dB (antenna gain is 4.5 dB greater than the 6 dB allowed) = 25.5 dBm conducted.

Fundamental Emission AVERAGE Output Power = 23.20 dBm + 1.2 dB for Cambium Networks connectorized cable = 24.4 dBm = **275 mW**



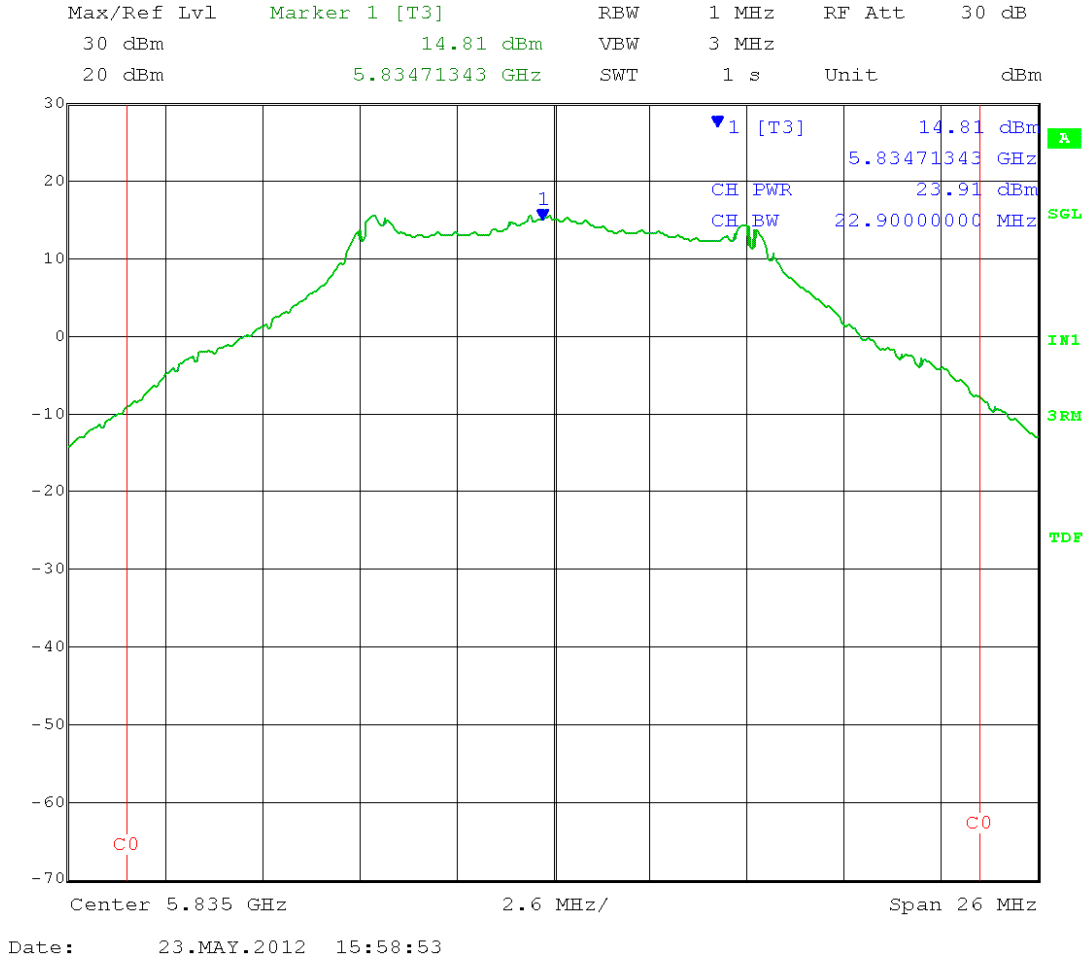
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.2.2.1 – AVG1 (power averaging over the EBW with slow sweep speed)
Operator: Craig B

Span = 5-30% greater than the EBW; RBW = 1 MHz
Detector = power average (RMS); VBW ≥ 3 MHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep
Use band power function with band limits set to EBW band edges.

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
26 dB EBW: 22.9 MHz Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dBm (1 Watt) – 4.5 dB (antenna gain is 4.5 dB greater than the 6 dB allowed) = 25.5 dBm conducted.

Fundamental Emission AVERAGE Output Power = 23.91 dBm + 1.2 dB for Cambium Networks connectorized cable = 25.11 dBm = **324 mW**



Appendix A – Measurement Data

A4.0 Maximum Power Spectral Density – Conducted

Rule Section: Section 15.247(e)
RSS-210 A8.2(b)

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 5.3.2 – AVGPSD (Average output power procedure was used to measure the fundamental emission power)

Description: Span = 5-30% greater than the EBW
RBW = 100 kHz
VBW ≥ 300 kHz
Detector = power average (RMS)
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

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.

Limit: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Results: Passed

Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Maximum Power Spectral Density – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.3.2 – AVGPSD
Operator: Craig B

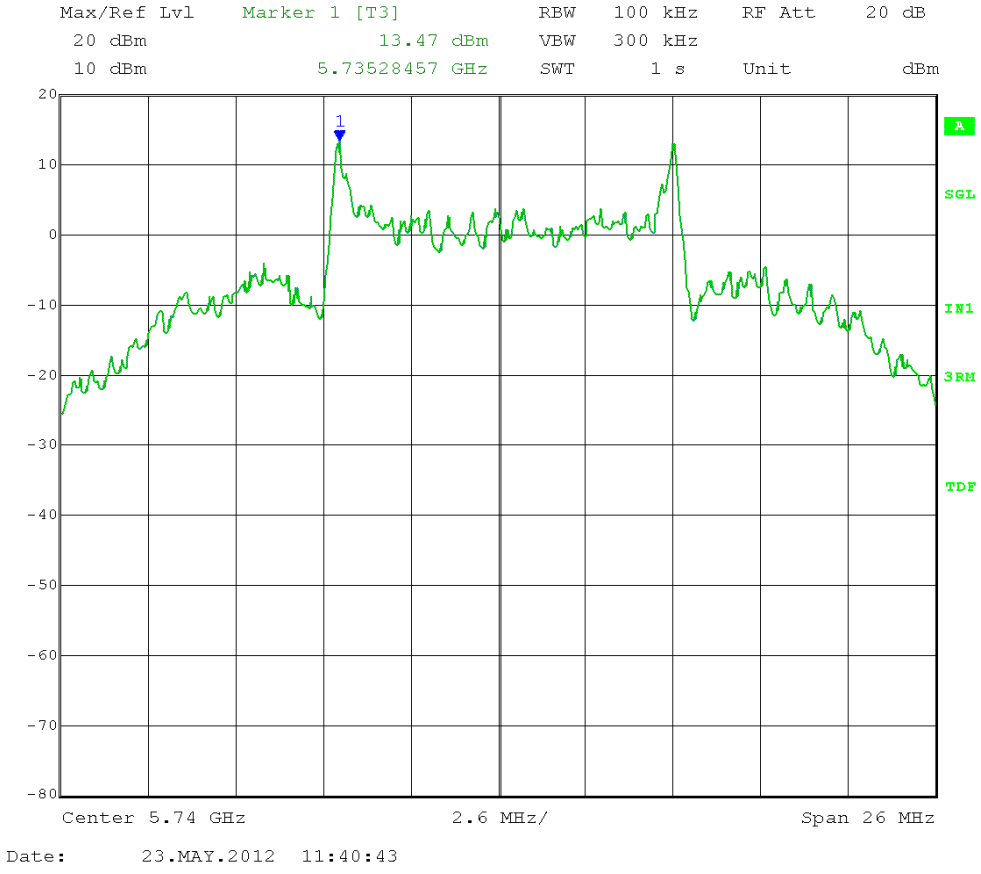
Span = 5-30% greater than the EBW; RBW = 100 kHz
Detector = power average (RMS); VBW ≥ 300 kHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(e)]: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Maximum PSD = 13.47 dBm + 1.2 dB for Cambium Networks connectorized cable = 14.67 dBm – 15.2 dB = -0.53 dBm



Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Maximum Power Spectral Density – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.3.2 – AVGPSD
Operator: Craig B

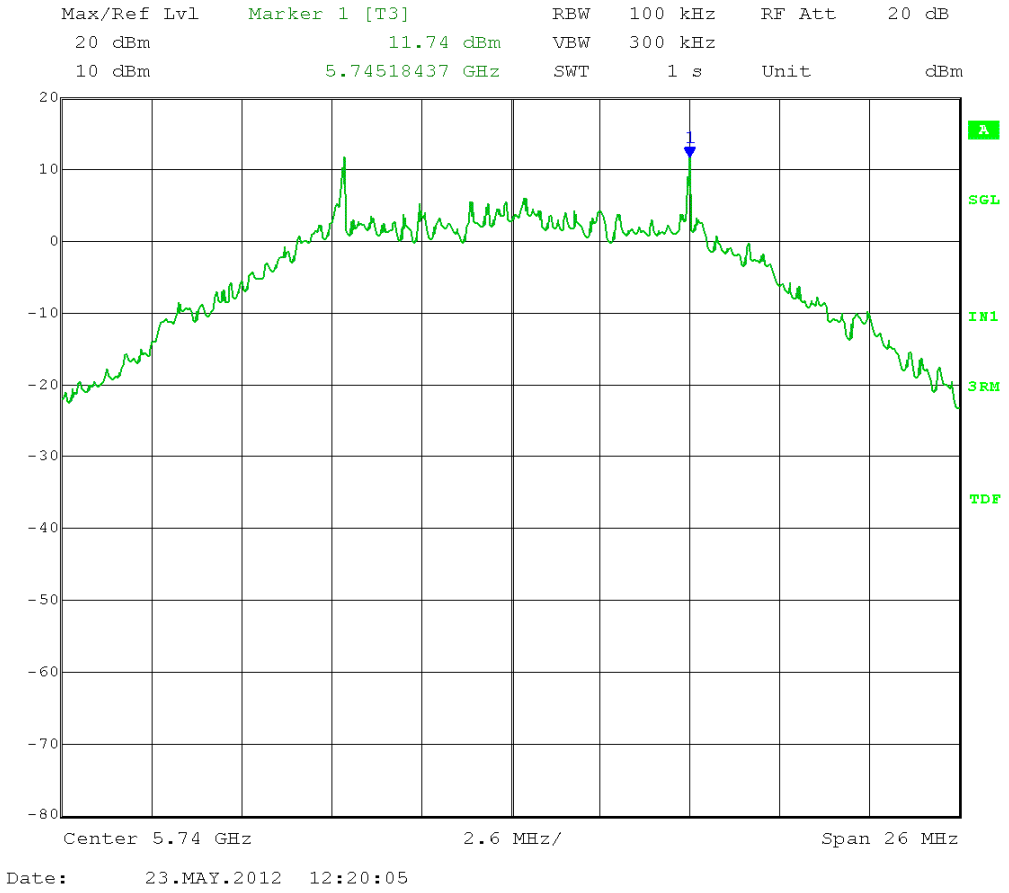
Span = 5-30% greater than the EBW; RBW = 100 kHz
Detector = power average (RMS); VBW ≥ 300 kHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(e)]: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Maximum PSD = 11.74 dBm + 1.2 dB for Cambium Networks connectorized cable = 12.94 dBm – 15.2 dB = -2.26 dBm



Test Date: 05-18-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Maximum Power Spectral Density – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.3.2 – AVGPSD
Operator: Craig B

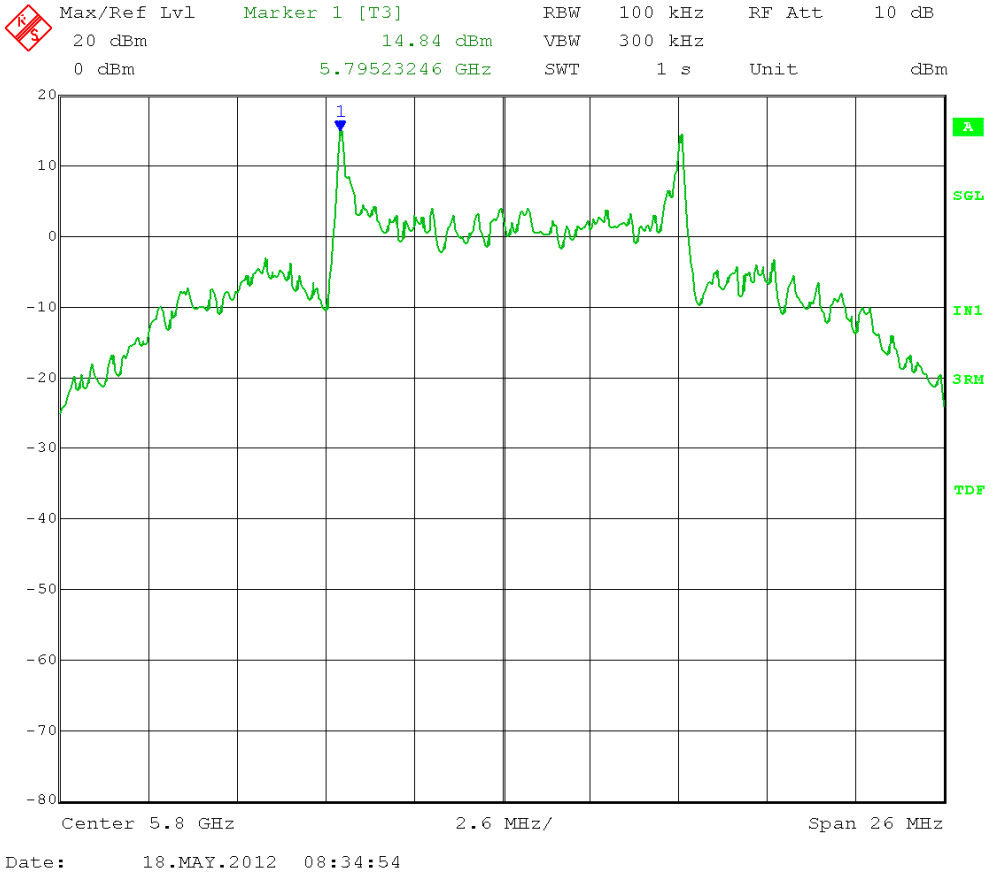
Span = 5-30% greater than the EBW; RBW = 100 kHz
Detector = power average (RMS); VBW ≥ 300 kHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(e)]: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Maximum PSD = 14.84 dBm + 1.2 dB for Cambium Networks connectorized cable = 16.04 dBm – 15.2 dB = 0.84 dBm



Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Maximum Power Spectral Density – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.3.2 – AVGPSD
Operator: Craig B

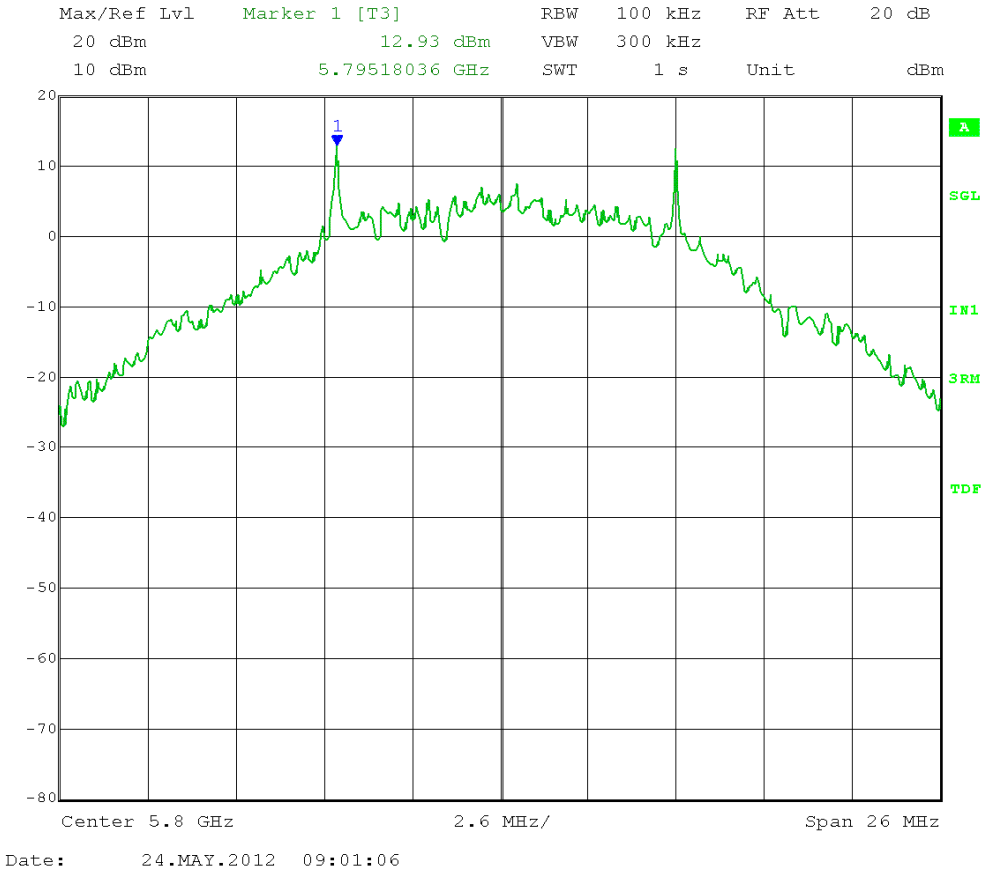
Span = 5-30% greater than the EBW; RBW = 100 kHz
Detector = power average (RMS); VBW ≥ 300 kHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(e)]: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Maximum PSD = 12.93 dBm + 1.2 dB for Cambium Networks connectorized cable = 14.13 dBm – 15.2 dB = -1.07 dBm



Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Maximum Power Spectral Density – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.3.2 – AVGPSD
Operator: Craig B

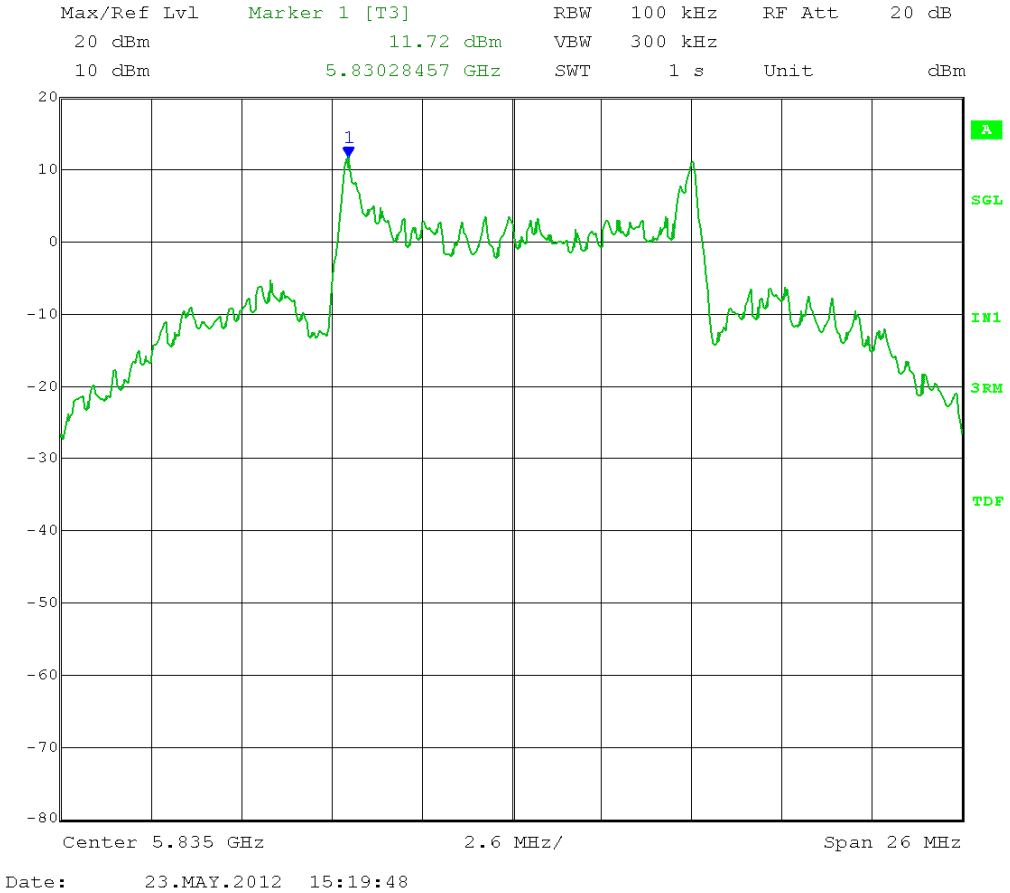
Span = 5-30% greater than the EBW; RBW = 100 kHz
Detector = power average (RMS); VBW ≥ 300 kHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(e)]: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Maximum PSD = 11.72 dBm + 1.2 dB for Cambium Networks connectorized cable = 12.92 dBm – 15.2 dB = -2.28 dBm



Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: AVERAGE Maximum Power Spectral Density – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.3.2 – AVGPSD
Operator: Craig B

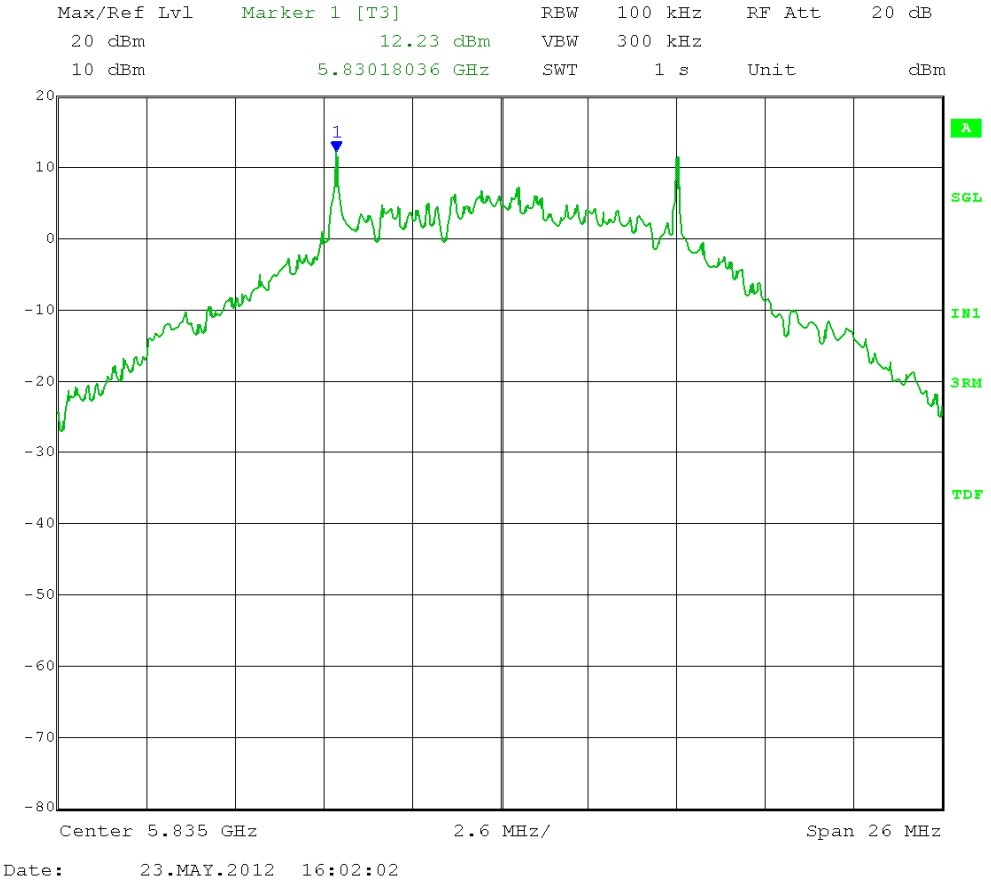
Span = 5-30% greater than the EBW; RBW = 100 kHz
Detector = power average (RMS); VBW ≥ 300 kHz
Number of measurement points in sweep ≥ 2 x (span/RBW)
Sweep time: ≥ 10 x (number of measurement points) x (transmission symbol period)
= 10 x 500 x 100 ns = 500 µsec
Trace mode: single sweep

Set marker to maximum level within the fundamental EBW.
Scale the observed power level to an equivalent level in 3 kHz by reducing the measured power by 15.2 dB (bandwidth correction factor = 10log (3 kHz / 100 kHz = -15.2 dB)

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(e)]: 8 dBm in any 3 kHz band segment within the fundamental EBW during any time interval of continuous transmission.

Maximum PSD = 12.23 dBm + 1.2 dB for Cambium Networks connectorized cable = 13.43 dBm – 15.2 dB = -1.77 dBm



166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A5.0 Maximum Unwanted Emission Levels – Conducted

Rule Section: Section 15.247(d)
RSS-210 A8.5

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 5.4.1.2 – Unwanted Emissions

Description: RBW = 100 kHz
VBW ≥ 300 kHz
Span = spectrum to be examined – (Unwanted Emissions)
Detector = peak
Sweep = auto couple
Trace mode = max hold

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.

Limit: 30 dB below maximum in-band average PSD level (maximum level in any 100 kHz band). Average output power procedure was used to measure the fundamental emission power

Results: Passed

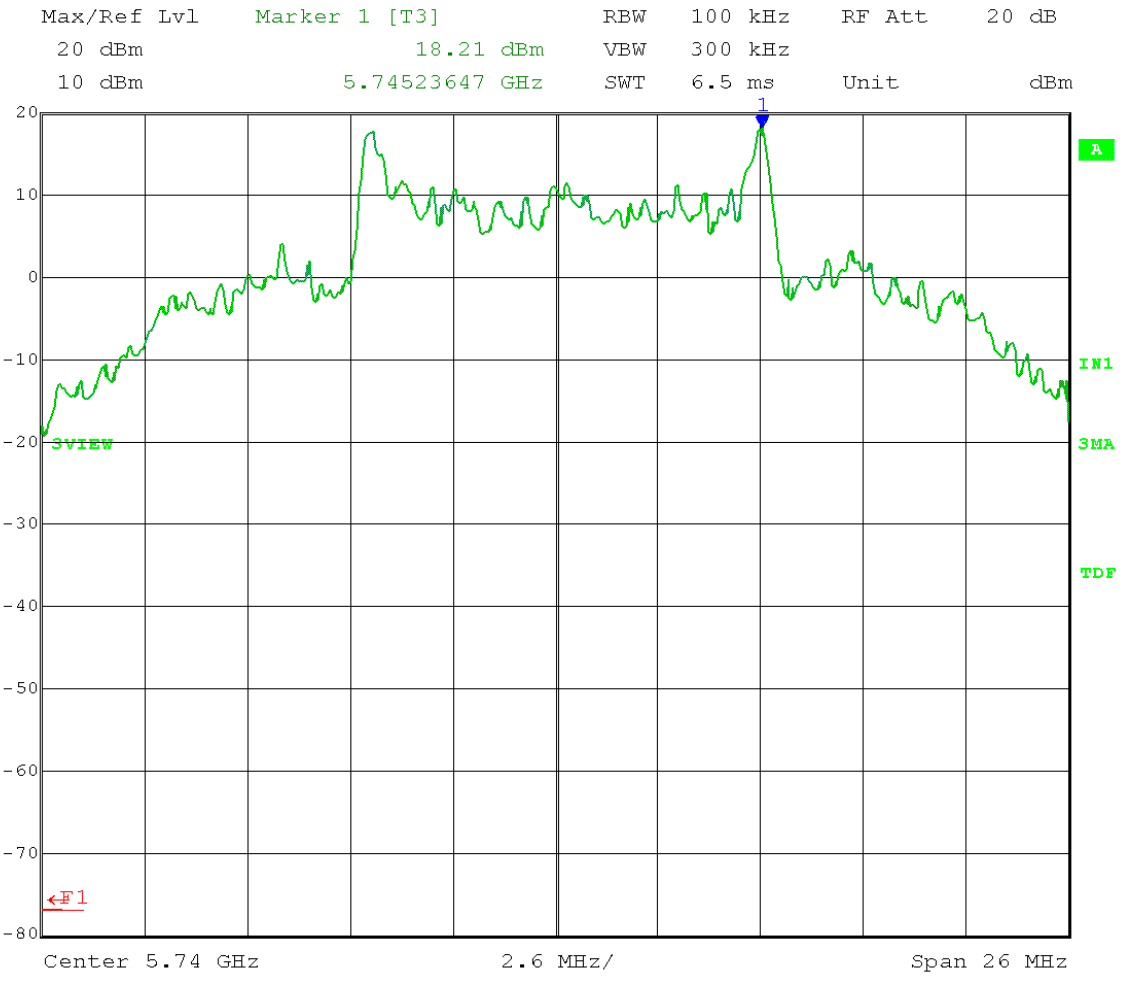
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:25:01

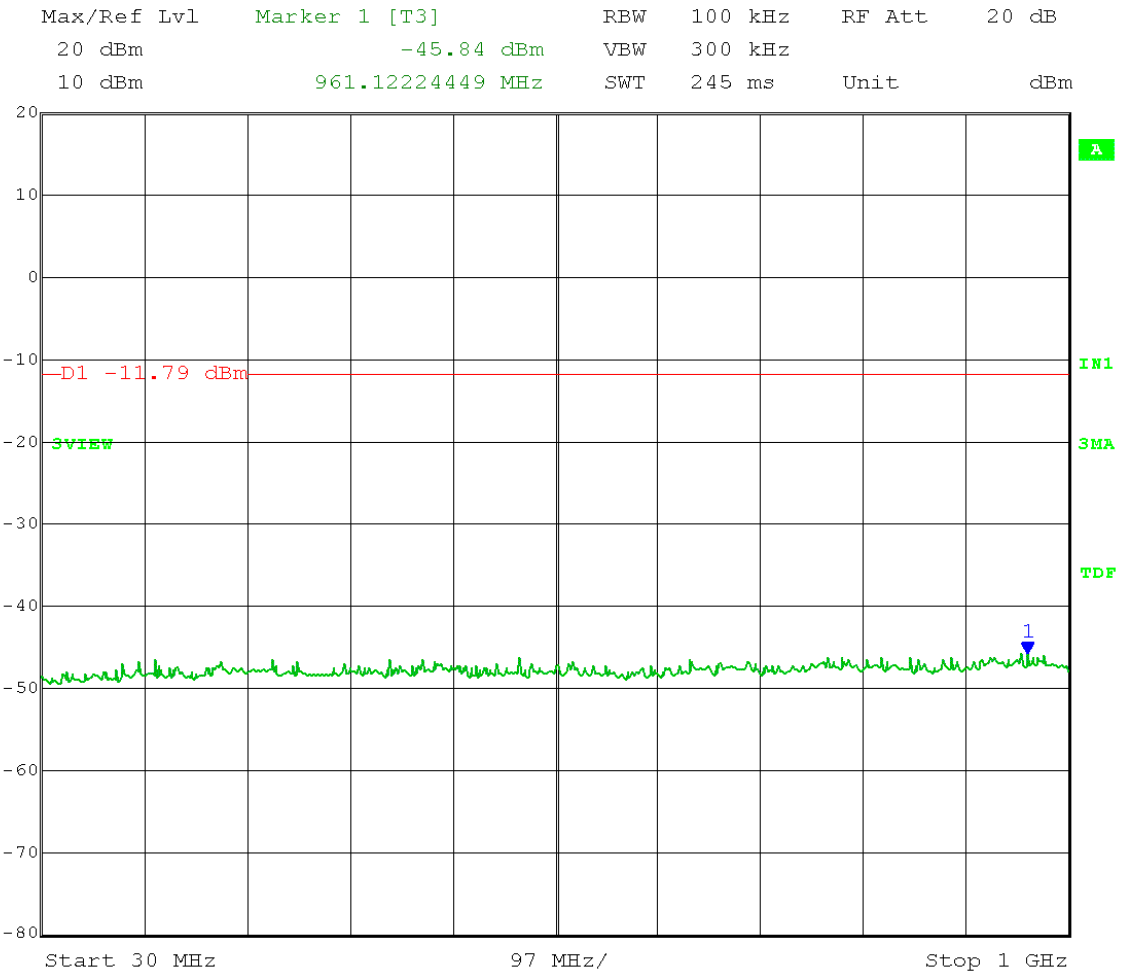
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 30 – 1000 MHz
Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:38:26

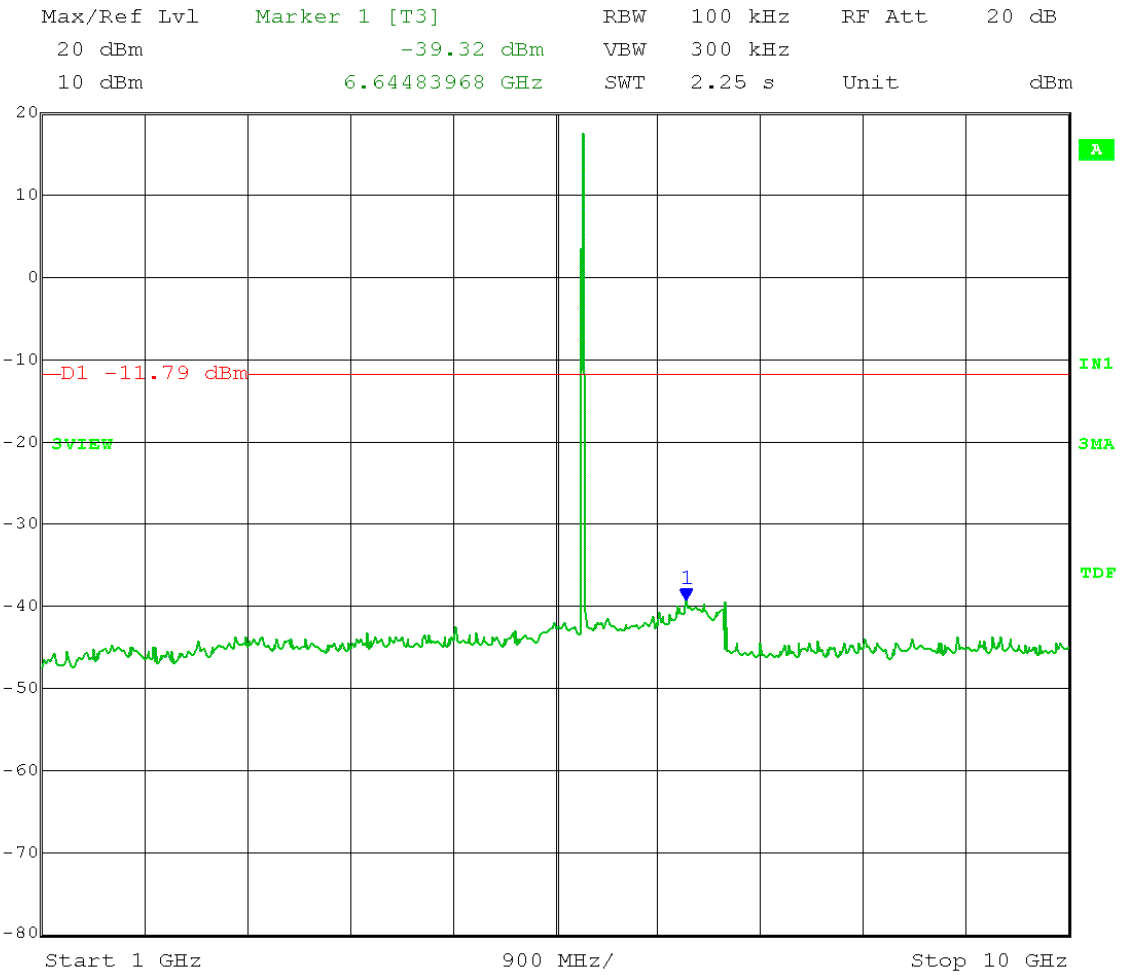
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 1 – 10 GHz
Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:32:39

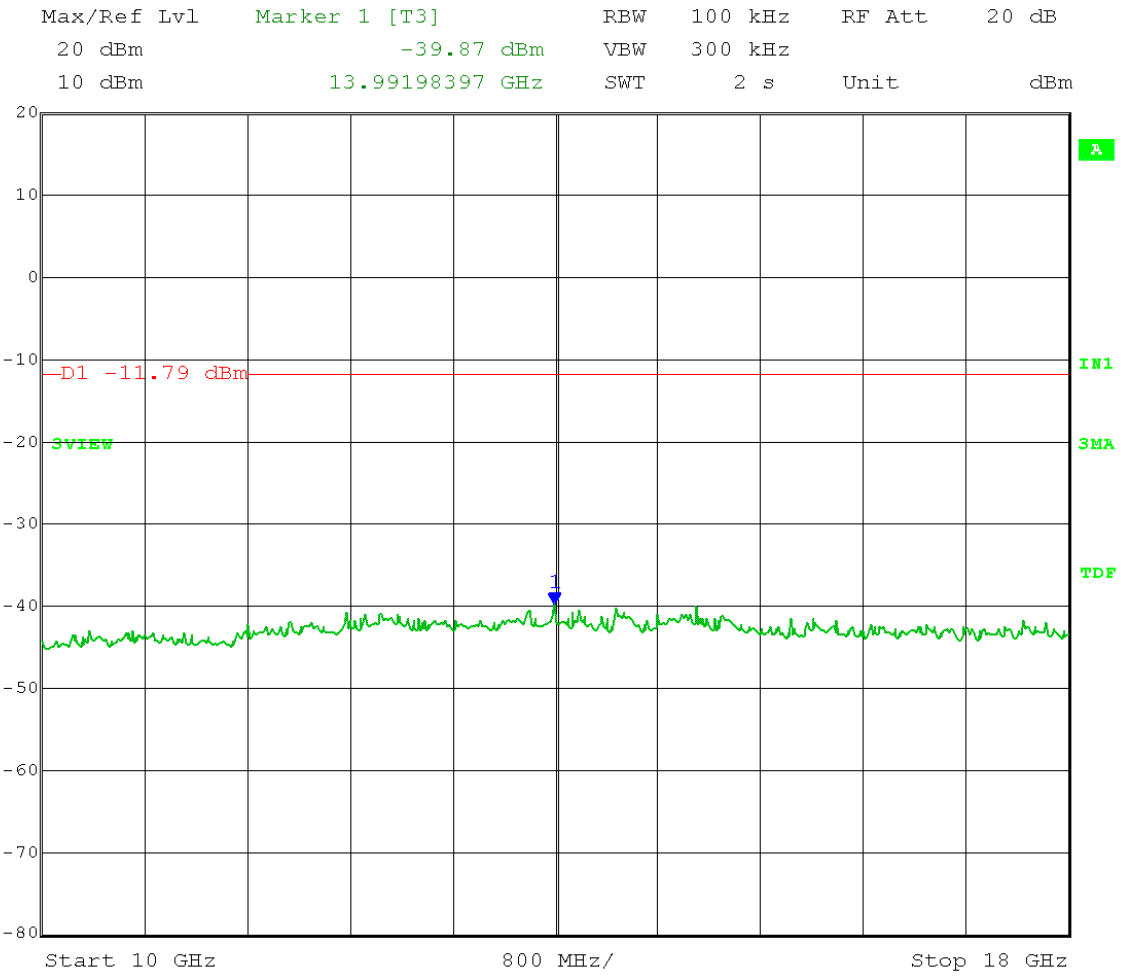
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 10 – 18 GHz
Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:33:52

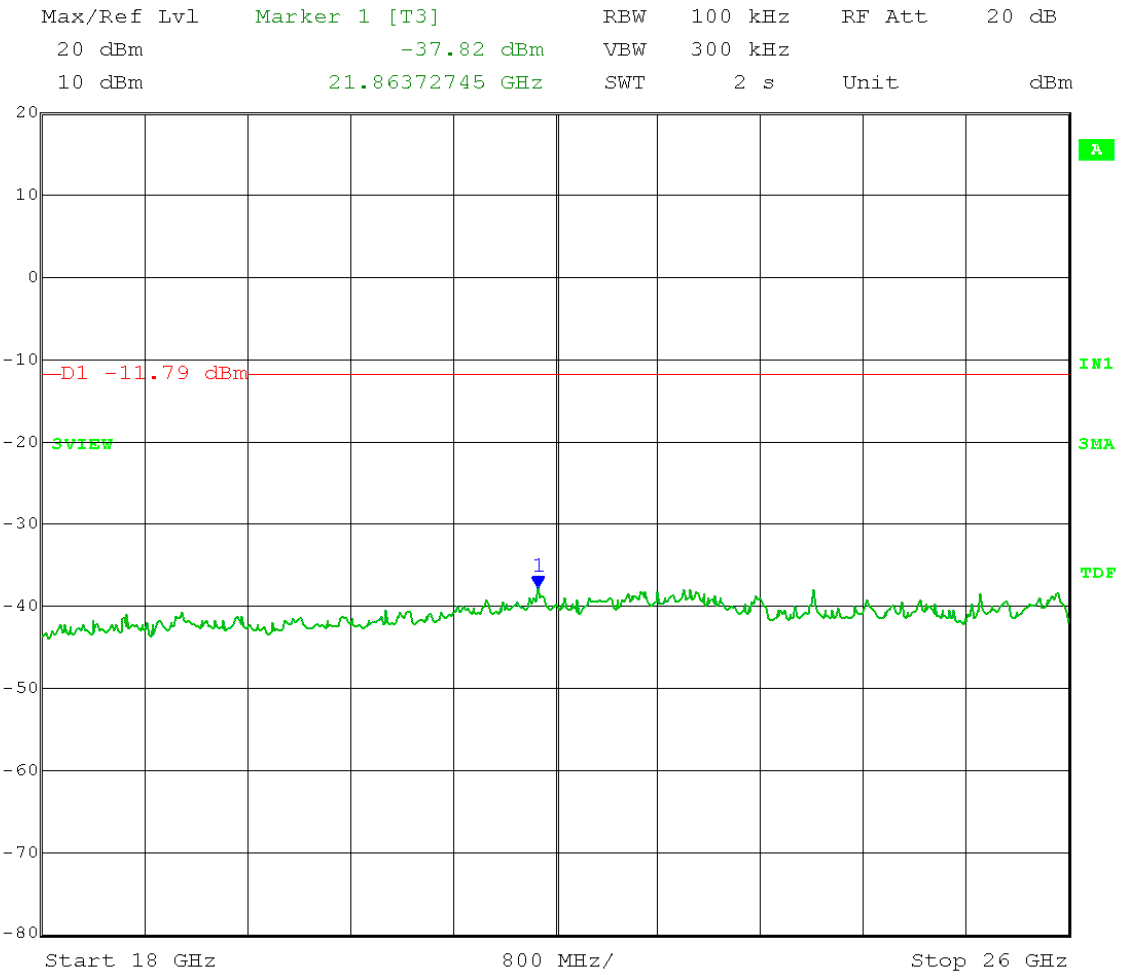
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 18 – 26 GHz
Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:35:20

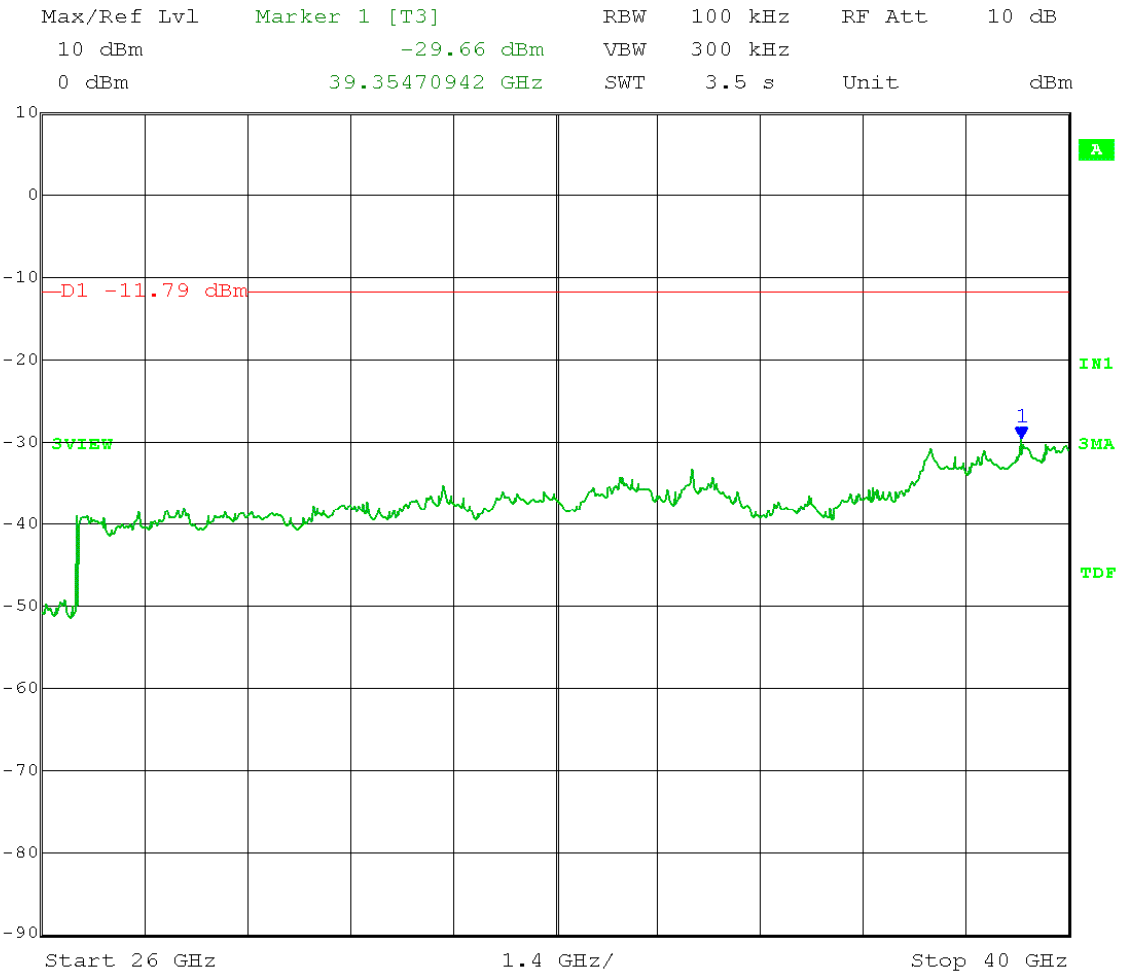
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 26 – 40 GHz
Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:36:45

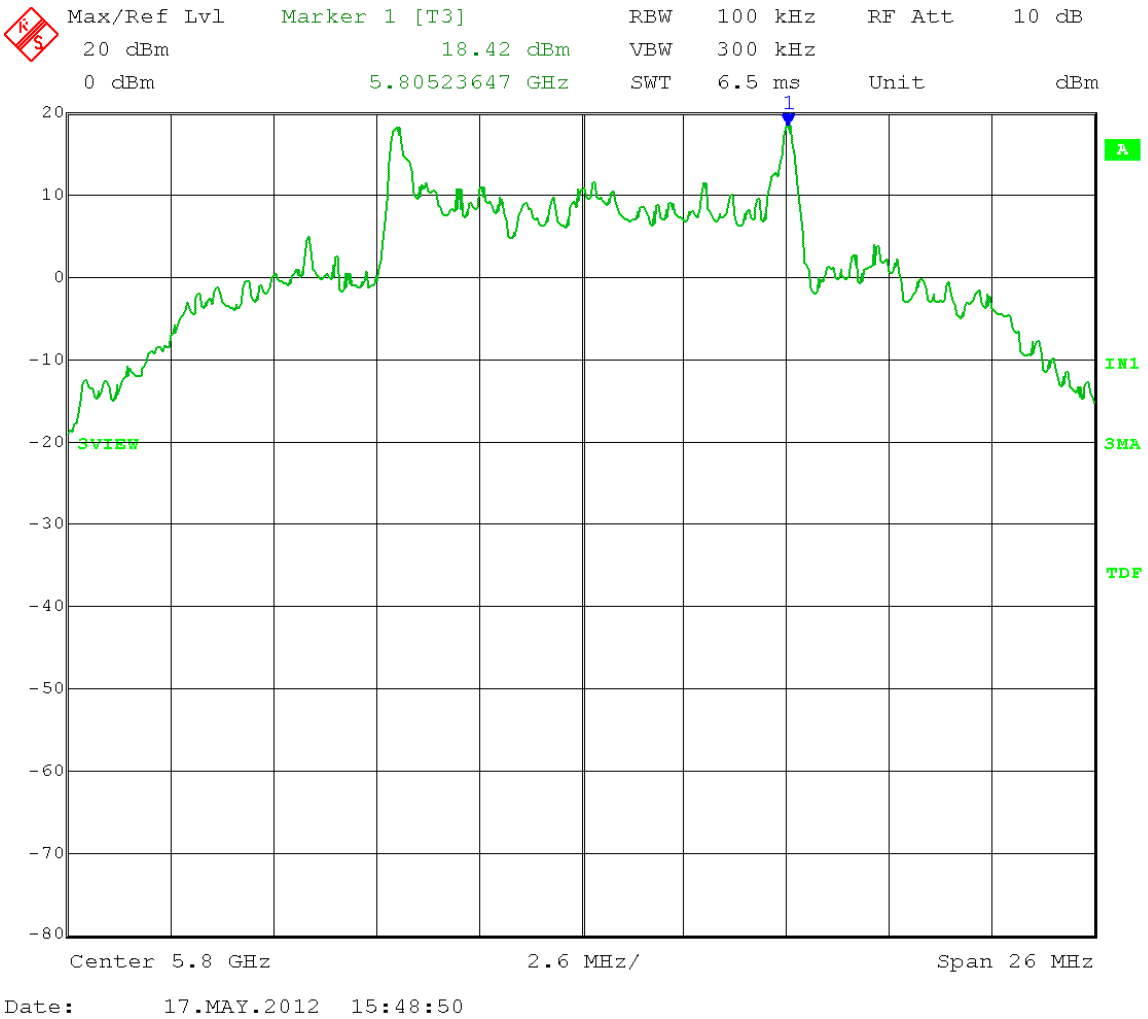
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 18.42 dBm – 30 dB = -11.58 dBm



Date: 17.MAY.2012 15:48:50

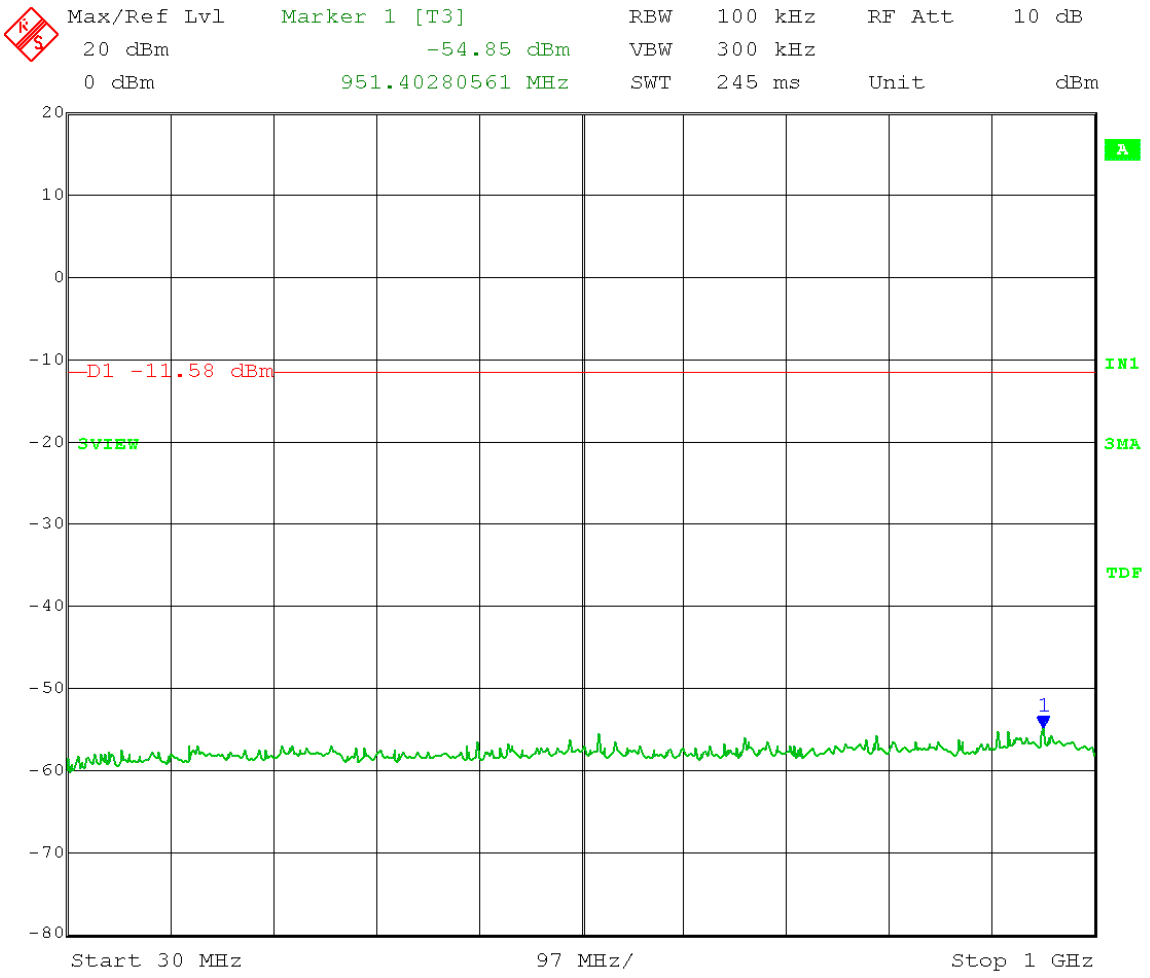
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 30 – 1000 MHz
Limit = 18.42 dBm – 30 dB = -11.58 dBm



Date: 17.MAY.2012 16:02:00

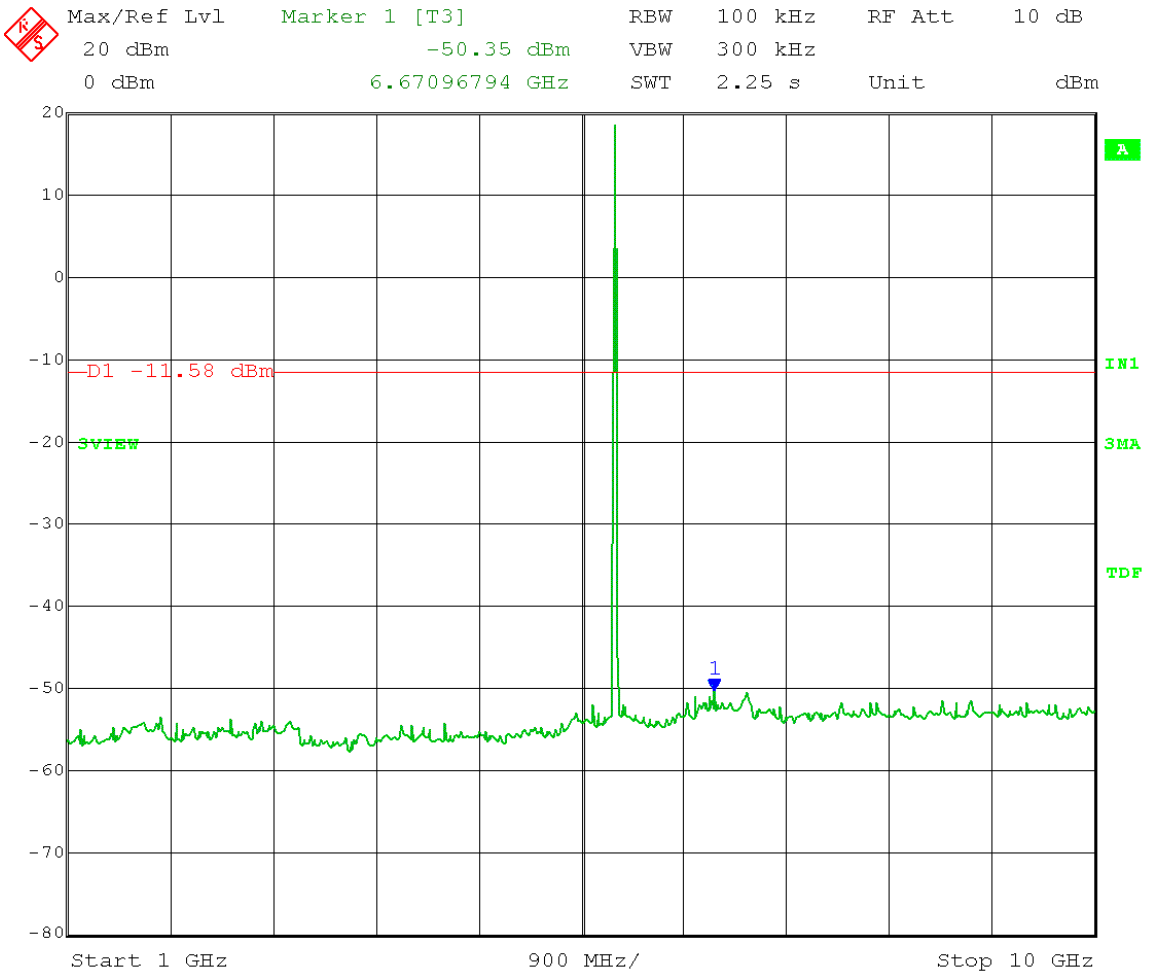
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 1 – 10 GHz
Limit = 18.42 dBm – 30 dB = -11.58 dBm



Date: 17.MAY.2012 15:55:26

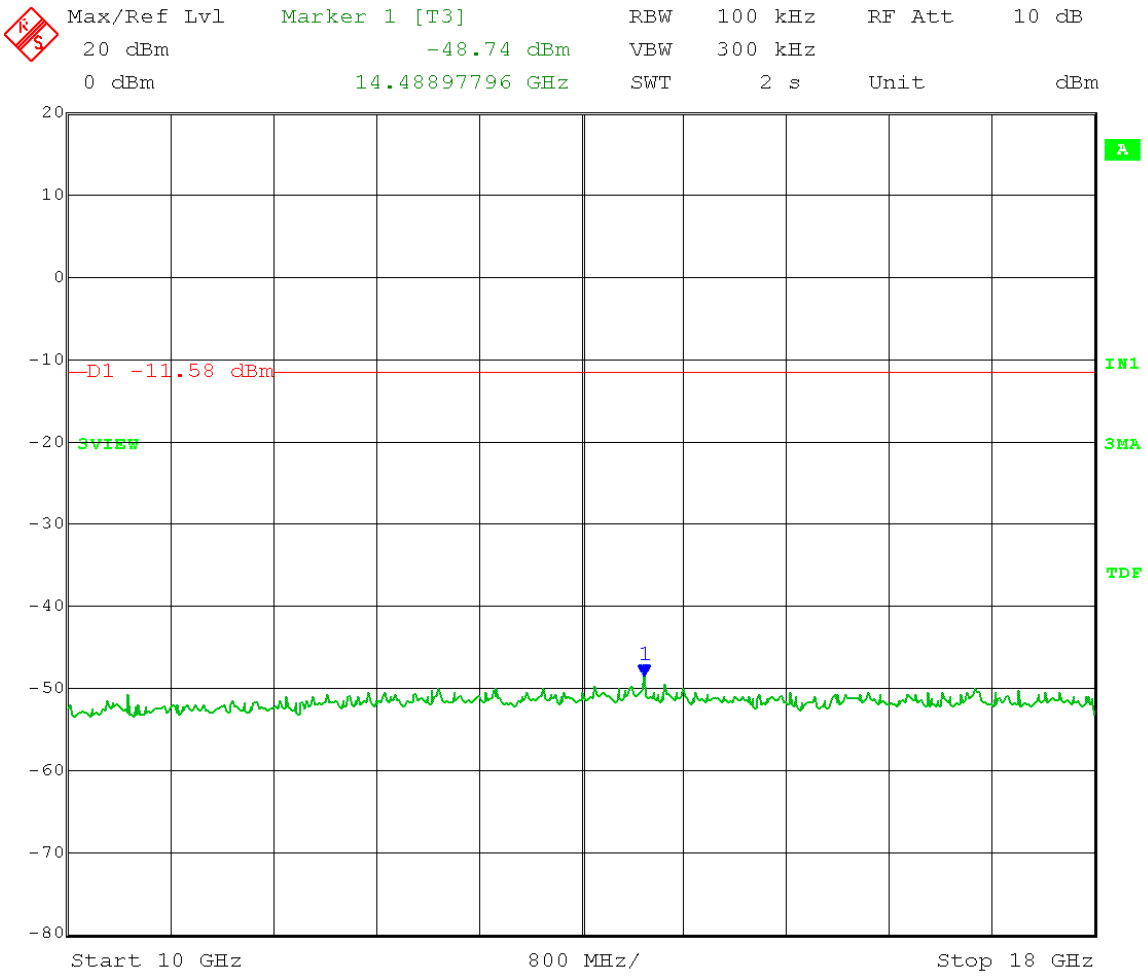
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 10 – 18 GHz
Limit = 18.42 dBm – 30 dB = -11.58 dBm



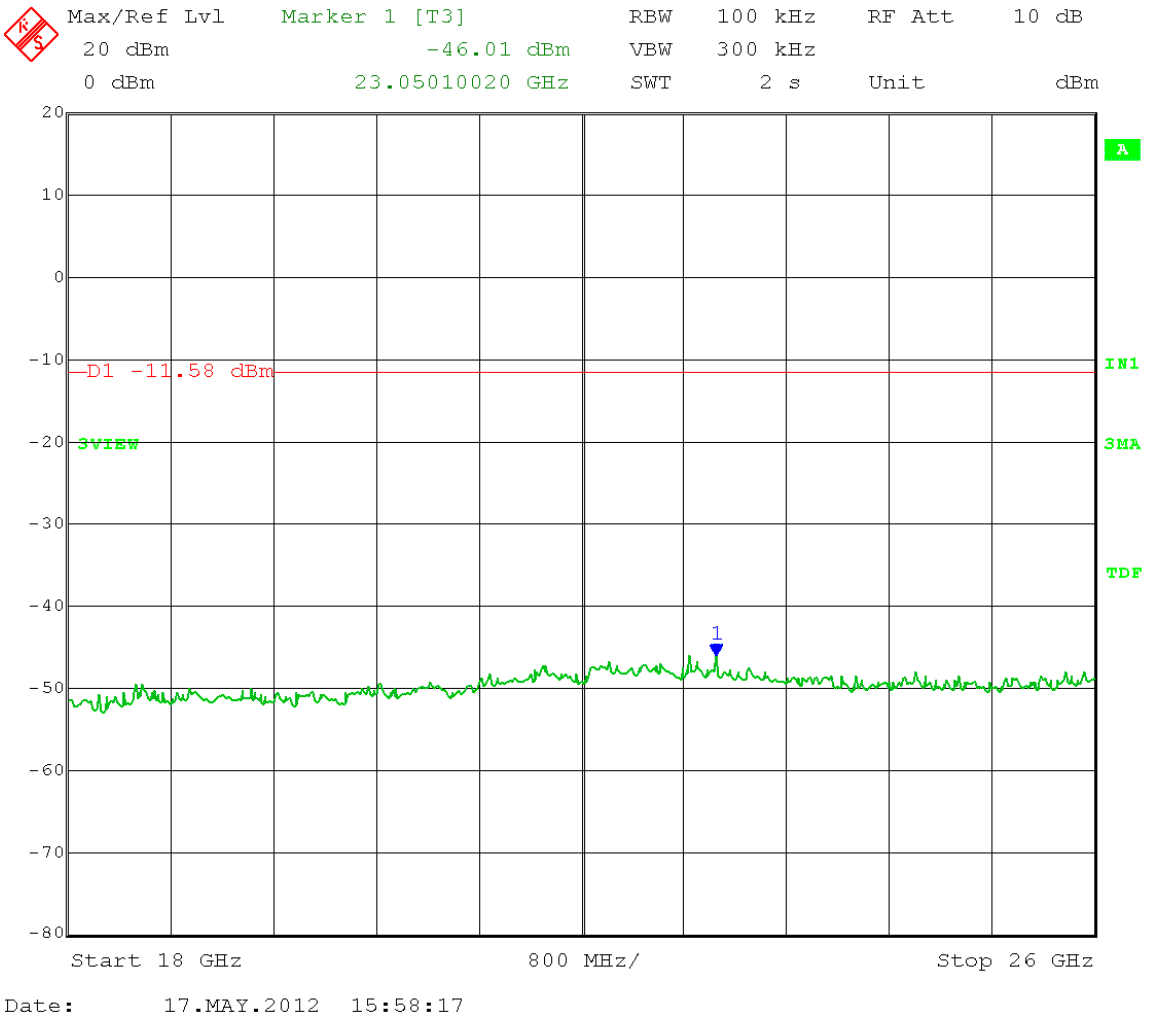
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 18 – 26 GHz
Limit = 18.42 dBm – 30 dB = -11.58 dBm



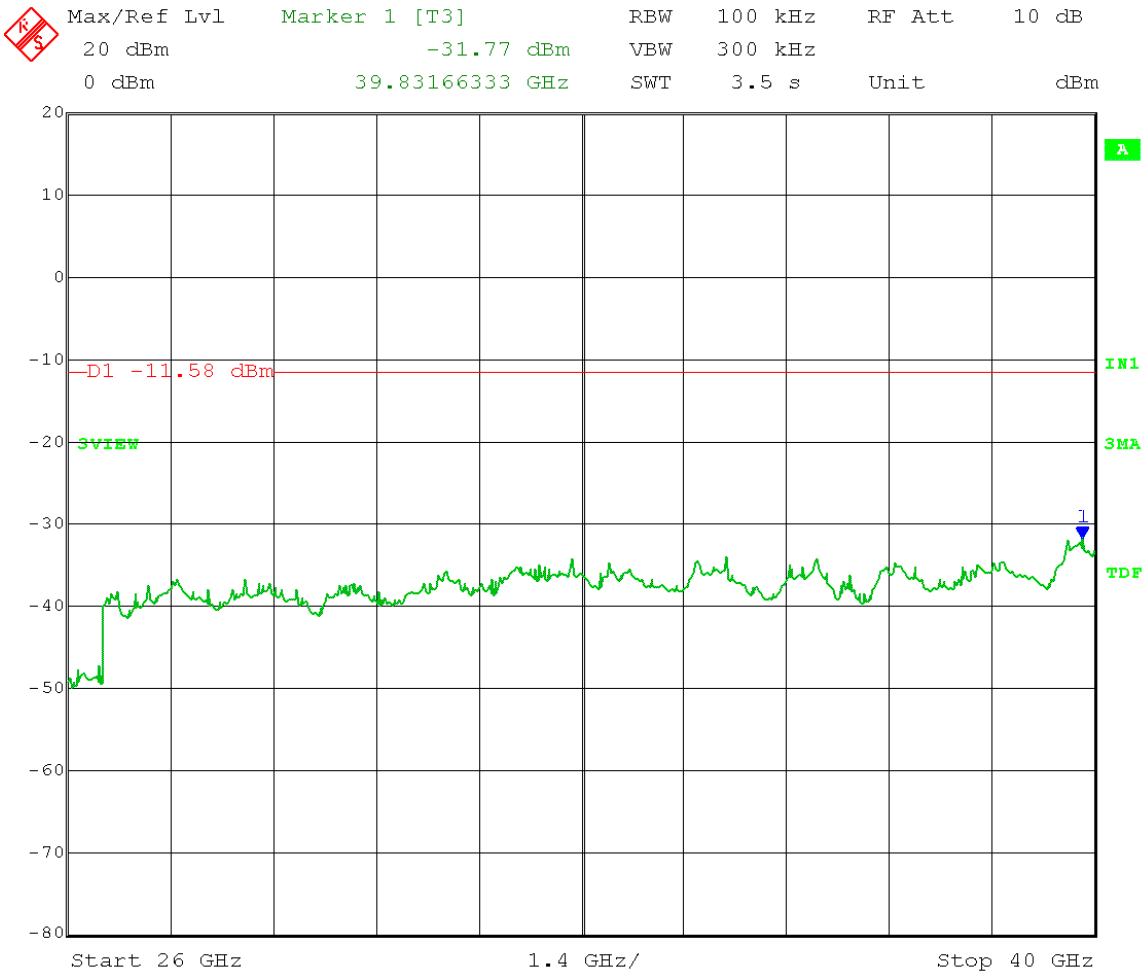
Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 26 – 40 GHz
Limit = 18.42 dBm – 30 dB = -11.58 dBm



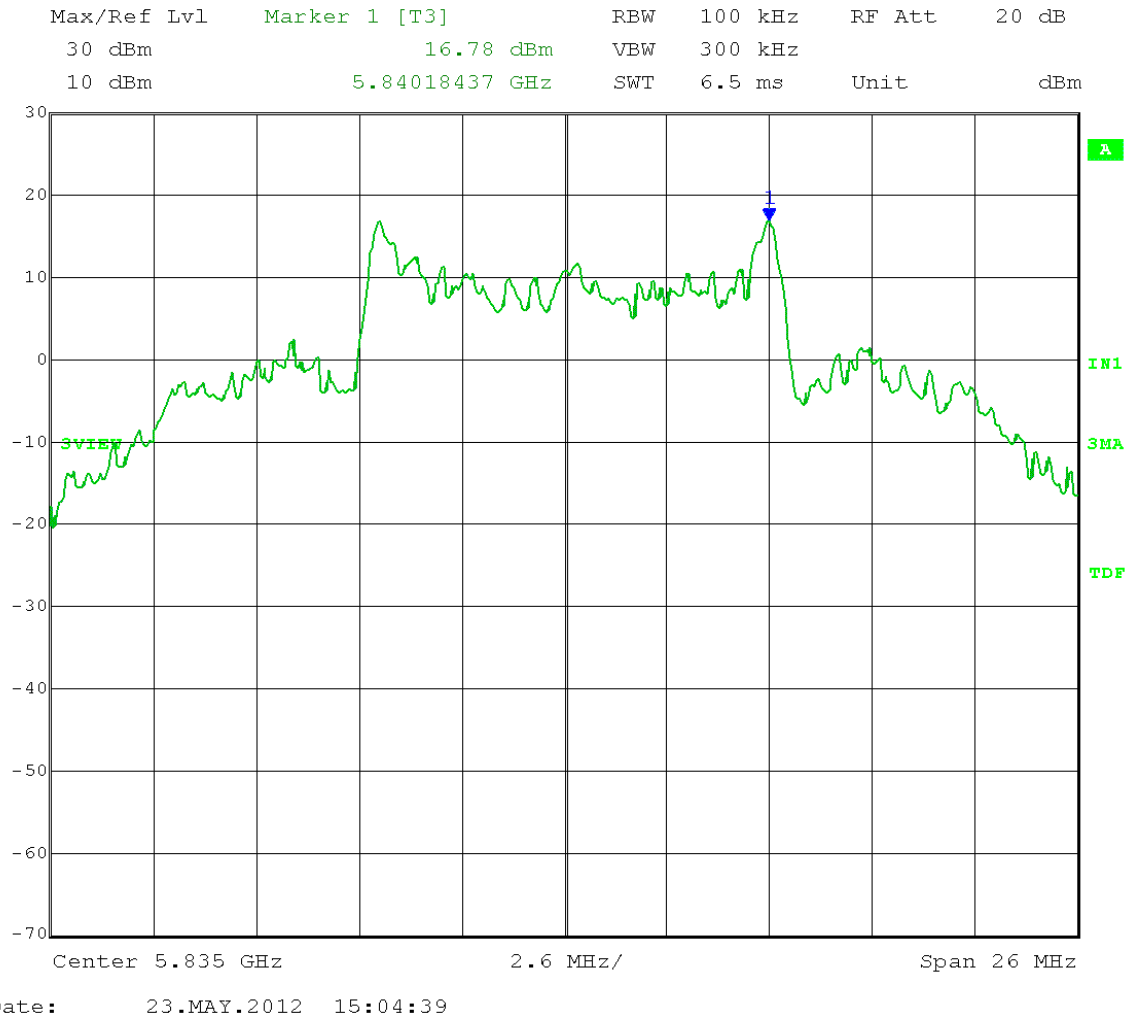
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:04:39

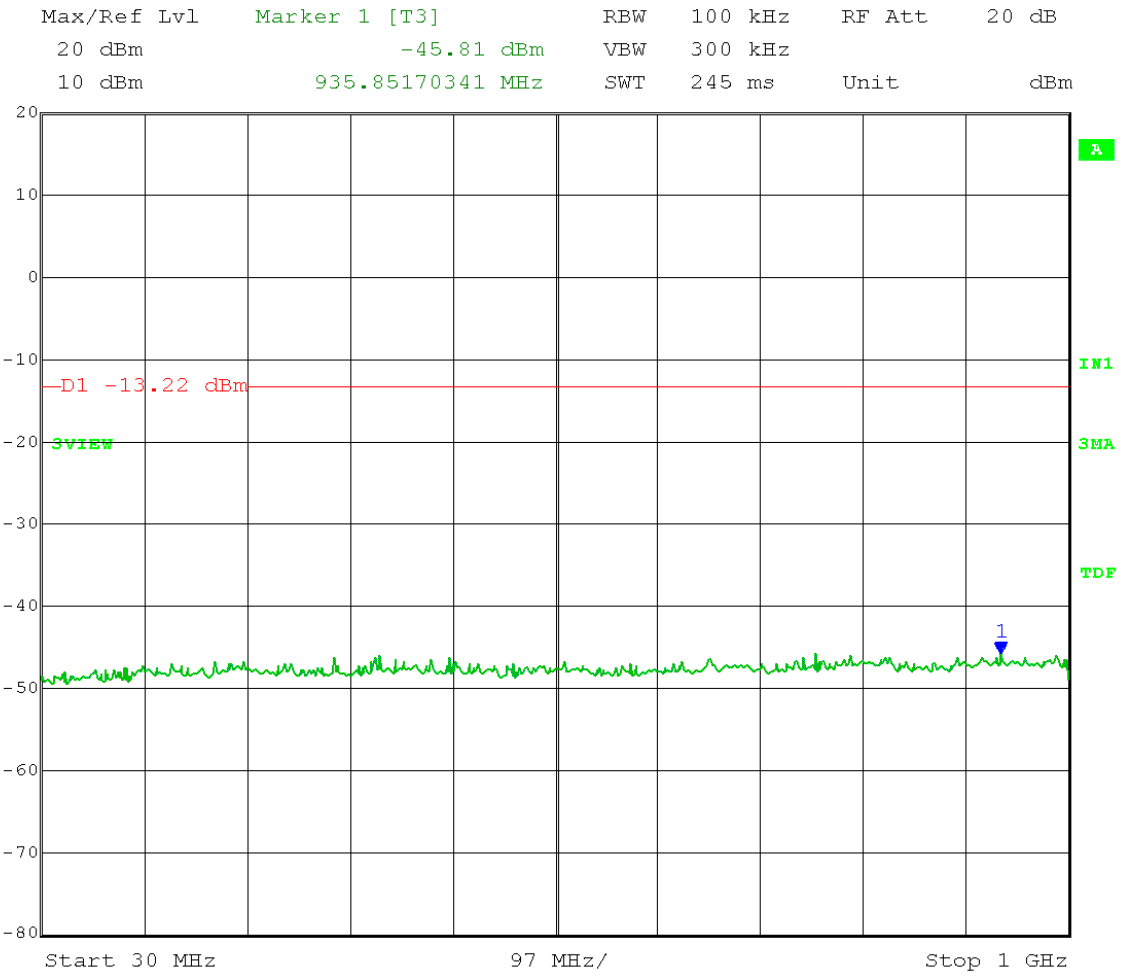
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 30 – 1000 MHz
Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:32:52

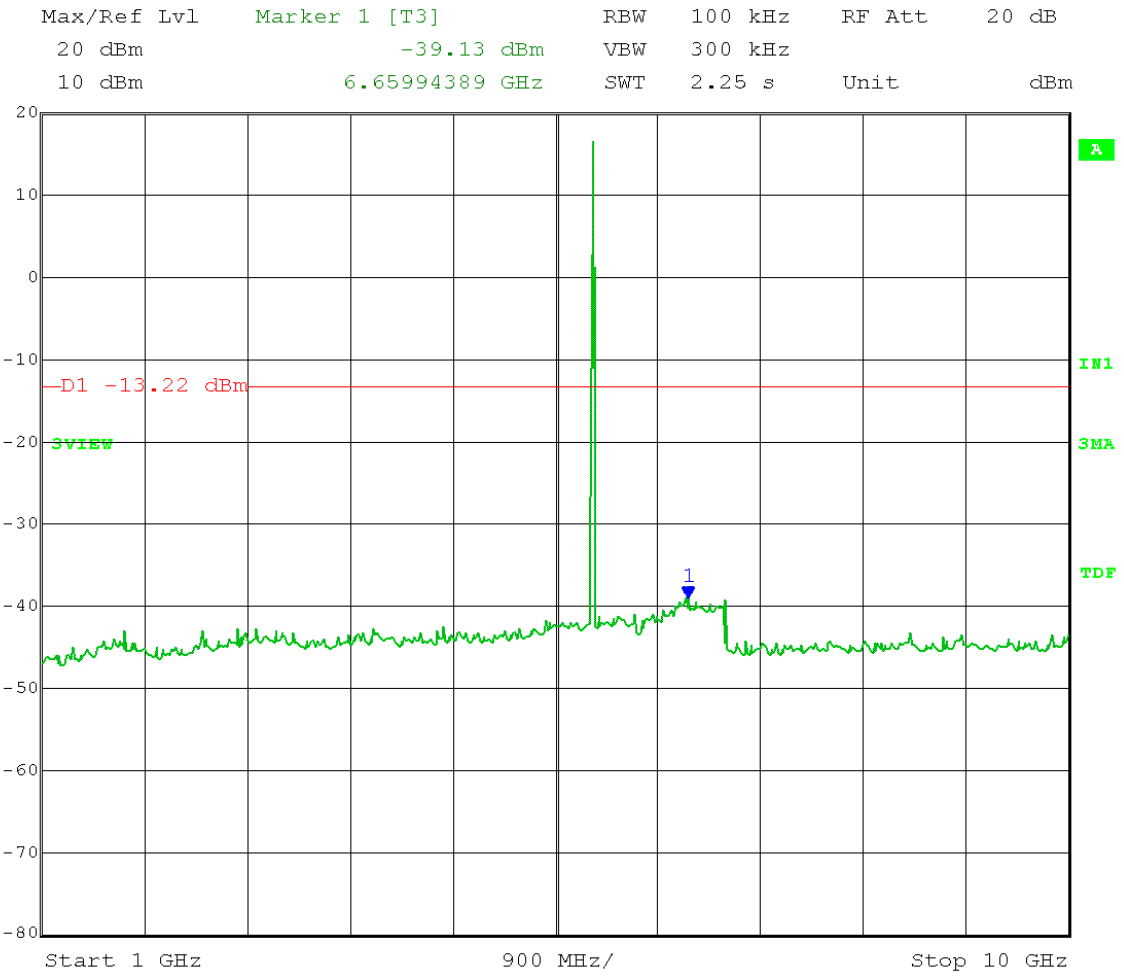
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 1 – 10 GHz
Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:27:26

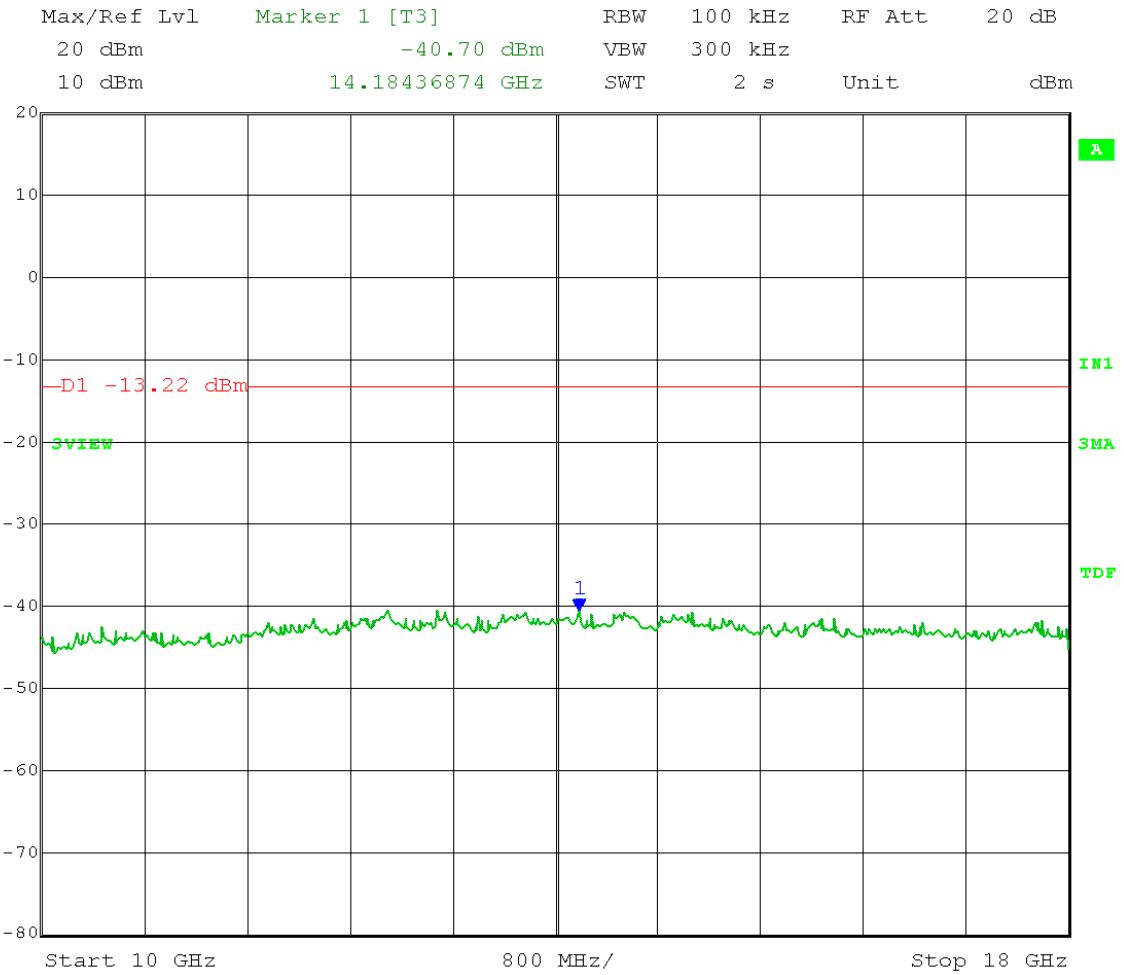
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 10 – 18 GHz
Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:28:58

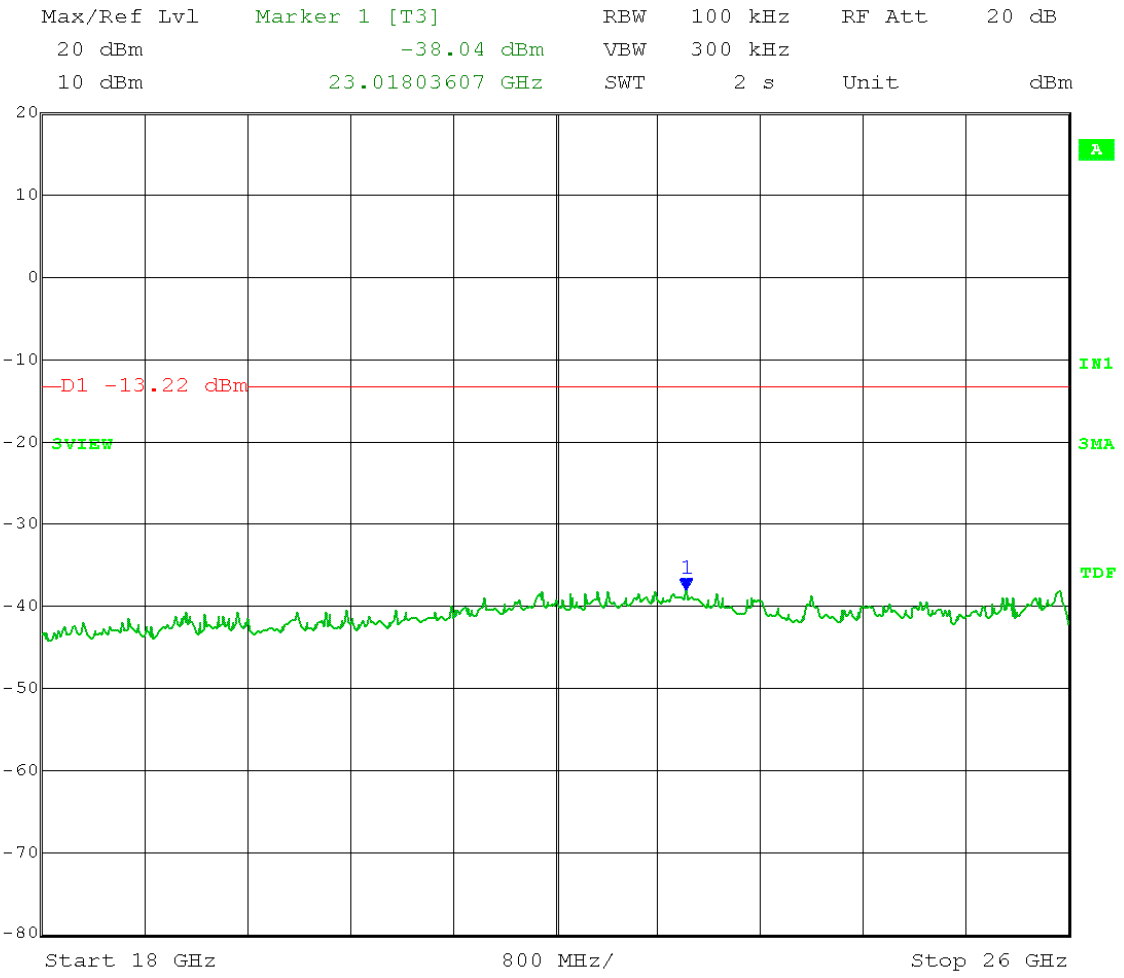
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 18 – 26 GHz
Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:30:20

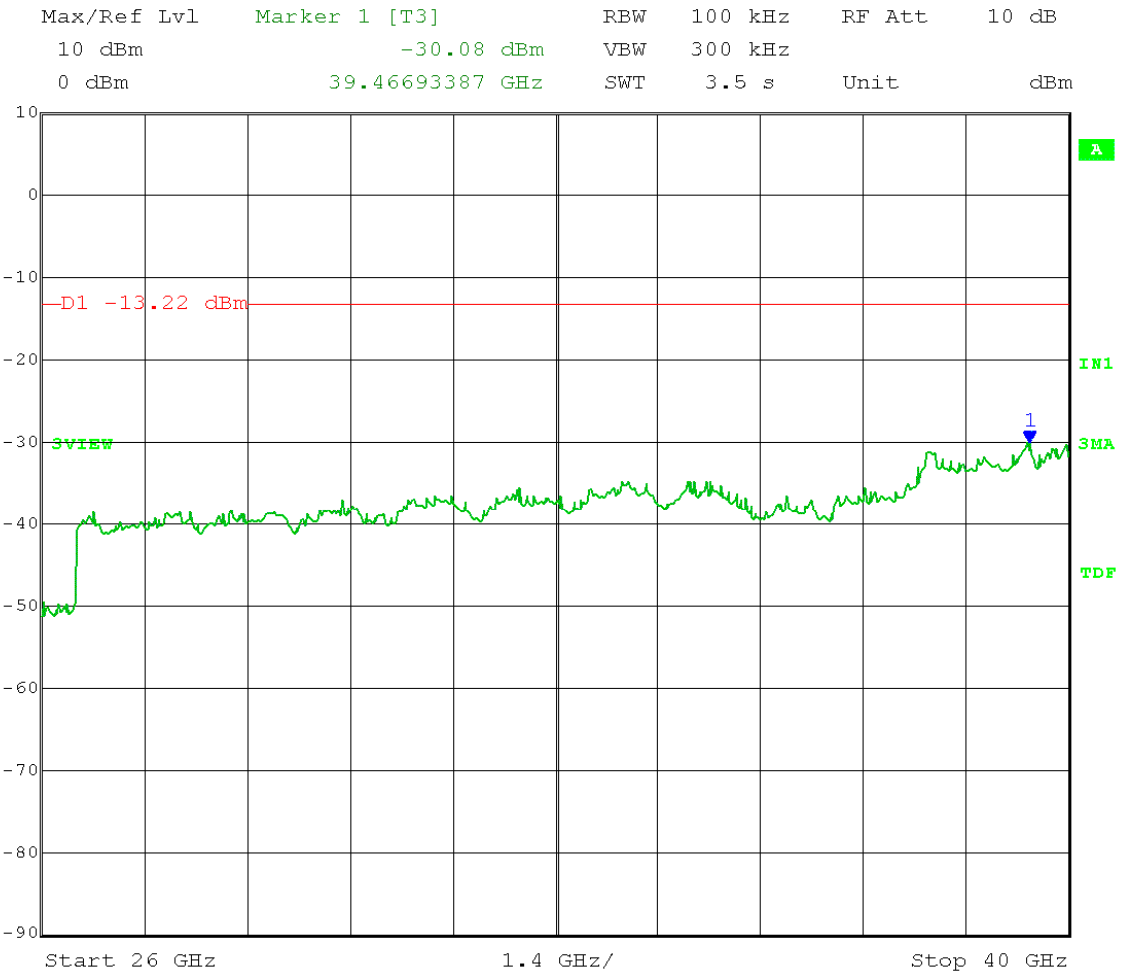
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 26 – 40 GHz
Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:31:34

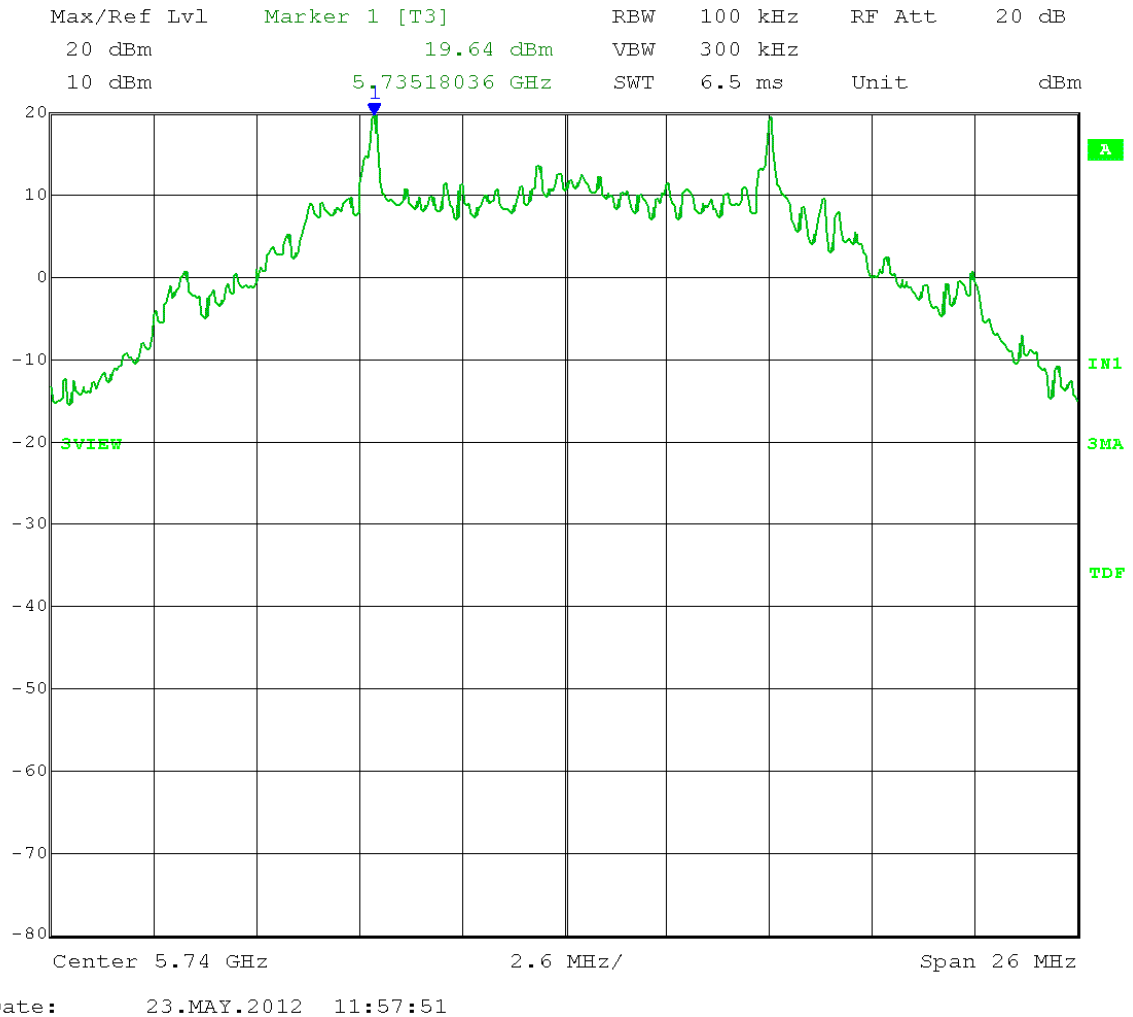
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 11:57:51

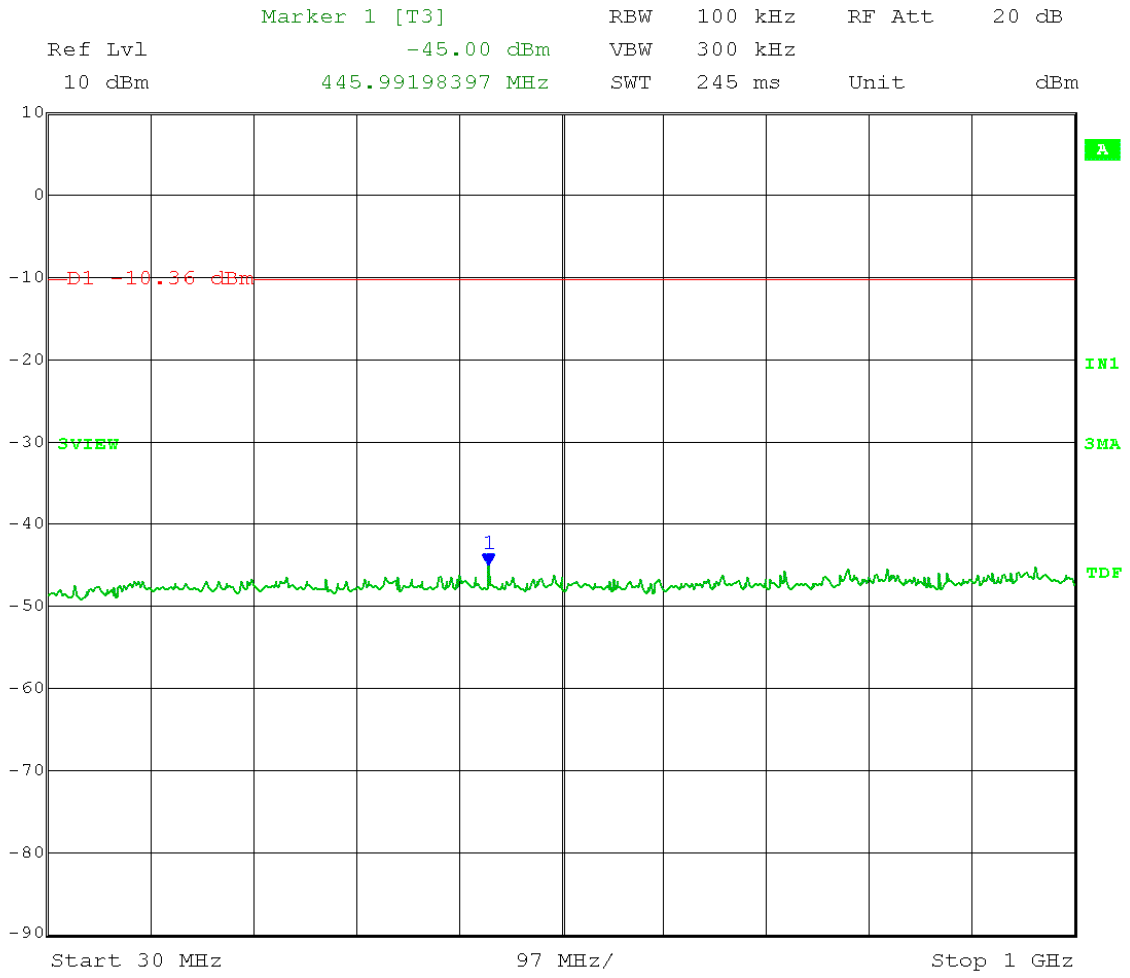
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 30 – 1000 MHz
Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 12:18:06

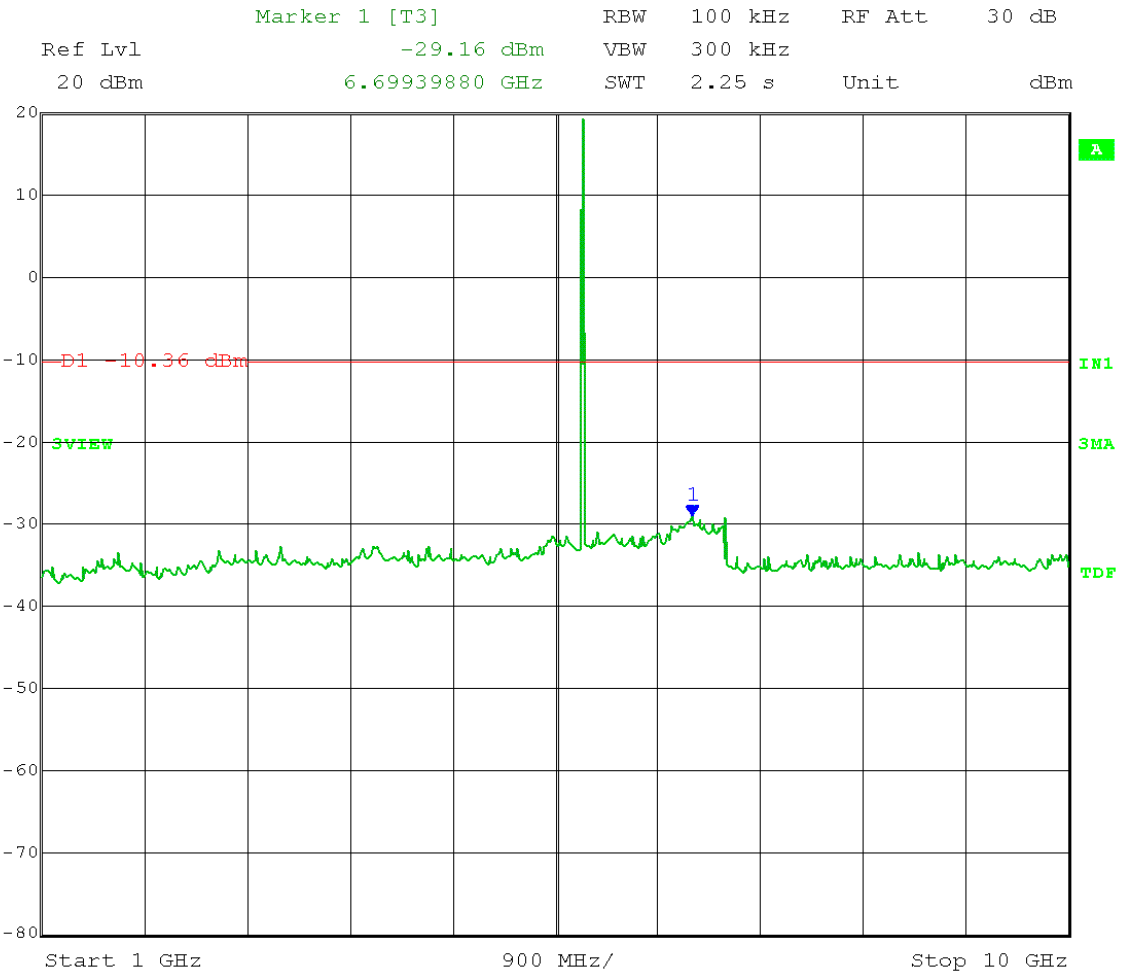
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 1 – 10 GHz
Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 12:12:11

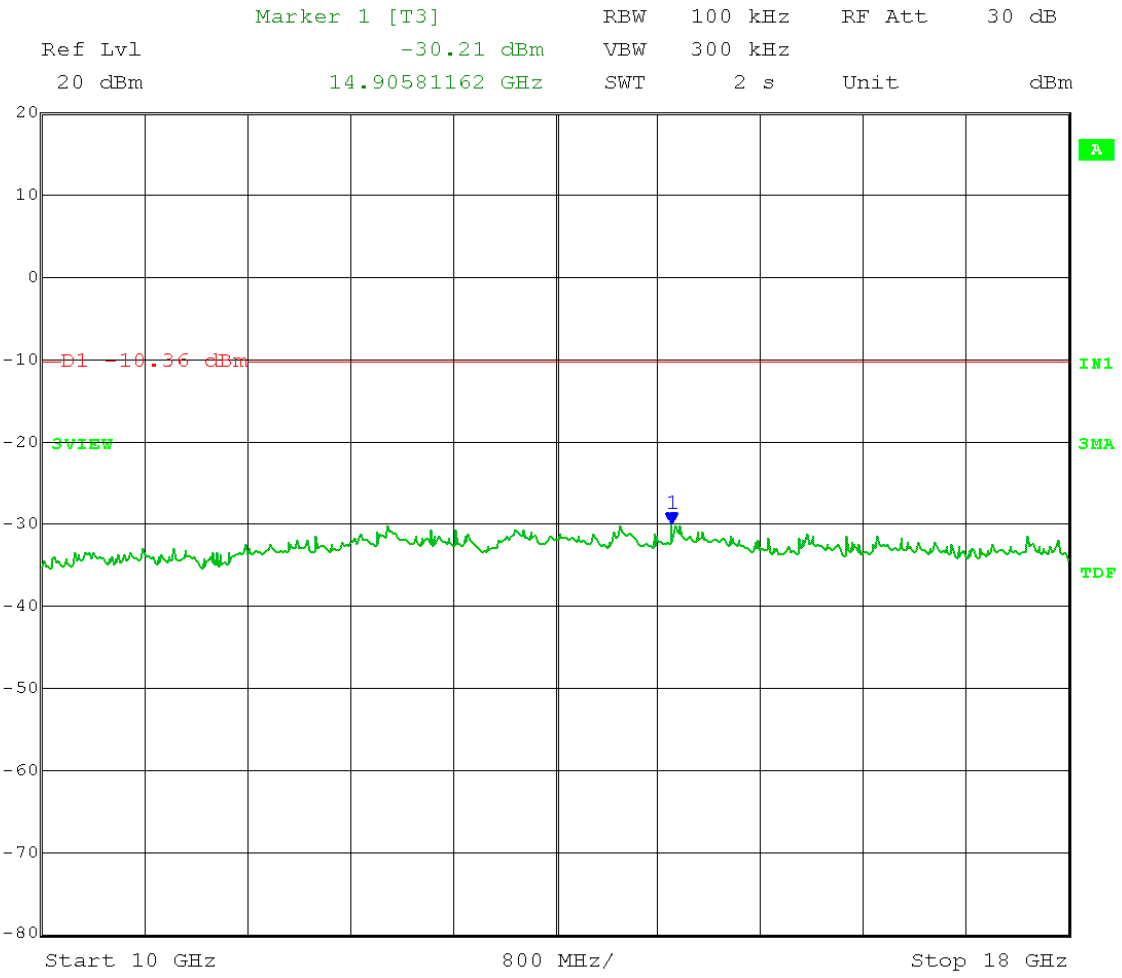
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 10 – 18 GHz
Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 12:13:55

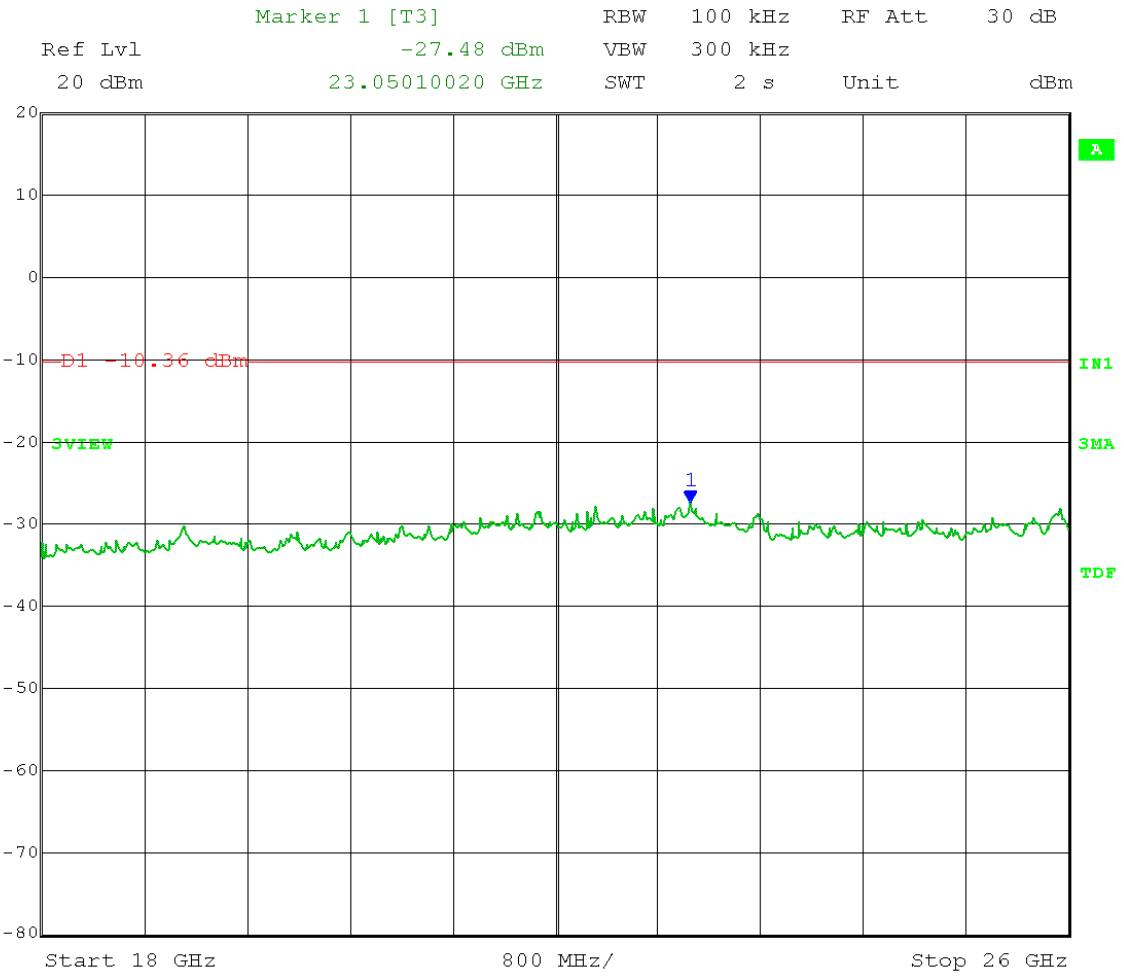
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 18 – 26 GHz
Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 12:15:24

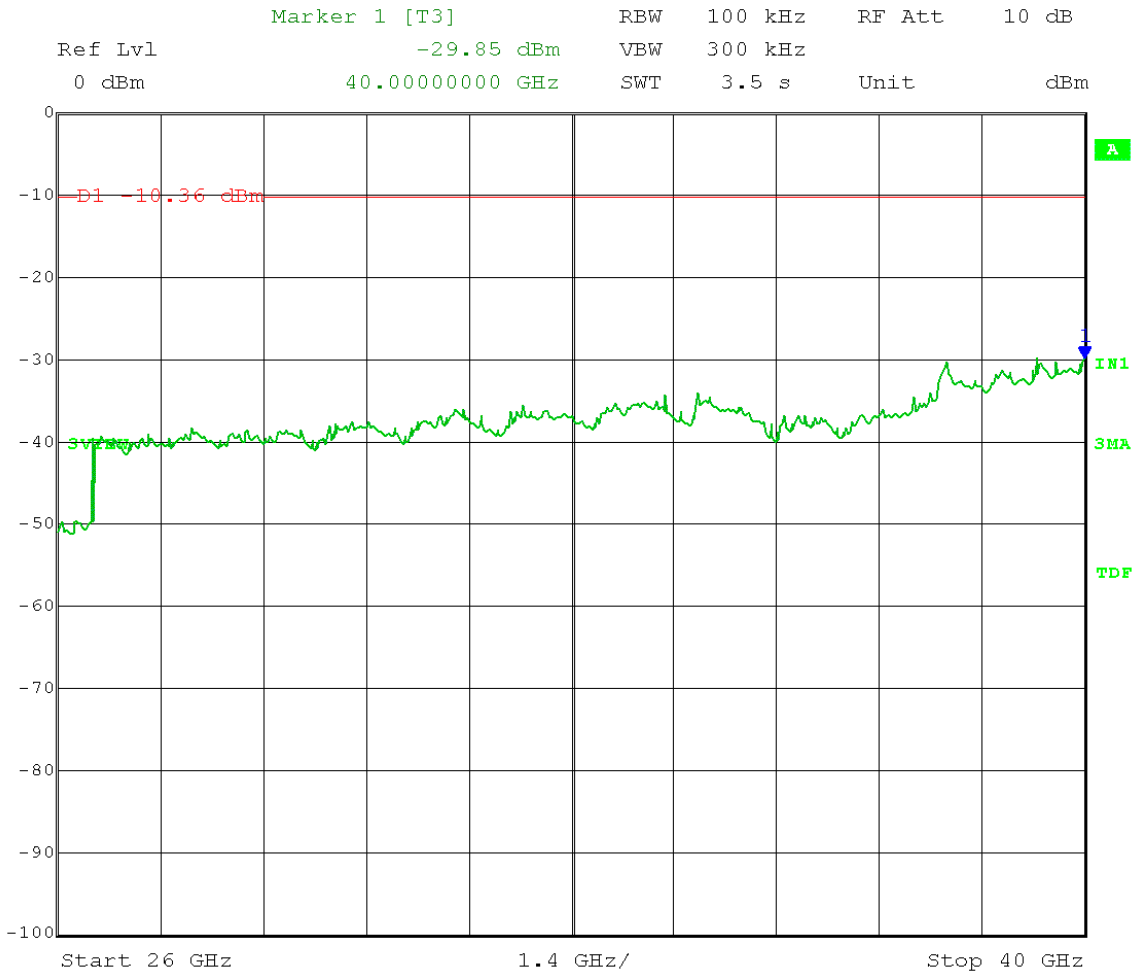
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 26 – 40 GHz
Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 12:16:38

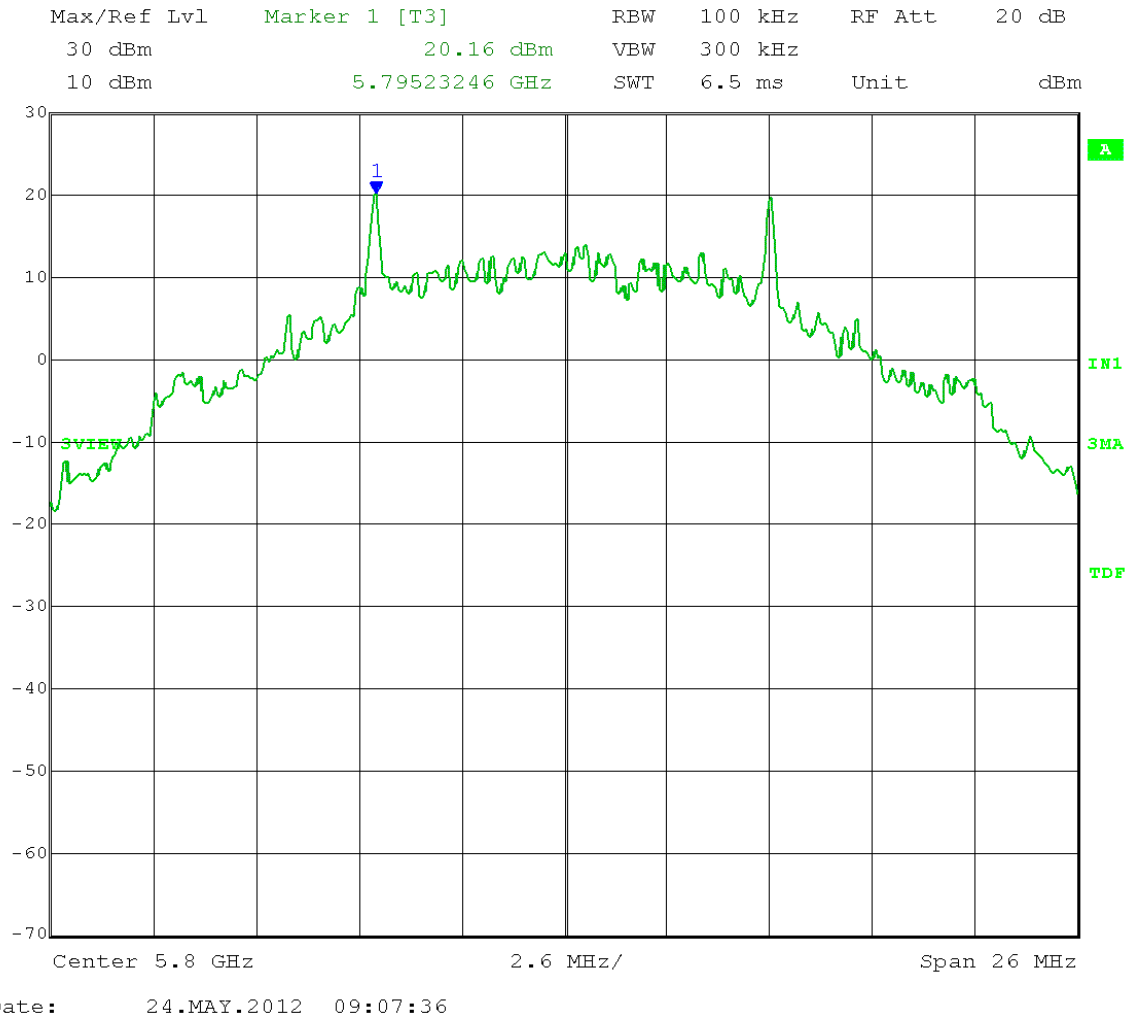
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 20.16 dBm – 30 dB = -9.84 dBm



Date: 24.MAY.2012 09:07:36

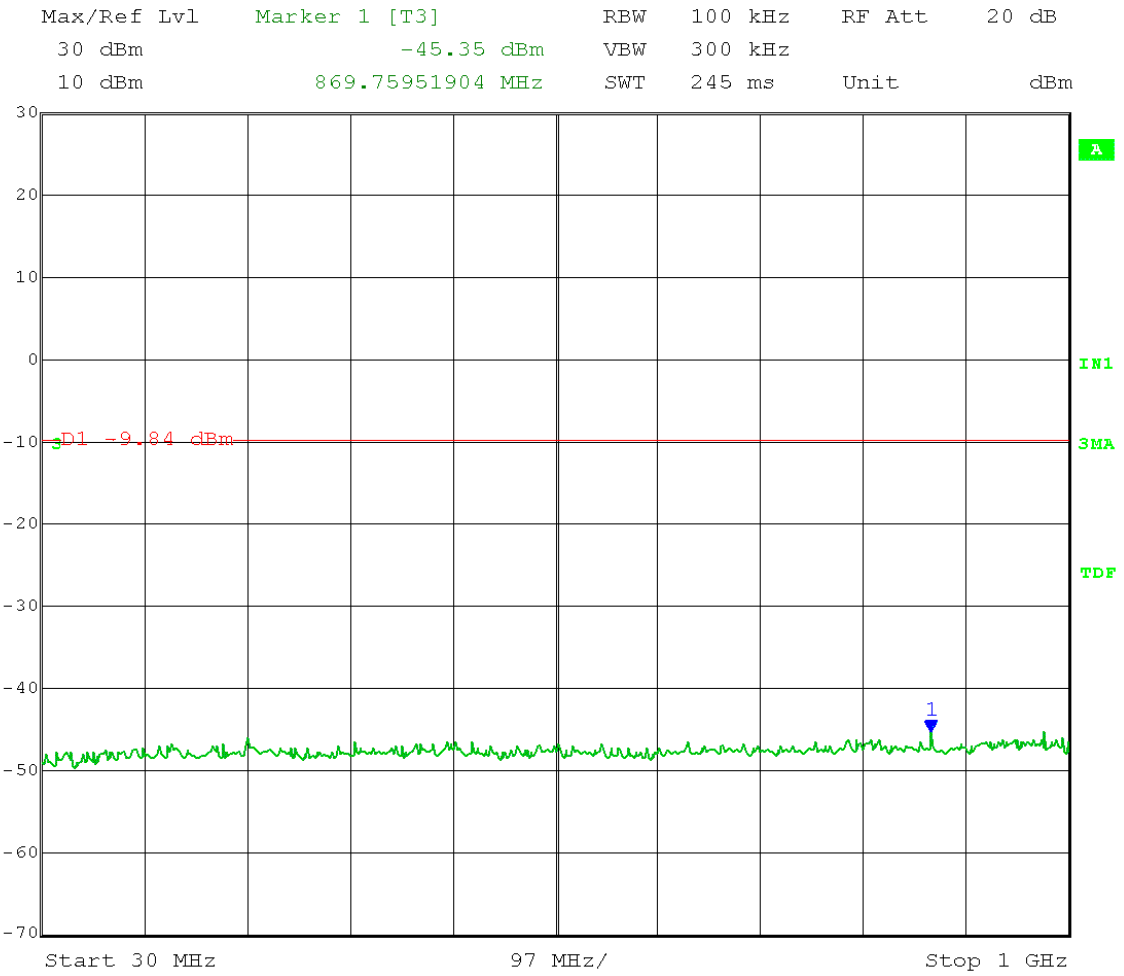
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 30 – 1000 MHz
Limit = 20.16 dBm – 30 dB = -9.84 dBm



Date: 24.MAY.2012 09:16:11

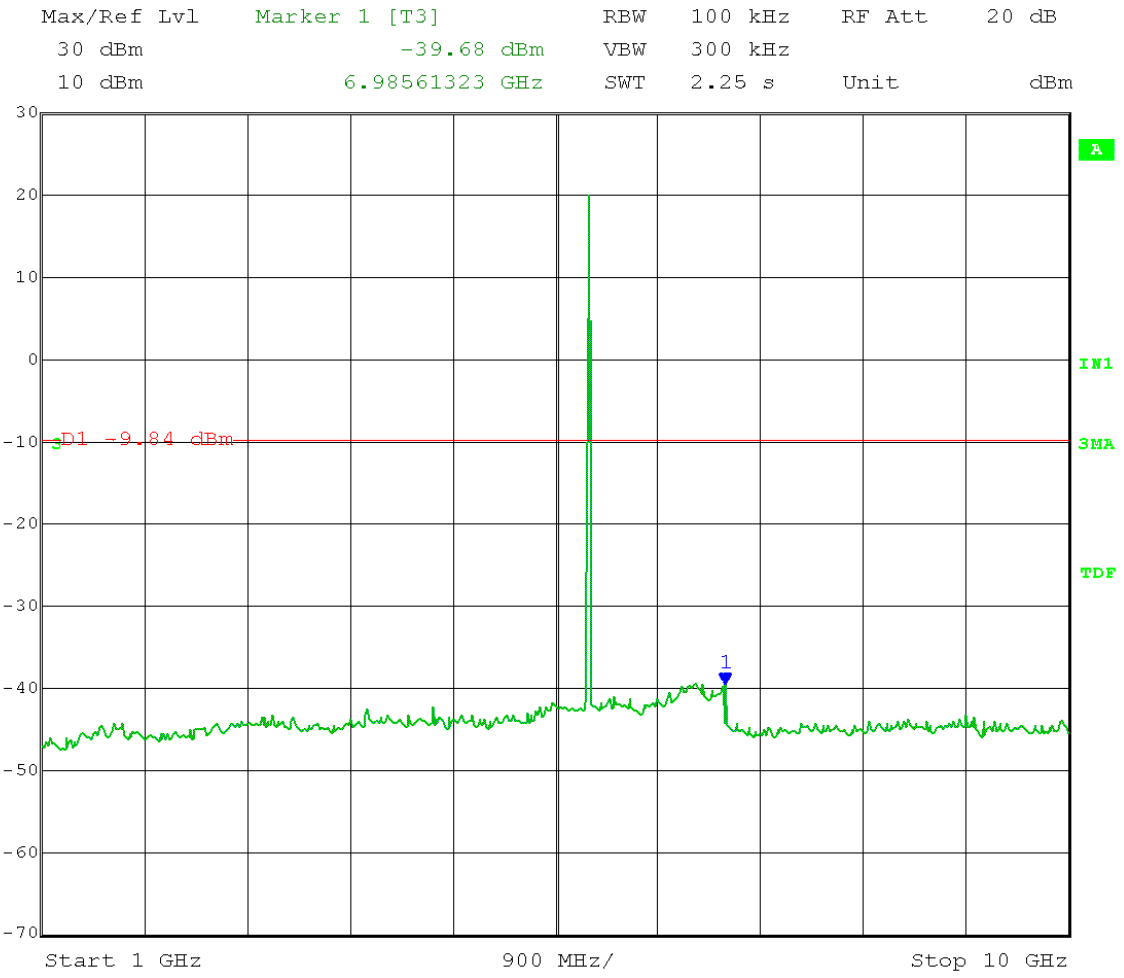
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 1 – 10 GHz
Limit = 20.16 dBm – 30 dB = -9.84 dBm



Date: 24.MAY.2012 09:10:36

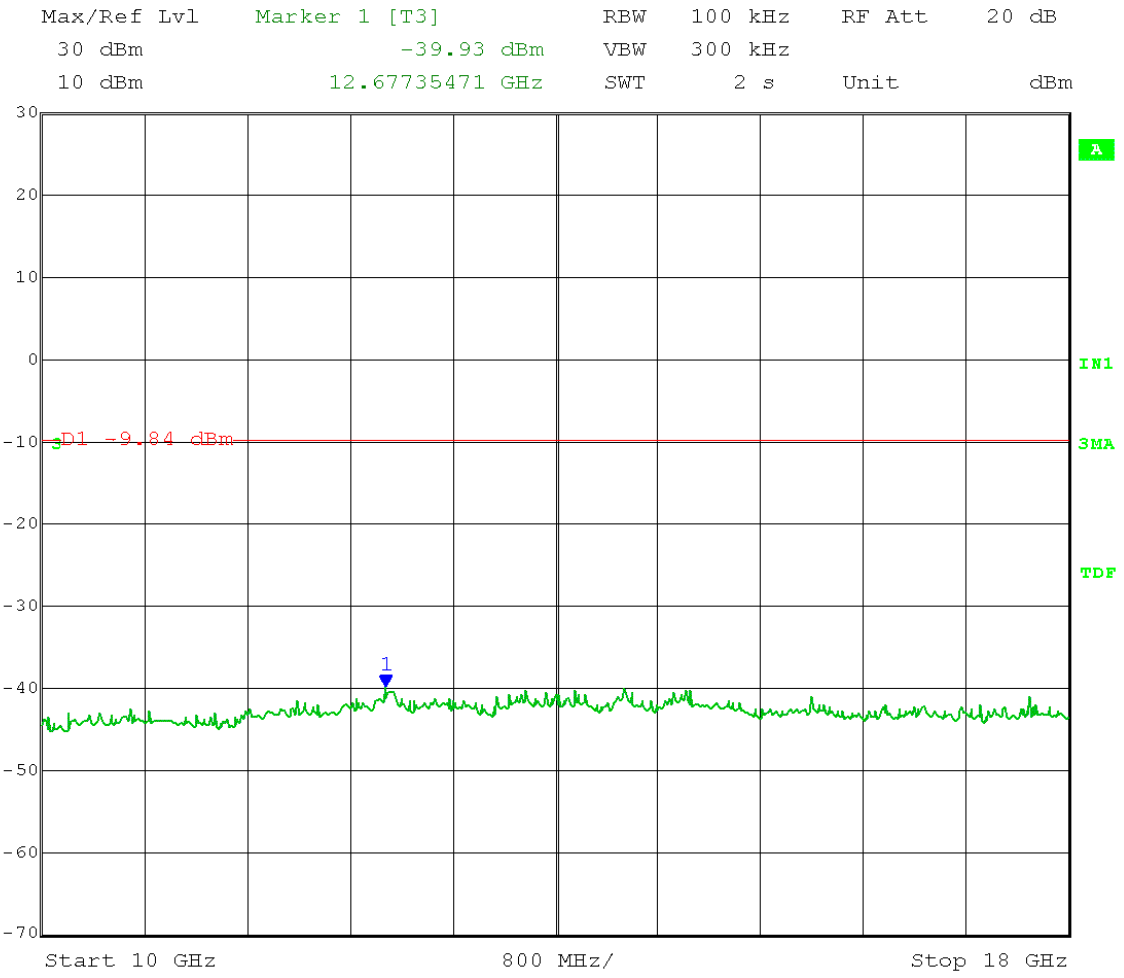
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 10 – 18 GHz
Limit = 20.16 dBm – 30 dB = -9.84 dBm



Date: 24.MAY.2012 09:12:06

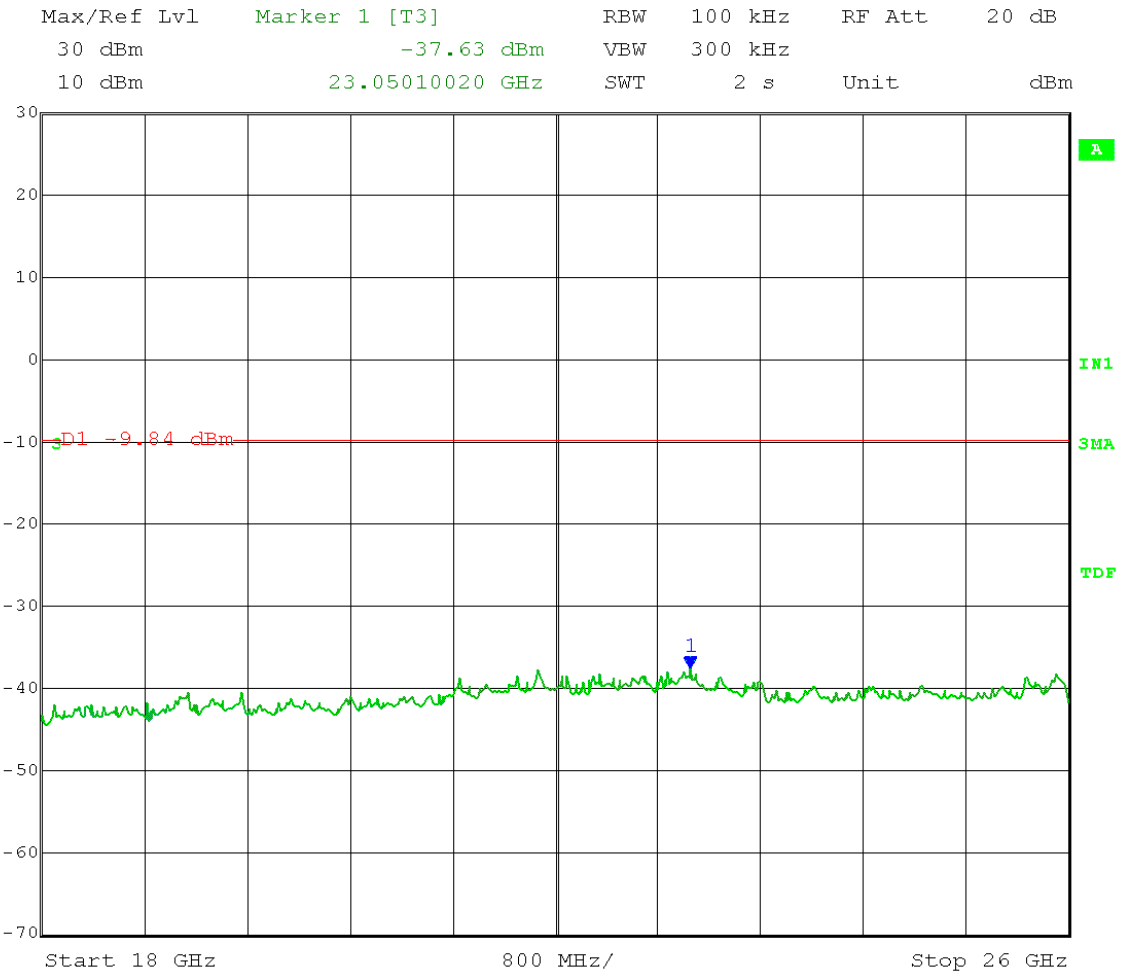
Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 18 – 26 GHz
Limit = 20.16 dBm – 30 dB = -9.84 dBm



Date: 24.MAY.2012 09:13:23

Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 26 – 40 GHz
Limit = 20.16 dBm – 30 dB = -9.84 dBm

Date: 24.MAY.2012 09:14:47

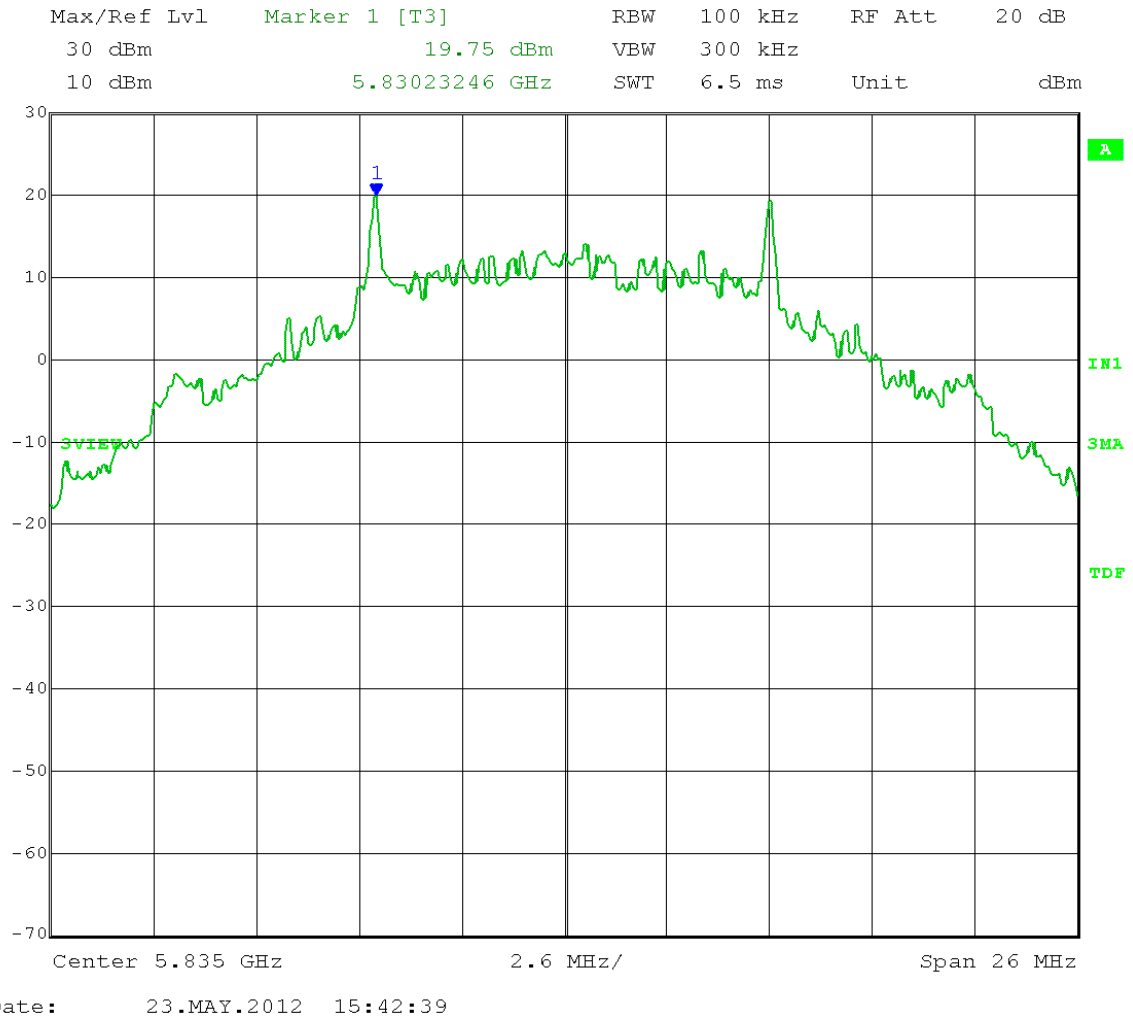
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 15:42:39

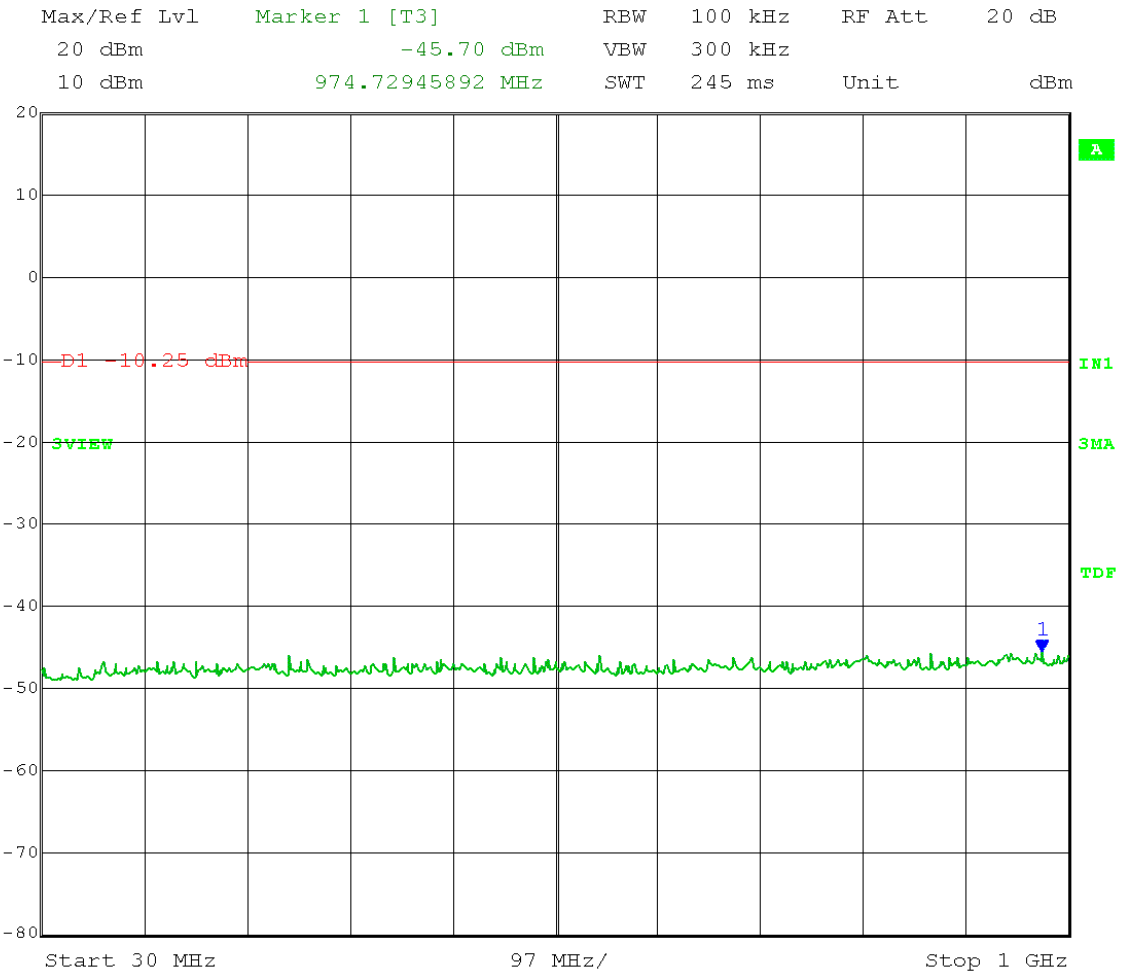
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 30 – 1000 MHz
Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 16:10:39

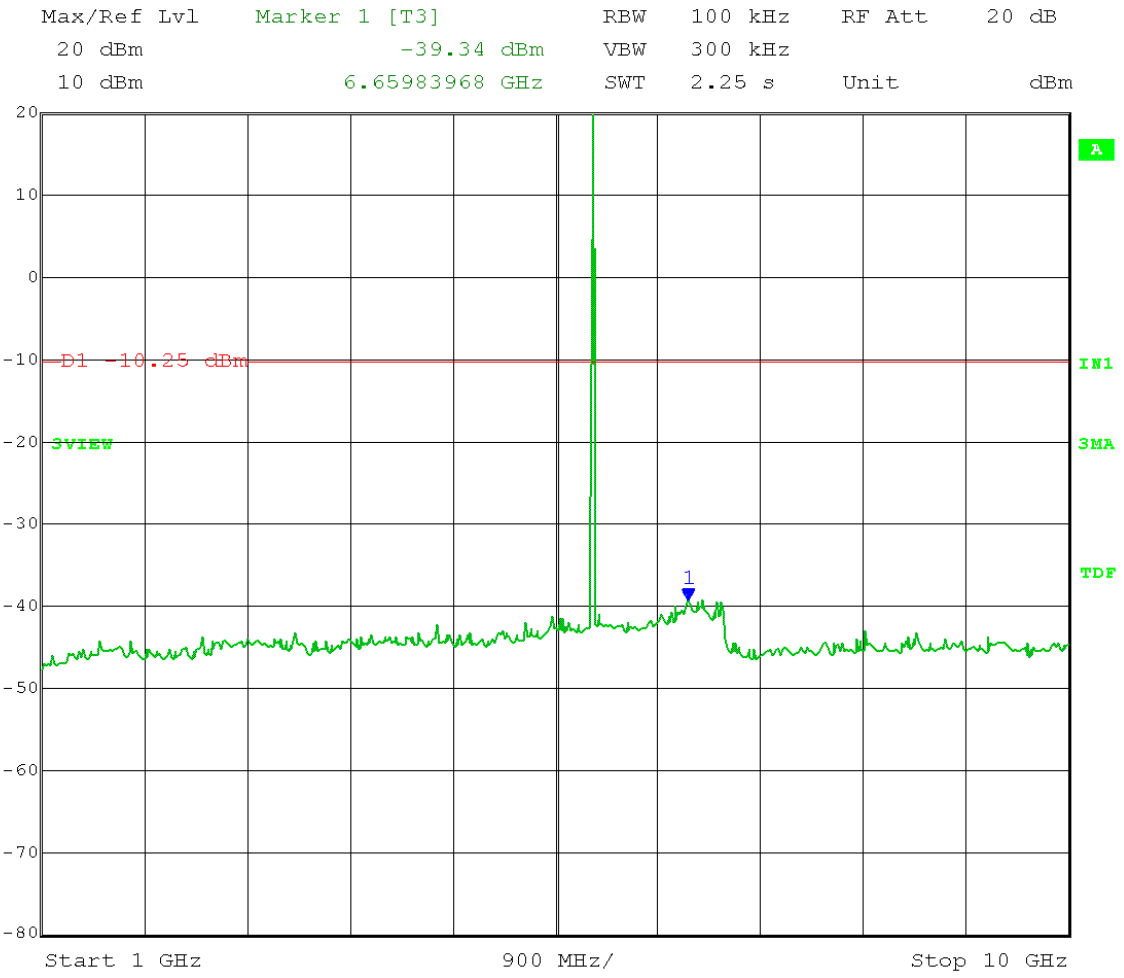
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 1 – 10 GHz
Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 16:05:55

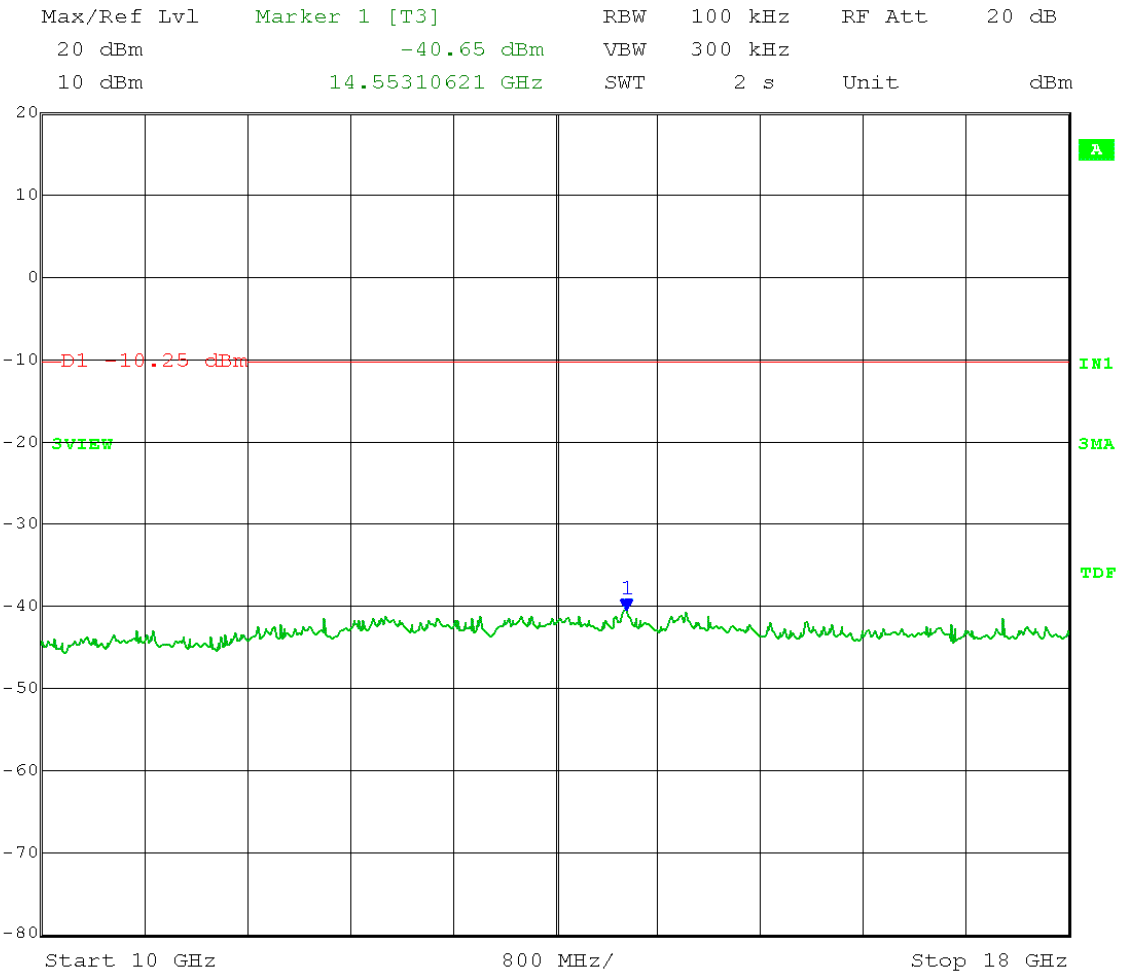
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 10 – 18 GHz
Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 16:06:59

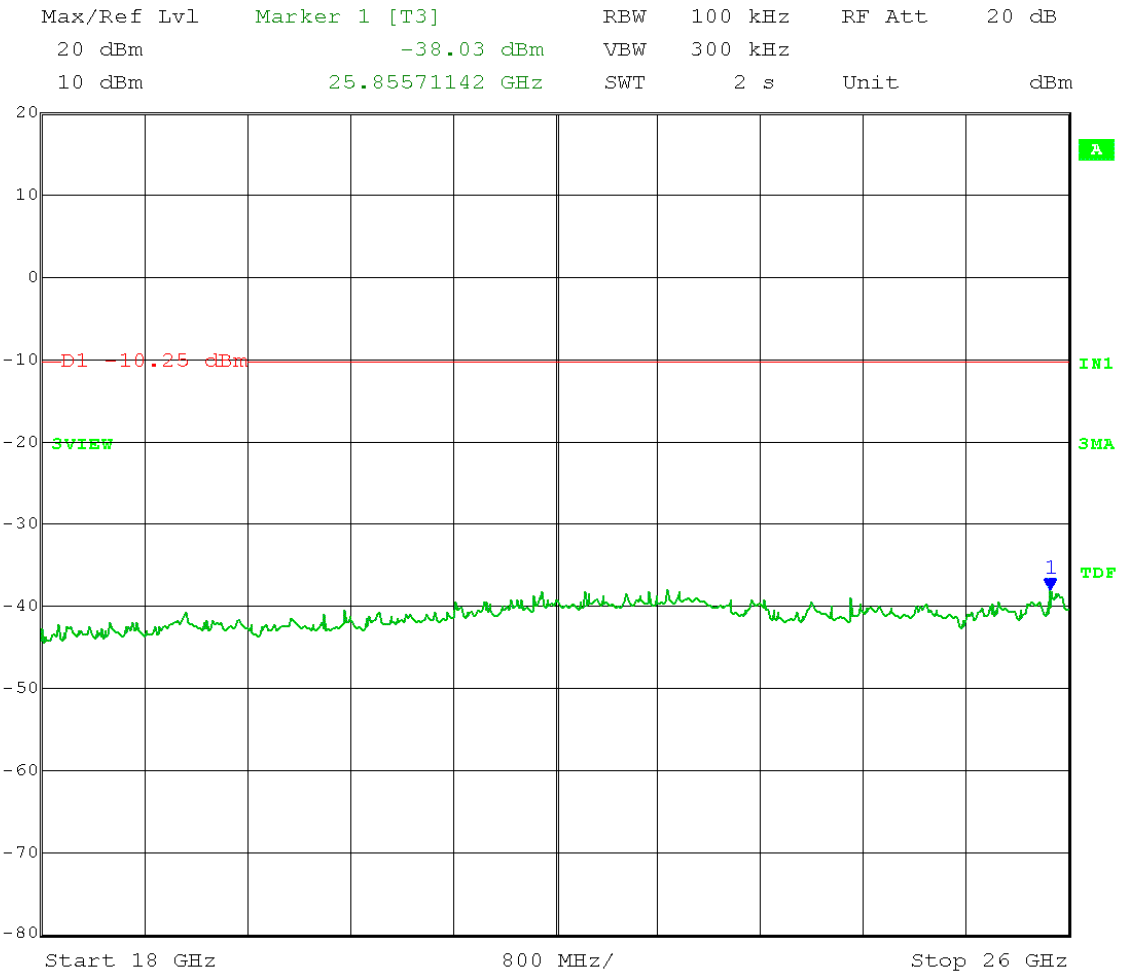
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 18 – 26 GHz
Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 16:08:05

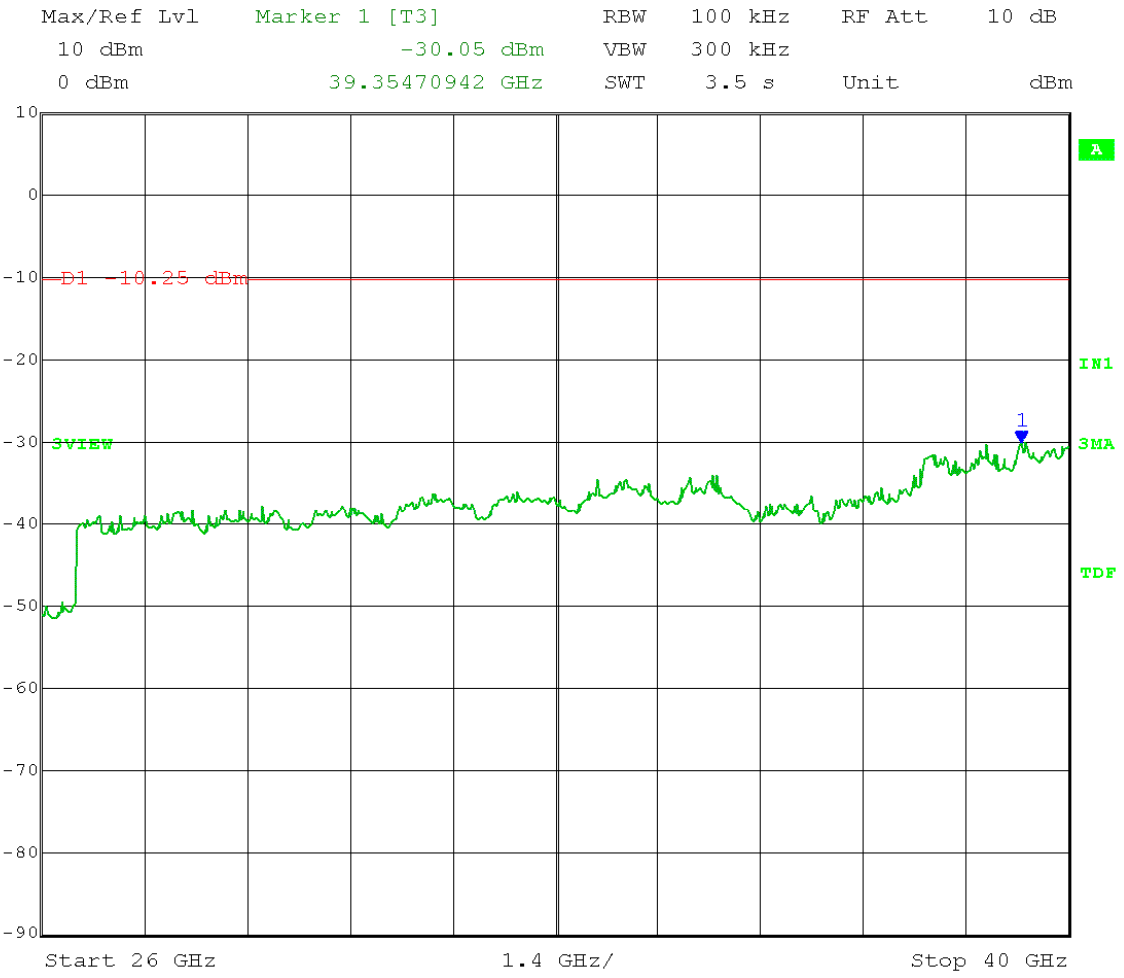
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting: E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Frequency Range: 26 – 40 GHz
Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 16:09:18

166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A6.0 Maximum Unwanted Emission Levels into Restricted Frequency Bands – Radiated

Rule Section: Section 15.247(d)
RSS-210 A8.5
RSS-Gen 7.2.2

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.

Limit: FCC Part 15.209, Canada: RSS-Gen 7.2.5 Table 5

Results: Passed

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 42% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Continuous transmit; Power setting 19; Both channel A and B turned ON
Comment: OFDM 10 & 20 MHz channel bandwidths; FSK (with dual patch & omni antennas); Low, Mid, and High channels
Date: 05-30-2012

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)

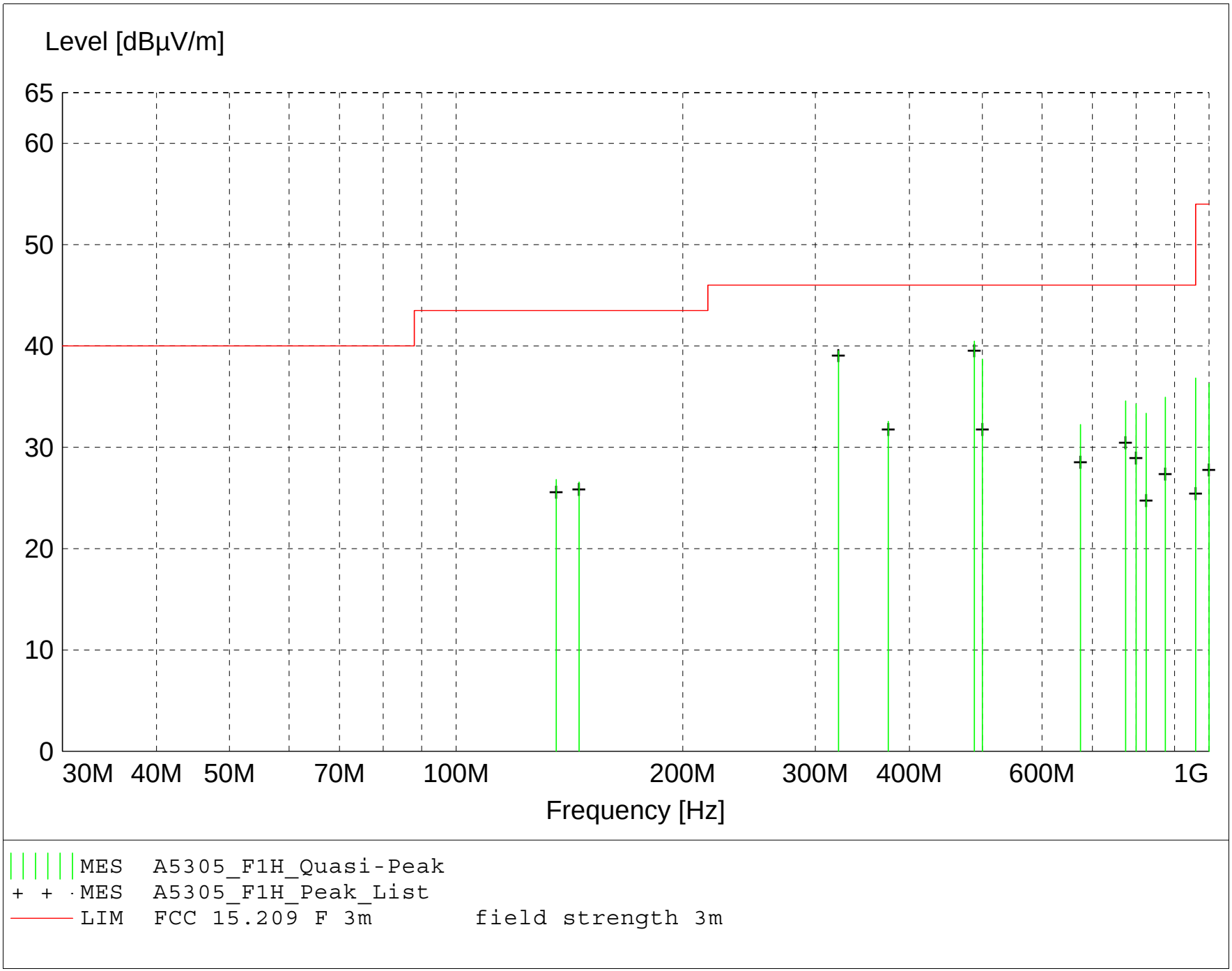
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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 A5305_F1H_Quasi-Peak
MES A5305_F1H_Peak_List
LIM FCC 15.209 F 3m field strength 3m

MEASUREMENT RESULT: "A5305_F1H_Final"

5/30/2012 1:33PM

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		
487.800000	42.97	17.64	-20.1	40.5	46.0	5.5	1.10	0	QUASI-PEAK	broadband
322.000000	45.92	14.76	-21.1	39.5	46.0	6.5	2.00	280	QUASI-PEAK	broadband
500.000000	40.44	18.20	-19.9	38.7	46.0	7.3	1.10	15	QUASI-PEAK	None
960.000000	29.62	23.90	-16.7	36.8	46.0	9.2	2.10	220	QUASI-PEAK	None
875.000000	29.33	23.20	-17.6	34.9	46.0	11.1	1.00	180	QUASI-PEAK	None
774.980000	30.72	21.60	-17.8	34.6	46.0	11.4	1.10	180	QUASI-PEAK	None
774.980000	30.72	21.60	-17.8	34.6	46.0	11.4	1.10	180	QUASI-PEAK	None
800.000000	30.24	21.70	-17.7	34.3	46.0	11.7	1.30	165	QUASI-PEAK	None
825.000000	28.23	22.20	-17.1	33.4	46.0	12.6	1.00	170	QUASI-PEAK	None
375.000000	37.87	15.30	-20.6	32.6	46.0	13.4	1.60	220	QUASI-PEAK	None
675.000000	30.13	21.10	-19.0	32.2	46.0	13.8	1.30	195	QUASI-PEAK	None
135.810000	36.42	12.50	-22.1	26.8	43.5	16.7	3.30	90	QUASI-PEAK	broadband
145.665000	36.69	12.07	-22.2	26.6	43.5	16.9	1.30	270	QUASI-PEAK	broadband
1000.000000	28.01	24.50	-16.2	36.3	54.0	17.7	1.30	180	QUASI-PEAK	None

FCC Part 15.205/15.209 Sprios Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 42% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Continuous transmit; Power setting 19; Both channel A and B turned ON
Comment: OFDM 10 & 20 MHz channel bandwidths; FSK (with dual patch & omni antennas); Low, Mid, and High channels
Date: 05-30-2012

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

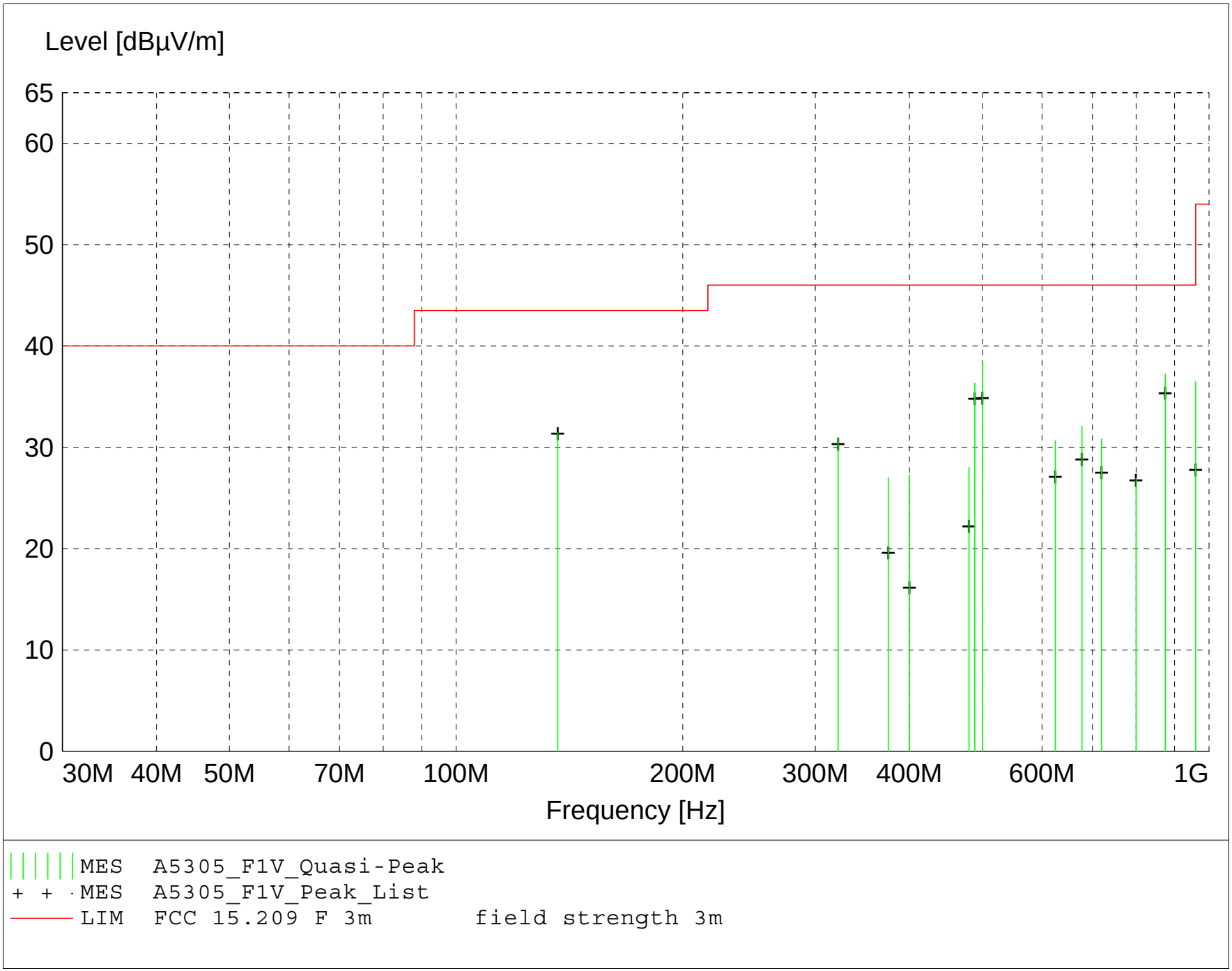
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A5305_F1V_Quasi-Peak
MES A5305_F1V_Peak_List
LIM FCC 15.209 F 3m field strength 3m

MEASUREMENT RESULT: "A5305_F1V_Final"

5/30/2012 1:09PM

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		
500.000000	40.06	18.20	-19.9	38.3	46.0	7.7	1.60	190	QUASI-PEAK	None
875.000000	31.62	23.20	-17.6	37.2	46.0	8.8	2.00	190	QUASI-PEAK	None
960.000000	29.27	23.90	-16.7	36.5	46.0	9.5	1.20	135	QUASI-PEAK	None
488.530000	38.83	17.63	-20.1	36.3	46.0	9.7	1.00	225	QUASI-PEAK	broadband
136.470000	41.15	12.41	-22.1	31.4	43.5	12.1	2.50	270	QUASI-PEAK	broadband
677.850000	30.01	21.04	-19.0	32.1	46.0	13.9	1.20	180	QUASI-PEAK	broadband
321.620000	37.31	14.77	-21.1	30.9	46.0	15.1	1.00	180	QUASI-PEAK	broadband
720.000000	28.39	21.30	-18.9	30.8	46.0	15.2	1.70	180	QUASI-PEAK	None
625.000000	30.44	19.50	-19.3	30.6	46.0	15.4	1.10	165	QUASI-PEAK	None
480.000000	30.68	17.70	-20.4	28.0	46.0	18.0	1.00	210	QUASI-PEAK	None
400.000000	31.97	16.00	-20.7	27.3	46.0	18.7	1.00	180	QUASI-PEAK	None
375.000000	32.31	15.30	-20.6	27.0	46.0	19.0	1.40	45	QUASI-PEAK	None
800.000000	22.94	21.70	-17.7	27.0	46.0	19.0	1.10	30	QUASI-PEAK	None

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 44% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Dual Patch antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

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)

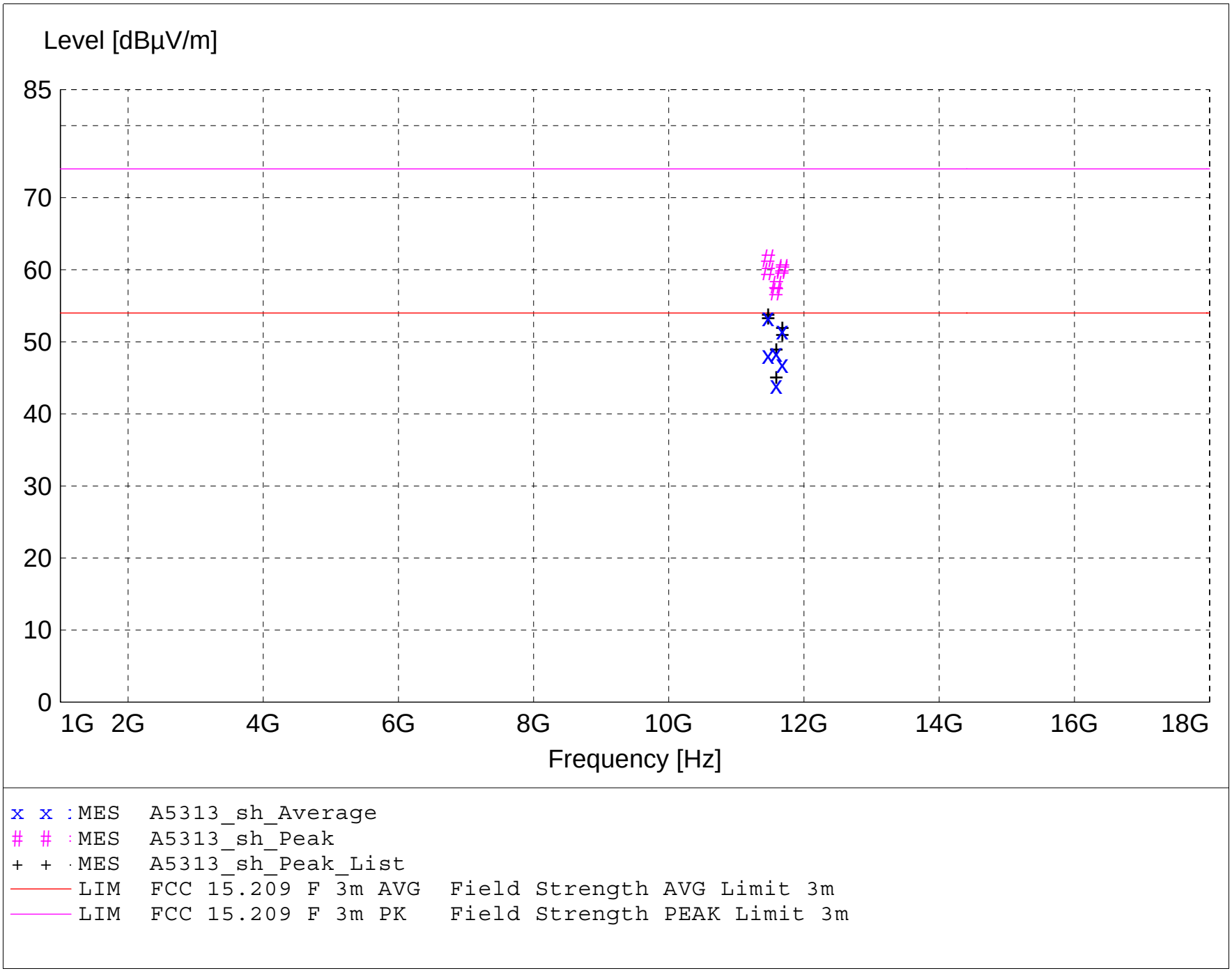
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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



x x : MES A5313_sh_Average
: MES A5313_sh_Peak
+ + : MES A5313_sh_Peak_List
——— LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5313_sh_Final"

5/31/2012 11:14AM

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		
11470.360000	48.02	40.66	-35.3	53.4	54.0	0.6	1.00	135	AVERAGE	Low ch; 2-lvl
11680.350000	46.34	40.51	-35.3	51.5	54.0	2.5	1.10	240	AVERAGE	High ch; 2-lvl
11590.380000	43.22	40.65	-35.4	48.4	54.0	5.6	1.10	180	AVERAGE	Mid ch; 2-lvl
11470.360000	42.77	40.66	-35.3	48.1	54.0	5.9	1.00	135	AVERAGE	Low ch; 4-lvl
11680.400000	41.74	40.51	-35.3	46.9	54.0	7.1	1.00	240	AVERAGE	High ch; 4-lvl
11590.350000	38.84	40.65	-35.4	44.0	54.0	10.0	1.10	180	AVERAGE	Mid ch; 4-lvl
11470.360000	56.28	40.66	-35.3	61.6	74.0	12.4	1.00	135	MAX PEAK	Low ch; 2-lvl
11680.400000	55.08	40.51	-35.3	60.2	74.0	13.8	1.00	240	MAX PEAK	High ch; 4-lvl
11680.350000	54.81	40.51	-35.3	60.0	74.0	14.0	1.10	240	MAX PEAK	High ch; 2-lvl
11470.360000	54.41	40.66	-35.3	59.8	74.0	14.2	1.00	135	MAX PEAK	Low ch; 4-lvl
11590.380000	52.69	40.65	-35.4	57.9	74.0	16.1	1.10	180	MAX PEAK	Mid ch; 2-lvl
11590.350000	51.73	40.65	-35.4	56.9	74.0	17.1	1.10	180	MAX PEAK	Mid ch; 4-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 44% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Dual Patch antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

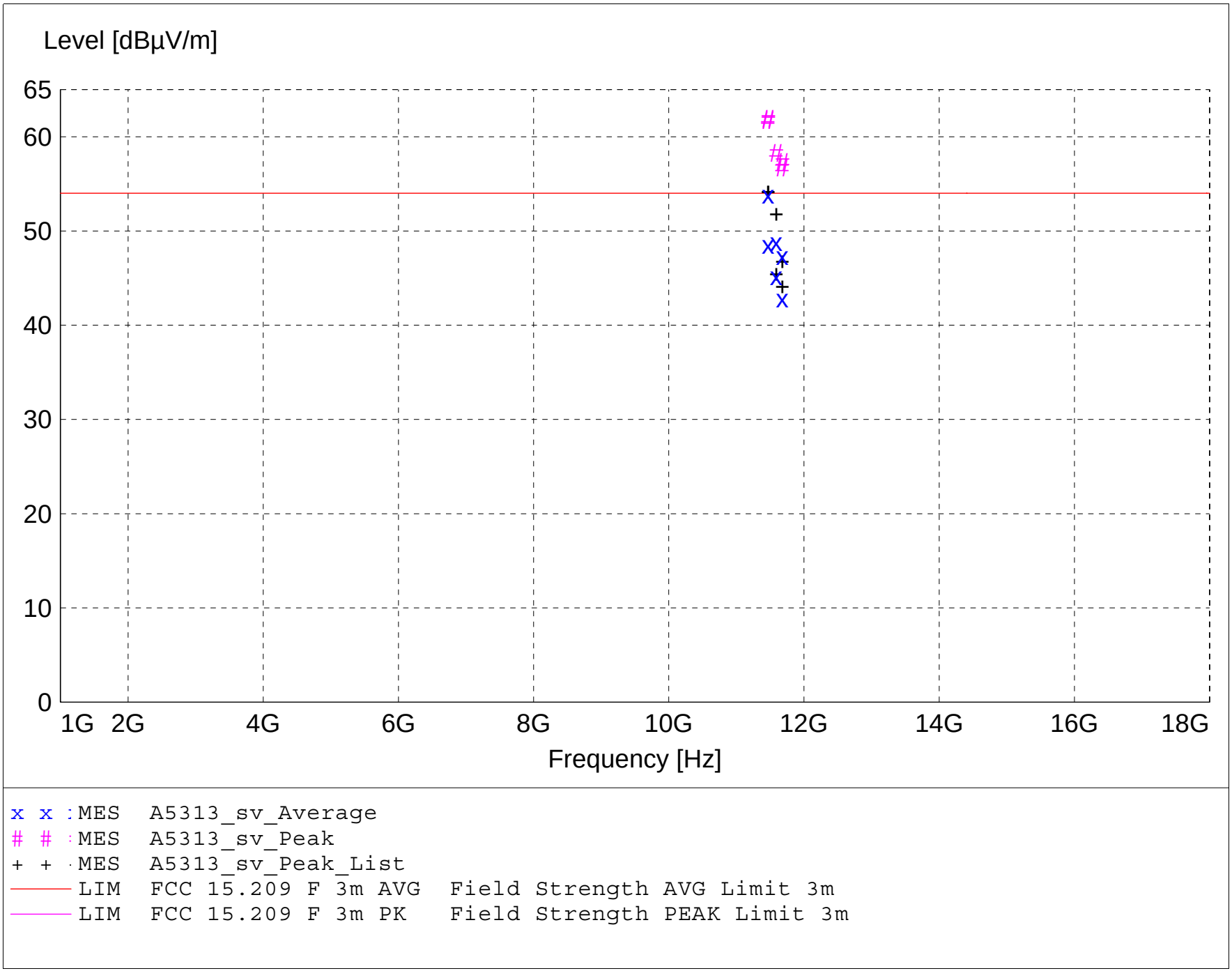
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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



x x : MES A5313_sv_Average
: MES A5313_sv_Peak
+ + : MES A5313_sv_Peak_List
——— LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5313_sv_Final"

5/31/2012 10:35AM

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		
11470.350000	48.47	40.66	-35.3	53.8	54.0	0.2	1.60	135	AVERAGE	Low ch; 2-lvl
11590.390000	43.59	40.65	-35.4	48.8	54.0	5.2	1.60	225	AVERAGE	Mid ch; 2-lvl
11470.350000	43.16	40.66	-35.3	48.5	54.0	5.5	1.60	135	AVERAGE	Low ch; 4-lvl
11680.310000	42.18	40.51	-35.3	47.3	54.0	6.7	1.50	225	AVERAGE	High ch; 2-lvl
11590.400000	39.96	40.65	-35.4	45.2	54.0	8.8	1.60	225	AVERAGE	Mid ch; 4-lvl
11680.400000	37.66	40.51	-35.3	42.8	54.0	11.2	1.50	225	AVERAGE	High ch; 4-lvl
11470.350000	56.54	40.66	-35.3	61.9	74.0	12.1	1.60	135	MAX PEAK	Low ch; 2-lvl
11470.350000	56.41	40.66	-35.3	61.8	74.0	12.2	1.60	135	MAX PEAK	Low ch; 4-lvl
11590.390000	53.10	40.65	-35.4	58.3	74.0	15.7	1.60	225	MAX PEAK	Mid ch; 2-lvl
11590.400000	53.10	40.65	-35.4	58.3	74.0	15.7	1.60	225	MAX PEAK	Mid ch; 4-lvl
11680.310000	52.14	40.51	-35.3	57.3	74.0	16.7	1.50	225	MAX PEAK	High ch; 2-lvl
11680.400000	51.60	40.51	-35.3	56.8	74.0	17.2	1.50	225	MAX PEAK	High ch; 4-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 44% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Omni antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

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)

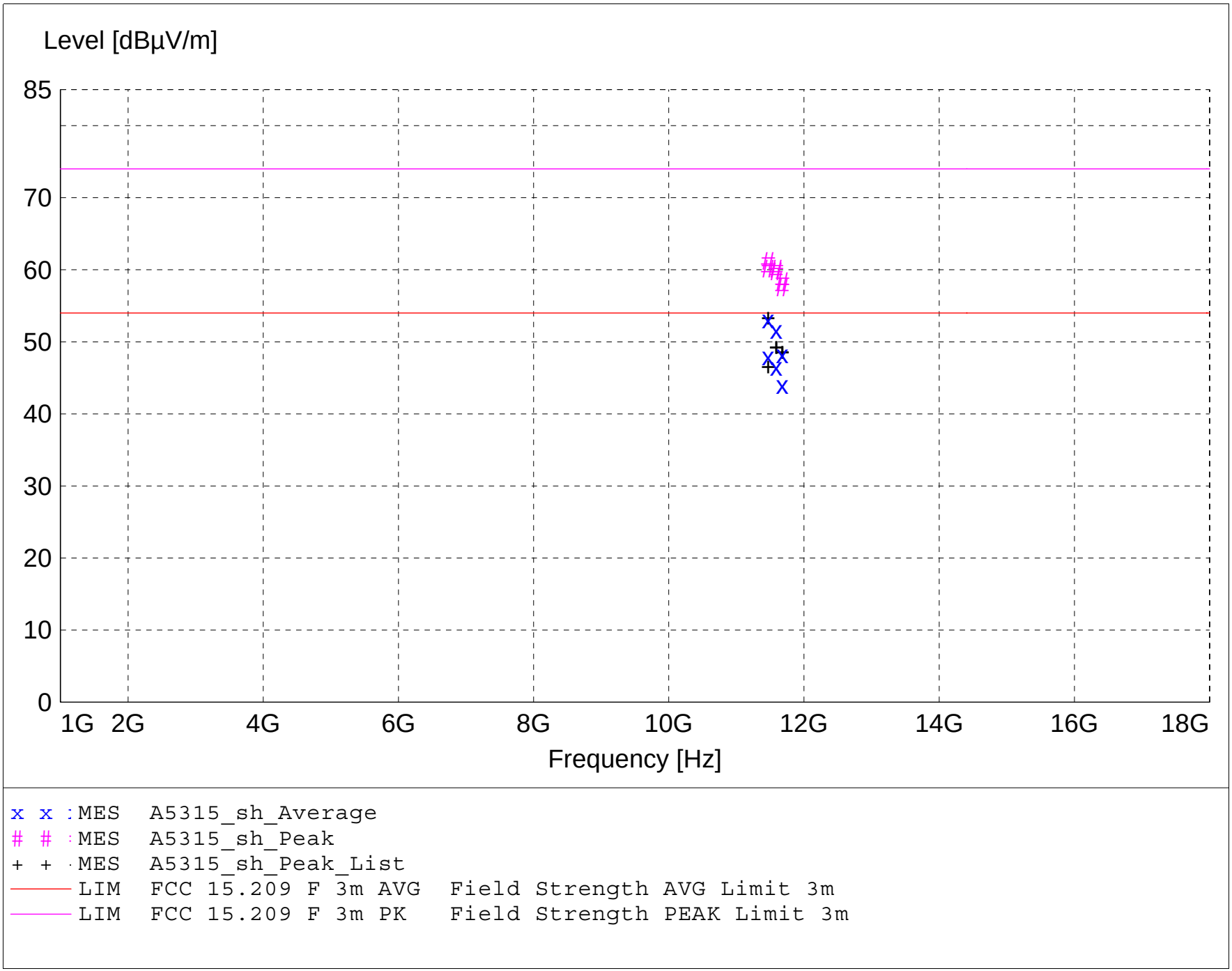
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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



x x : MES A5315_sh_Average
: MES A5315_sh_Peak
+ + : MES A5315_sh_Peak_List
——— LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5315_sh_Final"

5/31/2012 2:15PM

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		
11470.360000	47.71	40.66	-35.3	53.1	54.0	0.9	1.50	180	AVERAGE	Low ch; 2-lvl
11590.420000	46.43	40.65	-35.4	51.6	54.0	2.4	1.40	135	AVERAGE	Mid ch; 2-lvl
11680.360000	43.13	40.51	-35.3	48.3	54.0	5.7	1.50	170	AVERAGE	High ch; 2-lvl
11470.320000	42.63	40.66	-35.3	48.0	54.0	6.0	1.50	180	AVERAGE	Low ch; 4-lvl
11590.420000	41.32	40.65	-35.4	46.5	54.0	7.5	1.40	135	AVERAGE	Mid ch; 4-lvl
11680.360000	38.84	40.51	-35.3	44.0	54.0	10.0	1.50	170	AVERAGE	High ch; 4-lvl
11470.360000	55.88	40.66	-35.3	61.2	74.0	12.8	1.50	180	MAX PEAK	Low ch; 2-lvl
11470.320000	54.81	40.66	-35.3	60.2	74.0	13.8	1.50	180	MAX PEAK	Low ch; 4-lvl
11590.420000	54.95	40.65	-35.4	60.1	74.0	13.9	1.40	135	MAX PEAK	Mid ch; 2-lvl
11590.420000	54.54	40.65	-35.4	59.7	74.0	14.3	1.40	135	MAX PEAK	Mid ch; 4-lvl
11680.360000	53.23	40.51	-35.3	58.4	74.0	15.6	1.50	170	MAX PEAK	High ch; 2-lvl
11680.360000	52.42	40.51	-35.3	57.6	74.0	16.4	1.50	170	MAX PEAK	High ch; 4-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 44% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Omni antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

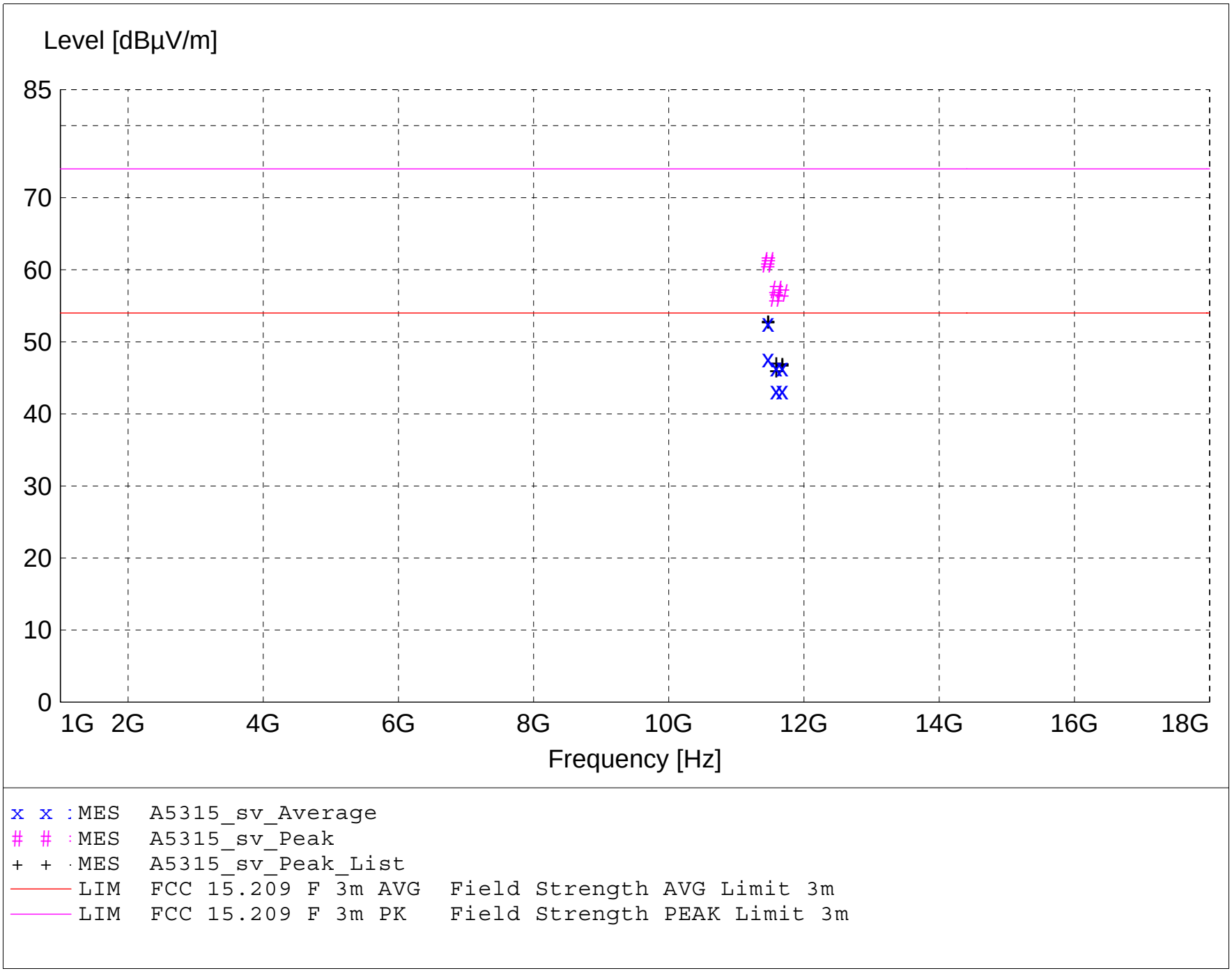
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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



x x : MES A5315_sv_Average
: MES A5315_sv_Peak
+ + : MES A5315_sv_Peak_List
——— LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5315_sv_Final"

5/31/2012 2:02PM

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		
11470.350000	47.22	40.66	-35.3	52.6	54.0	1.4	1.50	135	AVERAGE	Low ch; 2-lvl
11470.390000	42.36	40.66	-35.3	47.7	54.0	6.3	1.60	135	AVERAGE	Low ch; 4-lvl
11680.380000	41.28	40.51	-35.3	46.4	54.0	7.6	1.60	140	AVERAGE	High ch; 2-lvl
11590.400000	41.20	40.65	-35.4	46.4	54.0	7.6	1.60	240	AVERAGE	Mid ch; 2-lvl
11590.400000	38.07	40.65	-35.4	43.3	54.0	10.7	1.60	240	AVERAGE	Mid ch; 4-lvl
11680.400000	38.07	40.51	-35.3	43.2	54.0	10.8	1.60	140	AVERAGE	High ch; 4-lvl
11470.390000	55.88	40.66	-35.3	61.2	74.0	12.8	1.60	135	MAX PEAK	Low ch; 4-lvl
11470.350000	55.48	40.66	-35.3	60.8	74.0	13.2	1.50	135	MAX PEAK	Low ch; 2-lvl
11590.400000	52.00	40.65	-35.4	57.2	74.0	16.8	1.60	240	MAX PEAK	Mid ch; 2-lvl
11680.380000	51.60	40.51	-35.3	56.8	74.0	17.2	1.60	140	MAX PEAK	High ch; 2-lvl
11680.400000	51.60	40.51	-35.3	56.8	74.0	17.2	1.60	140	MAX PEAK	High ch; 4-lvl
11590.400000	50.93	40.65	-35.4	56.1	74.0	17.9	1.60	240	MAX PEAK	Mid ch; 4-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 42% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Dual Patch antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

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)

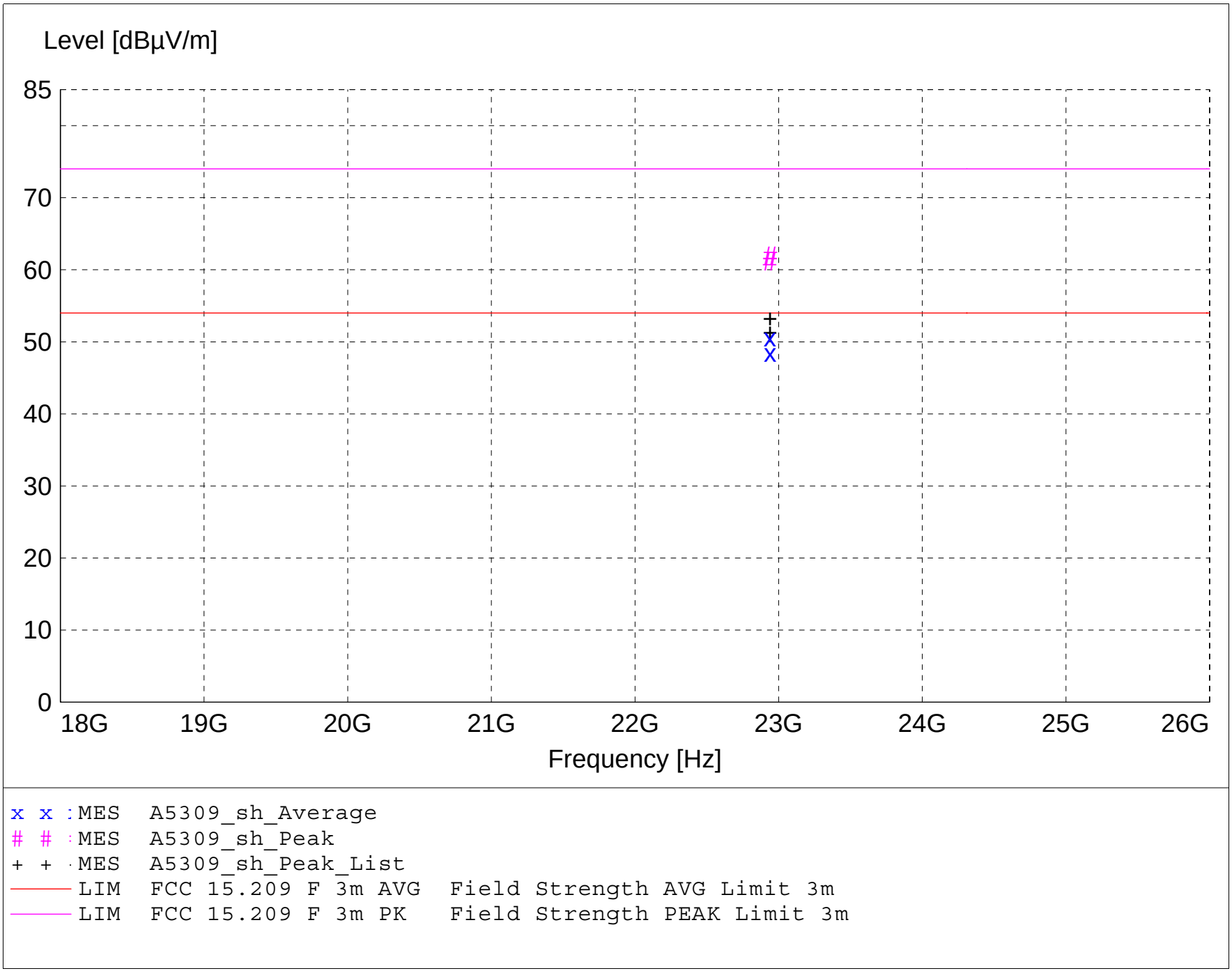
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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]
85
70
60
50
40
30
20
10
0
18G
19G
20G
21G
22G
23G
24G
25G
26G
Frequency [Hz]
x x :MES A5309_sh_Average
:MES A5309_sh_Peak
+ + :MES A5309_sh_Peak_List
LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5309_sh_Final"

5/30/2012 4:19PM

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		
22940.570000	46.98	46.36	-42.8	50.6	54.0	3.4	1.40	160	AVERAGE	Low ch; 2-lvl
22940.780000	44.83	46.36	-42.8	48.4	54.0	5.6	1.40	160	AVERAGE	Low ch; 4-lvl
22940.780000	58.46	46.36	-42.8	62.0	74.0	12.0	1.40	160	MAX PEAK	Low ch; 4-lvl
22940.570000	57.55	46.36	-42.8	61.1	74.0	12.9	1.40	160	MAX PEAK	Low ch; 2-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 42% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Dual Patch antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

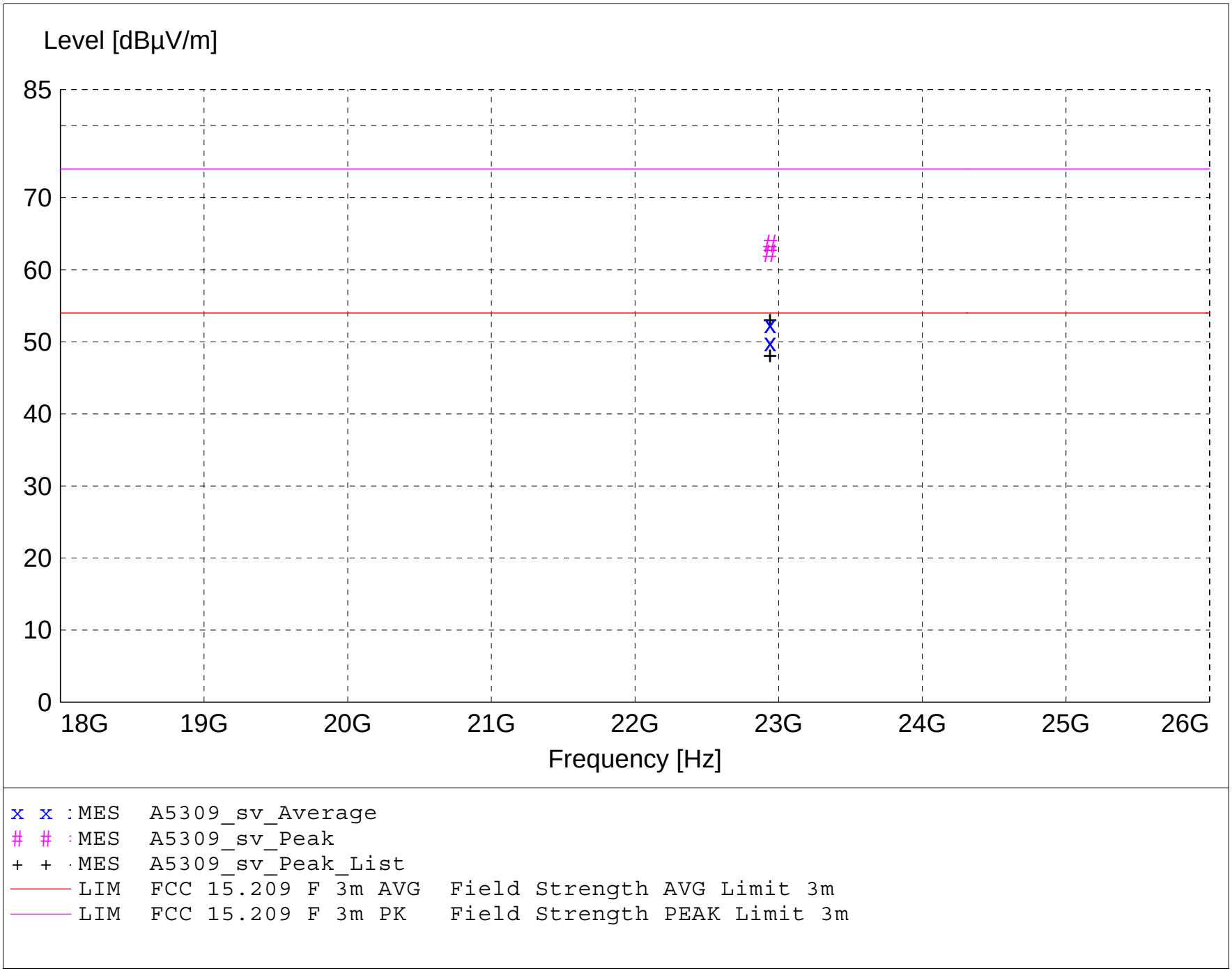
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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



x x : MES A5309_sv_Average
: MES A5309_sv_Peak
+ + : MES A5309_sv_Peak_List
——— LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5309_sv_Final"

5/30/2012 4:30PM

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		
22940.590000	48.80	46.36	-42.8	52.4	54.0	1.6	1.50	170	AVERAGE	Low ch; 2-lvl
22940.730000	46.32	46.36	-42.8	49.9	54.0	4.1	1.50	170	AVERAGE	Low ch; 4-lvl
22940.730000	60.11	46.36	-42.8	63.7	74.0	10.3	1.50	170	MAX PEAK	Low ch; 4-lvl
22940.590000	58.73	46.36	-42.8	62.3	74.0	11.7	1.50	170	MAX PEAK	Low ch; 2-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 44% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Omni antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

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)

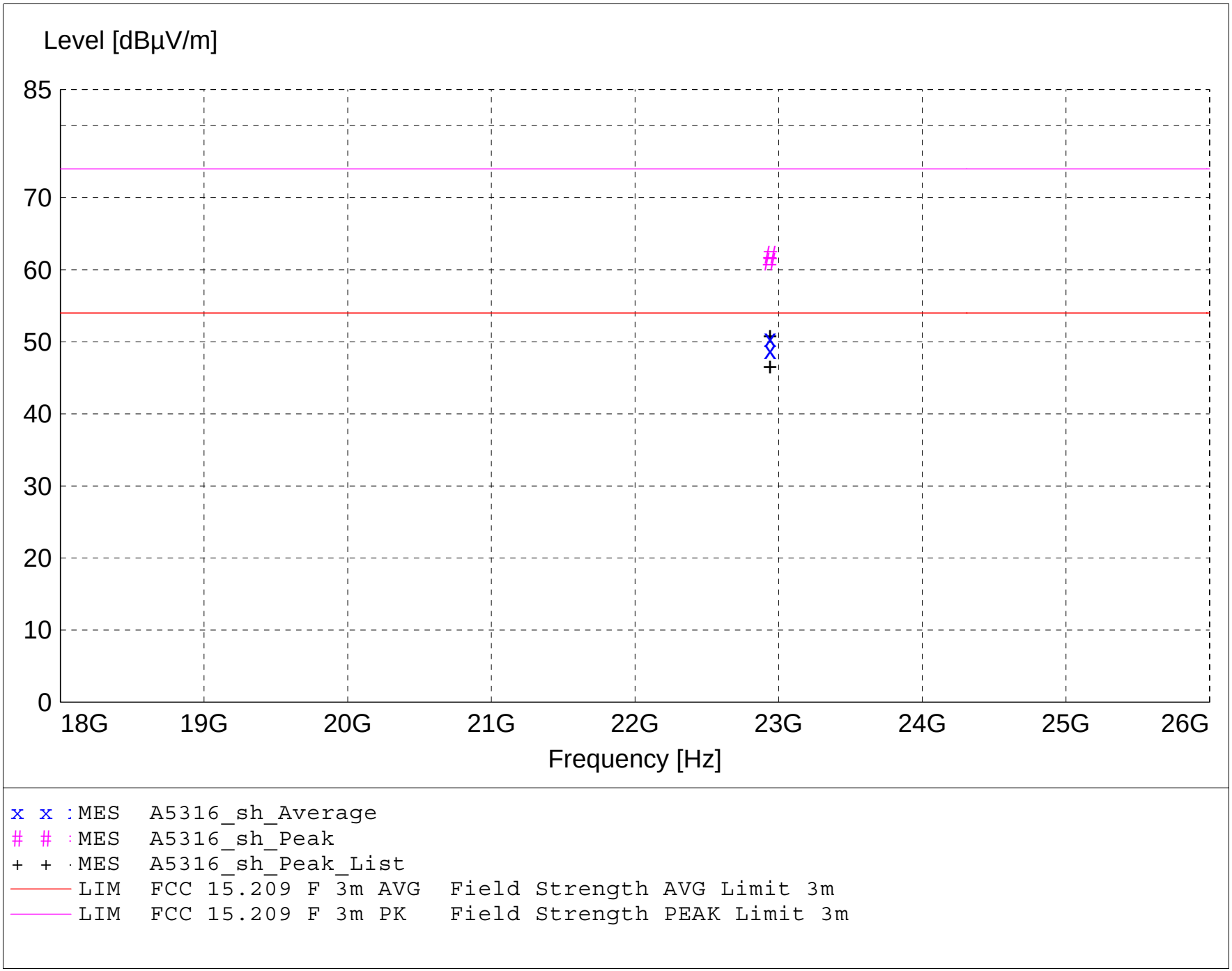
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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]
85
70
60
50
40
30
20
10
0
18G
19G
20G
21G
22G
23G
24G
25G
26G
Frequency [Hz]
x x :MES A5316_sh_Average
:MES A5316_sh_Peak
+ + :MES A5316_sh_Peak_List
LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5316_sh_Final"

5/31/2012 2:57PM

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		
22940.570000	47.06	46.18	-42.8	50.5	54.0	3.5	1.20	170	AVERAGE	Low ch; 2-lvl
22940.760000	45.41	46.18	-42.8	48.8	54.0	5.2	1.20	170	AVERAGE	Low ch; 4-lvl
22940.760000	58.74	46.18	-42.8	62.1	74.0	11.9	1.20	170	MAX PEAK	Low ch; 4-lvl
22940.570000	57.70	46.18	-42.8	61.1	74.0	12.9	1.20	170	MAX PEAK	Low ch; 2-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 68 deg. F; 44% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Spurious Emissions
Comment: FSK - Omni antenna; Continuous Transmit; Low, Mid, and High channels
Date: 05-30-2012

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

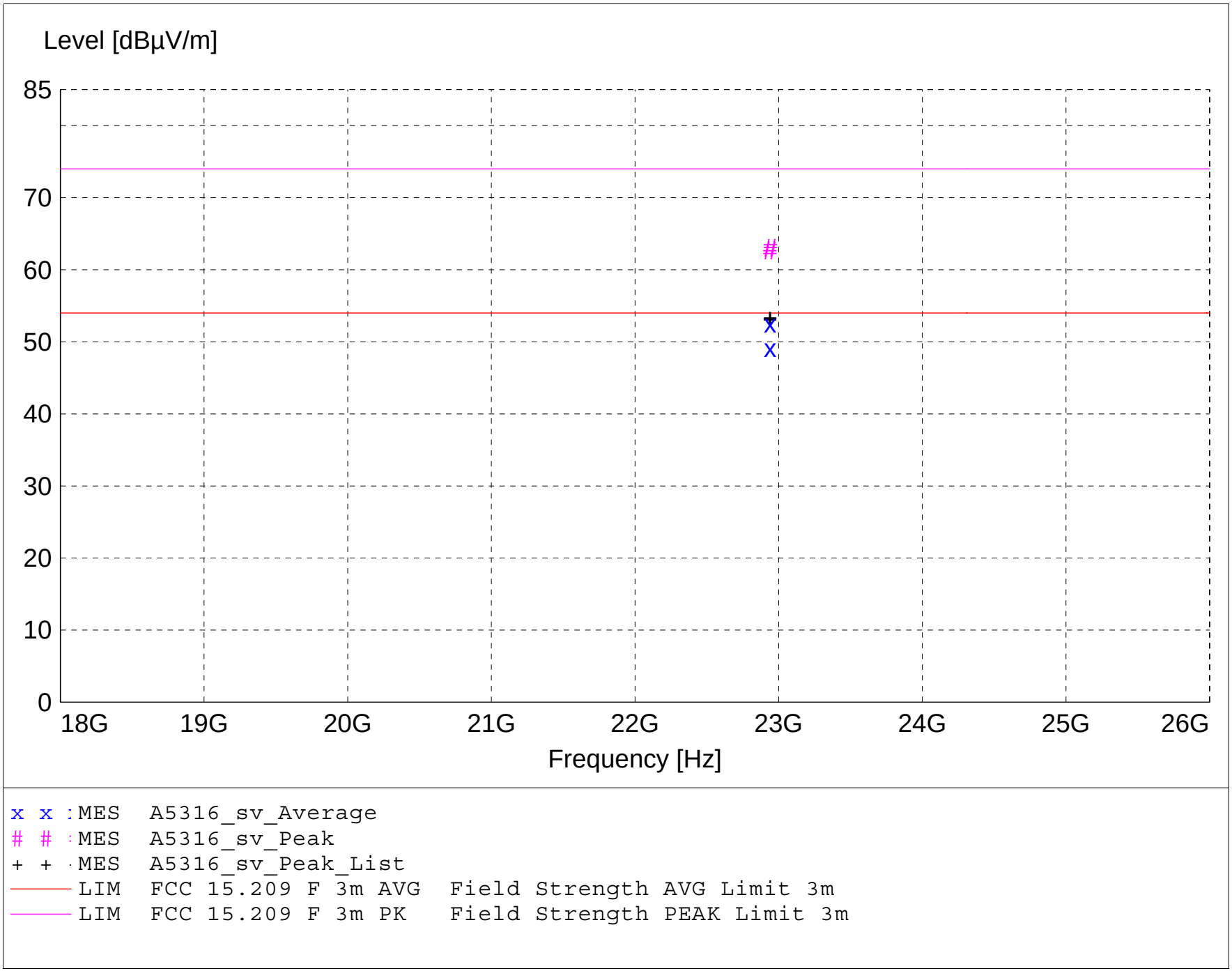
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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 A5316_sv_Average
:MES A5316_sv_Peak
+ + :MES A5316_sv_Peak_List
LIM FCC 15.209 F 3m AVG Field Strength AVG Limit 3m
LIM FCC 15.209 F 3m PK Field Strength PEAK Limit 3m

MEASUREMENT RESULT: "A5316_sv_Final"

5/31/2012 2:41PM

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		
22940.700000	49.13	46.18	-42.8	52.5	54.0	1.5	1.40	170	AVERAGE	Low ch; 2-lvl
22940.730000	45.78	46.18	-42.8	49.2	54.0	4.8	1.40	170	AVERAGE	Low ch; 4-lvl
22940.700000	59.69	46.18	-42.8	63.1	74.0	10.9	1.40	170	MAX PEAK	Low ch; 2-lvl
22940.730000	59.28	46.18	-42.8	62.7	74.0	11.3	1.40	170	MAX PEAK	Low ch; 4-lvl

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 70 deg. F; 47% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Continuous transmit; Power setting 19; Both channel A and B turned ON
Comment: OFDM 10 & 20 MHz channel bandwidths; FSK (with dual patch & omni antennas); Low, Mid, and High channels
Date: 05-29-2012

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)

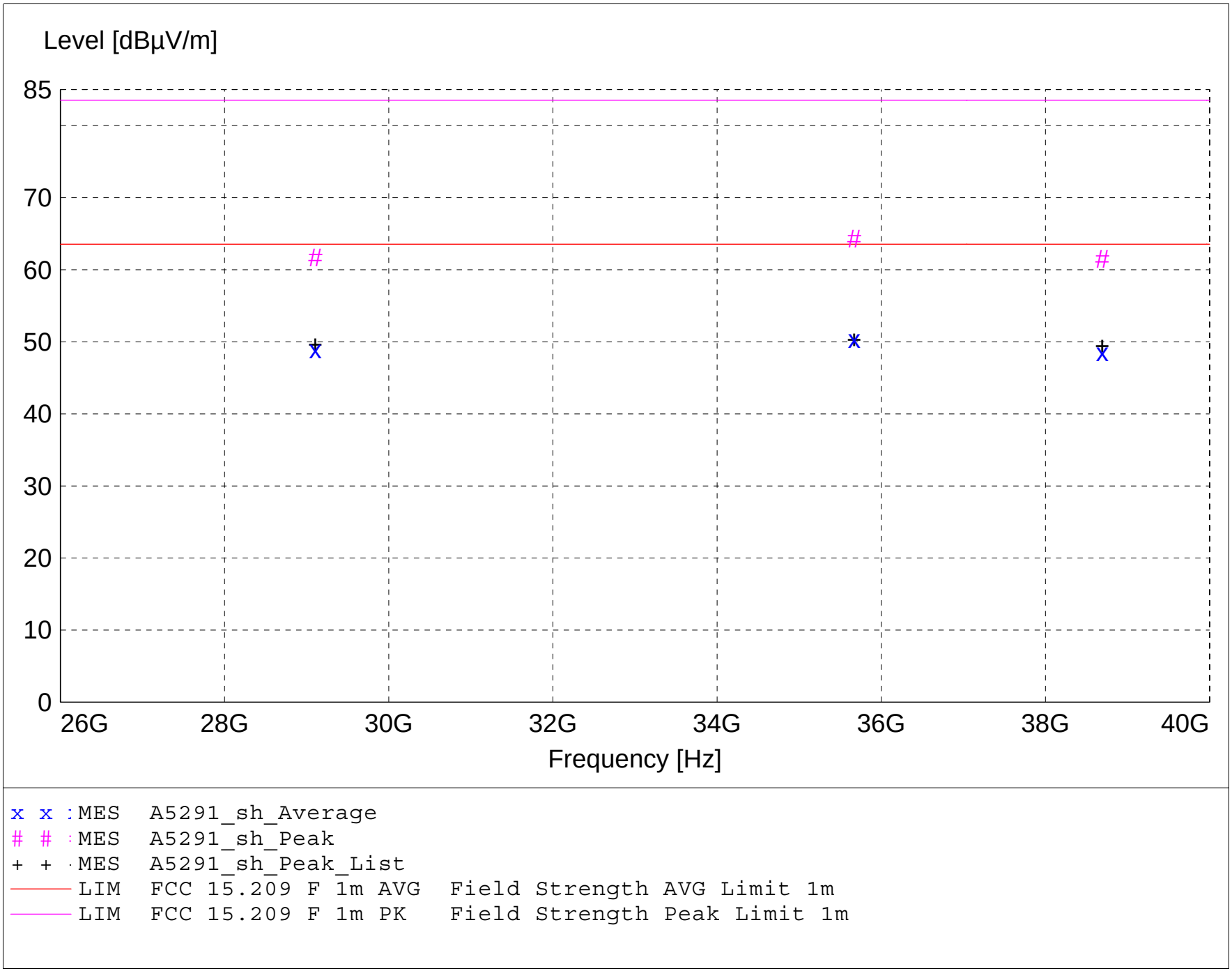
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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
26G
28G
30G
32G
34G
36G
38G
40G
Frequency [Hz]
x x : MES A5291_sh_Average
: MES A5291_sh_Peak
+ + : MES A5291_sh_Peak_List
LIM FCC 15.209 F 1m AVG Field Strength AVG Limit 1m
LIM FCC 15.209 F 1m PK Field Strength Peak Limit 1m

MEASUREMENT RESULT: "A5291_sh_Final"

5/29/2012 8:42AM

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		
35671.200000	48.57	48.46	-46.6	50.4	63.5	13.1	1.30	225	AVERAGE	noise floor
29106.600000	50.73	46.64	-48.4	48.9	63.5	14.6	1.30	180	AVERAGE	noise floor
38693.600000	49.24	45.35	-46.0	48.6	63.5	15.0	1.30	180	AVERAGE	noise floor
35671.200000	62.45	48.46	-46.6	64.3	83.5	19.2	1.30	225	MAX PEAK	noise floor
29106.600000	63.52	46.64	-48.4	61.7	83.5	21.8	1.30	180	MAX PEAK	noise floor
38693.600000	62.18	45.35	-46.0	61.5	83.5	22.0	1.30	180	MAX PEAK	noise floor

FCC Part 15.205/15.209 Spurious Emissions in Restricted Bands

Electric Field Strength

EUT: PMP450AP 5.7 GHz MIMO/COMBO
Manufacturer: Cambium Networks
Operating Condition: 70 deg. F; 47% R.H.
Test Site: DLS O.F. Site 2
Operator: Craig B
Test Specification: Continuous transmit; Power setting 19; Both channel A and B turned ON
Comment: OFDM 10 & 20 MHz channel bandwidths; FSK (with dual patch & omni antennas); Low, Mid, and High channels
Date: 05-29-2012

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)

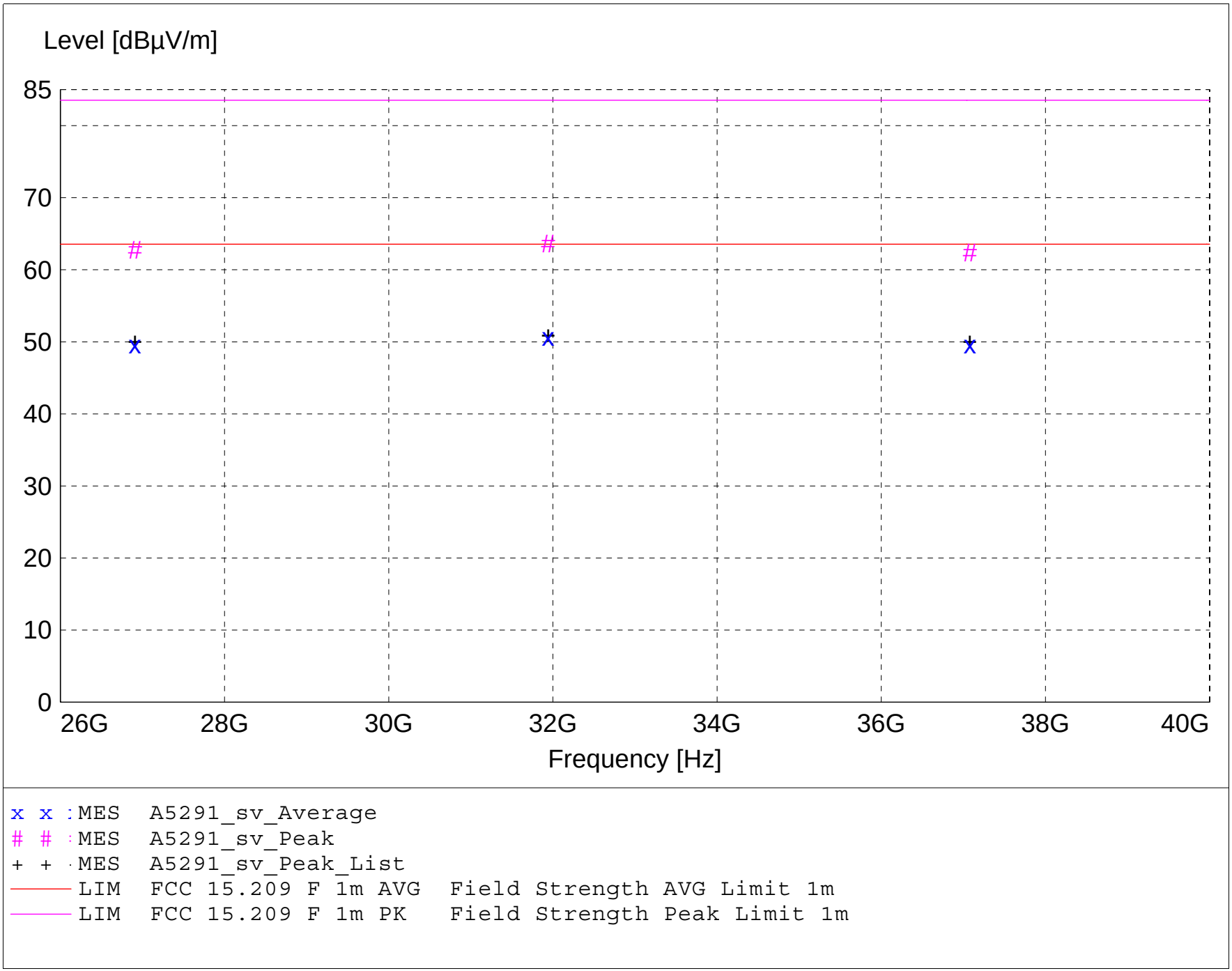
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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



x x : MES A5291_sv_Average
: MES A5291_sv_Peak
+ + : MES A5291_sv_Peak_List
——— LIM FCC 15.209 F 1m AVG Field Strength AVG Limit 1m
——— LIM FCC 15.209 F 1m PK Field Strength Peak Limit 1m

MEASUREMENT RESULT: "A5291_sv_Final"

5/29/2012 9:19AM

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		
31941.400000	51.56	48.04	-49.0	50.6	63.5	12.9	1.30	200	AVERAGE	noise floor
37081.200000	50.07	45.94	-46.4	49.6	63.5	13.9	1.30	225	AVERAGE	noise floor
26909.800000	52.09	46.30	-48.8	49.6	63.5	14.0	1.30	315	AVERAGE	noise floor
31941.400000	64.58	48.04	-49.0	63.7	83.5	19.9	1.30	200	MAX PEAK	noise floor
26909.800000	65.24	46.30	-48.8	62.7	83.5	20.8	1.30	315	MAX PEAK	noise floor
37081.200000	62.85	45.94	-46.4	62.4	83.5	21.1	1.30	225	MAX PEAK	noise floor

166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A7.0 Maximum Unwanted Emission Levels – Conducted Band-Edge

Rule Section: Section 15.247(d)
RSSS-210 A8.5

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 5.4.1.1 – Reference Level
Section 5.4.1.2 – Unwanted Emissions

Description: RBW = 100 kHz
VBW ≥ 300 kHz
Span = 5-30% greater than the EBW – (Reference Level)
Span = spectrum to be examined – (Unwanted Emissions)
Detector = peak
Sweep = auto couple
Trace mode = max hold

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.

Limit: 30 dB below maximum in-band average PSD level (maximum level in any 100 kHz band). Average output power procedure was used to measure the fundamental emission power.

Results: Passed

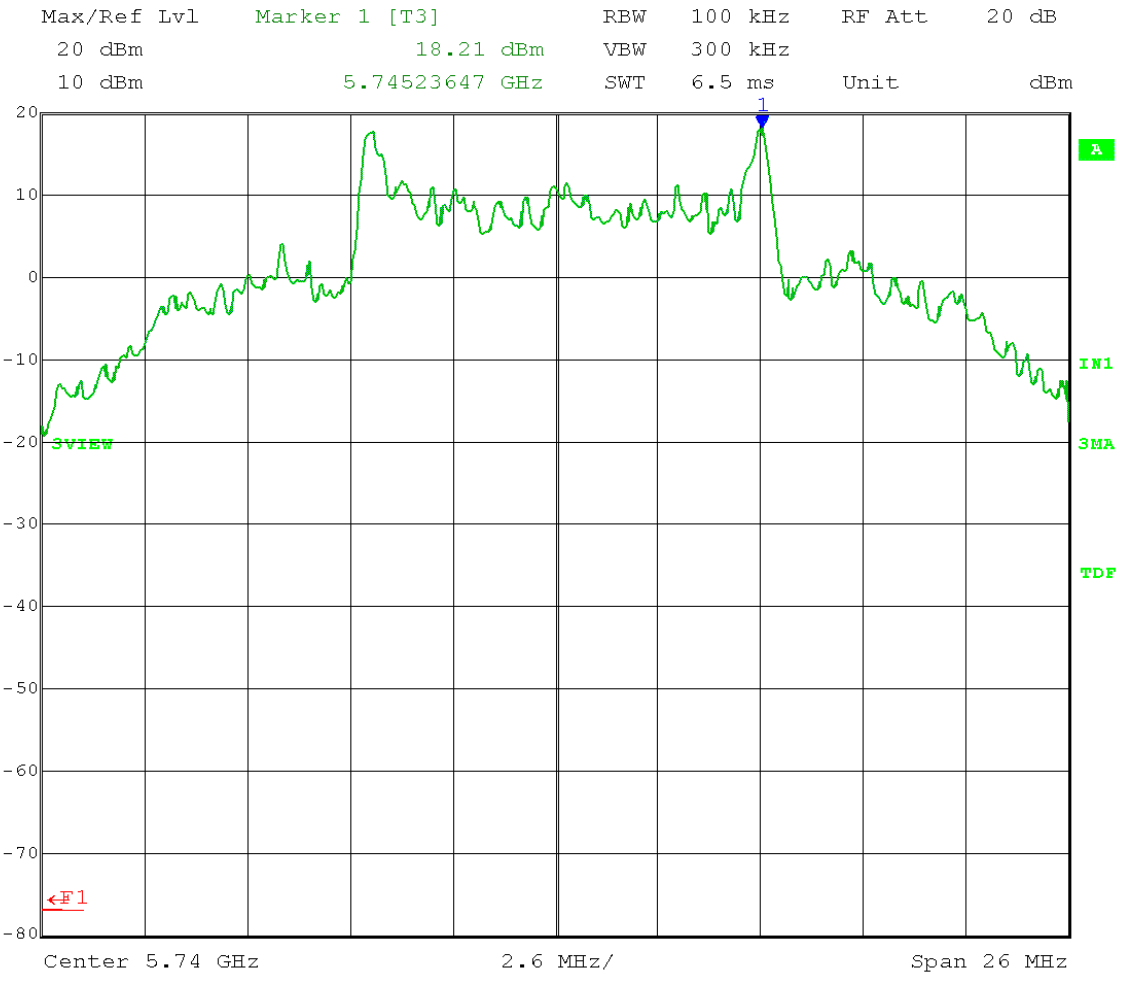
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:25:01

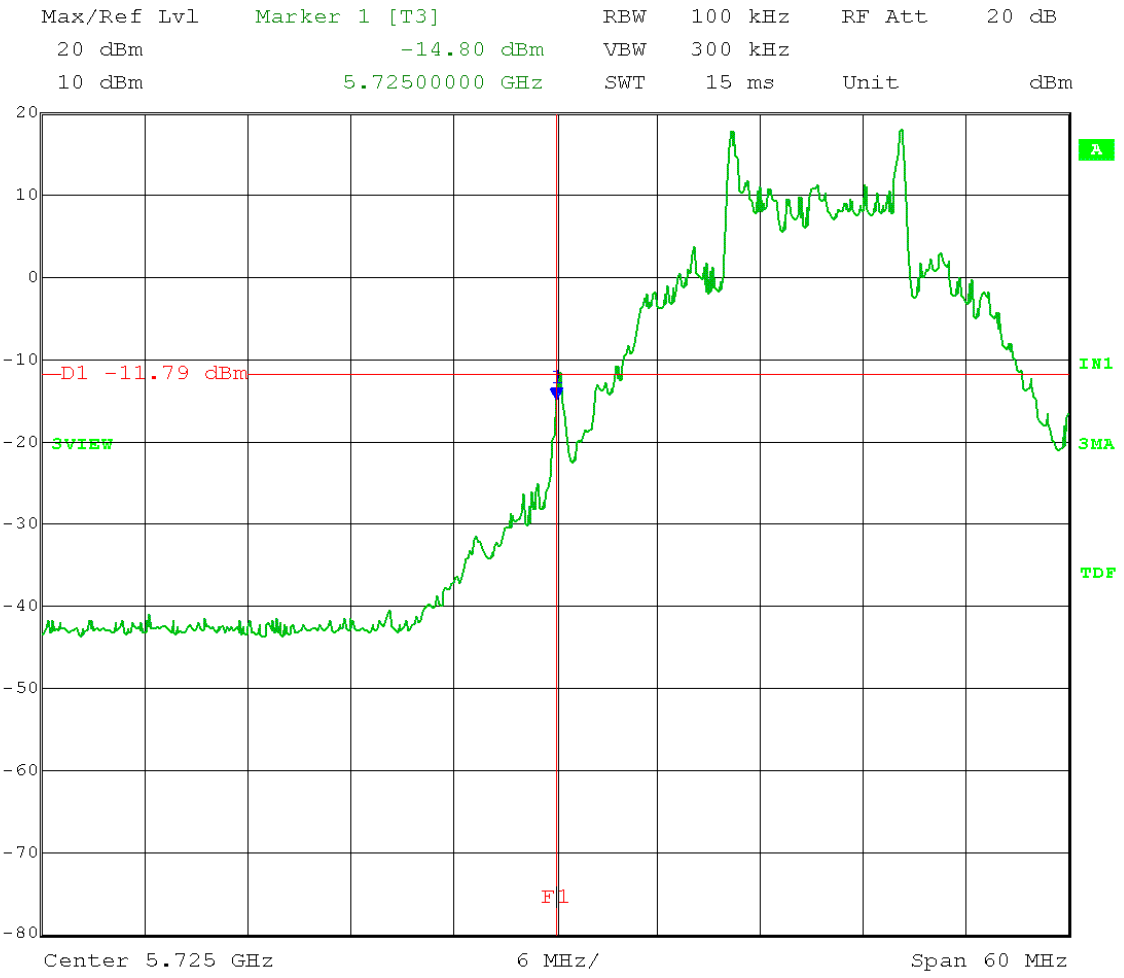
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 2-level FSK

Band-edge frequency: 5.725 GHz
Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 18.21 dBm – 30 dB = -11.79 dBm



Date: 23.MAY.2012 11:28:59

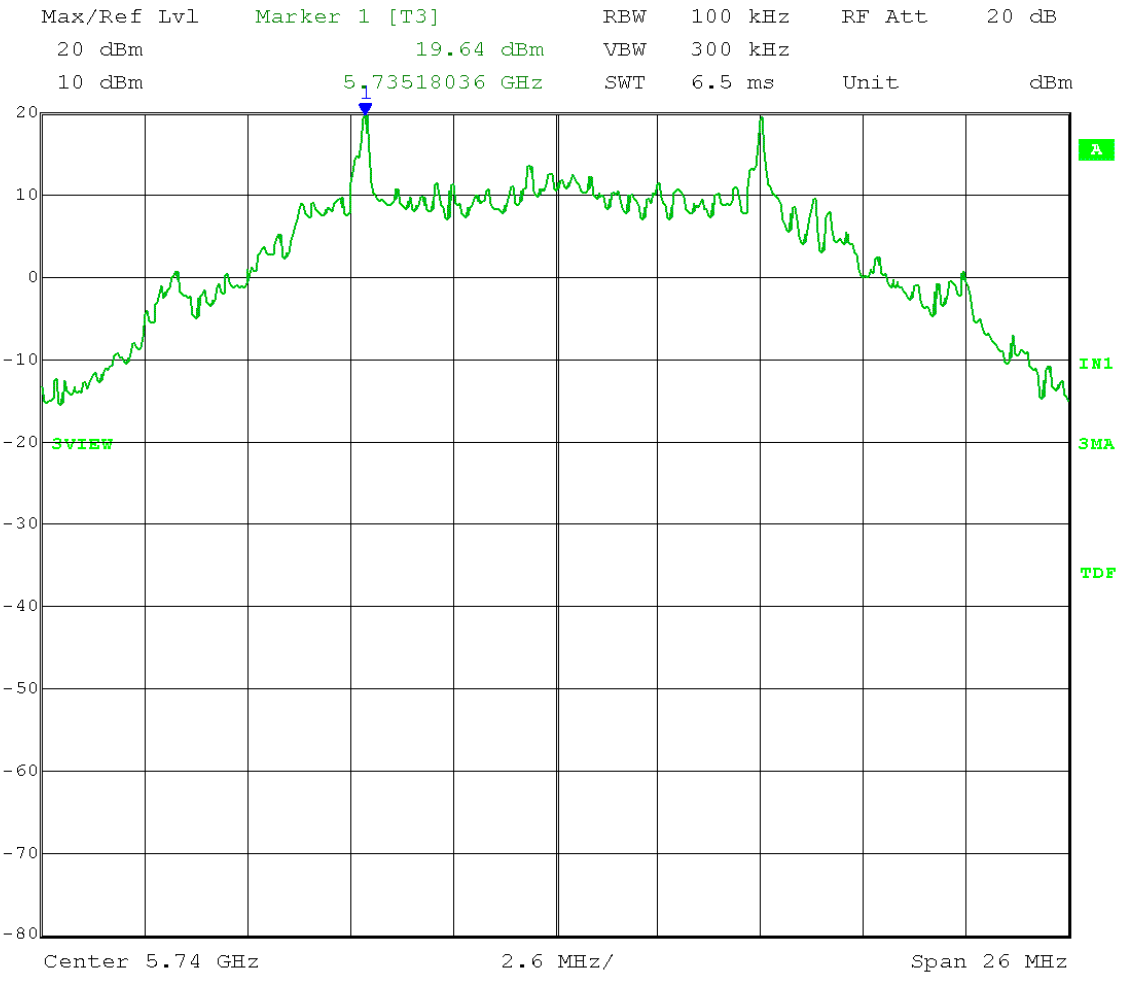
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 11:57:51

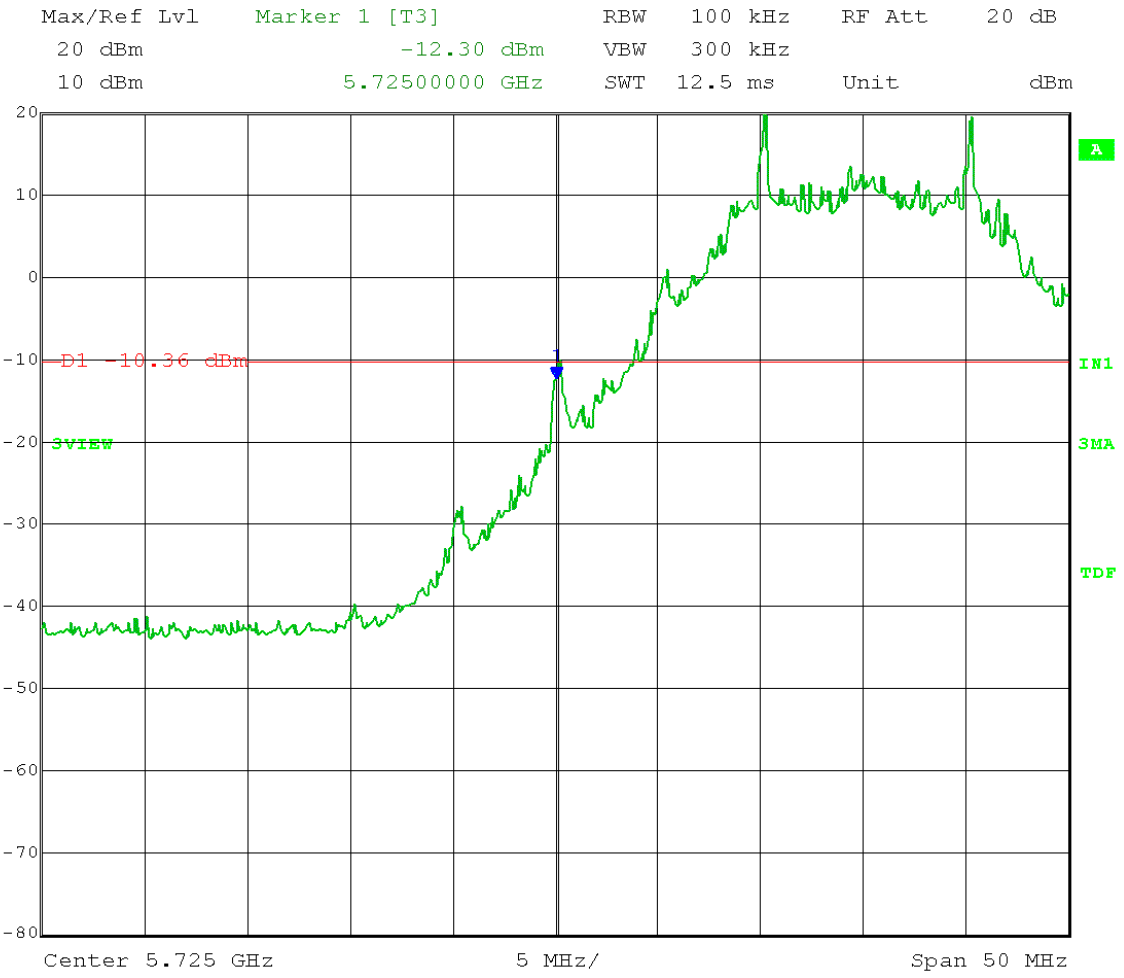
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; Low Channel Frequency: 5.740 GHz
Modulation Type: 4-level FSK

Band-edge frequency: 5.725 GHz
Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 19.64 dBm – 30 dB = -10.36 dBm



Date: 23.MAY.2012 12:00:53

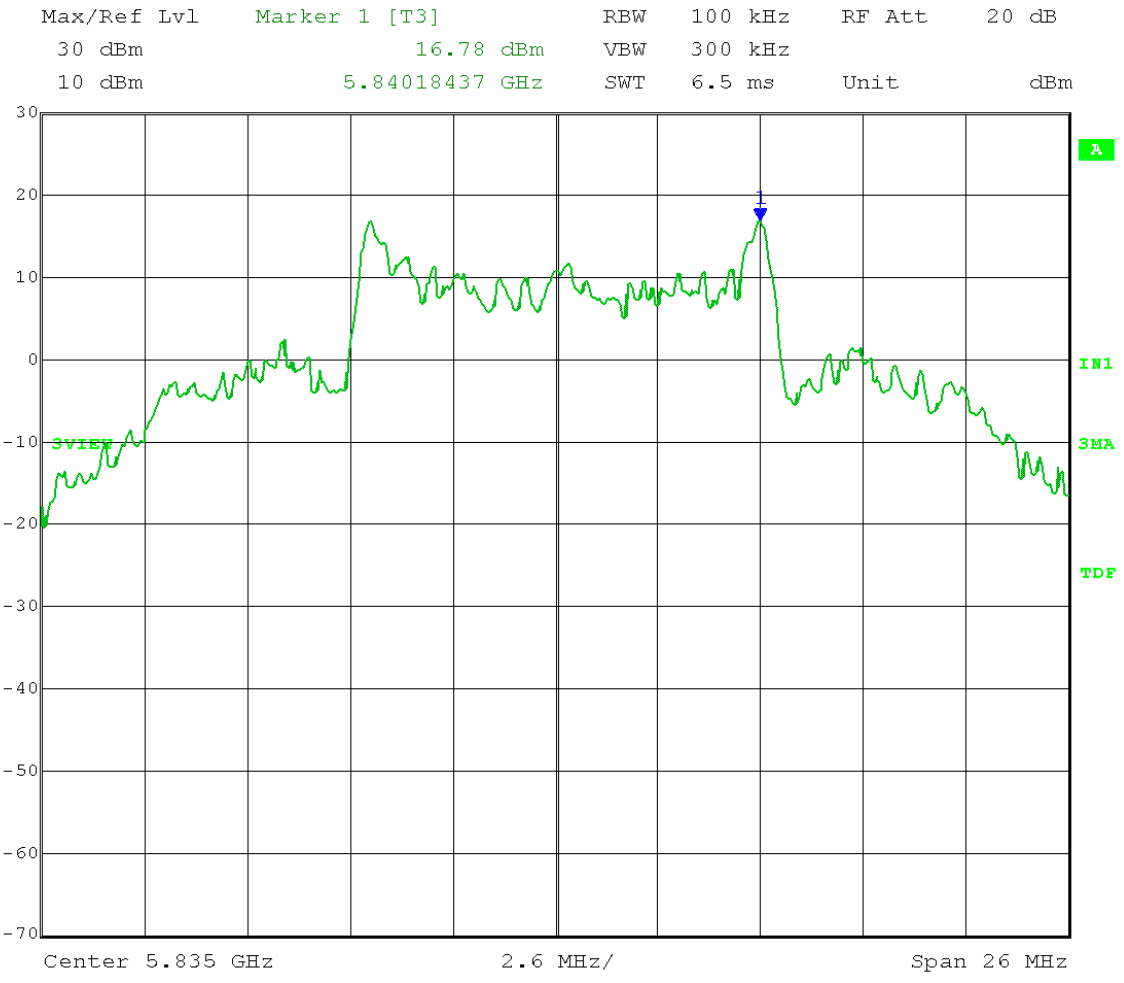
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:04:39

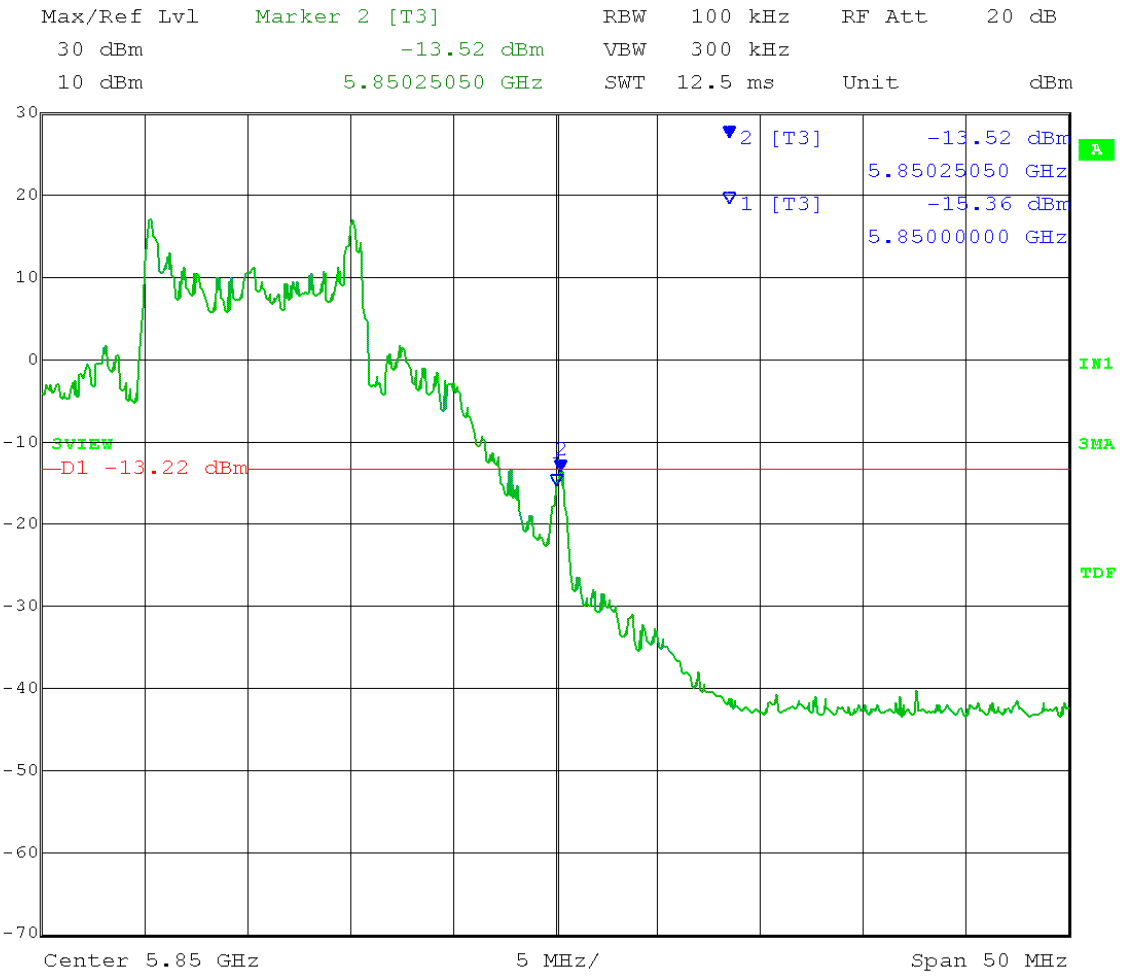
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; High Channel Frequency: 5.835 GHz
Reg 7000103C set to 81400000 Modulation Type: 2-level FSK

Band-edge frequency: 5.850 GHz
Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 16.78 dBm – 30 dB = -13.22 dBm



Date: 23.MAY.2012 15:07:39

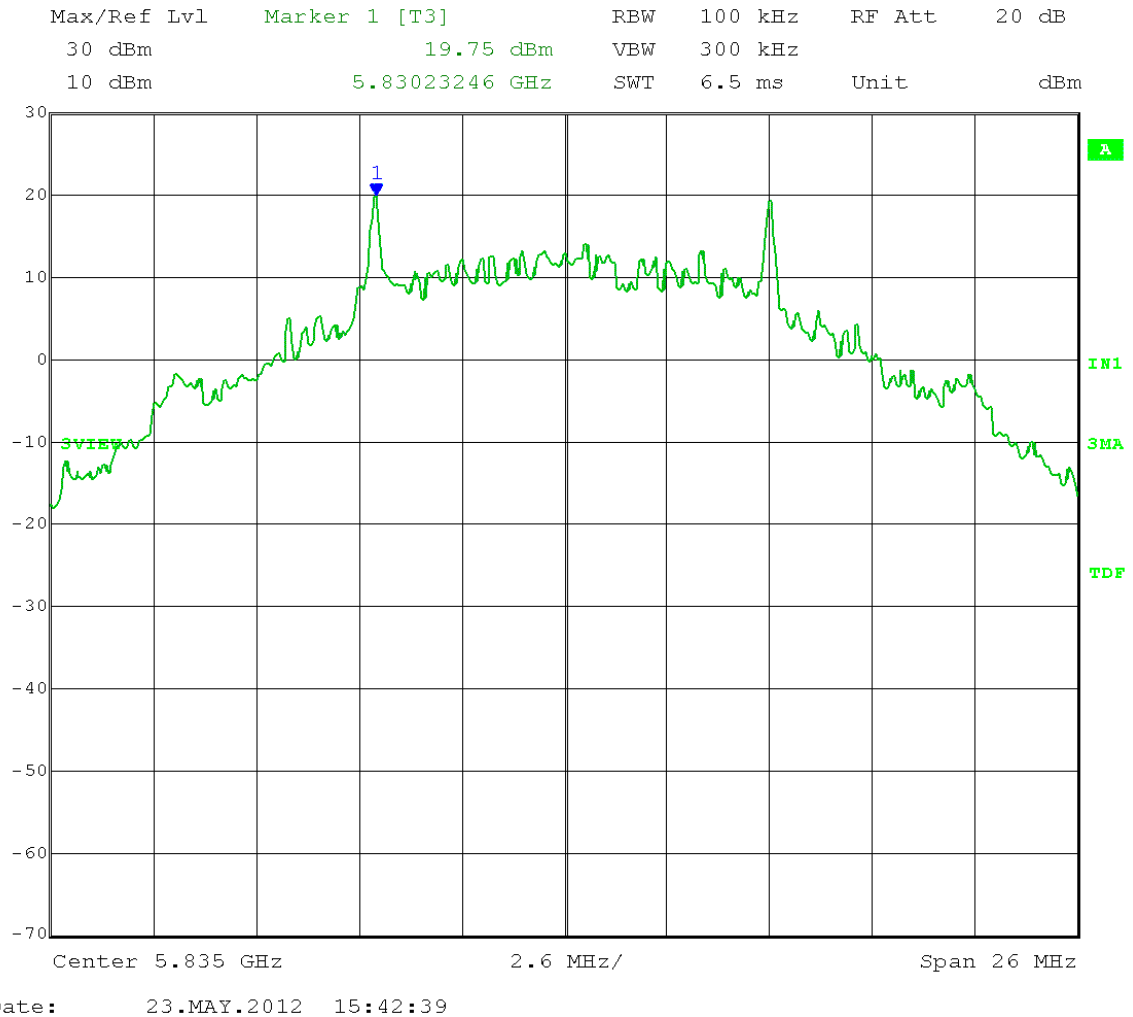
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.1 – **Reference Level**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = 5-30% greater than EBW; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 15:42:39

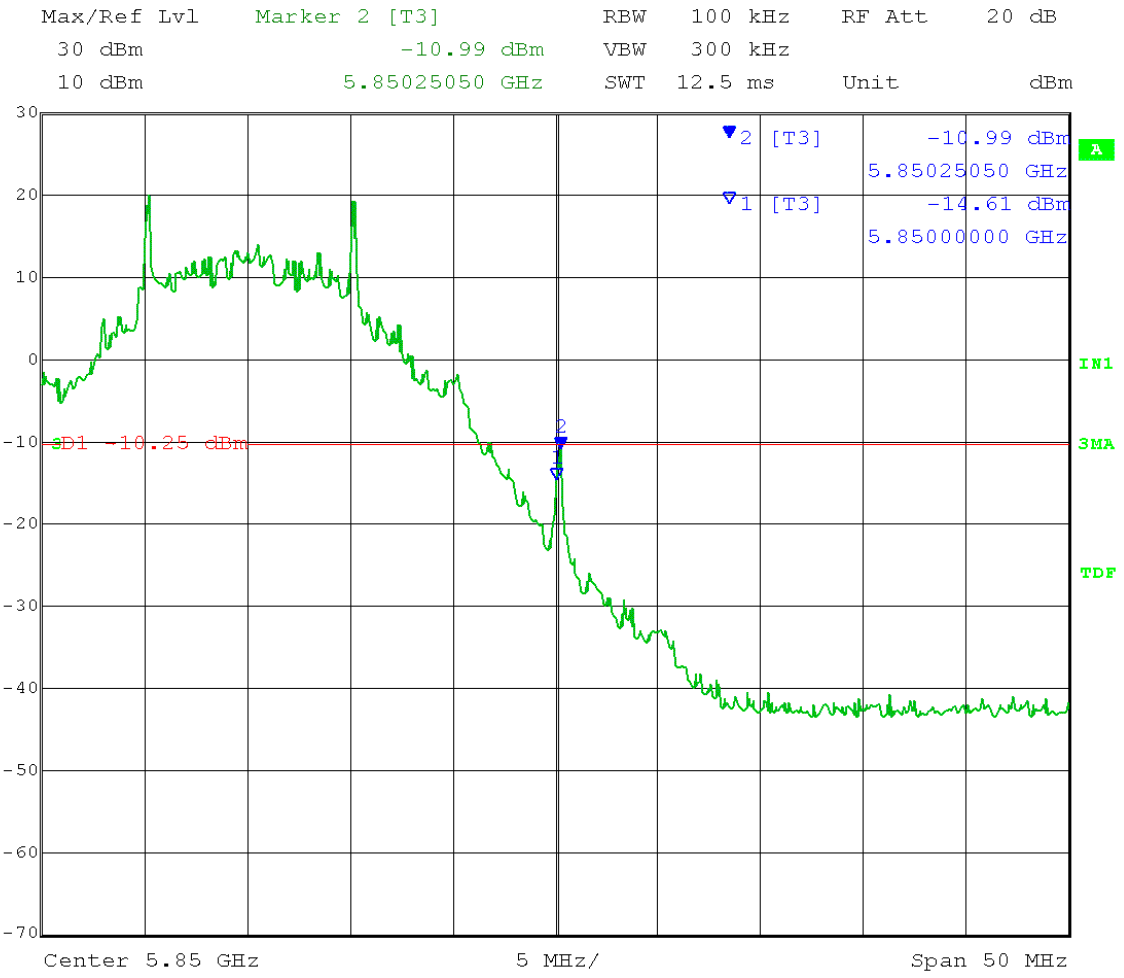
Test Date: 05-23-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Maximum Unwanted Emission Levels – Conducted Band-Edge
Procedure: FCC KDB 558074 D01 DTS Meas Guidance v01
Section 5.4.1.2 – **Unwanted Emissions**
Operator: Craig B

RBW = 100 kHz; VBW ≥ 300 kHz
Span = spectrum to be examined; Detector = peak;
Sweep = auto couple; Trace mode = max hold

EUT nominal channel bandwidth: 20 MHz
Output power setting E4; High Channel Frequency: 5.835 GHz
Modulation Type: 4-level FSK

Band-edge frequency: 5.850 GHz
Limit: [15.247(b)(3)]: 30 dB below maximum in-band average PSD level (Average output power procedure was used to measure the fundamental emission power)

Limit = 19.75 dBm – 30 dB = -10.25 dBm



Date: 23.MAY.2012 15:47:10

166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A8.0 Duty Cycle of Test Unit

Rule Part: FCC Section 15.35(c)
RSS-Gen 7.2.3

Test Procedure: ANSI C63.10-2009 Section 7.5

Limits: Informative

Results: EUT is continuously transmitting (duty cycle ≥ 98%).

Sample Equations: None

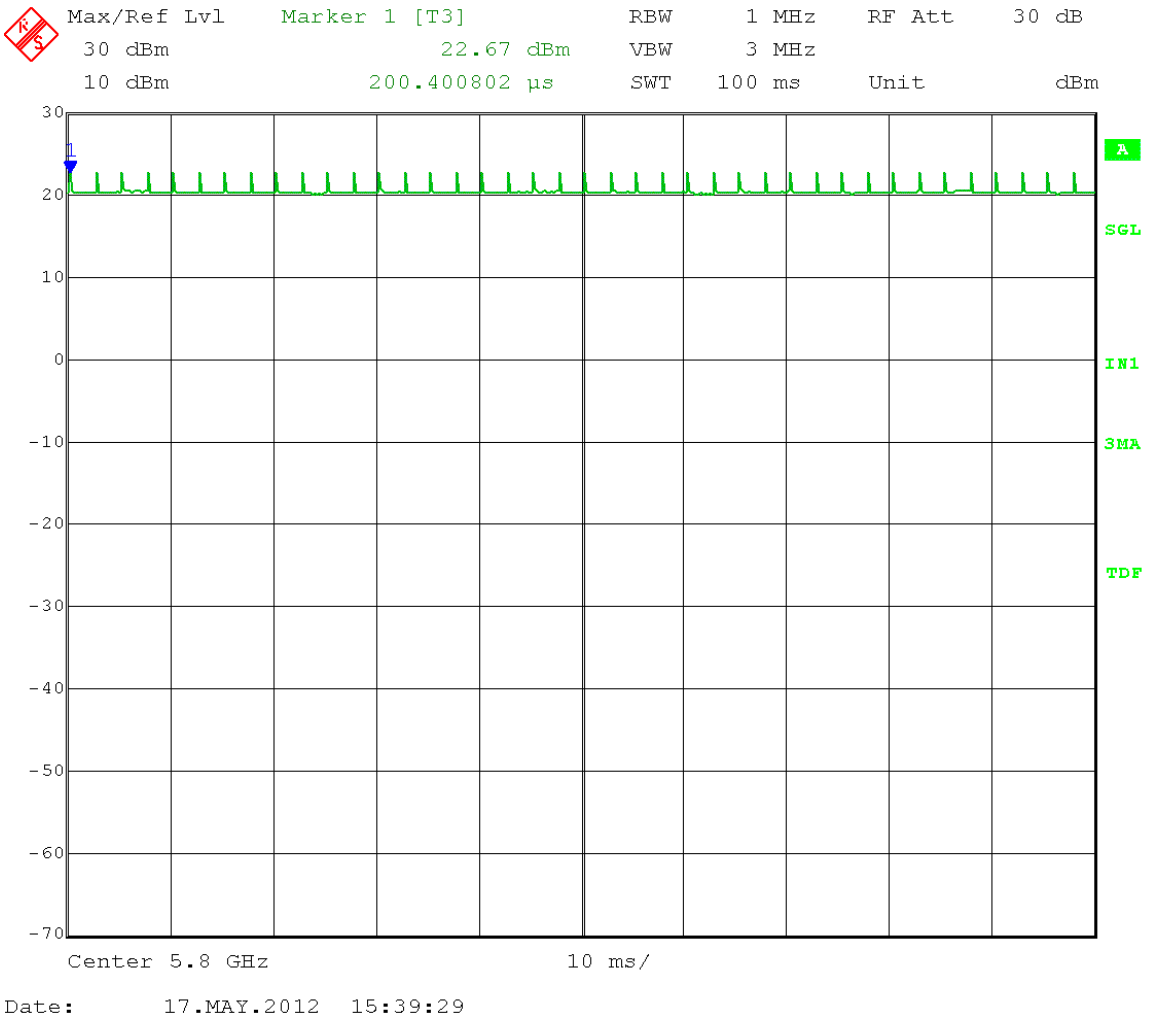
Notes: No duty cycle correction factor was applied to measurements for this device.

The EUT was transmitting at a minimum duty cycle of 98%.

Test Date: 05-17-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Duty Cycle – duty cycle used during testing (special test software)
Operator: Craig B

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 2-level FSK

Continuous transmit; 100 ms sweep:

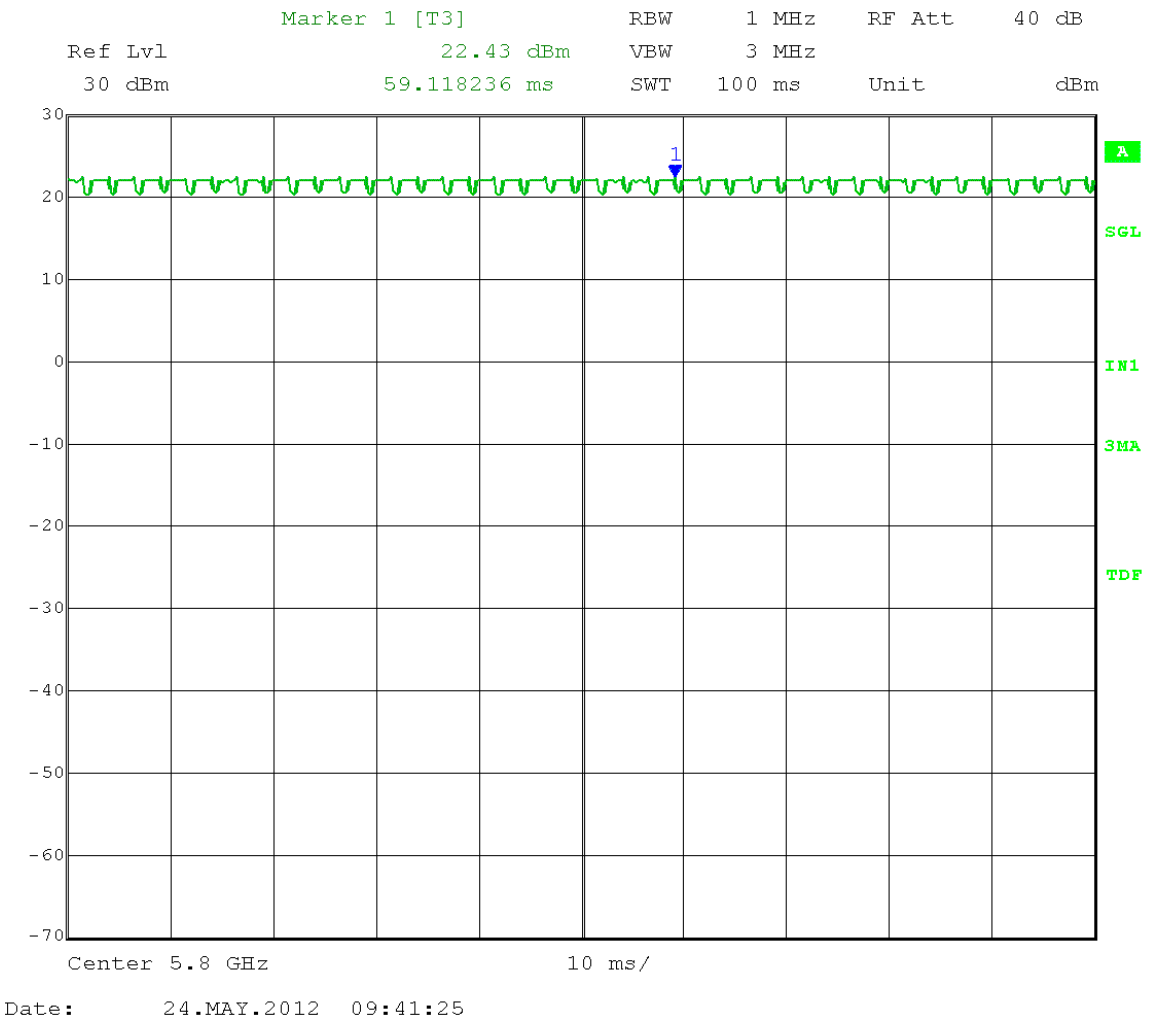


Date: 17.MAY.2012 15:39:29

Test Date: 05-24-2012
Company: Cambium Networks
EUT: PMP450AP 5.7 GHz MIMO/COMBO SN:0A003EA00154
Test: Duty Cycle – duty cycle used during testing (special test software)
Operator: Craig B

EUT nominal channel bandwidth: 20 MHz
Output power setting: E8; Middle Channel Frequency: 5.800 GHz
Modulation Type: 4-level FSK

Continuous transmit; 100 ms sweep:



Date: 24.MAY.2012 09:41:25

166 South Carter, Genoa City, WI 53128

Appendix A – Measurement Data

A9.0 AC Line Conducted Emissions

Rule Part: FCC Part 15.207
RSS-Gen 7.2.4

Test Procedure: ANSI C63.10-2009
Section 6.2

Limit: FCC Part 15.207(a)
Canada: RSS-Gen 7.2.4 Table 4

Results: Compliant

Notes: This was an AC Conducted emissions measurement.
The EUT was powered from a representative AC Adapter with an input of 120 VAC 60 Hz.

FCC Part 15.207

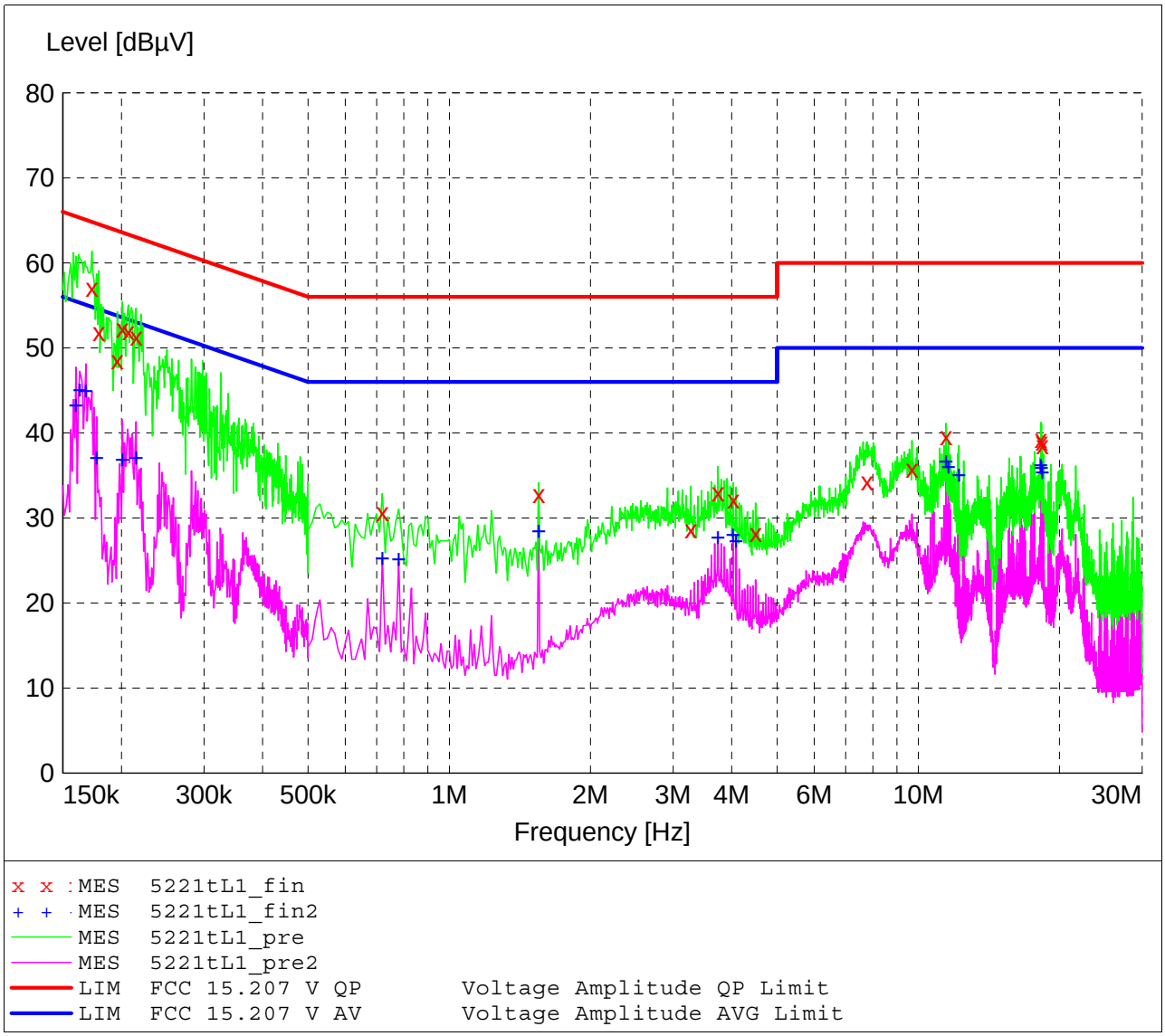
Voltage Mains Test

```
EUT:                  PMP450AP 5.7 GHz MIMO/COMBO   SN:0A003EA00154
Manufacturer:         Cambium Networks
Operating Condition:  70 deg. F,  36%  R.H.
Test Site:            DLS O.F. Screen Room
Operator:             Craig B
Test Specification:   120 V  60 Hz;  Power supply: Phihong Model PSA15A-295(MOT)
Comment:              Continuous transmit;  Line 1
                      Date:  05-22-2012
```

SCAN TABLE: "Line Cond SR Final"

Short Description: Line Conducted Emissions

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak CISPR AV	2.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "5221tL1_fin"

5/22/2012 3:06PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.173000	57.10	13.0	65	7.7	QP
0.179000	51.90	12.9	65	12.6	QP
0.196000	48.60	12.7	64	15.2	QP
0.201000	52.30	12.6	64	11.3	QP
0.207000	52.00	12.6	63	11.3	QP
0.215000	51.30	12.5	63	11.7	QP
0.720000	30.70	10.9	56	25.3	QP
1.550000	32.80	10.5	56	23.2	QP
3.270000	28.70	10.7	56	27.3	QP
3.740000	33.00	10.7	56	23.0	QP
4.030000	32.20	10.7	56	23.8	QP
4.500000	28.20	10.7	56	27.8	QP
7.775000	34.30	10.8	60	25.7	QP
9.695000	35.80	10.9	60	24.2	QP
11.465000	39.60	11.0	60	20.4	QP
18.245000	39.30	11.3	60	20.7	QP
18.305000	39.00	11.3	60	21.0	QP
18.365000	38.60	11.3	60	21.4	QP

MEASUREMENT RESULT: "5221tL1_fin2"

5/22/2012 3:06PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.160000	43.20	13.4	56	12.3	CAV
0.163000	45.10	13.3	55	10.2	CAV
0.168000	44.90	13.1	55	10.2	CAV
0.177000	37.10	13.0	55	17.5	CAV
0.201000	36.80	12.6	54	16.8	CAV
0.215000	37.10	12.5	53	15.9	CAV
0.720000	25.30	10.9	46	20.7	CAV
0.780000	25.10	10.9	46	20.9	CAV
1.550000	28.50	10.5	46	17.5	CAV
3.740000	27.70	10.7	46	18.3	CAV
4.030000	28.00	10.7	46	18.0	CAV
4.090000	27.30	10.7	46	18.7	CAV
11.465000	36.60	11.0	50	13.4	CAV
11.585000	36.00	11.0	50	14.0	CAV
12.200000	35.00	11.0	50	15.0	CAV
18.245000	36.20	11.3	50	13.8	CAV
18.305000	35.90	11.3	50	14.1	CAV
18.365000	35.40	11.3	50	14.6	CAV

FCC Part 15.207

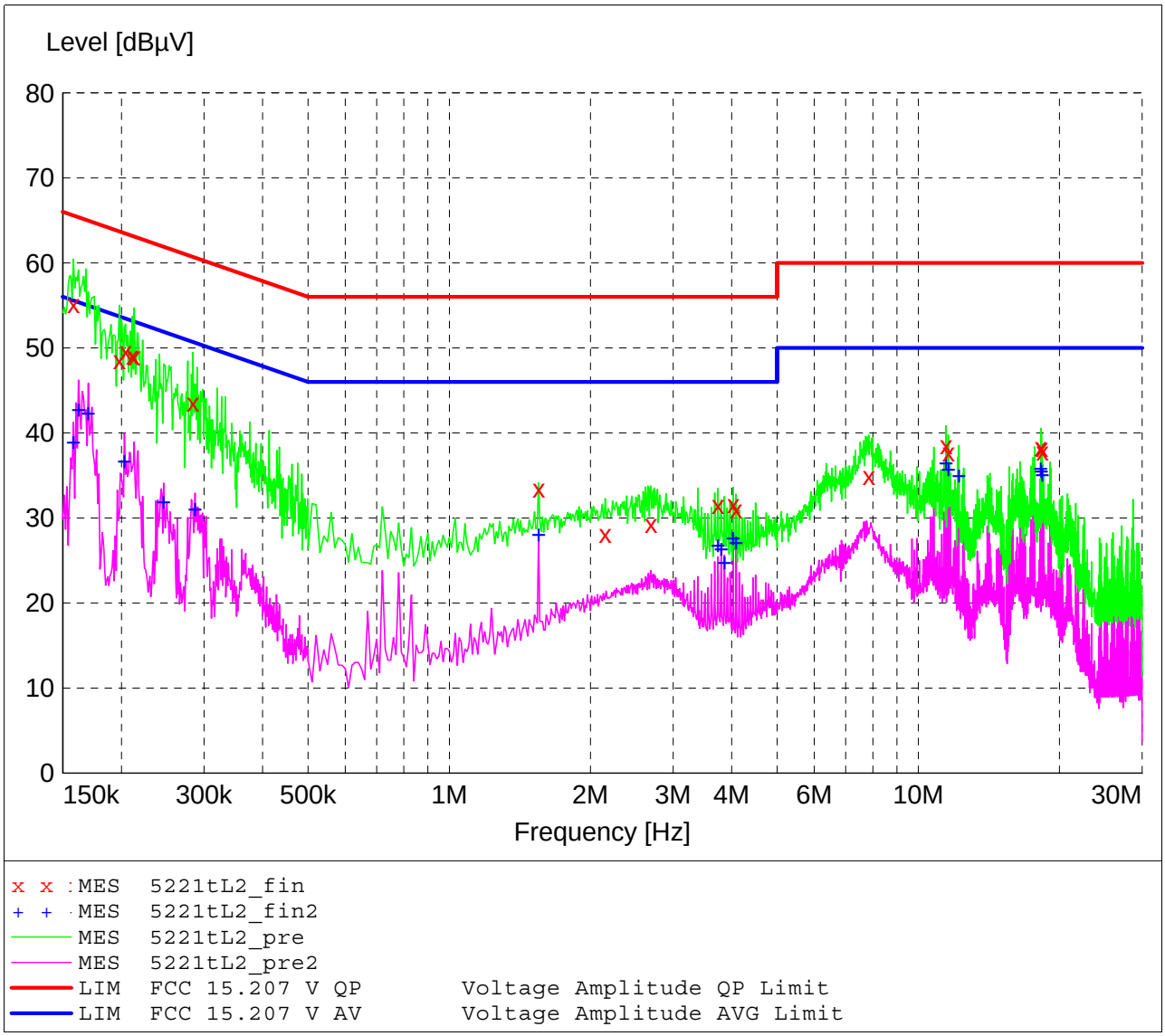
Voltage Mains Test

```
EUT:                  PMP450AP 5.7 GHz MIMO/COMBO   SN:0A003EA00154
Manufacturer:         Cambium Networks
Operating Condition:  70 deg. F,  36%  R.H.
Test Site:            DLS O.F. Screen Room
Operator:             Craig B
Test Specification:   120 V  60 Hz;  Power supply: Phihong Model PSA15A-295(MOT)
Comment:              Continuous transmit;  Line 2
                      Date:  05-22-2012
```

SCAN TABLE: "Line Cond SR Final"

Short Description: Line Conducted Emissions

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	4.0 kHz	QuasiPeak CISPR AV	2.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "5221tL2_fin"

5/22/2012 3:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.158000	55.20	13.4	66	10.4	QP
0.198000	48.60	12.7	64	15.1	QP
0.204000	49.60	12.6	63	13.8	QP
0.211000	49.10	12.5	63	14.1	QP
0.213000	49.00	12.5	63	14.1	QP
0.284000	43.60	11.9	61	17.1	QP
1.550000	33.50	10.5	56	22.5	QP
2.150000	28.10	10.7	56	27.9	QP
2.690000	29.30	10.6	56	26.7	QP
3.740000	31.50	10.7	56	24.5	QP
4.030000	31.60	10.7	56	24.4	QP
4.090000	31.00	10.7	56	25.0	QP
7.835000	34.90	10.8	60	25.1	QP
11.465000	38.60	11.0	60	21.4	QP
11.585000	37.70	11.0	60	22.3	QP
18.245000	38.40	11.3	60	21.6	QP
18.305000	38.20	11.3	60	21.8	QP
18.365000	37.80	11.3	60	22.2	QP

MEASUREMENT RESULT: "5221tL2_fin2"

5/22/2012 3:17PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.158000	38.90	13.4	56	16.7	CAV
0.162000	42.70	13.3	55	12.7	CAV
0.170000	42.30	13.1	55	12.7	CAV
0.203000	36.60	12.6	54	16.9	CAV
0.246000	31.90	12.1	52	20.0	CAV
0.287000	31.00	11.9	51	19.6	CAV
1.550000	28.00	10.5	46	18.0	CAV
3.740000	26.80	10.7	46	19.2	CAV
3.800000	26.30	10.7	46	19.7	CAV
3.860000	24.70	10.7	46	21.3	CAV
4.030000	27.60	10.7	46	18.4	CAV
4.090000	27.10	10.7	46	18.9	CAV
11.465000	36.40	11.0	50	13.6	CAV
11.585000	35.70	11.0	50	14.3	CAV
12.200000	34.90	11.0	50	15.1	CAV
18.245000	35.80	11.3	50	14.2	CAV
18.305000	35.50	11.3	50	14.5	CAV
18.365000	35.00	11.3	50	15.0	CAV

END OF REPORT

Revision #	Date	Comments	By
1.0 Part III	06-04-2012	Preliminary Release, FSK - RF Cond data	CB
1.1 Part III	06-05-2012	Added final data	JS