166 South Carter, Genoa City, WI 53128

Company:	Cambium Networks
Model Tested:	C058900P112A
Report Number:	19220
DLS Project:	5945

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart E – Unlicensed National Information Infrastructure Devices
Section 15.407
General Technical Requirements.

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION
(DFS not tested by DLS Electronic Systems Inc.)

Formal Name:	Avenger AP 5.4GHz (or 5.7GHz) Radio
Kind of Equipment:	Point-to-Multipoint Digital Transmission Transceiver
Frequency Range:	**5495 to 5705 MHz (5.4 GHz xcvr in this report)** 5740 to 5835 MHz (5.7 GHz xcvr reported to the FCC in CFR 47 Part 15 Subpart C Section 15.247 report # 19128)
Test Configuration:	Stand-alone
Model Number(s):	C058900P112A
Model(s) Tested:	C058900P112A
Serial Number(s):	000456C005DE & 000456C005E4
Date of Tests:	June, July & August 2013
Test Conducted For:	Cambium Networks 3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA

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

166 South Carter, Genoa City, WI 53128

Company:	Cambium Networks
Model Tested:	C058900P112A
Report Number:	19220
DLS Project:	5945

SIGNATURE PAGE

Tested By:

Craig Brandt
Senior 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).

2012-10-01 through 2013-09-30
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 Avenger AP 5.4GHz Radio, Model: C058900P112A, complies with the requirements of CFR 47 Part 15 Subpart E Section 15.407. The data demonstrating FCC compliance of the 5.7GHz radio is found in D.L.S. Electronics, Inc. Reports #19128.

Subpart E Section 15.407 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
Informative	Duty Cycle	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section B(2)(b)	1	NA
Informative	Emission Bandwidth – 26 dB bandwidth	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section C	1	NA
Informative	99 Percent Occupied Bandwidth	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section D	1	NA
15.407(a)(2)	Maximum Conducted Output Power	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section E(3)(a)	1	Yes
15.407(a)(2)	Peak Power Spectral Density - Conducted	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections F & E(2)(b)	1	Yes
15.407(a)(6)	Peak Excursion - Conducted	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section G	1	Yes
15.407(b)(3)	Unwanted Emission Levels – Conducted Band-Edge	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H(1), H(2), H(3), & H(5)	1	Yes
15.407(b)(3)	Unwanted Emission Levels – Radiated Band-Edge	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H(1), H(2), H(3), H(5), & H(6)	2	Yes
15.407(b)(3) & 15.407(b)(6)	Unwanted Emission Levels – RF Conducted	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H(1), H(2), H(3), H(4), H(5), & H(6)	1	Yes

Subpart E Section 15.407 Applicable Technical Requirements: continued

15.407(b)(3) & 15.407(b)(6)	Unwanted Emission Levels – Radiated from cabinet	FCC KDB 789033 D01 General UNII Test Procedures v01r03 Sections H(1), H(2), H(3), H(4), H(5), & H(6)	2	Yes
15.407(b)6) & 15.207(a)	AC Line Conducted Emissions	ANSI C63.10:2009		Yes
15.407(h)(2)	Dynamic Frequency Selection (DFS)	Not tested by DLS		NA

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

2.0 Introduction

In June, July & August 2013 the Avenger AP 5.4GHz Radio, Model: C058900P112A, as provided from Cambium Networks, was tested to the requirements of CFR 47 Part 15 Subpart E Section 15.407. 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 5.4 GHz (or 5.7GHz) 802.11 fixed outdoor transceiver with either 20 MHz or 40 MHz channel bandwidth. 16dBi antenna assembly. OFDM modulation. This is a software defined radio.

Type of Equipment / Frequency Range:

Stand-Alone / **5495 to 5705 MHz (20 MHz bandwidth) (in this report)**
5510 to 5695 MHz (40 MHz bandwidth) (in this report)

5740 to 5835 MHz (5.7 GHz xcvr reported to the FCC in report # 19128)

Physical Dimensions of Equipment Under Test:

Length: 8.5 in. Width: 3 in. Height: 1 in.

Power Source:

30 VDC (Power Over Ethernet to Radio)
120 Vac, 60 Hz using Phihong power supply model: PSA15M-300(SM) (for AC Line Conducted)

Internal Frequencies:

292 kHz, 940 - 1000 kHz, 4 MHz (Switching Power Supply Frequency)
25 MHz, 40 MHz

Transmit / Receive Frequencies Used For Test Purpose:

20 MHz Channel Bandwidth: Low channel: 5495 MHz, Middle channel: 5575 MHz, High channel: 5705 MHz

40 MHz Channel Bandwidth: Low channel: 5510 MHz, Middle channel: 5575 MHz, High channel: 5695 MHz

Type of Modulation(s):

OFDM: 802.11n: MCS15

Description of Circuit Board(s) / Part Number:

AP PCB	84009654001
external 17dBi antenna w/1dB cables	85009324001 Rev AA
antenna assembly	P005135

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	837808/005	20 Hz – 40 GHz	7-23-13	7-23-14
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-24-13	5-24-14
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1-7-13	1-7-14
Limiter	Electro-Metrics	EM-7600	706	9 kHz – 30 MHz	1-7-13	1-7-14
Preamp	Miteq	AMF-7D-01001800-22-10P	1809602	1GHz-18GHz	5-29-13	5-29-14
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	3-18-13	3-18-15
High Pass Filter	Planar	HP8G-7G8-CD-SFF	PF1226/0728	7.5-18 GHz	8-14-13	8-14-14
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	8-12-13	8-12-14
Horn Antenna	ETS Lindgren	3116	00062917	18 – 40GHz	10-4-11	9-23-13
High Pass Filter	Planar	CL22500-9000-CD-SS	PF1229/0728	15-40 GHz	8-14-13	8-14-14
20 dB attenuator	Aeroflex/weinschel	75A-20-12	1071	DC – 40 GHz	8-14-13	8-14-14
10 dB attenuator	narda	4768-10	0702	DC – 40 GHz	8-13-13	8-13-14
Receiver	Rohde & Schwarz	ESI 26	837491/010	20 Hz – 26 GHz	1-3-13	1-3-14
Preamplifier	Rohde & Schwarz	TS-PR10	032001/005	9 kHz – 1 GHz	1-10-13	1-10-14
Antenna	EMCO	3104C	97014785	20 MHz – 200 MHz	8-22-12	8-22-14
Antenna	EMCO	3146	97024895	200 MHz – 1 GHz	9-6-12	9-6-14
Power Meter	Anritsu	ML2487A	6K00002069	N/A	3-8-13	3-8-14
Thermal Power Sensor	Anritsu	MA24002A	1204359	10MHz-18GHz	3-3-13	3-3-14

6.0 Test Arrangements

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 789033 D01 General UNII test Procedures v01r03 and ANSI C63.10-2009, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for photos of the test set up.

Radiated Emissions Measurement Arrangement:

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

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

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

7.0 Test Conditions

Normal Test Conditions:

Temperature and Humidity:

73°F at 51% RH

Supply Voltage:

30 VDC (Power Over Ethernet to Radio)
120 Vac, 60 Hz using Phihong power supply model: PSA15M-300(SM) (for AC Line Conducted)

8.0 Modifications Made To EUT For Compliance

No modifications were made to the EUT at the time of test.

9.0 Additional Descriptions

Testing was performed at low, mid, and high channels over 2 modulation bandwidths (20MHz & 40MHz). The antenna ports were tested (Channel 0 & 1). Worst case emissions were recorded. AC line conducted tested in transmit mode.

Radiated emissions were tested with a 16dBi panel antenna assembly, Model: 85009324001 Rev AA, below 1 GHz. Tested cabinet radiated emissions (ports terminated into a 50 Ohm load) above 1 GHz.

Emission Designators: 20M0x1D, 40M0x1D

Power Settings noted on the test data.

Please note that Cambium Networks requested a new model number for the Avenger AP 5.4GHz (or 5.7GHz) Radio on August 22, 2013. The model number for the 5.7GHz radio was reported as C050900P12A in DLS Report # 19128. This number has been updated to C058900P112A. The same physical units were used to test the radio at all frequencies reported to the FCC.

10.0 Results

Measurements were performed in accordance with FCC Publication KDB 789033 D01 General UNII test Procedures v01r03 and ANSI C63.10-2009. Graphical and tabular data can be found in Appendix B at the end of this report.

11.0 Conclusion

Dynamic Frequency Selection (DFS) testing was not performed by DLS Electronic Systems,Inc. Otherwise, the Avenger AP 5.4GHz Radio, Model C058900P112A, as provided from Cambium Networks tested in June, July & August 2013 **meets** the requirements of CFR 47 Part 15 Subpart E Section 15.407.

Appendix A – Test Photos

Photo Information and Test Setup:

Item0: Avenger AP 5.4GHz (or 5.7GHz) Radio, Model C058900P112A
Item1: Laird 5.4-6.0 GHz 17 dBi Panel Antenna with cable, Model: 85009324001 Rev AA
Item2: Unshielded Ethernet Cable - 20 meters long

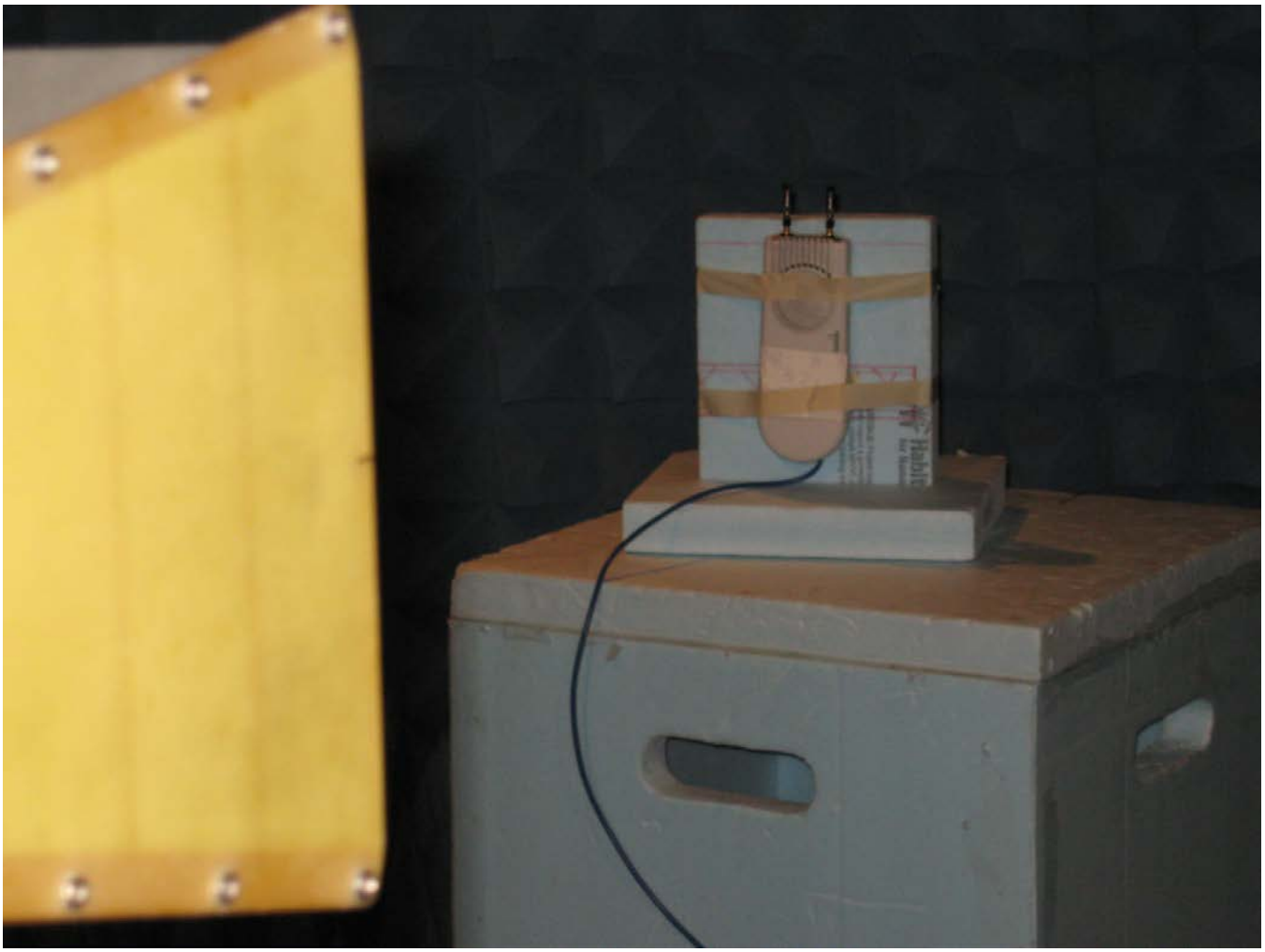
Radiated - Below 1 GHz

Appendix A – Test Photos

Radiated - Below 1 GHz - Back - showing Panel Antenna

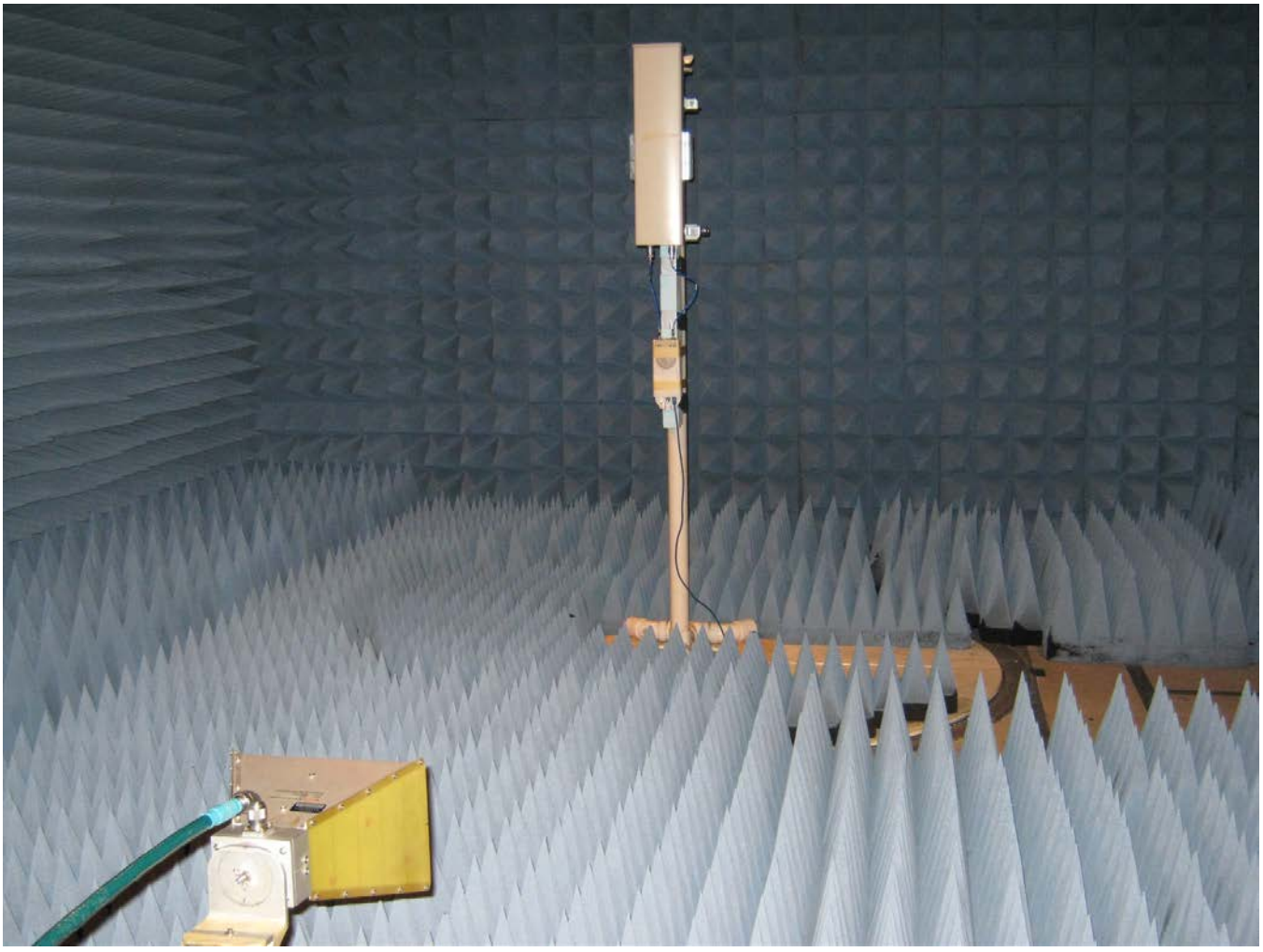
Appendix A – Test Photos

Radiated - above 1 GHz



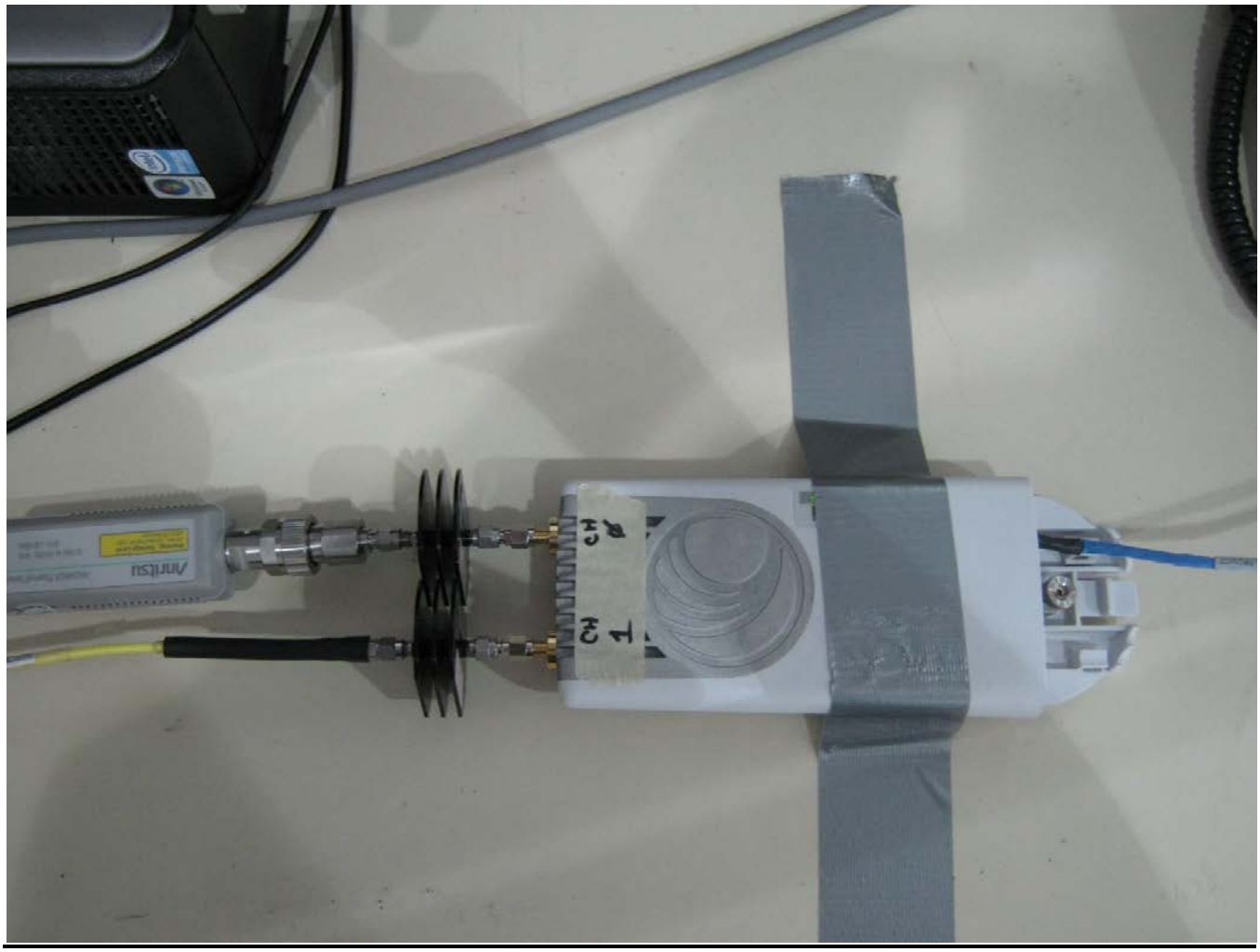
Appendix A – Test Photos

Radiated Band-Edge Setup for 40MHz Bandwidth Radio using Panel Antenna



Appendix A – Test Photos

RF Conducted / Output Power



Appendix A – Test Photos

AC Line Conducted

B1.0 Duty Cycle of Test Unit

Rule Part: FCC Section 15.35(c)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 Section B(2)(b)

Limits: Informative

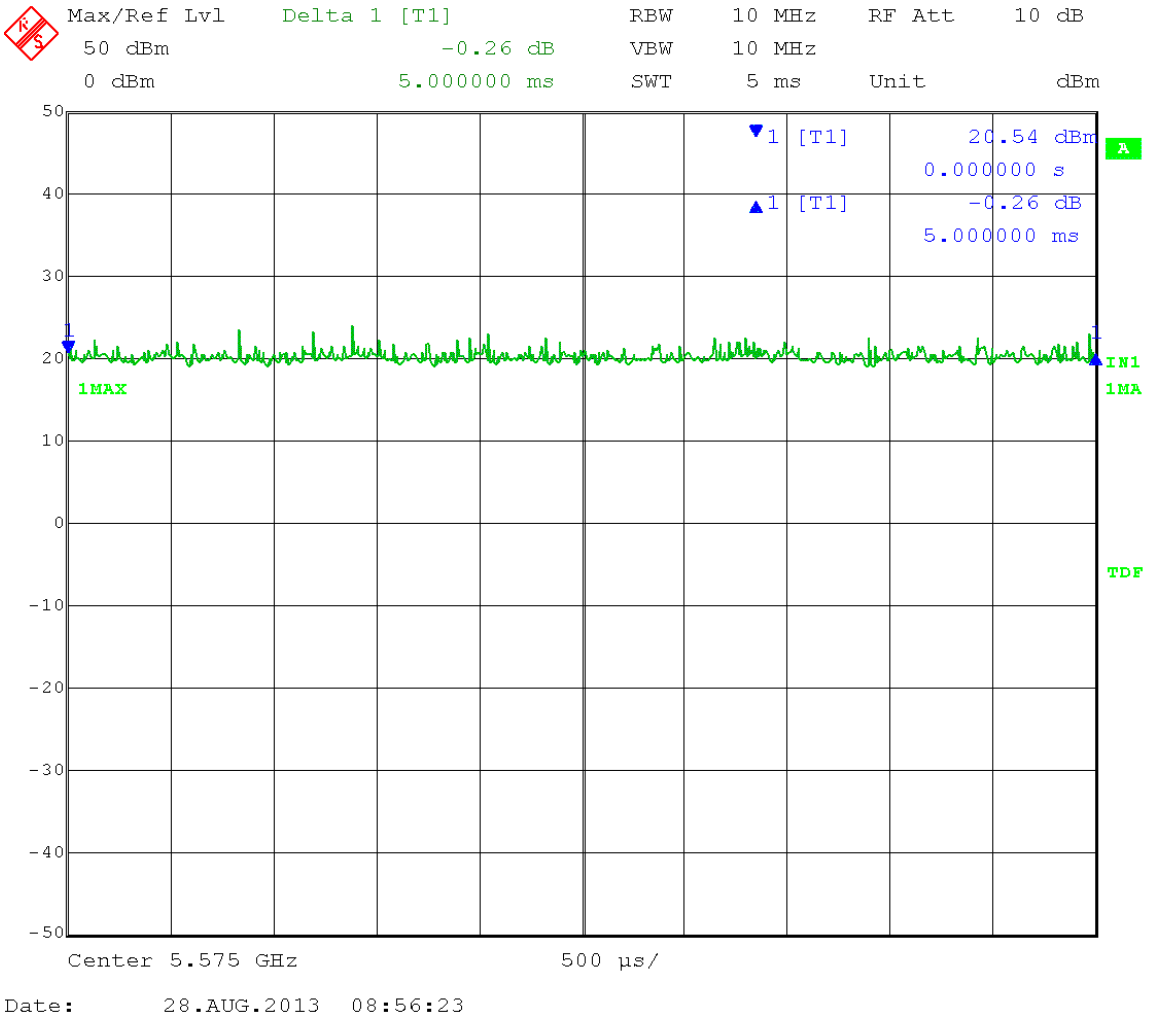
Results: EUT is continuously transmitting (duty cycle = 100%).

Sample Equations: None

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

Test Date: 8-28-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM
Test: Duty Cycle during testing
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
B)2)b) Duty Cycle measurement: zero-span method - Page 3
RBW = 10 MHz VBW = 10 MHz
Span = 0 Hz SWT = 5 ms
Mid Channel: Transmit = 5.575GHz 20MHz BW
Total on Time = Duration of one pulse = 5.000000 ms

Duty cycle factor x = 5.0/ 5.0 = **1.00**



Appendix B – Measurement Data

B2.0 Emission Bandwidth – 26 dB bandwidth – conducted

Rule Section: Informative

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section C – Emission bandwidth

Description: RBW = approximately 1% of EBW
VBW > RBW
Detector = Peak
Trace mode = max hold

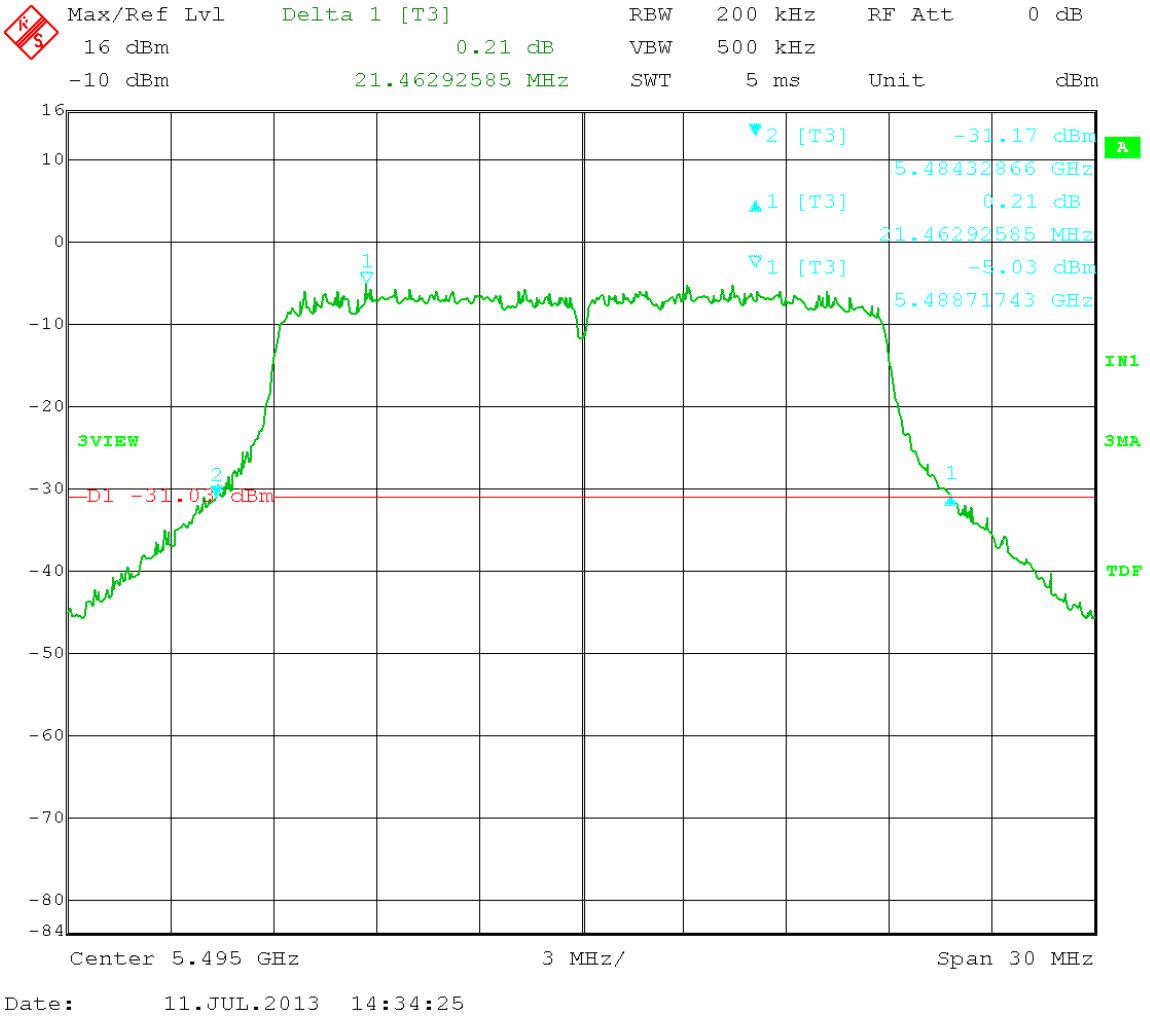
Measure the maximum width of the emission between the lower and upper frequencies that measure 26 dB below the maximum level of the in-band emission.

Limit: Informative

Notes: Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

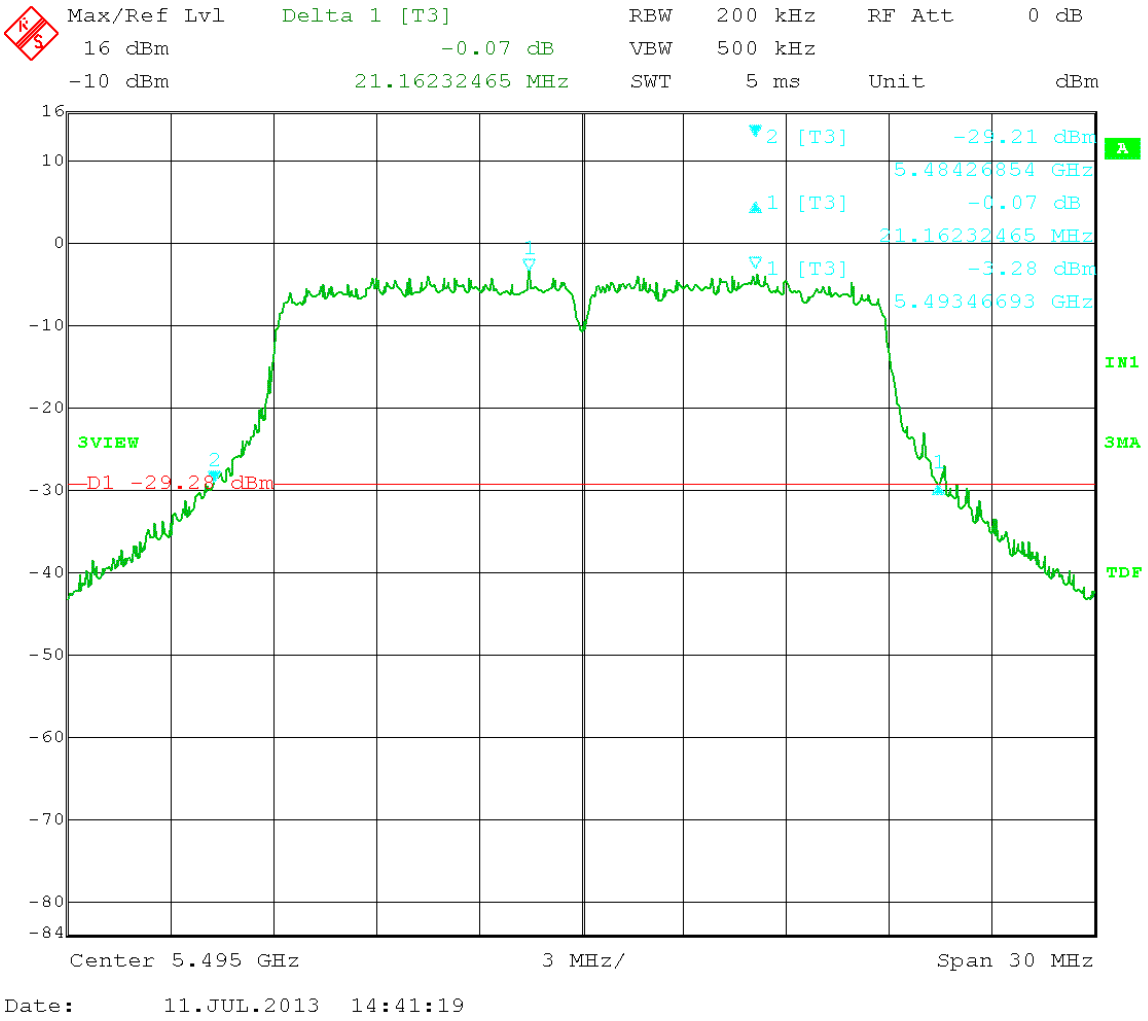
Test Date: 07-11-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
C) Emission bandwidth: Page 3
RBW = 200 kHz VBW = 500 kHz
Low Channel: Transmit = 5.495 GHz 20MHz BW
Output power setting: 7 Channel 0

26 dB Emission Bandwidth = 21.46MHz



Test Date:	07-11-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	Emission Bandwidth (26 dB) - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	C) Emission bandwidth: Page 3
	RBW = 200 kHz VBW = 500 kHz
	Low Channel: Transmit = 5.495 GHz 20MHz BW
	Output power setting: 7 Channel 1

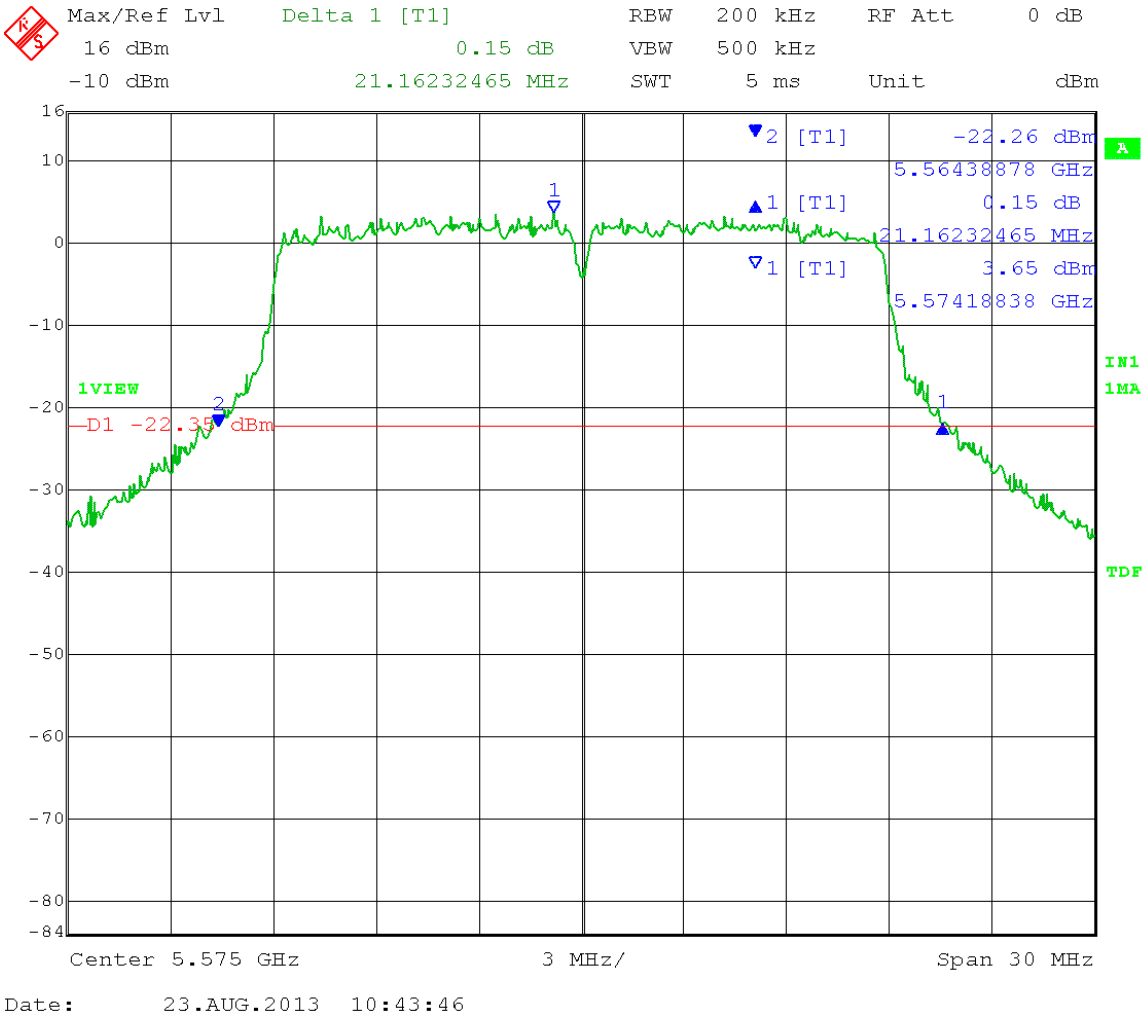
26 dB Emission Bandwidth = 21.16MHz



Test Date: 08-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
C) Emission bandwidth - Page 3
RBW = 200 kHz VBW = 500 kHz
Mid Channel: Transmit = 5.575GHz 20MHz BW
Output power setting: 14

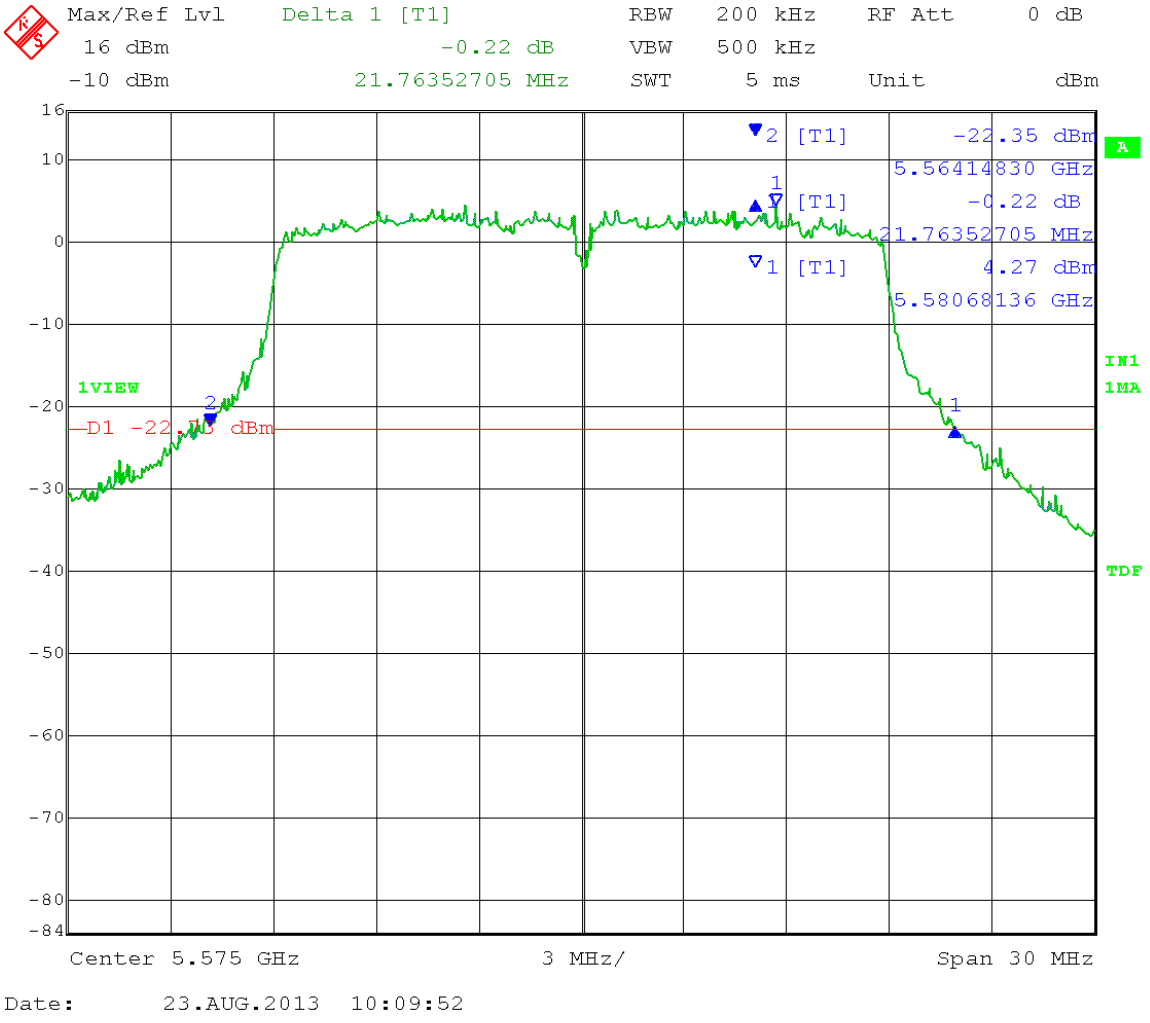
Channel 0:

26 dB Emission Bandwidth = 21.16MHz



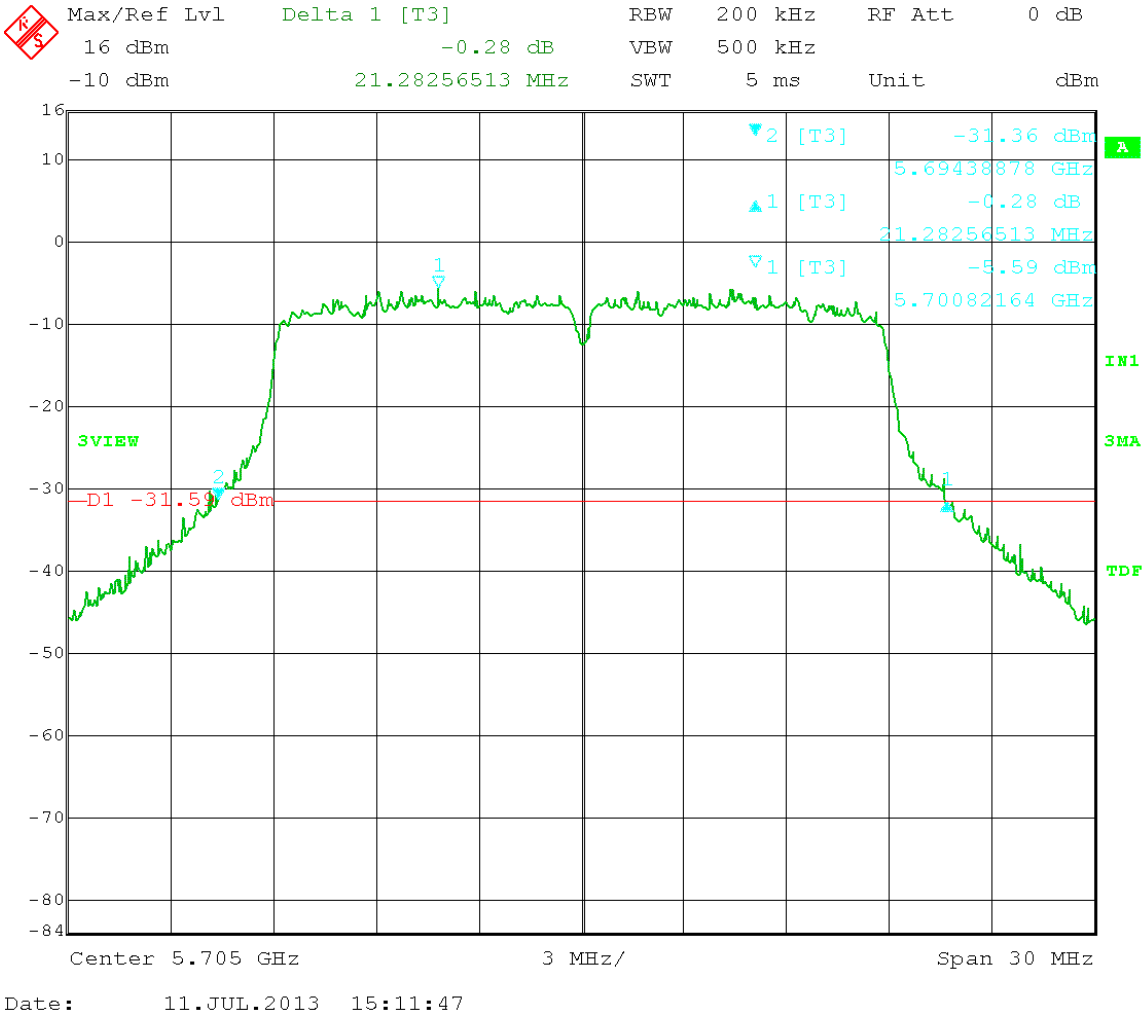
Channel 1:

26 dB Emission Bandwidth = 21.76MHz



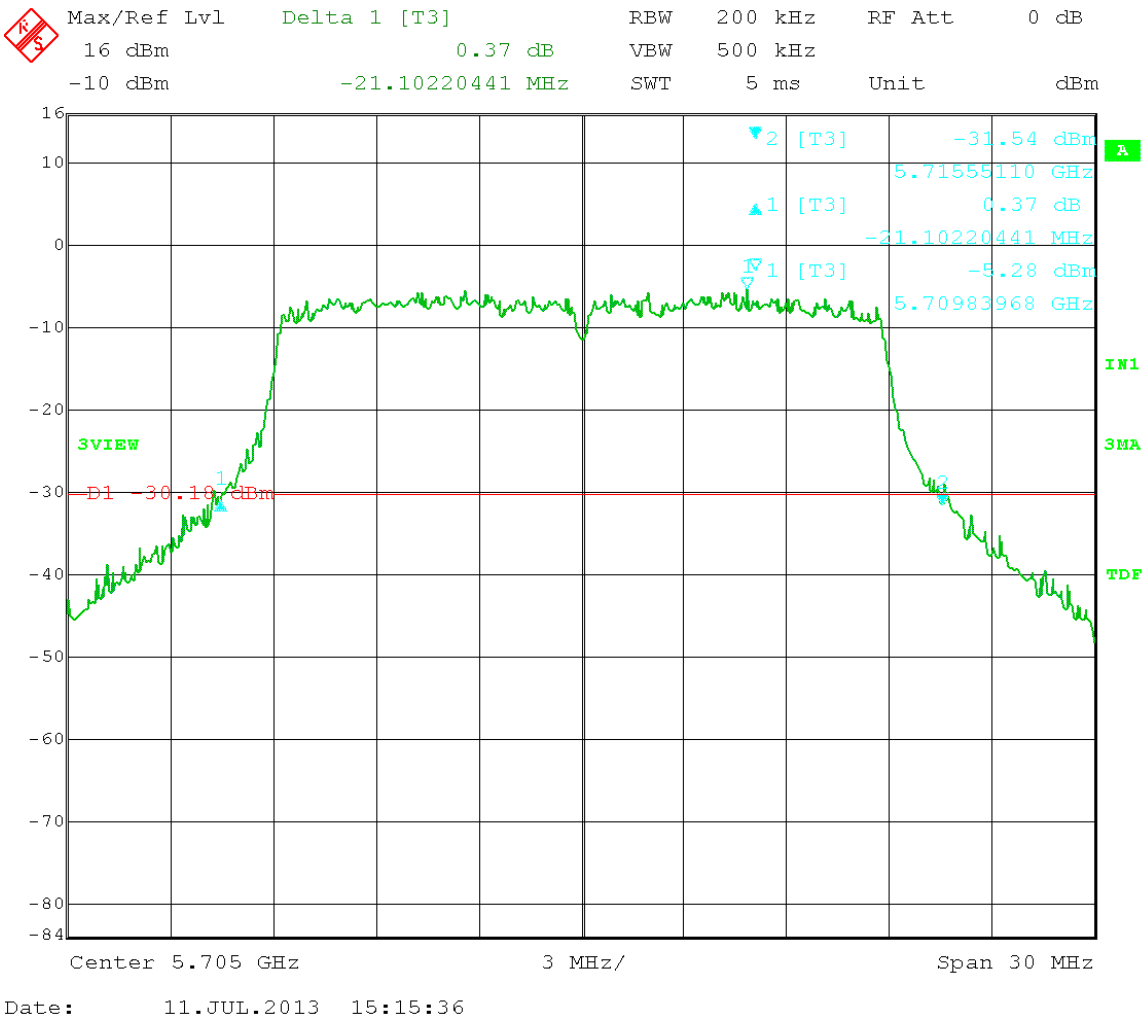
Test Date: 07-11-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
C) Emission bandwidth - Page 3
RBW = 200 kHz VBW = 500 kHz
High Channel: Transmit = 5.705GHz 20MHz BW
Output power setting: 7 Channel 0

Emission Bandwidth = 21.28MHz



Test Date:	07-11-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	Emission Bandwidth (26 dB) - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	C) Emission bandwidth - Page 3
	RBW = 200 kHz VBW = 500 kHz
	High Channel: Transmit = 5.705GHz 20MHz BW
	Output power setting: 7 Channel 1

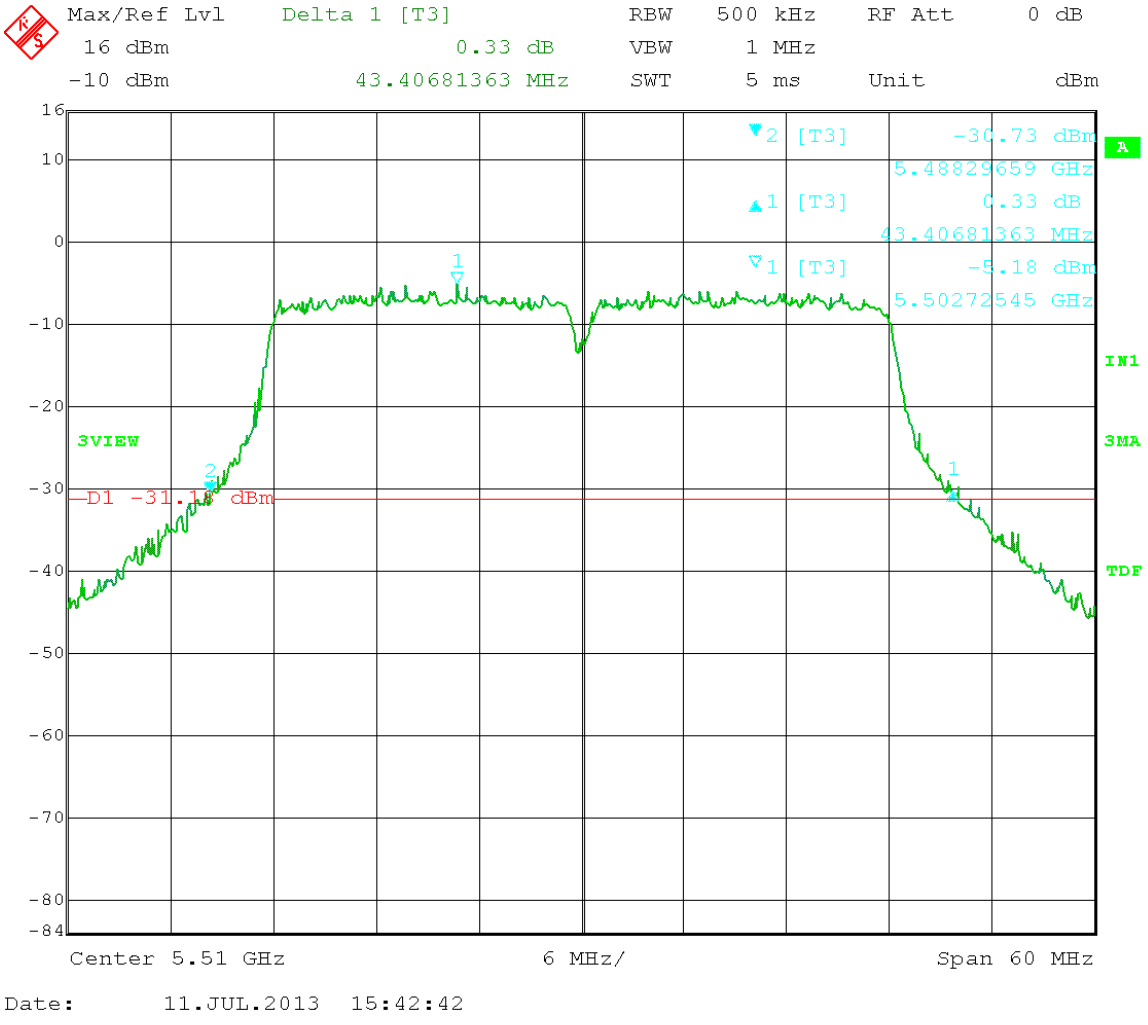
Emission Bandwidth = 21.10MHz



Date: 11.JUL.2013 15:15:36

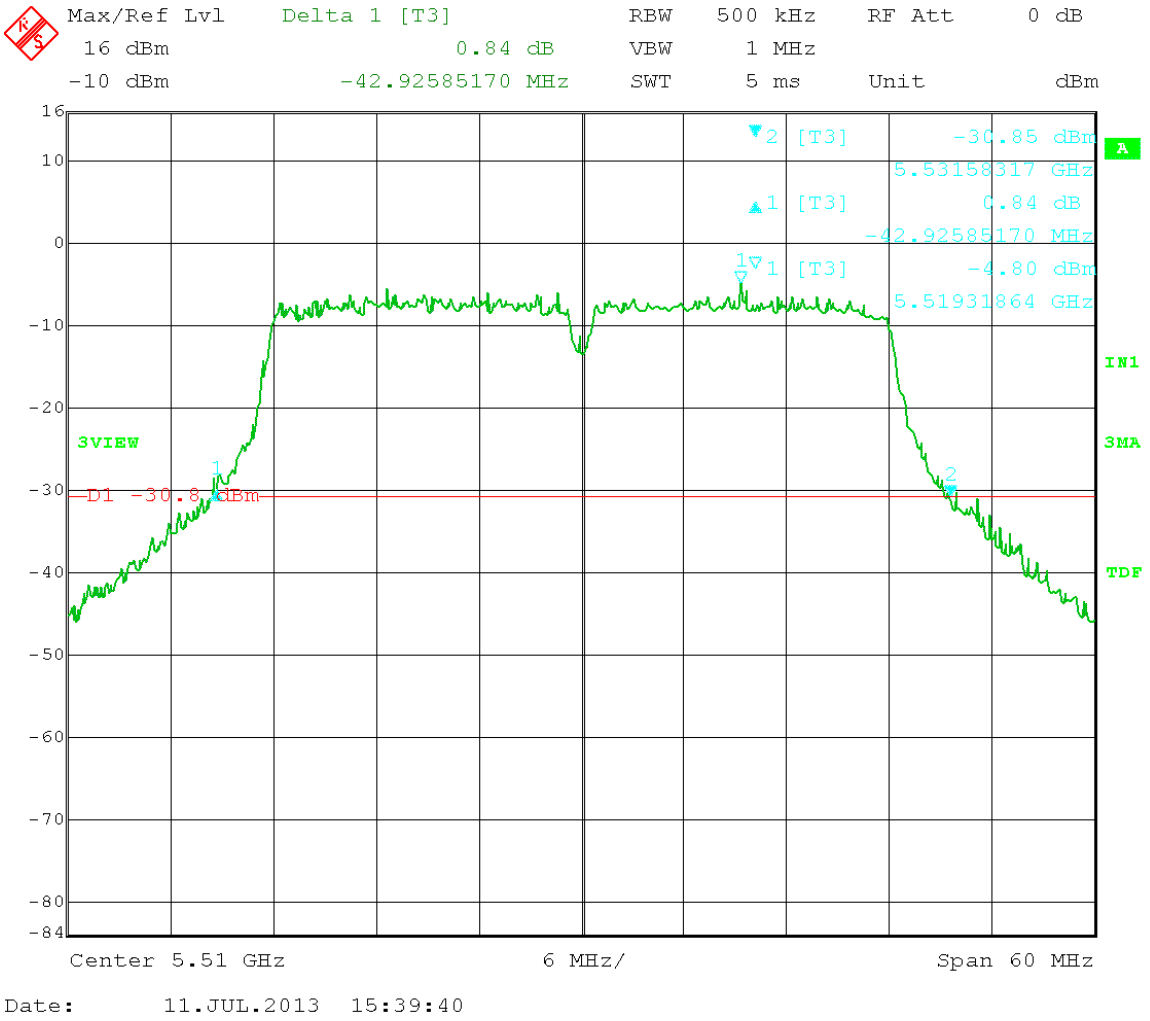
Test Date: 07-11-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
C) Emission bandwidth - Page 3
RBW = 500 kHz VBW = 1 MHz
Low Channel: Transmit = 5.510GHz 40MHz BW
Output power setting: 4 Channel 0

Emission Bandwidth = 43.41MHz



Test Date:	07-11-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	Emission Bandwidth (26 dB) - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	C) Emission bandwidth - Page 3
	RBW = 500 kHz VBW = 1 MHz
	Low Channel: Transmit = 5.510GHz 40MHz BW
	Output power setting: 4 Channel 1

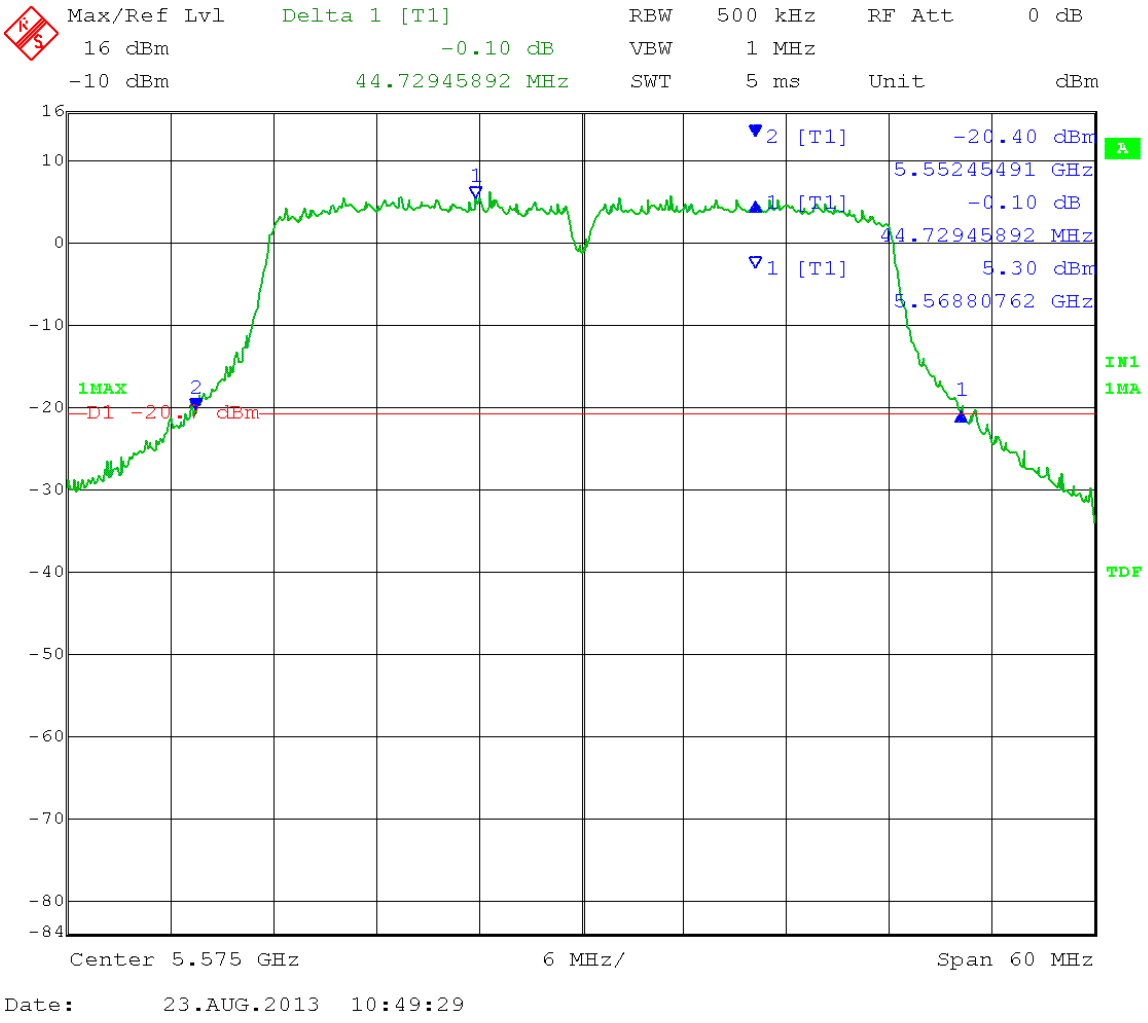
Emission Bandwidth = 42.93MHz



Test Date: 08-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
C) Emission bandwidth - Page 3
RBW = 200 kHz VBW = 500 kHz
Mid Channel: Transmit = 5.575GHz 40MHz BW
Output power setting: 14

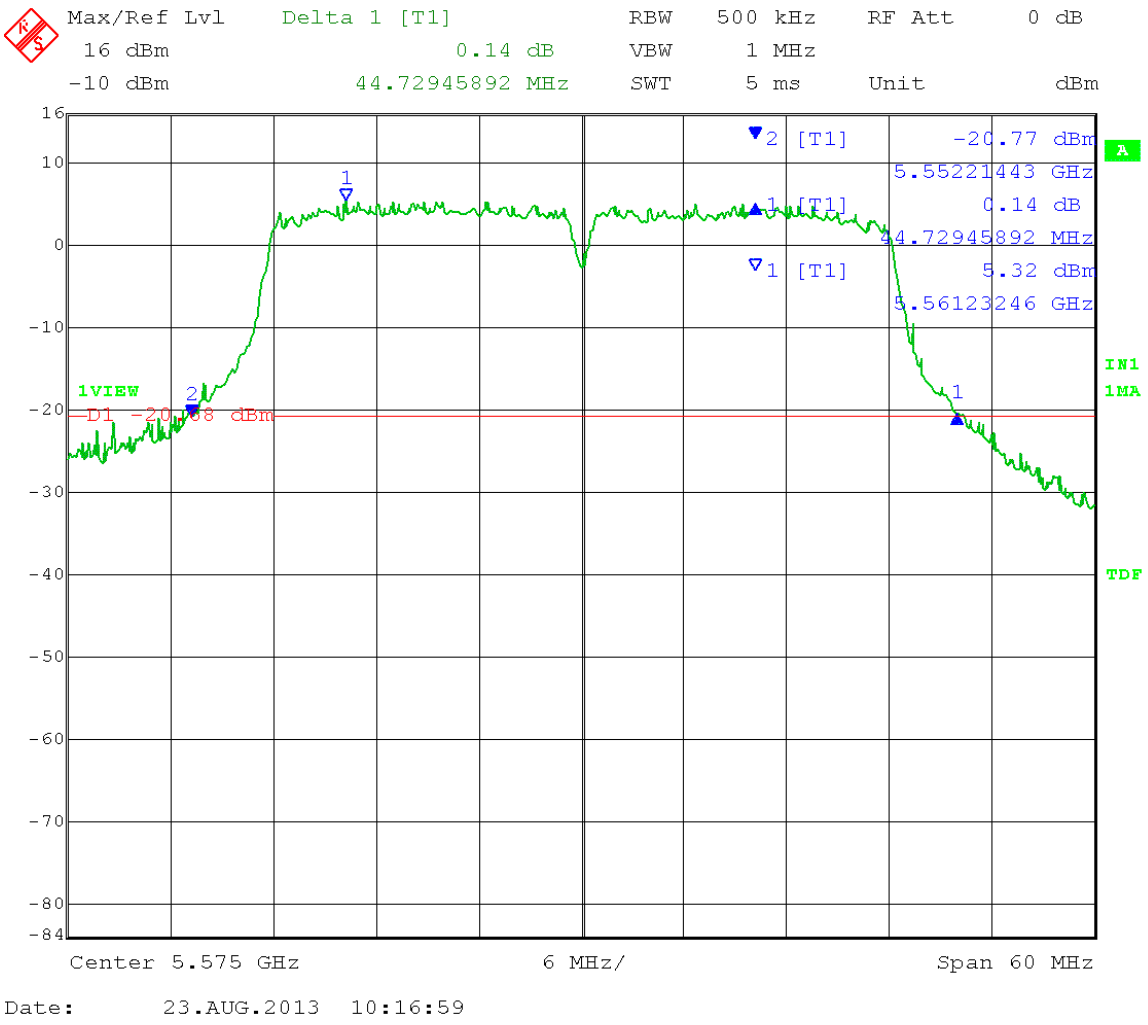
Channel 0:

26 dB Emission Bandwidth = 44.73MHz



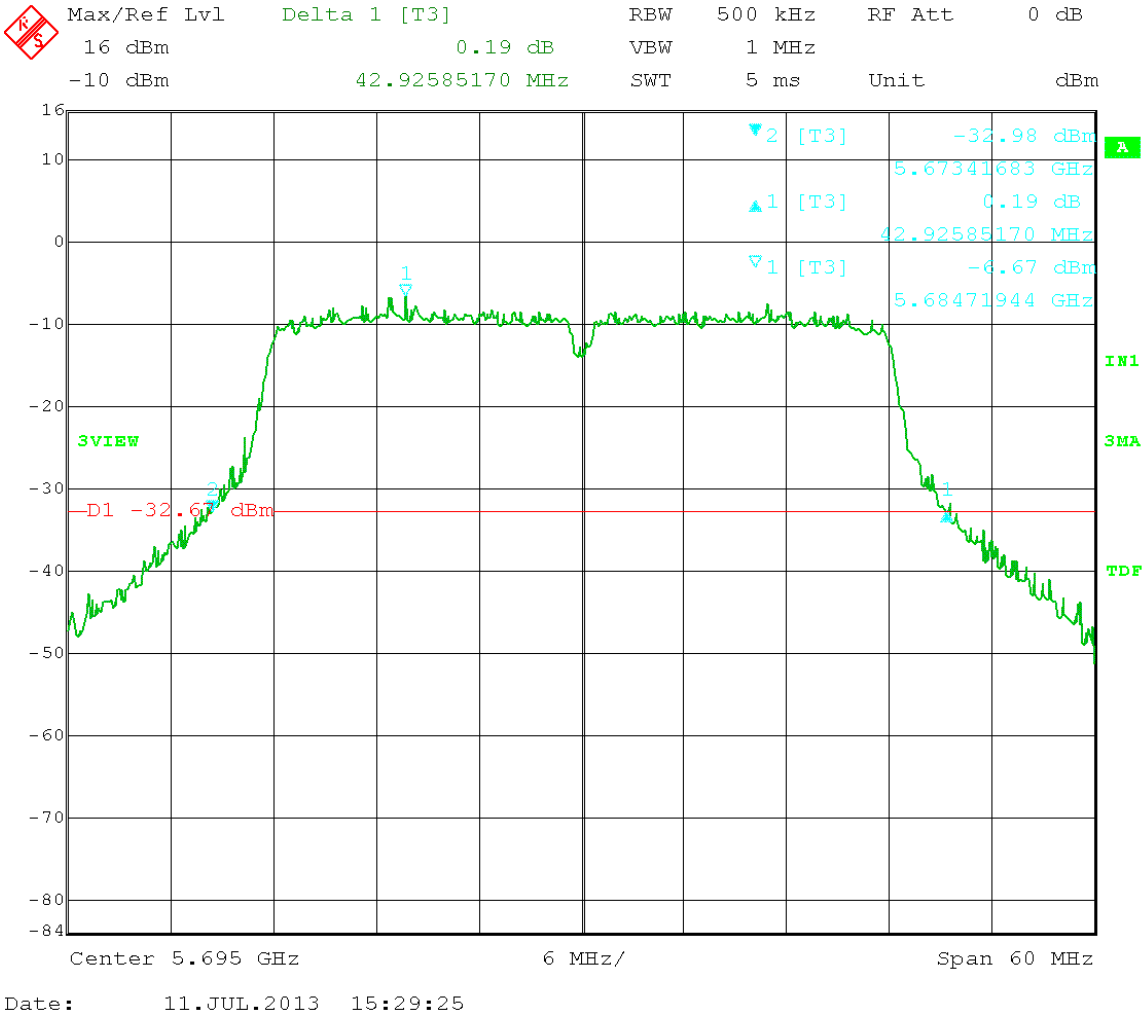
Channel 1:

26 dB Emission Bandwidth = 44.73MHz



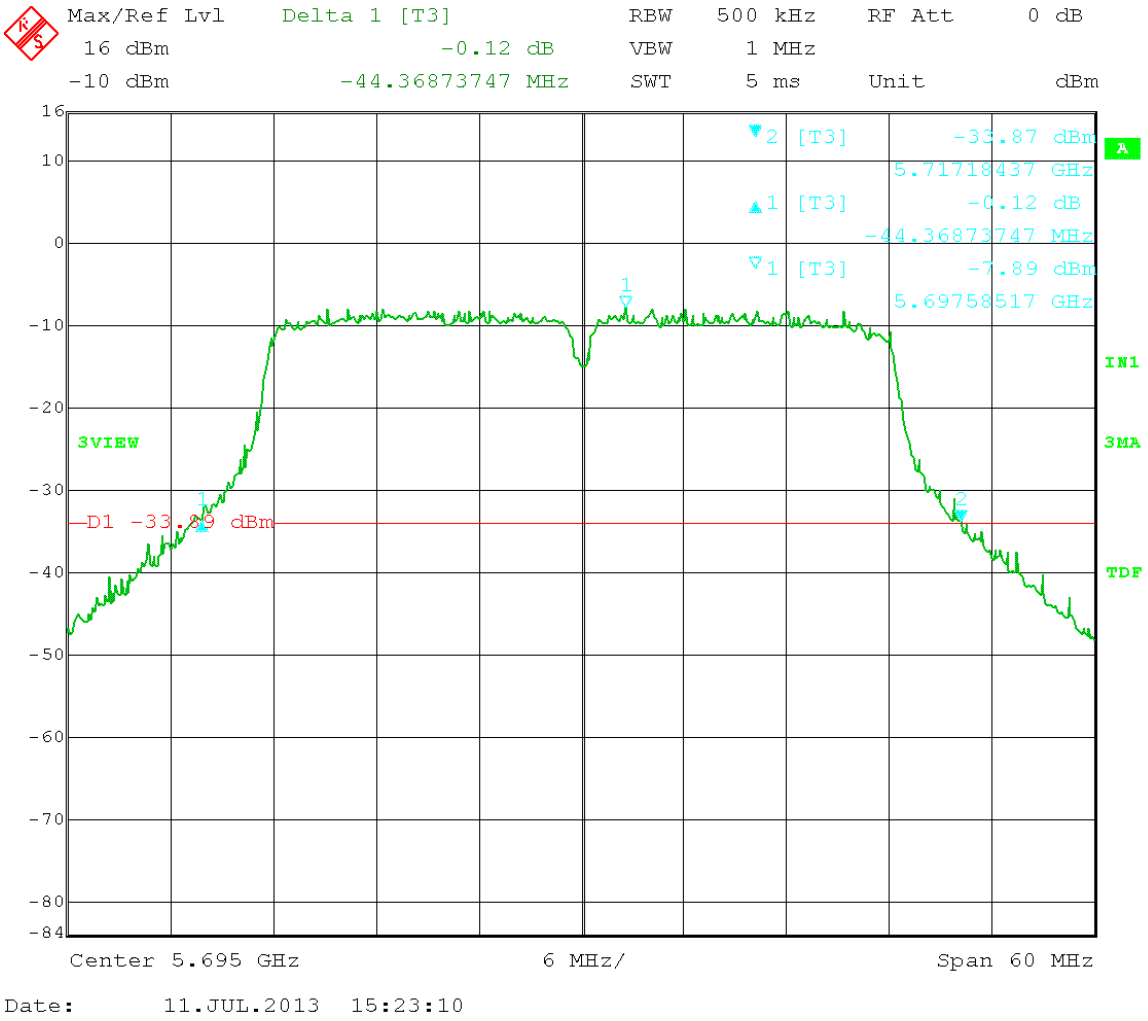
Test Date: 07-11-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: Emission Bandwidth (26 dB) - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
C) Emission bandwidth - Page 3
RBW = 500 kHz VBW = 1 MHz
High Channel: Transmit = 5.695GHz 40MHz BW
Output power setting: 2 Channel 0

Emission Bandwidth = 42.93MHz



Test Date:	07-11-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	Emission Bandwidth (26 dB) - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	C) Emission bandwidth - Page 3
	RBW = 500 kHz VBW = 1 MHz
	High Channel: Transmit = 5.695GHz 40MHz BW
	Output power setting: 2 Channel 1

Emission Bandwidth = 44.37MHz



Date: 11.JUL.2013 15:23:10

Appendix B – Measurement Data

B3.0 99 Percent Occupied Bandwidth

Rule Section: Informative

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section D – 99 Percent Occupied Bandwidth

Description: SPAN = 1.5 to 5 times the OBW
RBW = 1% to 5% of OBW
VBW ≥ RBW
Detector = Peak
Trace mode = max hold

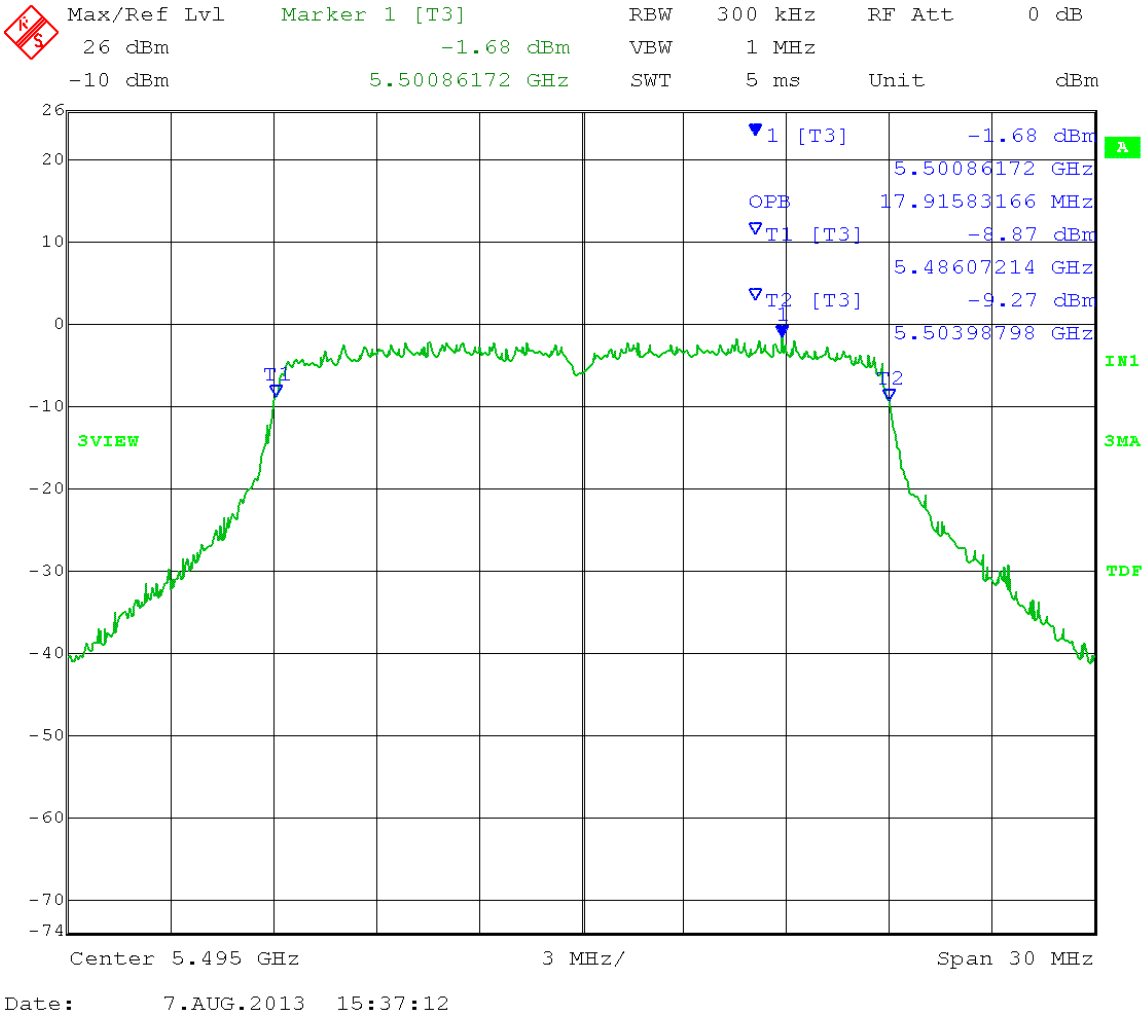
Measure the width of the emission using the 99% power bandwidth function of the spectrum analyzer

Limit: Informative

Notes: Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

Test Date:	08-7-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	99% Occupied Bandwidth - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	D) 99% Occupied Bandwidth - Page 4
	RBW = 300 kHz VBW = 1 MHz
	Detector = Peak Trace = Max Hold
	Low Channel: Transmit = 5.495 GHz 20MHz BW
	Output power setting: 7 Channel 0

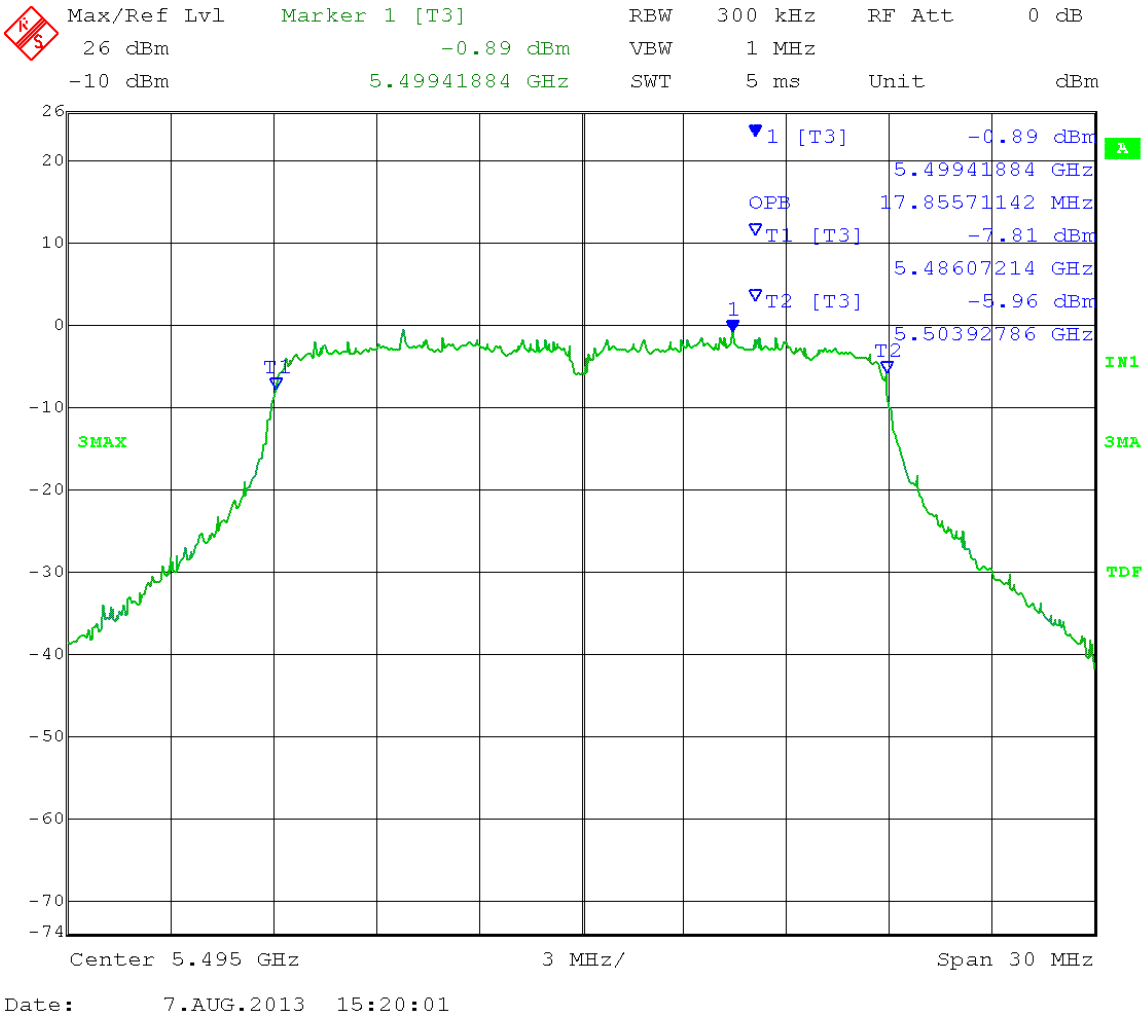
99% OBW = 17.92MHz



Test Date: 08-7-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
D) 99% Occupied Bandwidth - Page 4

RBW = 300 kHz	VBW = 1 MHz
Detector = Peak	Trace = Max Hold
Low Channel: Transmit = 5.495 GHz	20MHz BW
Output power setting: 7	Channel 1

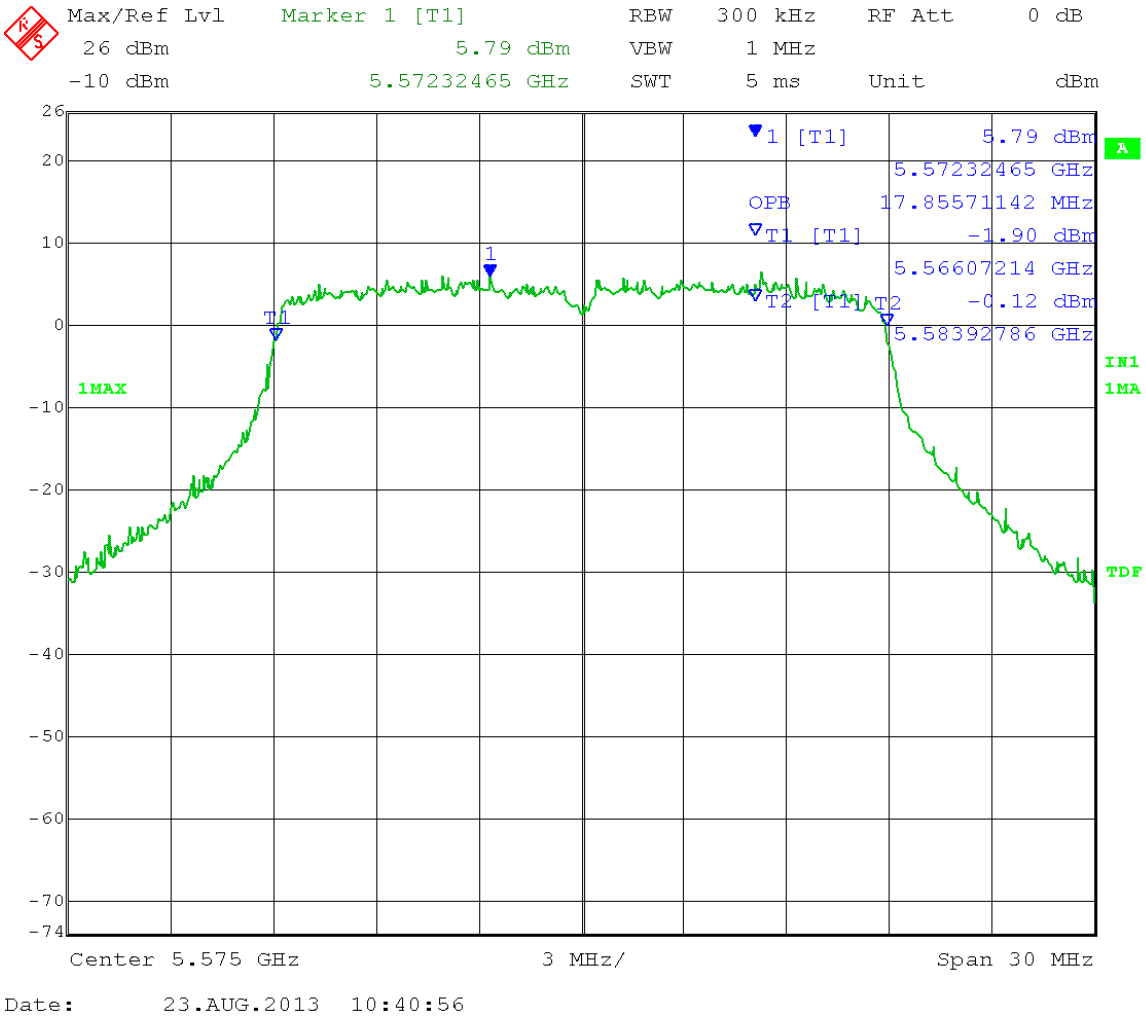
99% OBW = 17.86MHz



Test Date: 08-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
D) 99% Occupied Bandwidth - Page 4
RBW = 300 kHz VBW = 1 MHz
Detector = Peak Trace = Max Hold
Mid Channel: Transmit = 5.575 GHz 20MHz BW
Output power setting: 14

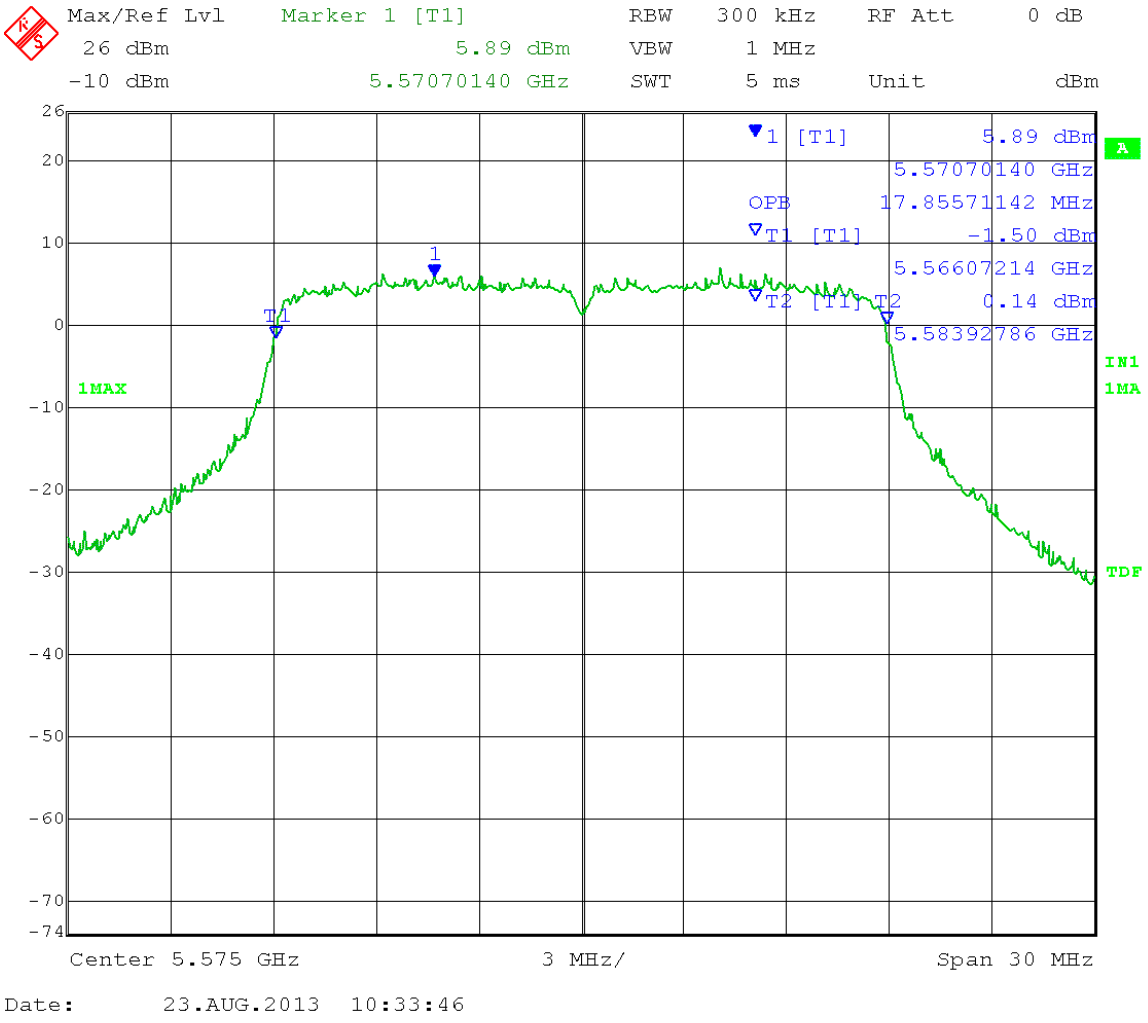
Channel 0:

99% OBW = 17.86MHz



Channel 1:

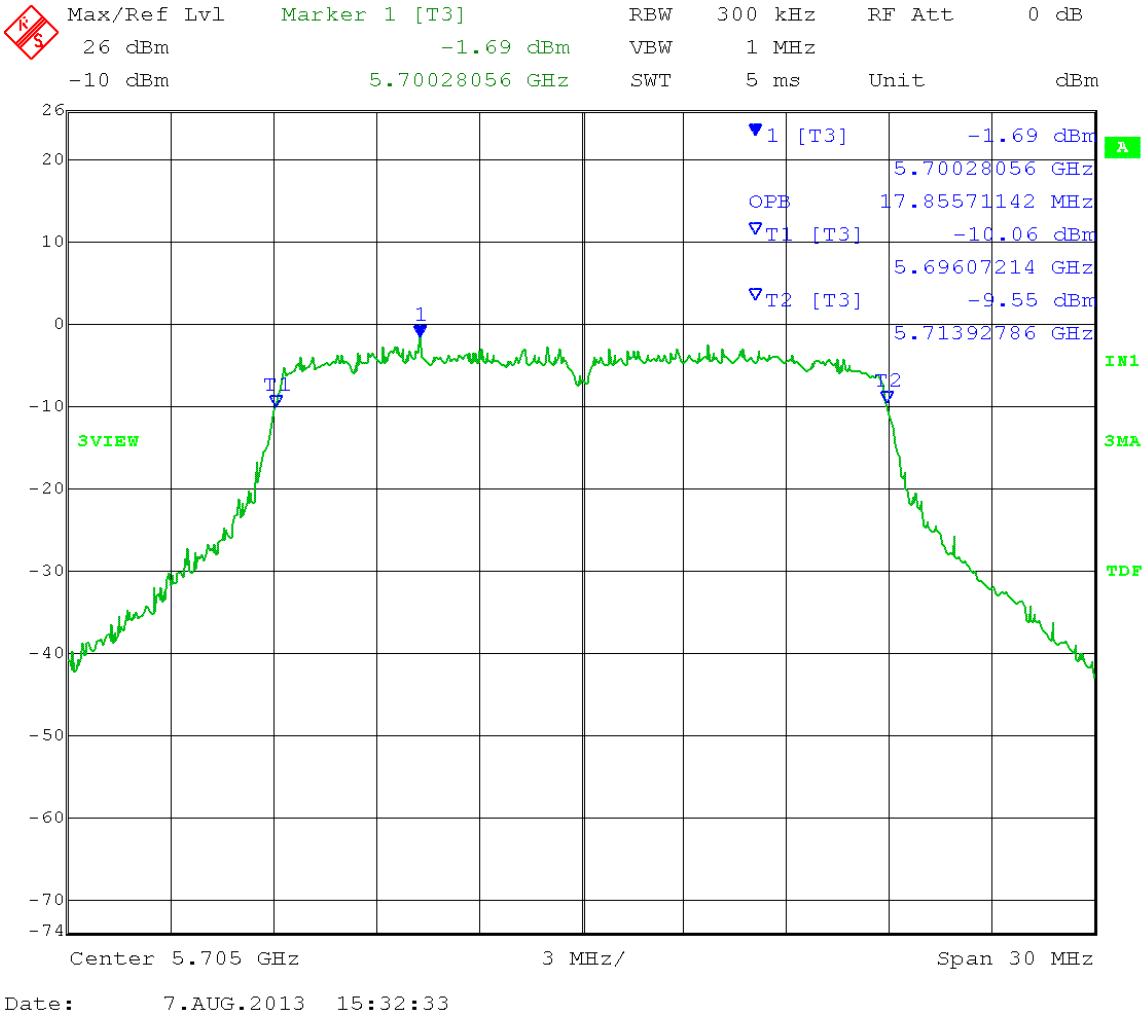
99% OBW = 17.86MHz



Test Date: 08-7-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
D) 99% Occupied Bandwidth - Page 4

RBW = 300 kHz	VBW = 1 MHz
Detector = Peak	Trace = Max Hold
High Channel: Transmit = 5.705 GHz	20MHz BW
Output power setting: 7	Channel 0

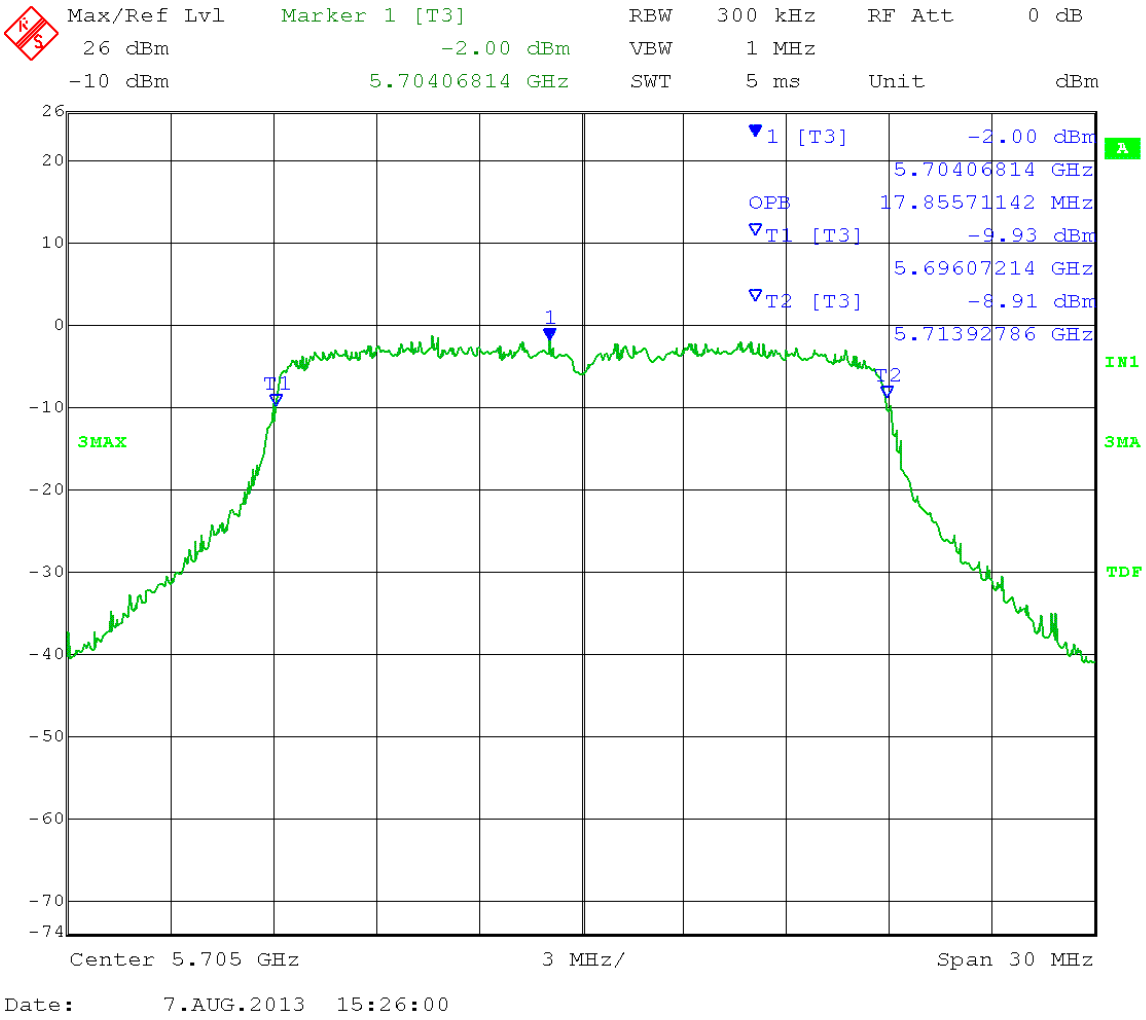
99% OBW = 17.86MHz



Test Date: 08-7-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
D) 99% Occupied Bandwidth - Page 4

RBW = 300 kHz	VBW = 1 MHz
Detector = Peak	Trace = Max Hold
High Channel: Transmit = 5.705 GHz	20MHz BW
Output power setting: 7	Channel 1

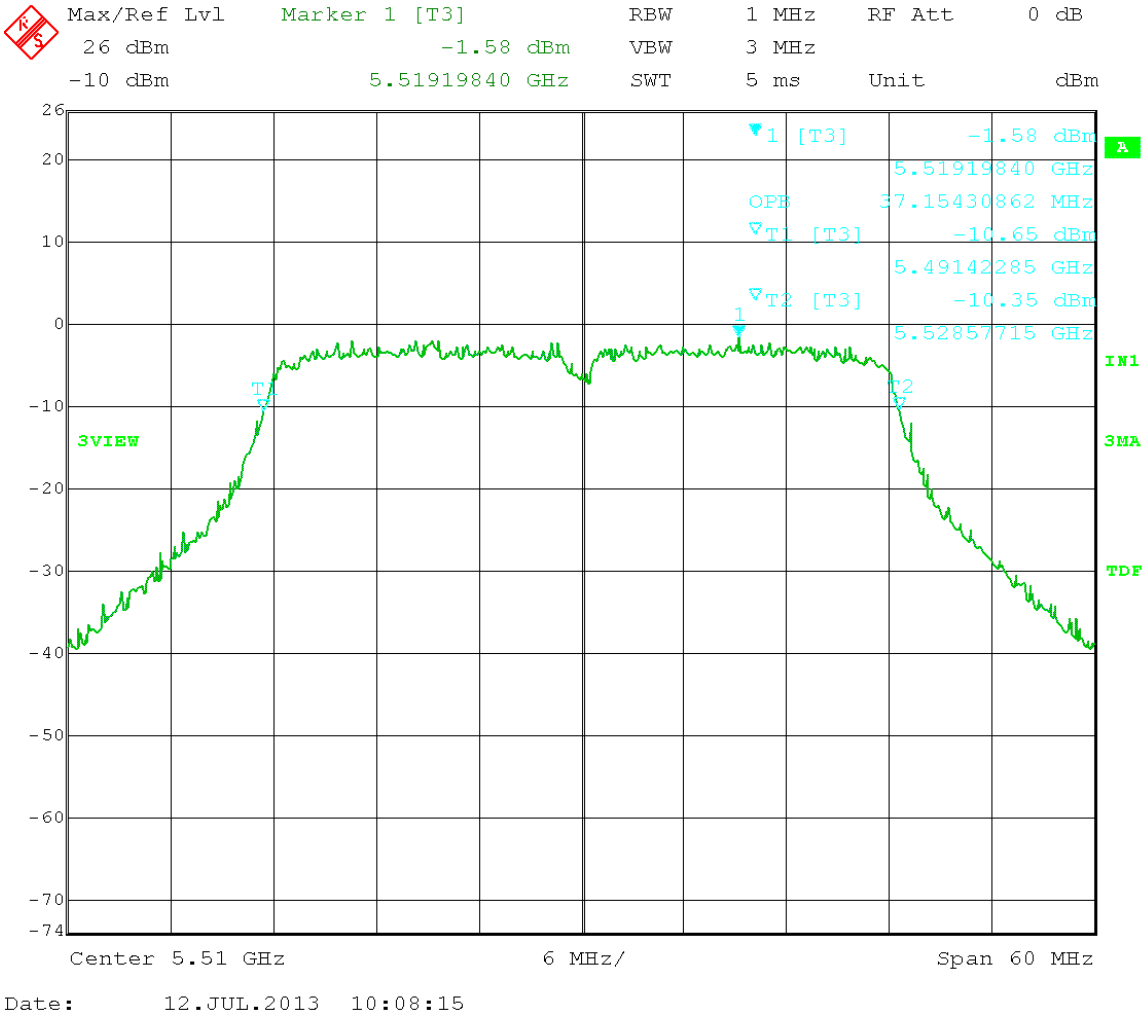
99% OBW = 17.86MHz



Date: 7.AUG.2013 15:26:00

Test Date: 07-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
D) 99% Occupied Bandwidth - Page 4
RBW = 1 MHz VBW = 3 MHz
Detector = Peak Trace = Max Hold
Low Channel: Transmit = 5.510 GHz 40MHz BW
Output power setting: 4 Channel 0

99% OBW = 37.15MHz

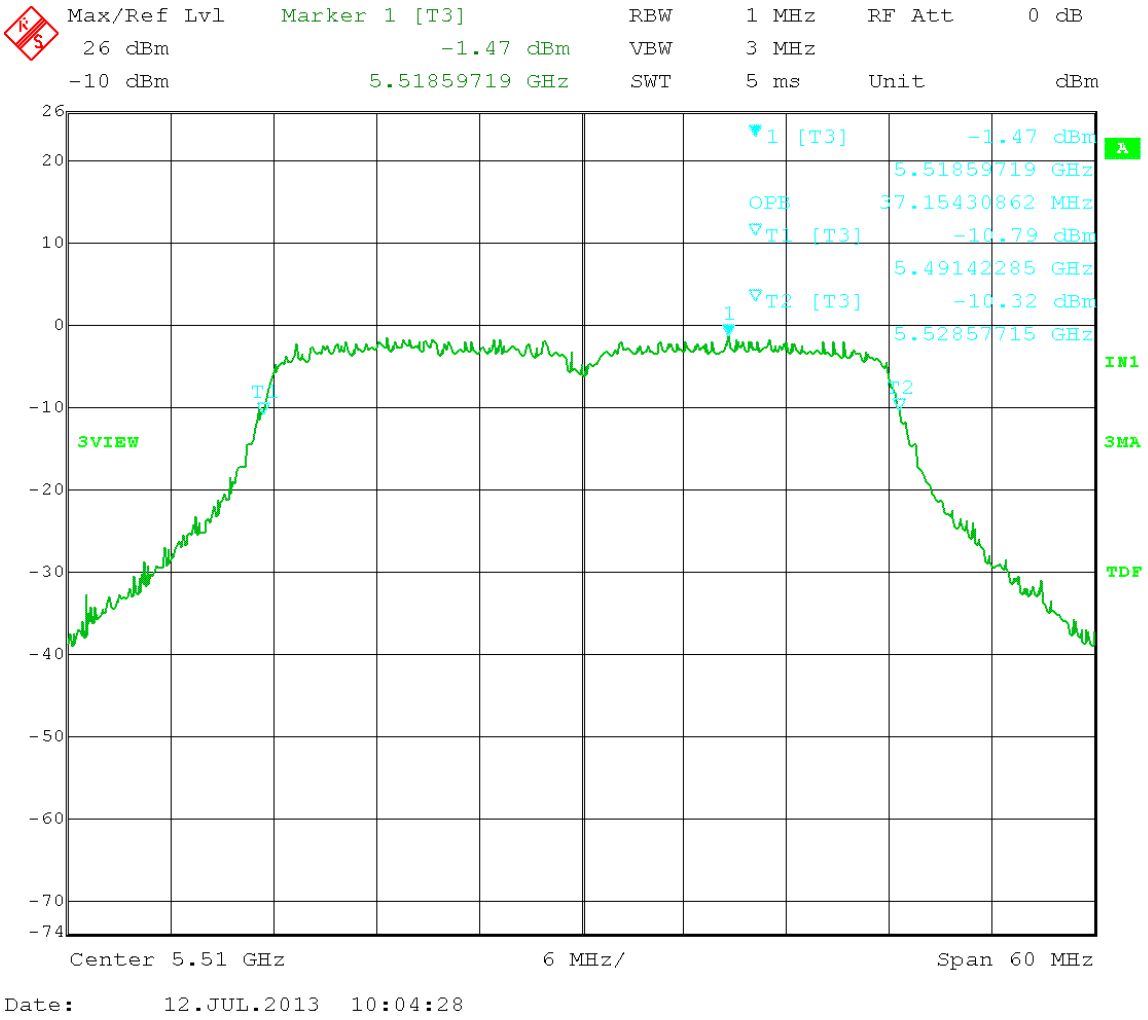


Test Date:	07-12-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	99% Occupied Bandwidth - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013

D) 99% Occupied Bandwidth - Page 4

RBW = 1 MHz	VBW = 3 MHz
Detector = Peak	Trace = Max Hold
Low Channel: Transmit = 5.510 GHz	40MHz BW
Output power setting: 4	Channel 1

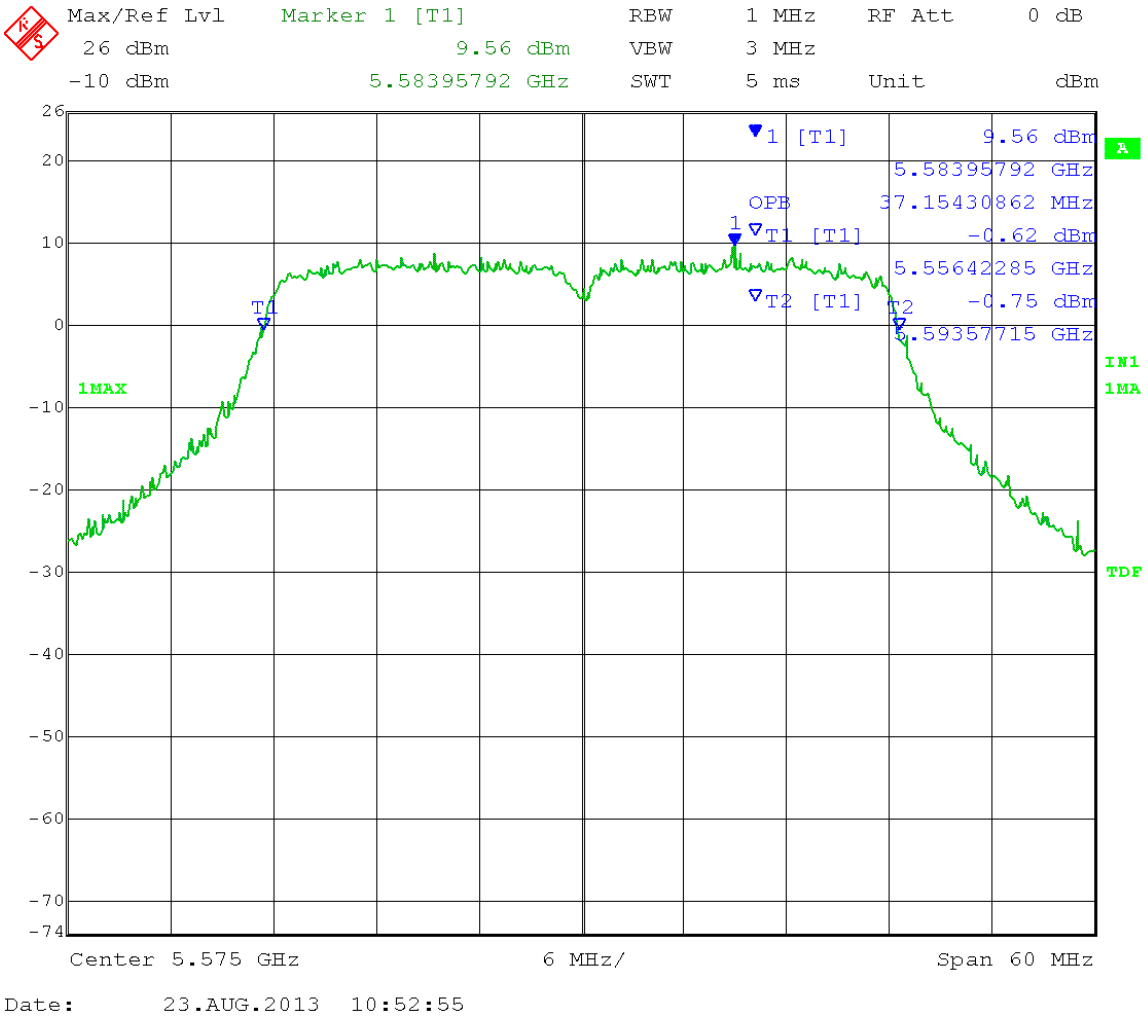
99% OBW = 37.15MHz



Test Date: 08-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test: 99% Occupied Bandwidth - Conducted
Operator: Lillian Li
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
D) 99% Occupied Bandwidth - Page 4
RBW = 1 MHz VBW = 3 MHz
Detector = Peak Trace = Max Hold
Mid Channel: Transmit = 5.575 GHz 40MHz BW
Output power setting: 14

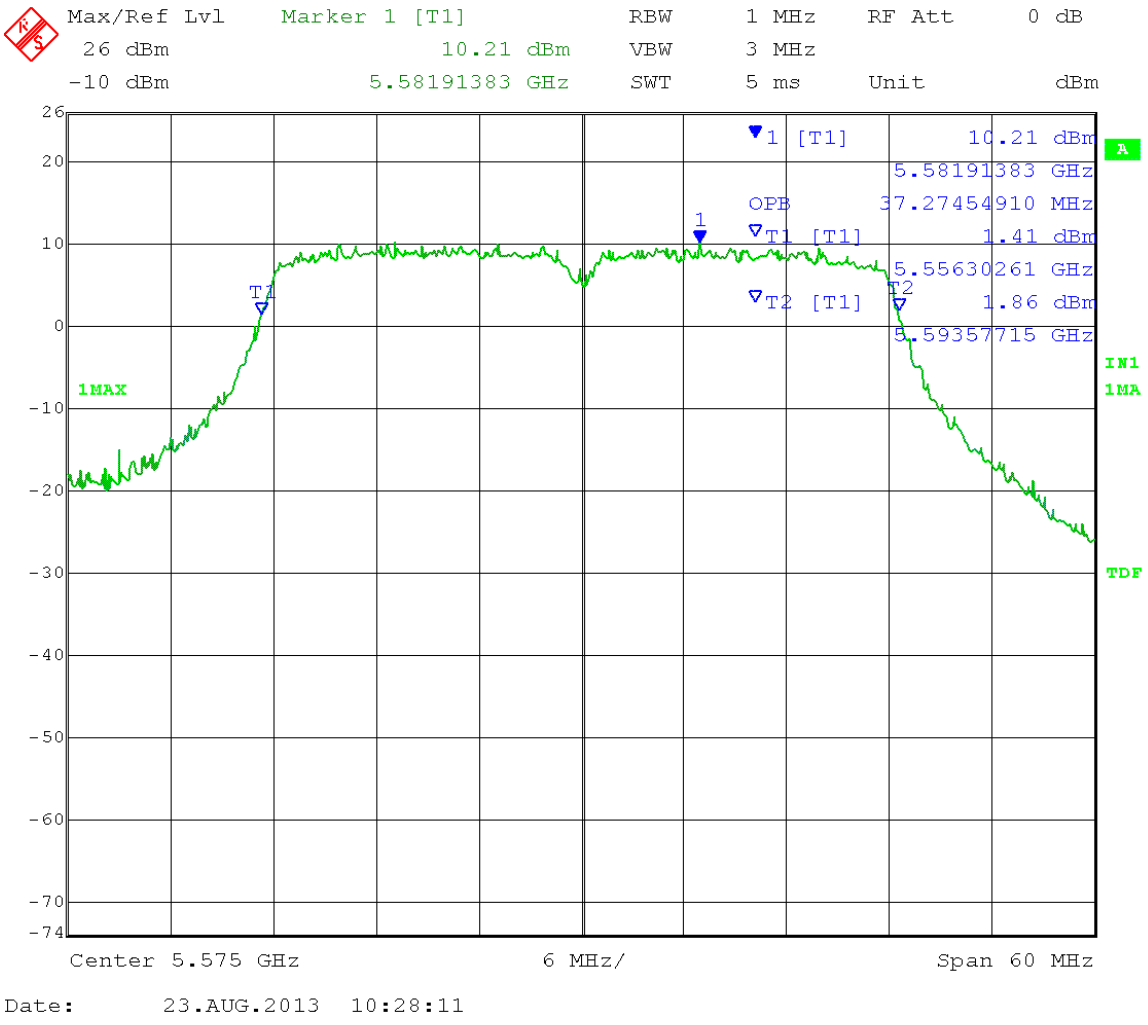
Channel 0:

99% OBW = 37.15MHz



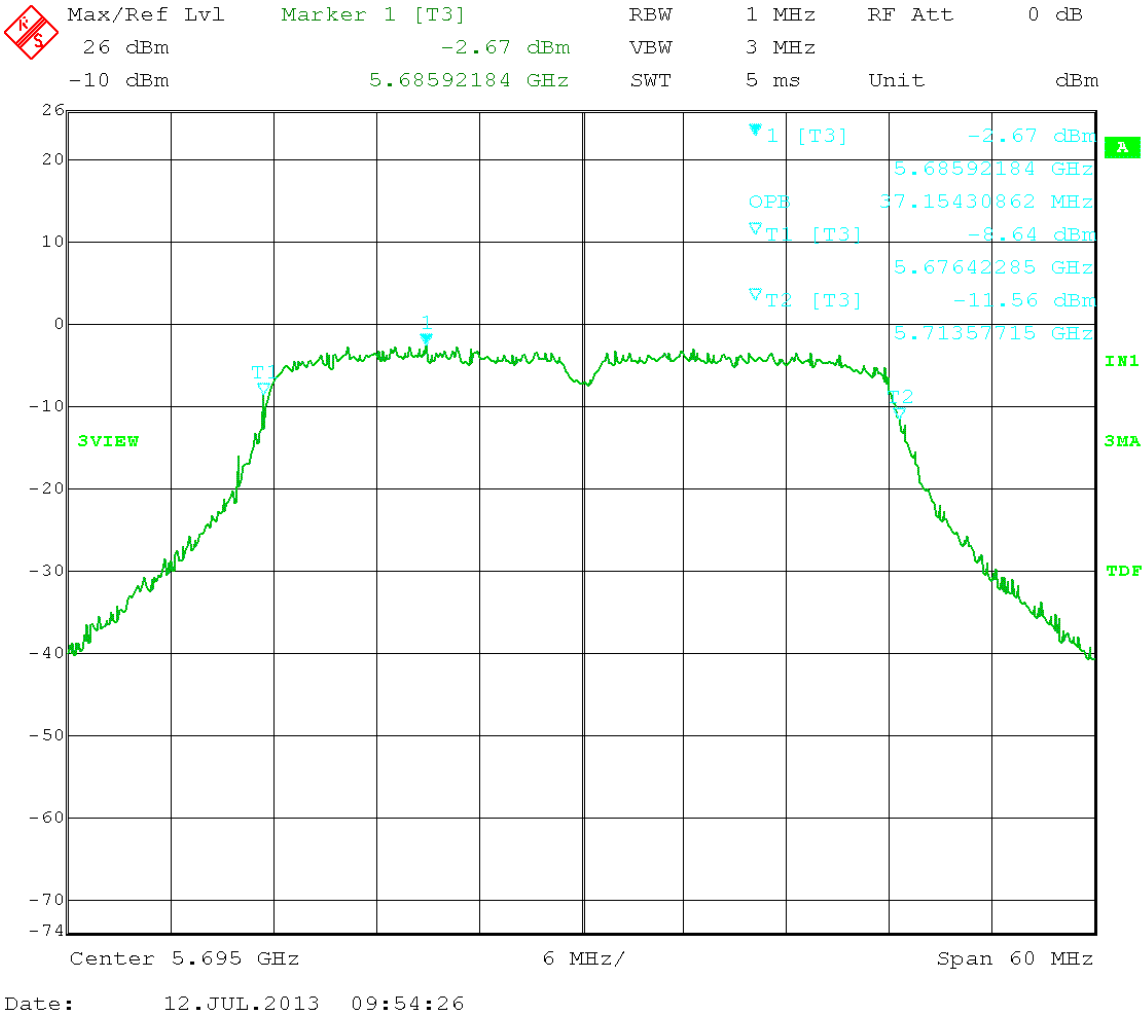
Channel 1:

99% OBW = 37.27MHz



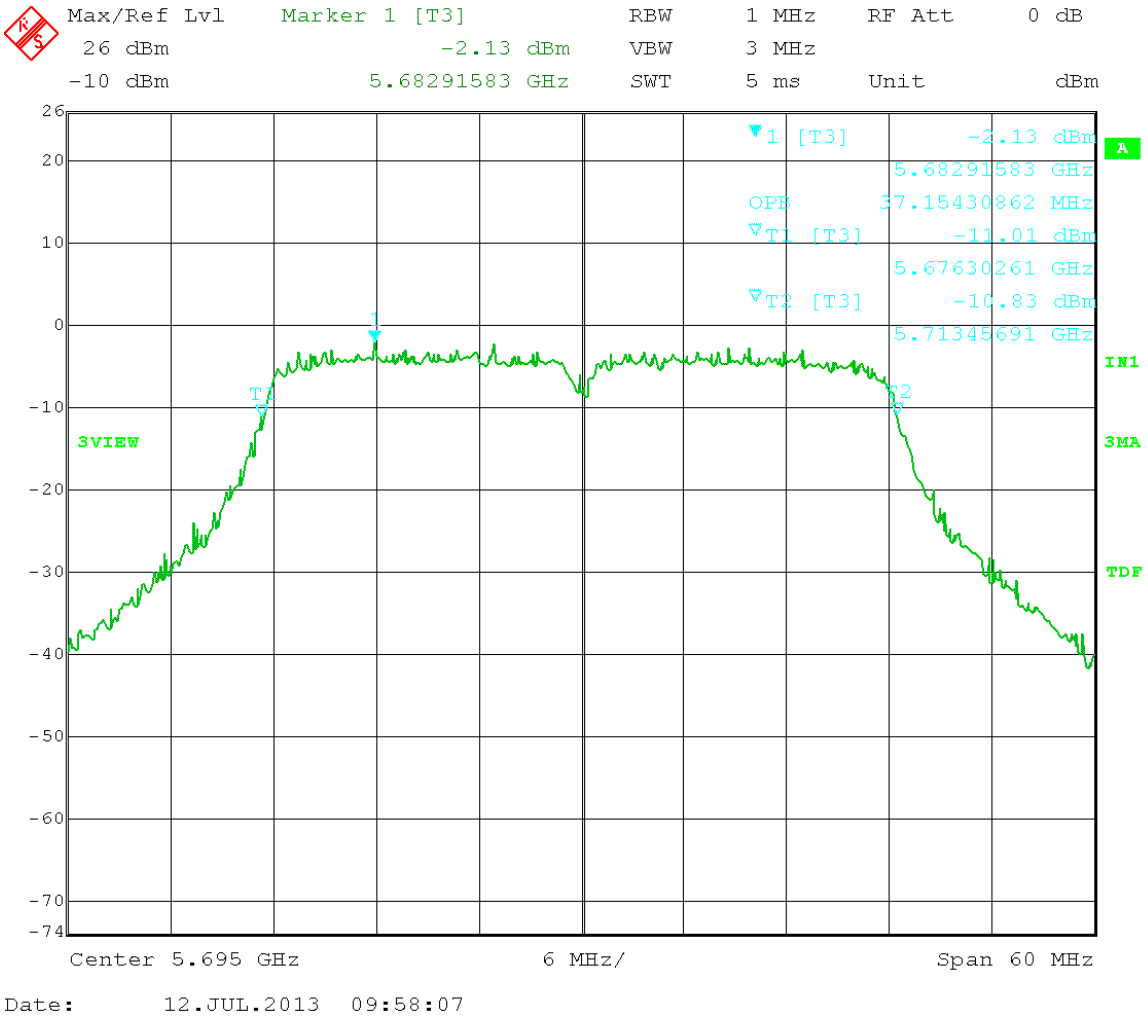
Test Date:	07-12-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	99% Occupied Bandwidth - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	D) 99% Occupied Bandwidth - Page 4
	RBW = 1 MHz — VBW = 3 MHz
	Detector = Peak — Trace = Max Hold
	High Channel: Transmit = 5.695 GHz — 40MHz BW
	Output power setting: 2 — Channel 0

99% OBW = 37.15MHz



Test Date:	07-12-2013
Company:	Cambium Networks
EUT:	Avenger AP 5.4GHz OFDM - ESN# 000456C005DE
Test:	99% Occupied Bandwidth - Conducted
Operator:	Lillian Li
Comment:	FCC UNII operating under 15.407 – OET 4/8/2013
	D) 99% Occupied Bandwidth - Page 4
	RBW = 1 MHz — VBW = 3 MHz
	Detector = Peak — Trace = Max Hold
	High Channel: Transmit = 5.695 GHz — 40MHz BW
	Output power setting: 2 — Channel 1

99% OBW = 37.15MHz



Appendix B – Measurement Data

B4.0 Maximum Conducted Output Power

Rule Section: Section 15.407(a)(2)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section E(3)(a) Method PM (Measurement using an RF average power meter): Measurements performed using a wideband RF power meter with a thermocouple detector

Description: Measure the average power of the transmitter
Add 10 log (1/x), where x is the duty cycle, to the measured power
Add 10 log(N), where N is the number of outputs, for MIMO operation (according to FCC KDB 662911)

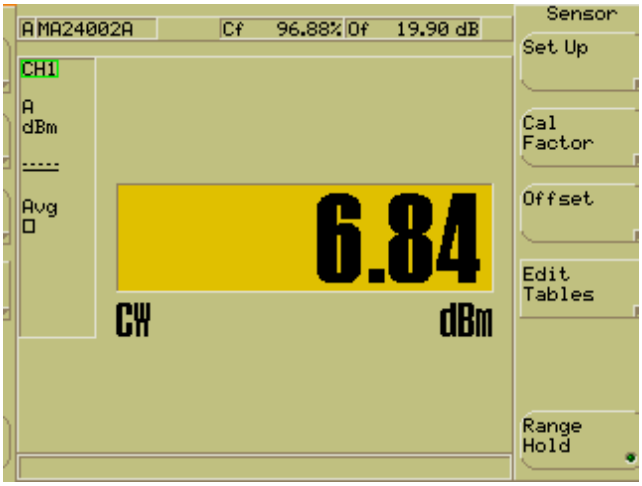
Limit: Lesser of: 250 mW (24 dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in MHz.
Limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

Results: Passed

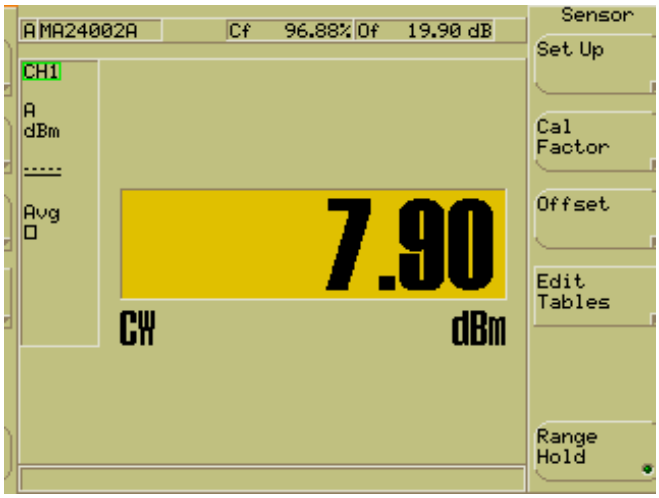
Notes: Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz OFDM - ESN# 000456C005DE
Test: Maximum conducted output power – Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
E)3) Measurement using a power meter(PM) - Page 8
Limit: [15.407(a)(2)]: 24.0 dBm conducted.
Operating Mode: Point-to-Multipoint; Antenna Gain = 16 dBi
EUT Limit: 24-(16-6) = 14 dBm
Low Channel: Transmit = 5.495 GHz 20MHz BW
Output power setting: 7

Ch 0:
Maximum conducted output power = 6.84dBm + 3 dB (MIMO)
= 9.84dBm < 14dBm = Pass

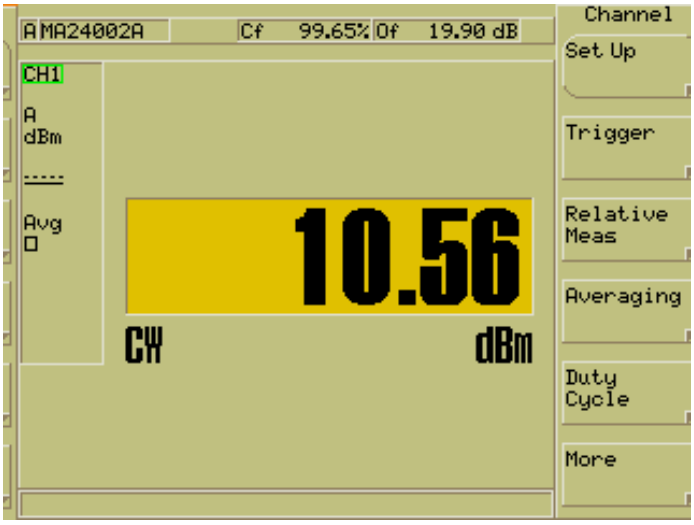


Ch 1:
Maximum conducted output power = 7.90dBm + 3 dB (MIMO)
= 10.90dBm < 14dBm = Pass

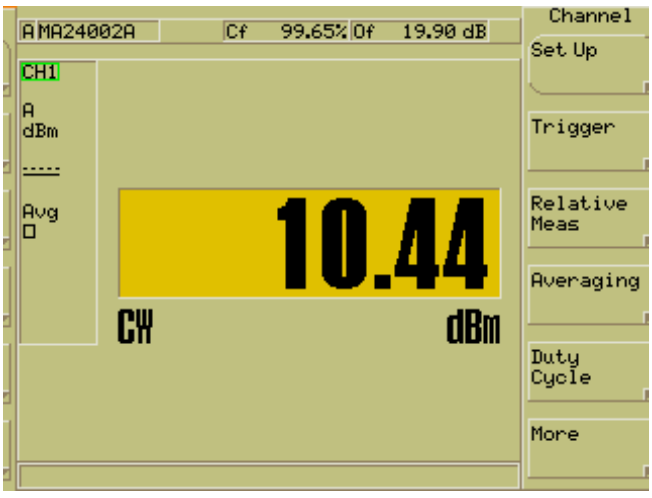


Test Date: 8-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz OFDM - ESN# 000456C005DE
Test: Maximum conducted output power – Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
E)3) Measurement using a power meter(PM) - Page 8
Limit: [15.407(a)(2)]: 24.0 dBm conducted.
Operating Mode: Point-to-Multipoint; Antenna Gain = 16 dBi
EUT Limit: 24-(16-6) = 14 dBm
Mid Channel: Transmit = 5.575 GHz 20MHz BW
Output power setting: 11

Ch 0:
Maximum conducted output power = 10.56dBm + 3 dB (MIMO)
= 13.56dBm < 14dBm = Pass

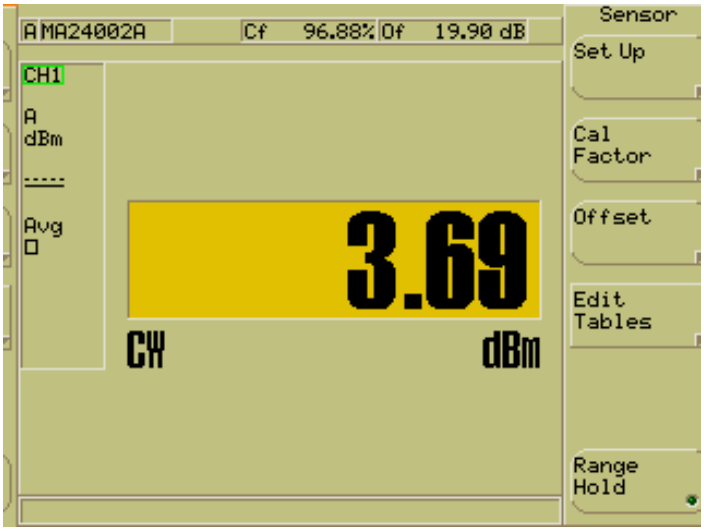


Ch 1:
Maximum conducted output power = 10.44dBm + 3 dB (MIMO)
= 13.44dBm < 14dBm = Pass

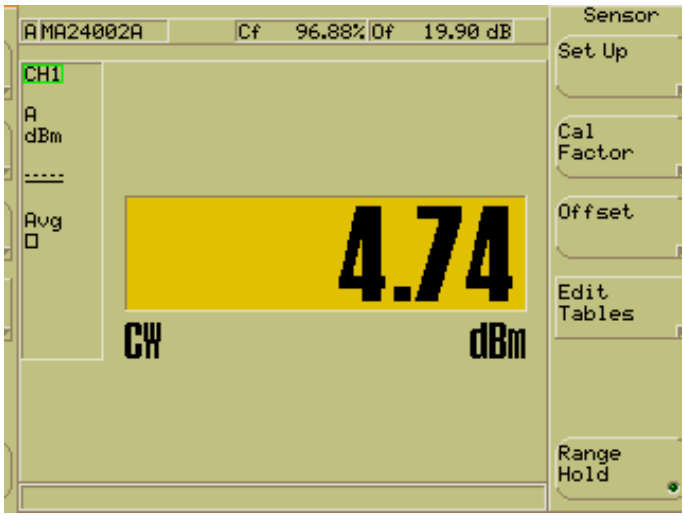


Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz OFDM - ESN# 000456C005DE
Test: Maximum conducted output power – Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
E)3) Measurement using a power meter(PM) - Page 8
Limit: [15.407(a)(2)]: 24.0 dBm conducted.
Operating Mode: Point-to-Multipoint; Antenna Gain = 16 dBi
EUT Limit: 24-(16-6) = 14 dBm
High Channel: Transmit = 5.705 GHz 20MHz BW
Output power setting: 5

Ch 0:
Maximum conducted output power = 3.69dBm + 3 dB (MIMO)
= 6.69dBm < 14dBm = Pass

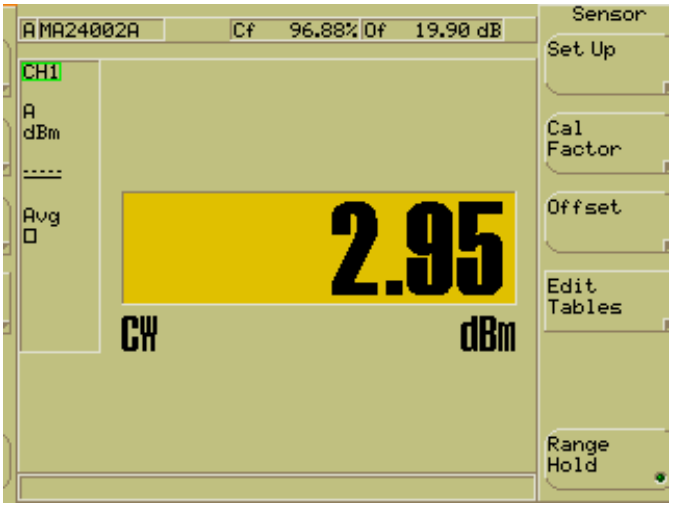


Ch 1:
Maximum conducted output power = 4.74dBm + 3 dB (MIMO)
= 7.74dBm < 14dBm = Pass

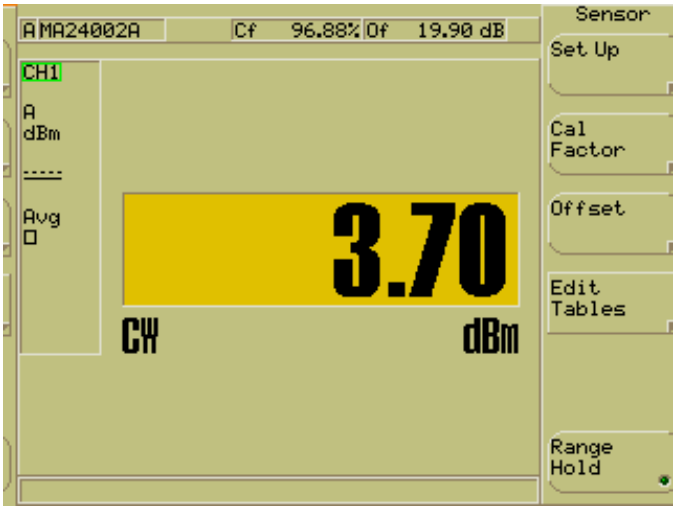


Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz OFDM - ESN# 000456C005DE
Test: Maximum conducted output power – Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
E)3) Measurement using a power meter(PM) - Page 8
Limit: [15.407(a)(2)]: 24.0 dBm conducted.
Operating Mode: Point-to-Multipoint; Antenna Gain = 16 dBi
EUT Limit: 24-(16-6) = 14 dBm
Low Channel: Transmit = 5.510 GHz 40MHz BW
Output power setting: 4

Ch 0:
Maximum conducted output power = 2.95dBm + 3 dB (MIMO)
= 5.95 dBm < 14dBm = Pass

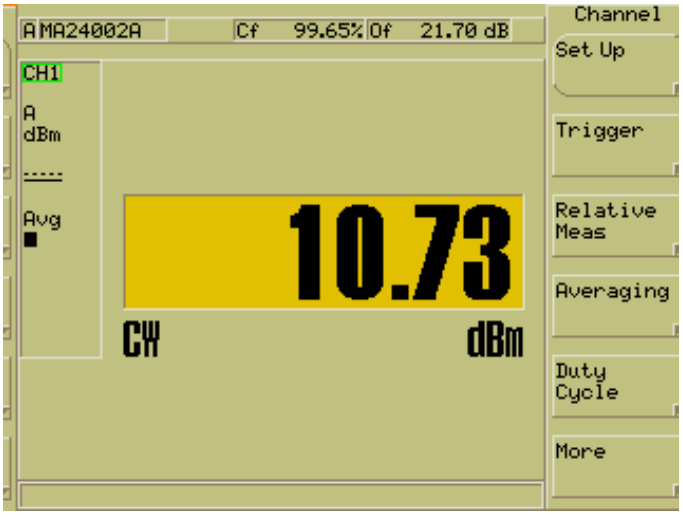


Ch 1:
Maximum conducted output power = 3.70dBm + 3 dB (MIMO)
= 6.70dBm < 14dBm = Pass

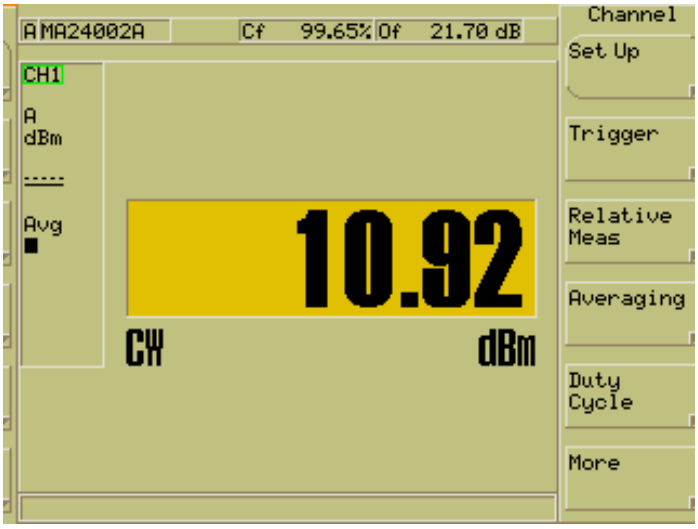


Test Date: 8-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz OFDM - ESN# 000456C005DE
Test: Maximum conducted output power – Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
E)3) Measurement using a power meter(PM) - Page 8
Limit: [15.407(a)(2)]: 24.0 dBm conducted.
Operating Mode: Point-to-Multipoint; Antenna Gain = 16 dBi
EUT Limit: 24-(16-6) = 14 dBm
Mid Channel: Transmit = 5.575 GHz 40MHz BW
Output power setting: 11

Ch 0:
Maximum conducted output power = 10.73dBm + 3 dB (MIMO)
= 13.73 dBm < 14dBm = Pass

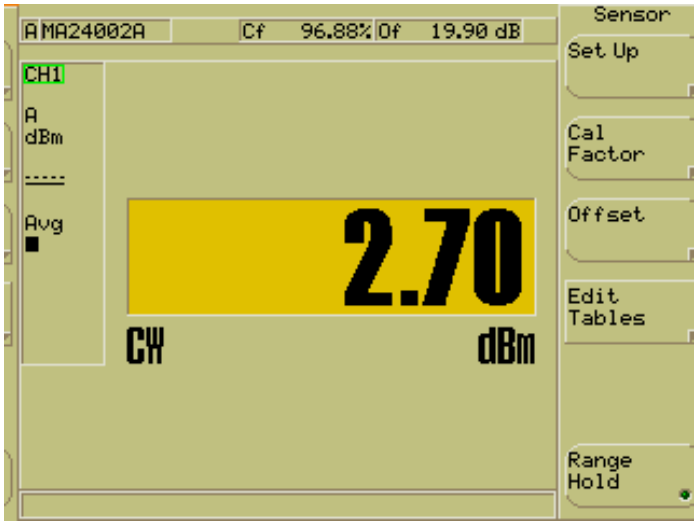


Ch 1:
Maximum conducted output power = 10.92dBm + 3 dB (MIMO)
= 13.92dBm < 14dBm = Pass

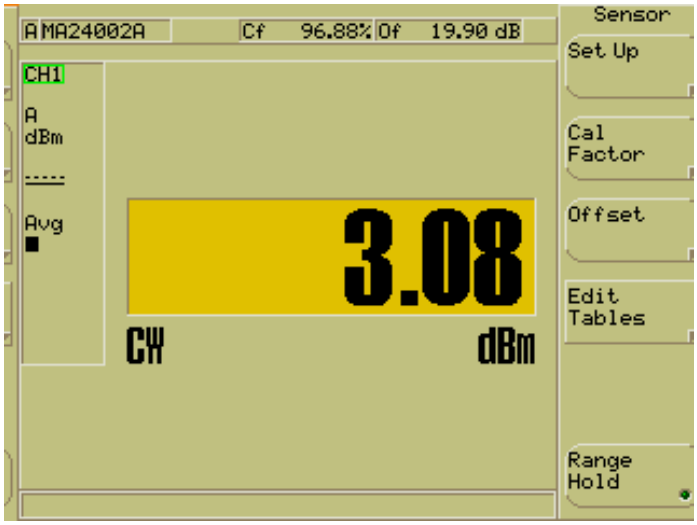


Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz OFDM - ESN# 000456C005DE
Test: Maximum conducted output power – Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
E)3) Measurement using a power meter(PM) - Page 8
Limit: [15.407(a)(2)]: 24.0 dBm conducted.
Operating Mode: Point-to-Multipoint; Antenna Gain = 16 dBi
EUT Limit: 24-(16-6) = 14 dBm
High Channel: Transmit = 5.695 GHz 40MHz BW
Output power setting: 2

Ch 0:
Maximum conducted output power = 2.70dBm + 3 dB (MIMO)
= 5.70 dBm < 14dBm = Pass



Ch 1:
Maximum conducted output power = 3.08dBm + 3 dB (MIMO)
= 6.08dBm < 14dBm = Pass



Appendix B – Measurement Data

B5.0 Peak Power Spectral Density – Conducted

Rule Section: Section 15.407(a)(2)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section F – Peak power spectral density (PPSD)
Using method E(2)(b) SA-1 for power spectrum

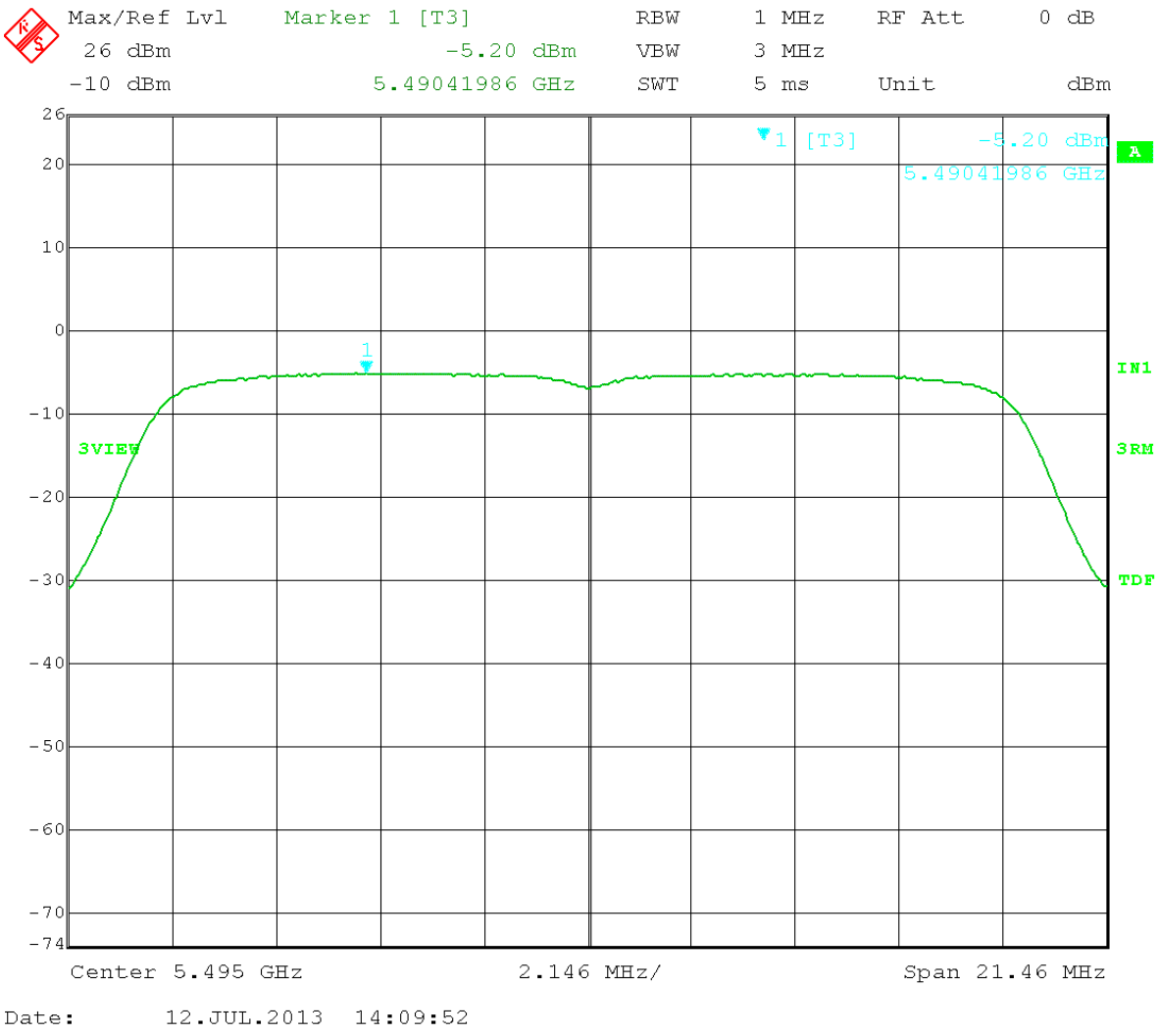
Description: SPAN: set to encompass entire emission bandwidth
RBW = 1 MHz
VBW ≥ 3 MHz
Number of points ≥ 2 x Span/RBW
Sweep time: auto
Detector = RMS
Sweep: trace average 200 sweeps in RMS mode
Use peak search to find the peak of the spectrum

Limit: 11 dBm in any 1 MHz band
Limit shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

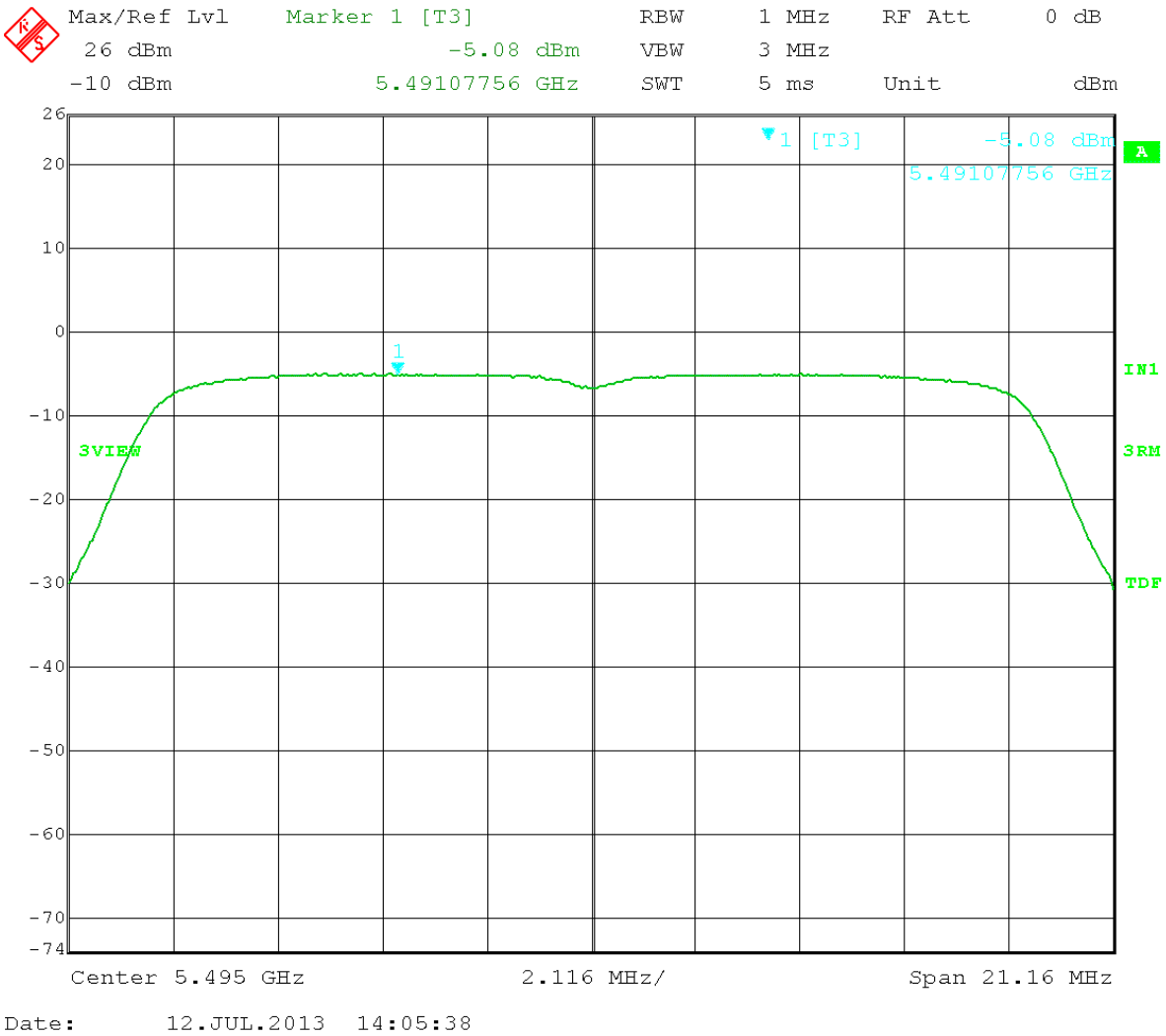
Results: Passed

Notes: Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
Low Channel: Transmit = 5.495GHz 20MHz BW
Output power setting: 7 Channel 0
26 dB Emission Bandwidth = 21.46MHz
PPSD = -5.20dBm < -2 dBm = Pass



Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
Low Channel: Transmit = 5.495GHz 20MHz BW
Output power setting: 7 Channel 1
26 dB Emission Bandwidth = 21.16MHz
PPSD = -5.08 dBm < -2 dBm = Pass

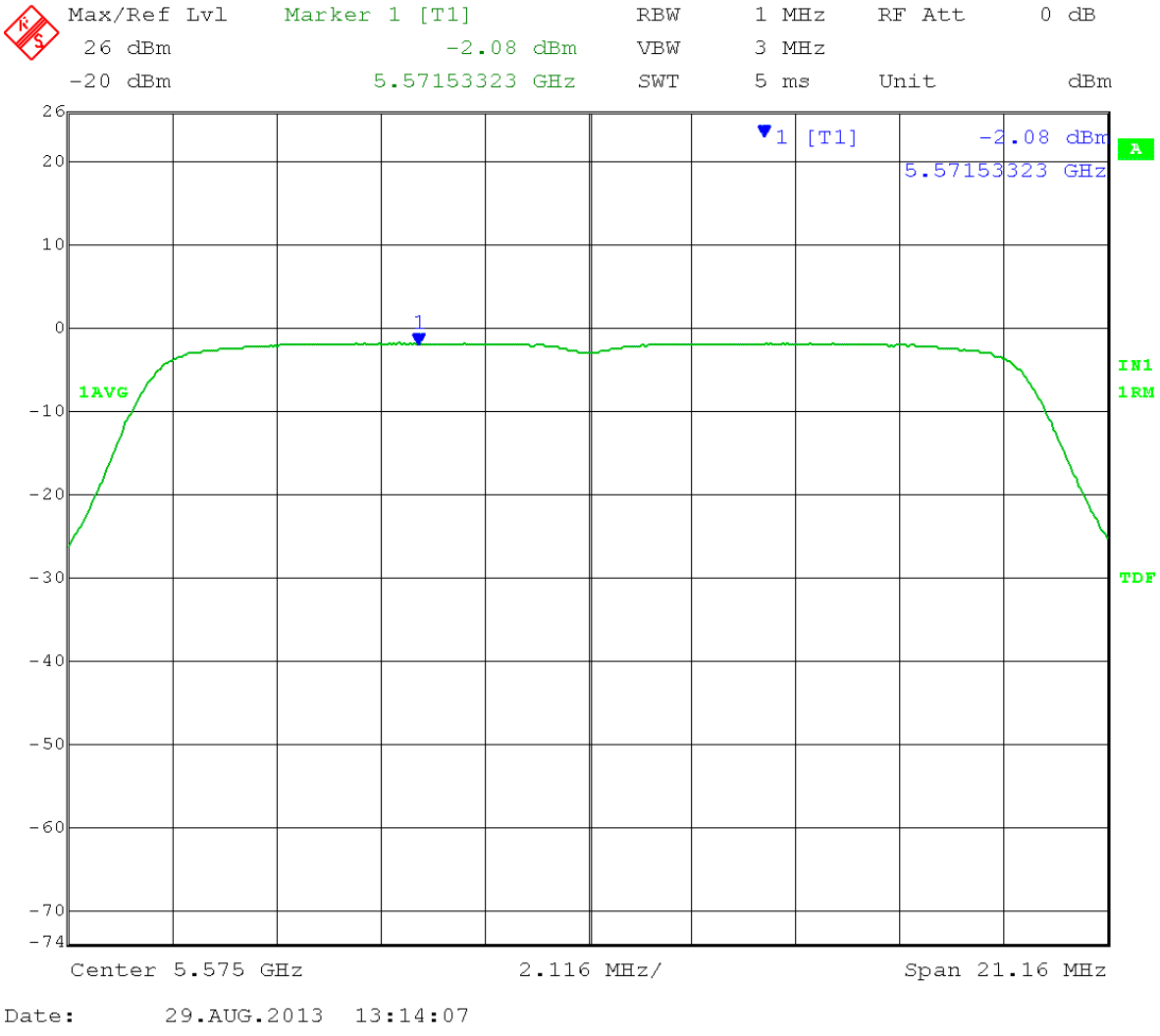


Date: 12.JUL.2013 14:05:38

Test Date: 8-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
Mid Channel: Transmit = 5.575GHz 20MHz BW
Output power setting: 11

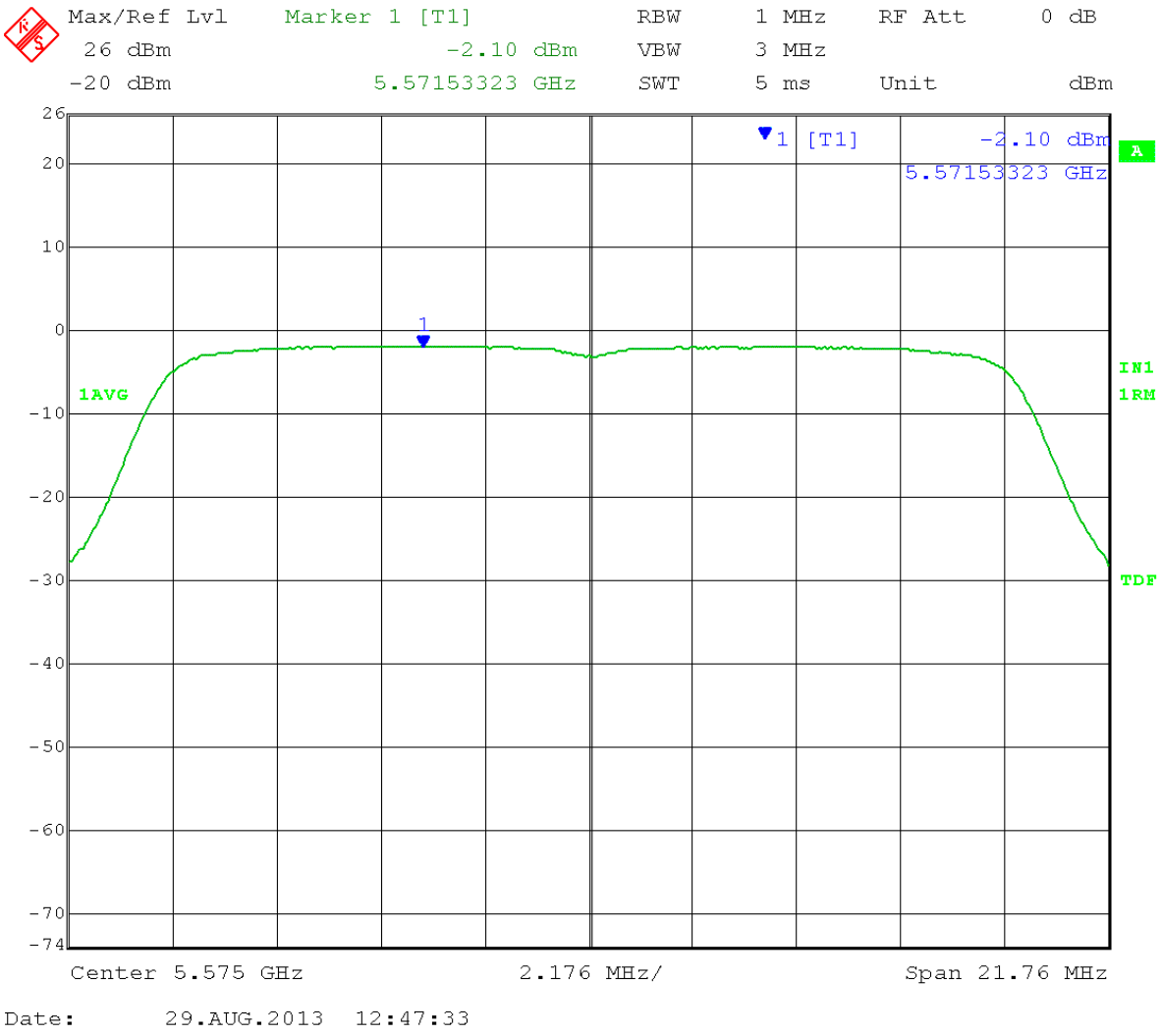
Channel 0:

26 dB Emission Bandwidth = 21.16MHz
Output Power =10.56 dBm
PPSD = -2.08dBm < -2 dBm = Pass

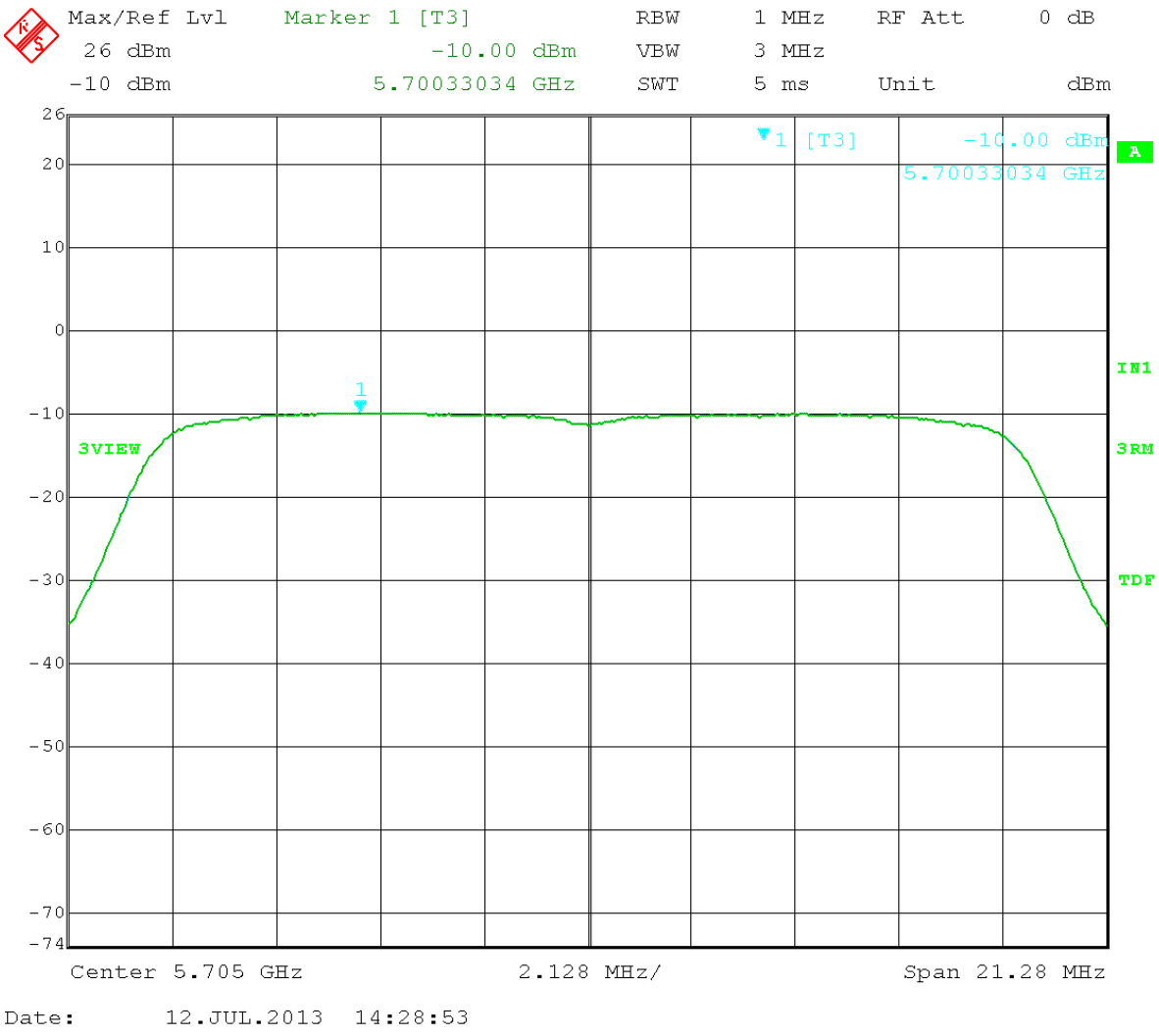


Channel 1

26 dB Emission Bandwidth = 21.76MHz
Output Power =10.44 dBm
PPSD = -2.10 dBm < -2 dBm = Pass

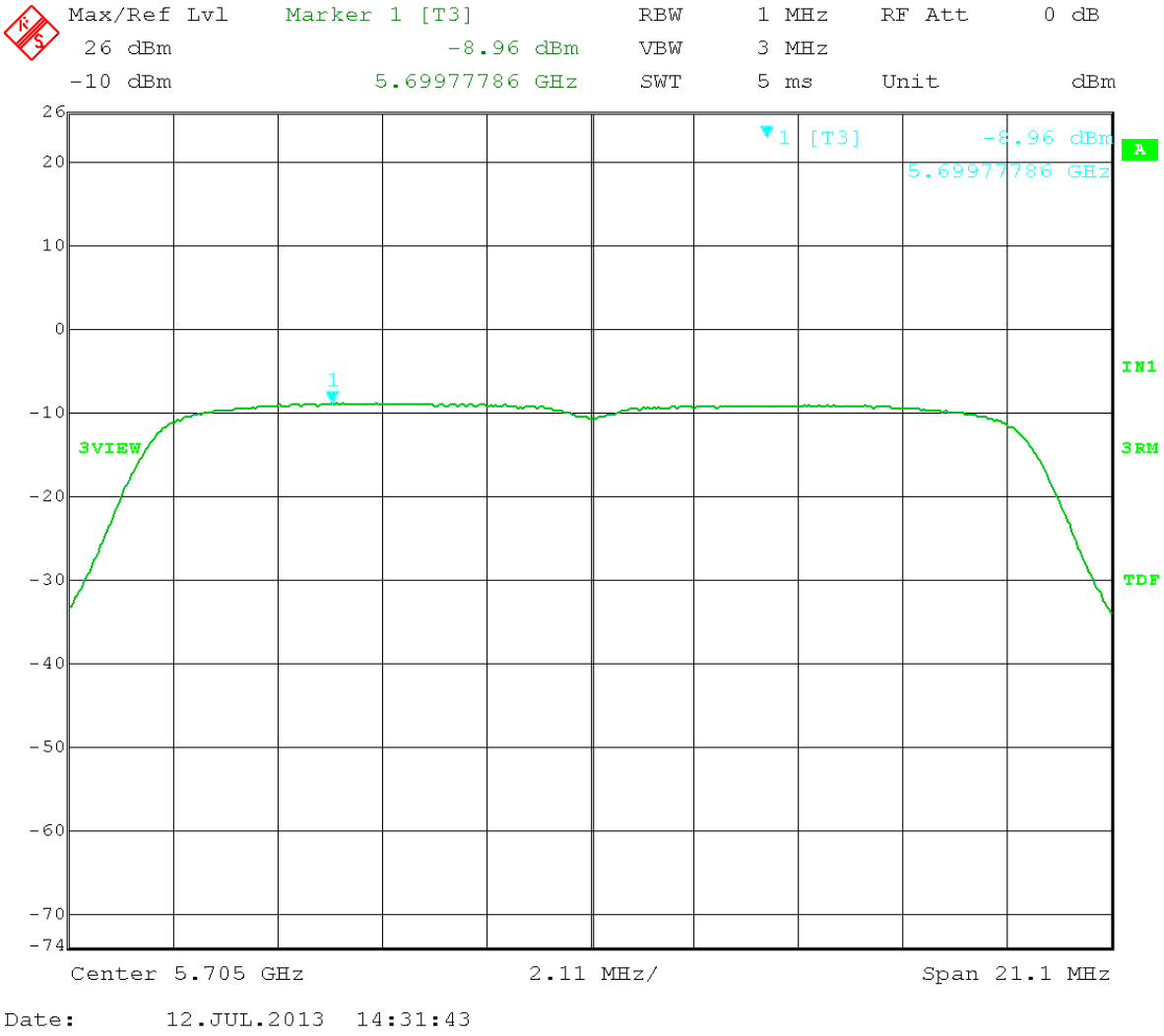


Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
High Channel: Transmit = 5.705GHz 20MHz BW
Output power setting: 5 Channel 0
26 dB Emission Bandwidth = 21.28MHz
PPSD = -10.00dBm < -2 dBm = Pass



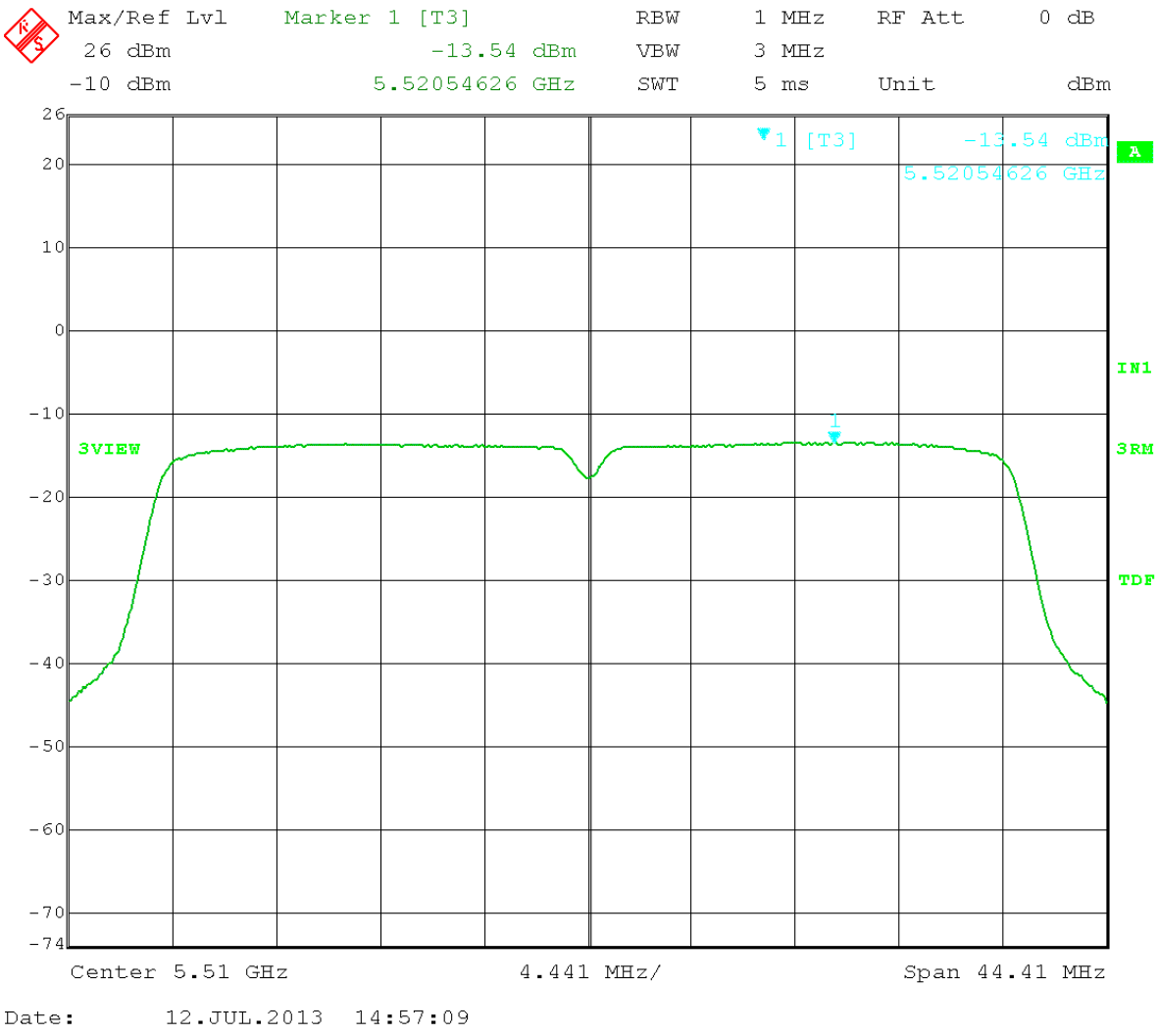
Date: 12.JUL.2013 14:28:53

Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
High Channel: Transmit = 5.705GHz 20MHz BW
Output power setting: 5 Channel 1
26 dB Emission Bandwidth = 21.10MHz
PPSD = -8.96 dBm < -2 dBm = Pass

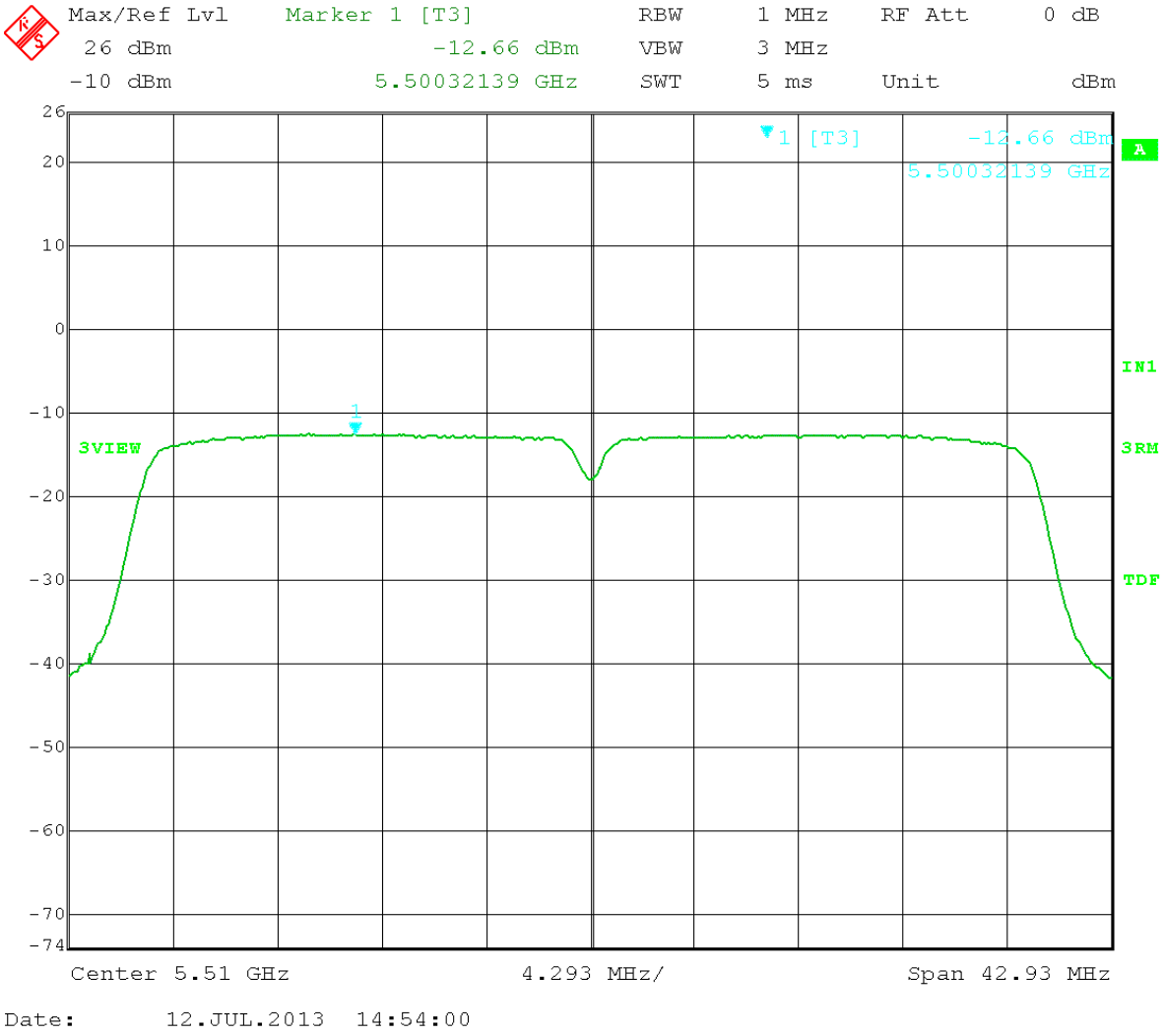


Date: 12.JUL.2013 14:31:43

Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
Low Channel: Transmit = 5.510GHz 40MHz BW
Output power setting: 4 Channel 0
26 dB Emission Bandwidth = 44.41MHz
PPSD = -13.54dBm < -2 dBm = Pass



Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
Low Channel: Transmit = 5.510GHz 40MHz BW
Output power setting: 4 Channel 1
26 dB Emission Bandwidth = 42.93MHz
PPSD = -12.66 dBm < -2 dBm = Pass

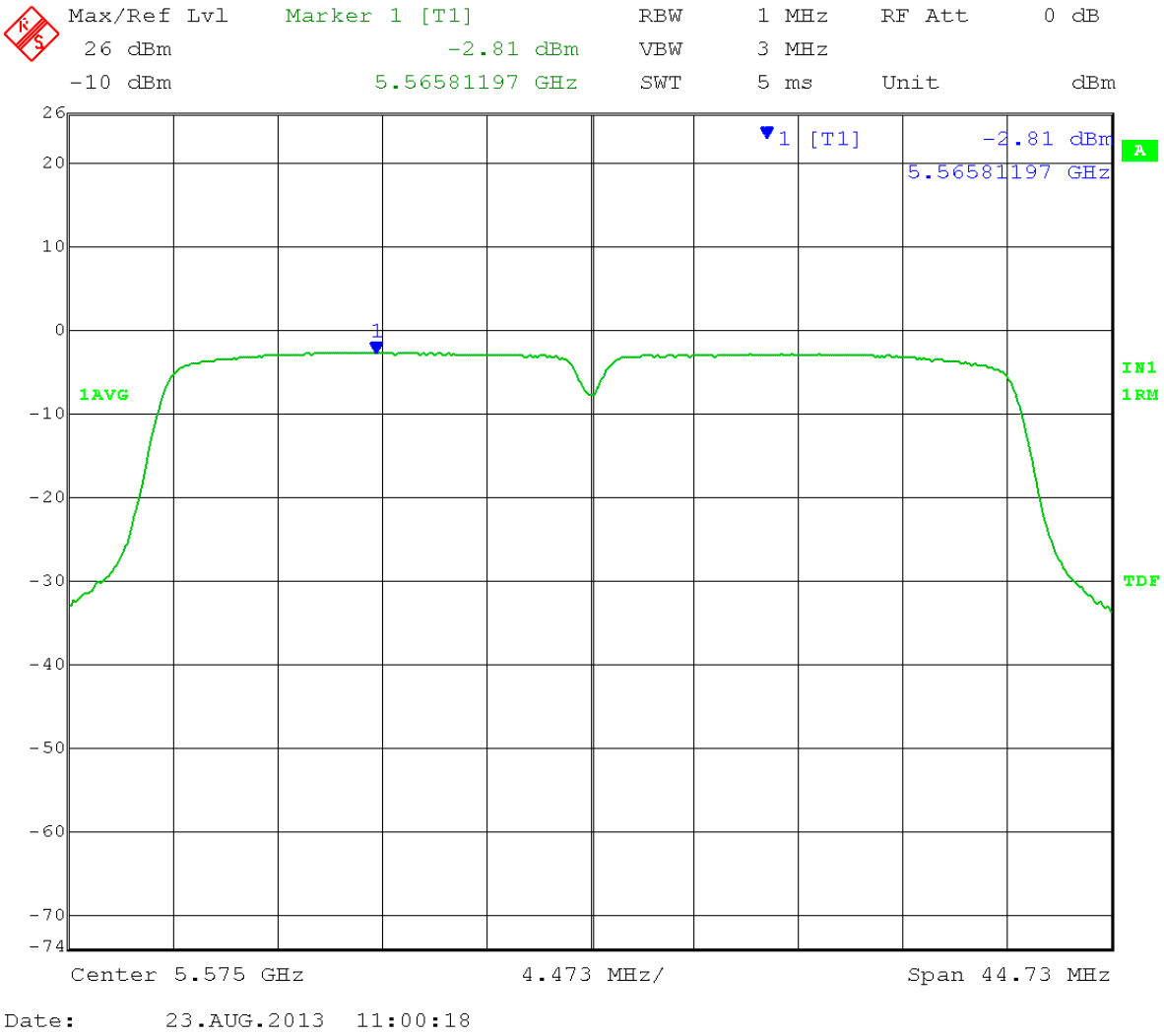


Date: 12.JUL.2013 14:54:00

Test Date: 8-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
Mid Channel: Transmit = 5.575GHz 40MHz BW
Output power setting: 14

Channel 0:

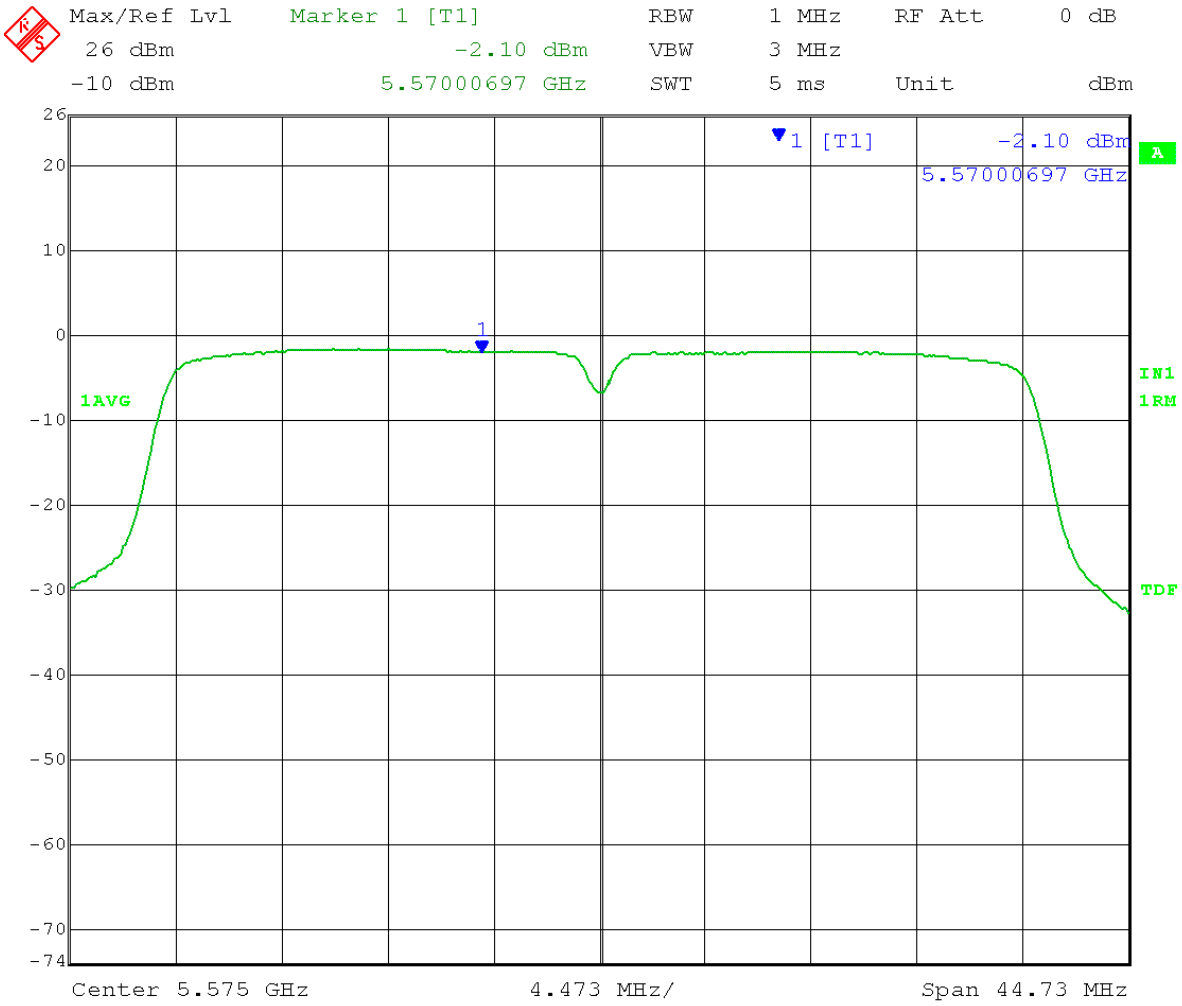
26 dB Emission Bandwidth = 44.73MHz
PPSD = -2.81dBm < -2 dBm = Pass



Date: 23.AUG.2013 11:00:18

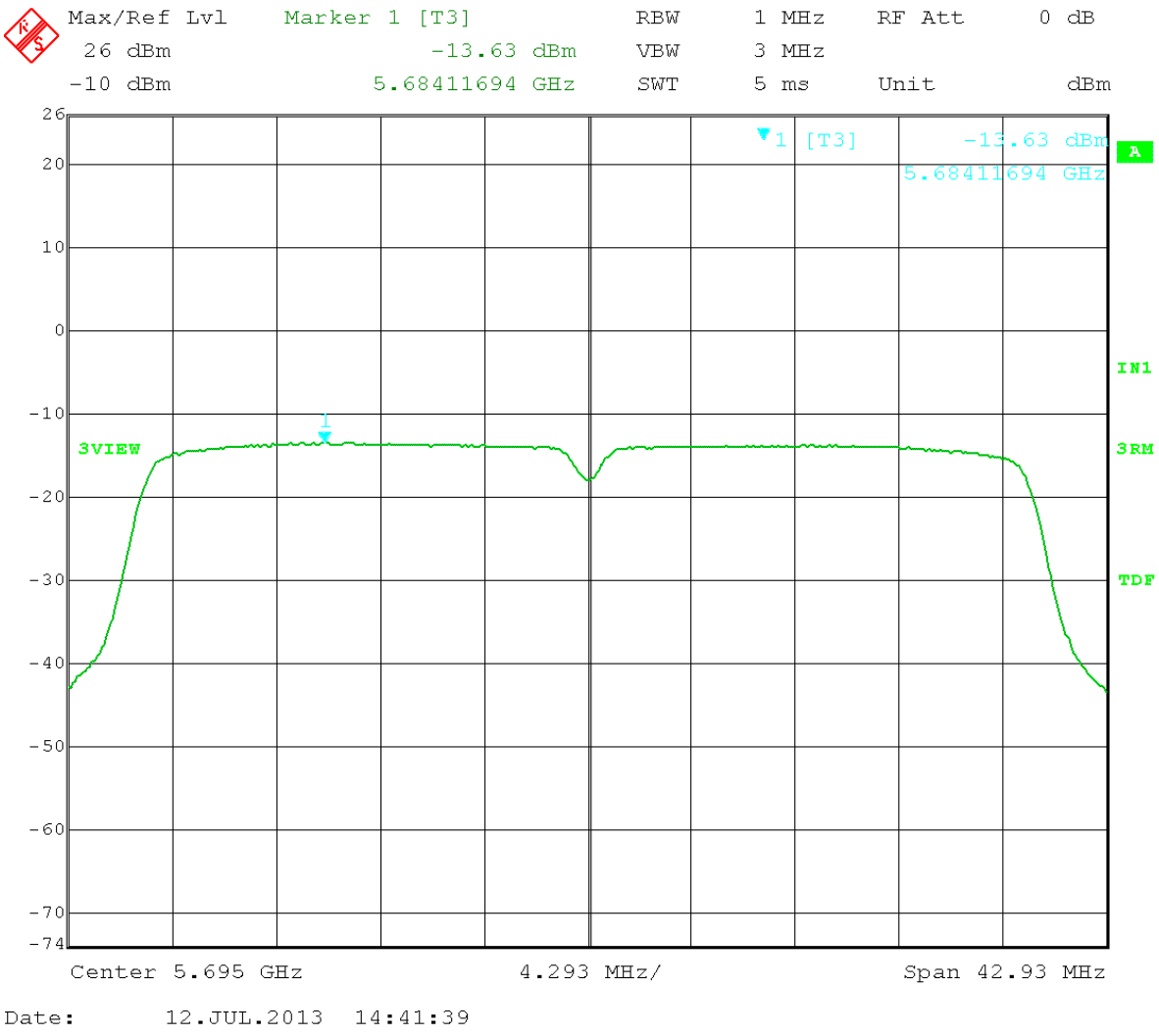
Channel 1:

26 dB Emission Bandwidth = 44.73MHz
PPSD = -2.10 dBm < -2 dBm = Pass

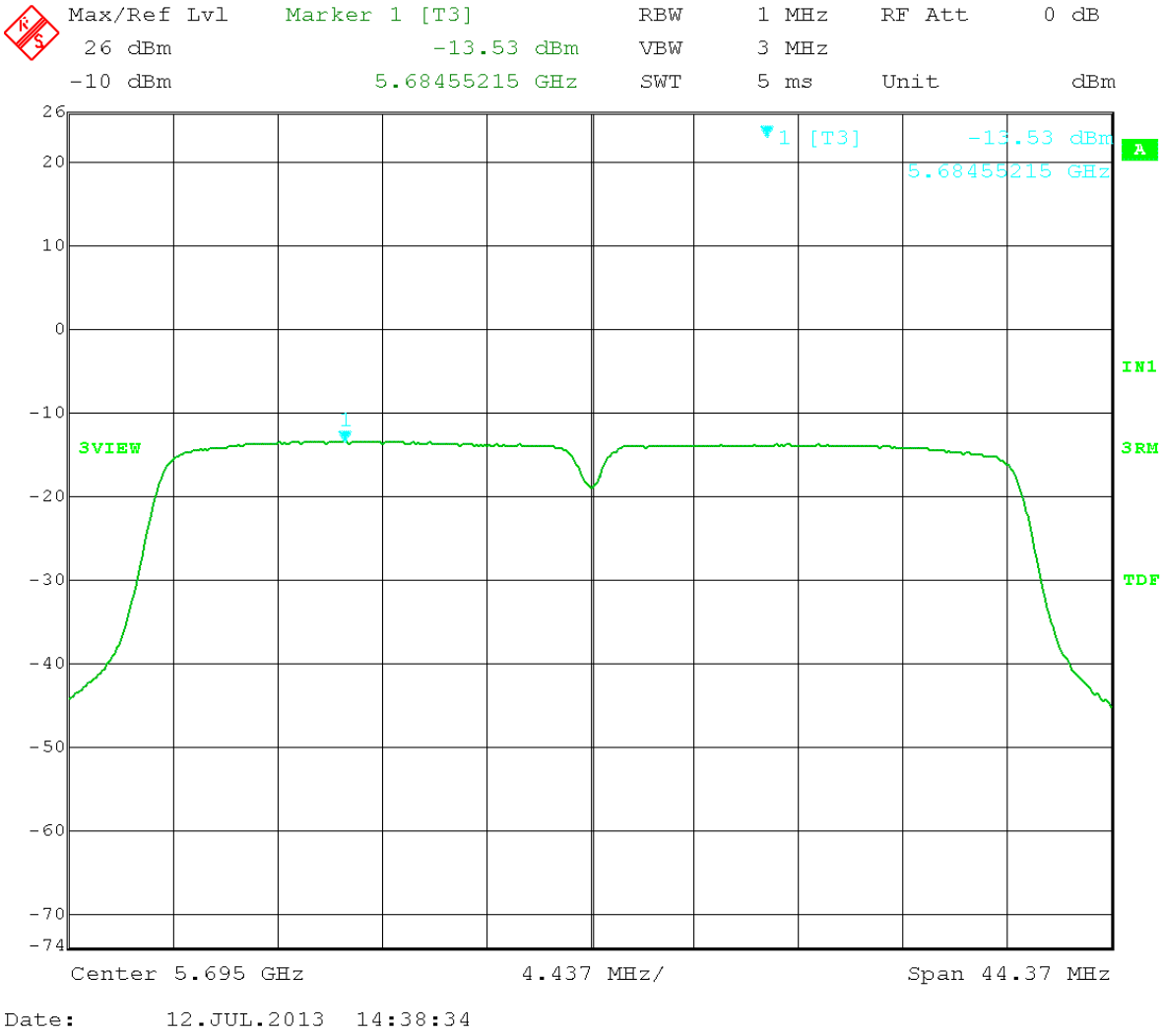


Date: 23.AUG.2013 11:20:04

Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
High Channel: Transmit = 5.695GHz 40MHz BW
Output power setting: 2 Channel 0
26 dB Emission Bandwidth = 42.93MHz
PPSD = -13.63dBm < -2 dBm = Pass



Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak Power Spectral Density - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
F) PPSD – Page 9
Limit:[15.407(a)(2)]: 11 – [16(antenna gain)+3(MIMO)-6]= -2dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = RMS Trace = AVG
Sweep Time = Auto Sweep counts = 200
High Channel: Transmit = 5.695GHz 40MHz BW
Output power setting: 2 Channel 1
26 dB Emission Bandwidth = 44.37MHz
PPSD = -13.53 dBm < -2 dBm = Pass



Date: 12.JUL.2013 14:38:34

Appendix B – Measurement Data

B6.0 Peak Excursion – Conducted

Rule Section: Section 15.407(a)(6)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section G – Peak excursion measurement

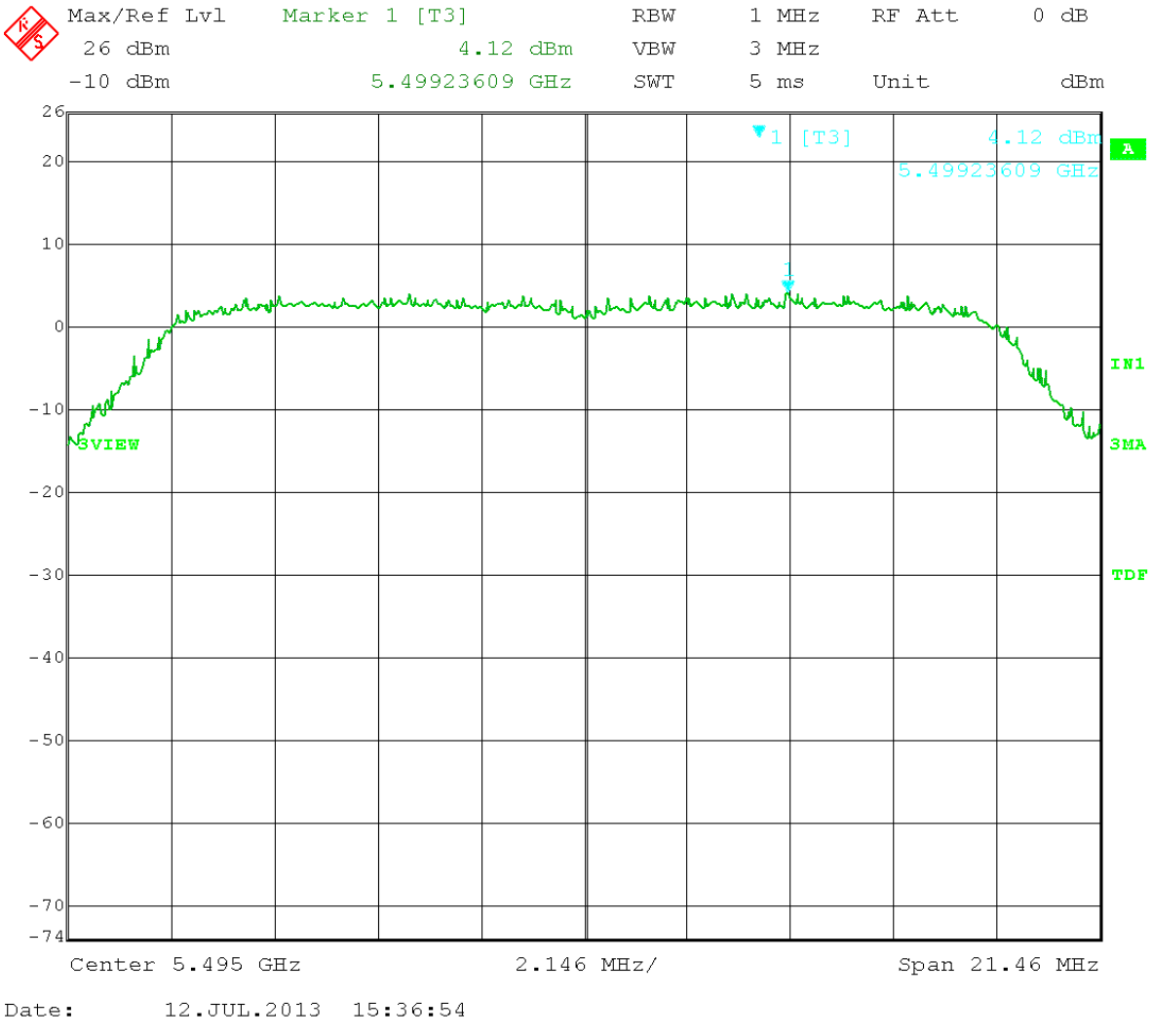
Description: SPAN: set to encompass entire emission bandwidth
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = Peak
Trace mod = max hold
Use peak search to find the peak of the spectrum
Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD

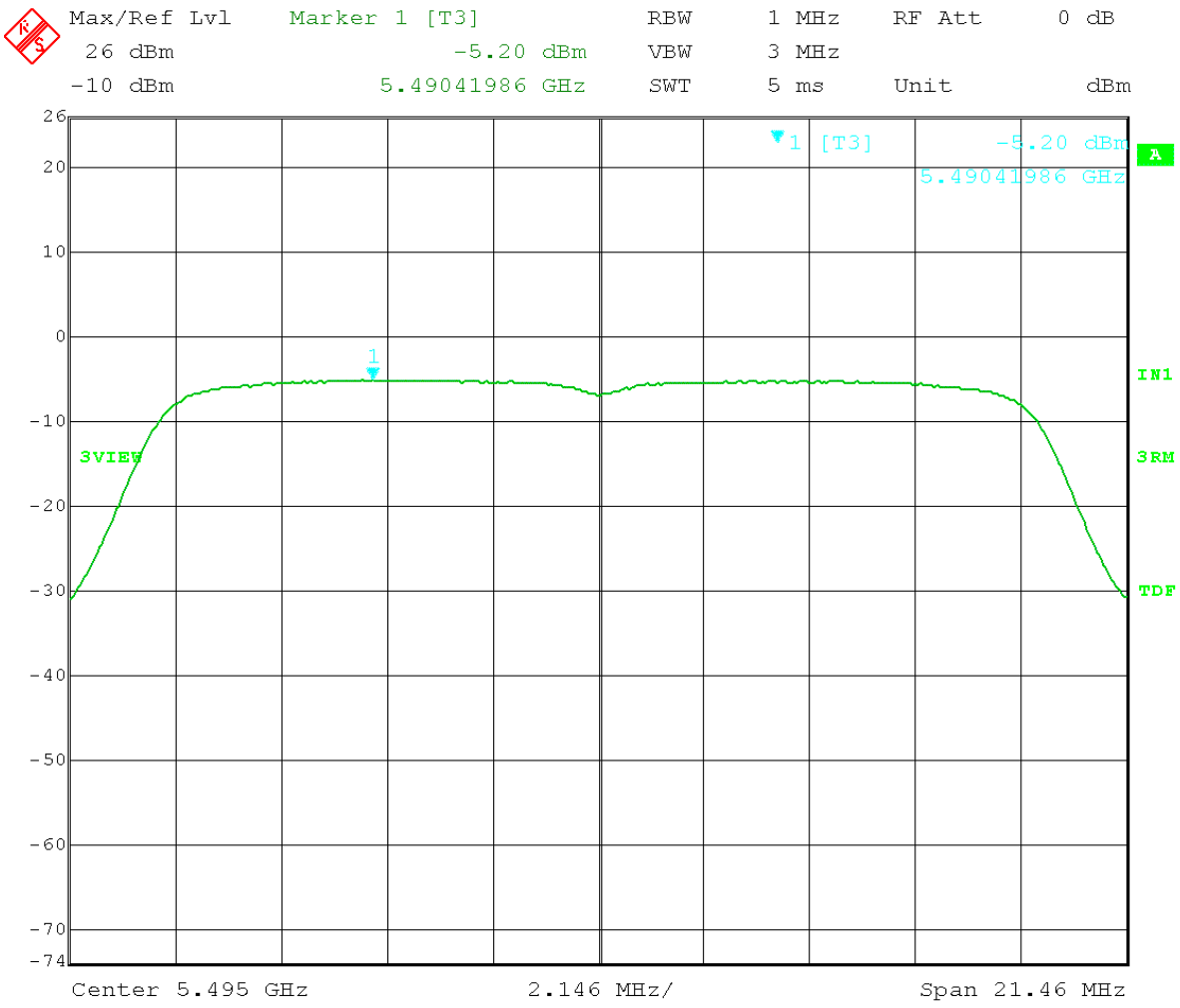
Limit: 13 dB peak-to-average ratio across any 1 MHz bandwidth

Results: Passed

Notes: Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

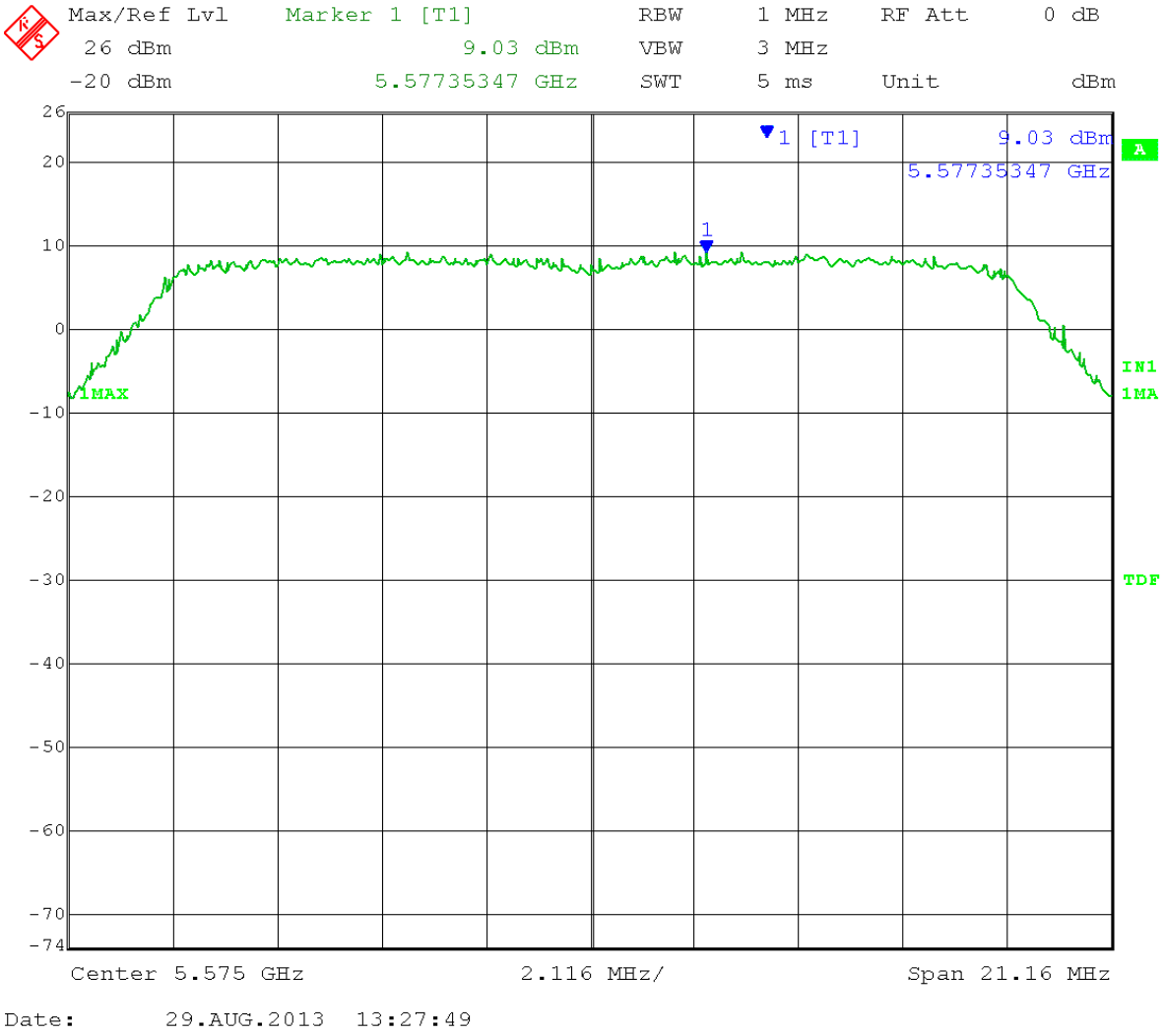
Test Date: 7-12-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak excursion measurement - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
G) PK excursion measurement – Page 9
Limit:[15.407(a)(6)]: 13dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = peak Trace = max-hold
Sweep Time = Auto Output power setting: 7
Low Channel: Transmit = 5.495GHz 20MHz BW
26 dB Emission Bandwidth = 21.46MHz PPSD = -5.20dBm
Peak excursion = 4.12 - (-5.20) = 9.32 dBm <13 dBm = Pass

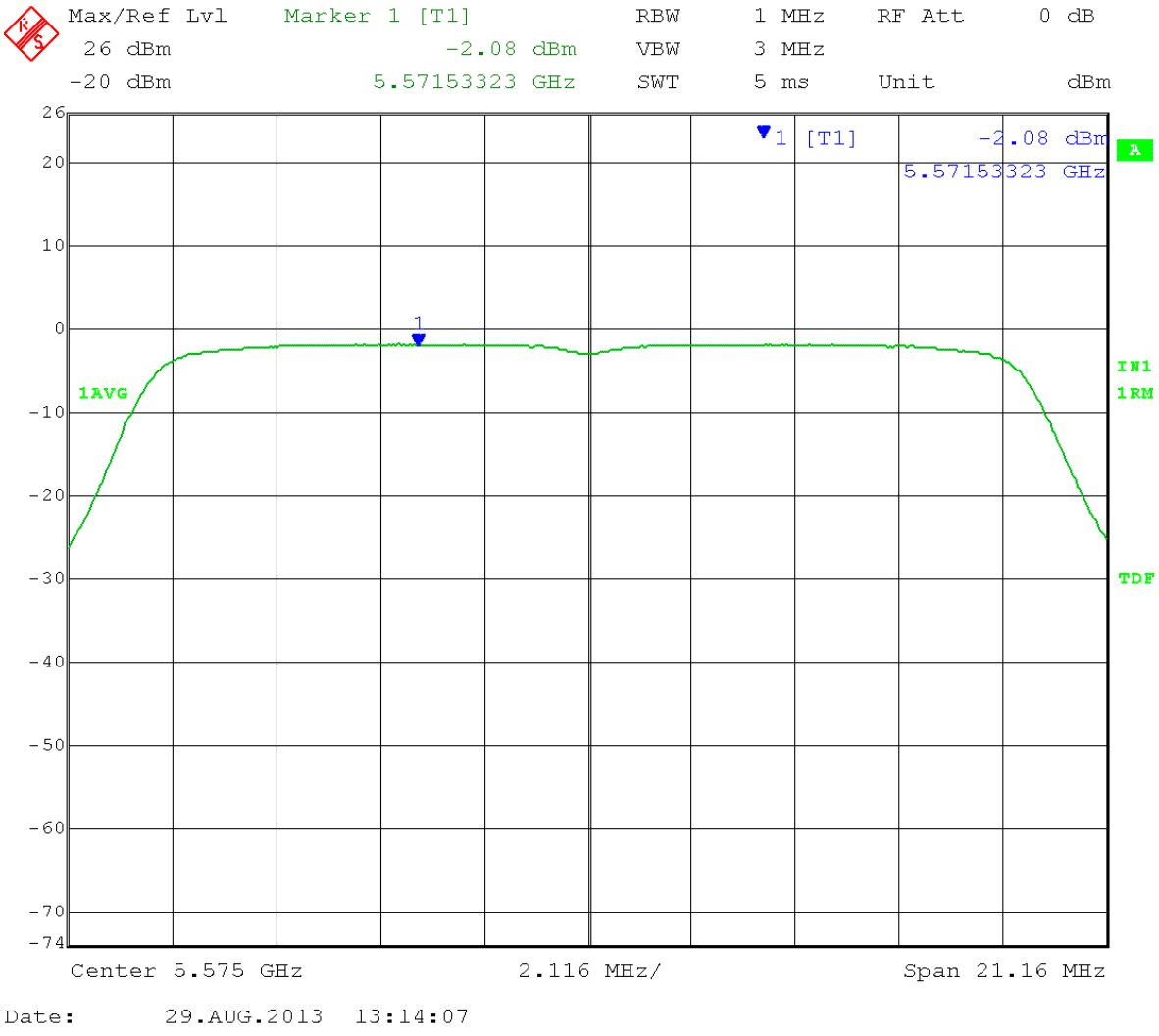




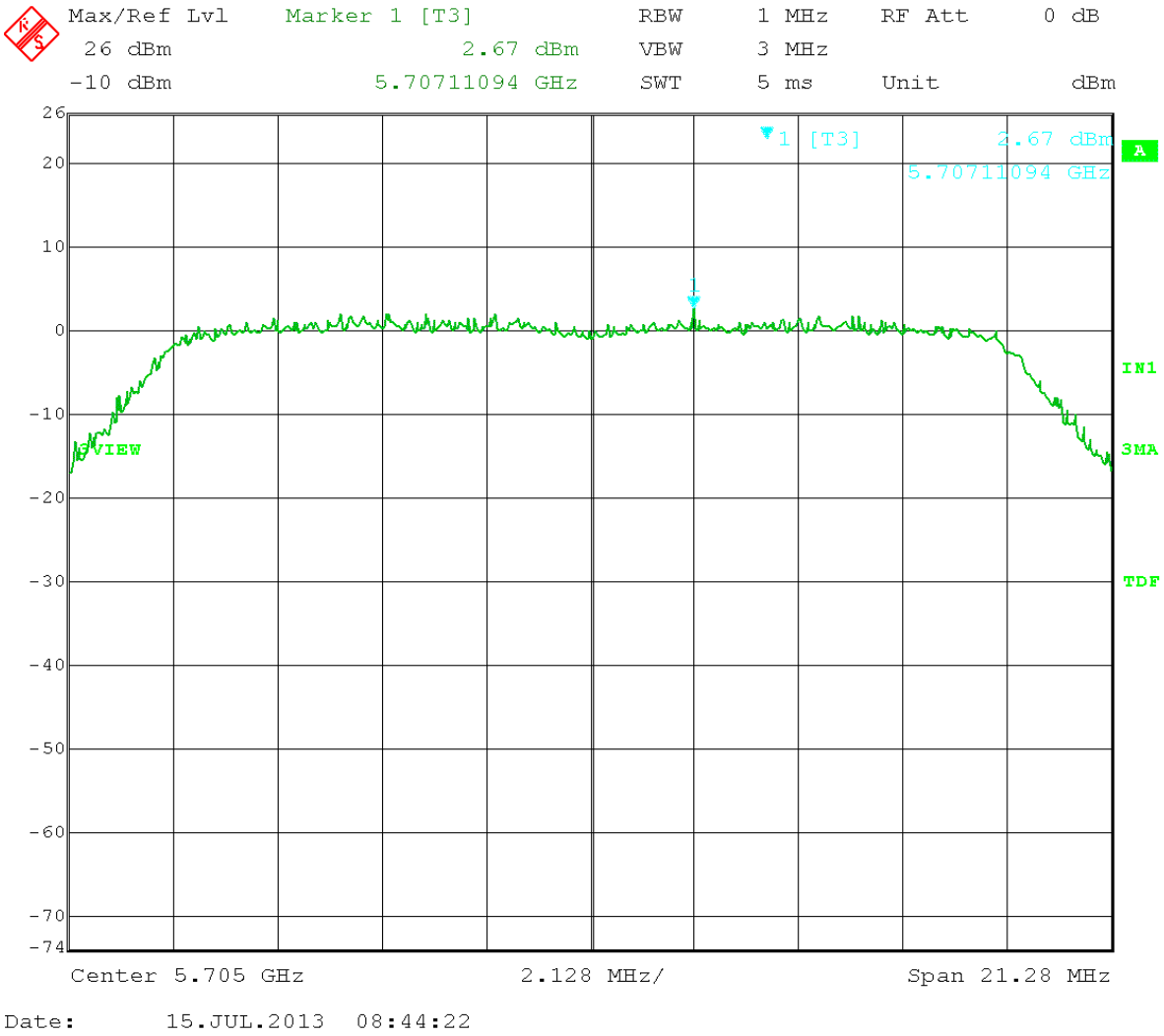
Date: 12.JUL.2013 14:09:52

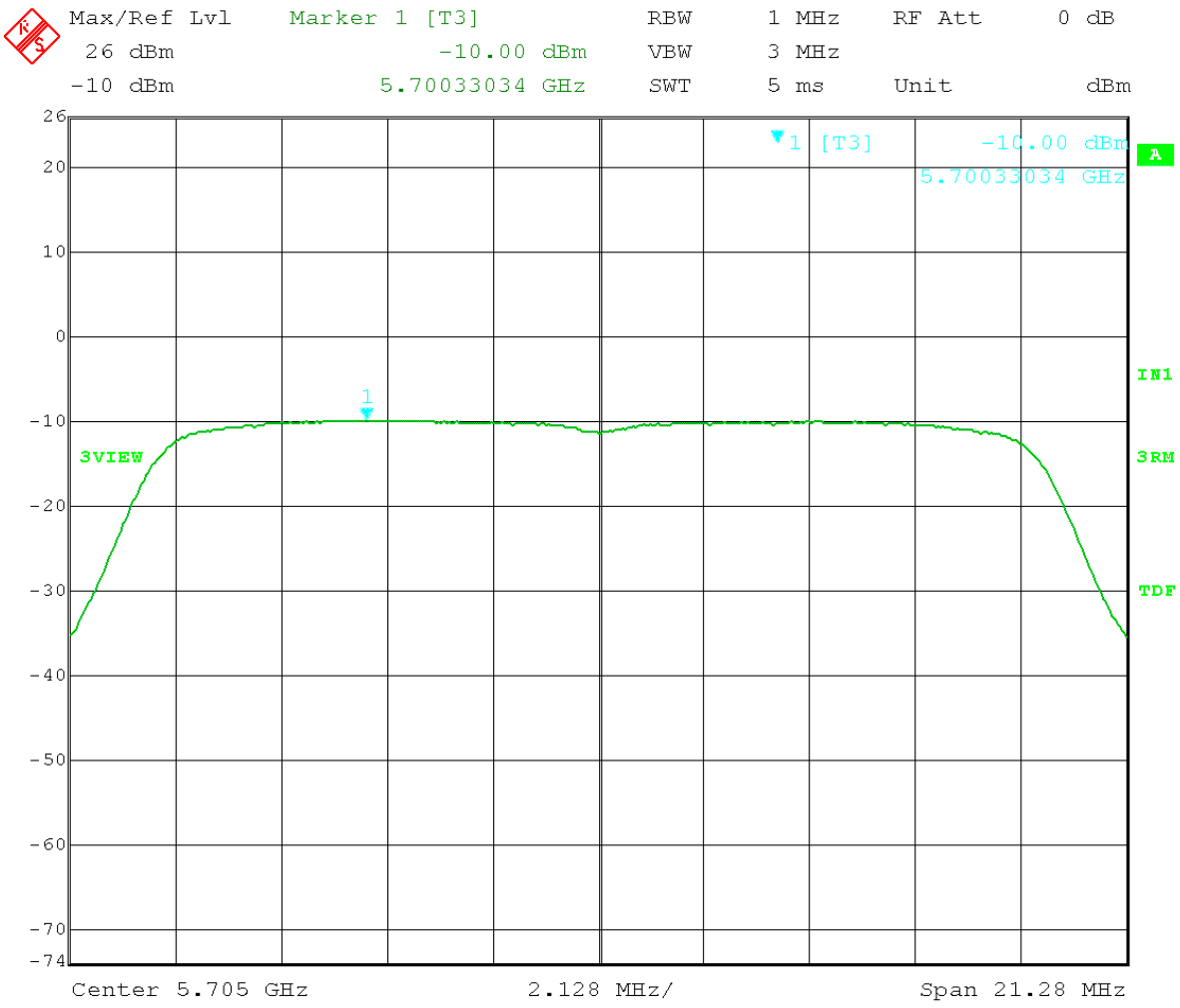
Test Date: 8-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak excursion measurement - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
G) PK excursion measurement – Page 9
Limit:[15.407(a)(6)]: 13dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = peak Trace = max-hold
Sweep Time = Auto Output power setting: 10
Mid Channel: Transmit = 5.575GHz 20MHz BW
26 dB Emission Bandwidth = 21.16MHz PPSD = -2.08dBm
Output Power =10.56 dBm
Peak excursion = 9.03 - (-2.08) = 11.11dBm <13 dBm = Pass




Max/Ref Lvl
26 dBm
-20 dBm
Marker 1 [T1]
-2.08 dBm
5.57153323 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 0 dB
Unit dBm
1 [T1]
-2.08 dBm
5.57153323 GHz
A
IN1
1RM
TDF
1AVG
Center 5.575 GHz
2.116 MHz/
Span 21.16 MHz
Date: 29.AUG.2013 13:14:07

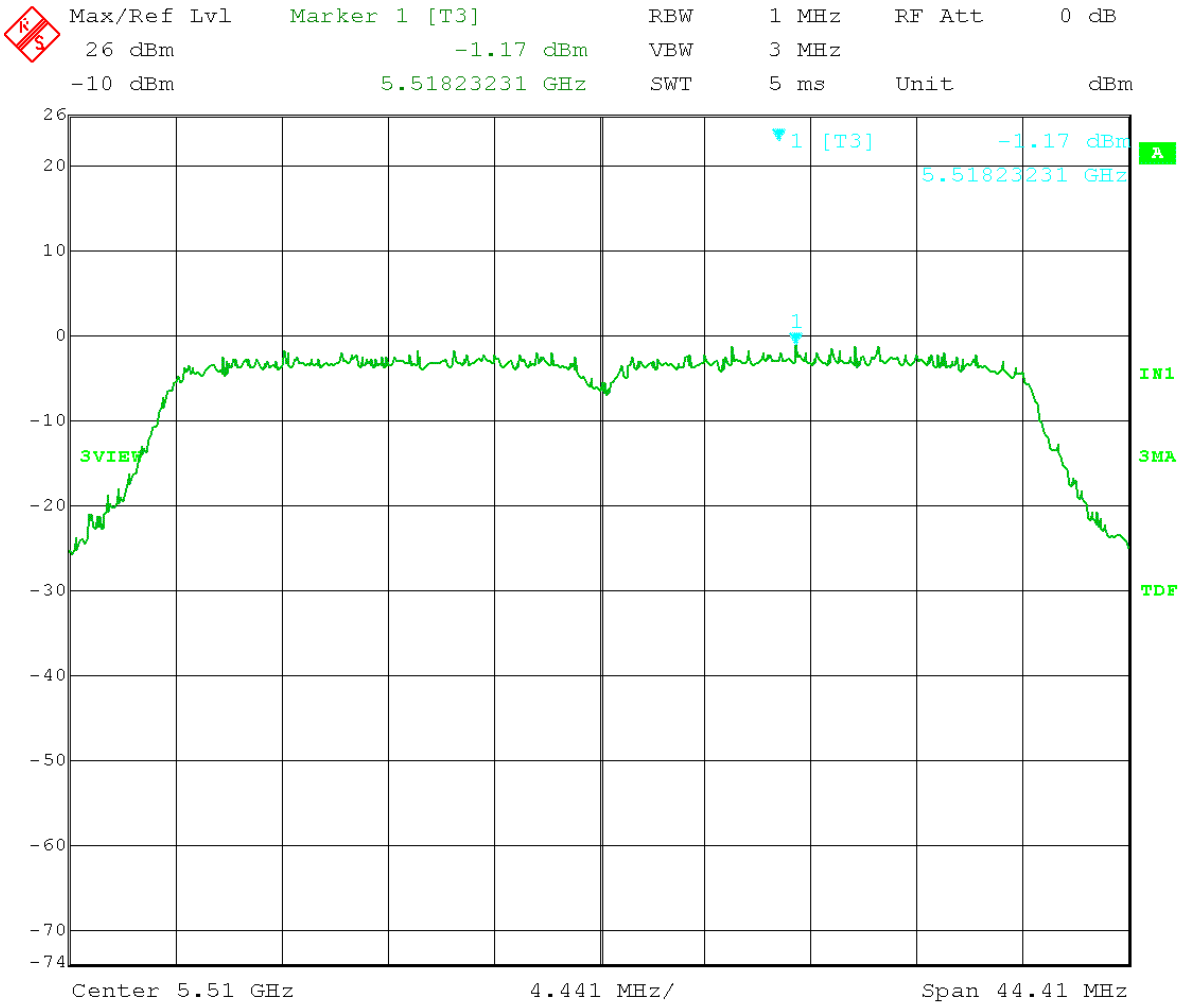
Test Date: 7-15-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak excursion measurement - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
G) PK excursion measurement – Page 9
Limit:[15.407(a)(6)]: 13dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = peak Trace = max-hold
Sweep Time = Auto Output power setting: 5
High Channel: Transmit = 5.705GHz 20MHz BW
26 dB Emission Bandwidth = 21.28MHz PPSD = -10.00dBm
Peak excursion = 2.67 - (-10.00) = 12.67dBm <13 dBm = Pass

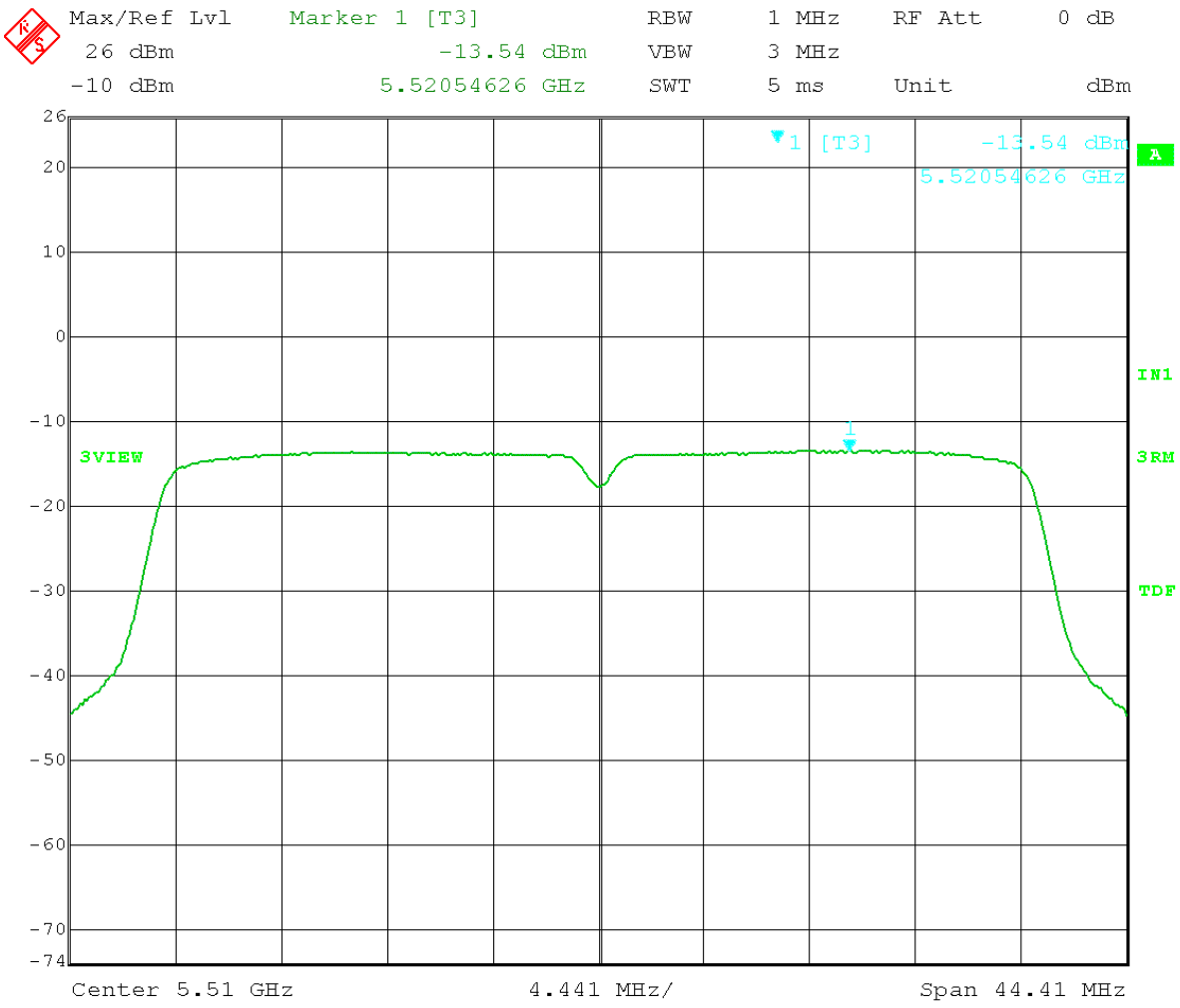




Date: 12.JUL.2013 14:28:53

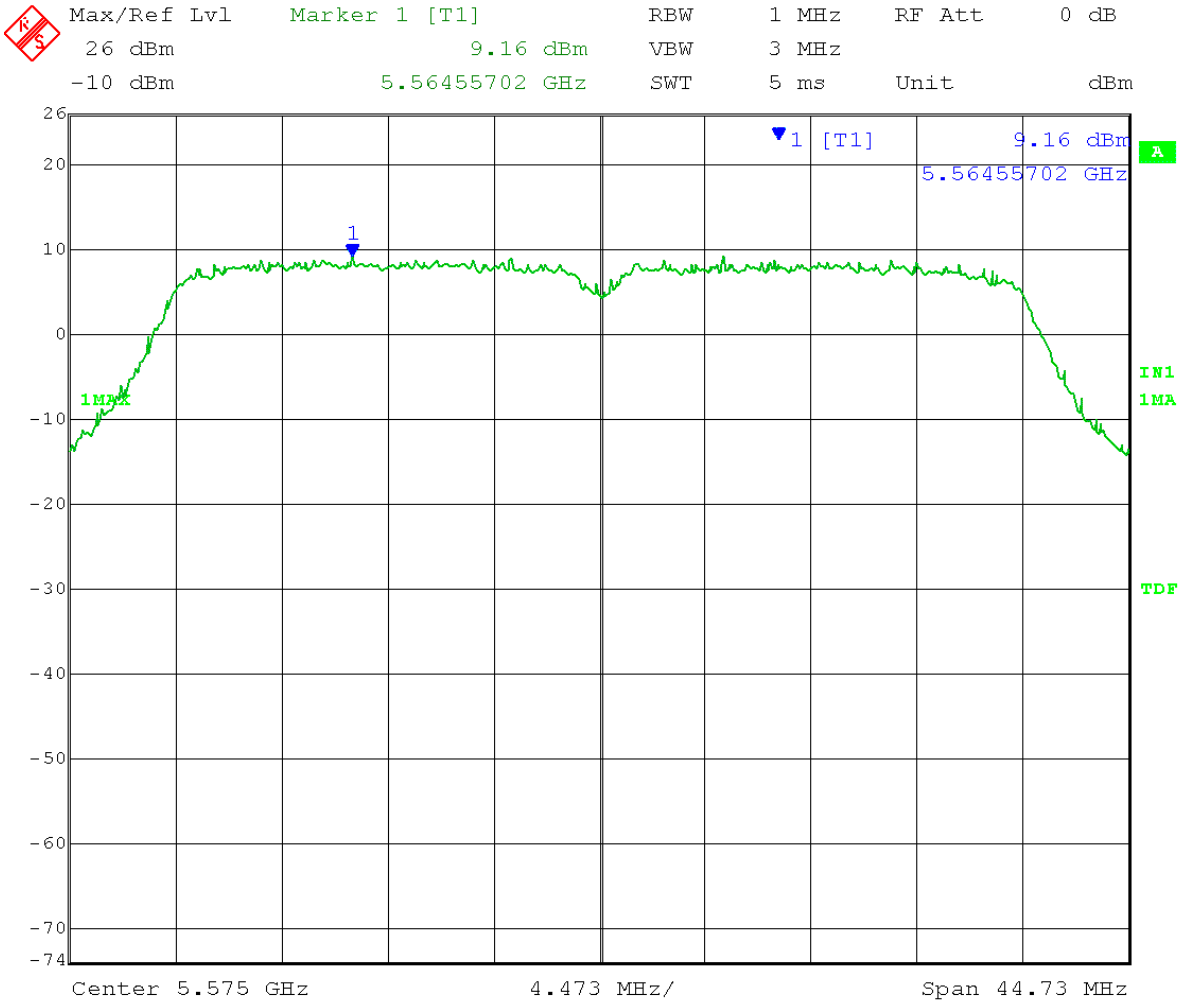
Test Date: 7-15-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak excursion measurement - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
G) PK excursion measurement – Page 9
Limit:[15.407(a)(6)]: 13dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = peak Trace = max-hold
Sweep Time = Auto Output power setting: 4
Low Channel: Transmit = 5.510GHz 40MHz BW
26 dB Emission Bandwidth = 44.41MHz PPSD = -13.54dBm
Peak excursion = -1.17 - (-13.54) = 12.37dBm <13 dBm = Pass

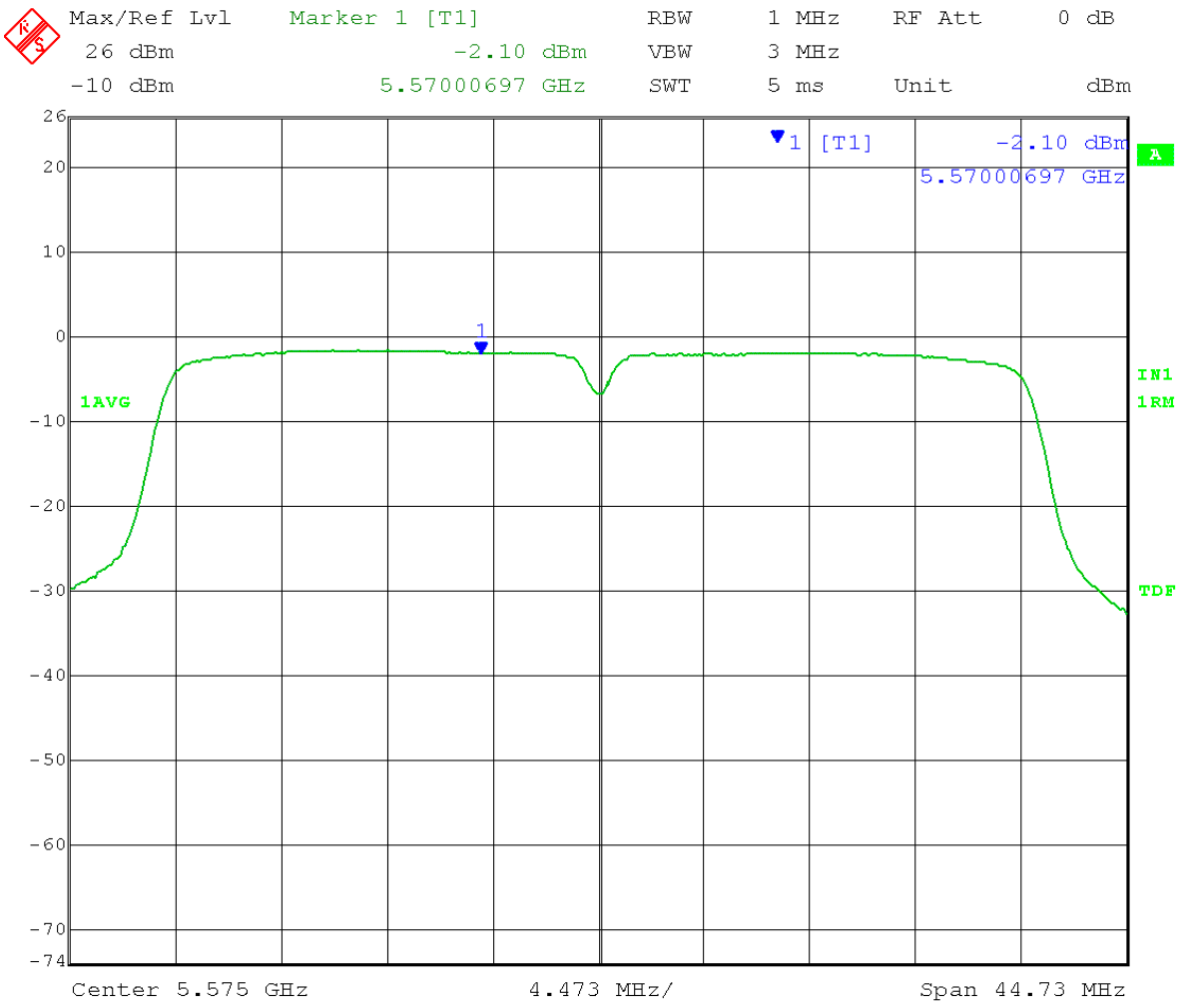




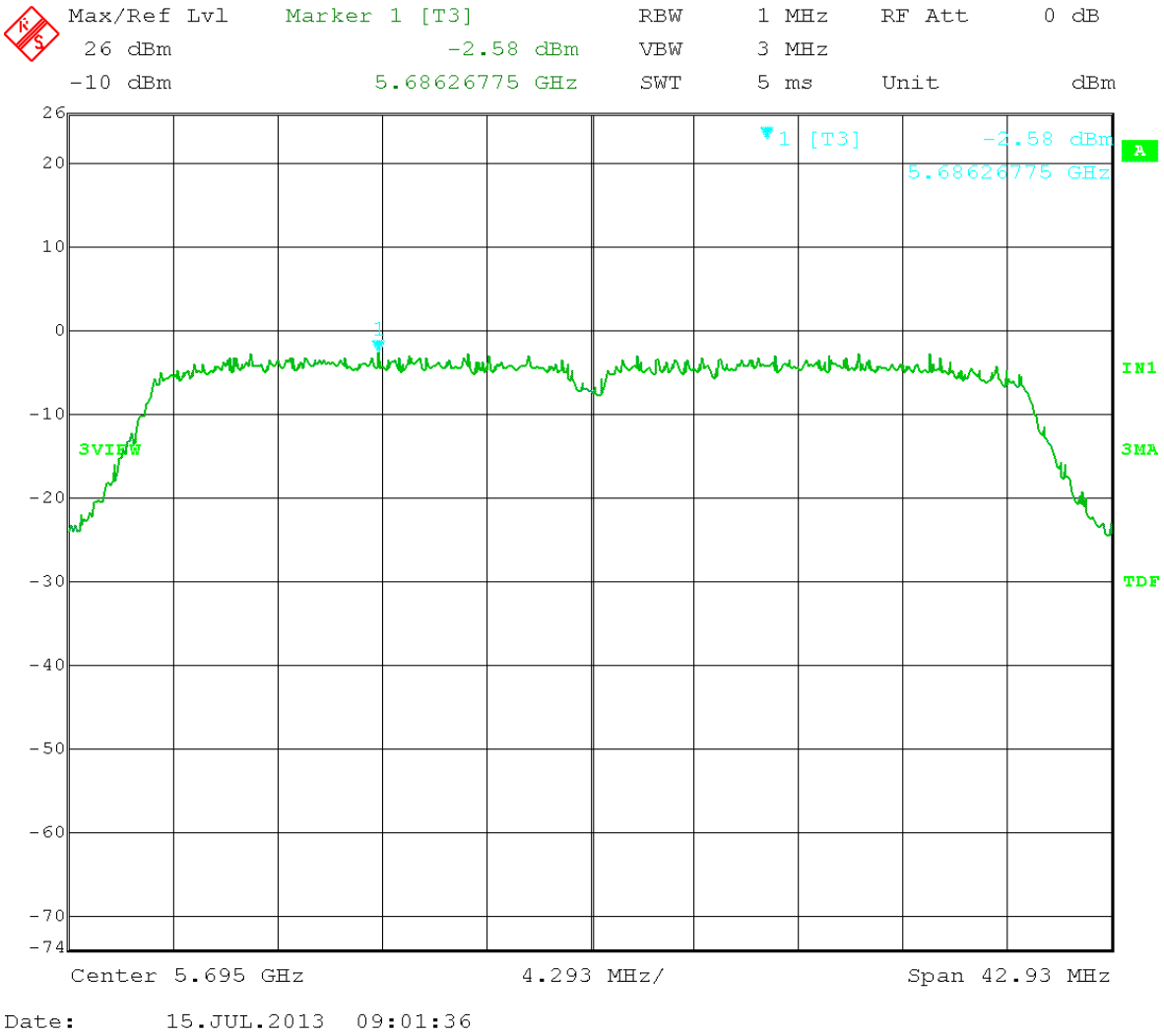
Date: 12.JUL.2013 14:57:09

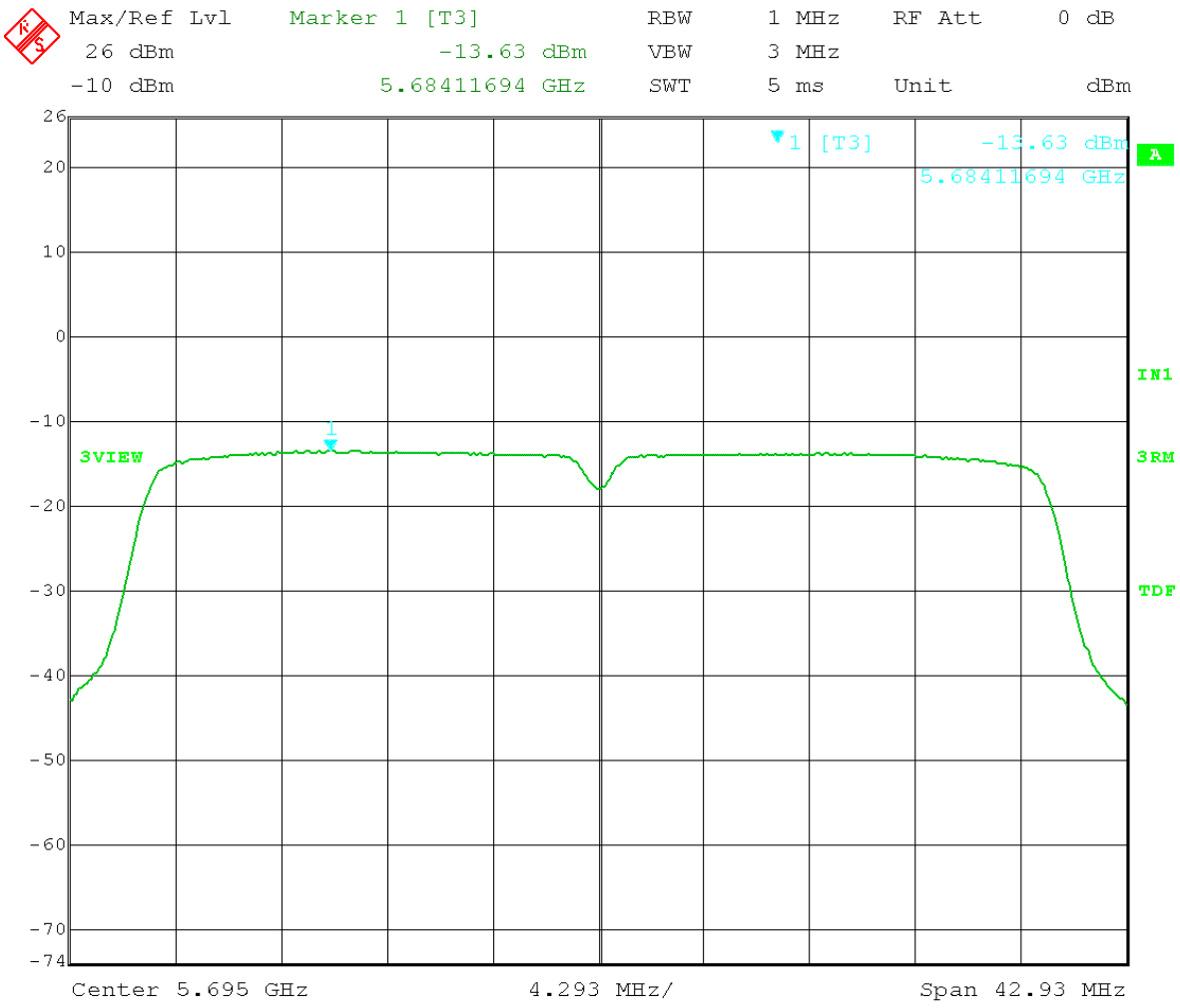
Test Date: 8-23-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak excursion measurement - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
G) PK excursion measurement – Page 9
Limit:[15.407(a)(6)]: 13dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = peak Trace = max-hold
Sweep Time = Auto Output power setting: 14
Mid Channel: Transmit = 5.575Hz 40MHz BW
26 dB Emission Bandwidth = 44.73MHz PPSD = -2.10dBm
Peak excursion = 9.16 - (-2.10) = 11.26dBm <13 dBm = Pass




Max/Ref Lvl
26 dBm
-10 dBm
Marker 1 [T1]
-2.10 dBm
5.57000697 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 0 dB
Unit dBm
1 [T1]
-2.10 dBm
5.57000697 GHz
A
1AVG
IN1
1RM
TDF
26
20
10
0
-10
-20
-30
-40
-50
-60
-70
-74
Center 5.575 GHz
4.473 MHz/
Span 44.73 MHz
Date: 23.AUG.2013 11:20:04

Test Date: 7-15-2013
Company: Cambium Networks
EUT: Avenger AP 5.4GHz: OFDM - ESN# 000456C005DE
Test: Peak excursion measurement - Conducted
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
G) PK excursion measurement – Page 9
Limit:[15.407(a)(6)]: 13dBm/1MHz
RBW = 1 MHz VBW = 3 MHz
Detector = peak Trace = max-hold
Sweep Time = Auto Output power setting: 2
High Channel: Transmit = 5.695GHz 40MHz BW
26 dB Emission Bandwidth = 42.93MHz PPSD = -13.63dBm
Peak excursion = -2.58 - (-13.63) = 11.05dBm <13 dBm = Pass





Date: 12.JUL.2013 14:41:39

Appendix B – Measurement Data

B7.0 Unwanted Emission Levels – Conducted Band-Edge - 20 MHz channel bandwidth

Rule Section: Sections 15.407(b)(3)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section H – Unwanted emission levels
Section H(1) – Unwanted emissions in the restricted bands
Section H(2) – Unwanted emissions that fall outside of the restricted bands
Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz

Description: Measure the band-edge emission level using the following settings
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = peak
Sweep time = auto
Trace mode = max hold

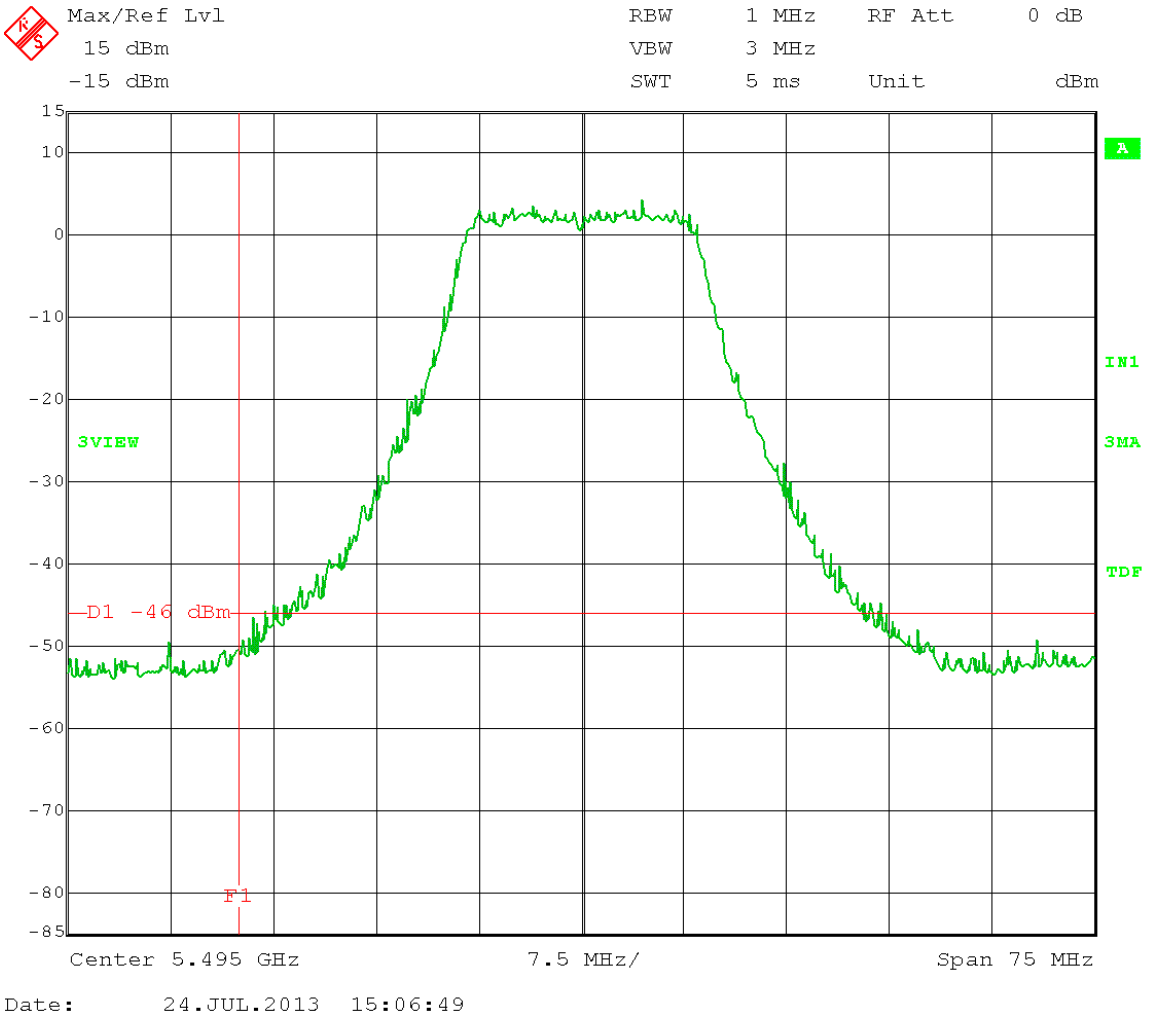
Limit: EIRP of -27 dBm/MHz

Calculation of RF conducted limit per output chain:
Subtract upper bound on out-of-band antenna gain (This is the maximum in-band gain or 2 dBi, whichever is greater)
Subtract 10 log(N), where N is the number of outputs, for MIMO operation
Corrected limit = -27 dBm/MHz - 16 dBi antenna gain - 3 dB (MIMO) = -46 dBm/MHz

Results: Passed

Notes: Measurements were taken for MCS15 OFDM modulation at the lowest and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

Test Date: 07-24-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP - OFDM; MCS15
Test: Lower Band-Edge Compliance - Conducted
(FCC 15.407(b)(3))
Operator: Lillian L
Comment: FCC UNII operating under 15.407 – OET 4/8/2013
Band edge measurement - Standard Method H)3)d) / H)5) –Page 13-15
EIRP Limit = -27 dBm/MHz, Antenna Gain = 16dBi, MIMO = 3 dB
D1 = -27-16-3 = -46 dBm Band-Edge F1 = 5.47 GHz
RBW = 1 MHz VBW = 3 MHz
Detector = Peak Trace = Max Hold
Low Channel: Transmit = 5.495 GHz 20MHz BW
Output power setting: 7 Channel 0
Result = Pass

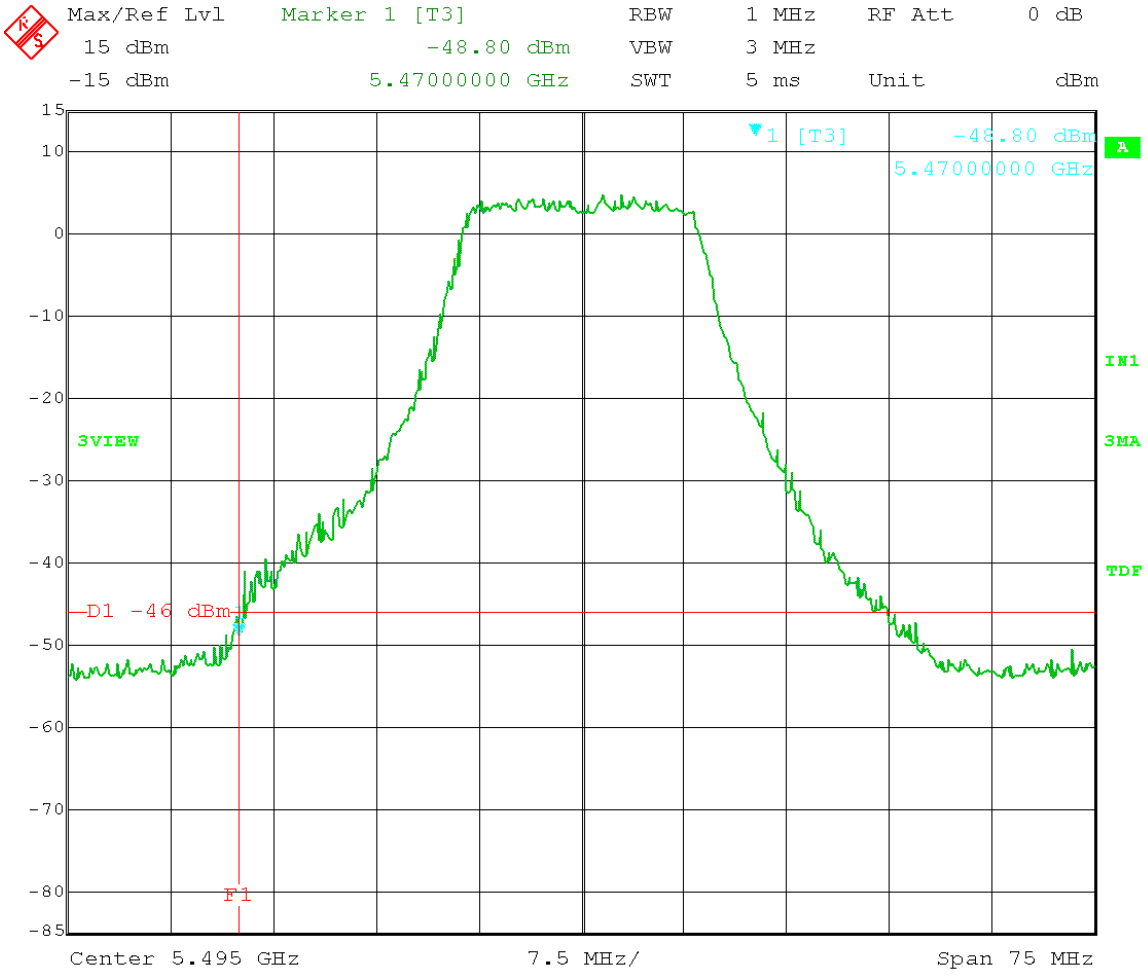


Test Date: 07-25-2013

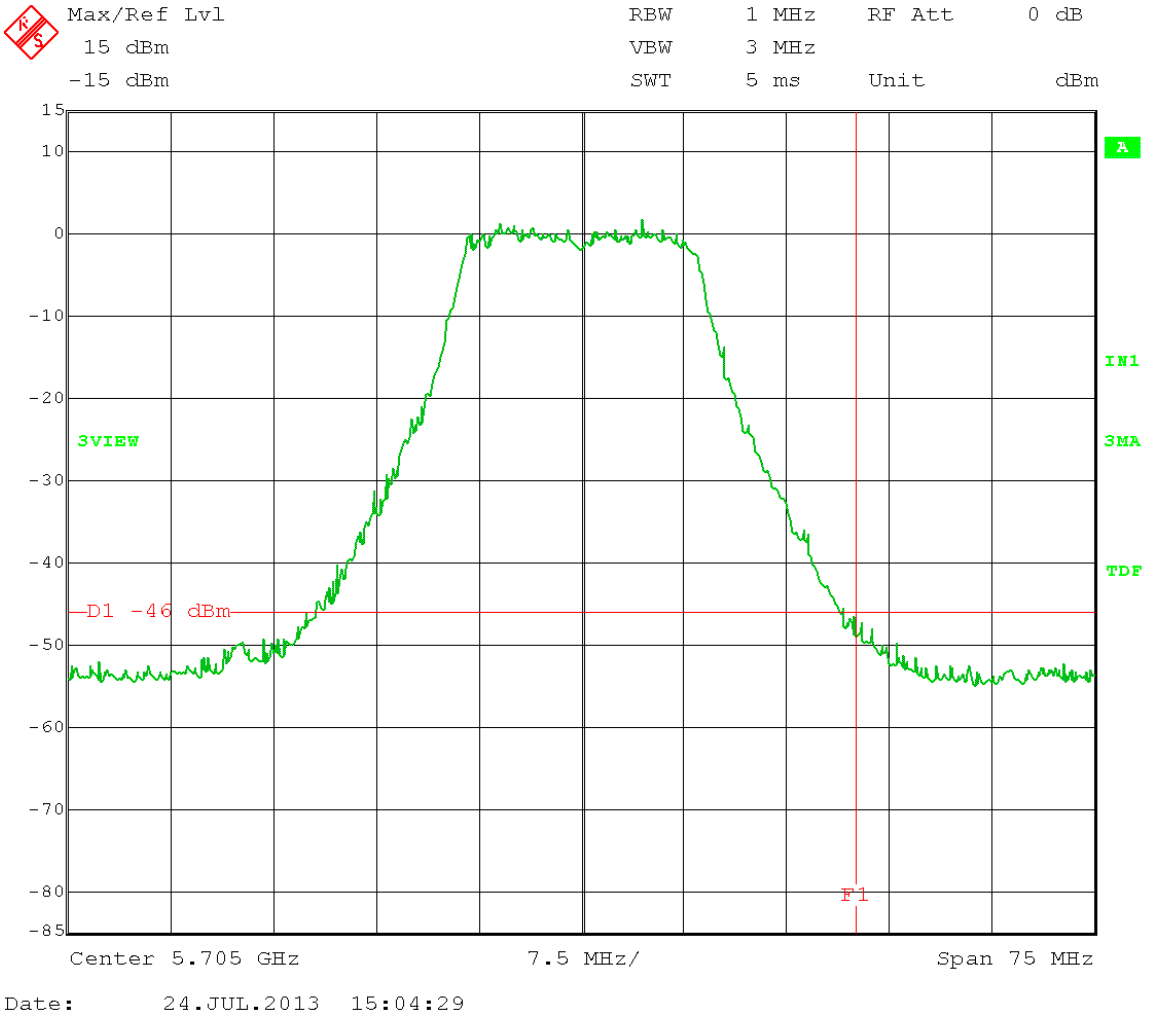
Low Channel: Transmit = 5.495 GHz 20MHz BW

Output power setting: 7 Channel 1

Result = Pass



Test Date: 07-24-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP - OFDM; MCS15
Test: Lower Band-Edge Compliance - Conducted
(FCC 15.407(b)(3))
Operator: Lillian L
Comment: Band edge measurement - Standard Method H)3)d) / H)5) –Page 13-15
EIRP Limit = -27 dBm/MHz, Antenna Gain = 16dBi, MIMO = 3 dB
D1 = -27-16-3 = -46 dBm Band-Edge F1 = 5.725 GHz
RBW = 1 MHz VBW = 3 MHz
Detector = Peak Trace = Max Hold
High Channel: Transmit = 5.705 GHz 20MHz BW
Output power setting: 5 Channel 0
Result = Pass

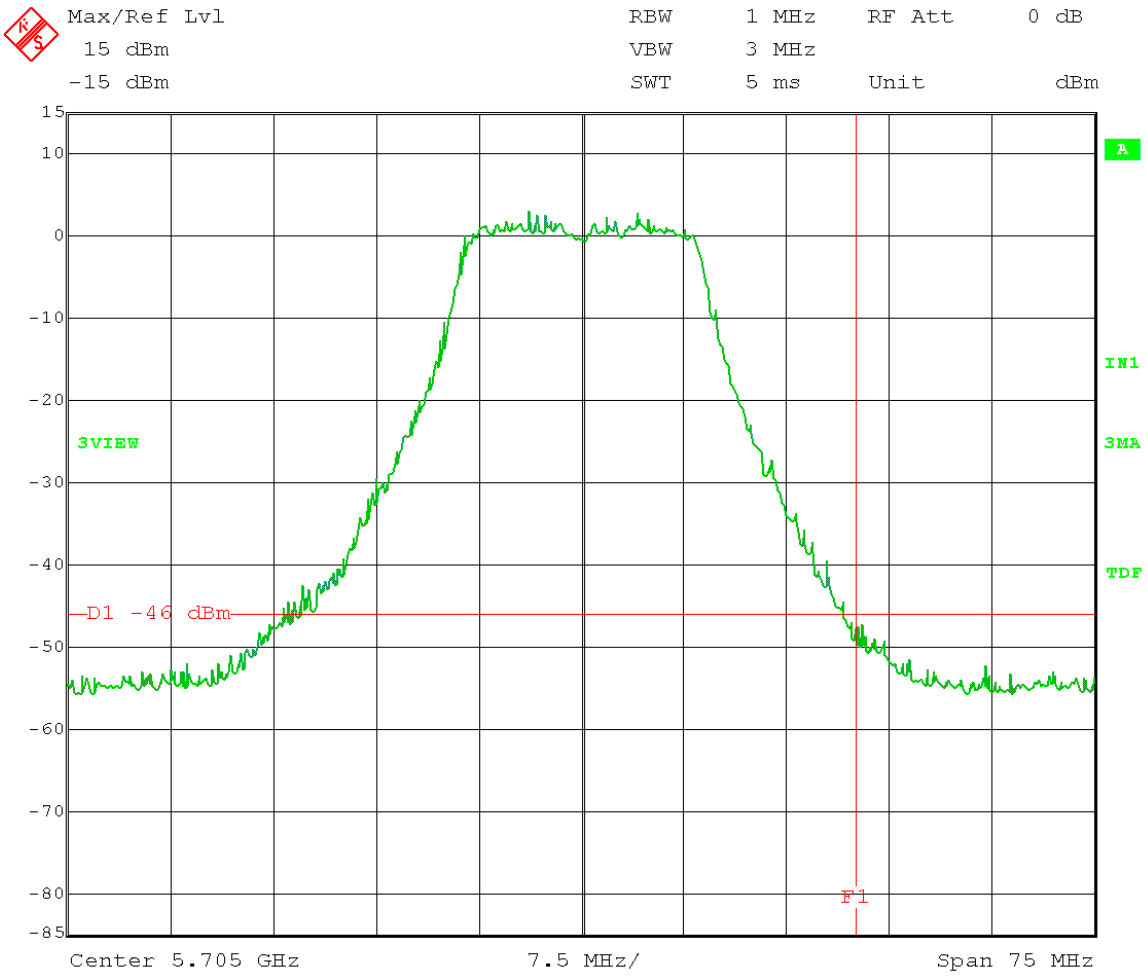


Test Date: 07-24-2013

High Channel: Transmit = 5.705 GHz 20MHz BW

Output power setting: 5 Channel 1

Result = Pass



Date: 24.JUL.2013 14:58:57

Test Date: 07-25-2013

Test: Unwanted emission in restricted band 5350 – 5460MHz

Low Channel: Transmit = 5.495 GHz 20MHz BW

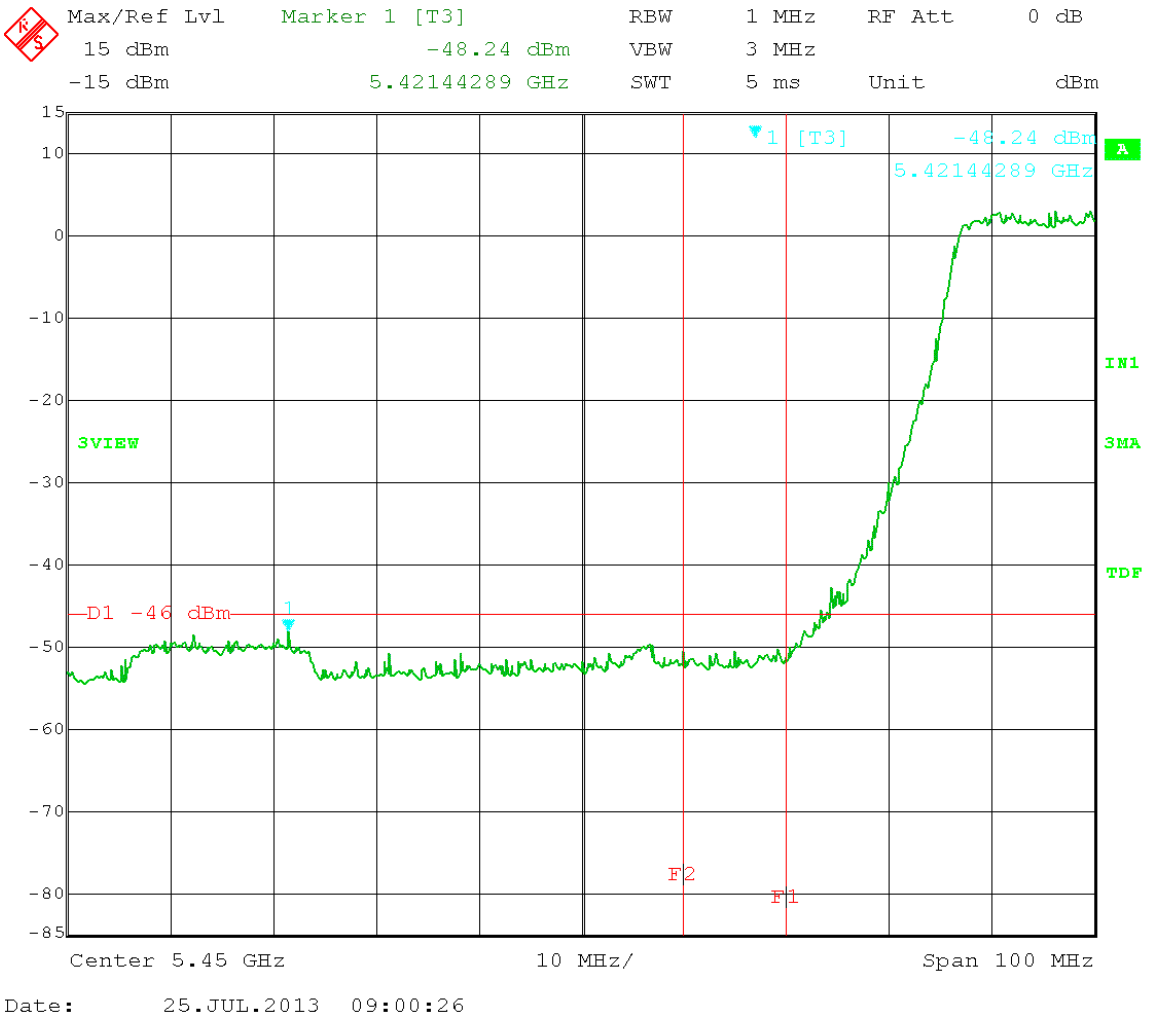
Output power setting: 4 Channel 0

Operating Band-Edge F1 = 5.47 GHz

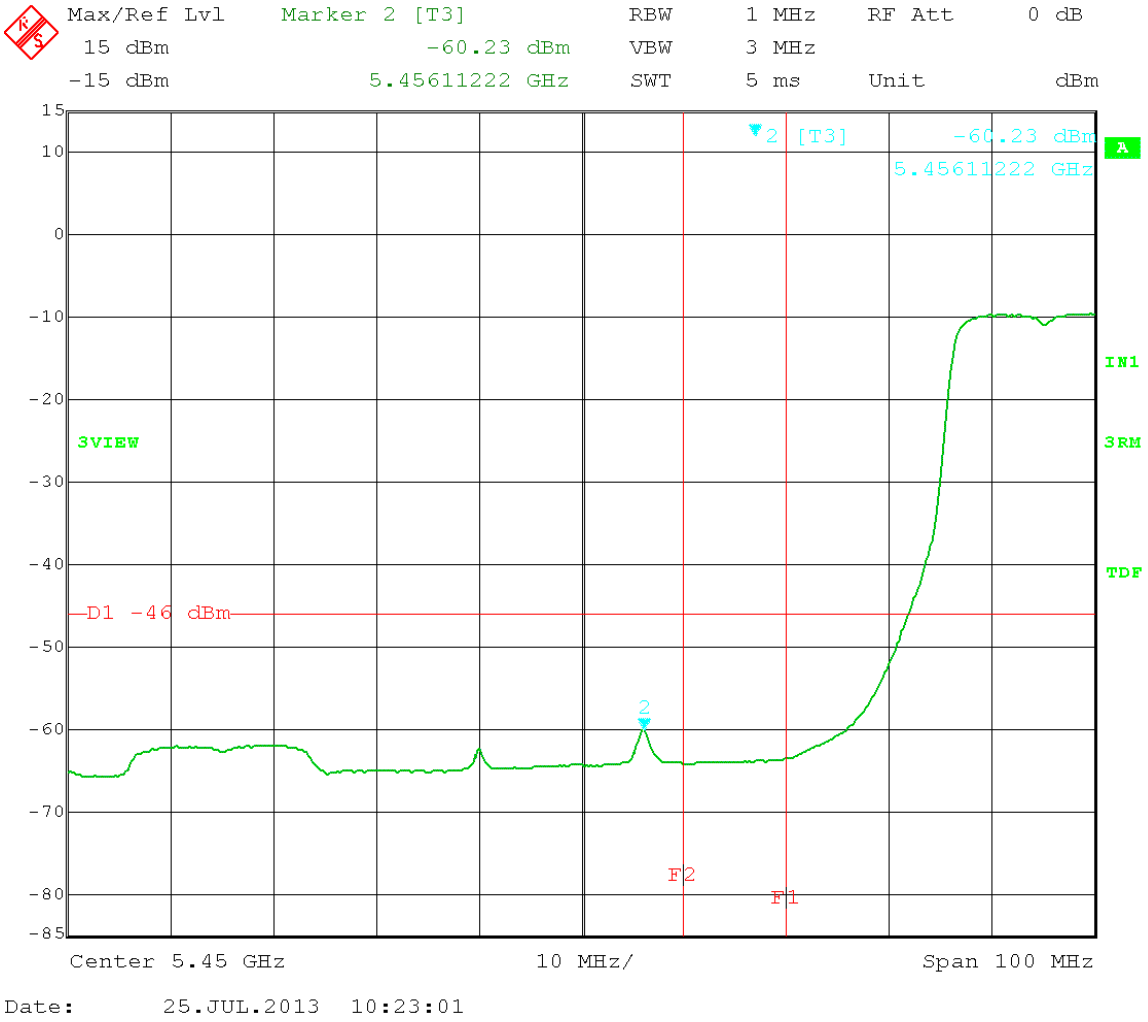
Restricted Band-Edge F2 = 5.46 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

Peak Marker 1: Calculated Field Strength (Restricted Band) = -48.24 + 16dBi antenna gain + 3 dB (MIMO) +95.2 = 65.96dBµV/m < 74dBµV/m Peak



AVG Marker 2: Calculated Field Strength (Restricted Band) = -60.23 + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = 53.97dBµV/m < 54dBµV/m Average, result = Pass

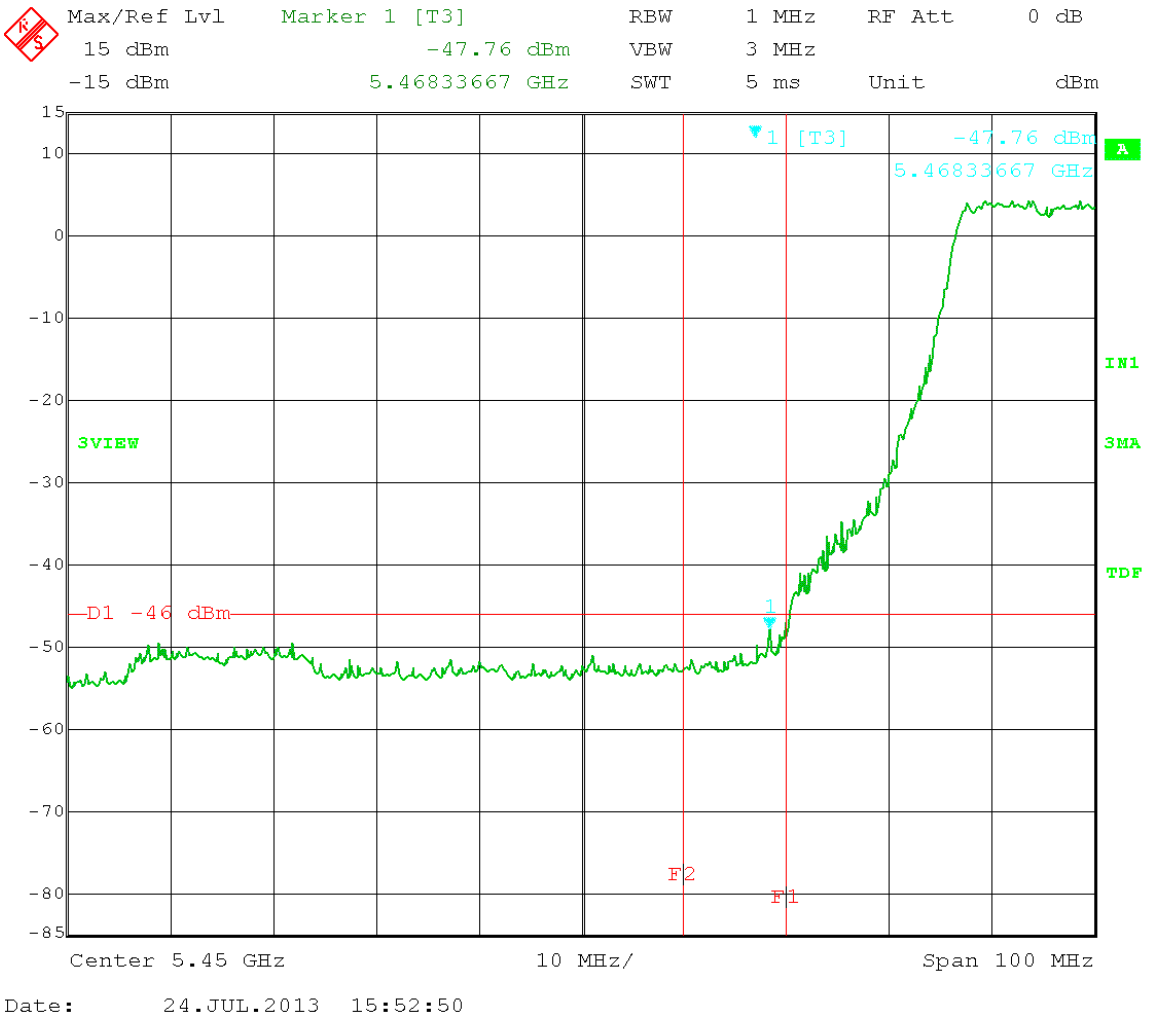


Test Date: 07-24-2013

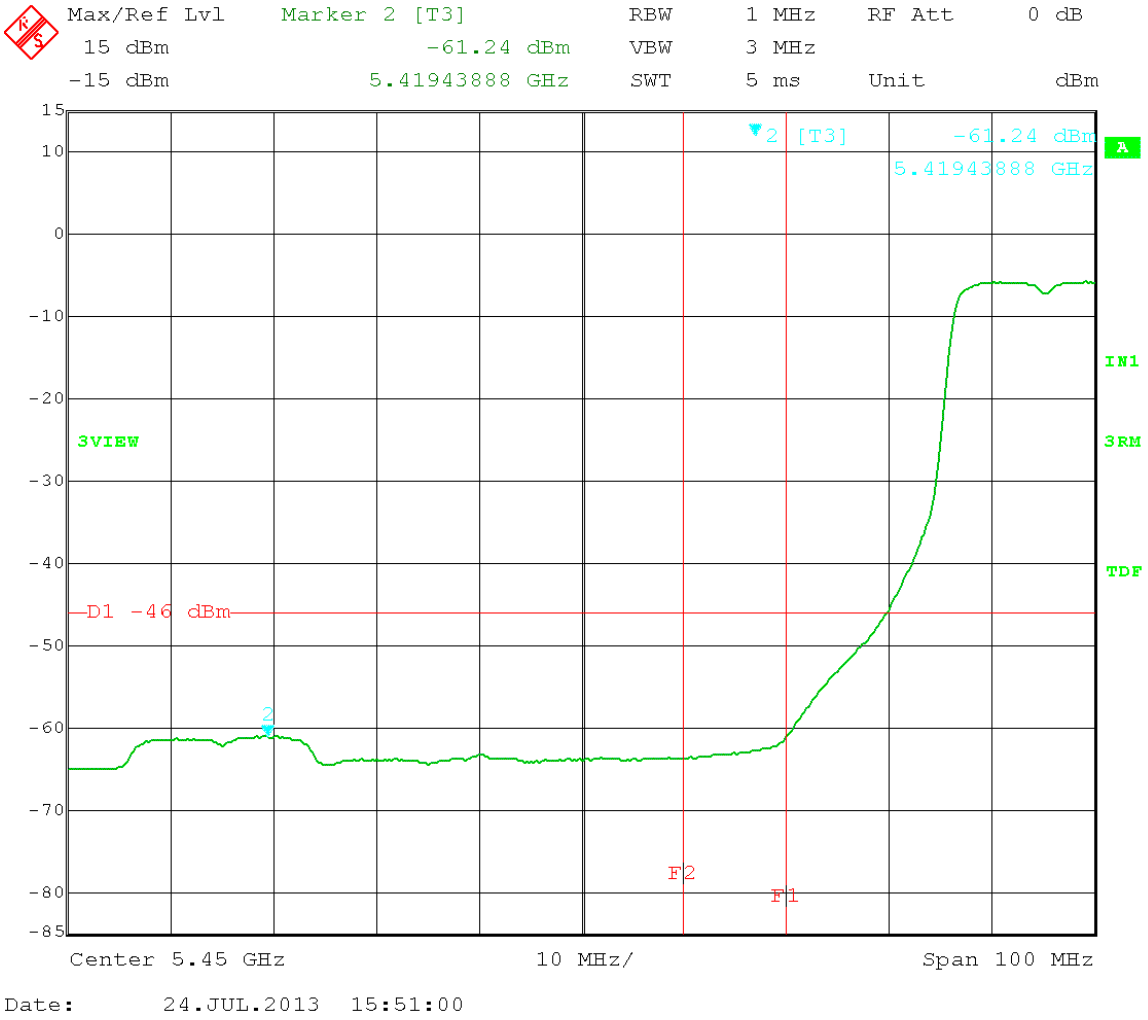
Test: Unwanted emission in restricted band 5350 – 5460MHz
Low Channel: Transmit = 5.510 GHz 40MHz BW
Output power setting: 4 Channel 1
Operating Band-Edge F1 = 5.47 GHz
Restricted Band-Edge F2 = 5.46 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

Peak Marker 1: Calculated Field Strength (Restricted Band) = -47.76 + 16dBi antenna gain + 3 dB (MIMO) +95.2 = 66.44dBµV/m < 74dBµV/m Peak



AVG Marker 2: Calculated Field Strength (Restricted Band) = -61.24 + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = 52.96dBµV/m < 54dBµV/m Average



Appendix B – Measurement Data

B8.0 Unwanted Emission Levels – Radiated Band-Edge - 20 MHz channel bandwidth
Radiated from Cabinet (50 Ohm terminations on antenna ports)

Rule Section: Sections 15.407(b)(3) and 15.407(b)(5)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section H – Unwanted emission levels
Section H(1) – Unwanted emissions in the restricted bands
Section H(2) – Unwanted emissions that fall outside of the restricted bands
Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz
Section H(6) – Procedure for Average Unwanted Emissions Measurements Above 1 GHz
Section H(6)(c) – Average Detection method

Description: Per Section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

Measure the band-edge emission level using the following settings

PEAK measurements:
- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = peak
- Sweep time = auto
- Trace mode = max hold

AVERAGE measurements:
- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = RMS
- Sweep time = auto
- Trace mode = trace average 200 traces

Limit: Peak and Average limits of 15.209 were used instead of the -27 dBm/MHz limit of FCC Part 15.407(b)(3)

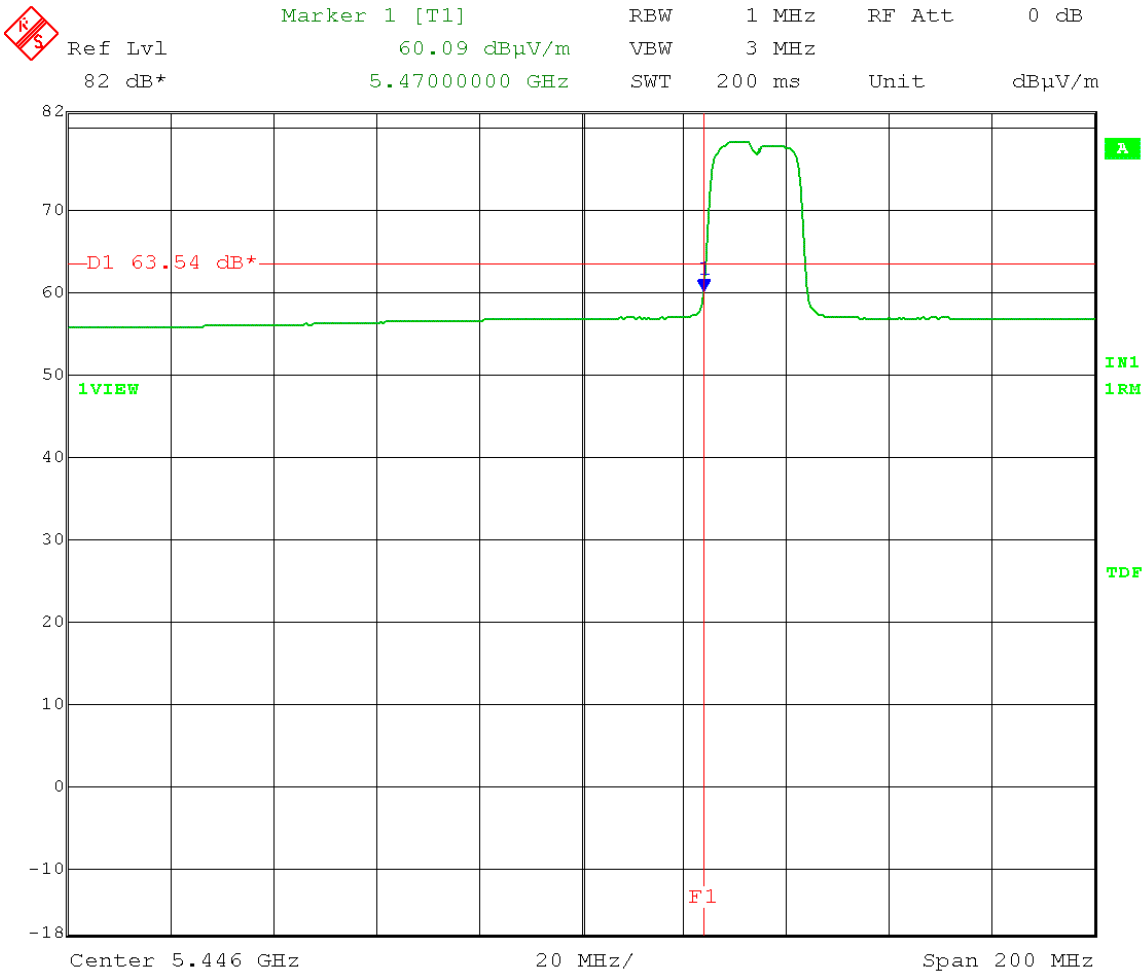
Results: Passed

Notes: Measurements were taken for MCS15 OFDM modulation at the lowest and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle. Both transmit chains were active.

Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.47 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

15.209 Limit: 63.54 dBµV/m AVERAGE at a test distance of 1 meter.

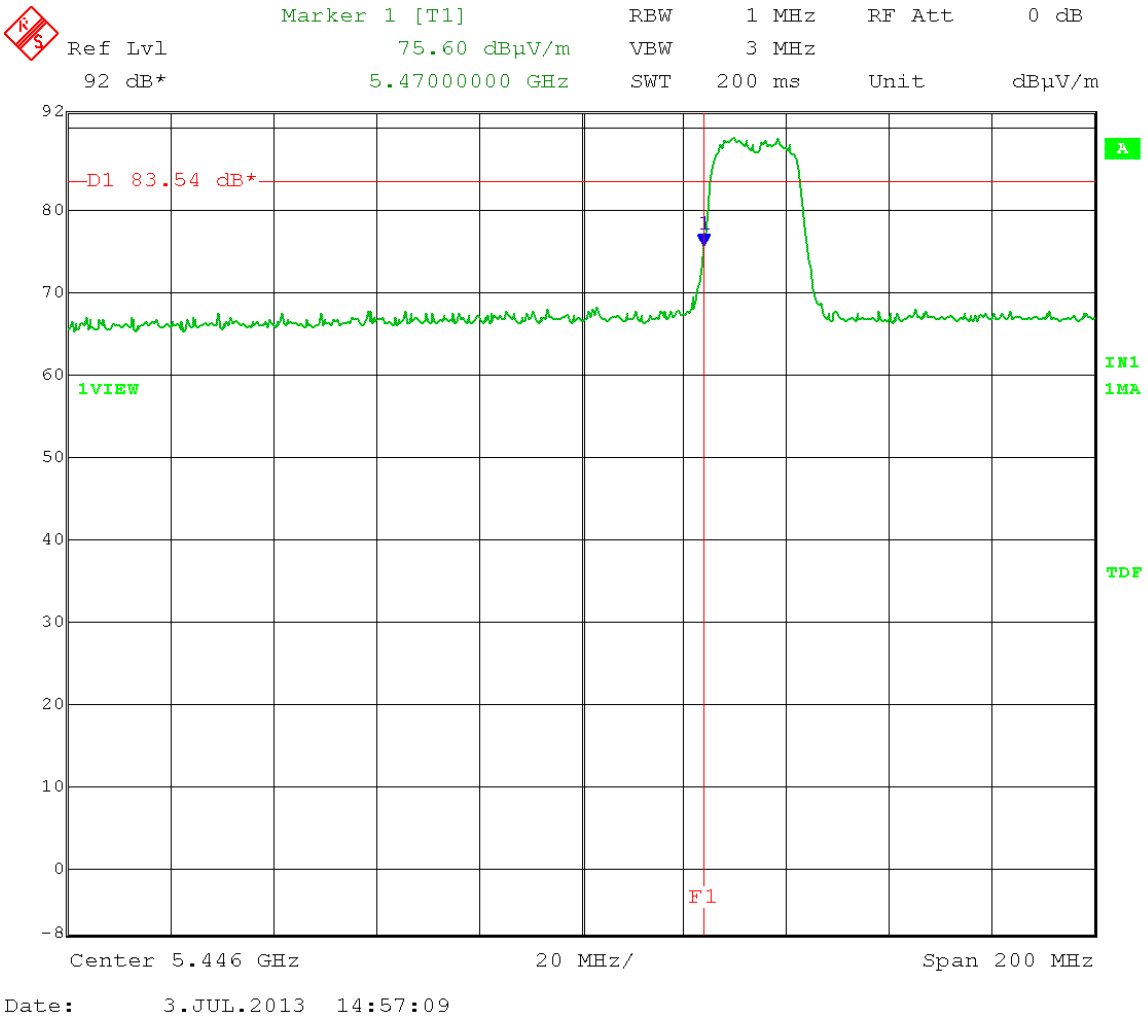


Date: 3.JUL.2013 14:54:47

Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.47 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

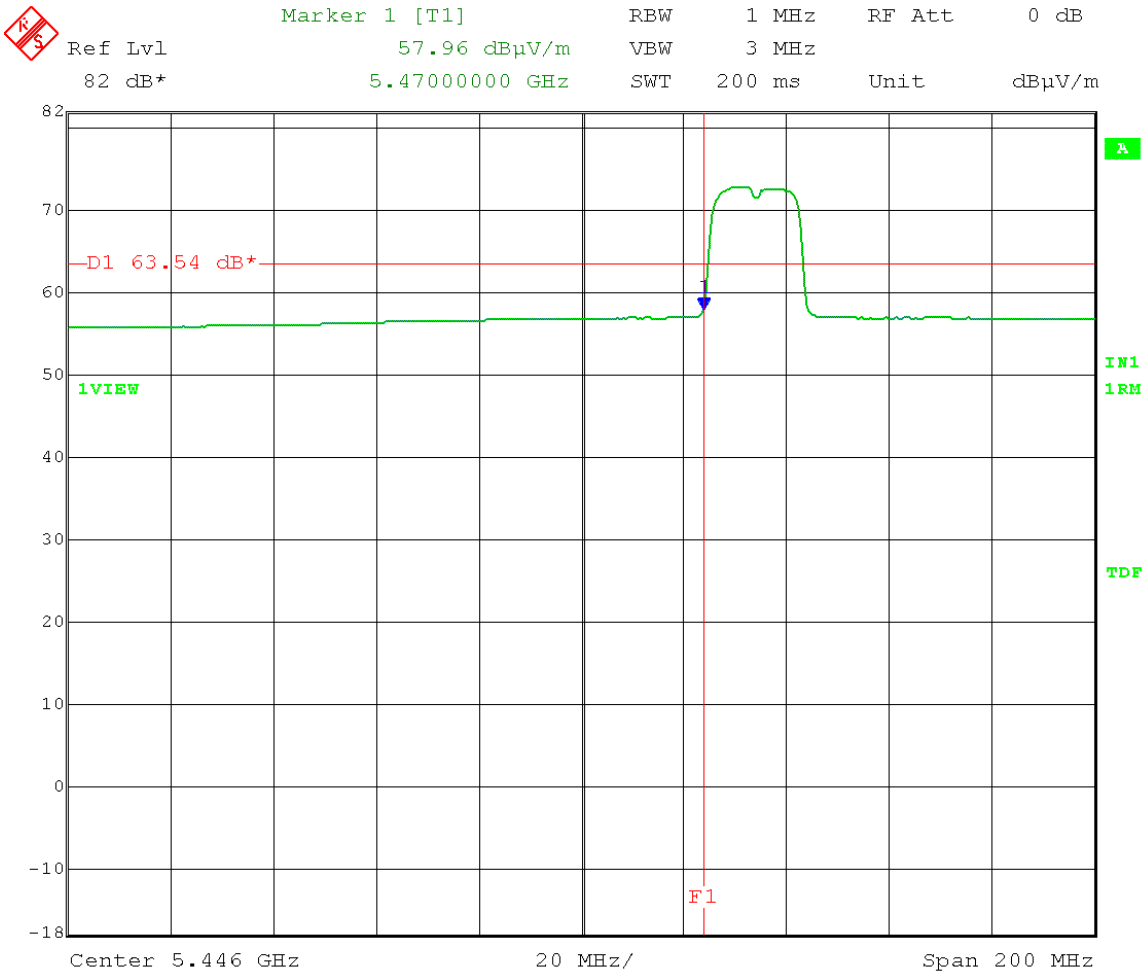
Band-Edge Limit: 83.54 dBµV/m PEAK at a test distance of 1 meter.



Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.47 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

15.209 Limit: 63.54 dBµV/m AVERAGE at a test distance of 1 meter.

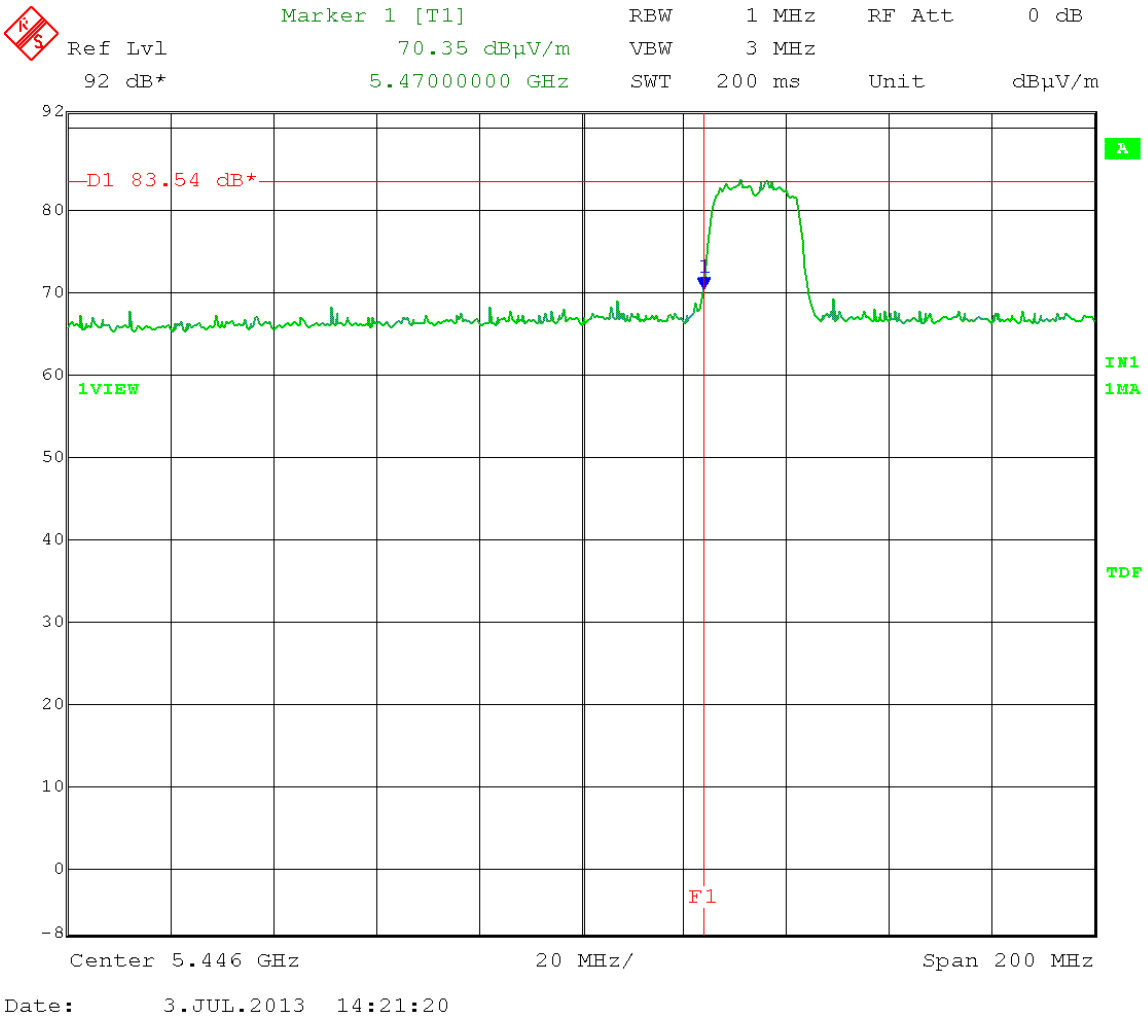


Date: 3.JUL.2013 14:24:38

Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.47 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

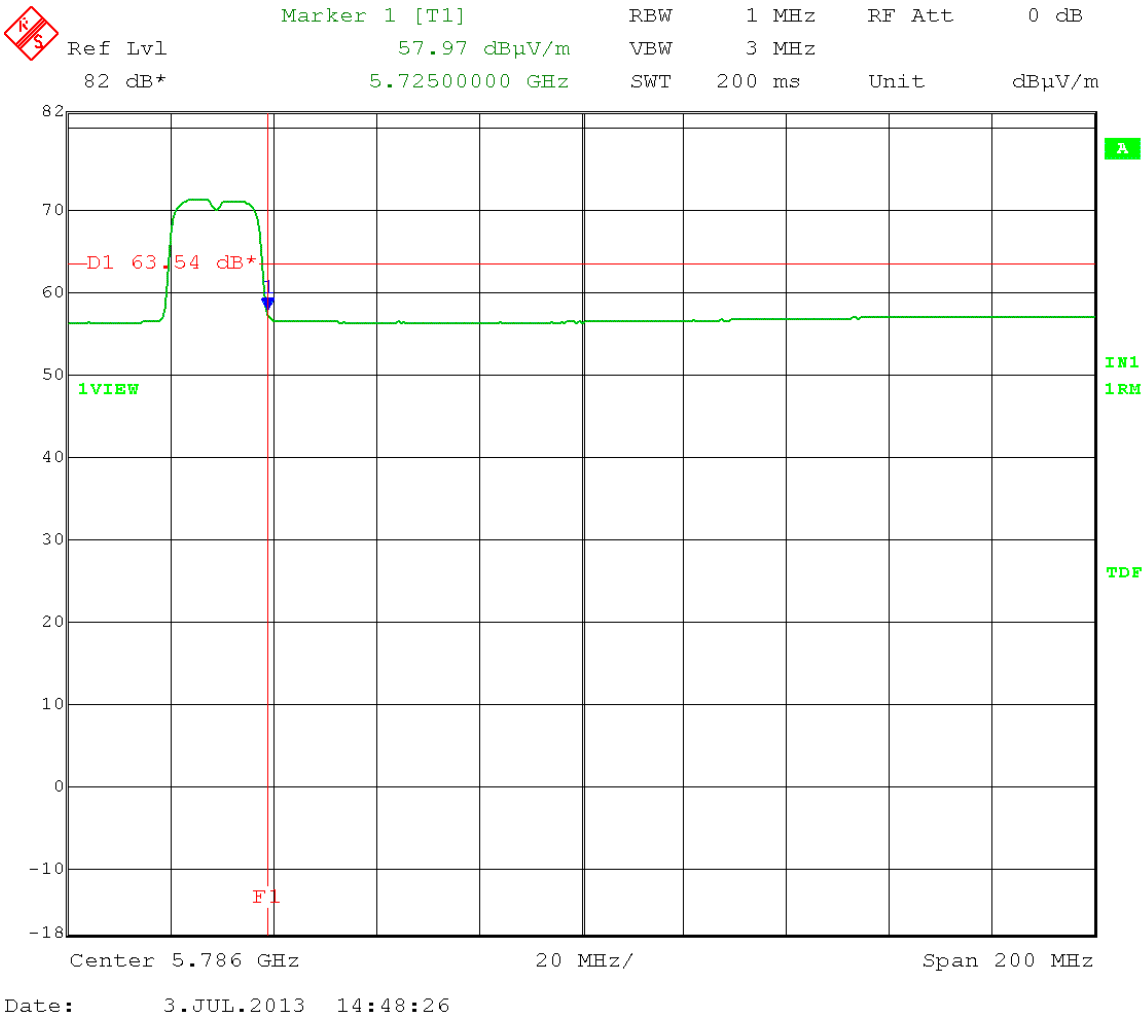
Band-Edge Limit: 83.54 dBµV/m PEAK at a test distance of 1 meter.



Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: High Channel: Frequency – 5715 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

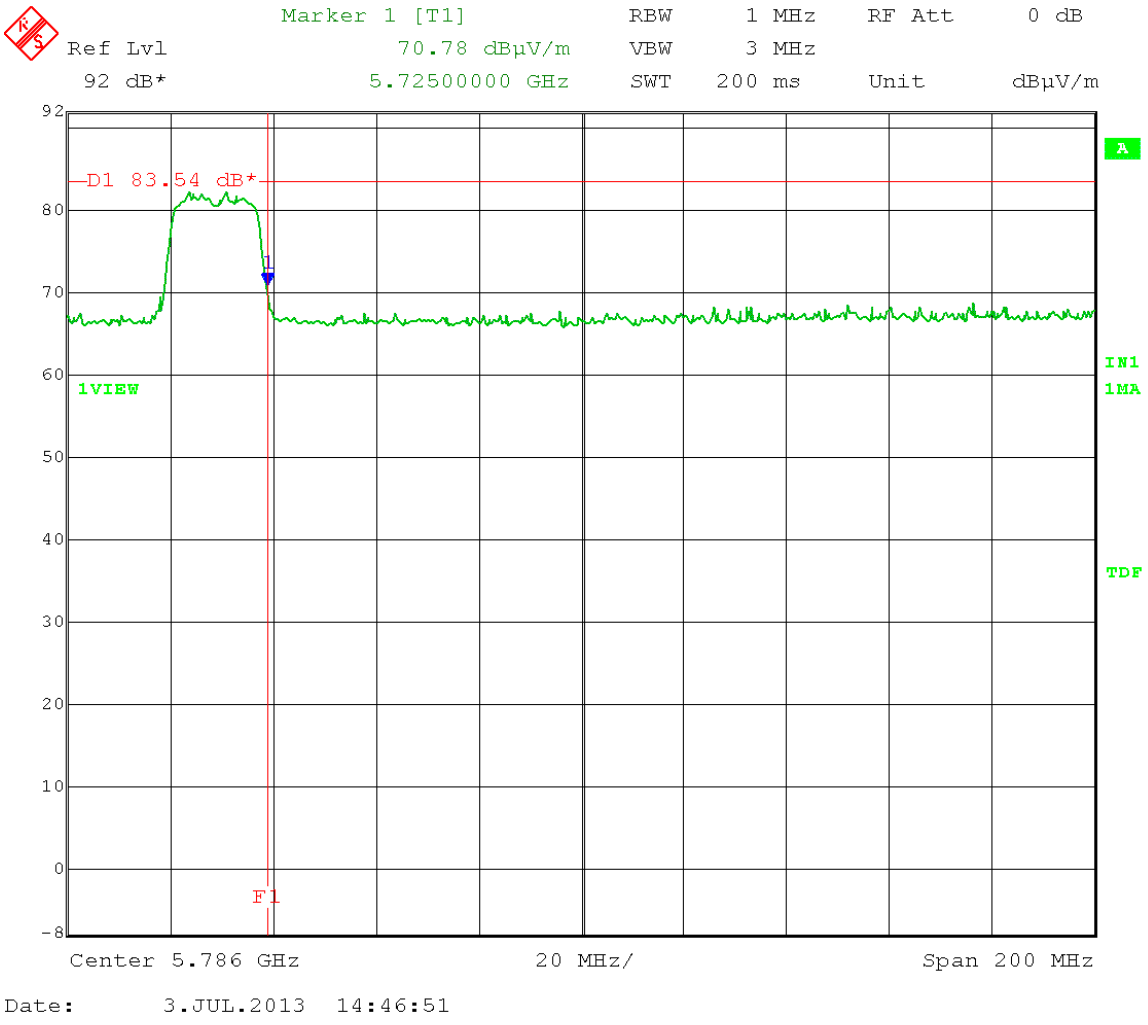
15.209 Limit: 63.54 dBµV/m AVERAGE at a test distance of 1 meter.



Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: High Channel: Frequency – 5715 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

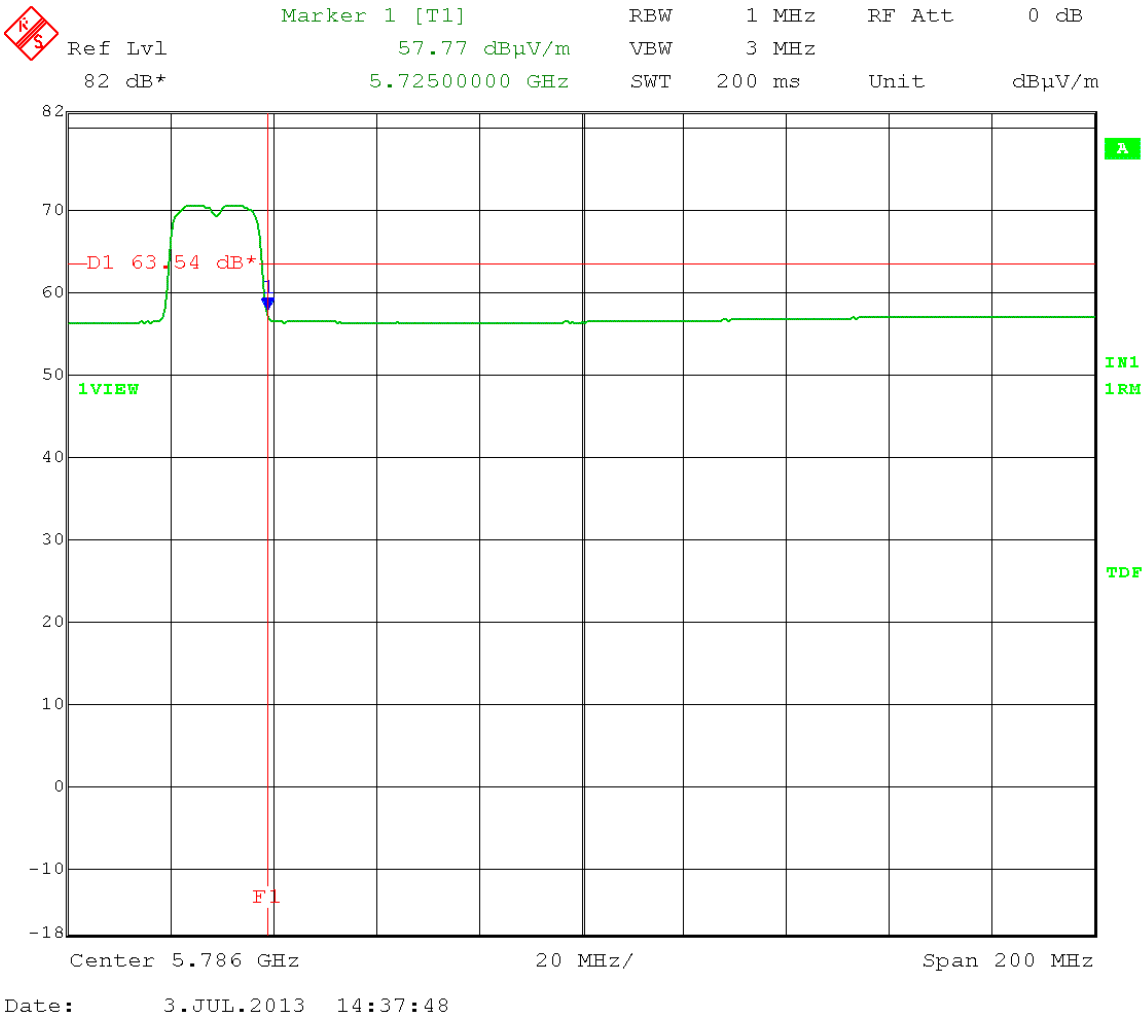
Band-Edge Limit: 83.54 dBµV/m PEAK at a test distance of 1 meter.



Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: High Channel: Frequency – 5715 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

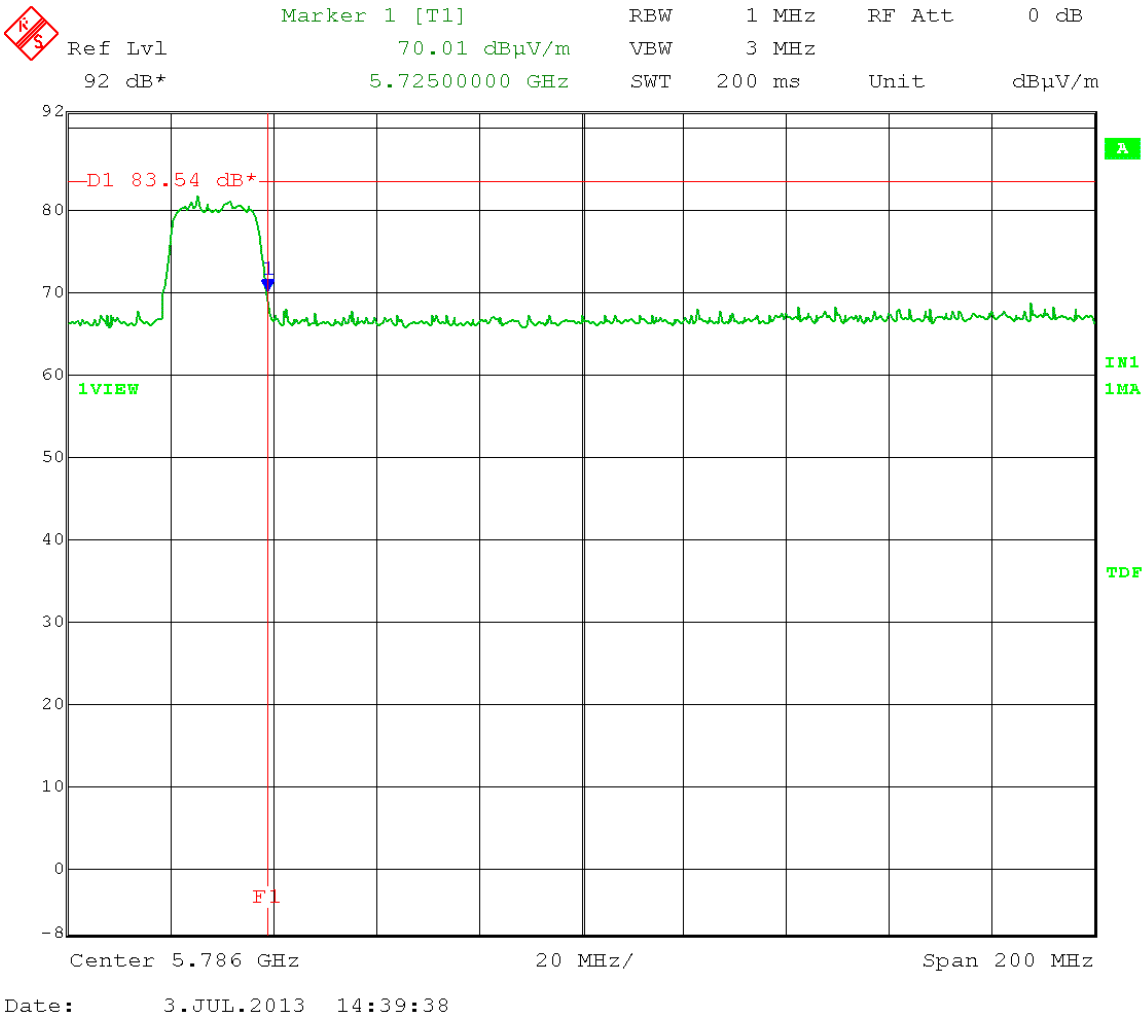
15.209 Limit: 63.54 dBµV/m AVERAGE at a test distance of 1 meter.



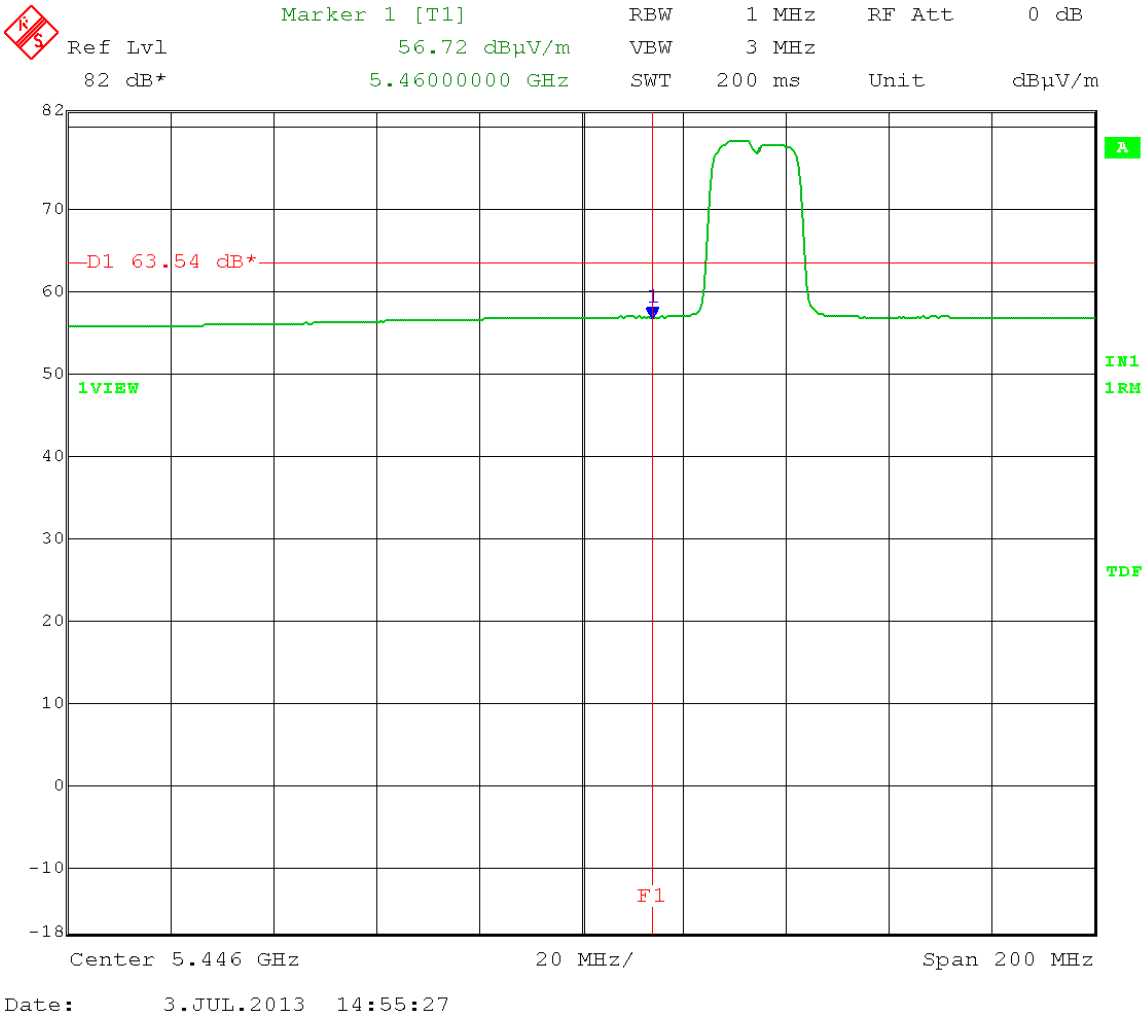
Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: High Channel: Frequency – 5715 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

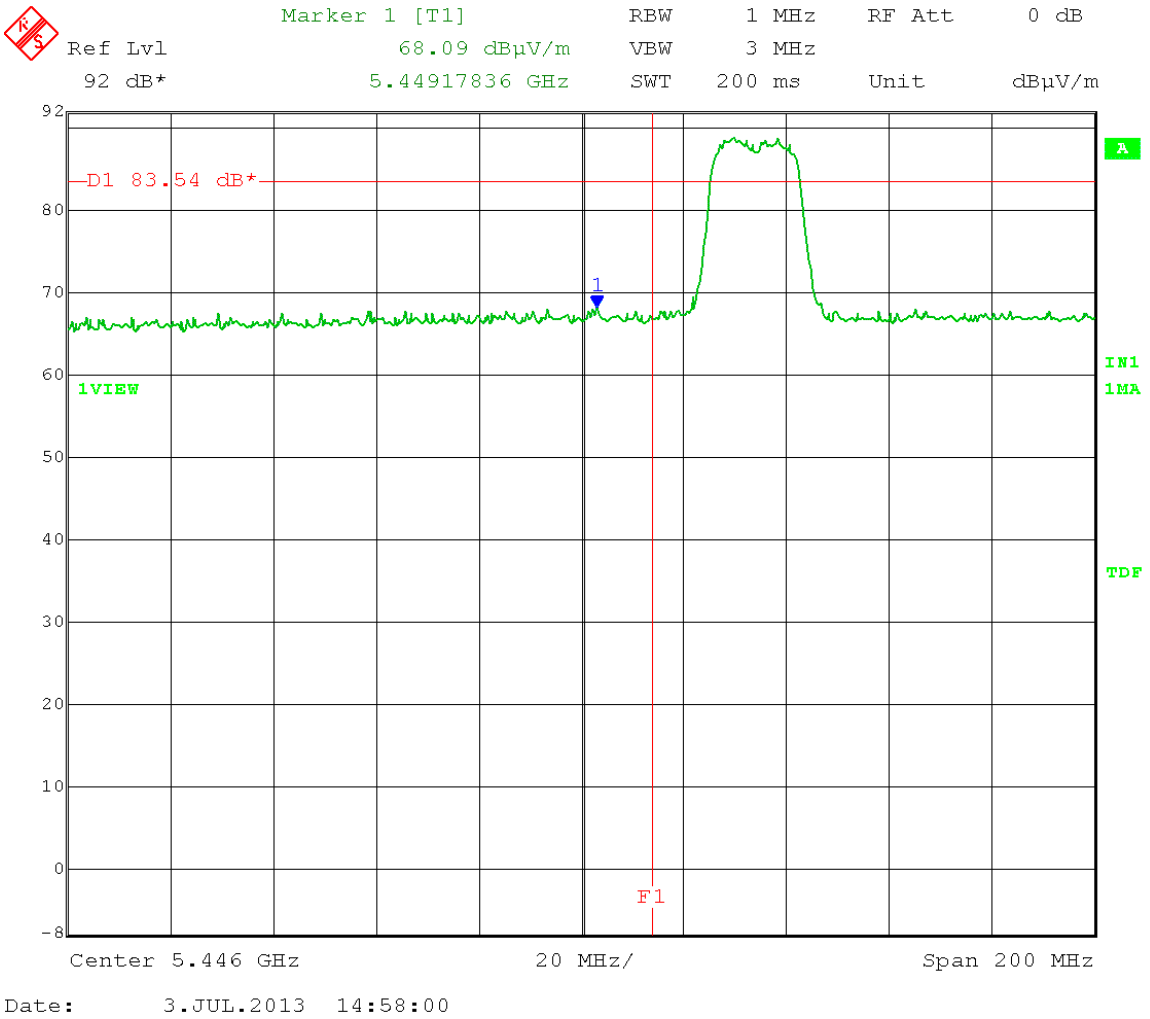
Band-Edge Limit: 83.54 dBµV/m PEAK at a test distance of 1 meter.



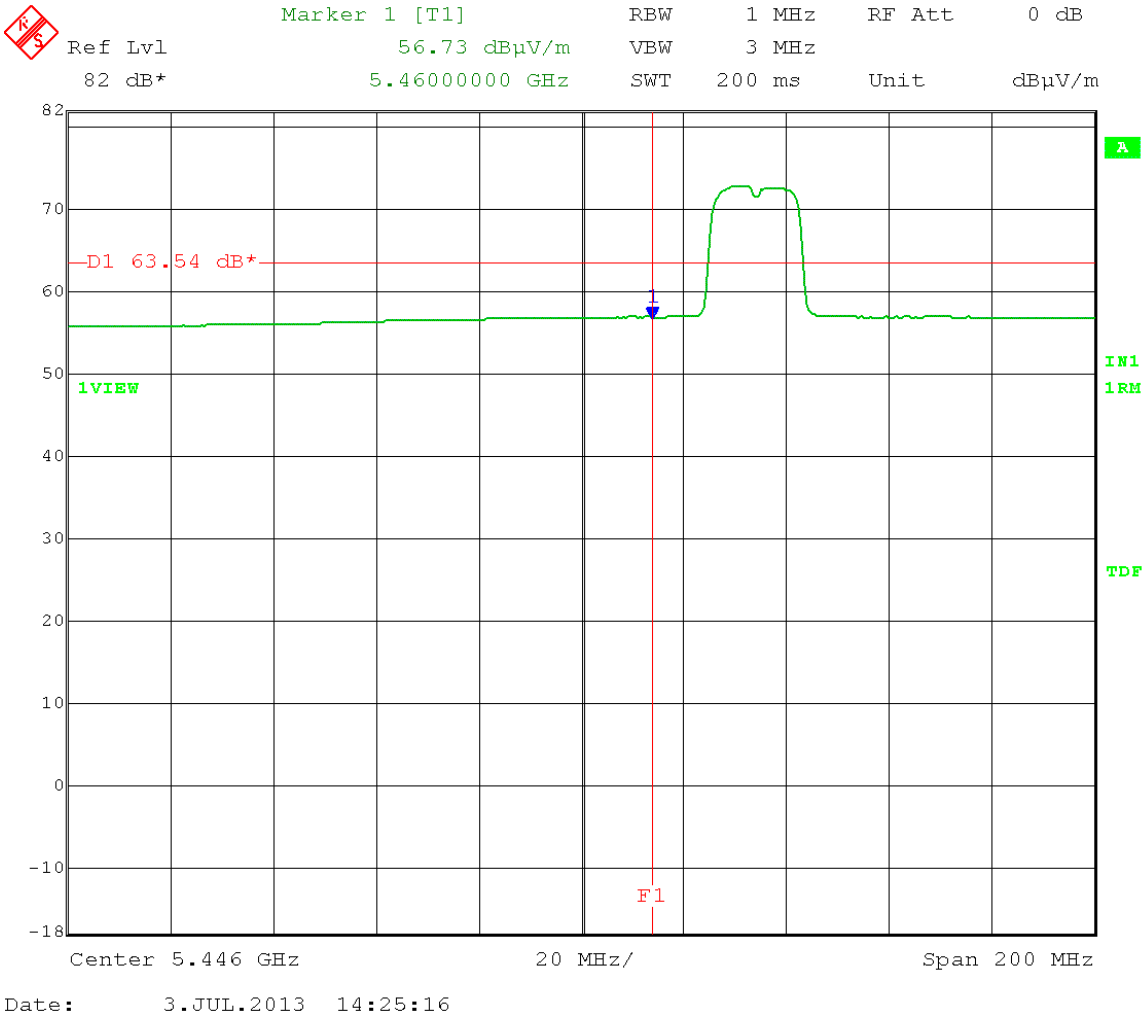
Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – AVG (FCC 15.407(b)(7)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Restricted Band-Edge Frequency: 5.46 GHz
Band-Edge Limit: 63.54 dBµV/m AVERAGE at a test distance of 1 meter.



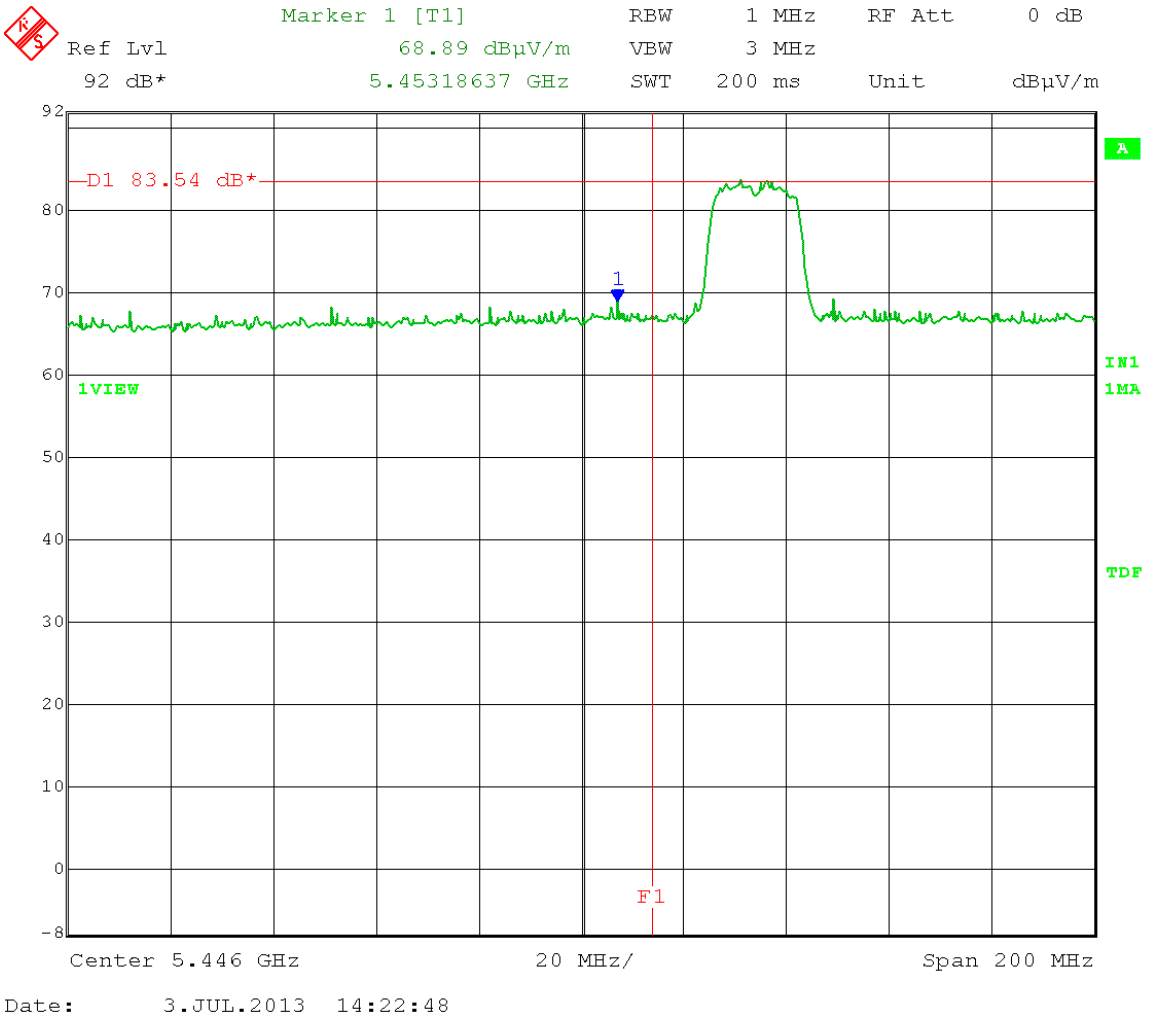
Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – PEAK (FCC 15.407(b)(7)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Restricted Band-Edge Frequency: 5.46 GHz
Band-Edge Limit: 83.54 dBµV/m PEAK at a test distance of 1 meter.



Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – AVG (FCC 15.407(b)(7)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Restricted Band-Edge Frequency: 5.46 GHz
Band-Edge Limit: 63.54 dBµV/m AVERAGE at a test distance of 1 meter.



Test Date: 07-03-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Lower Band-Edge Compliance - Radiated (Restricted Band) – PEAK (FCC 15.407(b)(7)) - With 50 Ohm terminations on antenna ports
Operator: Craig B
Comment: Low Channel: Frequency – 5480 MHz
Output power setting: 10.0 on both chains
Channel bandwidth: 20 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Restricted Band-Edge Frequency: 5.46 GHz
Band-Edge Limit: 83.54 dBµV/m PEAK at a test distance of 1 meter.



Appendix B – Measurement Data

B8.1 Unwanted Emission Levels – Radiated Band-Edge - 40 MHz channel bandwidth
Radiated with antenna connected

Rule Section: Sections 15.407(b)(3) and 15.407(b)(5)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*

Section H – Unwanted emission levels
Section H(1) – Unwanted emissions in the restricted bands
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Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz
Section H(6) – Procedure for Average Unwanted Emissions Measurements Above 1 GHz
Section H(6)(c) – Average Detection method

Description: Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

Measure the band-edge emission level using the following settings

PEAK measurements:
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = peak
Sweep time = auto
Trace mode = max hold

AVERAGE measurements:
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = RMS
Sweep time = auto
Trace mode = trace average 200 traces

Limit: Peak and Average limits of 15.209 were used instead of the -27 dBm/MHz limit of FCC Part 15.407(b)(3).

Results: Passed

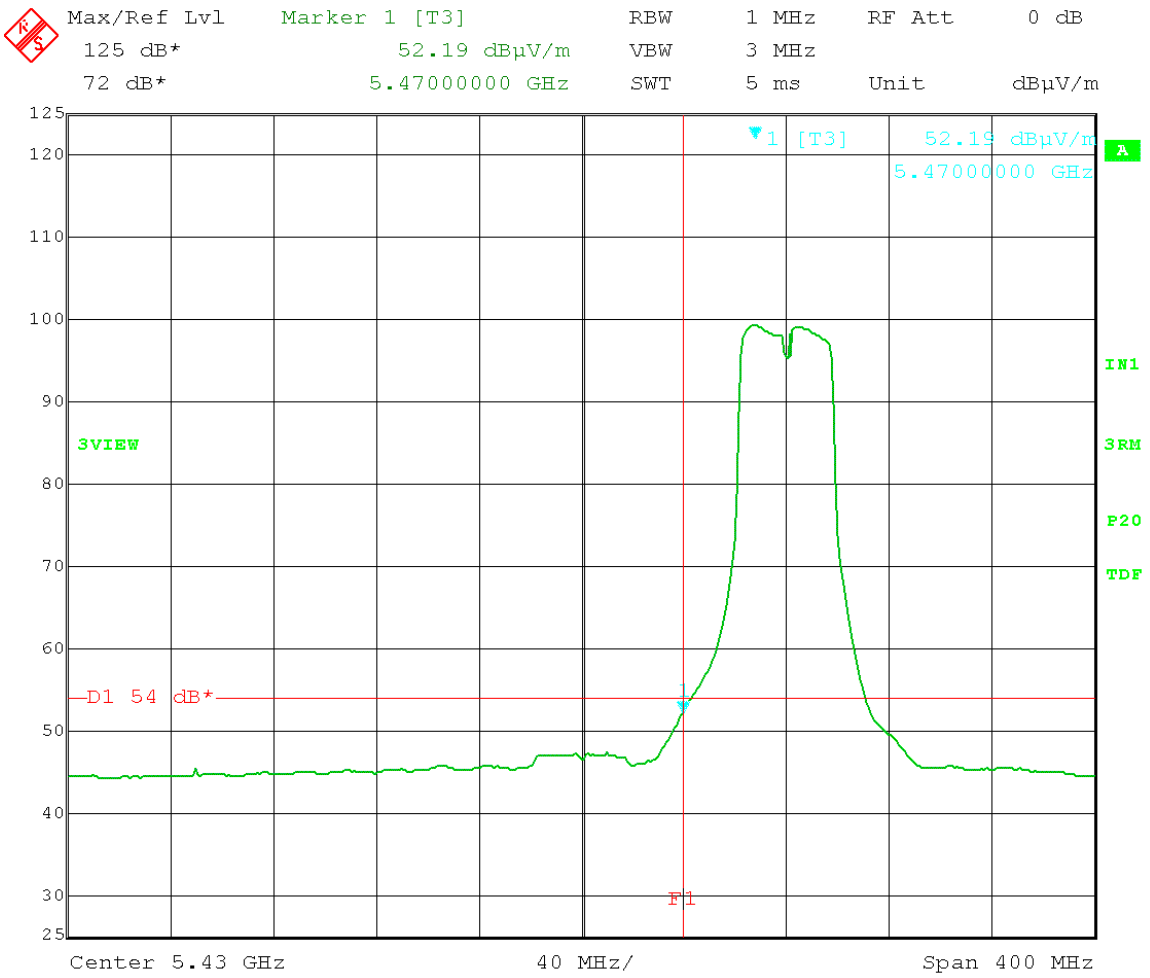
Notes: Measurements were taken for MCS15 OFDM modulation at the lowest and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

Tested with Laird 5.4-6.0 GHz 17 dBi Antenna (Model 85009324001) connected

Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.470 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

15.209 Limit: 54 dBµV/m AVERAGE at a test distance of 3 meter.

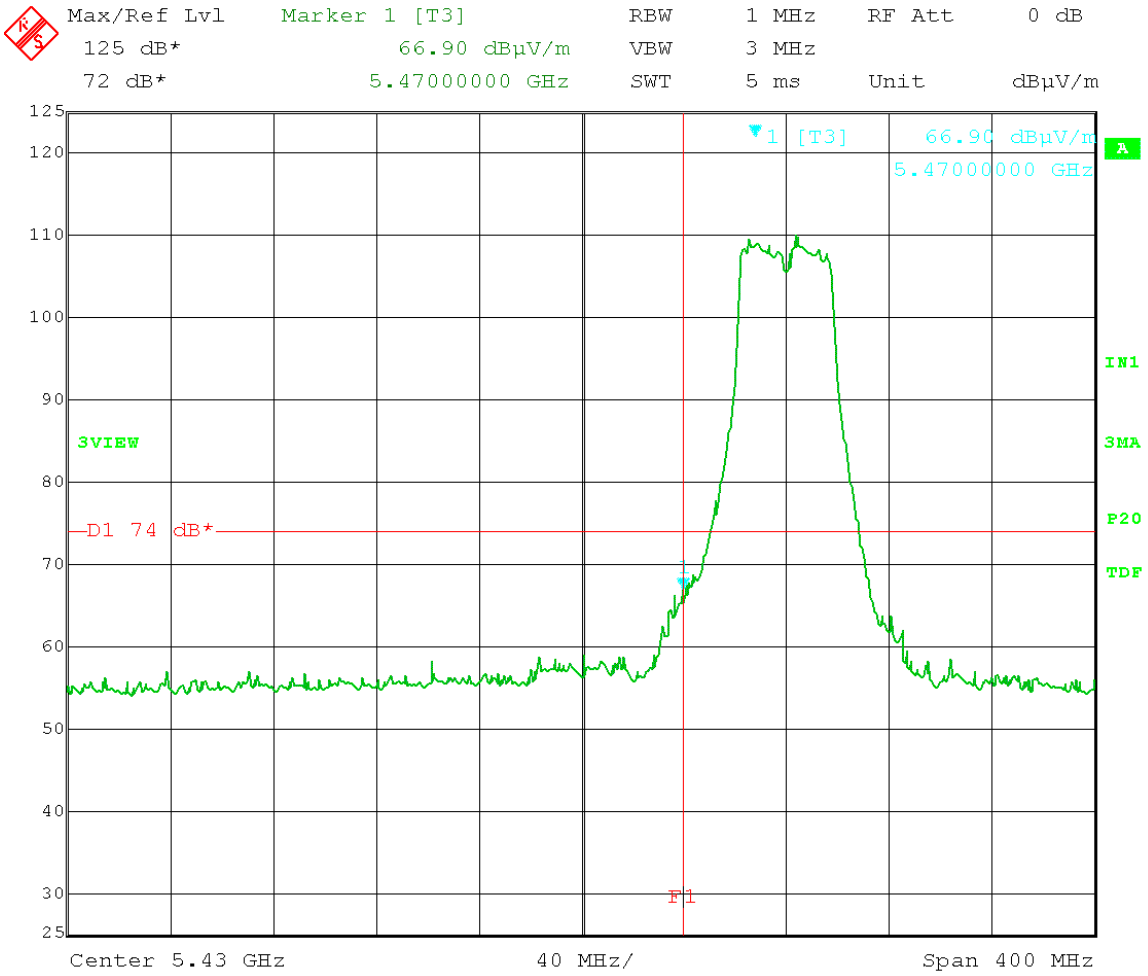


Date: 26.JUL.2013 10:53:49

Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.470 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

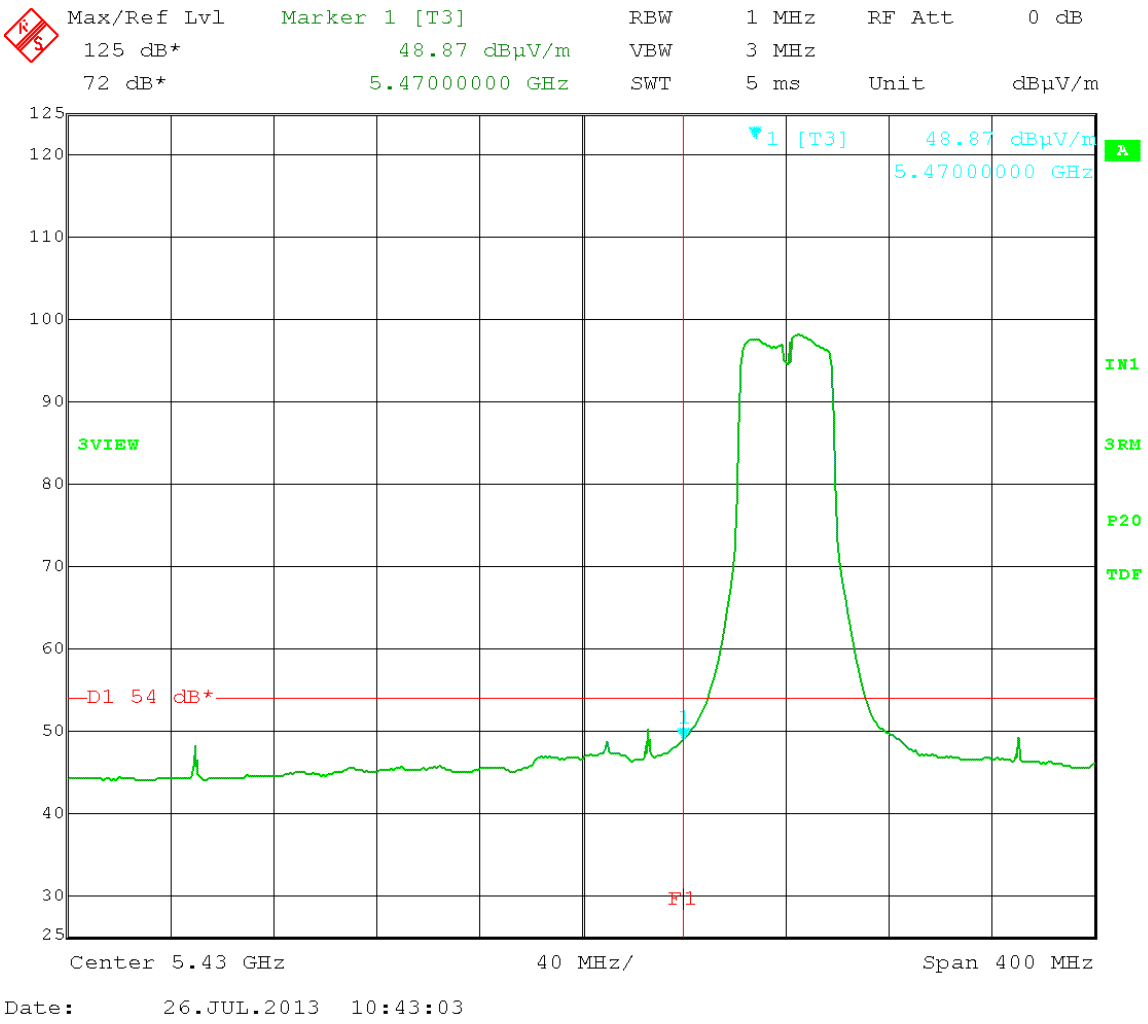
Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meter. Result = Pass



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.470 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

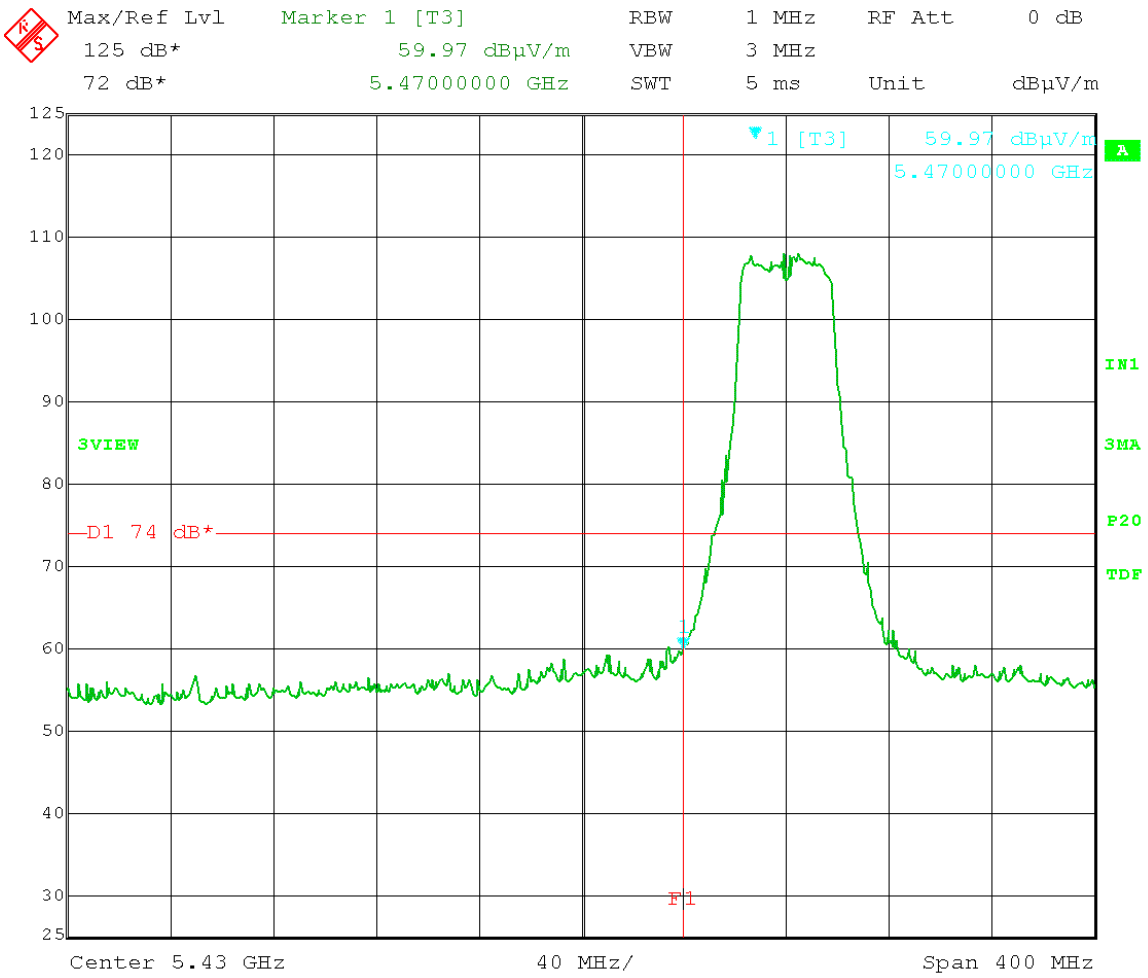
15.209 Limit: 54 dBµV/m AVERAGE at a test distance of 3 meter.



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.470 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meter. Result = Pass

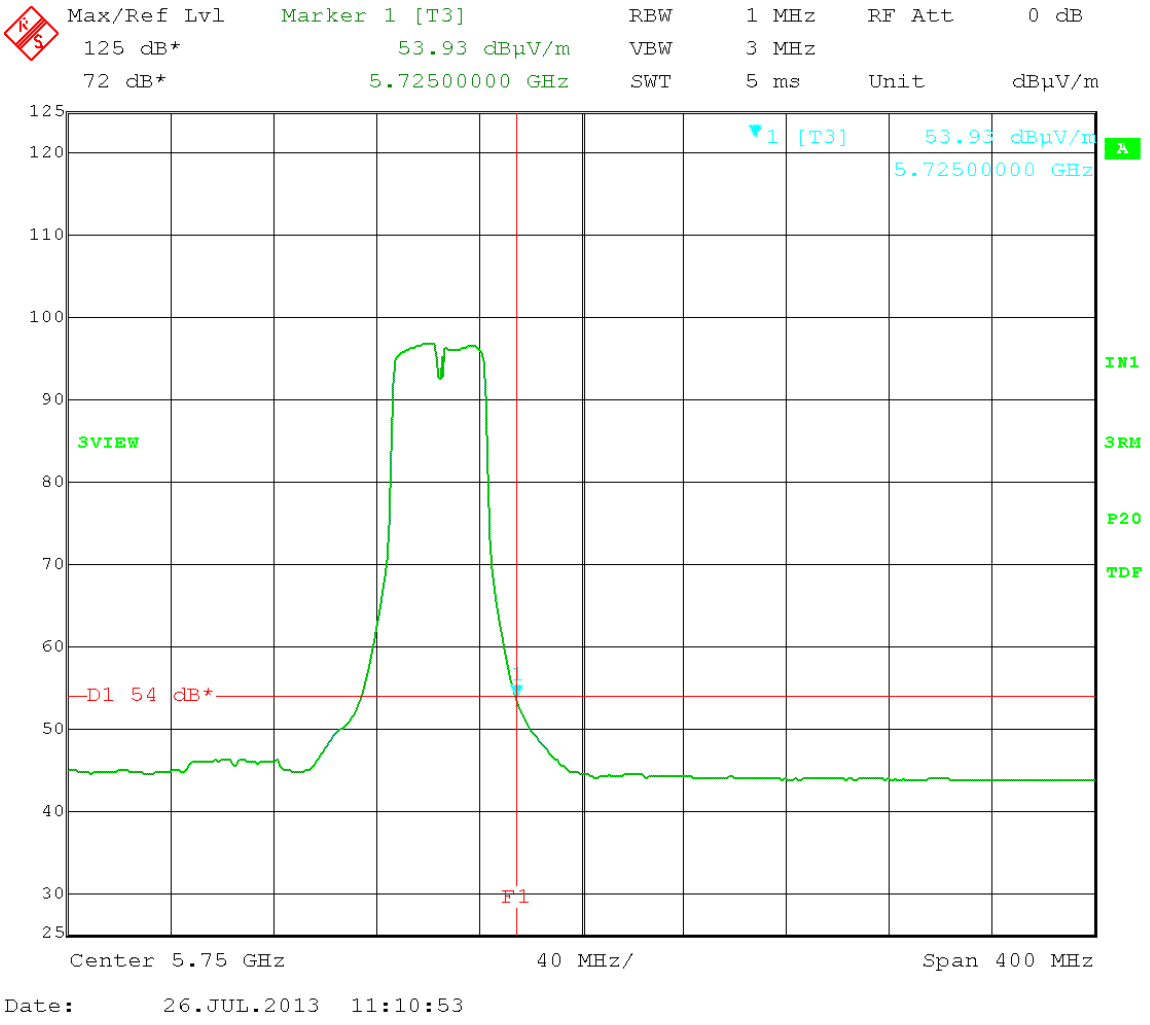


Date: 26.JUL.2013 10:41:49

Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: High Channel: Frequency – 5695 MHz
Output power setting: 2.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

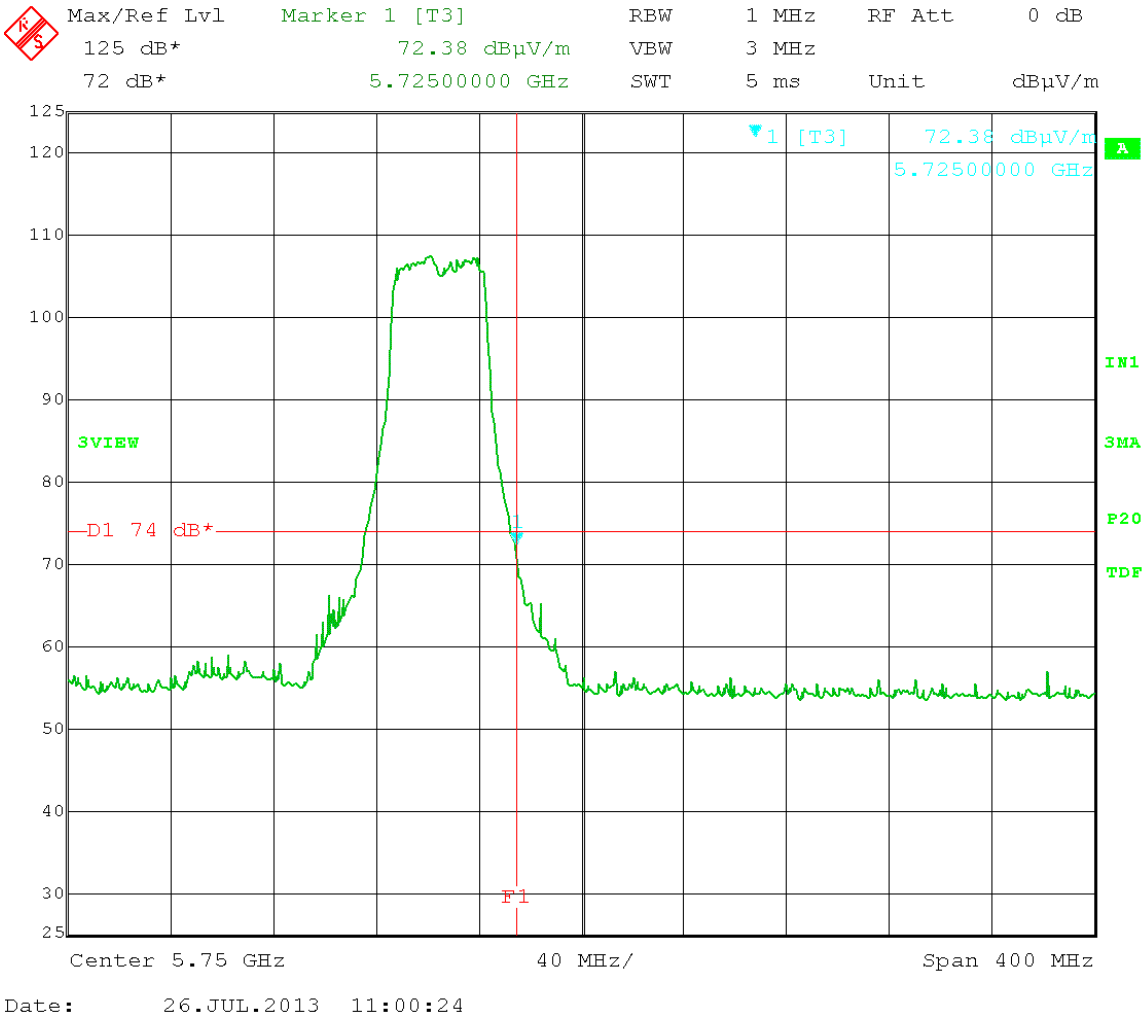
15.209 Limit: 54 dBµV/m AVERAGE at a test distance of 3 meter. Result = Pass



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: High Channel: Frequency – 5695 MHz
Output power setting: 2.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

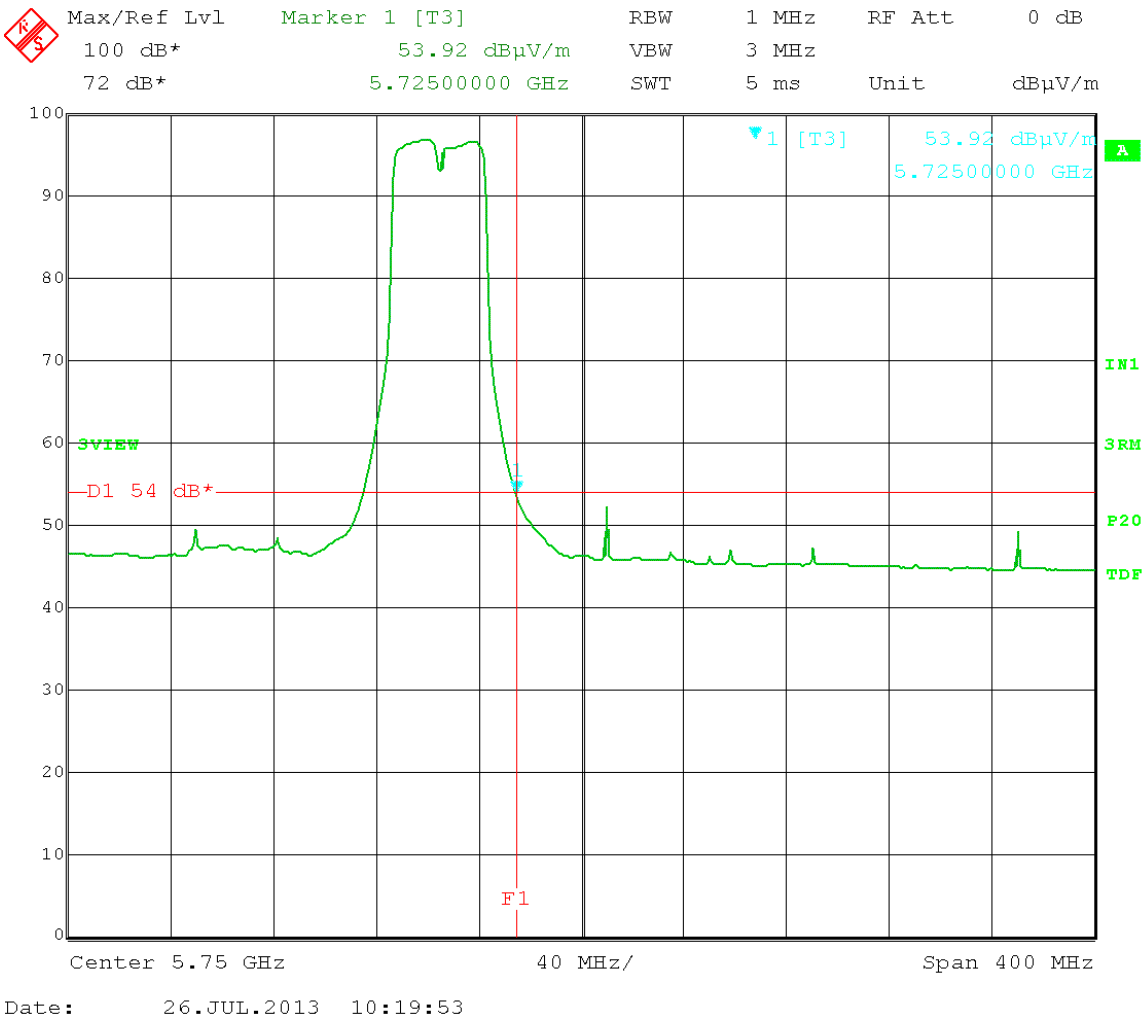
Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meter. Result = Pass



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – AVG
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: High Channel: Frequency – 5695 MHz
Output power setting: 2.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

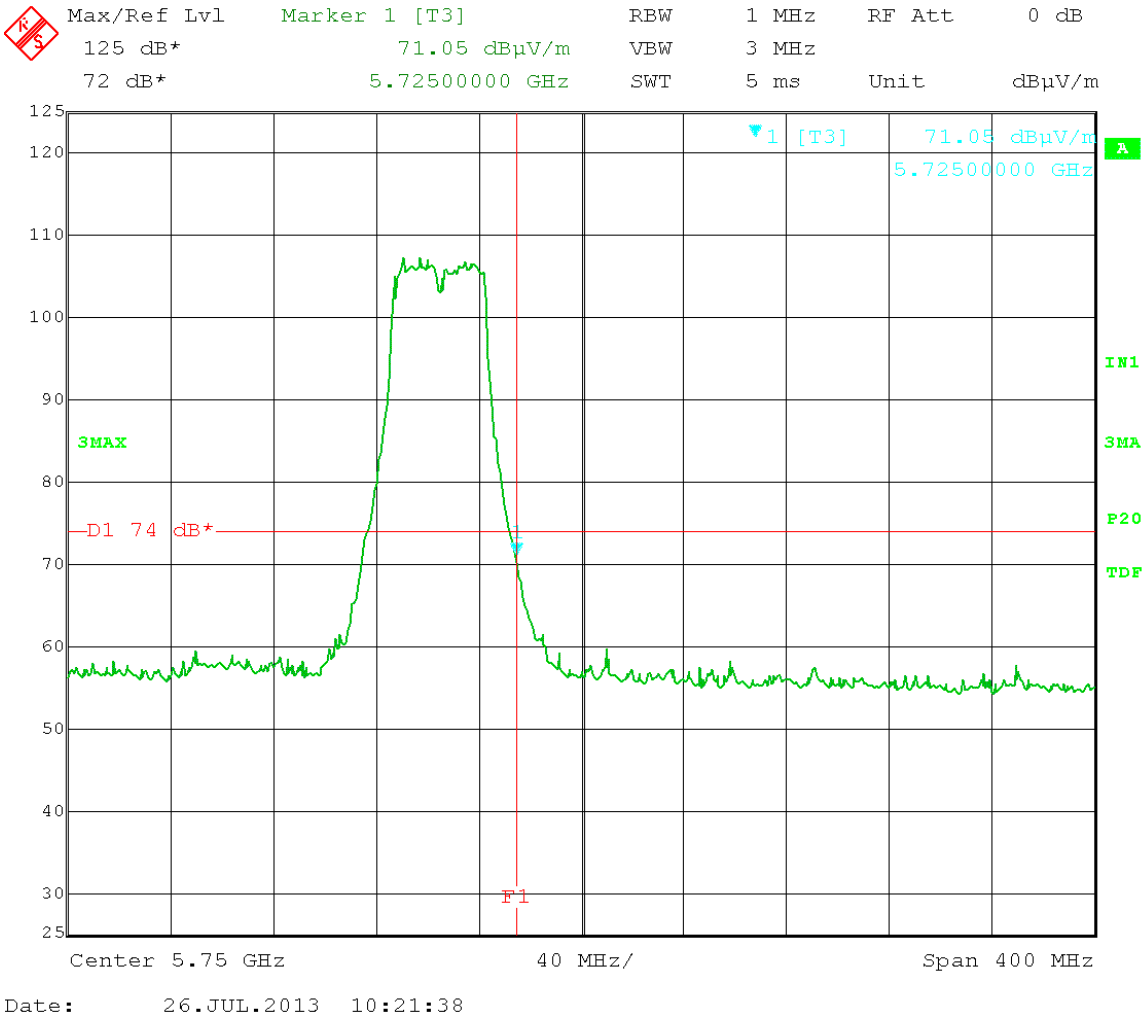
15.209 Limit: 54 dBµV/m AVERAGE at a test distance of 3 meter.



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Upper Band-Edge Compliance - Radiated – PEAK
(FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: High Channel: Frequency – 5695 MHz
Output power setting: 2.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Band-Edge Frequency: 5.725 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

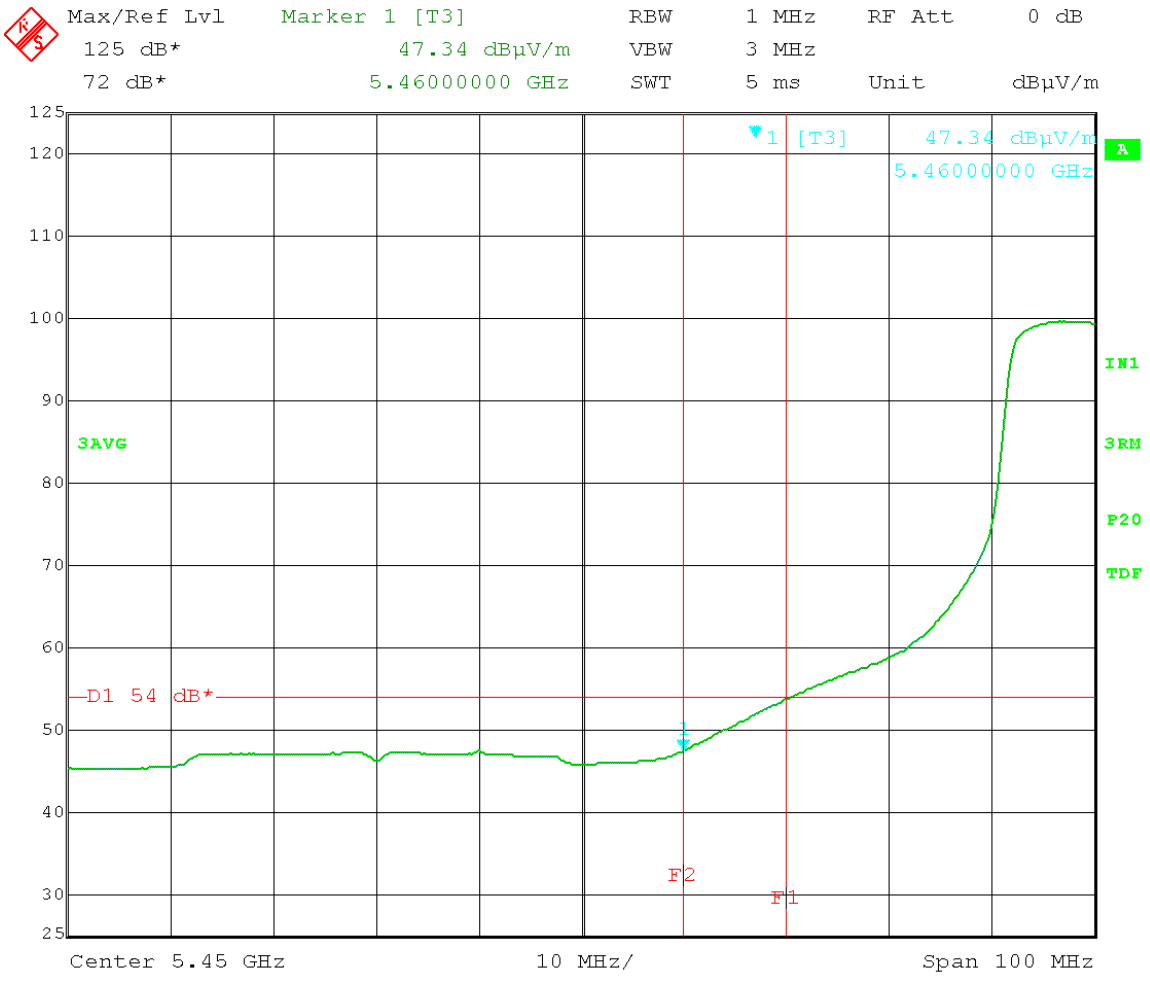
Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meter. Result = Pass



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Unwanted emission in restricted band 5350 – 5460MHz -Radiated – AVG (FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Operating Band-Edge F1 = 5.47 GHz
Restricted Band-Edge F2 = 5.46 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

15.209 Limit: 54 dBµV/m AVERAGE at a test distance of 3 meter.

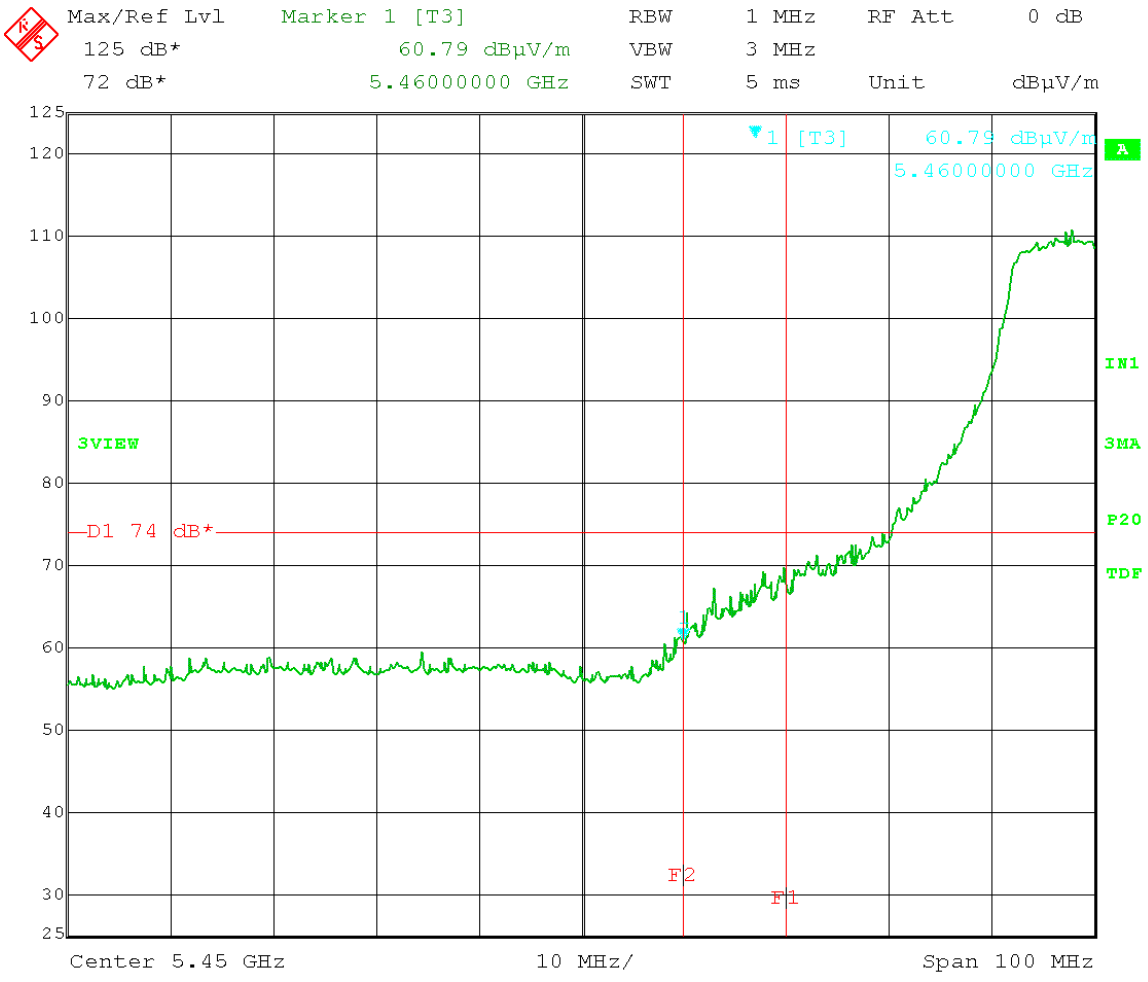


Date: 26.JUL.2013 11:21:27

Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Unwanted emission in restricted band 5350 – 5460MHz -Radiated – PEAK (FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Horizontal
Operating Band-Edge F1 = 5.47 GHz
Restricted Band-Edge F2 = 5.46 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meter. Result = Pass

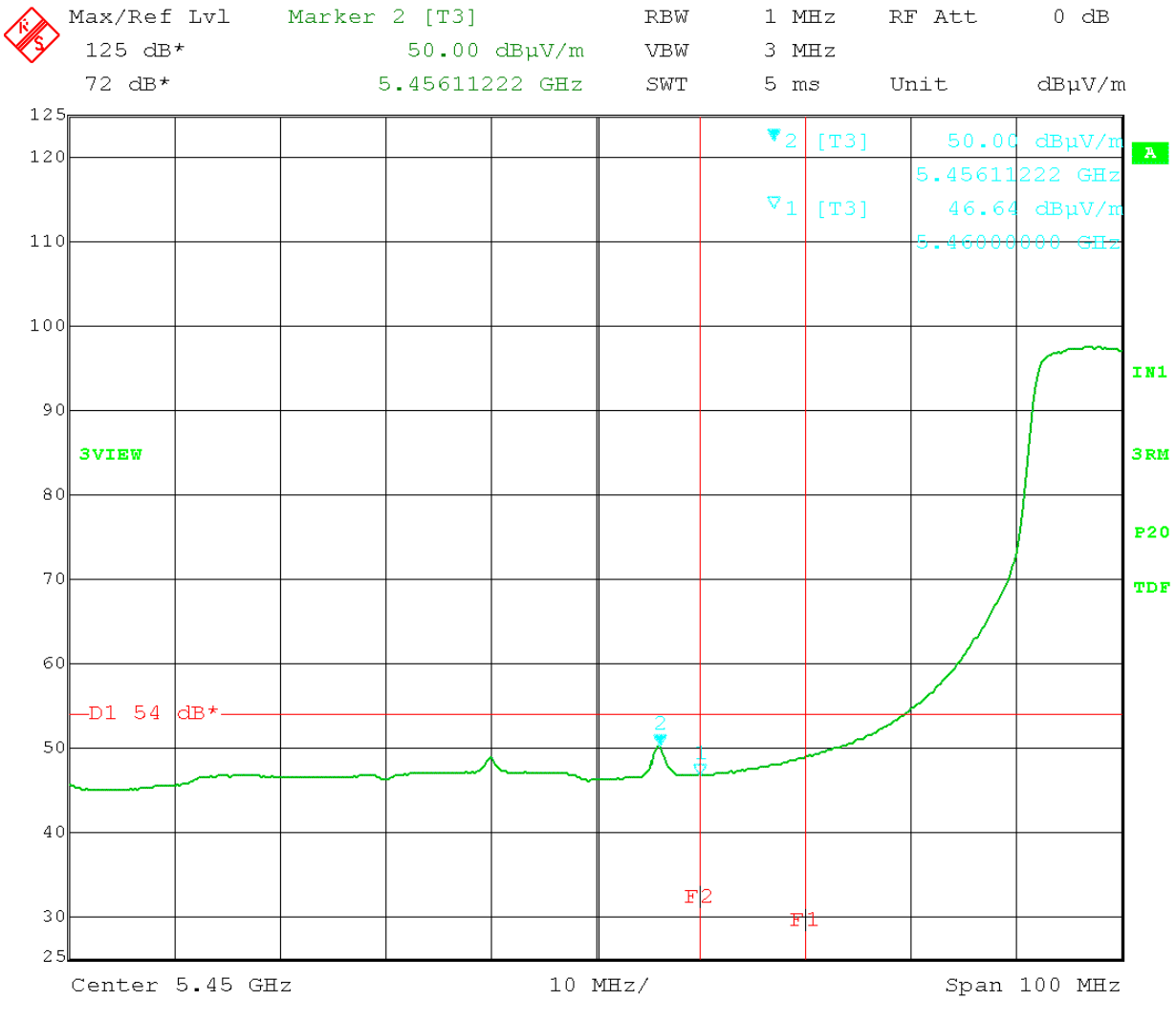


Date: 26.JUL.2013 11:26:06

Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Unwanted emission in restricted band 5350 – 5460MHz -Radiated – AVG (FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Operating Band-Edge F1 = 5.47 GHz
Restricted Band-Edge F2 = 5.46 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

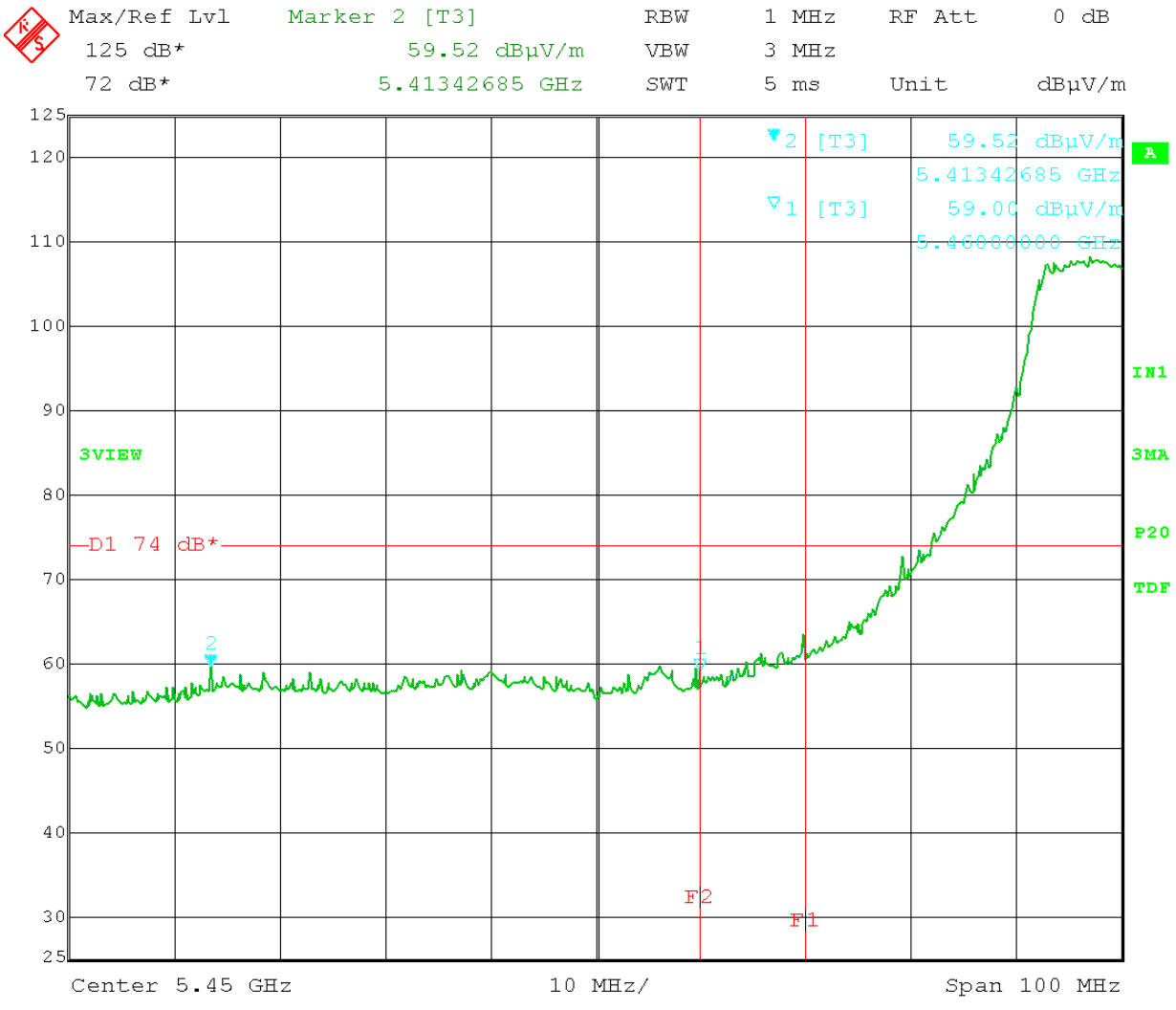
15.209 Limit: 54 dBµV/m AVERAGE at a test distance of 3 meter.



Test Date: 07-26-2013
Company: Cambium Networks
EUT: 5.4 GHz Avenger AP
Test: Unwanted emission in restricted band 5350 – 5460MHz -Radiated – PEAK (FCC 15.407(b)(3)) - With Antenna (Model#: 85009324001) connected
Operator: Craig B/Lillian L
Comment: Low Channel: Frequency – 5510 MHz
Output power setting: 4.0 on both chains
Channel bandwidth: 40 MHz
Modulation: OFDM; MCS15
Polarization: Vertical
Operating Band-Edge F1 = 5.47 GHz
Restricted Band-Edge F2 = 5.46 GHz

Per 789033 D01 General UNII Test Procedures v01r03, section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

Band-Edge Limit: 74 dBµV/m PEAK at a test distance of 3 meter. Result = Pass



Appendix B – Measurement Data

B9.0 Unwanted Emission Levels – RF Conducted

Rule Section: Sections 15.407(b)(3) and 15.407(b)(6)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*
Section H(1) – Unwanted emissions in the restricted bands
Section H(2) – Unwanted emissions that fall outside of the restricted bands
Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(4) – Procedure for Unwanted Emissions Measurements Below 1 GHz
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz
Section H(6) – Procedure for Average Unwanted Emissions Measurements Above 1 GHz
Section H(6)(c) – Average Detection method

Below 1000 MHz
Detector = quasi-peak
Alternately, peak detector is permitted

Peak measurements above 1000 MHz
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = peak
Sweep time = auto
Trace mode = max hold

Average measurements above 1000 MHz (required for peak emissions that are above the average limits) –
Method AD (Average Detection)
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = RMS (span/(# of points in sweep) ≤ RBW/2)
Averaging type = power
Sweep time = auto
Trace mode = trace average 100 sweeps; increased by a factor of (1 / duty cycle)
For a duty cycle less than 98%, add 10 log (1/duty cycle)

EIRP calculation:
Add upper bound on out-of-band antenna gain to measured antenna port conducted emission power. (This is the maximum in-band gain or 2 dBi, whichever is greater)
Add 10 log(N), where N is the number of output, for MIMO operation
Add an additional 10 log(N), if the signals are correlated according to FCC KDB 662911, or if the unwanted emission is narrowband

Field strength calculation:
Above 1 GHz: E (dBμV/m) = EIRP (dBm) – 20 log (d{meters}) + 104.77
Below 1 GHz: E (dBμV/m) = EIRP (dBm) – 20 log (d{meters}) + 104.77 + 4.7 dB

Limits: Outside restricted bands: Peak EIRP shall not exceed -27 dBm/MHz
Inside restricted bands: Peak and Average limits of FCC Part 15.209

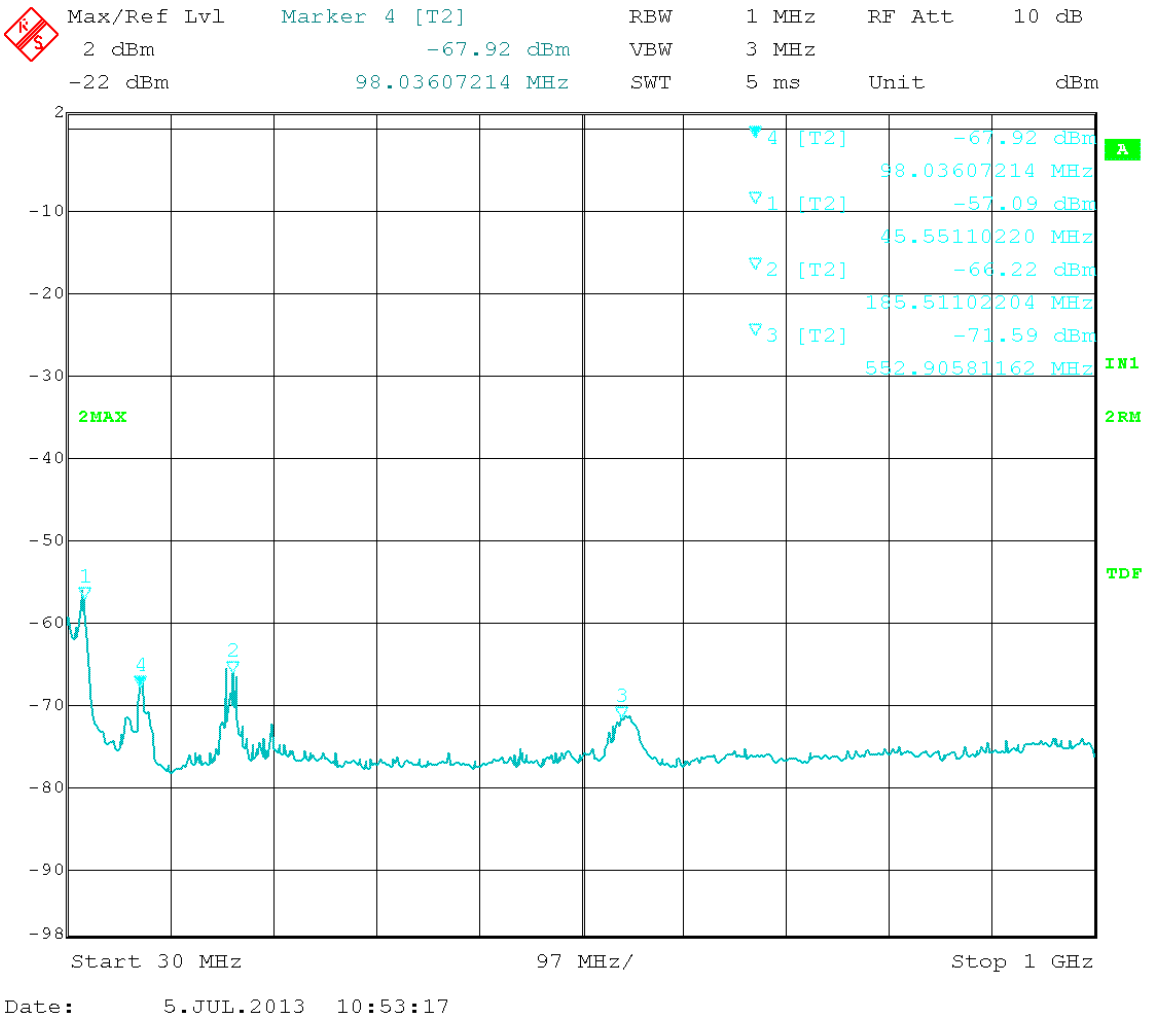
Notes: Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



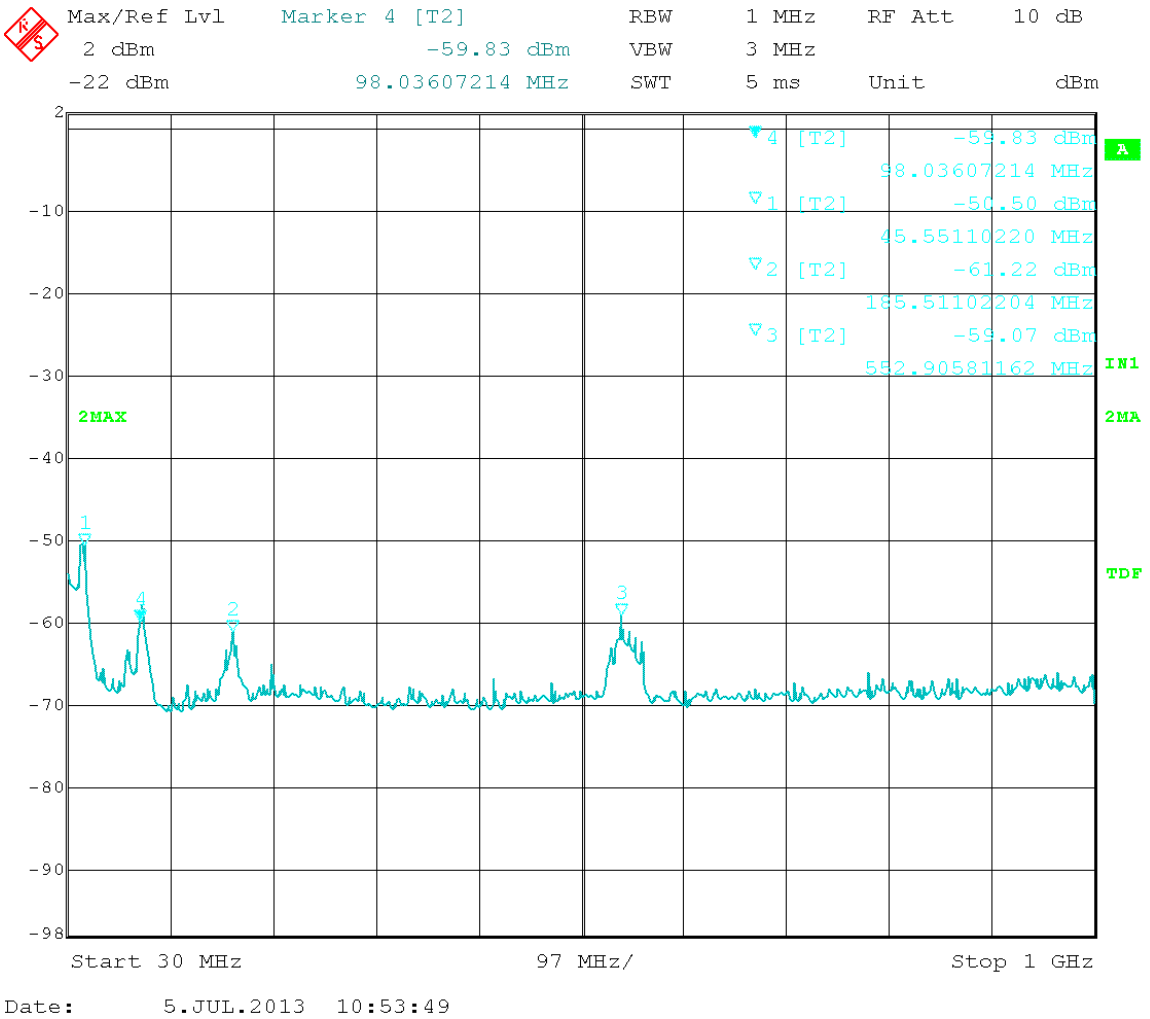
Marker 1: Non-Restricted Band
Marker 2: Non-Restricted Band
Marker 3: Non-Restricted Band
Marker 4: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



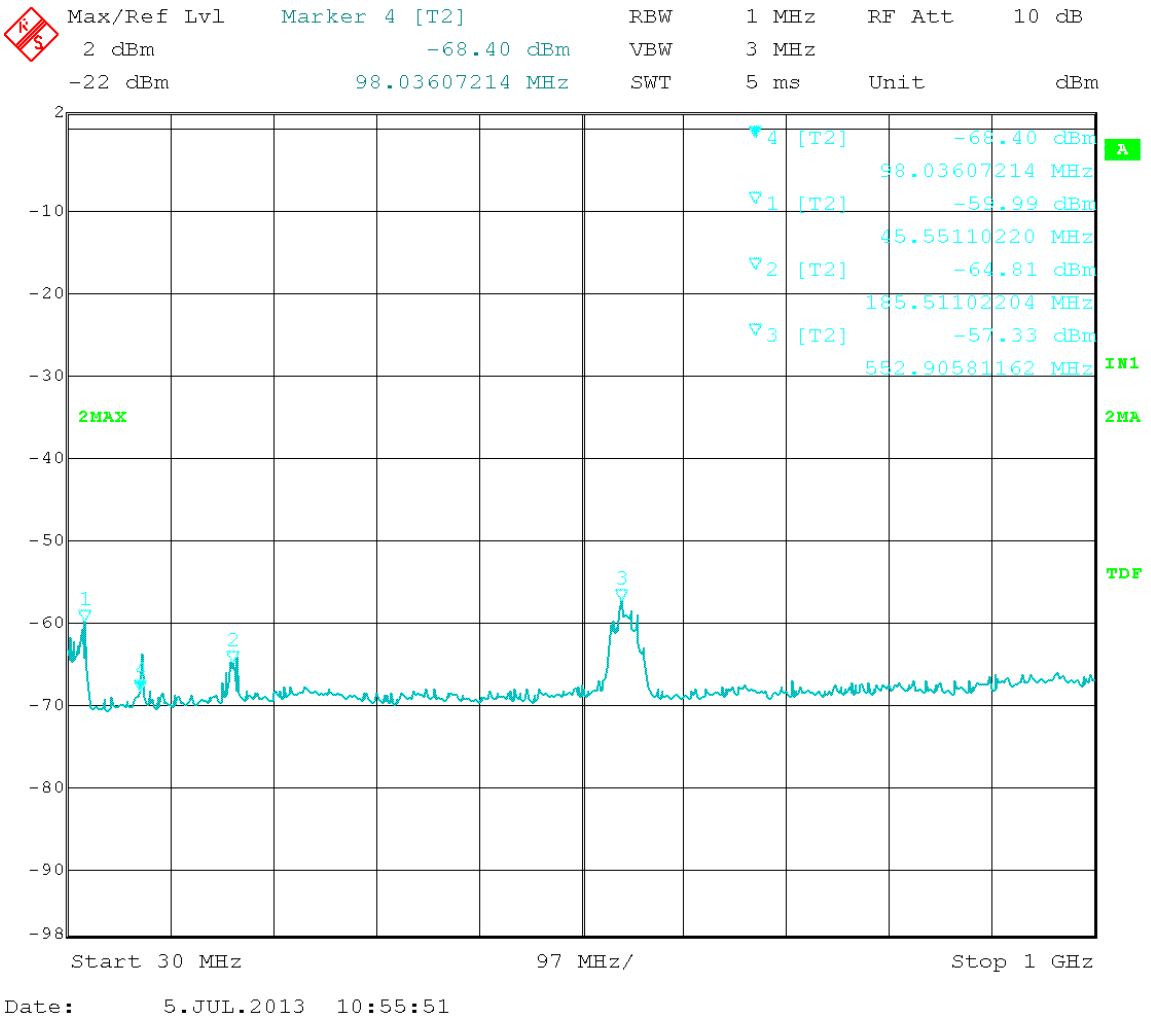
Marker 1: Non-Restricted Band
Marker 2: Non-Restricted Band
Marker 3: Non-Restricted Band
Marker 4: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



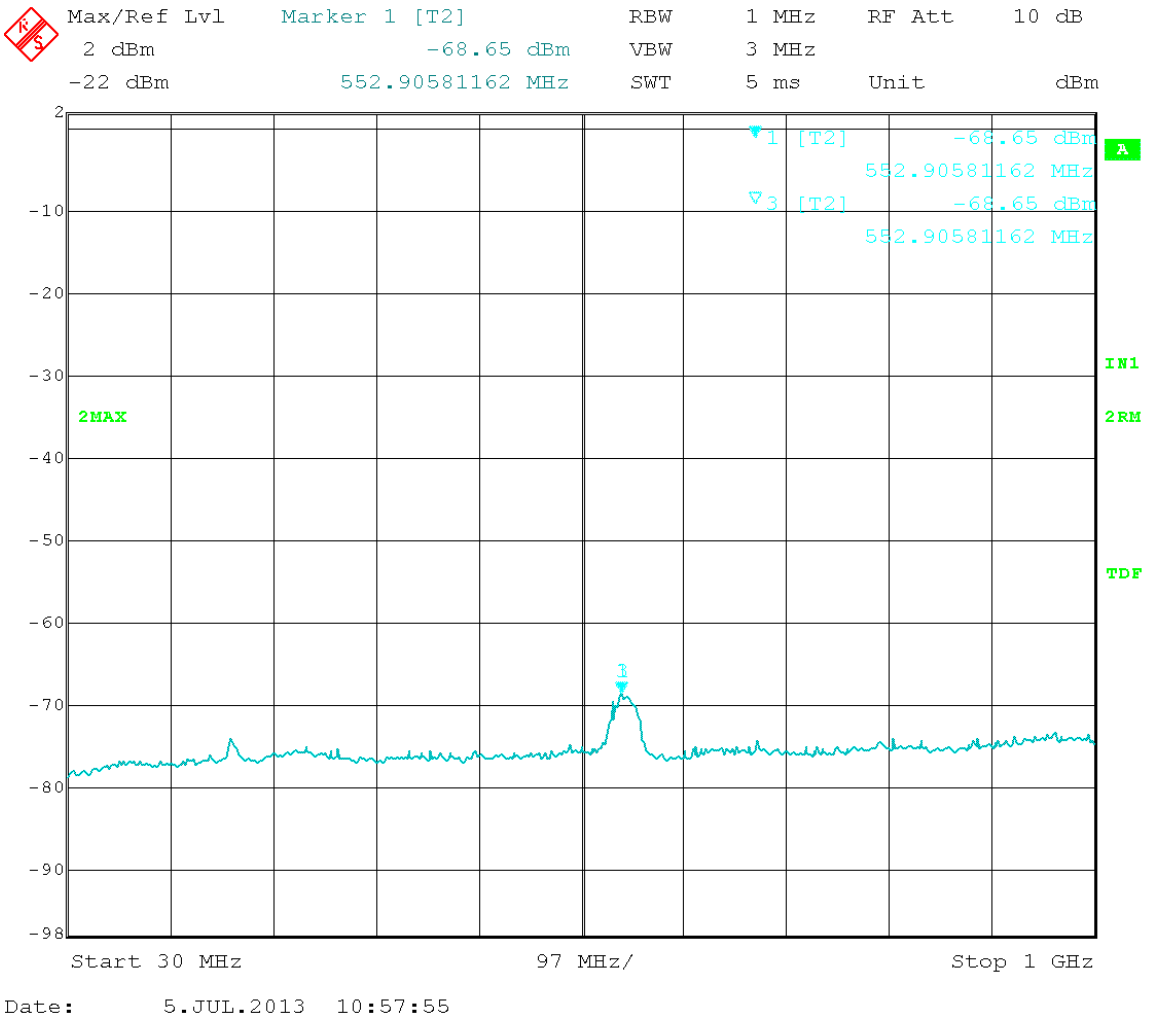
Marker 1: Non-Restricted Band
Marker 2: Non-Restricted Band
Marker 3: Non-Restricted Band
Marker 4: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



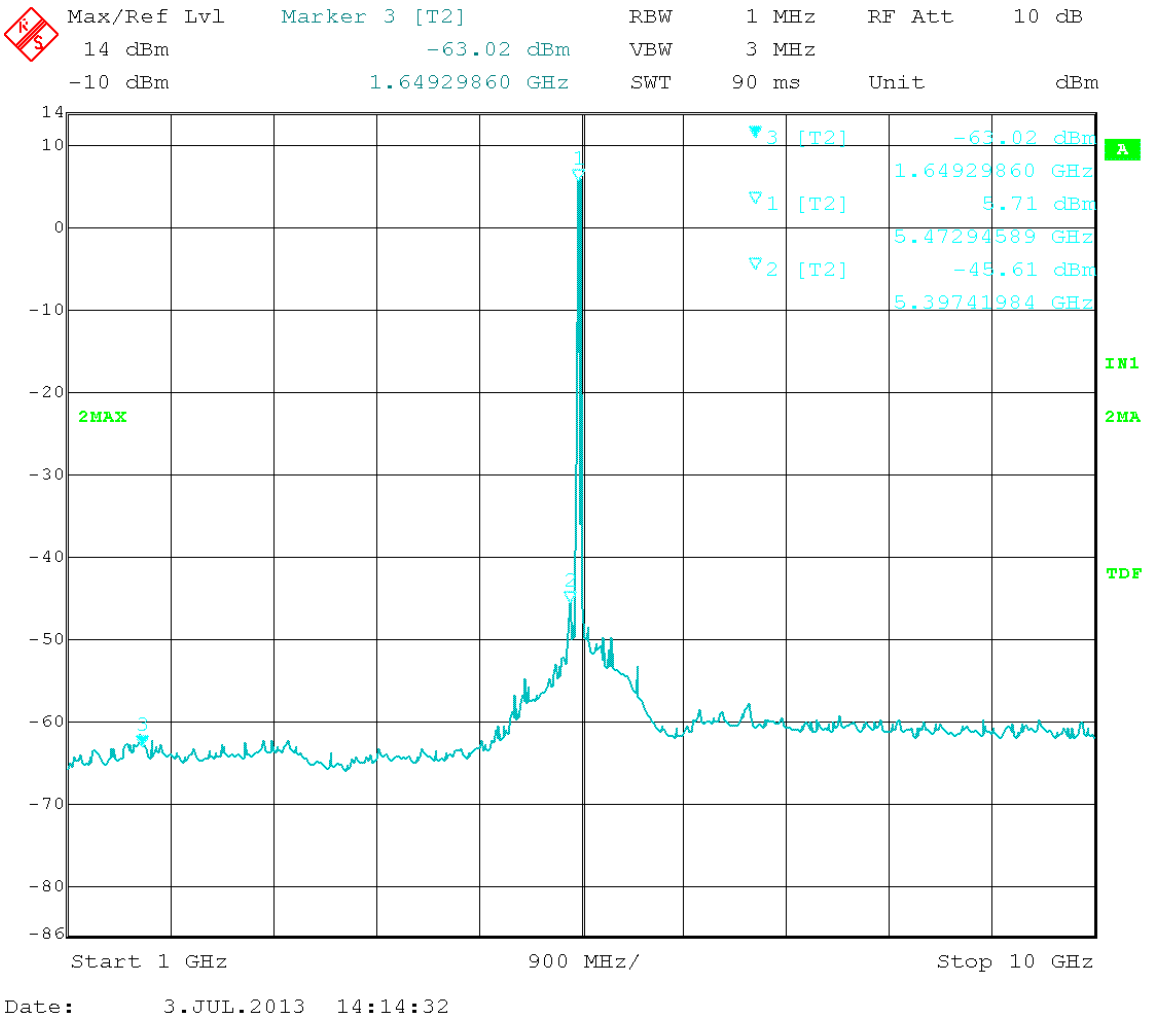
Marker 3: Non-Restricted Band

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



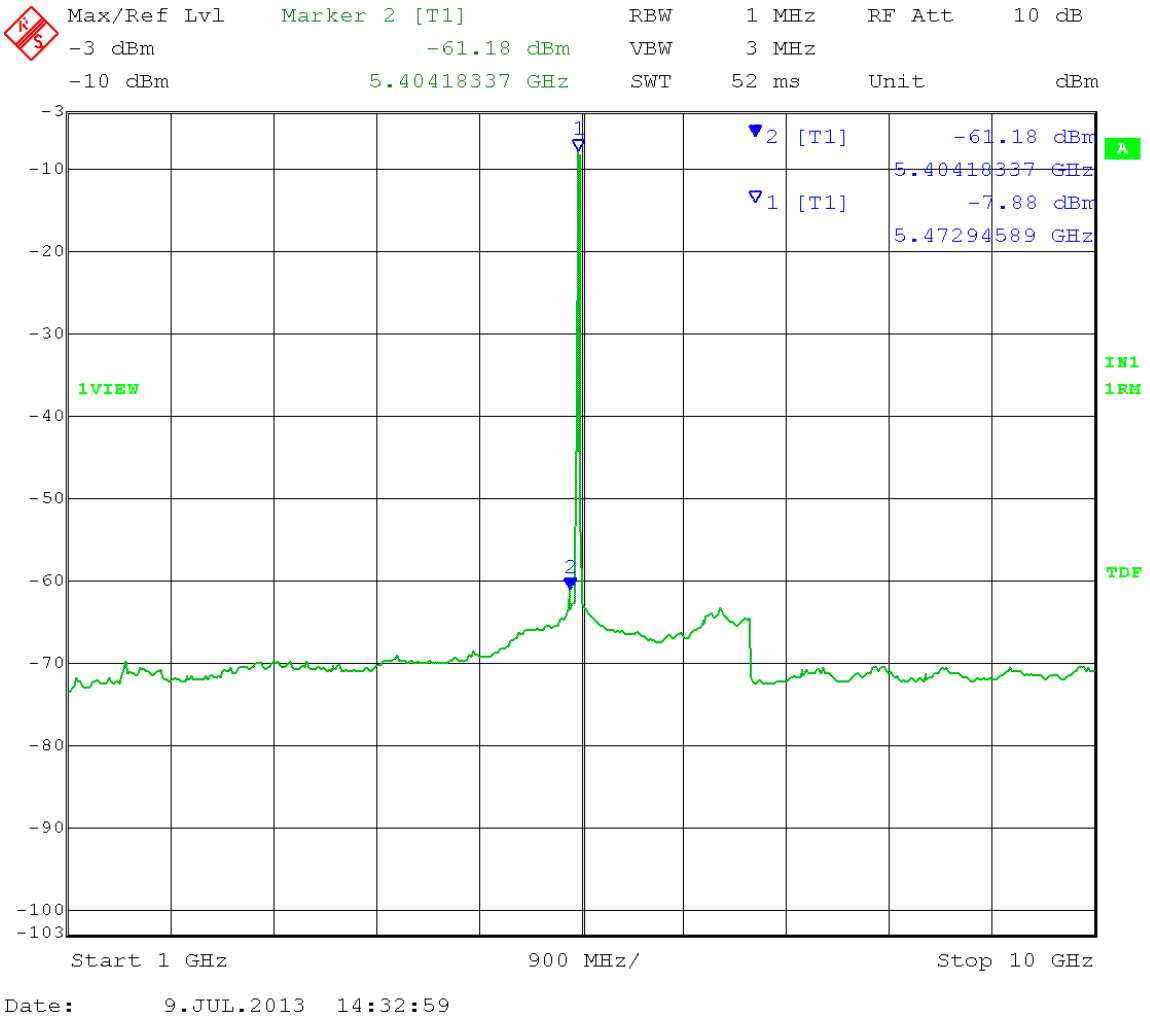
Marker 2: Calculated Field Strength (Restricted Band) = -45.61 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 68.62dBµV/m Peak

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 6
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



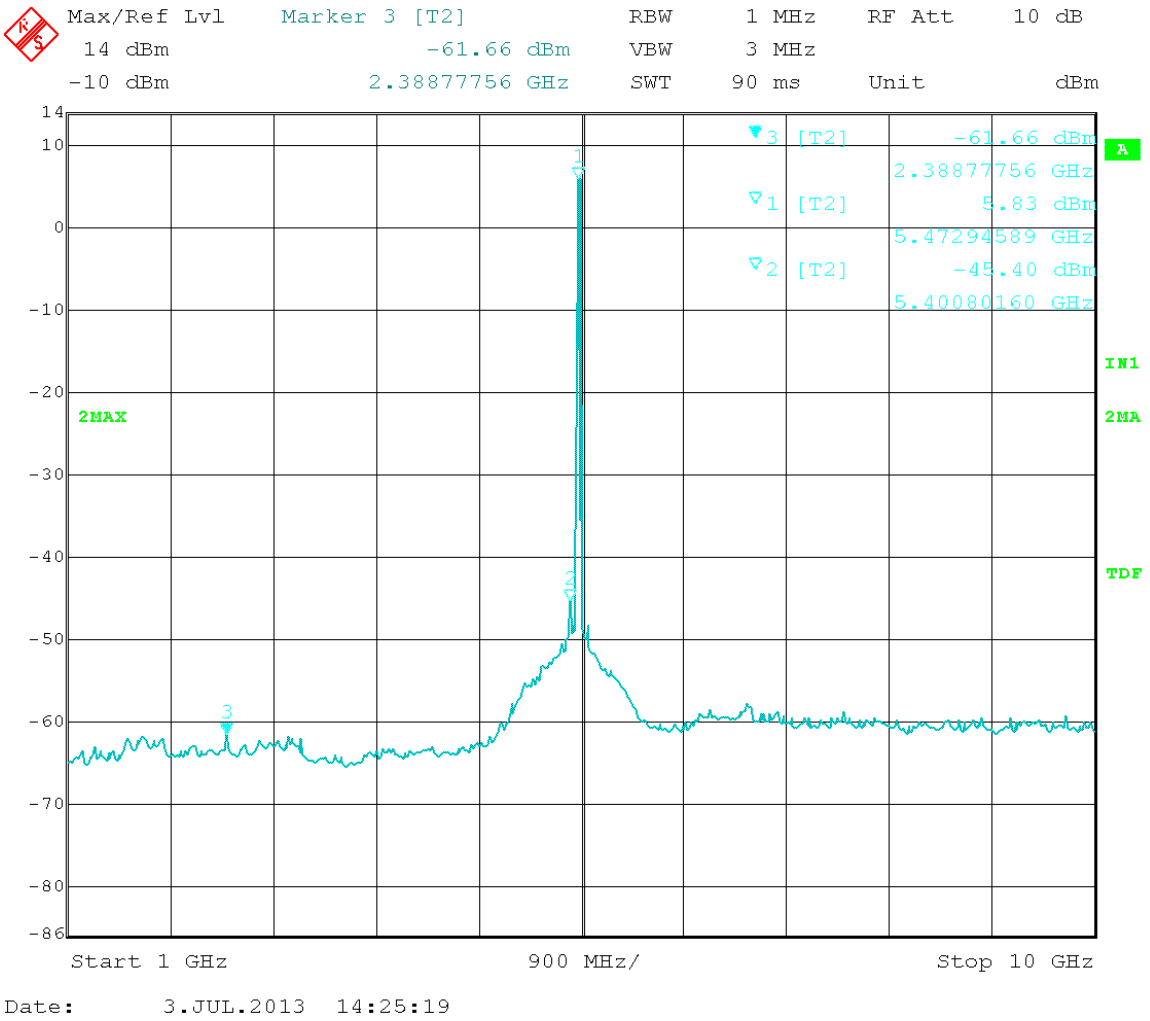
Marker 2: Calculated Field Strength (Restricted Band) = -61.18 + 16dBi antenna gain
+ 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 53.05dBµV/m Average

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



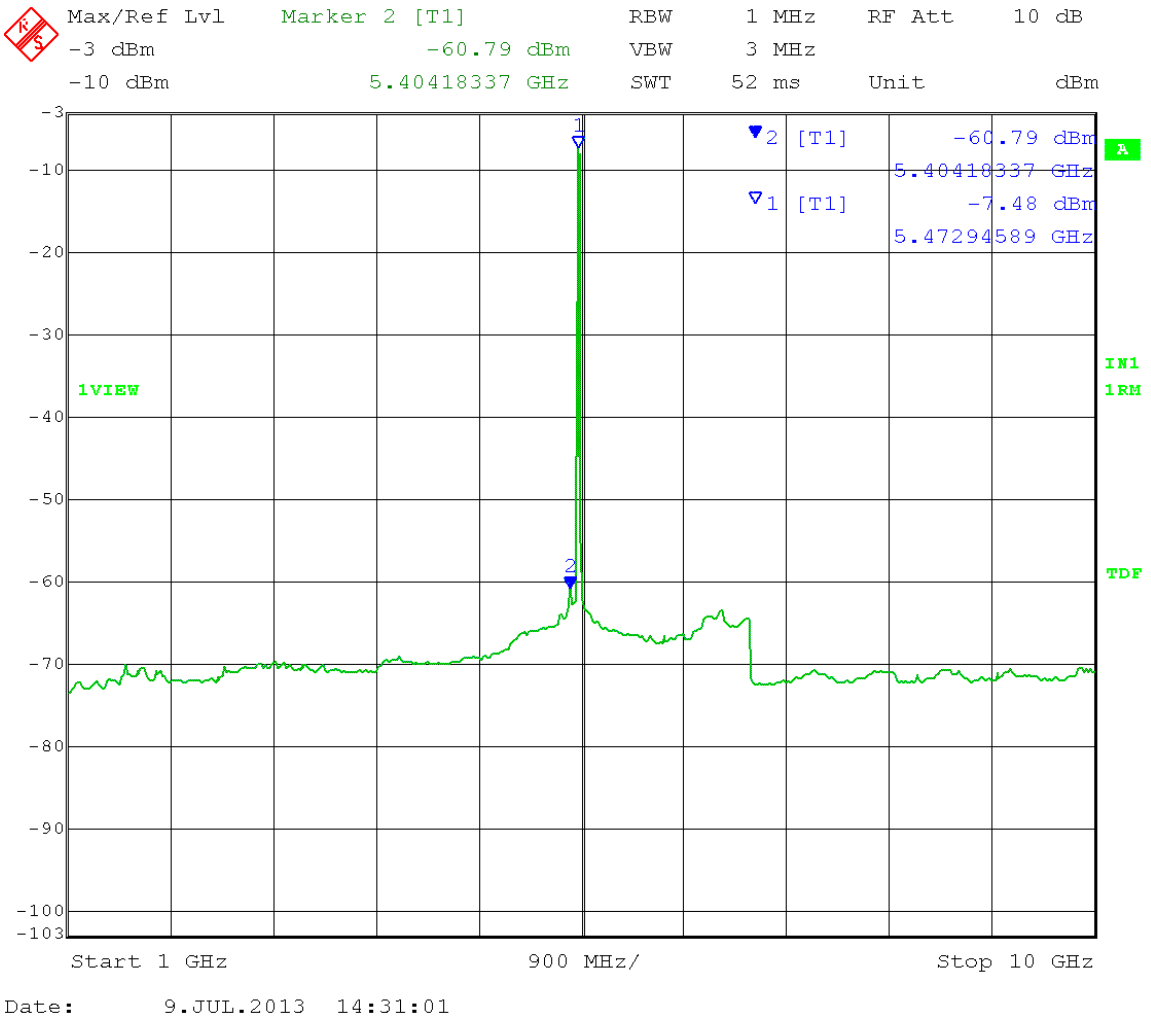
Marker 2: Calculated Field Strength (Restricted Band) = -45.40 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 68.83dBµV/m Peak

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 6
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



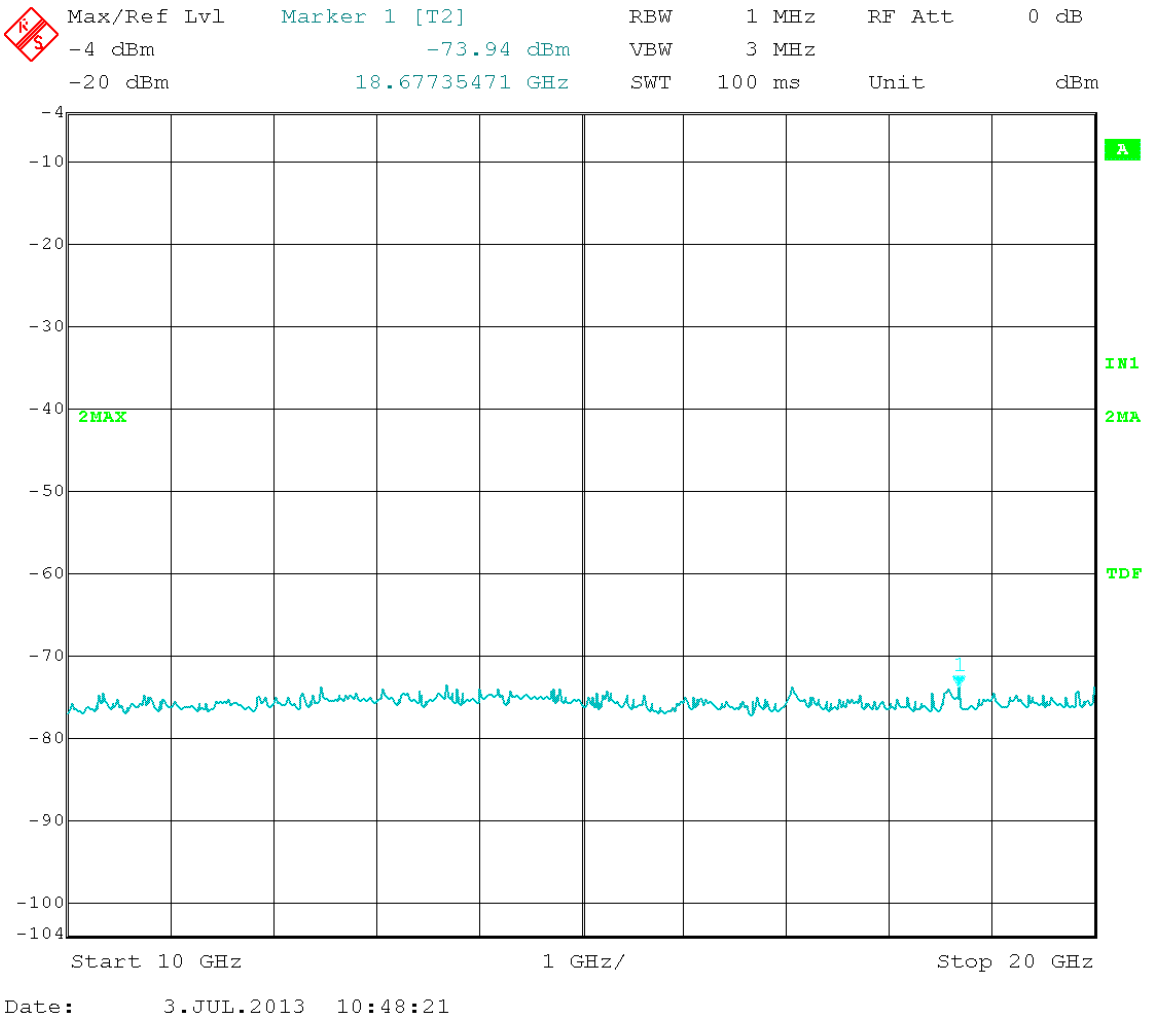
Marker 2: Calculated Field Strength (Restricted Band) = -60.79 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 53.44dBµV/m Average

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



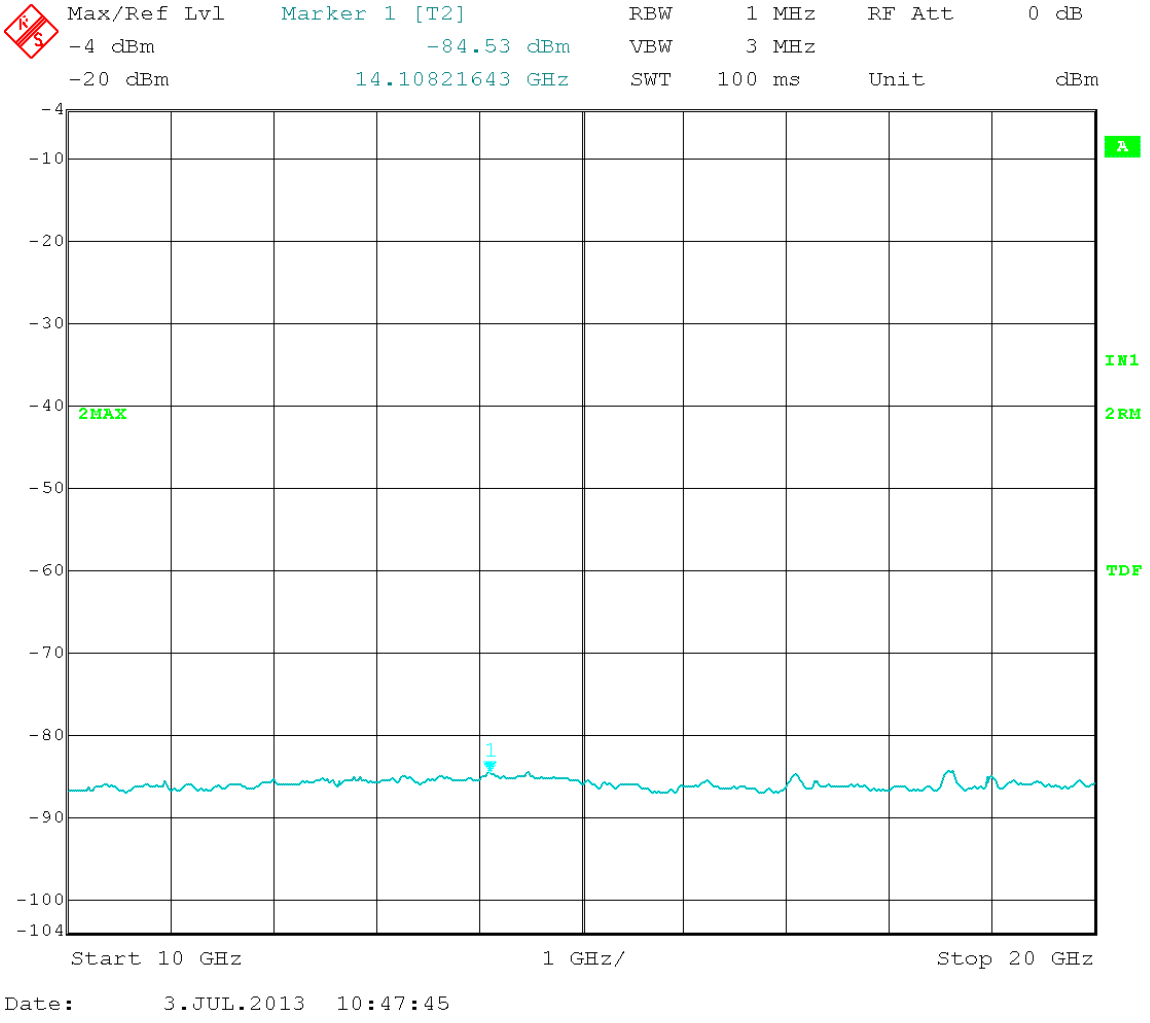
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



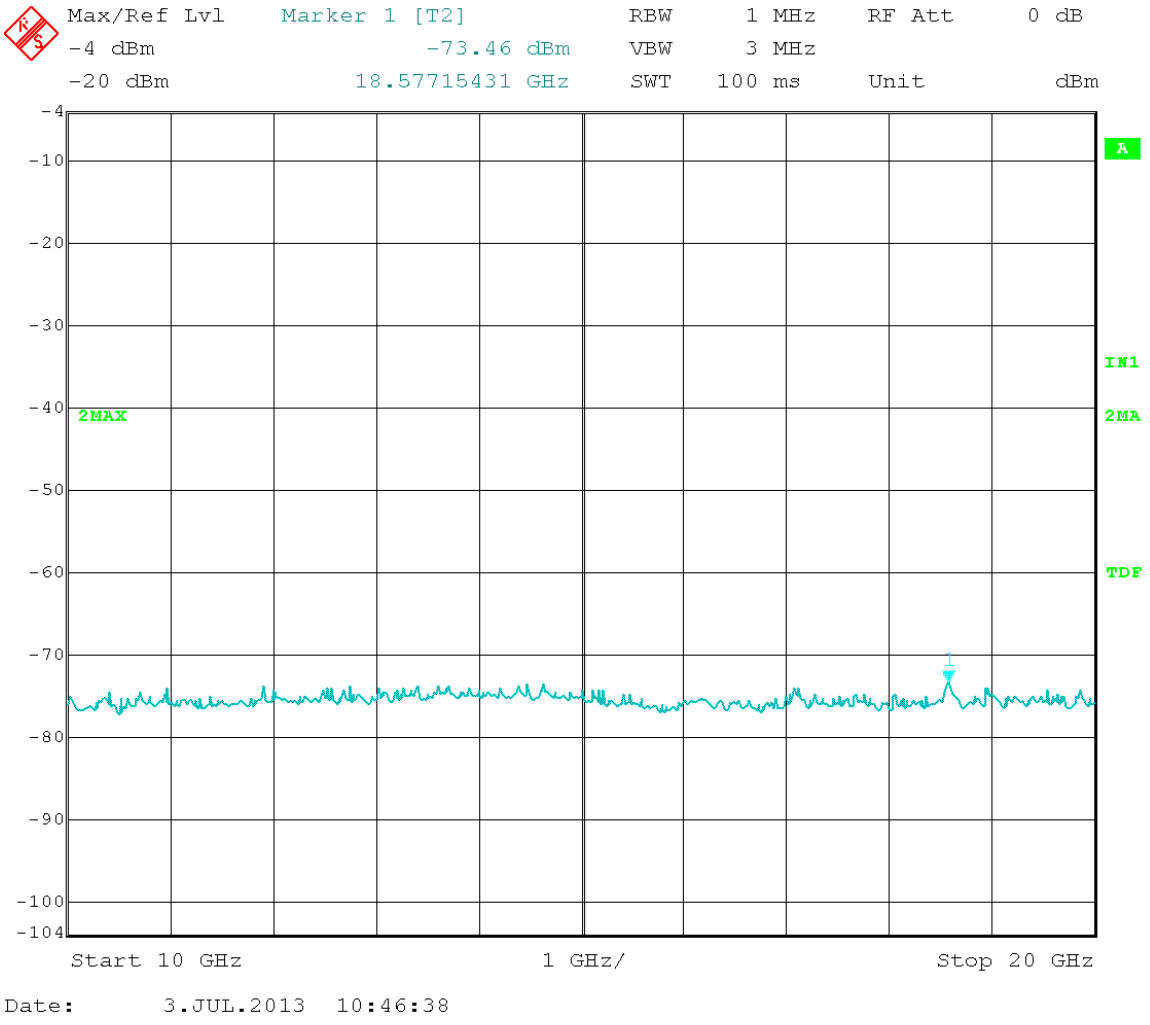
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



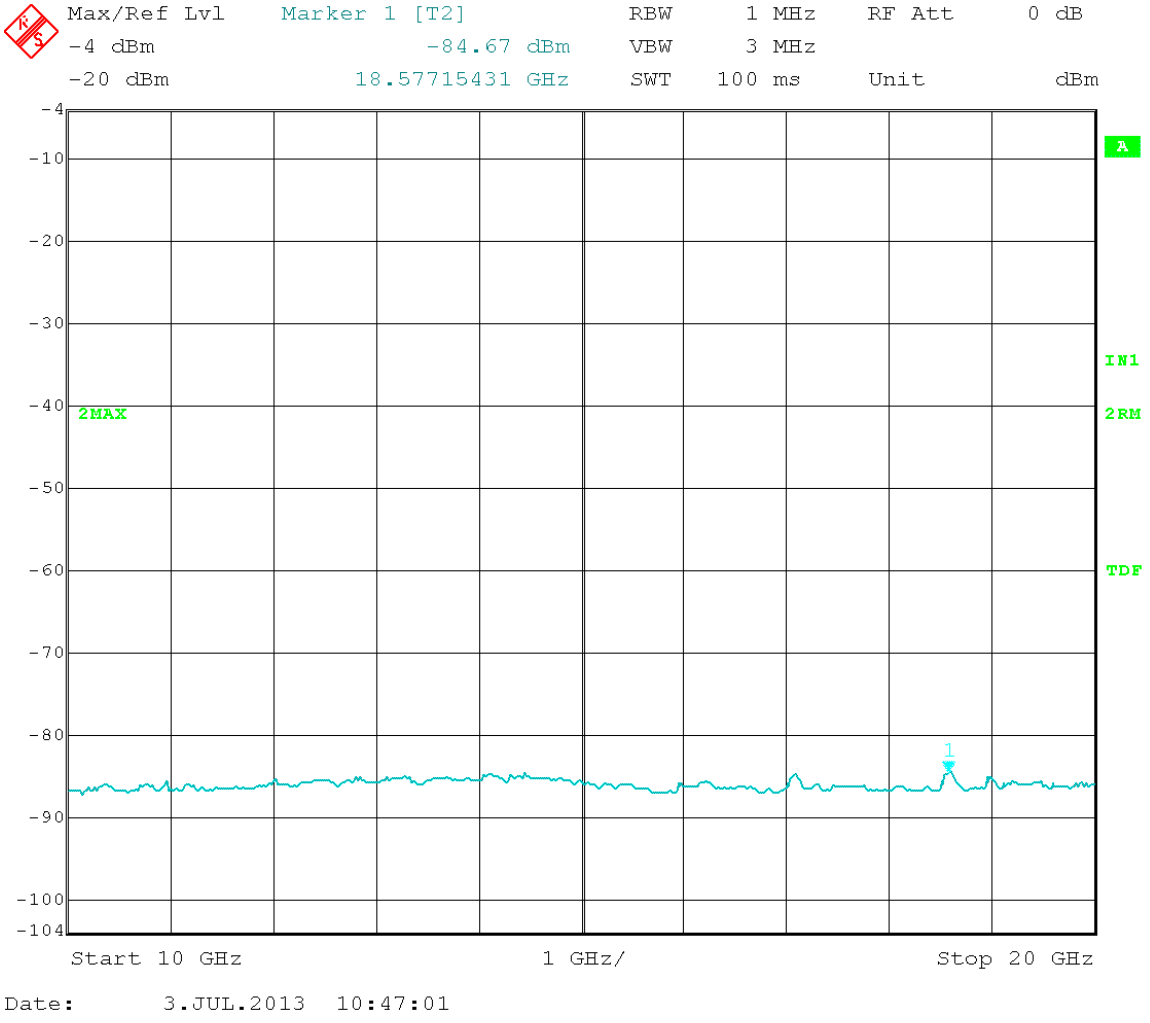
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



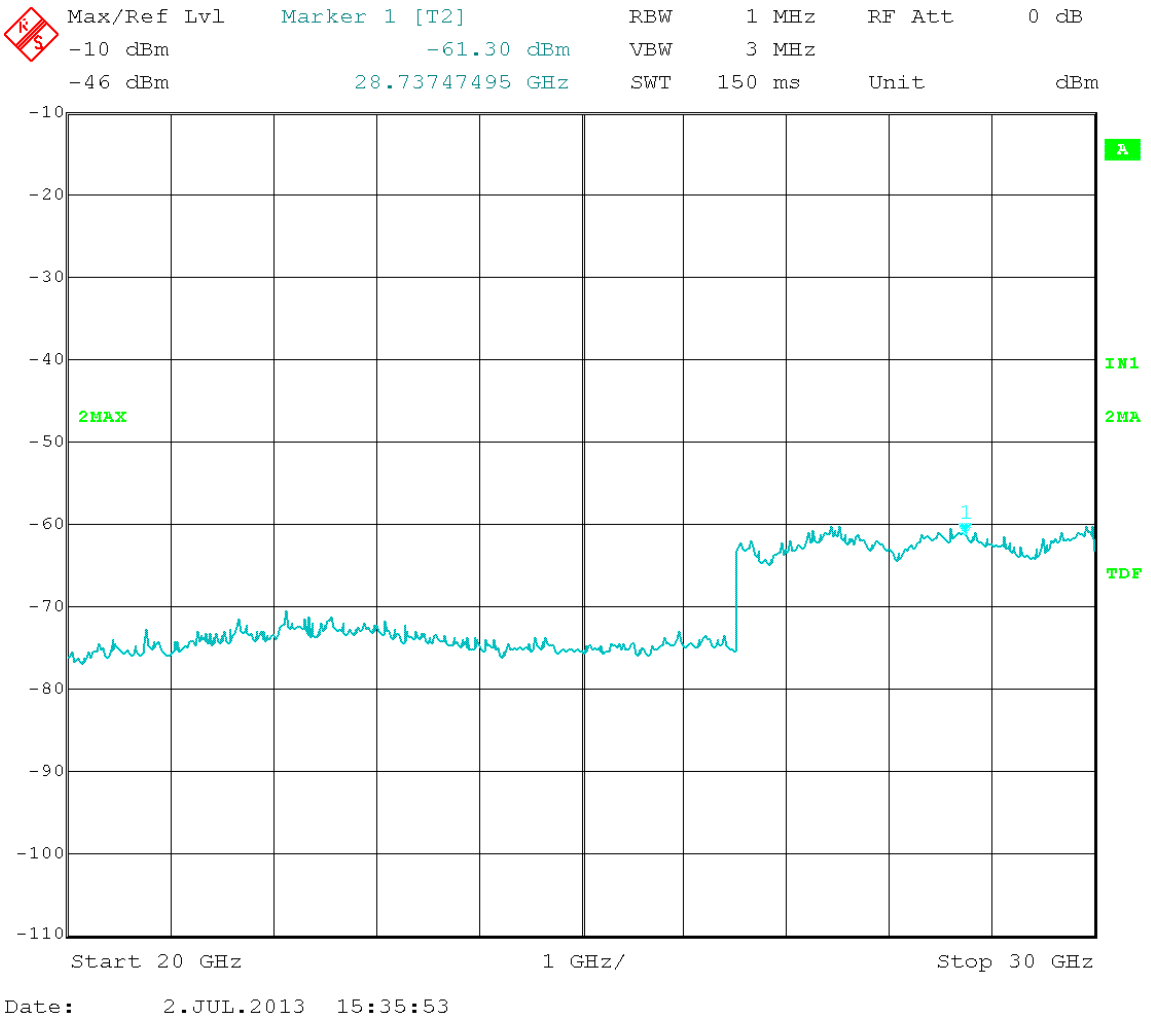
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



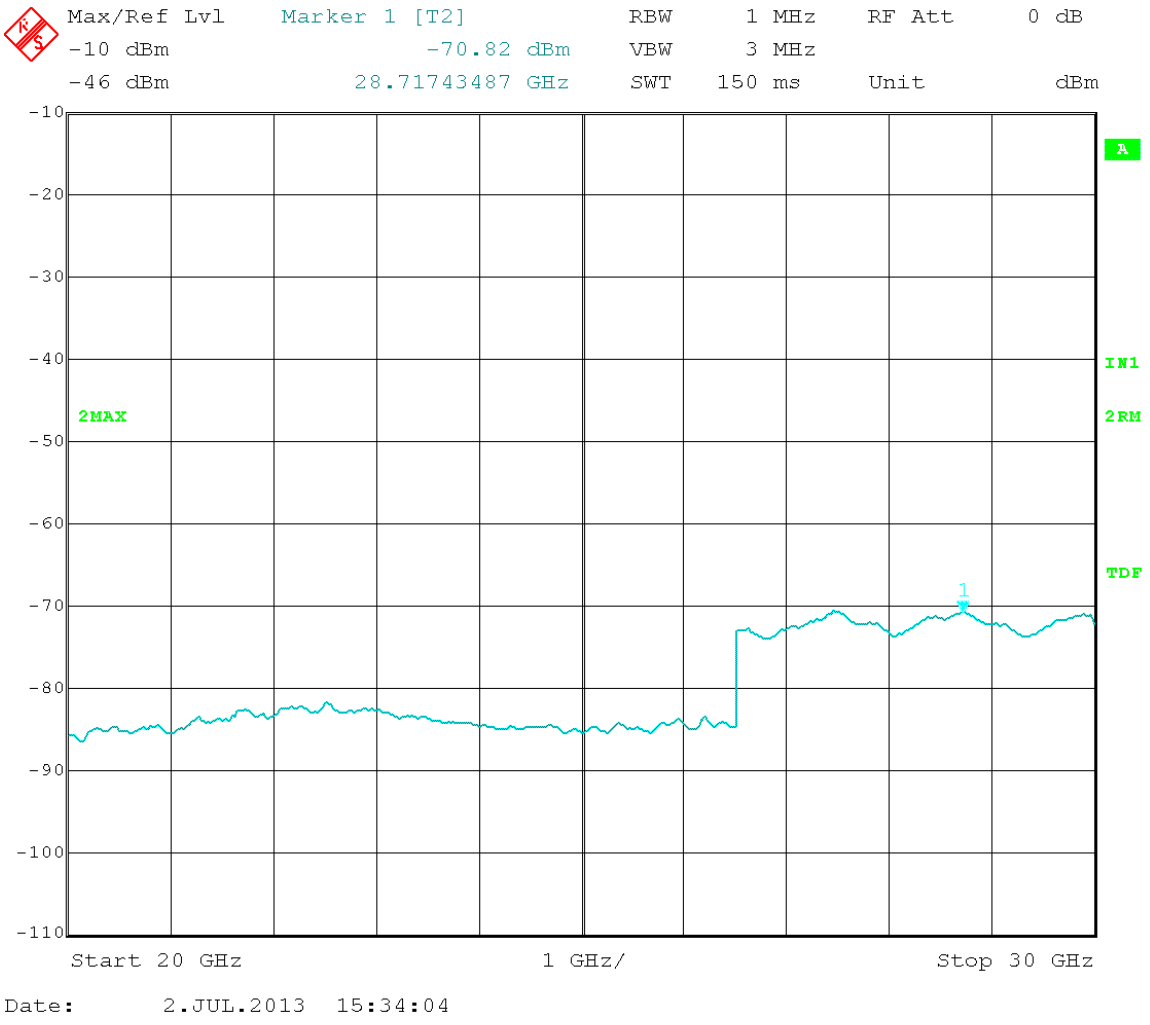
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



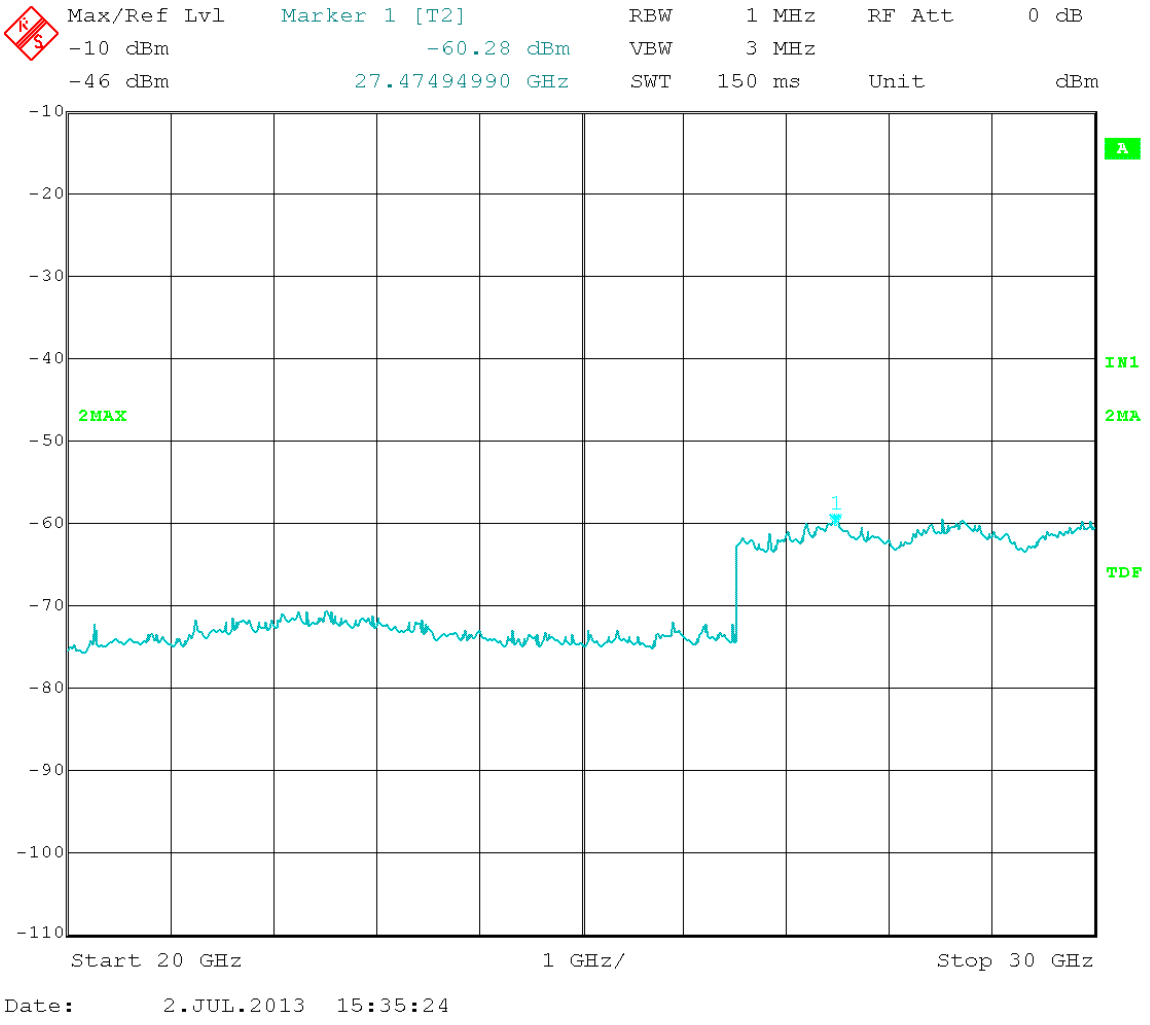
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



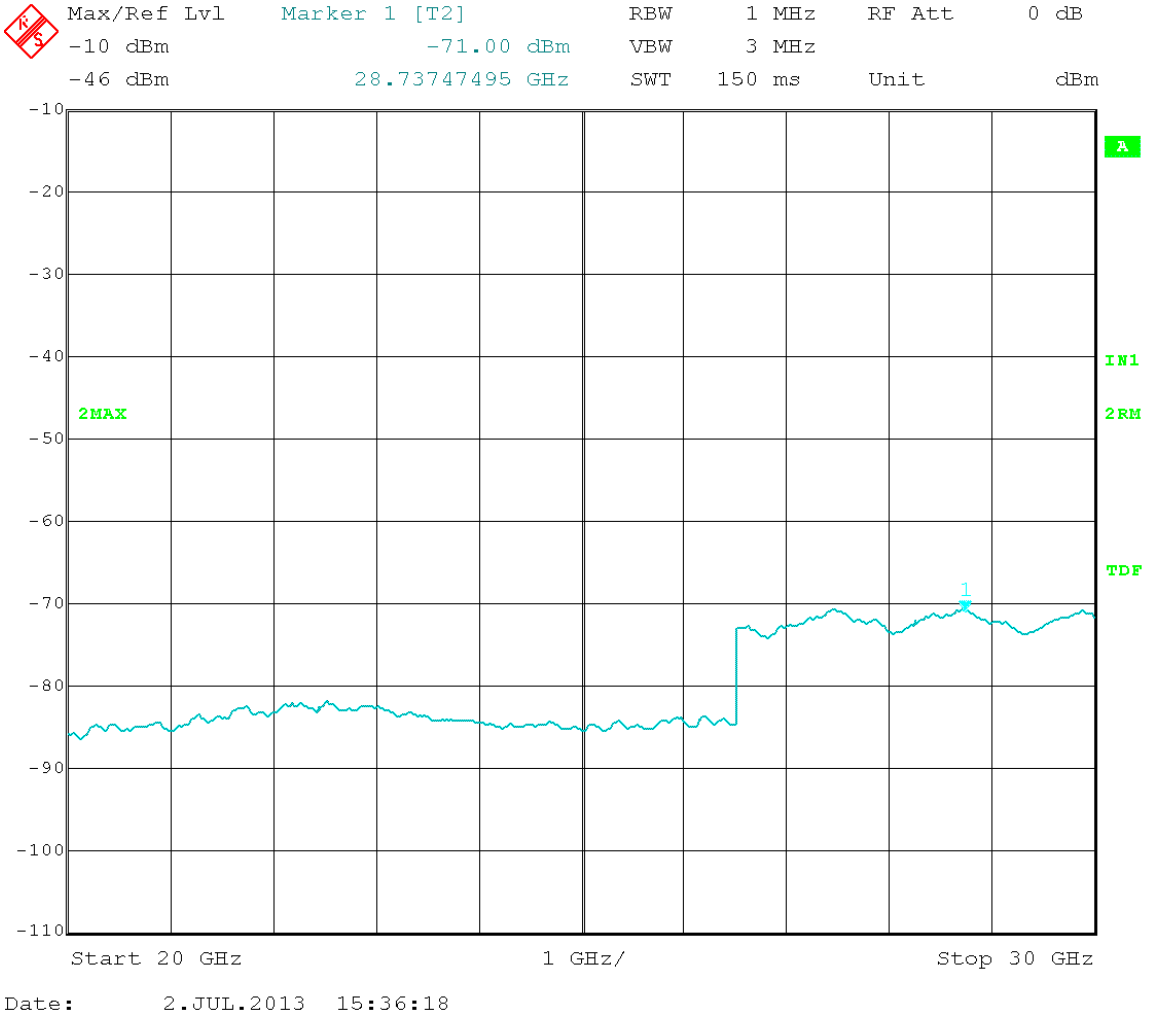
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



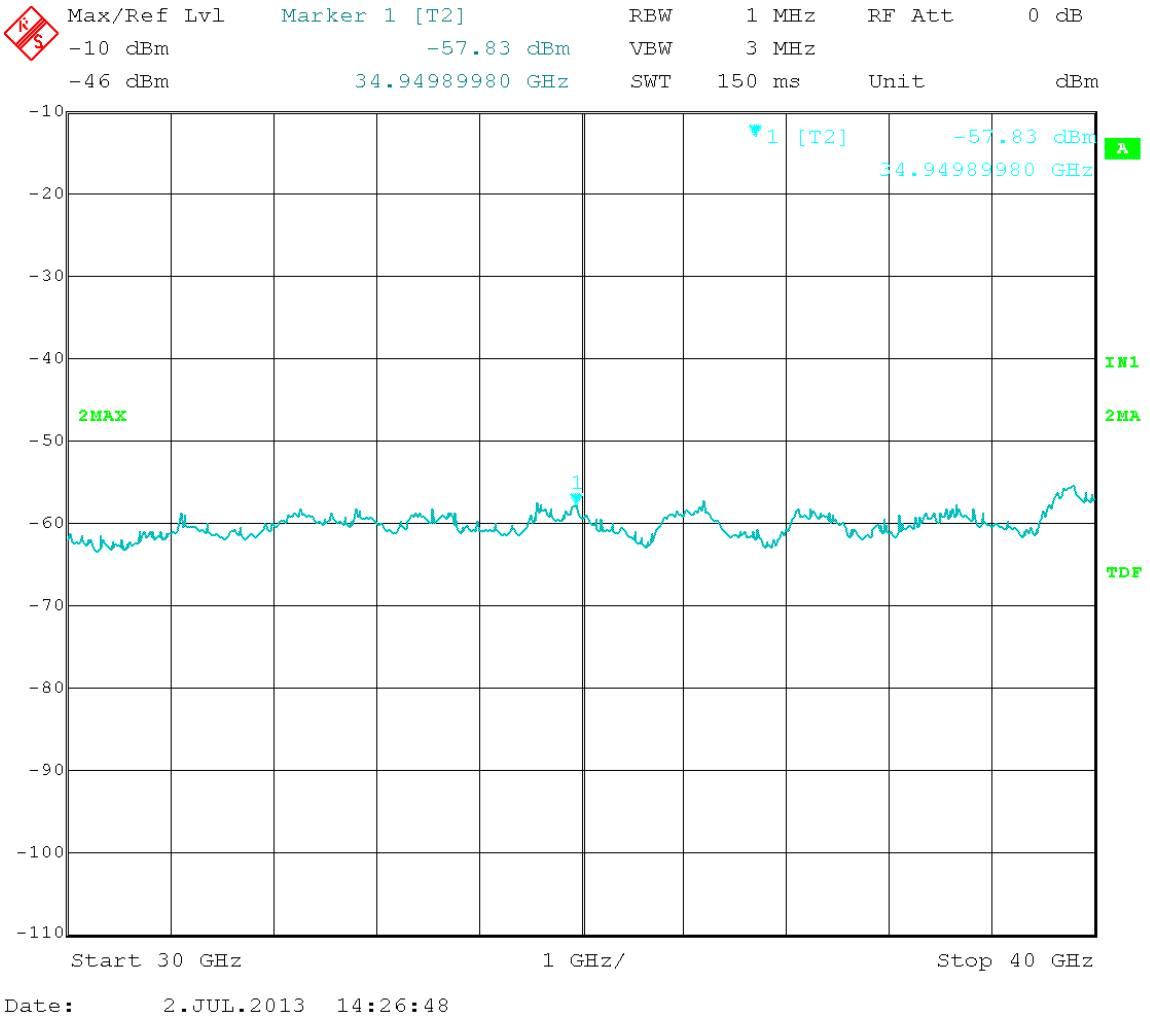
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



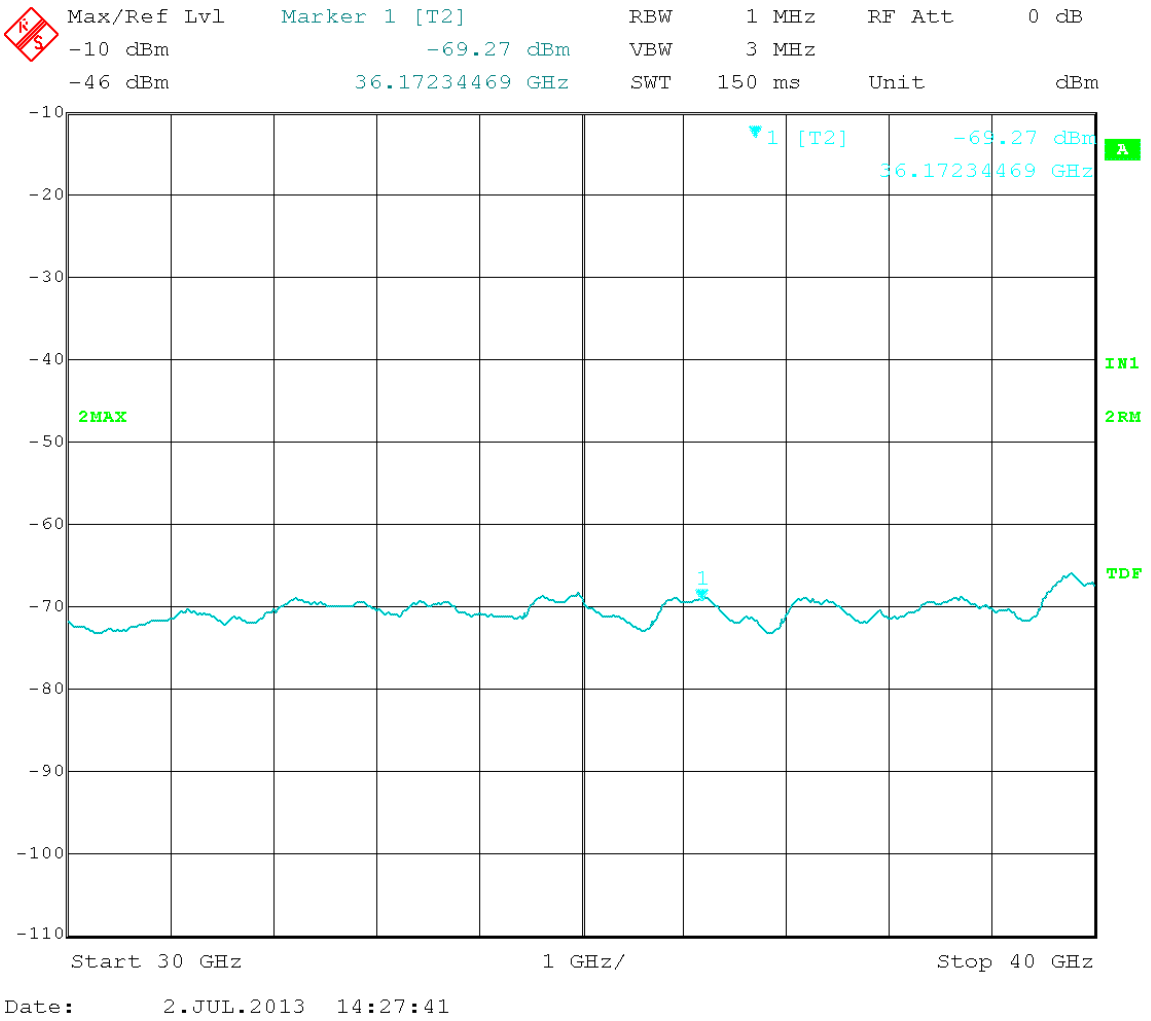
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



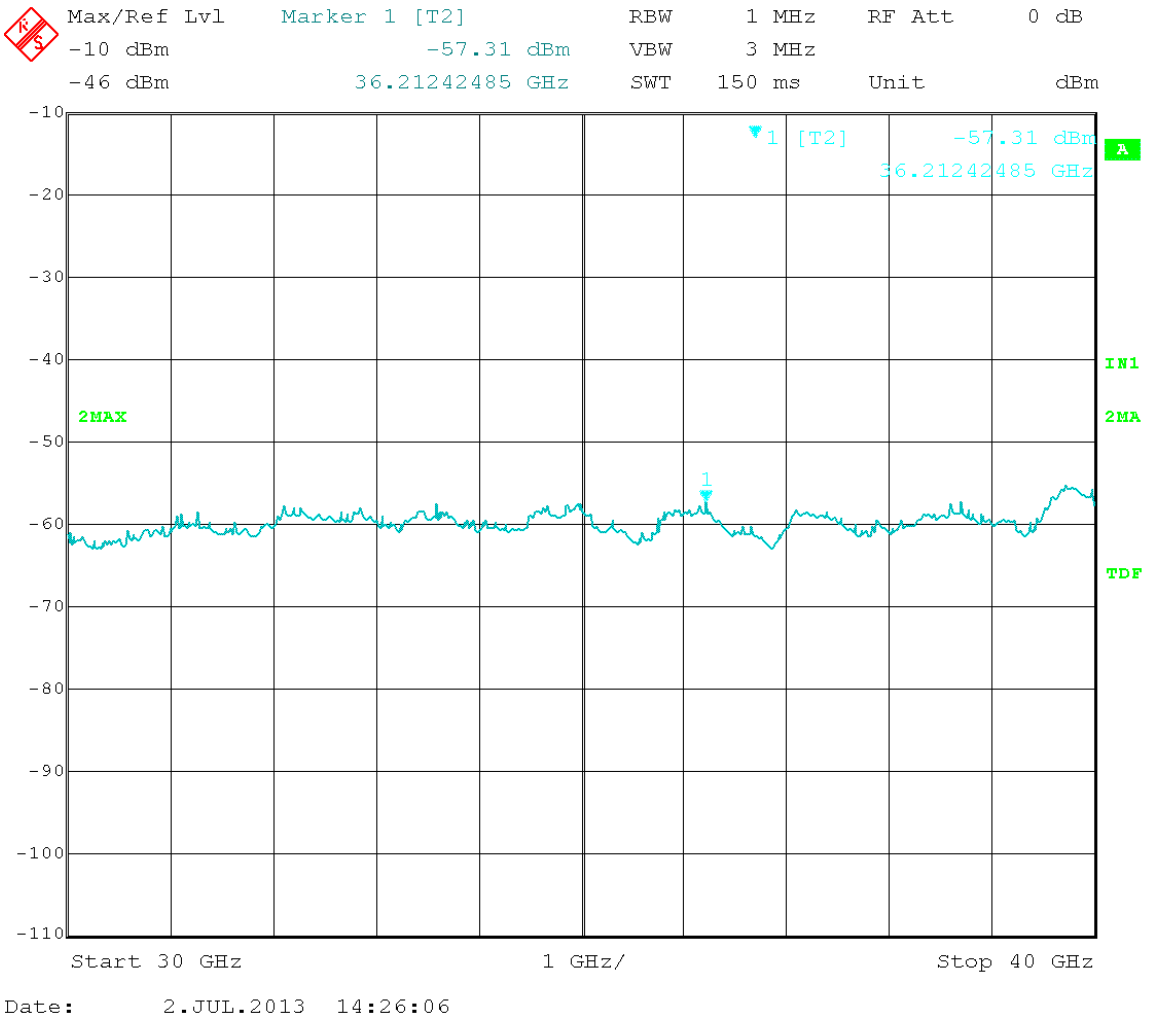
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



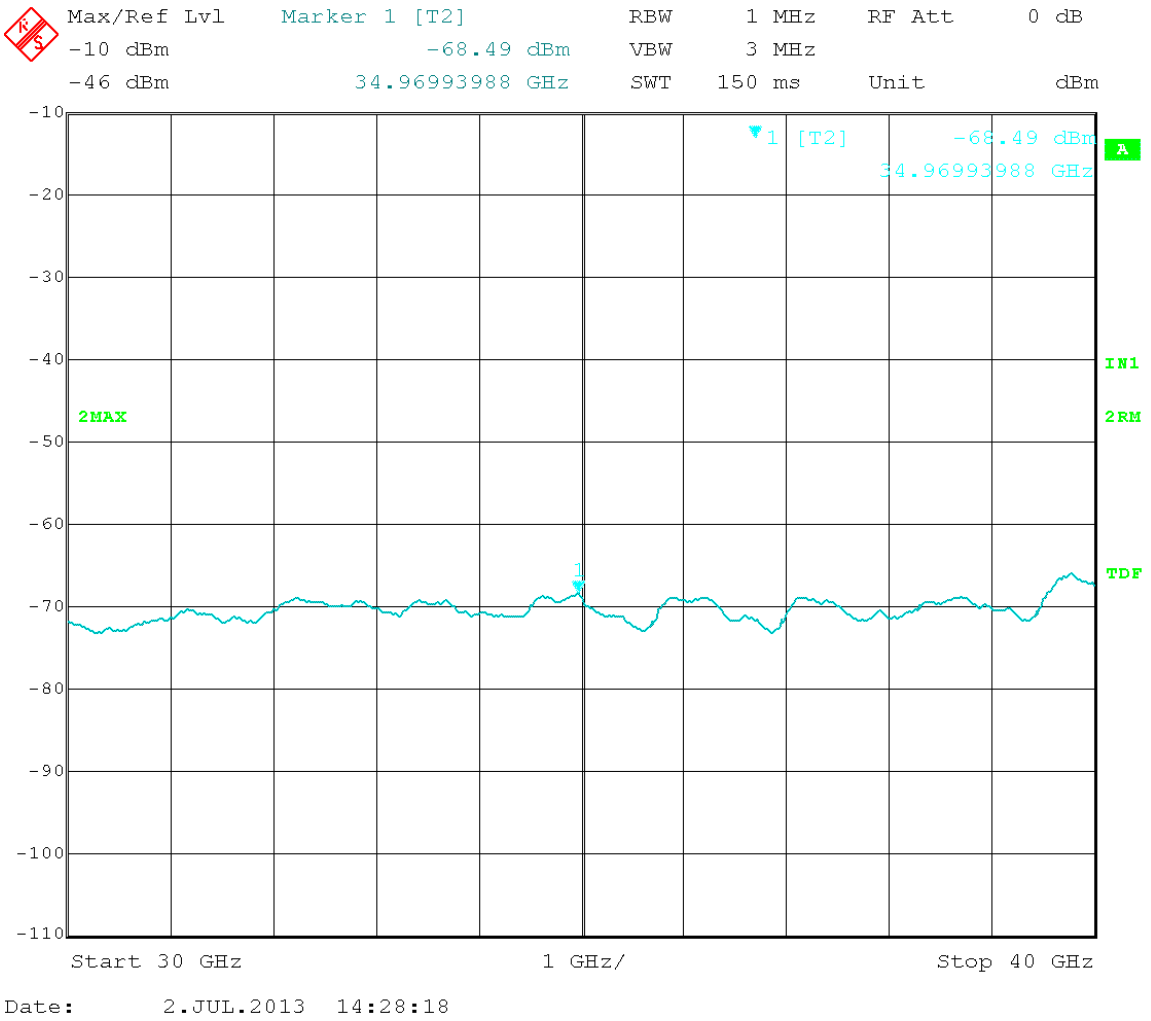
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.480 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



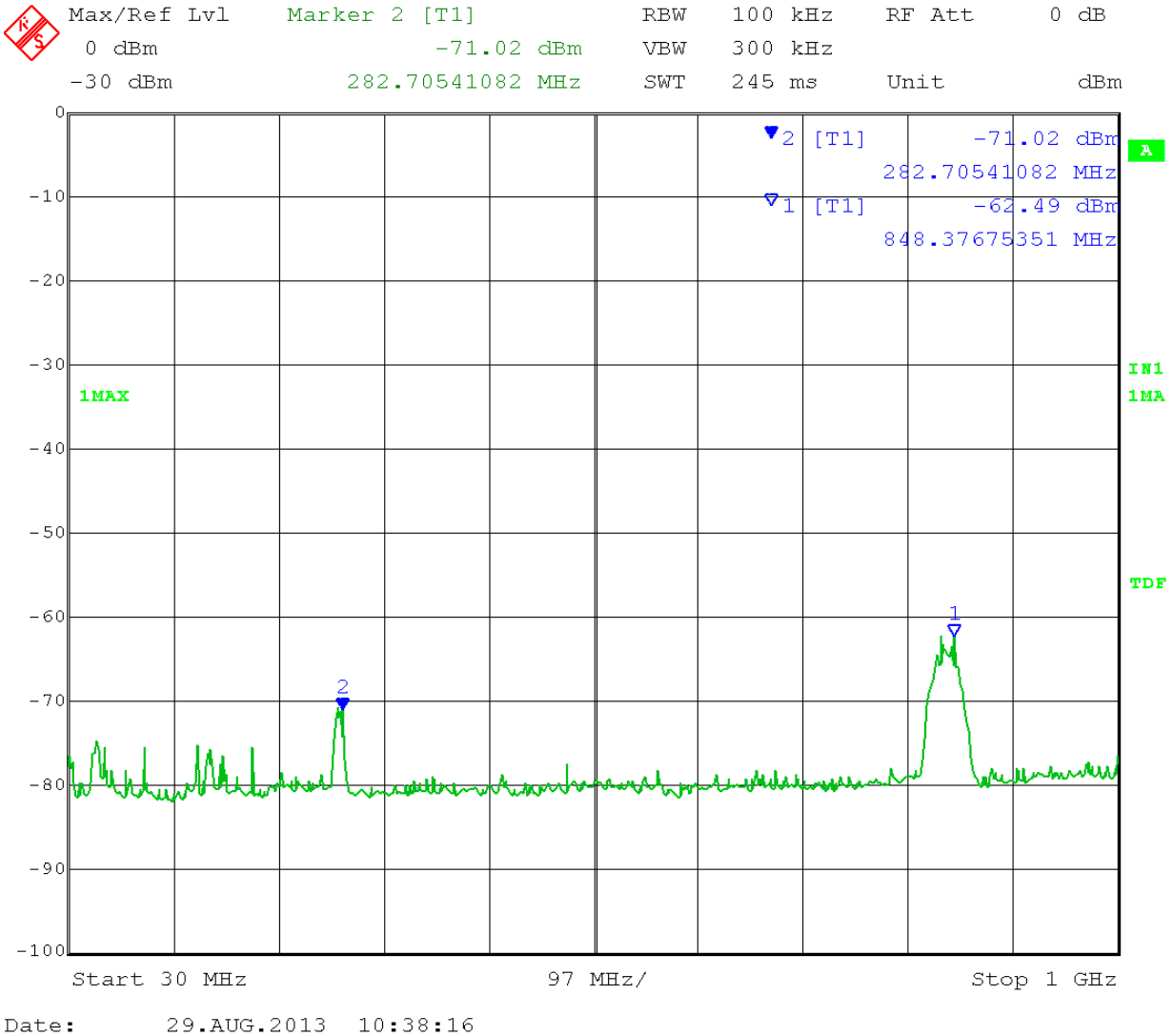
Marker 1: Greater than 20dB below limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 20 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 30M - 1 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

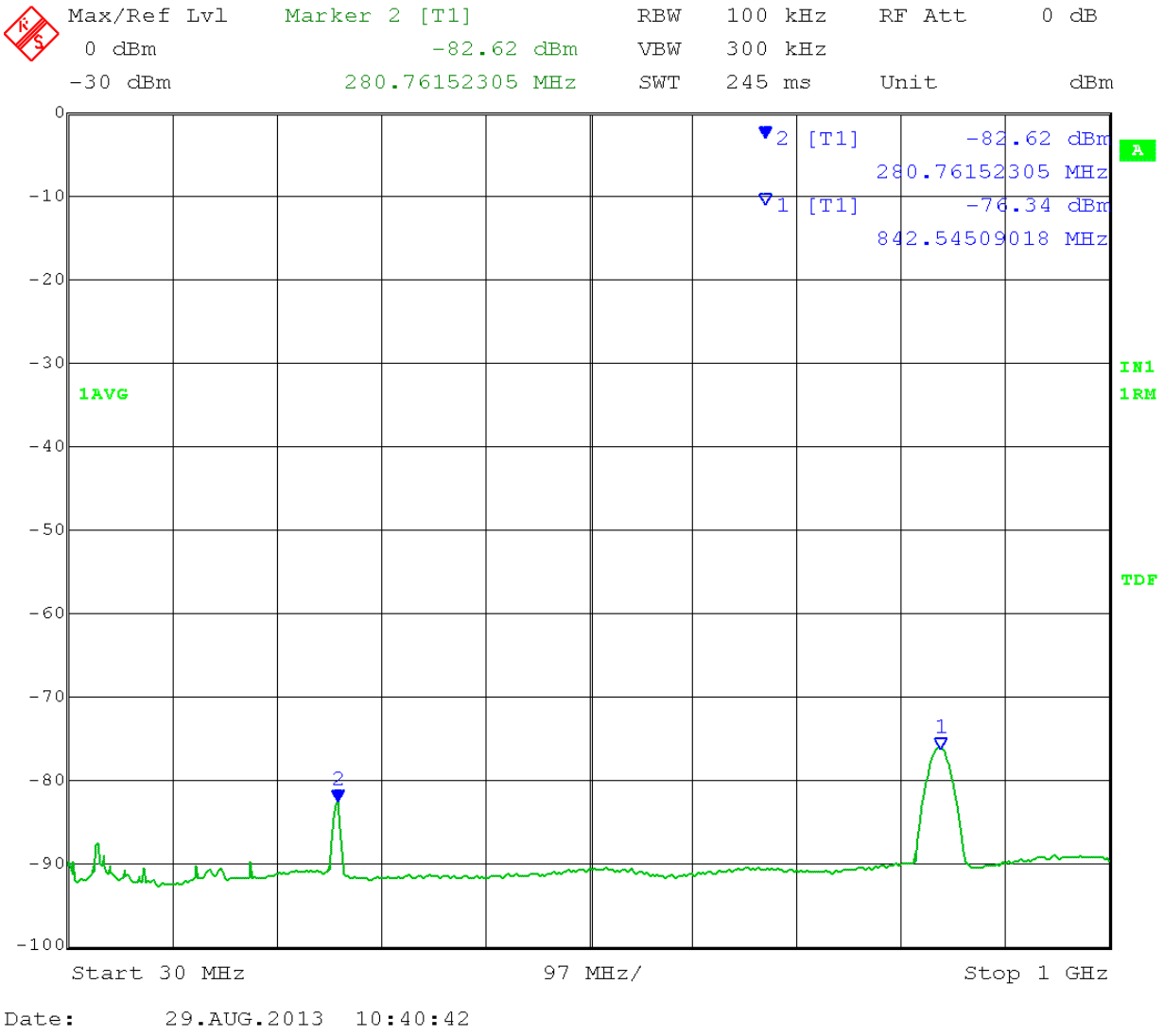
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



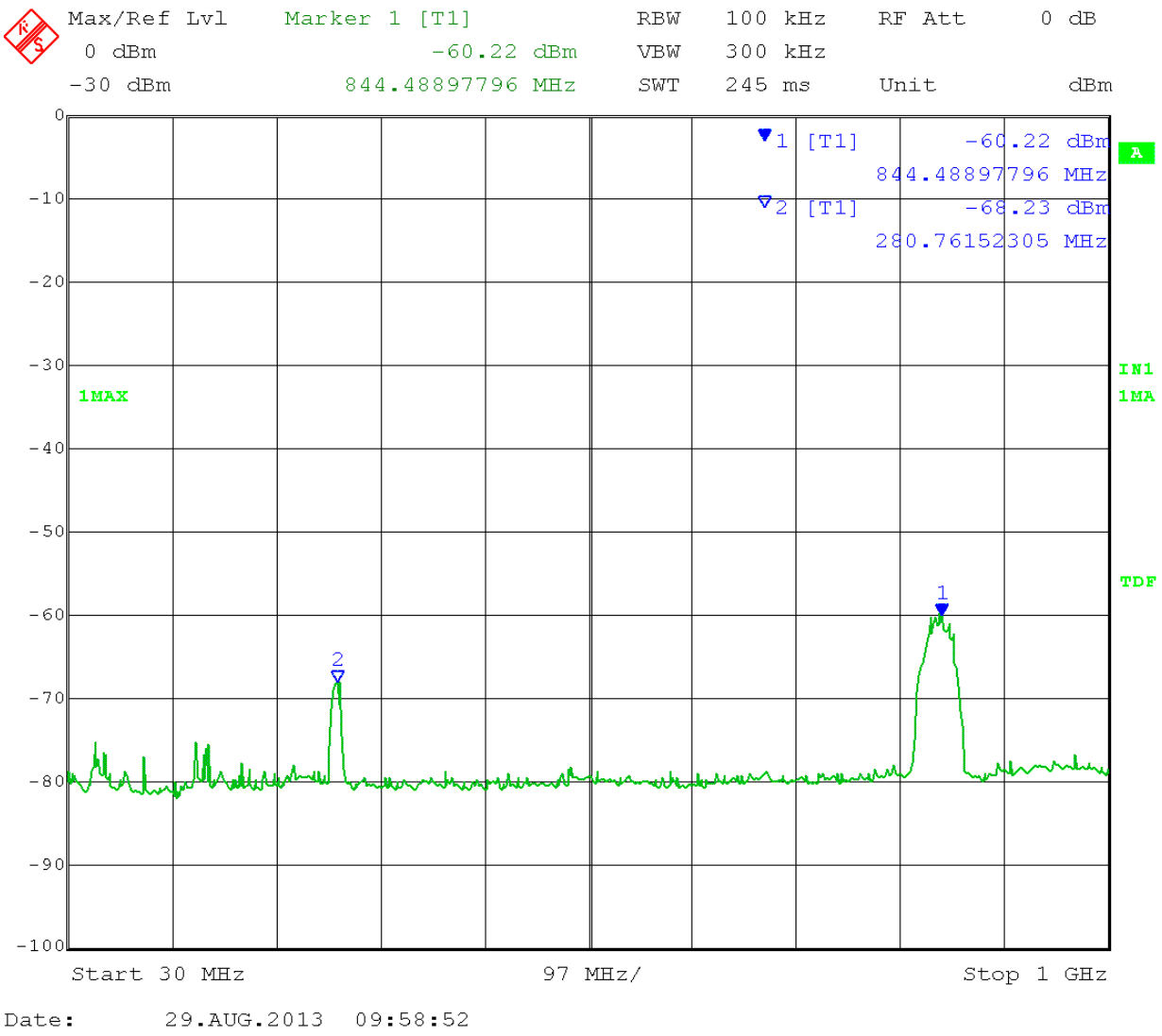
Marker 1: Calculated Field Strength is 20dB below 74dBµV/m PK Limit

Channel 0 Average:



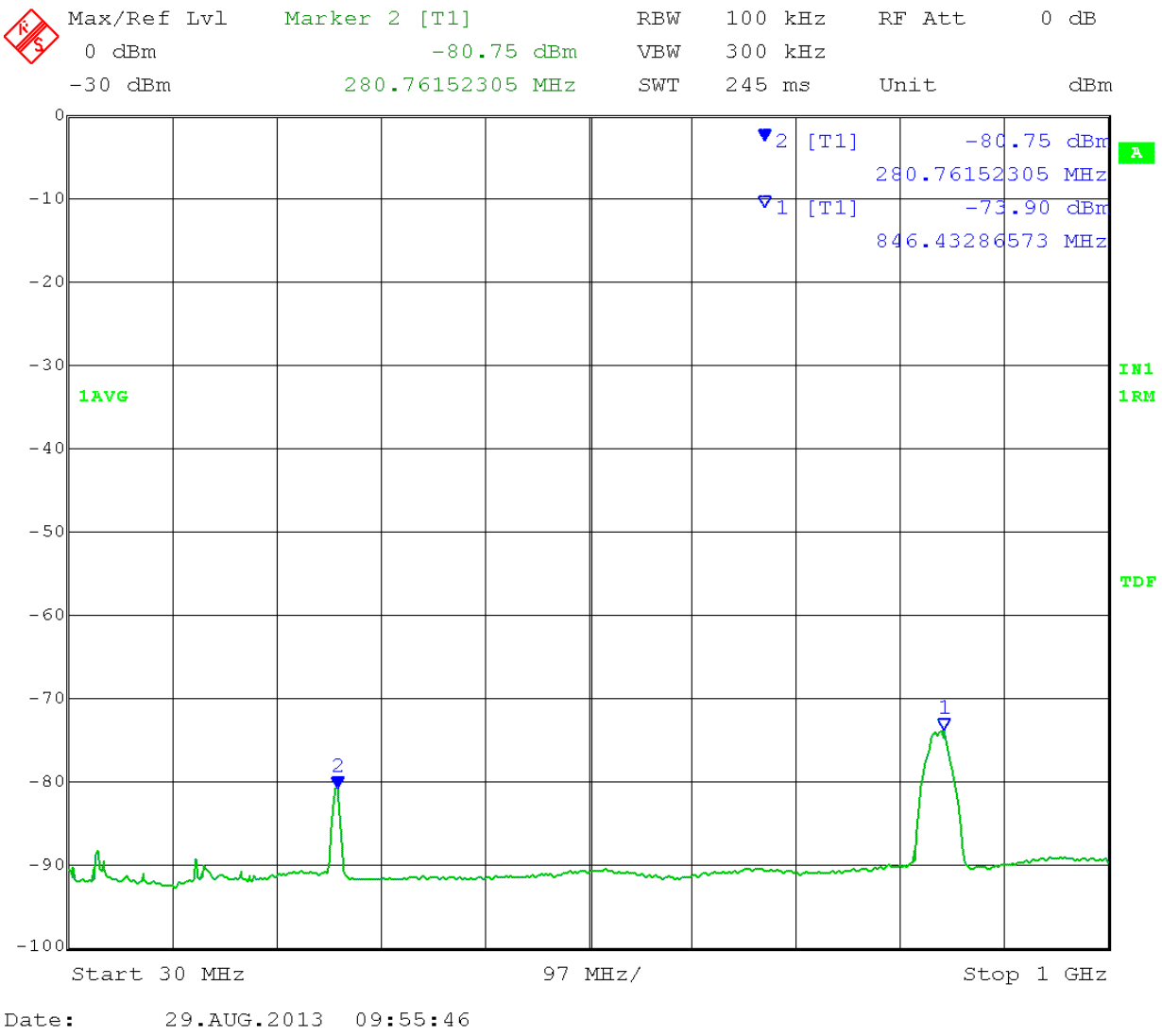
Marker 1: Calculated Field Strength = -76.34 + 114.2 = 37.86dBµV/m AVG < 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 1: Calculated Field Strength = -60.22 + 114.2 = 53.98dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



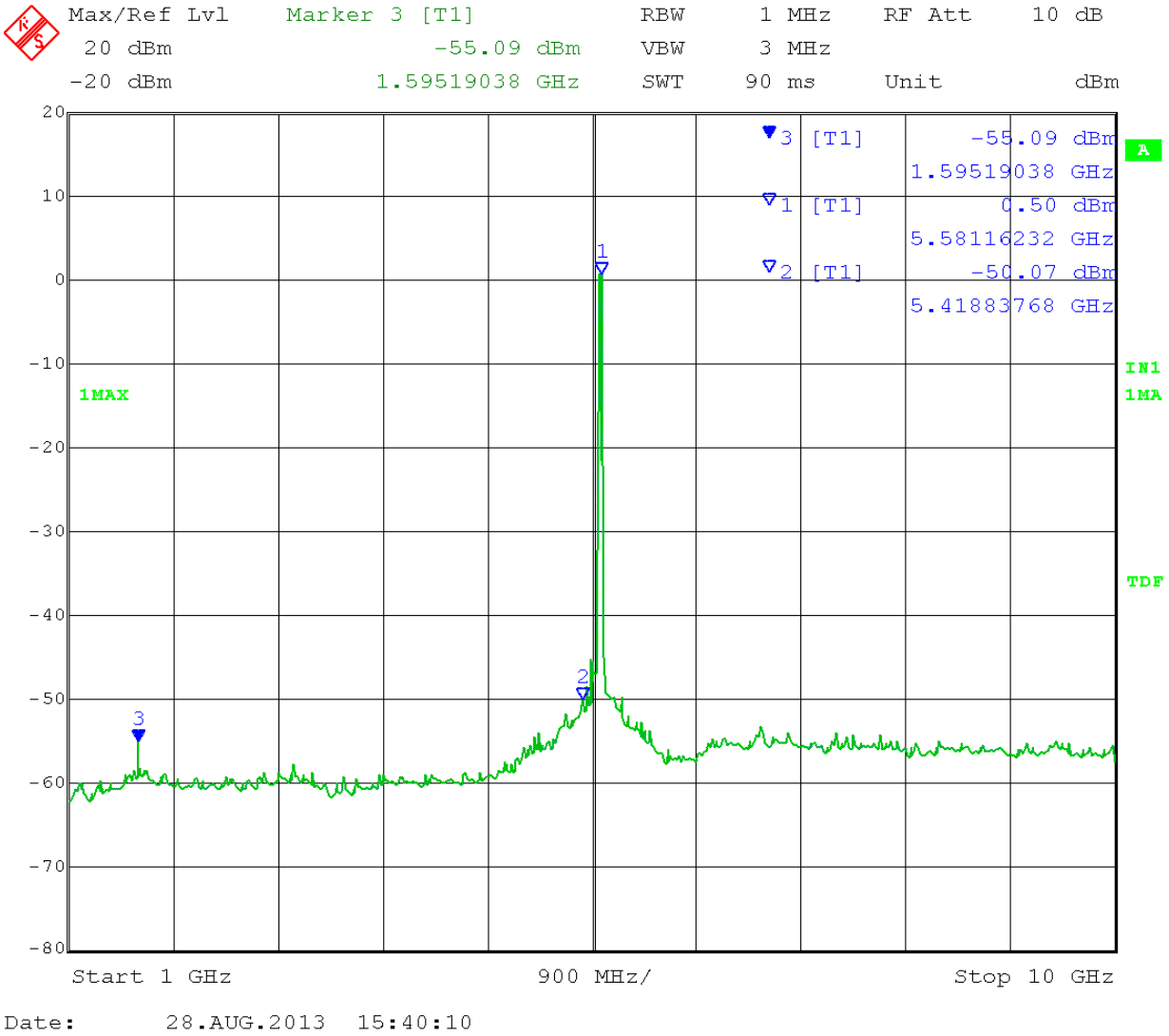
Marker 1: Calculated Field Strength = -73.90 + 114.2 = 40.30dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-28-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 20 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 1 - 10 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

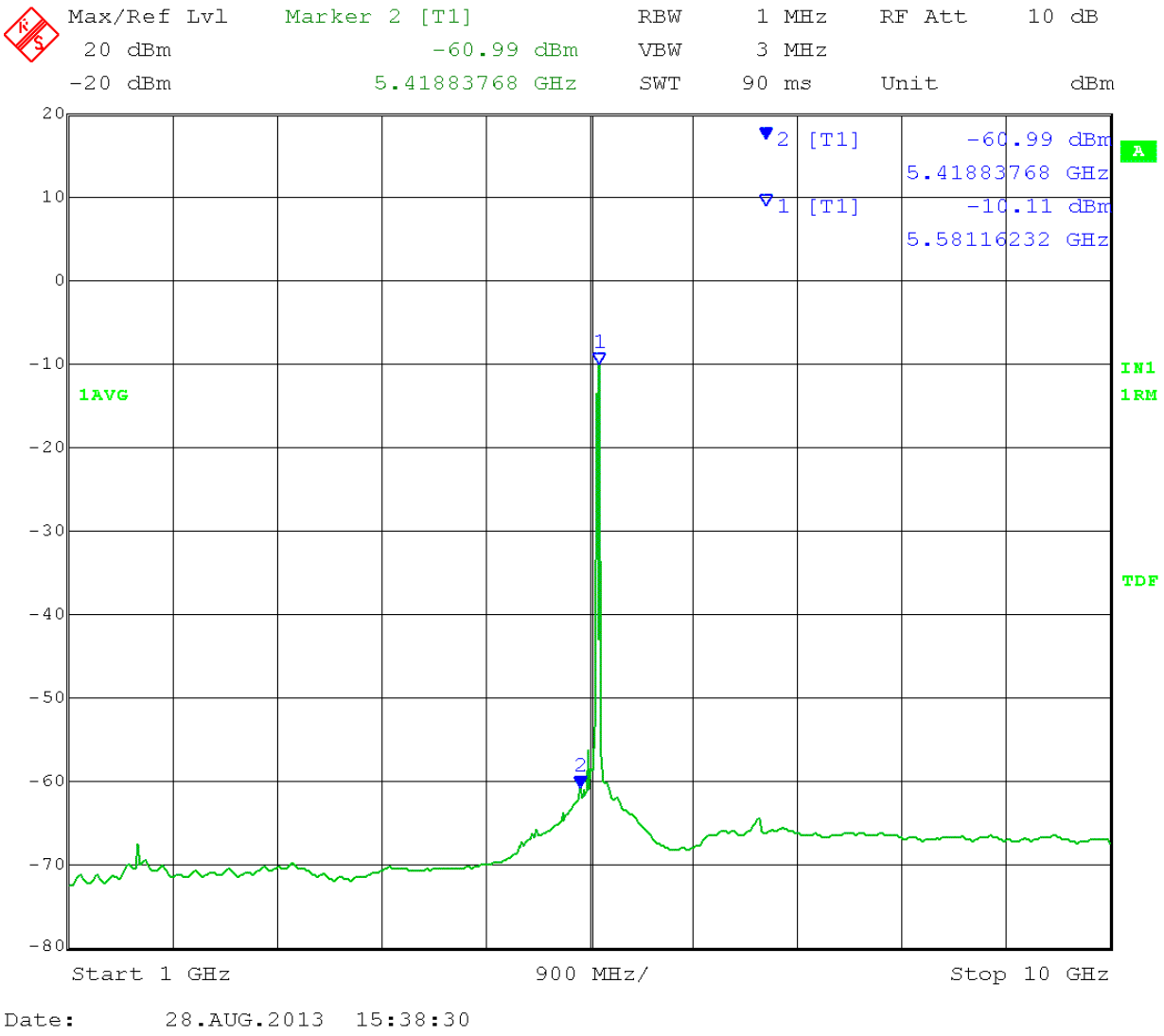
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



Marker 2: Calculated Field Strength = -50.07 + 114.2 = 64.13dBµV/m PK < 74dBµV/m PK Limit
Marker 3: Calculated Field Strength = -55.09 + 114.2 = 59.11dBµV/m PK < 74dBµV/m PK Limit

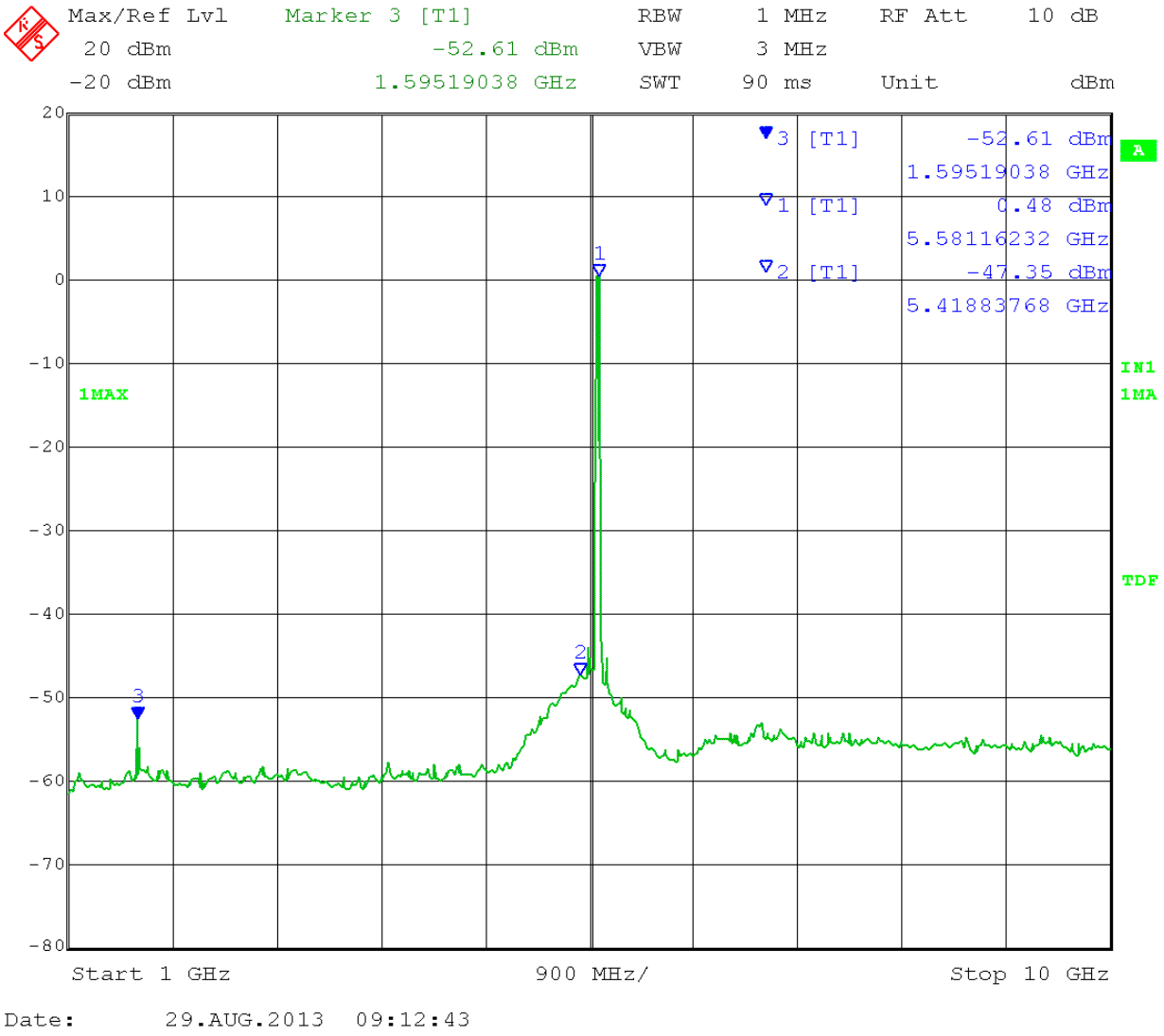
Channel 0 Average:



Marker 2: Calculated Field Strength = -60.99 + 114.2 = 53.21dBµV/m AVG < 54dBµV/m AVG Limit

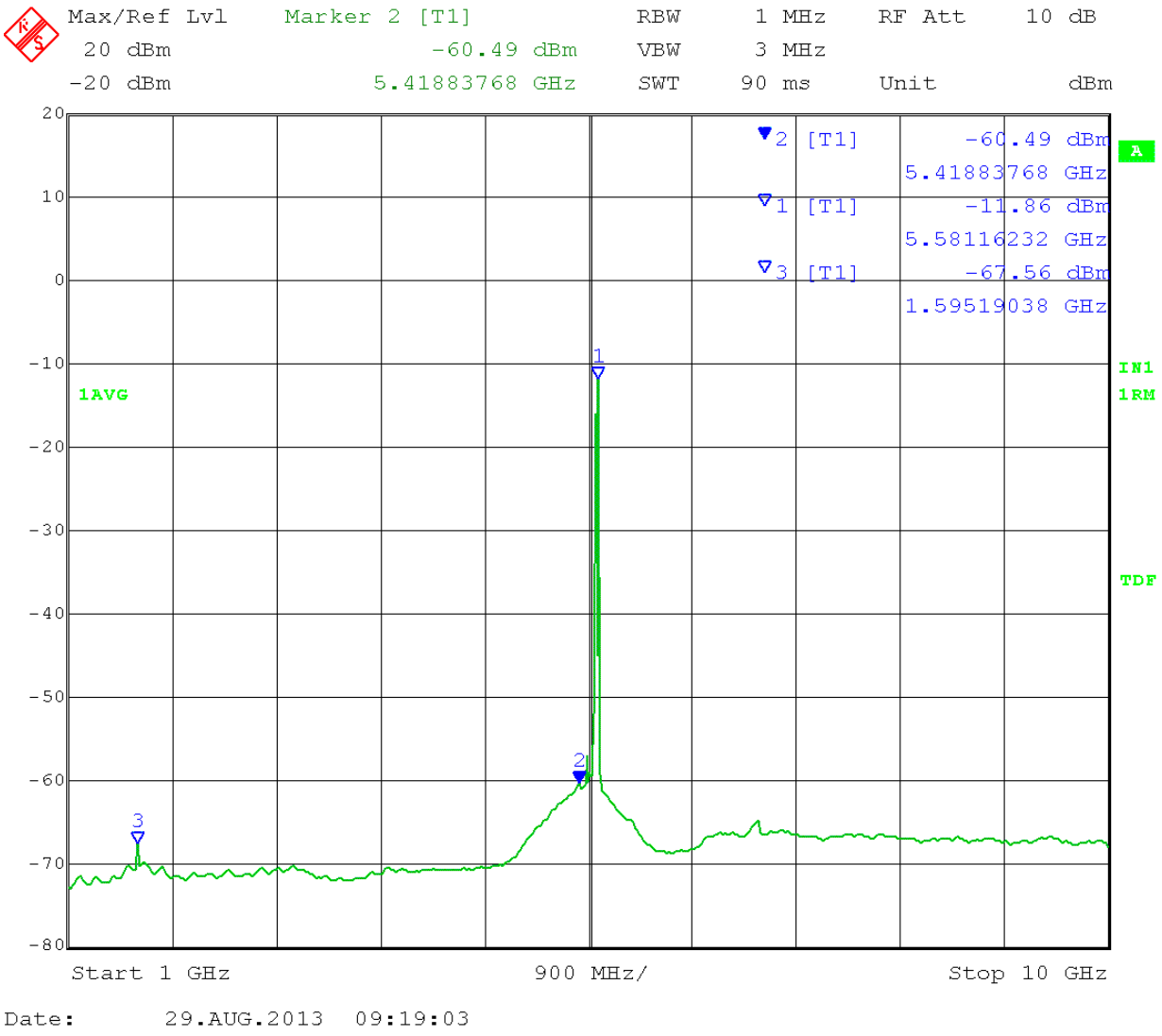
Test Date: 08-29-2013

Channel 1 Peak:



Marker 2: Calculated Field Strength = -47.35 + 114.2 = 66.85dBµV/m PK < 74dBµV/m PK Limit
Marker 3: Calculated Field Strength = -52.61 + 114.2 = 61.59dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



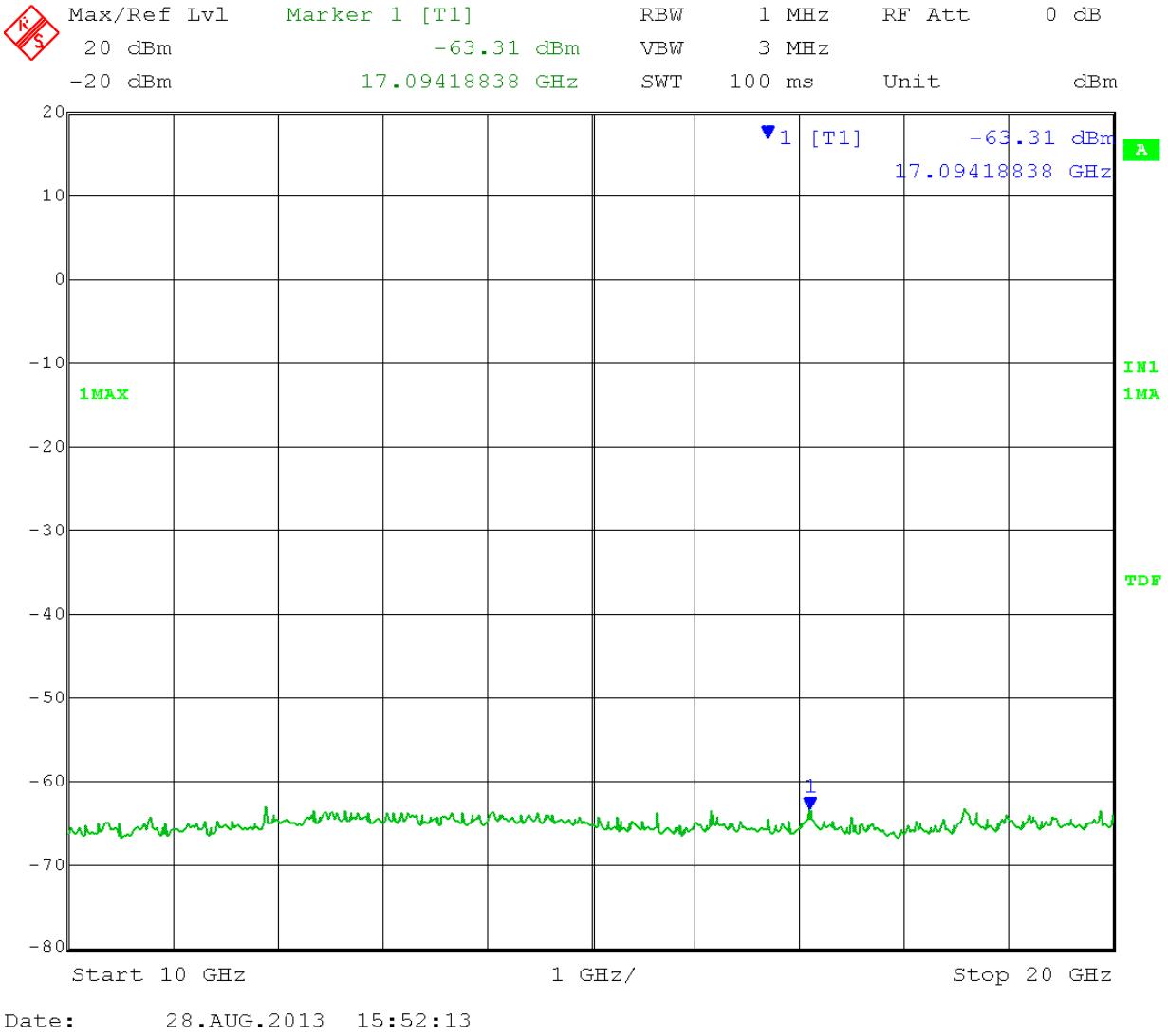
Marker 2: Calculated Field Strength = -60.49 + 114.2 = 53.71dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-28-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 20 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 10 - 20 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

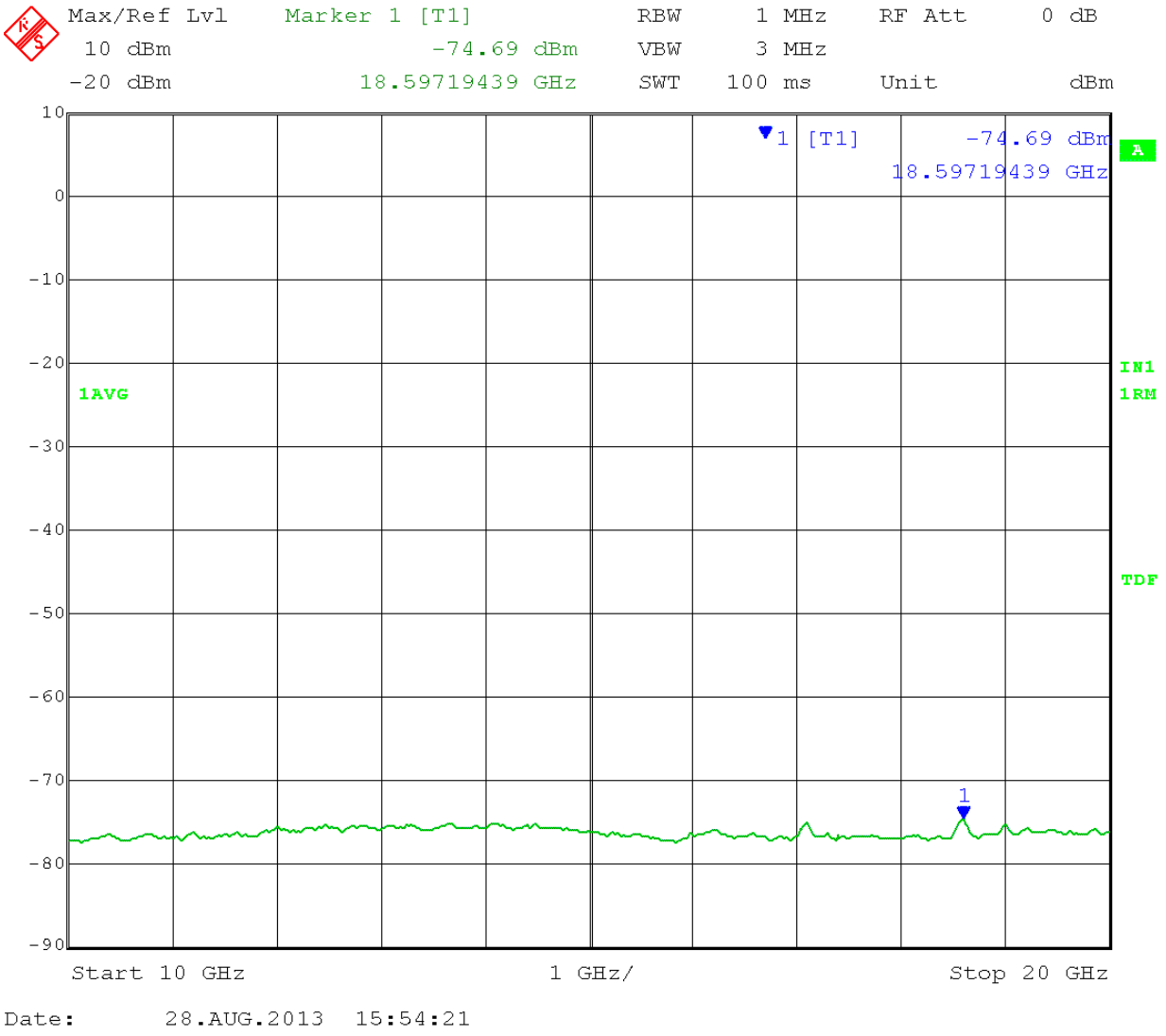
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



Marker 1: Calculated Field Strength = -63.31 + 114.2 = 50.89dBµV/m PK < 74dBµV/m PK Limit

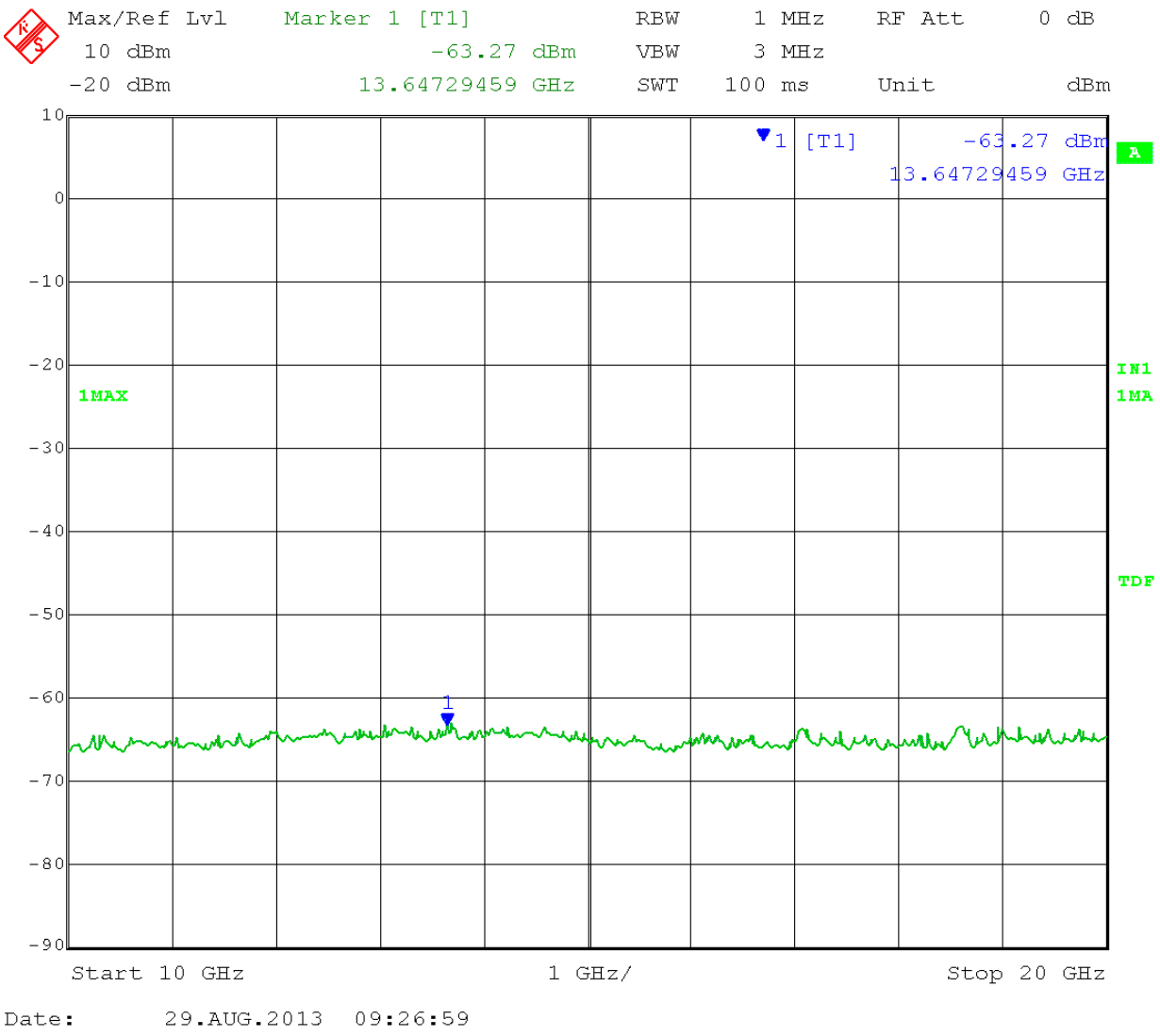
Channel 0 Average:



Marker 1: Calculated Field Strength = -74.69 + 114.2 = 39.51dBµV/m AVG < 54dBµV/m AVG Limit

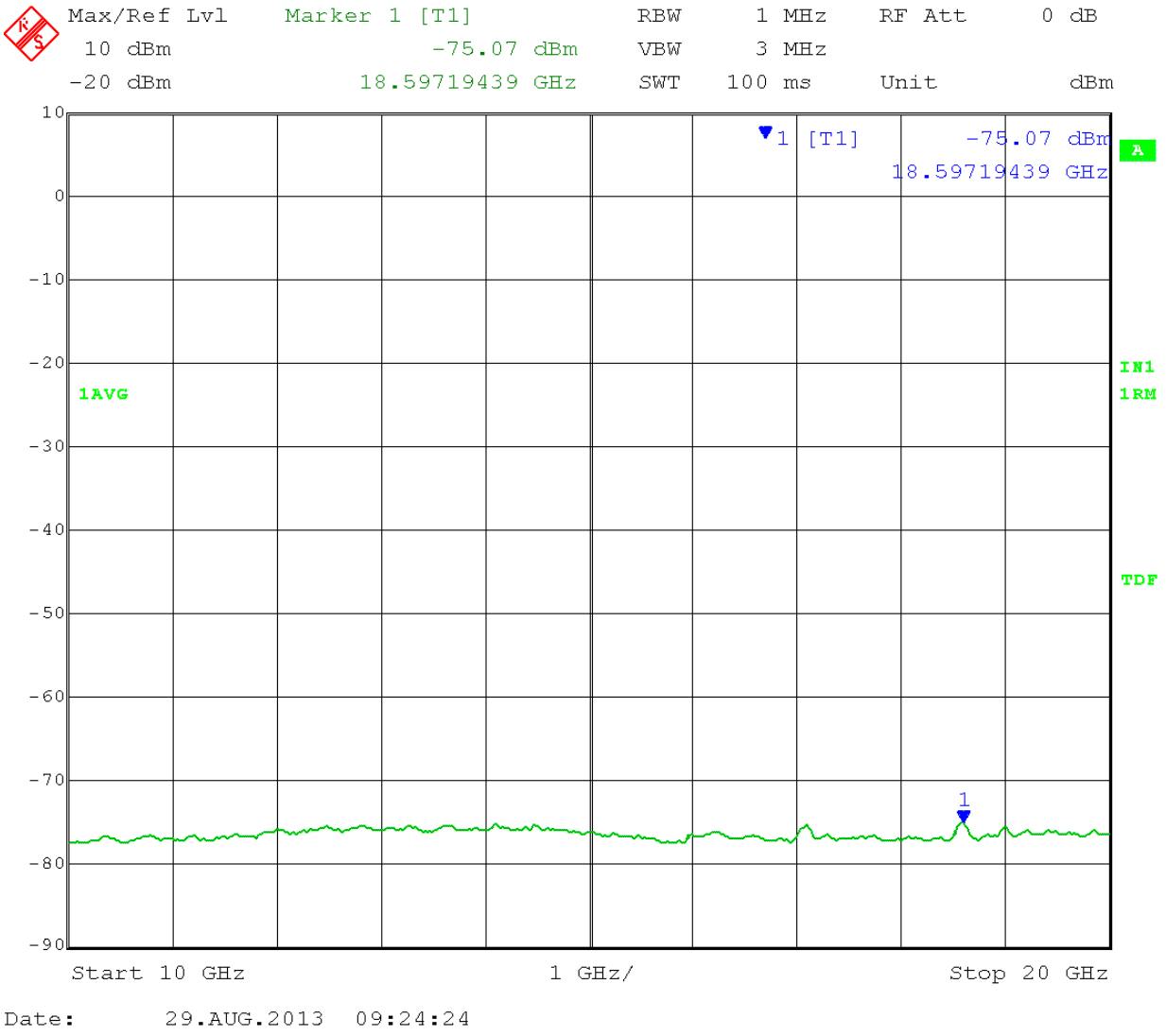
Test Date: 08-29-2013

Channel 1 Peak:



Marker 1: Calculated Field Strength = -63.27 + 114.2 = 50.93dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



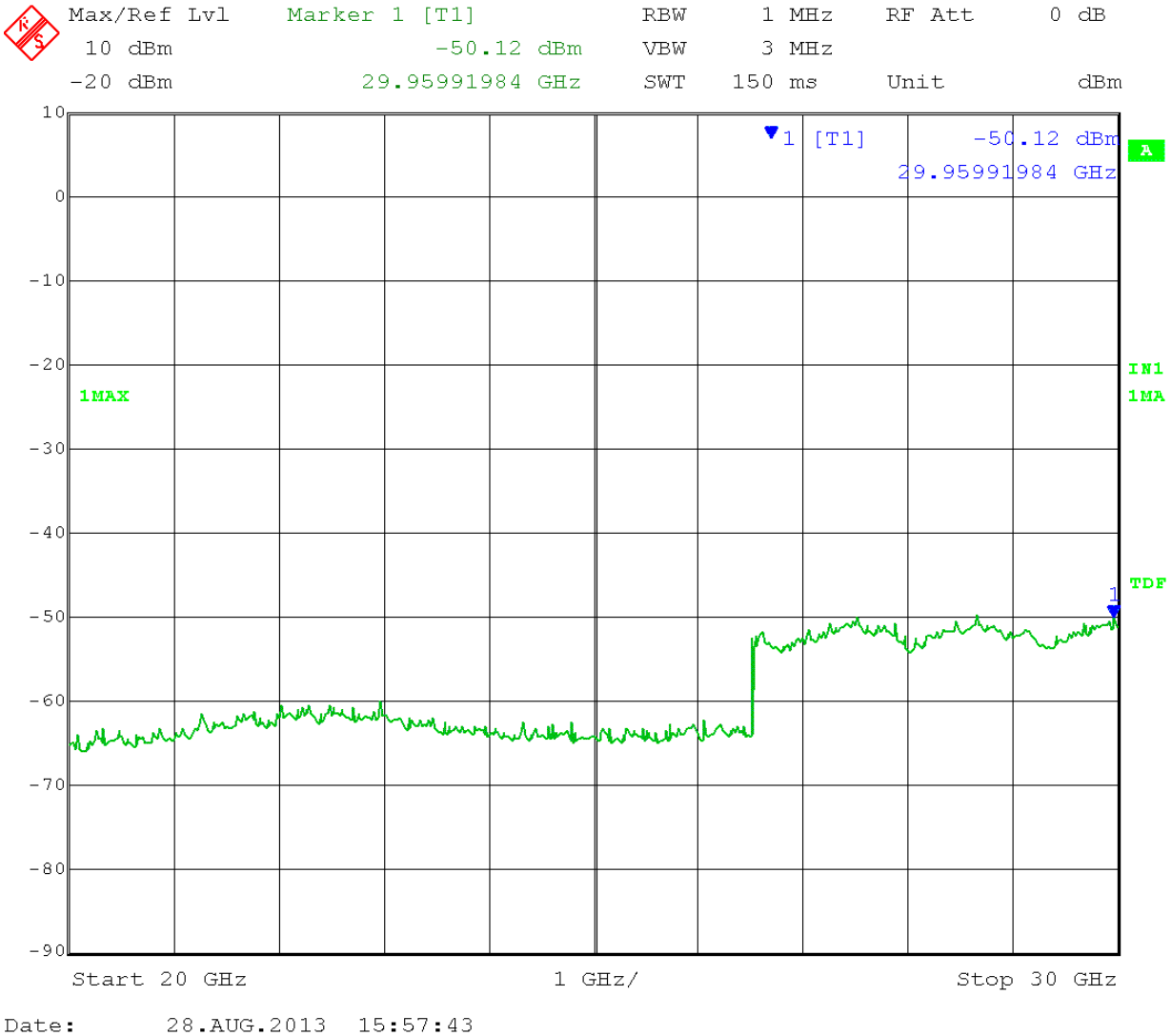
Marker 1: Calculated Field Strength = -75.07 + 114.2 = 39.13dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-28-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 20 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 20 - 30 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

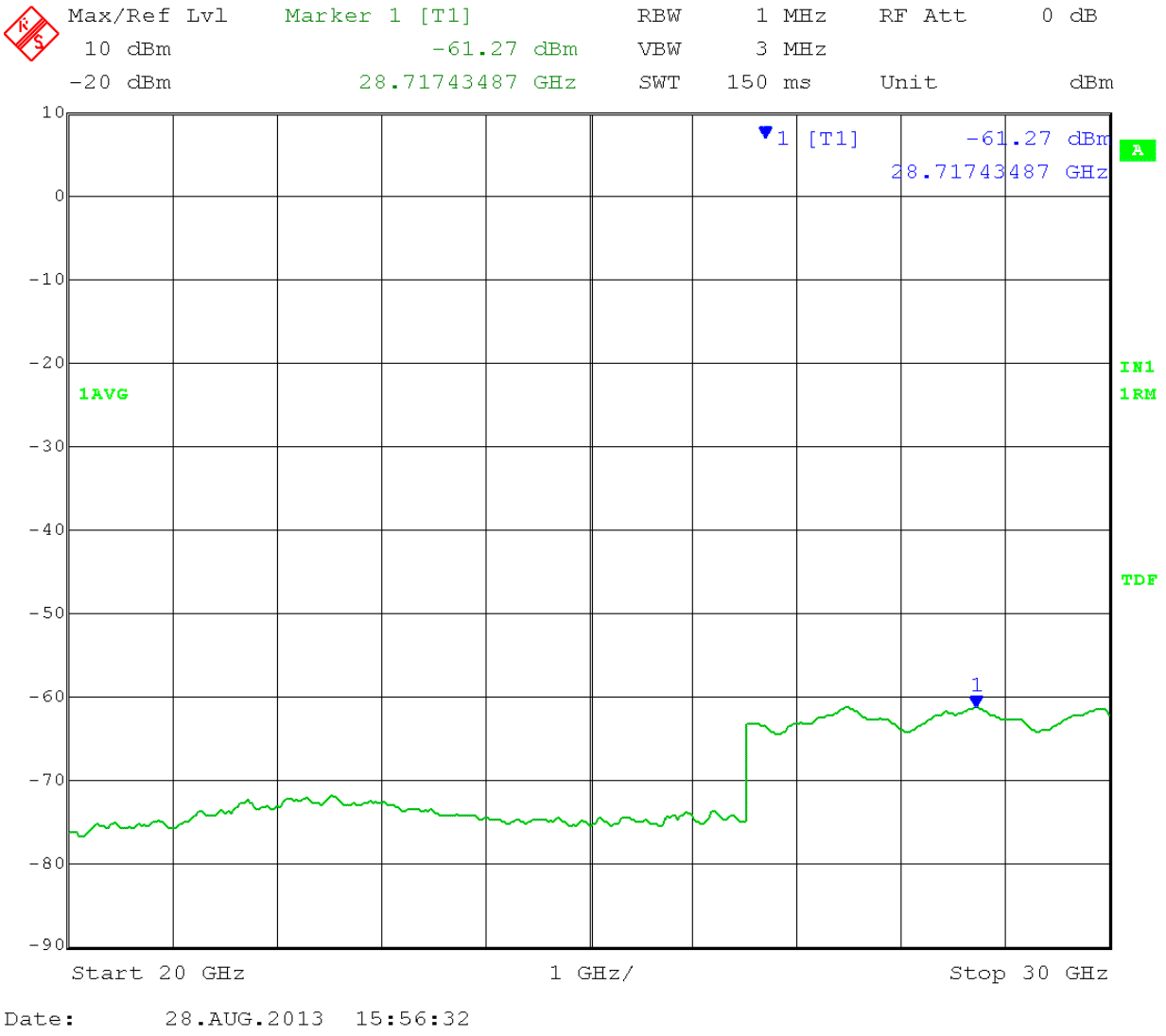
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



Marker 1: Calculated Field Strength = -50.12 + 114.2 = 64.08dBµV/m PK < 74dBµV/m PK Limit

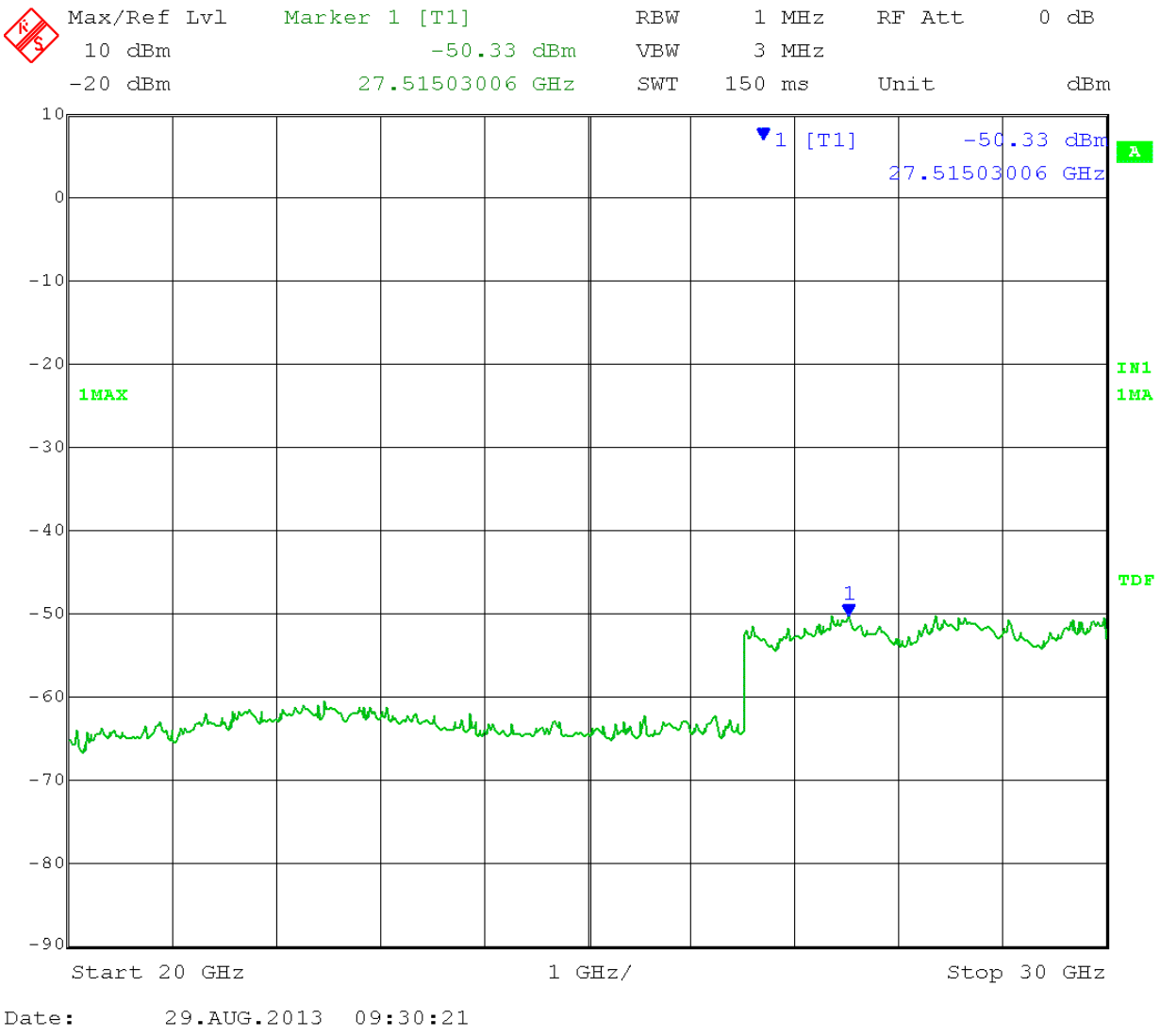
Channel 0 Average:



Marker 1: Calculated Field Strength = -61.27 + 114.2 = 52.93dBµV/m AVG < 54dBµV/m AVG Limit

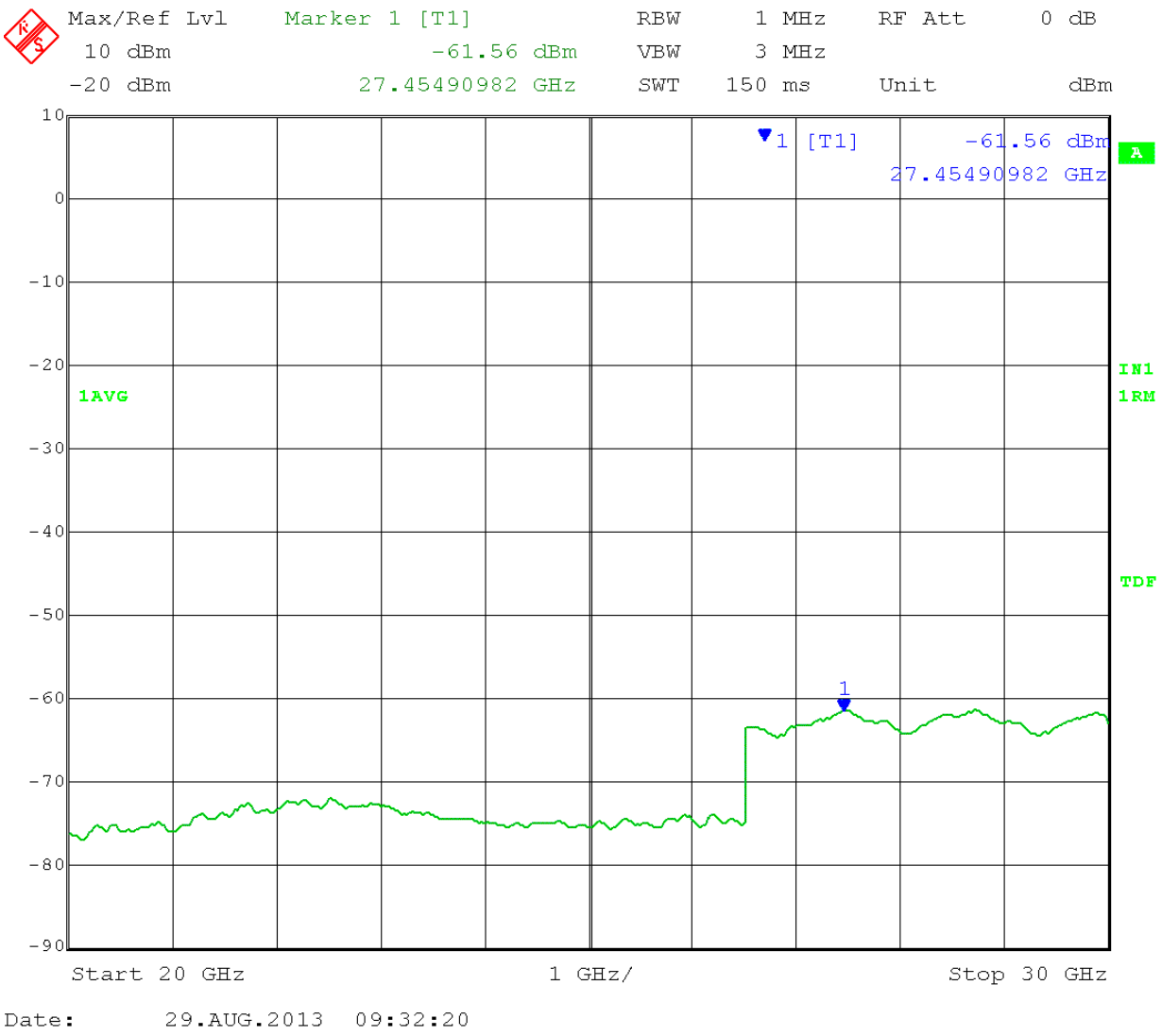
Test Date: 08-29-2013

Channel 1 Peak:



Marker 1: Calculated Field Strength = -50.33 + 114.2 = 63.87BµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



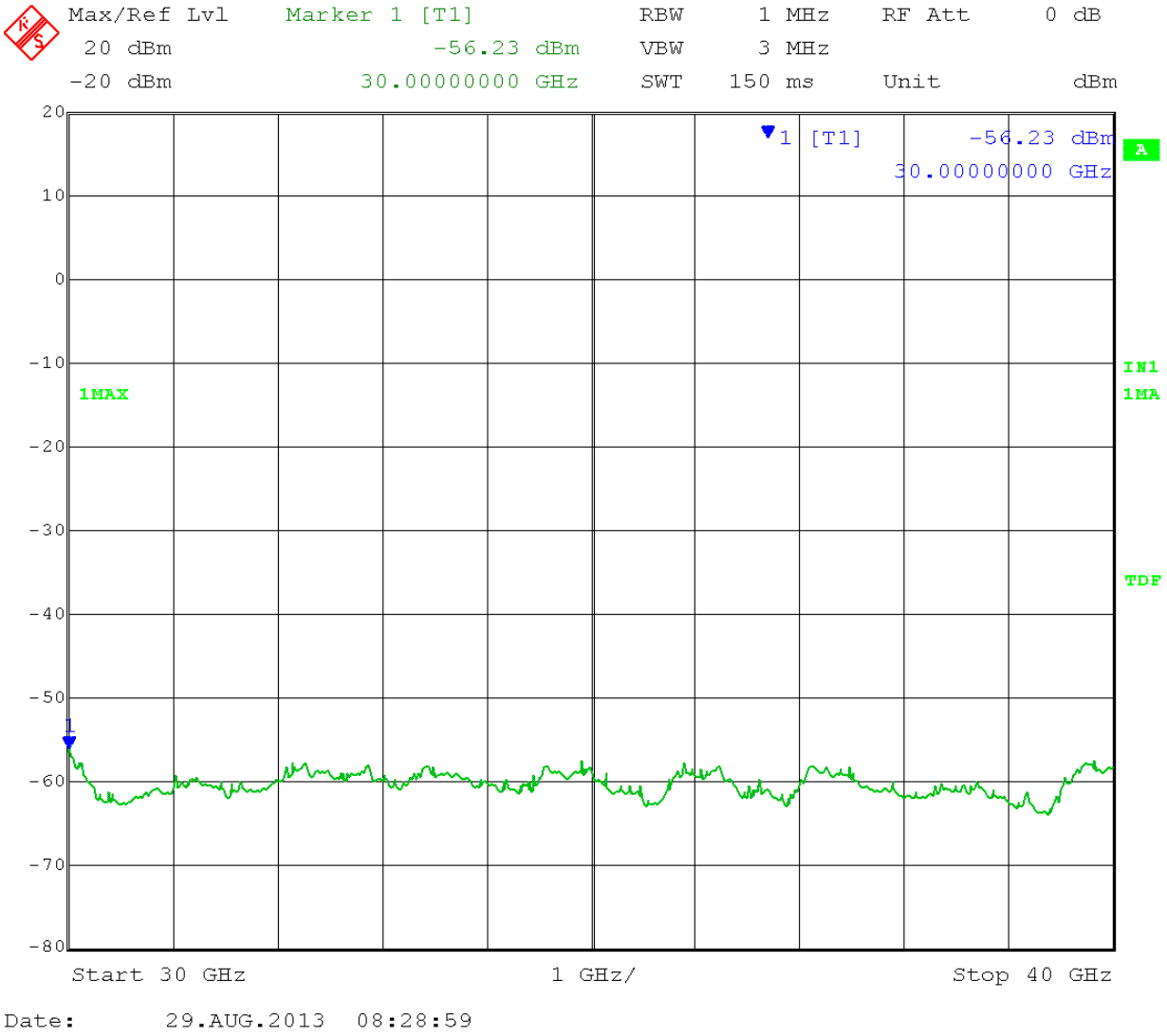
Marker 1: Calculated Field Strength = -61.56 + 114.2 = 52.64dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 20 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 30 - 40 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

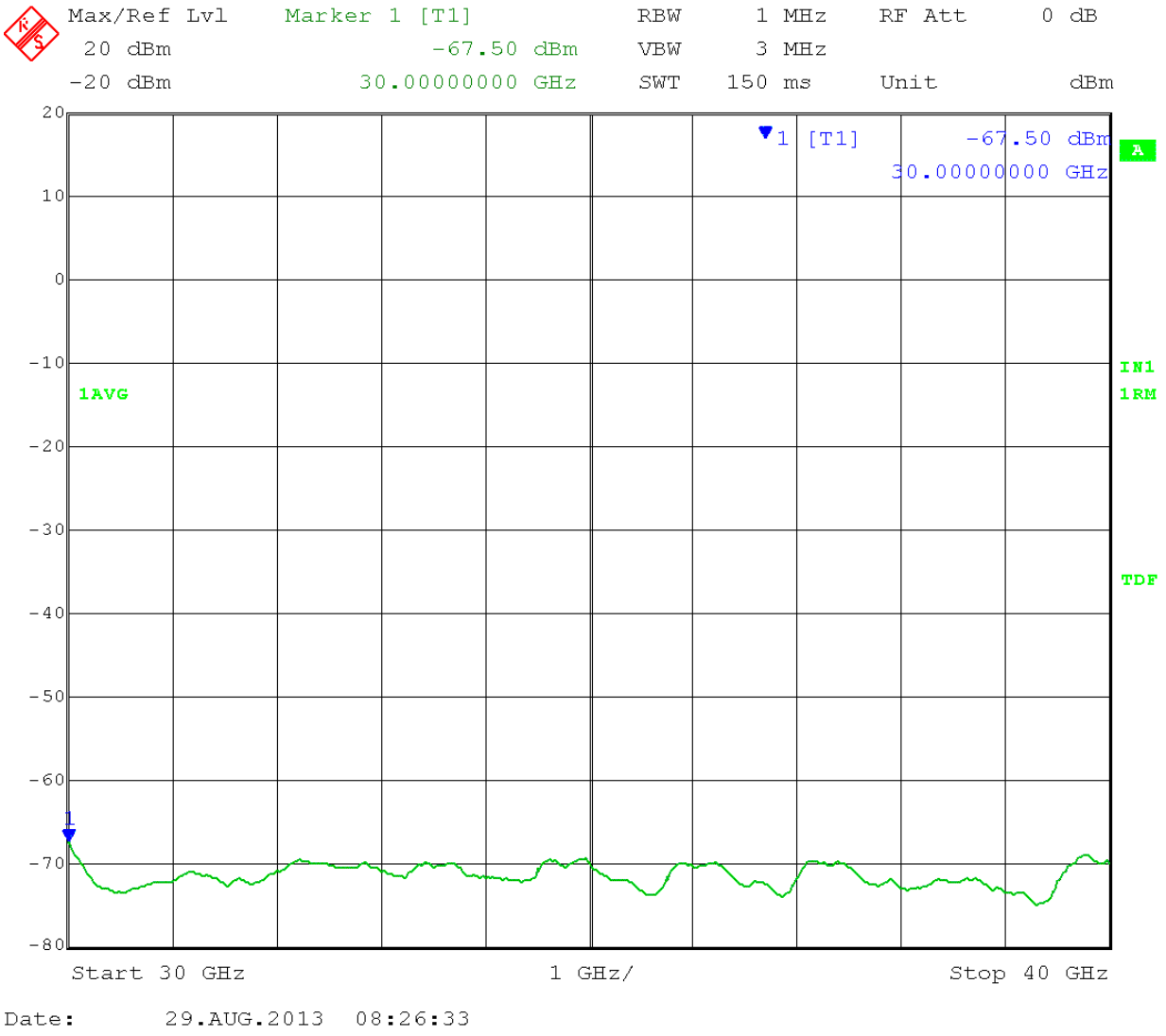
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



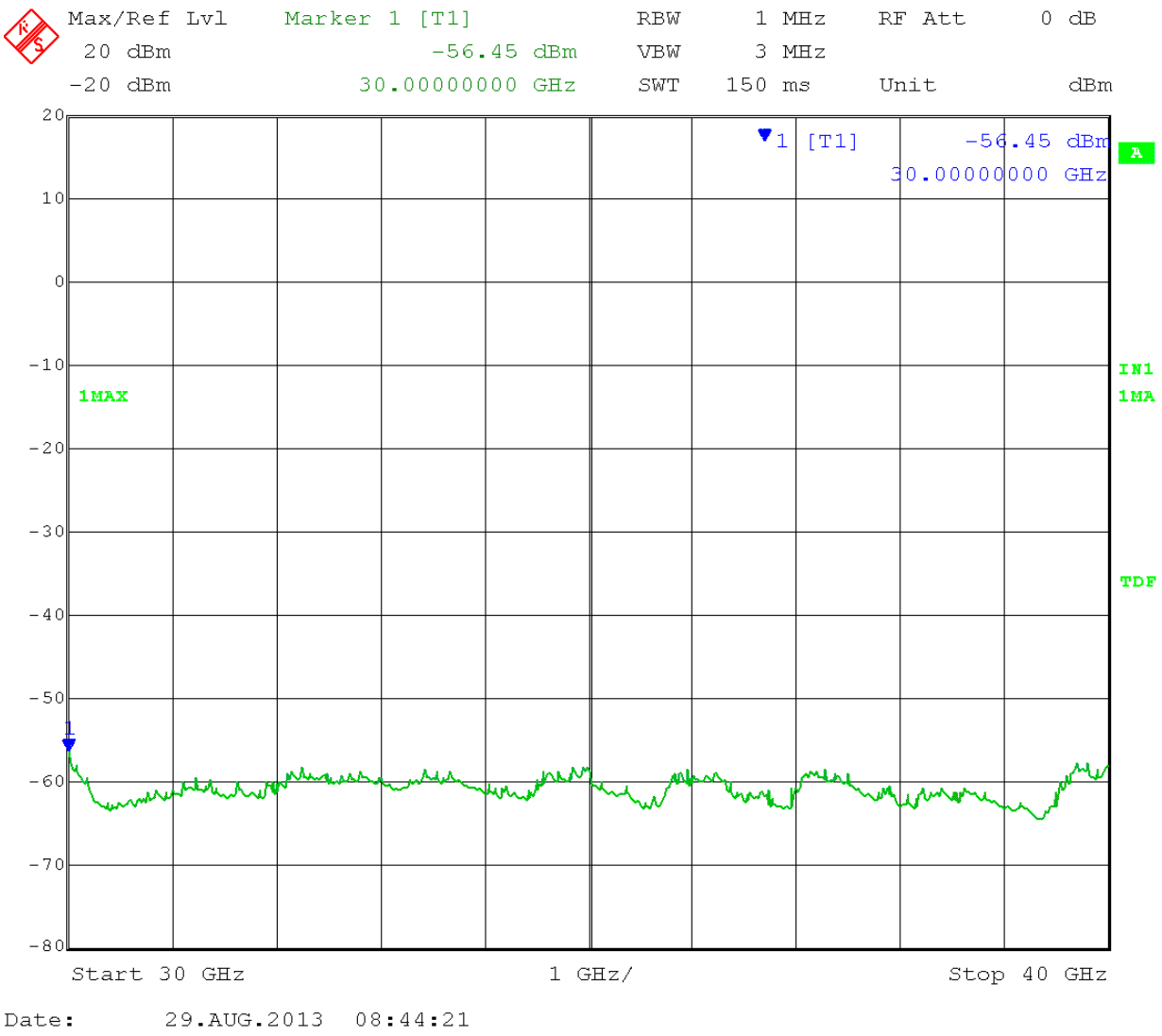
Marker 1: Calculated Field Strength = -56.23 + 114.2 = 57.97dBµV/m PK < 74dBµV/m PK Limit

Channel 0 Average:



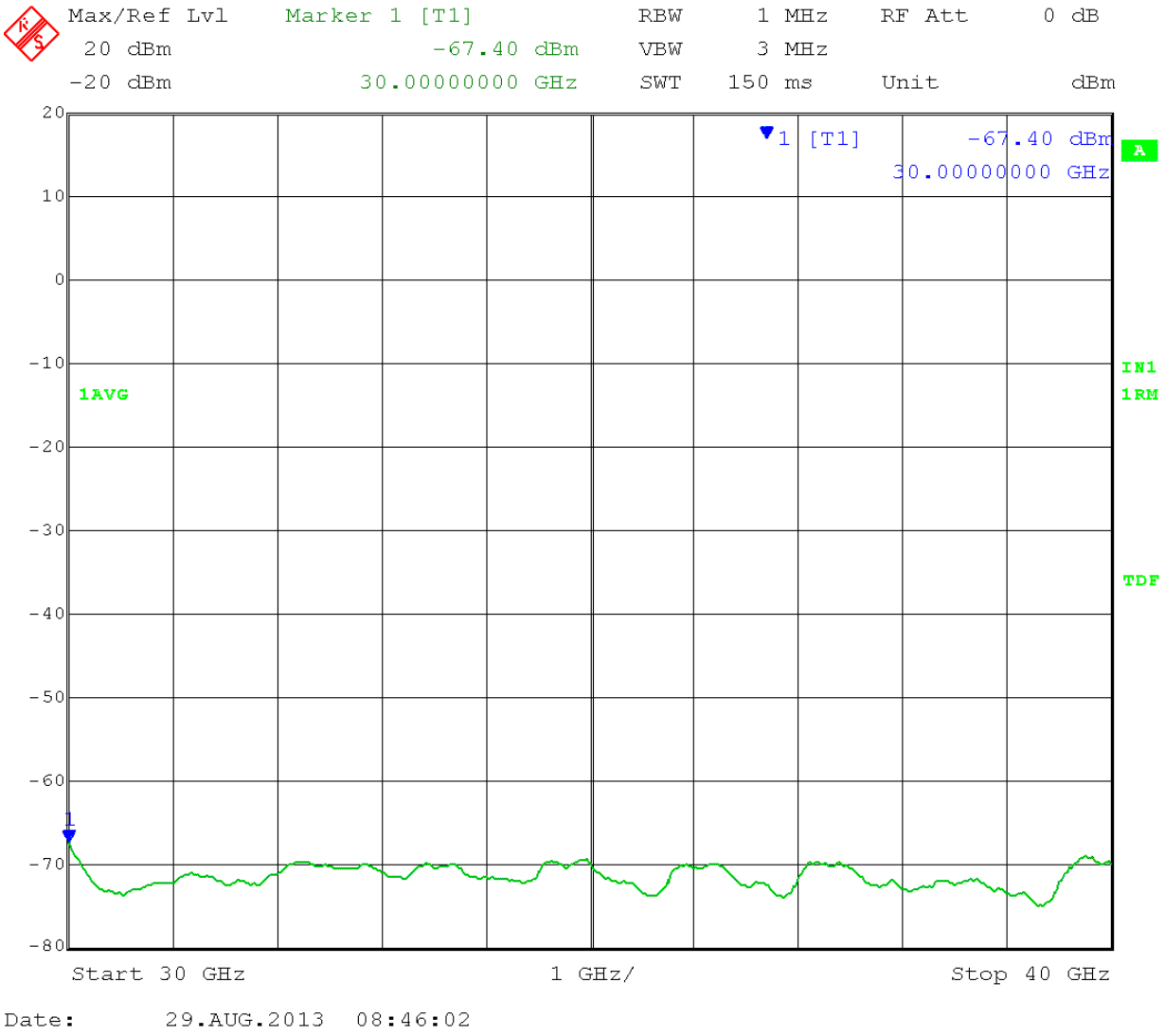
Marker 1: Calculated Field Strength = -67.50 + 114.2 = 46.70dBµV/m AVG < 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 1: Calculated Field Strength = -56.45 + 114.2 = 57.75dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



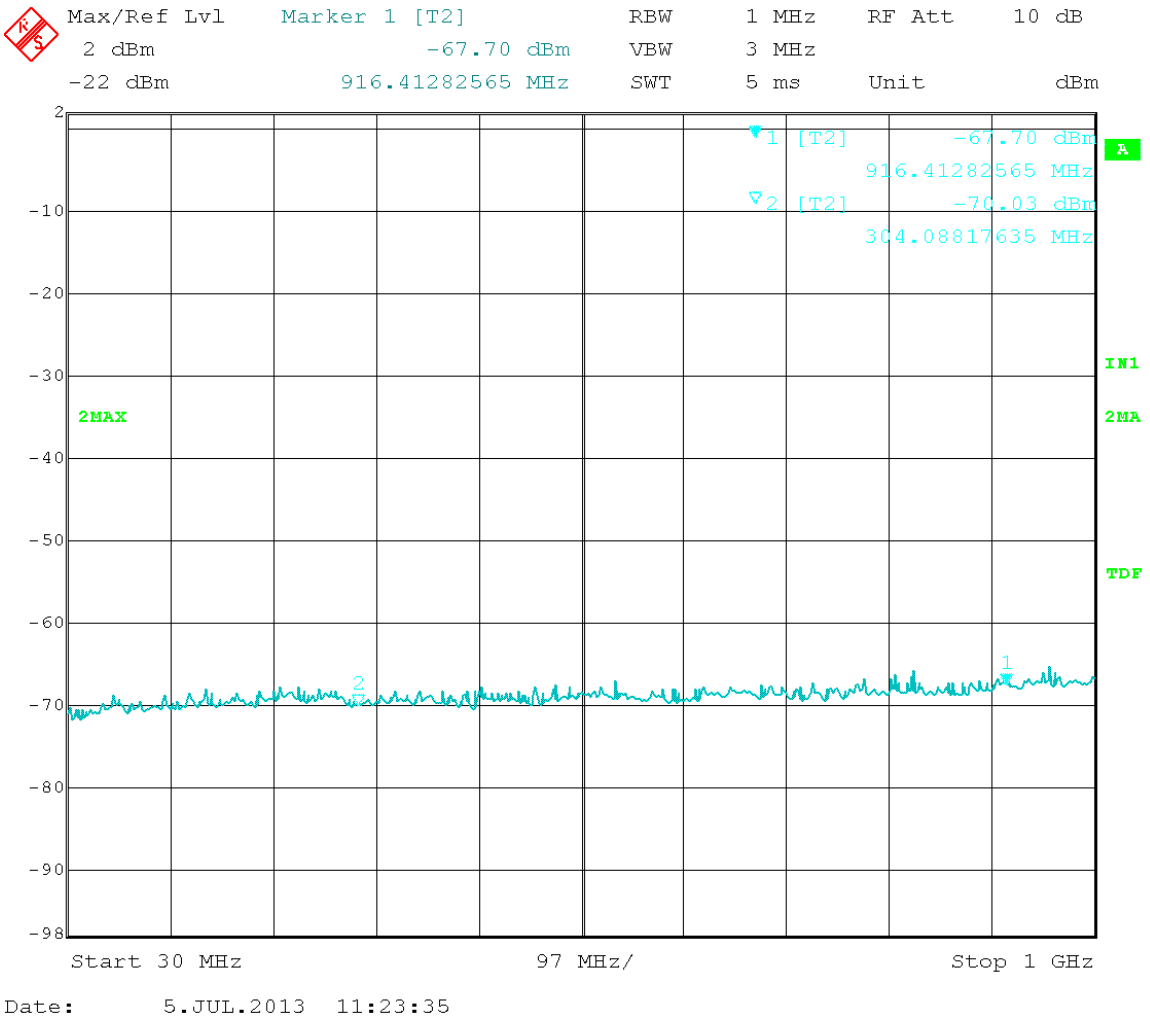
Marker 1: Calculated Field Strength = -67.40 + 114.2 = 46.80dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



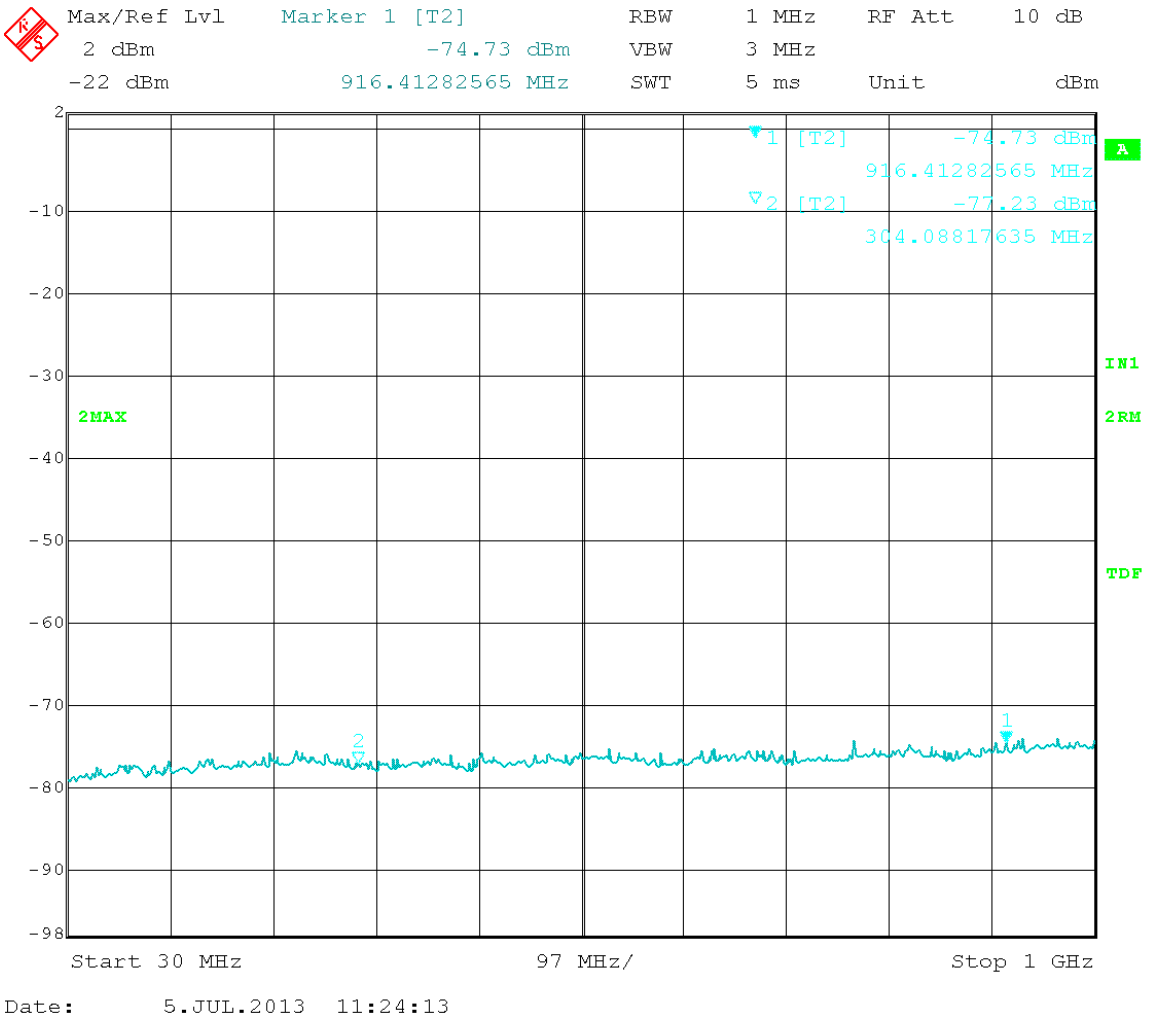
Marker 1: Non-Restricted Band
Marker 2: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



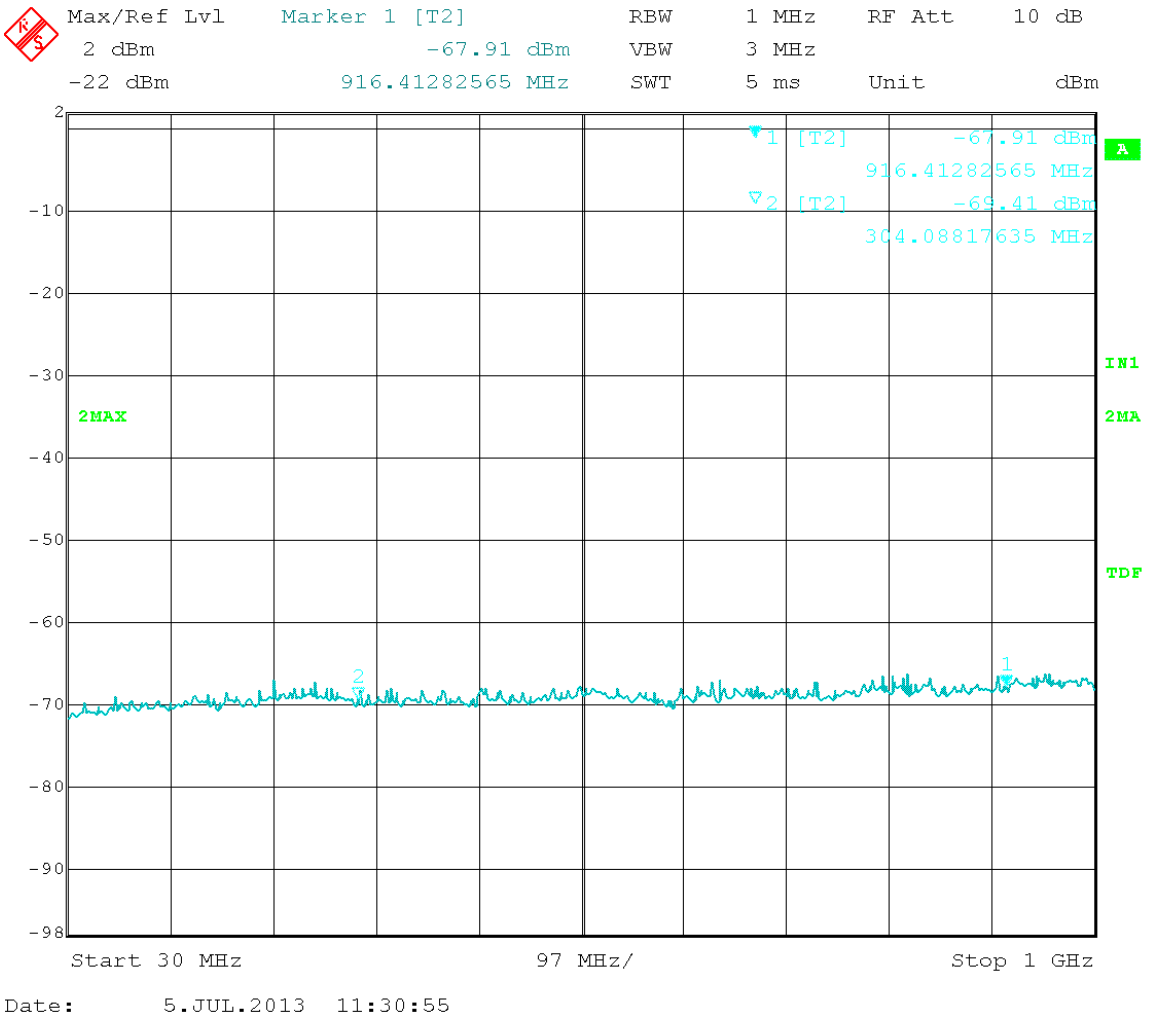
Marker 1: Non-Restricted Band
Marker 2: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



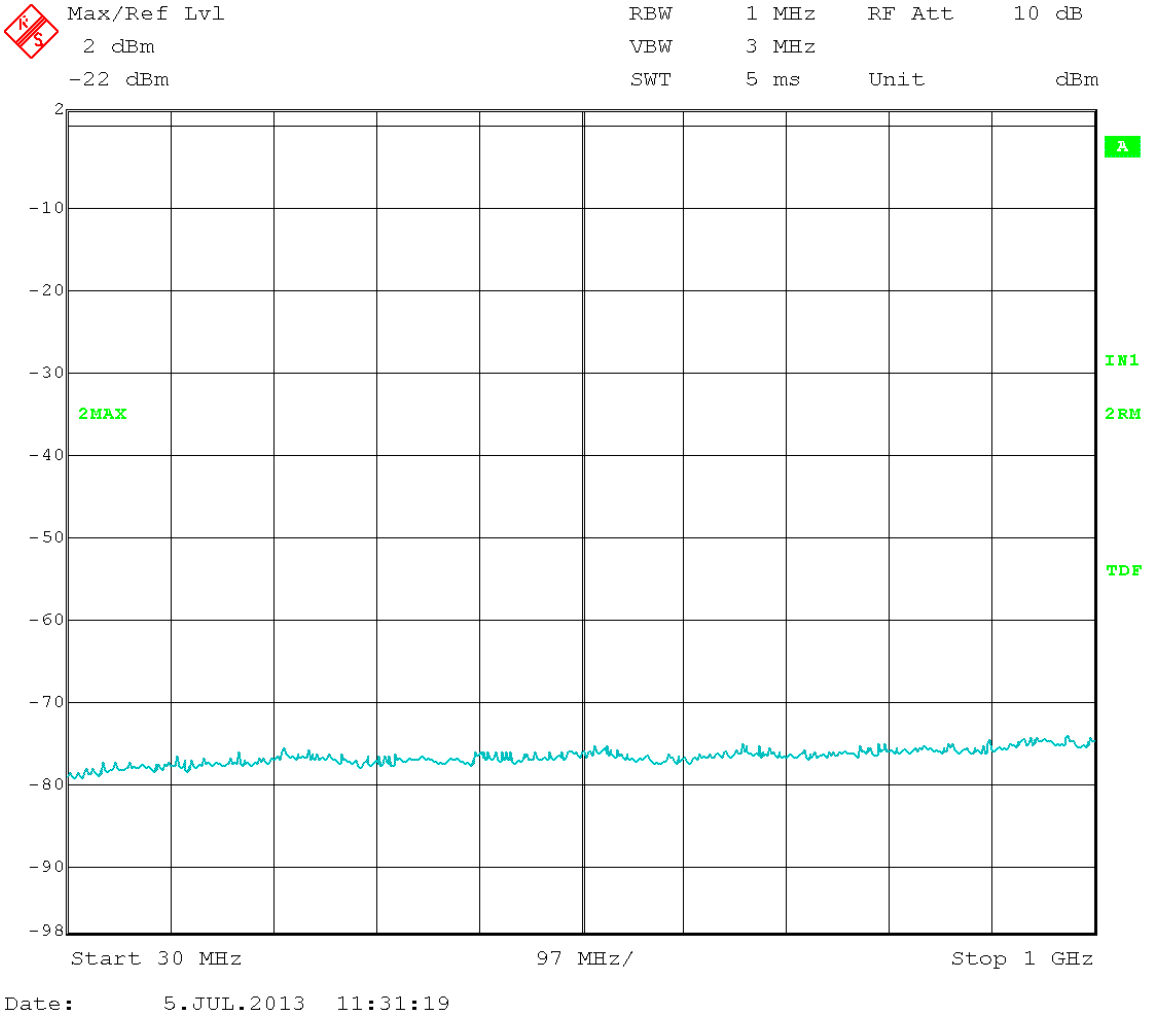
Date: 5.JUL.2013 11:30:55

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



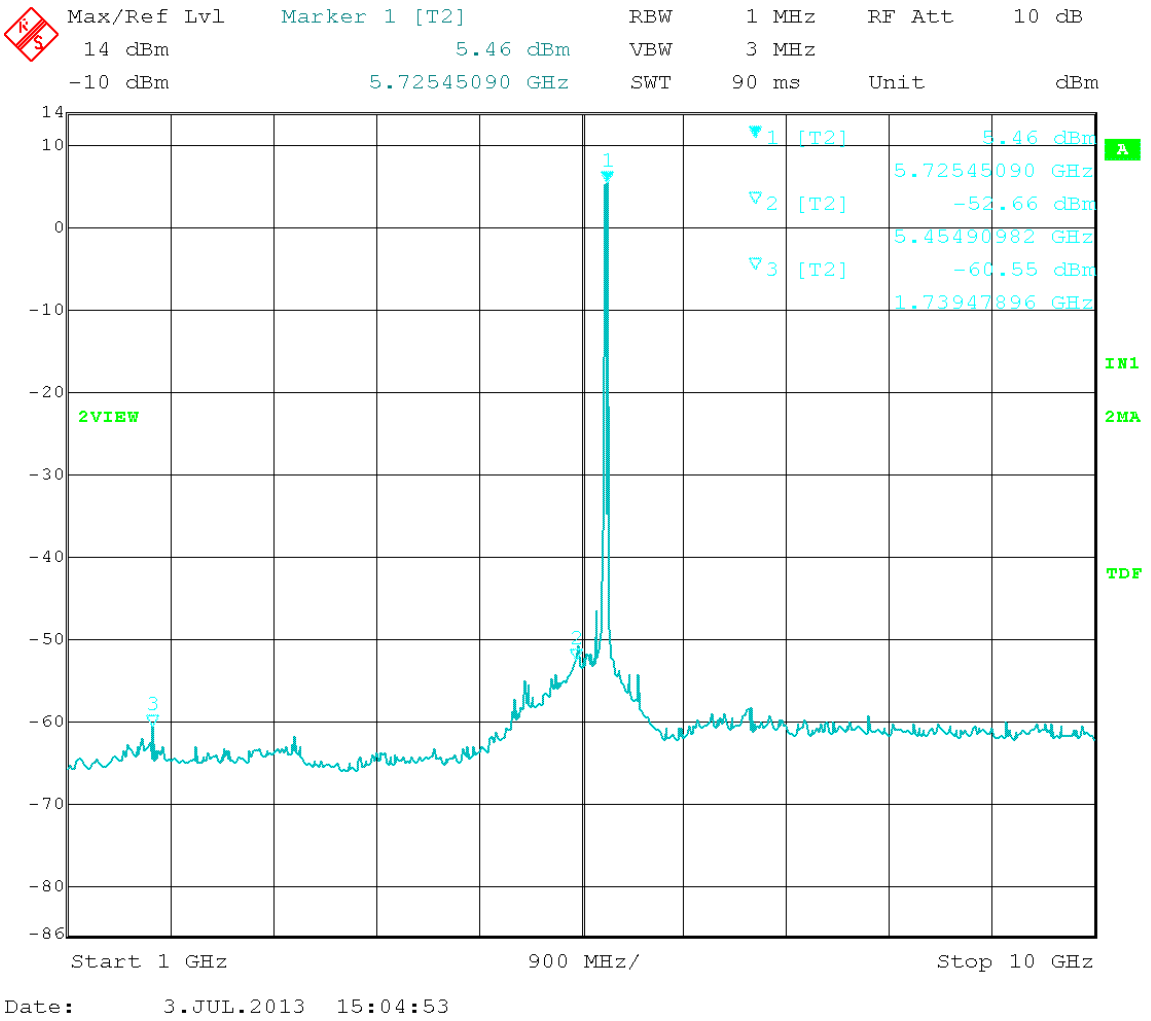
Date: 5.JUL.2013 11:31:19

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



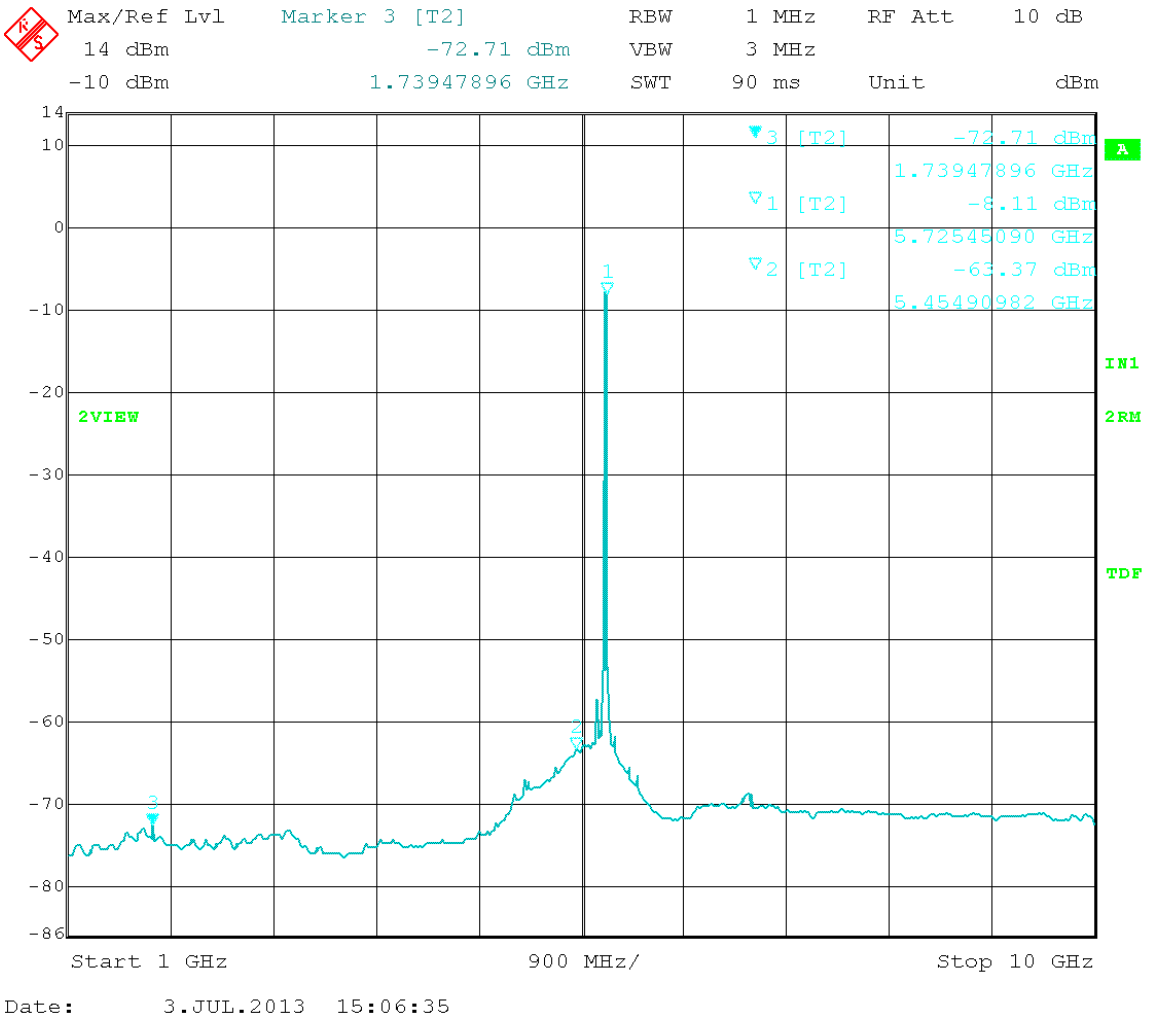
Marker 2: Calculated Field Strength (Restricted Band) = -52.66 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 61.57dBµV/m Peak
Marker 3: Calculated Field Strength (Restricted Band) = -60.55 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 53.68dBµV/m Peak

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



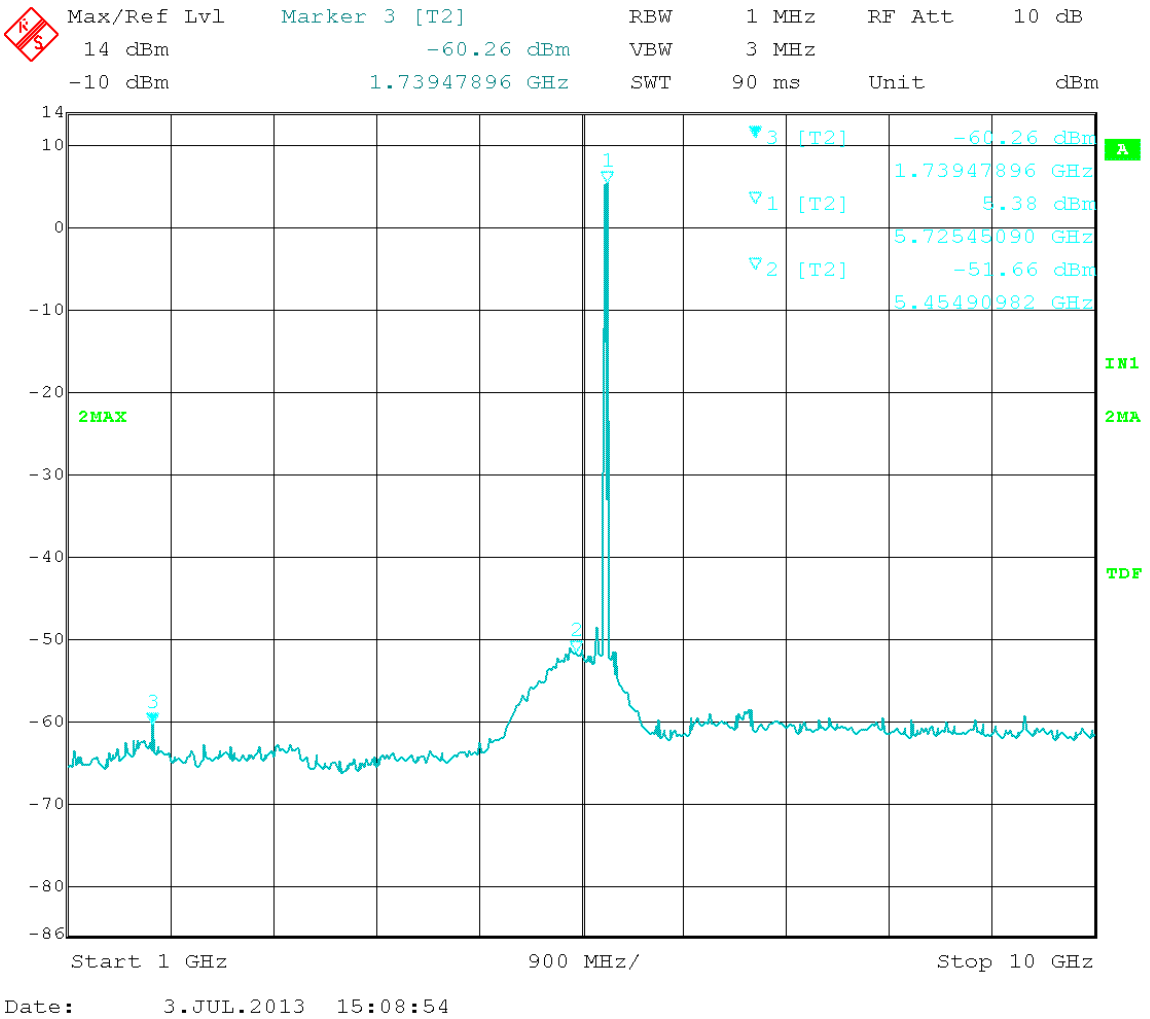
Marker 2: Calculated Field Strength (Restricted Band) = -63.37 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 50.86dBµV/m Average
Marker 3: Calculated Field Strength (Restricted Band) = -72.71 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 41.52dBµV/m Average

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



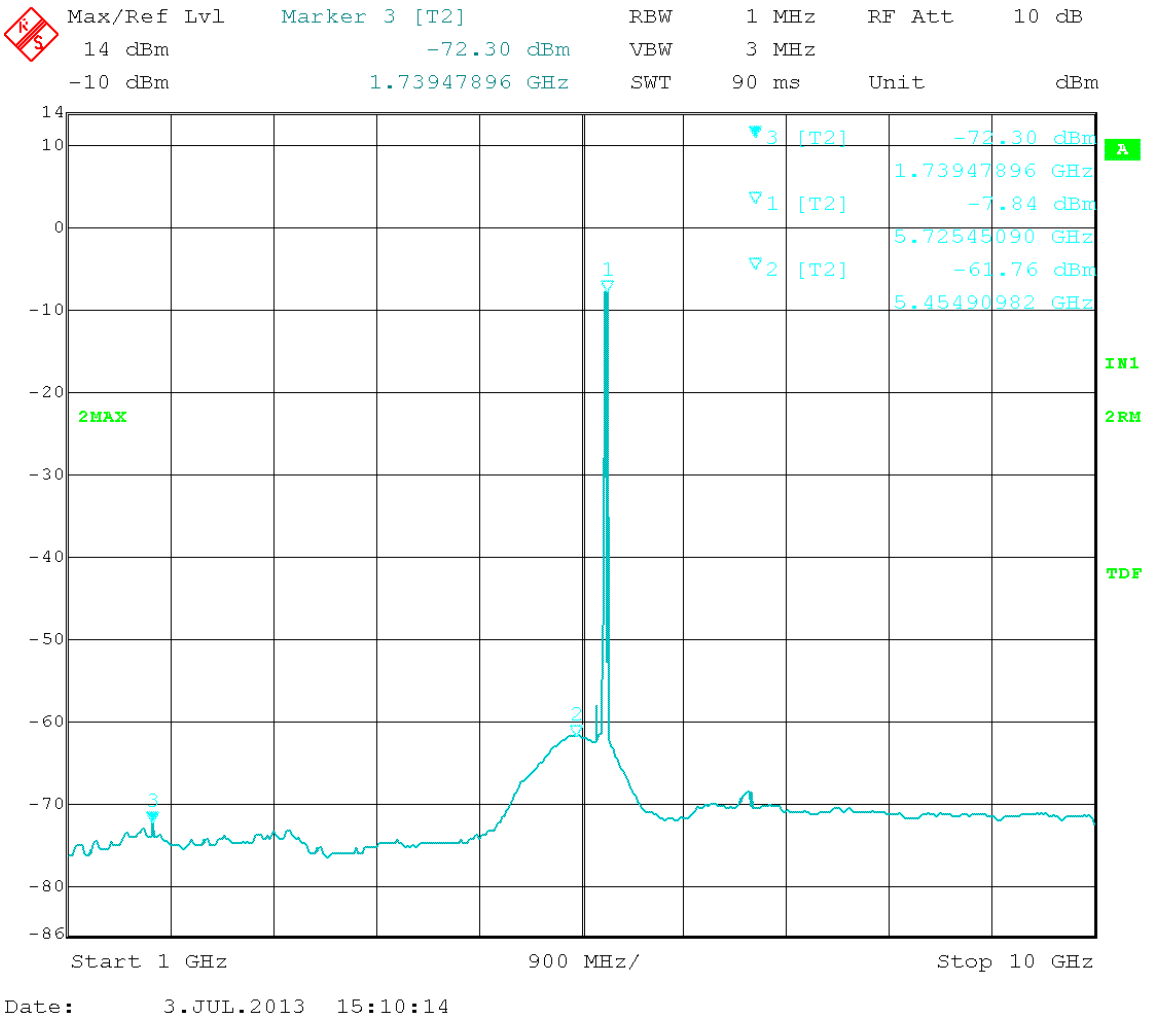
Marker 2: Calculated Field Strength (Restricted Band) = -51.66 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 62.57dBµV/m Peak
Marker 3: Calculated Field Strength (Restricted Band) = -59.11 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 55.12dBµV/m Peak

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



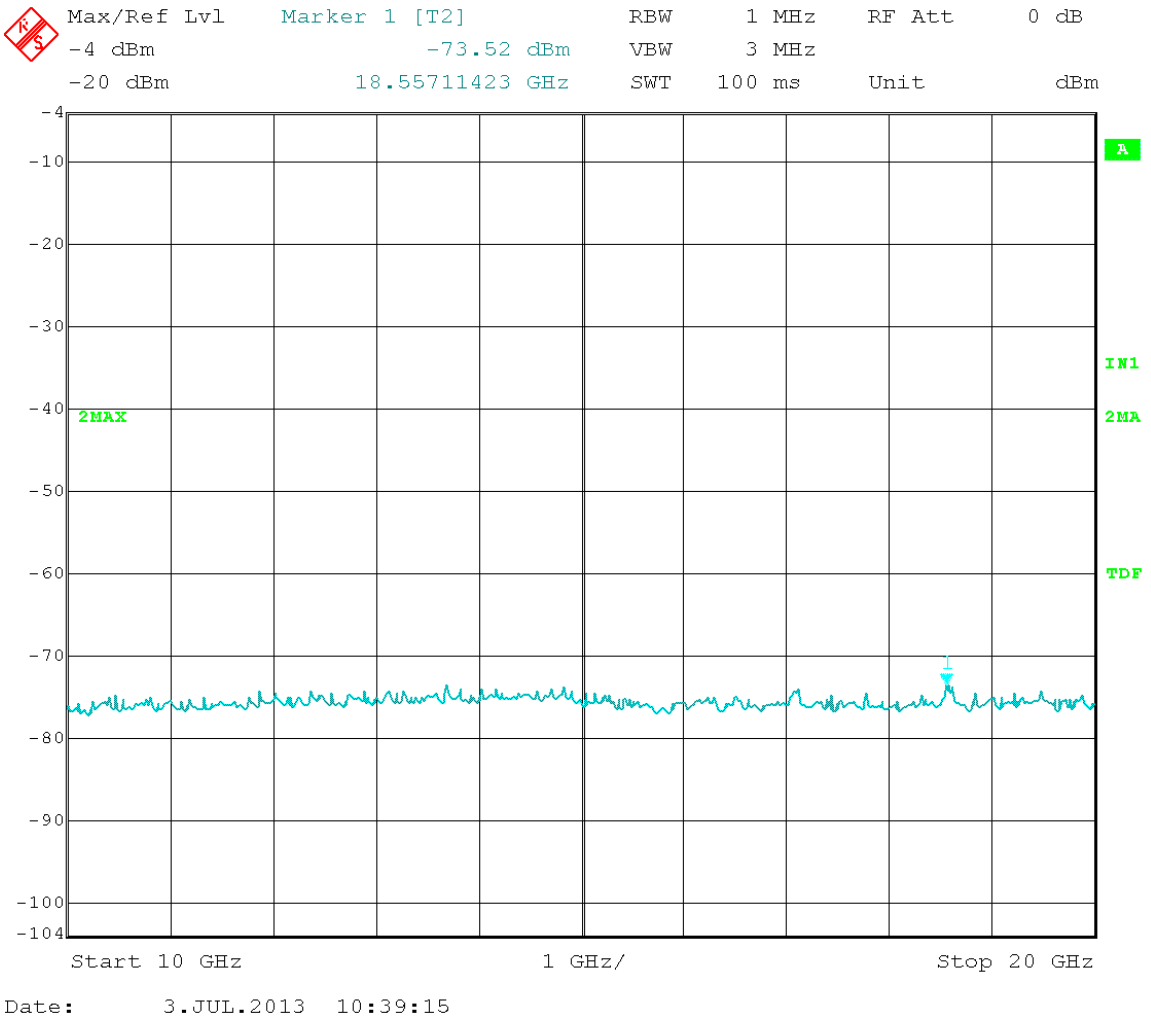
Marker 2: Calculated Field Strength (Restricted Band) = -62.76 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 51.47dBµV/m Average
Marker 3: Calculated Field Strength (Restricted Band) = -72.30 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 41.93dBµV/m Average

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



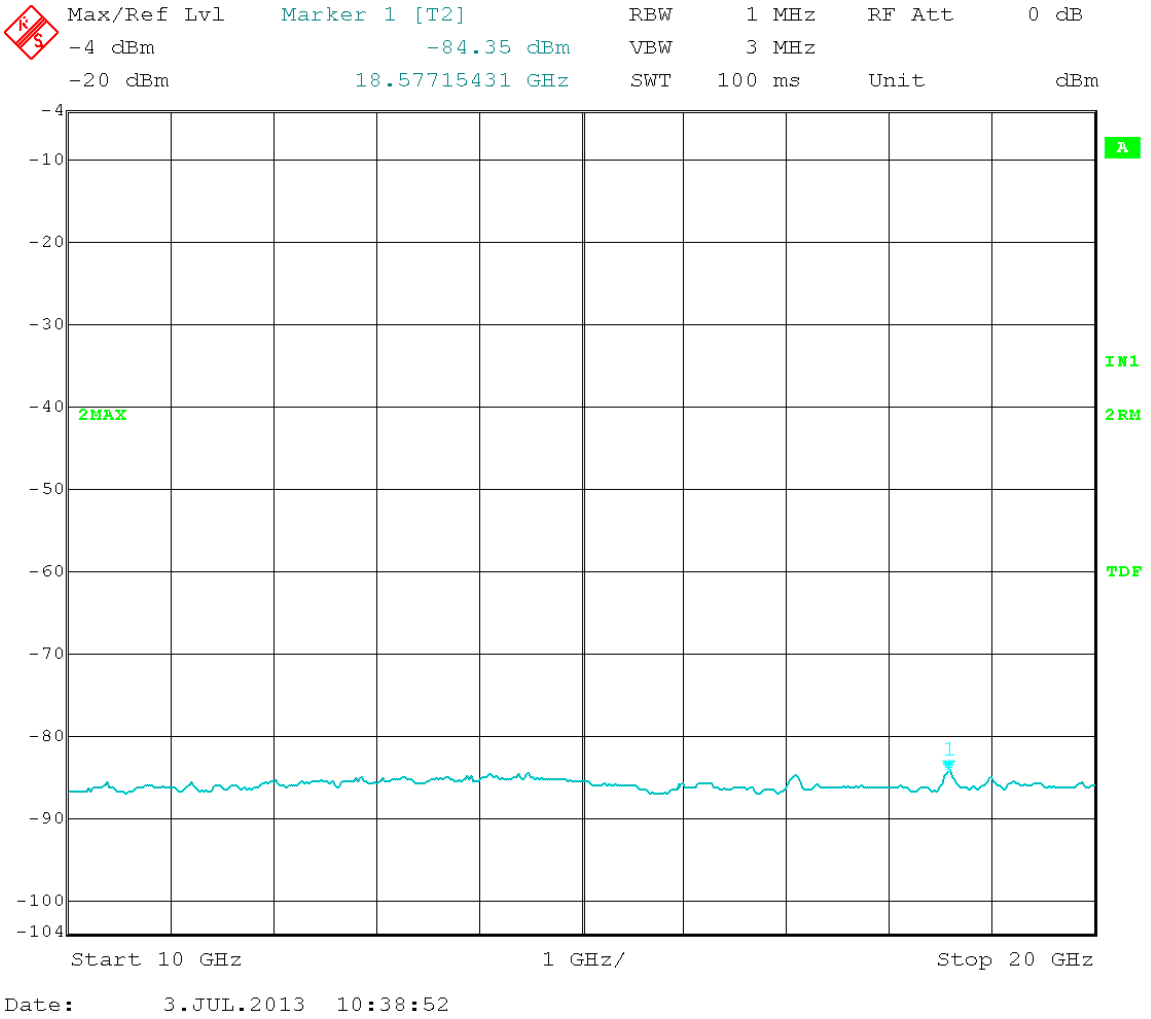
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



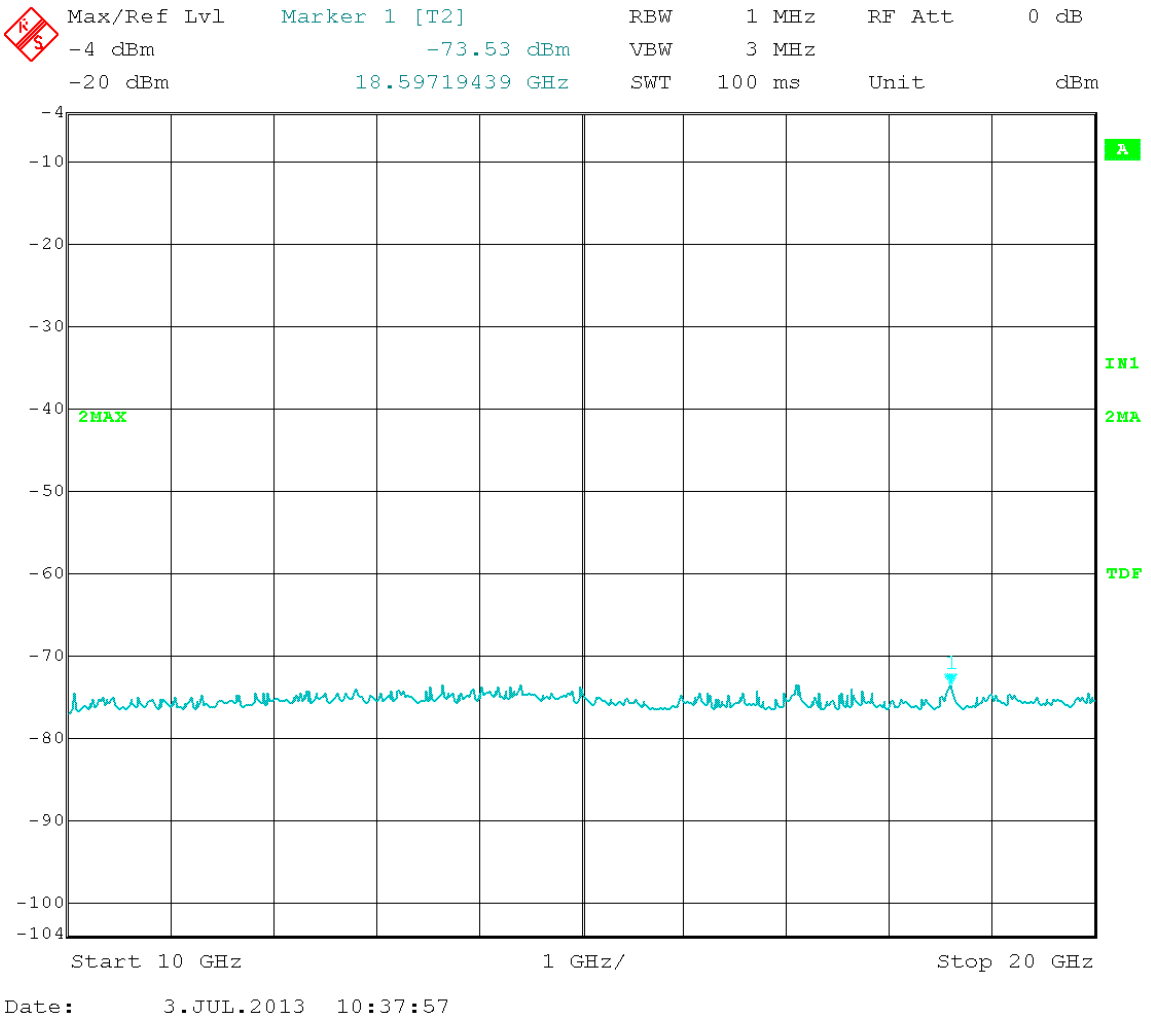
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



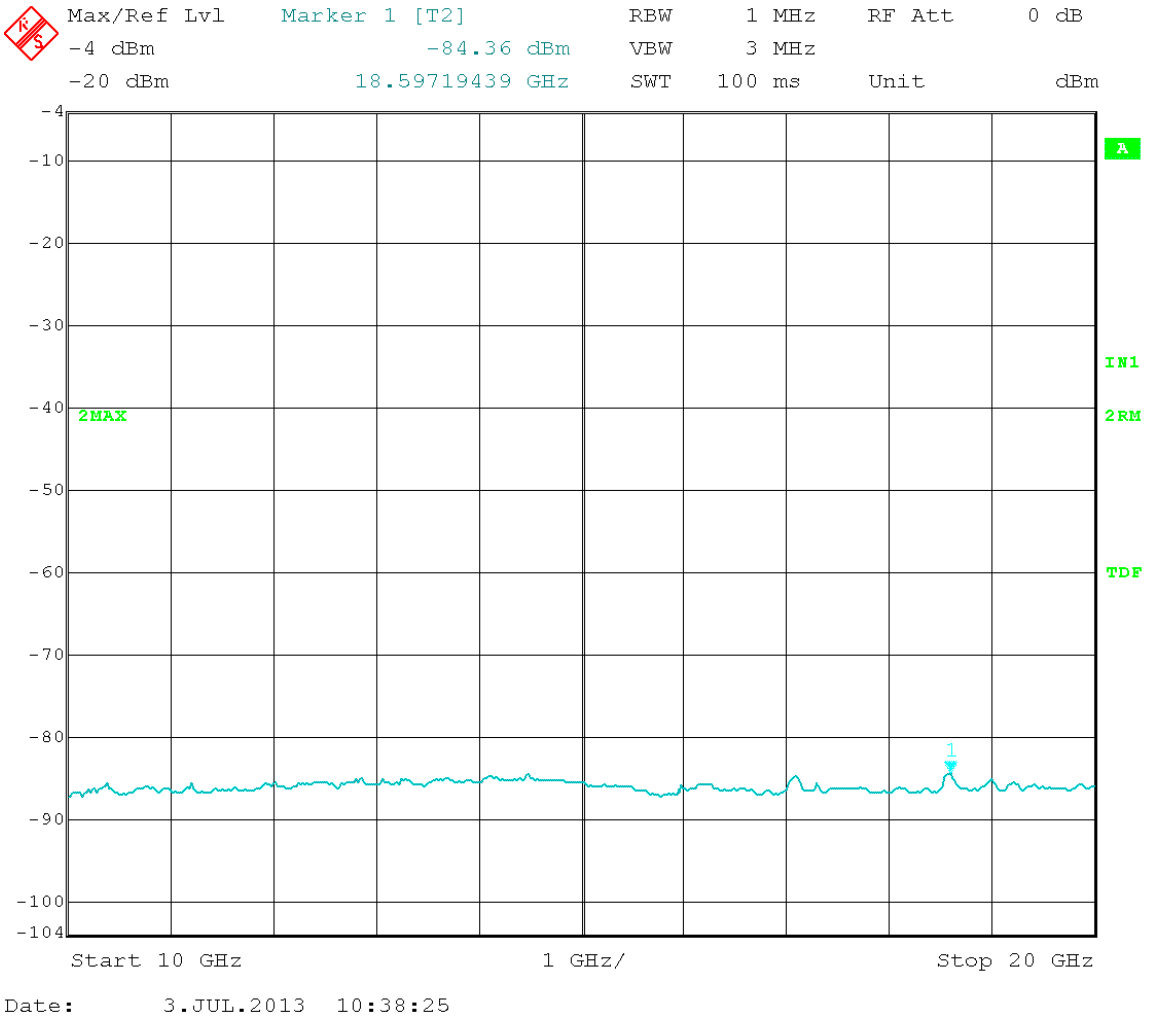
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



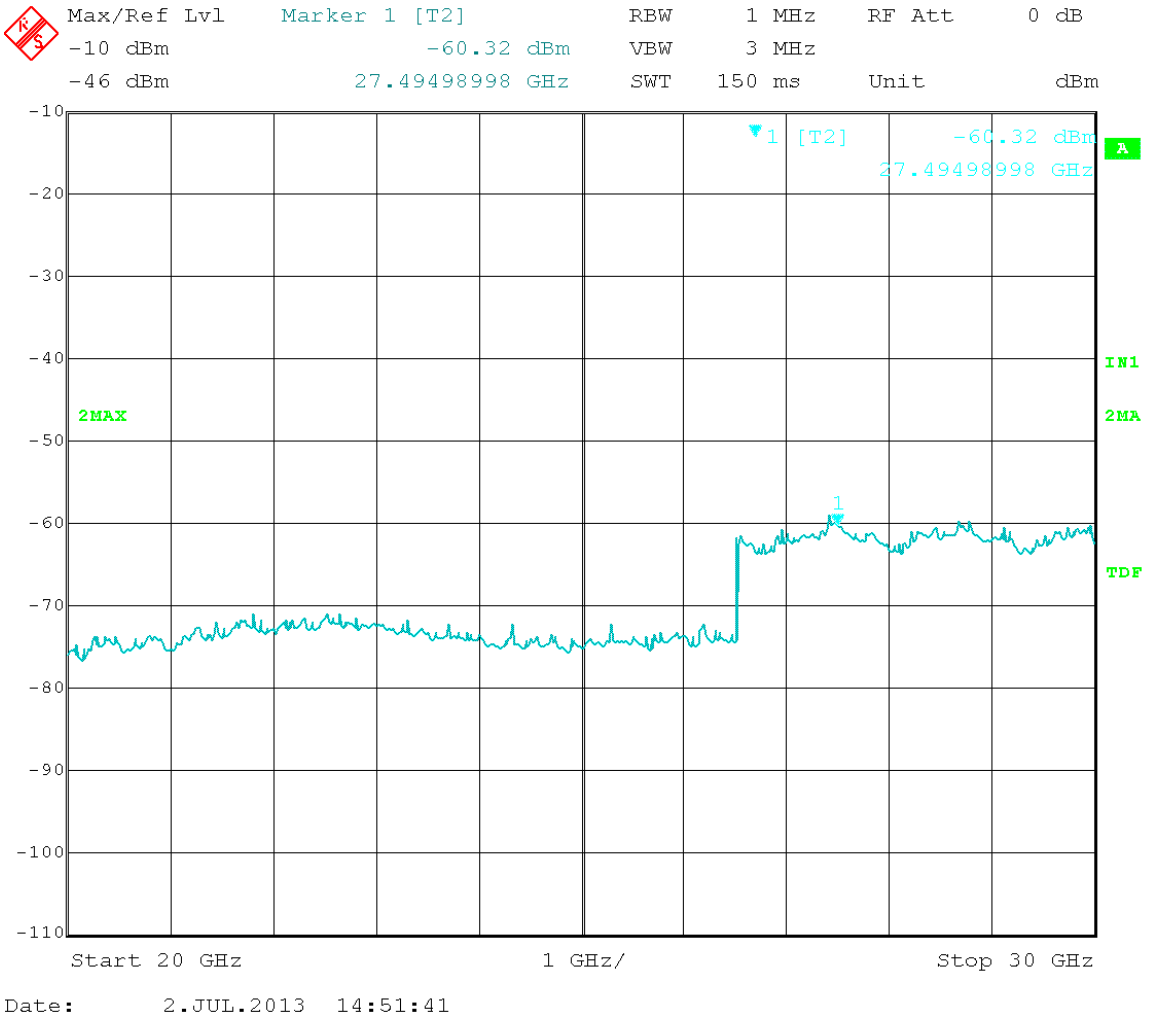
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



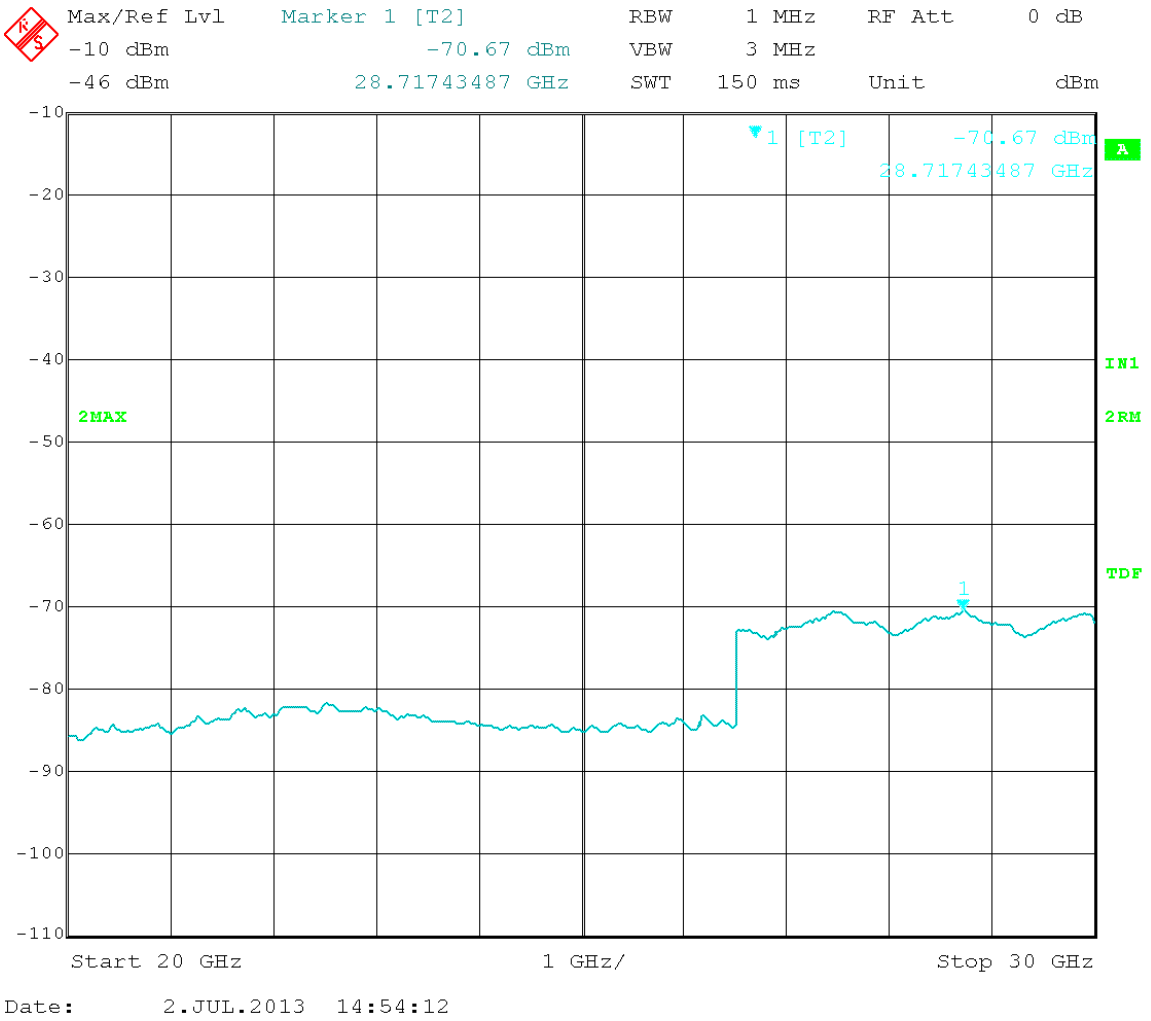
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



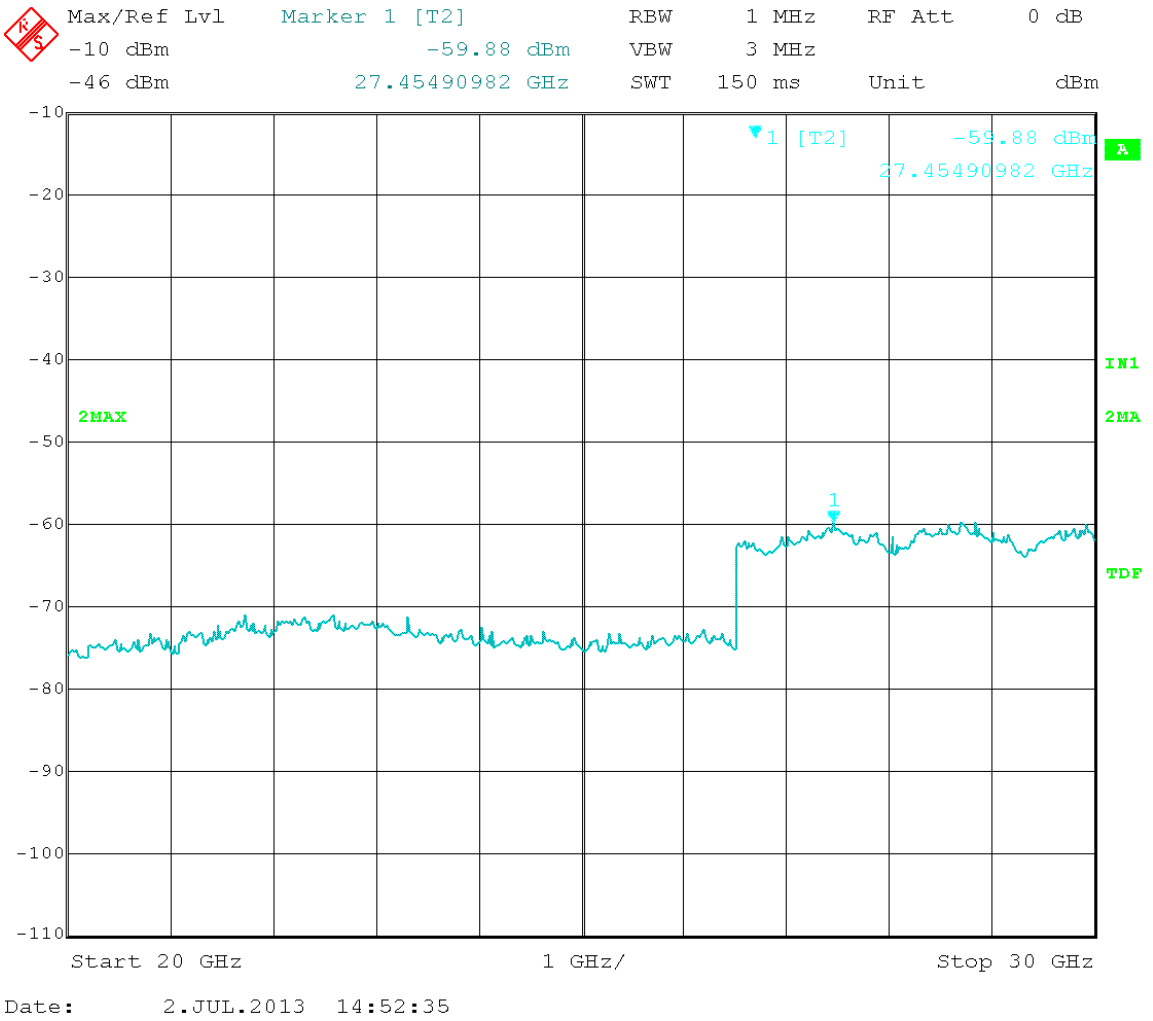
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



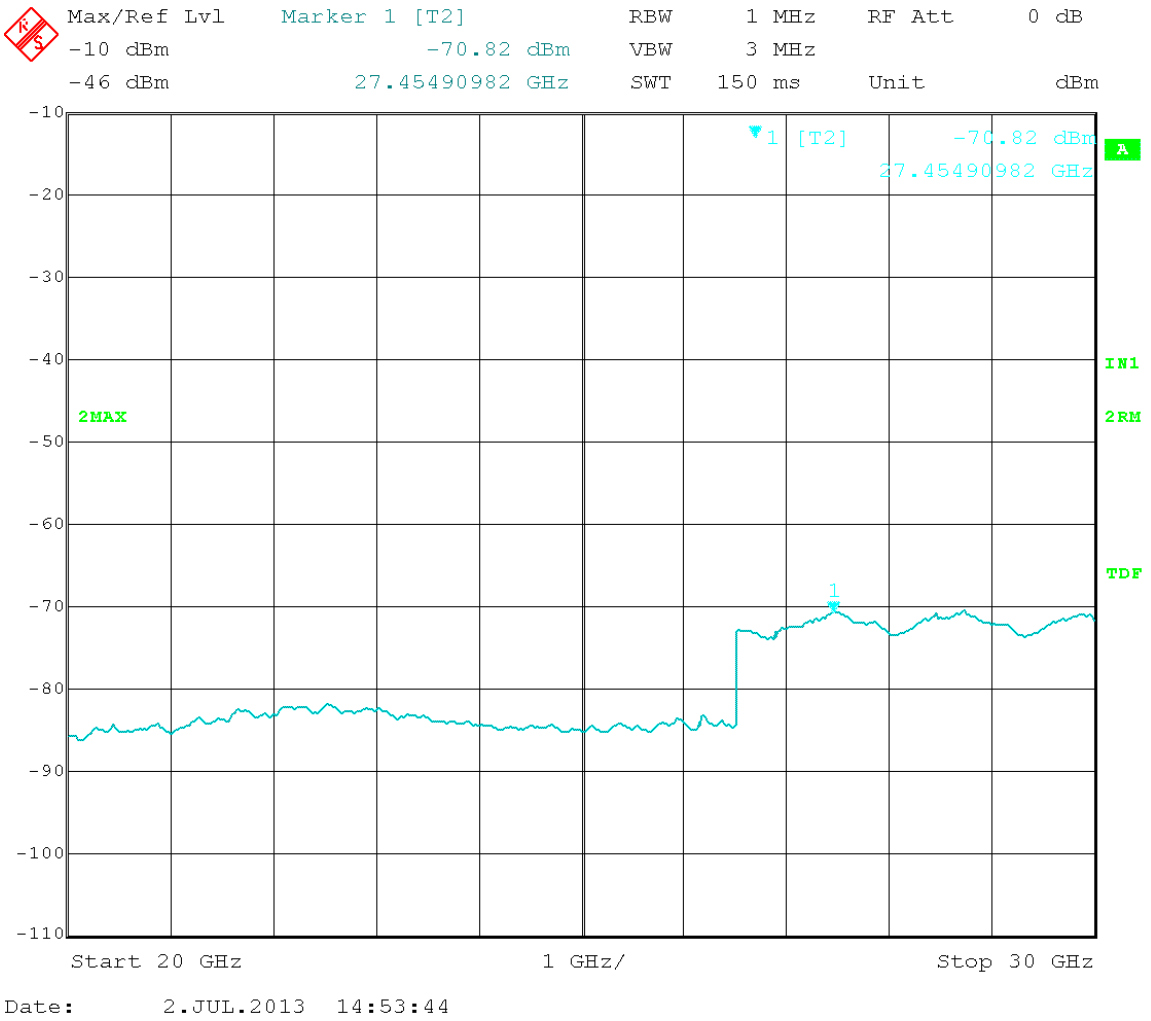
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



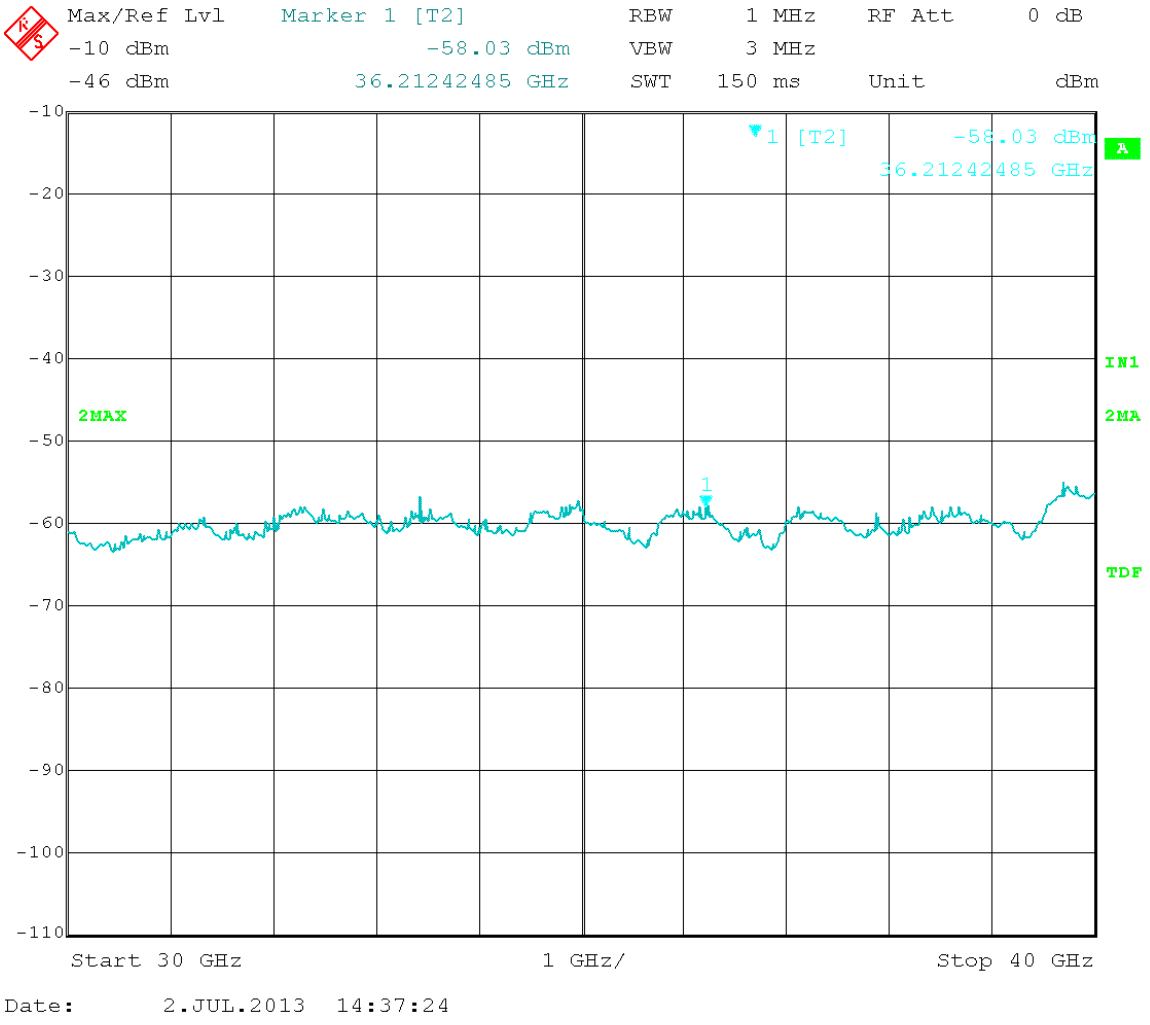
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



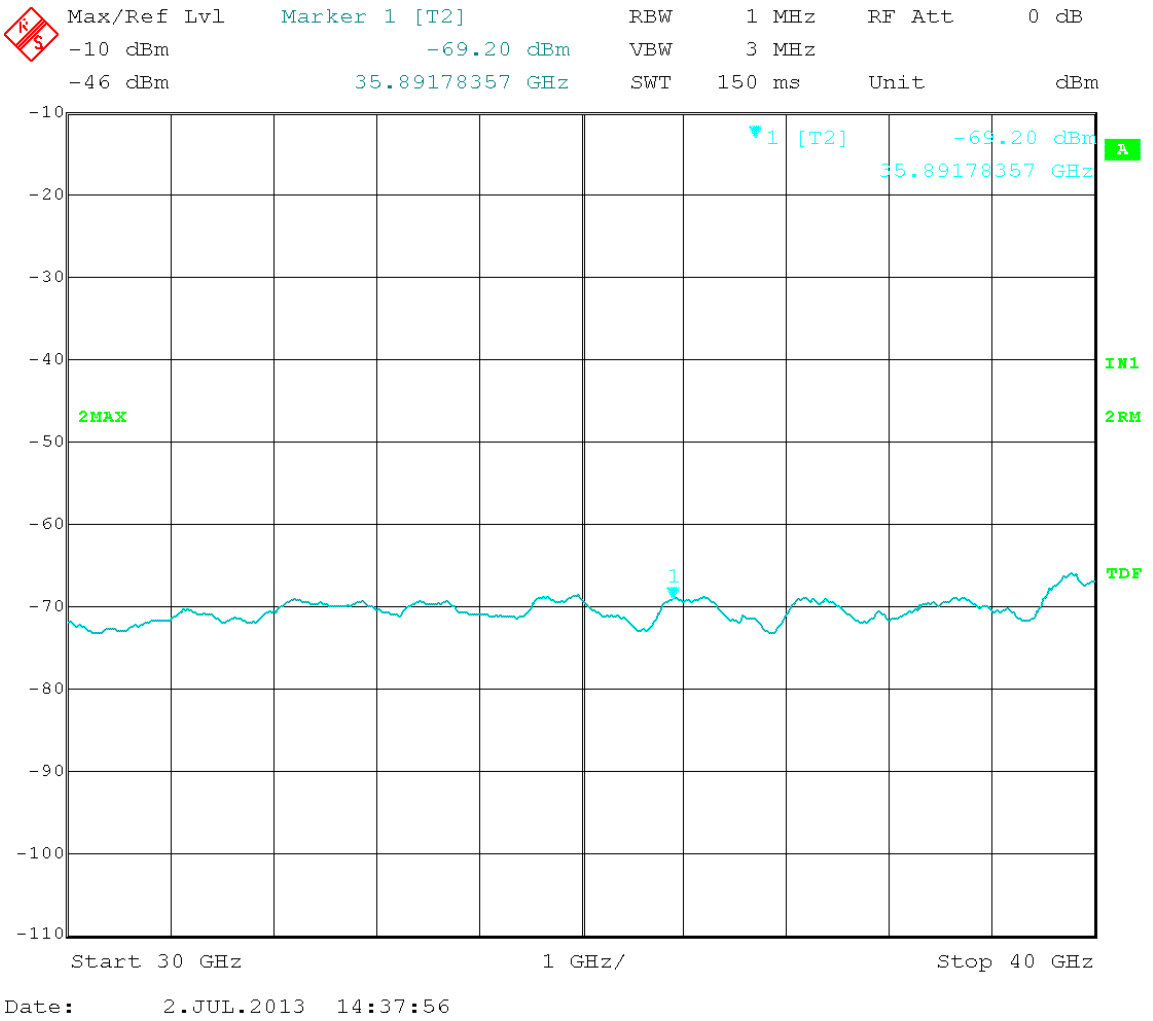
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



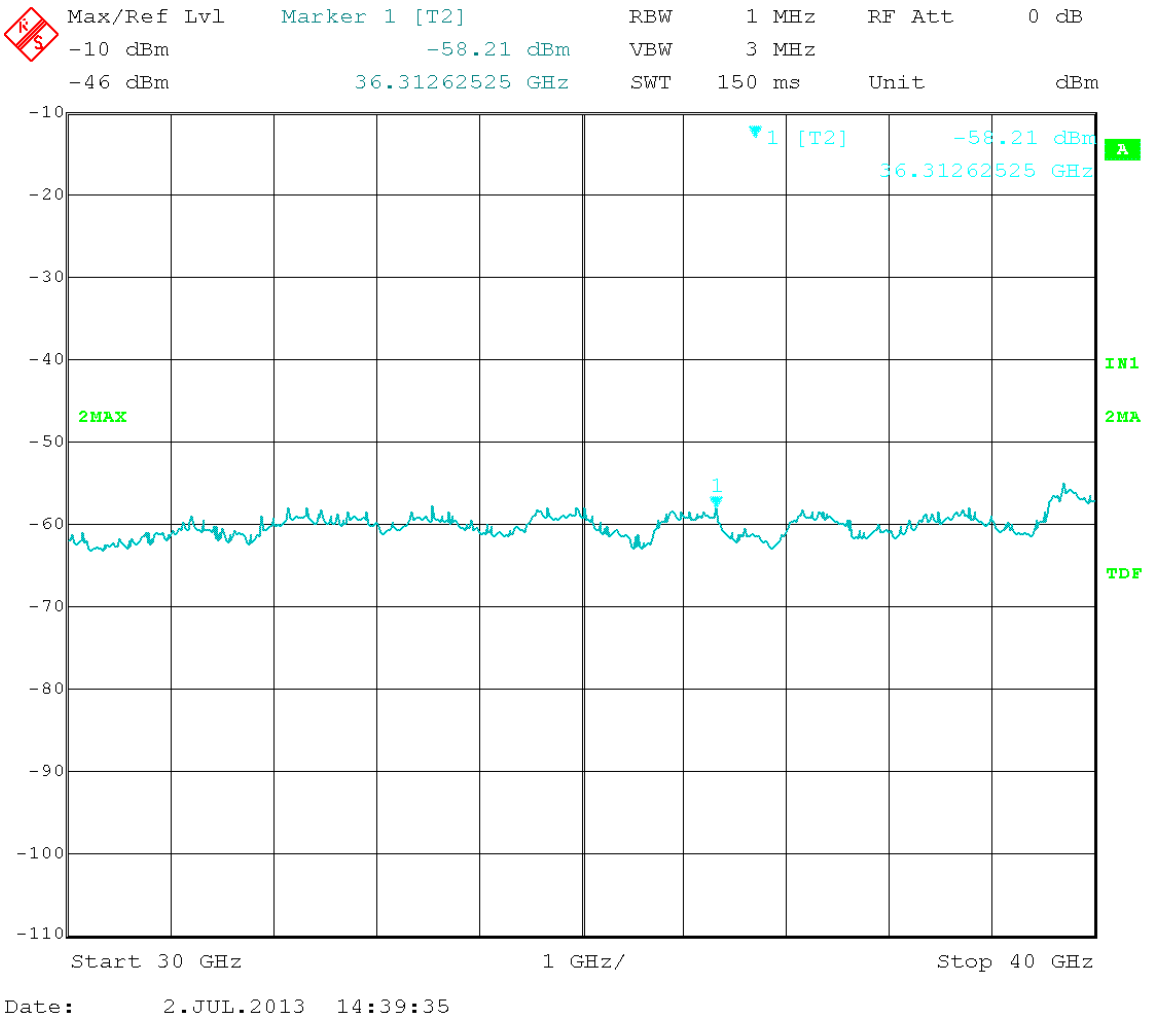
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



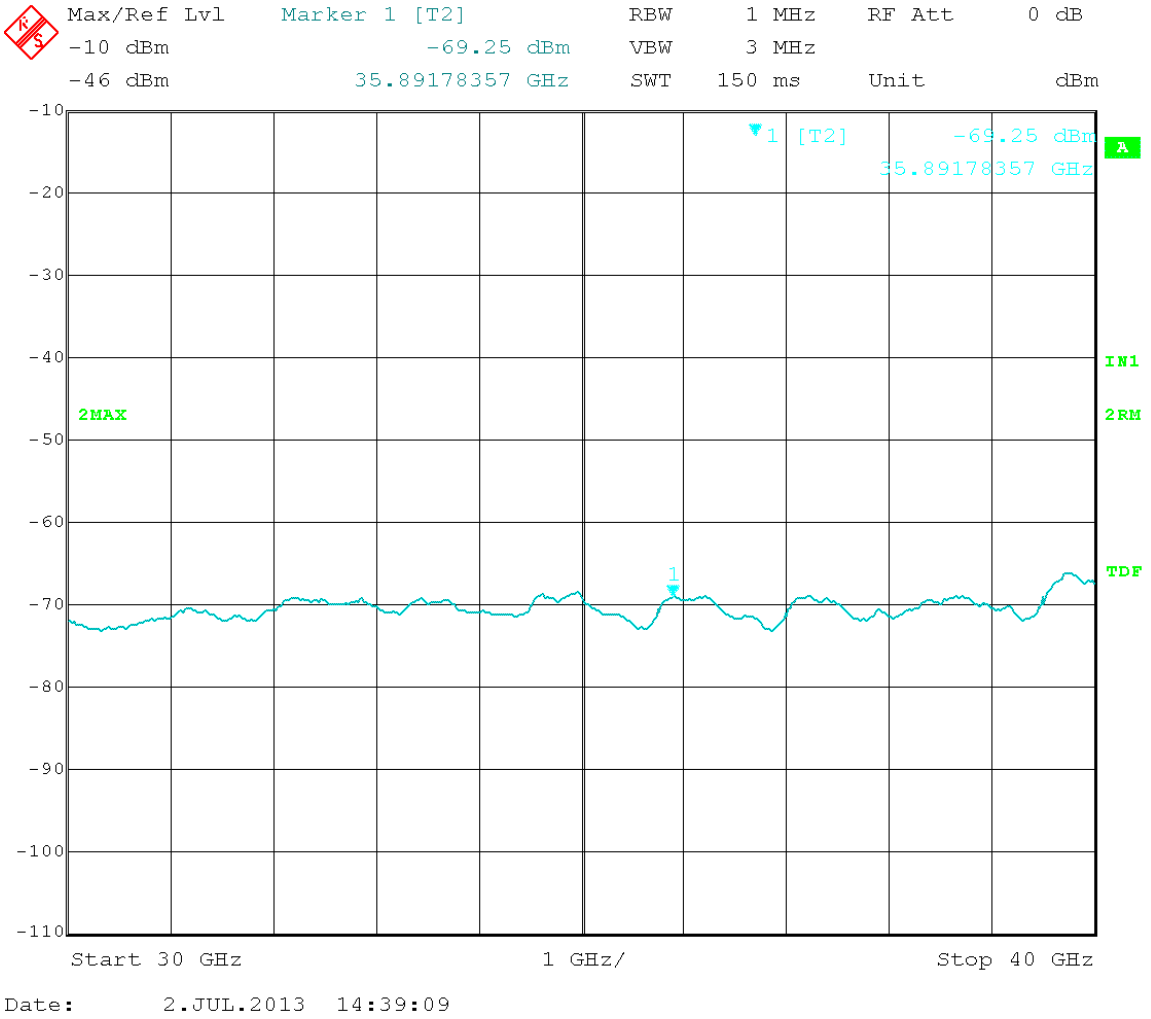
Marker 1: Greater than 20dB below limit

Test Date: 07-02-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 20 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.715 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



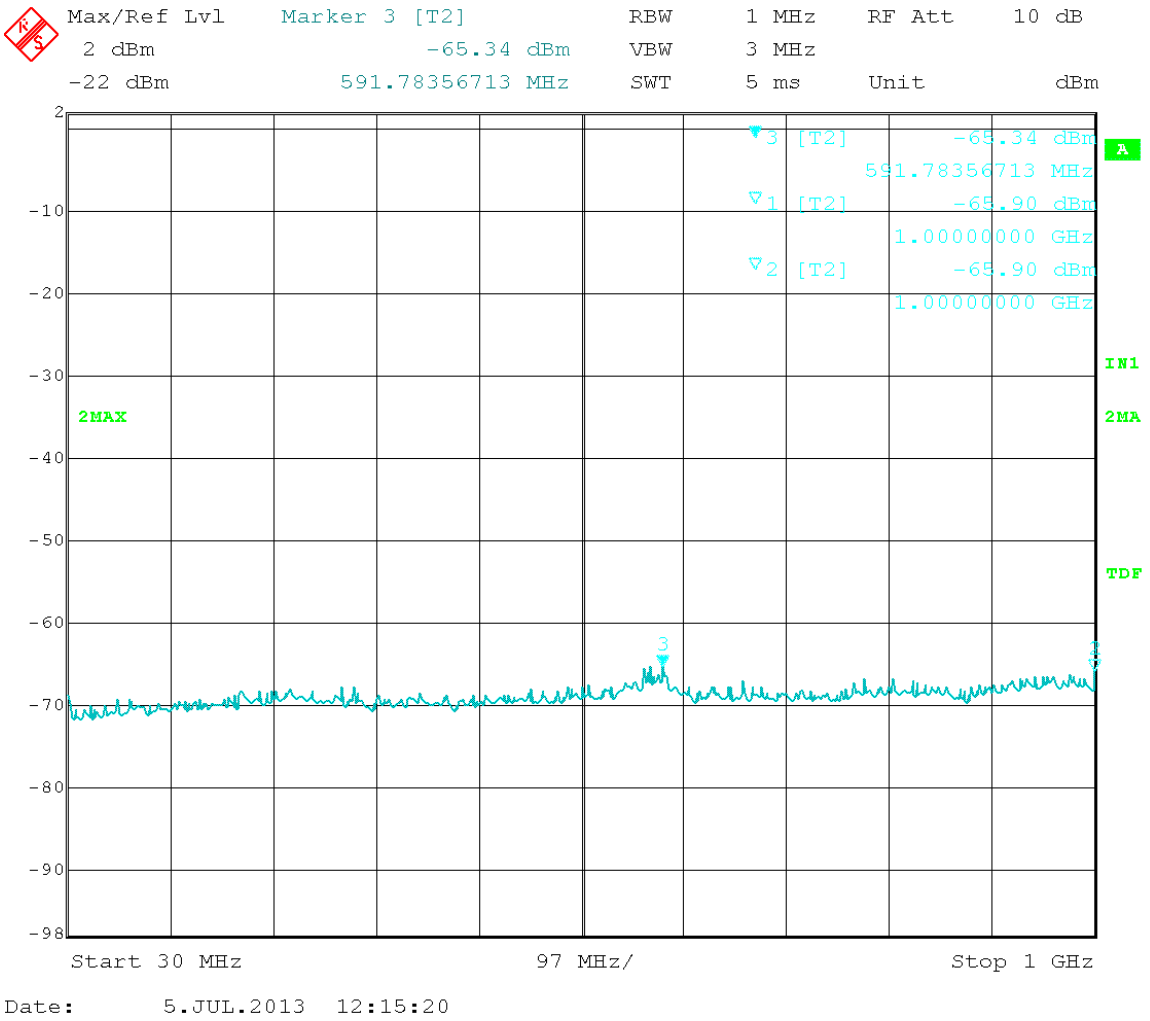
Marker 1: Greater than 20dB below limit

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



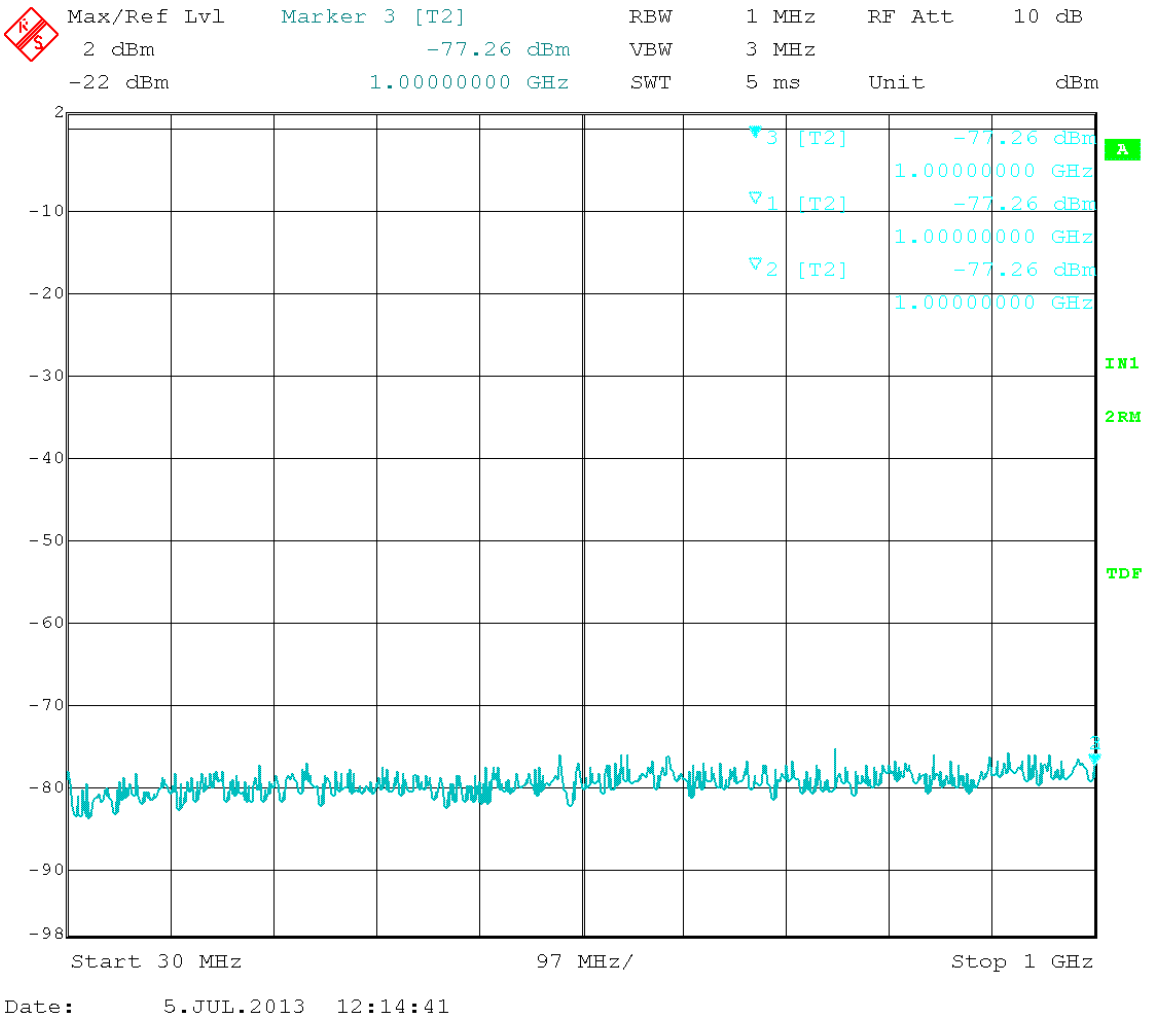
Marker 3: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



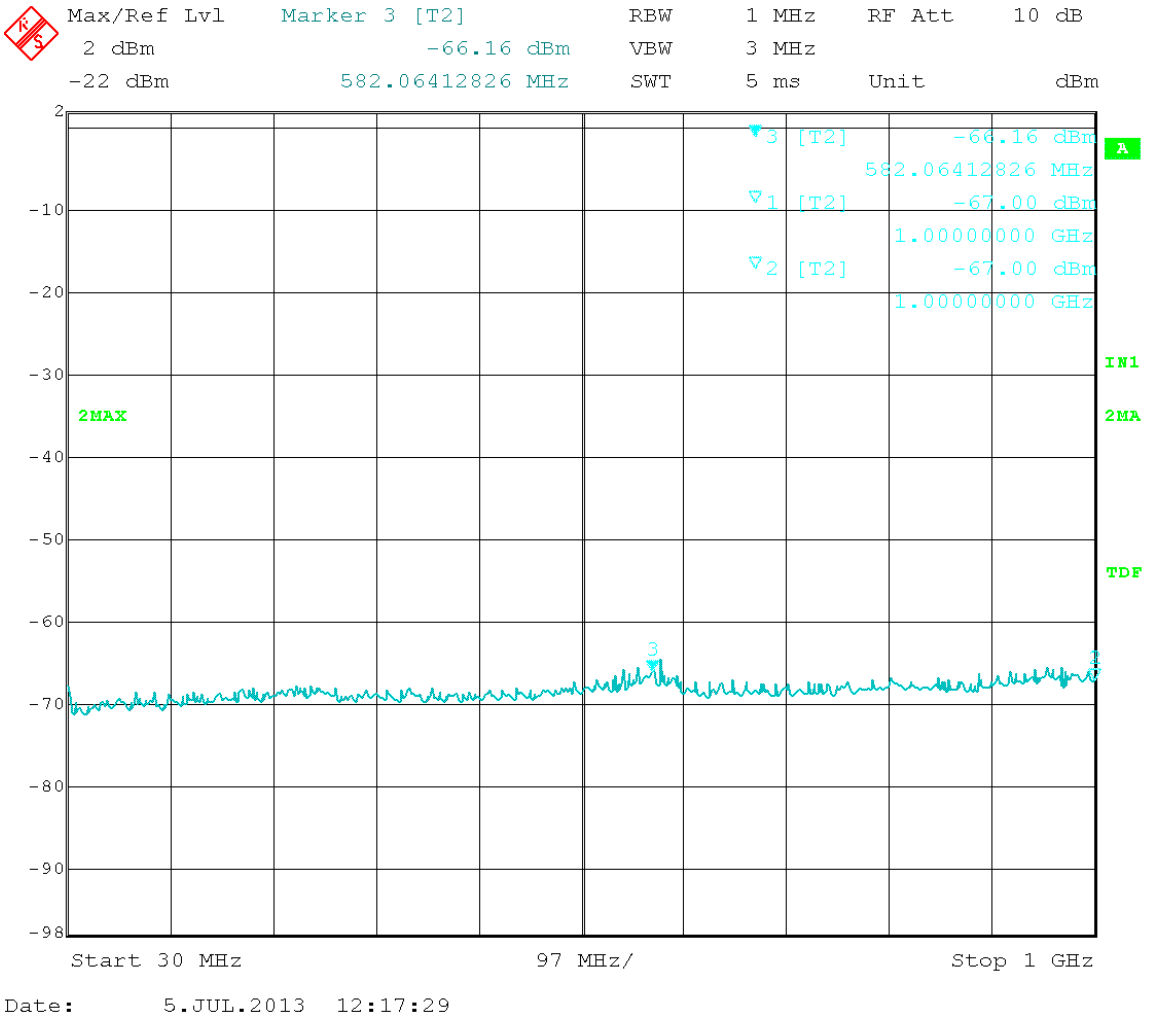
Date: 5.JUL.2013 12:14:41

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



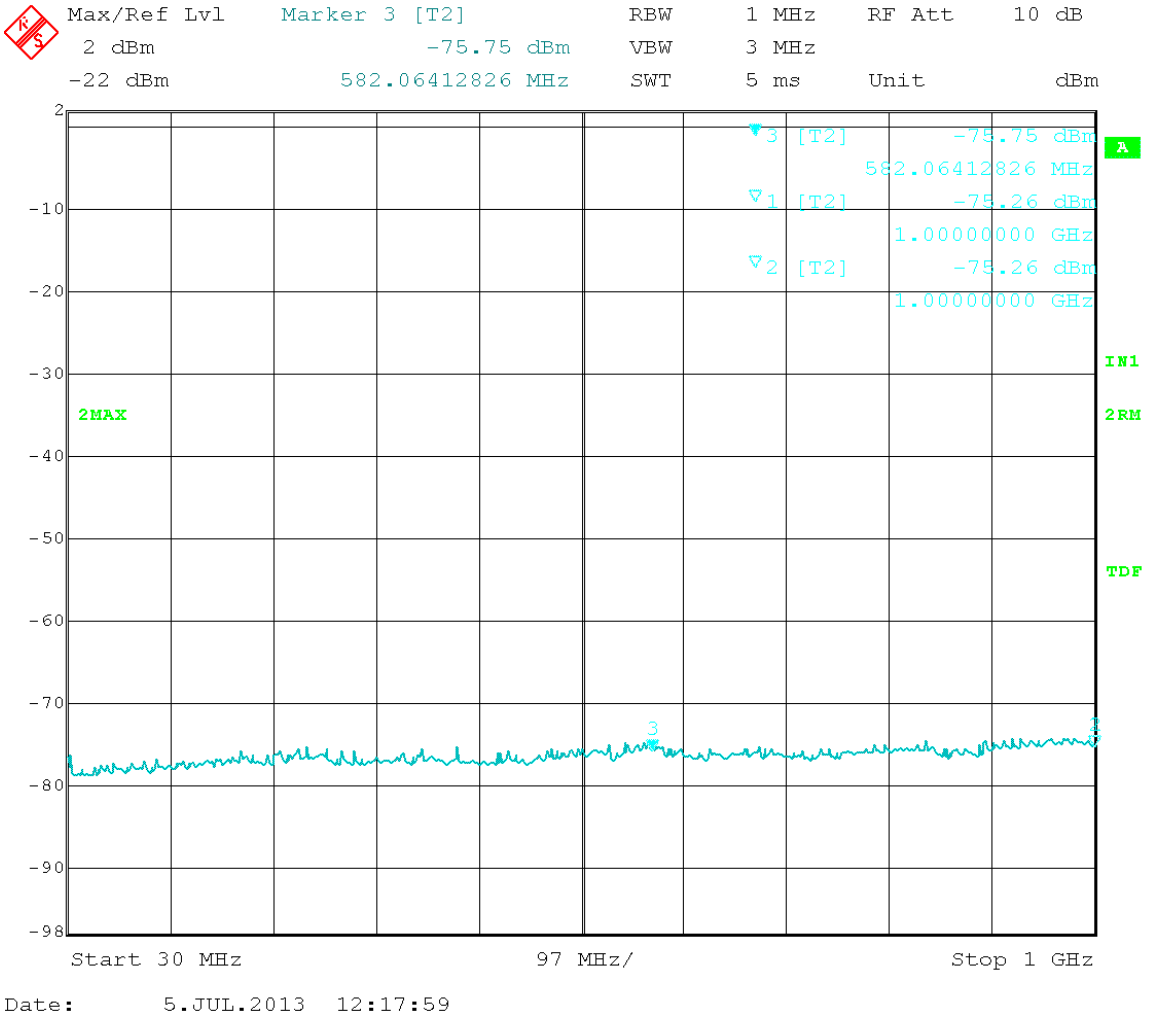
Marker 3: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



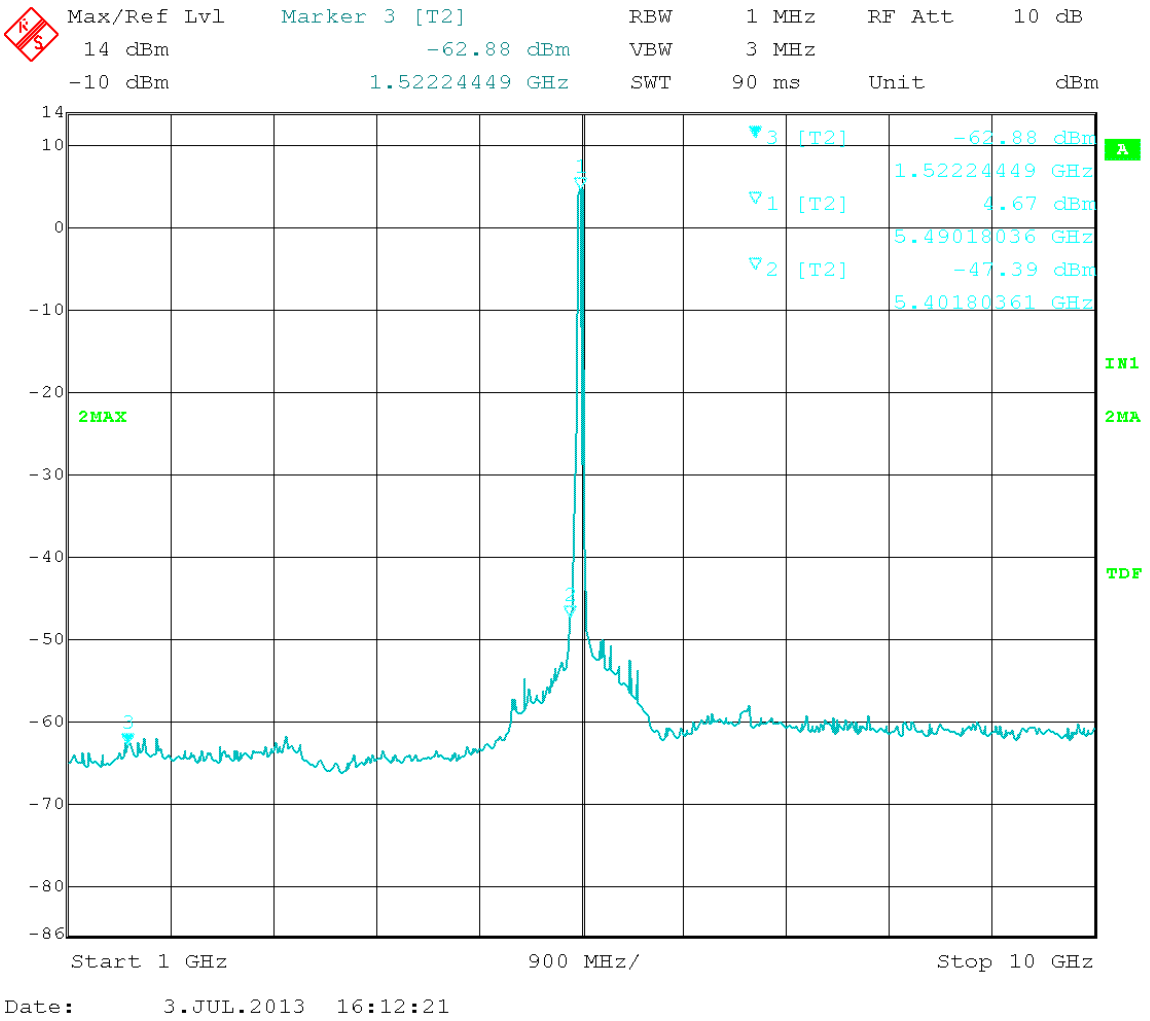
Marker 3: Non-Restricted Band

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



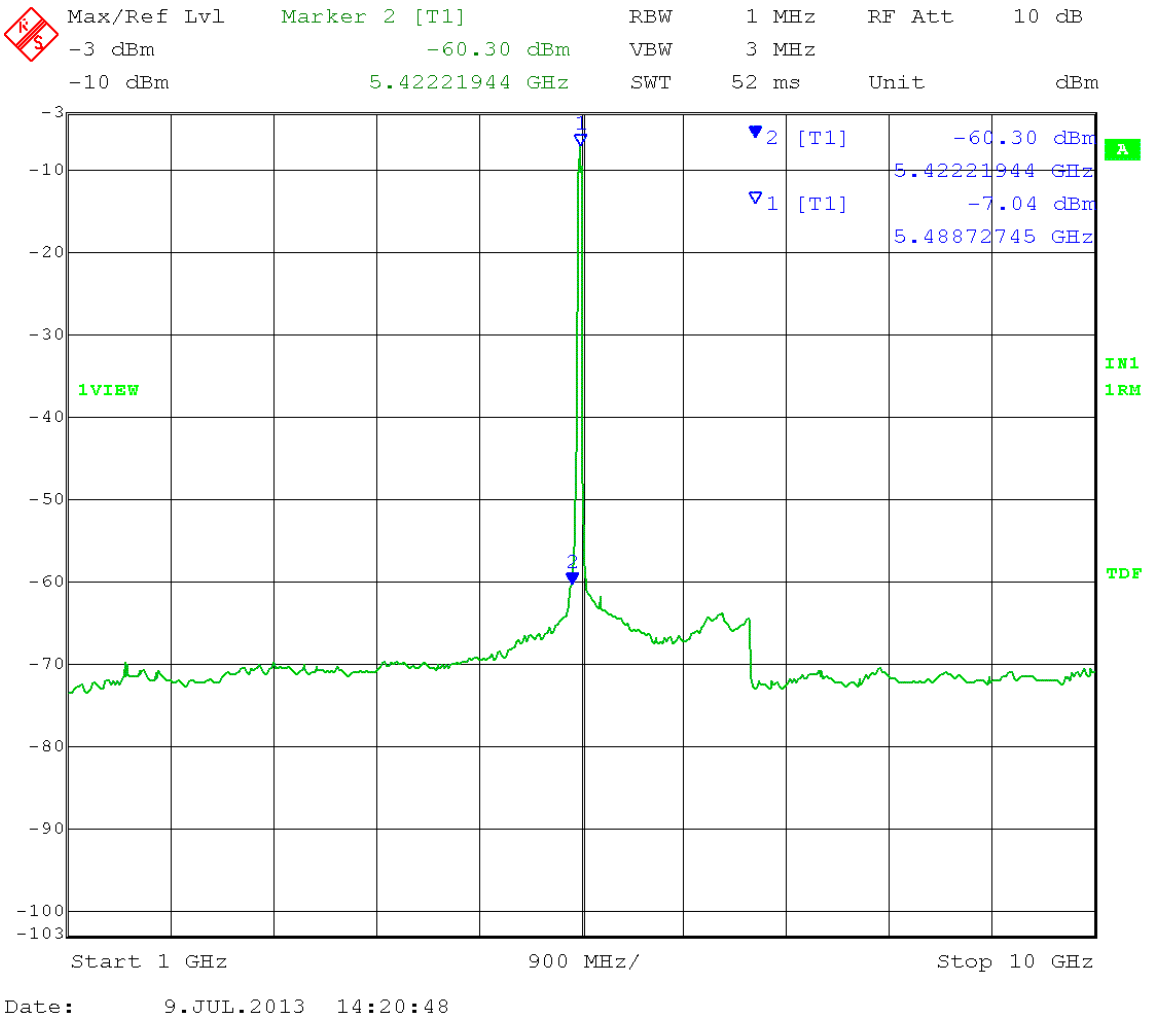
Marker 2: Calculated Field Strength (Restricted Band) = -47.39 + 16dBi antenna gain
+ 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 66.84dBµV/m Peak

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 8
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



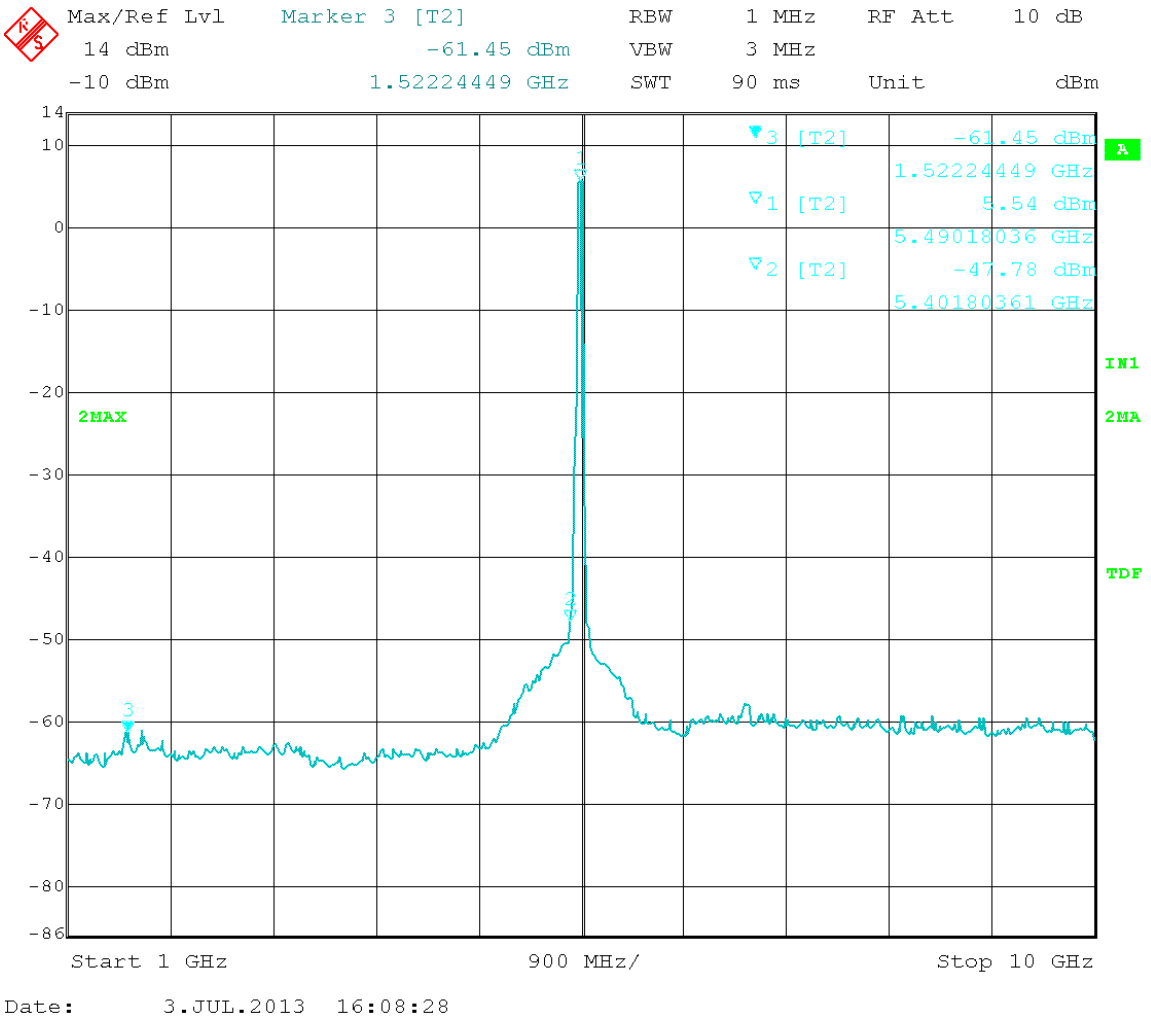
Marker 2: Calculated Field Strength (Restricted Band) = -56.88 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 53.93dBµV/m Average

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



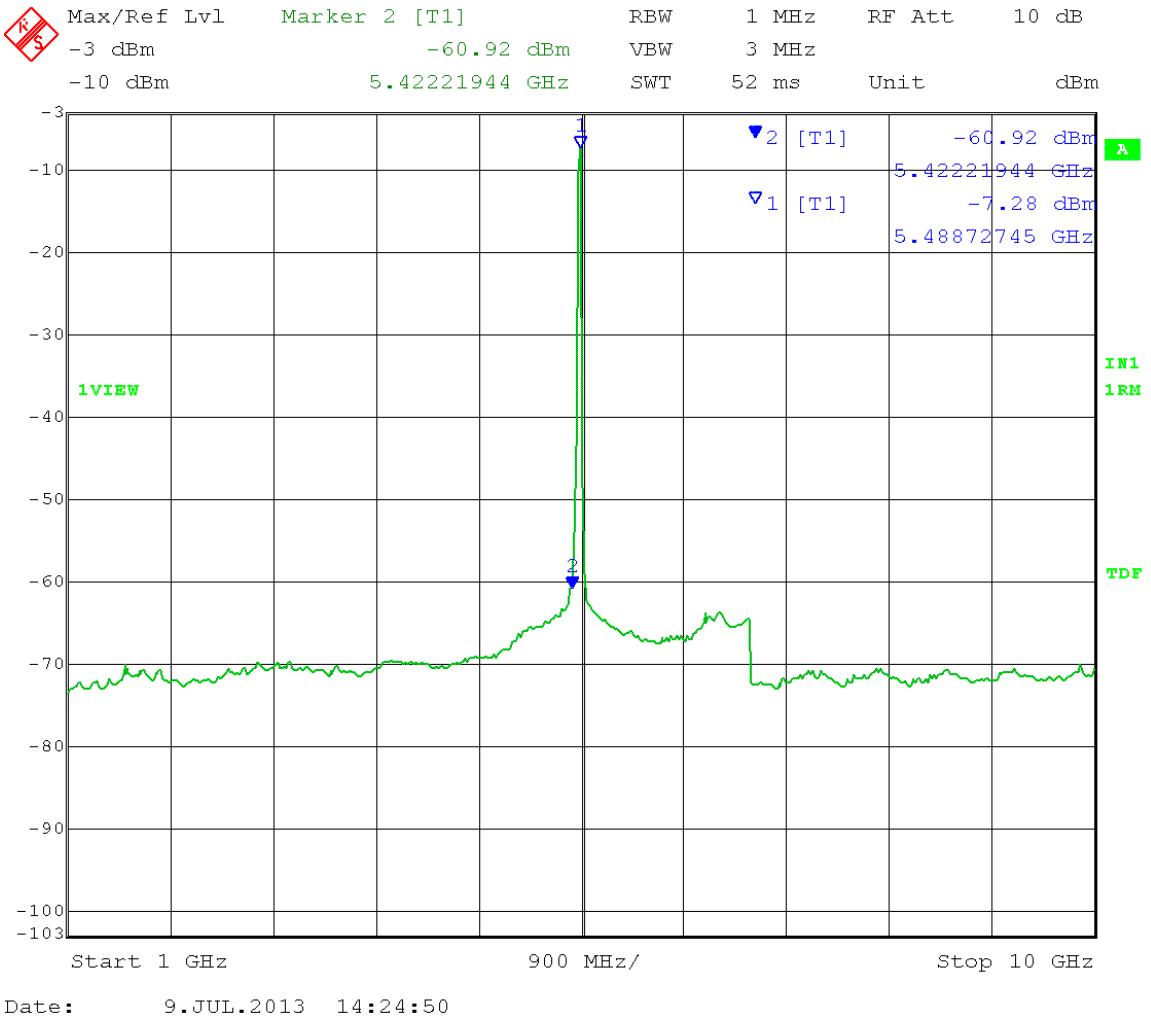
Marker 2: Calculated Field Strength (Restricted Band) = -47.78 + 16dBi antenna gain
+ 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 66.45dBµV/m Peak

Test Date: 07-09-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 8
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



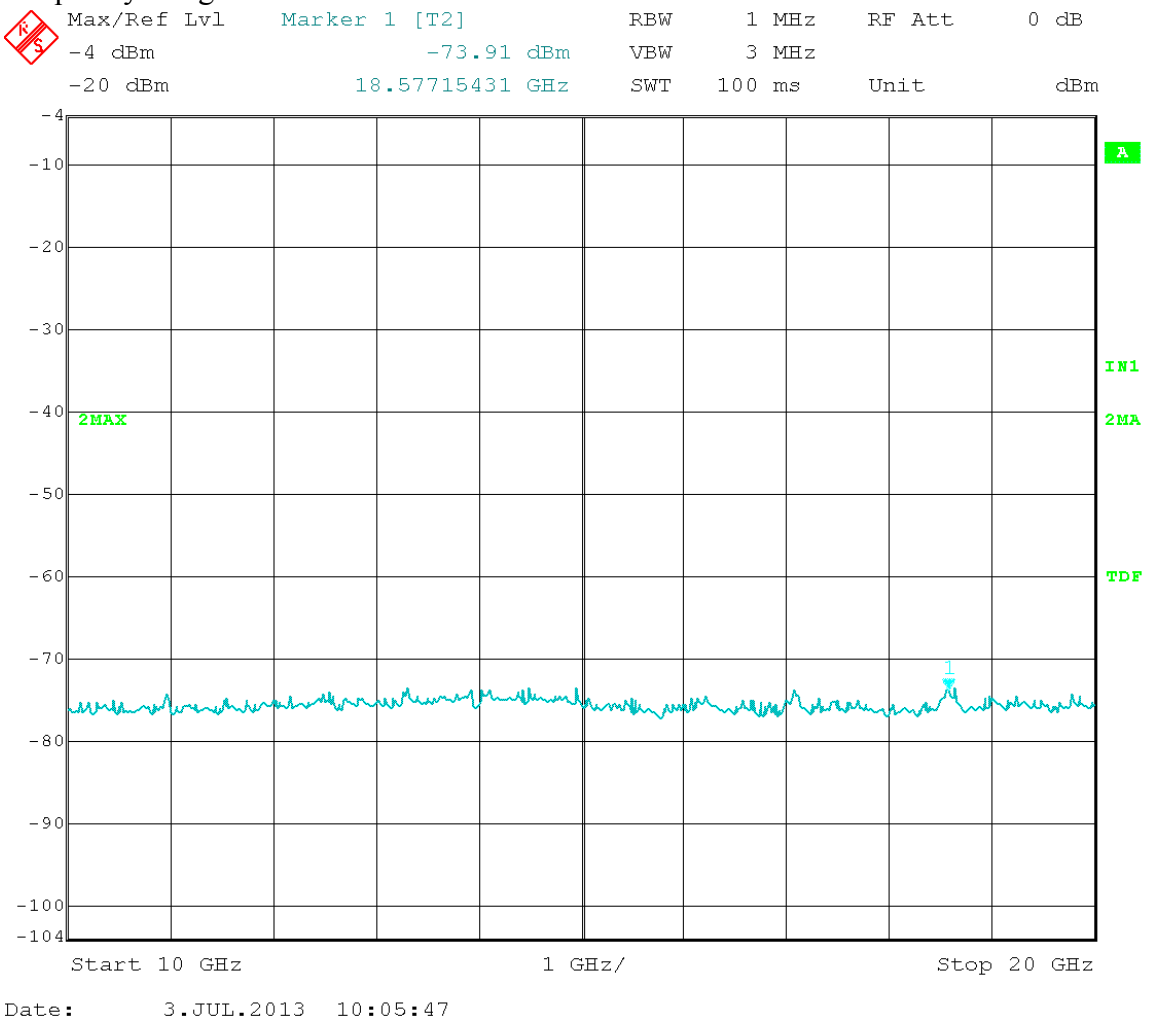
Marker 2: Calculated Field Strength (Restricted Band) = -60.92+ 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 53.31dBµV/m Average

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



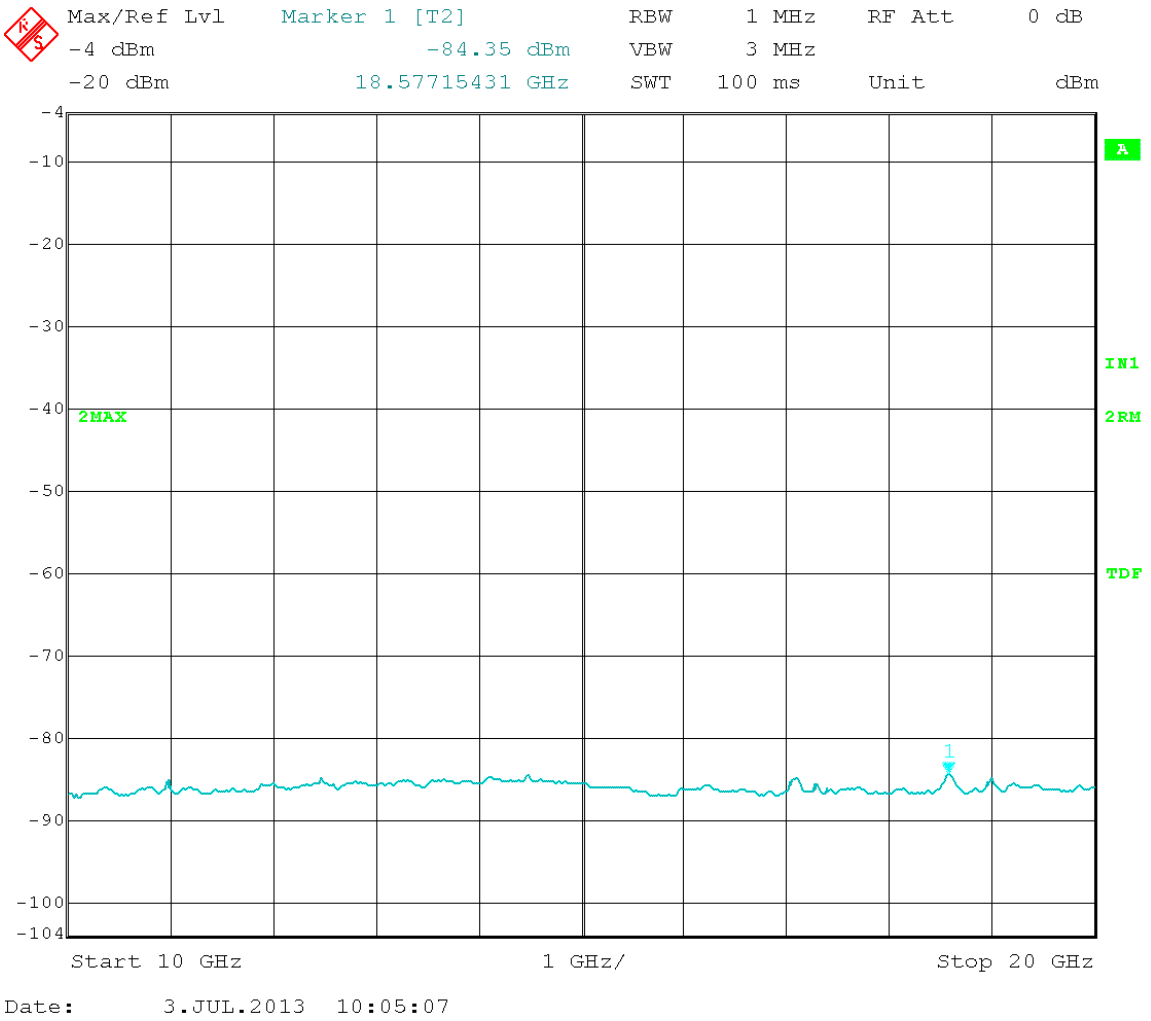
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



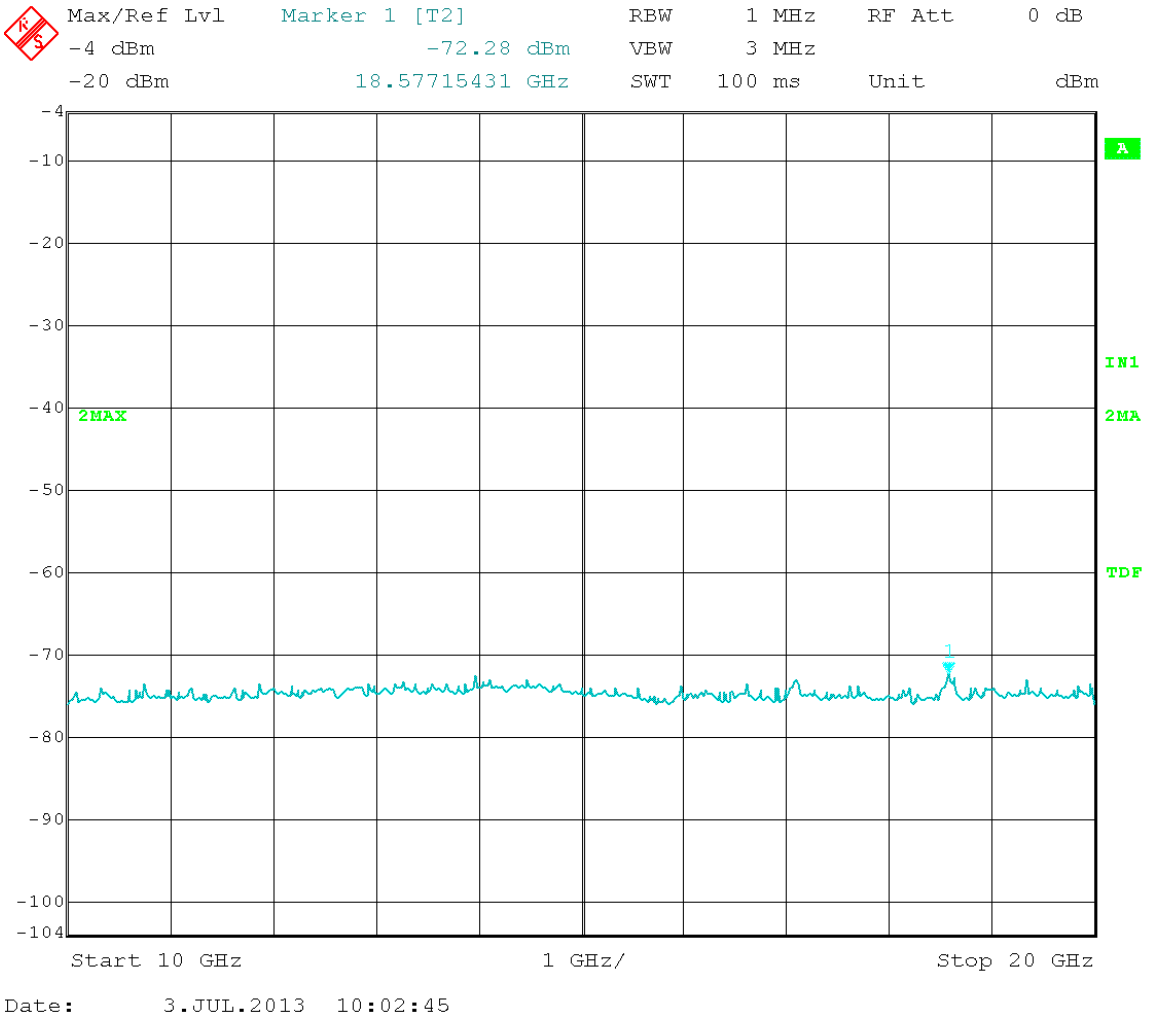
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



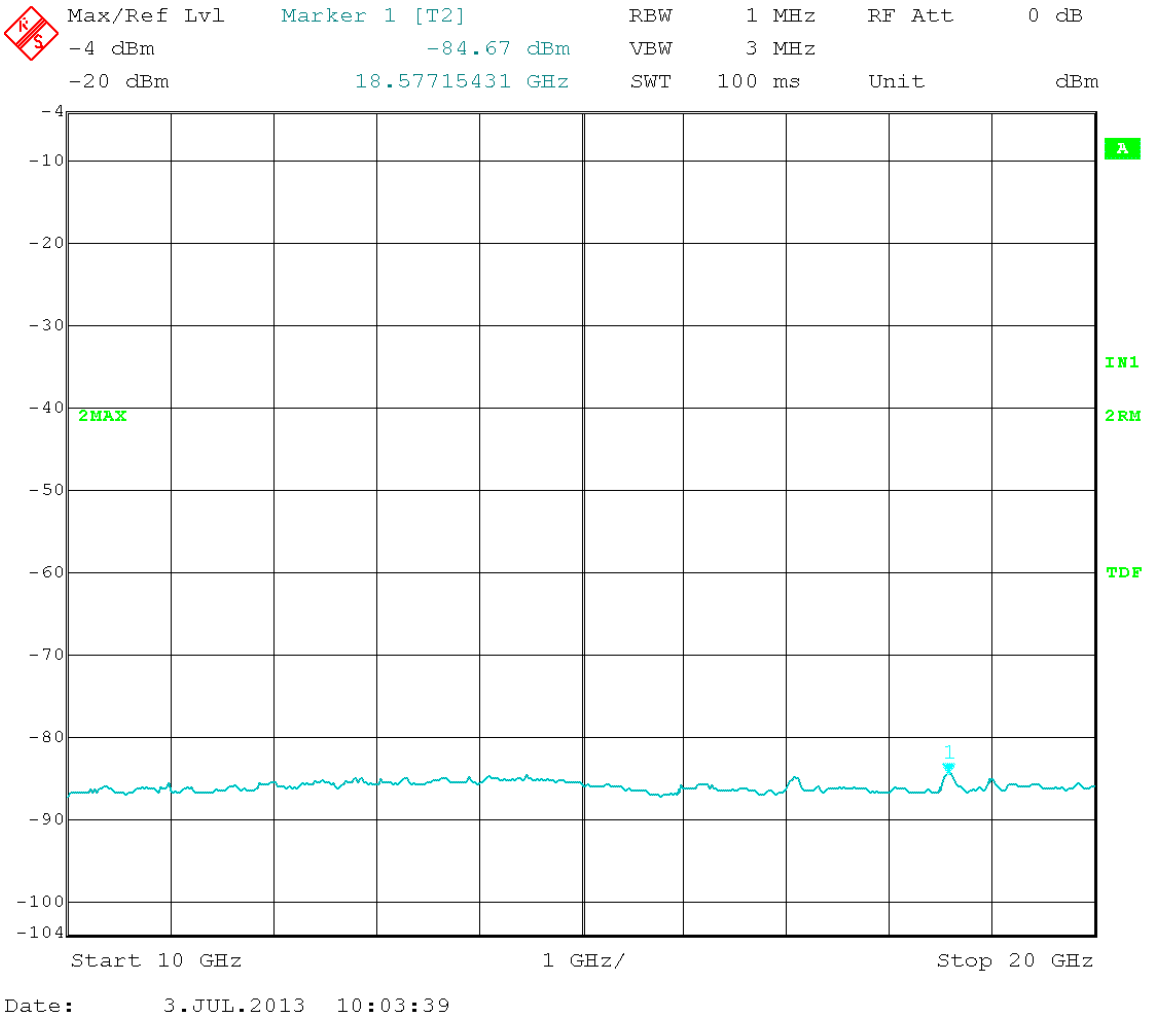
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



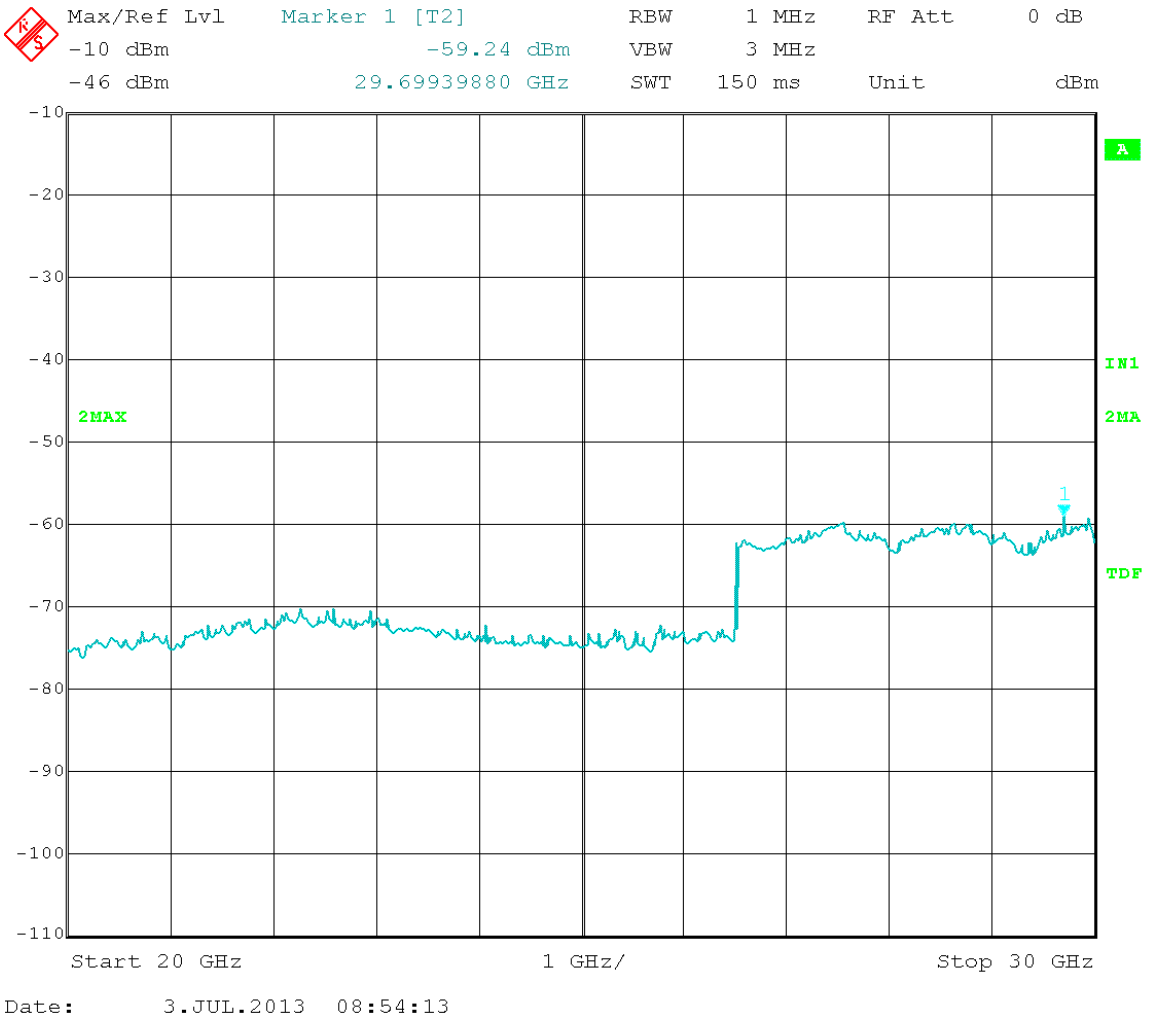
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



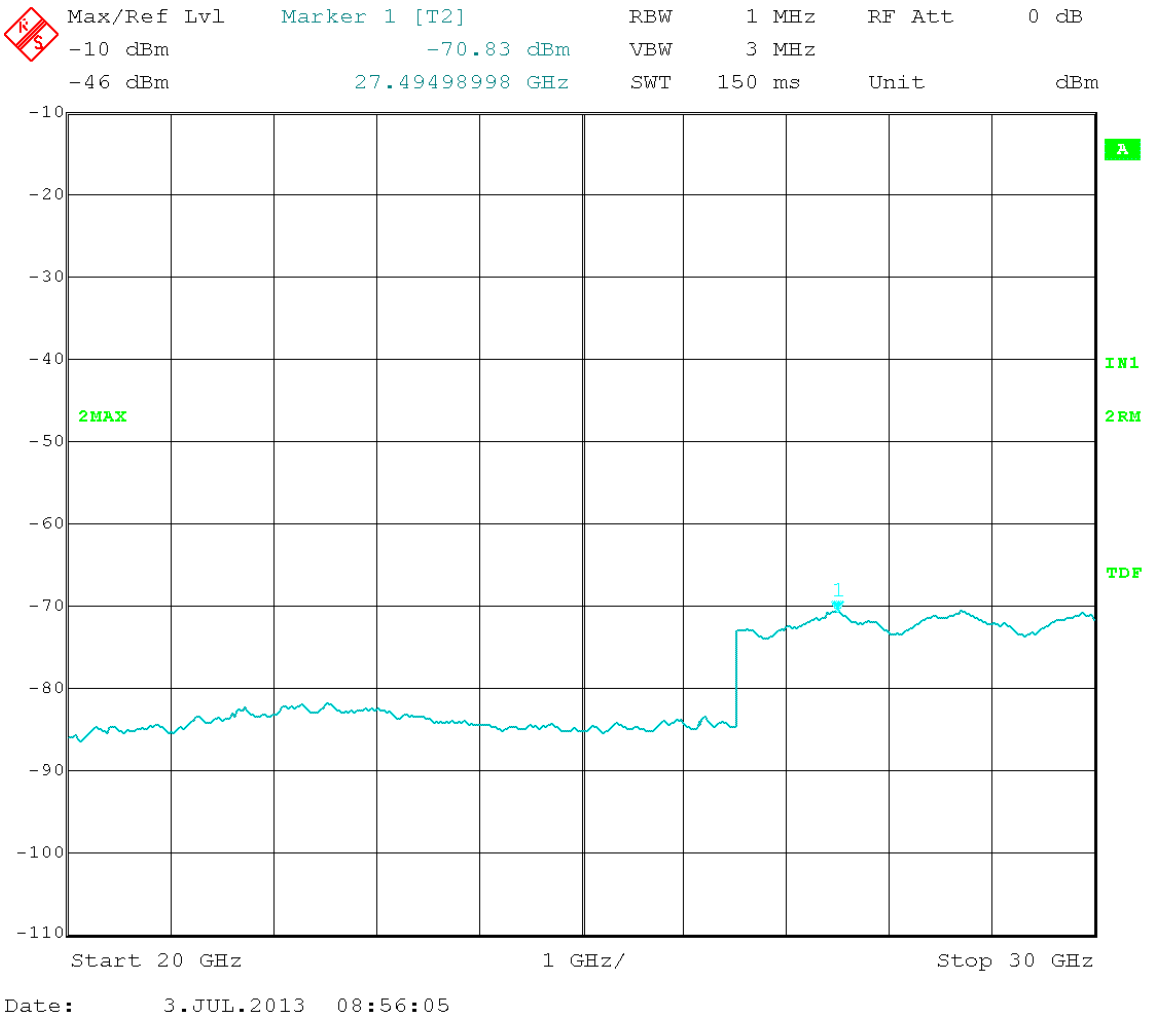
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



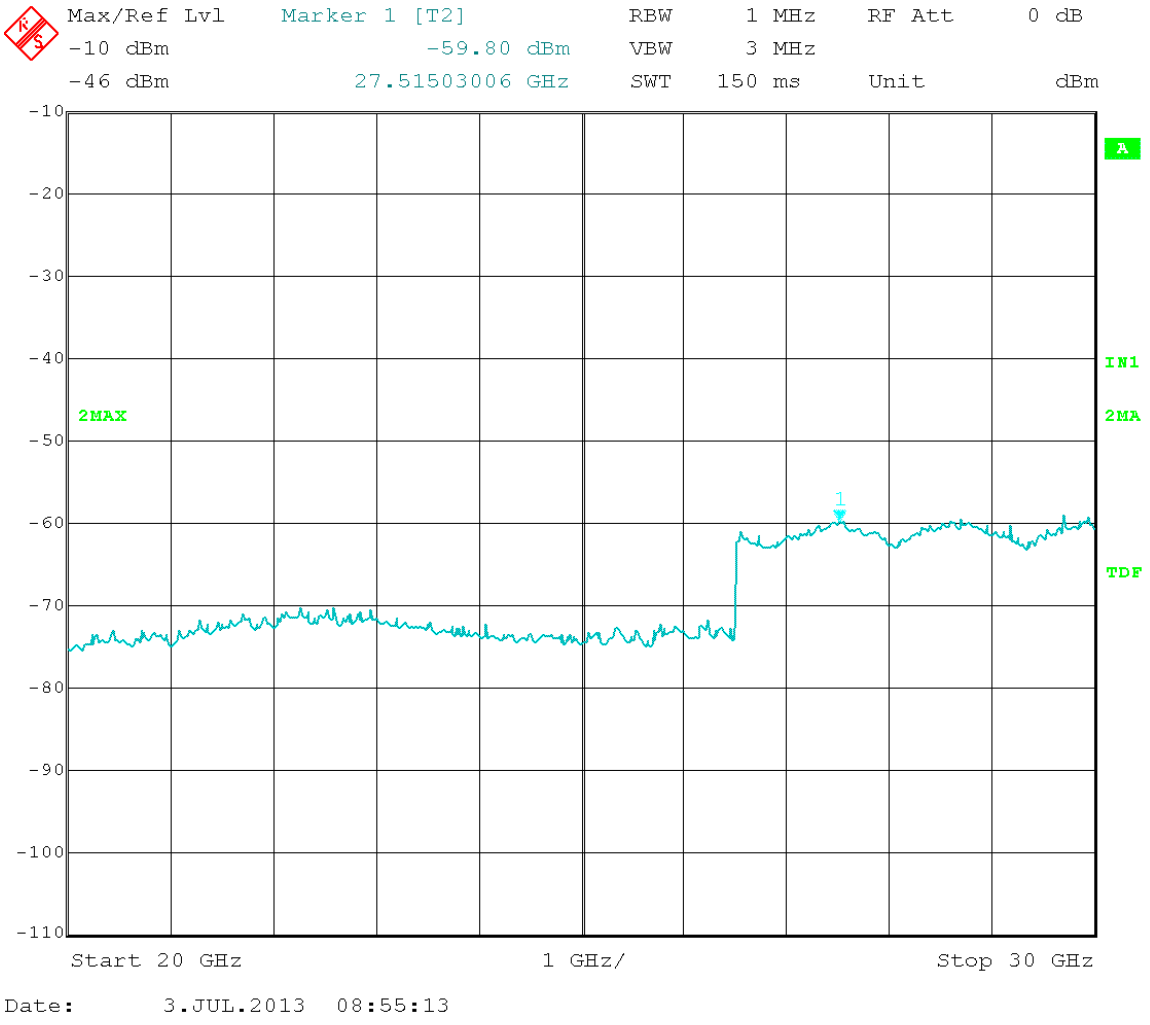
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



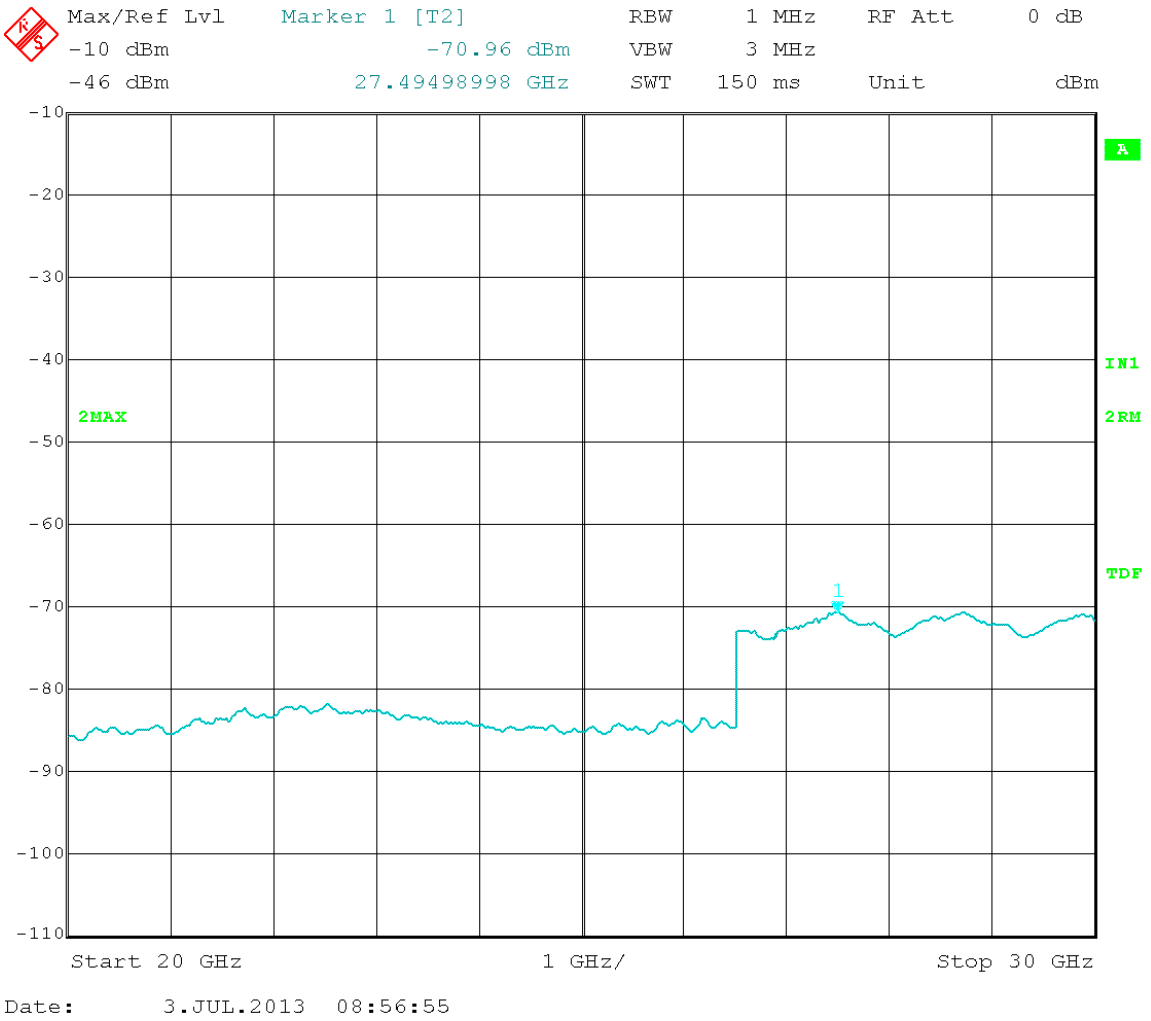
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



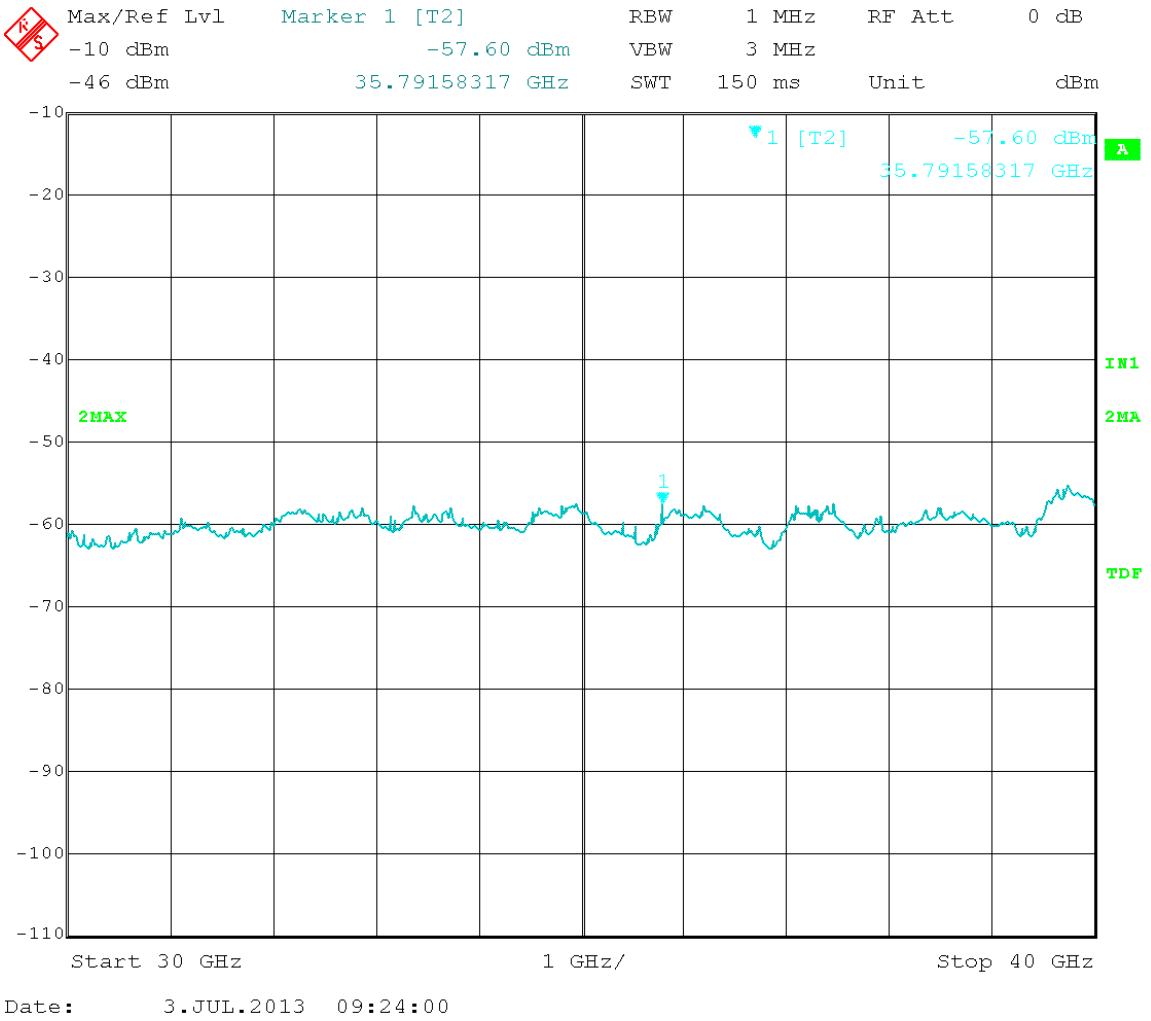
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



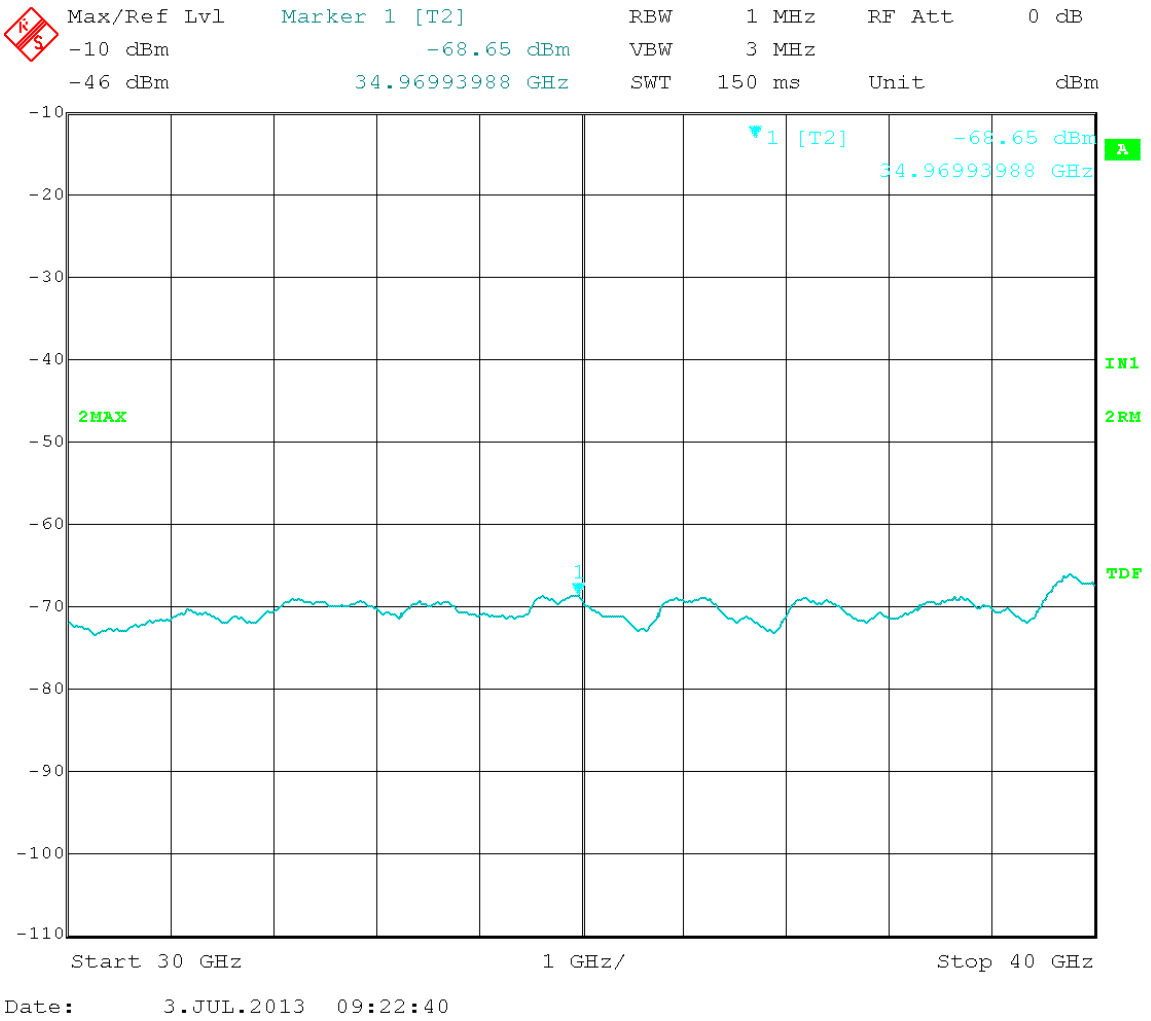
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



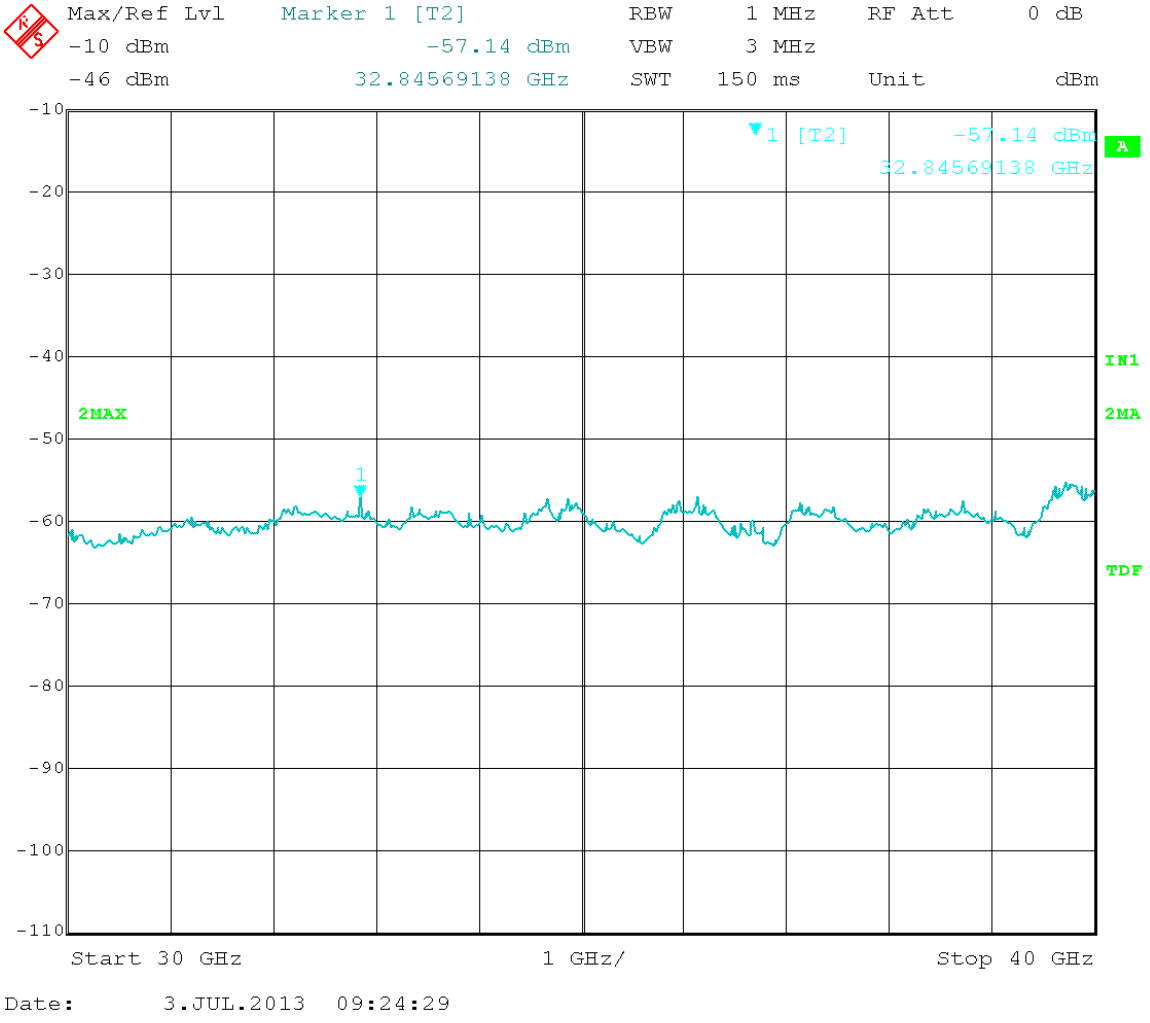
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



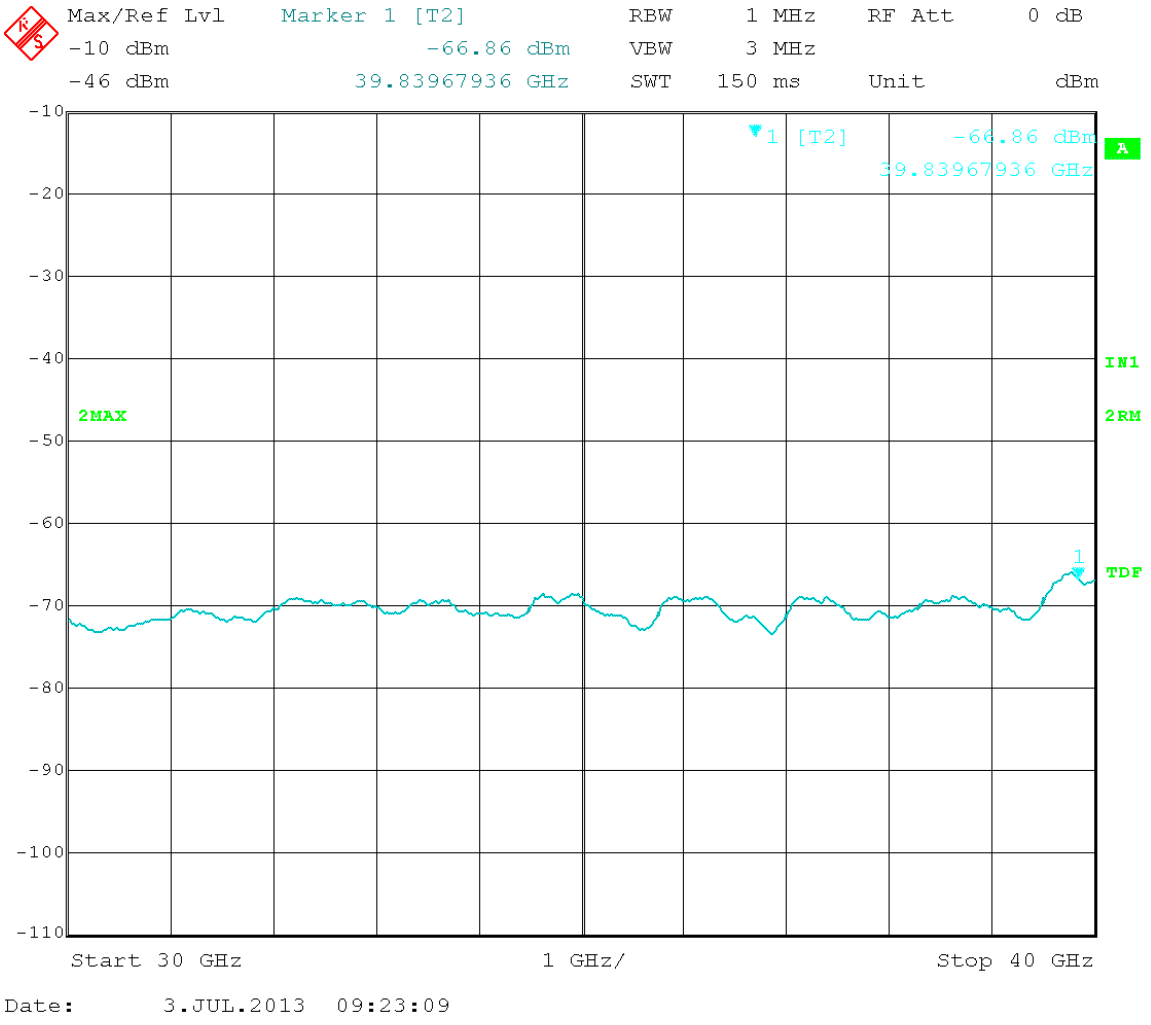
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
Low Channel Frequency: 5.490 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



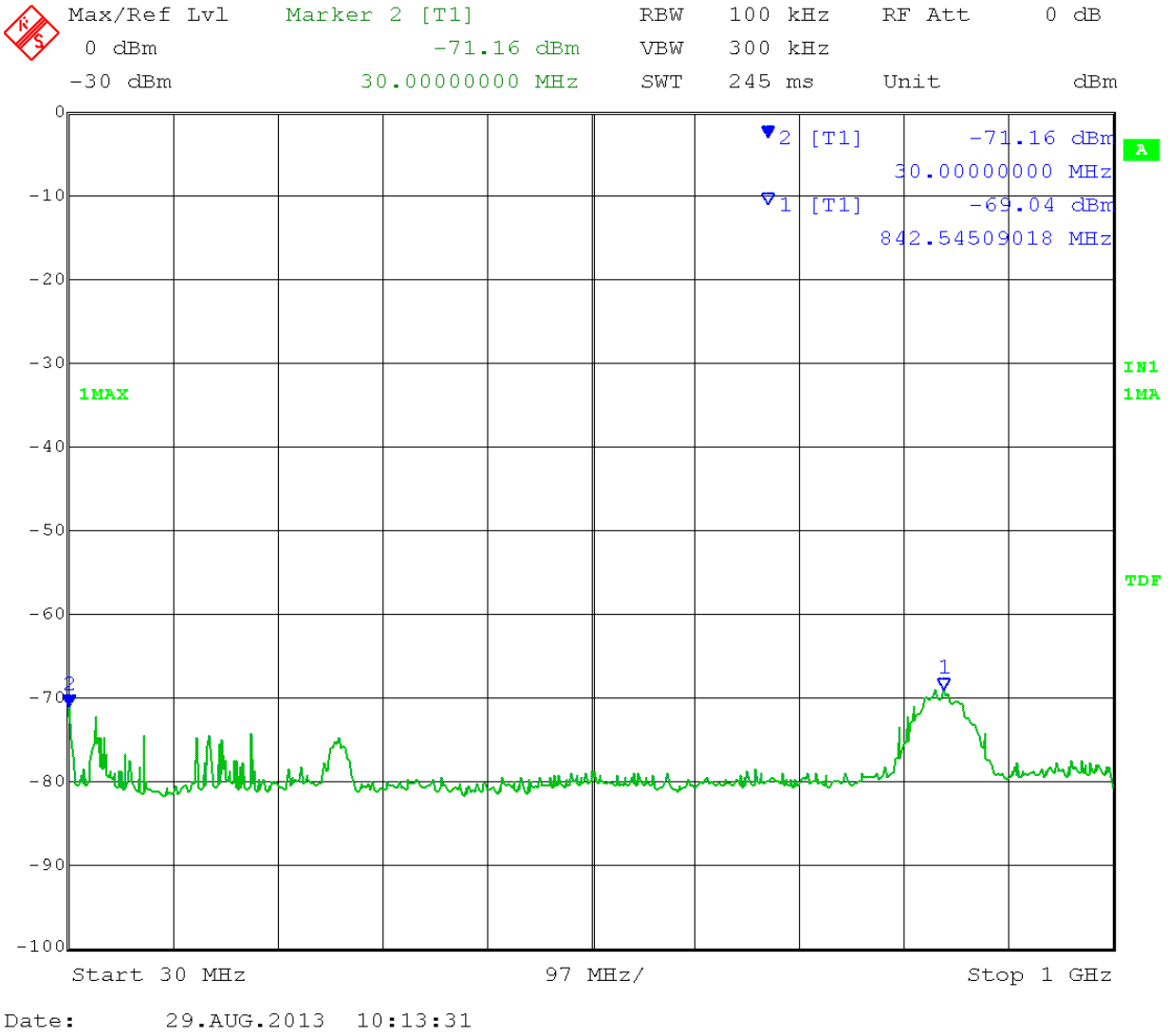
Marker 1: Greater than 20dB below limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 40 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 30M - 1 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

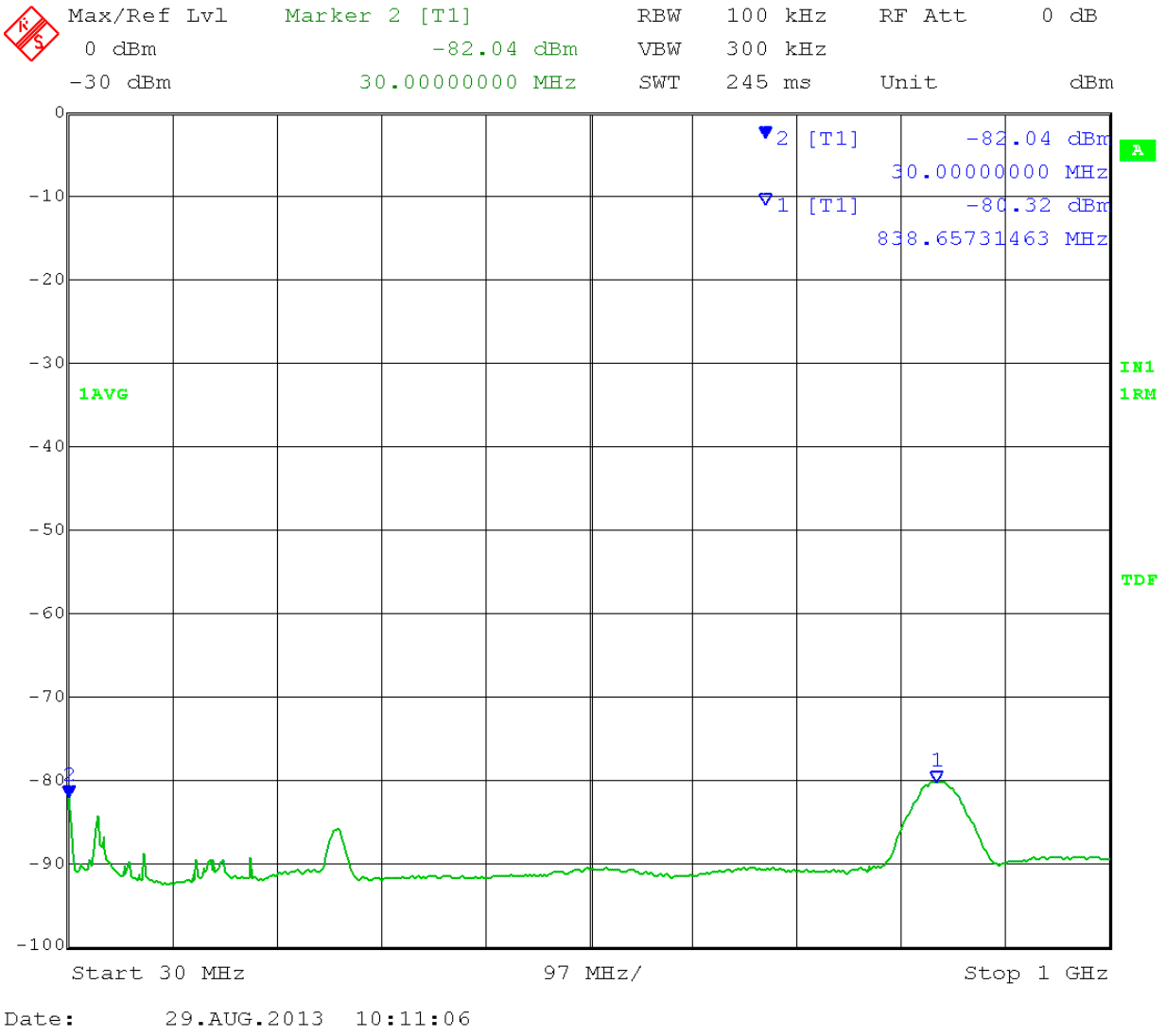
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



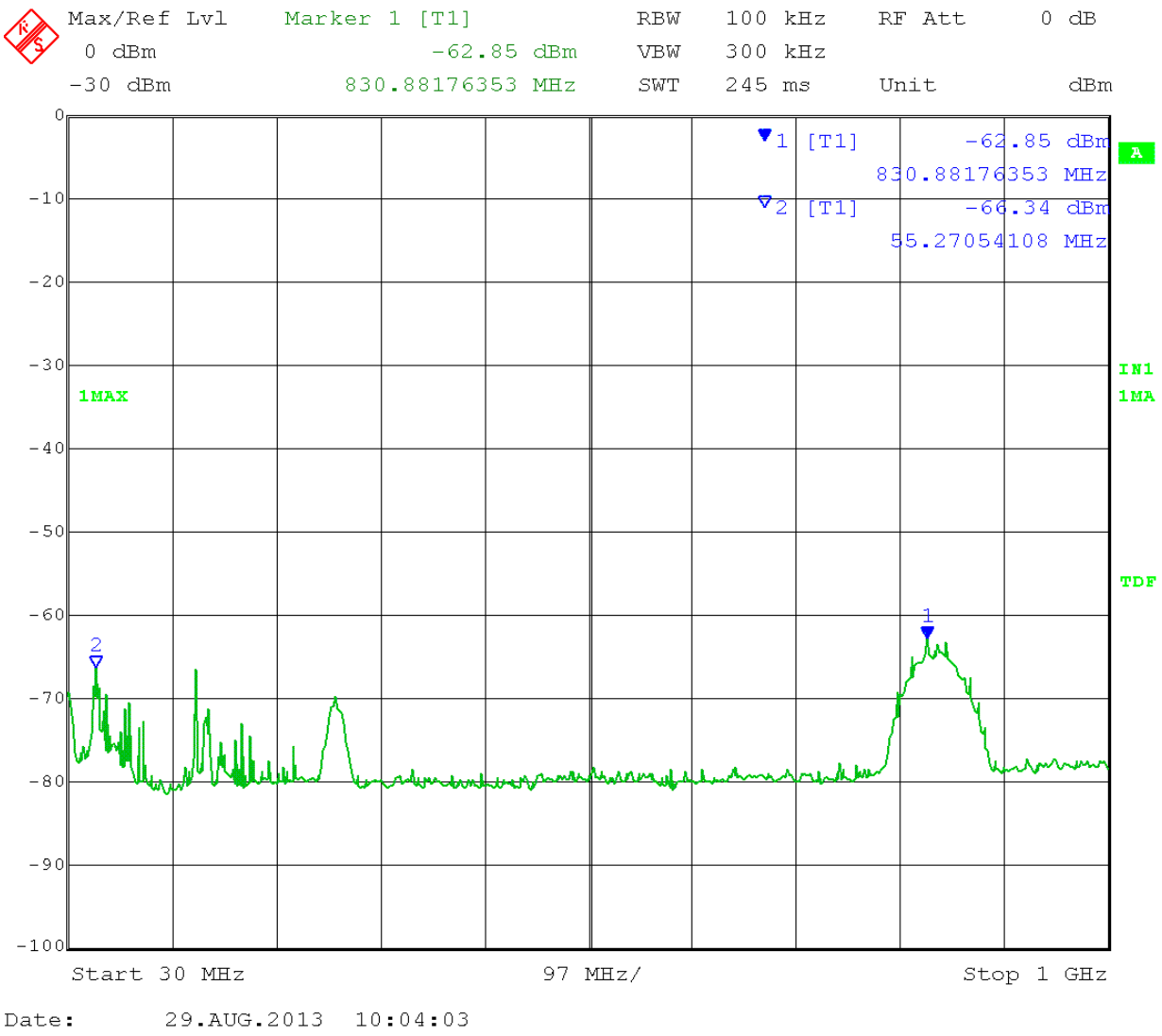
Marker 1: Calculated Field Strength is 20 dB below 74dBµV/m PK Limit

Channel 0 Average:



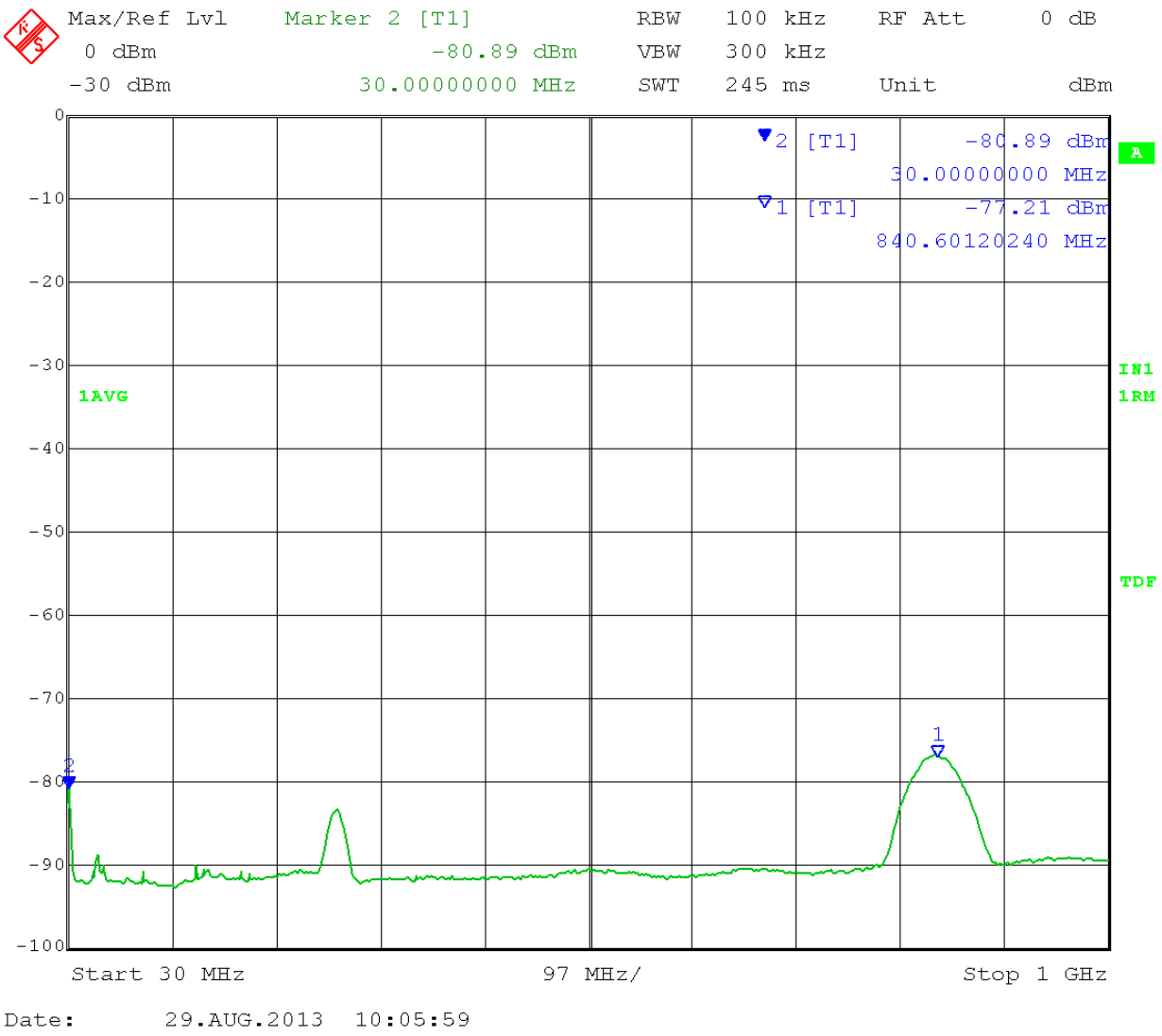
Marker 1: Calculated Field Strength is 20 dB below 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 1: Calculated Field Strength is 20 dB below 74dBµV/m PK Limit

Channel 1 Average:



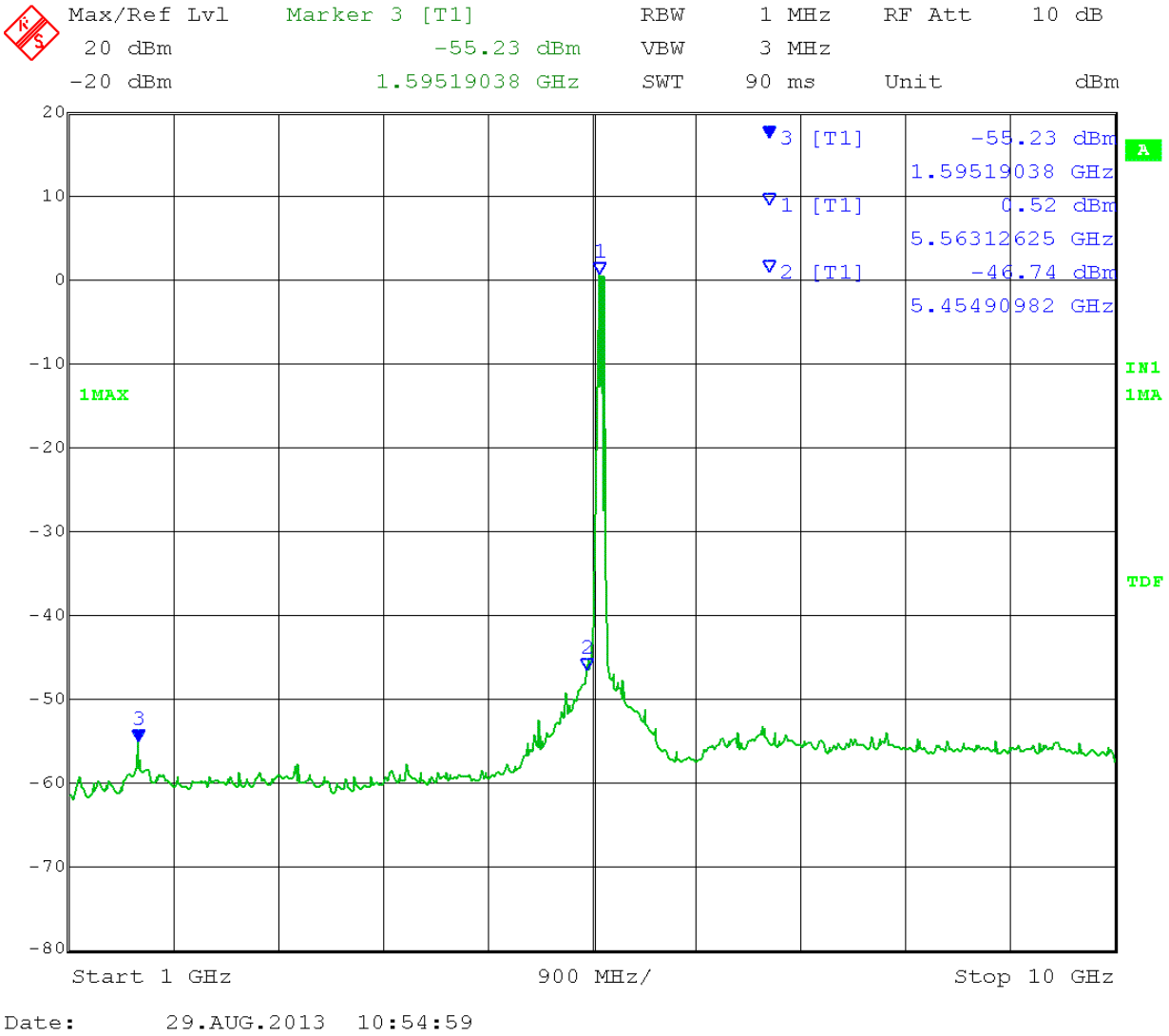
Marker 1: Calculated Field Strength = -77.21 + 114.2 = 36.99dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 40 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 1 - 10 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

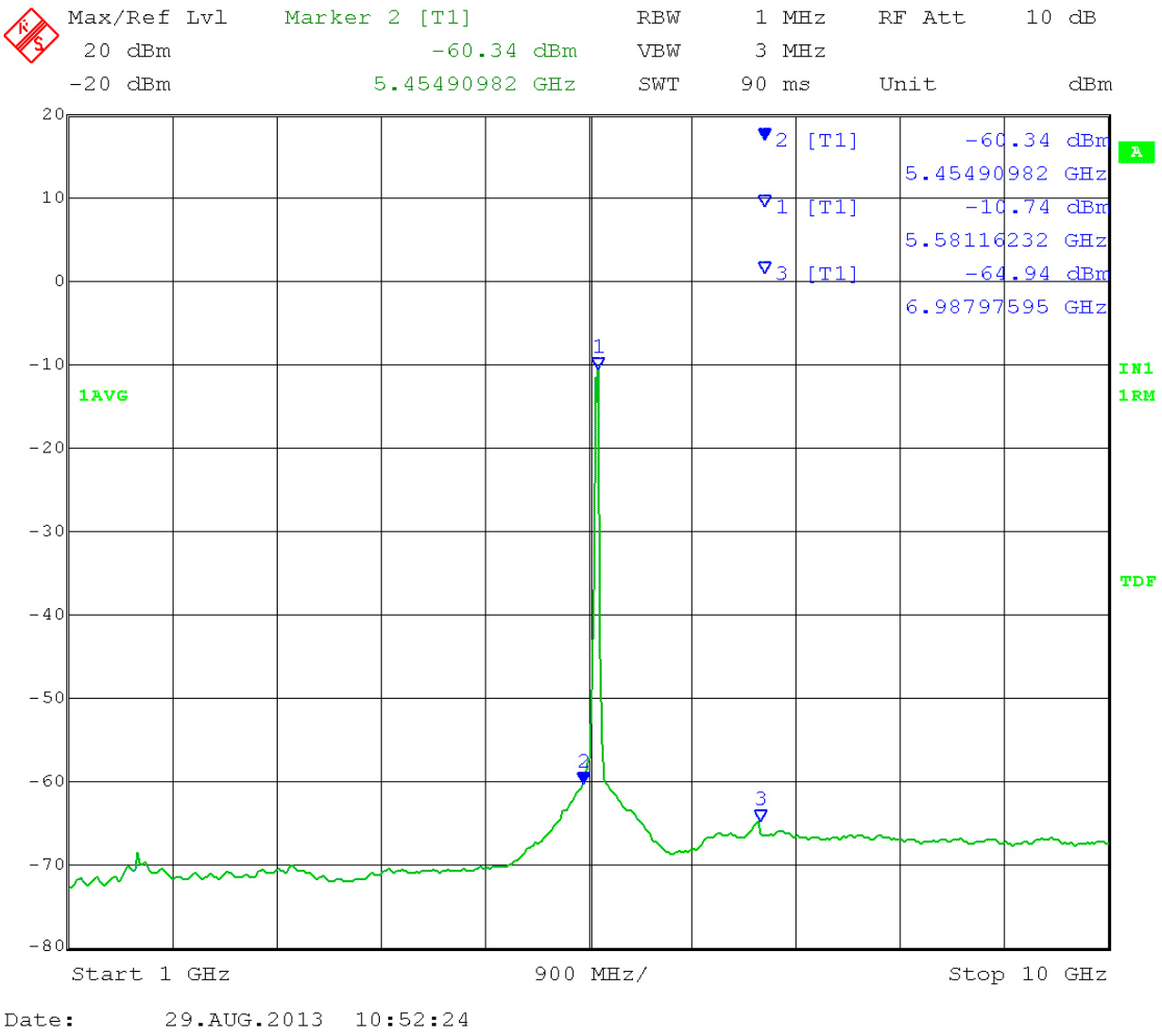
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



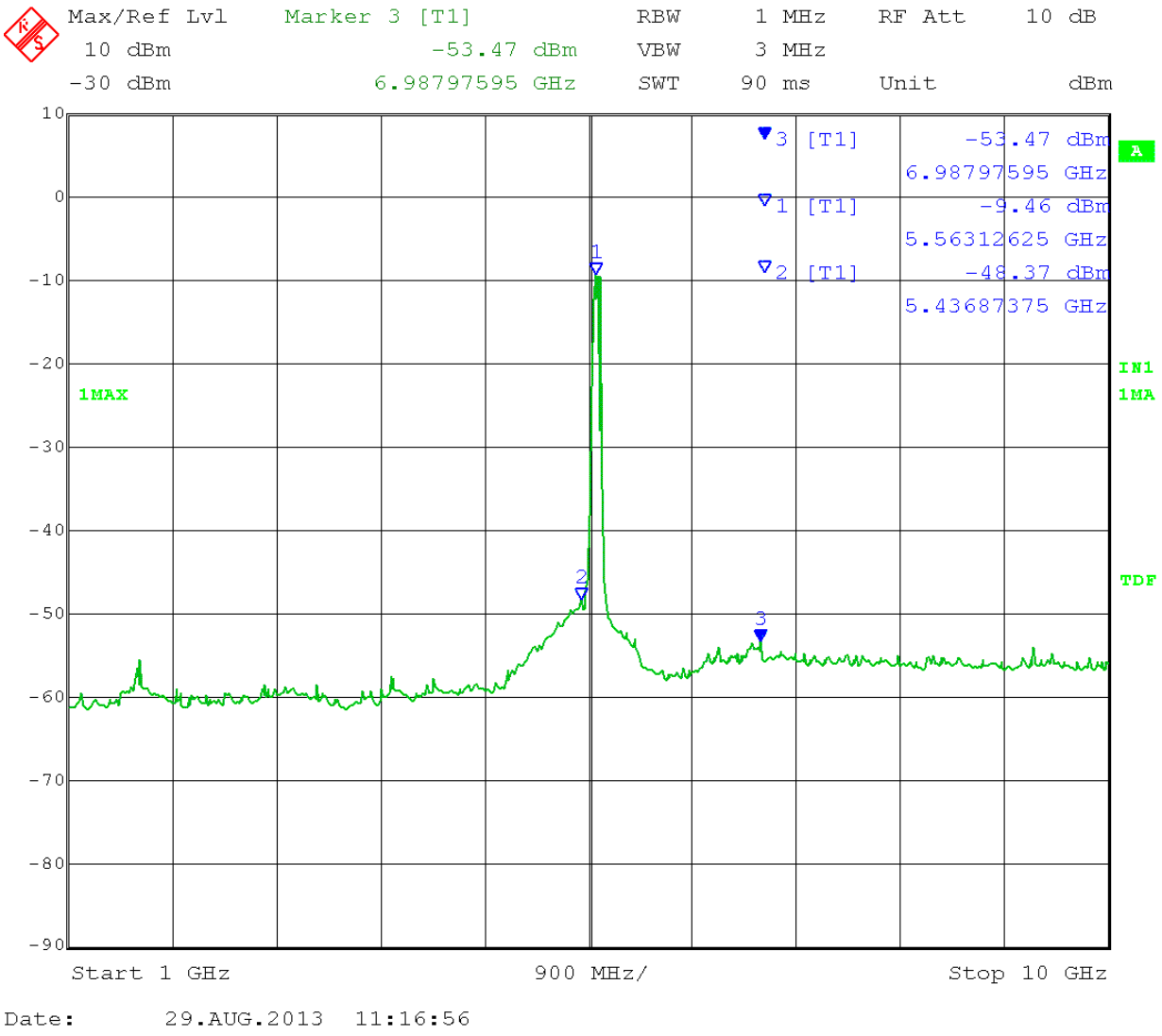
Marker 2: Calculated Field Strength = -46.74 + 114.2 = 67.46dBµV/m PK < 74dBµV/m PK Limit
Marker 3: Calculated Field Strength = -55.23 + 114.2 = 58.97dBµV/m PK < 74dBµV/m PK Limit

Channel 0 Average:



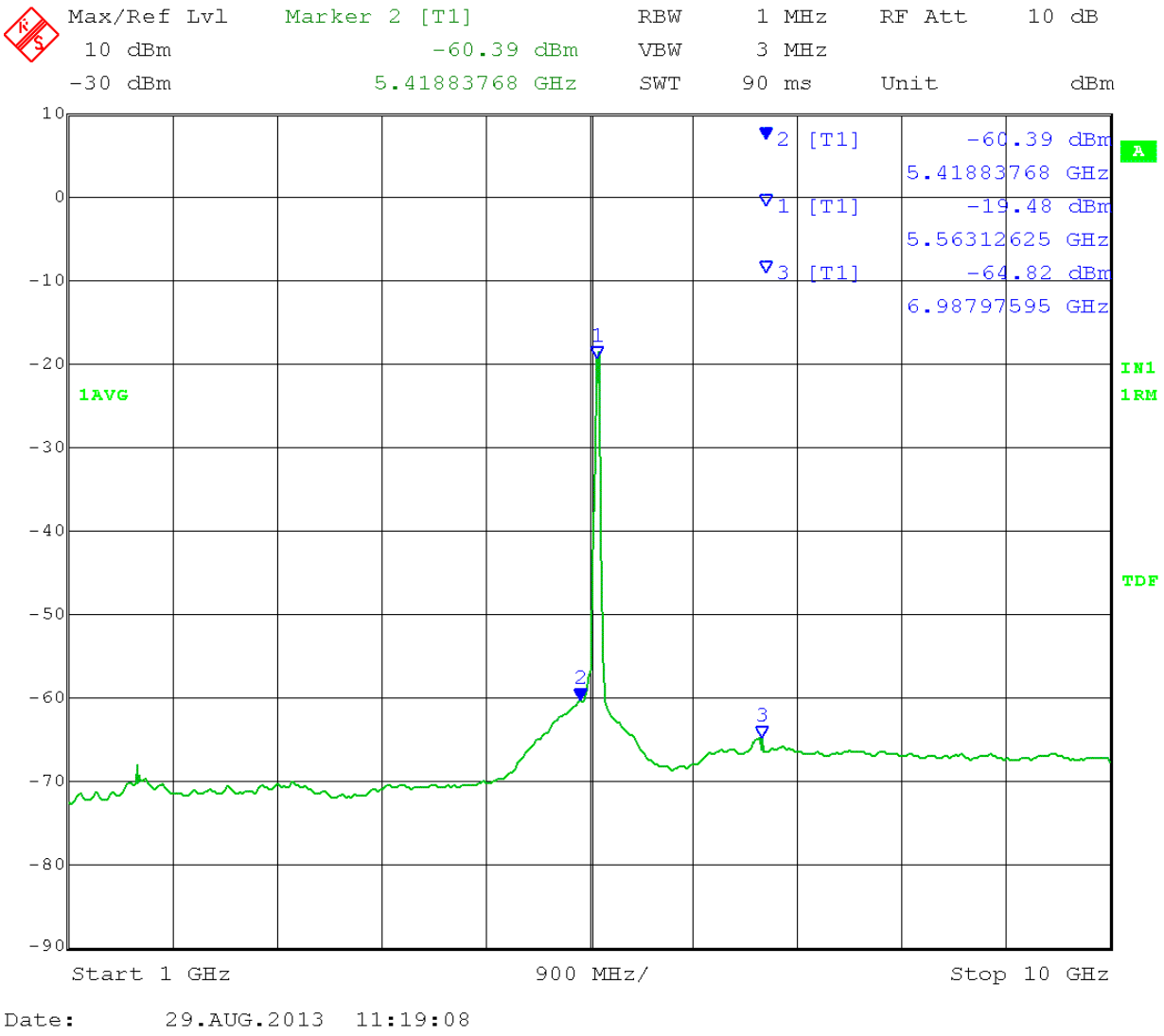
Marker 2: Calculated Field Strength = -60.34 + 114.2 = 53.86dBµV/m AVG < 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 2: Calculated Field Strength = -48.37 + 114.2 = 65.83dBµV/m PK < 74dBµV/m PK Limit
Marker 3: Calculated Field Strength = -53.47 + 114.2 = 60.73dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



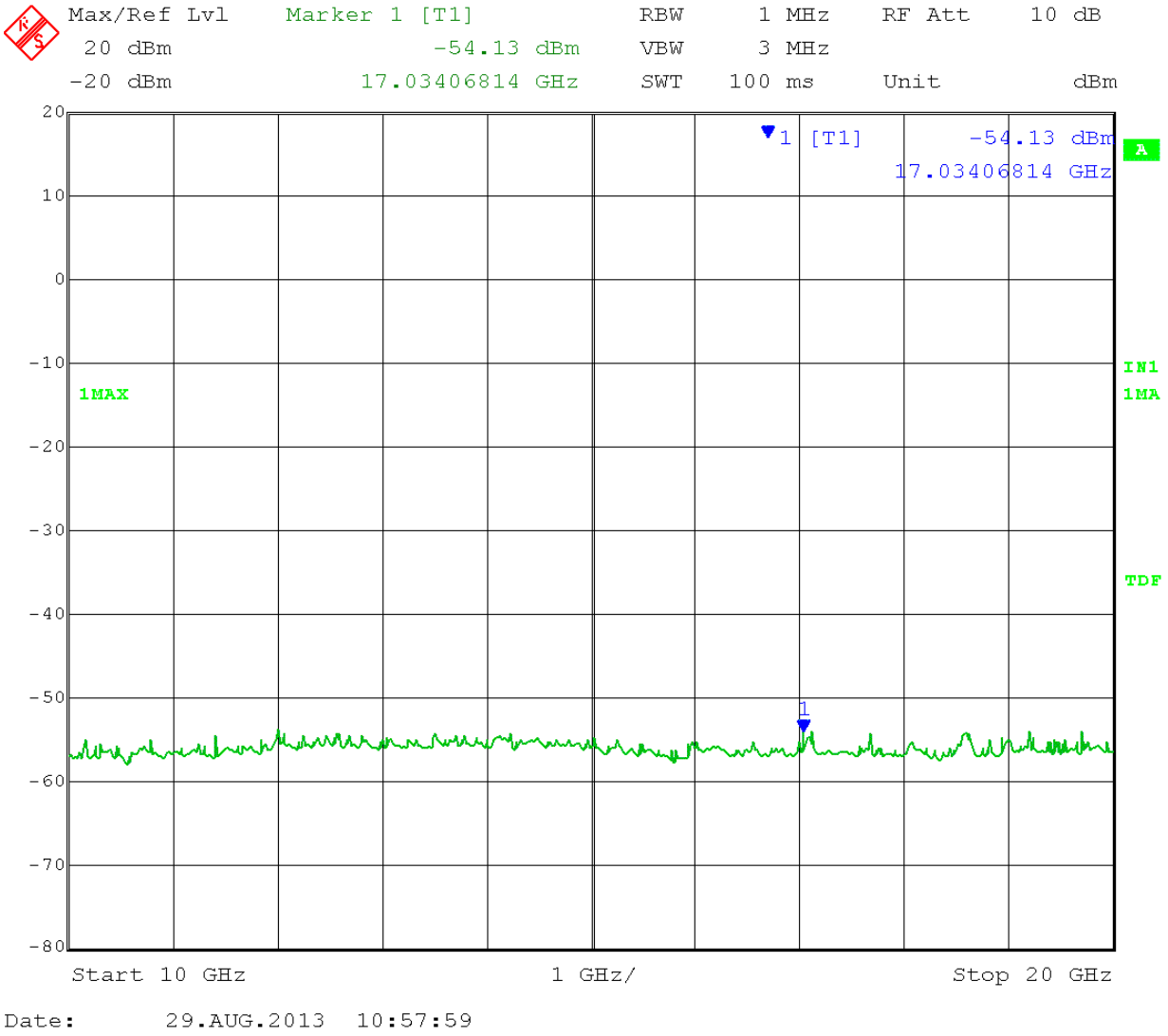
Marker 2: Calculated Field Strength = -60.39 + 114.2 = 53.81dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 40 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 10 - 20 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

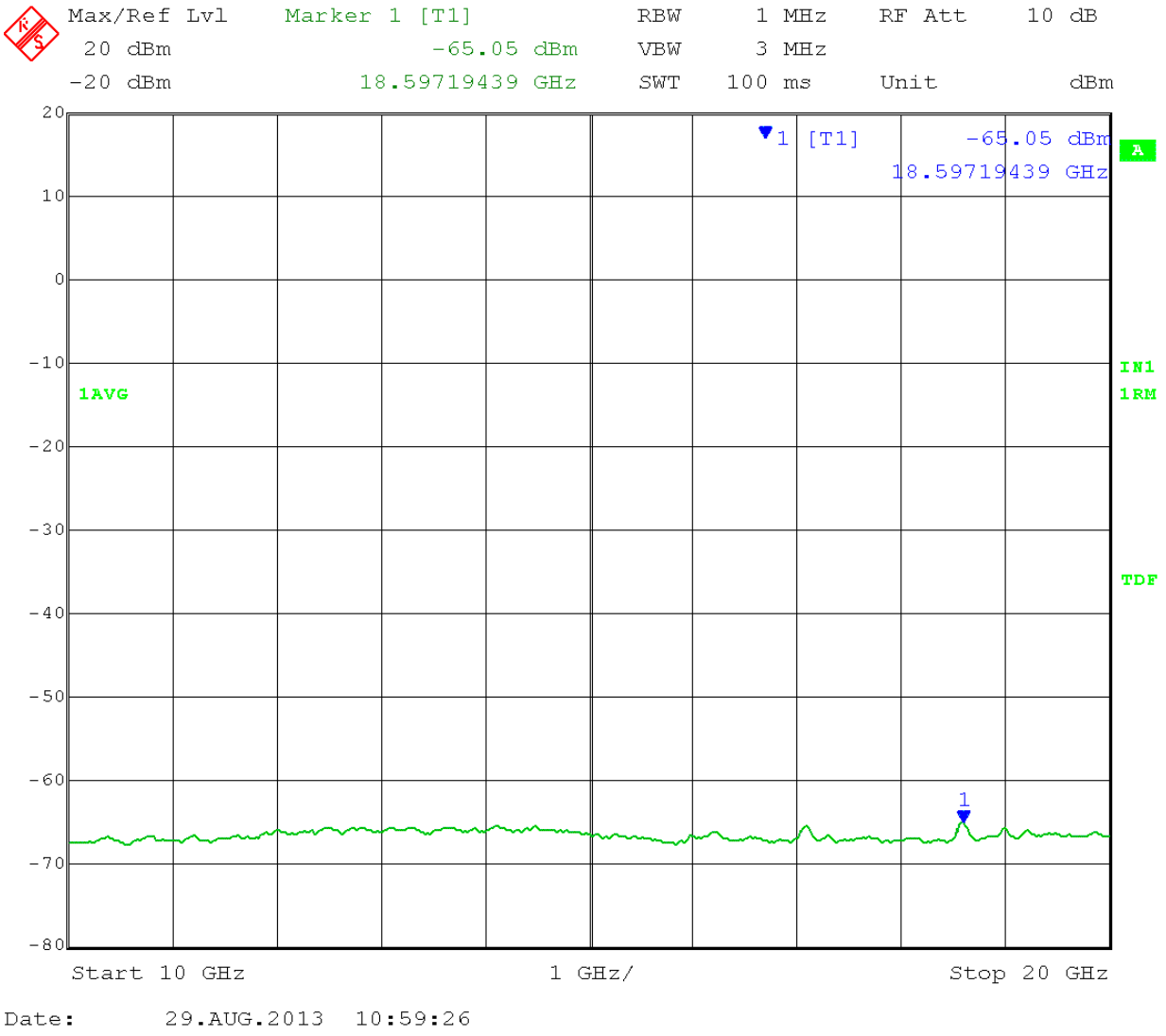
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



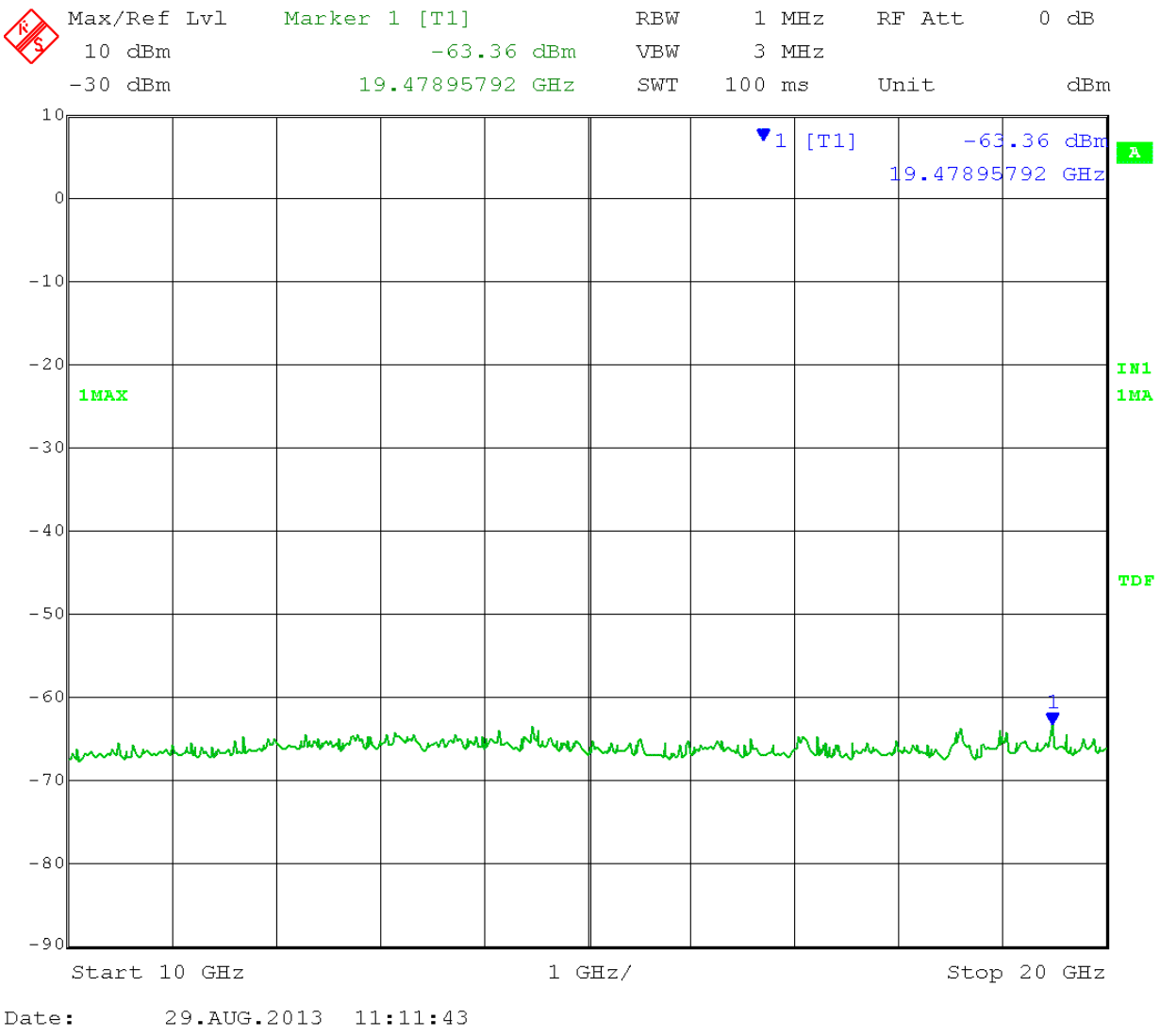
Marker 1: Calculated Field Strength = -54.13 + 114.2 = 60.07dBµV/m PK < 74dBµV/m PK Limit

Channel 0 Average:



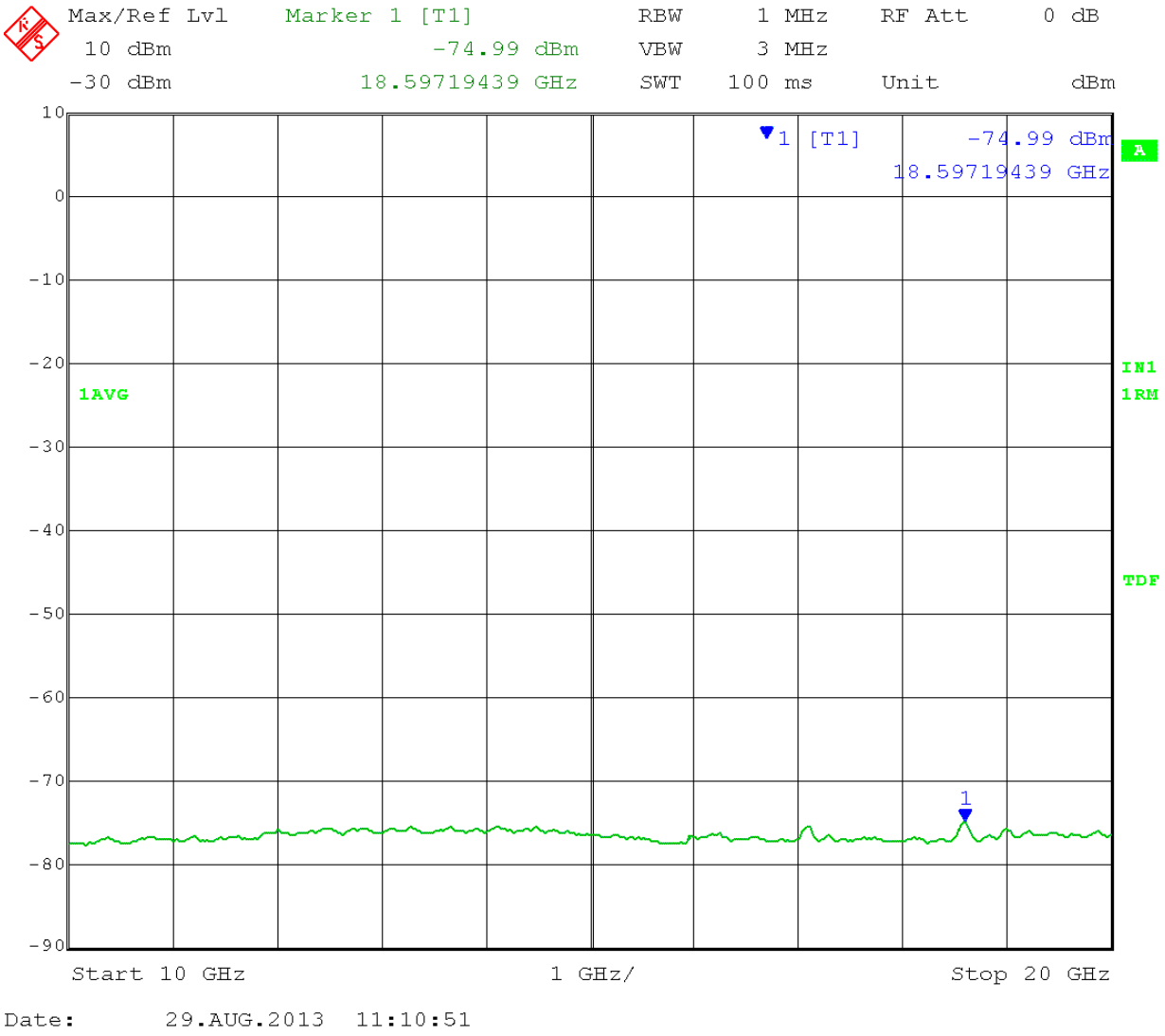
Marker 1: Calculated Field Strength = -65.05 + 114.2 = 49.15dBµV/m AVG < 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 1: Calculated Field Strength = -63.36 + 114.2 = 50.84dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



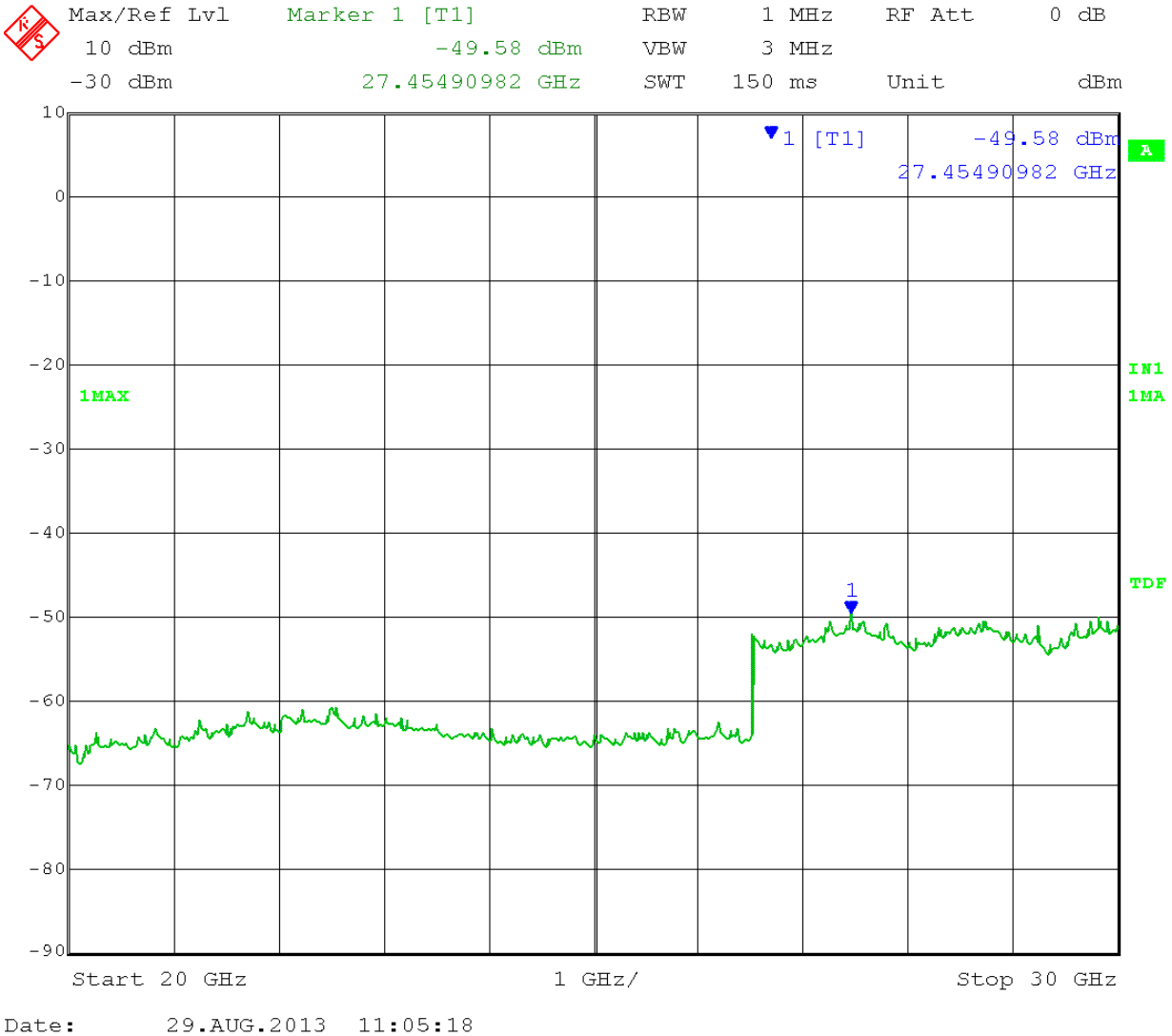
Marker 1: Calculated Field Strength = -74.99 + 114.2 = 39.21dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 40 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 20 - 30 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

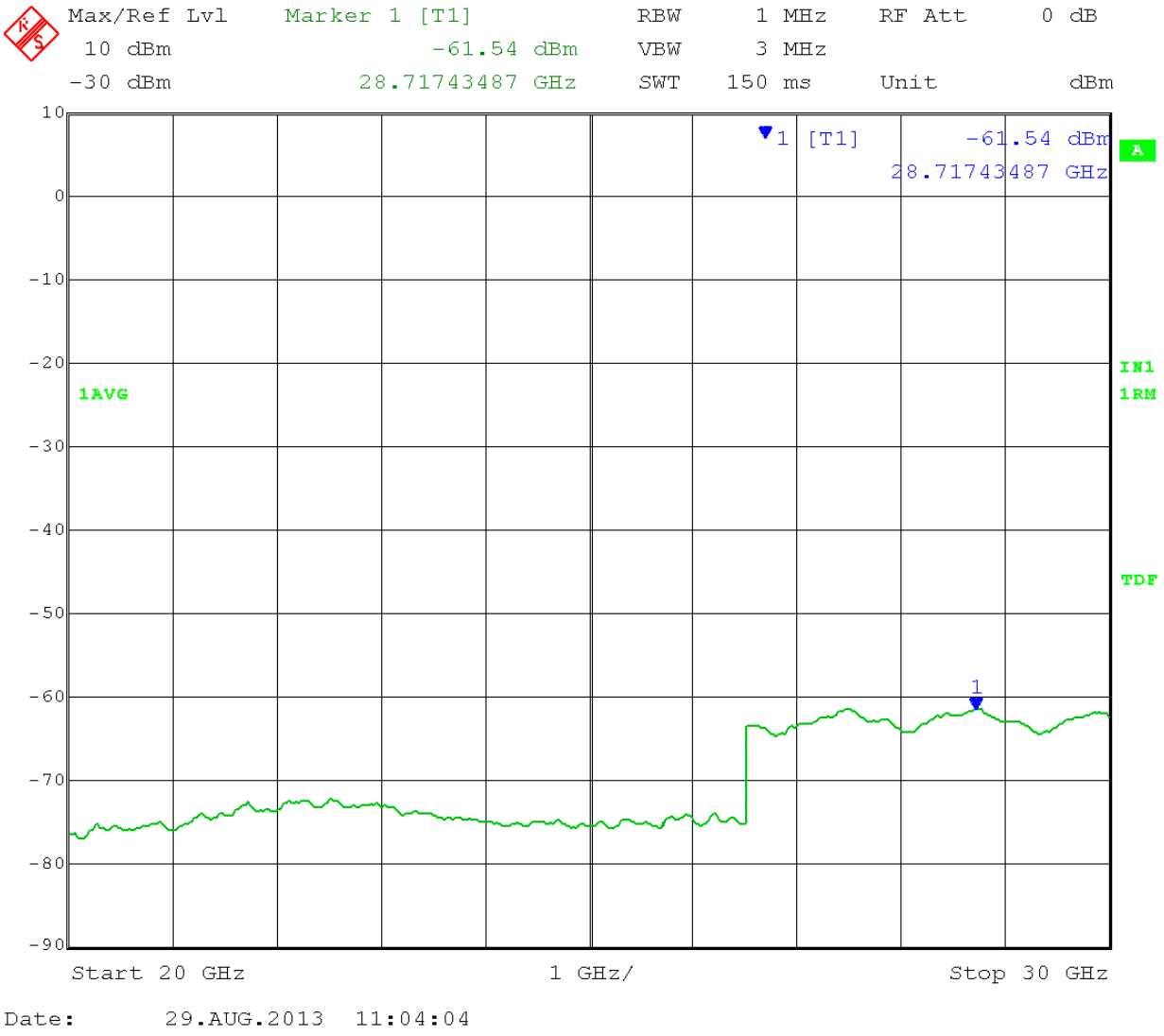
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



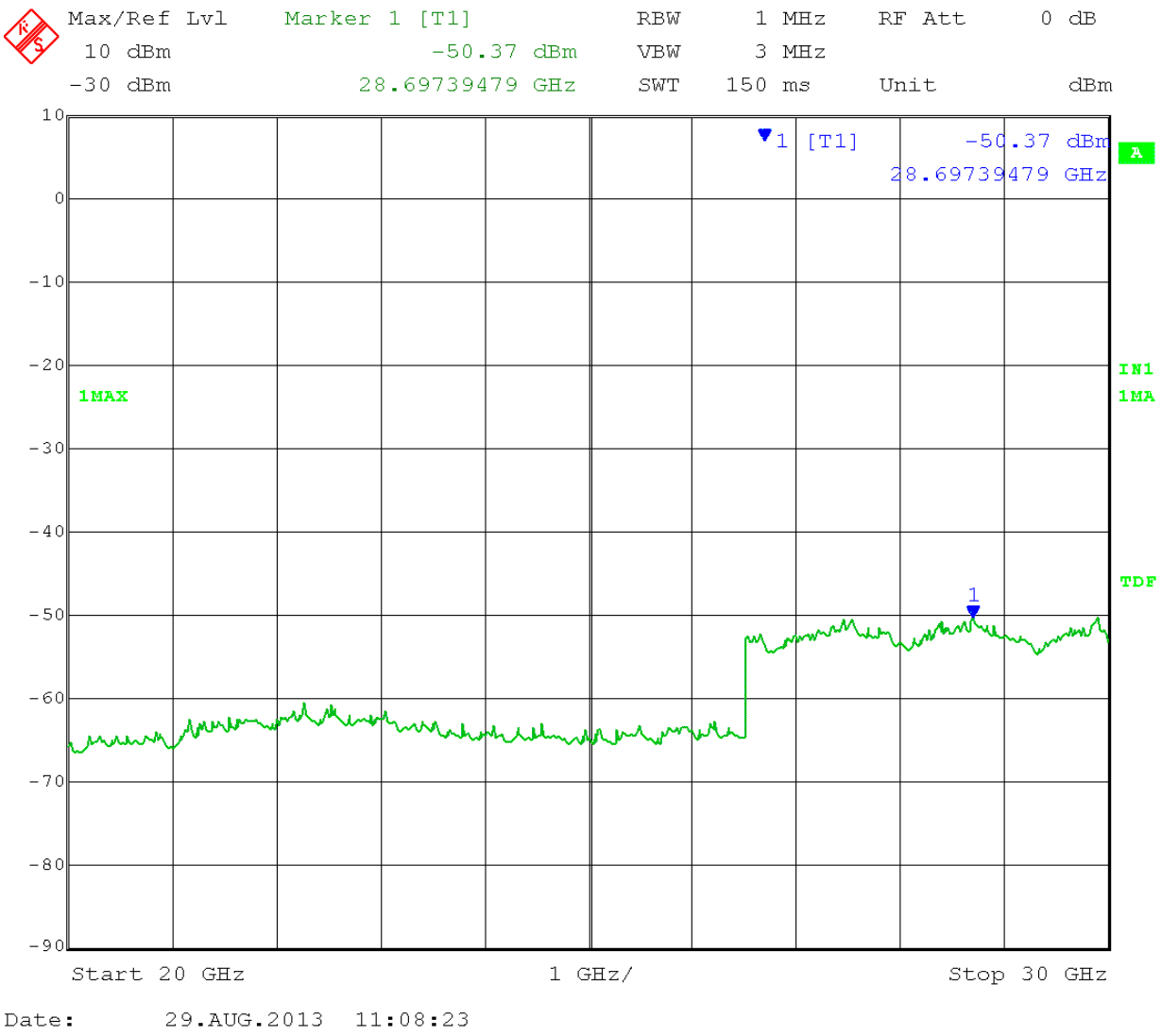
Marker 1: Calculated Field Strength = -49.58 + 114.2 = 64.62dBµV/m PK < 74dBµV/m PK Limit

Channel 0 Average:



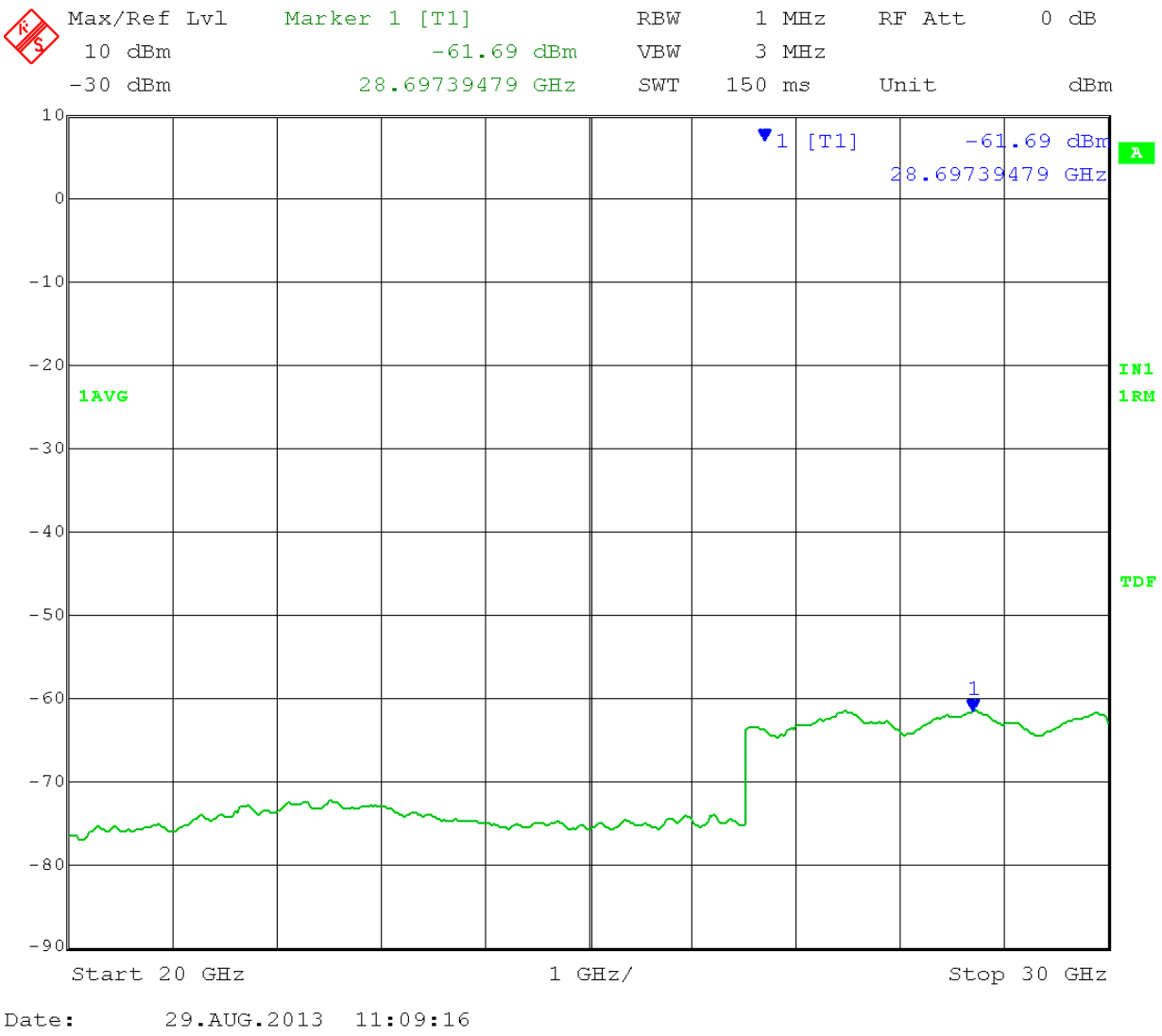
Marker 1: Calculated Field Strength = -61.54 + 114.2 = 52.66dBµV/m AVG < 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 1: Calculated Field Strength = -50.37 + 114.2 = 63.83BµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



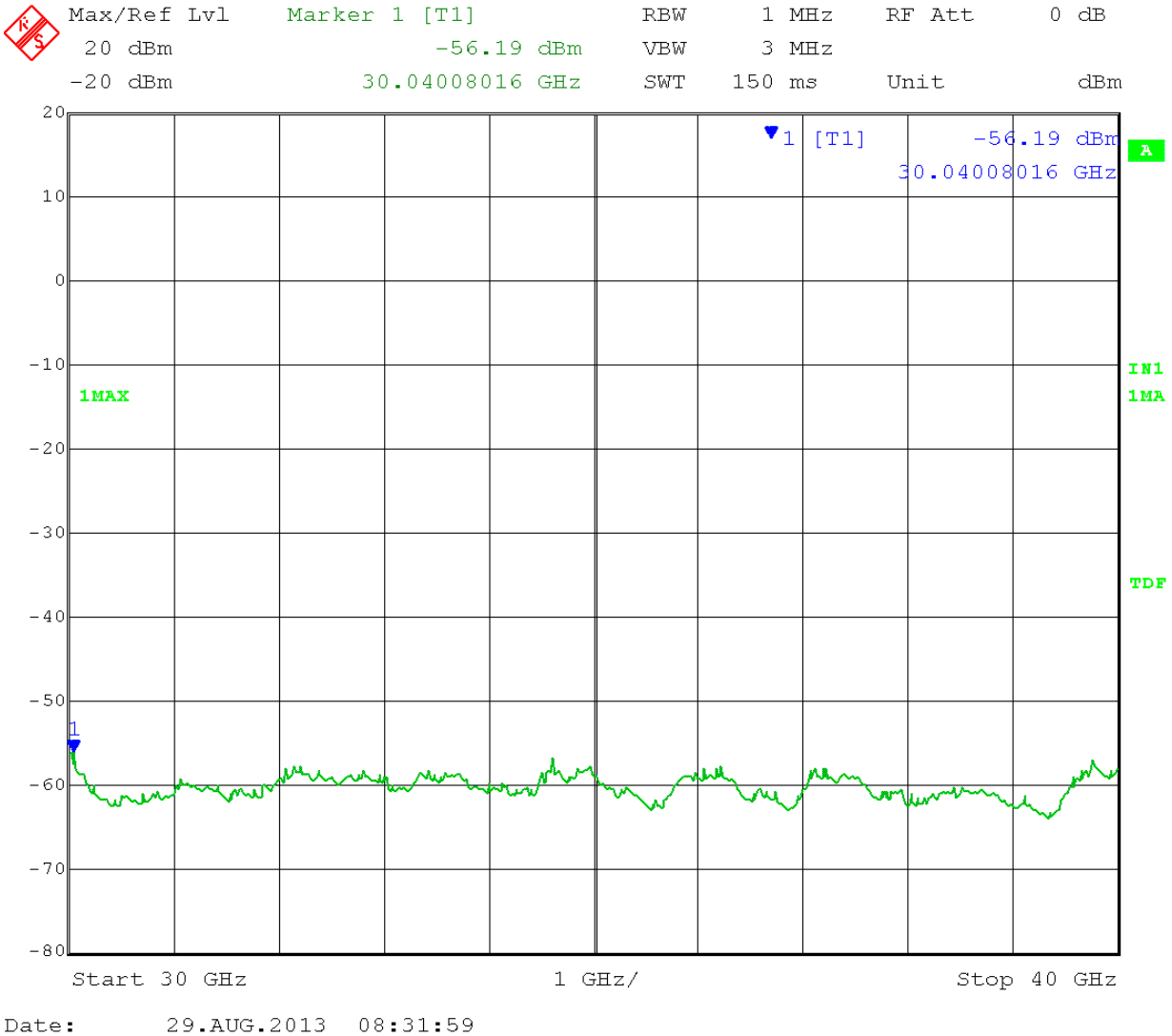
Marker 1: Calculated Field Strength = -61.69 + 114.2 = 52.51dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 08-29-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Point-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Lillian L
EUT Nominal Channel Bandwidth: 40 MHz
Mid Channel Frequency: 5.575 GHz
Output Power Setting: 14
Modulation Type: OFDM
Antenna Gain: 16dBi
EIRP Limit: -27dBm/MHz
Frequency Range: 30 - 40 GHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.

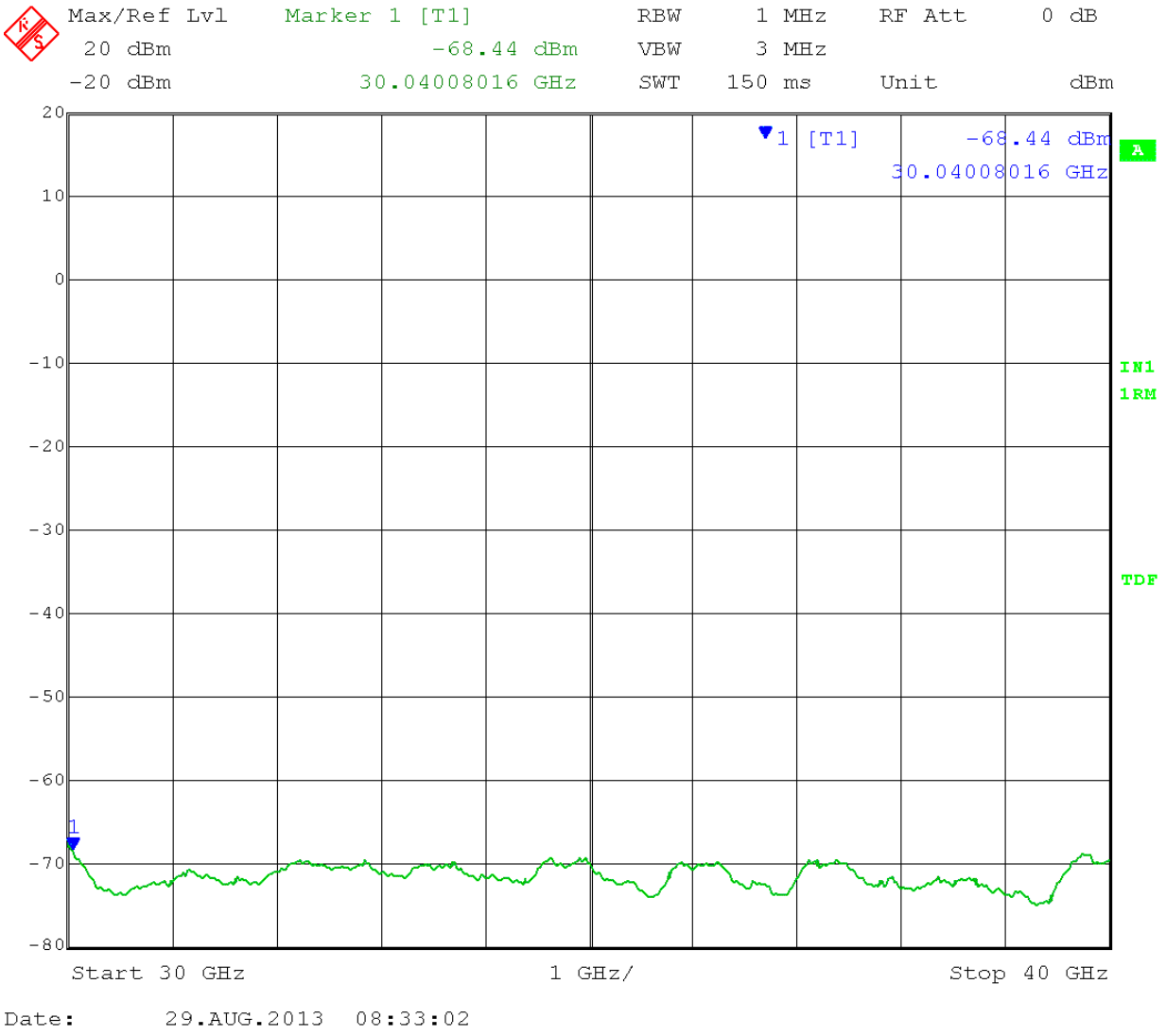
Calculated Field Strength (Restricted Band) = EIRP – 20 log (3 meters) + 104.77
= Conducted Power + 16dBi antenna gain + 3 dB (MIMO) + 95.2 = Ctd Pwr +114.2

Channel 0 Peak:



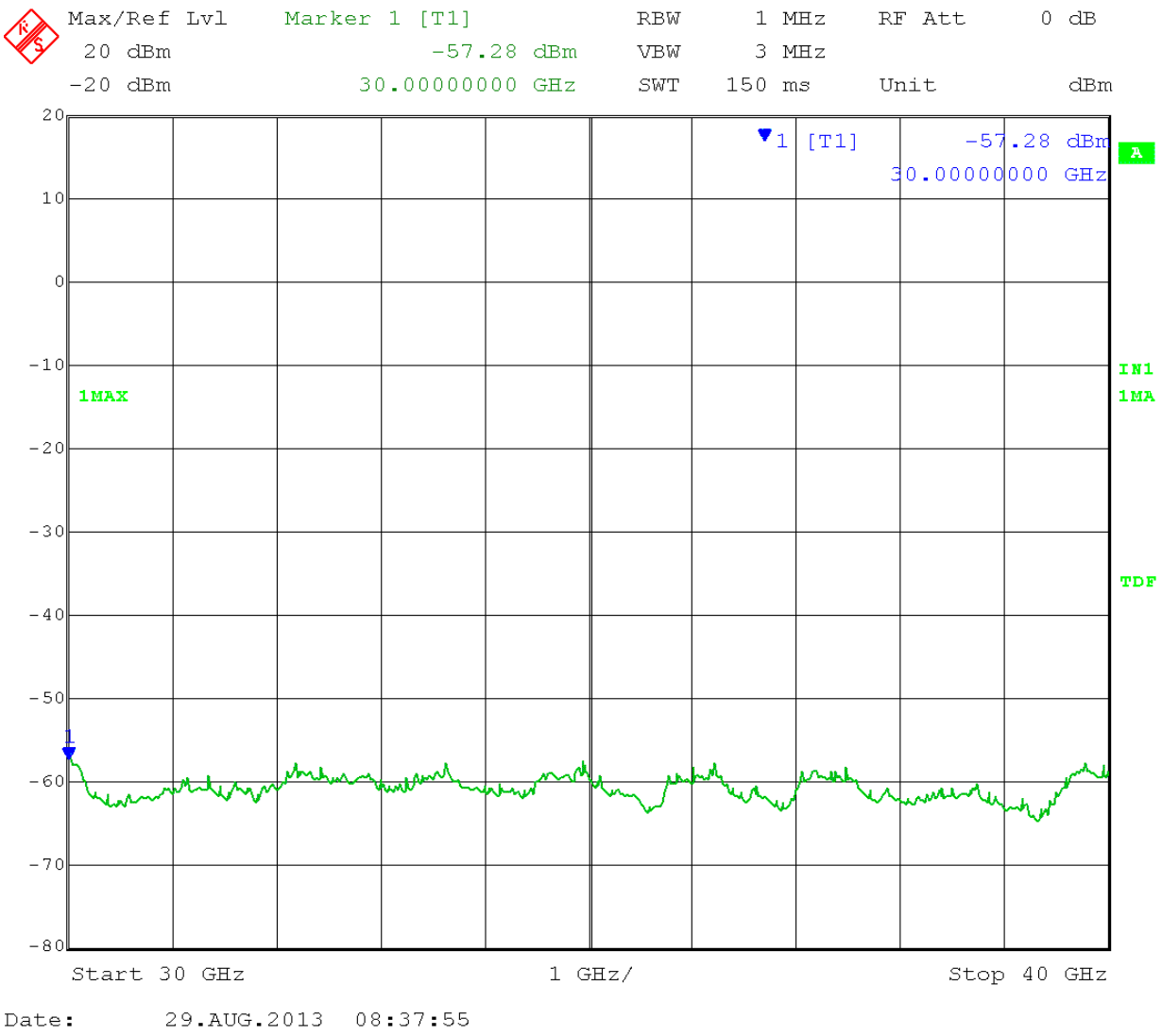
Marker 1: Calculated Field Strength = -56.19 + 114.2 = 58.01dBµV/m PK < 74dBµV/m PK Limit

Channel 0 Average:



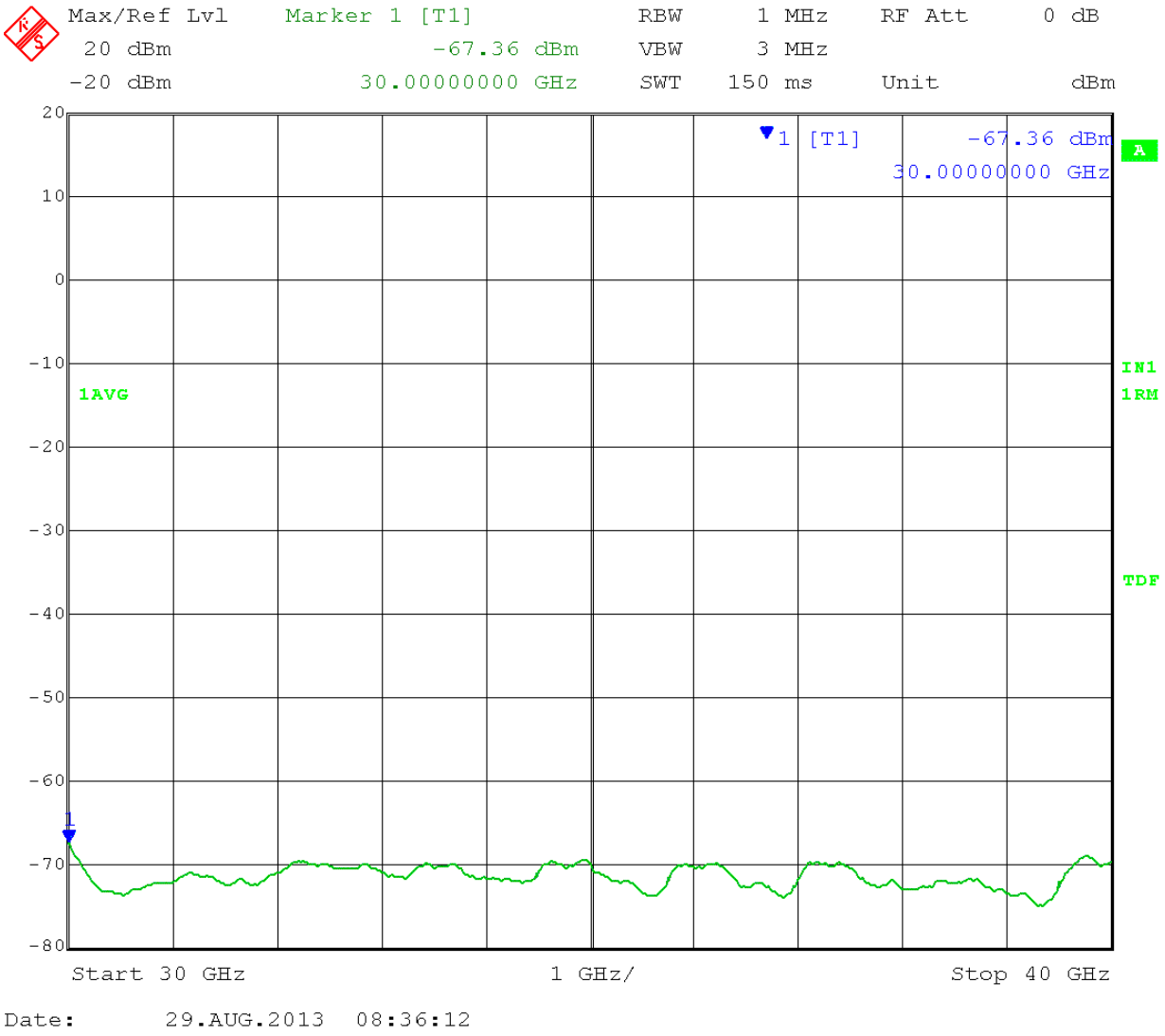
Marker 1: Calculated Field Strength = -68.44 + 114.2 = 45.76dBµV/m AVG < 54dBµV/m AVG Limit

Channel 1 Peak:



Marker 1: Calculated Field Strength = -57.28 + 114.2 = 56.92dBµV/m PK < 74dBµV/m PK Limit

Channel 1 Average:



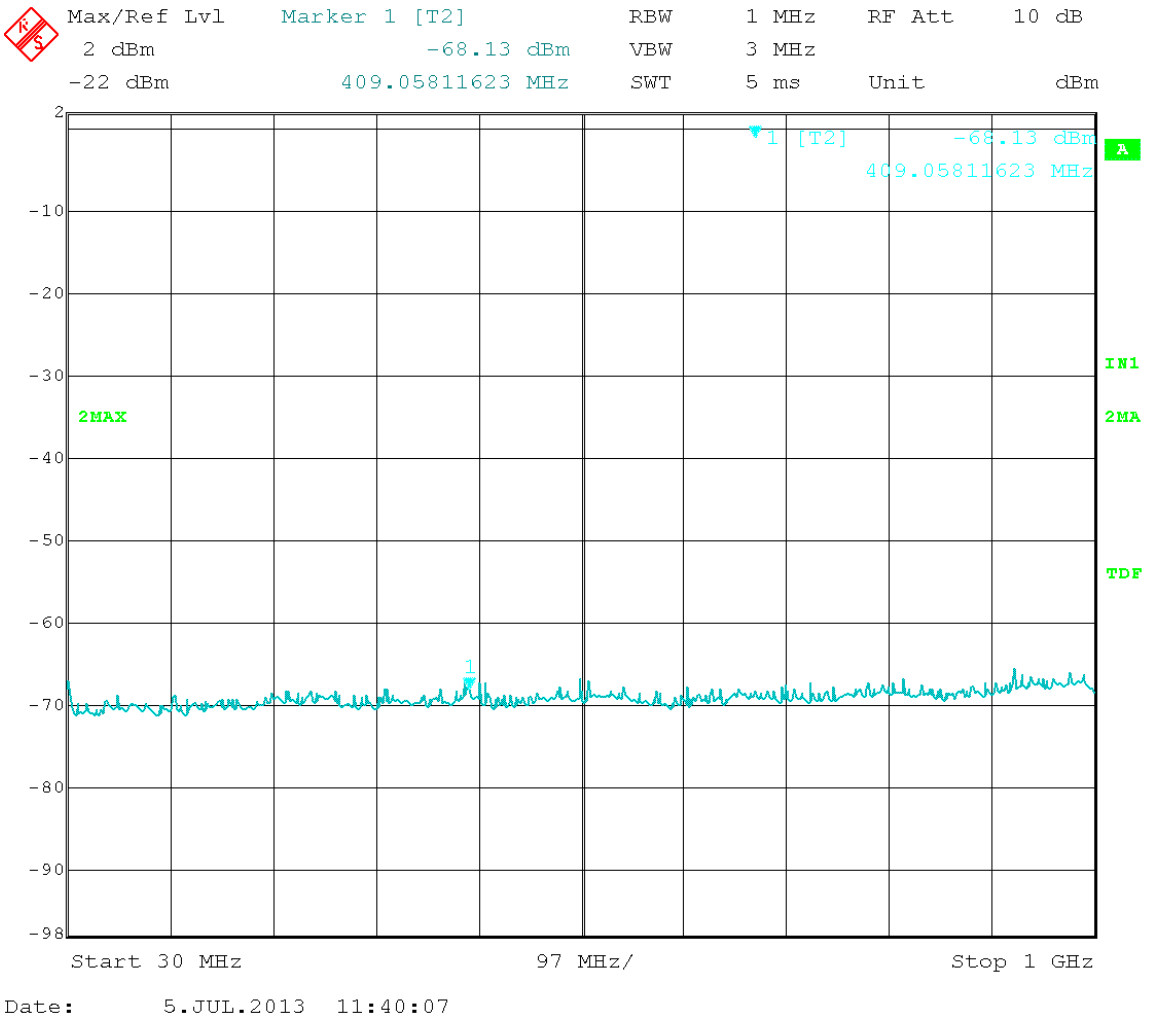
Marker 1: Calculated Field Strength = -67.36 + 114.2 = 46.84dBµV/m AVG < 54dBµV/m AVG Limit

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



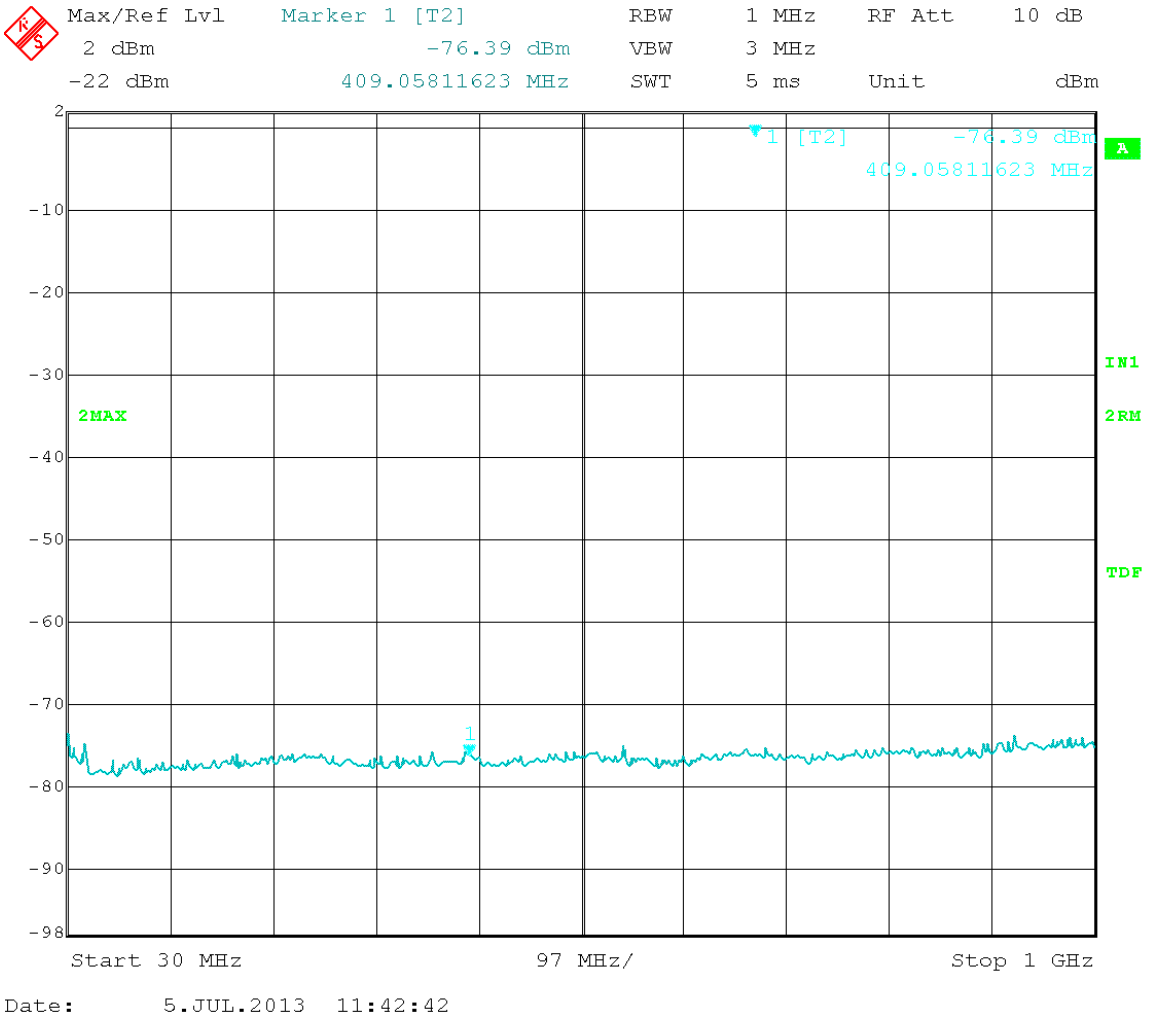
Marker 1: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



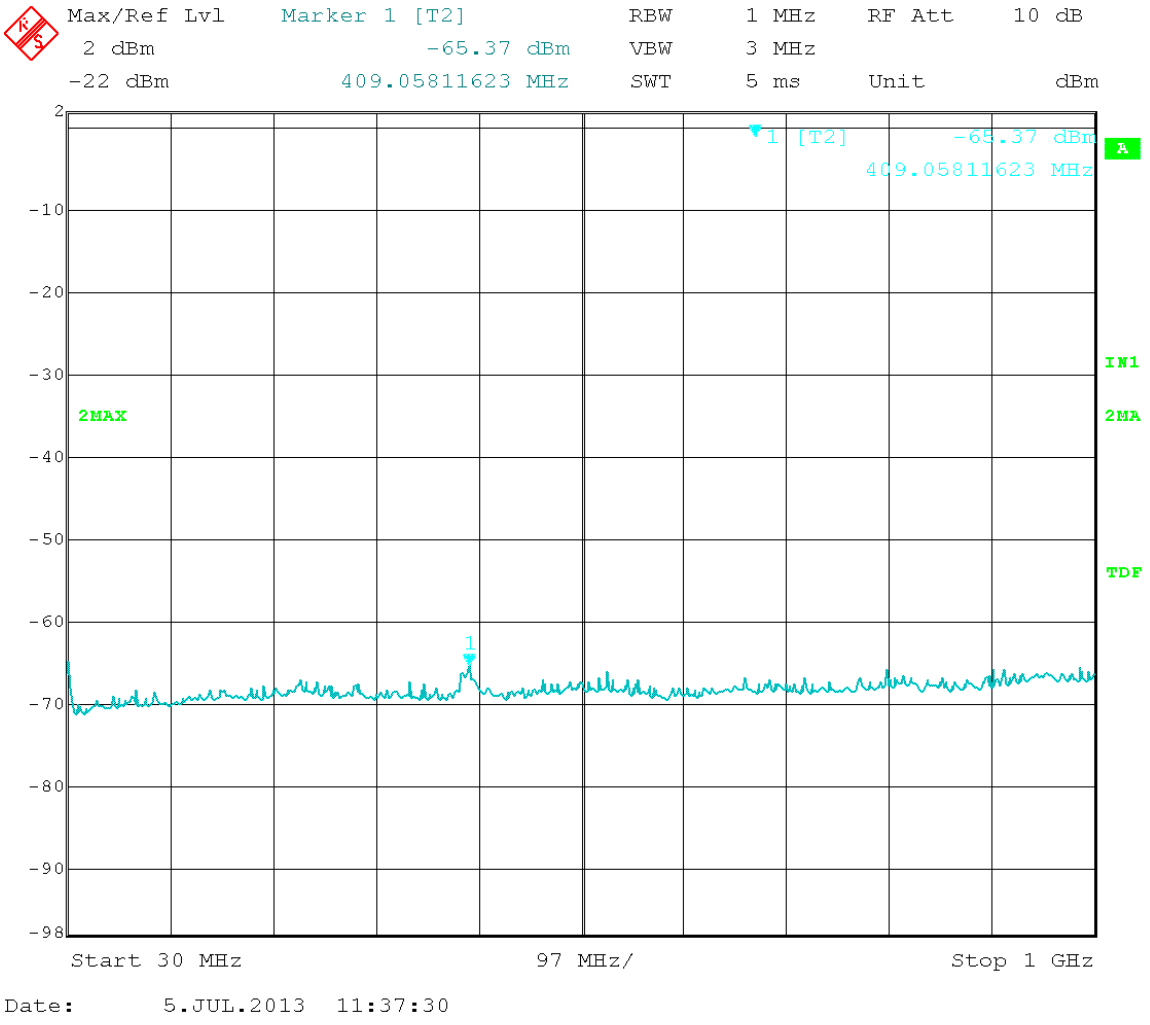
Marker 1: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



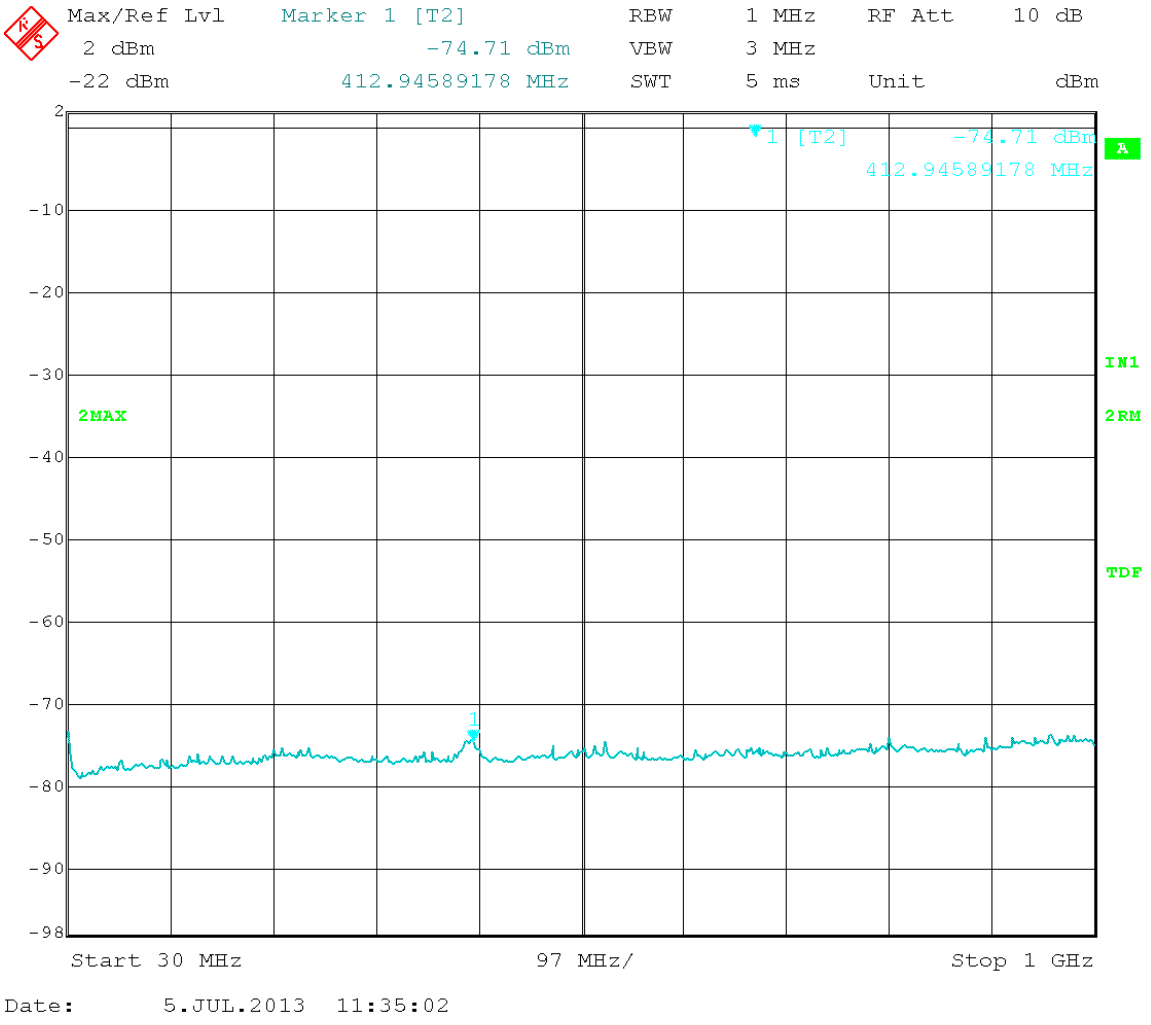
Marker 1: Non-Restricted Band

Test Date: 07-05-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 14
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30MHz to 1 GHz



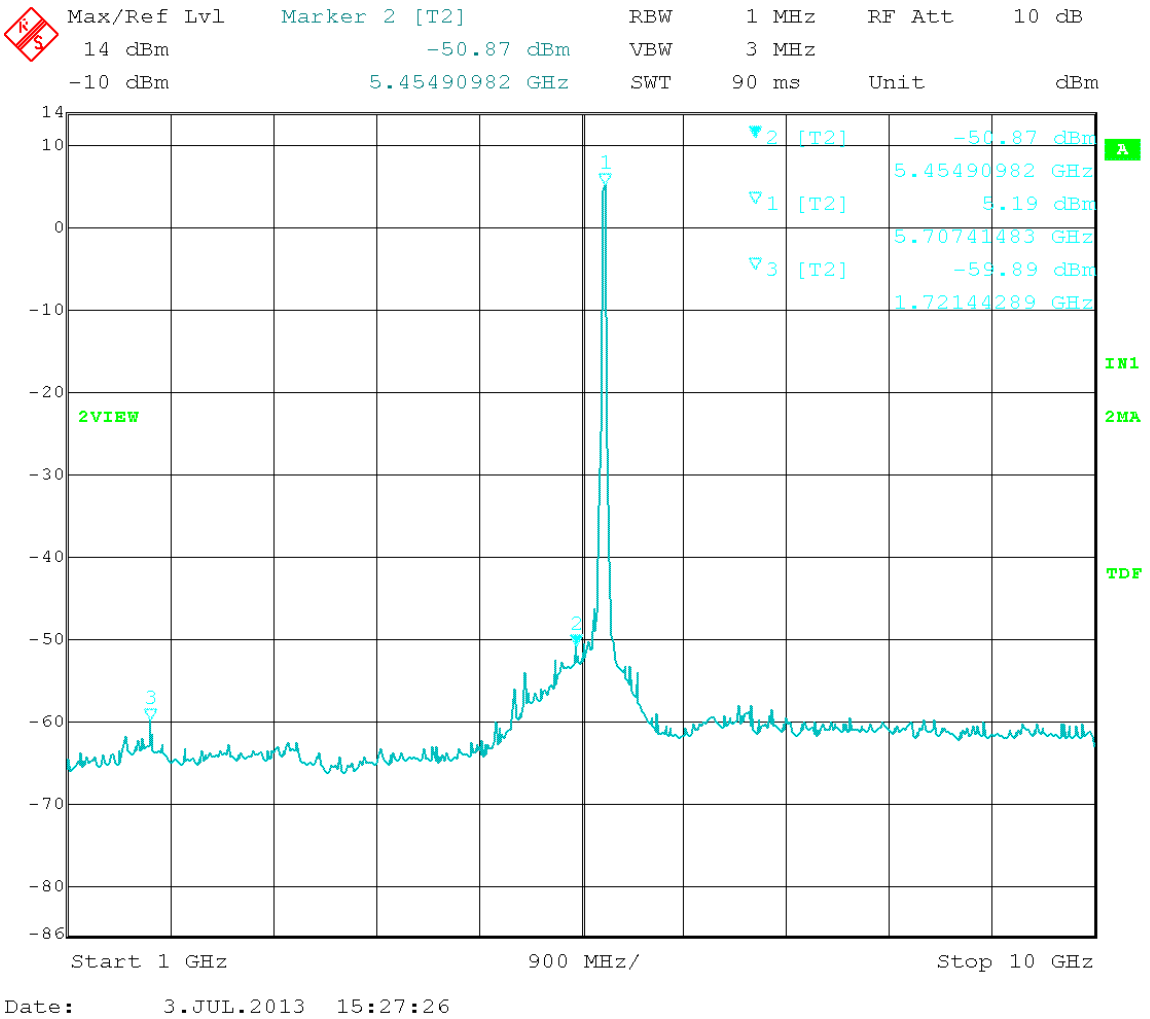
Marker 1: Non-Restricted Band

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 11
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



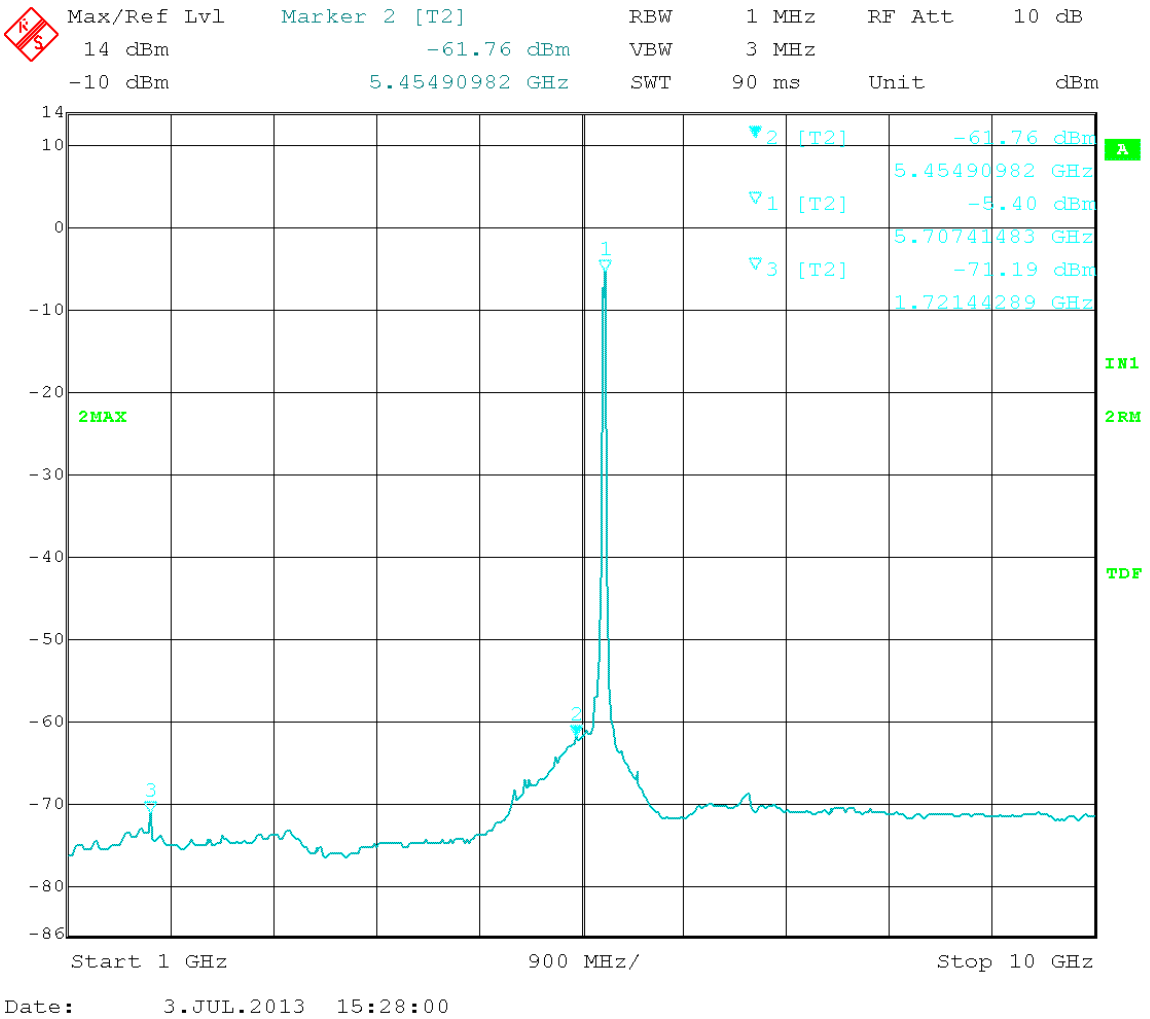
Marker 2: Calculated Field Strength (Restricted Band) = -50.87 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 63.36dBµV/m Peak
Marker 3: Calculated Field Strength (Restricted Band) = -59.89 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 54.34dBµV/m Peak

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 11
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



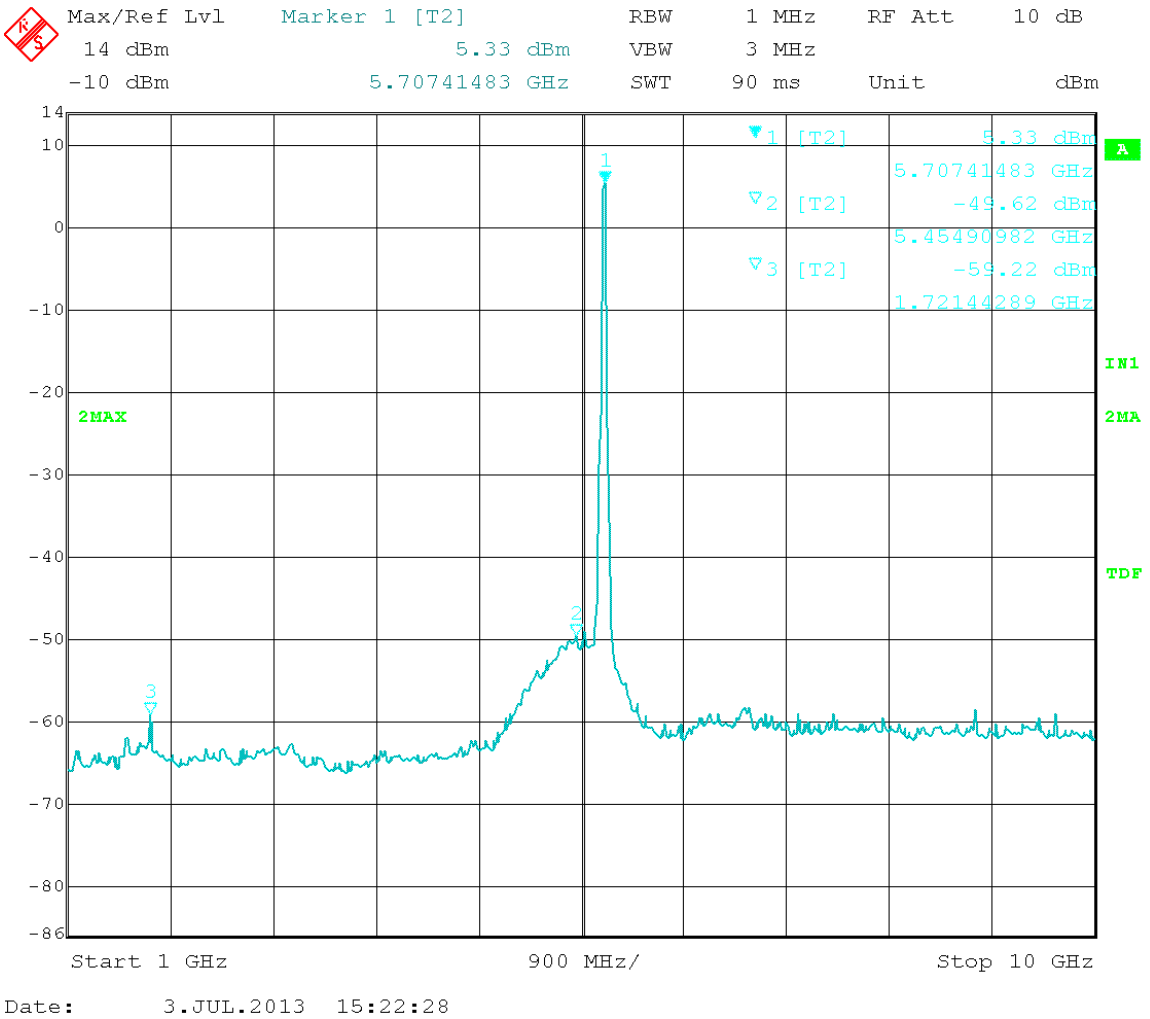
Marker 2: Calculated Field Strength (Restricted Band) = -61.76 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 52.47dBµV/m Average
Marker 3: Calculated Field Strength (Restricted Band) = -71.19 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 43.04dBµV/m Average

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 11
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



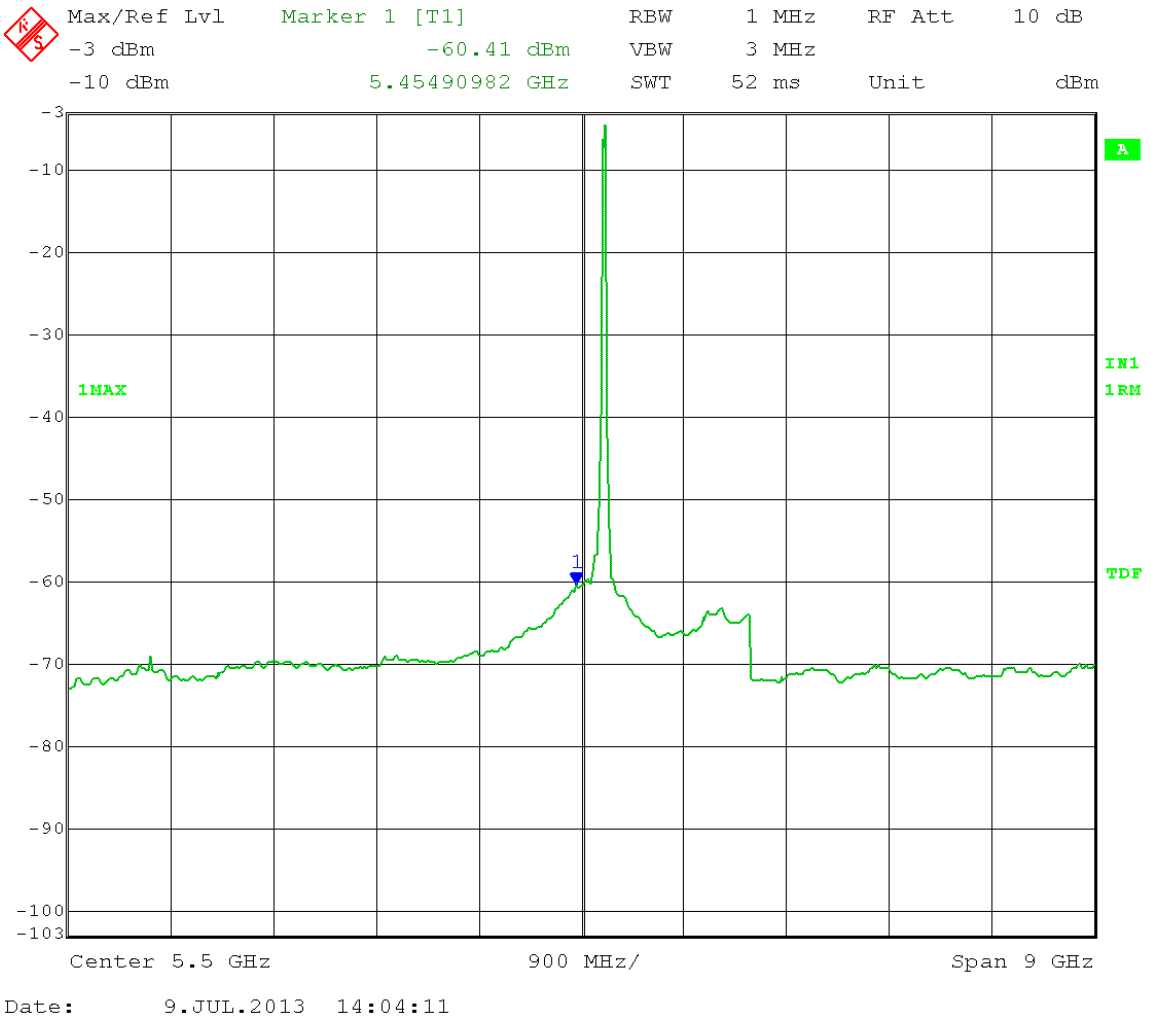
Marker 2: Calculated Field Strength (Restricted Band) = -49.62 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 64.61dBµV/m Peak
Marker 3: Calculated Field Strength (Restricted Band) = -59.22 + 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 55.01dBµV/m Peak

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 11
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 1 GHz to 10 GHz



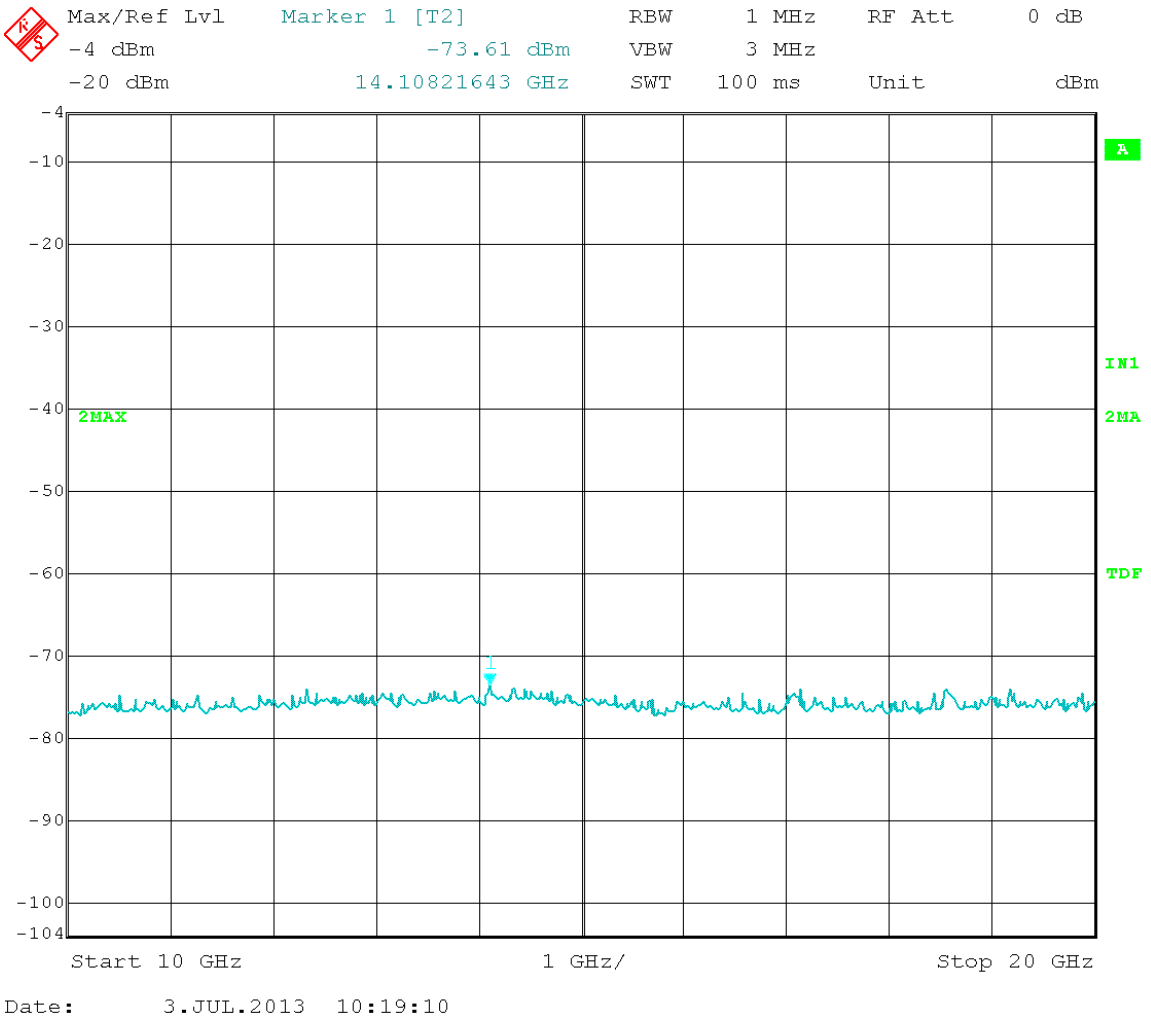
Marker 1: Calculated Field Strength (Restricted Band) = -60.41+ 16dBi antenna gain + 3 dB (MIMO) – 20 log (3 meters) + 104.77 = 53.82dBµV/m Average

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



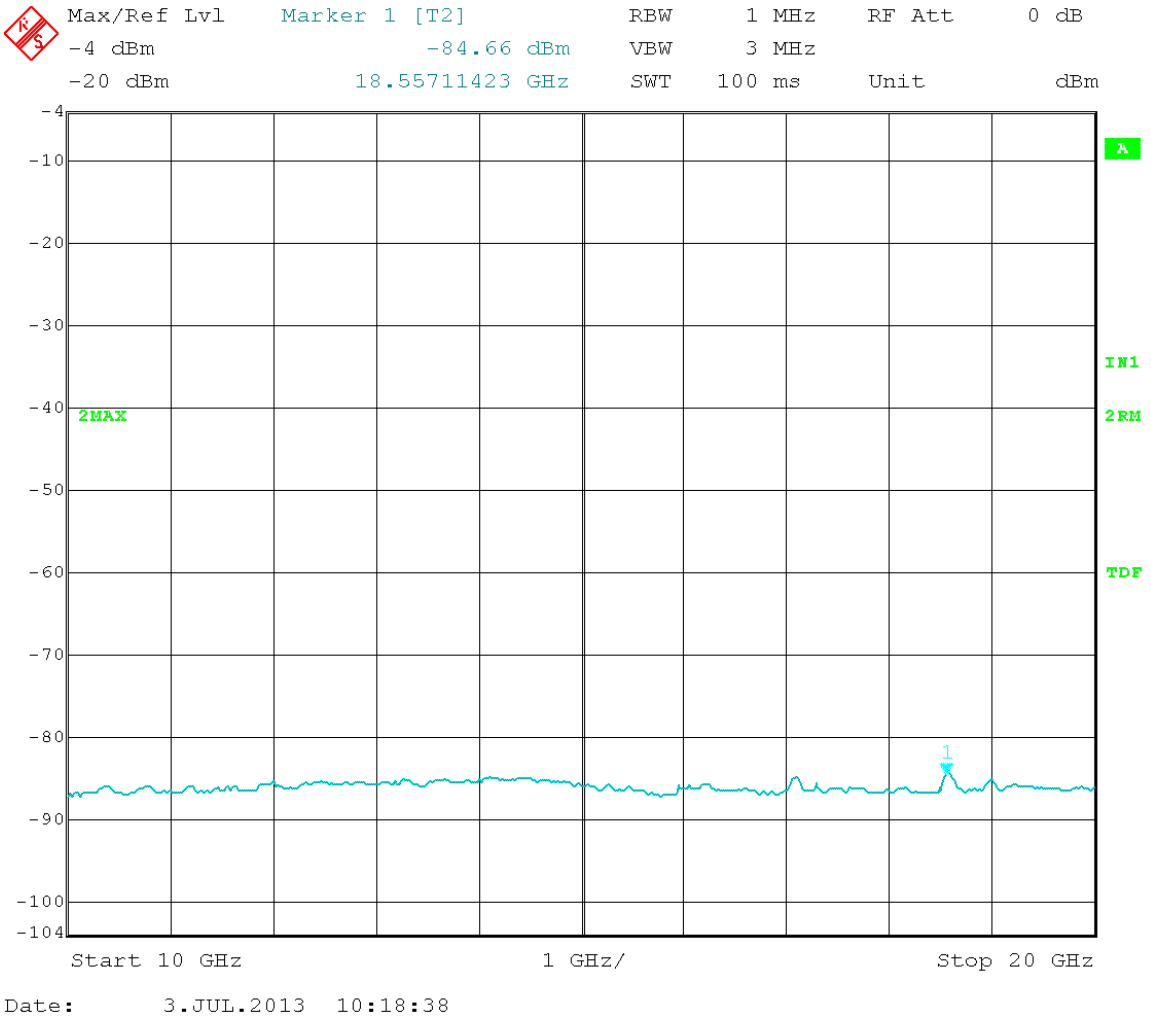
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



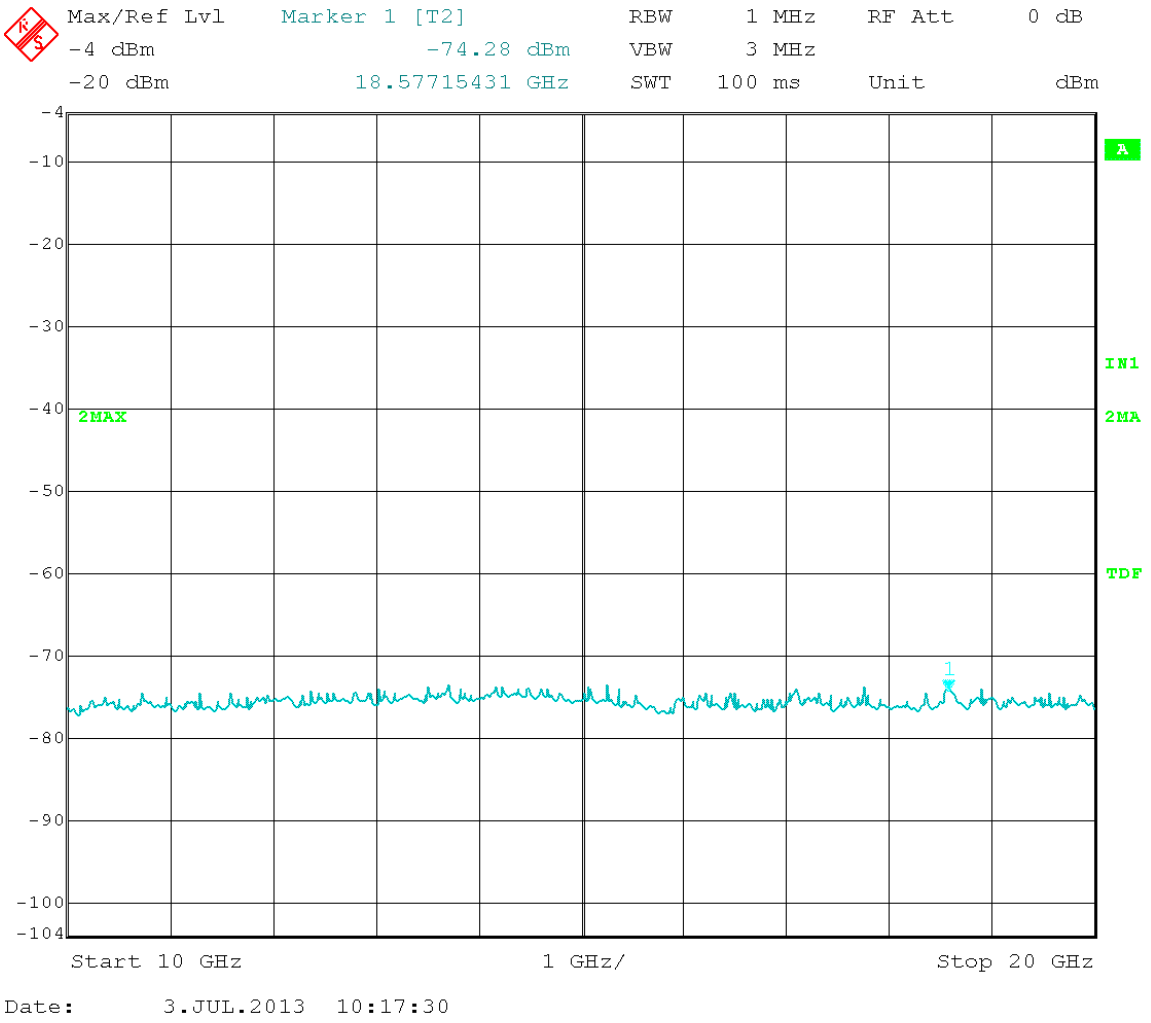
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



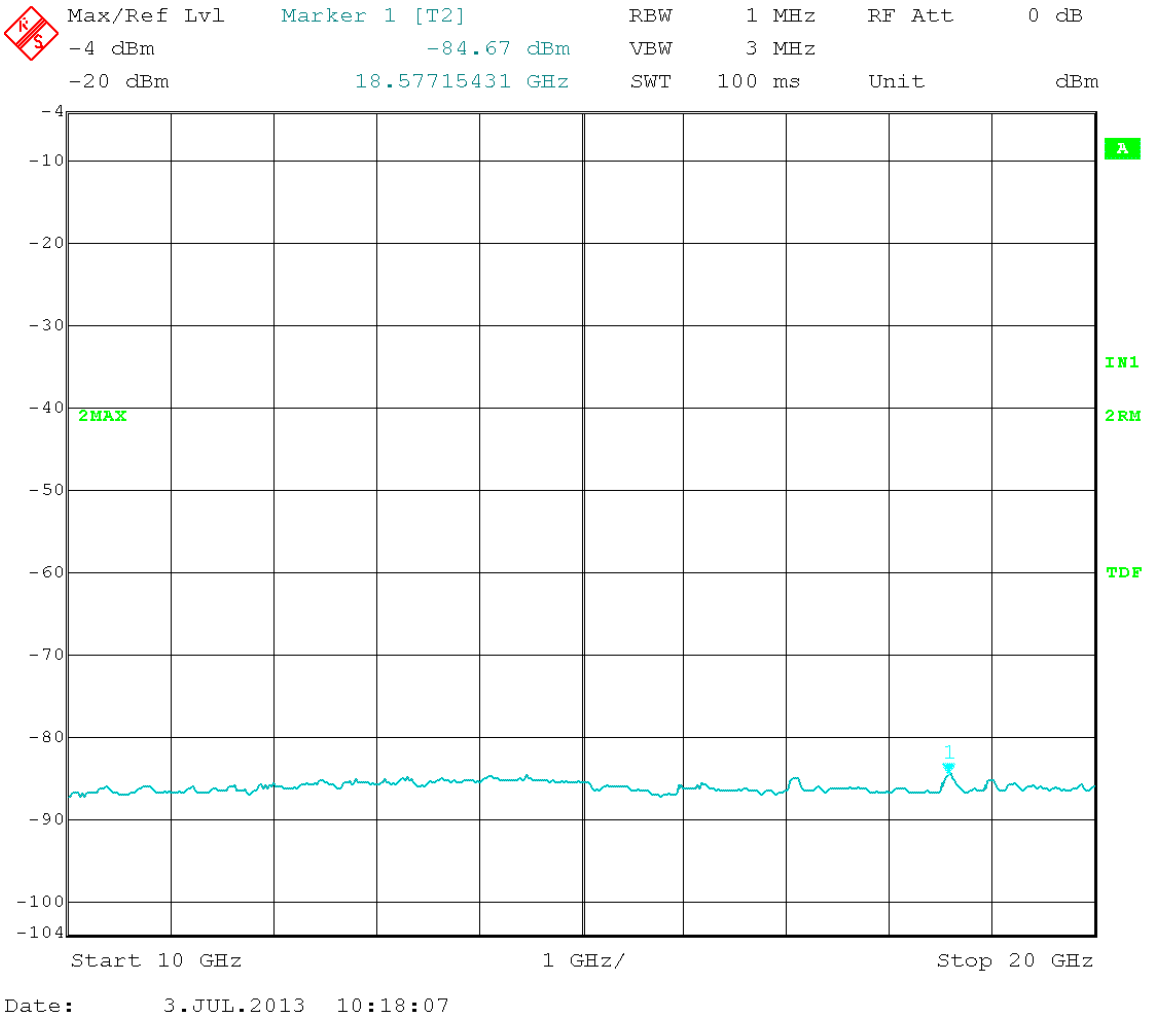
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 10 GHz to 20 GHz



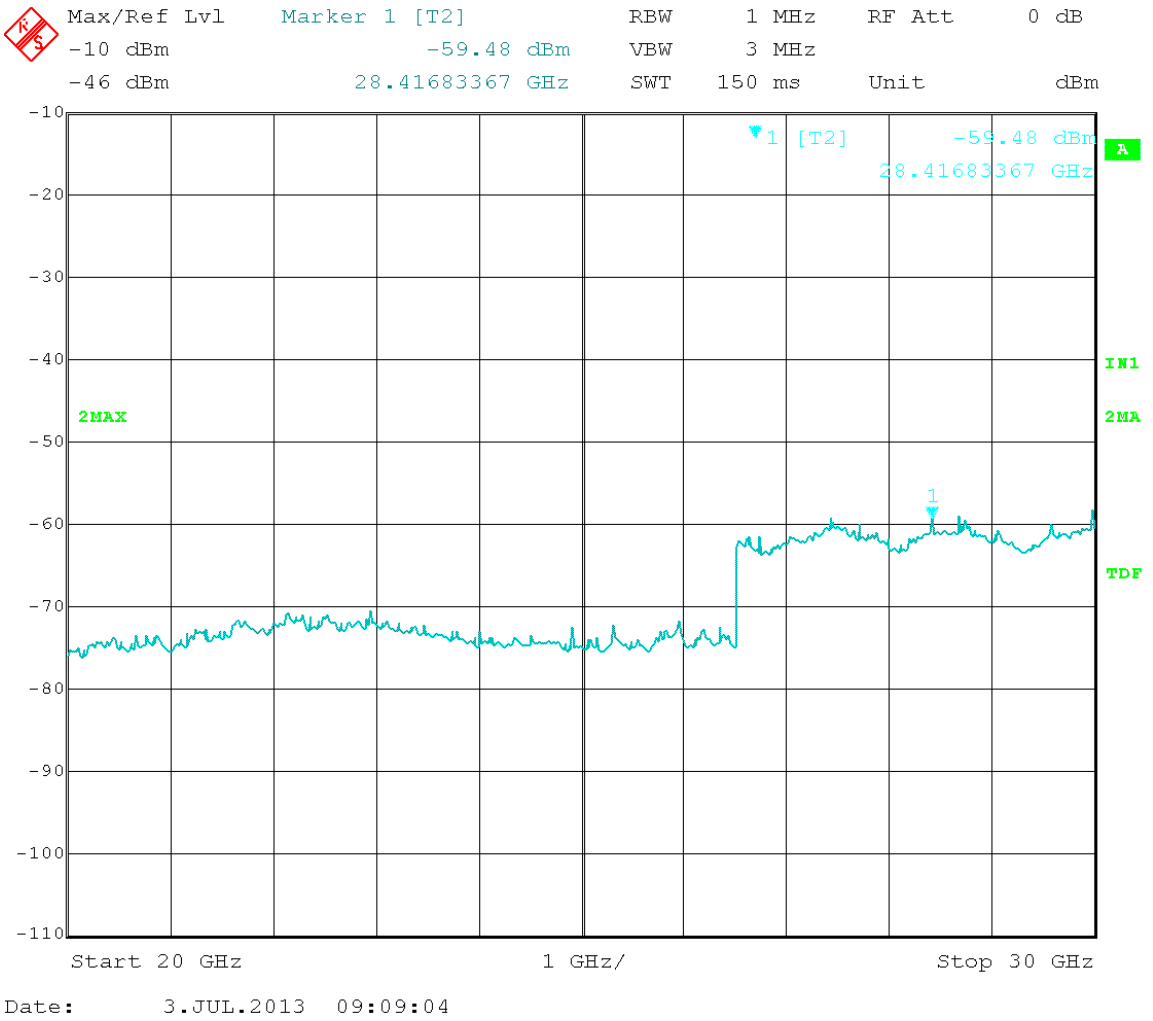
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



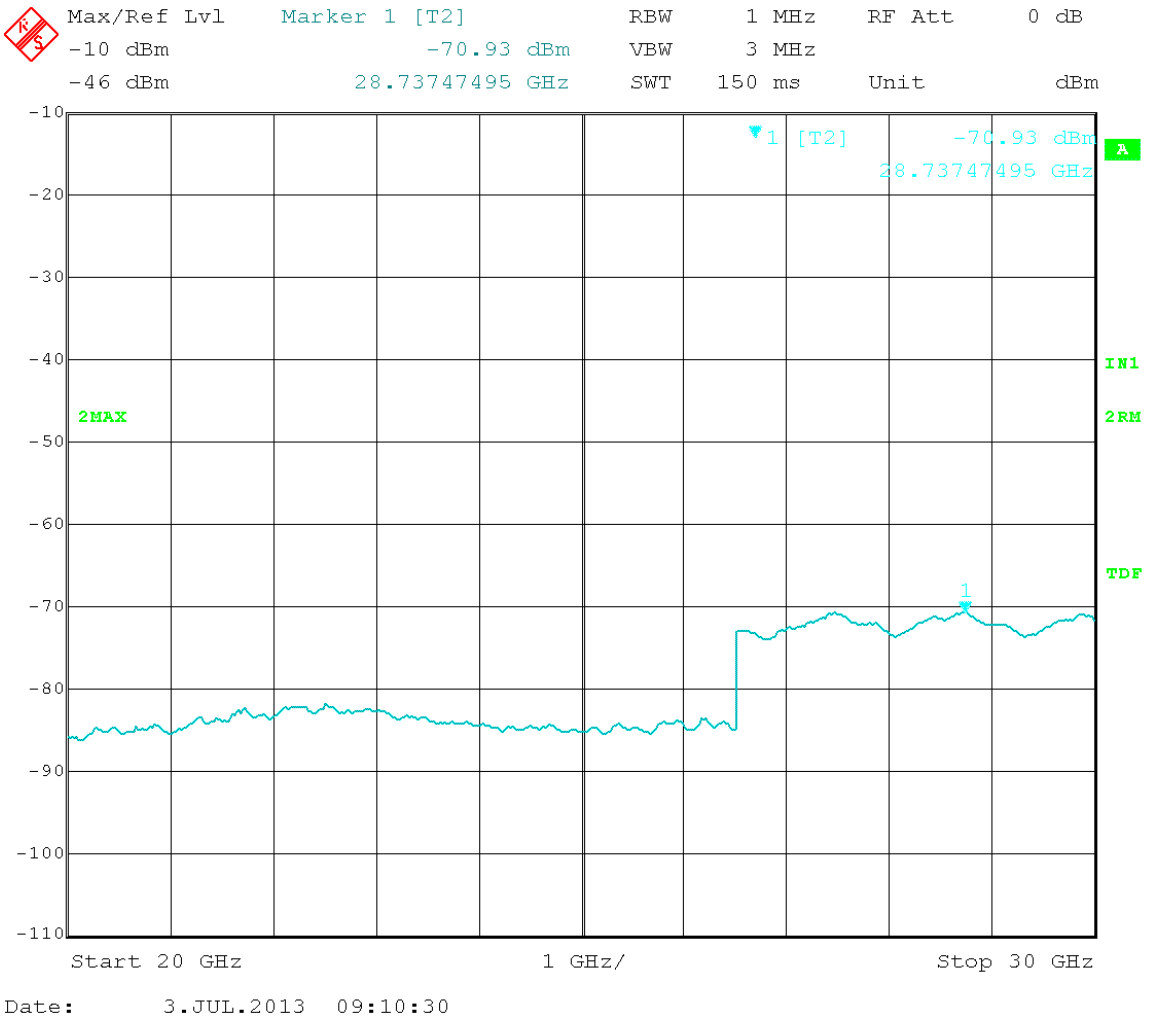
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



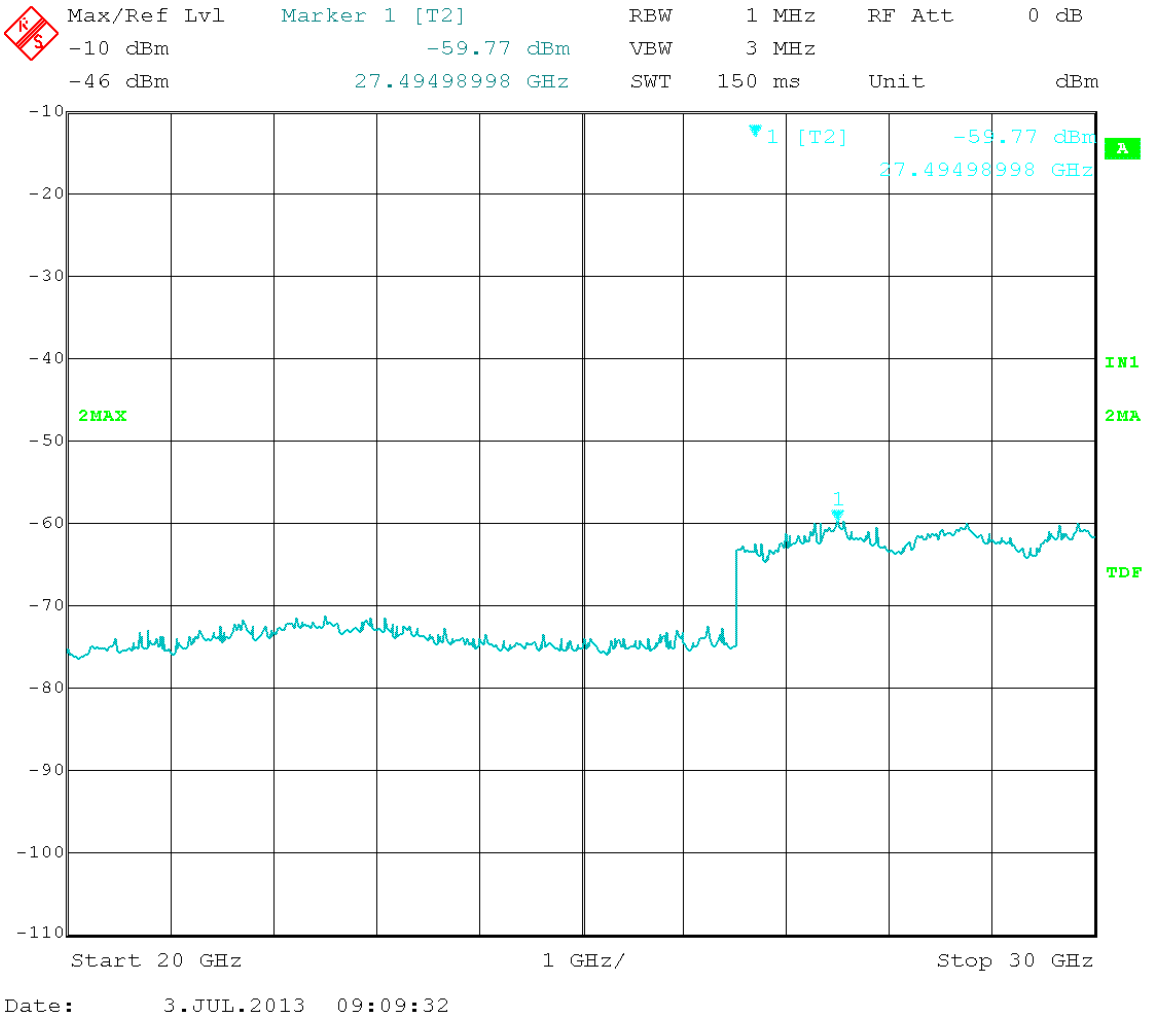
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



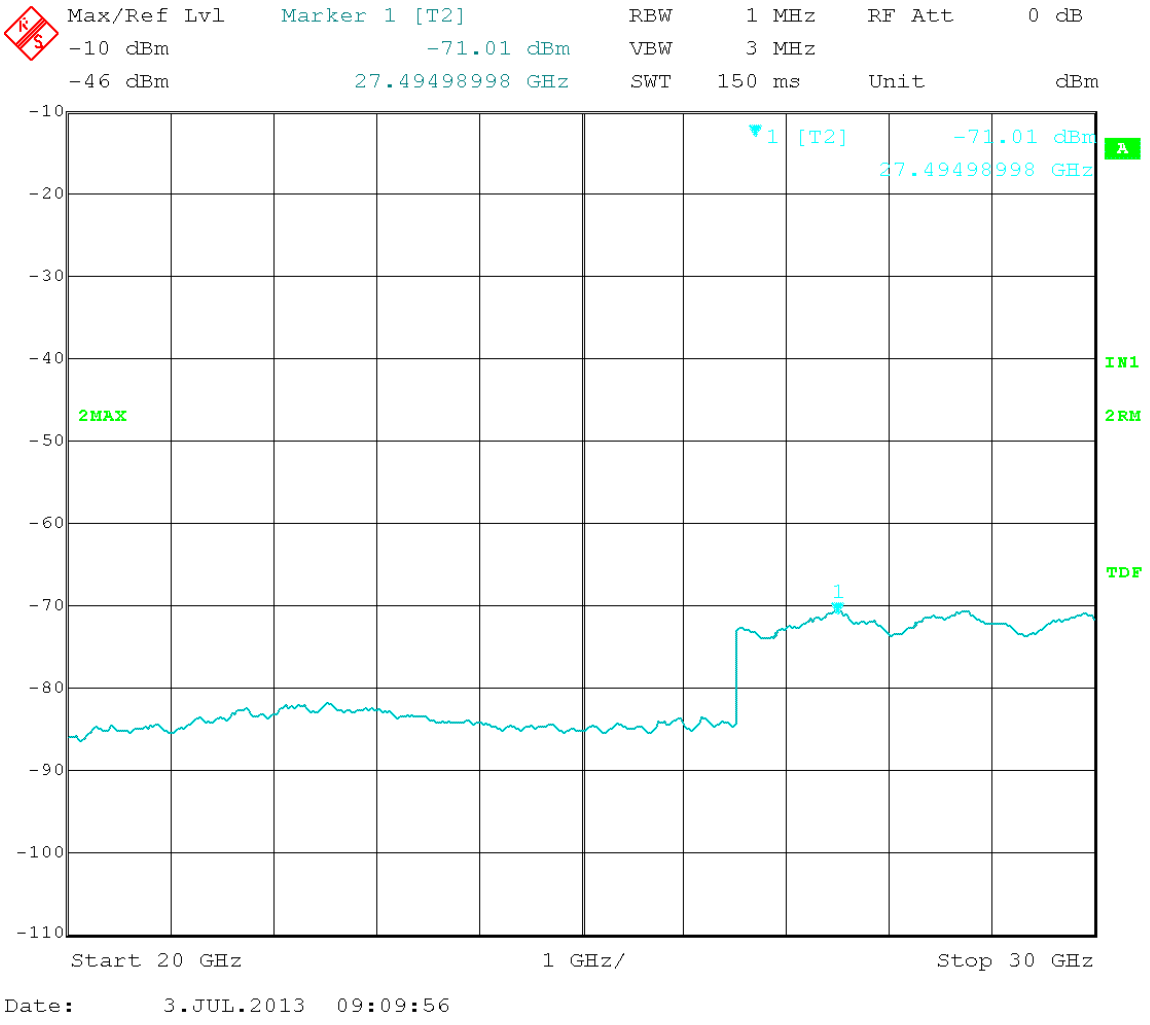
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 20 GHz to 30 GHz



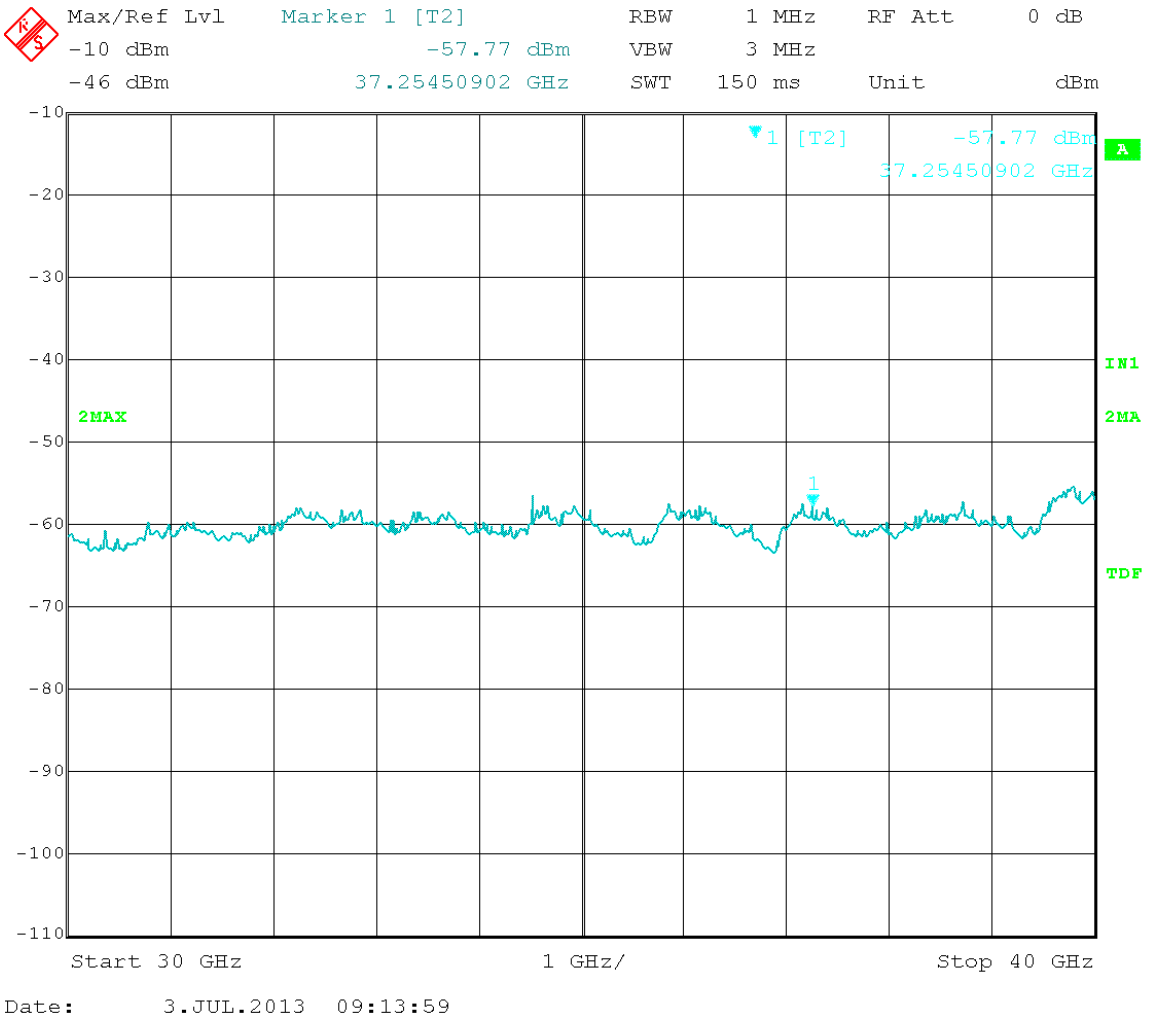
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



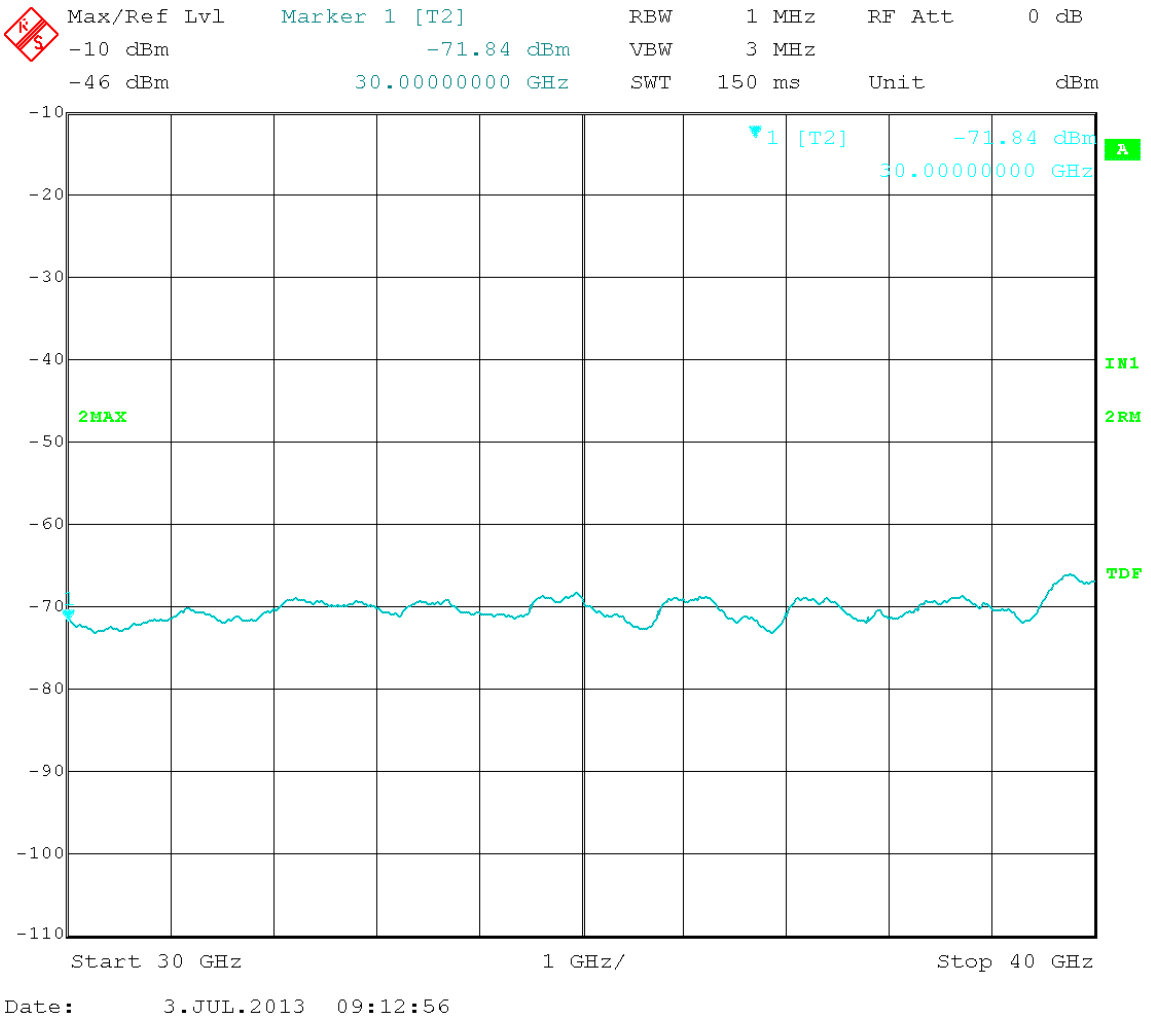
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 0
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



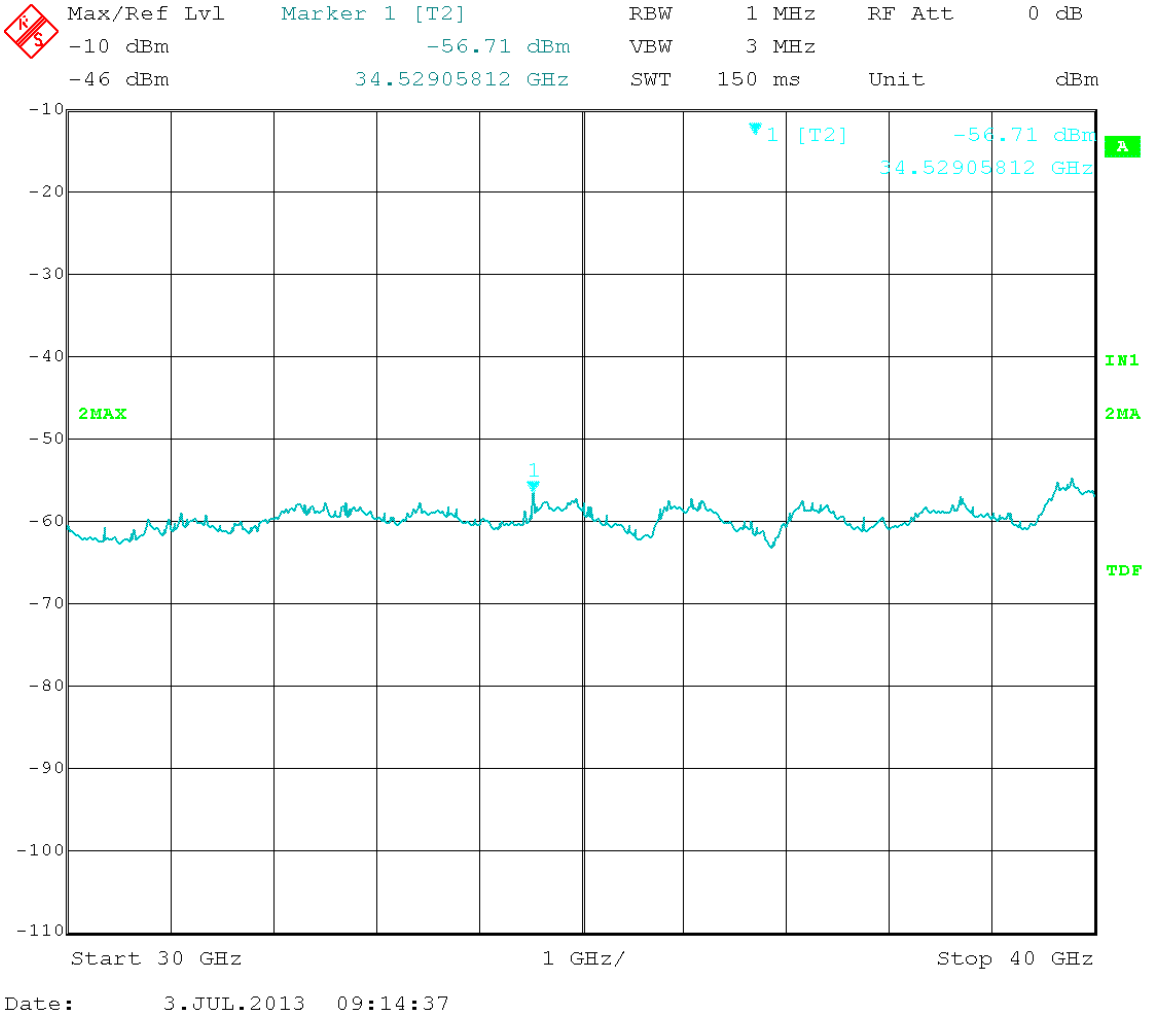
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

Peak Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



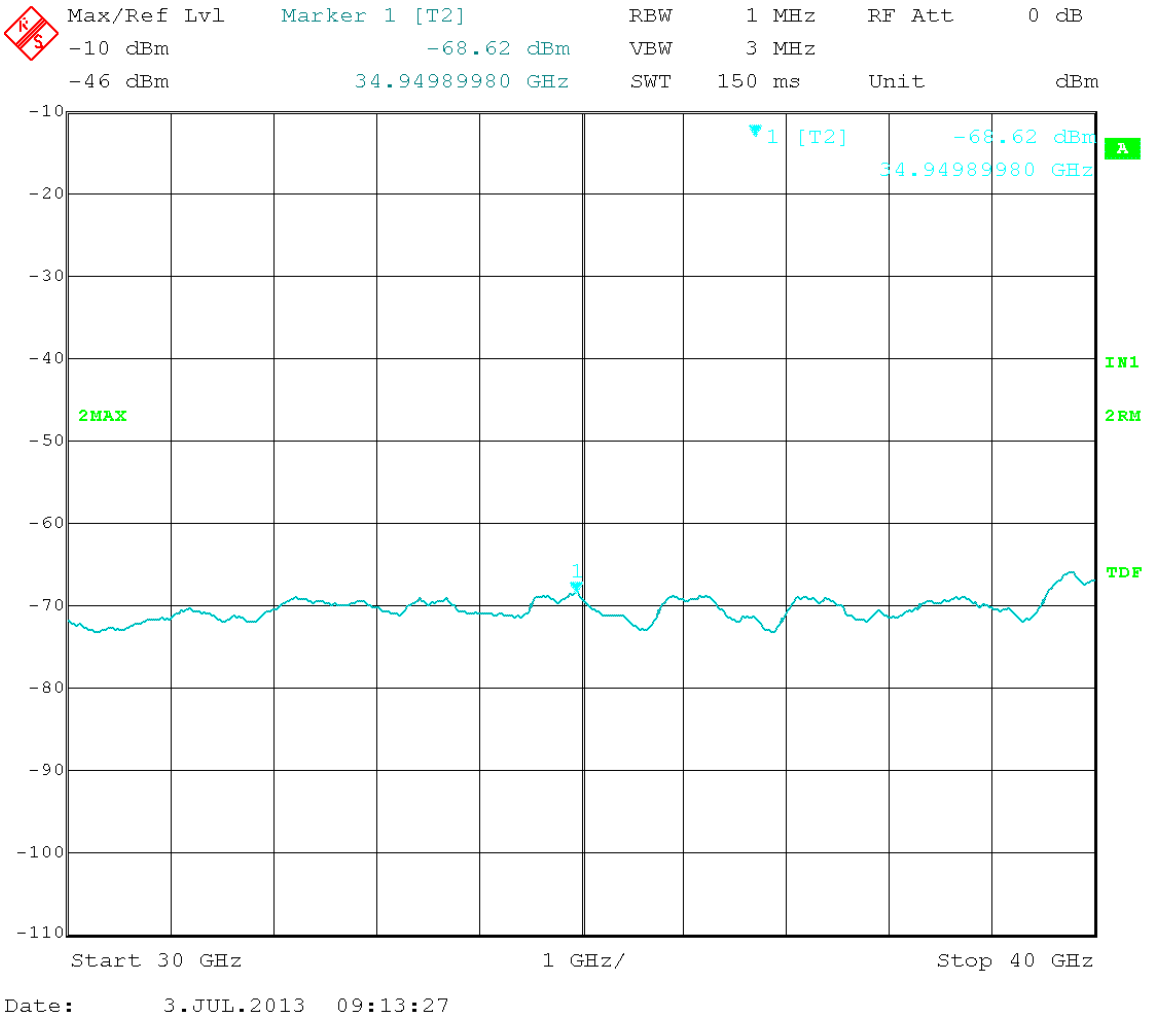
Marker 1: Greater than 20dB below limit

Test Date: 07-03-2013
Company: Cambium Networks
EUT: Avenger AP 5.4 GHz (Pont-to-Multipoint)
Test: Transmitter Unwanted Emissions – RF Conducted
Operator: Jim O

EUT Nominal Channel Bandwidth: 40 MHz
Output Port: Channel 1
Output Power Setting: 17
Antenna Gain: 16dBi

RMS Detector
High Channel Frequency: 5.705 GHz
Modulation Type: OFDM
EIRP Limit: -27dBm/MHz

Field strength limit (3 meters; Restricted Bands): 74dBµV/m Peak, 54dBµV/m Average
Corrected for external attenuation, cable and connector to antenna interface on radio.
Frequency Range: 30 GHz to 40 GHz



Marker 1: Greater than 20dB below limit

Appendix B – Measurement Data

B10.0 Unwanted Emission Levels – Radiated from cabinet

Rule Section: Sections 15.407(b)(3) and 15.407(b)(6)

Test Procedure: FCC KDB 789033 D01 General UNII Test Procedures v01r03 – *Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E*
Section H(1) – Unwanted emissions in the restricted bands
Section H(2) – Unwanted emissions that fall outside of the restricted bands
Section H(3) – General Requirements for Unwanted Emissions Measurements
Section H(4) – Procedure for Unwanted Emissions Measurements Below 1 GHz
Section H(5) – Procedure for Peak Unwanted Emissions Measurements Above 1 GHz
Section H(6) – Procedure for Average Unwanted Emissions Measurements Above 1 GHz
Section H(6)(c) – Average Detection method

Below 1000 MHz
Detector = quasi-peak
Alternately, peak detector is permitted

Peak measurements above 1000 MHz
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = peak
Sweep time = auto; increased by a factor of (1 / duty cycle)
Trace mode = max hold

Average measurements above 1000 MHz (required for peak emissions that are above the average limits) – Method AD (Average Detection)
RBW = 1 MHz
VBW ≥ 3 MHz
Detector = RMS (span/(# of points in sweep) ≤ RBW/2)
Averaging type = power
Sweep time = auto; increased by a factor of (1 / duty cycle)
Trace mode = trace average 100 sweeps; increased by a factor of (1 / duty cycle)
For a duty cycle less than 98%, add 10 log (1/duty cycle)

Limits: Outside restricted bands: Peak EIRP shall not exceed -27 dBm/MHz
Inside restricted bands: Peak and Average limits of FCC Part 15.209
Per Section H(2)(c)(i): "an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit."

Results: Passed

Notes: Both transmit chains active and at maximum power during test.

Antenna ports were terminated with 50 Ohm terminations.

Measurements were taken for MCS15 OFDM modulation at the lowest, middle, and highest channels of operation. EUT was set to transmit continuously with 100% duty cycle.

FCC Part 15.209 Class B

Electric Field Strength

EUT: 5.4 GHz Avenger AP
Manufacturer: Cambium Networks
Operating Condition: 73 deg. F; 64% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: 29.5 V DC (POE); L, M, and H channles
Comment: 20 & 40 MHz ch BW's; both chains active at 20 dBm, MCS15
Date: 06-13-2013

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)

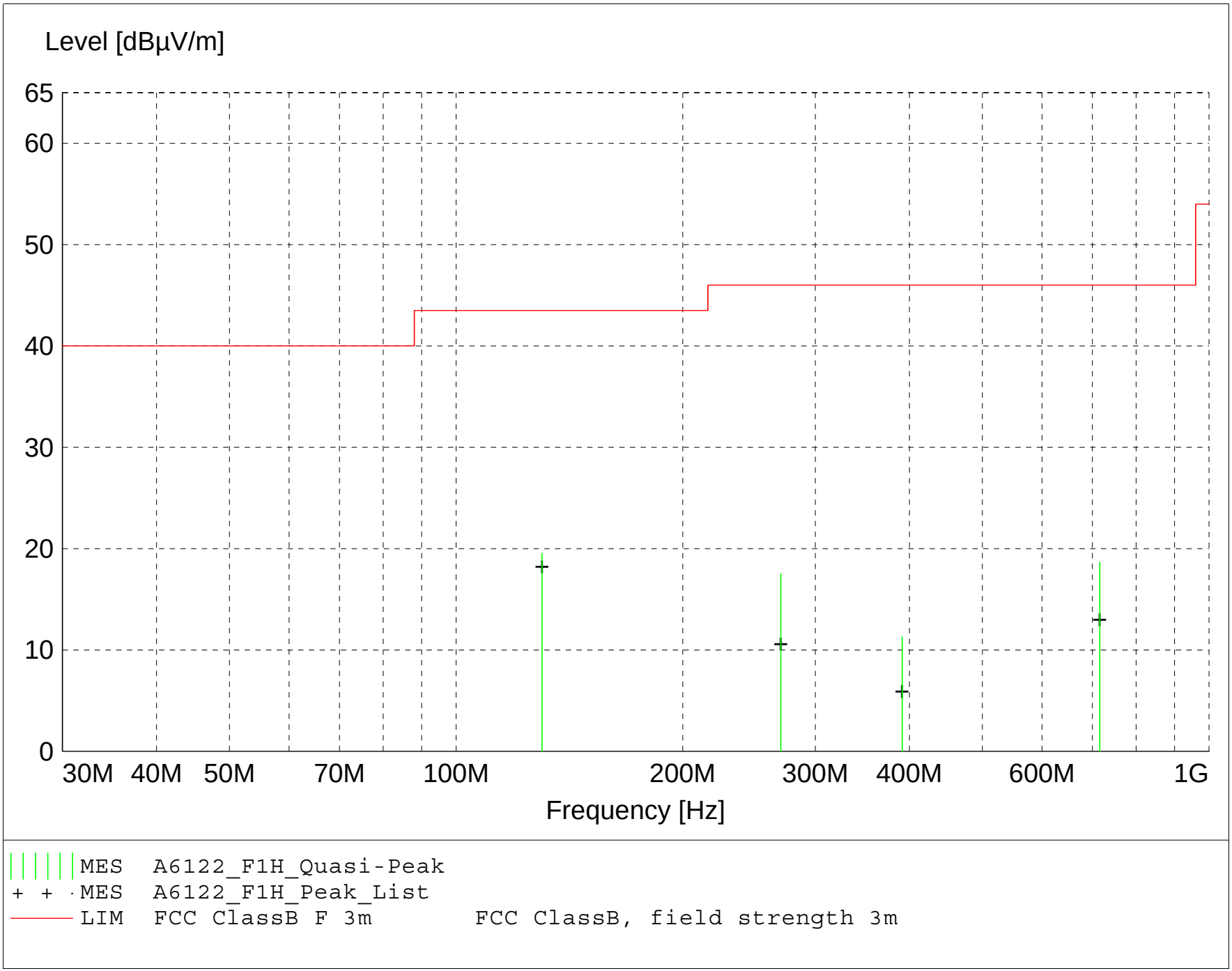
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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 A6122_F1H_Quasi-Peak
MES A6122_F1H_Peak_List
LIM FCC ClassB F 3m
FCC ClassB, field strength 3m

MEASUREMENT RESULT: "A6122_F1H_Final"

6/13/2013 10:03AM

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		
130.000000	29.07	12.90	-22.4	19.5	43.5	24.0	1.30	250	QUASI-PEAK	broadband
715.970000	16.37	21.04	-18.8	18.6	46.0	27.4	1.50	45	QUASI-PEAK	noise floor
269.970000	25.44	13.40	-21.3	17.5	46.0	28.5	3.10	290	QUASI-PEAK	None
391.250000	16.10	15.83	-20.6	11.3	46.0	34.7	1.00	0	QUASI-PEAK	noise floor

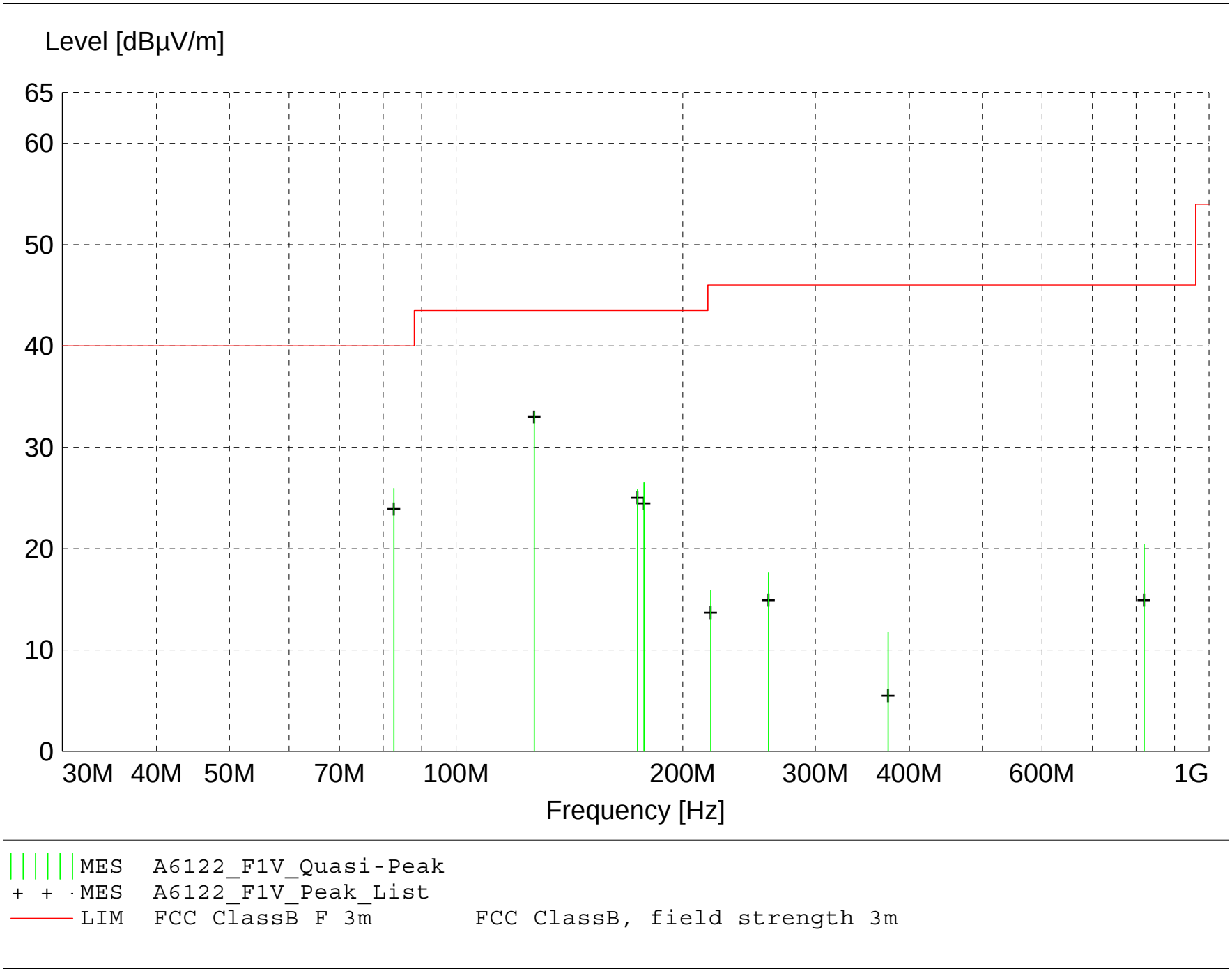
FCC Part 15.209 Class B

Electric Field Strength

```
EUT:                  5.4 GHz Avenger AP
Manufacturer:         Cambium Networks
Operating Condition:  73 deg. F; 64% R.H.
Test Site:            DLS O.F. Site 3
Operator:             Craig B
Test Specification:   29.5 V DC (POE);  L, M, and H channles
Comment:              20 & 40 MHz ch BW's; both chains active at 20 dBm, MCS15
                      Date:  06-13-2013
```

TEXT: "Vert 3 meters"

```
  Short Description:            Test Set-up


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


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

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


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

                |       Final maximized level using Quasi-Peak detector

                X       Final maximized level using Average dector

                #       Final maximized level using Peak detector
```


Level [dBµV/m]
65
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A6122_F1V_Quasi-Peak
MES A6122_F1V_Peak_List
LIM FCC ClassB F 3m
FCC ClassB, field strength 3m

MEASUREMENT RESULT: "A6122_F1V_Final"

6/13/2013 10:09AM

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		
127.005000	42.95	13.00	-22.5	33.5	43.5	10.0	1.00	260	QUASI-PEAK	broadband
82.675000	42.46	6.67	-23.2	25.9	40.0	14.1	1.20	315	QUASI-PEAK	broadband
177.640000	32.58	16.03	-22.1	26.5	43.5	17.0	1.00	290	QUASI-PEAK	broadband
174.135000	32.44	15.51	-22.1	25.8	43.5	17.7	1.00	270	QUASI-PEAK	broadband
819.980000	16.54	22.30	-18.4	20.4	46.0	25.6	1.00	0	QUASI-PEAK	noise floor
260.000000	26.13	13.00	-21.5	17.6	46.0	28.4	2.00	90	QUASI-PEAK	None
217.860000	26.11	11.54	-21.8	15.9	46.0	30.1	2.20	90	QUASI-PEAK	boradband
374.820000	17.14	15.29	-20.7	11.8	46.0	34.2	1.00	0	QUASI-PEAK	noise floor

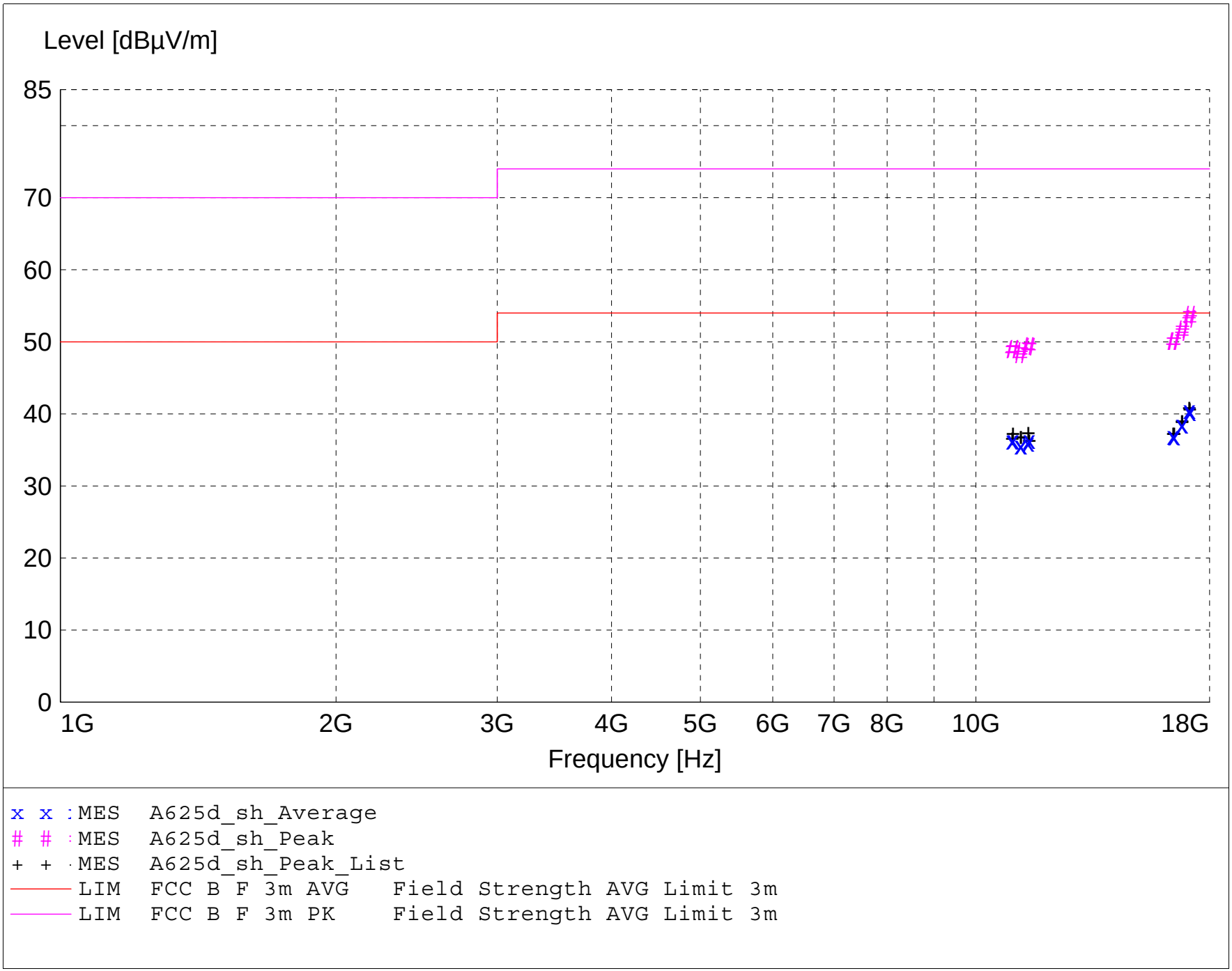
FCC Part 15.407

Electric Field Strength

```
EUT:                  Avenger AP 5.4GHz
Manufacturer:         Cambium Networks
Operating Condition:  23 deg C  29% R.H.
Test Site:            DLS O.F. G1
Operator:             Jim O
Test Specification:   Continuous TX; 1-18GHz
Comment:              L,M,H ch; 20MHz & 40MHz
                      Date:  6-25-2013
```

TEXT: "Horz 3 meters"

```
  Short Description:            Test Set-up


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


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

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


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

                |       Final maximized level using Quasi-Peak detector

                X       Final maximized level using Average dector

                #       Final maximized level using Peak detector

                -       Background Scan Peak Detector (Optional)

                -       Background Scan Average Detector (Optional)
```



x x : MES A625d_sh_Average
: MES A625d_sh_Peak
+ + : MES A625d_sh_Peak_List
——— LIM FCC B F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC B F 3m PK Field Strength AVG Limit 3m

MEASUREMENT RESULT: "A625d_sh_Final"

6/25/2013 1:22PM

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		
17115.020000	32.60	41.18	-33.2	40.5	54.0	13.5	1.50	0	AVERAGE	40M hch 3rd NF
17130.000000	32.28	41.22	-33.3	40.2	54.0	13.8	1.50	0	AVERAGE	None
16800.100000	32.60	39.93	-34.0	38.5	54.0	15.5	1.50	0	AVERAGE	40M mch 3rd NF
16799.520000	32.60	39.93	-34.0	38.5	54.0	15.5	1.50	0	AVERAGE	20M mch 3rd NF
16430.020000	33.12	38.18	-34.4	36.9	54.0	17.1	1.50	0	AVERAGE	None
16470.100000	32.92	38.39	-34.4	36.9	54.0	17.1	1.50	0	AVERAGE	40M lch 3rd NF
10979.980000	31.34	38.17	-33.1	36.4	54.0	17.6	1.50	0	AVERAGE	40M lch 2nd NF
11440.000000	30.96	38.60	-33.2	36.3	54.0	17.7	1.50	0	AVERAGE	NF
10960.060000	31.21	38.17	-33.1	36.2	54.0	17.8	1.50	0	AVERAGE	None
11410.060000	30.83	38.54	-33.4	36.0	54.0	18.0	1.50	0	AVERAGE	40M hch 2nd NF
11199.800000	30.28	38.37	-33.0	35.6	54.0	18.4	1.50	0	AVERAGE	20M mch 2nd NF
11199.520000	30.28	38.37	-33.0	35.6	54.0	18.4	1.50	0	AVERAGE	40M mch 2nd NF
17115.020000	45.86	41.18	-33.2	53.8	74.0	20.2	1.50	0	MAX PEAK	40M hch 3rd NF
17130.000000	45.30	41.22	-33.3	53.2	74.0	20.8	1.50	0	MAX PEAK	20M lch 3rd NF
16799.520000	45.86	39.93	-34.0	51.8	74.0	22.2	1.50	0	MAX PEAK	20M mch 3rd NF
16800.100000	45.44	39.93	-34.0	51.4	74.0	22.6	1.50	0	MAX PEAK	40M mch 3rd NF
16430.020000	46.29	38.18	-34.4	50.1	74.0	23.9	1.50	0	MAX PEAK	None
16470.100000	46.15	38.39	-34.4	50.1	74.0	23.9	1.50	0	MAX PEAK	40M lch 3rd NF
11410.060000	44.22	38.54	-33.4	49.4	74.0	24.6	1.50	0	MAX PEAK	40M hch 2nd NF
11440.000000	43.95	38.60	-33.2	49.3	74.0	24.7	1.50	0	MAX PEAK	NF
10979.980000	43.95	38.17	-33.1	49.0	74.0	25.0	1.50	0	MAX PEAK	40M lch 2nd NF
10960.060000	43.95	38.17	-33.1	49.0	74.0	25.0	1.50	0	MAX PEAK	None
11199.800000	43.40	38.37	-33.0	48.7	74.0	25.3	1.50	0	MAX PEAK	20M mch 2nd NF
11199.520000	42.99	38.37	-33.0	48.3	74.0	25.7	1.50	0	MAX PEAK	40M mch 2nd NF

fcc Part 15.407

Electric Field Strength

EUT:	Avenger AP 5.4GHz
Manufacturer:	Cambium Networks
Operating Condition:	23 deg C 29% R.H.
Test Site:	DLS O.F. G1
Operator:	Jim O
Test Specification:	Continuous TX; 1-18GHz
Comment:	L, M, & H ch; 20MHz & 40MHz
	Date: 6-25-2013

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

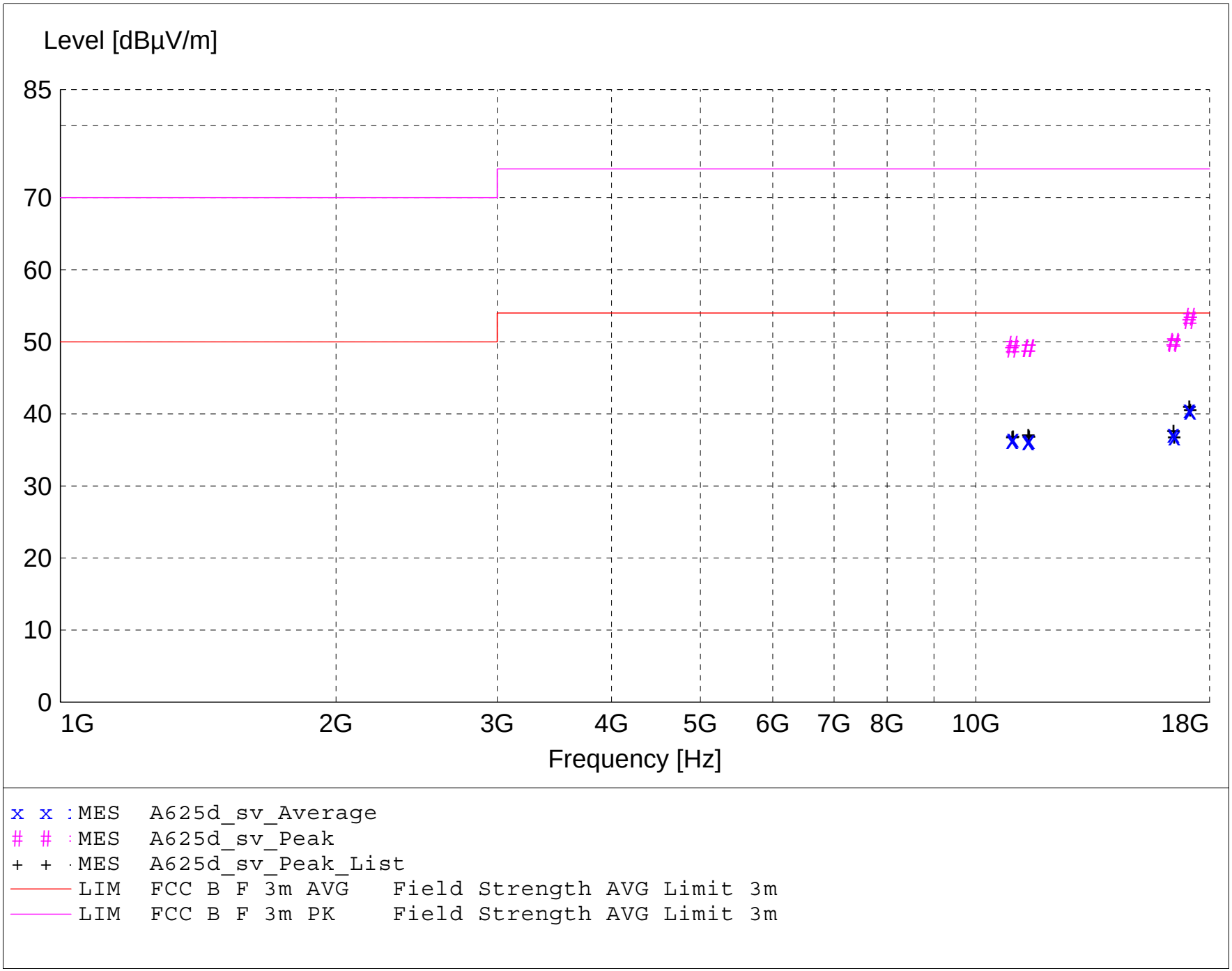
Sample Equations:

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

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

Graph Markers:

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



x x : MES A625d_sv_Average
: MES A625d_sv_Peak
+ + : MES A625d_sv_Peak_List
——— LIM FCC B F 3m AVG Field Strength AVG Limit 3m
——— LIM FCC B F 3m PK Field Strength AVG Limit 3m

MEASUREMENT RESULT: "A625d_sv_Final"

6/25/2013 10:55AM

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		
17114.860000	32.71	41.18	-33.2	40.6	54.0	13.4	1.50	0	AVERAGE	40M hch 3rd NF
17144.900000	32.50	41.26	-33.3	40.4	54.0	13.6	1.50	0	AVERAGE	20M hch 3rd NF
16439.960000	33.32	38.23	-34.4	37.2	54.0	16.8	1.00	0	AVERAGE	20M lch 3rd NF
16469.960000	32.92	38.39	-34.4	36.9	54.0	17.1	1.50	0	AVERAGE	40M lch 3rd NF
10980.000000	31.46	38.17	-33.1	36.5	54.0	17.5	1.50	0	AVERAGE	40M lch 2nd NF
11429.960000	31.08	38.58	-33.3	36.4	54.0	17.6	1.50	0	AVERAGE	20M hch 2nd NF
10959.980000	31.34	38.17	-33.1	36.4	54.0	17.6	1.50	0	AVERAGE	20M lch 2nd NF
11409.840000	30.96	38.54	-33.4	36.1	54.0	17.9	1.50	0	AVERAGE	40M hch 2nd NF
17114.860000	45.58	41.18	-33.2	53.5	74.0	20.5	1.50	0	MAX PEAK	40M hch 3rd NF
17144.900000	45.02	41.26	-33.3	52.9	74.0	21.1	1.50	0	MAX PEAK	20M hch 3rd NF
16439.960000	46.15	38.23	-34.4	50.0	74.0	24.0	1.00	0	MAX PEAK	20M lch 3rd NF
16469.960000	45.86	38.39	-34.4	49.8	74.0	24.2	1.50	0	MAX PEAK	40M lch 3rd NF
10959.980000	44.62	38.17	-33.1	49.7	74.0	24.3	1.50	0	MAX PEAK	20M lch 2nd NF
11409.840000	43.95	38.54	-33.4	49.1	74.0	24.9	1.50	0	MAX PEAK	40M hch 2nd NF
11429.960000	43.81	38.58	-33.3	49.1	74.0	24.9	1.50	0	MAX PEAK	20M hch 2nd NF
10980.000000	43.95	38.17	-33.1	49.0	74.0	25.0	1.50	0	MAX PEAK	40M lch 2nd NF

FCC Part 15 Class B

Electric Field Strength

EUT: 5.4 GHz Avenger AP
Manufacturer: Cambium Networks
Operating Condition: 73 deg. F; 68% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: Continuous transmit 20 and 40 MHz ch bandwidths; MCS15
Comment: Cabinet radiated; power set to 14; Low, Mid, and High channels
Date: 06-27-2013

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)

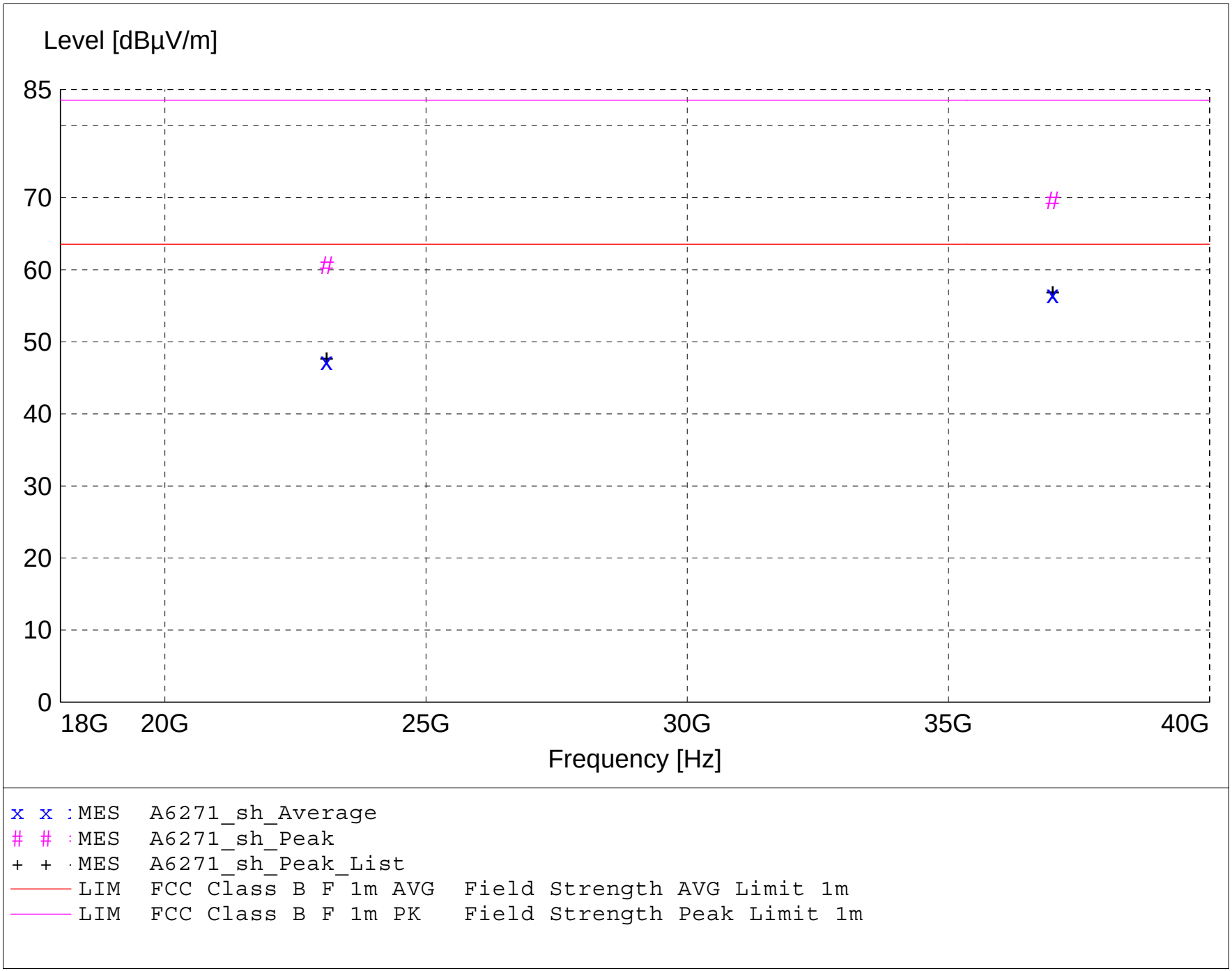
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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]
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70
60
50
40
30
20
10
0
18G
20G
25G
30G
35G
40G
Frequency [Hz]
x x :MES A6271_sh_Average
:MES A6271_sh_Peak
+ + :MES A6271_sh_Peak_List
LIM FCC Class B F 1m AVG Field Strength AVG Limit 1m
LIM FCC Class B F 1m PK Field Strength Peak Limit 1m

MEASUREMENT RESULT: "A6271_sh_Final"

6/27/2013 12:26PM

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		
36998.000000	47.10	46.37	-36.9	56.6	63.5	6.9	1.00	0	AVERAGE	noise floor
36998.000000	60.14	46.37	-36.9	69.6	83.5	13.9	1.00	0	MAX PEAK	noise floor
23098.600000	48.70	46.03	-47.5	47.2	63.5	16.3	1.00	0	AVERAGE	noise floor
23098.600000	62.13	46.03	-47.5	60.7	83.5	22.9	1.00	0	MAX PEAK	noise floor

FCC Part 15 Class B

Electric Field Strength

EUT: 5.4 GHz Avenger AP
Manufacturer: Cambium Networks
Operating Condition: 73 deg. F; 68% R.H.
Test Site: DLS O.F. Site 3
Operator: Craig B
Test Specification: Continuous transmit 20 and 40 MHz ch bandwidths; MCS15
Comment: Cabinet radiated; power set to 14; Low, Mid, and High channels
Date: 06-27-2013

TEXT: "Vert 1 meters"

Short Description: Test Set-up

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

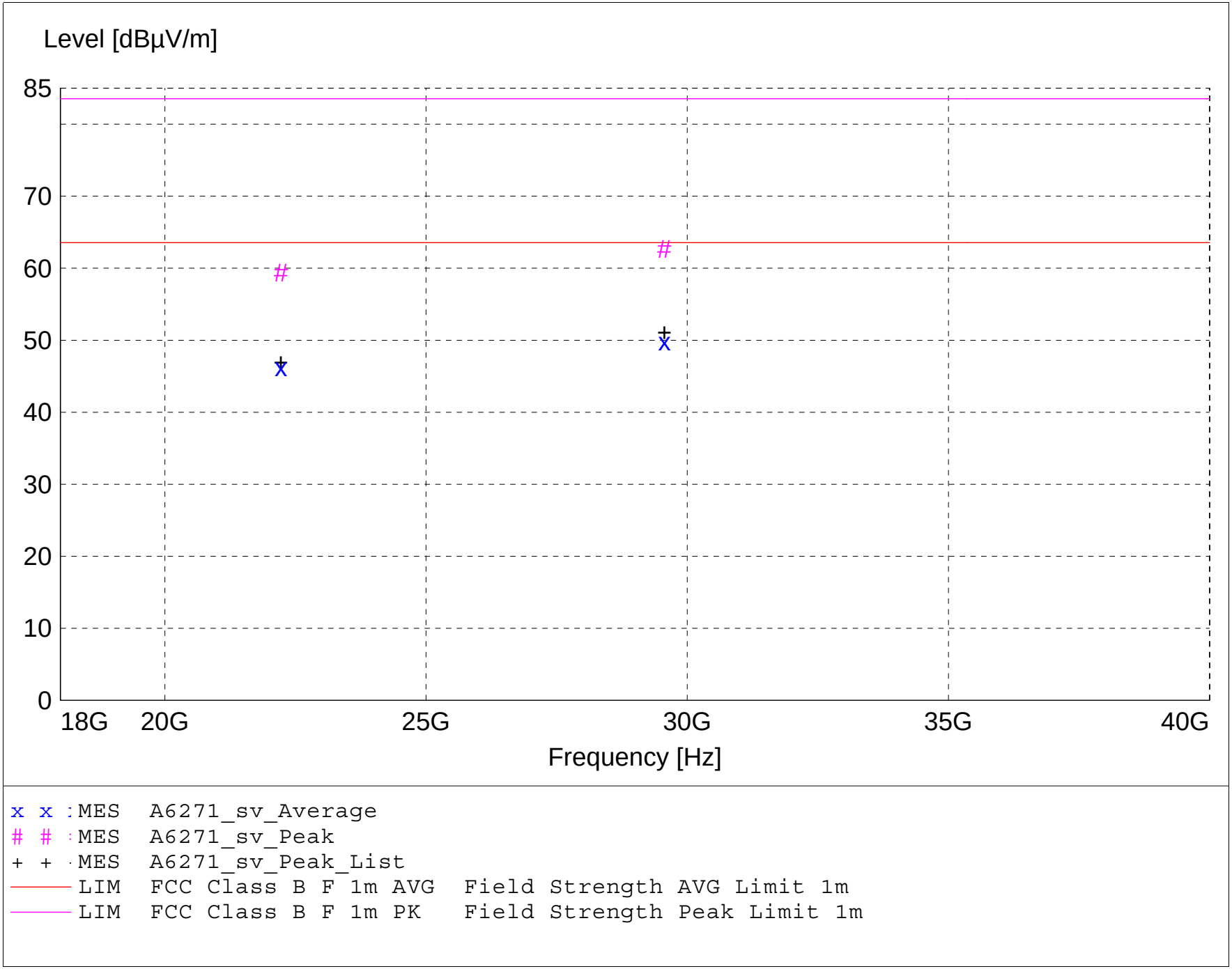
Sample Equations:

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

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

Graph Markers:

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



x x :MES A6271_sv_Average
:MES A6271_sv_Peak
+ + :MES A6271_sv_Peak_List
——— LIM FCC Class B F 1m AVG Field Strength AVG Limit 1m
——— LIM FCC Class B F 1m PK Field Strength Peak Limit 1m

MEASUREMENT RESULT: "A6271_sv_Final"

6/27/2013 11:43AM

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		
29562.000000	46.23	46.45	-42.9	49.8	63.5	13.7	1.00	0	AVERAGE	noise floor
22223.600000	49.16	46.37	-49.3	46.3	63.5	17.3	1.00	0	AVERAGE	noise floor
29562.000000	59.09	46.45	-42.9	62.7	83.5	20.9	1.00	0	MAX PEAK	noise floor
22223.600000	62.26	46.37	-49.3	59.4	83.5	24.2	1.00	0	MAX PEAK	noise floor

Appendix B – Measurement Data

B11.0 AC Line Conducted Emissions

Rule Part: FCC Part 15.207

Test Procedure: ANSI C63.10-2009
Section 6.2

Limit: FCC Part 15.207(a)

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 Class B

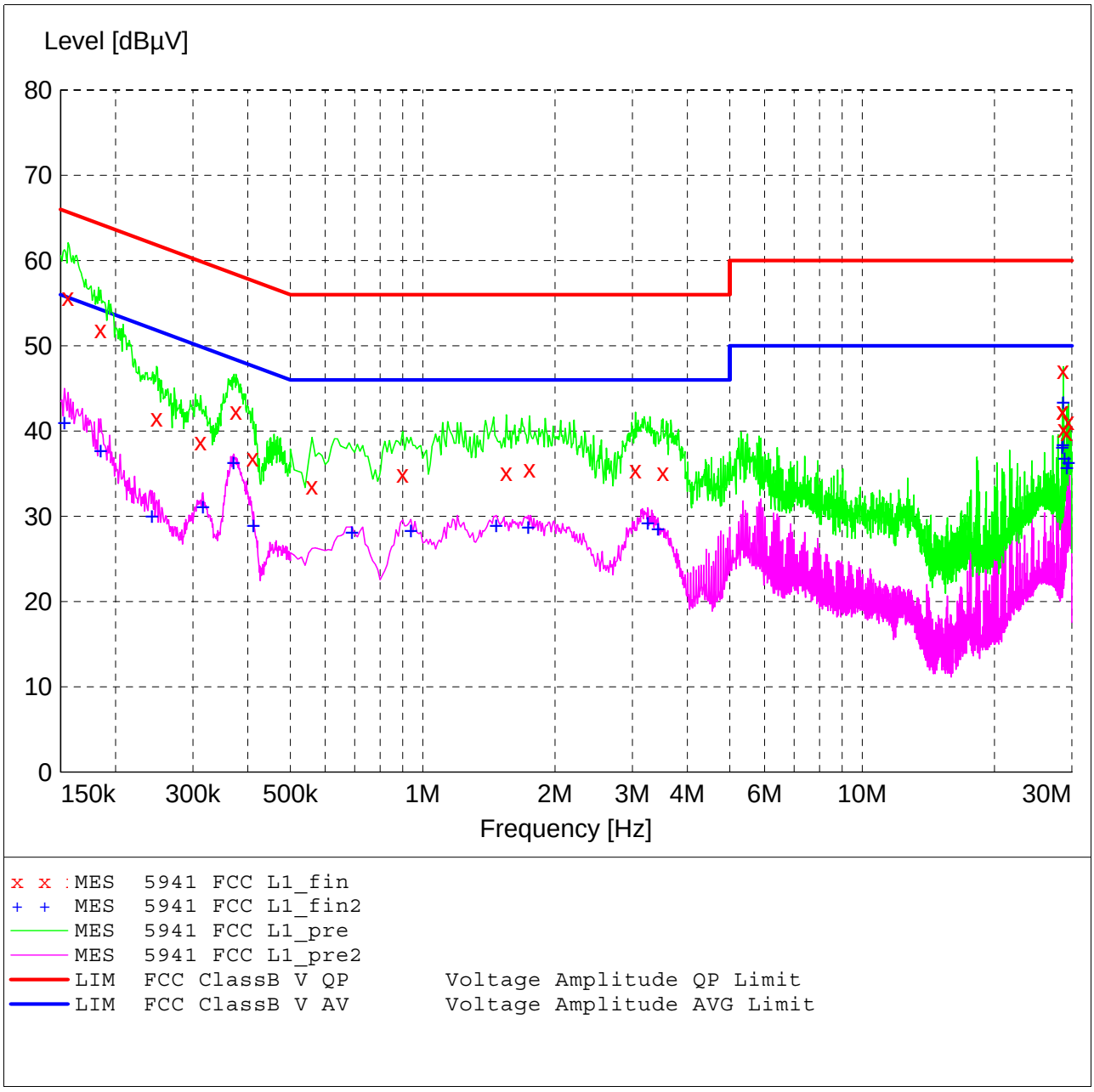
Voltage Mains Test

EUT:	Avenger AP Radio 5.4GHz
Manufacturer:	Cambium Networks
Operating Condition:	70 deg. F, 34% R.H.
Test Site:	DLS O.F. Screen Room
Operator:	Jim O/Lillian Li
Test Specification:	120V, 60Hz
Comment:	Continious TX; Line 1
	6-17-2013

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	5.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "5947 FCC L1_fin"

6/17/2013 9:06AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.156000	55.70	13.6	66	10.0	QP
0.185000	51.90	12.9	64	12.4	QP
0.248000	41.50	12.1	62	20.3	QP
0.312000	38.80	11.8	60	21.1	QP
0.376000	42.40	11.5	58	16.0	QP
0.410000	36.90	11.4	58	20.7	QP
0.560000	33.60	11.1	56	22.4	QP
0.900000	35.00	10.7	56	21.0	QP
1.550000	35.20	10.6	56	20.8	QP
1.750000	35.60	10.6	56	20.4	QP
3.050000	35.50	10.7	56	20.5	QP
3.520000	35.20	10.7	56	20.8	QP
28.565000	42.30	11.7	60	17.7	QP
28.625000	42.40	11.7	60	17.6	QP
28.685000	47.10	11.7	60	12.9	QP
28.745000	40.20	11.7	60	19.8	QP
29.240000	39.90	11.8	60	20.1	QP
29.480000	41.20	11.8	60	18.8	QP

MEASUREMENT RESULT: "5947 FCC L1_fin2"

6/17/2013 9:06AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.153000	41.00	13.7	56	14.8	CAV
0.185000	37.70	12.9	54	16.6	CAV
0.242000	30.00	12.2	52	22.0	CAV
0.316000	31.10	11.8	50	18.7	CAV
0.371000	36.30	11.5	49	12.2	CAV
0.412000	28.90	11.4	48	18.7	CAV
0.690000	28.10	10.8	46	17.9	CAV
0.940000	28.30	10.7	46	17.7	CAV
1.470000	28.90	10.6	46	17.1	CAV
1.740000	28.70	10.6	46	17.3	CAV
3.250000	29.20	10.7	46	16.8	CAV
3.430000	28.50	10.7	46	17.5	CAV
28.565000	38.10	11.7	50	11.9	CAV
28.625000	38.30	11.7	50	11.7	CAV
28.685000	43.30	11.7	50	6.7	CAV
28.865000	36.80	11.7	50	13.2	CAV
29.240000	35.70	11.8	50	14.3	CAV
29.480000	36.30	11.8	50	13.7	CAV

FCC Part 15 Class B

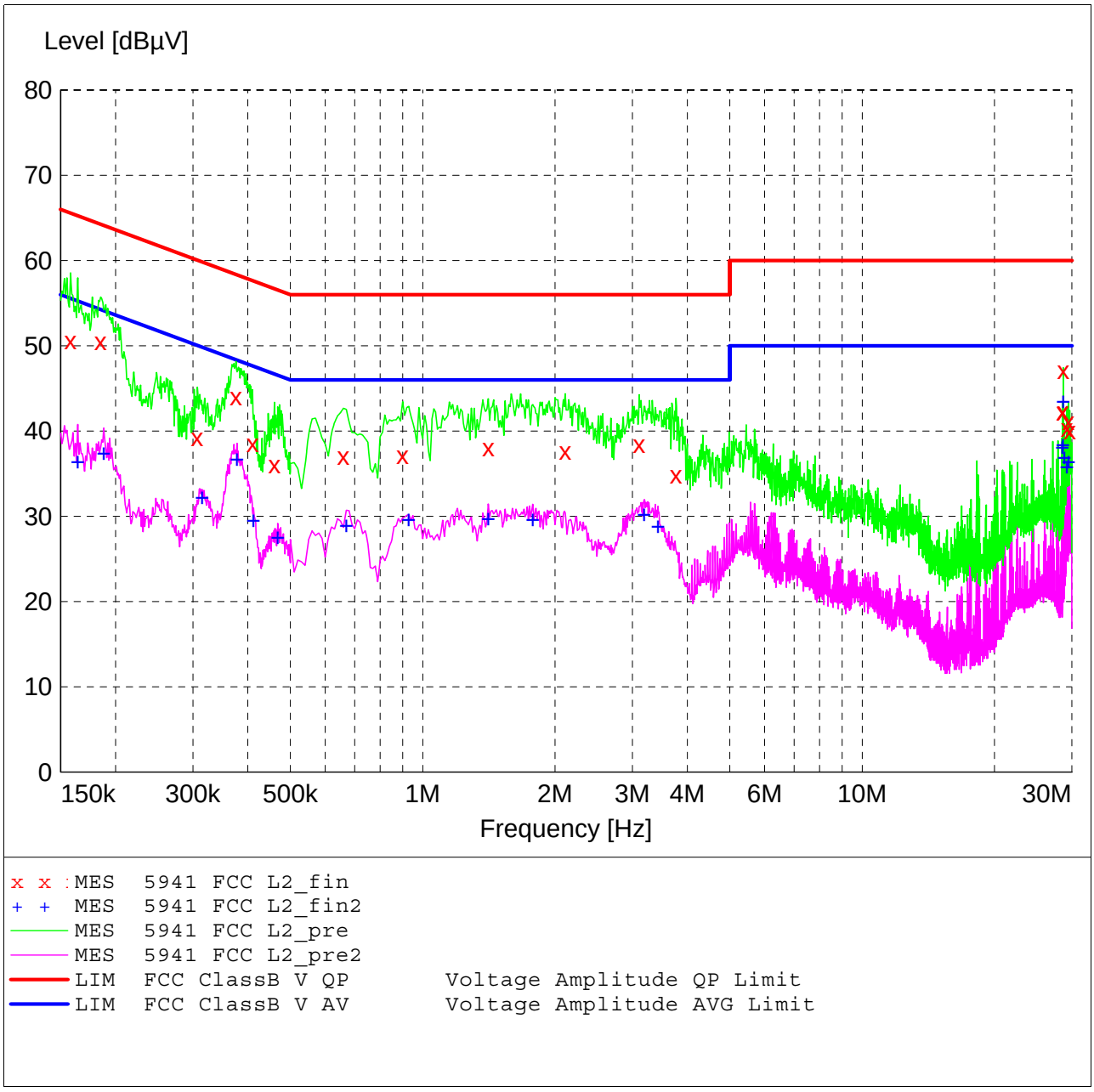
Voltage Mains Test

EUT:	Avenger AP Radio 5.4GHz
Manufacturer:	Cambium Networks
Operating Condition:	70 deg. F, 34% R.H.
Test Site:	DLS O.F. Screen Room
Operator:	Jim O/Lillian Li
Test Specification:	120V, 60Hz
Comment:	Continious TX; Line 2
	6-17-2013

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	5.0 s	9 kHz	LISN DLS#128



MEASUREMENT RESULT: "5947 FCC L2_fin"

6/17/2013 9:17AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.158000	50.60	13.6	66	15.0	QP
0.185000	50.50	12.9	64	13.8	QP
0.307000	39.30	11.8	60	20.8	QP
0.376000	44.00	11.5	58	14.4	QP
0.410000	38.60	11.4	58	19.0	QP
0.460000	36.10	11.3	57	20.6	QP
0.660000	37.10	10.9	56	18.9	QP
0.900000	37.20	10.7	56	18.8	QP
1.410000	38.10	10.6	56	17.9	QP
2.110000	37.60	10.6	56	18.4	QP
3.110000	38.50	10.7	56	17.5	QP
3.770000	34.90	10.7	56	21.1	QP
28.565000	42.20	11.7	60	17.8	QP
28.625000	42.30	11.7	60	17.7	QP
28.685000	47.10	11.7	60	12.9	QP
29.240000	40.30	11.8	60	19.7	QP
29.480000	41.10	11.8	60	18.9	QP
29.660000	40.00	11.8	60	20.0	QP

MEASUREMENT RESULT: "5947 FCC L2_fin2"

6/17/2013 9:17AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector
0.164000	36.40	13.4	55	18.9	CAV
0.188000	37.40	12.9	54	16.7	CAV
0.315000	32.20	11.8	50	17.6	CAV
0.378000	36.70	11.5	48	11.6	CAV
0.412000	29.50	11.4	48	18.1	CAV
0.468000	27.50	11.3	47	19.0	CAV
0.670000	28.90	10.8	46	17.1	CAV
0.930000	29.60	10.7	46	16.4	CAV
1.410000	29.70	10.6	46	16.3	CAV
1.780000	29.60	10.6	46	16.4	CAV
3.190000	30.20	10.7	46	15.8	CAV
3.430000	28.80	10.7	46	17.2	CAV
28.565000	38.10	11.7	50	11.9	CAV
28.625000	38.30	11.7	50	11.7	CAV
28.685000	43.40	11.7	50	6.6	CAV
28.865000	36.90	11.7	50	13.1	CAV
29.240000	35.80	11.8	50	14.2	CAV
29.480000	36.40	11.8	50	13.6	CAV

END OF REPORT

Revision #	Date	Comments	By
1.0	7-30-2013	Preliminary Release	JS
1.1	8-06-2013	Added data	LL
1.2	8-07-2013	Final compilation with photos & bookmarks	JS
1.3	8-08-2013	Final edits	JS
1.4	8-28-2013	New mid channel data & updated model number	JS
1.5	8-29-2013	20MHz BW mid channel data update	JS