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

Company:	Cambium Networks
Models Tested:	C009045A001A
Report Number:	21322
Project Number:	7505

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators
Section 15.247
Operation within the bands 902 - 928 MHz, 2400 – 2483.5 MHz and 5725 – 5850 MHz,

THE FOLLOWING **MEETS** THE ABOVE TEST SPECIFICATION

Formal Name:	PMP450i 900MHz AP MIMO Transceiver
Kind of Equipment:	Transceiver
Frequency Range:	902 - 928 MHz
Test Configuration:	Tabletop
Model Number(s):	C009045A001A
Model Tested:	C009045A001A
Serial Number(s):	Unit for RF Conducted & Radiated Above 1GHz testing: 0A003E4586C8 Unit for Radiated Below 1GHz testing: 0A003E4586BA
Date of Tests:	October 5th to 12th, 2015
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
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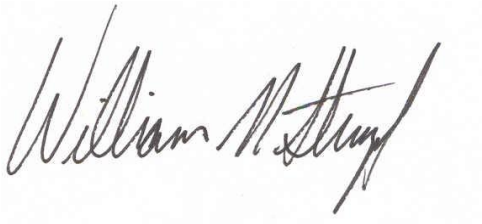
SIGNATURE PAGE

Tested By:

Paul Leo
Test Engineer

Craig Brandt
Senior Engineer

Reviewed By:



William m. Stumpf
OATS Manager

Approved By:

Brian Mattson
General Manager

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United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

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

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

Electromagnetic Compatibility & 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).

2015-09-25 through 2016-09-30
Effective Dates

For the National Voluntary Laboratory Accreditation Program

ELECTROMAGNETIC COMPATIBILITY & TELECOMMUNICATIONS

NVLAP LAB CODE 100276-0

Emissions

Designation	***Description***
Off-site test location	D.L.S. Electronics performs radiated emissions testing at an additional location, 166 South Carter Street, Genoa City, WI 53128.

1.0 Summary of Test Report

It was determined that the Cambium Networks PMP450i 900MHz AP MIMO Transceiver, Model C009045A001A, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247.

Subpart C Section 15.247 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
Informative	Duty Cycle	FCC KDB 558074 Section 6.0		NA
15.247(a)(2)	DTS Bandwidth	FCC KDB 558074 Sections 8.0, 8.1 & 8.2	1	Yes
15.247(b)(3),(b)(4)	Fundamental Emission Output Power	FCC KDB 558074 Sections 9.2 & 9.2.3.1 FCC KDB 662911(E)(1)	1	Yes
15.247(e)	Maximum Power Spectral Density	FCC KDB 558074 Sections 10.0 & 10.6 FCC KDB 662911 (E)(2)(c)	1	Yes
15.247(d)	Emissions in Non-Restricted Frequency Bands – RF Conducted	FCC KDB 558074 Sections 11.0, 11.2 & 11.3	1	Yes
15.247(d), 15.209	Radiated Spurious in Restricted Bands Below 1GHz	FCC KDB 558074 ANSI C63.10-2013	2	Yes
15.247(d), 15.205(5), 15.209(a)	Radiated Spurious in Restricted Bands Above 1GHz	FCC KDB 558074 Sections 12.0 & 12.1 ANSI C63.10-2013	2	Yes
15.247(d)	Band-edge Measurements – RF Conducted	FCC KDB 558074 Sections 11.0, 11.2 & 11.3	1	Yes
15.207(a)	AC Line Conducted Emissions	ANSI C63.4-2014	3	Yes

Note 1: RF Conducted measurement.
Note 2: Radiated Emissions measurement.
Note 3: AC Mains Emissions measurement

2.0 Introduction

From October 5th to 12th, 2015 two units of the PMP450i 900MHz AP MIMO Transceiver, Model C009045A001A, as provided from Cambium Networks were tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247. 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:

Cambium Networks fixed outdoor frame based wireless transceiver with 12dBi Yagi antenna or 13dBi Sector antenna. Tested with worst case highest channel bandwidth of 20MHz and lowest channel bandwidth of 5MHz.

Type of Equipment / Frequency Range:

Stand-Alone Transceiver / 902 MHz to 928 MHz

Physical Dimensions of Equipment Under Test:

Length: 10” x Width: 5.25” x Height: 3.5”

Power Source:

56 VDC (Power Over Ethernet to Radio)
AC - 120V/60Hz, 240V/60Hz

4.0 Description of Test Sample continued…

Internal Frequencies:

55 kHz (switching power supply frequency)
40 MHz, 25 MHz, 20 MHz

Transmit / Receive Frequencies Used For Test Purpose:

5MHz BW – Low channel 904.550 MHz
Mid channel 915 MHz
High channel 925.450 MHz

20MHz BW – Low channel 912 MHz
Mid channel 916 MHz
High channel 918 MHz

Type of Modulation(s):

OFDM: QPSK tested as worst case modulation scheme as per Cambium Networks

Antenna Types:

12 dBi Yagi antenna or
13 dBi Sector antenna attached with female N-type connectors

Description of Circuit Board(s) / Part Number:

Cambium Networks PC Board	A006000
12 dBi Yagi Antenna	DB900-12-9D-25
13 dBi Sector Antenna	PS900-13-65X-2N
2 x LMR 1 dB Cables	30009406002
2 x N Female Connectors	NA

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 – G1, Site 2 and Screen Room

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Emissions 30-1000 MHz (S2)						
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	6-25-15	6-25-16
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	10-1-14	10-1-16
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	10-24-14	10-24-16
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A
Emissions 1-10 GHz (G1)						
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	6-25-15	6-25-16
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	1-26-15	1-26-16
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	6-1-15	6-1-17
Filter- High-Pass	Planar Filter Co.	HP2G-1780-CD-SS	PF1227/0728	1.5GHz-18GHz	6-29-15	6-29-16
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A
AC Line Conducted (Screen Room)						
Receiver	Narda PMM	9010F	020WW40102	10Hz-50MHz	6-25-15	6-25-16
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	5-21-15	5-21-16
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	1-7-15	1-7-16
Limiter	Electro-Metrics	EM-7600	705	9 kHz – 30 MHz	1-7-15	1-7-16
Test Software	Narda PMM	PMM Emission Suite	Rel.2.17	N/A	N/A	N/A

Test Equipment continued: **D.L.S. Wisconsin – Chamber G1**

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Dates	Cal Due Dates
Other (G1)						
20 dB attenuator	Aeroflex/weinschel	75A-20-12	1071	DC – 40 GHz	7-1-15	7-1-16
20 dB attenuator	Anritsu	42N50-20	000451	DC – 18 GHz	5-29-15	5-29-16
Thermal Power Sensor	Rohde & Schwarz	NRP-Z51	1138.0005.03-104290-Wq	DC - 18GHz	6-25-15	6-25-16

6.0 Test Arrangements

Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to FCC KDB 558074 D01 v03r03, ANSI C63.4-2014, and ANSI C63.10-2013 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 – provede as a separate exhibit.

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

Test Conditions recorded during test:

Temperature and Humidity:

66°F at 51% RH or as noted on test data

Voltage:

56 VDC (Power Over Ethernet to Radio)
AC - 120V/60Hz, 240V/60Hz

8.0 Modifications Made To EUT for Compliance

None noted at time of test.

9.0 Additional Descriptions from Test Engineer

Continuous transmit less than 98% duty cycle on low, mid and high channels.
5 and 20 MHz channel bandwidths.
QPSK type modulation.
Tested with 12 dBi Yagi antenna and with 13 dBi Sector antenna..

FCC ID: Z8H89FT0022

Emission Designators: 5M0X1D, 20M0X1D

10.0 Antenna Statement

SECTION 15.203 ANTENNA REQUIREMENT

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device…. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221.

Statement: This wireless device (Intentional Radiator) meets the requirements of FCC Part 15.203:

☐ The antenna is permanently attached

☐ The antenna has a unique coupling to the intentional radiator.
Description of coupling:

☒ This intentional radiator is professionally installed

☐ This intentional radiator, in accordance with Section 15.31(d), must be measured at the installation site.

11.0 Results

Measurements were performed in accordance with FCC KDB 558074 D01 DTS Meas Guidance v03r03, ANSI C63.4-2014, and ANSI C63.10-2013. Graphical and tabular data can be found in Appendix B at the end of this report.

12.0 Conclusion

The PMP450i 900MHz AP MIMO Transceiver, Model C009045A001A, as provided from Cambium Networks tested from October 5th to 12th, 2015 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247.

Appendix A – Test Photos - provided in a separate exhibit

Appendix B – Measurement Data

B1.0 Duty Cycle

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
Section 6.0 Duty cycle
Paragraph b, zero-span mode on spectrum analyzer

Limit:

Informative

Results:

5 MHz channel bandwidth – during RF conducted measurements: **17.13%**
(This was the highest duty cycle achievable with the test software at the time of test)
5 MHz channel bandwidth – during radiated measurements: **47.20%**
20 MHz channel bandwidth: **65.60%**

Notes:

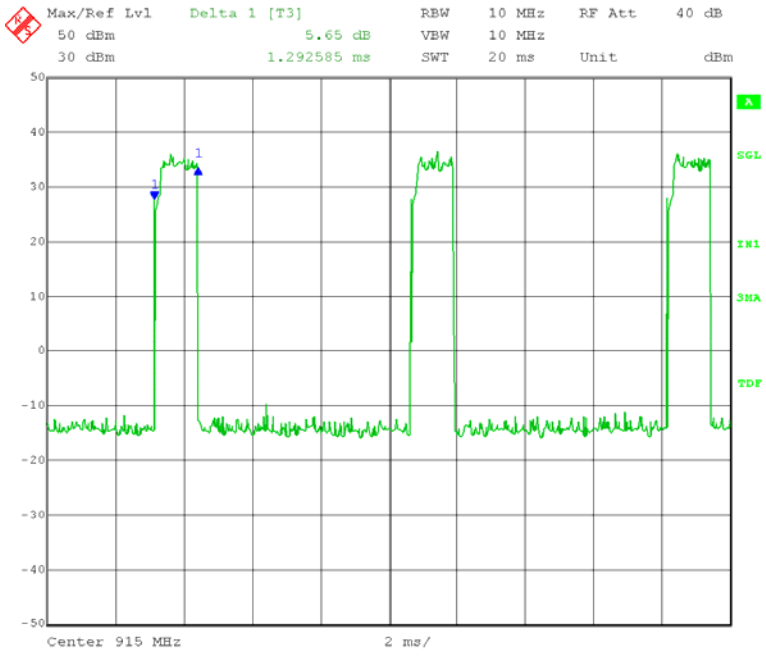
Duty cycle is less than 98%. Therefore, measured average values must be corrected by adding a duty cycle correction factor.

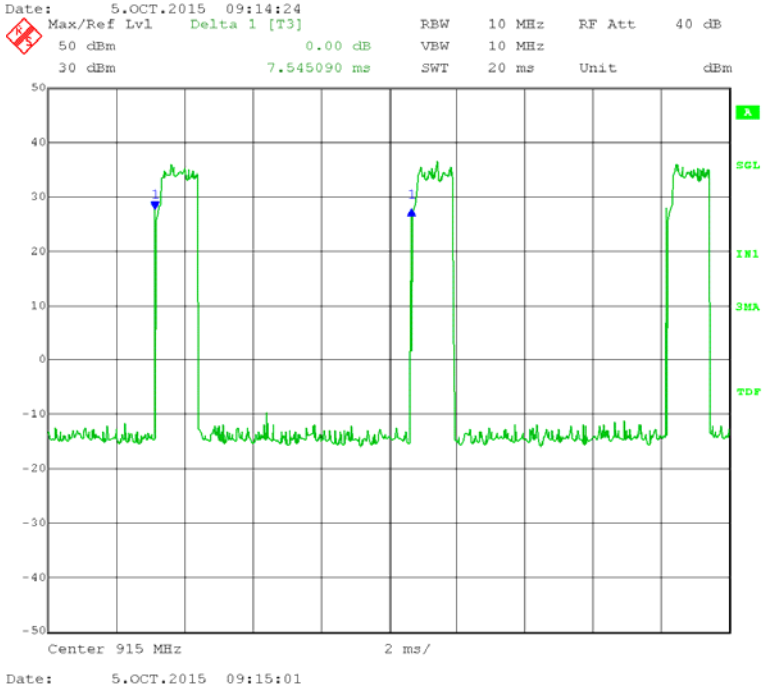
Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks.

5 MHz channel bandwidth:
Correction factor x = 10 Log (1 / 0.1713) = 7.66 dB for power measurements.
Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB for voltage measurements.

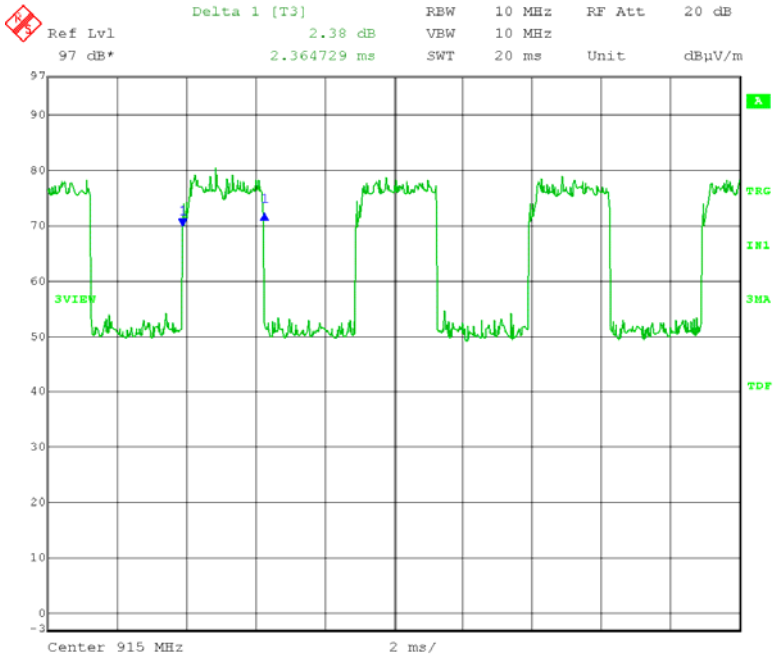
20 MHz channel bandwidth:
Correction factor x = 10 Log (1 / 0.6560) = 1.83 dB for power measurements.
Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB for voltage measurements.

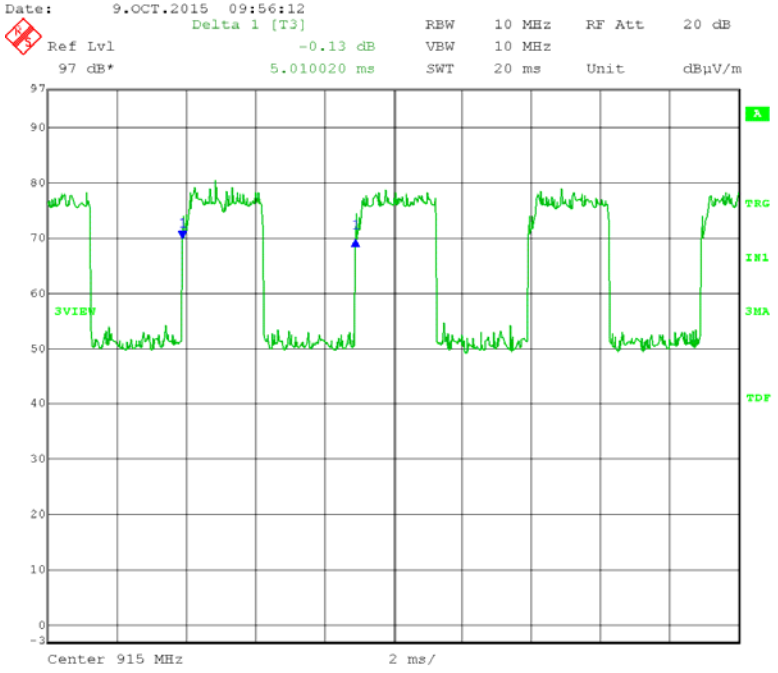
Test Date:	10-05-2015
Company:	Cambium Networks
EUT:	450i 900 MHz AP MAC: 0A003E4586C8
Test:	Duty Cycle during testing
Operator:	Craig B
	5 MHz channel bandwidth; QPSK
Comment:	Duty cycle = (1.292585 / 7.545090) * 100 = 17.13%
	Correction factor x = 10 Log (1 / 0.1713) = 7.66 dB



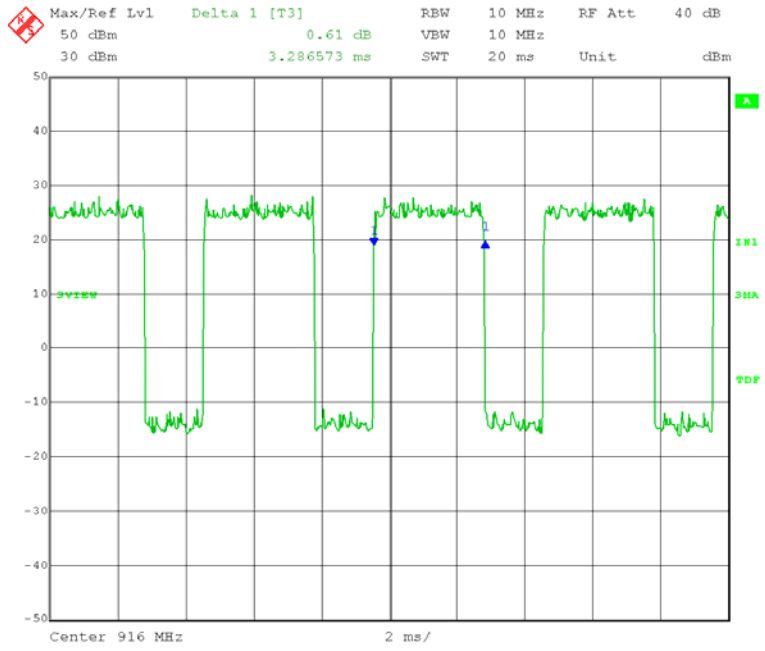


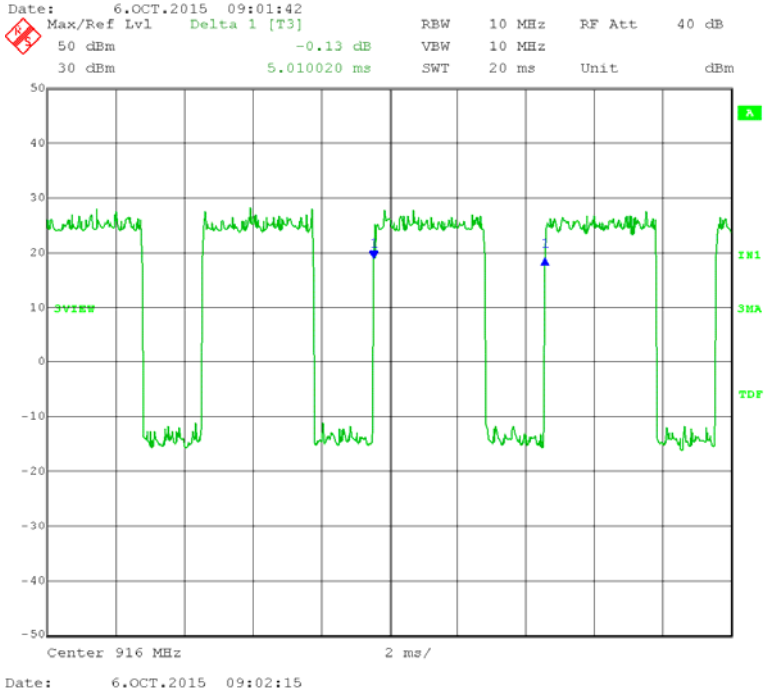
Test Date: 10-09-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Duty Cycle during testing – Radiated emissions
Operator: Craig B
5 MHz channel bandwidth; QPSK
Comment: Duty cycle = (2.364729 / 5.010020) * 100 = 47.20%
Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB





Test Date:	10-06-2015
Company:	Cambium Networks
EUT:	450i 900 MHz AP MAC: 0A003E4586C8
Test:	Duty Cycle during testing
Operator:	Craig B
	20 MHz channel bandwidth; QPSK
Comment:	Duty cycle = (3.286573 / 5.010020) * 100 = 65.60%
	Correction factor x = 10 Log (1 / 0.6560) = 1.83 dB





Appendix B – Measurement Data

B2.0 DTS Bandwidth

Rule Part:

Section 15.247(a)(2)

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
Section 8.0 DTS bandwdidth
Measurement Procedure, Sections 8.1 and 8.2

Limit:

6 dB bandwidth shall be at least 500 kHz

Results:

Compliant
Minimum 6 dB bandwidth: **4.65 MHz**

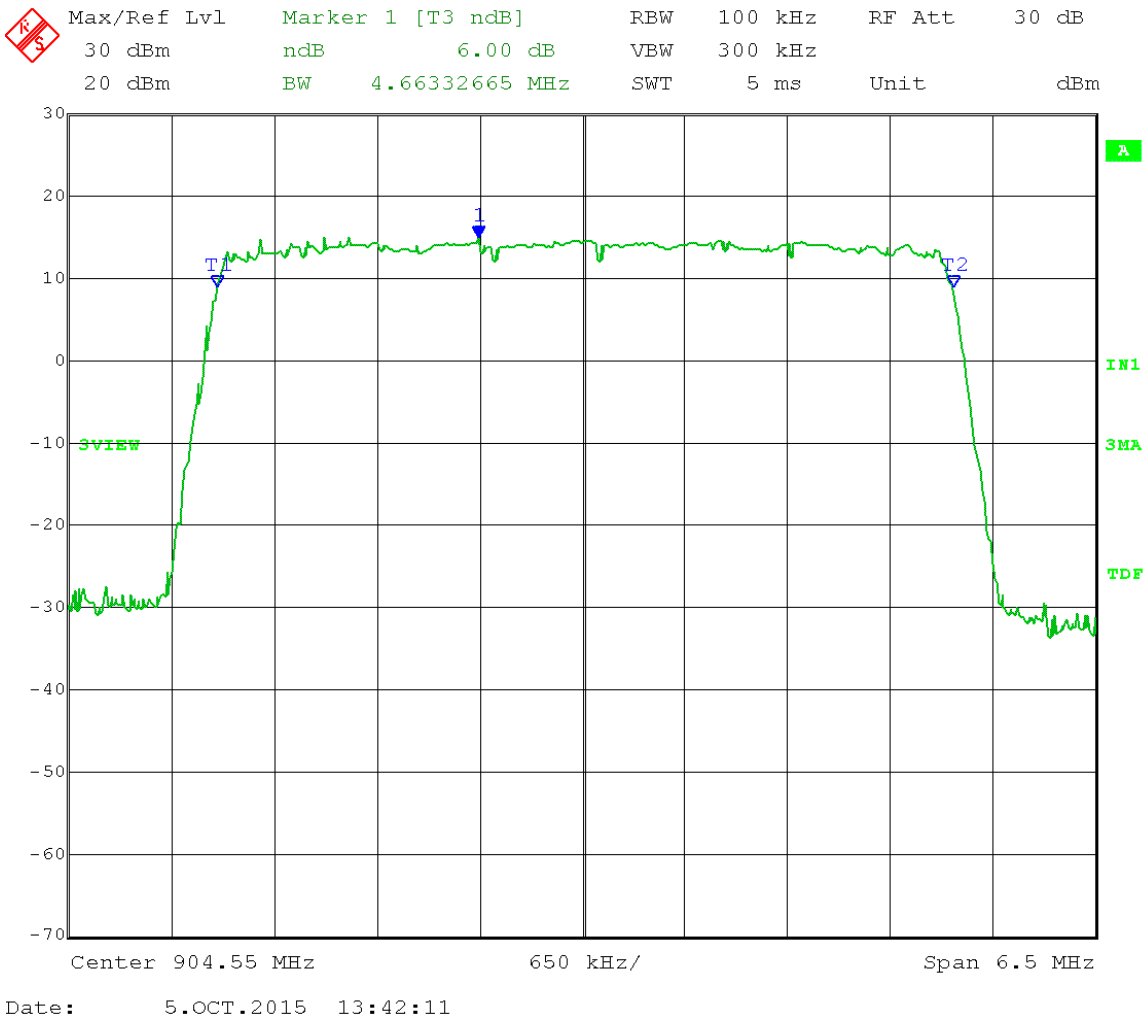
Notes:

Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks. The EUT was tested at the low, middle, and high channels of operation.

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: DTS Bandwidth (6 dB) - Conducted
Operator: Craig B

Comment: Low Channel: Transmit = 904.550 MHz
Output power setting: 18 5 MHz channel BW
Output port A Modulation: QPSK

6 dB DTS Bandwidth = 4.66 MHz

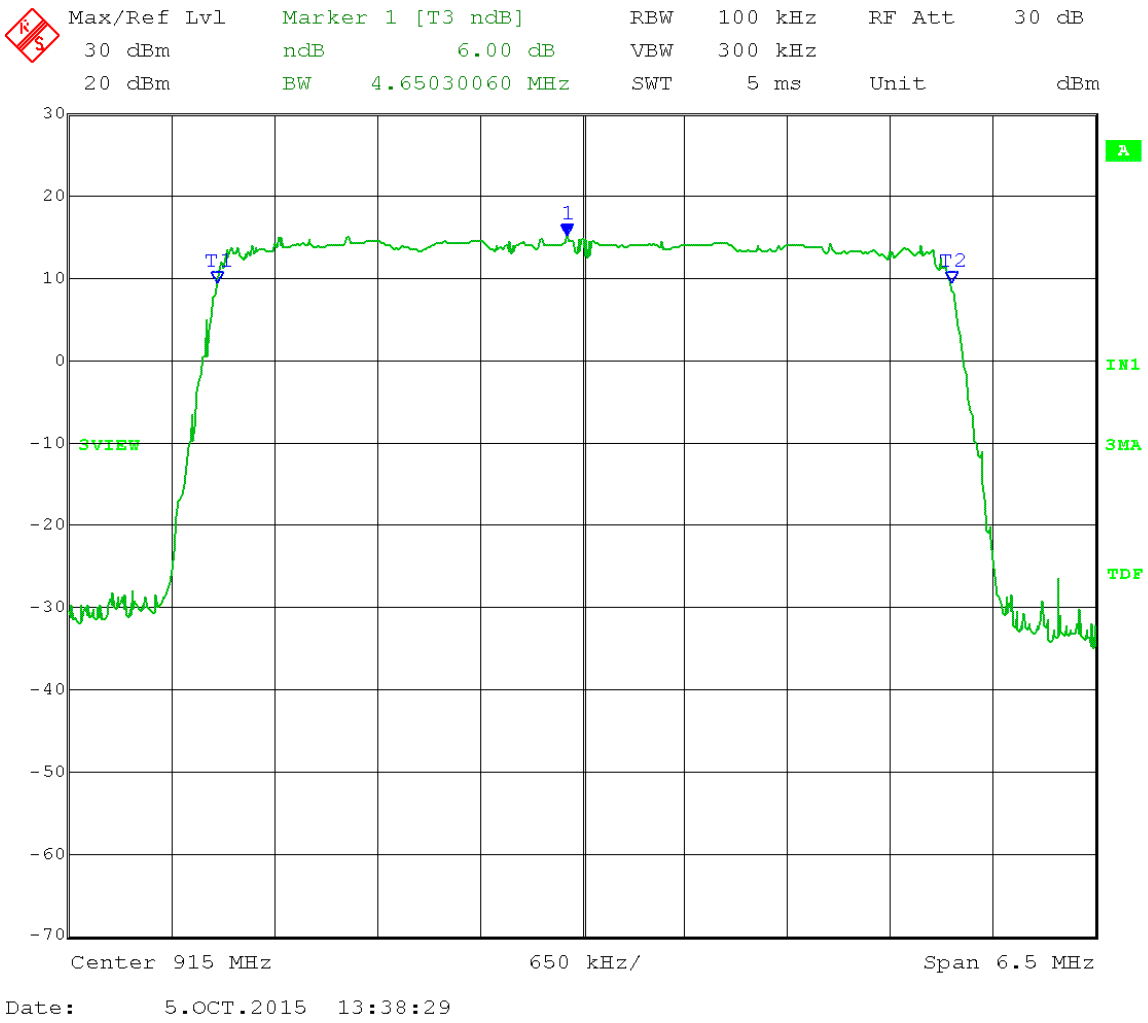


Date: 5.OCT.2015 13:42:11

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: DTS Bandwidth (6 dB) - Conducted
Operator: Craig B

Comment: Mid Channel: Transmit = 915 MHz
Output power setting: 18 5 MHz channel BW
Output port A Modulation: QPSK

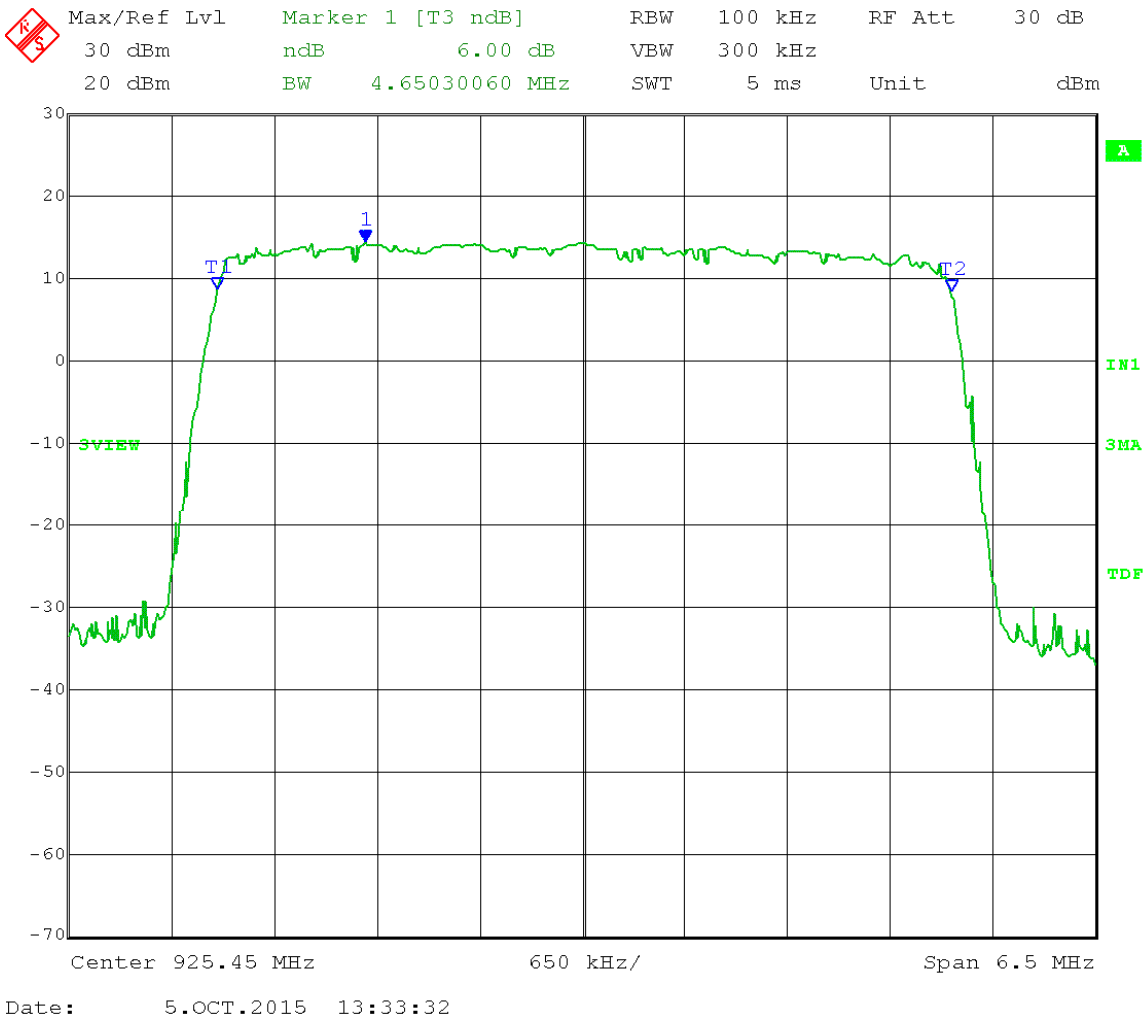
6 dB DTS Bandwidth = 4.65 MHz



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: DTS Bandwidth (6 dB) - Conducted
Operator: Craig B

Comment: High Channel: Transmit = 925.450 MHz
Output power setting: 18 5 MHz channel BW
Output port A Modulation: QPSK

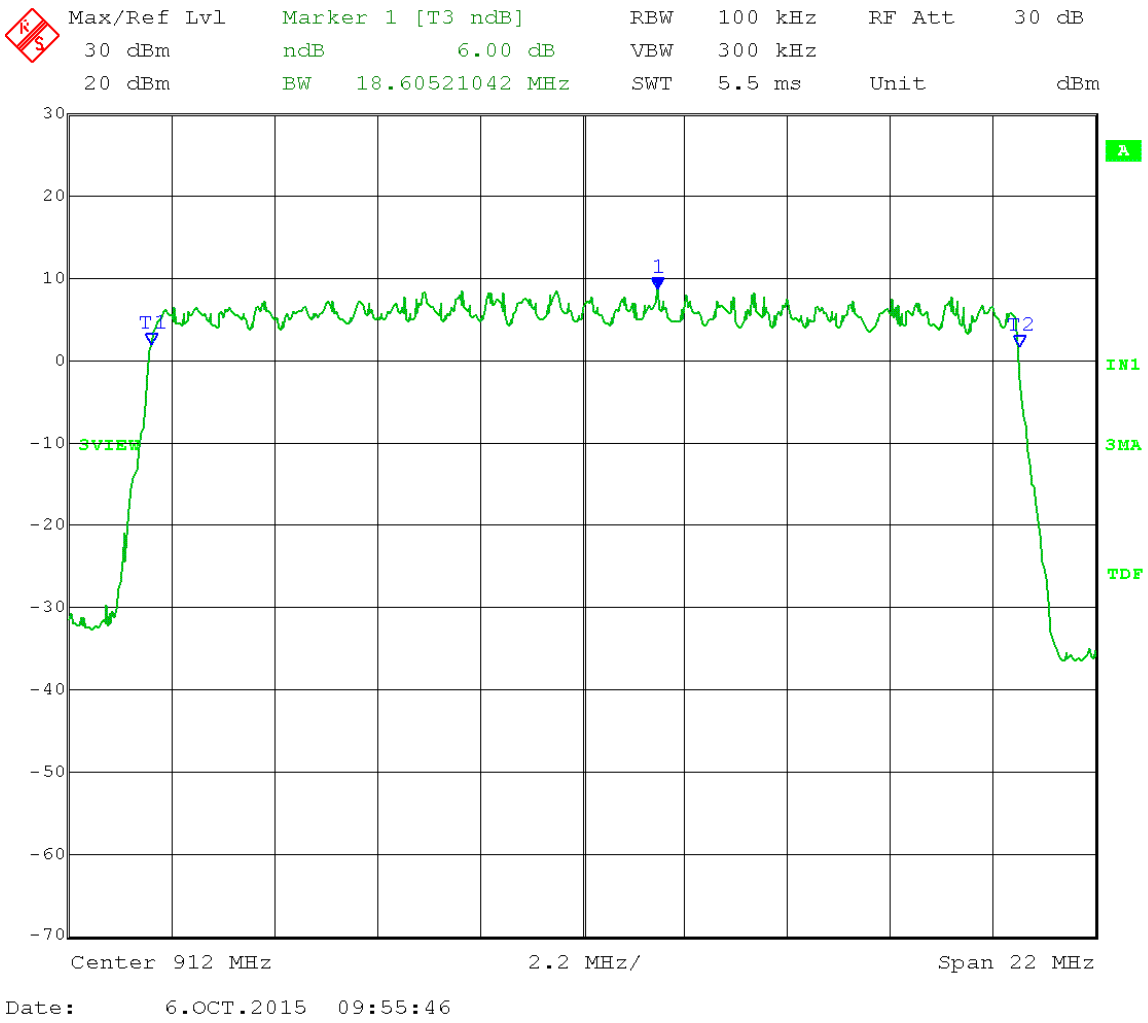
6 dB DTS Bandwidth = 4.65 MHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: DTS Bandwidth (6 dB) - Conducted
Operator: Craig B

Comment: Low Channel: Transmit = 912 MHz
Output power setting: 19 20 MHz channel BW
Output port A Modulation: QPSK

6 dB DTS Bandwidth = 18.61 MHz

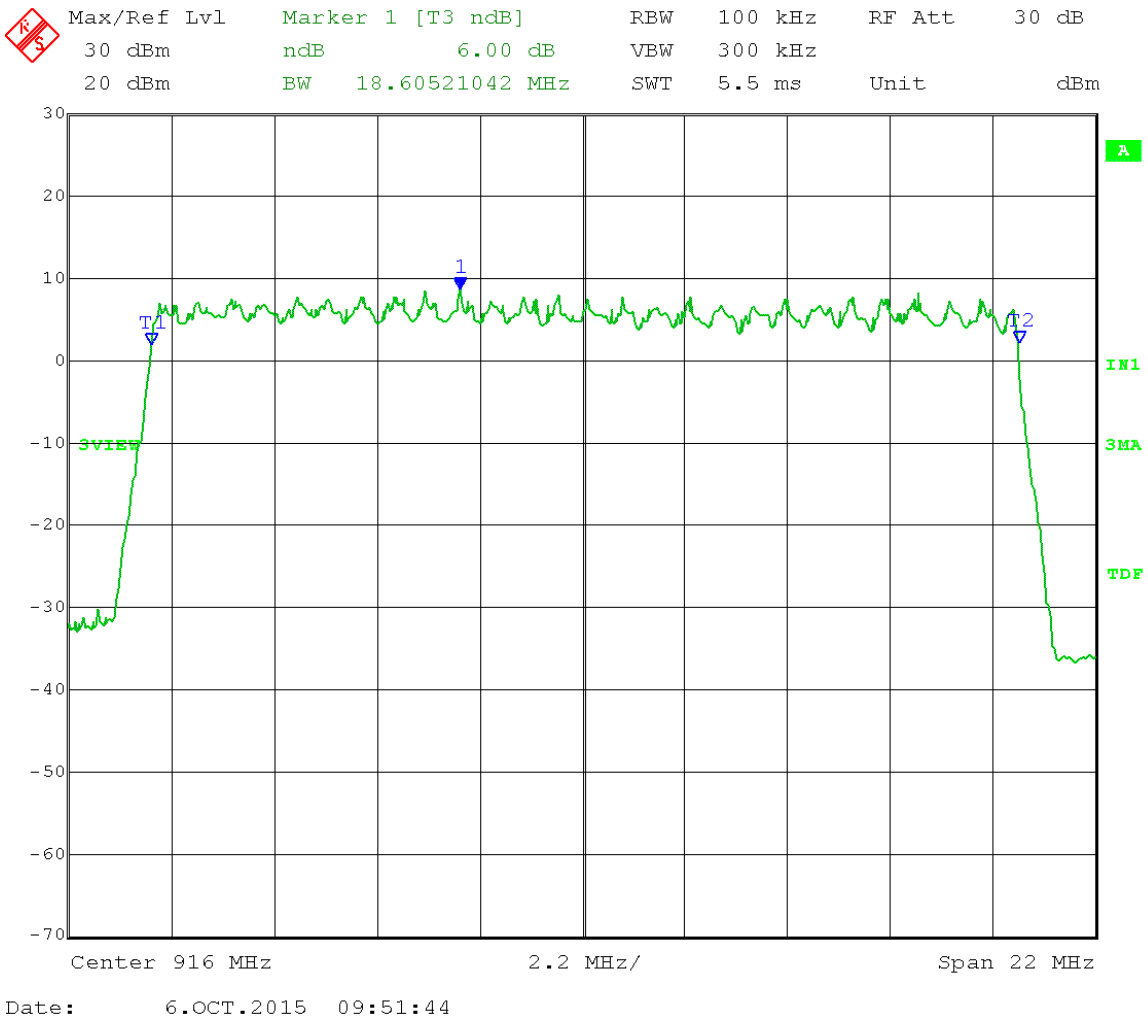


Date: 6.OCT.2015 09:55:46

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: DTS Bandwidth (6 dB) - Conducted
Operator: Craig B

Comment: Mid Channel: Transmit = 916 MHz
Output power setting: 19 20 MHz channel BW
Output port A Modulation: QPSK

6 dB DTS Bandwidth = 18.61 MHz



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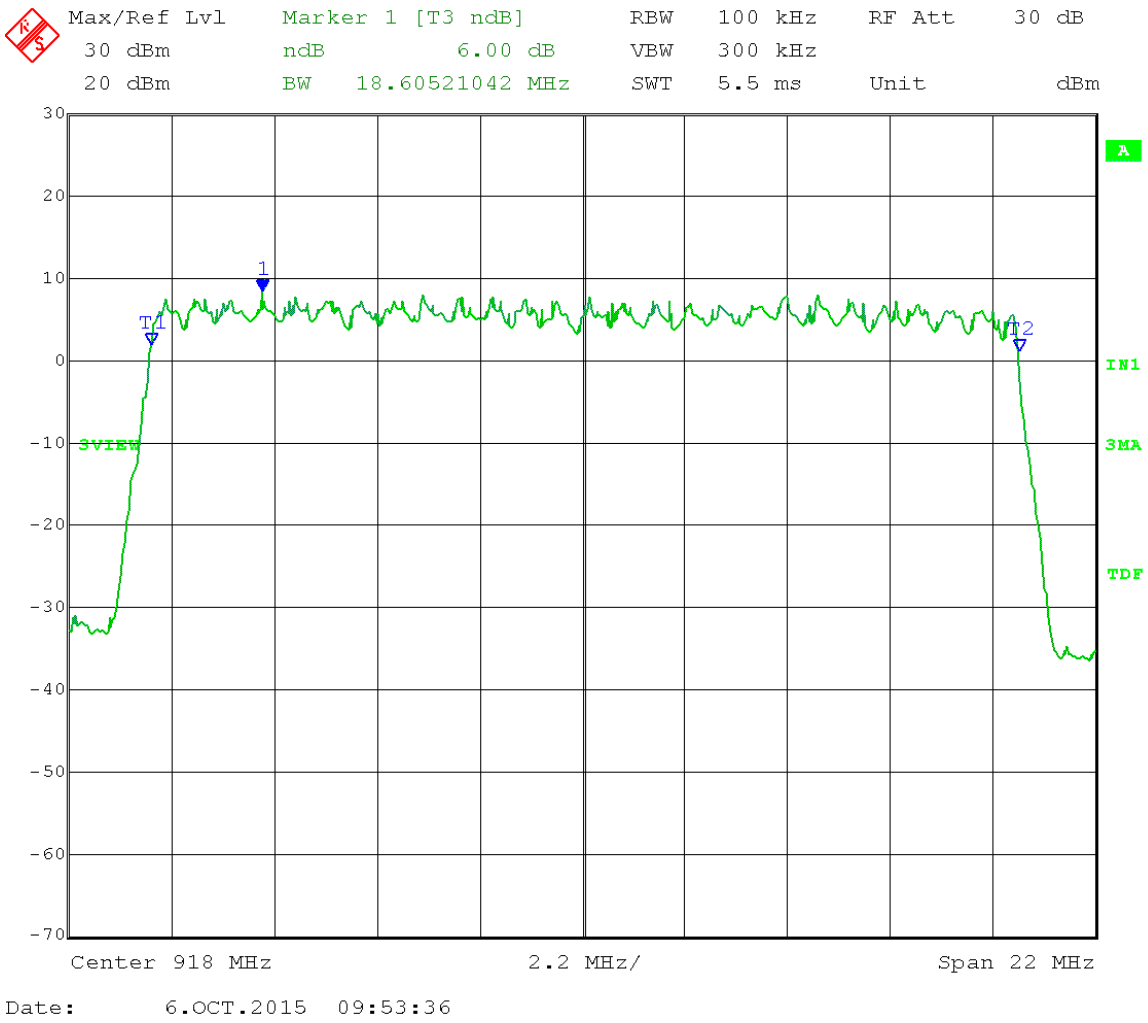
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: DTS Bandwidth (6 dB) - Conducted
Operator: Craig B

Comment: High Channel: Transmit = 918 MHz
Output power setting: 19 20 MHz channel BW
Output port A Modulation: QPSK

6 dB DTS Bandwidth = 18.61 MHz



Appendix B – Measurement Data

B3.0 Fundamental Emission Output Power

Rule Part:

15.247(b)(3) and 15.247(b)(4)

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
Section 9.2 Maximum conducted (average) output power
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
662911 D01 Multiple Transmitter Output v02r01(E)(1) – Measure and sum technique for In-Band Power Measurements

Limit:

The maximum peak conducted output power limit is 1 watt (30 dBm).
The conducted output power shall be reduced below 1 watt by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

With 13 dBi sector antenna: Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = **23 dBm** conducted.

With 12 dBi Yagi antenna: Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = **24 dBm** conducted.

Results: Compliant

With 13 dBi sector antenna: Maximum conducted output power: **188.16 mW (22.75 dBm)**

With 12 dBi Yagi antenna: Maximum conducted output power: **241.15 mW (23.82 dBm)**

Notes:

Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks. The EUT was tested at the low, middle, and high channels of operation. The power meter measurements were corrected to account for the external attenuator. The RF conducted power was measured at the end of the Cambium Networks cables that are supplied with the EUT. The cables are part of the EUT and not part of the antenna.

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

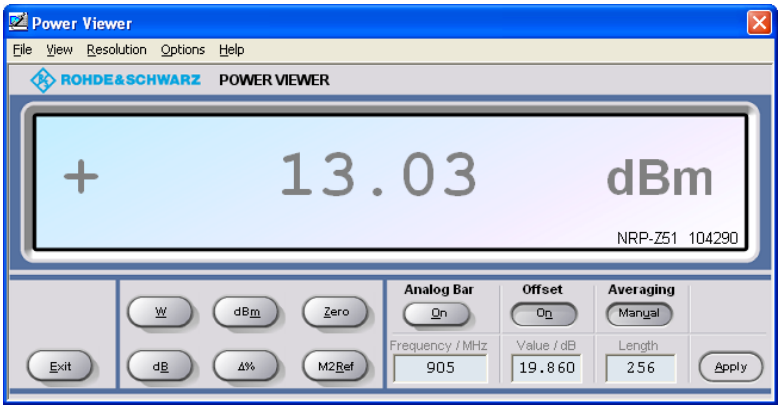
EUT nominal channel bandwidth: 5 MHz
Low Channel Frequency: 904.5 MHz
Test software power setting: 19
Modulation Type: QPSK
Antenna gain: 12 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = 24 dBm conducted.

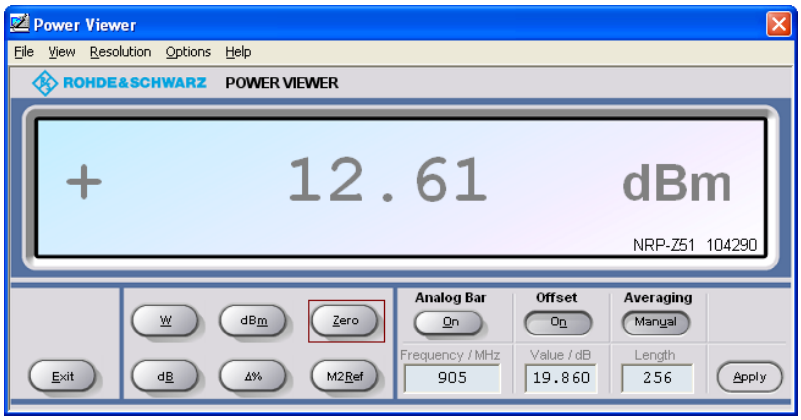
Correction for duty cycle = 7.66 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 13.03 dBm + 7.66 dB = 20.69 dBm = 117.22 mW
Port B: 12.61 dBm + 7.66 dB = 20.27 dBm = 106.41 mW
Total Power: 223.63 mW = 23.50 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

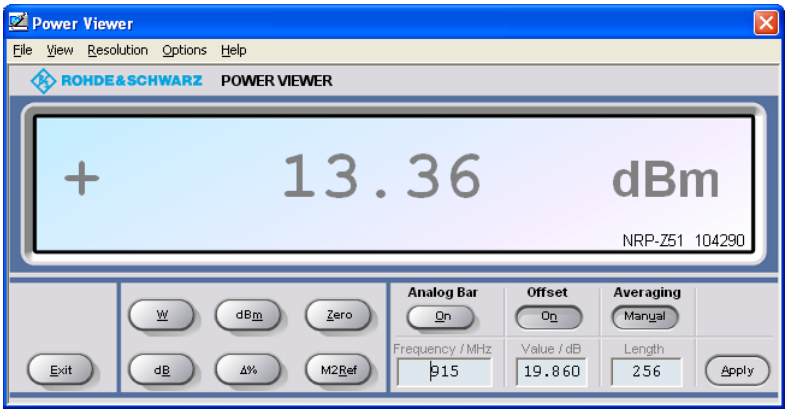
EUT nominal channel bandwidth: 5 MHz
Mid Channel Frequency: 915 MHz
Test software power setting: 19
Modulation Type: QPSK
Antenna gain: 12 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = 24 dBm conducted.

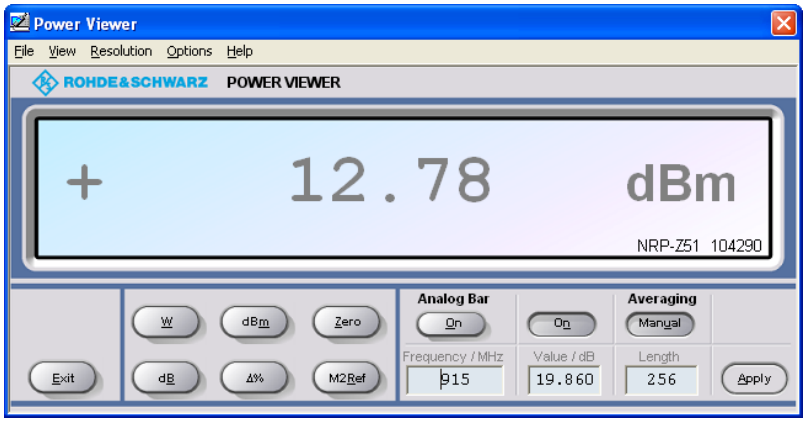
Correction for duty cycle = 7.66 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 13.36 dBm + 7.66 dB = 21.02 dBm = 126.47 mW
Port B: 12.78 dBm + 7.66 dB = 20.44 dBm = 110.66 mW
Total Power: 237.13 mW = 23.75 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

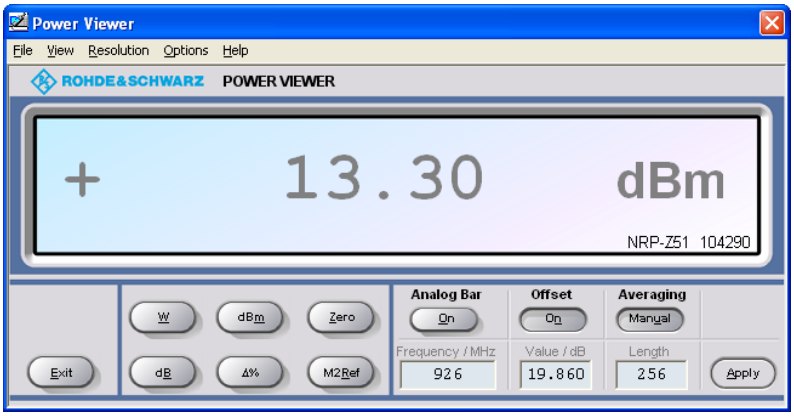
EUT nominal channel bandwidth: 5 MHz
High Channel Frequency: 925.5 MHz
Test software power setting: 19
Modulation Type: QPSK
Antenna gain: 12 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = 24 dBm conducted.

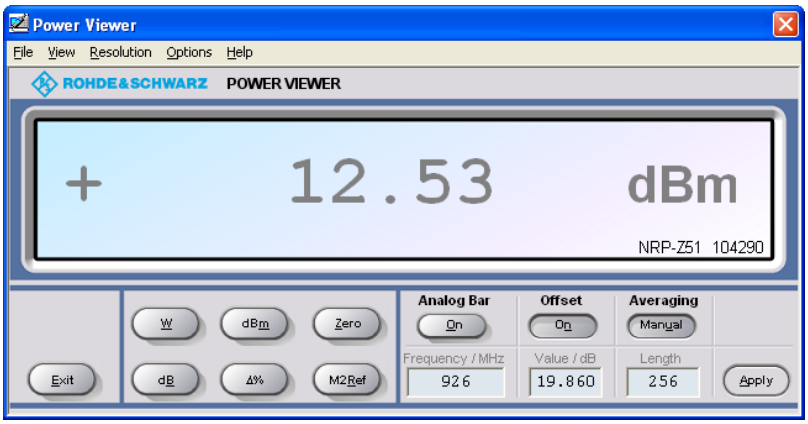
Correction for duty cycle = 7.66 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 13.30 dBm + 7.66 dB = 20.96 dBm = 124.74 mW
Port B: 12.53 dBm + 7.66 dB = 20.19 dBm = 104.47 mW
Total Power: 229.21 mW = 23.60 dBm

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

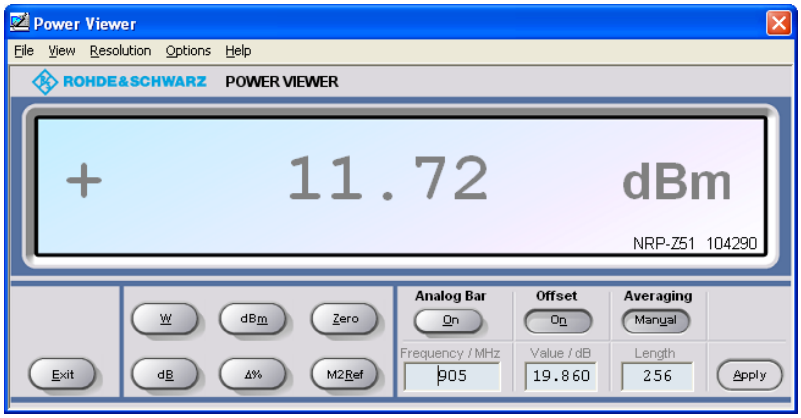
EUT nominal channel bandwidth: 5 MHz
Low Channel Frequency: 904.5 MHz
Test software power setting: 18
Modulation Type: QPSK
Antenna gain: 13 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = 23 dBm conducted.

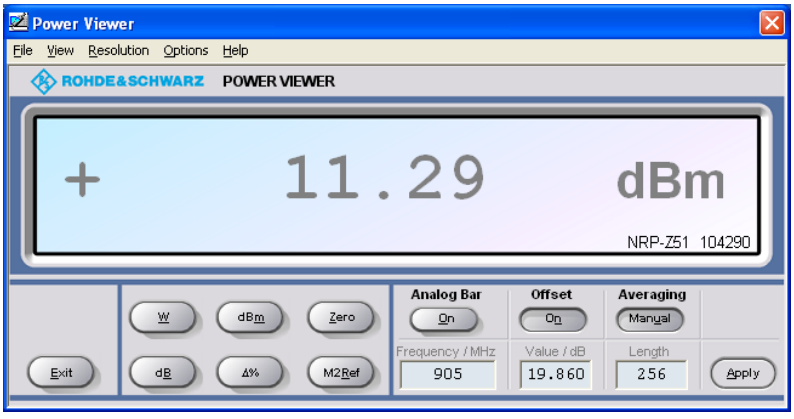
Correction for duty cycle = 7.66 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 11.72 dBm + 7.66 dB = 19.38 dBm = 86.70 mW
Port B: 11.29 dBm + 7.66 dB = 18.95 dBm = 78.52 mW
Total Power: 165.22 mW = 22.18 dBm

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

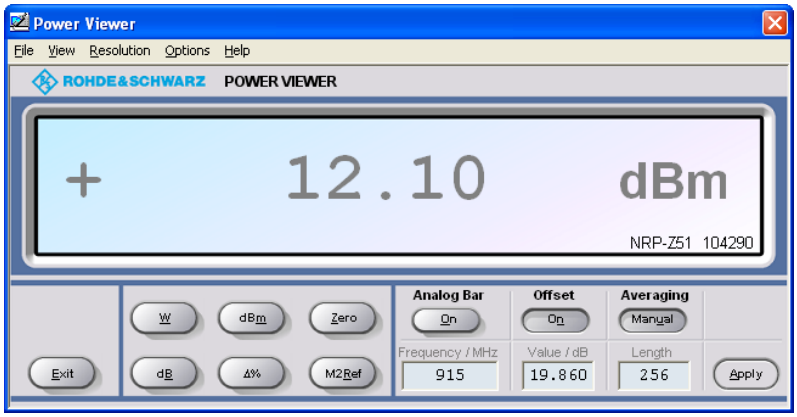
EUT nominal channel bandwidth: 5 MHz
Mid Channel Frequency: 915 MHz
Test software power setting: 18
Modulation Type: QPSK
Antenna gain: 13 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = 23 dBm conducted.

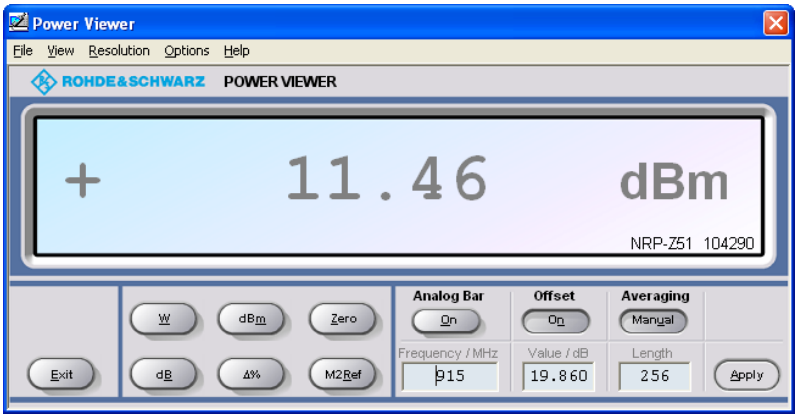
Correction for duty cycle = 7.66 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 12.10 dBm + 7.66 dB = 19.76 dBm = 94.62 mW
Port B: 11.46 dBm + 7.66 dB = 19.12 dBm = 81.66 mW
Total Power: 176.28 mW = 22.46 dBm

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

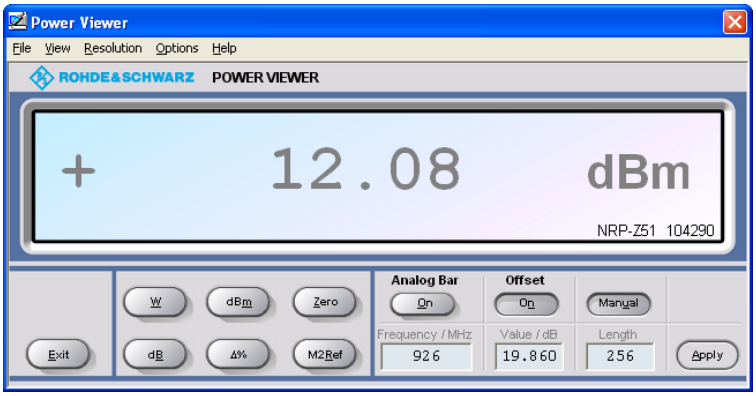
EUT nominal channel bandwidth: 5 MHz
High Channel Frequency: 925.5 MHz
Test software power setting: 18
Modulation Type: QPSK
Antenna gain: 13 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = 23 dBm conducted.

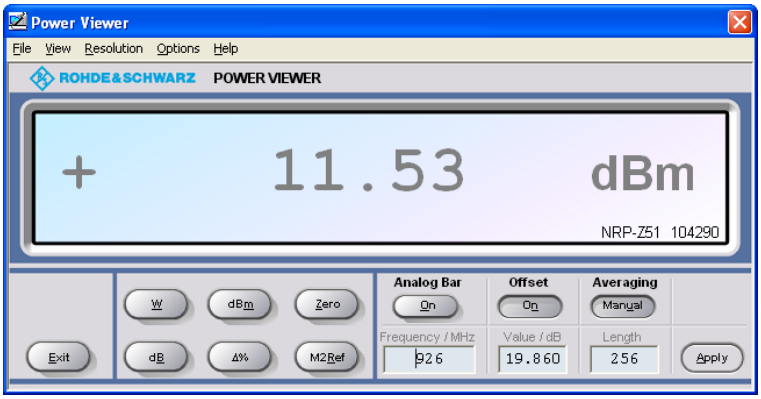
Correction for duty cycle = 7.66 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 12.08 dBm + 7.66 dB = 19.74 dBm = 94.19 mW
Port B: 11.53 dBm + 7.66 dB = 19.19 dBm = 82.99 mW
Total Power: 177.18 mW = 22.48 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

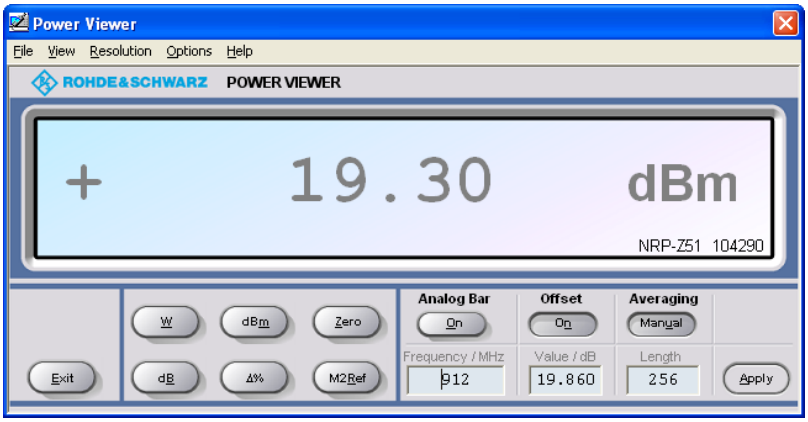
EUT nominal channel bandwidth: 20 MHz
Low Channel Frequency: 912 MHz
Test software power setting: 20
Modulation Type: QPSK
Antenna gain: 12 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = 24 dBm conducted.

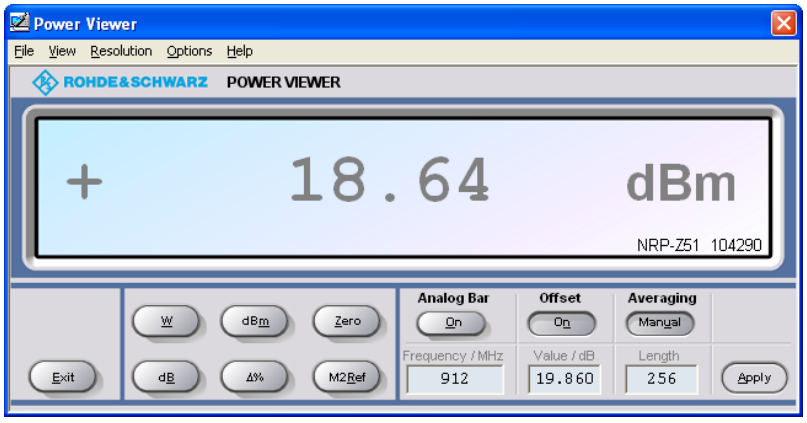
Correction for duty cycle = 1.83 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 19.30 dBm + 1.83 dB = 21.13 dBm = 129.72 mW
Port B: 18.64 dBm + 1.83 dB = 20.47 dBm = 111.43 mW
Total Power: 241.15 mW = 23.82 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

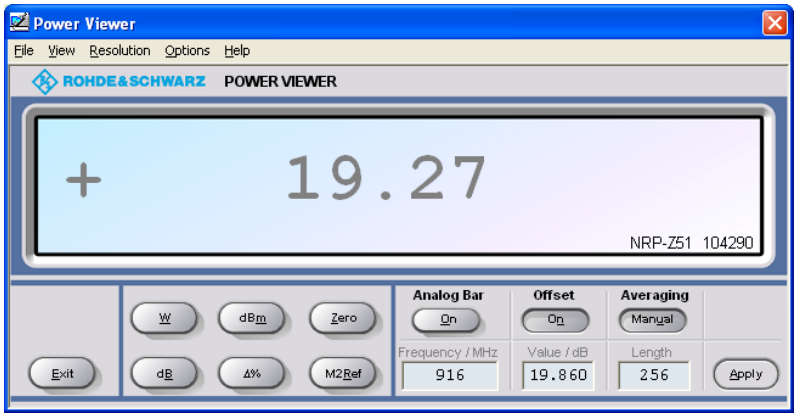
EUT nominal channel bandwidth: 20 MHz
Mid Channel Frequency: 916 MHz
Test software power setting: 20
Modulation Type: QPSK
Antenna gain: 12 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = 24 dBm conducted.

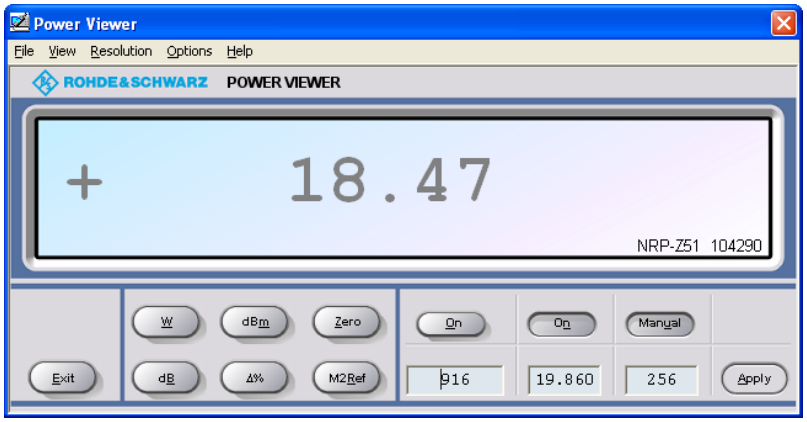
Correction for duty cycle = 1.83 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 19.27 dBm + 1.83 dB = 21.10 dBm = 128.82 mW
Port B: 18.47 dBm + 1.83 dB = 20.30 dBm = 107.15 mW
Total Power: 235.97 mW = 23.73 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

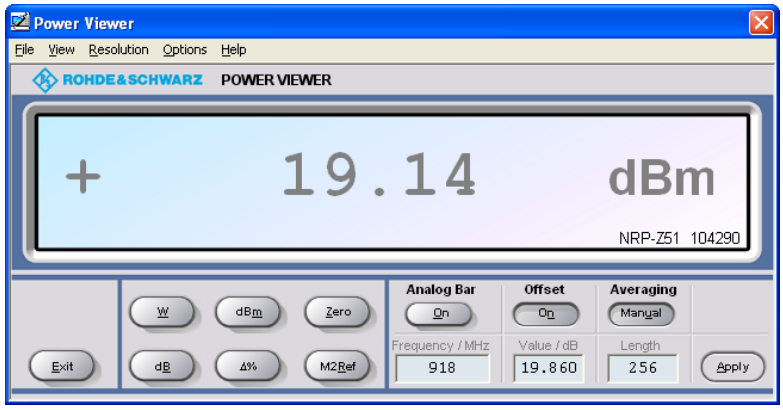
EUT nominal channel bandwidth: 20 MHz
High Channel Frequency: 918 MHz
Test software power setting: 20
Modulation Type: QPSK
Antenna gain: 12 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 6 dB (antenna gain is 6 dB greater than the 6 dBi allowed) = 24 dBm conducted.

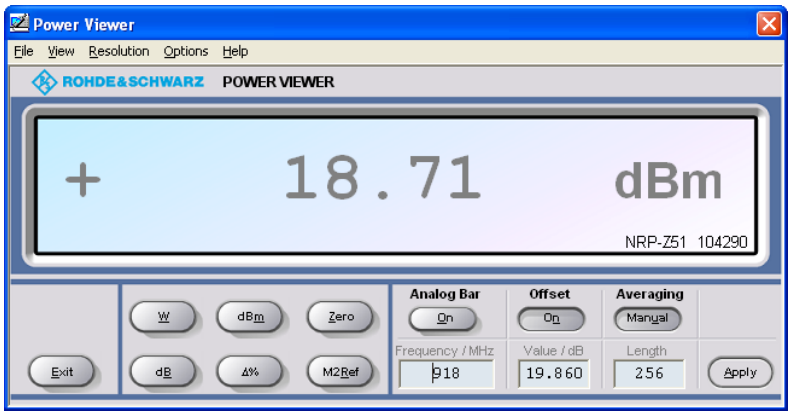
Correction for duty cycle = 1.83 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 19.14 dBm + 1.83 dB = 20.97 dBm = 125.03 mW
Port B: 18.71 dBm + 1.83 dB = 20.54 dBm = 113.24 mW
Total Power: 238.27 mW = 23.77 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

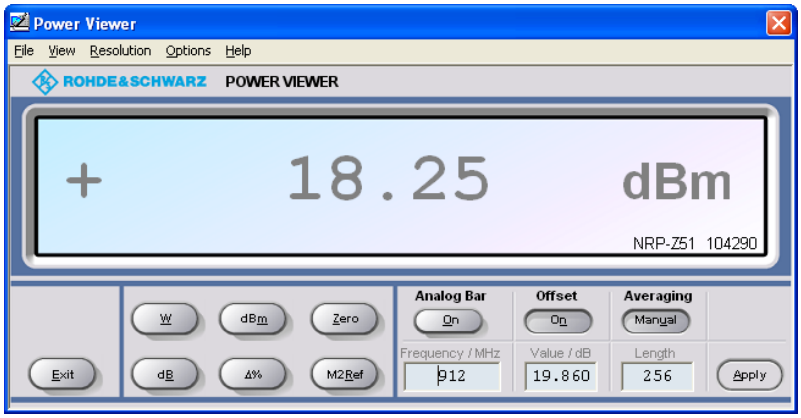
EUT nominal channel bandwidth: 20 MHz
Low Channel Frequency: 912 MHz
Test software power setting: 19
Modulation Type: QPSK
Antenna gain: 13 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = 23 dBm conducted.

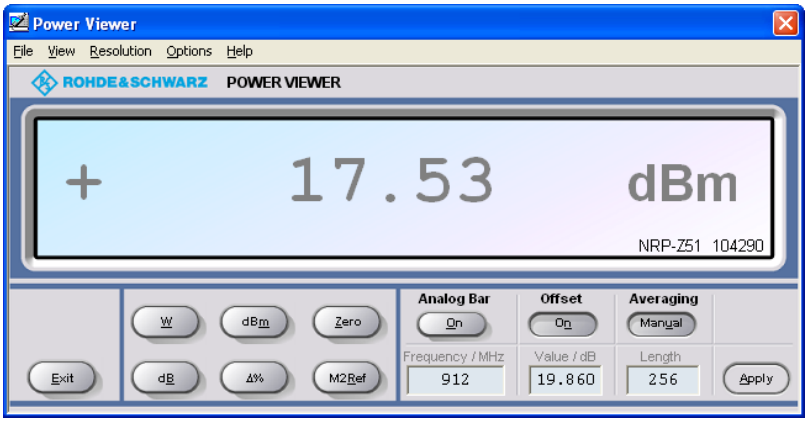
Correction for duty cycle = 1.83 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 18.25 dBm + 1.83 dB = 20.08 dBm = 101.86 mW
Port B: 17.53 dBm + 1.83 dB = 19.36 dBm = 86.30 mW
Total Power: 188.16 mW = 22.75 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

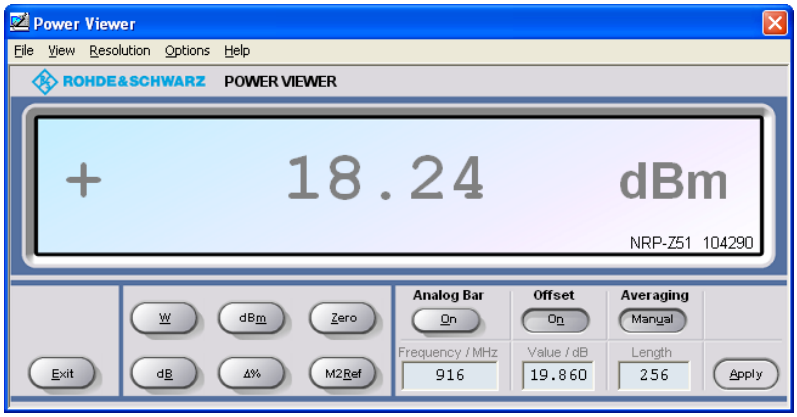
EUT nominal channel bandwidth: 20 MHz
Mid Channel Frequency: 916 MHz
Test software power setting: 19
Modulation Type: QPSK
Antenna gain: 13 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = 23 dBm conducted.

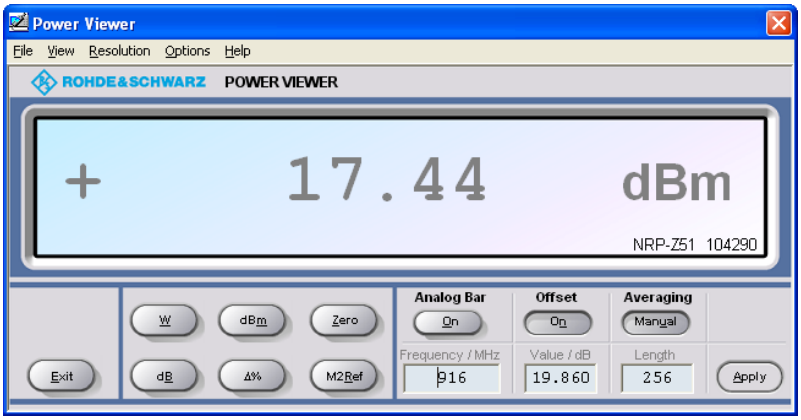
Correction for duty cycle = 1.83 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 18.24 dBm + 1.83 dB = 20.07 dBm = 101.62 mW
Port B: 17.44 dBm + 1.83 dB = 19.27 dBm = 84.53 mW
Total Power: 186.15 mW = 22.70 dBm

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: AVERAGE Fundamental Emission Output Power – Conducted
Procedure: FCC KDB D01 DTS Meas Guidance v03r03
Section 9.2.3.1 – AVGPM (Measurement using an RF average power meter with a thermocouple detector)
Operator: Craig B

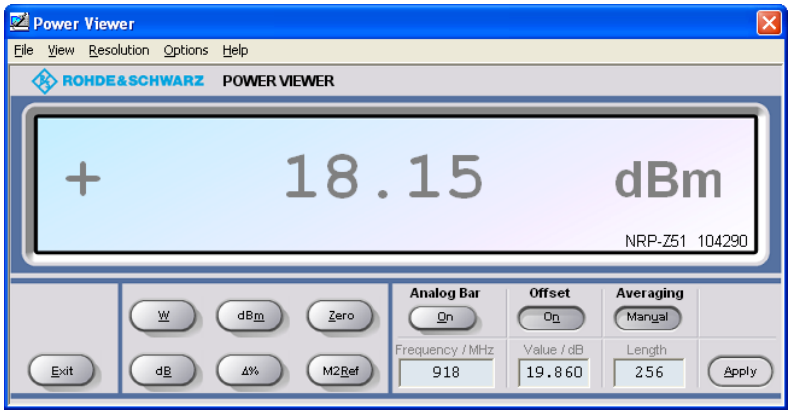
EUT nominal channel bandwidth: 20 MHz
High Channel Frequency: 918 MHz
Test software power setting: 19
Modulation Type: QPSK
Antenna gain: 13 dBi

Limit: [15.247(b)(3)&(4)]: 30 dBm (1 Watt) – 7 dB (antenna gain is 7 dB greater than the 6 dBi allowed) = 23 dBm conducted.

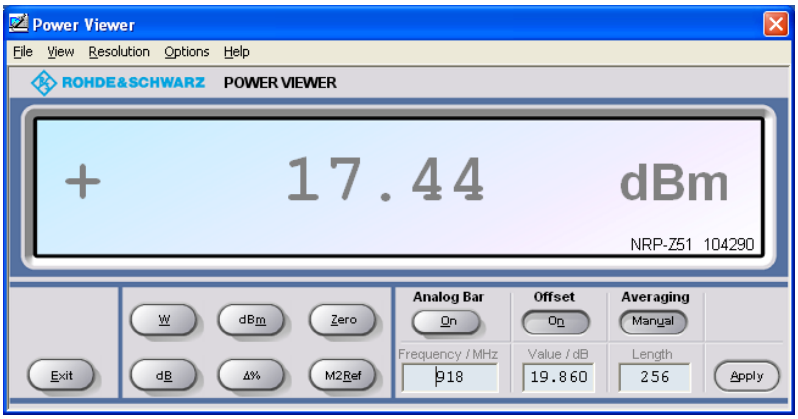
Correction for duty cycle = 1.83 dB

Fundamental Emission AVERAGE Output Power:

Port A:



Port B:



Port A: 18.15 dBm + 1.83 dB = 19.98 dBm = 99.54 mW
Port B: 17.44 dBm + 1.83 dB = 19.27 dBm = 84.53 mW
Total Power: 184.07 mW = 22.65 dBm

Appendix B – Measurement Data

B4.0 Maximum Power Spectral Density (PSD)

Rule Part:

15.247(e)

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
Section 10.0 Maximum Power Spectral Density Level in the Fundamental Emission
Section 10.6, method AVGPSD-2 Alternative – RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
662911 D01 Multiple Transmitter Output v02r01(E)(2)(c) – Measure and add 10 log(N_{ant}) dB where N is the number of outputs for In-Band Power Spectral Density (PSD) Measurements

Limit:

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

Results: Compliant

With 13 dBi sector antenna:
Maximum conducted power spectral density (PSD): **5.66 dBm / 50 kHz**

With 12 dBi Yagi antenna:
Maximum conducted power spectral density (PSD): **6.67 dBm / 50 kHz**

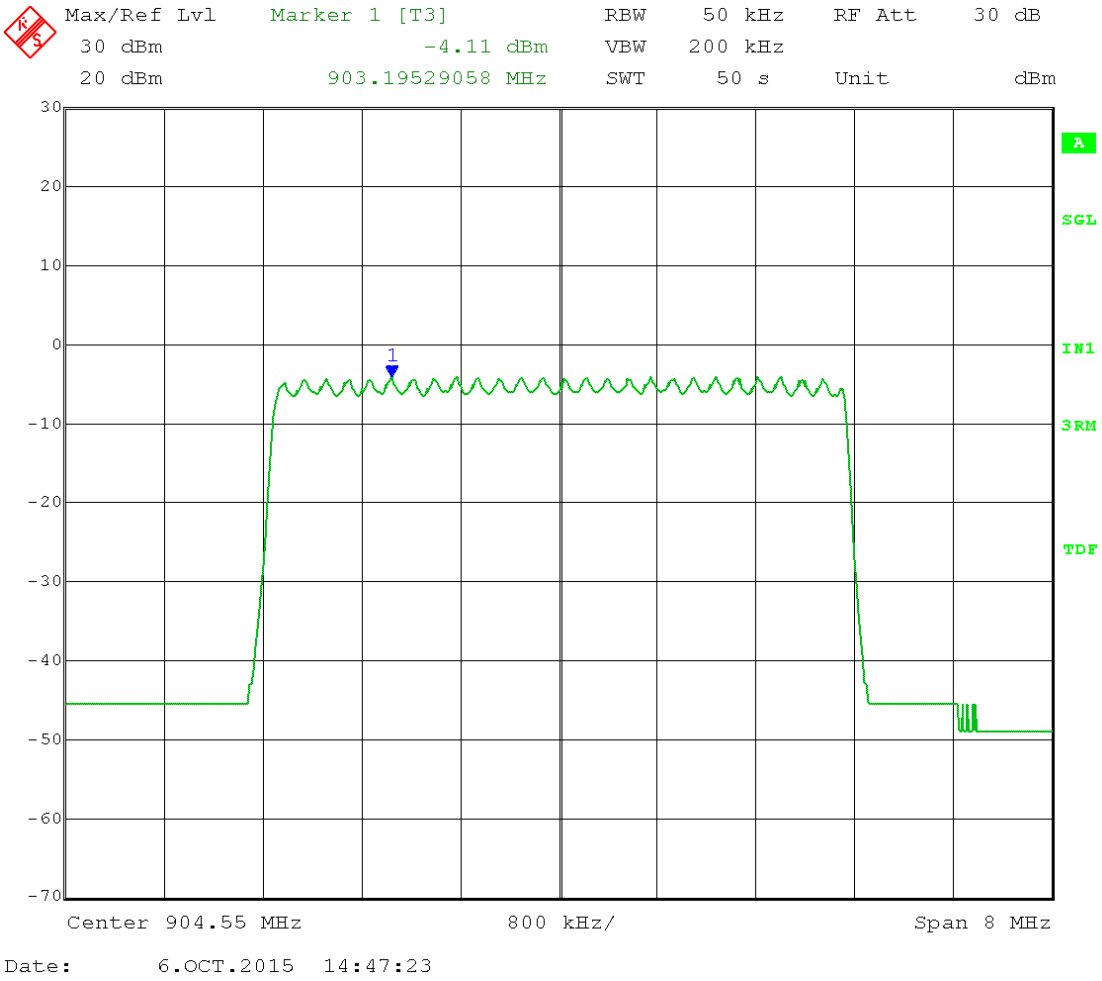
Notes:

Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks. The EUT was tested at the low, middle, and high channels of operation. The spectrum analyzer measurements were corrected to account for the cable loss and external attenuator.

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Low Channel: Frequency = 904.550 MHz
Output Power Setting = 19 5 MHz channel BW
RBW = 50 kHz VBW = 200 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 7.545090 ms = 38 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

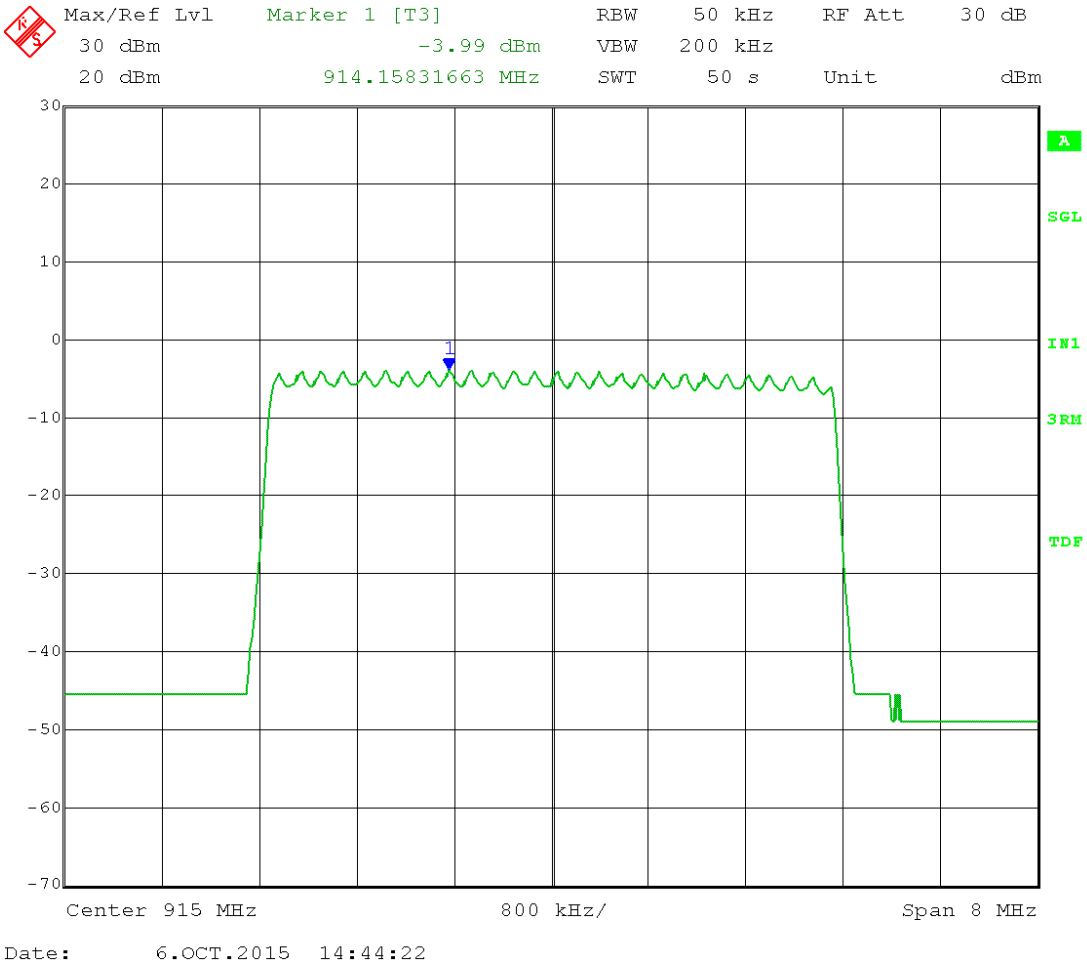
Max PSD = -4.11 dBm / 50 kHz + 7.66 dB (duty cycle correction) + 3 dB (MIMO)
= 6.55 dBm / 50 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Mid Channel: Frequency = 915 MHz
Output Power Setting = 19 5 MHz channel BW
RBW = 50 kHz VBW = 200 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 7.545090 ms = 38 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

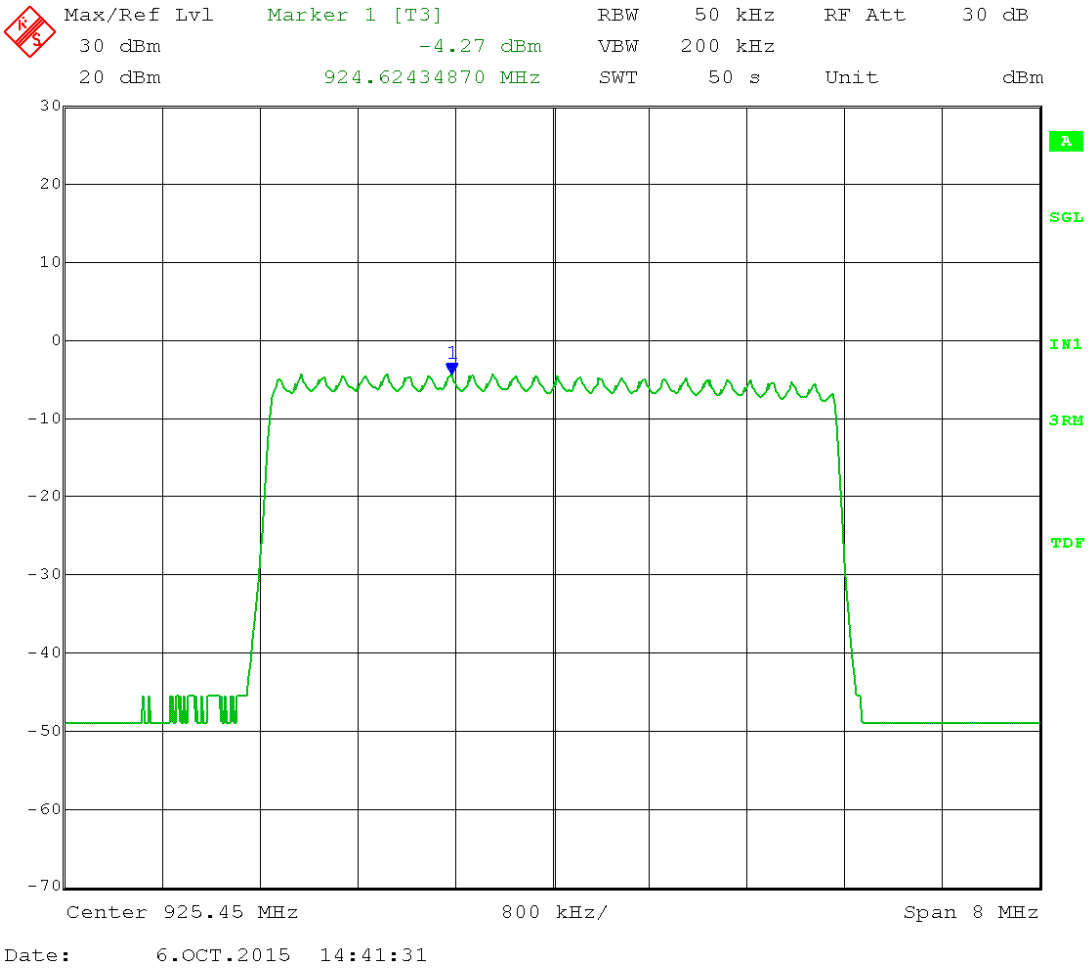
Max PSD = -3.99 dBm / 50 kHz + 7.66 dB (duty cycle correction) + 3 dB (MIMO)
= 6.67 dBm / 50 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: High Channel: Frequency = 925.450 MHz
Output Power Setting = 19 5 MHz channel BW
RBW = 50 kHz VBW = 200 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 7.545090 ms = 38 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

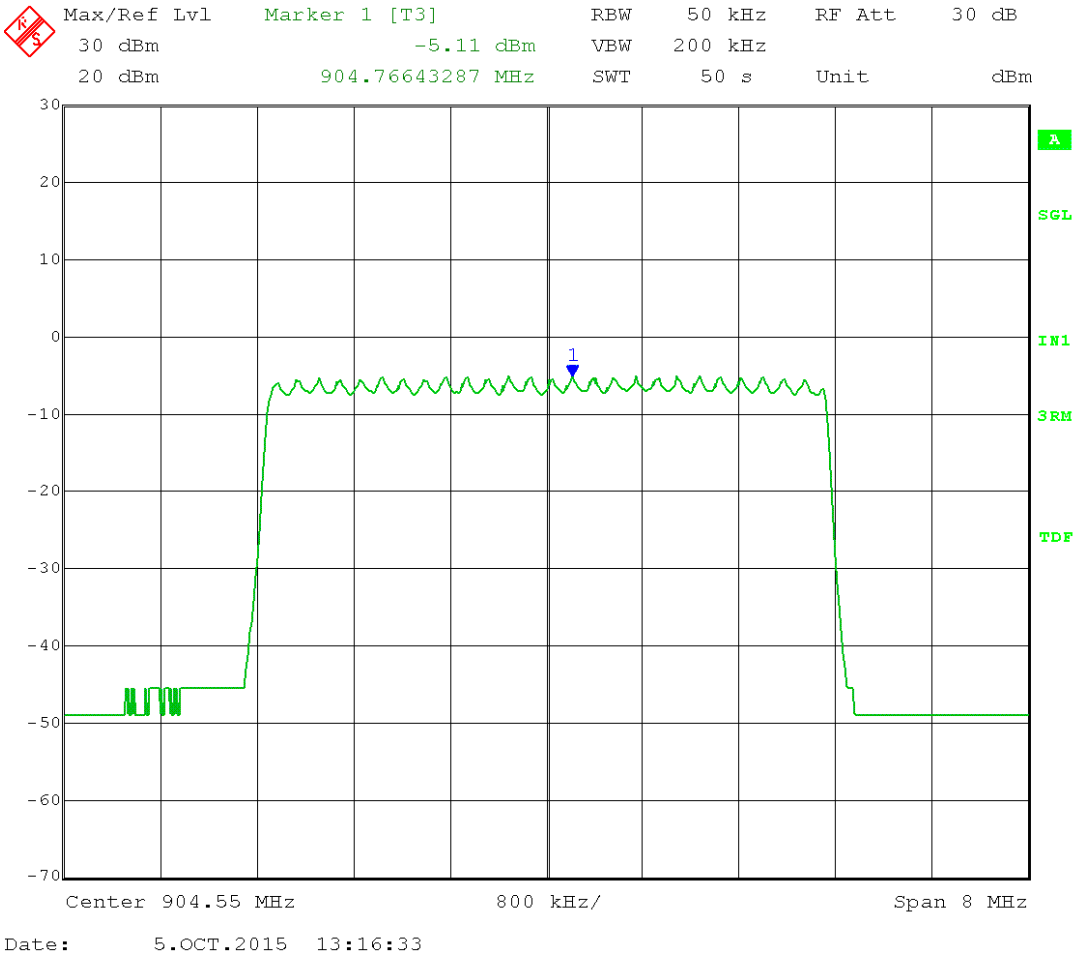
Max PSD = -4.27 dBm / 50 kHz + 7.66 dB (duty cycle correction) + 3 dB (MIMO)
= 6.39 dBm / 50 kHz



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Low Channel: Frequency = 904.550 MHz
Output Power Setting = 18 5 MHz channel BW
RBW = 50 kHz VBW = 200 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 7.545090 ms = 38 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

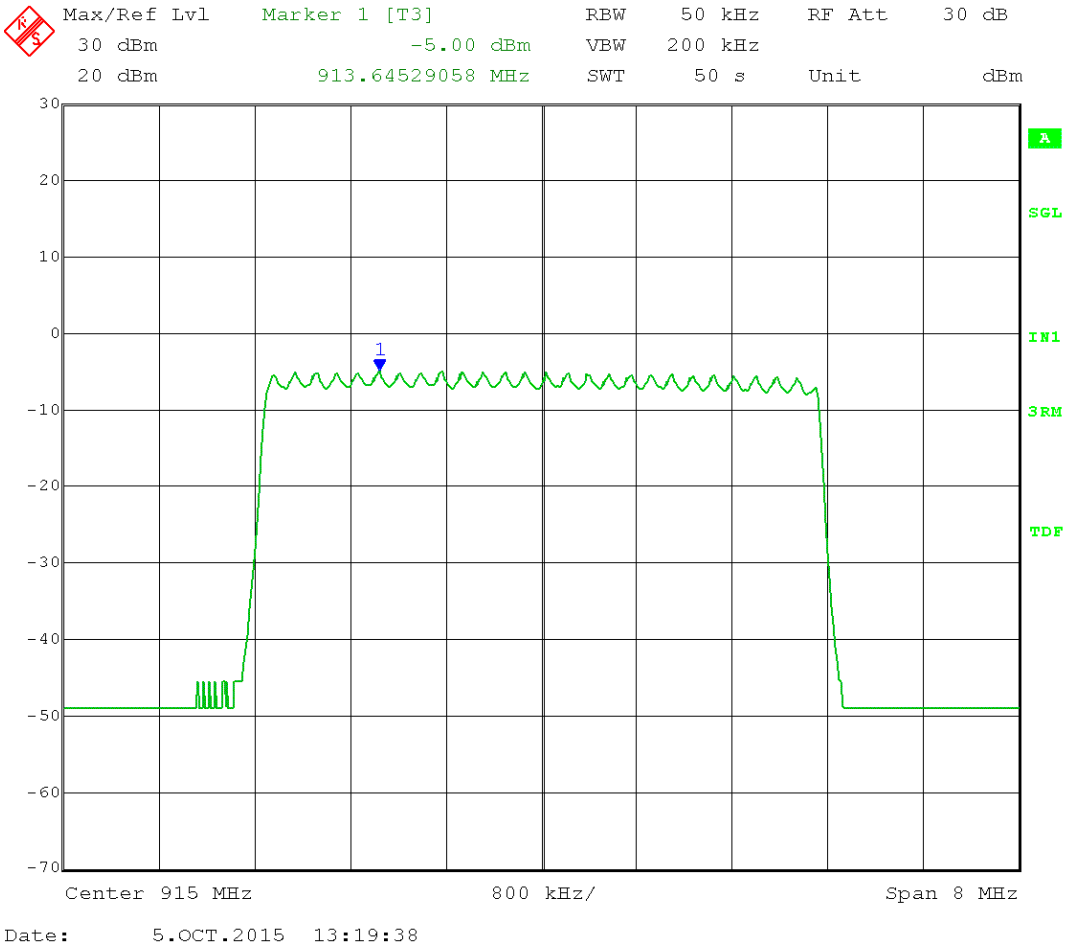
Max PSD = -5.11 dBm / 50 kHz + 7.66 dB (duty cycle correction) + 3 dB (MIMO)
= 5.55 dBm / 50 kHz



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Mid Channel: Frequency = 915 MHz
Output Power Setting = 18 5 MHz channel BW
RBW = 50 kHz VBW = 200 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 7.545090 ms = 38 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

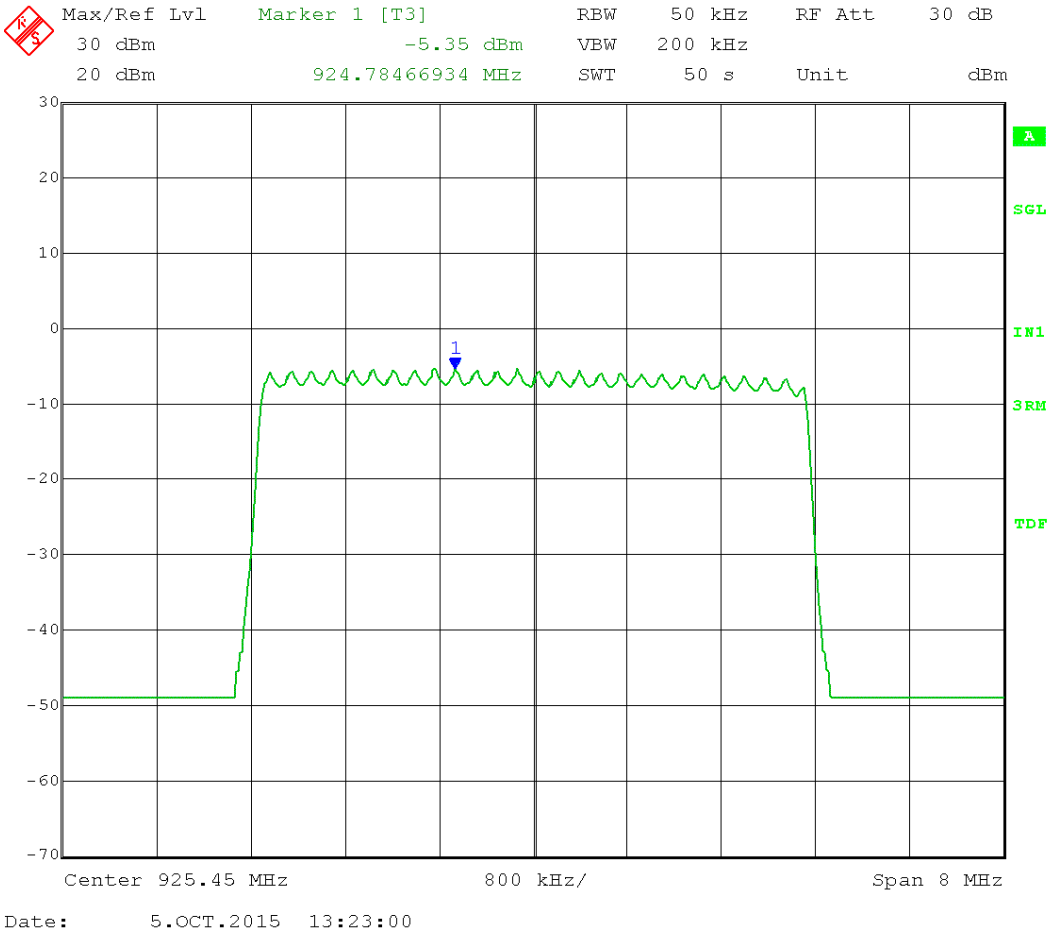
Max PSD = -5.00 dBm / 50 kHz + 7.66 dB (duty cycle correction) + 3 dB (MIMO)
= 5.66 dBm / 50 kHz



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: High Channel: Frequency = 925.450 MHz
Output Power Setting = 18 5 MHz channel BW
RBW = 50 kHz VBW = 200 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 7.545090 ms = 38 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

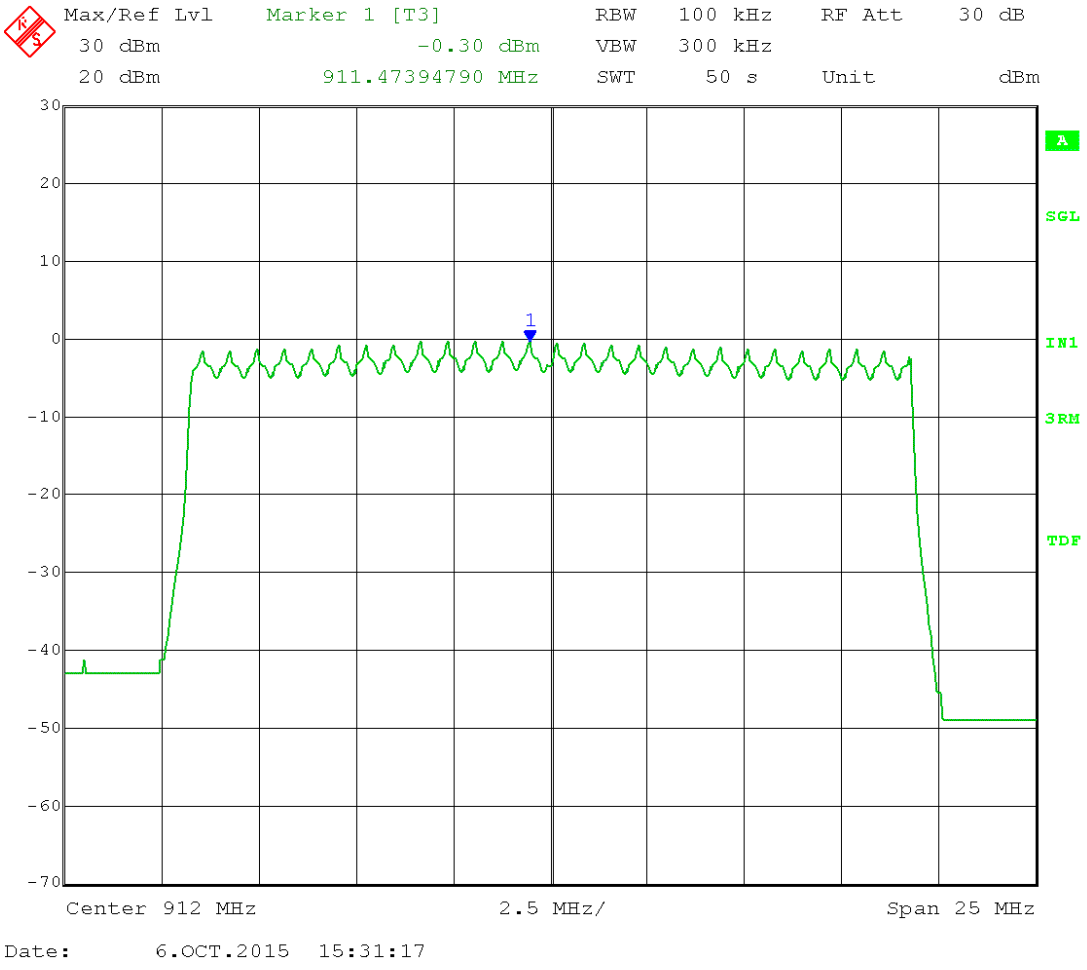
Max PSD = -5.35 dBm / 50 kHz + 7.66 dB (duty cycle correction) + 3 dB (MIMO)
= 5.31 dBm / 50 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Low Channel: Frequency = 912 MHz
Output Power Setting = 20 20 MHz channel BW
RBW = 100 kHz VBW = 300 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 5.010020 ms = 25 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

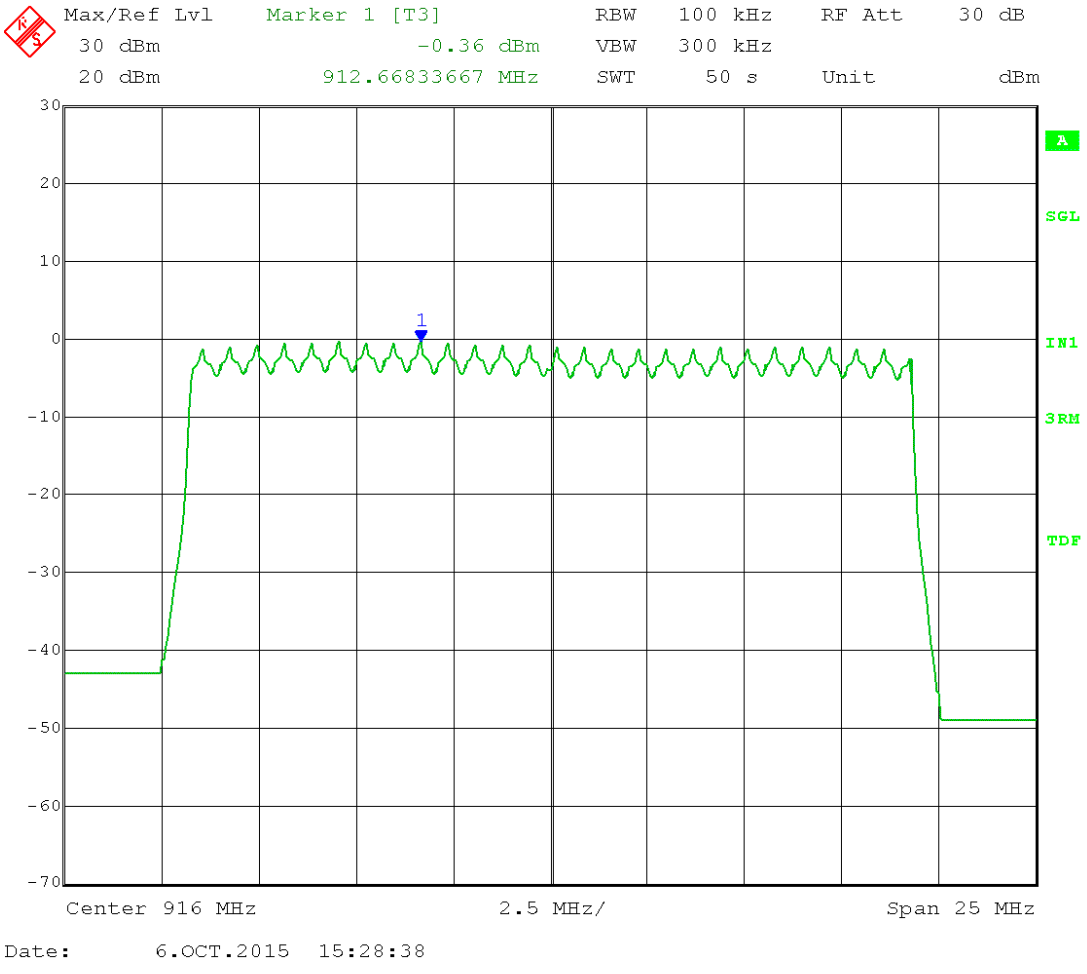
Max PSD = -0.30 dBm / 100 kHz + 1.83 dB (duty cycle correction) + 3 dB (MIMO) = 4.53 dBm / 100 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Mid Channel: Frequency = 916 MHz
Output Power Setting = 20 20 MHz channel BW
RBW = 100 kHz VBW = 300 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 5.010020 ms = 25 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

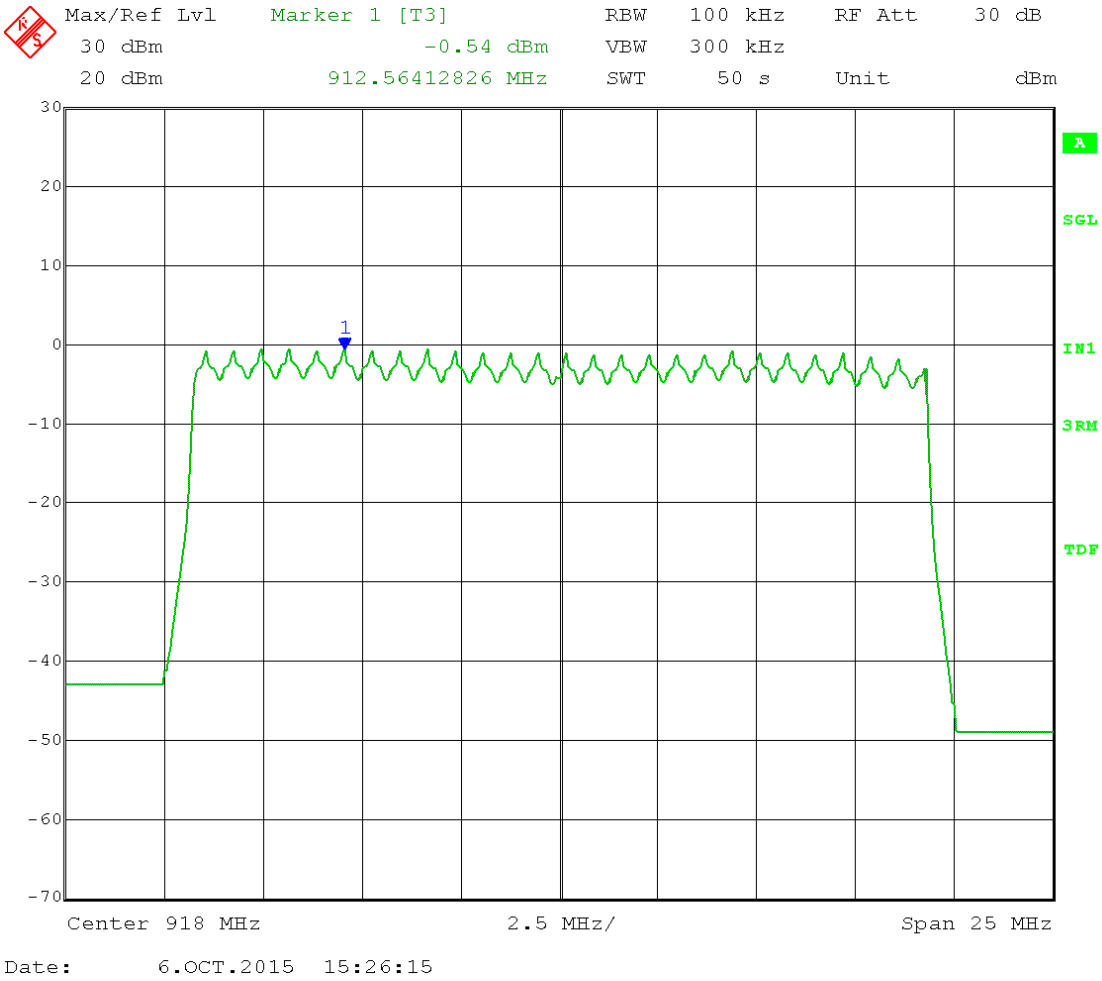
Max PSD = -0.36 dBm / 100 kHz + 1.83 dB (duty cycle correction) + 3 dB (MIMO) = 4.47 dBm / 100 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: High Channel: Frequency = 918 MHz
Output Power Setting = 20 20 MHz channel BW
RBW = 100 kHz VBW = 300 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 5.010020 ms = 25 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

Max PSD = -0.54 dBm / 100 kHz + 1.83 dB (duty cycle correction) + 3 dB (MIMO) = 4.29 dBm / 100 kHz

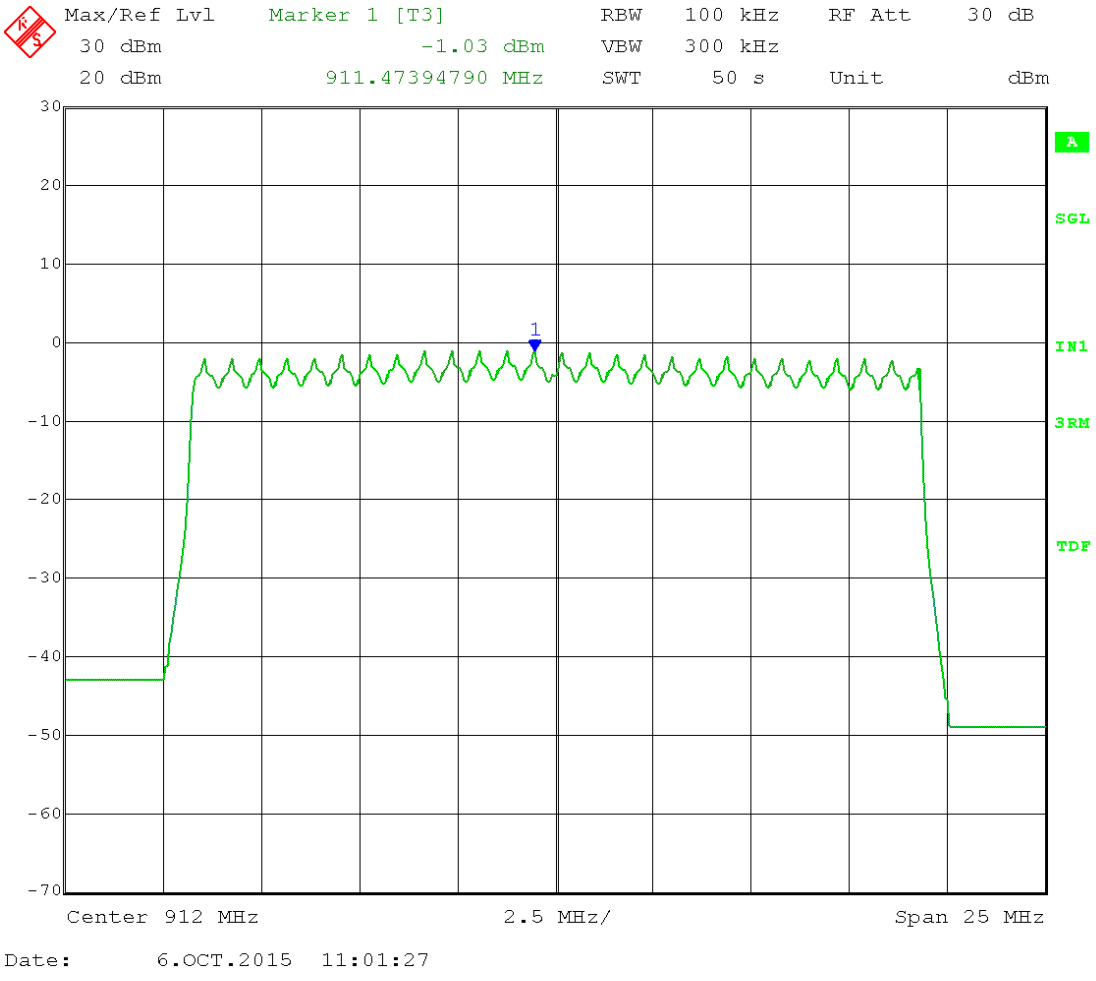


Date: 6.OCT.2015 15:26:15

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Low Channel: Frequency = 912 MHz
Output Power Setting = 19 20 MHz channel BW
RBW = 100 kHz VBW = 300 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 5.010020 ms = 25 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

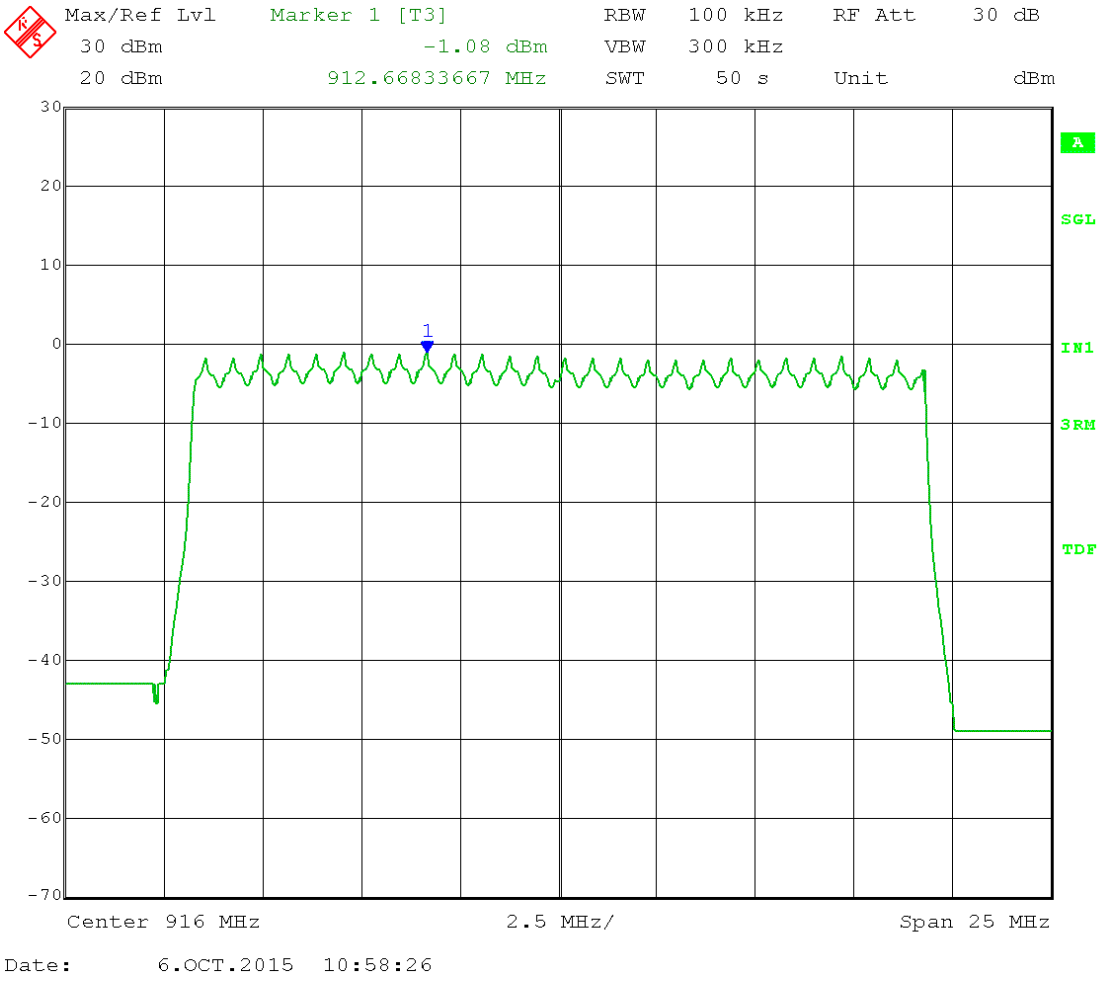
Max PSD = -1.03 dBm / 100 kHz + 1.83 dB (duty cycle correction) + 3 dB (MIMO) = 3.80 dBm / 100 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: Mid Channel: Frequency = 916 MHz
Output Power Setting = 19 20 MHz channel BW
RBW = 100 kHz VBW = 300 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 5.010020 ms = 25 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

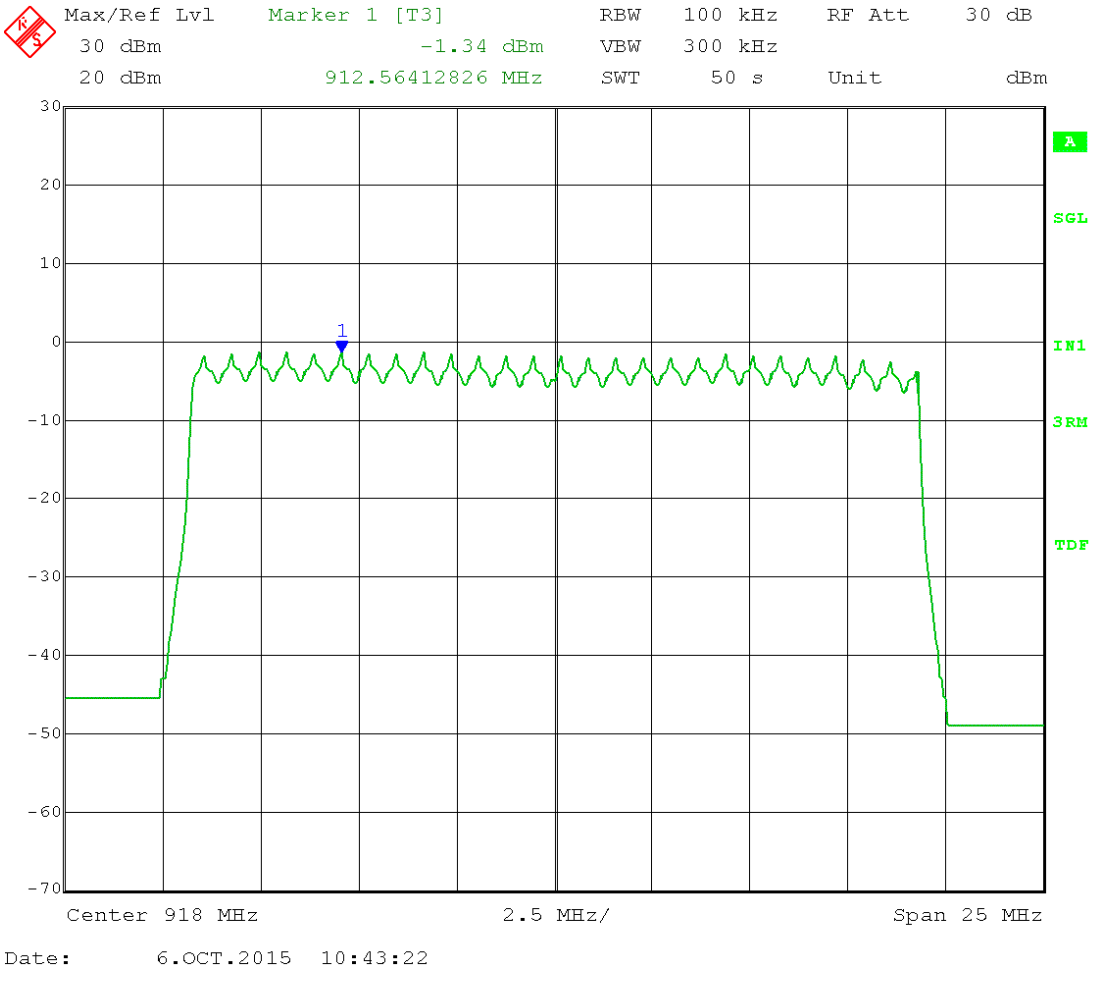
Max PSD = -1.08 dBm / 100 kHz + 1.83 dB (duty cycle correction) + 3 dB (MIMO) = 3.75 dBm / 100 kHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Power Spectral Density level in the fundamental emission
Method 10.6: AVGPSD-2 Alternative –RMS detection with slow sweep speed with spectrum bin averaging across on and off times of the EUT transmissions, followed by duty cycle correction
Operator: Craig B
Comment: High Channel: Frequency = 918 MHz
Output Power Setting = 19 20 MHz channel BW
RBW = 100 kHz VBW = 300 kHz
Span ≥ 1.5 x DTS bandwidth Detector = RMS
Sweep time ≥ 10 x (measurement points) x (total on/off period of the transmitted signal)
Sweep time ≥ 10 x 500 x 5.010020 ms = 25 seconds
Trace mode: single trace Output port A
Limit: +8 dBm / 3 kHz

KDB 662911 D01 v02r01, section E(2)(c): Measure and add 10 log(N_{ant}) dB for MIMO with Cross-Polarized antenna, where N is the number of outputs. = 10 log(2) = 3 dB

Max PSD = -1.34 dBm / 100 kHz + 1.83 dB (duty cycle correction) + 3 dB (MIMO) = 3.49 dBm / 100 kHz



Appendix B – Measurement Data

B5.0 Emissions in Non-Restricted Frequency Bands - RF Conducted

Rule Part:

15.247(d)

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
Section 11.0 Emissions in non-restricted frequency bands
Section 11.2 Reference Level Measurement
Section 11.3 Emissions Level Measurement

Limit:

The peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band peak PSD level. (Compliance to the conducted power limits is based on RMS averaging)

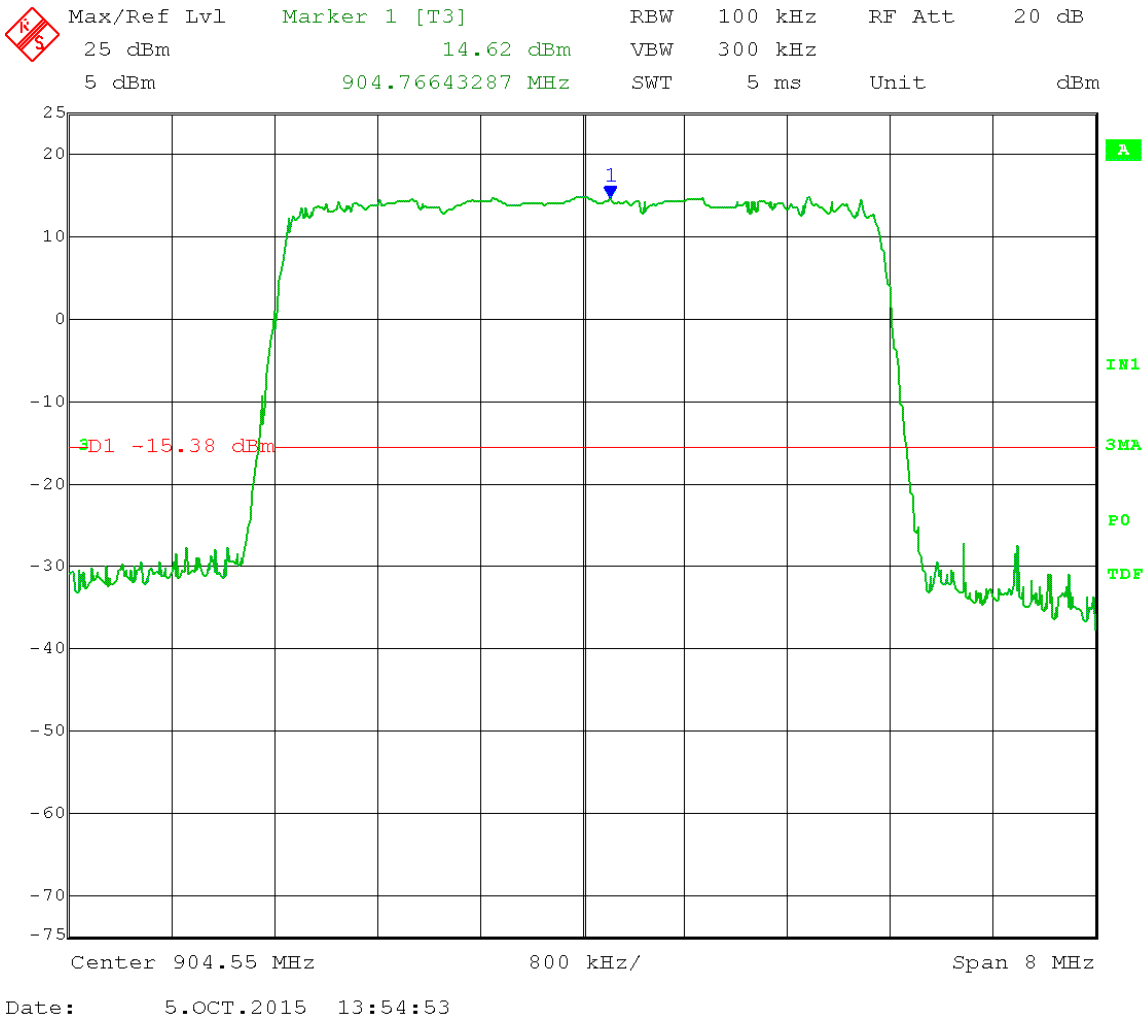
Results:

Compliant

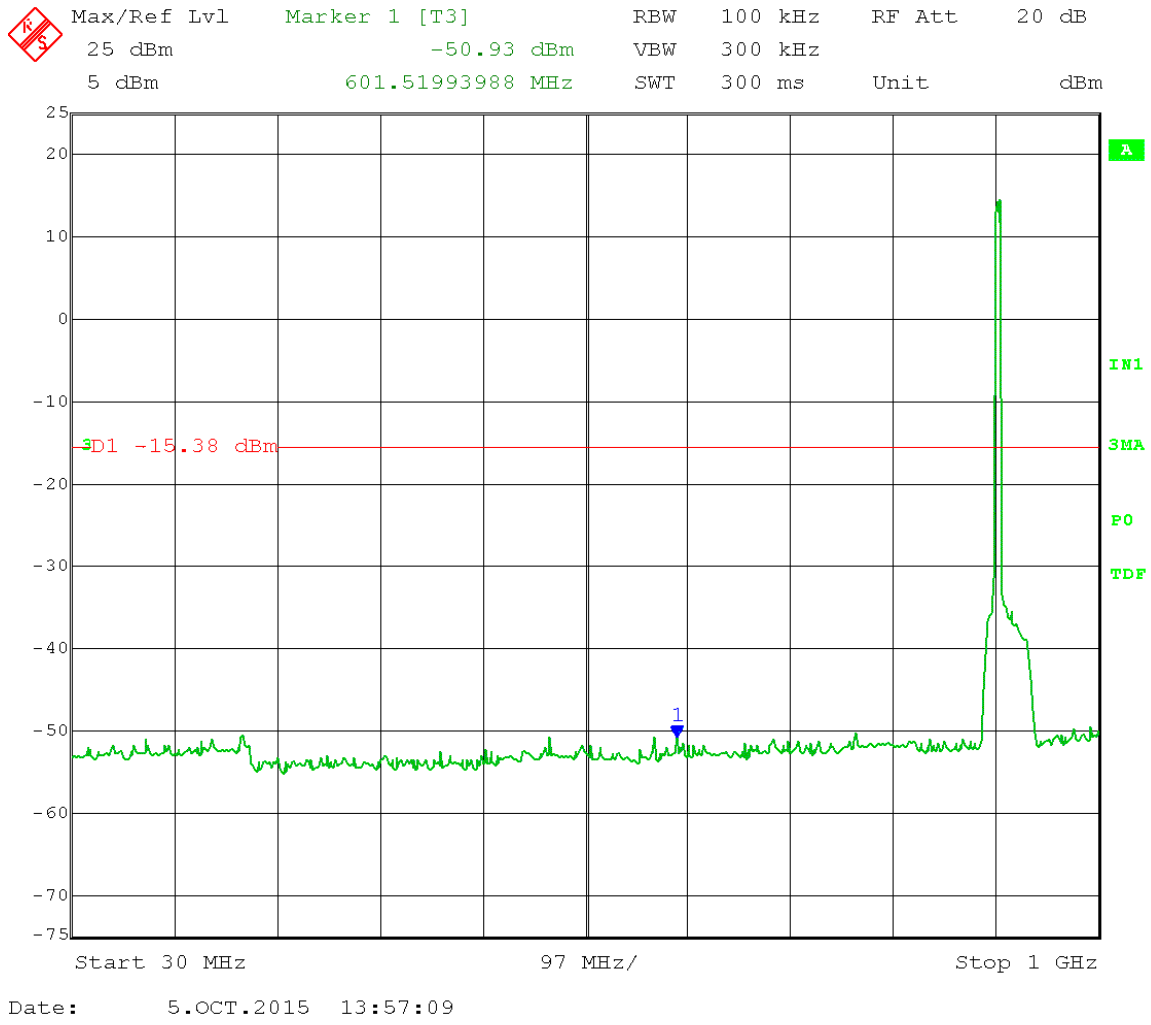
Notes:

Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks. The EUT was tested at the low, middle, and high channels of operation.

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 904.550 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Reference Level Measurement
Limit = 14.62 dBm – 30 dB = -15.38 dBm



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 904.550 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 14.62 dBm – 30 dB = -15.38 dBm
Frequency range: 30-1000 MHz



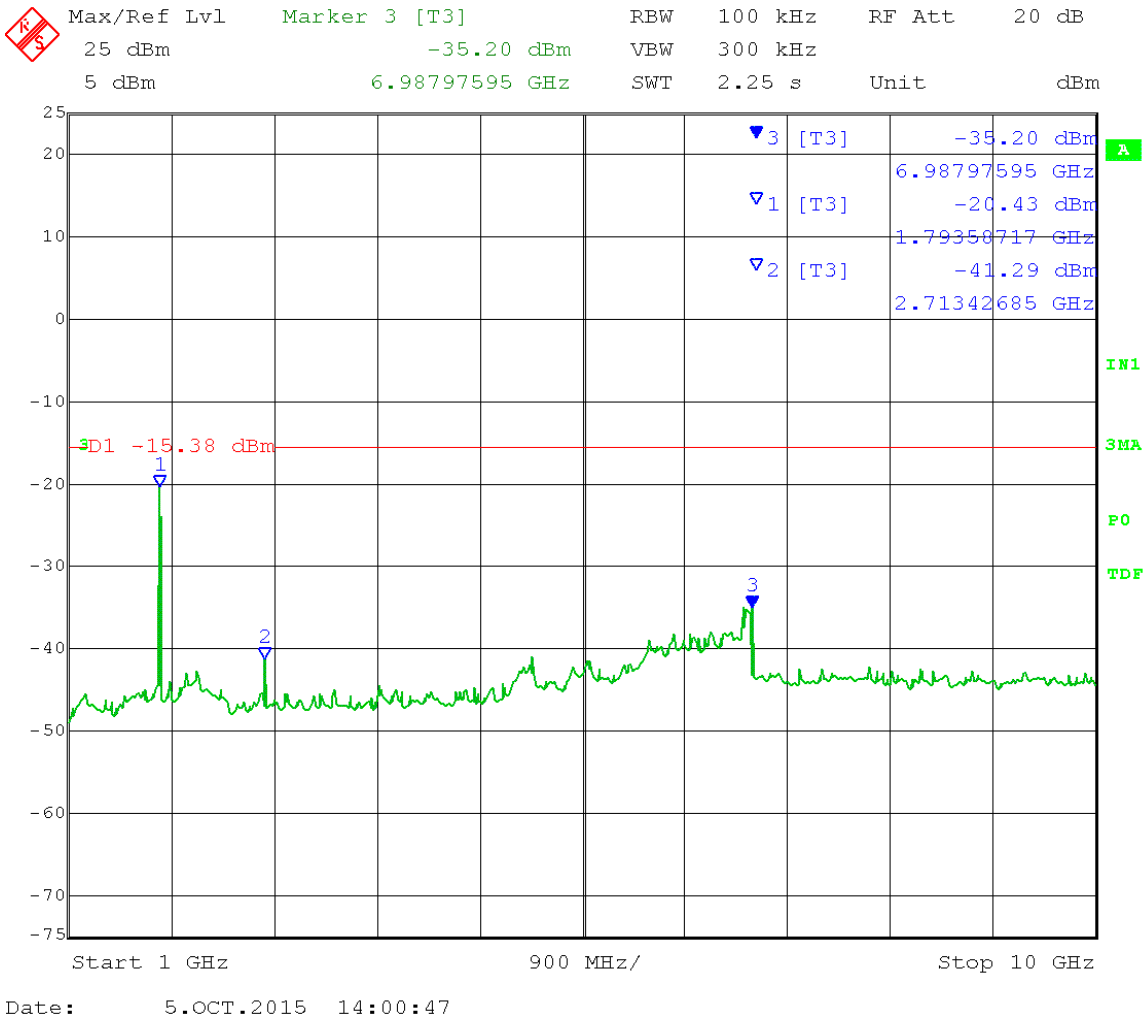
Date: 5.OCT.2015 13:57:09

Test Date:	10-05-2015	
Company:	Cambium Networks	
EUT:	450i 900 MHz AP MAC: 0A003E4586C8	
Test:	Maximum Unwanted Emission Levels - Conducted	
Operator:	Craig B	
Comment:	RBW = 100 kHz	VBW ≥ 300 kHz
	Detector = Peak	Sweep = Auto Couple
	Trace = Max Hold	Low Channel Transmit = 904.550 MHz
	Output Power Setting 18	Channel bandwidth: 5 MHz
	Output port: A	QPSK

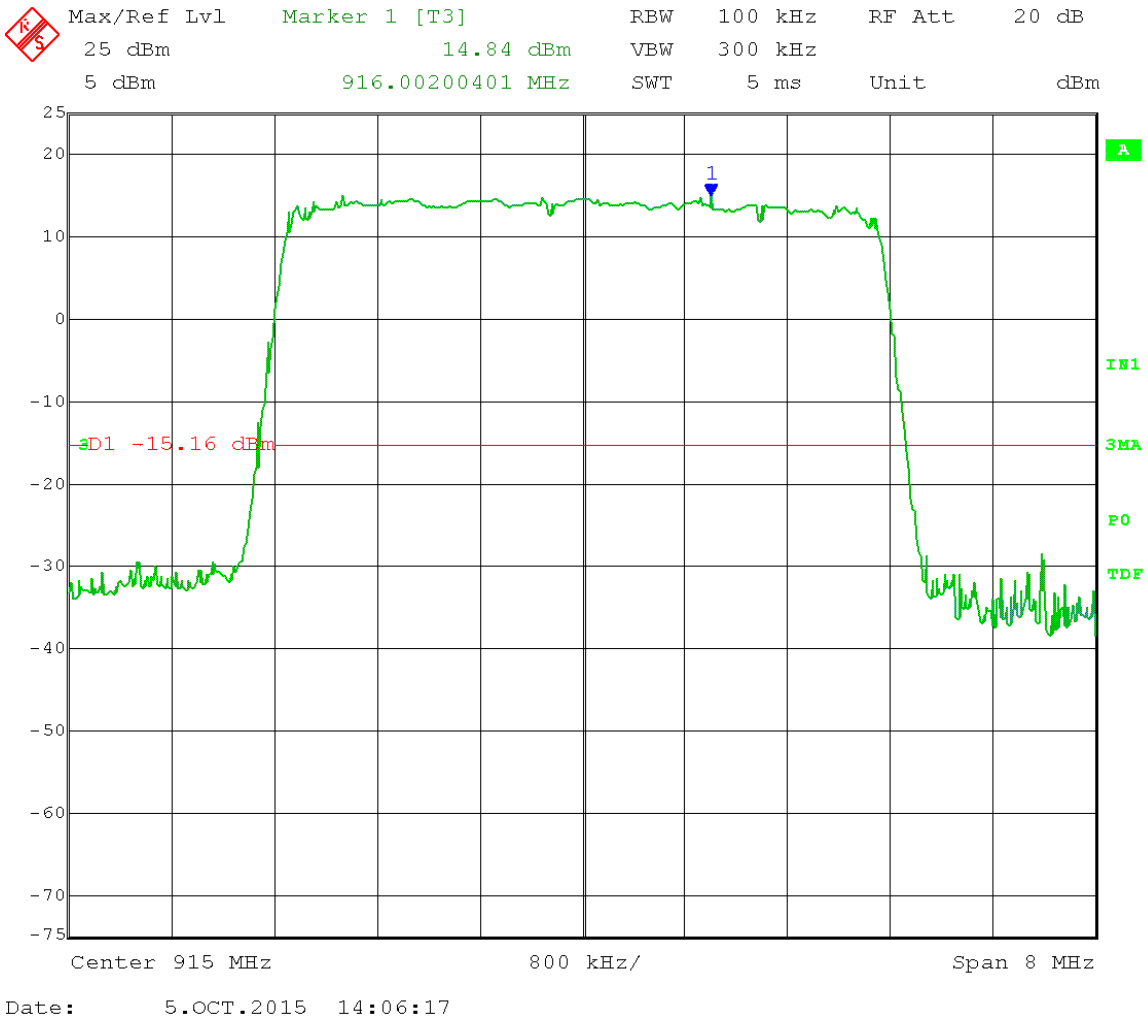
Emission Level Measurement

Limit = 14.62 dBm – 30 dB = -15.38 dBm

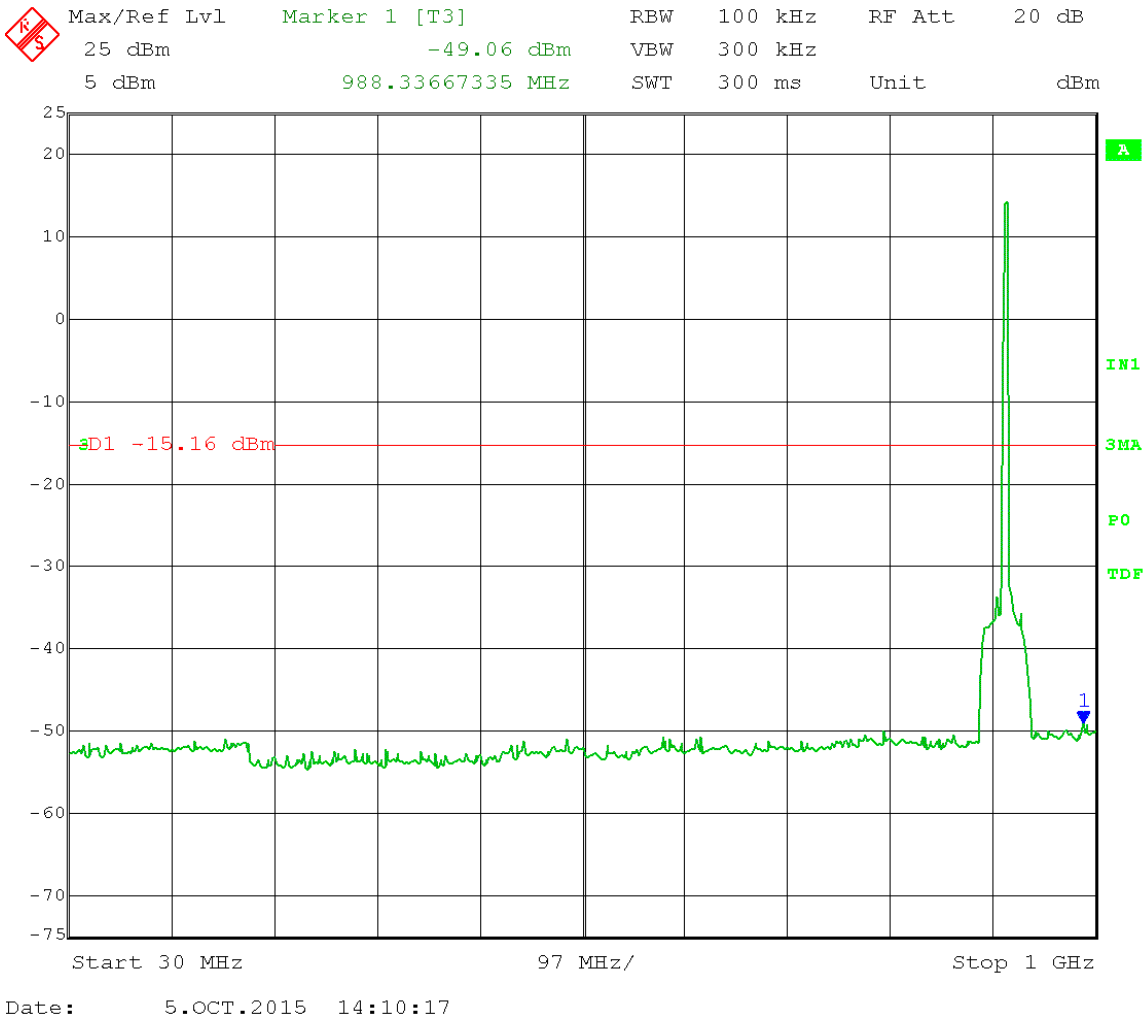
Frequency range: 1-10 GHz



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 915 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Reference Level Measurement
Limit = 14.84 dBm – 30 dB = -15.16 dBm

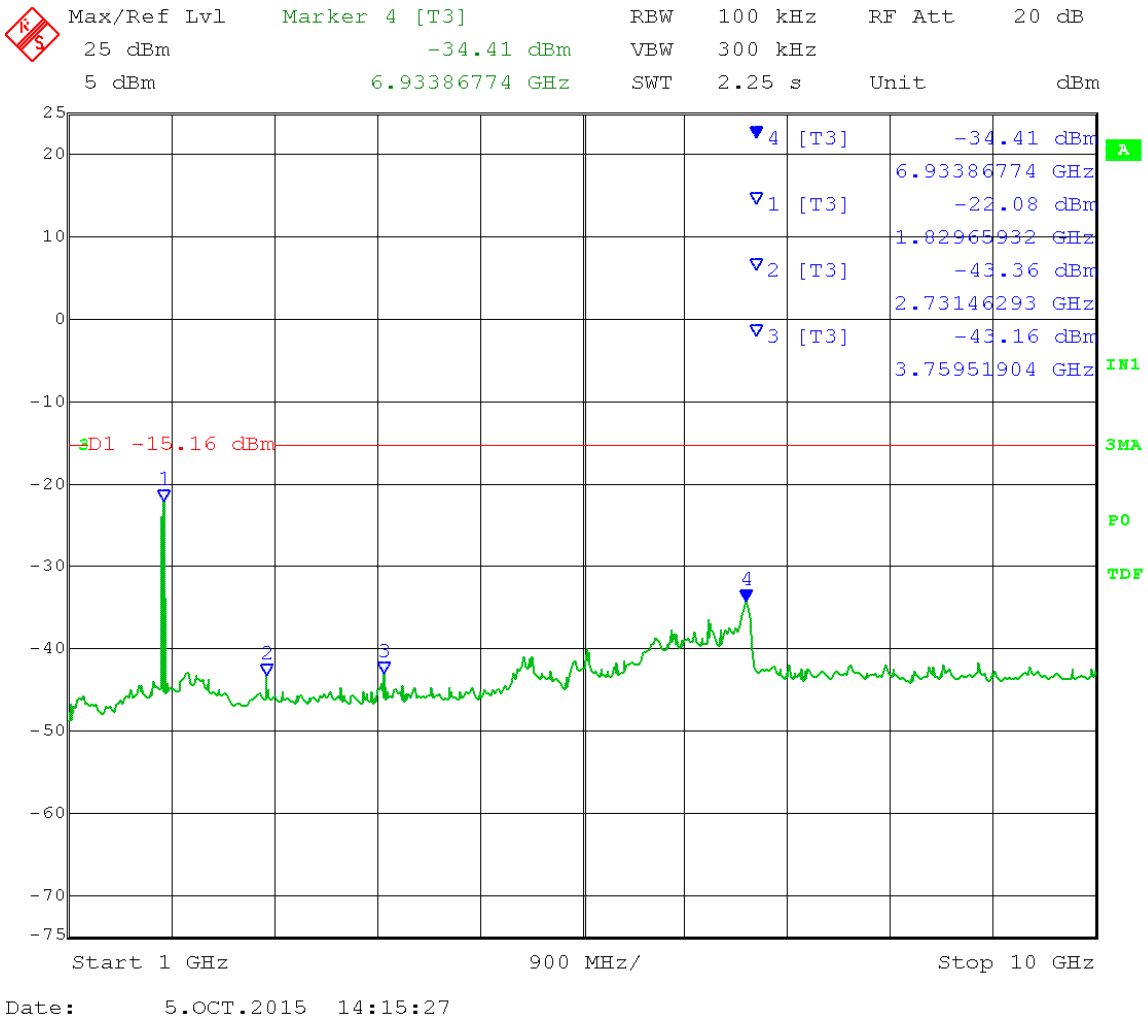


Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 915 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 14.84 dBm – 30 dB = -15.16 dBm
Frequency range: 30-1000 MHz



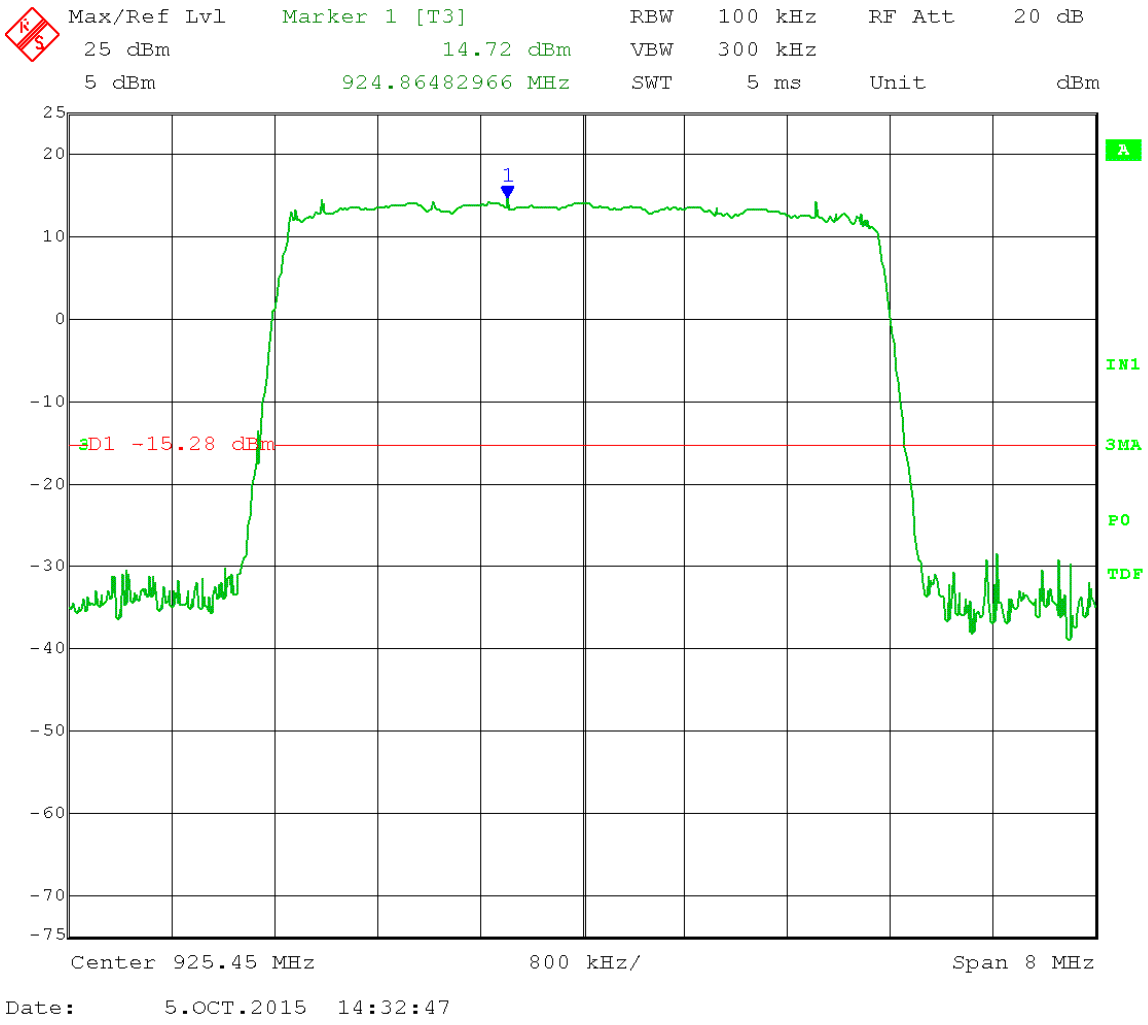
Date: 5.OCT.2015 14:10:17

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 915 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 14.84 dBm – 30 dB = -15.16 dBm
Frequency range: 1-10 GHz

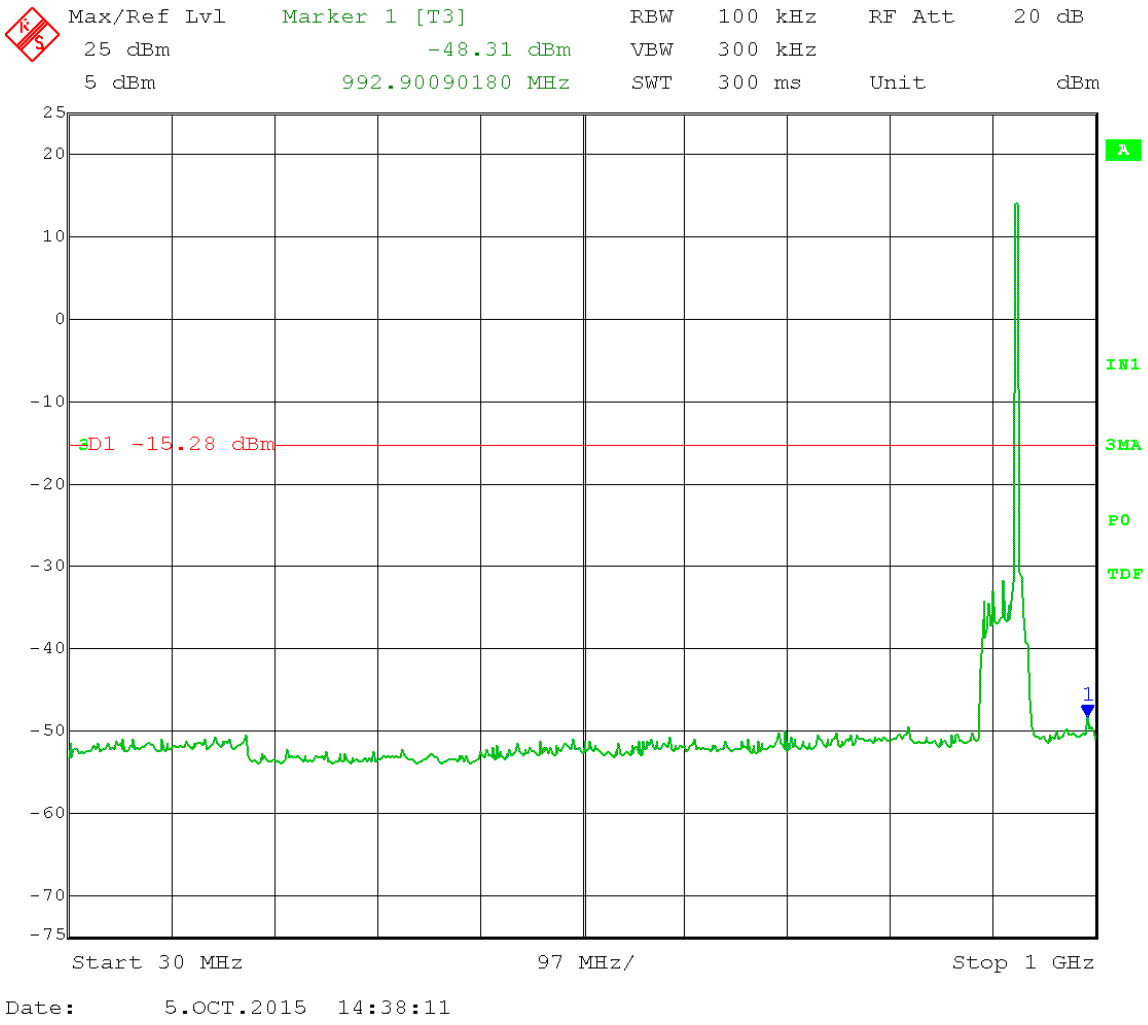


Date: 5.OCT.2015 14:15:27

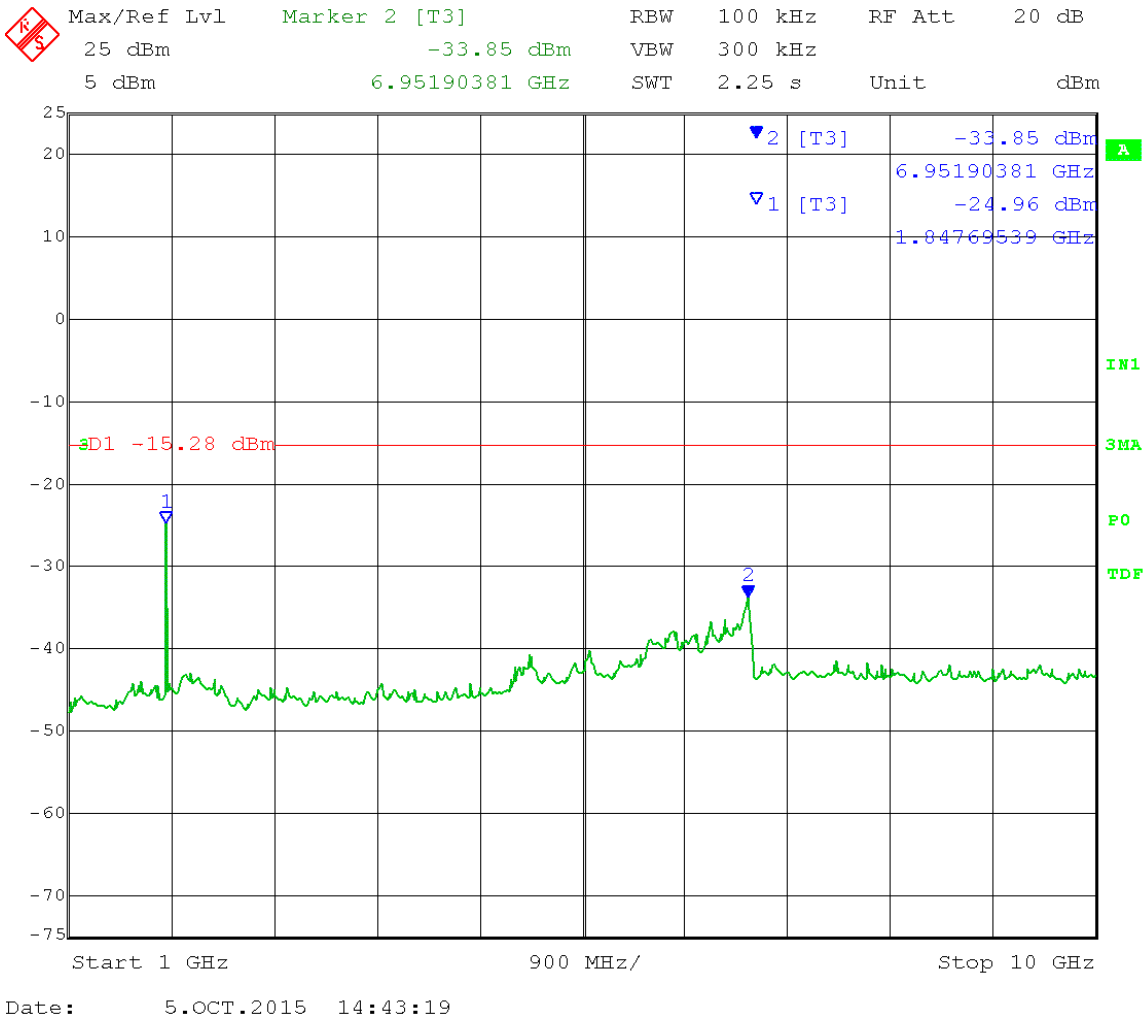
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 925.450 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Reference Level Measurement
Limit = 14.72 dBm – 30 dB = -15.28 dBm



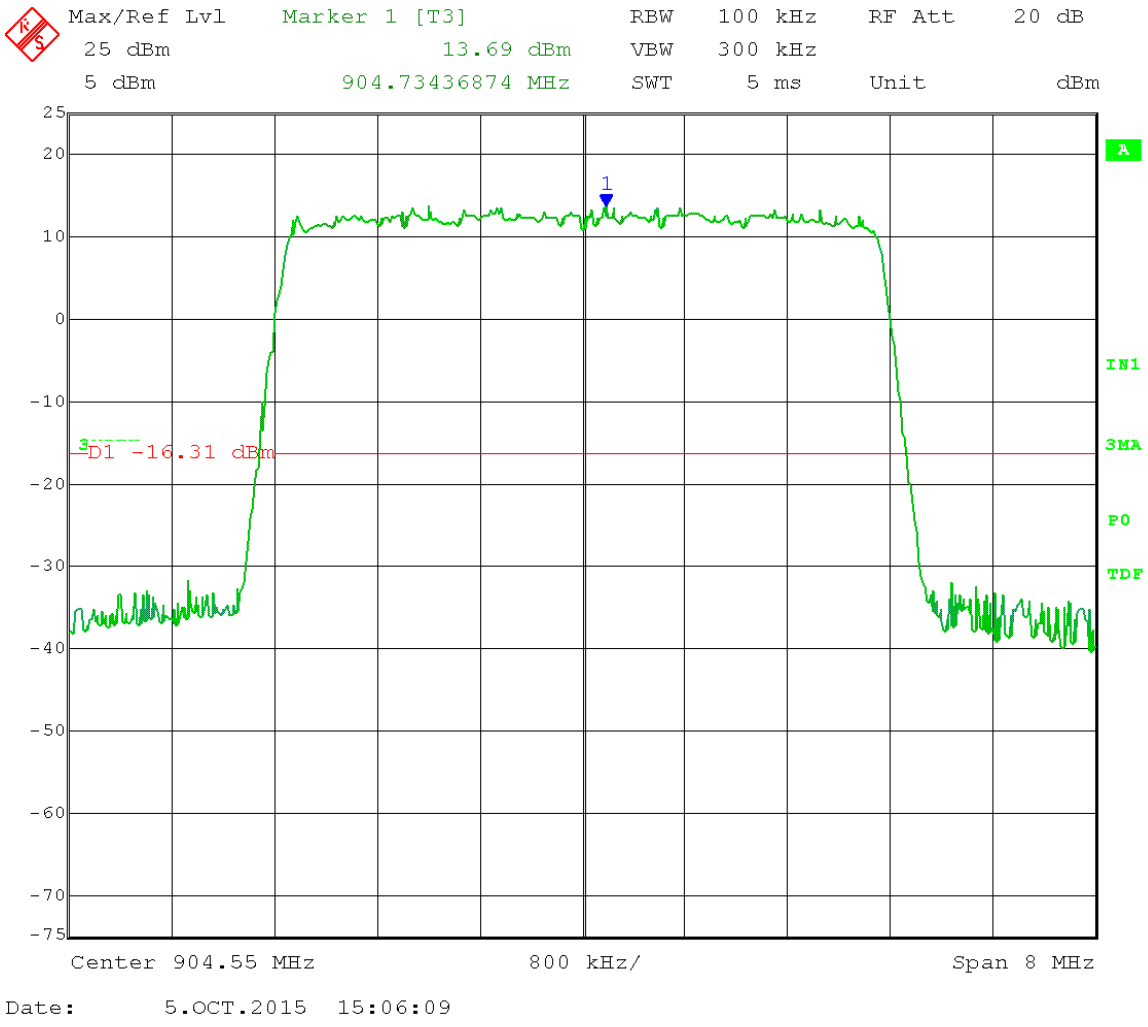
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 925.450 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 14.72 dBm – 30 dB = -15.28 dBm
Frequency range: 30-1000 MHz



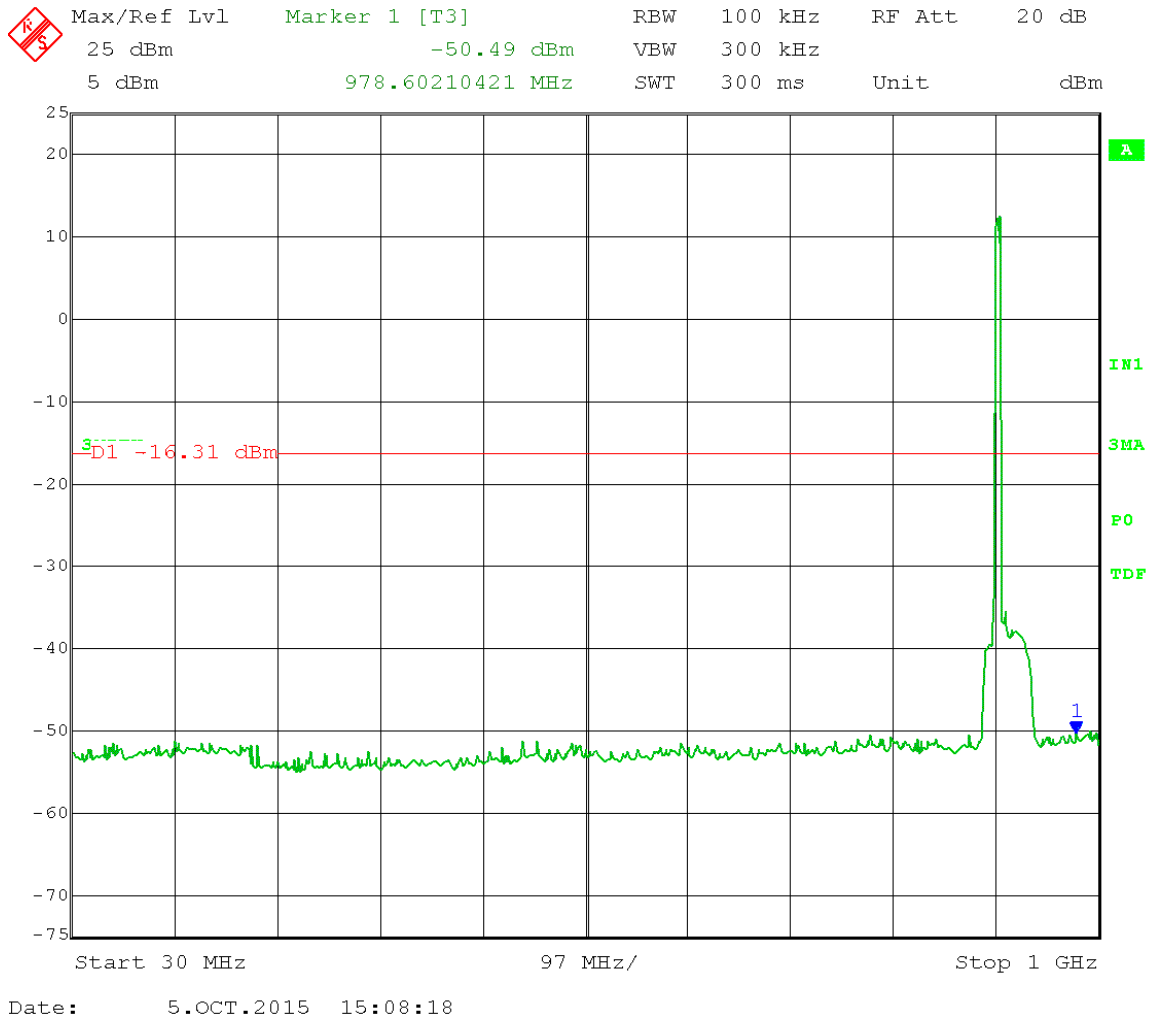
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 925.450 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 14.72 dBm – 30 dB = -15.28 dBm
Frequency range: 1-10 GHz



Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 904.550 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Reference Level Measurement
Limit = 13.69 dBm – 30 dB = -16.31 dBm

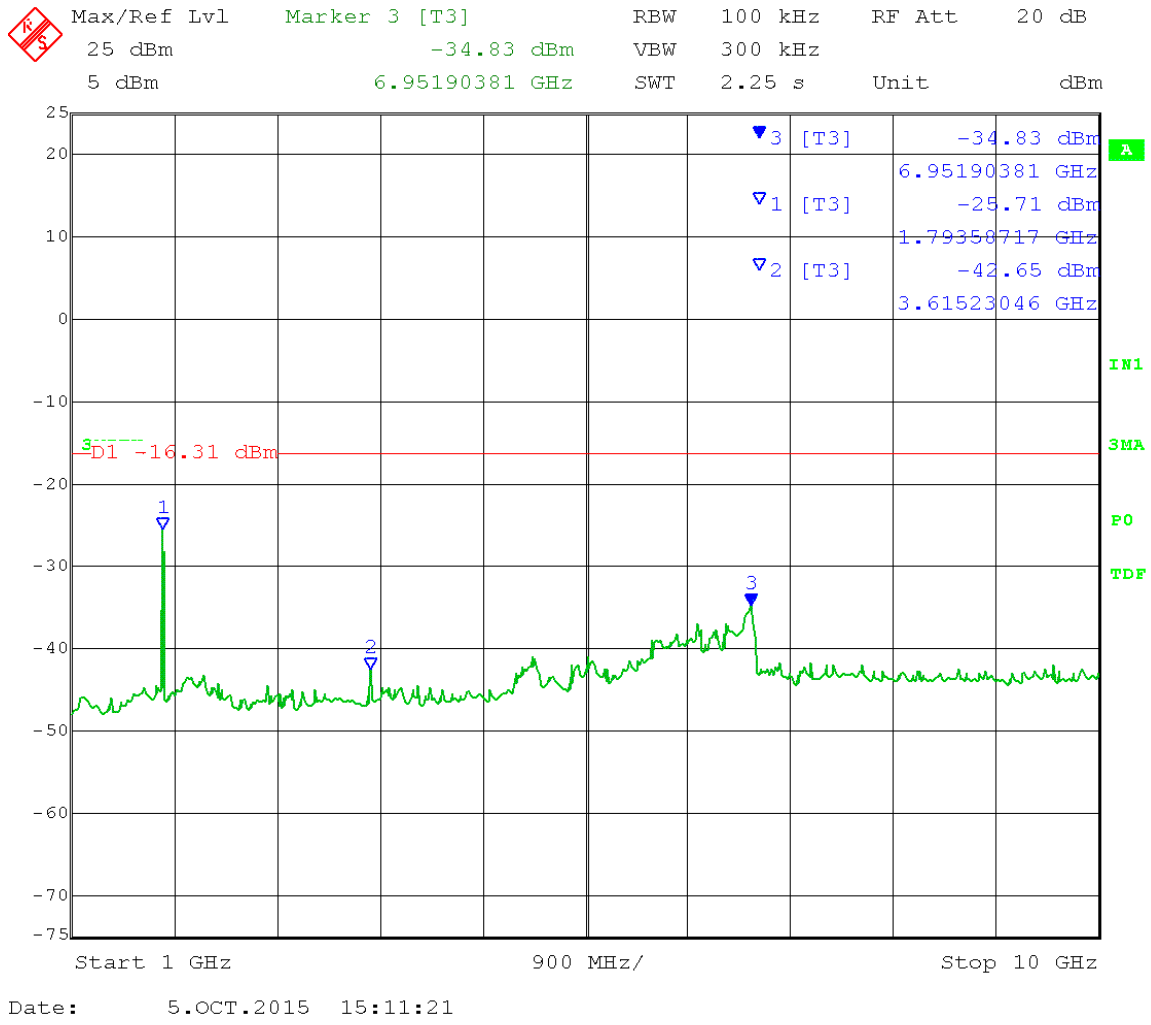


Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 904.550 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 13.69 dBm – 30 dB = -16.31 dBm
Frequency range: 30-1000 MHz



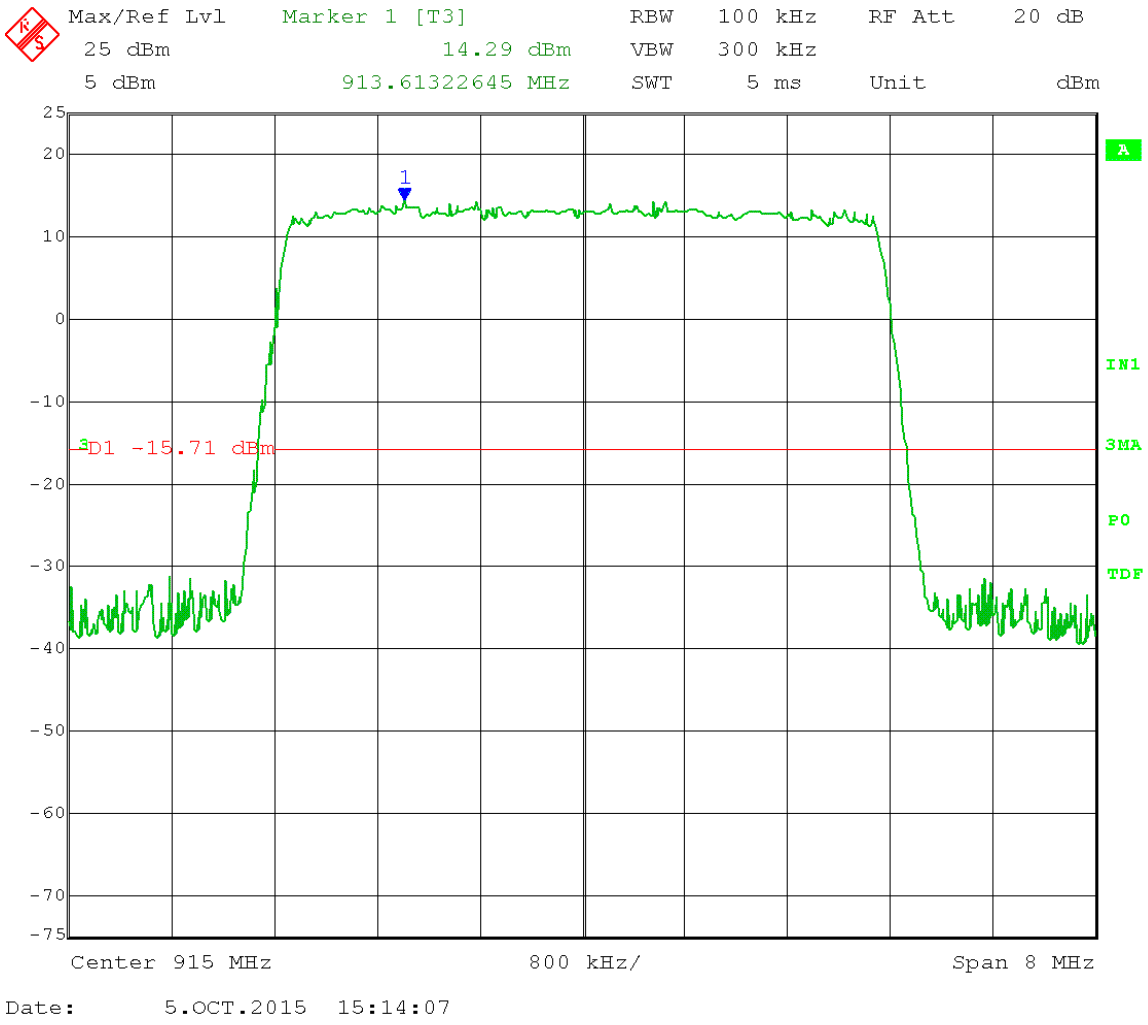
Date: 5.OCT.2015 15:08:18

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 904.550 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 13.69 dBm – 30 dB = -16.31 dBm
Frequency range: 1-10 GHz

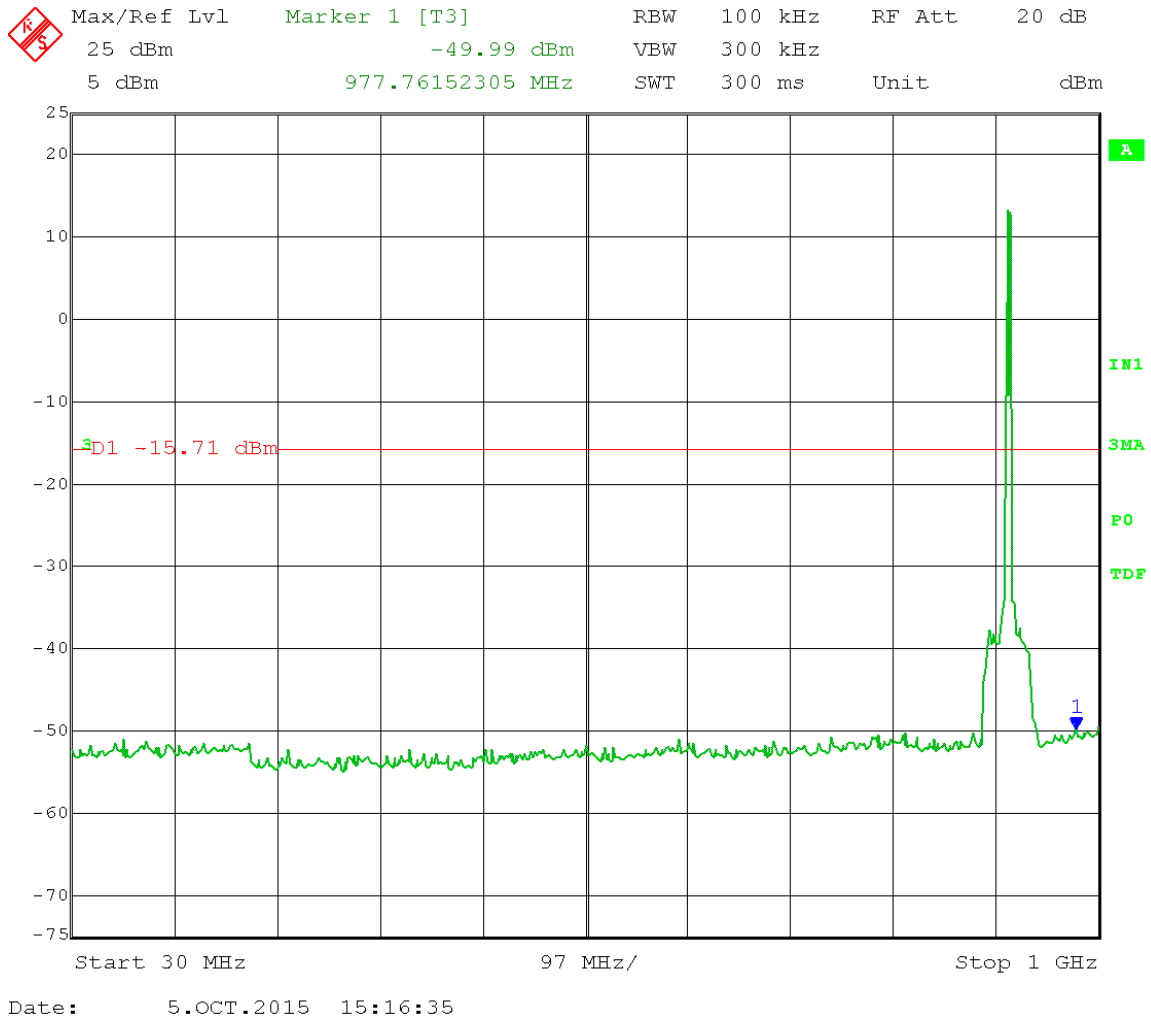


Date: 5.OCT.2015 15:11:21

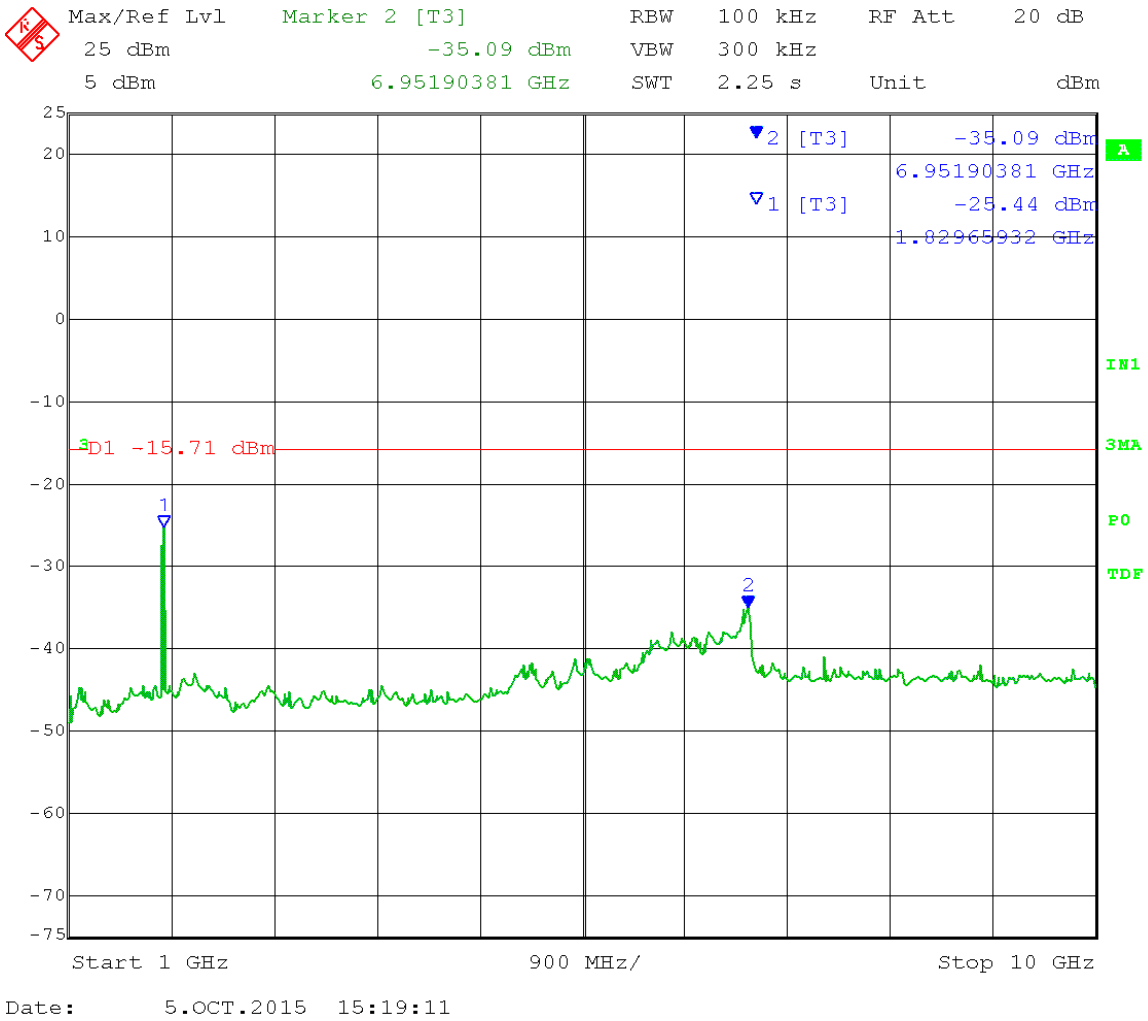
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 915 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Reference Level Measurement
Limit = 14.29 dBm – 30 dB = -15.71 dBm



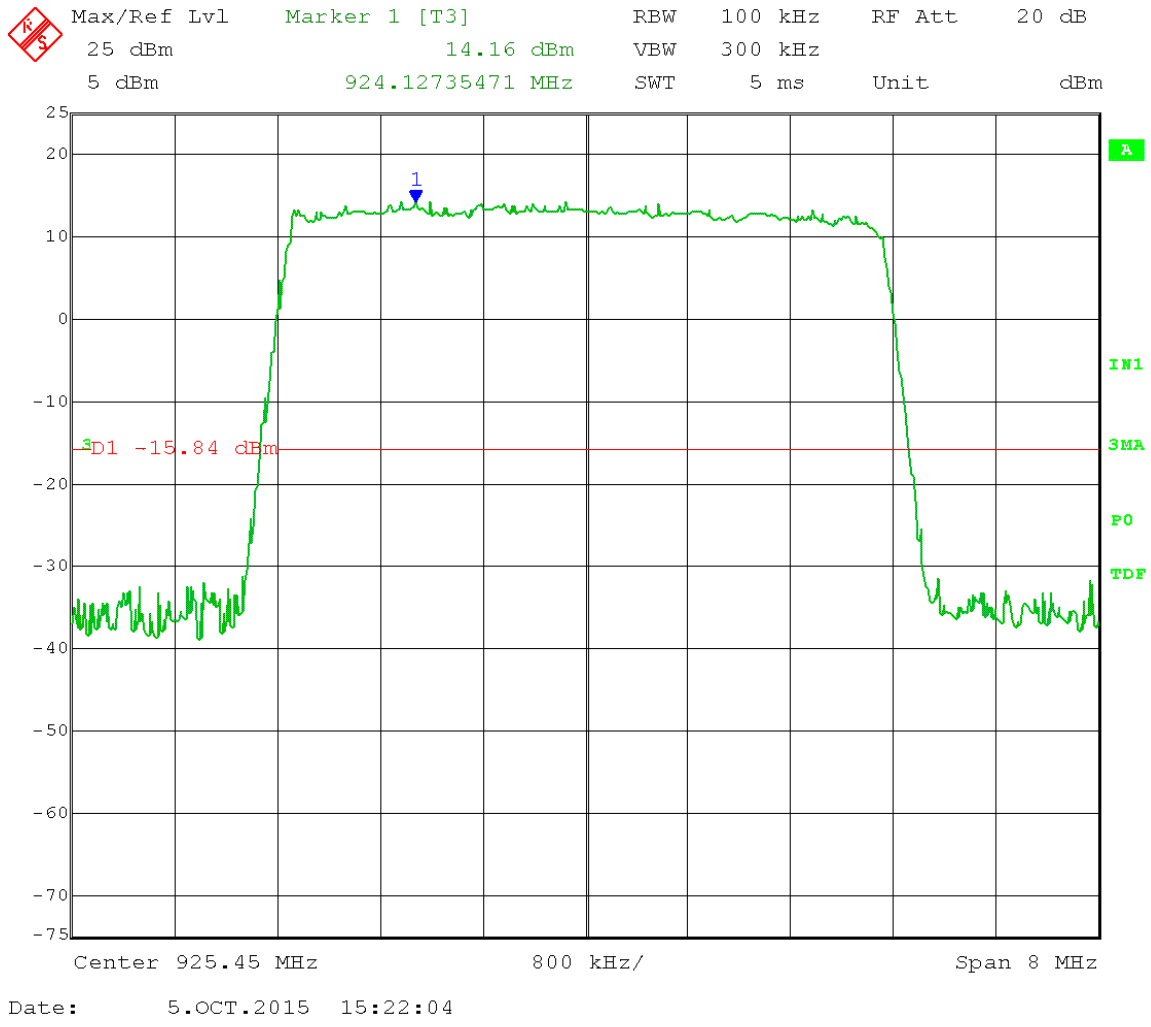
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 915 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 14.29 dBm – 30 dB = -15.71 dBm
Frequency range: 30-1000 MHz



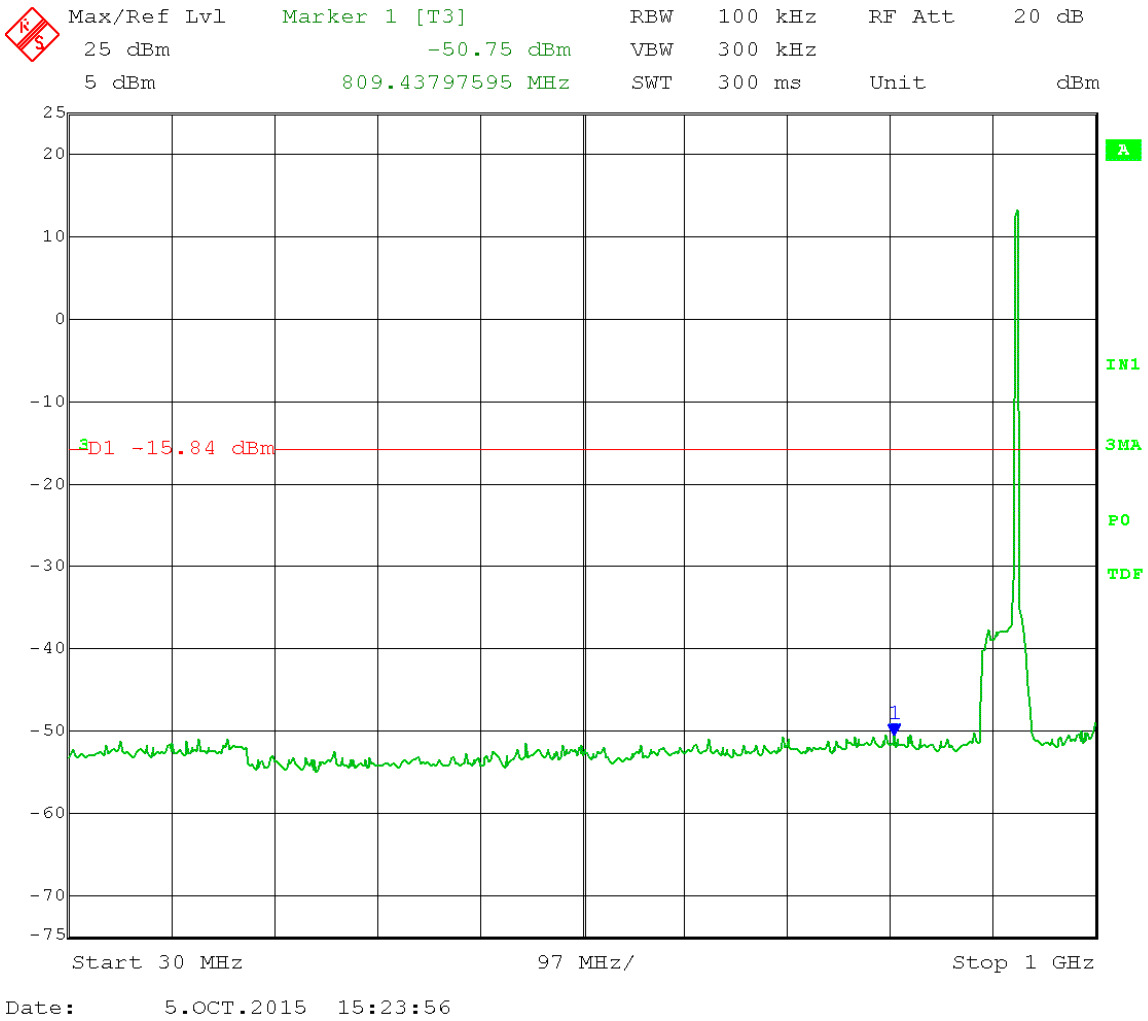
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 915 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 14.29 dBm – 30 dB = -15.71 dBm
Frequency range: 1-10 GHz



Test Date:	10-05-2015	
Company:	Cambium Networks	
EUT:	450i 900 MHz AP MAC: 0A003E4586C8	
Test:	Maximum Unwanted Emission Levels - Conducted	
Operator:	Craig B	
Comment:	RBW = 100 kHz	VBW ≥ 300 kHz
	Detector = Peak	Sweep = Auto Couple
	Trace = Max Hold	High Channel Transmit = 925.450 MHz
	Output Power Setting 18	Channel bandwidth: 5 MHz
	Output port: B	QPSK
	Reference Level Measurement	
	Limit = 14.16 dBm – 30 dB = -15.84 dBm	

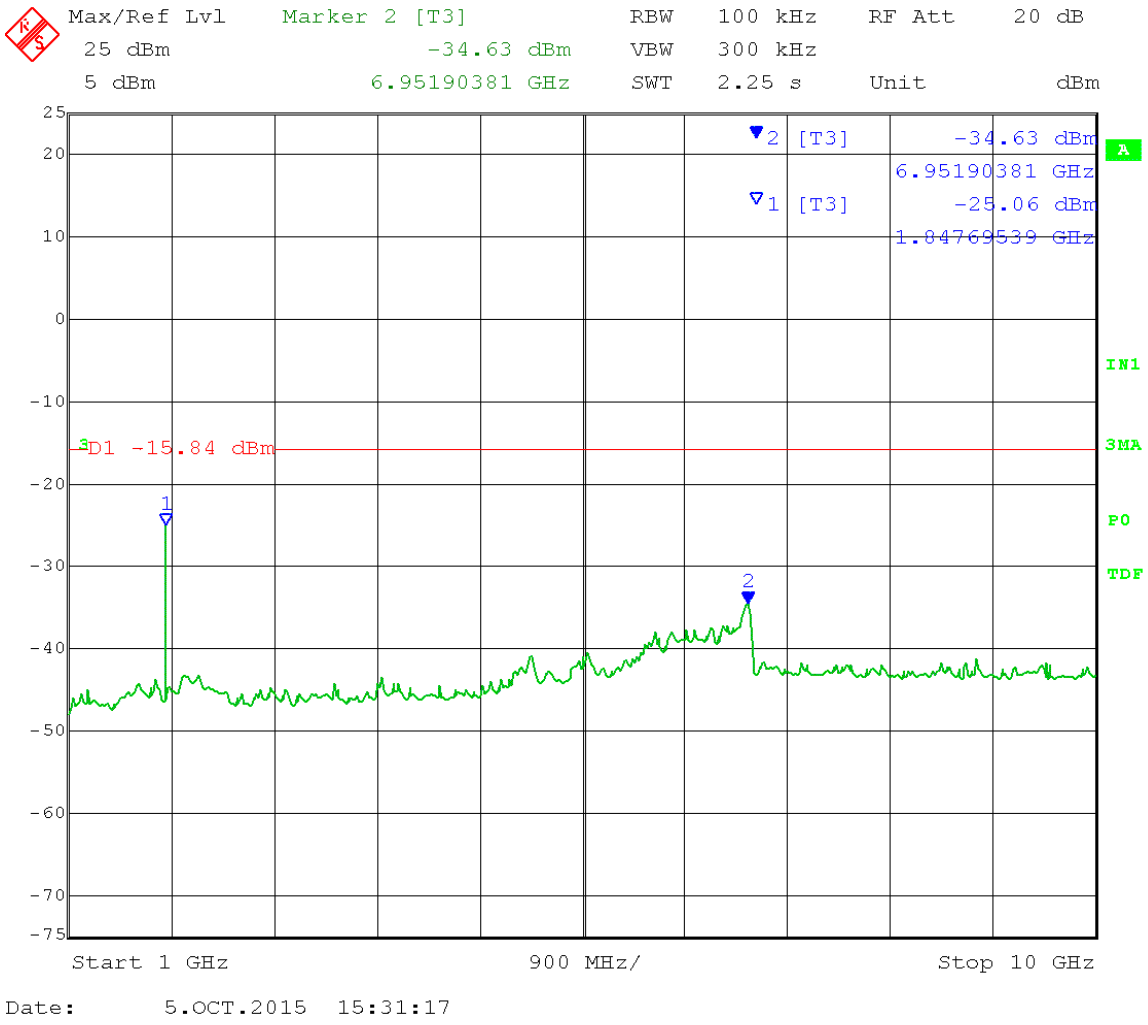


Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 925.450 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 14.16 dBm – 30 dB = -15.84 dBm
Frequency range: 30-1000 MHz



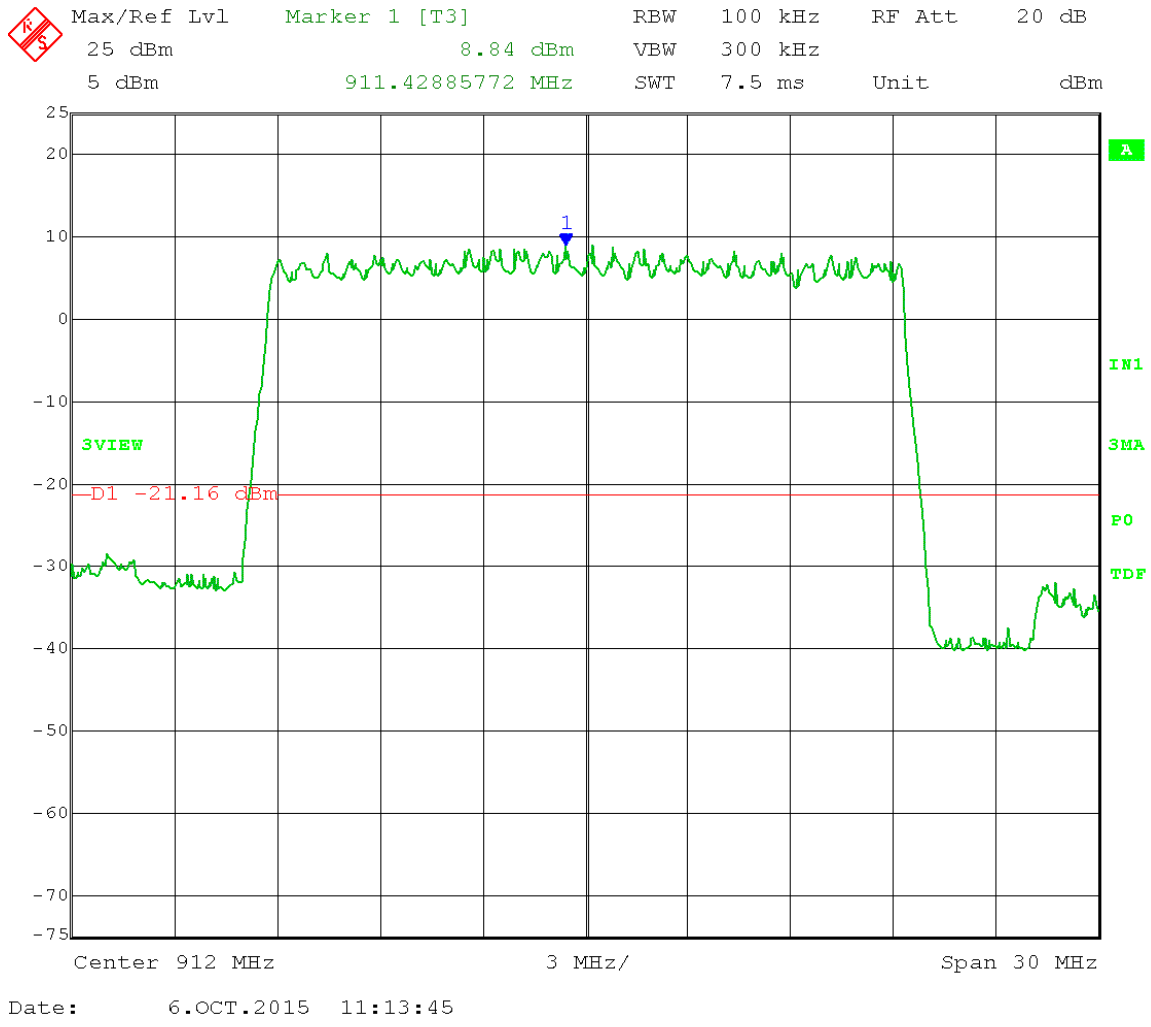
Date: 5.OCT.2015 15:23:56

Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 925.450 MHz
Output Power Setting 18 Channel bandwidth: 5 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 14.16 dBm – 30 dB = -15.84 dBm
Frequency range: 1-10 GHz

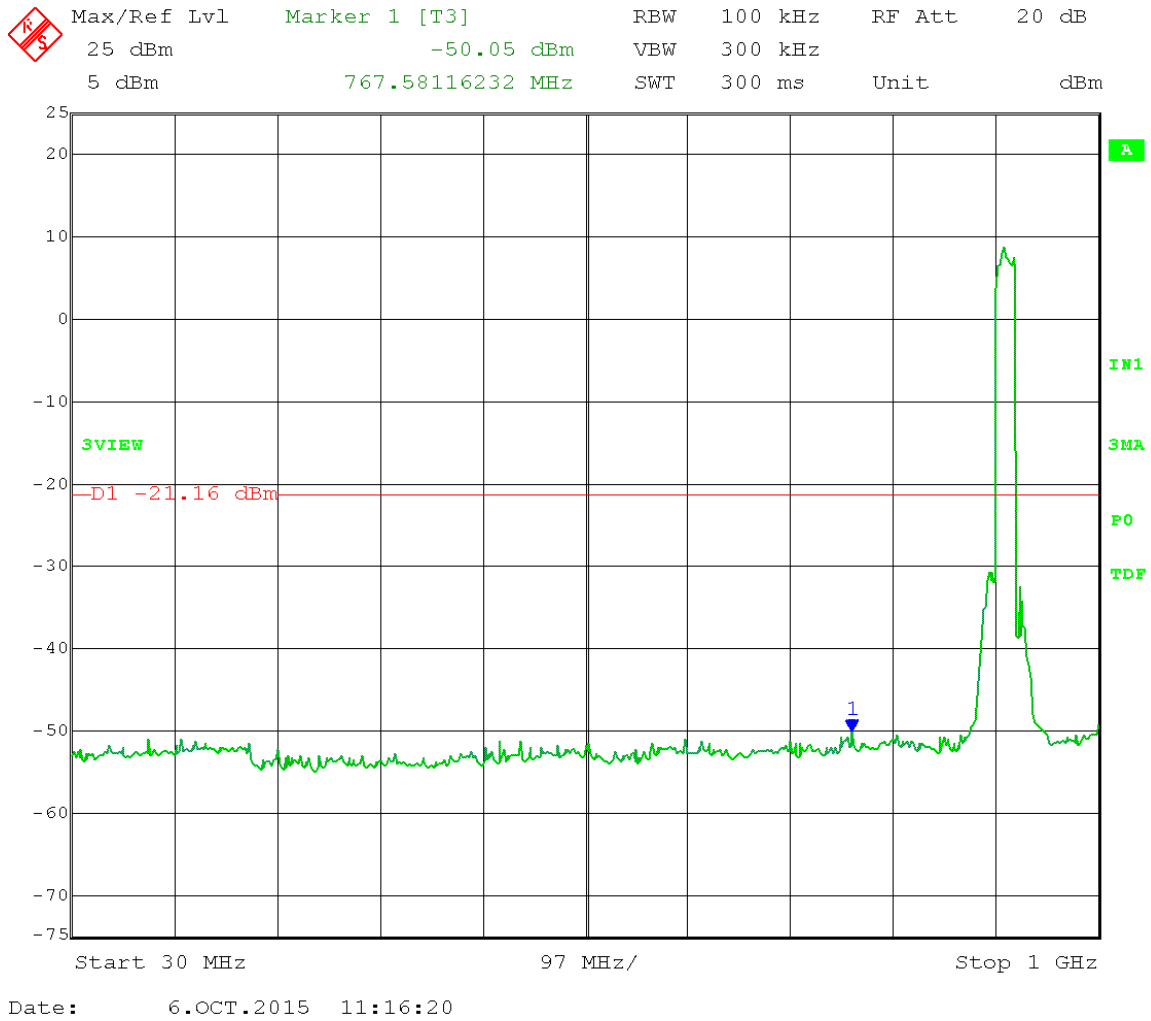


Date: 5.OCT.2015 15:31:17

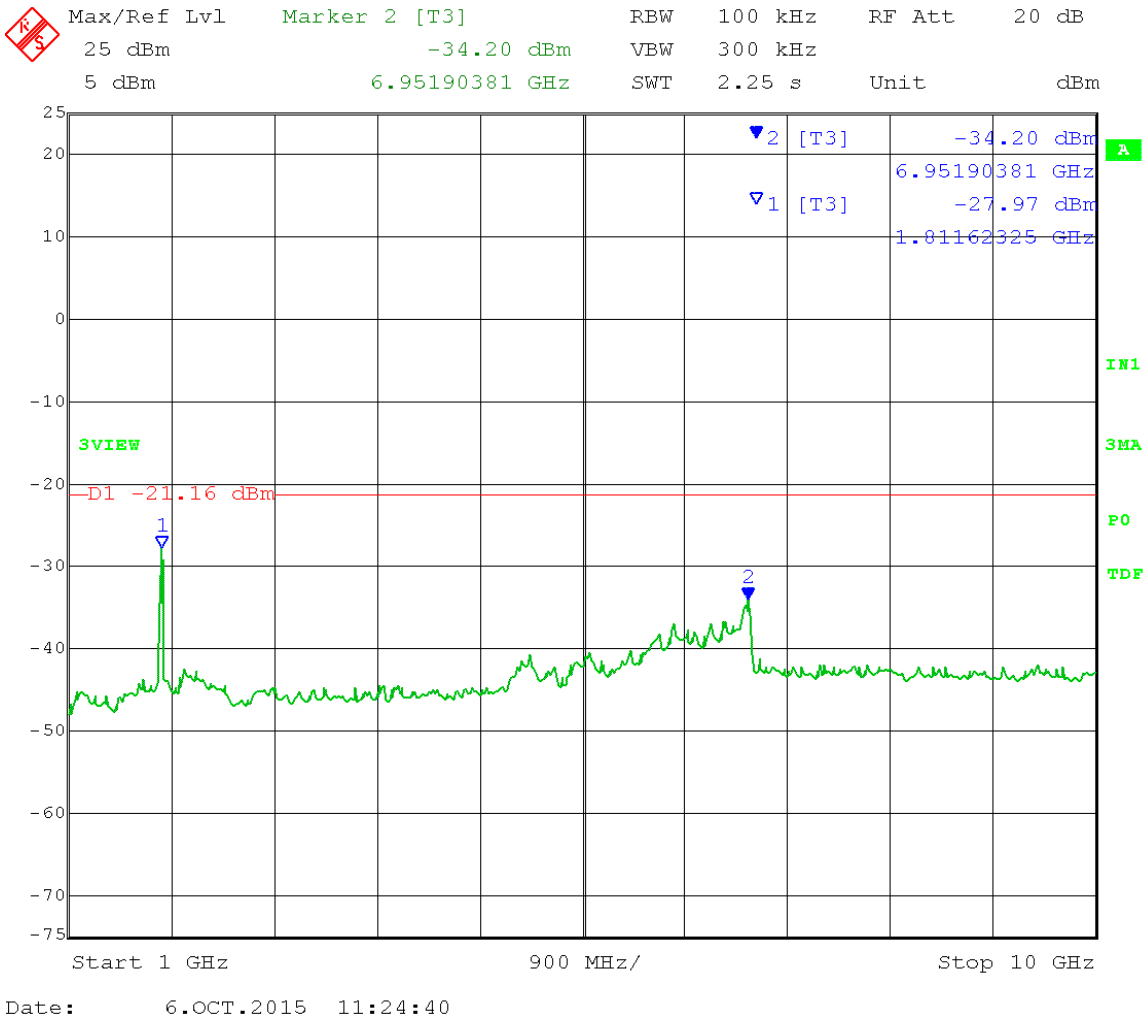
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 912 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Reference Level Measurement
Limit = 8.84 dBm – 30 dB = -21.16 dBm



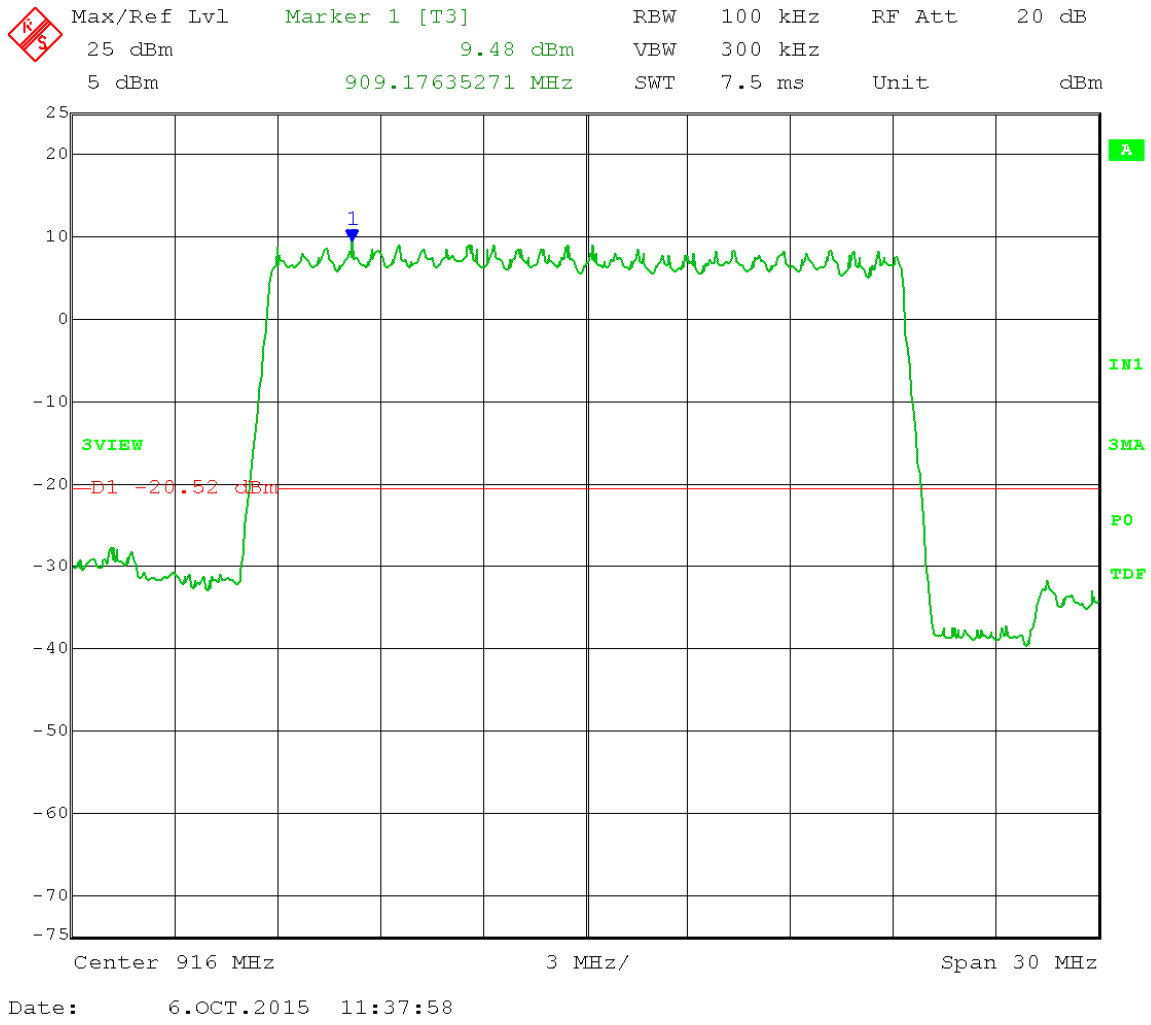
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 912 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 8.84 dBm – 30 dB = -21.16 dBm
Frequency range: 30-1000 MHz



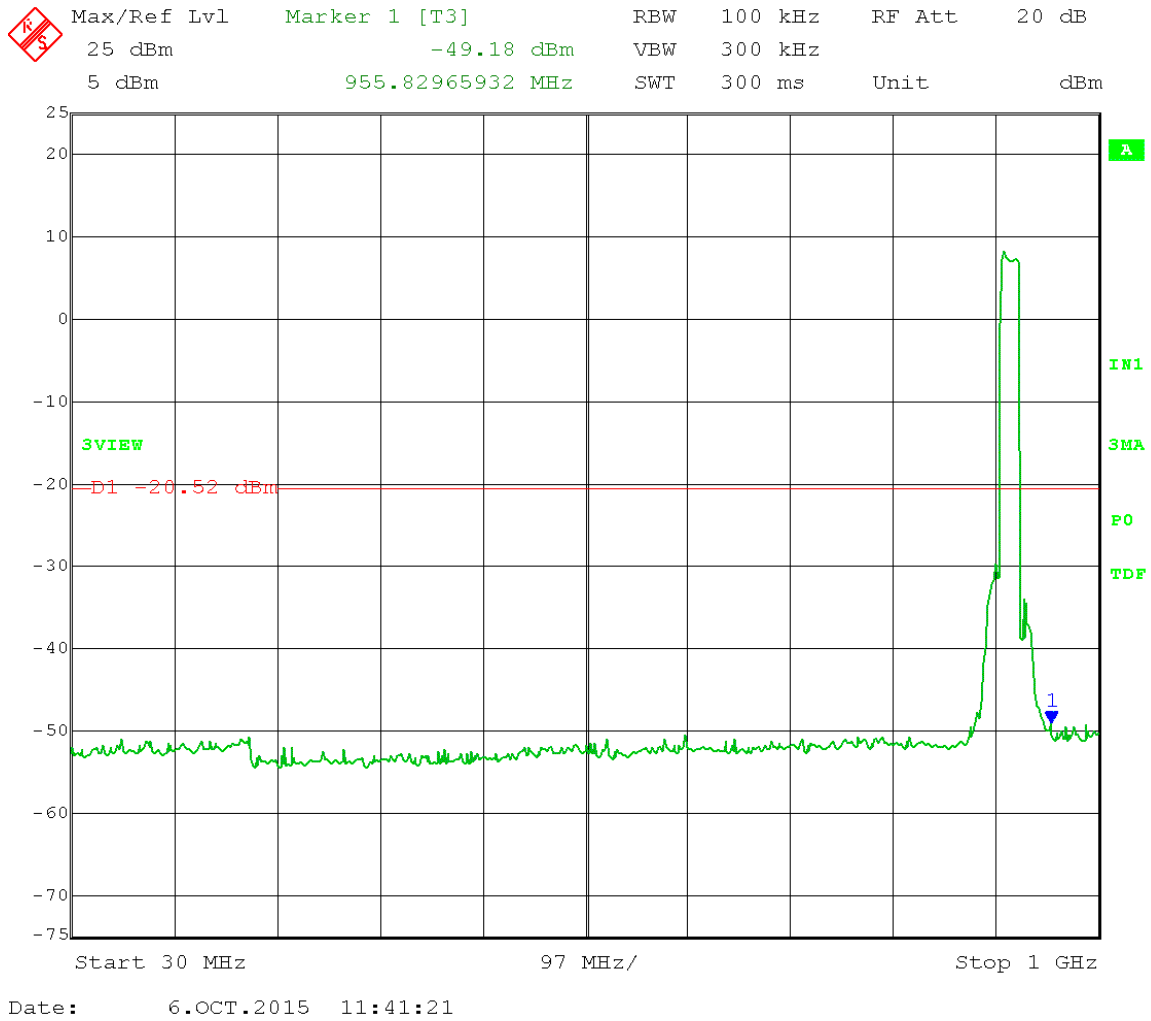
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 912 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 8.84 dBm – 30 dB = -21.16 dBm
Frequency range: 1-10 GHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 916 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Reference Level Measurement
Limit = 9.48 dBm – 30 dB = -20.52 dBm



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 916 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 9.48 dBm – 30 dB = -20.52 dBm
Frequency range: 30-1000 MHz



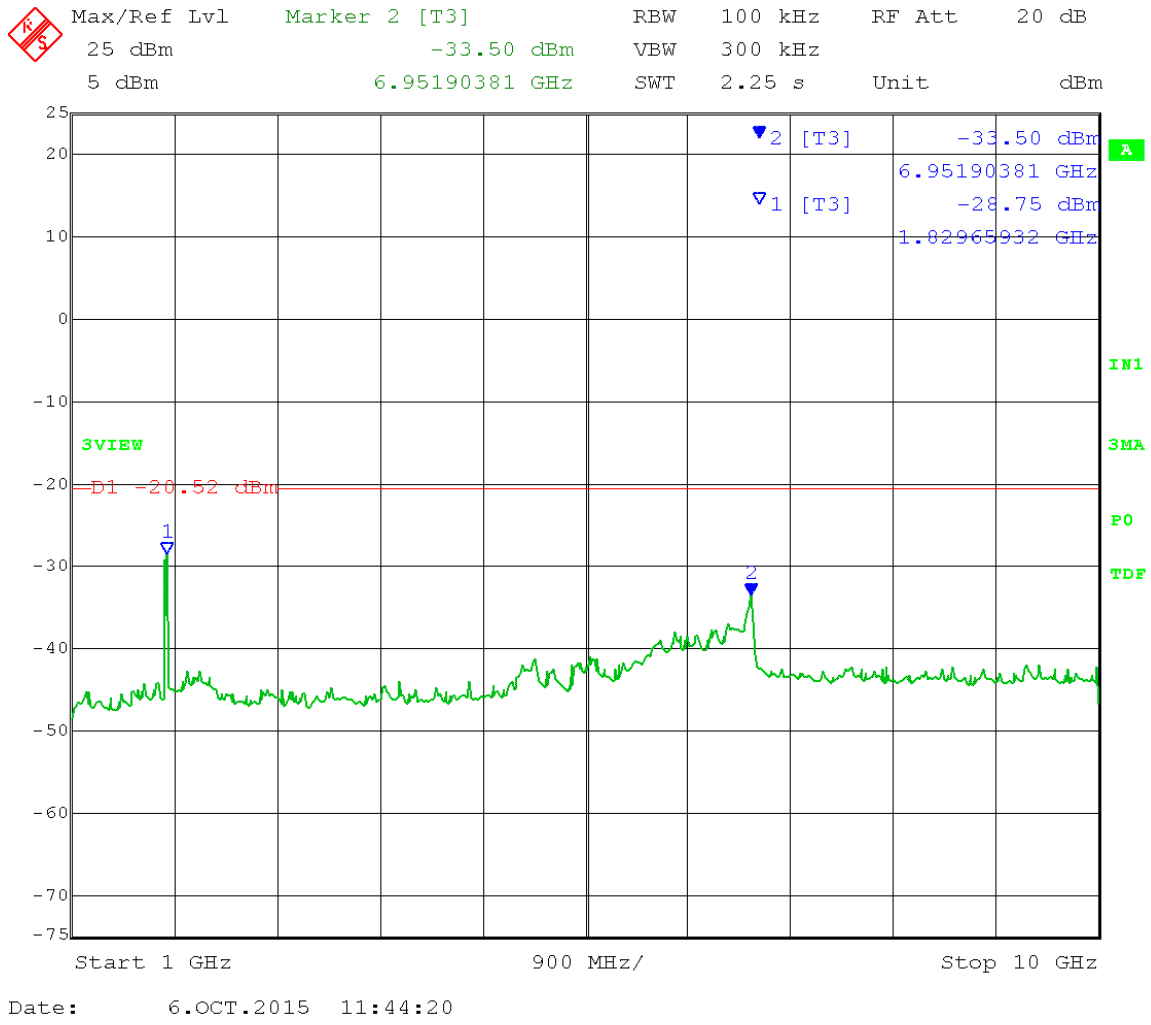
Date: 6.OCT.2015 11:41:21

Test Date:	10-06-2015	
Company:	Cambium Networks	
EUT:	450i 900 MHz AP MAC: 0A003E4586C8	
Test:	Maximum Unwanted Emission Levels - Conducted	
Operator:	Craig B	
Comment:	RBW = 100 kHz	VBW ≥ 300 kHz
	Detector = Peak	Sweep = Auto Couple
	Trace = Max Hold	Mid Channel Transmit = 916 MHz
	Output Power Setting 19	Channel bandwidth: 20 MHz
	Output port: A	QPSK

Emission Level Measurement

Limit = 9.48 dBm – 30 dB = -20.52 dBm

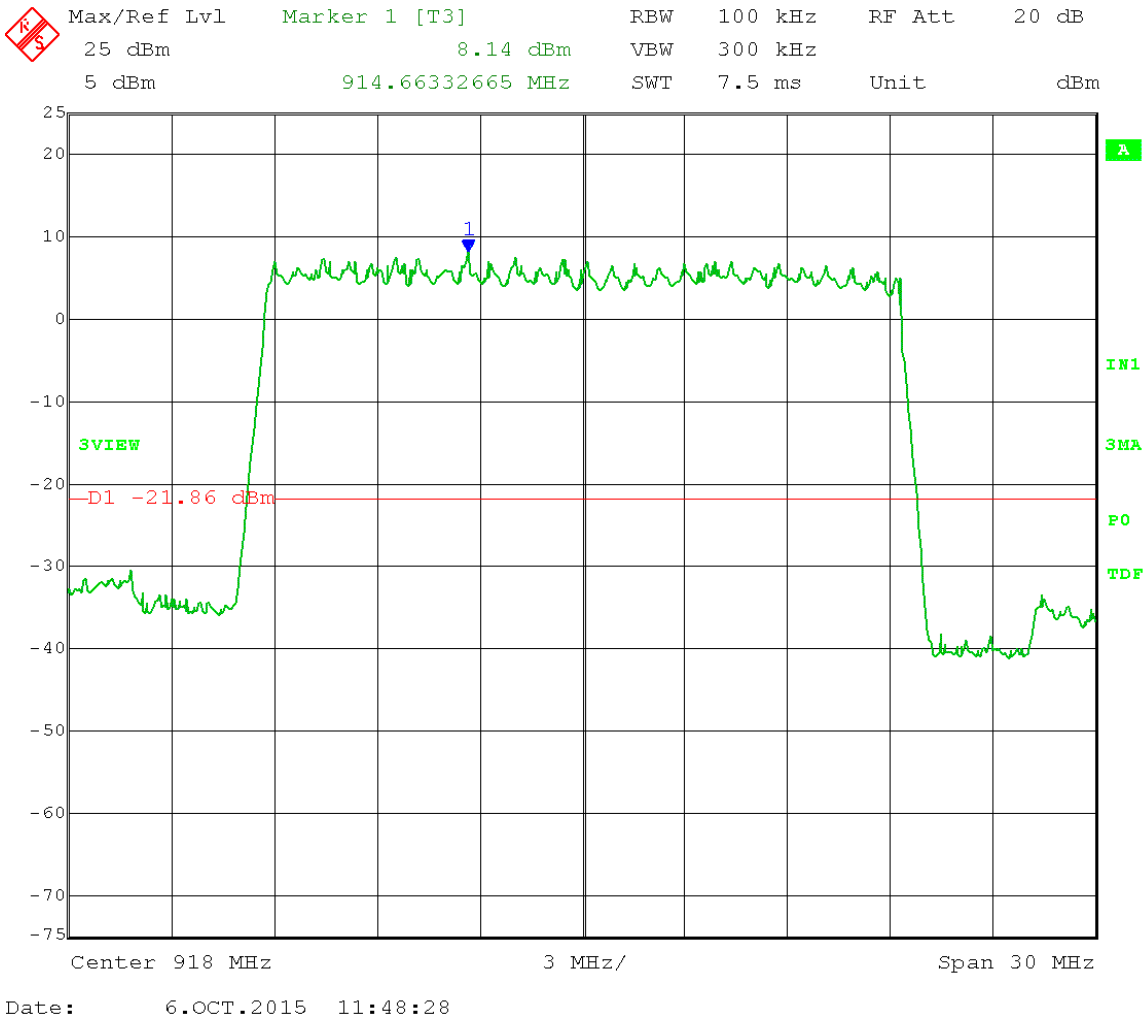
Frequency range: 1-10 GHz



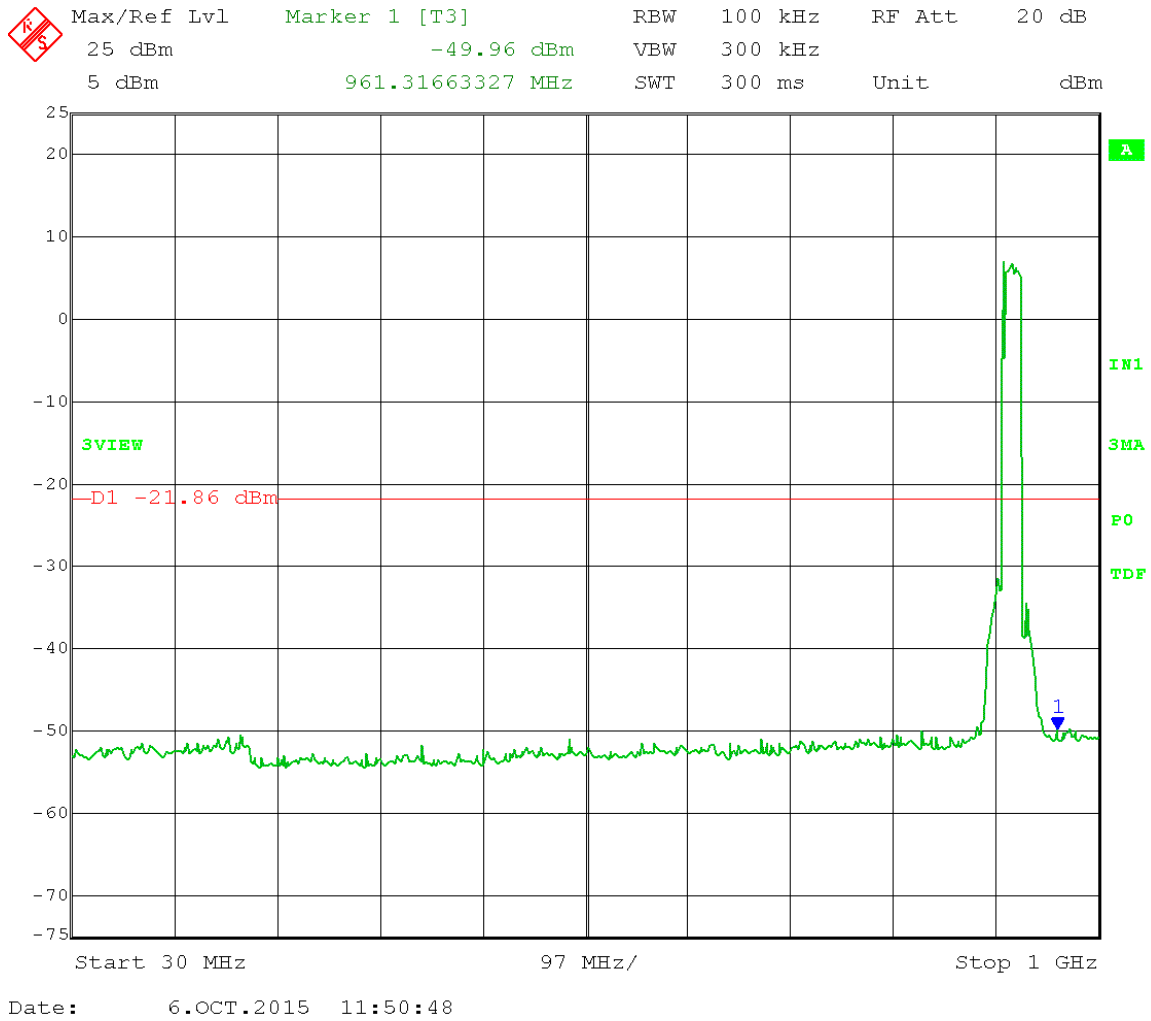
Test Date:	10-06-2015	
Company:	Cambium Networks	
EUT:	450i 900 MHz AP MAC: 0A003E4586C8	
Test:	Maximum Unwanted Emission Levels - Conducted	
Operator:	Craig B	
Comment:	RBW = 100 kHz	VBW ≥ 300 kHz
	Detector = Peak	Sweep = Auto Couple
	Trace = Max Hold	High Channel Transmit = 918 MHz
	Output Power Setting 19	Channel bandwidth: 20 MHz
	Output port: A	QPSK

Reference Level Measurement

Limit = 8.14 dBm – 30 dB = -21.86 dBm

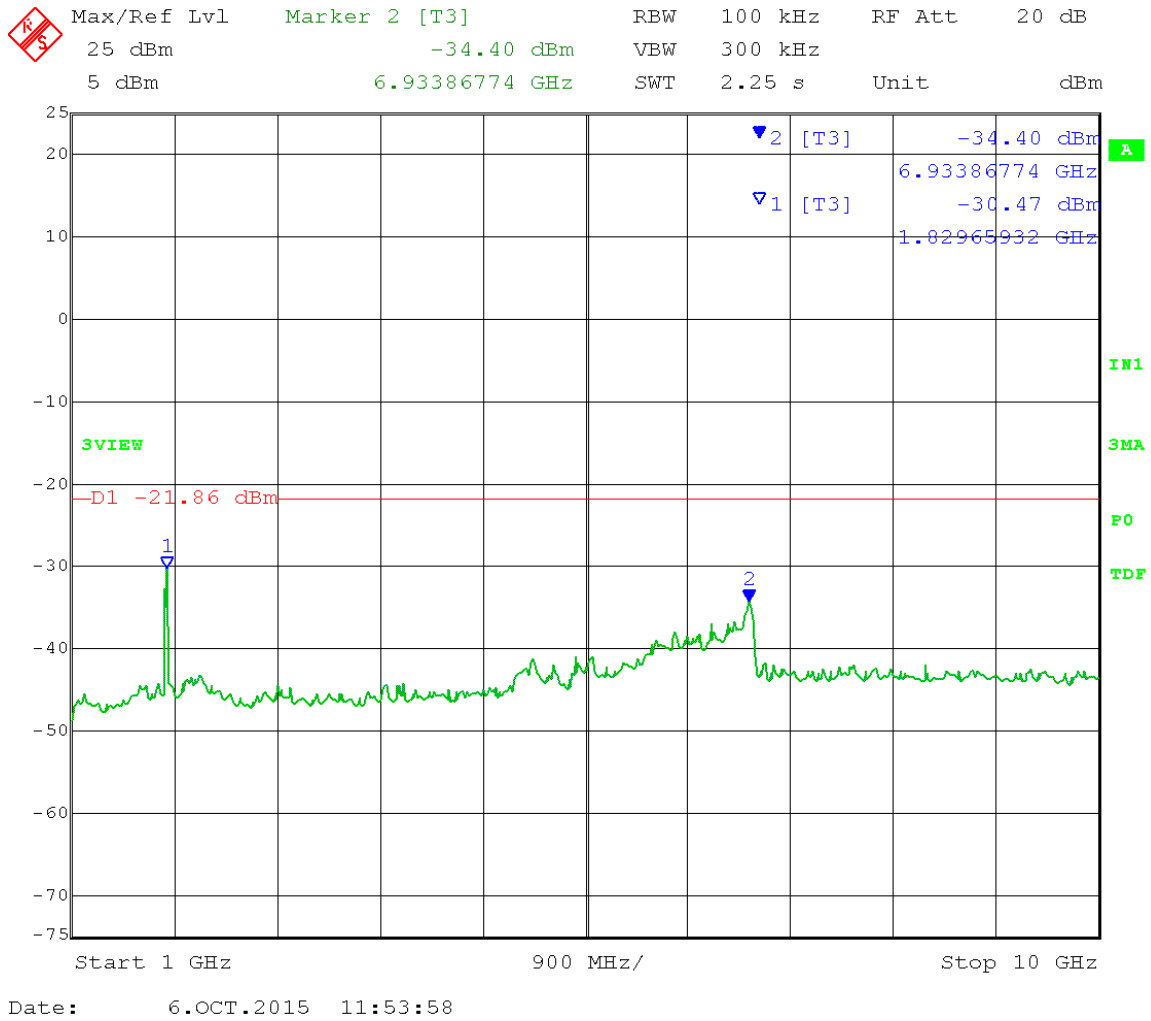


Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 918 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 8.14 dBm – 30 dB = -21.86 dBm
Frequency range: 30-1000 MHz



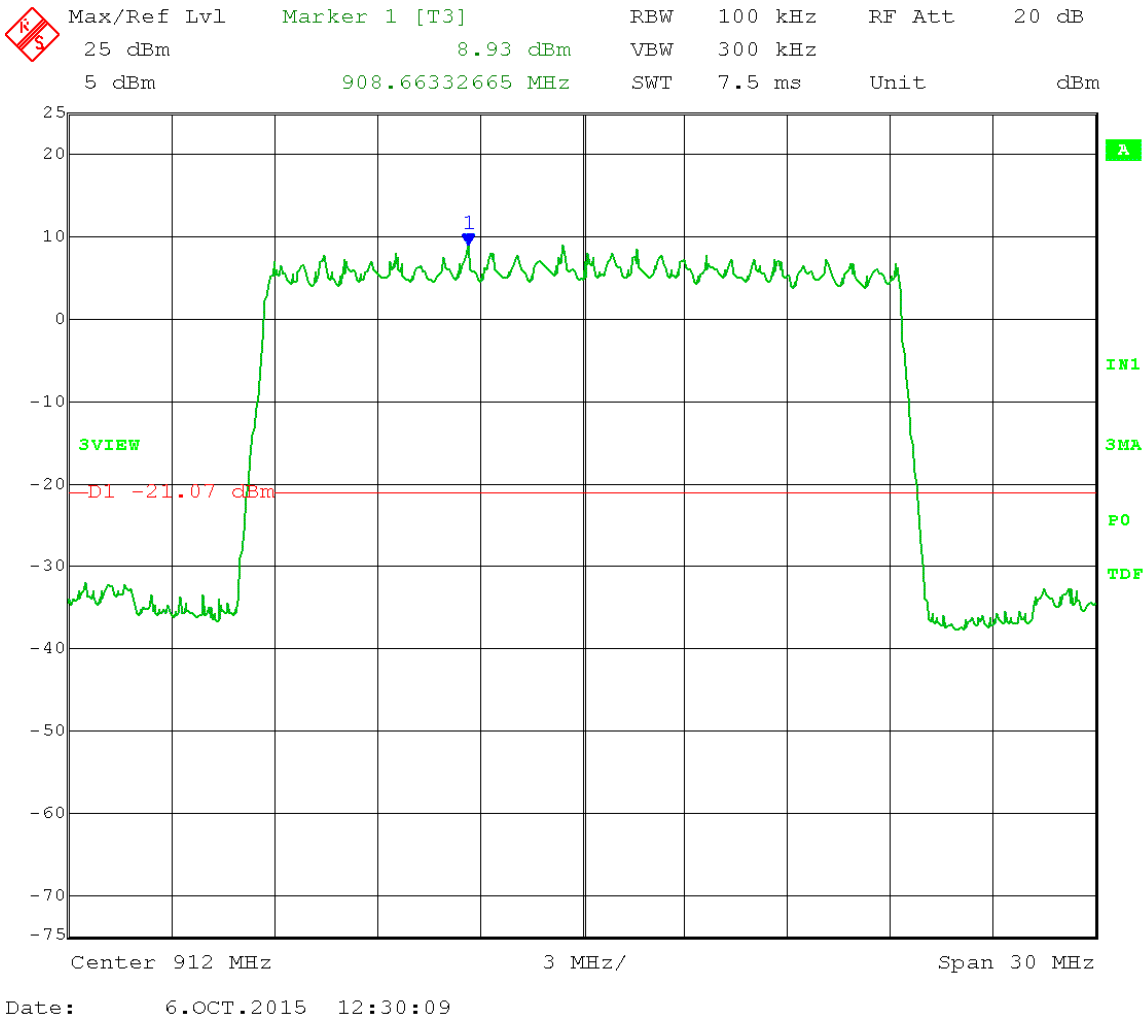
Date: 6.OCT.2015 11:50:48

Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 918 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: A QPSK
Emission Level Measurement
Limit = 8.14 dBm – 30 dB = -21.86 dBm
Frequency range: 1-10 GHz

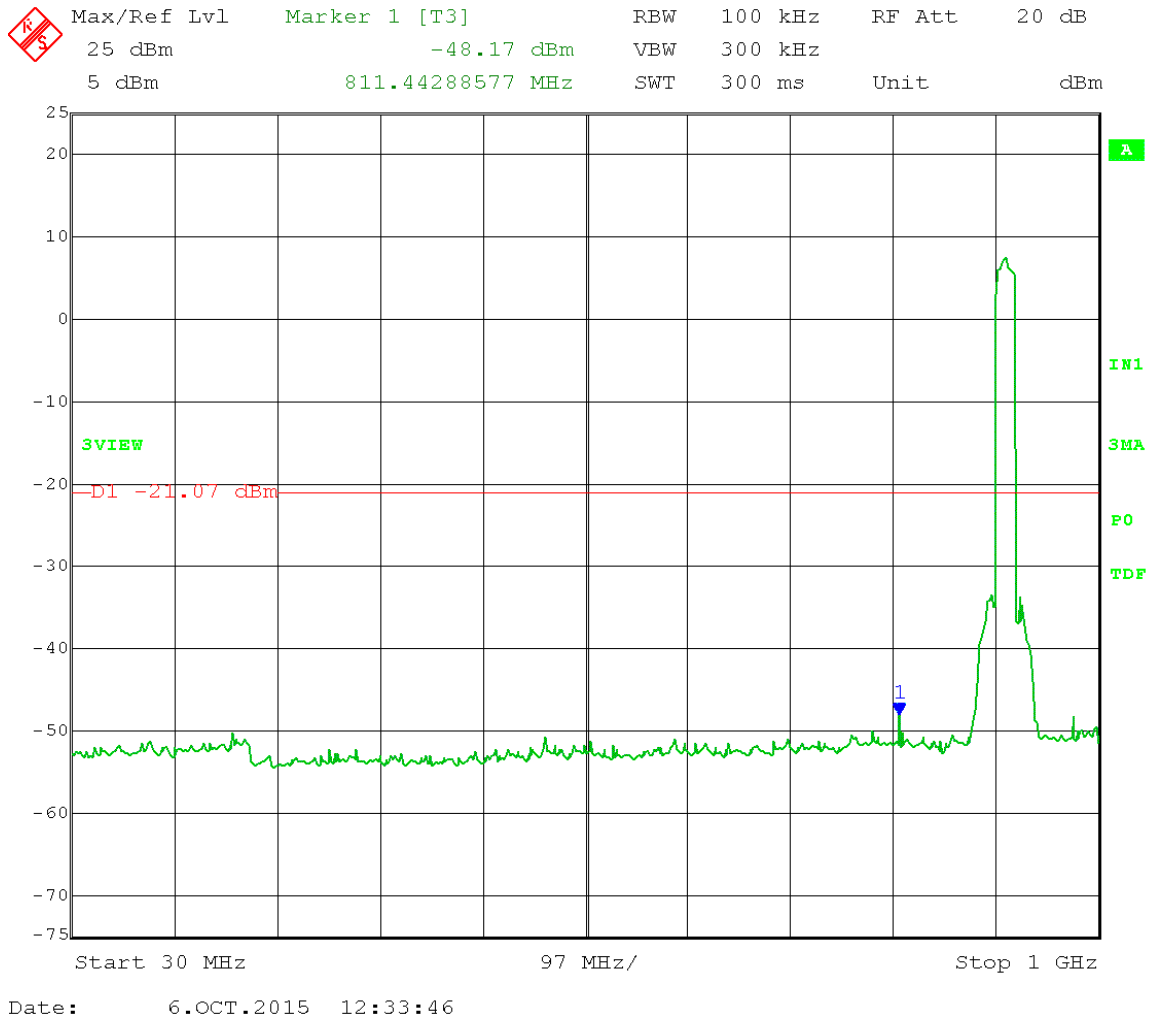


Date: 6.OCT.2015 11:53:58

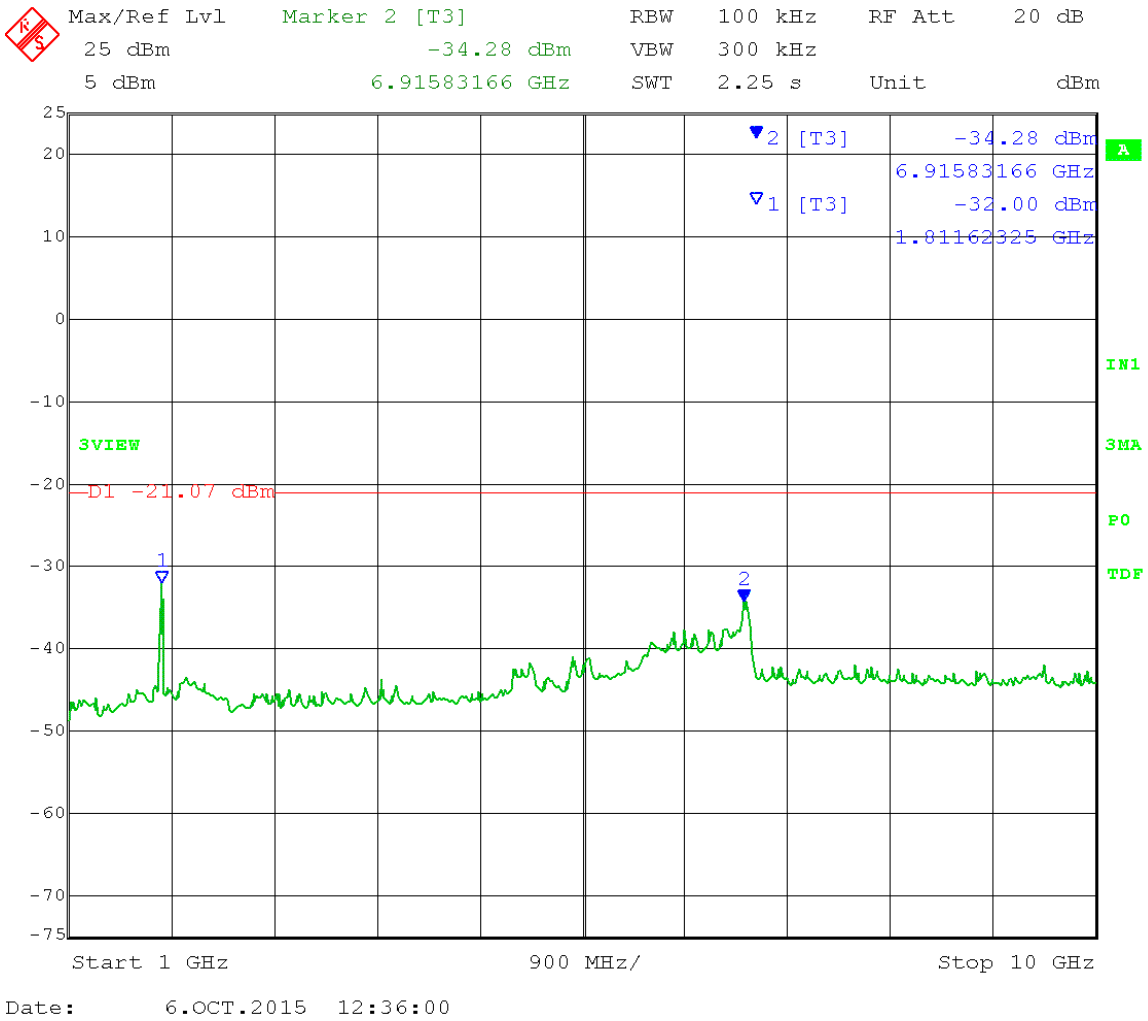
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 912 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Reference Level Measurement
Limit = 8.93 dBm – 30 dB = -21.07 dBm



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 912 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 8.93 dBm – 30 dB = -21.07 dBm
Frequency range: 30-1000 MHz

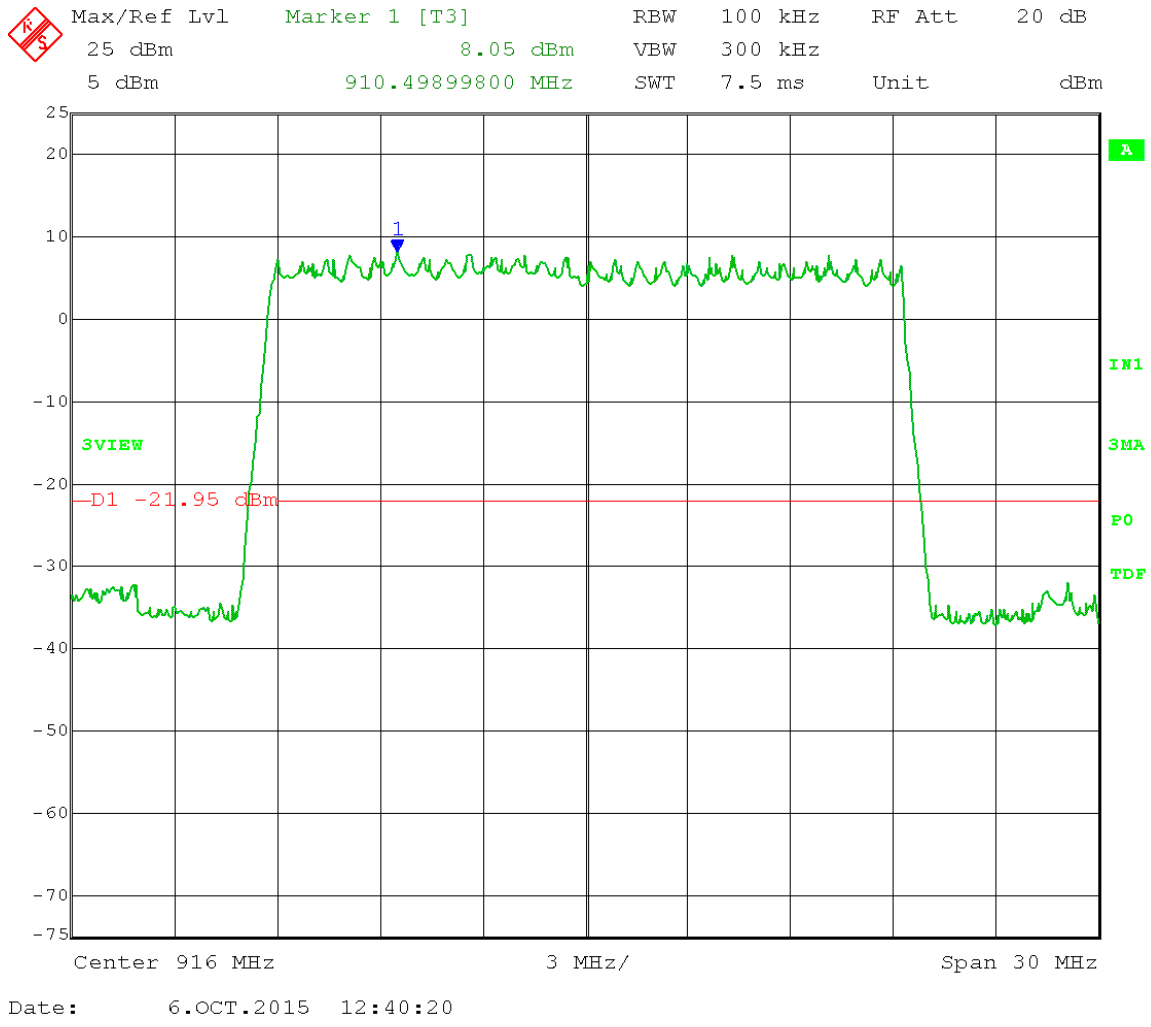


Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Low Channel Transmit = 912 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 8.93 dBm – 30 dB = -21.07 dBm
Frequency range: 1-10 GHz

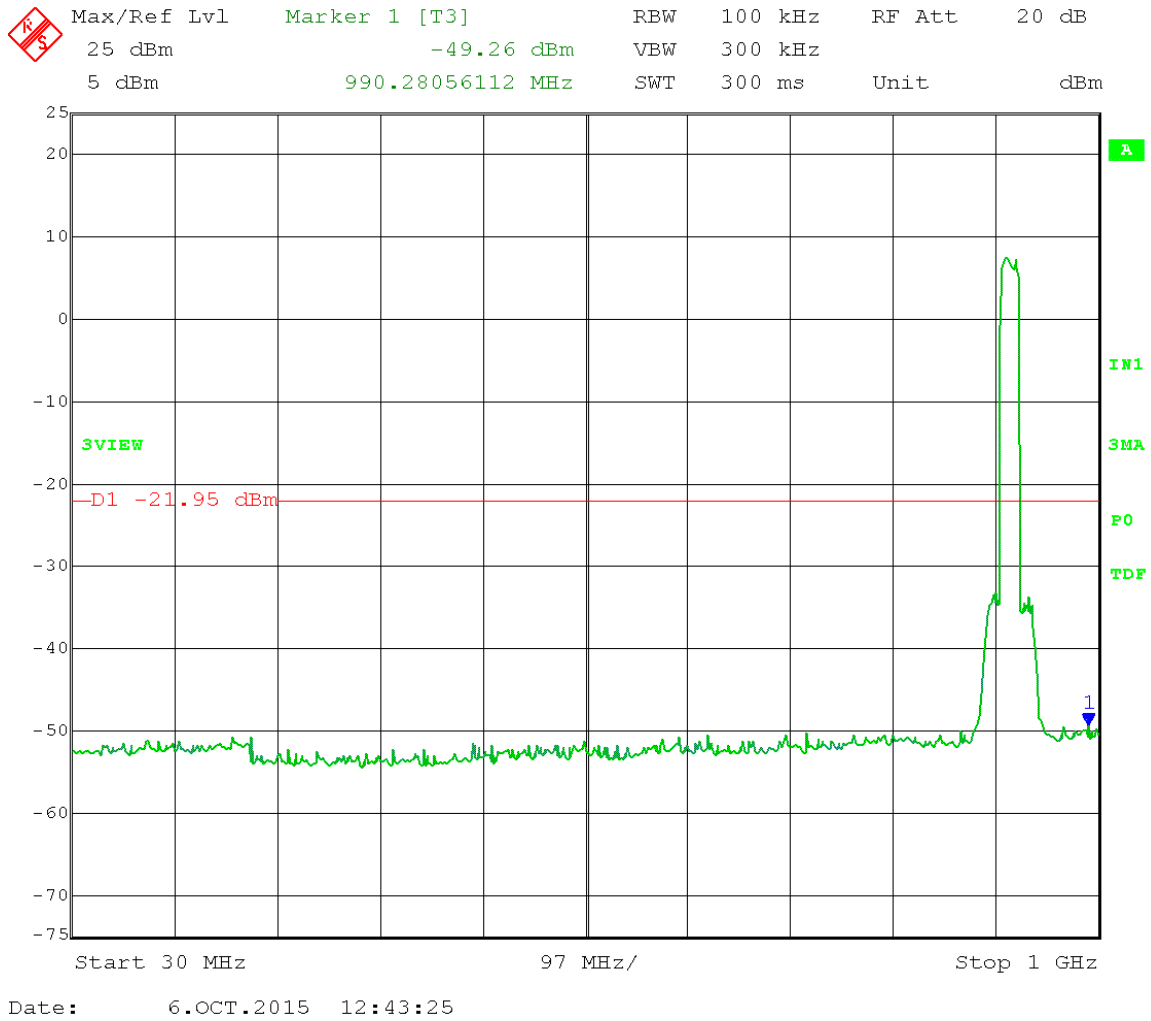


Date: 6.OCT.2015 12:36:00

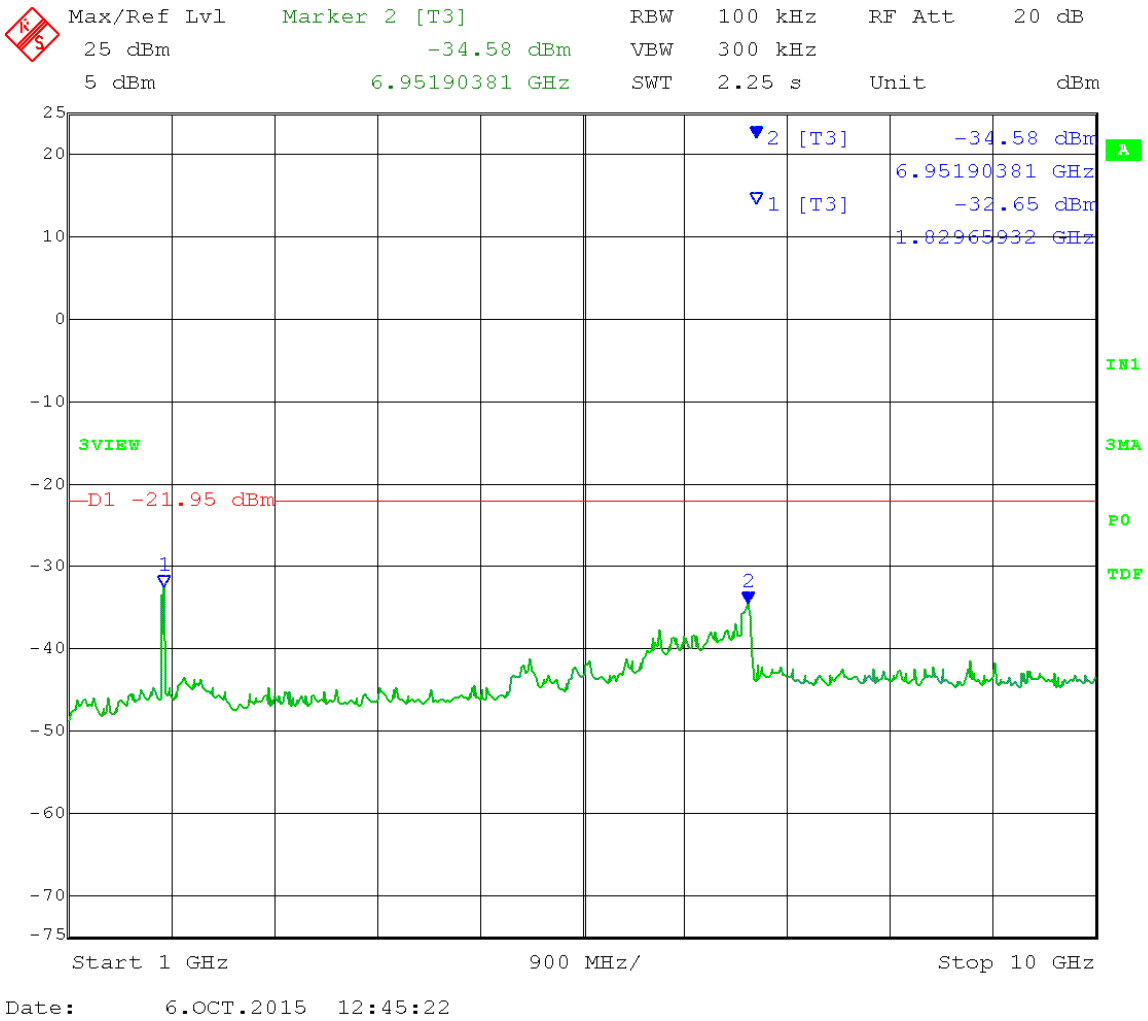
Test Date:	10-06-2015	
Company:	Cambium Networks	
EUT:	450i 900 MHz AP MAC: 0A003E4586C8	
Test:	Maximum Unwanted Emission Levels - Conducted	
Operator:	Craig B	
Comment:	RBW = 100 kHz	VBW ≥ 300 kHz
	Detector = Peak	Sweep = Auto Couple
	Trace = Max Hold	Mid Channel Transmit = 916 MHz
	Output Power Setting 19	Channel bandwidth: 20 MHz
	Output port: B	QPSK
	Reference Level Measurement	
	Limit = 8.05 dBm – 30 dB = -21.95 dBm	



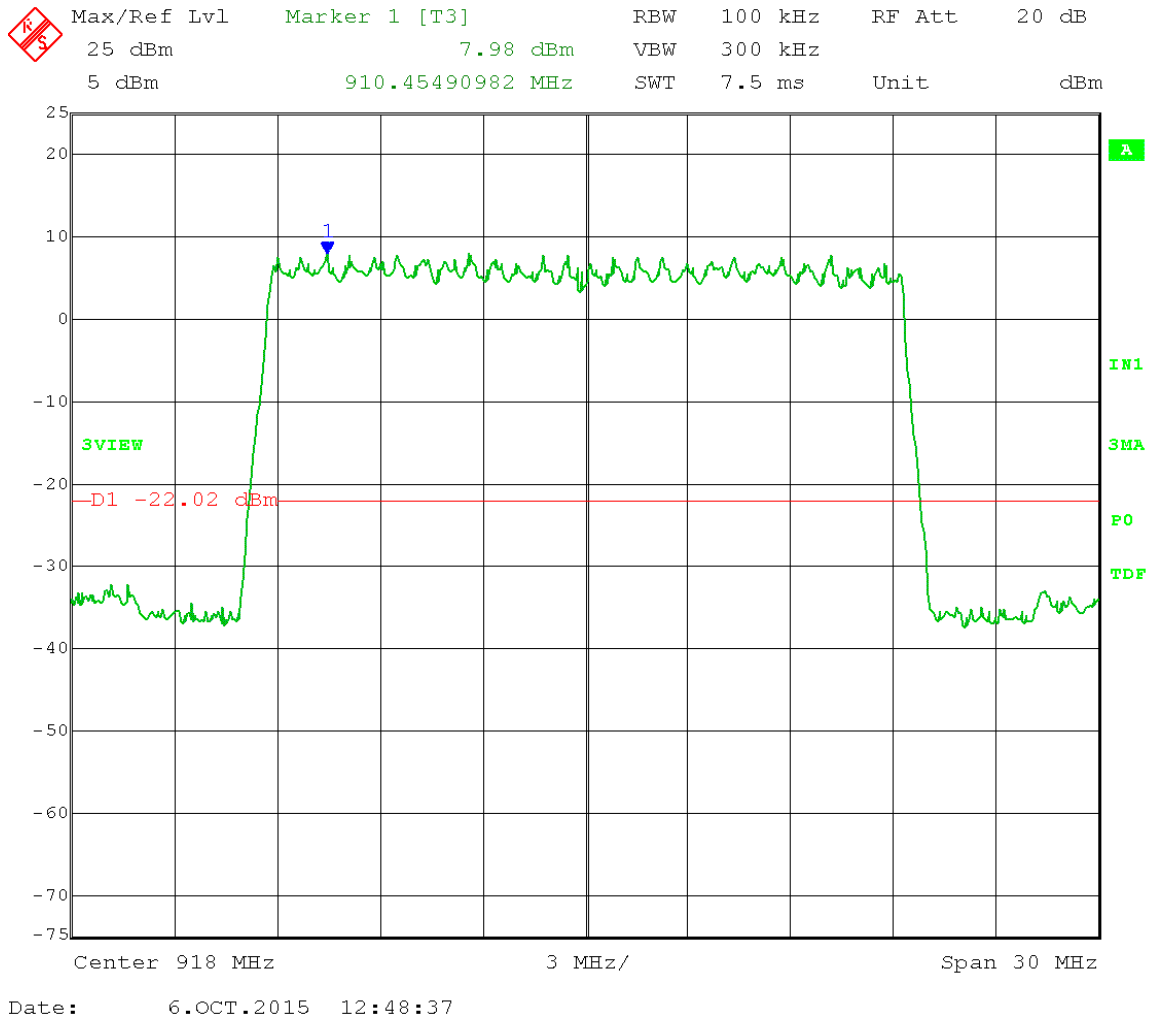
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 916 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 8.05 dBm – 30 dB = -21.95 dBm
Frequency range: 30-1000 MHz



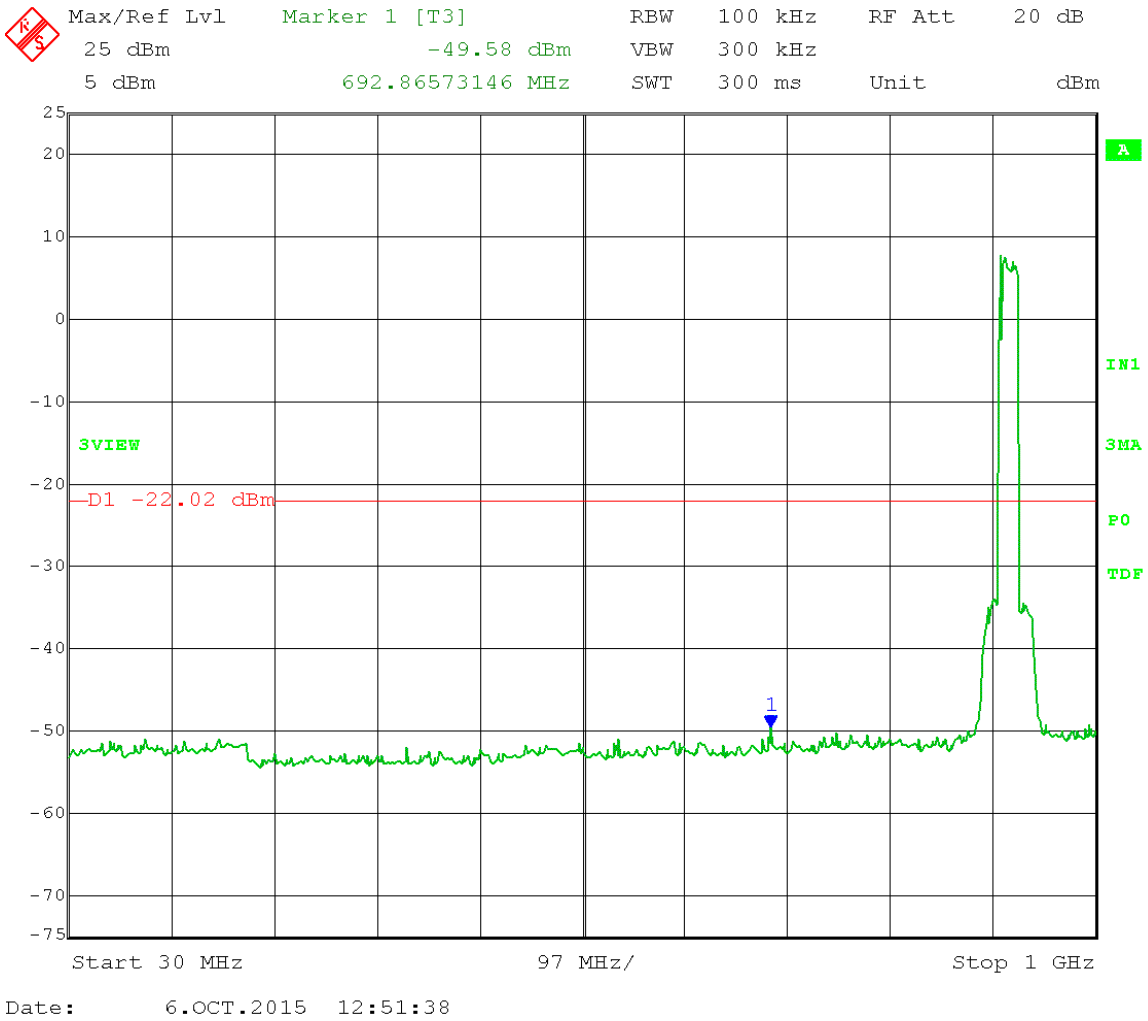
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold Mid Channel Transmit = 916 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 8.05 dBm – 30 dB = -21.95 dBm
Frequency range: 1-10 GHz



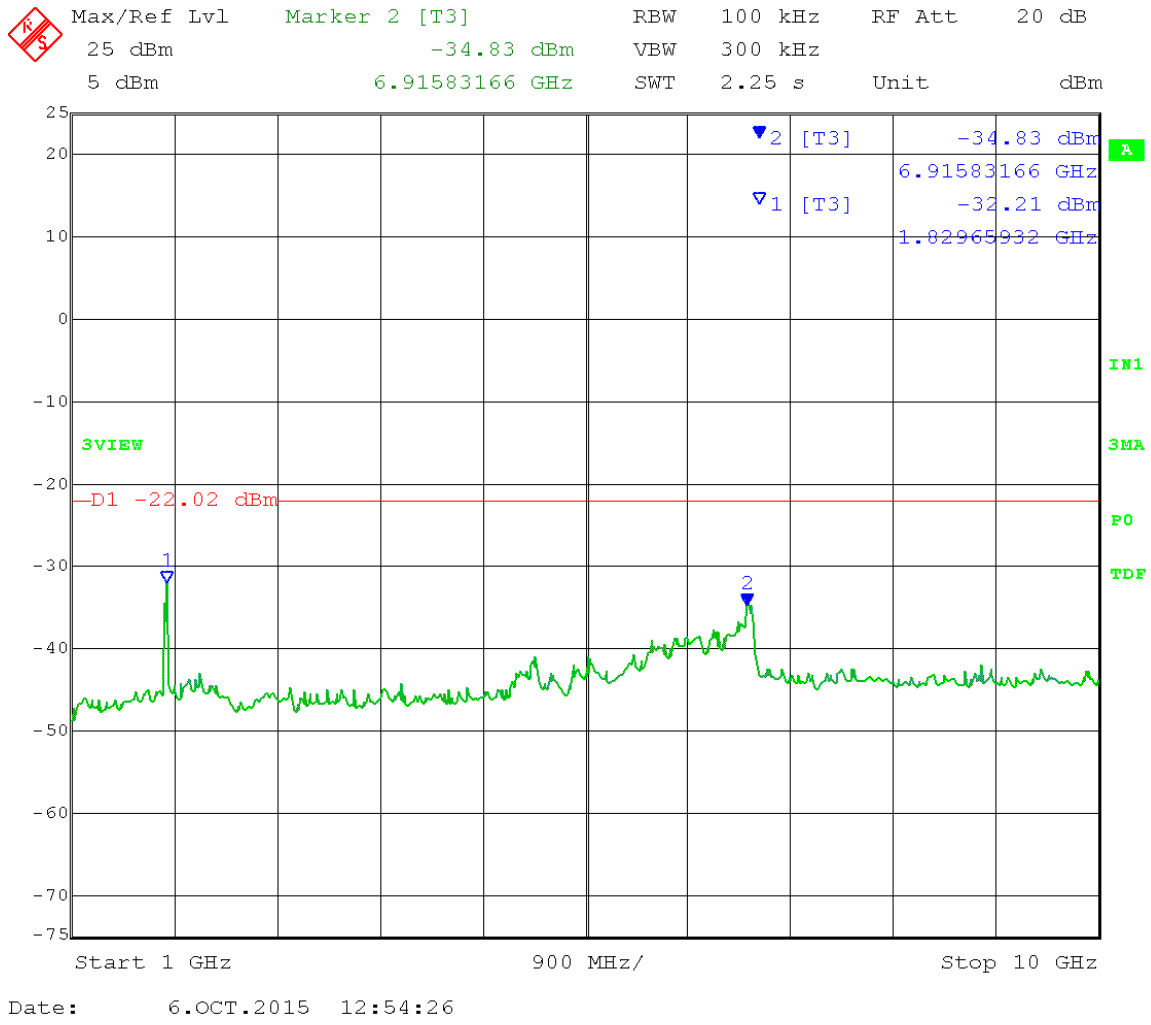
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 918 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Reference Level Measurement
Limit = 7.98 dBm – 30 dB = -22.02 dBm



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 918 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 7.98 dBm – 30 dB = -22.02 dBm
Frequency range: 30-1000 MHz



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Maximum Unwanted Emission Levels - Conducted
Operator: Craig B
Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = Auto Couple
Trace = Max Hold High Channel Transmit = 918 MHz
Output Power Setting 19 Channel bandwidth: 20 MHz
Output port: B QPSK
Emission Level Measurement
Limit = 7.98 dBm – 30 dB = -22.02 dBm
Frequency range: 1-10 GHz



Date: 6.OCT.2015 12:54:26

Appendix B – Measurement Data

B6.0 Radiated Spurious Emissions in Restricted Bands – Below 1GHz

Tested with 12 dBi Yagi Antenna and
Tested with 13 dBi Sector Antenna

Rule Part: 15.247(d); 15.209

Test Procedure: ANSI C63.10, 2013, FCC KDB 558074 Guidance on Measurements for Digital Transmission Systems

Limit: FCC 15.209

Results: PASS

Notes: The measurement bandwidth on the receiver was set to 120 kHz from 30 to1000 MHz. A peak detector was used since the duty cycle was less than 98%. The test distance was 3 meters. The EUT was set to Max Power output with both antenna transmitting simultaneously. Low, Mid, and High channels were explored and the worst case was reported.

FCC Part 15.209

Electric Field Strength

EUT:	450I 900MHz AP
Manufacturer:	Cambium Networks
Operating Condition:	66deg. F; 51% R.H.
Test Site:	DLS Site 2
Operator:	Paul L
Test Specification:	120VAC 60Hz 56VDC to EUT
Comment:	12dbi Yagi Antenna 5MHz BW
	Date: 10-8-2015

TEXT: "Horz 3 meters"

Short Description: Test Set-up

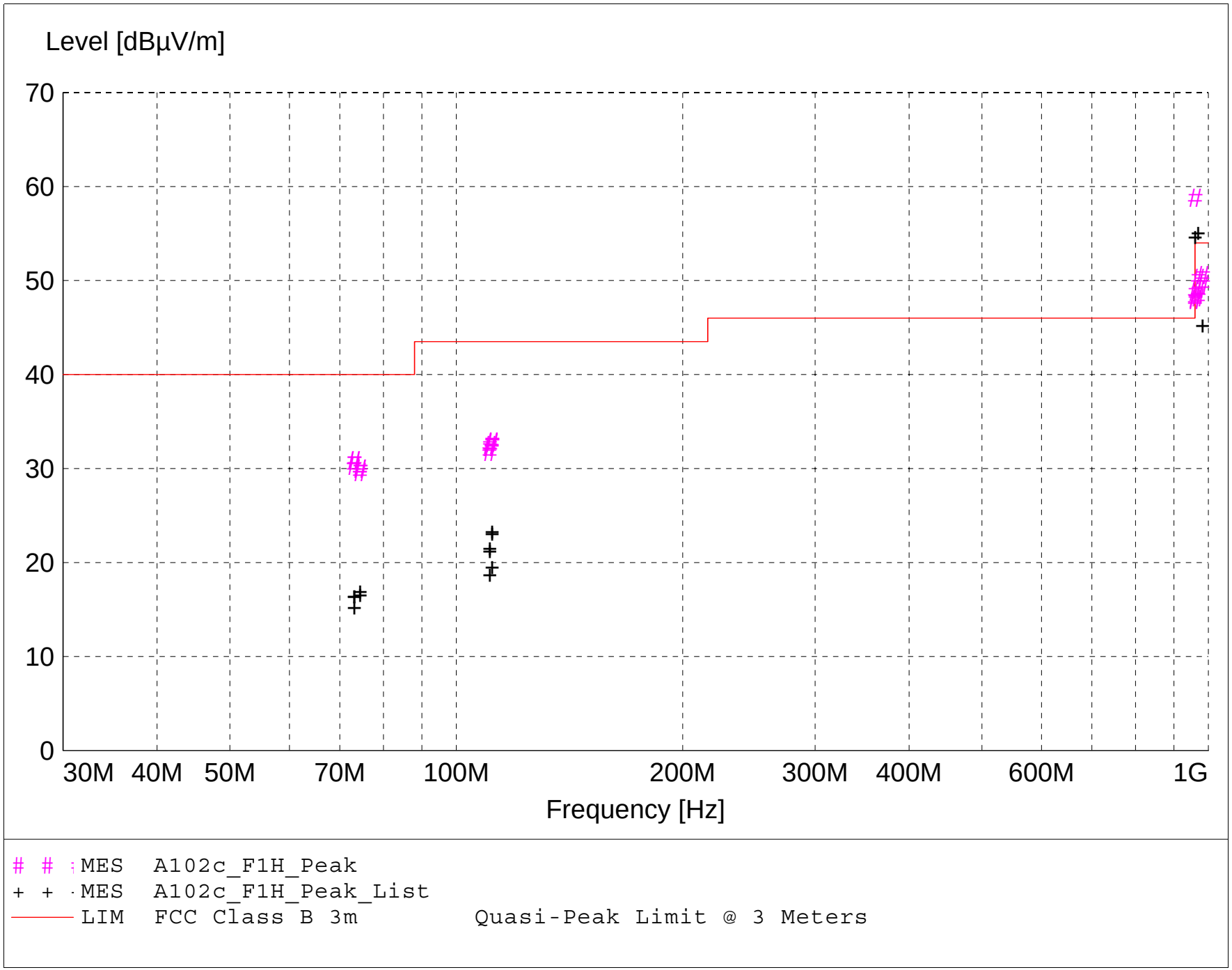
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

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]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102c_F1H_Peak
+ + MES A102c_F1H_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102c_F1H_Final"

10/9/2015 11:33AM

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		
983.300000	19.64	24.27	6.6	50.5	54.0	3.5	1.00	0	MAX PEAK	RB 915MHz
969.450000	19.85	23.80	6.6	50.3	54.0	3.7	1.00	0	MAX PEAK	RB 915MHz
983.300000	18.73	24.27	6.6	49.6	54.0	4.4	1.00	0	MAX PEAK	RB 925.45MHz
969.450000	18.54	23.80	6.6	48.9	54.0	5.1	1.00	0	MAX PEAK	RB 925.45MHz
960.600000	18.32	23.89	6.6	48.8	54.0	5.2	1.00	0	MAX PEAK	RB 904.5MHz
969.450000	17.79	23.80	6.6	48.2	54.0	5.8	1.00	0	MAX PEAK	RB 904.5MHz
960.600000	17.53	23.89	6.6	48.0	54.0	6.0	1.00	0	MAX PEAK	RB 925.45MHz
960.600000	17.42	23.89	6.6	47.9	54.0	6.1	1.00	0	MAX PEAK	RB 915MHz
73.200000	22.76	6.38	1.7	30.9	40.0	9.1	3.00	90	MAX PEAK	RB 925.45MHz
73.200000	22.76	6.38	1.7	30.9	40.0	9.1	3.00	90	MAX PEAK	RB 925.45MHz
73.200000	22.19	6.38	1.7	30.3	40.0	9.7	3.00	90	MAX PEAK	RB 915MHz
74.550000	22.04	6.19	1.7	30.0	40.0	10.0	3.00	90	MAX PEAK	RB 925.45MHz
74.550000	22.04	6.19	1.7	30.0	40.0	10.0	3.00	90	MAX PEAK	RB 925.45MHz
74.550000	21.67	6.19	1.7	29.6	40.0	10.4	3.00	90	MAX PEAK	RB 904.5MHz
111.600000	18.77	12.02	2.1	32.9	43.5	10.6	3.00	90	MAX PEAK	RB 915MHz
111.600000	18.70	12.02	2.1	32.8	43.5	10.7	3.00	90	MAX PEAK	RB 904.5MHz
111.600000	18.59	12.02	2.1	32.7	43.5	10.8	3.00	90	MAX PEAK	RB 925.45MHz
110.800000	18.49	11.90	2.1	32.5	43.5	11.0	3.00	90	MAX PEAK	RB 915MHz
110.800000	18.27	11.90	2.1	32.2	43.5	11.3	3.00	90	MAX PEAK	RB 904.5MHz
110.850000	17.79	11.90	2.1	31.8	43.5	11.7	3.00	90	MAX PEAK	RB 925.45MHz

FCC Part 15.209

Electric Field Strength

EUT: 450I 900MHz AP
Manufacturer: Cambium Networks
Operating Condition: 66deg. F; 51% R.H.
Test Site: DLS Site 2
Operator: Paul L
Test Specification: 120VAC 60Hz 56VDC to EUT
Comment: 12dbi Yagi Antenna 5MHz BW
Date: 10-8-2015

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

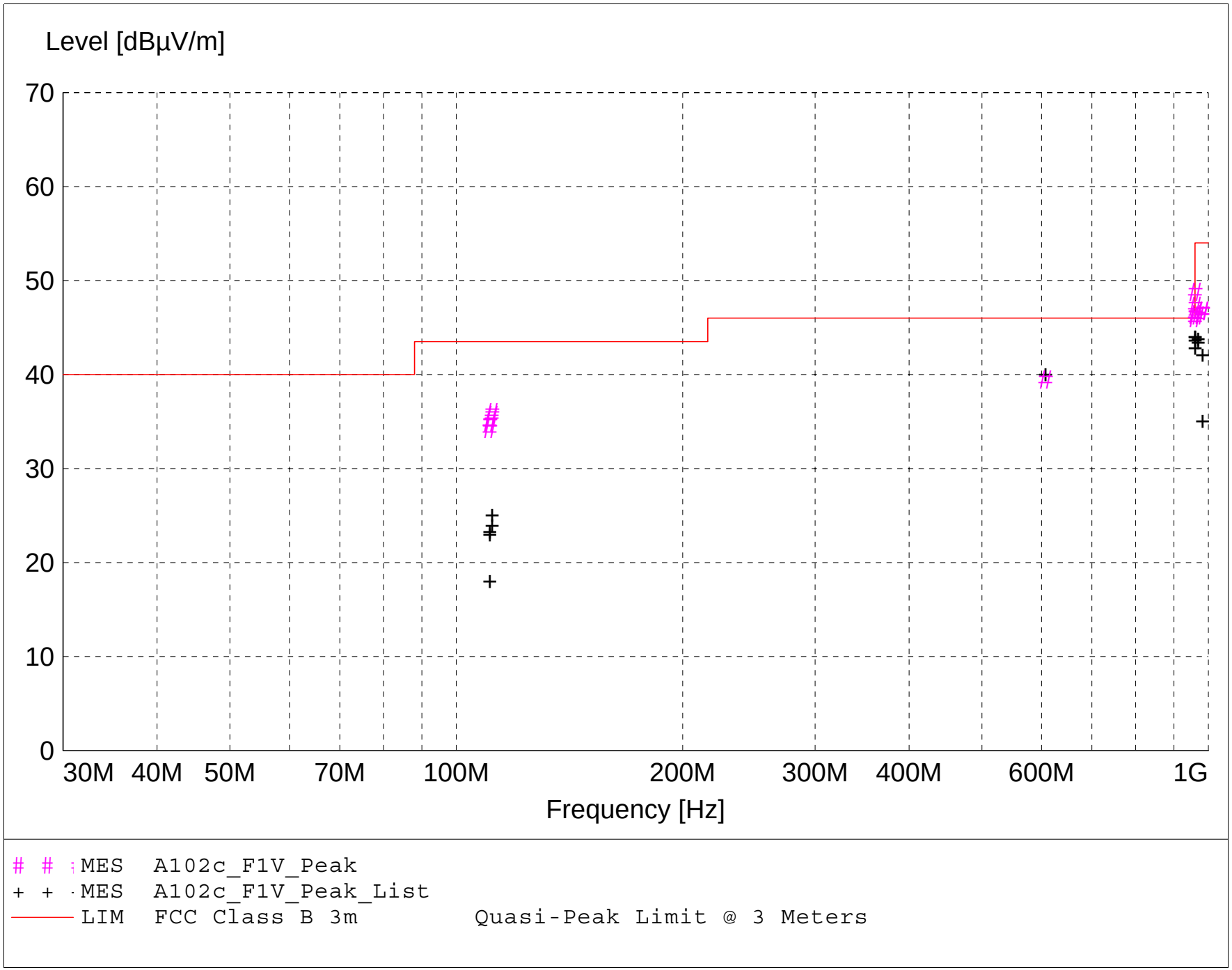
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average dector

Final maximized level using Peak detector


Level [dBµV/m]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102c_F1V_Peak
+ + MES A102c_F1V_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102c_F1V_Final"

10/9/2015 11:44AM

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		
960.600000	18.31	23.89	6.6	48.8	54.0	5.2	1.00	0	MAX PEAK	RB 925.45MHz
960.500000	16.83	23.89	6.6	47.3	54.0	6.7	1.00	0	MAX PEAK	RB 904.5MHz
983.350000	15.87	24.27	6.6	46.8	54.0	7.2	1.00	0	MAX PEAK	RB 925.45MHz
983.350000	15.87	24.27	6.6	46.8	54.0	7.2	1.00	0	MAX PEAK	RB 925.45MHz
983.350000	15.79	24.27	6.6	46.7	54.0	7.3	1.00	0	MAX PEAK	RB 915MHz
111.600000	21.88	12.02	2.1	36.0	43.5	7.5	1.00	225	MAX PEAK	RB 915MHz
960.850000	15.96	23.88	6.6	46.4	54.0	7.6	1.00	0	MAX PEAK	RB 925.45MHz
960.500000	15.88	23.89	6.6	46.4	54.0	7.6	1.00	0	MAX PEAK	RB 915MHz
969.500000	15.90	23.80	6.6	46.3	54.0	7.7	1.00	0	MAX PEAK	RB 904.5MHz
969.500000	15.90	23.80	6.6	46.3	54.0	7.7	1.00	0	MAX PEAK	RB 915MHz
111.600000	21.60	12.02	2.1	35.7	43.5	7.8	1.00	135	MAX PEAK	RB 925.45MHz
960.600000	15.52	23.89	6.6	46.0	54.0	8.0	1.00	0	MAX PEAK	RB 904.5MHz NF
111.600000	21.60	12.02	2.1	35.7	43.5	7.8	1.00	135	MAX PEAK	RB 925.45MHz
110.850000	20.86	11.90	2.1	34.8	43.5	8.7	1.00	225	MAX PEAK	RB 915MHz
110.850000	20.24	11.90	2.1	34.2	43.5	9.3	1.00	225	MAX PEAK	RB 904.5MHz

FCC Part 15.209

Electric Field Strength

EUT: 450I 900MHz AP
Manufacturer: Cambium Networks
Operating Condition: 68deg. F; 57% R.H.
Test Site: DLS Site 2
Operator: Paul L
Test Specification: 120VAC 60Hz 56VDC to EUT
Comment: 13dbi Sector Antenna 5MHz BW
Date: 10-6-2015

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)

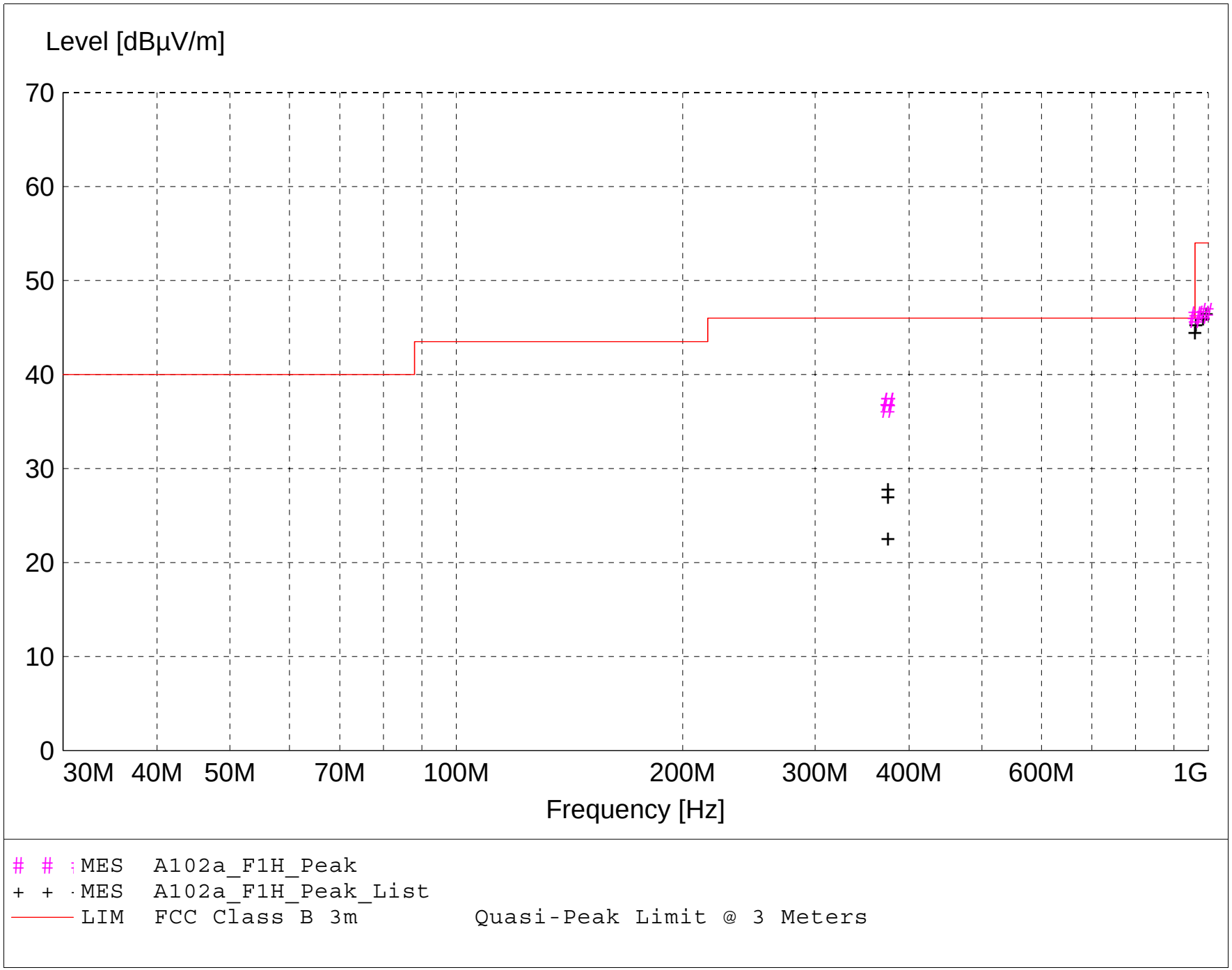
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102a_F1H_Peak
+ + MES A102a_F1H_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102a_F1H_Final"

10/9/2015 11:15AM

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		
994.100000	15.47	24.48	6.7	46.6	54.0	7.4	1.00	0	MAX PEAK	RB 925.45MHz
984.050000	15.41	24.28	6.6	46.3	54.0	7.7	1.00	0	MAX PEAK	RB 925.45MHz
960.250000	15.79	23.90	6.6	46.3	54.0	7.7	1.00	0	MAX PEAK	RB 925.45MHz
963.100000	15.46	23.84	6.6	45.9	54.0	8.1	1.00	0	MAX PEAK	RB 925.45MHz
375.000000	18.28	15.00	3.8	37.1	46.0	8.9	1.50	90	MAX PEAK	904.5MHz
375.000000	18.25	15.00	3.8	37.1	46.0	8.9	1.50	90	MAX PEAK	925.45MHz
375.000000	17.51	15.00	3.8	36.3	46.0	9.7	1.50	90	MAX PEAK	915.0MHz

FCC Part 15.209

Electric Field Strength

EUT: 450I 900MHz AP
Manufacturer: Cambium Networks
Operating Condition: 68deg. F; 57% R.H.
Test Site: DLS Site 2
Operator: Paul L
Test Specification: 120VAC 60Hz 56VDC to EUT
Comment: 13dbi Sector Antenna 5MHz BW
Date: 10-6-2015

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

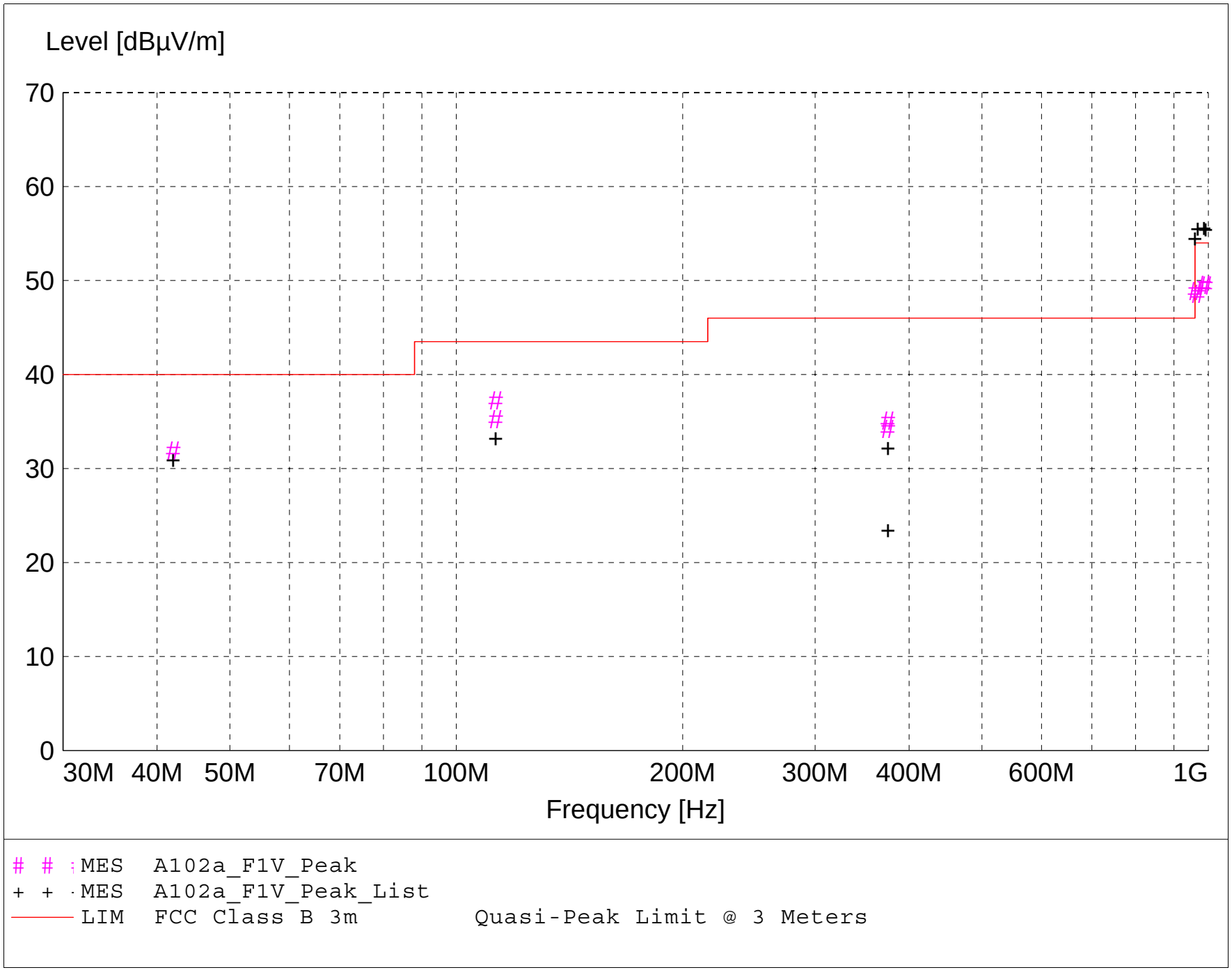
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average dector

Final maximized level using Peak detector


Level [dBµV/m]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102a_F1V_Peak
+ + MES A102a_F1V_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102a_F1V_Final"

10/9/2015 11:10AM

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		
986.700000	18.59	24.33	6.7	49.6	54.0	4.4	1.00	0	MAX PEAK	RB 925.45MHz
991.450000	18.37	24.43	6.7	49.5	54.0	4.5	1.00	0	MAX PEAK	RB 925.45MHz
960.250000	18.34	23.90	6.6	48.8	54.0	5.2	1.00	0	MAX PEAK	RB 925.45MHz
968.650000	18.17	23.80	6.6	48.6	54.0	5.4	1.00	0	MAX PEAK	RB 925.45MHz
112.900000	23.02	12.10	2.1	37.2	43.5	6.3	1.00	0	MAX PEAK	RB 915MHz
42.050000	18.74	11.90	1.3	31.9	40.0	8.1	1.00	0	MAX PEAK	915MHz
112.900000	21.06	12.10	2.1	35.2	43.5	8.3	1.00	0	MAX PEAK	RB 925.45MHz NF
375.000000	16.26	15.00	3.8	35.1	46.0	10.9	1.00	0	MAX PEAK	904.5Mhz

FCC Part 15.209

Electric Field Strength

EUT:	450I 900MHz AP
Manufacturer:	Cambium Networks
Operating Condition:	72deg. F; 55% R.H.
Test Site:	DLS Site 2
Operator:	Paul L
Test Specification:	120VAC 60Hz 56VDC to EUT
Comment:	12dbi Yagi Antenna 20MHz BW
	Date: 10-8-2015

TEXT: "Horz 3 meters"

Short Description: Test Set-up

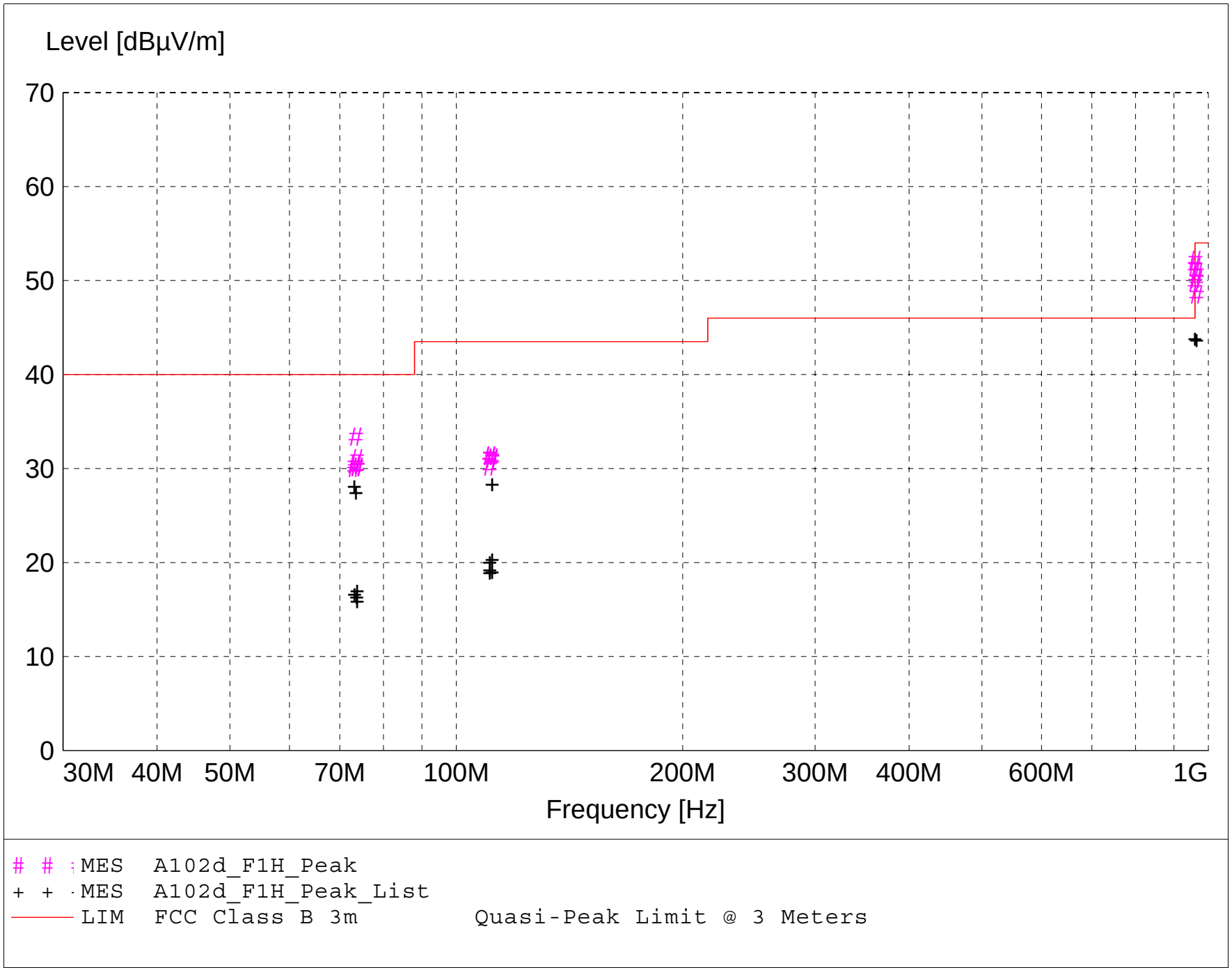
Test Set-up: EUT Measured at 3 Meters with HORIZONTAL Antenna Polarization

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]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102d_F1H_Peak
+ + MES A102d_F1H_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102d_F1H_Final"

10/9/2015 1:00PM

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		
960.050000	21.71	23.90	6.6	52.2	54.0	1.8	1.00	0	MAX PEAK	RB 918MHz
960.050000	20.99	23.90	6.6	51.5	54.0	2.5	1.00	0	MAX PEAK	RB 916MHz
964.950000	20.43	23.80	6.6	50.9	54.0	3.1	1.00	0	MAX PEAK	RB 918MHz
964.950000	19.67	23.80	6.6	50.1	54.0	3.9	1.00	0	MAX PEAK	RB 916MHz
960.050000	19.24	23.90	6.6	49.7	54.0	4.3	1.00	0	MAX PEAK	RB 912MHz
964.950000	18.03	23.80	6.6	48.5	54.0	5.5	1.00	0	MAX PEAK	RB 912MHz
73.550000	25.33	6.35	1.7	33.4	40.0	6.3	3.00	90	MAX PEAK	RB 916MHz
73.750000	23.07	6.33	1.7	31.1	40.0	8.9	3.00	90	MAX PEAK	RB 912MHz
73.200000	22.30	6.38	1.7	30.4	40.0	9.6	3.00	90	MAX PEAK	RB 918MHz
73.850000	22.14	6.32	1.7	30.2	40.0	9.8	3.00	90	MAX PEAK	RB 916MHz
73.850000	22.11	6.32	1.7	30.2	40.0	9.8	3.00	90	MAX PEAK	RB 918MHz
73.250000	21.92	6.38	1.7	30.0	40.0	10.0	3.00	90	MAX PEAK	RB 912MHz
110.800000	17.37	11.90	2.1	31.4	43.5	12.1	3.00	90	MAX PEAK	RB 912MHz
110.800000	17.32	11.90	2.1	31.3	43.5	12.2	3.00	90	MAX PEAK	RB 916MHz
111.600000	17.08	12.02	2.1	31.2	43.5	12.3	3.00	90	MAX PEAK	RB 916MHz
111.600000	16.92	12.02	2.1	31.0	43.5	12.5	3.00	90	MAX PEAK	RB 918MHz
111.600000	16.92	12.02	2.1	31.0	43.5	12.5	3.00	90	MAX PEAK	RB 912MHz
110.850000	16.23	11.90	2.1	30.2	43.5	13.3	3.00	90	MAX PEAK	RB 918MHz

FCC Part 15.209

Electric Field Strength

EUT:	450I 900MHz AP
Manufacturer:	Cambium Networks
Operating Condition:	72deg. F; 55% R.H.
Test Site:	DLS Site 2
Operator:	Paul L
Test Specification:	120VAC 60Hz 56VDC to EUT
Comment:	12dbi Yagi Antenna 20MHz BW
	Date: 10-8-2015

TEXT: "Vert 3 meters"

Short Description: Test Set-up

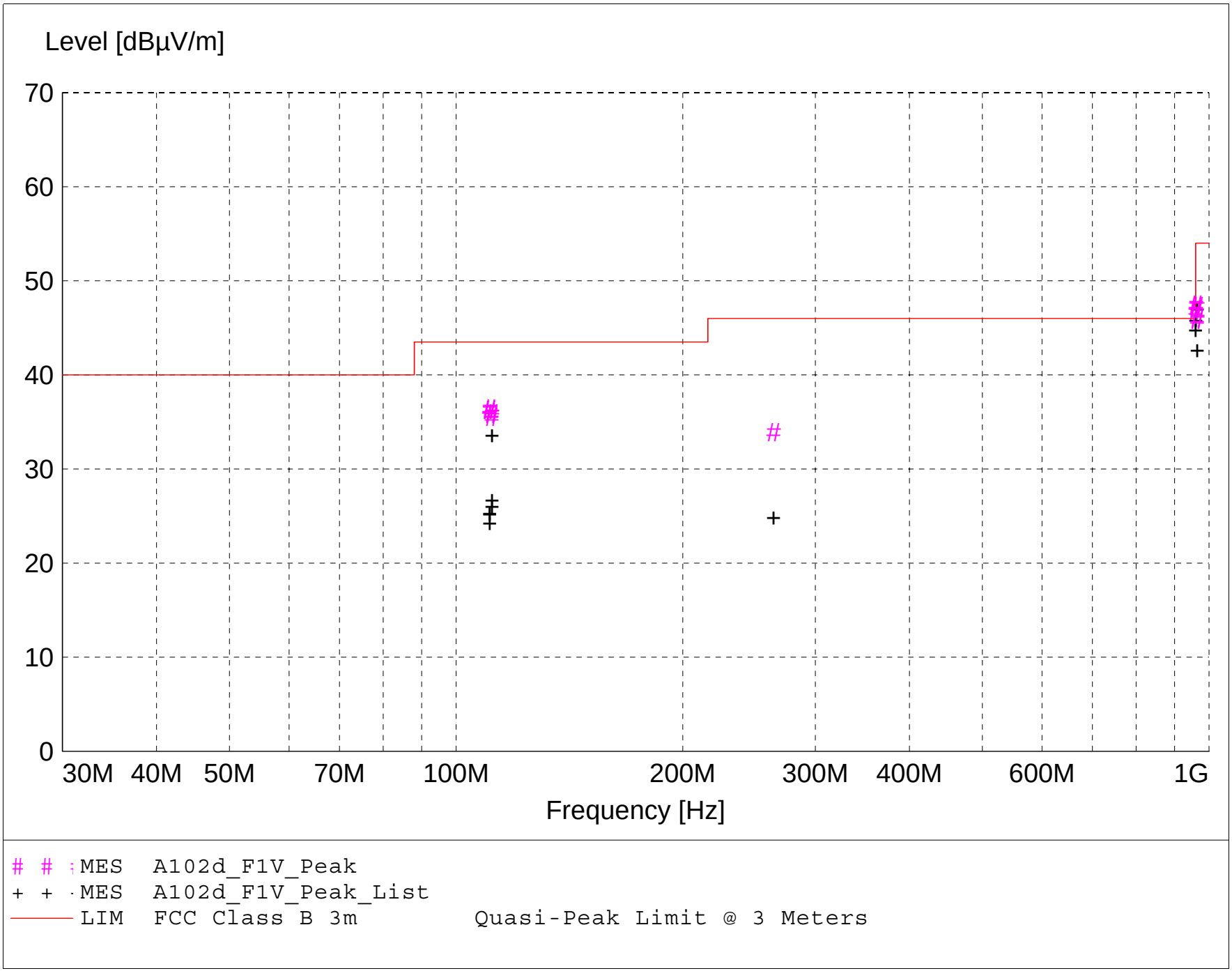
Test Set-up: EUT Measured at 3 Meters with VERTICAL Antenna Polarization

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

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

Graph Markers:

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


Level [dBµV/m]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102d_F1V_Peak
+ + MES A102d_F1V_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102d_F1V_Final"

10/9/2015 1:13PM

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		
960.550000	16.95	23.89	6.6	47.4	54.0	6.6	1.00	0	MAX PEAK	RB 918MHz
964.950000	16.90	23.80	6.6	47.3	54.0	6.7	1.00	0	MAX PEAK	RB 918MHz
960.050000	16.81	23.90	6.6	47.3	54.0	6.7	1.00	0	MAX PEAK	RB 916MHz
110.800000	22.43	11.90	2.1	36.4	43.5	7.1	1.00	180	MAX PEAK	RB 918MHz
110.800000	22.29	11.90	2.1	36.3	43.5	7.2	1.00	0	MAX PEAK	RB 916MHz
960.050000	16.32	23.90	6.6	46.8	54.0	7.2	1.00	0	MAX PEAK	RB 912MHz
110.800000	22.26	11.90	2.1	36.2	43.5	7.3	1.00	180	MAX PEAK	RB 912MHz
111.600000	21.82	12.02	2.1	35.9	43.5	7.6	1.00	180	MAX PEAK	RB 912MHz
111.600000	21.76	12.02	2.1	35.9	43.5	7.6	1.00	180	MAX PEAK	RB 916MHz
111.600000	21.39	12.02	2.1	35.5	43.5	8.0	1.00	180	MAX PEAK	RB 918MHz
964.950000	15.55	23.80	6.6	46.0	54.0	8.0	1.00	0	MAX PEAK	RB 916MHz
964.950000	15.38	23.80	6.6	45.8	54.0	8.2	1.00	0	MAX PEAK	RB 912MHz
264.050000	17.70	12.96	3.3	33.9	46.0	12.1	1.00	0	MAX PEAK	RB 918MHz

FCC Part 15.209

Electric Field Strength

EUT: 450I 900MHz AP
Manufacturer: Cambium Networks
Operating Condition: 66deg. F; 56% R.H.
Test Site: DLS Site 2
Operator: Paul L
Test Specification: 120VAC 60Hz 56VDC to EUT
Comment: 13dbi Sector Antenna 20MHz BW
Date: 10-7-2015

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)

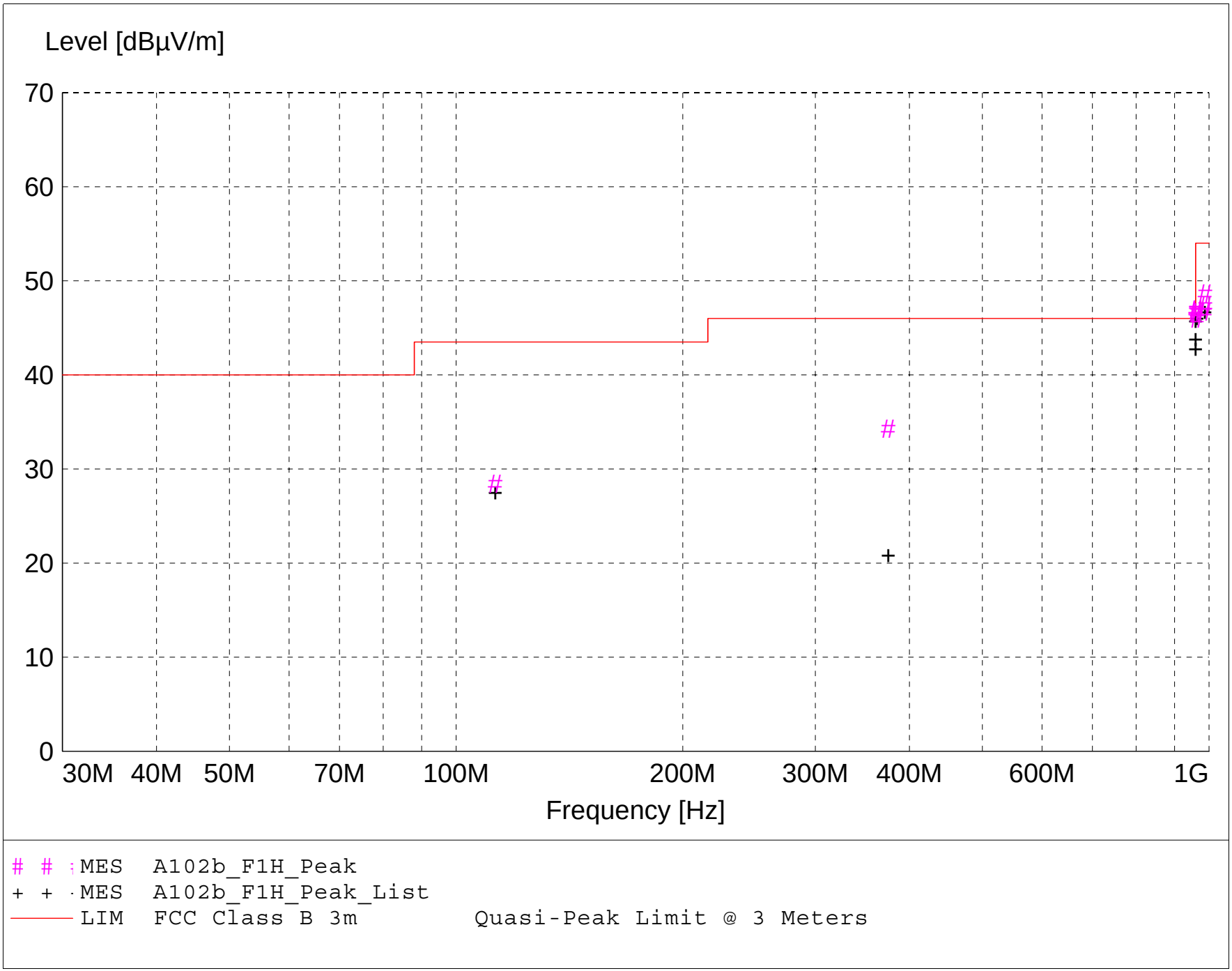
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102b_F1H_Peak
+ + MES A102b_F1H_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102b_F1H_Final"

10/9/2015 10:47AM

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		
987.650000	17.64	24.35	6.7	48.7	54.0	5.3	1.00	0	MAX PEAK	RB 918MHz
987.650000	16.28	24.35	6.7	47.3	54.0	6.7	1.00	0	MAX PEAK	RB 916MHz
960.050000	16.46	23.90	6.6	46.9	54.0	7.1	1.00	0	MAX PEAK	RB 918MHz
960.150000	16.41	23.90	6.6	46.9	54.0	7.1	1.00	0	MAX PEAK	RB 916MHz
960.050000	16.24	23.90	6.6	46.7	54.0	7.3	1.00	0	MAX PEAK	RB 912MHz
987.650000	15.70	24.35	6.7	46.7	54.0	7.3	1.00	0	MAX PEAK	RB 912MHz
964.400000	16.20	23.81	6.6	46.6	54.0	7.4	1.00	0	MAX PEAK	RB 912MHz
964.400000	15.54	23.81	6.6	46.0	54.0	8.0	1.00	0	MAX PEAK	RB 916MHz
375.000000	15.43	15.00	3.8	34.3	46.0	11.7	3.00	337	MAX PEAK	916MHz
112.750000	14.21	12.10	2.1	28.4	43.5	15.1	1.00	0	MAX PEAK	RB 918MHz NF

FCC Part 15.209

Electric Field Strength

EUT: 450I 900MHz AP
Manufacturer: Cambium Networks
Operating Condition: 66deg. F; 56% R.H.
Test Site: DLS Site 2
Operator: Paul L
Test Specification: 120VAC 60Hz 56VDC to EUT
Comment: 13dbi Sector Antenna 20MHz BW
Date: 10-7-2015

TEXT: "Vert 3 meters"

Short Description: Test Set-up

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

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

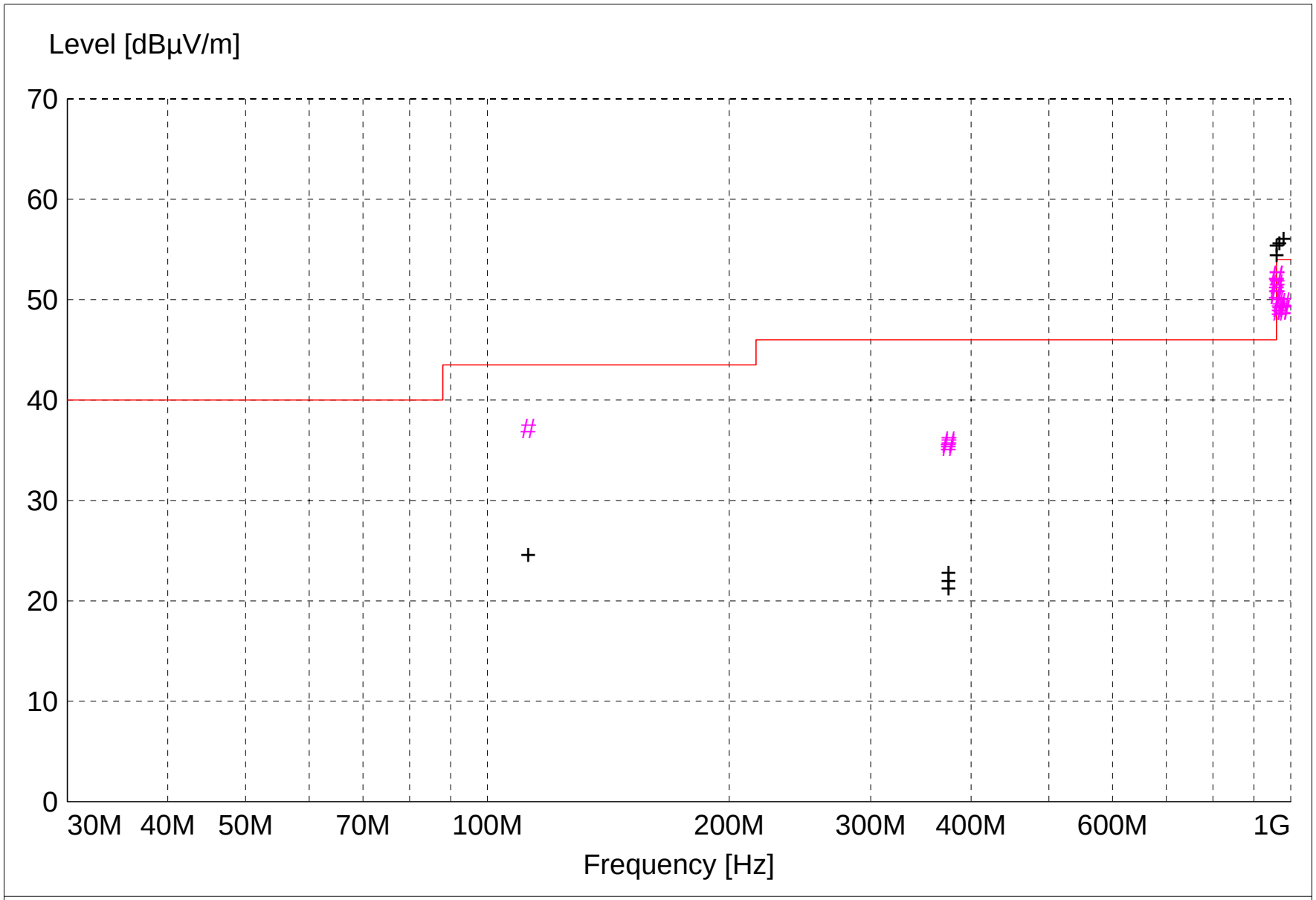
Margin(dB) = Limit(dBµV/m) - Total Level(dBµV/m)

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

| Final maximized level using Quasi-Peak detector

X Final maximized level using Average dector

Final maximized level using Peak detector


Level [dBµV/m]
70
60
50
40
30
20
10
0
30M
40M
50M
70M
100M
200M
300M
400M
600M
1G
Frequency [Hz]
MES A102b_F1V_Peak
+ + MES A102b_F1V_Peak_List
LIM FCC Class B 3m Quasi-Peak Limit @ 3 Meters

MEASUREMENT RESULT: "A102b_F1V_Final"

10/9/2015 10:59AM

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		
960.900000	21.98	23.88	6.6	52.5	54.0	1.5	1.00	0	MAX PEAK	RB 918MHz
960.450000	21.90	23.89	6.6	52.4	54.0	1.6	1.00	0	MAX PEAK	RB 918MHz
960.900000	21.03	23.88	6.6	51.5	54.0	2.5	1.00	0	MAX PEAK	RB 916MHz
960.450000	20.66	23.89	6.6	51.1	54.0	2.9	1.00	0	MAX PEAK	RB 916MHz
960.450000	20.04	23.89	6.6	50.5	54.0	3.5	1.00	0	MAX PEAK	RB 912MHz
960.900000	20.05	23.88	6.6	50.5	54.0	3.5	1.00	0	MAX PEAK	RB 912MHz
980.200000	18.93	24.20	6.6	49.8	54.0	4.2	1.00	0	MAX PEAK	RB 912MHz
968.350000	19.31	23.80	6.6	49.7	54.0	4.3	1.00	0	MAX PEAK	RB 918MHz
968.350000	18.82	23.80	6.6	49.2	54.0	4.8	1.00	0	MAX PEAK	RB 916MHz
980.200000	18.16	24.20	6.6	49.0	54.0	5.0	1.00	0	MAX PEAK	RB 916MHz
980.200000	18.10	24.20	6.6	49.0	54.0	5.0	1.00	0	MAX PEAK	RB 918MHz
968.350000	18.44	23.80	6.6	48.8	54.0	5.2	1.00	0	MAX PEAK	RB 912MHz
112.450000	22.99	12.10	2.1	37.2	43.5	6.3	1.00	0	MAX PEAK	RB 916MHz
375.000000	17.11	15.00	3.8	35.9	46.0	10.1	1.00	90	MAX PEAK	912MHz
375.000000	16.87	15.00	3.8	35.7	46.0	10.3	1.00	90	MAX PEAK	918MHz
375.000000	16.54	15.00	3.8	35.4	46.0	10.6	1.00	45	MAX PEAK	916MHz

Appendix B – Measurement Data

B7.0 Radiated Spurious Emissions in Restricted Bands – Above 1 GHz

Tested with 12dBi Yagi Antenna and
Tested with 13dBi Sector Antenna

Rule Part:

15.247(d), 15.205(5), 15.209(a)

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
12.0 Emissions in Restricted Frequency Bands
12.1 Radiated Emissions Measurements
Measurement Procedure – ANSI C63.10-2013

Limits:

15.209(a)

Results: Compliant

Notes:

Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks. The EUT was tested at the low, middle, and high channels of operation.

A duty cycle correction factor was added to the average measurement values because the transmitter duty cycle was less than 98%.

Power Setting 19 for 5MHz Channel Bandwidth with 12dBi Yagi Antenna
Power Setting 18 for 5MHz Channel Bandwidth with 13dBi Sector Antenna
Power Setting 20 for 20MHz Channel Bandwidth with 12dBi Yagi Antenna
Power Setting 19 for 20MHz Channel Bandwidth with 13dBi Sector Antenna

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 47.2% duty cycle Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Low Channel (904.550 MHz): **12 dBi Yagi antenna** **5 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.71365	Average	Vert	47.67	28.70	-39.5	36.8	6.52	43.3	54	10.7	Res. Band
2.71365	Max Peak	Vert	70.73	28.70	-39.5	59.9	---	59.9	74	14.1	Res. Band
2.71365	Average	Horz	45.14	28.70	-39.5	34.3	6.52	40.8	54	13.2	Res. Band
2.71365	Max Peak	Horz	66.38	28.70	-39.5	55.6	---	55.6	74	18.4	Res. Band
3.61820	Average	Vert	44.59	31.54	-38.9	37.3	6.52	43.8	54	10.2	Res. Band
3.61820	Max Peak	Vert	66.38	31.54	-38.9	59.0	---	59.0	74	15.0	Res. Band
3.61820	Average	Horz	40.50	31.54	-38.9	33.2	6.52	39.7	54	14.3	Res. Band
3.61820	Max Peak	Horz	59.48	31.54	-38.9	52.2	---	52.2	74	21.8	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 47.2% duty cycle Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Mid Channel (915 MHz): **12 dBi Yagi antenna** **5 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.745	Average	Vert	49.70	28.71	-39.5	38.9	6.52	45.4	54	8.6	Res. Band
2.745	Max Peak	Vert	70.98	28.71	-39.5	60.2	---	60.2	74	13.8	Res. Band
2.745	Average	Horz	46.03	28.71	-39.5	35.2	6.52	41.7	54	12.3	Res. Band
2.745	Max Peak	Horz	68.22	28.71	-39.5	57.4	---	57.4	74	16.6	Res. Band
3.660	Average	Vert	43.19	31.80	-38.8	36.2	6.52	42.7	54	11.3	Res. Band
3.660	Max Peak	Vert	63.93	31.80	-38.8	56.9	---	56.9	74	17.1	Res. Band
3.660	Average	Horz	40.37	31.80	-38.8	33.3	6.52	39.8	54	14.2	Res. Band
3.660	Max Peak	Horz	51.91	31.80	-38.8	44.9	---	44.9	74	29.1	Res. Band
7.320	Average	Vert	35.87	36.46	-35.3	37.0	6.52	43.5	54	10.5	Res. Band
7.320	Max Peak	Vert	48.27	36.46	-35.3	49.4	---	49.4	74	24.6	Res. Band
7.320	Average	Horz	N/A								
7.320	Max Peak	Horz	N/A								

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 47.2% duty cycle Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

High Channel (925.450 MHz): **12 dBi Yagi antenna** **5 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.77635	Average	Vert	46.03	28.73	-39.5	35.3	6.52	41.8	54	12.2	Res. Band
2.77635	Max Peak	Vert	67.86	28.73	-39.5	57.1	---	57.1	74	16.9	Res. Band
2.77635	Average	Horz	43.03	28.73	-39.5	32.3	6.52	38.8	54	15.2	Res. Band
2.77635	Max Peak	Horz	63.53	28.73	-39.5	52.8	---	52.8	74	21.2	Res. Band
3.70180	Average	Vert	43.06	32.06	-38.8	36.4	6.52	42.9	54	11.1	Res. Band
3.70180	Max Peak	Vert	58.63	32.06	-38.8	51.9	---	51.9	74	22.1	Res. Band
3.70180	Average	Horz	41.28	32.06	-38.8	34.6	6.52	41.1	54	12.9	Res. Band
3.70180	Max Peak	Horz	50.64	32.06	-38.8	43.9	---	43.9	74	30.1	Res. Band
7.40360	Average	Vert	41.00	36.62	-35.4	42.2	6.52	48.7	54	5.3	Res. Band
7.40360	Max Peak	Vert	49.74	36.62	-35.4	51.0	---	51.0	74	23.0	Res. Band
7.40360	Average	Horz	36.71	36.62	-35.4	37.9	6.52	44.4	54	9.6	Res. Band
7.40360	Max Peak	Horz	48.41	36.62	-35.4	49.6	---	49.6	74	24.4	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 47.2% duty cycle Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Low Channel (904.550 MHz): **13 dBi sector antenna** **5 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.71365	Average	Vert	40.01	28.70	-39.5	29.2	6.52	35.7	54	18.3	Res. Band
2.71365	Max Peak	Vert	60.47	28.70	-39.5	49.6	---	49.6	74	24.4	Res. Band
2.71365	Average	Horz	N/A								
2.71365	Max Peak	Horz	N/A								
3.61820	Average	Vert	40.41	31.54	-38.9	33.1	6.52	39.6	54	14.4	Res. Band
3.61820	Max Peak	Vert	64.73	31.54	-38.9	57.4	---	57.4	74	16.6	Res. Band
3.61820	Average	Horz	41.78	31.54	-38.9	34.4	6.52	40.9	54	13.1	Res. Band
3.61820	Max Peak	Horz	51.54	31.54	-38.9	44.2	---	44.2	74	29.8	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 47.2% duty cycle Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Mid Channel (915 MHz): **13 dBi sector antenna** **5 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.745	Average	Vert	44.43	28.71	-39.5	33.6	6.52	40.1	54	13.9	Res. Band
2.745	Max Peak	Vert	65.74	28.71	-39.5	55.0	---	55.0	74	19.0	Res. Band
2.745	Average	Horz	40.06	28.71	-39.5	29.3	6.52	35.8	54	18.2	Res. Band
2.745	Max Peak	Horz	58.89	28.71	-39.5	48.1	---	48.1	74	25.9	Res. Band
3.660	Average	Vert	41.24	31.80	-38.8	34.2	6.52	40.7	54	13.3	Res. Band
3.660	Max Peak	Vert	65.86	31.80	-38.8	58.8	---	58.8	74	15.2	Res. Band
3.660	Average	Horz	40.67	31.80	-38.8	33.6	6.52	40.1	54	13.9	Res. Band
3.660	Max Peak	Horz	52.18	31.80	-38.8	45.2	---	45.2	74	28.8	Res. Band
7.320	Average	Vert	N/A								
7.320	Max Peak	Vert	N/A								
7.320	Average	Horz	35.95	36.46	-35.3	37.1	6.52	43.6	54	10.4	Res. Band
7.320	Max Peak	Horz	47.99	36.46	-35.3	49.2	---	49.2	74	24.8	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 47.2% duty cycle Correction factor x = 20 Log (1 / 0.4720) = 6.52 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

High Channel (925.450 MHz): **13 dBi sector antenna** **5 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.77635	Average	Vert	42.07	28.73	-39.5	31.3	6.52	37.8	54	16.2	Res. Band
2.77635	Max Peak	Vert	62.47	28.73	-39.5	51.7	---	51.7	74	22.3	Res. Band
2.77635	Average	Horz	N/A								
2.77635	Max Peak	Horz	N/A								
3.70180	Average	Vert	42.00	32.06	-38.8	35.3	6.52	41.8	54	12.2	Res. Band
3.70180	Max Peak	Vert	50.77	32.06	-38.8	44.1	---	44.1	74	29.9	Res. Band
3.70180	Average	Horz	42.70	32.06	-38.8	36.0	6.52	42.5	54	11.5	Res. Band
3.70180	Max Peak	Horz	51.41	32.06	-38.8	44.7	---	44.7	74	29.3	Res. Band
7.40360	Average	Vert	40.54	36.62	-35.4	41.8	6.52	48.3	54	5.7	Res. Band
7.40360	Max Peak	Vert	49.74	36.62	-35.4	51.0	---	51.0	74	23.0	Res. Band
7.40360	Average	Horz	39.73	36.62	-35.4	41.0	6.52	47.5	54	6.5	Res. Band
7.40360	Max Peak	Horz	49.48	36.62	-35.4	50.7	---	50.7	74	23.3	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 51% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 65.60% duty cycle Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Low Channel (912 MHz): **12 dBi Yagi antenna** **20 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.736	Average	Vert	47.52	28.71	-39.5	36.7	3.66	40.4	54	13.6	Res. Band
2.736	Max Peak	Vert	64.73	28.71	-39.5	53.9	---	53.9	74	20.1	Res. Band
2.736	Average	Horz	43.50	28.71	-39.5	32.7	3.66	36.4	54	17.6	Res. Band
2.736	Max Peak	Horz	59.84	28.71	-39.5	49.0	---	49.0	74	25.0	Res. Band
3.648	Average	Vert	42.63	31.72	-38.8	35.5	3.66	39.2	54	14.8	Res. Band
3.648	Max Peak	Vert	59.02	31.72	-38.8	51.9	---	51.9	74	22.1	Res. Band
3.648	Average	Horz	40.28	31.72	-38.8	33.2	3.66	36.9	54	17.1	Res. Band
3.648	Max Peak	Horz	51.54	31.72	-38.8	44.4	---	44.4	74	29.6	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 51% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 65.60% duty cycle Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Mid Channel (916 MHz): **12 dBi Yagi antenna** **20 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.748	Average	Vert	47.26	28.71	-39.5	36.5	3.66	40.2	54	13.8	Res. Band
2.748	Max Peak	Vert	63.66	28.71	-39.5	52.9	---	52.9	74	21.1	Res. Band
2.748	Average	Horz	43.98	28.71	-39.5	33.2	3.66	36.9	54	17.1	Res. Band
2.748	Max Peak	Horz	60.08	28.71	-39.5	49.3	---	49.3	74	24.7	Res. Band
3.664	Average	Vert	41.40	31.82	-38.8	34.4	3.66	38.1	54	15.9	Res. Band
3.664	Max Peak	Vert	57.10	31.82	-38.8	50.1	---	50.1	74	23.9	Res. Band
3.664	Average	Horz	39.15	31.82	-38.8	32.1	3.66	35.8	54	18.2	Res. Band
3.664	Max Peak	Horz	52.59	31.82	-38.8	45.6	---	45.6	74	28.4	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 51% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 65.60% duty cycle Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB
Date: 10-09-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

High Channel (918 MHz): **12 dBi Yagi antenna** **20 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.754	Average	Vert	47.48	28.72	-39.5	36.7	3.66	40.4	54	13.6	Res. Band
2.754	Max Peak	Vert	64.19	28.72	-39.5	53.4	---	53.4	74	20.6	Res. Band
2.754	Average	Horz	44.01	28.72	-39.5	33.2	3.66	36.9	54	17.1	Res. Band
2.754	Max Peak	Horz	59.95	28.72	-39.5	49.2	---	49.2	74	24.8	Res. Band
3.672	Average	Vert	41.16	31.87	-38.8	34.2	3.66	37.9	54	16.1	Res. Band
3.672	Max Peak	Vert	57.73	31.87	-38.8	50.8	---	50.8	74	23.2	Res. Band
3.672	Average	Horz	40.84	31.87	-38.8	33.9	3.66	37.6	54	16.4	Res. Band
3.672	Max Peak	Horz	51.54	31.87	-38.8	44.6	---	44.6	74	29.4	Res. Band
7.344	Average	Vert	36.78	36.51	-35.3	38.0	3.66	41.7	54	12.3	Res. Band
7.344	Max Peak	Vert	49.22	36.51	-35.3	50.4	---	50.4	74	23.6	Res. Band
7.344	Average	Horz	N/A								
7.344	Max Peak	Horz	N/A								

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 65.60% duty cycle Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB
Date: 10-12-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Low Channel (912 MHz): **13 dBi sector antenna** **20 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.736	Average	Vert	40.06	28.71	-39.5	29.3	3.66	33.0	54	21.0	Res. Band
2.736	Max Peak	Vert	56.20	28.71	-39.5	45.4	---	45.4	74	28.6	Res. Band
2.736	Average	Horz	37.78	28.71	-39.5	27.0	3.66	30.7	54	23.3	Res. Band
2.736	Max Peak	Horz	52.20	28.71	-39.5	41.4	---	41.4	74	32.6	Res. Band
3.648	Average	Vert	41.44	31.72	-38.8	34.3	3.66	38.0	54	16.0	Res. Band
3.648	Max Peak	Vert	51.14	31.72	-38.8	44.0	---	44.0	74	30.0	Res. Band
3.648	Average	Horz	39.34	31.72	-38.8	32.2	3.66	35.9	54	18.1	Res. Band
3.648	Max Peak	Horz	51.00	31.72	-38.8	43.9	---	43.9	74	30.1	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 65.60% duty cycle Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB
Date: 10-12-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

Mid Channel (916 MHz): **13 dBi sector antenna** **20 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.748	Average	Vert	40.88	28.71	-39.5	30.1	3.66	33.8	54	20.2	Res. Band
2.748	Max Peak	Vert	57.36	28.71	-39.5	46.6	---	46.6	74	27.4	Res. Band
2.748	Average	Horz	37.34	28.71	-39.5	26.6	3.66	30.3	54	23.7	Res. Band
2.748	Max Peak	Horz	50.73	28.71	-39.5	39.9	---	39.9	74	34.1	Res. Band
3.664	Average	Vert	41.52	31.82	-38.8	34.5	3.66	38.2	54	15.8	Res. Band
3.664	Max Peak	Vert	51.14	31.82	-38.8	44.1	---	44.1	74	29.9	Res. Band
3.664	Average	Horz	40.77	31.82	-38.8	33.8	3.66	37.5	54	16.5	Res. Band
3.664	Max Peak	Horz	50.73	31.82	-38.8	43.7	---	43.7	74	30.3	Res. Band
7.328	Average	Vert	N/A								
7.328	Max Peak	Vert	N/A								
7.328	Average	Horz	36.88	36.47	-35.3	38.1	3.66	41.8	54	12.2	Res. Band
7.328	Max Peak	Horz	48.12	36.47	-35.3	49.3	---	49.3	74	24.7	Res. Band

Radiated Spurious Emissions in Restricted Bands
Tested at a 3 Meter Distance from 1 GHz to 10 GHz

EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Manufacturer: Cambium networks
Operating Condition: 72 deg F; 52% R.H.
Test Site: Site G1
Operator: Craig B
Test Specification: FCC Part 15.247(d) and FCC Part 15.205
Comment: Transmit @ 65.60% duty cycle Correction factor x = 20 Log (1 / 0.6560) = 3.66 dB
Date: 10-12-2015
Notes: **(1)** Peak measurements were taken with receiver 1 MHz Peak detector.
(2) Average measurements were taken with receiver 1 MHz linear CISPR Average detector.
(3) All other restricted band emissions at least 20 dB under the limit.

High Channel (918 MHz): **13 dBi sector antenna** **20 MHz channel Bandwidth**

Frequency (GHz)	Measurement Type	Ant. Pol.	Level (dBuV)	Antenna Factor (dB/m)	System Loss (dB)	Total Level (dBuV/m)	Duty Cycle Correction (dB)	Final Corrected (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Comment
2.754	Average	Vert	40.80	28.72	-39.5	30.0	3.66	33.7	54	20.3	Res. Band
2.754	Max Peak	Vert	56.72	28.72	-39.5	45.9	---	45.9	74	28.1	Res. Band
2.754	Average	Horz	37.97	28.72	-39.5	27.2	3.66	30.9	54	23.1	Res. Band
2.754	Max Peak	Horz	53.27	28.72	-39.5	42.5	---	42.5	74	31.5	Res. Band
3.672	Average	Vert	42.15	31.87	-38.8	35.2	3.66	38.9	54	15.1	Res. Band
3.672	Max Peak	Vert	50.73	31.87	-38.8	43.8	---	43.8	74	30.2	Res. Band
3.672	Average	Horz	39.78	31.87	-38.8	32.8	3.66	36.5	54	17.5	Res. Band
3.672	Max Peak	Horz	50.59	31.87	-38.8	43.7	---	43.7	74	30.3	Res. Band
7.344	Average	Vert	36.78	36.51	-35.3	38.0	3.66	41.7	54	12.3	Res. Band
7.344	Max Peak	Vert	48.10	36.51	-35.3	49.3	---	49.3	74	24.7	Res. Band
7.344	Average	Horz	34.12	36.51	-35.3	35.3	3.66	39.0	54	15.0	Res. Band
7.344	Max Peak	Horz	46.72	36.51	-35.3	47.9	---	47.9	74	26.1	Res. Band

Appendix B – Measurement Data

B8.0 Band-Edge Measurements – RF Conducted

Rule Part:

15.247(d)

Test Procedure:

558074 D01 DTS Meas Guidance v03r03
11.0 Emissions in non-restricted frequency bands
11.2 Reference Level Measurement
11.3 Emissions Level Measurement

Limit:

The peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band peak PSD level. (Compliance to the conducted power limits is based on RMS averaging)

Results:

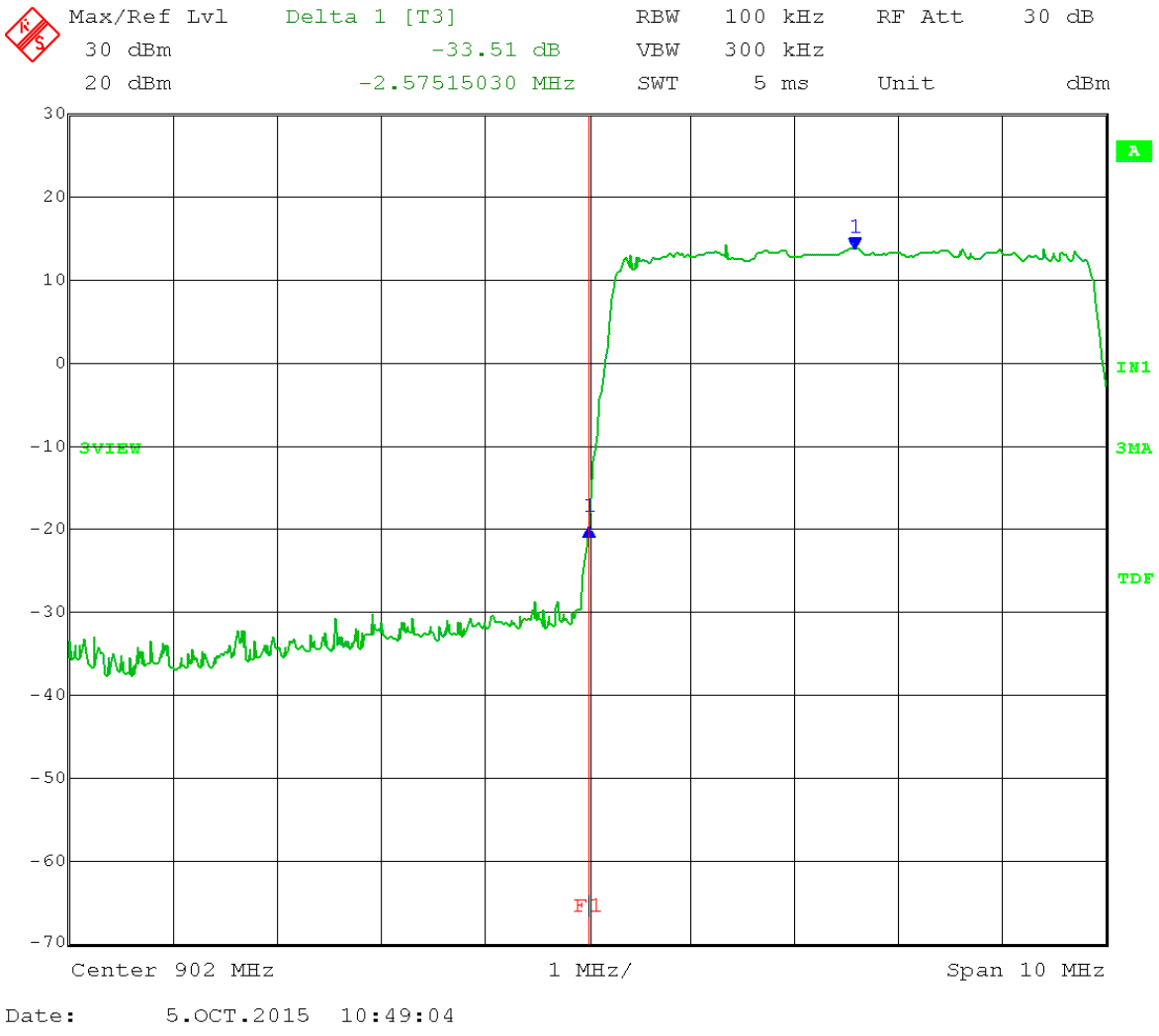
Compliant

Notes:

Measurements were performed using the worst-case modulation (QPSK) as determined by Cambium Networks. The EUT was tested at the low and high channels of operation.

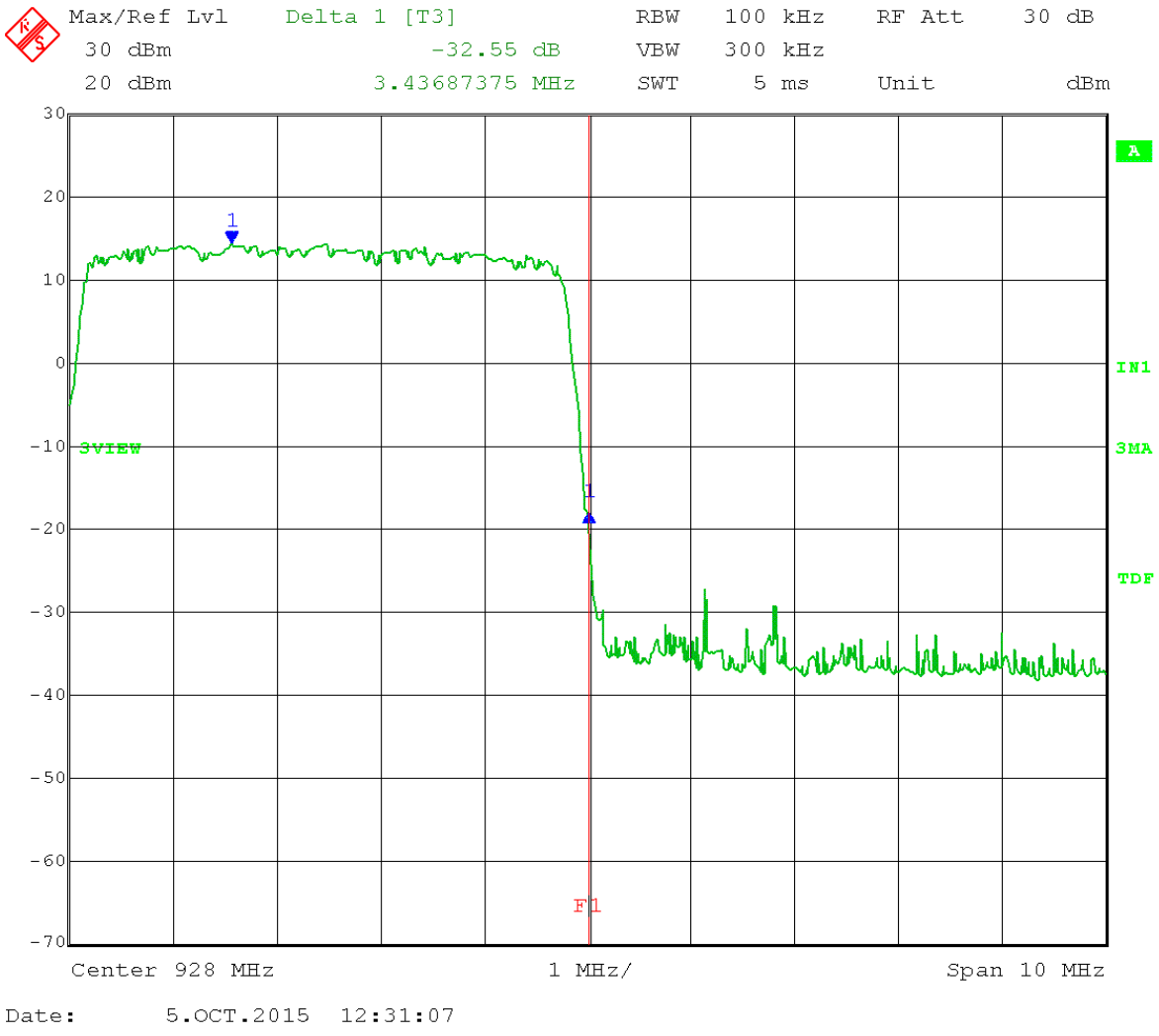
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Lower Band-Edge Measurement - Conducted
Operator: Craig B

Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = auto couple
Trace = max hold
Low Channel: Transmit = 904.550 MHz Output power setting: 18
Channel bandwidth: 5 MHz Output port: A
Lower band edge frequency = 902 MHz
Limit: > 30 dB below Peak In-Band Emission



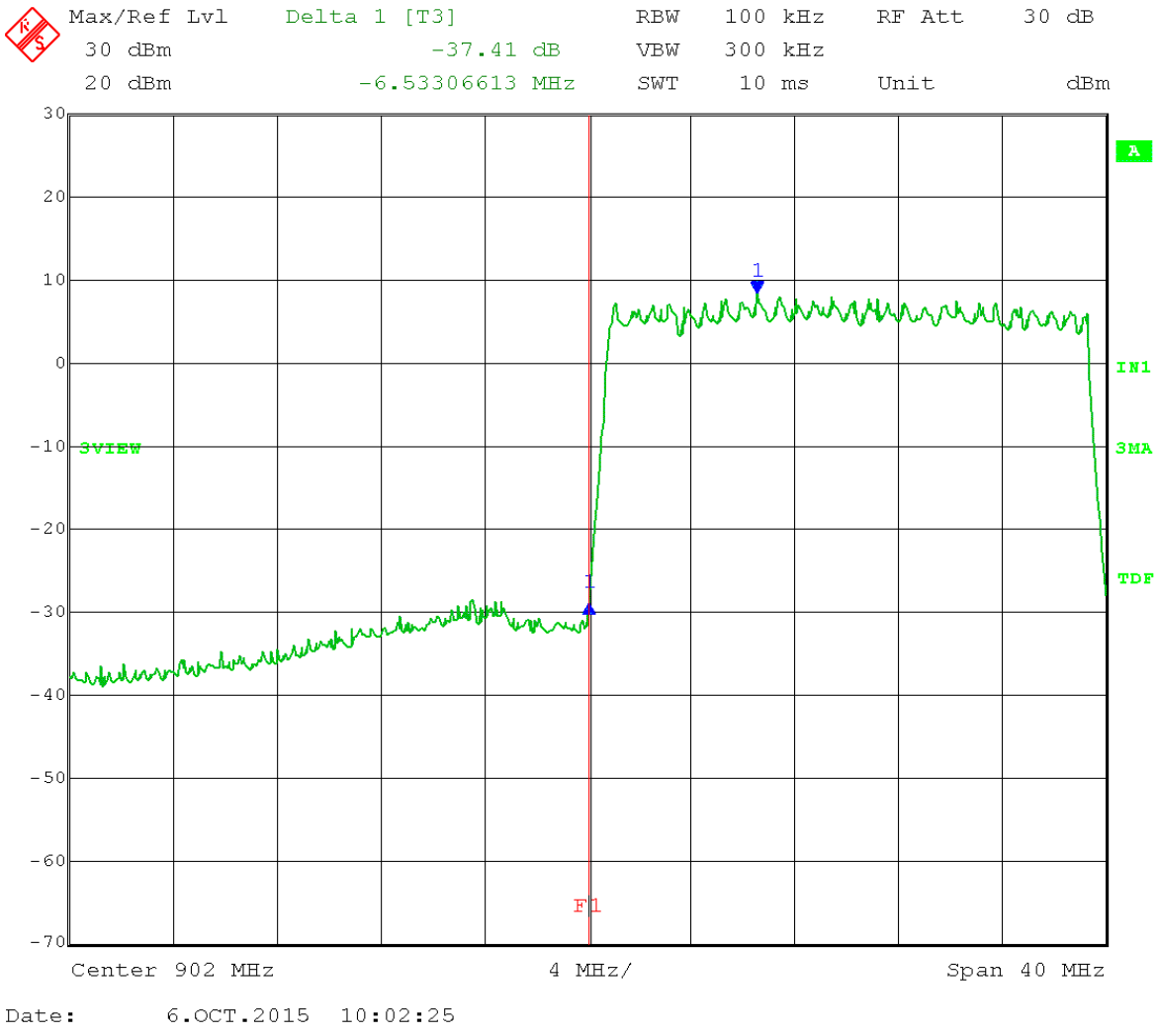
Test Date: 10-05-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Upper Band-Edge Measurement - Conducted
Operator: Craig B

Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = auto couple
Trace = max hold
High Channel: Transmit = 925.450 MHz Output power setting: 18
Channel bandwidth: 5 MHz Output port: A
Upper band edge frequency = 928 MHz
Limit: > 30 dB below Peak In-Band Emission



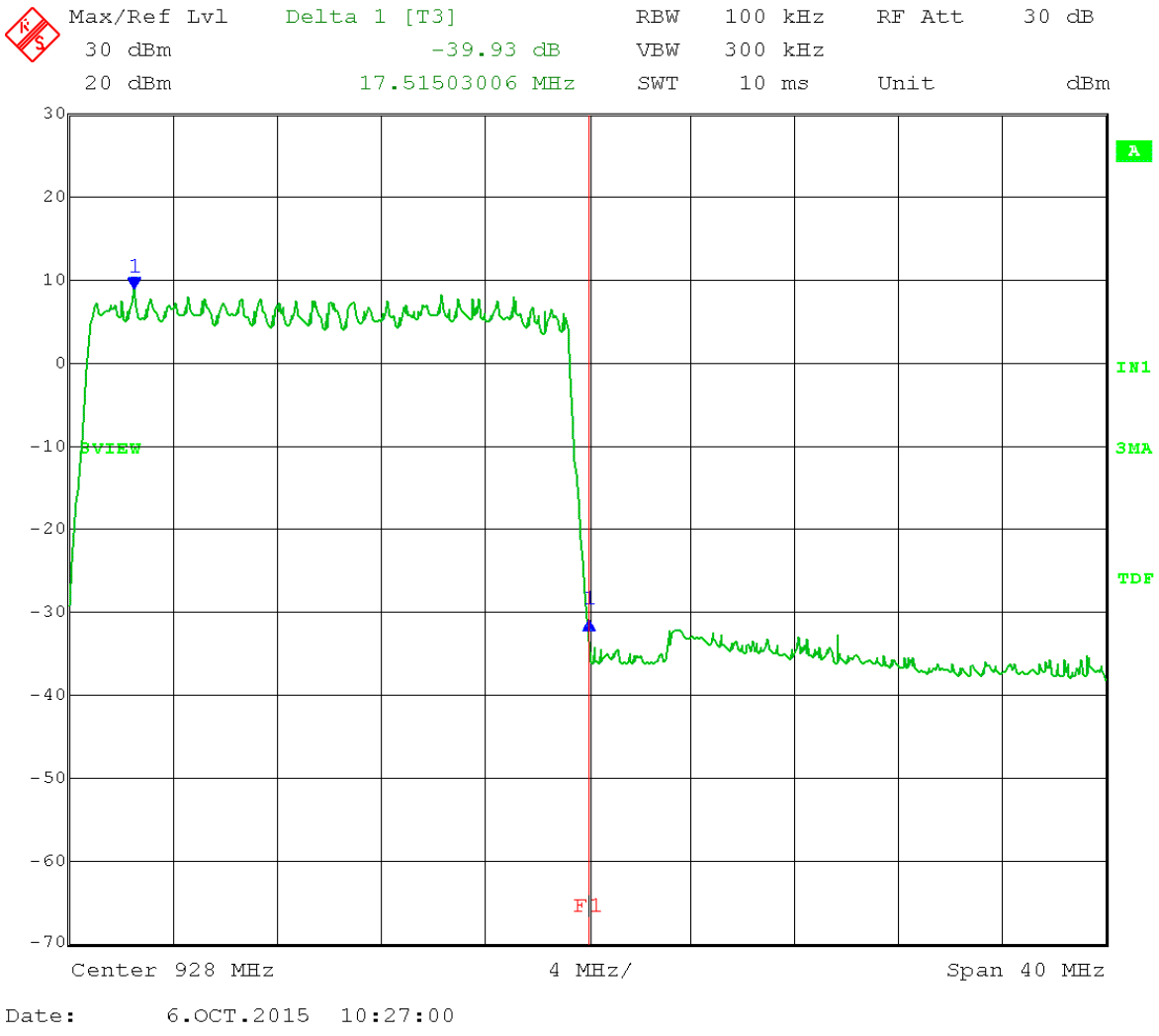
Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Lower Band-Edge Measurement - Conducted
Operator: Craig B

Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = auto couple
Trace = max hold
Low Channel: Transmit = 912 MHz Output power setting: 19
Channel bandwidth: 20 MHz Output port: A
Lower band edge frequency = 902 MHz
Limit: > 30 dB below Peak In-Band Emission



Test Date: 10-06-2015
Company: Cambium Networks
EUT: 450i 900 MHz AP MAC: 0A003E4586C8
Test: Upper Band-Edge Measurement - Conducted
Operator: Craig B

Comment: RBW = 100 kHz VBW ≥ 300 kHz
Detector = Peak Sweep = auto couple
Trace = max hold
High Channel: Transmit = 918 MHz Output power setting: 19
Channel bandwidth: 20 MHz Output port: A
Upper band edge frequency = 928 MHz
Limit: > 30 dB below Peak In-Band Emission



Appendix B – Measurement Data

B9.0 AC Line Conducted Emissions

Rule Part: FCC Pt.15.207(a)

Test Procedure: ANSI C63.4-2014

Limit: FCC Pt.15.207(a)

Results: Compliant

Notes: This was an AC Power Line Conducted emissions measurement.

The EUT was powered from an included AC Adapter with an input of 120 VAC, 60 Hz and 240VAC, 60Hz: Cambium Networks Model NET-P30-56 (56VDC Class VI power supply).

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 120V L1

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:1 Average
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

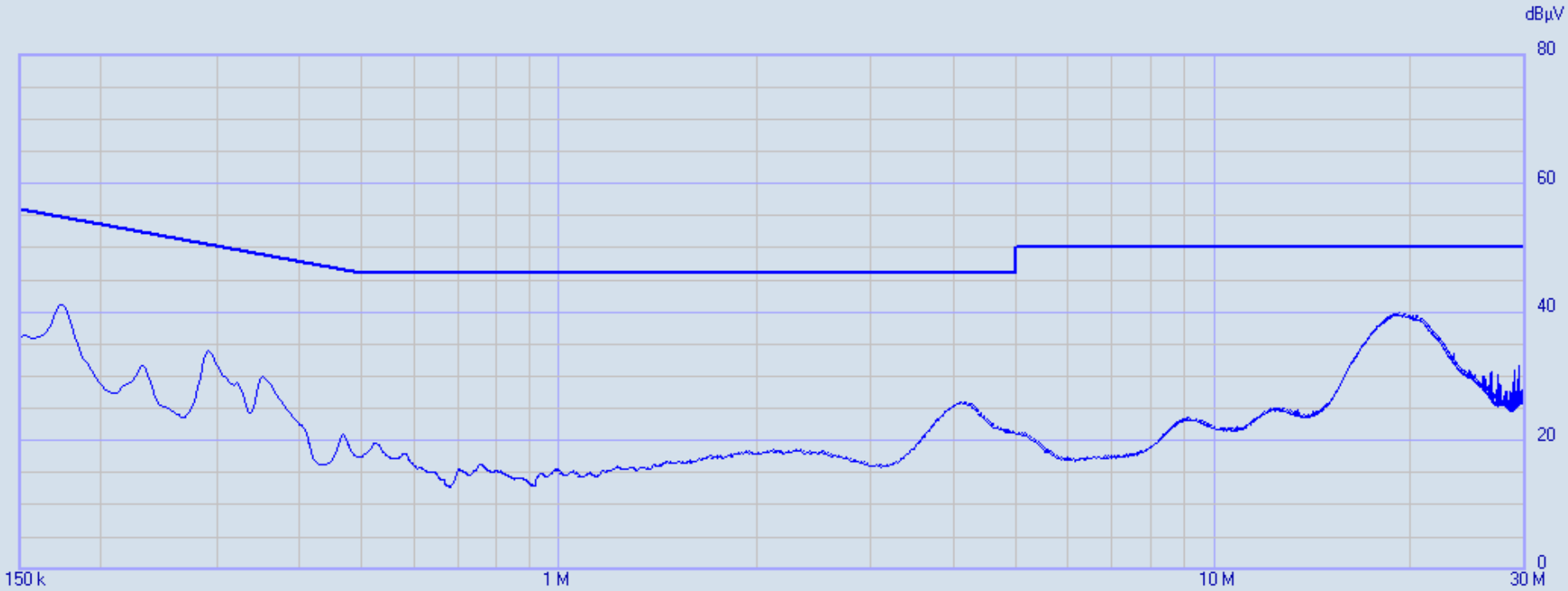
Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 120 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



7505 Cambium 450I 900MHz 120V L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

C-Avg

7505 Cambium 450I 900MHz 120V L1 07/10/2015 14:24:25
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 10.5 dB

	Frequency [MHz]	C-Avg [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	18.77177	39.63	50.00	-10.37	0.36	9.85	0.19	0.80
2	18.773815	39.53	50.00	-10.47	0.36	9.85	0.19	0.80
3	18.871975	39.64	50.00	-10.36	0.36	9.85	0.19	0.80
4	18.97218	39.73	50.00	-10.27	0.36	9.86	0.19	0.81
5	18.974225	39.54	50.00	-10.46	0.36	9.86	0.19	0.81
6	19.072385	39.66	50.00	-10.34	0.36	9.86	0.19	0.81
7	19.07443	39.61	50.00	-10.39	0.36	9.86	0.19	0.81
8	19.174635	39.84	50.00	-10.16	0.36	9.86	0.19	0.81
9	19.17668	39.65	50.00	-10.35	0.36	9.86	0.19	0.81
10	19.27484	39.71	50.00	-10.29	0.36	9.86	0.19	0.81
11	19.276885	39.57	50.00	-10.43	0.36	9.86	0.19	0.81
12	19.37709	39.68	50.00	-10.32	0.36	9.86	0.19	0.81
13	19.379135	39.57	50.00	-10.43	0.36	9.86	0.19	0.81
14	19.481385	39.66	50.00	-10.34	0.36	9.86	0.19	0.81
15	19.583635	39.60	50.00	-10.40	0.36	9.86	0.19	0.81
16	19.58568	39.52	50.00	-10.48	0.36	9.86	0.19	0.81
17	19.68793	39.52	50.00	-10.48	0.36	9.86	0.19	0.81

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 120V L1

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:1 QP
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

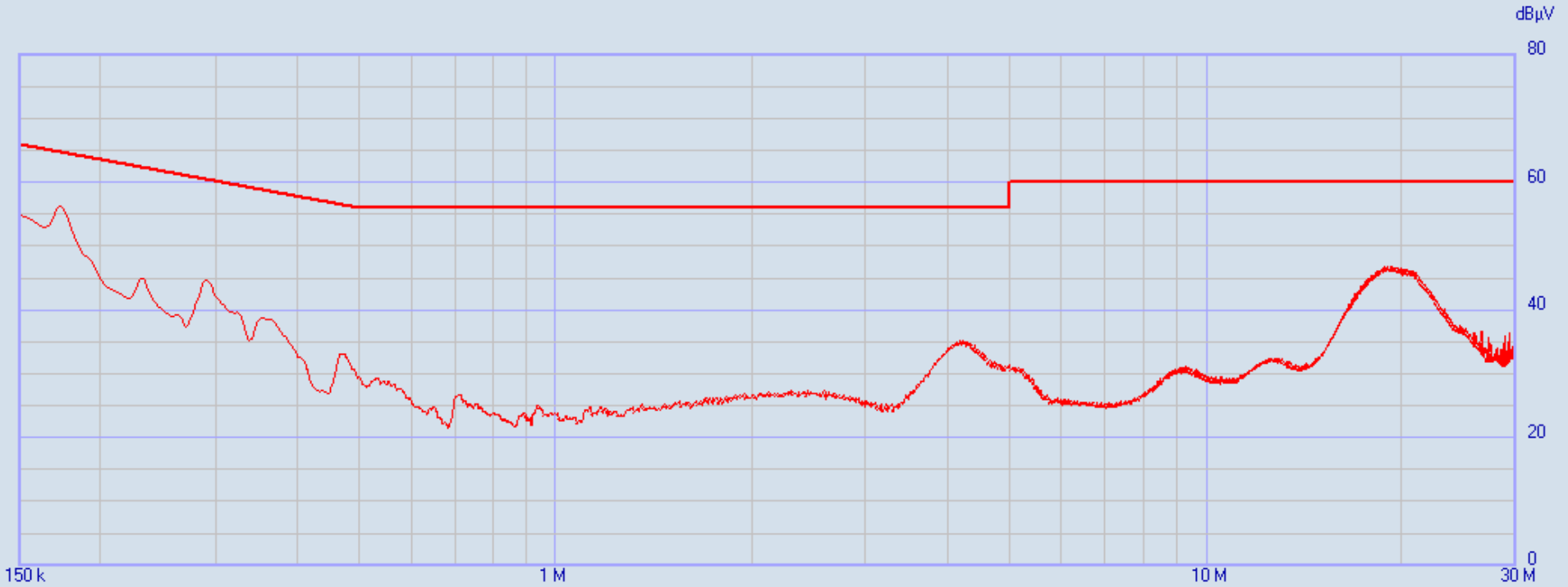
Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 120 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



7505 Cambium 450I 900MHz 120V L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

QPeak

7505 Cambium 450I 900MHz 120V L1 07/10/2015 14:24:25
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 13 dB

	Frequency [MHz]	QPeak [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	0.15	54.71	66.00	-11.29	1.67	9.64	2.12	0.03
2	0.152045	54.62	65.89	-11.27	1.64	9.65	2.09	0.04
3	0.15409	54.31	65.78	-11.47	1.61	9.66	2.07	0.04
4	0.156135	54.01	65.67	-11.66	1.59	9.67	2.04	0.04
5	0.15818	53.68	65.56	-11.88	1.56	9.67	2.02	0.05
6	0.160225	53.34	65.45	-12.11	1.54	9.68	1.99	0.05
7	0.16227	52.99	65.35	-12.36	1.51	9.69	1.97	0.06
8	0.164315	53.02	65.24	-12.22	1.48	9.70	1.94	0.06
9	0.16636	53.46	65.14	-11.68	1.46	9.71	1.92	0.07
10	0.168405	54.43	65.04	-10.61	1.43	9.71	1.90	0.07
11	0.17045	55.71	64.94	-9.23	1.40	9.71	1.88	0.08
12	0.172495	56.13	64.84	-8.71	1.38	9.71	1.86	0.08
13	0.17454	56.08	64.74	-8.66	1.36	9.71	1.85	0.08
14	0.176585	55.32	64.64	-9.32	1.34	9.70	1.83	0.09
15	0.17863	54.15	64.55	-10.40	1.32	9.70	1.81	0.09
16	0.180675	52.70	64.45	-11.75	1.30	9.70	1.79	0.09
17	0.18272	51.58	64.36	-12.78	1.28	9.70	1.78	0.09

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 120V L2

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:2 Average
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

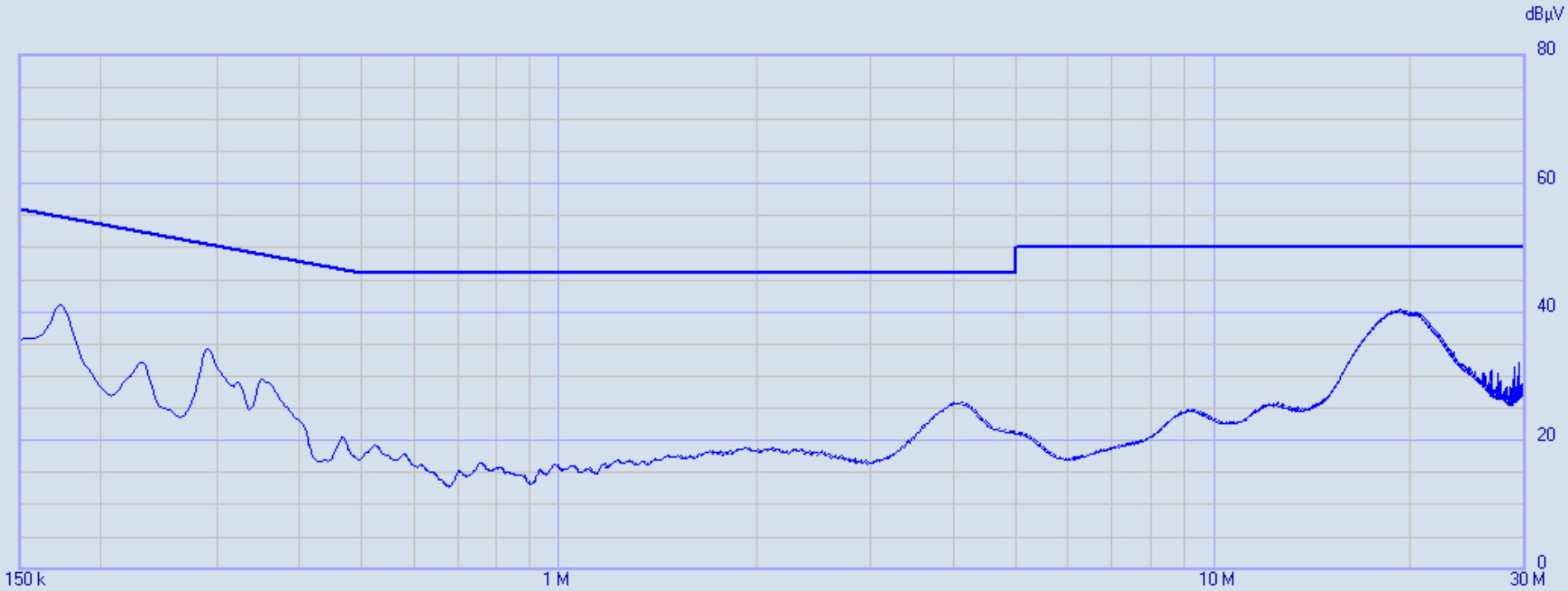
Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 120 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



7505 Cambium 450I 900MHz 120V L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

C-Avg

7505 Cambium 450I 900MHz 120V L2 07/10/2015 14:32:40
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 10 dB

	Frequency [MHz]	C-Avg [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	18.671565	40.06	50.00	-9.94	0.36	9.85	0.19	0.80
2	18.67361	40.02	50.00	-9.98	0.36	9.85	0.19	0.80
3	18.77177	40.18	50.00	-9.82	0.36	9.85	0.19	0.80
4	18.773815	40.08	50.00	-9.92	0.36	9.85	0.19	0.80
5	18.871975	40.18	50.00	-9.82	0.36	9.85	0.19	0.80
6	18.87402	40.02	50.00	-9.98	0.36	9.85	0.19	0.80
7	18.97218	40.23	50.00	-9.77	0.36	9.86	0.19	0.81
8	18.974225	40.06	50.00	-9.94	0.36	9.86	0.19	0.81
9	19.072385	40.31	50.00	-9.69	0.36	9.86	0.19	0.81
10	19.07443	40.27	50.00	-9.73	0.36	9.86	0.19	0.81
11	19.174635	40.29	50.00	-9.71	0.36	9.86	0.19	0.81
12	19.17668	40.18	50.00	-9.82	0.36	9.86	0.19	0.81
13	19.27484	40.27	50.00	-9.73	0.36	9.86	0.19	0.81
14	19.276885	40.13	50.00	-9.87	0.36	9.86	0.19	0.81
15	19.37709	40.18	50.00	-9.82	0.36	9.86	0.19	0.81
16	19.481385	40.19	50.00	-9.81	0.36	9.86	0.19	0.81
17	19.583635	40.15	50.00	-9.85	0.36	9.86	0.19	0.81
18	19.58568	40.03	50.00	-9.97	0.36	9.86	0.19	0.81
19	19.68793	40.13	50.00	-9.87	0.36	9.86	0.19	0.81
20	19.792225	40.01	50.00	-9.99	0.36	9.86	0.19	0.81

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 120V L2

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:2 QP
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

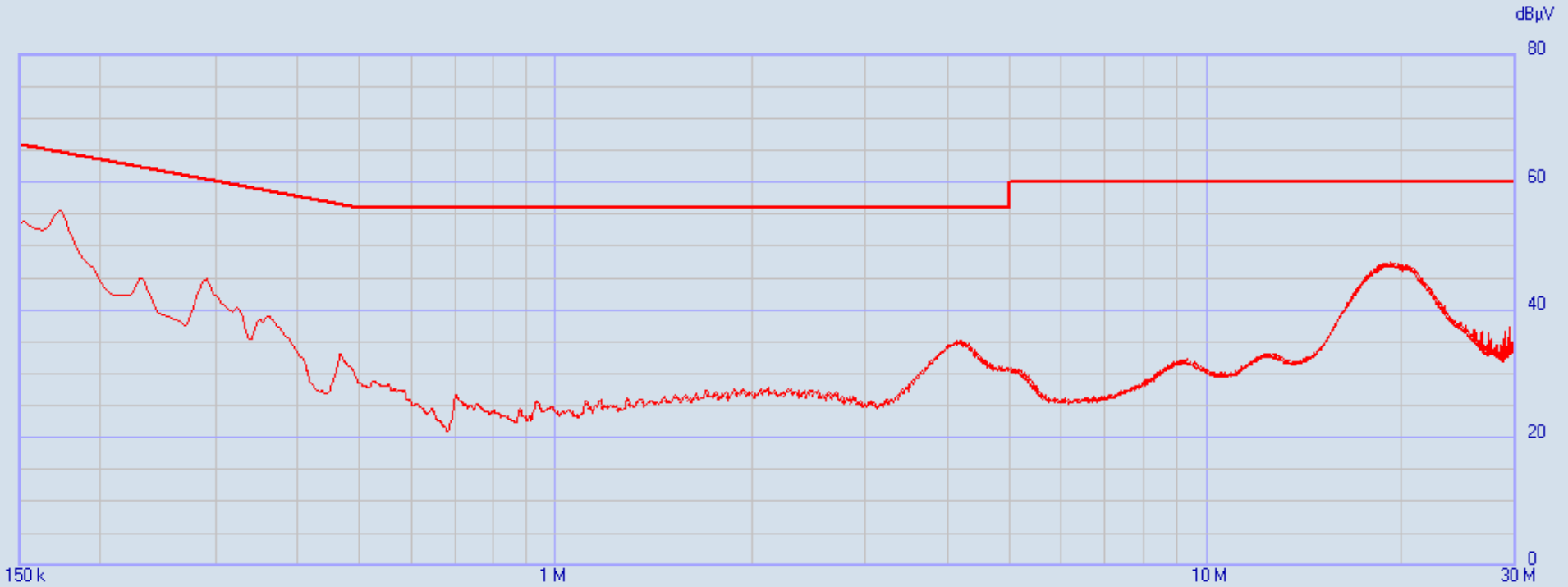
Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 120 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



7505 Cambium 450I 900MHz 120V L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

QPeak

7505 Cambium 450I 900MHz 120V L2 07/10/2015 14:32:40
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 12.5 dB

	Frequency [MHz]	QPeak [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	0.15	53.72	66.00	-12.28	1.67	9.64	2.12	0.03
2	0.152045	53.81	65.89	-12.08	1.64	9.65	2.09	0.04
3	0.15409	53.33	65.78	-12.45	1.61	9.66	2.07	0.04
4	0.16636	53.47	65.14	-11.67	1.46	9.71	1.92	0.07
5	0.168405	54.58	65.04	-10.46	1.43	9.71	1.90	0.07
6	0.17045	55.15	64.94	-9.79	1.40	9.71	1.88	0.08
7	0.172495	55.64	64.84	-9.20	1.38	9.71	1.86	0.08
8	0.17454	55.27	64.74	-9.47	1.36	9.71	1.85	0.08
9	0.176585	54.25	64.64	-10.39	1.34	9.70	1.83	0.09
10	0.17863	52.73	64.55	-11.82	1.32	9.70	1.81	0.09

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 240V L1

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:1 Average
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 240 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.

7505 Cambium 450I 900MHz 240V L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

C-Avg

7505 Cambium 450I 900MHz 240V L1 07/10/2015 14:47:20
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 9.5 dB

	Frequency [MHz]	C-Avg [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	18.1869	40.50	50.00	-9.50	0.35	9.85	0.18	0.80
2	18.28097	40.61	50.00	-9.39	0.36	9.85	0.18	0.80
3	18.283015	40.56	50.00	-9.44	0.36	9.85	0.18	0.80
4	18.377085	40.70	50.00	-9.30	0.36	9.85	0.18	0.80
5	18.37913	40.62	50.00	-9.38	0.36	9.85	0.18	0.80
6	18.475245	40.79	50.00	-9.21	0.36	9.85	0.19	0.80
7	18.47729	40.70	50.00	-9.30	0.36	9.85	0.19	0.80
8	18.573405	40.83	50.00	-9.17	0.36	9.85	0.19	0.80
9	18.57545	40.71	50.00	-9.29	0.36	9.85	0.19	0.80
10	18.671565	40.91	50.00	-9.09	0.36	9.85	0.19	0.80
11	18.67361	40.72	50.00	-9.28	0.36	9.85	0.19	0.80
12	18.77177	40.94	50.00	-9.06	0.36	9.85	0.19	0.80
13	18.773815	40.69	50.00	-9.31	0.36	9.85	0.19	0.80
14	18.871975	40.86	50.00	-9.14	0.36	9.85	0.19	0.80
15	18.87402	40.72	50.00	-9.28	0.36	9.85	0.19	0.80
16	18.97218	40.80	50.00	-9.20	0.36	9.86	0.19	0.81
17	18.974225	40.66	50.00	-9.34	0.36	9.86	0.19	0.81
18	19.072385	40.79	50.00	-9.21	0.36	9.86	0.19	0.81
19	19.07443	40.69	50.00	-9.31	0.36	9.86	0.19	0.81
20	19.174635	40.74	50.00	-9.26	0.36	9.86	0.19	0.81
21	19.17668	40.65	50.00	-9.35	0.36	9.86	0.19	0.81
22	19.27484	40.69	50.00	-9.31	0.36	9.86	0.19	0.81
23	19.276885	40.52	50.00	-9.48	0.36	9.86	0.19	0.81
24	19.37709	40.60	50.00	-9.40	0.36	9.86	0.19	0.81
25	19.481385	40.53	50.00	-9.47	0.36	9.86	0.19	0.81

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 240V L1

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:1 QP
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

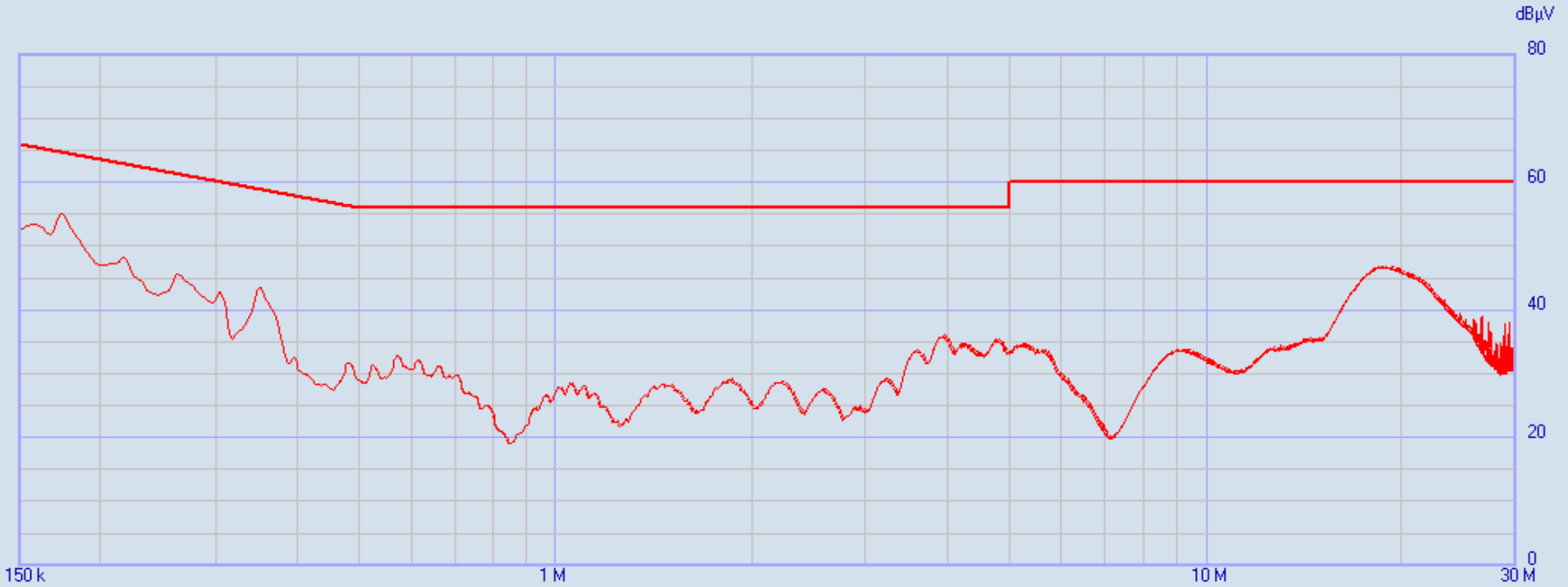
Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 240 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



7505 Cambium 450I 900MHz 240V L1

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

QPeak

7505 Cambium 450I 900MHz 240V L1 07/10/2015 14:47:20
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 12.5 dB

	Frequency [MHz]	QPeak [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	0.156135	53.32	65.67	-12.35	1.59	9.67	2.04	0.04
2	0.15818	53.44	65.56	-12.12	1.56	9.67	2.02	0.05
3	0.160225	53.24	65.45	-12.21	1.54	9.68	1.99	0.05
4	0.16227	52.90	65.35	-12.45	1.51	9.69	1.97	0.06
5	0.17045	53.60	64.94	-11.34	1.40	9.71	1.88	0.08
6	0.172495	54.75	64.84	-10.09	1.38	9.71	1.86	0.08
7	0.17454	55.00	64.74	-9.74	1.36	9.71	1.85	0.08
8	0.176585	54.57	64.64	-10.07	1.34	9.70	1.83	0.09
9	0.17863	53.47	64.55	-11.08	1.32	9.70	1.81	0.09
10	0.180675	52.57	64.45	-11.88	1.30	9.70	1.79	0.09
11	0.18272	51.91	64.36	-12.45	1.28	9.70	1.78	0.09

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 240V L2

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:2 Average
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 240 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.

7505 Cambium 450I 900MHz 240V L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V AV

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

C-Avg

7505 Cambium 450I 900MHz 240V L2 07/10/2015 14:56:10
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 8.75 dB

	Frequency [MHz]	C-Avg [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	18.28097	41.25	50.00	-8.75	0.36	9.85	0.18	0.80
2	18.377085	41.37	50.00	-8.63	0.36	9.85	0.18	0.80
3	18.475245	41.41	50.00	-8.59	0.36	9.85	0.19	0.80
4	18.47729	41.39	50.00	-8.61	0.36	9.85	0.19	0.80
5	18.573405	41.45	50.00	-8.55	0.36	9.85	0.19	0.80
6	18.57545	41.39	50.00	-8.61	0.36	9.85	0.19	0.80
7	18.671565	41.49	50.00	-8.51	0.36	9.85	0.19	0.80
8	18.67361	41.50	50.00	-8.50	0.36	9.85	0.19	0.80
9	18.77177	41.51	50.00	-8.49	0.36	9.85	0.19	0.80
10	18.773815	41.46	50.00	-8.54	0.36	9.85	0.19	0.80
11	18.871975	41.53	50.00	-8.47	0.36	9.85	0.19	0.80
12	18.87402	41.31	50.00	-8.69	0.36	9.85	0.19	0.80
13	18.97218	41.48	50.00	-8.52	0.36	9.86	0.19	0.81
14	18.974225	41.28	50.00	-8.72	0.36	9.86	0.19	0.81
15	19.072385	41.52	50.00	-8.48	0.36	9.86	0.19	0.81
16	19.174635	41.39	50.00	-8.61	0.36	9.86	0.19	0.81
17	19.27484	41.35	50.00	-8.65	0.36	9.86	0.19	0.81

PMM NARDA REPORT: 7505 Cambium 450I 900MHz 240V L2

Report issuing date : 10-7-2015

Standard : FCC Part 15.207
Test Type : Voltage Mains
Test Site : DLS O.F. Screen Room
Temperature : 70 °F
Humidity : 55 %
Test Specs : Line:2 QP
Operator : Paul L
DLS Project # : 7505
Result : Pass

EUT

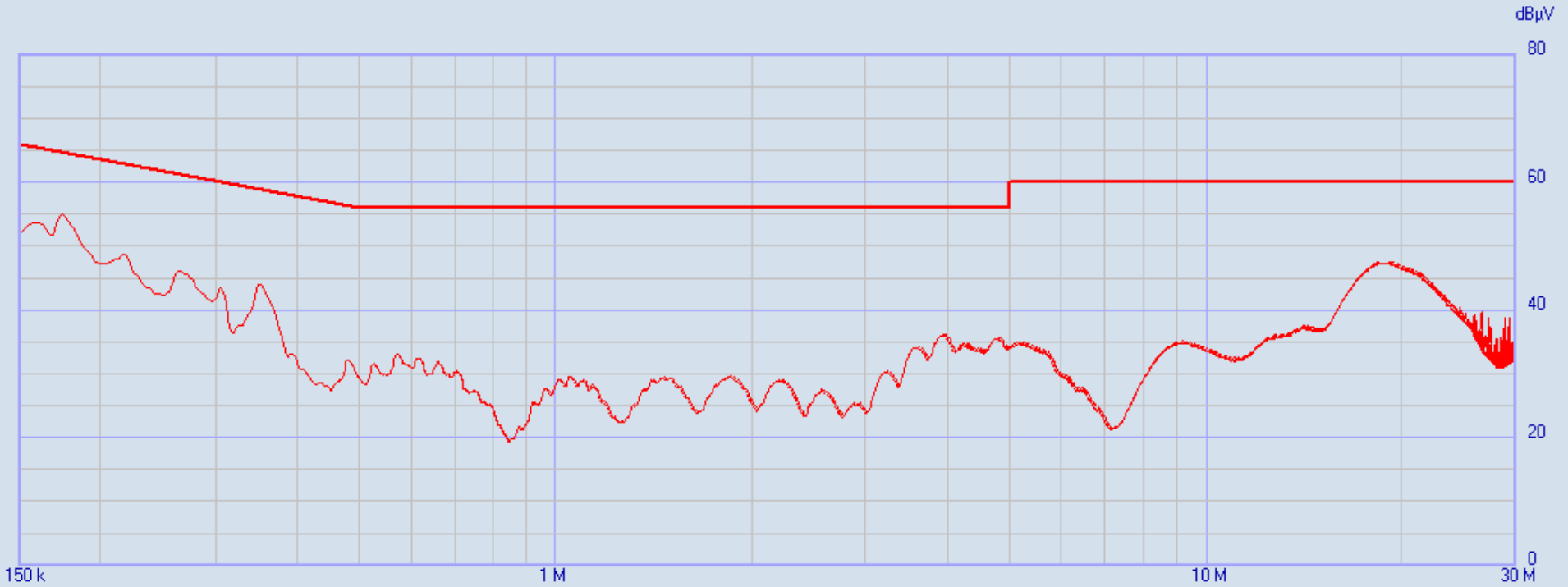
Manufacturer : Cambium Networks
Model : 450I 900MHz AP
Product : Radio
Notes : 240 V 60 Hz

Testing Company : DLS Electronic Systems, Inc.
Telephone : 262-279-0210
Web site : http://www.dlsemc.com

Receiver Details

Model : PMM 9010F
Brand : Narda
S/N : 020WW40102
Last Calibration : 06/25/2015

NOTE: The column in the table that is labeled "delta" shows the margin in dB with respect to the limit. A negative number indicates the level of the emission is under the limit by the given value, while a positive number indicates the emission level is above the limit by the given value.



7505 Cambium 450I 900MHz 240V L2

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C	1000 ms	9 kHz	10	OFF	ON	...	...

Ancillary = General

Limits:
FCC Class B V QP

Factors:
LISN DLS#128
DLS #507
DLS#592
Cables 43 & 45

QPeak

7505 Cambium 450I 900MHz 240V L2 07/10/2015 14:56:10
Rel. SW 2.19 (July 2014)
Rel. FW 1.45 27/03/15
Margin: 12 dB

	Frequency [MHz]	QPeak [dBµV]	Limit FCC Class.. [dBµV]	Delta [dB]	Factor LISN DLS#.. [dB]	Factor DLS #507 [dB]	Factor DLS#592 [dB]	Factor Cables 43.. [dB]
1	0.15818	53.74	65.56	-11.82	1.56	9.67	2.02	0.05
2	0.160225	53.74	65.45	-11.71	1.54	9.68	1.99	0.05
3	0.16227	53.37	65.35	-11.98	1.51	9.69	1.97	0.06
4	0.17045	53.47	64.94	-11.47	1.40	9.71	1.88	0.08
5	0.172495	54.68	64.84	-10.16	1.38	9.71	1.86	0.08
6	0.17454	55.01	64.74	-9.73	1.36	9.71	1.85	0.08
7	0.176585	54.54	64.64	-10.10	1.34	9.70	1.83	0.09
8	0.17863	53.88	64.55	-10.67	1.32	9.70	1.81	0.09
9	0.180675	53.26	64.45	-11.19	1.30	9.70	1.79	0.09
10	0.18272	52.68	64.36	-11.68	1.28	9.70	1.78	0.09

END OF REPORT

Revision #	Date	Comments	By
1.0	10-13-2015	Preliminary Release	JS
1.1	10-13-2015	Minor edits to spacing on cover pages (& MHZ to MHz)	JS
1.2	10-19-2015	Setup photos extracted	JS