



Measurement of RF Emissions from an Model C036045C008A Canopy Radio Transmitter

For

Cambium Networks, Inc. 3800 Golf Road Rolling Meadows, IL 60714

P.O. Number 4500371074
Date Tested July 11, 2018 through August 2, 2018 and September 28, 2018
Test Personnel Richard King
Test Specification FCC "Code of Federal Regulations" Title 47 Part 96 Subpart E, Section 96.41

KDB 940660 January 29, 2018

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REVISION HISTORY

Revision	Date	Description
_	05 SEP 2018	Initial release
А	11 OCT 2018 By Rick King	 Added Rev A to the report number on the cover and throughout the report. Added Reception Limits test throughout the test report.
В	8 APR 2019 By Rick King	 Added the applicable antenna information to section 1.1 which was originally listed in section 3.1.2 Added a table of the PSD results at the end of the PSD plots. Corrected the EIRP output power table on page 27 to read dBm/10MHz. Added the FCC ID number Z8H89FT0009 to section 1.1.
с	17 JUN 2019 By Rick King	 Added Rev C to the report number on the cover and throughout the report. Included a reference to the Total Power table on page 7. Added a Total Power Ports A +B table on page 28.
D	28 JUN 2019 By Rick King	 Added Rev D to the report number on the cover and throughout the report. Updated the average power measurements throughout report. Updated the power spectral density measurements throughout report. Updated the peak to average ratio measurements throughout report. Updated section 3.2 power settings. Corrected a Total Power Ports A +B table on page 28.

Measurement of RF Emissions from a Canopy Radio Transmitter, Model No. C036045C008A

1. INTRODUCTION

1.1. Scope of Tests

This document represents the results of a series of radio interference measurements performed on a Cambium Networks, Inc. Canopy Radio Transmitter, Model No. C036045C008A, (hereinafter referred to as the Equipment Under Test (EUT)). The EUT was manufactured and submitted for testing by Cambium Networks, Inc. located in Rolling Meadows, IL.

Applicable antennas:

PMP 450 3 GHz Access Point Antenna / Winncom model C030045D901A, serial number 3011130004 3.3-3.8GHz 65 Deg. 17dBi gain antenna.

FCC ID: Z8H89FT0009

1.2. Purpose

The test series was performed to determine if the EUT would meet selected requirements of FCC Part 96, Subpart E, Section 96.41, for Citizens Broadband Radio Service. Testing was performed in accordance with KDB 940660 D01 Part 96 CBRS Eqpt v01 and IEEE C63.26-2015.

1.3. Deviations, Additions and Exclusions

There were no deviations, additions to, or exclusions from the test specification during this test series.

1.4. EMC Laboratory Identification

This series of tests was performed by Elite Electronic Engineering Incorporated of Downers Grove, Illinois. The laboratory is accredited by the American Association for Laboratory Accreditation (A2LA), A2LA Lab Code: 1786-01.

1.5. Laboratory Conditions

The temperature at the time of the test was 23°C and the relative humidity was 48%.

2. APPLICABLE DOCUMENTS

The following documents of the exact issue designated form part of this document to the extent specified herein:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 96, Subpart E, Section 96.41
- Federal Communications Commission "Code of Federal Regulations", Title 47, Part 2
- IEEE C63.26-2015 "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services Accredited by the American National Standards Institute"
- FCC KDB 940660, "Certification and Test Procedures For Citizens Broadband Radio Service Devices Authorized Under PART 96", Released January 29, 2018



3. EUT SETUP AND OPERATION

3.1. General Description

The EUT is a Cambium Networks, Inc., Canopy Radio Transmitter, Model No. C036045C008A. A block diagram of the EUT setup is shown as Figure 1. A photograph of the EUT is shown as Figure 2.

3.1.1.Power Input

The EUT was powered by 30V from a Gigabit Compatible, Model No. PSA15M300 POE power supply.

3.1.2. Peripheral Equipment

The EUT was submitted with a PMP 450 3 GHz Access Point Antenna / Winncom model C030045D901A, serial number 3011130004 3.3-3.8GHz 65 Deg. 17dBi gain antenna. This antenna was used to establish the EIRP output power level.

3.1.3.Signal Input/Output Leads No interconnect cables were submitted with the EUT.

3.1.4.Grounding

The EUT was not grounded.

3.1.5.Frequency of EUT

Per FCC CFR 47 Subpart J §2.1057 - Frequency spectrum to be investigated:

(a) In all of the measurements set forth in §§2.1051 and 2.1053, the spectrum shall be investigated from the lowest radio frequency signal generated in the equipment, without going below 9 kHz, up to at least the frequency shown below:

(1) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

For this test series the frequency spectrum from 30MHz to 40GHz was investigated.

3.2. Operational Mode

All emissions tests were performed separately in the following modes:

Tx @ 3555MHz, 16dBm, 10MHz Tx @ 3600MHz, 16dBm, 10MHz Tx @ 3695MHz, 16dBm, 10MHz

3.3. EUT Modifications

No modifications were required for compliance.

4. TEST FACILITY AND TEST INSTRUMENTATION

4.1. Shielded Enclosure

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. With the exception of the floor, the reflective surfaces of the shielded chamber are lined with ferrite tiles on the walls and ceiling. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with ANSI C63.4-2014 and CISPR 16 for site attenuation.

4.2. Test Instrumentation

The test instrumentation and auxiliary equipment used during the tests are listed in Table 9-1.



4.3. Calibration Traceability

Test equipment is maintained and calibrated on a regular basis with a calibration interval not greater than two years. All calibrations are traceable to the National Institute of Standards and Technology (NIST).

4.4. Measurement Uncertainty

All measurements are an estimate of their true value. The measurement uncertainty characterizes, with a specified confidence level, the spread of values which may be possible for a given measurement system.

Values of Expanded Measurement Uncertainty (95% Confidence) are presented below:

Measurement Type	Expanded Measurement Uncertainty
Conducted disturbance (mains port) (150 kHz – 30 MHz)	2.7
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	4.3
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	3.1
Radiated disturbance (electric field strength on an open area test site or alternative test site) (6 GHz – 18 GHz)	3.2

5. TEST PROCEDURES

5.1. FCC RF Power Output Measurements

5.1.1.Requirements

5.1.1.1 FCC 96.41

Per 96.41(b), Power limits. Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD ¹	47	37

¹ Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

5.1.2.Procedures

5.1.2.1 EIRP/Average Conducted Output Power

5.2.4.3.2 Alternative procedure for measuring average power of a narrowband signal with a constant duty cycle using a spectrum/signal analyzer or EMI receiver

In accordance with paragraph 5.2.4.3.2 of C63.26: 2015 Alternative procedure for measuring average power of a narrowband signal with a constant duty cycle using a spectrum/signal analyzer or EMI receiver.



When the fundamental condition for average power measurements cannot be realized (i.e., the EUT cannot be configured to transmit at full-power on a continuous basis (i.e., duty cycle < 98%) and the instrumentation cannot be configured to measure only during active full-power transmissions), then the following procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less than or equal to $\pm 2\%$):

- a) Set span to $2 \times to 3 \times the OBW$.
- b) Set RBW ≥ OBW.
- c) Set VBW ≥ 3 × RBW.
- d) Set number of measurement points in sweep $\ge 2 \times \text{span} / \text{RBW}$.
- e) Sweep time:
 - 1) Set = auto-couple, or
 - Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automationcompatible) measurement. The transmission period is the (on + off) time.
- f) Detector = power averaging (rms).
- g) Set sweep trigger to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
- i) Use the peak marker function to determine the maximum amplitude level.
- j) Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.
- 5.1.3.Results

The conducted output power data are shown on pages 21 through 26. All output power readings from the EUT were below the limits of FCC 96.41. The EIRP output power is shown on pages 27 and 28. As can be seen from the data all emissions measured were within the specification limits.

- 5.2. Emissions Outside the Fundamental
 - 5.2.1.Requirements
 - 5.2.1.1 FCC 96.41

Emission and interference limits—Confirm that the device satisfies the emission limits specified in Section 96.41(e) for all declared channel sizes, at the lowest and highest edges of the band, and in the middle of the band.

3.5 GHz Emissions and Interference Limits—(1) General protection levels. Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed –13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any emission shall not exceed –25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels.

Emissions outside the fundamental—The limits for emission outside the fundamental are as follows.

- Within 0 MHz to 10 MHz above and below the assigned channel \leq -13 dBm/MHz.
- Greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz.
- Any emission below 3530 MHz and above 3720 MHz \leq -40 dBm/MHz.



5.2.2.Procedures

When the fundamental condition for average power measurements cannot be realized (i.e., the EUT cannot be configured to transmit at full-power on a continuous basis (i.e., duty cycle < 98%) and the instrumentation cannot be configured to measure only during active full-power transmissions), then the following procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less than or equal to $\pm 2\%$):

- a) Set span to 2 × to 3 × the OBW.
- b) Set RBW ≥ OBW.
- c) Set VBW \geq 3 × RBW.
- d) Set number of measurement points in sweep $\ge 2 \times \text{span} / \text{RBW}$.
- e) Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. The transmission period is the (on + off) time.
- f) Detector = power averaging (rms).
- g) Set sweep trigger to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to autocouple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
- i) Use the peak marker function to determine the maximum amplitude level.
- 5.2.3.Results

The plots for emissions outside the fundamental are presented on pages 29 through 39. All emissions measured from the EUT were within the specification limits.

5.3. Spurious Radiated Emissions

5.3.1.Requirements

5.3.1.1 FCC 96.41

Emission and interference limits—Confirm that the device satisfies the emission limits specified in Section 96.41(e) for all declared channel sizes, at the lowest and highest edges of the band, and in the middle of the band.

Emissions outside the fundamental—The limits for emission outside the fundamental are as follows.

- Any emission below 3530 MHz and above 3720 MHz \leq -40 dBm/MHz.
- 5.3.2. Antenna Conducted Spurious Emissions Procedures

The antenna port of the EUT was connected to the spectrum analyzer through 30dB of attenuation. The emissions in the frequency range from 30MHz to 40GHz were observed and plotted separately with the EUT transmitting at low, middle and high hopping frequencies.

- a) Set RBW 1MHz.
- b) Set VBW \geq 3 × RBW.

c) Sweep time:

- 1) Set = auto-couple
- d) Detector = power averaging (rms).
- e) Use the peak marker function to determine the maximum amplitude level.

5.3.3.Spurious Radiated Emissions - Procedures

All tests were performed in a 32ft. x 20ft. x 18ft. hybrid ferrite-tile/anechoic absorber lined test chamber. The walls and ceiling of the shielded chamber are lined with ferrite tiles. Anechoic absorber material is installed over the ferrite tile. The floor of the chamber is used as the ground plane. The chamber complies with CISPR



16 for site attenuation.

The shielded enclosure prevents emissions from other sources, such as radio and TV stations from interfering with the measurements. All powerlines and signal lines entering the enclosure pass through filters on the enclosure wall. The powerline filters prevent extraneous signals from entering the enclosure on these leads.

- 1. Preliminary radiated measurements were performed to determine the frequencies where the significant emissions might be found. The EUT was placed on a 1.5 meter high, non-conductive stand and set to transmit. With the EUT at one set position and the measurement antenna at a set height (i.e. without maximizing), the radiated emissions were measured using a peak detector and automatically plotted. The broadband measuring antenna was positioned at a 3 meter distance from the EUT. This data was then automatically plotted up through the tenth harmonic of the transmit frequency of the EUT. All preliminary tests were performed separately with the EUT operating in the modes listed in paragraph 3.2.
- 2. All significant broadband and narrowband signals found in the preliminary sweeps were then maximized. For all measurements below 1GHz, a bilog antenna was used as the measurement antenna. For all tests an RMS average detector was used. For all measurements above 1GHz, a horn antenna was used as the measurement antenna. An average detector was used for all tests above 1GHz.
- 3. To ensure that maximum emission levels were measured, the following steps were taken:
 - a. The EUT was rotated so that all of its sides were exposed to the receiving antenna.
 - b. Since the measuring antennas are linearly polarized, both horizontal and vertical field components were measured.
 - c. The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.

The equivalent power was determined from the field intensity levels measured at 3 meters using the substitution method. To determine the emission power, another antenna was set in place of the EUT and connected to a calibrated signal generator. (A tuned dipole was used for all measurements below 1GHz and a double ridged waveguide antenna was used for all measurements above 1GHz.) The output of the signal generator was adjusted to match the received level at the spectrum analyzer. The signal level was recorded. The reading was corrected to compensate for cable loss, as required, and for frequencies above 1GHz, increased by the gain of the waveguide.

5.3.4.Results

The plots of the RMS average antenna conducted emissions are presented on pages 40 through 51. All antenna conducted spurious emissions measured from the EUT were within the specification limits.

The plots of the peak preliminary spurious radiated emissions and the final tabular average spurious radiated emissions results are presented on pages 52 through 87. All spurious radiated emissions measured from the EUT were within the specification limits.

Photographs of the test configuration which yielded the highest or worst case, radiated emissions levels are shown as Figure 3 and Figure 4.

5.4. Power Spectral Density

5.4.1.Requirements

Per 96.41(b), Power limits. Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table in this paragraph (b):



Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a
Category A CBSD	30	20
Category B CBSD ¹	47	37

¹Category B CBSDs will only be authorized for use after an ESC is approved and commercially deployed consistent with §§96.15 and 96.67.

5.4.2.Procedures

In accordance with paragraph 5.2.4.3.2 of C63.26: 2015 Alternative procedure for measuring average power of a narrowband signal with a constant duty cycle using a spectrum/signal analyzer or EMI receiver.

When the fundamental condition for average power measurements cannot be realized (i.e., the EUT cannot be configured to transmit at full-power on a continuous basis (i.e., duty cycle < 98%) and the instrumentation cannot be configured to measure only during active full-power transmissions), then the following procedure can be used if the EUT duty cycle is constant (i.e., duty cycle variations are less than or equal to $\pm 2\%$):

- a) Set span to $2 \times to 3 \times the OBW$.
- b) Set RBW 1MHz.
- c) Set VBW \geq 3 × RBW.
- d) Set number of measurement points in sweep $\ge 2 \times \text{span} / \text{RBW}$.
- e) Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automationcompatible) measurement. The transmission period is the (on + off) time.
- f) Detector = power averaging (rms).
- g) Set sweep trigger to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. (To accurately determine the average power over the on and off period of the transmitter, it can be necessary to increase the number of traces to be averaged above 100 or, if using a manually configured sweep time, increase the sweep time.)
- i) Use the peak marker function to determine the maximum amplitude level.
- j) Add [10 log (1/duty cycle)] to the measured maximum power level to compute the average power during continuous transmission. For example, add [10 log (1/0.25)] = 6 dB if the duty cycle is a constant 25%.

5.4.3.Results

The power spectral density plots and table with the EUT transmitting are shown on pages 88 through 94. As can be seen from the data, the power spectral density levels from the EUT are within the limits.

5.5. Peak-to-Average Power Ratio (PAPR)

5.5.1.Requirements

Power measurement: The peak-to-average power ratio (PAPR) of any CBSD transmitter output power must not exceed 13 dB. PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

5.5.2.Procedures

In accordance with paragraph 5.2.4.3.2 of C63.26: 2015 Alternative procedure for measuring average power of a narrowband signal with a constant duty cycle using a spectrum/signal analyzer or EMI receiver. The average



power was measured and recorded.

See 5.1.2.1 for the measurement procedure.

In accordance with paragraph 5.2.3.3 of C63.26: 2015 Measurement of peak power in a narrowband signal with a spectrum/signal analyzer or EMI receiver

This procedure can be used to measure the peak power in either a CW-like or noise-like narrowband RF signal. The measurement instrument must have a RBW that is greater than or equal to the OBW of the signal to be measured and a VBW \ge 3 × RBW.

- a) Set the RBW ≥ OBW.
- b) Set VBW \ge 3 × RBW.
- c) Set span $\ge 2 \times OBW$.
- d) Sweep time $\ge 10 \times$ (number of points in sweep) × (transmission symbol period).
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the peak amplitude level..

5.5.3.Results

The results are presented on data page 95. As can be seen from the data the peak to average ratio is less than the 13 dB limit.

5.6. Reception Limits

5.6.1.Requirements

Reception limits. Priority Access Licensees must accept adjacent channel and in-band blocking interference (emissions from other authorized Priority Access or GAA CBSDs transmitting between 3550 and 3700 MHz) up to a power spectral density level not to exceed -40 dBm in any direction with greater than 99% probability when integrated over a 10 megahertz reference bandwidth unless the affected Priority Access Licensees agree to an alternative limit and communicates that to the SAS.

5.6.2. Procedures

- a) Interfering signal was set to 3565MHz.
- b) The interfering signal was adjusted to the -40 dBm power spectral density level at the input of the EUT port tested.
- c) The link signal was verified between link signal source and the EUT.
- d) Recorded the downlink and up link efficiency with the interfering signal removed.
- e) Applied the interfering signal to the EUT
- f) Recorded the downlink and uplink efficiency
- g) Steps (a) through (f) were repeated with the interfering signal set to adjacent channel 3575MHz
- h) Steps (a) through (f) were repeated with the interfering signal set to adjacent channel 3585MHz.

5.6.3.Results

Plots of the applied interfering signal are shown on data pages 96 through 98. The results are presented on data page 99. As can be seen from the data the downlink and uplink efficiency remained at acceptable percentages when the -40dBm power spectral density level was applied.



6. OTHER TEST CONDITIONS

6.1. Test Personnel and Witnesses

All tests were performed by qualified personnel from Elite Electronic Engineering Incorporated.

6.2. Disposition of the EUT

The EUT and all associated equipment were returned to Cambium Networks, Inc. upon completion of the tests.

7. CONCLUSIONS

The Cambium Networks, Inc. Canopy Radio Transmitter, Model No. C036045C008A did fully meet the output EIRP power, power spectral density, peak-to-average power ratio, spurious emissions and emissions outside the fundamental requirements of the FCC "Code of Federal Regulations" Title 47, Part 96, Subpart E and FCC KDB 940660 when tested per IEEE C63.26-2015.

8. CERTIFICATION

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the test specifications.

The data presented in this test report pertains to the EUT at the test date. Any electrical or mechanical modification made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST or any agency of the Federal Government.



9. EQUIPMENT LIST

Table 9-1 Equipment List

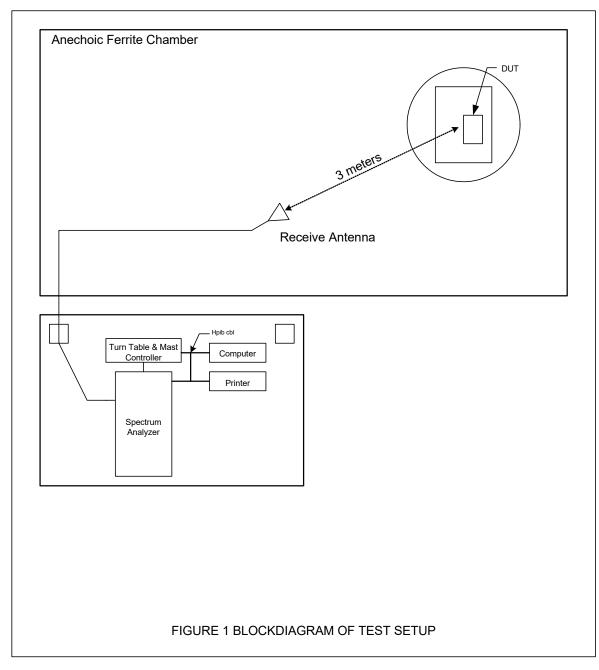
Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW0	PREAMPLIFIER	PLANAR ELECTRONICS	PE2-30-20G20R6G	PL2926/0646	20GHZ-26.5GHZ	4/5/2018	4/5/2019
APW10	PREAMPLIFIER	PMI	PE2-35-120-5R0-10- 12-SFF	PL9609/1139	1GHZ-20GHZ	4/5/2018	4/5/2019
APW5	PREAMPLIFIER	PLANAR	PE2-36-26D540G- 5R0-1	PL3044/0651	26.5GHZ-40GHZ	2/28/2018	2/28/2020
CDX5	COMPUTER	ELITE	WORKSTATION			N/A	
GSE0	SIGNAL GENERATOR (40GHZ)	ROHDE & SCHWARZ	SMB100A	175137	100KHZ-40GHZ	8/17/2017	8/17/2018
NHG0	STANDARD GAIN HORN ANTENNA	NARDA	638		18-26.5GHZ	NOTE 1	
NHG1	STANDARD GAIN HORN ANTENNA	NARDA	638		18-26.5GHZ	NOTE 1	
NHH0	STANDARD GAIN HORN ANTENNA	NARDA	V637		26.5-40GHZ	NOTE 1	
NHH1	STANDARD GAIN HORN ANTENNA	NARDA	V637		26.5-40GHZ	NOTE 1	
NTA3	BILOG ANTENNA	TESEQ	6112D	32853	25-1000MHz	9/11/2017	9/11/2018
NWQ0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3117	66657	1GHZ-18GHZ	5/31/2018	5/31/2020
NWQ1	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS-LINDGREN	3117	66655	1GHZ-18GHZ	4/10/2018	4/10/2020
RBG0	EMI ANALYZER	ROHDE & SCHWARZ	ESW44	101533	10HZ-44GHZ	12/7/2017	12/7/2018
T1EE	10DB 25W ATTENUATOR	WEINSCHEL	46-10-34	BN2321	DC-18GHZ	7/9/2018	7/9/2020
T1P0	10dB ATTENUATOR (40GHz)	WEINSCHEL	89-10-12	254	DC-40GHz	3/2/2018	3/2/2020
T2DS	20DB, 25W ATTENUATOR	WEINSCHEL	46-20-34	BS0916	DC-18GHZ	4/24/2018	4/24/2020
T2Q2	20DB/20W ATTENUATOR	AEROFLEX/WEINSCHEL	89-20-21	336	DC-40GHZ	8/15/2017	8/15/2019
XOA1	WAVE-TO-COAX ADAPTER	HEWLETT PACKARD	R281A	02119	26.5-65GHZ	NOTE 1	
XOA2	WAVE-TO-COAX ADAPTER	HEWLETT PACKARD	R281B	01138	26.5-65GHZ	NOTE 1	
XOB1	ADAPTER	HEWLETT PACKARD	K281C	10422	18-26.5GHZ	NOTE 1	
XOB2	ADAPTER	HEWLETT PACKARD	K281C,012	09407	18-26.5GHZ	NOTE 1	

I/O: Initial Only

N/A: Not Applicable

Note 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.







MultiView	Receiver	x Spe	ectrum 🛛 🔆	x				▼
Ref Level 20.0 Att Input TRG:VID	00 dBm Offse 20 dB = SWT 1 AC PS	22.5 ms VE	BW (CISPR) 120 BW 1 otch	0 kHz MHz Off			Frequ	ency 3.5998420 GHz
1 Zero Span								2Rm Clrw
10 dBm	TRG 9.000 dBm							D4[2] 1.09 dB 9.9900 ms M1[2] 0.32 dBm
1		03		D4				0.0000000 s
State And All		Municipal	1914	Martin	UNIFU JANY	m	Menal al Just	and the of the office
-10 dBm								
-20 dBm								
-30 dBm								
-10 dBm	•							
-50 dBm								
-60 dBm	terpopolitikajaja	1 ¹	William	ww/	4Apres	NAMANA	1944W	พัฒนานี้ 1
-70 dBm								
CF 3.599842 G	Hz			1001	ots			2.25 ms/
2 Marker Table				1001	- pro			2120 1137
Type Ref	Trc	X-Value		Y-Value	Fund	tion	Functi	on Result
M1 D2 M1 D3 M1 D4 M1	2 2 2	0.0 s 2.4075 ms 4.995 ms 9.99 ms		0.32 dBm 41.30 dB 1.56 dB 1.09 dB				
		Spectrum: Wa	aiting for Trigger		Measurir	g (111111)	11.07.2018 20:04:15	Ref Level RBW

Date: 11.JUL.2018 20:04:15

Checked BY RICHARD E. King



MANUFACTURER
MODEL NO.
SERIAL NO.
SPECIFICATION
DATE
MODE
NOTES

- : Cambium Networks, Inc.
- : C036045C008A
- : 0A003E431A31
- : FCC 96.41(e) Conducted Output Power
- : June 28, 2019
- : Transmit at 3555MHz Channel A

: AVG Conducted Output Power = 22.33dBm + 3dB = 25.33dBm

MultiView	Receiver	X) Sp	ectrum	x										♥
Ref Level 41. Att Input	00 dBm Offs 10 dB SWT 1 AC PS	1.08 m	B • RE is • VE in No	3W	120 kHz 1 MHz 0ff	Mode A	ito Sweep	Cou	nt 200/200		Fr	equency	3.55	50000	GHz
1 ACLR														●1Rm	Max
30 d8m															
30 dBm-															
20 dBm						יד	1						_		
10 d8m															
				m	_										
0 dBm			ſ	~~~~			~~~~	_	J	1			-		_
-10 dBm			1												
-20 dBm															
-30 dBm			<u> </u>		_								_		
-40 dBm															
winnen	hanna	men									mon	you	un	um	mm
-50 dBm															
CF 3.555 GHz				100)1 pts			2.	04 MHz/				S	pan 20.4	1 MHz
2 Result Summ	arv					No	ne								
Channe		Band	width		0	ffset			Power						
Tx1 (Re Tx Tota	Ð	10.000						-4	7.67 dBm/l 22.33 dB	1z m					
	n N						Me	_	g		28.06.2		Level		₿₩

Date: 28.JUN.2019 19:23:15

Checked BY RICHARD & King



MANUFACTURER	: Cambium Networks, I
MODEL NO.	: C036045C008A
SERIAL NO.	: 0A003E431A31
SPECIFICATION	: FCC 96.41(e) Conduc
DATE	: June 28, 2019
MODE	: Transmit at 3555MHz
NOTES	: AVG Conducted Outp

Inc.

icted Output Power

- z Channel B
- put Power = 21.33dBm + 3dB = 24.33dBm

MultiView 😁 S	pectrum												♥
Input 1 /	m Offset 18 SWT 10 PS	1.08 n		SW .		Mode Au	to Sweep	Cou	nt 200/200		Fr	equency 3	3.5550000 GH
ACLR													1Rm Max
0 dBm-													
0 dBm					-	CT .	1						
0 dBm					_					<u> </u>			
dBm			~	men	mon	1 m	m		mo	m			
			(
10 dBm													
10 dBm			1										
			1										
20 dBm-			1							t t			
30 dBm			1										
40 dBm					_					<u> </u>			
monum	more	للمسميد									munul	muran	manner
50 d8m												-	
CF 3.555 GHz				1001	pts			2.	04 MHz/				Span 20.4 MH
Result Summary Channel		Dand	width		05	Nor	he		Power				
Tx1 (Ref)		10.000			01	act		-4	8.67 dBm/	Hz			
Tx Total		10.000	, in						8.67 dBm/ 21.33 dB	m			
1							Ma	a cuelo	g (-	28.06.2		evel RBW

Date: 28.JUN.2019 19:41:08

Checked BY RICHARD E. King :



: Cambium Networks, Inc.

- : C036045C008A
- : 0A003E431A31
- : FCC 96.41(e) Conducted Output Power
- : June 28, 2019
- : Transmit at 3600MHz Channel A

: AVG Conducted Output Power = 22.8dBm + 3dB = 25.8dBm

MultiView 🕀	Receiver	x) Spe	ectrum	×										v
	0 dBm Offse 10 dB SWT 1 AC PS	1.08 m	S RB S VB No		20 kHz 1 MHz Off	Mode A	ito Sweep	Cou	nt 200/200		Fr	equency	3.60	00000) GHz
1 ACLR														•1Rm	Мах
30 dBm															
20 dBm					+	T	1						_		
10 dBm					-										
0 dBm			کی کی	Marin	~~v	hand	~~~~	~	m	1					
-10 dBm					-										
-20 dBm			$\left \right $		-								_		
-30 dBm					-								_		
-40 dBm					+							mm			
-50 dBm	~~~~~						1					- marine		and the provide of	w~~~~
CF 3.6 GHz				1001 p	ts			2.	04 MHz/				s	pan 20.4	4 MHz
2 Result Summar Channel Tx1 (Ref) Tx Total	Ŷ	Bandy 10.000			0	No ffset	ne	-4	Power 7.20 dBm/H 22.80 dB	1z m					
							Me	asurin	g (28.06.2		f Level] ["	₿₩

Date: 28.JUN.2019 19:25:52

Checked BY RICHARD & King :



: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) Conducted Output Power : June 28, 2019 : Transmit at 3600MHz Channel B : AVG Conducted Output Power = 21.85dBm + 3dB = 24.85dBm

MultiView E Spectrum		W (CISDO) 100 kHz					▽
Att 10 dB SWI Input 1 AC PS	1.08 ms = VB On Not	V 1 MHz	Mode Auto Sweep	Count 200/200		Frequency 3	3.6000000 GH
I ACLR	011 100						1Rm Max
MBm-							
20 dBm			TNI				
			11				
10 dBm							
to dem							
		manue	mohem	mon	nun l		
0 dBm							
-10 dBm							
20 dBm						_	
30 dBm							
40 dBm							
were all and the second and the second secon	much				ne	hallones	mound
							-W-W-BARRAN AND AND A
-50 dBm							
CF 3.6 GHz		1001 pts		2.04 MHz/			Span 20.4 MHz
Result Summary			None				
Channel	Bandwidth	0	ffset	Power			
Tx1 (Ref) Tx Total	10.000 MHz			-48.15 dBm/ 21.85 dB	HZ		
1 10:01					20	06.2019 Ref	Level RBW
			Me	rasuring			KBW

Date: 28.JUN.2019 19:37:40

Checked BY RICHARD E. King



MANUFACTURER	: Cambium Networks, Inc.
MODEL NO.	: C036045C008A
SERIAL NO.	: 0A003E431A31
SPECIFICATION	: FCC 96.41(e) Conducted Output Power
DATE	: June 28, 2019
MODE	: Transmit at 3695MHz Channel A
MODE	: Transmit at 3695MHz Channel A
NOTES	: AVG Conducted Output Power = 22.01dBm + 3dB = 25.01dBm

MultiView 🗄 R	eceiver	x) Sp	ectrum	x								V
Ref Level 41.00 dE Att 10 Input 1/		1.08 m	B • RE Is • VE		120 kHz 1 MHz Off	Mode Aut	to Sweep	Coun	t 200/200		Fr	equency 3	3.6950000 GH
1 ACLR													1Rm Max
30 dBm													
mab 05						T3	1						
10 dBm					_								
				mm	and	mat	more	m	m	h l			
) dBm			ſ					- 1		1			
			2							Lug .			
-10 dBm													
-20 dBm			1										
										1			
30 dBm			<u> </u>		_								
40.45													
-40 dBm).	
manunt	man	when									your	muns	monor
50 dBm													
CF 3.695 GHz				1001	l pts			2.0)4 MHz/				Span 20.4 MH
Result Summary						Nor	he		-				
Channel		Bandy			0	ffset		41	Power				
Tx1 (Ref) Tx Total		10.000	MHz					-4	7.99 dBm/l 22.01 dB	1Z			
1x lotal									22.01 05				
							Me	asuring		444	28.06.2		evel RBW

Date: 28.JUN.2019 19:27:04

Checked BY RICHARD E. King :



MANUFACTURER MODEL NO. SERIAL NO. SPECIFICATION DATE MODE	: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) Conducted Output Power : June 28, 2019 : Transmit at 3695MHz Channel B
NOTES	: AVG Conducted Output Power = 21.64dBm + 3dB = 24.64dBm

MultiView	Spect	rum														V
Ref Level 41.0 Att Input		SWT 1	.08 ms	B • RB • VB	w	120 kHz 1 MHz Off	Mode A	ito Sweep	Cour	at 200/200		Fr	equency	3.69		
ACLR															∙1Rm	мах
30 dBm									-							
0 dBm							T	81	_							
								1								
10 dBm																
) dBm				~	man	-	m	many	m		my					
10 dBm																
10 0011																
20 dBm																
30 dBm						_			_					_		
40 dBm																
mound	mann	mon	men									Marry	er franktissen	m	www	س
50 dBm												<u> </u>				
CF 3.695 GHz					100)1 pts			2.0	04 MHz/				Sp	an 20.4	MH
Result Summa							No	ne								
	Channel Bandwid Tx1 (Ref) 10.000 M Tx Total 10.000 M					0	ffset		-4	Power 8.36 dBm/H 21.64 dB	1z m					
								Me	asurin	g (1 111111)	40	28.06.2		fLevel	RE	W

Date: 28.JUN.2019 19:34:25

Checked BY RICHARD E. King :



: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) EIRP : August 2, 2018 :

Frequency MHz	Antenna Port	RMS Average Meter Reading (dBm)	Duty Cycle Correction dB	Antenna Gain (dBi)	EIRP Total (dBm/10MHz)	EIRP Limit (dBm/10MHz)	Margin (dB)
3555	А	22.33	3	17	42.33	47	-4.67
3555	В	21.33	3	17	41.33	47	-5.67
3600	А	22.90	3	17	45.24	47	-4.10
3600	В	21.85	3	17	41.85	47	-5.15
3695	А	22.05	3	17	44.43	47	-4.95
3695	В	21.85	3	17	44.31	47	-5.15

EIRP (dBm) = RMS AVG Meter Reading + Duty Cycle Correction + Antenna Gain

Checked BY RICHARD E. King :



: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) Total Power : August 2, 2018 :

Frequency MHz	Me Rea Ante Po A a	Average eter dings enna orts nd B 3m) B	RMS Total Average Meter Readings Ports A + B (dBm)	Duty Cycle Correction dB	Antenna Gain (dBi)	EIRP Total Ports A+B (dBm/10MHz)	EIRP Limit (dBm/10MHz)
3555	22.33	21.33	24.9	3	17	44.9	47
3600	22.90	21.85	25.4	3	17	45.4	47
3695	22.05	21.85	25.0	3	17	45.0	47

EIRP (dBm) = RMS AVG Meter Reading (Ports A+B) + Duty Cycle Correction + Antenna Gain

Checked BY RICHARD E. King :



MANUFACTURER : Cambium Networks, Inc. : C036045C008A MODEL NO. SERIAL NO. : 0A003E431A31 **SPECIFICATION** : FCC 96.41(e) Emissions outside the fundamental : August 2, 2018 DATE MODE : Transmit at 3555MHz Channel A NOTES : V1- low edge of the assigned channel minus 5MHz = 3550MHz

- : V2- high edge of the assigned channel plus 5MHz = 3560MHz
- ∇ MultiView Spectrum x Receiver х Offset 29.10 dB • RBW SWT 1.08 ms VBW 100 kHz Ref Level 30.00 dBm 1 MHz Mode Auto Sweep Count 1000/1000 Frequency 3.5550000 GHz Att 10 dB OR Input 1 40 PS On Notch 1 Frequency Sweep 2Rm Max 30.78 dB 3.5610440 GHz -29.71 dBn M1[2] 20 dE 3.5490060 GHz 10 dB di -10 dB/ H1 -13.000 dBm -20 dBr 30 dBr and 40 dB 50 dB May 1.161 -60 dBm CF 3.555 GHz 1001 pts 5.0 MHz/ Span 50.0 MHz 1.07.2018 Ref Leve CONTRACTOR OF STREET, Measuring...

Date: 11.JUL.2018 23:26:39

RICHARD E. King : Checked BY

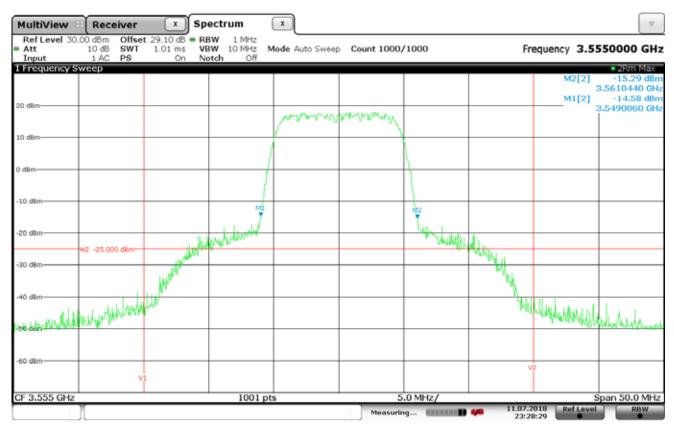
Richard E. King

23:26:38



MANUFACTURER : Cambium Networks, Inc. : C036045C008A MODEL NO. SERIAL NO. : 0A003E431A31 **SPECIFICATION** : FCC 96.41(e) Emissions outside the fundamental : August 2, 2018 DATE MODE : Transmit at 3555MHz Channel A NOTES : V1- low edge of the assigned channel minus 10MHz = 3540MHz

: V2- high edge of the assigned channel plus 10MHz = 3570MHz



Date: 11.JUL.2018 23:28:28

RICHARD E. King : Checked BY



: Cambium Networks, Inc.

: C036045C008A : 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

: August 2, 2018

: Transmit at 3555MHz Channel A

: V1

: V2

MultiView 🕀	Receiver	x) Spe	ectrum	x					♥
		29.10 dB • RB 1.01 ms VB On No		Mode Auto Sweep	Count 1000/	/1000	Fre	quency 3.6	250000 GHz
1 Frequency Sw								M2[2]	 2Rm Max -16.11 dBm 3.561040 GHz
20 dBm-	and the							M1[2]	-11.45 dBm 3.549010 GHz
10 dBm-									
0 dBm-									
-10 d8m	м								
-20 dBm	J.	^w u							
-30 dBm									
-40 dBm	2 -40.000 dBm	Ma							
+sp-dahlawW		U philip	Were and the of		رويعا والمرجا والمحافظ	·····		angles hours los	• • • • • • • • • • • • • • • • • • •
-60 dBm									V2
3.52 GHz			1001 p	ts	21	LO MHz/			3.73 GHz
					_	ig (1 11111)	11.07.20 23:29		

Date: 11.JUL.2018 23:29:52

Checked BY RICHARD & King :



: Cambium Networks, Inc.

- : C036045C008A
- : 0A003E431A31
- : FCC 96.41(e) Emissions outside the fundamental
- : August 2, 2018
- : Transmit at 3555MHz Channel B
- : V1 : V2

MultiView	Receiver	<u> </u>	ectrum	×					
Ref Level 30. Att Input		0.10 dB • RB .01 ms VB On No	W 10 MHz	Mode Auto Sweep	Count 1000,	/1000	Fr	equency 3	.6250000 GH
1 Frequency S		01 100	un on						2Rm Max
								M2[2	
		I						-	3.561040 GH
an in		I						M1[2	
20 dBm-									3.549010 GH
	NYYY	I							
		I							
10 dBm-									
		I							
		I							
0 dBm									
		I							
		I							
-10 dBm	14 N								
	Ma	I							
		I							
-20 dBm									
		I							
20.45	µ‴ ™.	I							
-30 dBm									
		1							
-40 dBm	H2 -40.000 dBm								
and the state		Mugali	and a state				L .		
SO SEW WHEN			A CONTRACTOR	min and the second first	Mail and the second	MUMPHUM	all with the	and a state of the	Will Man Mark Mark
-60 dBm									V2
vi									Ĩ
Ĩ									
3.52 GHz			1001	ots	2	1.0 MHz/			3.73 GH

Date: 11.JUL.2018 23:33:08

RICHARD E. King : Checked BY



: Cambium Networks, Inc.

: C036045C008A

: 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

: August 2, 2018

: Transmit at 3600MHz Channel A

: V1

: V2

MultiView	Receiver	x) Sp	ectrum (×					▽)
Ref Level 10.0 Att Input	20 dBm Offse 20 dB = SWT 1 AC PS	22.5 ms V	BW (CISPR) 12 BW :		uto Sweep Co	ount 1000/1000	Fn	equency 3.	5000000 GHz
1 Frequency Sv		011 11							1Rm Max
0 dBm				purchar	unante			M2[1] M1[1]	3.6060000 GHz
-10 dBm	H1 -13.000 dBm								
-20 dBm									
-30 dBm									
-40 dBm			William Ma			M2 Mandanialun			
-50 dBm		all and the second second					- Andrew		
en marine	فبطأمه ليهمهم ريادته	and for the					- well	الاستينان يعادينه	where the state of the
-60 dBm									
-70 dBm									
-80 dBm						v2			
			v	1					
CF 3.6 GHz			1001 pt:	ŝ		5.0 MHz/			Span 50.0 MHz
	[Measuri	ing (111111)	11.07.2 22:33		el RBW

Date: 11.JUL.2018 22:33:37

Checked BY RICHARD & King :



MANUFACTURER: CarMODEL NO.: COCSERIAL NO.: 0ACSPECIFICATION: FCCDATE: AugMODE: TraNOTES: V1

: Cambium Networks, Inc.

: C036045C008A

: 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

: August 2, 2018

: Transmit at 3600MHz Channel A

: V1 : V2

MultiView	Receiver	x) Sp	pectrum	x					▽
Ref Level 20. Att Input	00 dBm Offs 20 dB = SWT 1 AC PS	22.5 ms	RBW (CISPR) 1 VBW 10 Notch	MHz MHz Mode A	uto Sweep Cour	nt 1000/1000	Freq	uency 3.6	000000 GHz
1 Frequency S									IRm Max
	ii uup							M2[1] M1[1]	-30.54 dBm 3.6060000 GHz -29.92 dBm
10 dBm				1					3.5940000 GHz
0 dBm				1					
-10 dBm									
-20 dBm									
-30 dBm	H2 -25.000 dBm		Ma Ma			N12			
-40 dBm		a sheet for the	www			The way	and white		
-50 dBm	فاستحد والمعادية	and the					Willer	hal antion	
-60 dBm									
-70 dBm	v	1					V2		
05.0.4.011-			1001						
CF 3.6 GHz			1001 p	ts	;	5.0 MHz/	11.07.000		Span 50.0 MHz
	Л				Measuri	ing	11.07.201 22:46:5		RBW

Date: 11.JUL.2018 22:46:57

Checked BY RICHARD & King :



MANUFACTURER: CamMODEL NO.: C030SERIAL NO.: 0A00SPECIFICATION: FCCDATE: AuguMODE: TranNOTES: V1

: Cambium Networks, Inc.

: C036045C008A

: 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

: August 2, 2018

: Transmit at 3600MHz Channel A

: V1 : V2

Multi	iView	Receiv	ver	x	Spe	ctrum	(x											♥
Ref Att Inpu		0.00 dBm 20 dB = 1 AC		22.5 ms	 RB VB No 	w	10 1	VIHz VIHz Off	Mode A	uto Swe	ep Cour	t 26	4/1000		Fre	equency	3.62	5000	0 GHz
	uency S	Sweep	10	011	140	-cerr		011										● 1Rr	n Max
																	2[1] 1[1]	-31. 3.6060	39 dBm
10 dBm	-		-		-		NUT			+		\vdash						3.5940	
0 dBm—			_		_							-							
10 45-11																			
-10 dBm	1																		
-20 dBm			+		+					+		\vdash							
-30 dBm						M		M2											
						y y		1											
-40 dbm	'	H2 -40.000 (JBm			1													
-50 dBrr	·					1			lunk			-							
-60 dBm																			
-70 dBm			+							+								v	2
	ĩ – I																		
3.52	GHz		-			10)01 pt	\$			2	1.0 N	/Hz/					3.7	73 GHz
		Ι									Measuri	ng		440	11.07.2		Level		RBW

Date: 11.JUL.2018 22:49:56

Checked BY RICHARD & King :



: Cambium Networks, Inc.

- : C036045C008A
- : 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

- : August 2, 2018
- : Transmit at 3695MHz Channel A
- : V1
- : V2

MultiView	Receiver	x) Sp	ectrum	x					▽
Ref Level 29. Att Input	75 dBm Offset 10 dB SWT 1 AC PS	1.08 ms VE	BW 100 kHz BW 1 MHz Steh Off	Mode Auto Sweep	Count 1000	/1000	F	requency 3	8.6950000 GHz
1 Frequency S		011 14	Xan on						2Rm Max
								M1[M2[2] -31.87 dBm 3.6894330 GHz
20 dBm									3.7010440 GHz
10 dBm				monor	MARKING			+	
0 dBm				David a shift of					
-10 dBm									
	H2 -13.250 dBm								
-20 dBm-									
-30 dBm			L. LO			WM2			
-40 dBm		JAN 1	AN MARINA			uttown black	Ume		
-50 dBm-		- Markey							
-30 dBm	Munun	MV					W	Morgens	Manusuleron
-so dam-					v	2			
CF 3.695 GHz			1001 pt	s	5	.0 MHz/			Span 50.0 MHz
)[]				Measurin	ng		.2018 Ref L 51:18	evel RBW

Date: 11.JUL.2018 23:51:18

Checked BY RICHARD & King :



: Cambium Networks, Inc.

- : C036045C008A
- : 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

- : August 2, 2018
- : Transmit at 3695MHz Channel A
- : V1 :

٧Z

MultiView 🕀	Receiver	x) Sp	ectrum	x					▽
Ref Level 29.73 Att Input	5 dBm Offset 10 dB SWT 1 AC PS	1.01 ms VE	BW 1 MHz BW 10 MHz otch Off	Mode Auto Sweep	Count 1000,	/1000	Fn	equency 3.	5950000 GHz
1 Frequency Sw						_			2Rm Max
20 dBm								M1[2] M2[2]	3.6894330 GHz -15.67 dBm
				· · · · · · · · · · · · · · · · · · ·	m				3.7010440 GHz
10 dBm									
0 dBm									
-10 d8m						N2			
-20 dBm		الرولي ر	www.			hand	ւս և		
-30 dBm	2 -25.000 dBm	www					and have		
-40 dBm	Multiple	And a contract of the second s					740	My William he	
-20 d8m -30 d8m -40 d8m -40 d8m Jun Manual M	104								Www.hollow
-60 dBm	v	1					v	2	
CF 3.695 GHz			1001 p	ts	5	.0 MHz/			Span 50.0 MHz
					_	ig (111111)	# 12.07.2		

Date: 12.JUL.2018 00:04:37

Checked BY RICHARD & King :



: Cambium Networks, Inc.

- : C036045C008A
- : 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

- : August 2, 2018
- : Transmit at 3695MHz Channel A
- : V1
- : V2

Ref Level 29.75 dbm Offset 28.85 db Ref Level 29.75 dbm Offset 28.85 db Ref Level 29.75 dbm Prequency 3.6950000 GHz 10 db 98 0 m Notch 0 ff Mide Auto Sweep Count 1000/1000 Prequency 3.6950000 GHz 20 dbm 1.4C 98 0 m Notch 0 m Mil 23.6694330 GHz 20 dbm 1.4C 98 0 m 1.4C 98 1.4C 20 dbm 1.4C 98 0 m 1.4C 1.4C 1.4C 20 dbm 1.4C 1.4C 1.4C 1.4C 1.4C 1.4C 20 dbm 1.4C 1.4C 1.4C 1.4C 1.4C 1.4C 10 dbm 1.4C 1.4C 1.4C 1.4C 1.4C 1.4C -10 dbm 1.4C 1.4C 1.4C 1.4C 1.4C 1.4C 1.4C -20 dbm 1.4C	MultiView	Receiver	x) Sp	ectrum	x					∇
I Frequency Sweep 2 /2 /1 /2 /2 /2 /2 /2 /2 /2 /2 /2 /2 /2 /2 /2	Att	10 dB SWT	1.01 ms VE	3W 10 MHz 1	Mode Auto Sweep	Count 1000/	1000	Fre	equency 3.6	950000 GHz
20 dBm			01 14							2Rm Max
20 dBm 10 dBm -10 dBm -20 d										3.6894330 GHz
0 dBm -10 dBm -20 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40 d	20 dBm					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
-10 dBm -20 dBm -20 dBm -20 dBm -30 dBm -30 dBm -30 dBm -40	10 dBm						\			
-20 dBm H2 -25.000 dBm H2 -25.000 dBm H4 -25.000 dBm	0 dBm									
-20 dBm	-10 dBm									
-60 dbm	20 db -						N2			
-60 dbm	-20 060	H2 -25.000 dBm	ليوليه المحالية والمحالية والمحالية والمحالية والمحالية والمحالية والمحالية والمحالية والمحالية والمحالية والمح	ANN MARCH			marthe	which is a		
-60 dbm	-30 dBm	الملهلي	WARMA					- We	Markinia I	
-60 dbm	-40 dBm	PNPAR								Maryhouth
-60 dbm	-50 dBm-									- www.
V1 Span 50.0 MHz CF 3.695 GHz 1001 pts 5.0 MHz/ Span 50.0 MHz Maxwing 12.07.2010 Ref Level RBW									2	
Magueine 12.07.2010 Ref Level RBW		v	1							
	CF 3.695 GHz	Y		1001 p	ls				018 Ref Leve	

Date: 12.JUL.2018 00:04:37

Checked BY RICHARD & King :



: Cambium Networks, Inc.

- : C036045C008A
- : 0A003E431A31

: FCC 96.41(e) Emissions outside the fundamental

- : August 2, 2018
- : Transmit at 3695MHz Channel A
- : V1 :

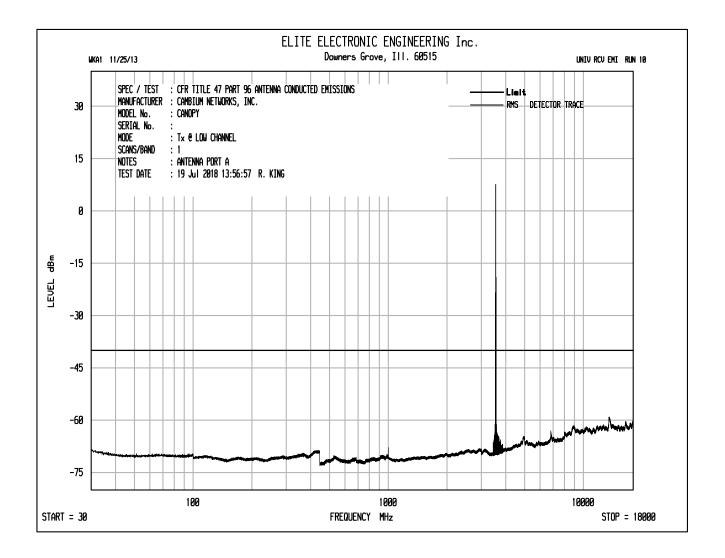
V2

MultiView	Receiver	x) Sp	ectrum	x					♥
Ref Level 29. Att Input	.75 dBm Offset 10 dB SWT 1 AC PS		BW 1 MHz BW 10 MHz otch Off	Mode Auto Sweep	Count 1000	/1000	Fre	equency 3.	5250000 GHz
1 Frequency S		011 14						M1[2]	
20 dBm-								M2[2]	
								pony	3.555000 GHz
10 dBm-									
0 dBm								$\left \right $	
-10 d8m									
-20 dBm							J.	the here	
-30 dBm-									
-40 dBm	H2 -40.000 dBm						JA C		14
-40 dbm							كللها		N.
(-59. dBp)		h an an a n an	aller and the second second	د فا سم اسال مير ليك م	وميا الإلتين محمدور الباقية	المحجود المحاد المحاكم والمحاكم والمحاجم	w.W.		Nelsource
-60 dBm-									
VI									×2
3.52 GHz	~		1001	pts		1.0 MHz/	12.07.2	OID (Defier	3.73 GHz
	J				Measurin	ng (12.07.2 00:00		el RBW

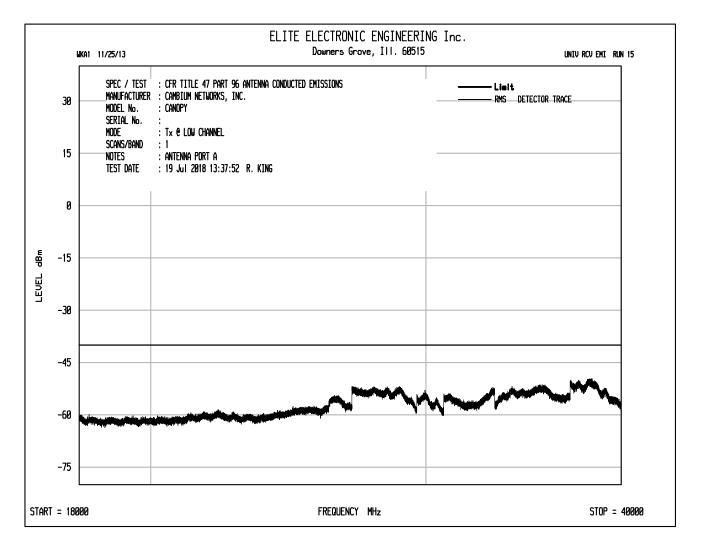
Date: 12.JUL.2018 00:08:56

Checked BY RICHARD & King :

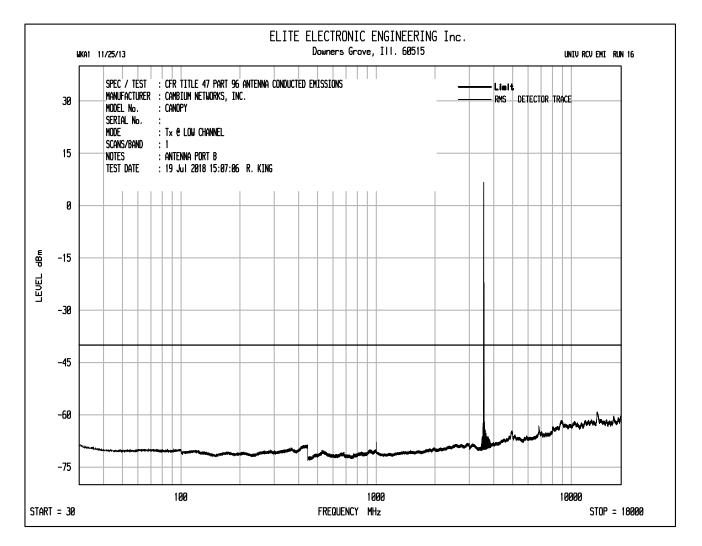




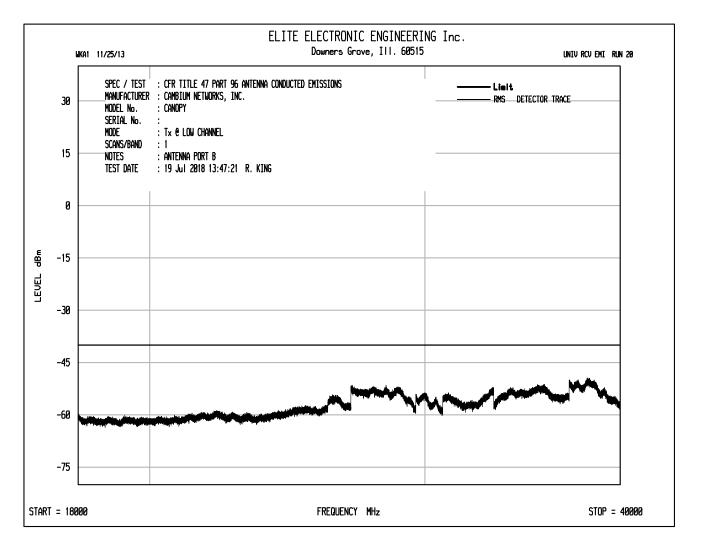




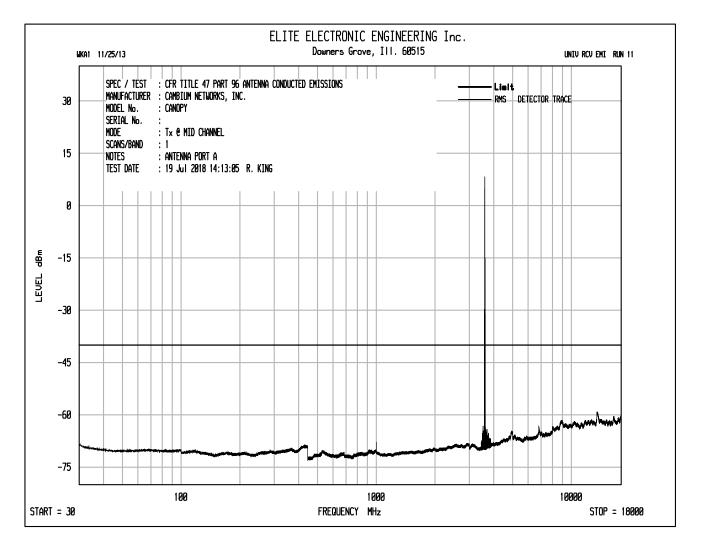




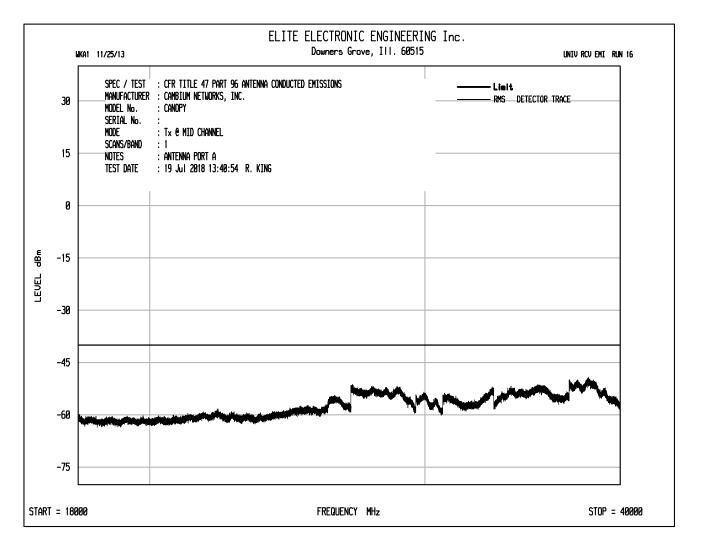




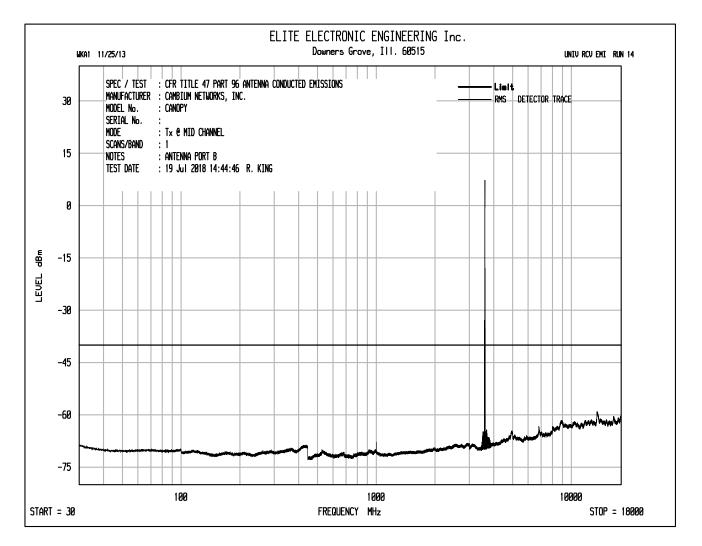




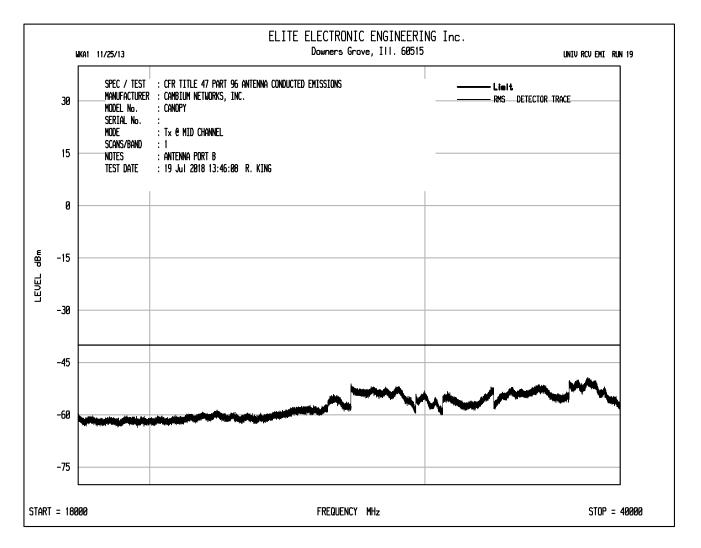




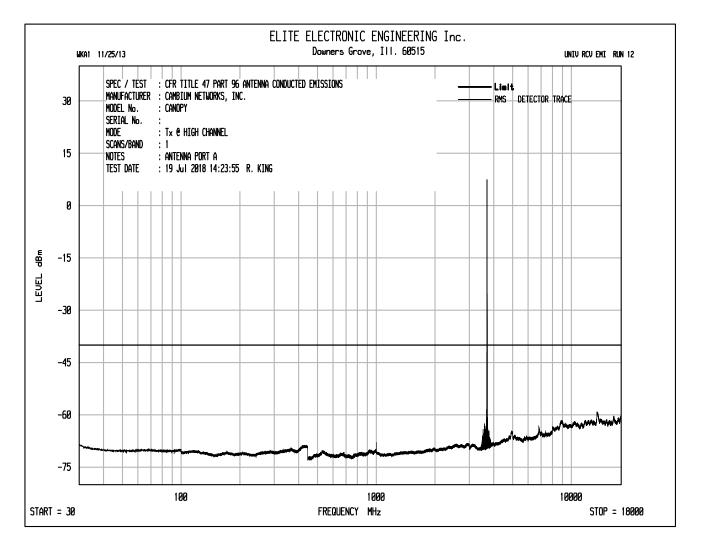




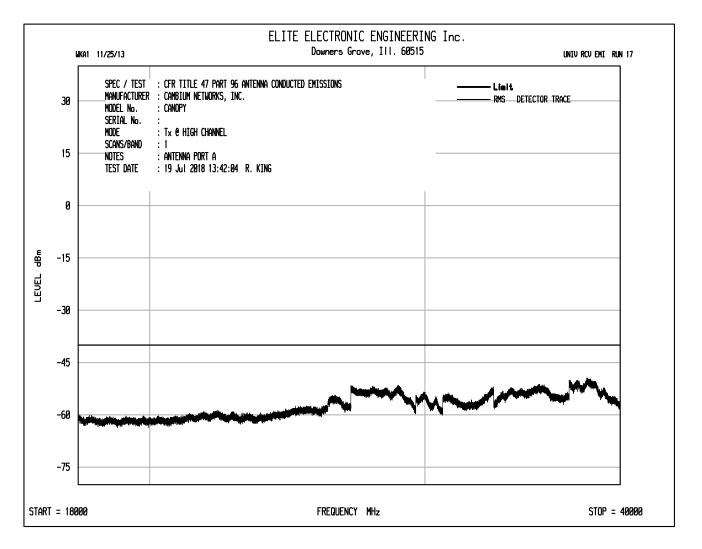




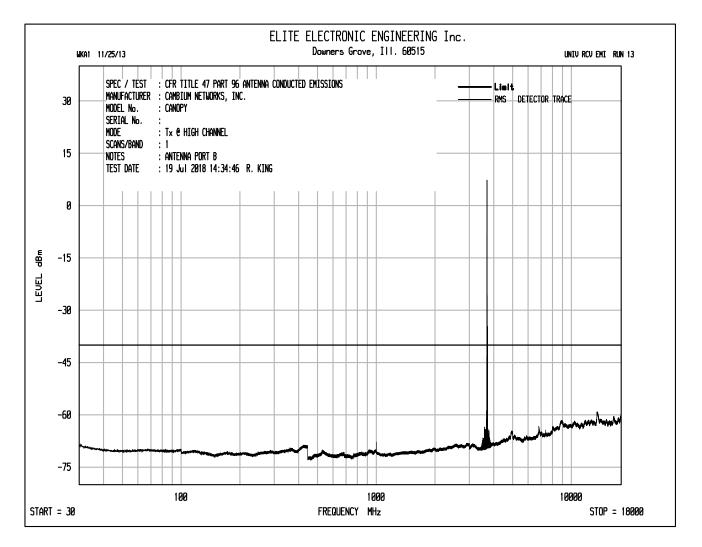




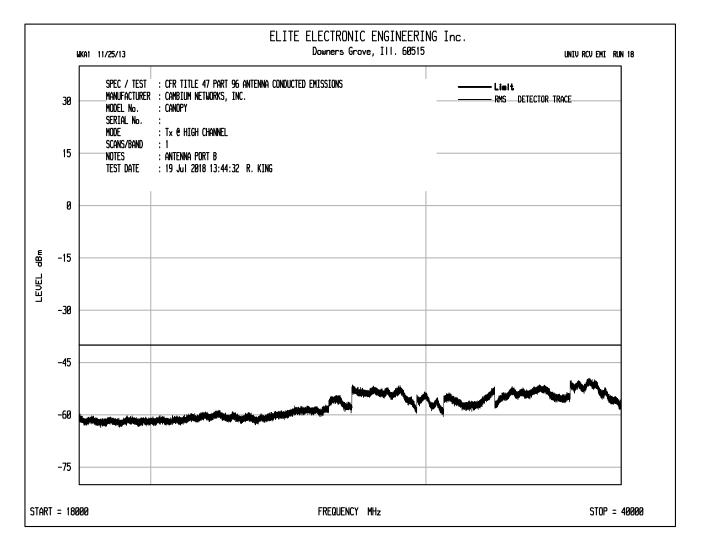




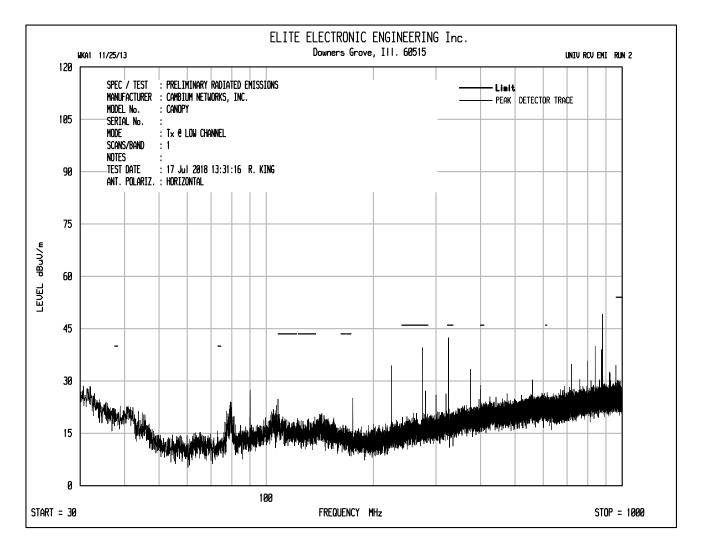




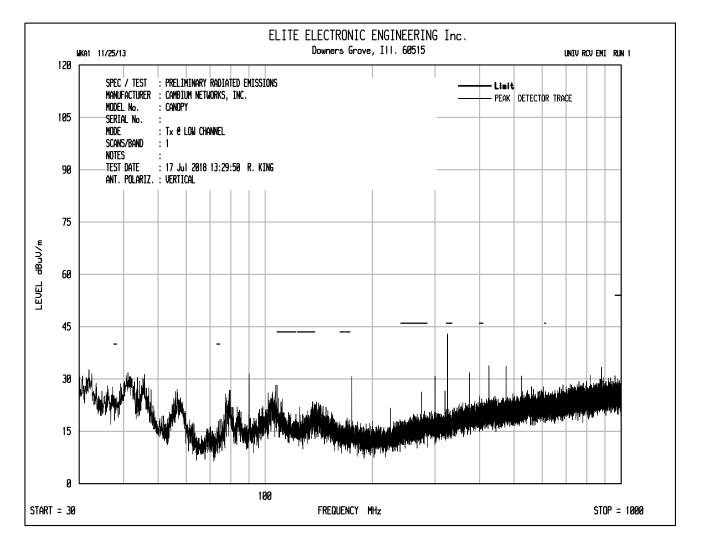




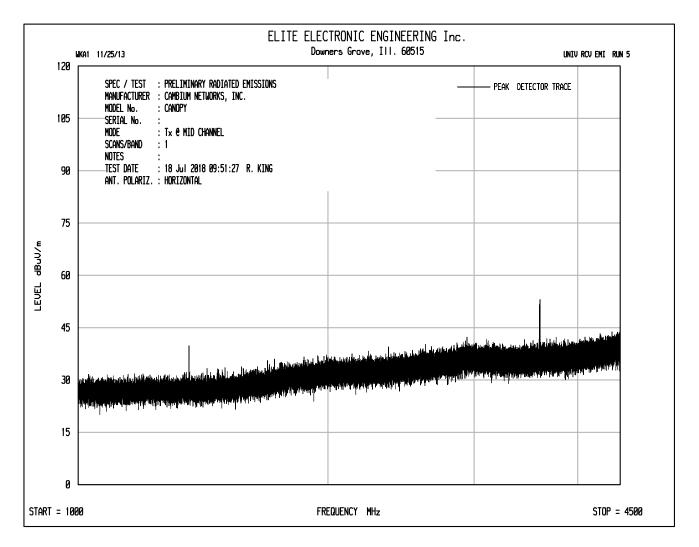




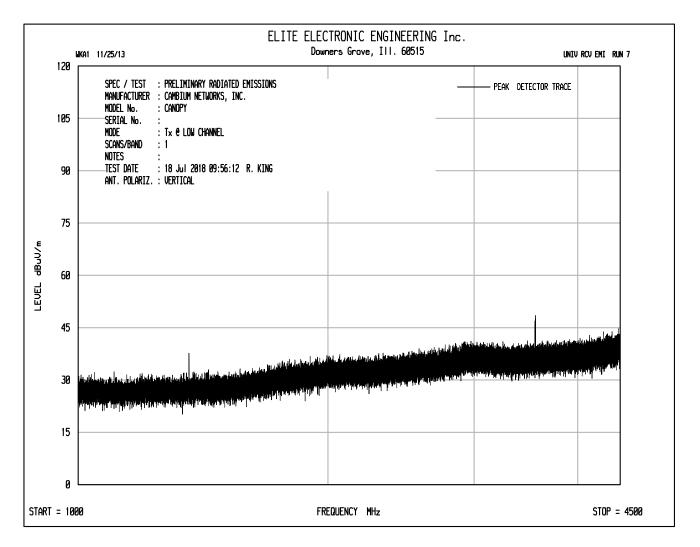




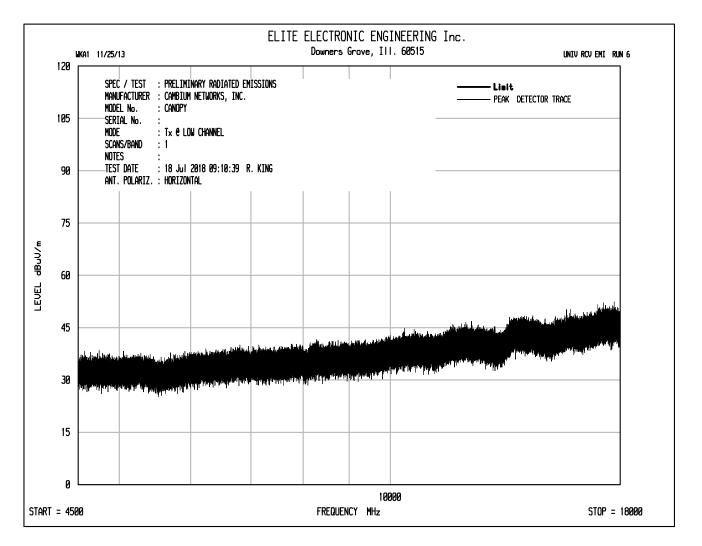




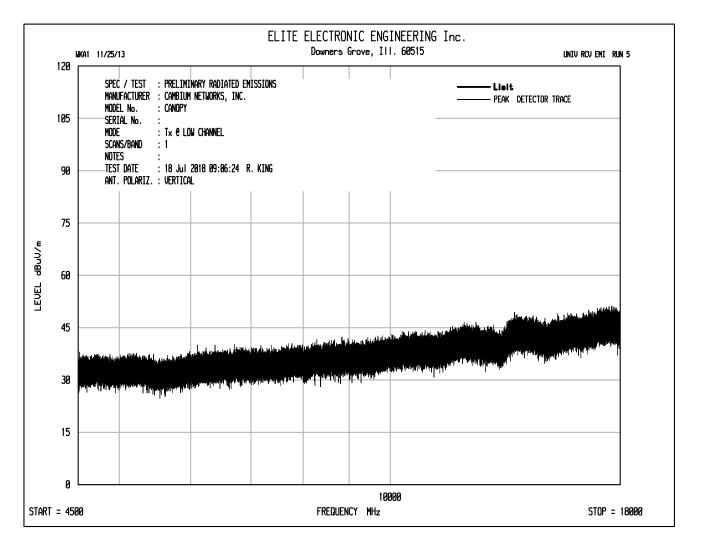




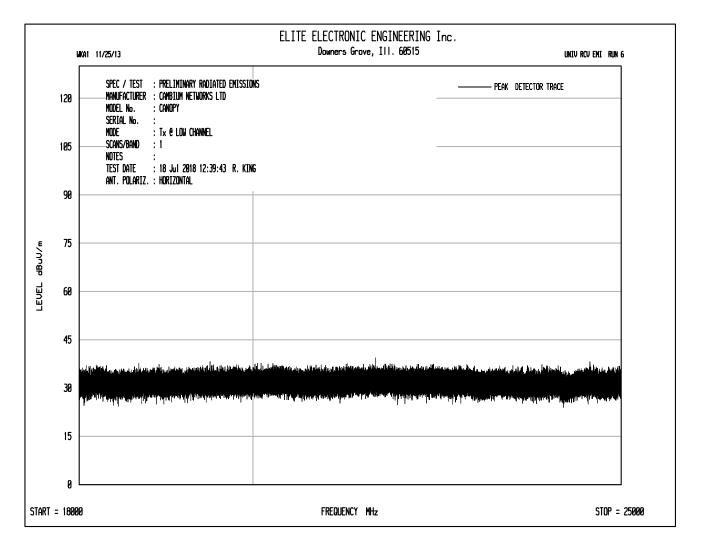




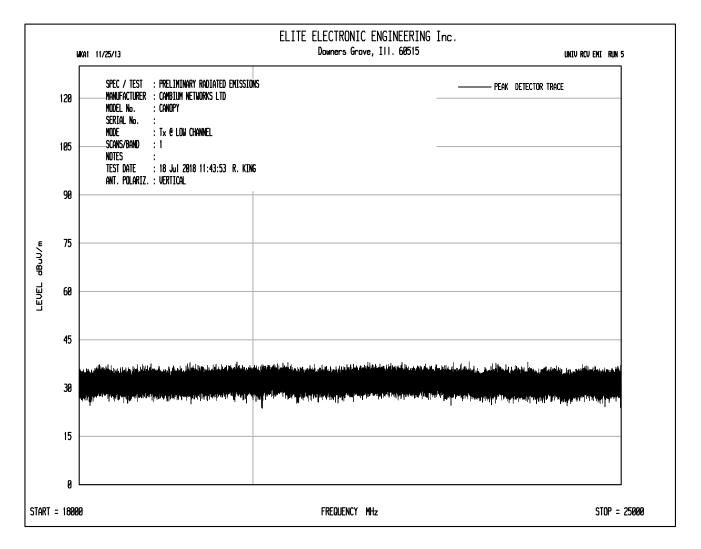




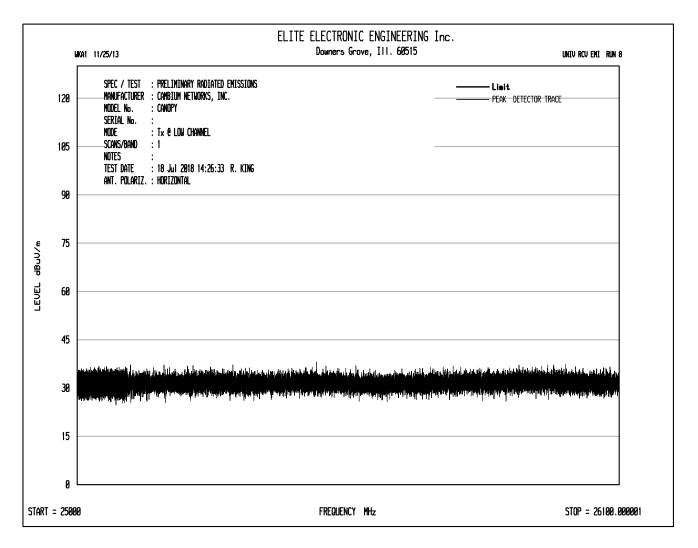




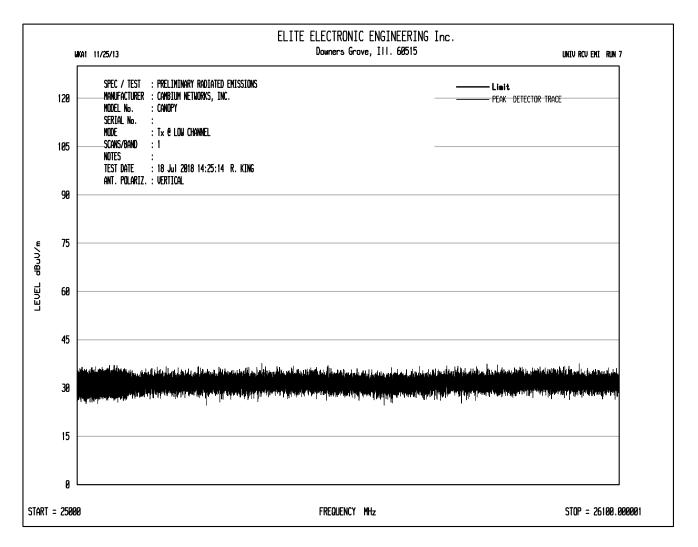




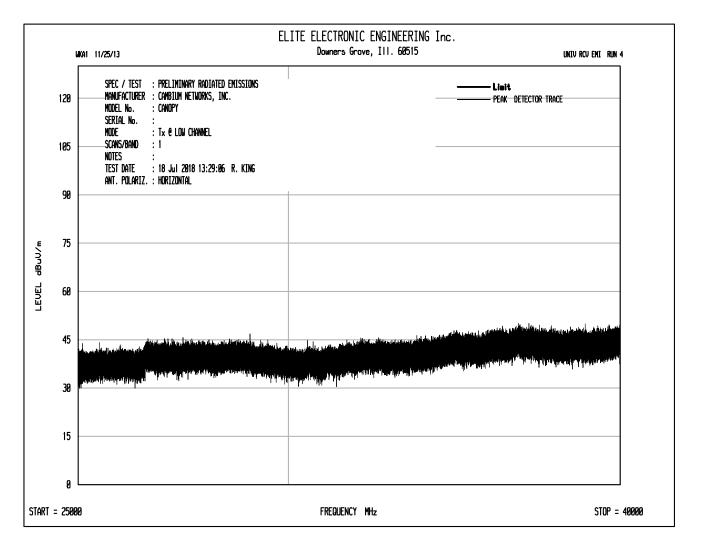




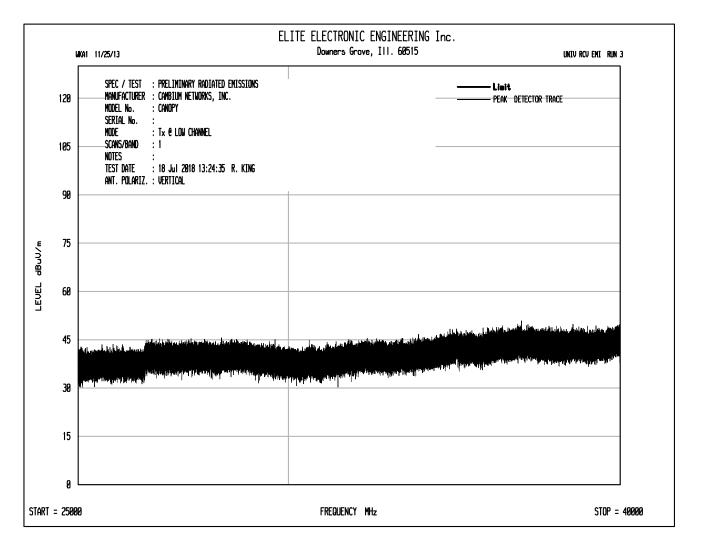




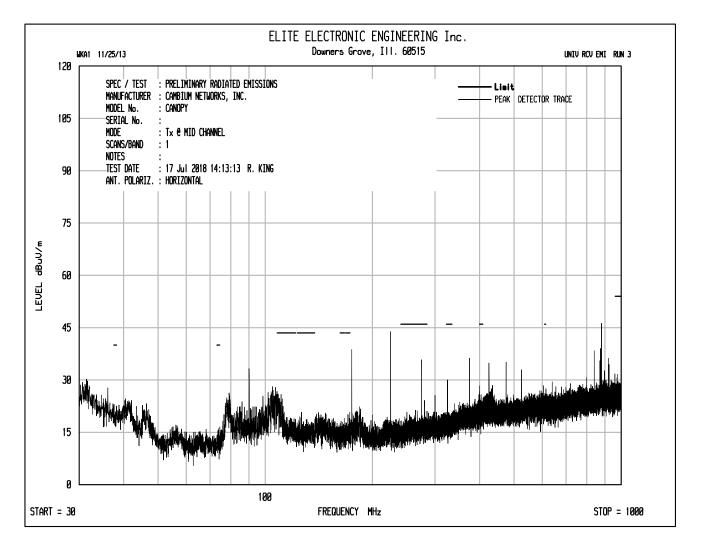




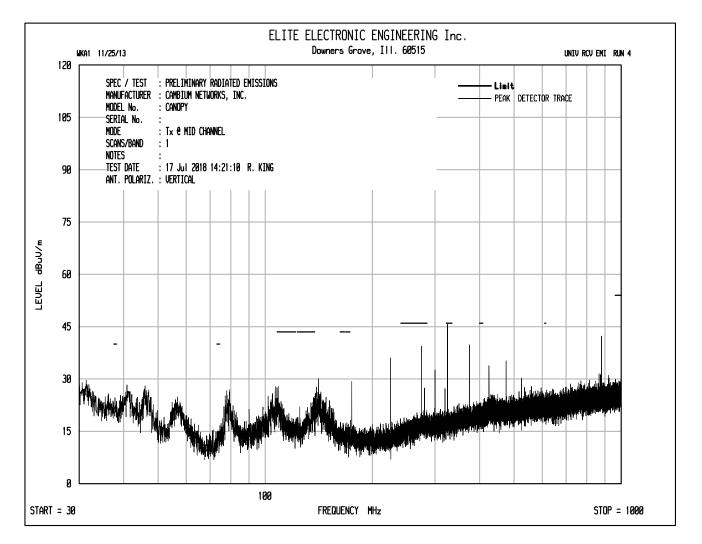




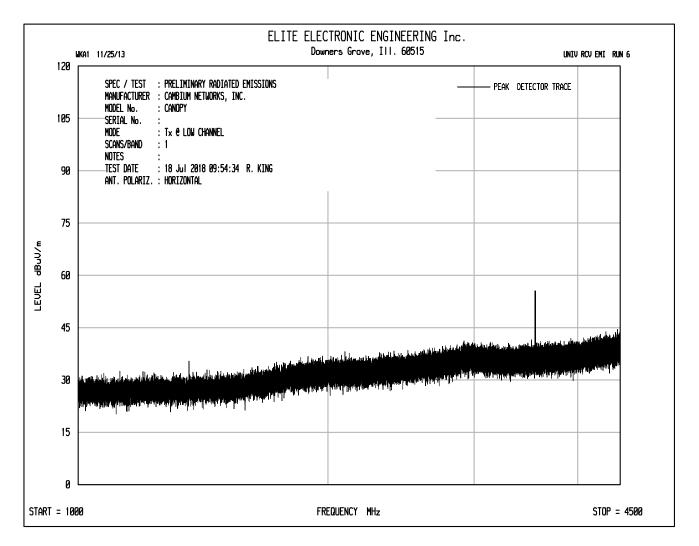




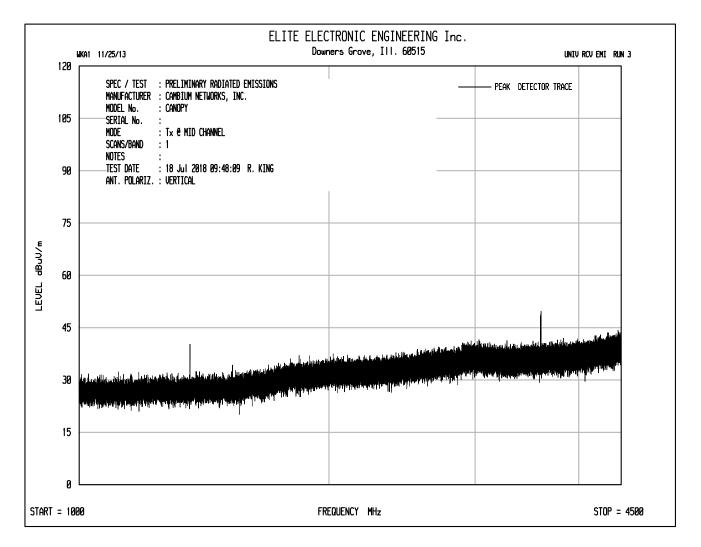




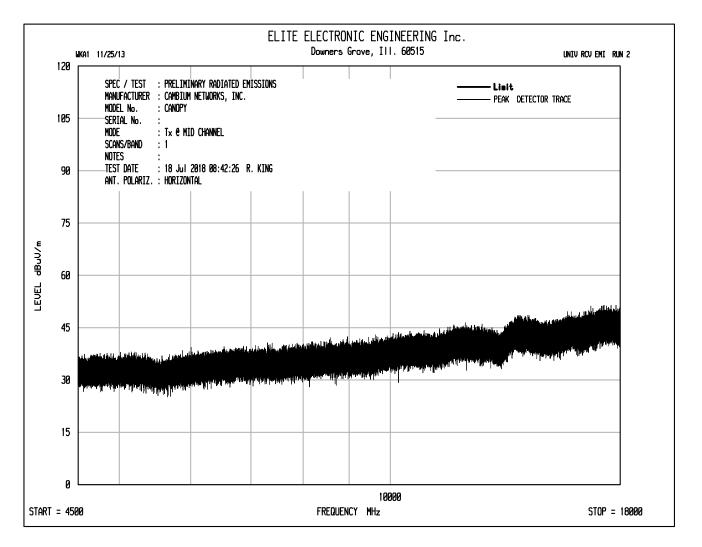




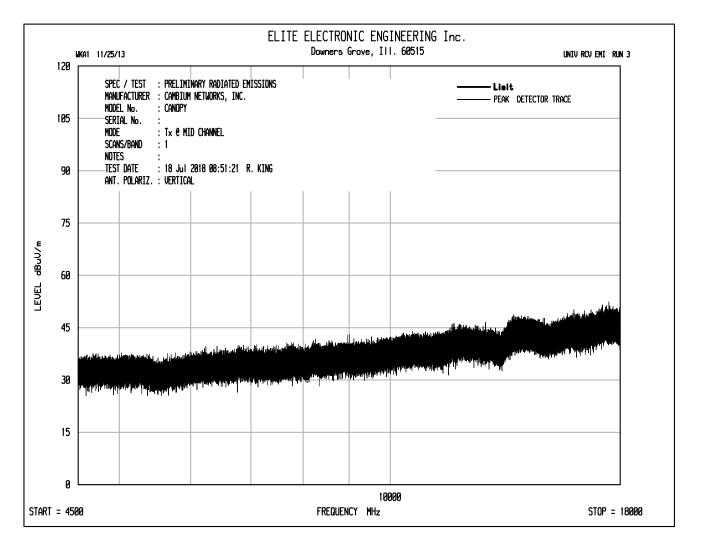




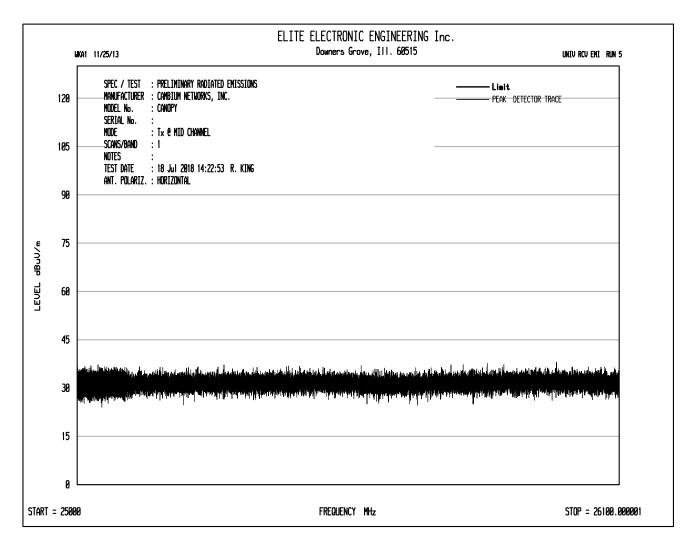




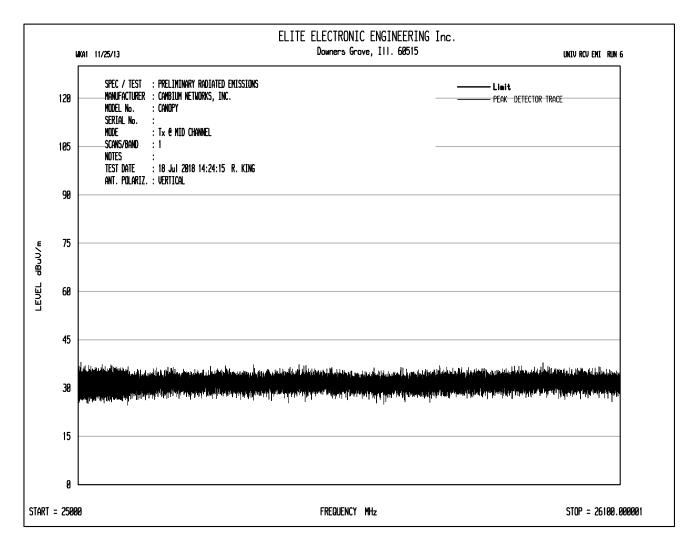




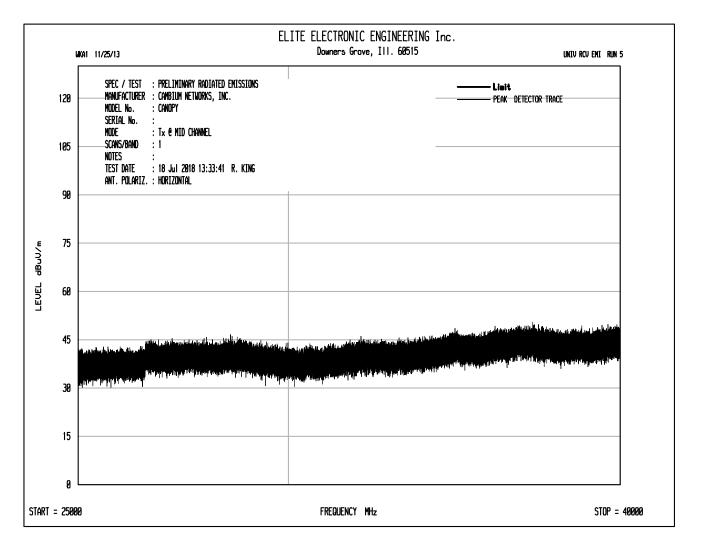




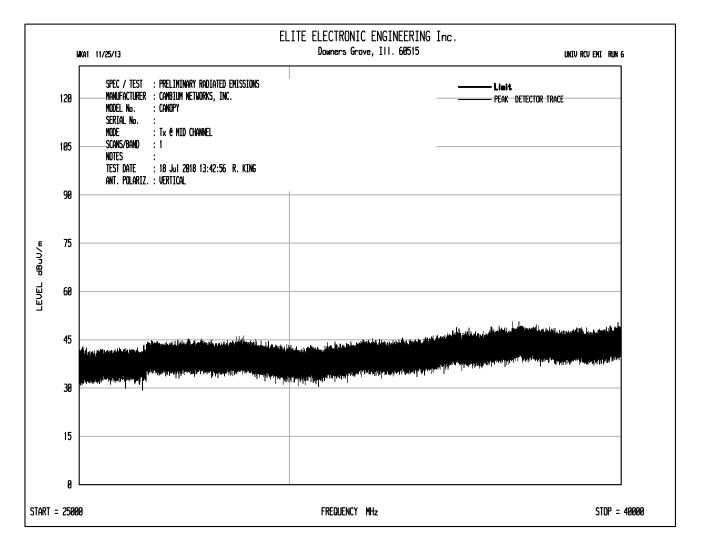




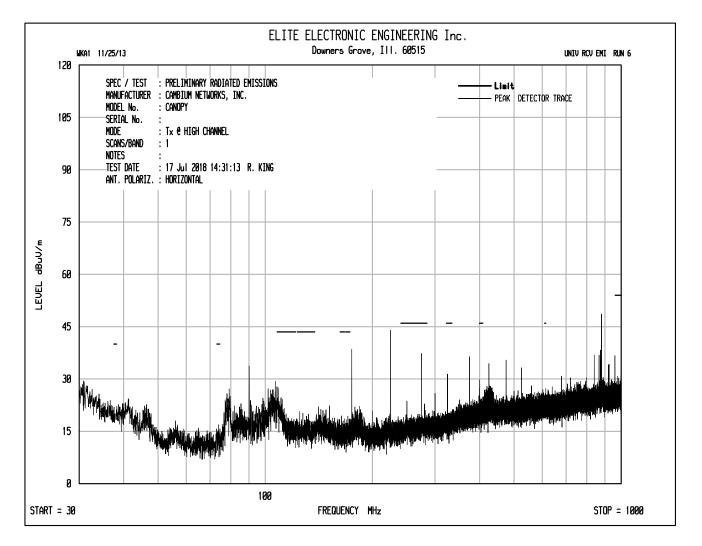




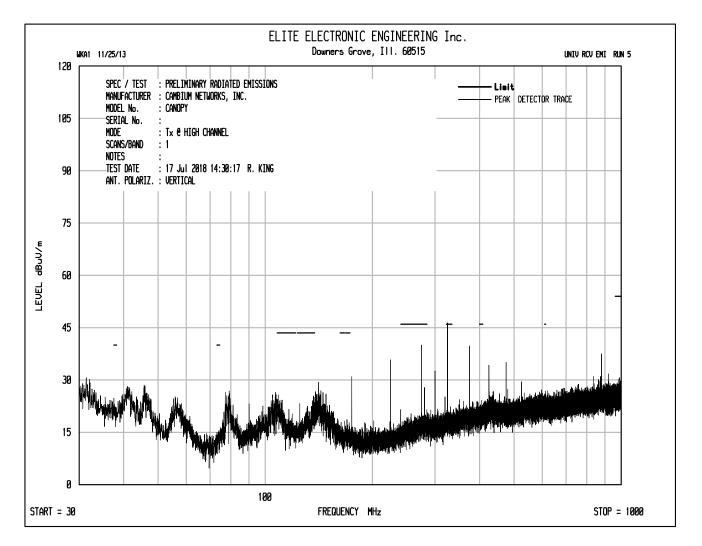




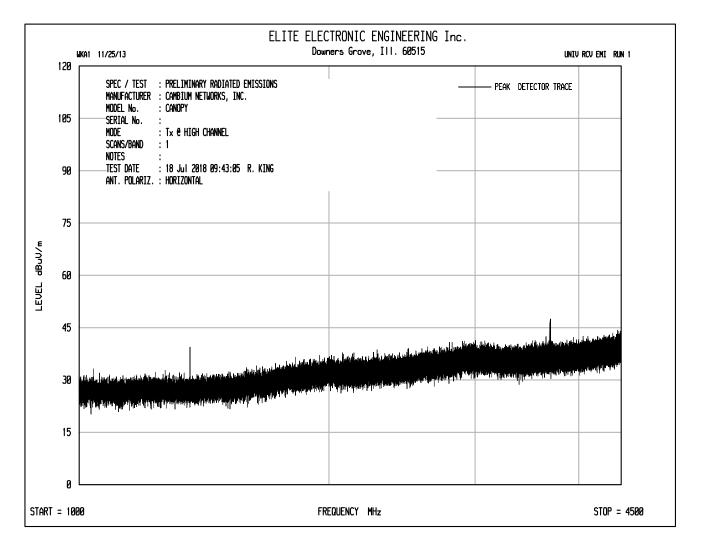




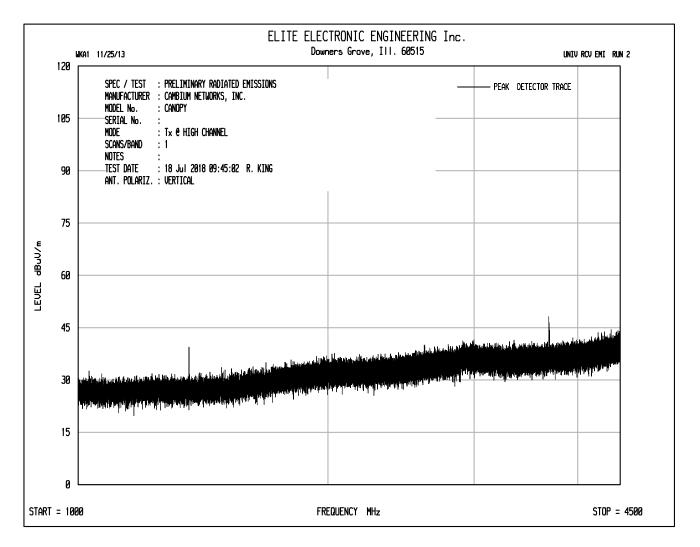




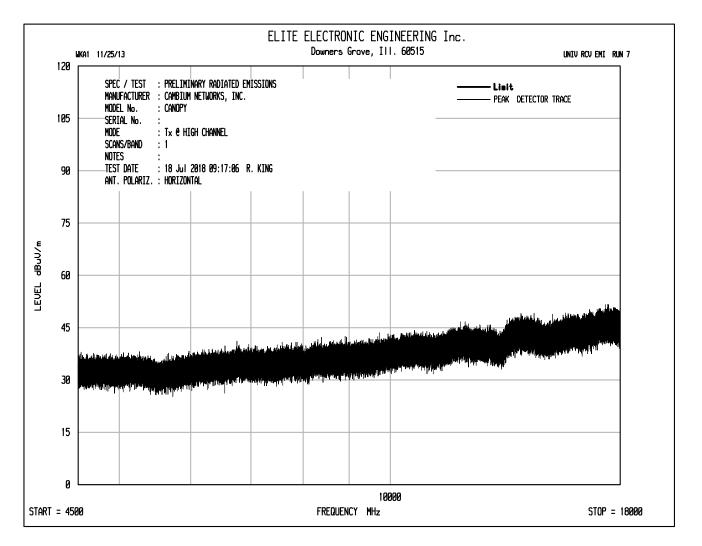




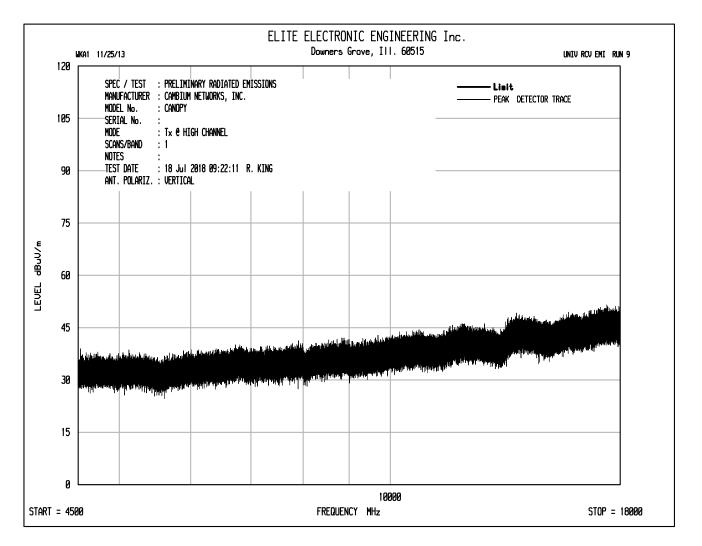




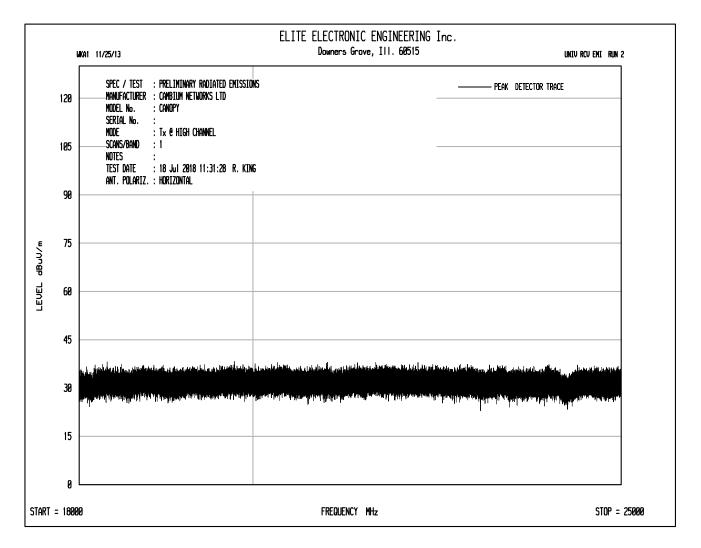




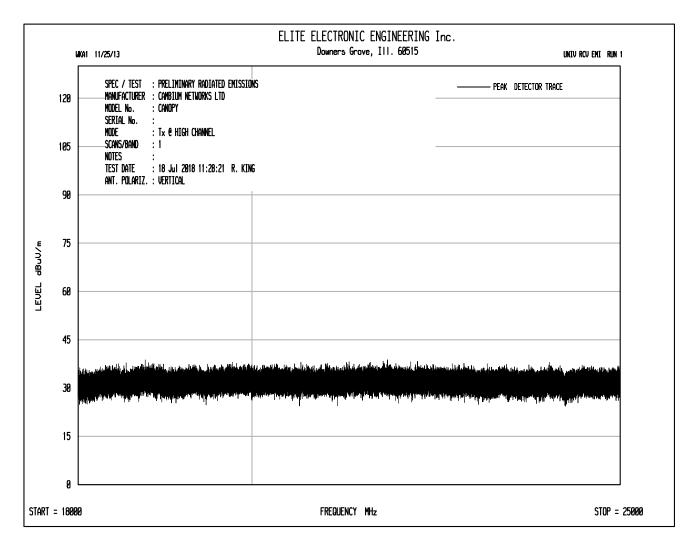




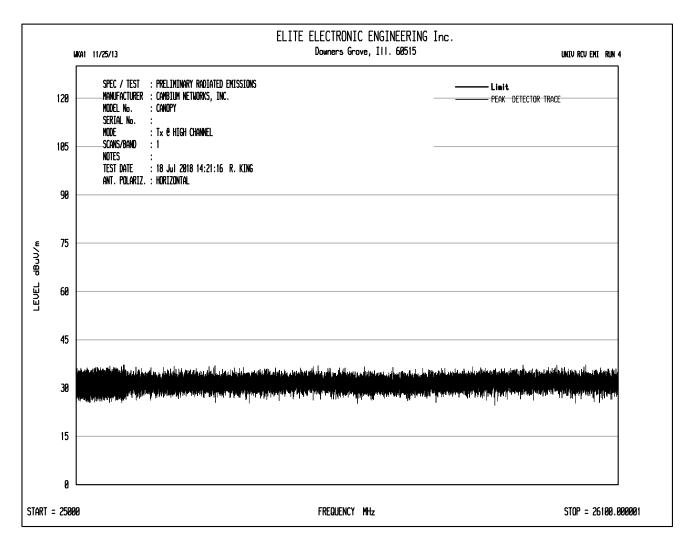




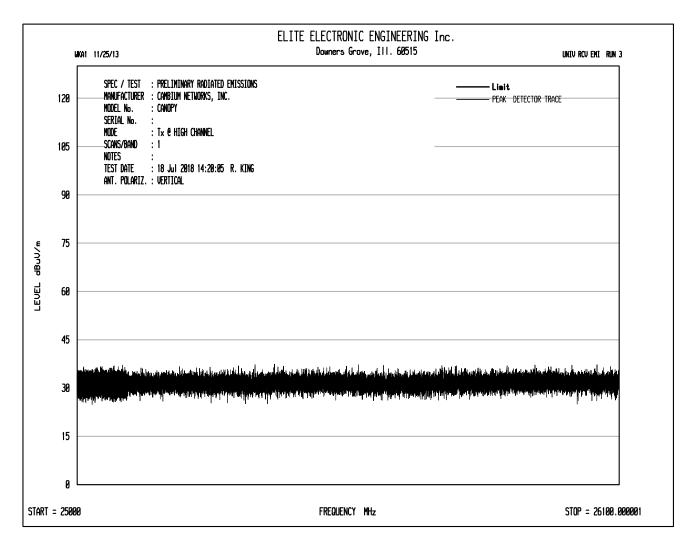




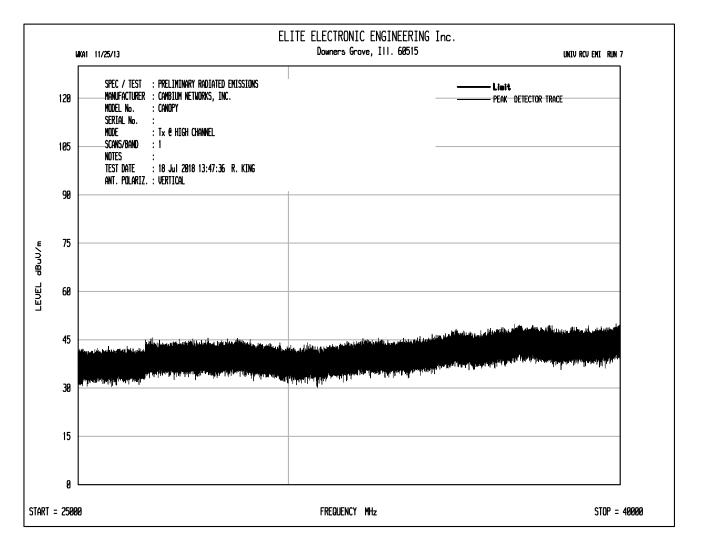














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MANUFACTURER	: Cambium Networks, Inc.
MODEL NO.	: C036045C008A
SPECIFICATION	: FCC 96.41(e) Spurious Radiated Emissions
DATE	: July 19, 2018
MODE	: Transmit at 3555MHz
NOTES	:

Freq. (MHz) 7110.0	Ant Pol	Meter Reading (dBuV) 40.1	CBL Fac (dB) 4.6	Ant Fac (dB) 38.0	Pre Amp (dB) -40.3	Total dBuV/m at 3m 42.4	ERP (dBm/MHz) -54.8	ERP LIMIT (dBm/MHz) -40.0
7110.0	V	40.5	4.6	38.0	-40.3	42.8	-54.4	-40.0
10665.0	H	39.2	5.6	40.5	-40.1	45.1	-52.1	-40.0
10665.0	V	40.0	5.6	40.5	-40.1	45.9	-51.3	-40.0
14220.0	Н	41.0	6.5	41.7	-39.5	49.7	-47.5	-40.0
14220.0	V	41.9	6.5	41.7	-39.5	50.6	-46.6	-40.0
17775.0	Н	39.4	7.5	43.7	-39.6	51.0	-46.2	-40.0
17775.0	V	38.7	7.5	43.7	-39.6	50.3	-46.9	-40.0
21330.0	Н	36.7	2.3	40.4	-28.9	50.5	-46.7	-40.0
21330.0	V	37.0	2.3	40.4	-28.9	50.7	-46.5	-40.0
24885.0	Н	39.0	2.2	40.6	-30.6	51.2	-46.0	-40.0
24885.0	V	38.3	2.2	40.6	-30.6	50.6	-46.6	-40.0
28440.0	Н	41.5	2.3	43.8	-34.7	52.9	-44.3	-40.0
28440.0	V	41.9	2.3	43.8	-34.7	53.4	-43.8	-40.0
31995.0	Н	42.8	2.6	44.0	-35.7	53.6	-43.6	-40.0
31995.0	V	42.8	2.6	44.0	-35.7	53.6	-43.6	-40.0
35550.0	Н	41.7	2.7	44.1	-34.4	54.1	-43.1	-40.0
35550.0	V	42.3	2.7	44.1	-34.4	54.7	-42.5	-40.0
1360.0	Н	51.9	1.9	29.6	-41.7	41.7	-55.5	-40.0
1360.0	V	49.8	1.9	29.6	-41.7	39.6	-57.6	-40.0

Checked BY RICHARD E. King :



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MODEL NO.: C036045C008ASPECIFICATION: FCC 96.41(e) Spurious Radiated EmissionsDATE: July 19, 2018MODE: Transmit at 3600MHzNOTES:
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		Meter	CBL	Ant	Pre	Total		
Freq.	Ant	Reading	Fac	Fac	Amp	dBuV/m	ERP	ERP LIMIT
(MHz)	Pol	(dBuV)	(dB)	(dB)	(dB)	at 3m	(dBm/MHz)	(dBm/MHz)
7200.0	Н	41.0	4.6	38.1	-40.3	43.5	-53.7	-40.0
7200.0	V	40.3	4.6	38.1	-40.3	42.8	-54.4	-40.0
10800.0	Н	40.2	5.6	40.5	-40.1	46.2	-51.0	-40.0
10800.0	V	40.1	5.6	40.5	-40.1	46.1	-51.1	-40.0
14400.0	Н	41.1	6.6	42.0	-39.6	50.2	-47.0	-40.0
14400.0	V	41.5	6.6	42.0	-39.6	50.6	-46.6	-40.0
18000.0	Н	39.4	2.2	40.3	-31.6	50.3	-46.9	-40.0
18000.0	V	38.7	2.2	40.3	-31.6	49.6	-47.6	-40.0
21600.0	Н	36.7	2.2	40.6	-28.9	50.7	-46.5	-40.0
21600.0	V	37.0	2.2	40.6	-28.9	50.9	-46.3	-40.0
25200.0	Н	39.0	2.2	40.7	-30.3	51.5	-45.7	-40.0
25200.0	V	38.3	2.2	40.7	-30.3	50.9	-46.3	-40.0
28800.0	Н	41.5	2.4	43.8	-34.8	52.9	-44.3	-40.0
28800.0	V	41.9	2.4	43.8	-34.8	53.3	-43.9	-40.0
32400.0	Н	42.8	2.6	44.0	-36.1	53.3	-43.9	-40.0
32400.0	V	42.8	2.6	44.0	-36.1	53.3	-43.9	-40.0
36000.0	Н	41.7	2.7	44.1	-34.8	53.7	-43.5	-40.0
36000.0	V	42.3	2.7	44.1	-34.8	54.3	-42.9	-40.0
1360.0	Н	52.9	1.9	29.6	-41.7	42.7	-54.5	-40.0
1360.0	V	50.1	1.9	29.6	-41.7	39.9	-57.3	-40.0

Checked BY RICHARD E. King :



MANUFACTURER	: Cambium Networks, Inc.
MODEL NO.	: C036045C008A
SPECIFICATION	: FCC 96.41(e) Spurious Radiated Emissions
DATE	: July 19, 2018
MODE	: Transmit at 3695MHz
NOTES	:

Freq. (MHz)	Ant Pol	Meter Reading (dBuV)	CBL Fac (dB)	Ant Fac (dB)	Pre Amp (dB)	Total dBuV/m at 3m	ERP (dBm/MHz)	ERP LIMIT (dBm/MHz)
7390.0	Н	41.0	4.7	38.1	-40.3	43.5	-53.7	-40.0
7390.0	V	40.2	4.7	38.1	-40.3	42.7	-54.5	-40.0
11085.0	Н	39.7	5.7	40.6	-40.0	46.0	-51.2	-40.0
11085.0	V	40.3	5.7	40.6	-40.0	46.6	-50.6	-40.0
14780.0	Н	41.0	6.8	42.6	-39.6	50.8	-46.4	-40.0
14780.0	V	38.1	6.8	42.6	-39.6	47.9	-49.3	-40.0
18475.0	Н	39.4	2.2	40.3	-30.1	51.8	-45.4	-40.0
18475.0	V	38.7	2.2	40.3	-30.1	51.1	-46.1	-40.0
22170.0	Н	36.7	2.2	40.6	-29.3	50.2	-47.0	-40.0
22170.0	V	37.0	2.2	40.6	-29.3	50.5	-46.7	-40.0
25865.0	Н	39.0	2.2	40.7	-30.0	51.9	-45.3	-40.0
25865.0	V	38.3	2.2	40.7	-30.0	51.2	-46.0	-40.0
29560.0	Н	41.5	2.4	43.8	-35.6	52.2	-45.0	-40.0
29560.0	V	41.9	2.4	43.8	-35.6	52.6	-44.6	-40.0
33255.0	Н	42.8	2.6	44.0	-35.9	53.5	-43.7	-40.0
33255.0	V	42.8	2.6	44.0	-35.9	53.6	-43.6	-40.0
36950.0	Н	41.7	2.8	44.1	-35.3	53.4	-43.8	-40.0
36950.0	V	42.3	2.8	44.1	-35.3	54.0	-43.2	-40.0
1360.0	Н	54.4	1.9	29.6	-41.7	44.2	-53.0	-40.0
1360.0	V	51.0	1.9	29.6	-41.7	40.8	-56.4	-40.0

Checked BY RICHARD E. King



MANUFACTURER MODEL NO. SERIAL NO. SPECIFICATION DATE MODE	: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) Power Spectral Density : June 28, 2019 : Transmit at 3555MHz Channel A
MODE	
NOTES	: Power Spectral Density = 14.63dBm + 3dB =17.63dBm

MultiView 🗄 Spectrum	🛛 🔆 🗴 Spectrum 2	x Spectrum 3 x		▼
Ref Level 41.00 dBm Offse Att 10 dB SWT Input 1 AC PS	t 41.00 dB • RBW 1 MHz 1.01 ms • VBW 10 MHz On Notch Off	Mode Auto Sweep Count 200/200	Frequency 3	3.5550000 GH
Frequency Sweep				1Rm Max
			M1[14.63 dBn 3.5566380 GH
30 dBm-				
20 d8m				
		Mi	mon	
10 dBm				
0 dBm				
-10 dBm				
10 0011	1			
66 da	(
20 dBm-				
-30 dBm				
Harden Blender and March March 1			Labordo	retrierension
40 dBm				
-50 dBm				
CF 3.555 GHz	1001	pts 2.0 M	H2/	Span 20.0 MHz
T COOL OF IL	1001			evel RBW

Date: 28.JUN.2019 20:13:21

Checked BY RICHARD E. King :



MANUFACTURER: Cambium Networks, Inc.MODEL NO.: C036045C008ASERIAL NO.: 0A003E431A31SPECIFICATION: FCC 96.41(e) Power Spectral DensityDATE: June 28, 2019MODE: Transmit at 3555MHz Channel BNOTES: Power Spectral Density = 15.06dBm + 3dB = 18.06dBm

MultiView	Spectrum	🗧 🕺 Spectru	ım 2 🛛 🔆 🗴	Spectrum 3	X Spe	ctrum 4 🛛 🔆	×		▽
Att	.00 dBm Offse 10 dB SWT 1 AC PS	t 41.00 dB = RI 1.01 ms = VE On N	3W 10 MHz N	Iode Auto Sweep	Count 200/2	200	Fi	requency 3	.6000000 GHz
1 Frequency S	weep								1Rm Max
								M1[]] 15.06 dBm 3.6015780 GHz
30 dBm									
20 dBm					M1				
10 dBm		6	-marriello-	Annand	margare	marina	M.		
0 dBm									
-10 dBm		ſ							
-20 dBm	/	(
-30 dBm	+								
40 dBm-	electron has been all							Kinami	manderburger
-50 dBm									
			1001			0.181-1			0
CF 3.6 GHz	~		1001 pt	S		.0 MHz/	20.06	2010 (2-11-	Span 20.0 MHz
	Л				Measurin	ig 🚺 🖬 🖬 🖬	28.06. 20:1	2019 Ref Le 7:58	vel RBW

Date: 28.JUN.2019 20:17:58

Checked BY RICHARD E. King :



MANUFACTURER: Cambium Networks, Inc.MODEL NO.: C036045C008ASERIAL NO.: 0A003E431A31SPECIFICATION: FCC 96.41(e) Power Spectral DensityDATE: June 28, 2019MODE: Transmit at 3600MHz Channel ANOTES: Power Spectral Density = 14.26dBm + 3dB = 17.26dBm

MultiView 🗄 Spectr	um 🤾 🗴	Spectrum 2	🔆 🗴 Spectrum 3	X Spe	ctrum 4 🛛 🦂	x		▽
Ref Level 41.00 dBm Att 10 dB Input 1 AC			MHz MHz Mode Auto Swee Off	count 200/2	00	Fre	equency 3	.6950000 GHz
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-40 dBm								
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CF 3.695 GHz			1001 pts	2.	0 MHz/			Span 20.0 MHz
				Measurin	g (111111)	28.06.2 20:11		evel RBW

Date: 28.JUN.2019 20:18:27

Checked BY RICHARD E. King :



MANUFACTURER	: Cambium Networks, Inc.
MODEL NO.	: C036045C008A
SERIAL NO.	: 0A003E431A31
SPECIFICATION	: FCC 96.41(e) Power Spectral Density
DATE	: June 28, 2019
MODE	: Transmit at 3600MHz Channel B
MODE	: Transmit at 3600MHz Channel B
NOTES	: Power Spectral Density = 12.65dBm + 3dB = 15.65dBm

Ref Level 41.00 dBm Offset 41.00 dB RBW 1 MHz Mode Auto Sweep Count 200/200 Frequency 3.5550000 Input 1 AC PS On Notch Off Imput 12.65 3.556658 30 dBm Imput Impu	V
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30 dBm 30 dBm 3.5566580 20 dBm 10 dBm 10 dBm 0 dBm 10 dBm 10 dBm	
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20 dBm /	
10 dBm M1 M2 M2	
10 dBm M1 M2 M2	
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-10 dBm	
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well was and the transmit	
-40 dBm	
-50 dBm	
CF 3.555 GHz 1001 pts 2.0 MHz/ Span 20.0	0 MHz
	BW

Date: 28.JUN.2019 20:05:49

Checked BY RICHARD E. King



MANUFACTURER	: Cambium Networks, Inc.
MODEL NO.	: C036045C008A
SERIAL NO.	: 0A003E431A31
SPECIFICATION	: FCC 96.41(e) Power Spectral Density
DATE	: June 28, 2019
MODE	: Transmit at 3695MHz Channel A
NOTES	: Power Spectral Density = 13.35dBm + 3dB = 16.35dBm

MultiView 🕀	Spectrum	- 🔆 🗶 🗧	Spectrum 2	🛛 🎽 🗴 Spect	rum 3 🛛 🛛 🗴)		~
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CF 3.6 GHz			1001	ots	2.0 M	Hz/		Span 20.0 MHz
I 10 01 1			1001				28.06.2019 Re 20:04:27	f Level RBW

Date: 28.JUN.2019 20:04:27

Checked BY RICHARD E. King :



MANUFACTURER	: Cambium Networks, Inc.
MODEL NO.	: C036045C008A
SERIAL NO.	: 0A003E431A31
SPECIFICATION	: FCC 96.41(e) Power Spectral Density
DATE	: June 28, 2019
MODE	: Transmit at 3695MHz Channel B
NOTES	: Power Spectral Density = 13.19dBm + 3dB = 16.19dBm

MultiView 😁	Spectrum	🛛 🔆 🗶 🕅 S	pectrum 2	🛛 🔆 🗶	rum 3 (x			♥
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-40 dBm				++					
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CF 3.695 GHz			1001 p	ots		.0 MHz/	28.06.2	019 Ref Le	Span 20.0 MHz
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Date: 28.JUN.2019 20:06:15

Checked BY RICHARD E. King :



MANUFACTURER MODEL NO. SERIAL NO. SPECIFICATION DATE NOTES

: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) Power Spectral Density : June 28, 2019

Frequency MHz	Antenna Port	Meter Reading (dBm)	Duty Cycle Correction dB	Total PSD (dBm/MHz)	Maximum PSD (dBm/MHz)	Margin (dB)
3555	А	12.65	3	15.65	37	-21.35
3555	В	14.63	3	17.63	37	-19.37
3600	А	13.35	3	16.35	37	-20.65
3600	В	15.06	3	18.06	37	-18.94
3695	А	13.19	3	16.19	37	-20.81
3695	В	14.26	3	17.26	37	-19.74

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PSD = Meter Reading + Duty Cycle Correction

Checked BY RICHARD E. King :



MANUFACTURER: CaMODEL NO.: COSERIAL NO.: 0ASPECIFICATION: FCDATE: JurNOTES:

: Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(e) Peak to Average Ratio : June 28, 2019

Frequency (MHZ)	Antenna Port	Peak Meter Reading (dBm)	Average Meter Reading (dBM)	Peak to Average Total (dB)	Peak to Average Limit (dB)	Margin (dB)
3555	А	25.10	22.30	2.80	13	-10.20
3555	В	23.93	21.33	2.60	13	-10.40
3600	А	25.40	22.90	2.50	13	-10.50
3600	В	24.48	21.85	2.63	13	-10.37
3695	А	24.51	22.05	2.46	13	-10.54
3695	В	24.42	21.85	2.57	13	-10.43

Checked BY

RICHARD E. King :



MANUFACTURER PART NO. SERIAL NO. SPECIFICATION DATE MODE NOTES

- : Cambium Networks, Inc.
- : C036045C008A
- : 0A003E431A31
- : FCC 96.41(f) Reception Limits
- : September 28, 2018
- : Transmit at 3565MHz Channel A
- : Applied Interferring Signal at the EUT



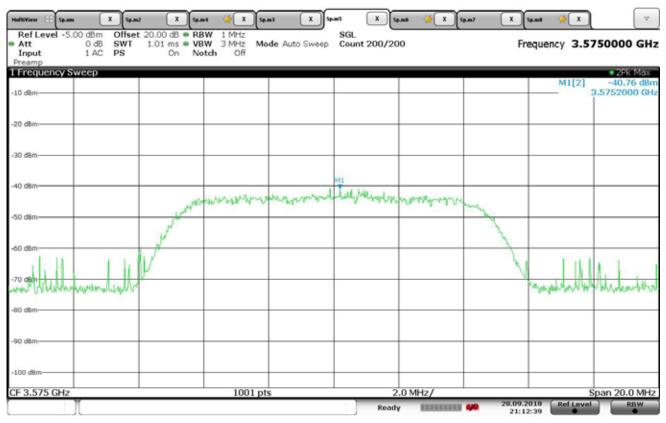
Date: 28.SEP.2018 21:15:23

Checked BY RICHARD & King :



MANUFACTURER PART NO. SERIAL NO. SPECIFICATION DATE MODE NOTES

- : Cambium Networks, Inc.
- : C036045C008A
- : 0A003E431A31
- : FCC 96.41(f) Reception Limits
- : September 28, 2018
- : Transmit at 3575MHz Channel A
- : Applied Interferring Signal at the EUT



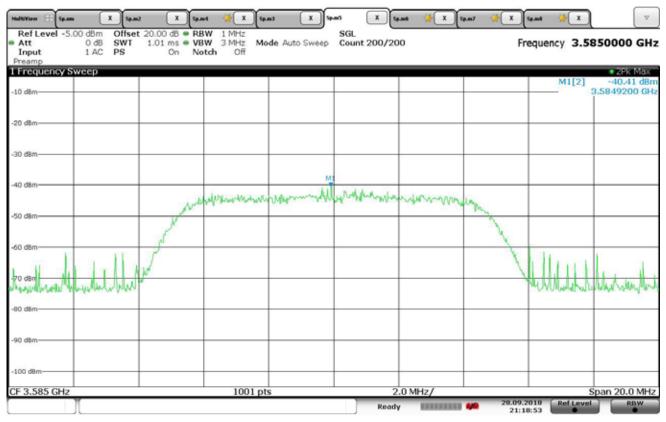
Date: 28.SEP.2018 21:12:39

Checked BY RICHARD & King



MANUFACTURER PART NO. SERIAL NO. SPECIFICATION DATE MODE NOTES

- : Cambium Networks, Inc.
- : C036045C008A
- : 0A003E431A31
- : FCC 96.41(f) Reception Limits
- : September 28, 2018
- : Transmit at 3575MHz Channel A
- : Applied Interferring Signal at the EUT



Date: 28.SEP.2018 21:18:54

Checked BY RICHARD E. King :



MANUFACTURER PART NO. SERIAL NO. SPECIFICATION DATE NOTES : Cambium Networks, Inc. : C036045C008A : 0A003E431A31 : FCC 96.41(f) Reception Limits : September 28, 2018 :

		Applied Interfering	Link Throughput Test Before applied interfering signal (%)		Link Throughput Test after applied interfering signal (%)		Reception Limit
Frequency (MHZ)	Antenna Port	Signal (dBm)	Downlink Efficiency	Uplink Efficiency	Downlink Efficiency	Uplink Efficiency	(dBm)
3565	А	-40.00	99	99	98	99	-40
3565	А	-40.00	99	99	98	99	-40
3685	А	-40.00	99	99	98	99	-40

Checked BY RICHARD E. King :