



FCC RADIO EXPOSURE TEST REPORT

FCC ID : Z8H89FT0058

Equipment : Wireless Access Point

Brand Name : Cambium Networks

Model Name : REG-XV3-8

Applicant : Cambium Networks Inc.
3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA

Manufacturer : Cambium Networks, Ltd.
Ashburton, TQ13 7UP, UK

Standard : 47 CFR Part 2.1091

The product was received on Sep. 23, 2019, and testing was started from Sep. 26, 2019 and completed on Feb. 07, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.


Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
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Report Template No.: CB-A1_1 Ver1.0



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Cindy Peng



1 General Description

1.1 EUT General Information

<DBS mode>

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

<SBS mode>

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

<Scan Radio>

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

**<Bluetooth Radio>**

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
Bluetooth	2400-2483.5	2402-2480	LE: GFSK

1.2 Testing Location

Testing Location		
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 31 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

<DBS mode>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	9.25	24.28	33.53	0.50	34.03	2.52930	31	0.20944	1.00000
5.2G;D1D	11.66	24.29	35.95	0.04	35.99	3.97192	31	0.32889	1.00000
5.8G;D1D	11.41	24.54	35.95	0.04	35.99	3.97192	31	0.32889	1.00000

<SBS mode>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
5.2G;D1D	9.58	25.69	35.27	0.50	35.77	3.77572	31	0.31265	1.00000
5.8G;D1D	8.79	27.02	35.81	0.18	35.99	3.97192	31	0.32889	1.00000

<Scan Radio>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	5.08	25.32	30.40	0.50	30.90	1.23027	31	0.10187	1.00000
5.2G;D1D	6.27	19.96	26.23	0.50	26.73	0.47098	31	0.03900	1.00000
5.8G;D1D	6.27	19.32	25.59	0.50	26.09	0.40644	31	0.03366	1.00000

<Bluetooth Radio>

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;BT-LE	4.90	8.29	13.19	0.50	13.69	0.02339	31	0.00194	1.00000

**Simultaneous Transmission Analysis Mode:****1. DBS Mode (2.4GHz) + DBS Mode (5GHz) + Scan Radio (2.4GHz) + Bluetooth Radio**

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	9.25	24.28	33.53	0.50	34.03	2.52930	31	0.20944	1.00000	0.20944
5.8G;D1D	11.41	24.54	35.95	0.04	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D	5.08	25.32	30.40	0.50	30.90	1.23027	31	0.10187	1.00000	0.10187
2.4G;BT-LE	4.90	8.29	13.19	0.50	13.69	0.02339	31	0.00194	1.00000	0.00194
									Sum Ratio	0.64214
									Ratio Limit	1

2. DBS Mode (2.4GHz) + DBS Mode (5GHz) + Scan Radio (5GHz) + Bluetooth Radio

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	9.25	24.28	33.53	0.50	34.03	2.52930	31	0.20944	1.00000	0.20944
5.8G;D1D	11.41	24.54	35.95	0.04	35.99	3.97192	31	0.32889	1.00000	0.32889
5.2G;D1D	6.27	19.96	26.23	0.50	26.73	0.47098	31	0.03900	1.00000	0.03900
2.4G;BT-LE	4.90	8.29	13.19	0.50	13.69	0.02339	31	0.00194	1.00000	0.00194
									Sum Ratio	0.57927
									Ratio Limit	1

3. SBS Mode (5GHz low band) + SBS Mode (5GHz high band) + DBS Mode (2.4GHz) + Scan Radio (2.4GHz) + Bluetooth Radio

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
5.2G;D1D	9.58	25.69	35.27	0.50	35.77	3.77572	31	0.31265	1.00000	0.31265
5.8G;D1D	8.79	27.02	35.81	0.18	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D	9.25	24.28	33.53	0.50	34.03	2.52930	31	0.20944	1.00000	0.20944
2.4G;D1D	5.08	25.32	30.40	0.50	30.90	1.23027	31	0.10187	1.00000	0.10187
2.4G;BT-LE	4.90	8.29	13.19	0.50	13.69	0.02339	31	0.00194	1.00000	0.00194
									Sum Ratio	0.95479
									Ratio Limit	1

4. SBS Mode (5GHz low band) + SBS Mode (5GHz high band) + DBS Mode (2.4GHz) + Scan Radio (5GHz) + Bluetooth Radio

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
5.2G;D1D	9.58	25.69	35.27	0.50	35.77	3.77572	31	0.31265	1.00000	0.31265
5.8G;D1D	8.79	27.02	35.81	0.18	35.99	3.97192	31	0.32889	1.00000	0.32889
2.4G;D1D	9.25	24.28	33.53	0.50	34.03	2.52930	31	0.20944	1.00000	0.20944
5.2G;D1D	6.27	19.96	26.23	0.50	26.73	0.47098	31	0.03900	1.00000	0.03900
2.4G;BT-LE	4.90	8.29	13.19	0.50	13.69	0.02339	31	0.00194	1.00000	0.00194
									Sum Ratio	0.89192
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

THE END