

Radio Exposure Evaluation Report

FCC ID : Q6G-AP340
Equipment : Access Point
Brand Name : WatchGuard
Model Name : AP340, AP140
Applicant : WatchGuard Technologies, Inc.
255 S. King Street, Suite 1100 Seattle,
WA 98104, USA
Manufacturer : WatchGuard Technologies, Inc.
255 S. King Street, Suite 1100 Seattle,
WA 98104, USA
Standard : 47 CFR FCC Part 2 Subpart J, section 2.1091

The product was received on Feb. 24, 2025, and testing was started from Mar. 20, 2025 and completed on Apr. 15, 2025. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR FCC Part 2 Subpart J, section 2.1091 and shown compliance with the applicable technical standards.

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


Approved by: Jackson Tsai

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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:

None

Reviewed by: Barry Hsiao

Report Producer: Michelle Tsai

1 General Description

1.1 Information

Radio 3 (Scan radio) is only RX function.

1.1.1 EUT General Information

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) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5720 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
6GHz WLAN	5925-7125	5955-7115	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)

**1.1.2 Antenna Information****Model Name : AP140**

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Radio
1	Enrack	7102A1222000	PIFA	I-Pex	2.4G	Radio 1
2	Enrack	7102A1223000	PIFA	I-Pex	2.4G	
3	Enrack	7102A1224000	PIFA	I-Pex	5G	Radio 2
4	Enrack	7102A1225000	PIFA	I-Pex	5G	
5	AWAN	7102A0952000	Alford Loop	I-Pex	6G	
6	AWAN	7102A0951000	Alford Loop	I-Pex	6G	

Ant.	Port	Gain (dBi)		
		2.4G	5G	6G
1	1	4.4	-	-
2	2	4.0	-	-
3	1	-	5.6	-
4	2	-	4.6	-
5	1	-	-	5.0
6	2	-	-	5.5

Model Name : AP340

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Radio
1	Enrack	7102A1222000	PIFA	I-Pex	2.4G	Radio 1
2	Enrack	7102A1223000	PIFA	I-Pex	2.4G	
3	Enrack	7102A1224000	PIFA	I-Pex	5G	Radio 2
4	Enrack	7102A1225000	PIFA	I-Pex	5G	
5	AWAN	7102A0952000	Alford Loop	I-Pex	6G	
6	AWAN	7102A0951000	Alford Loop	I-Pex	6G	
7	Enrack	7102A1355000	PIFA	I-Pex	2.4G/5G/6G	Scan Radio 3 (RX)
8	Enrack	7102A1356000	PIFA	I-Pex	2.4G/5G/6G	

Ant.	Port	Gain (dBi)		
		2.4G	5G	6G
1	1	4.4	-	-
2	2	4.4	-	-
3	1	-	5.6	-
4	2	-	5.1	-
5	1	-	-	5.0
6	2	-	-	5.5
7	1	4.2	5.2	5.3
8	2	4.2	5.1	4.9

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax/be mode (2TX/2RX) < **Radio 1** >

Ant. 1 (port 1) and Ant. 2 (port 2) could receive simultaneously.

For IEEE 802.11 b/g/n/VHT/ax mode (2RX) < **Radio 3** >

Ant. 7 (port 1) and Ant. 8 (port 2) could receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax/be mode(2TX/2RX) < **Radio 2** >

Ant. 3 (port 1) and Ant. 4 (port 2) could receive simultaneously.

For IEEE 802.11 a/n/ac/ax mode (2RX) < **Radio 3** >

Ant. 7 (port 1) and Ant. 8 (port 2) could receive simultaneously.

For 6GHz function:

For IEEE 802.11 ax/be mode(2TX/2RX) < **Radio 2** >

Ant. 5 (port 1) and Ant. 6 (port 2) could receive simultaneously.

For IEEE 802.11 ax mode (2RX) < **Radio 3** >

Ant. 7 (port 1) and Ant. 8 (port 2) could receive simultaneously.

Note 1: Directional gain information

	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

1.1.3 Table for Multiple Listing

Model Name	Description
AP340	The difference between AP340 and 140 is that AP340 have a RX scanning radio.
AP140	

Note: The model AP340 was measured during the test.

1.2 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR FCC Part 2 Subpart J, section 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310

1.3 Testing Location

Test Lab. : Sporton International Inc. Hsinhua Laboratory		
☒	Hsinhua	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)
	(TAF: 3785)	TEL: 886-3-327-3456 FAX: 886-3-327-0973
Test site Designation No. TW3785 with FCC.		
☐	Wen 33rd.St.	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)
	(TAF: 3785)	TEL: 886-3-318-0787 FAX: 886-3-318-0287
Test site Designation No. TW0008 with FCC.		

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 ²)*	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 ²)*	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

Multiple Transmitters Condition

Co-location as simultaneously transmitting (co-transmitting) and the evaluation shall be consider that simultaneous transmissions from co-located devices the individual transmitters are evaluated separately. After sum of the individual value (basic restriction / reference level) are measured/calculated also have to under basic restriction / reference level.

Co-transmitting mode:

1. Radio 1(2.4G) + Radio 2(5G) + Radio 2(6G)

2.2 RF Exposure Exempt Measurement

Option	Refer Std.	Exemption Exposure Thresholds (TL)
A	§1.1307(b)(3)(i)(A)	Available maximum time-averaged power is no more than 1 mW
B	§1.1307(b)(3)(i)(B)	$P_{th}(mW) = \begin{cases} ERP_{20cm} (d / 20cm)^x \rightarrow d \leq 20cm \\ ERP_{20cm} \rightarrow 20cm < d \leq 40cm \end{cases}$ $x = -\log_{10} \left(\frac{60}{ERP_{20cm} \sqrt{f}} \right) \text{ and } f \text{ is in GHz}$ $\begin{cases} ERP_{20cm} : 0.3GHz \leq f < 1.5GHz \rightarrow 2040f(mW) \\ ERP_{20cm} : 1.5GHz \leq f \leq 6GHz \rightarrow 3060(mW) \end{cases}$
C	§1.1307(b)(3)(i)(C)	$\begin{cases} 0.3 \sim 1.34MHz \rightarrow ERP(W) = 1920R^2 \\ 1.34 \sim 30MHz \rightarrow ERP(W) = 3450R^2 / f^2 \\ 30 \sim 300MHz \rightarrow ERP(W) = 3.83R^2 \\ 300 \sim 1500MHz \rightarrow ERP(W) = 0.0128R^2 f \\ 1500 \sim 100000MHz \rightarrow ERP(W) = 19.2R^2 \end{cases}$ f is in MHz; R is in m; $R > \lambda / 2\pi$

2.3 Multiple RF Sources Exposure

Refer Std.	Exemption Exposure Thresholds (TL)
§1.1307(b)(3)(ii)(A)	The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required)
§1.1307(b)(3)(ii)(B)	$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{ExposureLimit_k} \leq 1$ a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(B) of this section for P , including existing exempt transmitters and those being added. b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added. c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters. P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive). P_{th,i} = the exemption threshold power (P_{th}) according to paragraph §1.1307(b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i. ERP_j = the ERP of fixed, mobile, or portable RF source j. ERP_{th,j} = exemption threshold ERP for fixed, mobile, or portable RF source j, at a distance of at least λ/2π according to the applicable formula of paragraph §1.1307(b)(3)(i)(C) of this section. Evaluated_k = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure. Evaluated Limit_k = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k, as applicable from § 1.1310 of this chapter.



2.4 MPE Calculation Method

The MPE was calculated at 41 cm to show compliance with the power density limit.
The following formula was used to calculate the Power Density:

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

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

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



2.5 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Non-Beamforming

2.4GHz WLAN

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	4.40	27.18	29.43	0.50	984.011	41	C	3227.6	0.3050
2.4G;D1D	4.40	24.89	27.14	0.50	580.764	41	C	3227.6	0.1800

5GHz WLAN

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
5.2G;D1D	5.60	24.50	27.95	0.50	699.842	41	C	3227.6	0.2169
5.3G;D1D	5.60	23.87	27.32	0.50	605.341	41	C	3227.6	0.1876
5.6G;D1D	5.60	23.87	27.32	0.50	605.341	41	C	3227.6	0.1876
5.8G;D1D	5.60	25.50	28.95	0.50	881.049	41	C	3227.6	0.2731

6GHz WLAN

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
6.2G;D1D	-	-	23.85	0.50	272.270	41	C	3227.6	0.0844
6.4G;D1D	-	-	25.01	0.50	355.631	41	C	3227.6	0.1102
6.7G;D1D	-	-	26.03	0.50	449.780	41	C	3227.6	0.1394
7.0G;D1D	-	-	22.00	0.50	177.828	41	C	3227.6	0.0551

**Beamforming****2.4GHz WLAN**

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	7.41	24.41	29.67	0.50	1039.920	41	C	3227.6	0.3223

5GHz WLAN

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
5.2G;D1D	8.36	24.50	30.71	0.50	1321.296	41	C	3227.6	0.4095
5.3G;D1D	8.36	20.98	27.19	0.50	587.489	41	C	3227.6	0.1821
5.6G;D1D	8.36	21.13	27.34	0.50	608.135	41	C	3227.6	0.1885
5.8G;D1D	8.36	25.50	31.71	0.50	1663.413	41	C	3227.6	0.5156

6GHz WLAN

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
6.2G;D1D	-	-	23.29	0.50	239.332	41	C	3227.6	0.0742
6.4G;D1D	-	-	24.00	0.50	281.838	41	C	3227.6	0.0874
6.7G;D1D	-	-	23.84	0.50	271.644	41	C	3227.6	0.0842
7.0G;D1D	-	-	23.04	0.50	225.944	41	C	3227.6	0.0700

Note 1: Option A, B and C refer as clause 2.2

Note 2: For option B, Pth(mW) convert to TL ERP(mW); For option C, ERP(W) convert to TL ERP(mW)

Note 3: TL Ratio=Tune-up ERP(mW)/TL ERP(mW)

Simultaneous Transmission Analysis Mode:

Radio 1(2.4G) + Radio 2(5G) + Radio 2(6G)

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;D1D	7.41	24.41	29.67	0.50	1039.920	41	C	3227.6	0.3223
5.8G;D1D	8.36	25.50	31.71	0.50	1663.413	41	C	3227.6	0.5156
6.7G;D1D	-	-	26.03	0.50	449.780	41	C	3227.6	0.1394
Sum TL Ratio_C	0.9773								
Ratio Limit	1								

Note 1: Option A, B and C refer as clause 2.2

Note 2: For option B, Pth(mW) convert to TL ERP(mW); For option C, ERP(W) convert to TL ERP(mW)

Note 3: TL Ratio=Tune-up ERP(mW)/TL ERP(mW)

Note 4: Refer as clause 2.3 Multiple RF Sources Exposure. Please follow below option and sum TL ration table.

Option	Sum TL Ratio_B	Option	Sum TL Ratio_C	Option	Sum TL Ratio_E
B	$\sum_{i=1}^a \frac{P_i}{P_{th,i}}$	C	$\sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}}$	E	$\sum_{k=1}^c \frac{Evaluated_k}{ExposureLimit_k}$

Note: The above antenna gain was declared by manufacturer.

————THE END————