

LP0002: 2011**TEST REPORT****For****無線接入器 / 802.11ac Dual Band PoE Access Point****Model / Trade Name:**

Model No.	Trade name
C-100	WatchGuard
AP125	WatchGuard

Issued to

鎮陞科技股份有限公司
臺中市南區忠明南路 760 號 14 樓

*Issued by***Compliance Certification Services Inc.**

**No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)**

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Testing Laboratory
1309

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
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1 Test Result Certification

Applicant: 鎮陞科技股份有限公司
臺中市南區忠明南路 760 號 14 樓

Equipment Under Test: 無線接入器 / 802.11ac Dual Band PoE Access Point

Model Name / Trade Name:

Model No.	Brand name
C-100	WatchGuard
AP125	WatchGuard

APPLICABLE STANDARDS	
STANDARD	RESULT
LP0002: 2011	PASS

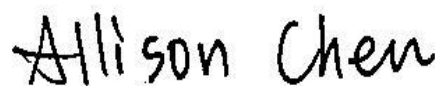
The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in LP0002. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:



Sam Chuang
Manager

Prepared by:



Allison Chen
Report coordinator

2 EUT Description

Product	無線接入器 / 802.11ac Dual Band PoE Access Point		
Model Name / Trade Name:	Model No.	Brand name	
	C-100	WatchGuard	
	AP125	WatchGuard	
Frequency Range	Bluetooth: 2402 ~ 2480 (MHz) 2.4GHz WLAN: 2412 ~ 2472 (MHz) 5GHz WLAN: 5150 ~ 5350 (MHz) 5470 ~ 5850 (MHz)		
Transmit Power (mean Avg. burst power)	Bluetooth: 5.07 dBm (3.214 mW) 2.4GHz WLAN 24.63 dBm (290.402 mW) 5GHz WLAN 25.60 dBm (363.078 mW)		
Antenna gain (G)	BT: PIFA Antenna / Gain: 2.6 dBi 2.4GHz: PIFA Antenna Ant1: Gain: 4.7 dBi Ant2: Gain: 3.3 dBi 5GHz: PIFA Antenna Ant1: Gain: 5.1dBi Ant2: Gain: 5.0 dBi Bluetooth: 2.60 dBi (Numeric gain: 1.82) worst 2.4GHz 4.70 dBi (Numeric gain: 2.95) worst 5GHz 5.10 dBi (Numeric gain: 3.24) worst		

Remark: 1. for more details, please refer to the User's manual of the EUT.

3 Facilities and Accreditations

3.1. Facilities

All measurement facilities used to collect the measurement data are located at

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Dist, New Taipei City 24891, Taiwan (R.O.C.)

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☐ No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, Taiwan, R.O.C.

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

3.2. Equipment

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

3.3. Laboratory Accreditations and Listings

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200600-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: 93105 and 90471).

4 LP0002 Requirement

4.1. Limit

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the following limits.

Limits for Occupational / Controller 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

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

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

4.2. Human Exposure Assessment

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

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

Changing to units of mW and cm, using:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P / 1000) \times G}{377 \times (d / 100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \textbf{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Maximum Permissible Exposure

Substituting the MPE safe distance using $d = 20$ cm into Equation 1:

$$S = 0.000199 \times P \times G$$

Where P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

Bluetooth :

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
39	2441	3.214	1.82	20	0.0012	1

2.4GHz WLAN:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
1	2412	290.402	2.95	20	0.1705	1

5GHz WLAN:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
48	5240	363.078	3.24	20	0.2341	1