

# RF EXPOSURE REPORT

**REPORT NO.:** SA140717E01

MODEL NO.: C-65

FCC ID: TOR-C-65

RECEIVED: July 17, 2014

**TESTED:** Aug. 08, 2014

**ISSUED:** Aug. 25, 2014

**APPLICANT:** AirTight Networks Inc.

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ISSUED BY: Bureau Veritas Consumer Products Services

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# **RELEASE CONTROL RECORD**

ISSUE NO. REASON FOR CHANGE		DATE ISSUED
SA140717E01	Original release	Aug. 25, 2014

Report No.: SA140717E01 3 of 10 Report Format Version 5.0.1



#### 1. CERTIFICATION

PRODUCT: Access Point / Sensor

**BRAND NAME:** AirTight

MODEL NO.: C-65

TEST SAMPLE: ENGINEERING SAMPLE

**APPLICANT:** AirTight Networks Inc.

**TESTED DATE:** Aug. 08, 2014

**STANDARDS:** FCC Part 2 (Section 2.1091)

KDB 447498 D03

**IEEE C95.1** 

The above equipment (Model: C-65) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : , DATE: Aug. 25, 2014

(Elsie Hsu, Specialist)

(May Chen, Manager)



#### 2. RF EXPOSURE LIMIT

# LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	POWER DENSITY (mW/cm²)	AVERAGE TIME (minutes)					
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE								
300-1500			F/1500	30				
1500-100,000			1.0	30				

F = Frequency in MHz

#### 3. MPE CALCULATION FORMULA

 $Pd = (Pout*G) / (4*pi*r^2)$ 

where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

pi = 3.1416

r = distance between observation point and center of the radiator in cm

#### 4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.



# 5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

	The antennas provided to the EOT, please feler to the following table.									
	For 2.4G WLAN used									
Ant. No.	Transmitter Circuit	Brand	Part No.	Antenna Gain(dBi) <including cable="" loss=""></including>	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type	Cable Length (mm)		
1	Chain (0)	LYNwave	ALA140-05102A-000000	4.42	2412~2483	PCB-Dipole	IPEX	85		
2	Chain (1)	LIINWave	ALA140-05102A-000001	4.39	2412~2403	г СБ-Біроіе	II LX	170		
			For 5G	WLAN use	d					
Ant. No.	Transmitter Circuit	Brand	Part No.	Antenna Gain(dBi) <including cable loss&gt;</including 	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type	Cable Length (mm)		
1	Chain (0)	LYNwave	ALA140-091025-000000	4.39	5150 5925	DCB Dinala	IPEX	70		
2	Chain (1)	Linwave	ALA140-091025-000001	4.84	5150~5825	)~5825 PCB-Dipole		160		



### 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

# For 15.247 (2.4GHz)

#### 802.11b

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
2412 - 2462	292.634	7.42	20	0.32141	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.42 dBi$ .

#### 802.11g

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
2412 - 2462	347.353	7.42	20	0.38150	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.42 dBi$ .

### 802.11n (HT20)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
2412 - 2462	227.854	7.42	20	0.25026	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.42 dBi$ .

### 802.11n (HT40)

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
2422 - 2452	109.794	7.42	20	0.12059	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.42 dBi$ .



# For 15.247 (5GHz)

#### 802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
5745 - 5825	397.228	7.63	20	0.45790	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .

# 802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
5745 - 5825	396.343	7.63	20	0.45688	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .

#### 802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm²)
5755 - 5795	532.978	7.63	20	0.61438	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .

#### 802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
5775	97.373	7.63	20	0.11225	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .



# For 15.407 (5GHz)

#### 802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
5180 - 5240	31.863	7.63	20	0.03673	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .

# 802.11ac (VHT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
5180 - 5240	30.61	7.63	20	0.03529	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .

# 802.11ac (VHT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm <sup>2</sup> )	LIMIT (mW/cm²)
5190 - 5230	46.944	7.63	20	0.05411	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .

# 802.11ac (VHT80)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm²)	LIMIT (mW/cm²)
5210	44.373	7.63	20	0.05115	1.00

**NOTE:** Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 7.63 dBi$ .



#### **CONCLUSION:**

Both of the 2.4GHz and 5GHz WLAN can transmit simultaneously, the formula of calculated the MPE is:

CPD<sub>1</sub> / LPD<sub>1</sub> + CPD<sub>2</sub> / LPD<sub>2</sub> + .....etc. < 1 CPD = Calculation power density LPD = Limit of power density

Therefore, the worst-case situation is 0.38150 / 1 + 0.61438 / 1 = 0.996, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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