

RF EXPOSURE REPORT

REPORT NO.: SA140402E02 R1

MODEL NO.: ECWO5320, ECWO5320-L, ECWO5320-C,
ECWO5324, ECWO5324-L, ECWO5324-C

FCC ID: YZKECWO5320

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ISSUED: May 30, 2014

APPLICANT: Edgecore Networks Corporation.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA140402E02	Original release	May 14, 2014
SA140402E02 R1	Modified the product name	May 30, 2014

1. CERTIFICATION

PRODUCT: 802.11ac Outdoor Dual Band Access Point

BRAND NAME: Edge-corE

MODEL NO.: ECWO5320, ECWO5320-L, ECWO5320-C,
ECWO5324, ECWO5324-L, ECWO5324-C

TEST SAMPLE: ENGINEERING SAMPLE

APPLICANT: Edgecore Networks Corporation.

TESTED DATE: Apr. 08 to 10, 2014

STANDARDS: FCC Part 2 (Section 2.1091)
FCC OET Bulletin 65, Supplement C (01-01)
IEEE C95.1

The above equipment (Model: ECWO5320, ECWO5324) have 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 : Midoli Peng , **DATE:** May 30, 2014
(Midoli Peng, Specialist)

APPROVED BY : May Chen , **DATE:** May 30, 2014
(May Chen, Manager)

2. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm ²)	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

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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

External antenna								
Transmitter Circuit	Antenna Type	Connector Type	Antenna Gain(dBi) < excluding cable loss>	Inside EUT		Outside EUT		Frequency range (MHz to MHz)
				Cable Loss (dB)	Cable Length (mm)	Cable Loss (dB)	Cable Length (mm)	
Chain (0)	Dipole	RP-SMA	2.65	1	250	1.5	500	2400~2500
			2.7	1.2	250	2.9	500	5150~5850
Chain (1)	Dipole	RP-SMA	2.65	1	250	1.5	500	2400~2500
			2.7	1.2	250	2.9	500	5150~5850
Internal antenna								
Transmitter Circuit	Antenna Type		Connector Type	Antenna Gain(dBi)		Frequency range (MHz to MHz)		
Chain (0)	Patch Array		MMCX	12.5		5150~5850		
Chain (1)	Patch Array		MMCX	12.5		5150~5850		

※For 802.11a/b/g mode will fix transmission on Chain (0)

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For WLAN: 15.247(2.4GHz)

802.11b

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412 - 2462	137.404	0.15	20	0.02830	1.00

802.11g

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412 - 2462	146.893	0.15	20	0.03025	1.00

802.11n (HT20), 1Tx

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412 - 2462	148.594	0.15	20	0.03060	1.00

802.11n (HT40), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2422 - 2452	102.802	0.15	20	0.02117	1.00

802.11n (HT20), 2Tx

FREQUENCY BAND (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412 - 2462	222.389	0.15	20	0.04580	1.00

802.11n (HT40), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2422 - 2452	260.942	0.15	20	0.05374	1.00

For WLAN: 15.247(5GHz)

With External antenna

802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 - 5825	253.513	-1.4	20	0.03654	1.00

802.11ac (VHT20), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 - 5825	253.513	-1.4	20	0.03654	1.00

802.11ac (VHT40), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5755 - 5795	251.768	-1.4	20	0.03629	1.00

802.11ac (VHT80), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5775	153.109	-1.4	20	0.02207	1.00

802.11ac (VHT20), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 - 5825	224.946	-1.4	20	0.03530	1.00

802.11ac (VHT40), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5755 - 5795	200.708	-1.4	20	0.02893	1.00

802.11ac (VHT80), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5775	192.573	-1.4	20	0.02775	1.00

For WLAN: 15.247(5GHz)

With Internal antenna

802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 - 5825	138.995	12.5	20	0.49173	1.00

802.11ac (VHT20), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 - 5825	211.349	12.5	20	0.74770	1.00

802.11ac (VHT40), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5755 - 5795	208.449	12.5	20	0.73744	1.00

802.11ac (VHT80), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5775	153.109	12.5	20	0.54166	1.00

802.11ac (VHT20), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 - 5825	217.548	12.5	20	0.76963	1.00

802.11ac (VHT40), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5755 - 5795	200.708	12.5	20	0.71006	1.00

802.11ac (VHT80), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5775	192.573	12.5	20	0.68128	1.00

For WLAN: 15.407
With External antenna
802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 - 5240	46.026	-1.4	20	0.00663	1.00

802.11ac (VHT20), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 - 5240	45.082	-1.4	20	0.00650	1.00

802.11ac (VHT40), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 - 5230	49.091	-1.4	20	0.00708	1.00

802.11ac (VHT80), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	49.091	-1.4	20	0.00708	1.00

802.11ac (VHT20), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 - 5240	45.450	-1.4	20	0.00655	1.00

802.11ac (VHT40), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 - 5230	49.095	-1.4	20	0.00708	1.00

802.11ac (VHT80), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	46.776	-1.4	20	0.00674	1.00

For WLAN: 15.407
With Internal antenna
802.11a

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 - 5240	10.423	12.5	20	0.03687	1.00

802.11ac (VHT20), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 - 5240	10.351	12.5	20	0.03662	1.00

802.11ac (VHT40), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 - 5230	10.447	12.5	20	0.03696	1.00

802.11ac (VHT80), 1Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	10.889	12.5	20	0.03852	1.00

802.11ac (VHT20), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180 - 5240	10.175	12.5	20	0.03600	1.00

802.11ac (VHT40), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5190 - 5230	11.048	12.5	20	0.03909	1.00

802.11ac (VHT80), 2Tx

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5210	10.896	12.5	20	0.03855	1.00

CONCLUSION:

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

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.05374 / 1 + 0.76963 / 1 = 0.823$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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