



RF EXPOSURE REPORT

REPORT NO.: SA120525E03

MODEL NO.: EA6500

FCC ID: Q87-EA6500

RECEIVED: May 25, 2012

TESTED: June 01 to 15, 2012

ISSUED: June 29, 2012

APPLICANT: Cisco Consumer Products LLC

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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
SA120525E03	Original release	June 29, 2012



1. CERTIFICATION

PRODUCT: Linksys EA6500 Dual-Band AC Router with Gigabit and 2xUSB

BRAND NAME: Cisco

MODEL NO.: EA6500

TEST SAMPLE: ENGINEERING SAMPLE

APPLICANT: Cisco Consumer Products LLC

TESTED: June 01 to 15, 2012

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

The above equipment (Model: EA6500) 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:** June 29, 2012
(Elsie Hsu, Specialist)

APPROVED BY :  , **DATE:** June 29, 2012
(May Chen, Deputy 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

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

For 2.4GHz				
Transmitter Circuit	Brand	Model	Antenna Type	Peak Gain (dBi)
Chain (0)	Galtronics	.02102142-05167-4	Dipole	2.88(V)
Chain (1)		02102142-05167-1	Dipole	2.65(V)
Chain (2)		02102142-04610-4	Dipole	3.84(H)
For 5GHz				
Chain (0)	Galtronics	02100073-05167-1	Dipole	4.53(V)
Chain (1)		02100073-05167-2	Dipole	4.98(V)
Chain (2)		02102073-04610-4	Dipole	4.10(H)

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247(2.4GHz):

802.11b:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412-2462	413.029	5.78	20	0.31096	1.00

Directional gain = $10 \log[(10^{G_1(\text{Chain}0)/20} + 10^{G_2(\text{Chain}1)/20})^2 / 2]$

Effective Legacy Gain (dBi) = 5.78

The effective legacy gain is 5.78 dBi, therefore the limit doesn't reduce.

802.11g:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412-2462	423.261	5.78	20	0.31867	1.00

Directional gain = $10 \log[(10^{G_1(\text{Chain}0)/20} + 10^{G_2(\text{Chain}1)/20})^2 / 2]$

Effective Legacy Gain (dBi) = 5.78

The effective legacy gain is 5.78 dBi, therefore therefore the limit doesn't reduce.

802.11n(20MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412-2462	416.703	3.84	20	0.20070	1.00

802.11n(40MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2422-2452	73.250	3.84	20	0.03528	1.00

For 15.247(5GHz):

802.11a:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	412.248	7.77	20	0.49078	1.00

$$\text{Directional gain} = 10 \log[(10^{G1(\text{Chain0})/20} + 10^{G2(\text{Chain1})/20})^2 / 2]$$

Effective Legacy Gain (dBi) = 7.77

The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

802.11ac (BW20):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	429.335	4.98	20	0.26886	1.00

802.11ac (BW40):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5755 ~ 5795	417.701	4.98	20	0.26157	1.00

802.11ac (BW80):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5775	415.723	4.98	20	0.26034	1.00

For 15.407(5GHz):
802.11a:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	18.131	7.77	20	0.02158	1.00

$$\text{Directional gain} = 10 \log[(10^{G1(\text{Chain0})/20} + 10^{G2(\text{Chain1})/20})^2 / 2]$$

Effective Legacy Gain (dBi) = 7.77

The effective legacy gain is 7.77dBi, therefore the limit needs to reduce.

802.11ac (BW20):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5180 ~ 5240	29.637	4.98	20	0.01856	1.00

802.11ac (BW40):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5190 ~ 5230	33.342	4.98	20	0.02088	1.00

802.11ac (BW80):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5210	17.809	4.98	20	0.01115	1.00

CONCLUSION:

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

$$\text{CPD}_1 / \text{LPD}_1 + \text{CPD}_2 / \text{LPD}_2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.31867 / 1 + 0.49078 / 1 + 0.02158 / 1 = 0.831$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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