# 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 |
| **ADDRESS:** | 121 Theory Drive Irvine, CA 92617(USA) |
| **ISSUED BY:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory |
| **LAB ADDRESS:** | No. 81-1, Lu Liao Keng, 9th Ling,Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C. |

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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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

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

where

Pd = power density in mW/cm2

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:

| 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[($10^{G1(Chain0)/20}$ + $10^{G2(Chain1)/20}$ )$^2$ / 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[($10^{G1(Chain0)/20}$ + $10^{G2(Chain1)/20}$ )$^2$ / 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 |

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

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

**$CPD_1 / LPD_1 + CPD_2 / LPD_2$ + ……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.

**--- END ---**