



# RF EXPOSURE REPORT

**REPORT NO.:** SA120927E07

**MODEL NO.:** X3500

**FCC ID:** Q87-X3500

**RECEIVED:** Sep. 27, 2012

**TESTED:** Oct. 15, 2012

**ISSUED:** Oct. 26, 2012

**APPLICANT:** Cisco Consumer Products, LLC

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**ISSUED BY:** Bureau Veritas Consumer Products Services  
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## TABLE OF CONTENTS

RELEASE CONTROL RECORD.....	3
1. CERTIFICATION.....	4
2. RF EXPOSURE LIMIT .....	5
3. MPE CALCULATION FORMULA.....	5
4. CLASSIFICATION.....	5
5. ANTENNA GAIN .....	6
6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER .....	7



## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA120927E07	Original release	Oct. 26, 2012



## 1. CERTIFICATION

**PRODUCT:** Linksys X3500 Advanced Wireless-N ADSL2+ Modem Router

**BRAND NAME:** Cisco

**MODEL NO.:** X3500

**TEST SAMPLE:** ENGINEERING SAMPLE

**APPLICANT:** Cisco Consumer Products, LLC

**TESTED DATE:** Oct. 15, 2012

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

The above equipment (Model: X3500 ) 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:** Oct. 26, 2012  
( Claire Kuan, Specialist )

**APPROVED BY :**  , **DATE:** Oct. 26, 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 <sup>2</sup> )	AVERAGE TIME (minutes)
<b>LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE</b>				
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/cm<sup>2</sup>

$P_{out}$  = 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

2.4GHz				
Transmitter Circuit	Antenna Type	Antenna Gain (dBi)	Connector	Frequency range (MHz to MHz)
Chain (0)	PIFA	2.3	NA	2400~2500
Chain (1)	PIFA	4.6		
5GHz				
Transmitter Circuit	Antenna Type	Antenna Gain (dBi)	Connector	Frequency range (MHz to MHz)
Chain (0)	PIFA	5.5	I-PEX	5180~5825
Chain (1)	PIFA	5		
Chain (2)	PIFA	4.9		

## 6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

### For 15.247(2.4GHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
2412-2462	333.022	4.60	20	0.19107	1

### For 15.247(5GHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5745 ~ 5825	379.345	5.50	20	0.26777	1

### For 15.407(5GHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm <sup>2</sup> )	LIMIT (mW/cm <sup>2</sup> )
5180 ~ 5240	46.595	5.50	20	0.03289	1

### CONCLUSION:

Both of the 2.4GHz and 5GHz WLAN 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  $0.19107 / 1 + 0.26777 / 1 = 0.45884$ , which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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