

## RF Exposure Report

**Report No.:** SA160725C02

**FCC ID:** UDX-60052010

**Test Model:** MR33-HW

**Received Date:** Jul. 25, 2016

**Test Date:** Jul. 25 ~ Aug. 31, 2016

**Issued Date:** Sep. 09, 2016

**Applicant:** Cisco Systems, Inc.

**Address:** 170 West Tasman Drive, San Jose, CA 95134

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)



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### Release Control Record

Issue No.	Description	Date Issued
SA160725C02	Original release	Sep. 09, 2016

## 1 Certificate of Conformity

**Product:** Wireless 802.11 abgn/ac indoor AP

**Brand:** Cisco

**Test Model:** MR33-HW

**Sample Status:** Engineering sample

**Applicant:** Cisco Systems, Inc.

**Test Date:** Jul. 25 ~ Aug. 31, 2016

**Standards:** FCC Part 2 (Section 2.1091)  
KDB 447498 D01 General RF Exposure Guidance v06  
IEEE C95.1

The above equipment 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 :** Celine Chou , **Date:** Sep. 09, 2016  
Celine Chou / Specialist

**Approved by :** Ken Liu , **Date:** Sep. 09, 2016  
Ken Liu / Senior Manager

## 2 RF Exposure

### 2.1 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)
Limits For General Population / Uncontrolled Exposure				
300-1500	...	...	F/1500	30
1500-100,000	...	...	1.0	30

F = Frequency in MHz

### 2.2 MPE Calculation Formula

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

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

### 2.3 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**.

### 3 Calculation Result of Maximum Conducted Power

Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
Radio 1					
WLAN: CDD mode					
2412-2462	22.67	6.97	20	0.183	1
WLAN: Beamforming mode					
2412-2462	21.78	6.97	20	0.149	1
Radio 2					
WLAN: CDD mode					
5180-5240	26.40	8.54	20	0.620	1
5745-5825	26.77	8.54	20	0.676	1
WLAN: Beamforming mode					
5180-5240	26.07	8.54	20	0.575	1
5745-5825	26.72	8.54	20	0.668	1
Radio 3					
WLAN: CDD mode					
2412-2462	21.98	4.65	20	0.092	1
5180-5240	17.40	5.50	20	0.039	1
5745-5825	17.18	5.50	20	0.037	1
Radio 4					
BT LE					
2402-2480	5.44	5.67	20	0.003	1

Note:

Radio 1: 2.4GHz Band: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 6.97dBi

Radio 2: 5GHz Band: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2]$  = 8.54 dBi

**Conclusion:**

Both of the WLAN 2.4G & WLAN 5G & BT LE can transmit simultaneously, the formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + .....etc. < 1$$

CPD = Calculation power density

LPD = Limit of power density

Radio 1 + Radio 2 + Radio 3 (2.4G) + Radio 3 (5G) + Radio 4

$$= 0.183+0.676+0.092+0.039+0.003=0.993$$

Therefore, the maximum calculation of this situation is 0.993, which is less than the "1" limit.

Note: All radio technologies can transmit simultaneously, but Radio 1 & Radio 2 & Radio 3 & Radio 4 will not simultaneously in the same sub-band.

**---END---**