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
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
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^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

2.2 MPE Calculation Formula

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

where

Pd = power density in mW/cm^2

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

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^2)	Limit (mW/cm^2)
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 = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/2] = 6.97$dBi
Radio 2: 5GHz Band: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/2] = 8.54$ 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 cantransmit simultaneously, but Radio 1 & Radio 2 & Radio 3 & Radio 4 will not simultaneously in the same sub-band.

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