

## RF Exposure Report

**Report No.:** SA180704E03D

**FCC ID:** UDX-60079010

**Test Model:** MR45-HW

**Received Date:** July 04, 2018

**Test Date:** Nov. 20 to 21, 2018

**Issued Date:** Mar. 12, 2019

**Applicant:** Cisco Systems, Inc.

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

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Taiwan R.O.C.

**Test Location :** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

Issue No.	Description	Date Issued
SA180704E03D	Original release.	Mar. 12, 2019

## 1 Certificate of Conformity

**Product:** 4x4 802.11a/b/g/n/ac/ax Access Point

**Brand:** Cisco

**Test Model:** MR45-HW

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Cisco Systems, Inc.

**Test Date:** Nov. 20 to 21, 2018

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

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 :**

*Mary Ko*

**Date:**

Mar. 12, 2019

Mary Ko / Specialist

**Approved by :**

*May Chen*

**Date:**

Mar. 12, 2019

May Chen / 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				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 33cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

WLAN Directional gain table – 4TX				
Frequency range (GHz)	Directional Antenna Gain (dBi)		Antenna Type	Antenna Connector
2.4 ~ 2.4835	7.74		PIFA	i-pex(MHF)
5.15 ~ 5.25	8.40			
5.25 ~ 5.35	8.93			
5.47 ~ 5.725	8.51			
5.725 ~ 5.85	8.11			
WLAN Directional gain table – 2TX				
Frequency range (GHz)	Antenna Combine Type	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4 ~ 2.4835	2.4G Ant. 1+4	6.12	PIFA	i-pex(MHF)
5.15 ~ 5.25	5.15G Ant. 1+3	6.62		
5.25 ~ 5.35	5.35G Ant. 1+2	7.50		
5.47 ~ 5.725	5.55G Ant. 3+4	7.71		
5.725 ~ 5.85	5.85G Ant. 3+4	7.27		
Bluetooth antenna spec.				
Antenna Net Gain (dBi)	Frequency range (GHz)		Antenna Type	Antenna Connector
4.24	2.4 ~ 2.4835		PIFA	i-pex(MHF)
Note: More detailed information, please refer to operating description.				

## 2.5 Calculation Result of Maximum Conducted Power

For 2.4GHz, 5GHz (U-NII-1 & UNII-3 band) data was copied from the original test report (Report No.: SA180704E03)

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN 2.4GHz (4TX)	2437	872.013	7.74	33	0.37869	1
WLAN 2.4GHz (2TX)	2437	503.965	6.12	33	0.15072	1
WLAN 2.4GHz (1TX)	2437	258.226	3.70	33	0.04423	1
WLAN 5GHz (UNII-1)-4TX	5200	572.519	8.40	33	0.28944	1
WLAN 5GHz (UNII-1)-2TX	5200	309.064	6.62	33	0.10371	1
WLAN 5GHz (UNII-1)-1TX	5200	214.783	4.06	33	0.03997	1
WLAN 5GHz (UNII-2A)-4TX	5270	248.689	8.93	33	0.14204	1
WLAN 5GHz (UNII-2A)-2TX	5270	244.988	7.50	33	0.10067	1
WLAN 5GHz (UNII-2A)-1TX	5270	125.314	5.23	33	0.03053	1
WLAN 5GHz (UNII-2C)-4TX	5670	237.322	8.51	33	0.12305	1
WLAN 5GHz (UNII-2C)-2TX	5610	237.497	7.71	33	0.10243	1
WLAN 5GHz (UNII-2C)-1TX	5610	121.619	5.44	33	0.03110	1
WLAN 5GHz (UNII-3)-4TX	5745	996.654	8.11	33	0.47131	1
WLAN 5GHz (UNII-3)-2TX	5825	614.522	7.27	33	0.23950	1
WLAN 5GHz (UNII-3)-1TX	5785	266.686	4.51	33	0.05505	1
BT-LE	2402	4.083	4.24	33	0.00079	1

**Conclusion:**

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz + Bluetooth =  $0.37869 / 1 + 0.47131 / 1 + 0.00079 / 1 = 0.85079$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

**--- END ---**