

## RF Exposure Report

**Report No.:** SA180704E02

**FCC ID:** UDX-60083010

**Test Model:** MR55-HW

**Received Date:** July 05, 2018

**Test Date:** Oct. 18 to 19, 2018

**Issued Date:** Dec. 24, 2018

**Applicant:** Cisco Systems, Inc.

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

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

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
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
SA180704E02	Original release.	Dec. 24, 2018

## 1 Certificate of Conformity

**Product:** 8x8 802.11a/b/g/n/ac/ax Access Point

**Brand:** Cisco

**Test Model:** MR55-HW

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Cisco Systems, Inc.

**Test Date:** Oct. 18 to 19, 2018

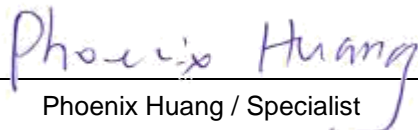
**Standards:** FCC Part 2 (Section 2.1091)

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 :**

  
Phoenix Huang / Specialist

**Date:**

Dec. 24, 2018

**Approved by :**

  
May Chen / Manager

**Date:**

Dec. 24, 2018

## 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

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

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 34cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

WLAN Directional gain table – 8TX				
Frequency range (GHz)	Directional Antenna Gain (dBi)	Antenna Type		Antenna Connector
5.15 ~ 5.25	9.29	PIFA		i-pex(MHF)
5.725 ~ 5.85	9.2			
WLAN Directional gain table – 4TX				
Frequency range (GHz)	Antenna Combine Type	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4 ~ 2.4835	Dual_1+Dual_2+Dual_3+Dual_4	5.43	PIFA	i-pex(MHF)
5.15 ~ 5.25	Single_1+Single_2+Single_3+Single_4	10.73		
5.725 ~ 5.85		10.68		
WLAN Directional gain table – 2TX				
Frequency range (GHz)	Antenna Combine Type	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4 ~ 2.4835	Dual_1+Dual_3	6.33	PIFA	i-pex(MHF)
5.15 ~ 5.25	Dual_2+Dual_3	8.47		
5.725 ~ 5.85		8.59		
Bluetooth antenna spec.				
Antenna Net Gain (dBi)	Frequency range (GHz)	Antenna Type		Antenna Connector
3.61	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

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	864.55	5.43	34	0.20779	1
WLAN 2.4GHz (2TX)	2437	456.82	6.33	34	0.13508	1
WLAN 2.4GHz (1TX)	2437	204.174	5.54	34	0.05033	1
WLAN U-NII-1 (8TX)	5180	432.724	9.29	34	0.25295	1
WLAN U-NII-1 (4TX)	5230	430.677	10.73	34	0.35074	1
WLAN U-NII-1 (2TX)	5200	376.099	8.47	34	0.18203	1
WLAN U-NII-1 (1TX)	5200	224.905	6.2	34	0.06454	1
WLAN U-NII-3 (8TX)	5825	412.219	9.29	34	0.23603	1
WLAN U-NII-3 (4TX)	5825	902.442	10.68	34	0.72653	1
WLAN U-NII-3 (2TX)	5745	440.884	8.59	34	0.21936	1
WLAN U-NII-3 (1TX)	5745	238.781	6.39	34	0.07159	1
BT-LE	2402	4.508	3.61	34	0.00071	1

Note:

1. The Max. Power = Max. tune up power including tolerance.
2. 2.4GHz (4TX): The directional gain = 5.43dBi  
 2.4GHz (2TX): The directional gain = 6.33dBi  
 2.4GHz (1TX): The max. gain = 5.54dBi  
 5GHz:  
 U-NII-1 (8TX): The directional gain = 9.29dBi  
 U-NII-1 (4TX): The directional gain = 10.73dBi  
 U-NII-1 (2TX): The directional gain = 8.47dBi  
 U-NII-1 (1TX): The max. gain = 6.2dBi  
 U-NII-3 (8TX): The directional gain = 9.2dBi  
 U-NII-3 (4TX): The directional gain = 10.68dBi  
 U-NII-3 (2TX): The directional gain = 8.59dBi  
 U-NII-3 (1TX): The max. gain = 6.39dBi

### 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

$$WLAN\ 2.4GHz + WLAN\ 5GHz + Bluetooth = 0.20779 / 1 + 0.72653 / 1 + 0.00071 / 1 = 0.93503$$

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

**--- END ---**