FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	UDX-60089010
Equipment	:	LTE Gateway
Brand Name	:	CISCO
Model Name	:	MG21-HW-NA and MG21E-HW-NA
Applicant	:	Cisco Systems 170 West Tasman Drive, San Jose, CA 95134 USA
Manufacturer	:	Cisco Systems 170 West Tasman Drive, San Jose, CA 95134 USA
Standard	:	47 CFR Part 2.1091

The product was received on Apr. 22, 2019, and testing was started from May 07, 2019 and completed on Jul. 02, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Cliff Chang

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA941924	01	Initial issue of report	Aug. 02, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3	-	Exposure evaluation	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Sandy Chuang

1 General Description

1.1 EUT General Information

RF General Information				
Evaluation Mode	**Bandwidth (MHz)**	**TX Frequency (MHz)**	**RX Frequency (MHz)**	**Modulation Type**
WCDMA Band 5	5	826.4 ~ 846.6	871.4 ~ 891.6	WCDMA: BPSK / QPSK HSDPA: BPSK / QPSK HSUPA: BPSK / QPSK
WCDMA Band 2	5	1852.4 ~ 1907.6	1932.4 ~ 1987.6	
WCDMA Band 4	5	1712.4 ~ 1752.6	2112.4 ~ 2152.6	
LTE Band 5	1.4	824.7 ~ 848.3	869.7 ~ 893.3	QPSK / 16QAM
	3	825.5 ~ 847.5	870.5 ~ 892.5	
	5	826.5 ~ 846.5	871.5 ~ 891.5	
	10	829.0 ~ 844.0	874.0 ~ 889.0	
LTE Band 2	1.4	1850.7 ~ 1909.3	1930.7 ~ 1989.3	
	3	1851.5 ~ 1908.5	1931.5 ~ 1988.5	
	5	1852.5 ~ 1907.5	1932.5 ~ 1987.5	
	10	1855.0 ~ 1905.0	1935.0 ~ 1985.0	
	15	1857.5 ~ 1902.5	1937.5 ~1982.5	
	20	1860.0 ~ 1900.0	1940.0 ~ 1980.0	
LTE Band 4	1.4	1710.7 ~ 1754.3	2110.7 ~ 2154.3	
	3	1711.5 ~ 1753.5	2111.5 ~ 2153.5	
	5	1712.5 ~ 1752.5	2112.5 ~ 2152.5	
	10	1715.0 ~ 1750.0	2115.0 ~ 2150.0	
	15	1717.5 ~ 1747.5	2117.5 ~ 2147.5	
	20	1720.0 ~ 1745.0	2120.0 ~ 2145.0	
LTE Band 12	1.4	699.7 ~ 715.3	729.7 ~ 745.3	
	3	700.5 ~ 714.5	730.5 ~ 744.5	
	5	701.5 ~ 713.5	731.5 ~ 743.5	
	10	704.0 ~ 711.0	734.0 ~ 741.0	
LTE Band 13	5	779.5 ~ 784.5	748.5 ~ 753.5	
	10	782.0	751.0	

1.2 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

EUT	Model No.	Antenna
EUT 1	MG21-HW-WW	Internal antenna
EUT 2	MG21E-HW-WW	External antenna

From the above models, EUT 2 was selected as representative model for the test and their data was recorded in this report.

1.3 Testing Location

Testing Location			
☐	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
		TEL :	886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD :	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
		TEL :	886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086B with Industry Canada.

2 RF Exposure Limit Introduction

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	Averaging Time |E|²,|H|² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.1 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

3 Radio Frequency Radiation Exposure Evaluation

3.1 Power Density Calculation

Band	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
Band 2 WCDMA_5MHz_Nss1_1TX	8.30	22.90	31.20	0.50	31.70	1.47911	20	0.29426	1.00000
Band 4 WCDMA_5MHz_Nss1_1TX	5.20	24.05	29.25	0.50	29.75	0.94406	20	0.18781	1.00000
Band 5 WCDMA_5MHz_Nss1_1TX	3.90	23.28	27.18	0.50	27.68	0.58614	20	0.11661	0.55100
Band 2 LTE_20MHz_Nss1,QPSK_1TX	8.30	22.90	31.20	0.50	31.70	1.47911	20	0.29426	1.00000
Band 4 LTE_10MHz_Nss1,QPSK_1TX	5.20	23.45	28.65	0.50	29.15	0.82224	20	0.16358	1.00000
Band 5 LTE_10MHz_Nss1,QPSK_1TX	3.90	22.87	26.77	0.50	27.27	0.53333	20	0.10610	0.55767
Band 12 LTE_10MHz_Nss1,QPSK_1TX	4.30	22.51	26.81	0.50	27.31	0.53827	20	0.10709	0.47167
Band 13 LTE_5MHz_Nss1,QPSK_1TX	5.40	20.79	26.19	0.50	26.69	0.46666	20	0.09284	0.52133

Note:

1.The above antenna gain was declared by manufacturer.

2.For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band

————THE END————