

MRT Technology (Suzhou) Co., Ltd Phone: +86-512-66308358

Web: www.mrt-cert.com

Report No.: 2204RSU031-U4 Report Version: V01 Issue Date: 2022-06-21

RF Exposure Evaluation Declaration

FCC ID: SFK-WF810

Applicant: CIG Shanghai Co., Ltd.

Product: Tri-band Wi-Fi 6 Extender

Model No.: WF-810

Brand Name: CIG

FCC Classification: Digital Transmission System (DTS)

Unlicensed National Information Infrastructure (NII)

FCC Rule Part(s): Part 2.1091

Result: Complies

Test Date: 2022-06-21

Reviewed By:

Kevin Guo

Approved By:

Robin Wu

Robin Wu

Kevin Guo

ACCREDITED

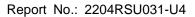
TESTING LABORATORY
CERTIFICATE #3628.01

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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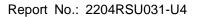
Revision History

Report No.	Version	Description	Issue Date	Note
2204RSU031-U4	Rev. 01	Initial Report	2022-06-21	Valid



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1. General Information

1.1. Applicant

CIG Shanghai Co., Ltd.

5F, Building 8, NO.2388 CHENGHANG ROAD, MINHANG DISTRTCT, SHANGHAI

1.2. Manufacturer

CIG Shanghai Co., Ltd.

5F, Building 8, NO.2388 CHENGHANG ROAD, MINHANG DISTRTCT, SHANGHAI

1.3. Testing Facility

\boxtimes	Test Site - MRT	Suzhou Laborator	у							
	Laboratory Loca	Laboratory Location (Suzhou - Wuzhong)								
	D8 Building, No.2	D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China								
	Laboratory Loca	ation (Suzhou - SIP	')							
	4b Building, Liand	do U Valley, No.200	Xingpu Rd., Shengpu	u Town, Suzhou Indu	strial Park, China					
	Laboratory Accre	editations								
	A2LA: 3628.01		CNAS	S: L10551						
	FCC: CN1166		ISED:	: CN0001						
	Voch	□R-20025	□G-20034	□C-20020	□T-20020					
	VCCI:	□R-20141	□G-20134	□C-20103	□T-20104					
	Test Site - MRT	Shenzhen Laborat	ory							
	Laboratory Loca	tion (Shenzhen)								
	1G, Building A, Ju	ınxiangda Building,	Zhongshanyuan Roa	ad West, Nanshan Di	strict, Shenzhen, China					
	Laboratory Accreditations									
	A2LA: 3628.02		CNAS	S: L10551						
	FCC: CN1284		ISED:	CN0105						
	Test Site - MRT	Taiwan Laboratory	/							
Laboratory Location (Taiwan)										
	No. 38, Fuxing 2n	No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)								
	Laboratory Accre	editations								
	TAF: L3261-1907	25								
	FCC: 291082, TW	/ 3261	ISED:	TW3261						



1.4. Product Information

Product Name	Tri-band Wi-Fi 6 Extender			
Model No.	WF-810			
Wi-Fi Specification	802.11a/b/g/n/ac/ax			
Bluetooth Specification	v5.0 single mode for BLE			
Antenna Information	Refer to Section 1.5			
Working Voltage	AC/DC Adapter			
Accessories				
AC/DC Adapter 1#	Model No.: ADS036G-W 120300			
	Input: 100-240V~50-60Hz, 1.0A			
	Output: 5.0V, 3.0A, 15.0W			
	9.0V, 3.0A, 27.0W			
	12.0V, 3.0A, 36.0W			
AC/DC Adapter 2#	Model No.: ADT-38FKJ-PCU00F			
Input: 100-240V~50-60Hz, Max. 1.0A				
	Output: 5.0V, 3.0A or 12.0V, 3.0A			

Remark:

The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.



1.5. Antenna Details

Radio	Frequency Band	Antenna Type					
Spec.	(MHz)	Ant 0	Ant 1	Ant 2	Ant 3		
Bluetooth	2400 ~ 2483.5	PCB Antenna					
2.4G Wi-Fi	2400 ~ 2483.5	PCB Antenna	PIFA Antenna				
5G Wi-Fi	5150 ~ 5350	PIFA Antenna	PCB Antenna				
3G WI-FI	5470 ~ 5850	PCB Antenna	PCB Antenna	PCB Antenna	PIFA Antenna		

Radio	Frequency	Tx	Antenna Gain			CDD Mode Correlated		STBC Mode	
Spec.	Band	Path	(dBi)			Gain (dBi)		Uncorrelated	
	(MHz)		Ant 0	Ant 1	Ant 2	Ant 3	For Power	For PSD	Gain (dBi)
Bluetooth	2400 ~ 2483.5	1	0.88	1	1	i			
2.4G Wi-Fi	2400 ~ 2483.5	2	3.76	4.22	-	-	4.22	4.69	1.90
50 M/: F:	5150 ~ 5350	2	4.67	4.31	-	-	4.67	6.13	3.21
5G Wi-Fi	5470 ~ 5850	4	3.96	5.48	5.16	6.61	6.61	8.49	2.73

Remark:

- 1. The antenna gain and directional gain refer to manufacturer's antenna specification.
- 2. The EUT supports CDD mode at 802.11a/b/g and CDD signals are correlated.

For power measurements: Array Gain = 0 dB for $N_{ANT} \le 4$, the directional gain = max antenna gain + array gain

For power spectral density (PSD) measurements: the max directional gain (each angle) = $10 \log[(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/N_{ANT}]$

3. The EUT also supports STBC mode at 802.11n/ac/ax and STBC signals are uncorrelated, the max directional gain (each angle) = $10 \log[(10^{G1/10} + 10^{G2/10} + ... + 10^{GN/10})/N_{ANT}]$



2. RF Exposure Evaluation

2.1. Test Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range	Electric Field	Magnetic Field	Power Density	Average Time				
(MHz)	Strength (V/m)	Strength (A/m)	(mW/cm ²)	(Minutes)				
	(A) Limits for Occupational/ Control Exposures							
300-1500			f/300	6				
1500-100,000			5	6				
	(B) Limits for General Population/ Uncontrolled Exposures							
300-1500			f/1500	6				
1500-100,000			1	30				

f= Frequency in MHz

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

Where

Pd = power density in mW/cm²

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

Pd is the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



2.2. Test Result

Product	Tri-band Wi-Fi 6 Extender
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.5.

Test Mode	Frequency Band	Conducted Power	Tune-up Power	Antenna Gain	Maximum EIRP
	(MHz)	(dBm)	(dBm)	(dBi)	(dBm)
BLE	2402 ~ 2480	-1.05	0	0.88	0.88
802.11b/g/n/ax	2412 ~ 2462	24.97	25.0	4.22	29.22
802.11a/n/ac/ax	5180 ~ 5240	26.04	26 F	4.64	24.44
602.11a/n/ac/ax	5260 ~ 5320	26.04	26.5	4.61	31.11
000 44 - /- / /	5500 ~ 5720	00.74	00.0	0.04	05.04
802.11a/n/ac/ax	5745 ~ 5825	28.74	29.0	6.61	35.61

Test Mode	Frequency Band	Maximum EIRP	Compliance	Power Density	Limit of Power
	(MHz)	(dBm)	Distance	(mW/cm ²)	Density
			(cm)		(mW/cm ²)
BLE	2402 ~ 2480	0.88	21.50	0.0002	1
802.11b/g/n/ax	2412 ~ 2462	29.22	21.50	0.1439	1
000 44 6/6/60/60	5180 ~ 5240	24.44	24.50	0.0000	4
802.11a/n/ac/ax	5260 ~ 5320	31.11	21.50	0.2223	1
000 44 a /a /a /a /a /	5500 ~ 5720	25.04	24.50	0.0005	4
802.11a/n/ac/ax	5745 ~ 5825	35.61	21.50	0.6265	1

CONCLUSION:

BLE, WLAN 2.4GHz Band and WLAN 5GHz can transmit simultaneously.

The max Power Density at R $(21.5 \text{ cm}) = 0.0002 \text{mW/cm}^2 + 0.1439 \text{mW/cm}^2 + 0.2223 \text{mW/cm}^2 + 0.6265 \text{mW/cm}^2 = 0.9928 < 1 \text{mW/cm}^2$.



Appendix A - EUT Photograph

Refer to "2204RSU031-UE" file.

_____ The End _____