

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



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.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

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

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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: 1. 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 Spec.	Frequency Band (MHz)	Antenna Type			
		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	--	--
	5470 ~ 5850	PCB Antenna	PCB Antenna	PCB Antenna	PIFA Antenna

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

Remark:

- The antenna gain and directional gain refer to manufacturer's antenna specification.
- The EUT supports CDD mode at 802.11a/b/g and CDD signals are correlated.
 For power measurements: Array Gain = 0 dB for $N_{ANT} \leq 4$, the directional gain = max antenna gain + array gain
 For power spectral density (PSD) measurements: the max directional gain (each angle) = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$
- The EUT also supports STBC mode at 802.11n/ac/ax and STBC signals are uncorrelated, the max directional gain (each angle) = $10 \log[(10^{G1/10} + 10^{G2/10} + \dots + 10^{GN/10}) / N_{ANT}]$

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 (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (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: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

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, 1 mW/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 (MHz)	Conducted Power (dBm)	Tune-up Power (dBm)	Antenna Gain (dBi)	Maximum EIRP (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 5260 ~ 5320	26.04	26.5	4.61	31.11
802.11a/n/ac/ax	5500 ~ 5720 5745 ~ 5825	28.74	29.0	6.61	35.61

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Compliance Distance (cm)	Power Density (mW/cm ²)	Limit of Power Density (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
802.11a/n/ac/ax	5180 ~ 5240 5260 ~ 5320	31.11	21.50	0.2223	1
802.11a/n/ac/ax	5500 ~ 5720 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 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 —————