



# RF Exposure Evaluation Declaration

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**FCC ID:** VW3FAST5290V2  
**Applicant:** SAGEMCOM BROADBAND SAS  
**Product:** Fiber Wireless Router FWR226e  
**Model No.:** FAST 5290  
**Brand Name:** SAGEMCOM  
**FCC Rule Part(s):** FCC Part 2.1091  
**Conclusion:** Complies  
**Test Date:** March 04 ~ April 21, 2022

**Reviewed By:**

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Sunny Sun

**Approved By:**

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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.

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### Revision History

Report No.	Version	Description	Issue Date	Note
2202RSU047-U8	Rev. 01	Initial Report	05-24-2022	Valid

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#### 1.4. Product Information

Product Name	Fiber Wireless Router FWR226e
Model No.	FAST 5290
EUT Identification No.	20220223Sample#04(Radiated) 20220223Sample#03(Conducted)
Wi-Fi Specification	802.11b/g/n/ac/ax
Antenna Information	Refer to Section 1.5
Power Type	AC Adapter
Operating Environment	Indoor Use
Accessories	
Adapter 1#	MODEL: MS-V4100R120-050A0-US INPUT: 100-127V ~ 50/60Hz Max 1.3A OUTPUT: 12V=4.1A
Adapter 2#	MODEL: ADS-50FKI-12 12049EPCU-L INPUT: 100-127V ~ 50/60Hz Max 1.2A OUTPUT: 12V=4.1A
Adapter 3#	MODEL: NBS50A120410VU INPUT: 100-127V ~ 50/60Hz Max 1.5A OUTPUT: 12V=4.1A
Remark: 1. The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. 2. For this report, we select Adapter 1# for testing.	

### 1.5. Antenna Details

Antenna Type	Frequency Band (GHz)	Antenna Gain (dBi)				Directional Gain (dBi)	
		Ant 0	Ant 1	Ant 2	Ant 3	For Power	For PSD
Wi-Fi Antenna (2.4G 3*3 MIMO)							
PCB	2.4 ~ 2.4835	4.12	3.66	2.01	--	4.12	4.65
Wi-Fi Antenna (5G 4*4 MIMO)							
PCB	5.15 ~ 5.85	4.52	5.10	5.33	5.58	5.58	5.91
Wi-Fi Antenna (6G 4*4 MIMO)							
PCB	5.925 ~ 7.125	4.68	5.79	6.18	5.95	6.18	6.29
<p>Note 1: The antenna gain and directional gain refer to manufacturer's antenna specification.</p> <p>Note 2: Software automatically backs power down based on a <math>10\log(N)</math> factor for beamforming operation.</p> <p>Note 3: The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.</p> <ul style="list-style-type: none"> <li>For power measurements: Array Gain = 0 dB for <math>N_{ANT} \leq 4</math>, the directional gain = max antenna gain + array gain</li> <li>For power density measurements: the max directional gain (each angle) = <math>10 \cdot \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]</math> dBi.</li> </ul>							

## 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 <sup>2</sup> )	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	30
1500-100,000	--	--	1	30

f= Frequency in MHz

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

Where

Pd = power density in mW/cm<sup>2</sup>

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/cm<sup>2</sup>. 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. Device Classification

According to the user manual, the antenna of this device is at least 30cm away from the body of the user, this device is classified as a **Mobile Device**. So, the RF exposure evaluation requirements of § 2.1091 for mobile device exposure conditions subject to MPE limits.

### 2.3. Calculation Result

Product	Fiber Wireless Router FWR226e
Test Item	RF Exposure Evaluation

Test Mode	Frequency Band (MHz)	Max. EIRP (dBm)	Power Density at 30cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
802.11b/g/n	2412 ~ 2462	33.95	0.2196	1
802.11a/n/ac/ax	5180 ~ 5240	35.21	0.2935	1
	5260 ~ 5320	29.37	0.0765	1
	5500 ~ 5720	29.30	0.0753	1
	5745 ~ 5825	35.12	0.2874	1
802.11a/ax	5955 ~ 7095	22.91	0.0173	1

#### CONCLUSION:

WLAN 2.4GHz, 5GHz and 6GHz can transmit simultaneously.

The Ratio of Power Density at R (35 cm) =  $0.2196 + 0.2935 + 0.0173 = 0.5304 < 1$ .



## Appendix - EUT Photograph

Refer to "2202RSU047-UE" file.

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The End