RADIO EXPOSURE TEST REPORT

FCC ID	:	VW3FAST5290
Equipment	:	Wireless Home Router
Brand Name	:	SAGEMCOM
Model Name	:	FAST 5290
Applicant	:	SAGEMCOM BROADBAND SAS 250 Route de l'Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE
Manufacturer	:	SAGEMCOM BROADBAND SAS 250 Route de l'Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE
Standard	:	47 CFR Part 2.1091

The product was received on May 08, 2021 , and testing was started from May 08, 2021 and completed on Oct. 18, 2021. We, Sporton International Inc. Hsinchu 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 test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA163028-01	01	Initial issue of report	Nov. 01, 2021

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	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	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
6GHz WLAN	5925-7125	5955-7095	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)

1.2 Antenna Information

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz					
1	1	2	-	Galtronics	02102140-07252C1 DB1	PCB	I-PEX	Note 1
2	2	3	-	Galtronics	02102140-07252C2 DB2	PCB	I-PEX	
3	3	4	-	Galtronics	02102140-07252c3 DB3	PCB	I-PEX	
4	-	1	-	Galtronics	02102142-07252CX 5G	PCB	I-PEX	
5	-	-	1	Galtronics	02102475-07252-1 6G1	PCB	I-PEX	
6	-	-	2	Galtronics	02102475-07252-2 6G2	PCB	I-PEX	
7	-	-	3	Galtronics	02102475-07252-3 6G3	PCB	I-PEX	
8	-	-	4	Galtronics	02102475-07252-4 6G4	PCB	I-PEX	

Antenna Gain (dBi)									
Ant.	WLAN 2.4GHz	WLAN 5GHz UNII 1	WLAN 5GHz UNII 2A	WLAN 5GHz UNII 2C	WLAN 5GHz UNII 3	WLAN 6GHz UNII 5	WLAN 6GHz UNII 6	WLAN 6GHz UNII 7	WLAN 6GHz UNII 8
1	4.12	3.13	3.67	3.57	3.29	-	-	-	-
2	3.66	4.52	5.1	5.33	5.58	-	-	-	-
3	2.01	1.8	2.64	1.87	2.2	-	-	-	-
4	-	3.19	1.58	2.36	3.7	-	-	-	-
5	-	-	-	-	-	3.07	2.98	3.17	5.85
6	-	-	-	-	-	4.39	4.2	4.57	5.95
7	-	-	-	-	-	3.74	3.39	3.25	4.8
8	-	-	-	-	-	4.68	5.79	6.18	4.91

Directional Gain (dBi)								
WLAN 2.4GHz [3T1S]	WLAN 5GHz UNII 1 [4T1S]	WLAN 5GHz UNII 2A [4T1S]	WLAN 5GHz UNII 2C [4T1S]	WLAN 5GHz UNII 3 [4T1S]	WLAN 6GHz UNII 5 [4T1S]	WLAN 6GHz UNII 6 [4T1S]	WLAN 6GHz UNII 7 [4T1S]	WLAN 6GHz UNII 8 [4T1S]
4.65	4.68	5.22	5.53	5.91	5.11	6.19	6.29	6.22

Note2: The above information was declared by manufacturer.

The EUT enables 2.4GHz, 5GHz UNII 1, UNII 3 and UNII 5~8 function.

The directional gain is measured which follows the procedure of KDB 662911 D03. The antenna report is provided in the operational description for this application.

For 2.4GHz function:
For IEEE 802.11b/g/n/VHT/ax (3TX/3RX):
Port 1, Port 2 and Port 3 can be used as transmitting/receiving antenna.
Port 1, Port 2 and Port 3 could transmit/receive simultaneously.
For 5GHz function:
For IEEE 802.11a/n/ac/ax (4TX/4RX):
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.
For 6GHz function:
For IEEE 802.11ax (4TX/4RX):
Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.
Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

1.3 Accessories

Accessories				
Equipment Name	**Brand Name**	**Model Name**	**Rating**	**Length of cable**
Adapter	Sagemcom	NBS60E120500M2	INPUT: 100-127V, 50/60Hz, 1.5A OUTPUT: 12.0V, 5.0A	Non-shielded, 1m
Others				
Power cable*1, non-shielded, 1m				

1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA163028

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding U-NII 5, UNII 6, UNII 7 and UNII 8 for this device.	Maximum Permissible Exposure.

Note: Maximum Permissible Exposure of 2.4GHz and 5GHz band 1, 4 are based on original test report

1.5 Testing Location

Testing Location Information		
Test Lab.：Sporton International Inc. Hsinchu Laboratory		
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)	
(TAF: 3787)	TEL: 886-3-656-9065	FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.	
	Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(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^2)	<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^2)	<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

2.2 MPE Calculation Method

The MPE was calculated at 25 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 = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	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)
2.4G;D1D	4.65	29.75	34.40	0.50	34.90	3.09030	25	0.39347	1.00000
5.2G;D1D	4.68	29.91	34.59	0.50	35.09	3.22849	25	0.41106	1.00000
5.8G;D1D	5.91	29.88	35.79	0.20	35.99	3.97192	25	0.50572	1.00000
6.2G;D1D	5.11	21.79	26.90	0.50	27.40	0.54954	25	0.06997	1.00000
6.4G;D1D	6.19	20.69	26.88	0.50	27.38	0.54702	25	0.06965	1.00000
6.7G;D1D	6.29	20.56	26.85	0.50	27.35	0.54325	25	0.06917	1.00000
7.0G;D1D	6.22	20.51	26.73	0.50	27.23	0.52845	25	0.06728	1.00000

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + 5GHz UNII 1 / 3 + 6GHz UNII 5~8

Mode	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)	Ratio (S/Limit)
2.4G;D1D	4.65	29.75	34.40	0.5	34.90	3.0903	25	0.39347	1	0.39347
5.8G;D1D	5.91	29.88	35.79	0.20	35.99	3.97192	25	0.50572	1	0.50572
6.2G;D1D	5.11	21.79	26.90	0.5	27.40	0.54954	25	0.06997	1	0.06997
									Sum Ratio	0.96916
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

———THE END———