



RADIO EXPOSURE TEST REPORT

FCC ID : VW3FAST5380V2

Equipment : Copper Wireless Router

Brand Name : SAGEMCOM

Model Name : FAST 5380

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 Feb. 12, 2022, and testing was started from Feb. 12, 2022 and completed on Mar. 18, 2022. 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

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Photographs of EUT v01



Summary of Test Result

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

Declaration of Conformity:

1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Measurement Uncertainty".

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: Vicky Huang



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 5250-5350 5470-5725 5725-5850	5180-5250 5250-5320 5500-5720 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)
6E WLAN	5925-7125	5955-7115	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)



1.2 Antenna Information

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

Note 1:

Ant.	Gain (dBi)				
	2.GHz	5GHz UNII 1	5GHz UNII 2A	5GHz UNII 2C	5GHz UNII 3
1	4.72	3.53	3.91	2.86	2.92
2	4.89	3.61	3.75	2.69	2.74
3	3.98	4.08	4.34	2.7	3.34
4	-	4.84	4.88	4.09	4.68

Ant.	Gain (dBi)			
	6GHz UNII 5	6GHz UNII 6	6GHz UNII 7	6GHz UNII 8
5	3.3	1.49	2.64	4.11
6	3.45	1.23	1.71	2.34
7	2.67	2.77	3.32	4.56
8	3.93	4.52	4.82	4.22



Ant.	Directional Gain (dBi)													
	2.GHz		5GHz UNII 1			5GHz UNII 2A			5GHz UNII 2C			5GHz UNII 3		
	3T1S	3T3S	4T1S	4T2S	4T4S	4T1S	4T2S	4T4S	4T1S	4T2S	4T4S	4T1S	4T2S	4T4S
1	5.05	1.05	5.06	2.06	-0.33	5.88	2.88	0.21	4.5	1.5	-0.76	5.09	2.09	-0.11
2														
3														
4	-	-												

Ant.	Directional Gain (dBi)											
	6GHz UNII 5			6GHz UNII 6			6GHz UNII 7			6GHz UNII 8		
	4T1S	4T2S	4T4S	4T1S	4T2S	4T4S	4T1S	4T2S	4T4S	4T1S	4T2S	4T4S
5	4.28	1.28	-1.11	4.78	1.78	-0.77	5.14	2.14	-0.57	5.34	2.34	0.24
6												
7												
8												

Note 2: The above information was declared by manufacturer.

Note 3: Maximum Directional Gain following KDB662911 D03.

The antenna report is provided in the operational description for this application.

For 2.4GHz:

For IEEE 802.11b/g/n/VHT/ax mode (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 UNII 1~3:

For IEEE 802.11a/n/ac/ax mode (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 UNII 5~8:

For IEEE 802.11ax mode (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 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA160328-03

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

Modifications	Performance Checking
1. Adding U-NII-2A and U-NII-2C bands (5250~5350 MHz, 5470~5725 MHz) for this device. 2. Enabling the 160MHz in ax mode for 5GHz.	MPE

Note: The 2.4GHz, 5GHz UNII1, 3 and 6GHz UNII5~8 MPE results were based on original report.

1.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter 1	SAGEMCOM	ADS-42FKJ-12 12042EPCU-L	INPUT: 100-120V~50/60Hz, Max.1.2A OUTPUT: 12V, 3.5A
Adapter 2	SAGEMCOM	MSG-V3500AR120-042A0-US	Input: 100-120V~50/60Hz, 1.2A Max. Output: 12V, 3.5A
Adapter 3	SAGEMCOM	NBS42E120350VU	INPUT: 100-120V~50/60Hz, 1.0A OUTPUT: 12.0V, 3.5A
Others			
RJ-11 cable*1(two by one): Non-Shielded, 2m			
ADSL RJ-11 cable*1(two by one): Non-Shielded, 2m			
RJ-45 cable*1: Shielded, 1.8m			

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310



1.6 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/ cm ²)	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/ cm ²)	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 50 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= P_{th}.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance

R between the person and the antenna / radiating structure, where $R > \lambda / 2 \pi$.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$
1.34-30	$3,450 R^2 / f^2$
30-300	$3.83 R^2$
300-1,500	$0.0128 R^2 f$
1,500-100,000	$19.2 R^2$
Note: R is in meters, f is in MHz.	



2.4 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;G1D	4.89	29.97	34.86	0.50	35.36	3.43558	50	0.10936	1.00000
5.2G;D1D	5.06	29.55	34.61	0.50	35.11	3.24340	50	0.10324	1.00000
5.3G;D1D	5.88	23.96	29.84	0.15	29.99	0.99770	50	0.03442	1.00000
5.6G;D1D	4.50	23.97	28.47	0.50	28.97	0.78886	50	0.02511	1.00000
5.8;D1D	5.09	28.65	33.74	0.50	34.24	2.65461	50	0.08450	1.00000
6.2G;D1D	4.28	22.95	27.23	0.50	27.73	0.59293	50	0.01887	1.00000
6.4G;D1D	4.78	22.32	27.10	0.50	27.60	0.57544	50	0.01832	1.00000
6.7G;D1D	5.14	22.27	27.41	0.50	27.91	0.61802	50	0.01967	1.00000
7.0G;D1D	5.34	22.27	27.61	0.50	28.11	0.64714	50	0.02060	1.00000

MPE Exemption Option C							
Frequency (MHz)	$\lambda/2\pi$ (m)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
5200	0.0092	0.50	35.11	32.96	1.977	4.800	Complies
2437	0.0196		35.36	33.21	2.094	4.800	Complies
6985	0.0068		28.11	25.96	0.394	4.800	Complies

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WLAN 5GHz+WLAN 6GHz

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
5200	0.50	35.11	32.96	1.977	4.800	0.93	<= 1
2437		35.36	33.21	2.094	4.800		
6985		28.11	25.96	0.394	4.800		

————THE END————