



Radio Exposure Evaluation Report

FCC ID : VW3FAST3890V3
Equipment : Docsis 3.1 Voice Gateway
Brand Name : Samgemcom
Model Name : F@ST3890 V3
Multiple Listing : F@ST3890 V3XXXXXXXXXXXXX
(X=0-9,A-Z or blank for marketing purpose)
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 Apr. 18, 2019, and testing was started from Apr. 18, 2019 and completed on May 06, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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 report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of United States government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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Photographs of EUT V01



History of this test report

Report No.	Version	Description	Issued Date
FA941813-01	01	Initial issue of report	Nov. 18, 2019



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:
None.

Reviewed by: Jackson Tsai

Report Producer: Ann Hou

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) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.2 Testing Location

Testing Location			
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test site Designation No. TW1190 with FCC.			
<input type="checkbox"/>	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 with FCC.			

1.3 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA941813

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

Modifications	Performance Checking
U-NII-2A and U-NII-2C were added	All

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 30 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 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

2.4G

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	3.81	27.76	31.57	0.00	31.57	1.43549	30	0.12693	1.00000
2.4G;D1D	3.81	29.37	33.18	0.00	33.18	2.07970	30	0.18389	1.00000

5G non-Beamforming

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)
5.2G;D1D	4.12	28.57	32.69	0.00	32.69	1.85780	30	0.16427	1.00000
5.3G;D1D	1.34	23.84	25.18	0.00	25.18	0.32961	30	0.02914	1.00000
5.6G;D1D	2.23	23.98	26.21	0.00	26.21	0.41783	30	0.03694	1.00000
5.8G;D1D	4.95	28.36	33.31	0.00	33.31	2.14289	30	0.18947	1.00000

5G Beamforming

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)
5.2G;D1D	7.38	28.55	35.93	0.00	35.93	3.91742	30	0.34638	1.00000
5.3G;D1D	6.99	22.70	29.69	0.00	29.69	0.93111	30	0.08233	1.00000
5.6G;D1D	7.46	22.42	29.88	0.00	29.88	0.97275	30	0.08601	1.00000
5.8G;D1D	7.80	28.17	35.97	0.00	35.97	3.95367	30	0.34958	1.00000

Co-TX

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	3.81	29.37	33.18	0.00	33.18	2.07970	30	0.18389	1.00000	0.18389
5.8G;D1D	7.80	28.17	35.97	0.00	35.97	3.95367	30	0.34958	1.00000	0.34958
									Sum Ratio	0.53347
									Ratio Limit	1

—————THE END—————