

## RF Exposure Report

**Report No.:** SA190415E04A

**FCC ID:** VW3FAST3686V2H

**Test Model:** F@ST 3686 V2.2 HP

**Received Date:** Apr. 15, 2019

**Test Date:** Sep. 12, 2019

**Issued Date:** Oct. 02, 2019

**Applicant:** SAGEMCOM Broadband SAS

**Address:** 250 Route de l'Empereur - 92848 RUEIL MALMAISON CEDEX- FRANCE

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

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Taiwan

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
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**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

Issue No.	Description	Date Issued
SA190415E04A	Original release.	Oct. 02, 2019

## 1 Certificate of Conformity

**Product:** Euro-DOCSIS3.0

**Brand:** Sagemcom

**Test Model:** F@ST 3686 V2.2 HP

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** SAGEMCOM Broadband SAS

**Test Date:** Sep. 12, 2019

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.3-2002

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Wendy Wu , **Date:** Oct. 02, 2019  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** Oct. 02, 2019  
May Chen / Manager

## 2 RF Exposure

### 2.1 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)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE 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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 23cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

Ant. No.	Chain No.	Brand	Antenna Gain (dBi)	Frequency Range (MHz)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain (0)	TSKY	3.13	2400~2500	PCB	i-pex(MHF)	56.5
			5.72	5150~5850			
2	Chain (1)	TSKY	3.57	5150~5850	PCB	i-pex(MHF)	250
3	Chain (2)	TSKY	3.54	2400~2500	PCB	i-pex(MHF)	40
			5.87	5150~5850			

## 2.5 Calculation Result of Maximum Conducted Power

For 2.4GHz, 5GHz (U-NII-1 & U-NII-3 band) data was copied from the original test report (Report No.: SA190415E04)

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN 2.4GHz	2437	468.343	6.35	23	0.30402	1
WLAN 5GHz (U-NII-1&U-NII-3)	5755	405.907	9.89	23	0.59533	1
WLAN 5GHz (U-NII-2A&U-NII-2C)	5610	247.321	9.89	23	0.36274	1

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: The directional gain =  $10 \log[(10^{G0/20} + 10^{G2/20})^2 / 2] = 6.35 \text{ dBi}$
- 5GHz: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2 / 3] = 9.89 \text{ dBi}$ .

### Conclusion:

The formula of calculated the MPE is:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

$$WLAN 2.4GHz + WLAN 5GHz = 0.30402 / 1 + 0.59533 / 1 = 0.89935$$

**Therefore the maximum calculations of above situations are less than the “1” limit.**

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