

## RF Exposure Report

**Report No.:** SA160614E05F

**FCC ID:** VW3FAST3686

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

**Received Date:** Oct. 20, 2017

**Test Date:** Nov. 02, 2017

**Issued Date:** Dec. 22, 2017

**Applicant:** SAGEMCOM Broadband SAS

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

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### Release Control Record

Issue No.	Description	Date Issued
SA160614E05F	Original release.	Dec. 22, 2017

## 1 Certificate of Conformity

**Product:** Euro-DOCSIS3.0

**Brand:** Sagemcom

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

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** SAGEMCOM Broadband SAS

**Test Date:** Nov. 02, 2017

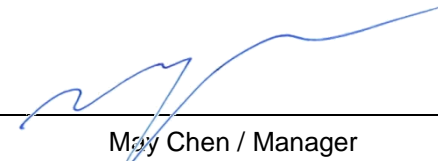
**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 General RF Exposure Guidance v06

IEEE C95.1-1992

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 :**  , **Date:** Dec. 22, 2017  
Claire Kuan / Specialist

**Approved by :**  , **Date:** Dec. 22, 2017  
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.	Antenna Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type	Cable loss (dB)	Cable Length (mm)
1	Chain (0)	3.3	5.15~5.725	PIFA	NA	NA	NA
		2.5	2.4~2.4835				
2	Chain (1)	4.6	5.15~5.725	PCB	i-pex(MHF)	1.58	250
3	Chain (2)	3.6	5.15~5.725	PIFA	NA	NA	NA
	Chain (1)	2.8	2.4~2.4835				

## 2.5 Calculation Result

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	573.092	5.66	23	0.31736	1
5180-5240	544.597	8.62	23	0.59622	1
5745-5825	524.872	8.62	23	0.57463	1

NOTE:

2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 5.66\text{dBi}$

5GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 3] = 8.62\text{dBi}$

### 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

$WLAN\ 2.4GHz + WLAN\ 5GHz = 0.31736 / 1 + 0.59622 / 1 = 0.91358$

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

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