

RF Exposure Report

Report No.: SA160614E05G

FCC ID: VW3FAST3686

Test Model: F@ST 3686 V2.2

Received Date: Oct. 20, 2017

Test Date: Nov. 28, 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
SA160614E05G	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. 28, 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 :

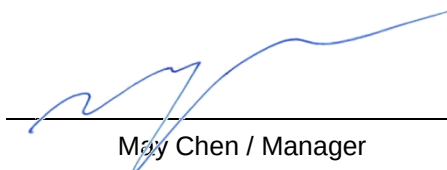


Date:

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 ²)	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 ²)*	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

$$P_d = (P_{out} * G) / (4 * \pi * r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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	5.15~5.850	PIFA	NA	NA	NA
		2.5	2.4~2.4835				
2	Chain (1)	4.6	5.15~5.850	PCB	i-pex(MHF)	1.58	250
3	Chain (2)	3.6	5.15~5.850	PIFA	NA	NA	NA
	Chain (1)	2.8	2.4~2.4835				

2.5 Calculation Result

For 2.4GHz and 5GHz (U-NII-1 & UNII-3 band) data was copied from the original test report (Report No.: SA 160614E05F)

Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	573.092	5.66	23	0.31736	1
5180-5240	544.597	8.62	23	0.59622	1
5260-5320	237.944	8.62	23	0.26050	1
5500-5720	249.215	8.62	23	0.27284	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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