MPE TEST REPORT

Applicant	Shanghai Smawave Technology Co. ,Ltd
FCC ID	2AU8HSRG411-A
Product	LTE CPE
Brand	Smawave
Model	SRG411-a
Report No.	R2001A0010-M1V1
Issue Date	May 7, 2020

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Yu Wang

Performed by: Yu Wang

Guangchang Fan

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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.**The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein .Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

1.3 Testing Location

Company:	TA Technology (Shanghai) Co., Ltd.
Address:	No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C

Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment under Test

Client Information

Applicant	Shanghai Smawave Technology Co. ,Ltd
Applicant address	3/F, Building 8, 1001 North Qinzhou Road， Xuhui District, Shanghai, China
Manufacturer	Shanghai Smawave Technology Co. ,Ltd
Manufacturer address	3/F, Building 8, 1001 North Qinzhou Road， Xuhui District, Shanghai, China

General Technologies

Model	SRG411-a
SN	1#
Hardware Version	V1.0
Software Version	SG625
Date of Testing:	February 19, 2020~ March 30, 2020
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.	

Note: This revised report (Report No.: R2001A0010-M1V1) supersedes and replaces the previously issued report (Report No.:R2001A0010-M1). Please discard or destroy the previously issued report and dispose of it accordingly.

3 Maximum conducted output power (measured) and antenna Gain

The numeric gain (G) of the antenna with a gain specified in dB is determined by
Numeric gain (G)=10^(antenna gain/10)

Band	Maximum Conducted Output Power (dBm)		Antenna Gain (dBi)	Numeric gain
	(dBm)	(mW)		
LTE Band 2	24.000	251.189	3.180	2.080
LTE Band 4	24.000	251.189	3.180	2.080
LTE Band 5	23.500	223.872	3.180	2.080
LTE Band 12	24.000	251.189	3.180	2.080
LTE Band 13	24.000	251.189	3.180	2.080
LTE Band 14	24.000	251.189	3.180	2.080
LTE Band 25	24.000	251.189	3.180	2.080
LTE Band 26	24.000	251.189	3.180	2.080
LTE Band 41	24.000	251.189	3.180	2.080
LTE Band 48	24.500	281.838	3.180	2.080
LTE Band 53	24.500	281.838	3.180	2.080
LTE Band 66	24.000	251.189	3.180	2.080
Wi-Fi 2.4G	18.310	67.764	5.00	3.162
Wi-Fi 5G	20.360	108.643	5.00	3.162

4 Test Result

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following

TABLE 1 – LIMITS FOR MAXIMUN PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm2)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3-30	1842/f	4.89/f	*(900/f2)	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				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	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

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 300~1500 MHz is f/1500, for 1500~100,000MHz is 1.0.So

Band	The maximum permissible exposure
LTE Band 2	1.0mW/cm^2
LTE Band 4	1.0mW/cm^2
LTE Band 5	0.55mW/cm^2
LTE Band 12	0.47mW/cm^2
LTE Band 13	0.52mW/cm^2
LTE Band 14	0.53mW/cm^2
LTE Band 25	1.0mW/cm^2
LTE Band 26	0.55mW/cm^2
LTE Band 41	1.0mW/cm^2
LTE Band 48	1.0mW/cm^2
LTE Band 53	1.0mW/cm^2
LTE Band 66	1.0mW/cm^2
Wi-Fi 2.4G	1.0mW/cm^2
Wi-Fi 5G	1.0mW/cm^2

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\prod R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm^2)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Band	PG (mW)	Test Result (mW/cm^2)	Limit Value (mW/cm^2)	The MPE ratio	Conclusion
LTE Band 2	522.396	0.104	1.000	0.104	Pass
LTE Band 4	522.396	0.104	1.000	0.104	Pass
LTE Band 5	465.586	0.093	0.550	0.168	Pass
LTE Band 12	522.396	0.104	0.470	0.221	Pass
LTE Band 13	522.396	0.104	0.520	0.200	Pass
LTE Band 14	522.396	0.104	0.530	0.196	Pass
LTE Band 25	522.396	0.104	1.000	0.104	Pass
LTE Band 26	522.396	0.104	0.550	0.189	Pass
LTE Band 41	522.396	0.104	1.000	0.104	Pass
LTE Band 48	586.138	0.117	1.000	0.117	Pass
LTE Band 53	586.138	0.117	1.000	0.117	Pass
LTE Band 66	522.396	0.104	1.000	0.104	Pass
Wi-Fi 2.4G	214.289	0.043	1.000	0.043	Pass
Wi-Fi 5G	343.558	0.068	1.000	0.068	Pass
Note: **R** = 20cm ∏= 3.1416					

So the simultaneous transmitting antenna pairs as below:

∑of MPE ratios=LTE + WiFi =0.221+0.068=0.289 <1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.

********END OF REPORT ********