

RF Exposure Evaluation Report

APPLICANT : Smawave Technology Co. ,Ltd
EQUIPMENT : CAT12 outdoor CPE
BRAND NAME : smawave
MODEL NAME : SRW410
FCC ID : 2AU8HSRW410-CBRS
STANDARD : 47 CFR Part 2.1091
FCC KDB 447498 D01 v06

The product evaluation date was started from Jan. 10, 2023 and completed on Jan. 10, 2023. We, Sporton International Inc. (Kunshan), would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091 and FCC KDB 447498 D01 v06, and pass the limit. Without written approval of Sporton International Inc. (Kunshan), the test report shall not be reproduced except in full.



Approved by: Si Zhang

Sporton International Inc. (Kunshan)

No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300
People's Republic of China



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1. Administration Data

1.1. Testing Laboratory

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory			
Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-KS	CN1257	314309

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

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



2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	CAT12 outdoor CPE
Brand Name	smawave
Model Name	SRW410
FCC ID	2AU8HSRW410-CBRS
Wireless Technology and Frequency Range	LTE Band 2 : 1850 MHz ~ 1910 MHz LTE Band 25 : 1850 MHz ~ 1915 MHz LTE Band 48: 3550 MHz ~ 3700 MHz
Mode	LTE: QPSK, 16QAM, 64QAM
Antenna Gain	Ant0: LTE Band 2 : 7.78 dBi LTE Band 25 : 7.78 dBi LTE Band 48 : 7.08 dBi Ant2: LTE Band 48 : 6.8 dBi
Antenna Type	WWAN: Fixed External Antenna
HW Version	V1.0
SW Version	OCB12FW_Codium_CBSD_V1.0.12

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This device supports UL CA_48B, CA_48C and CA_48A-48A, due to LTE Band 48 ULCA and non-CA power is same, so LTE Band 48 non-CA MPE analysis can represent ULCA MPE analysis.

Comments and Explanations:

1. The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.
2. The maximum RF output tune up power, antenna gain also the safe distance used for evaluate RF exposure were declared by manufacturer.



3. Maximum RF average output tune up power among production units

<LTE>

Mode		Maximum Average power(dBm)
LTE	Band 2	25.0
	Band 25	25.0
	Band 48 Ant0/2	24.0
	Band 48 Ant0+2	24.0



4. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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				
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

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
LTE Band 2	1850.7	7.78	25.00	32.780	1896.706	0.378	1.000	0.378
LTE Band 25	1850.7	7.78	25.00	32.780	1896.706	0.378	1.000	0.378
LTE Band 48	3552.50	7.08	24.00	31.080	1282.331	0.255	1.000	0.255

Note:

1. For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band.
2. Chose the maximum power to do MPE analysis.
3. LTE Band 48 chose the higher SISO gain as MIMO gain to perform MPE calculation.
4. LTE Band 48 supports MIMO mode. For per chain maximum power of MIMO mode power level is SISO mode power level. MIMO MPE base on standalone MPE analysis summed together as MIMO MPE analysis.



5.2. Collocated Power Density Calculation

MIMO

WWAN LTE B48 Ant0 Power Density / Limit	WWAN LTE B48 Ant1 Power Density / Limit	Σ (Power Density / Limit) of MIMO Ant0+1
0.255	0.255	0.510

Note:

1. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN MIMO Ant0+1.
2. LTE Band 48 supports MIMO mode. For per chain maximum power of MIMO mode power level is SISO mode power level. MIMO MPE base on standalone MPE analysis summed together as MIMO MPE analysis.

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.

-----THE END-----