RF Exposure Evaluation Report

APPLICANT	:	Chengdu Ebyte Electronic Technology Co.,Ltd.
EQUIPMENT	:	Wireless transceiver model
BRAND NAME	:	EBYTE
MODEL NAME	:	E22-400T22S, E220-400T22S, E32-433T20S
FCC ID	:	2A8C3-240101
STANDARD	:	47 CFR Part 2.1091 FCC KDB 447498 D01 V06

The product evaluation date was started from Jan. 18, 2024 and completed on Jan. 18, 2024. 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.

Si Zhang

Approved by: Si Zhang

ACCREDITED Cert #5145.02

Sporton International Inc. (Kunshan)
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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA3N2209	Rev. 01	Initial issue of report.	Feb. 01, 2024

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		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	SAR01-KS	CN1257	314309

Applicant	
Company Name	Chengdu Ebyte Electronic Technology Co.,Ltd.
Address	B5, Mould Industrial Park, 199# Xiqu Ave, West High-tech Zone, Chengdu, 611731, Sichuan, China

Manufacturer	
Company Name	Chengdu Ebyte Electronic Technology Co.,Ltd.
Address	B5, Mould Industrial Park, 199# Xiqu Ave, West High-tech Zone, Chengdu, 611731, Sichuan, China

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Wireless transceiver model
Brand Name	EBYTE
Model Name	E22-400T22S, E220-400T22S, E32-433T20S
FCC ID	2A8C3-240101
Wireless Technology and Frequency Range	410.125 MHz ~ 493.125 MHz
Mode	DSSS
Antenna Gain	4.0 dBi
Antenna Type	Rubber antenna
HW Version	V2.2
SW Version	V1.0
EUT Stage	Identical Prototype

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. The difference between the three models is that the corresponding labels are different.

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. 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/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

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

4. Radio Frequency Radiation Exposure Evaluation

4.1. 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)
410.125 MHz ~ 493.123 MHz	410.125			-16.410	0.023	0.000005	0.273

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. Band (410.125 MHz ~ 493.123 MHz) maximum EIRP power calculate from Band (410.125 MHz ~ 493.123 MHz) E-Field level from RF test report which can be referred to Sproton No: FR3N2209.
   1) This device maximum E-Field level is 78.82 dBuV/m at 3m, so the EIRP power is -16.41dBm(0.023mW).
   2) Pout EIRP (dBm) = Field Strength of Fundamental (dBuV/m) - 95.23 (dB)

Conclusion:

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

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