



CTC Laboratories, Inc. (FCC Designation Number: CN1208)

2/F., Building 1 and 1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Longhua District, Shenzhen, Guangdong, China

Tel: +86-755-27521059 Fax: +86-755-27521011 <http://www.sz-ctc.org.cn>

Maximum Permissible Exposure Evaluation

FCC ID: 2APN5ZBBRIDGEU

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b).

EUT Specification

Applicant	Shenzhen Sonoff Technologies Co.,Ltd.
Address	3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China
Product Name:	Zigbee Bridge
Trade Mark:	Sonoff
Model/Type Reference:	ZBBridge-U
Listed Model(s):	/
Model Differences:	/
Frequency Band (Operating)	Zigbee: 2405~2480MHz BLE: 2402~2480MHz 2.4G WiFi: 2412-2462MHz
Device Category	<input type="checkbox"/> Portable (<5mm separation) <input type="checkbox"/> Mobile (>20cm separation) <input checked="" type="checkbox"/> Fixed (>20cm separation) <input type="checkbox"/> Others ____
Exposure Classification	<input type="checkbox"/> Occupational/Controlled exposure (S=5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna Diversity	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> TX diversity <input type="checkbox"/> RX diversity <input type="checkbox"/> TX/RX diversity
Antenna Gain (Max)	Zigbee (RF Module: EFR32MG21): 3.85dBi BLE (RF Module: YC1175): 1.73dBi BLE/2.4G WiFi (RF Module: 6223A-SRD): 2.5dBi
Evaluation Applied	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

CTC Laboratories, Inc.

1-2/F., Building 2, Jiaquan Building, Guanlan High-Tech Park, Shenzhen, Guangdong, China

Tel.: (86)755-27521059

Fax: (86)755-27521011

[Http://www.sz-ctc.org.cn](http://www.sz-ctc.org.cn)



For anti-fake verification, please visit the official website of Certification and Accreditation Administration of the People's Republic of China : yz.cnca.cn

**Limits for Maximum Permissible Exposure (MPE)**

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 Exposure				
300-1500	--	--	F/300	<6
1500-100000	--	--	5	<6
(B) Limits for General Population/Uncontrolled Exposure				
300-1500	--	--	F/1500	<30
1500-100000	--	--	1	<30

Calculation Method

Friis transmission 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

P_d limit of MPE is 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.



Measurement Result

Mode	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Tune Up Tolerance (dB)	Max. Tune Up Power (dBm)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Result
Zigbee	2405	3.85	4.64	±1	5.50	0.0017	1	Pass
GFSK (BLE) (RF Module: YC1175)	2440	1.73	1.22	±1	2.00	0.0005	1	Pass
GFSK (BLE) (RF Module: 6223A-SRD)	2480	2.5	0.21	±1	1.00	0.0004	1	Pass
802.11g	2462	2.5	17.00	±1	18.00	0.0223	1	Pass

The Zigbee, BLE and WiFi can transmit simultaneously.

Mode	Frequency (MHz)	Antenna Gain (dBi)	Power Density at 20cm (mW/cm ²)	Total Power density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Result
Zigbee	2405	3.85	0.0017	0.0249	1	Pass
GFSK (BLE) (RF Module: YC1175)	2440	1.73	0.0005			
GFSK (BLE) (RF Module: 6223A-SRD)	2480	2.5	0.0004			
802.11n(HT40)	2462	2.5	0.0223			

Note:

1. Calculate in the worst-case mode.
2. Max. Tune Up Power is declared by manufacturer, and used to calculate.
3. For a more detailed features description, please refer to the RF Test Report.

*****THE END*****