



# 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: 2APN5PANELPRO120

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:	Smart Home Control Panel
Trade Mark:	Sonoff
Model/Type Reference:	NSPanel120PW
Listed Model(s):	NSPanel120PB
Model Differences:	All these models are identical in the same PCB, layout, electrical circuit and enclosure. The difference is the model name and appearance color.
Frequency Band (Operating)	BT: 2402~2480MHz Zigbee: 2405~2480MHz 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 <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
Antenna Diversity	<input checked="" type="checkbox"/> Single antenna <input type="checkbox"/> Multiple antennas <input type="checkbox"/> TX diversity <input type="checkbox"/> RX diversity <input type="checkbox"/> TX/RX diversity
Antenna Gain (Max)	2dBi
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](http://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 <sup>2</sup> )	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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  limit of MPE is 1mW/cm<sup>2</sup>. 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
BT	2402	2	7.592	±1	8.50	0.0022	1	Pass
Zigbee	2440	2	9.904	±1	11.00	0.0040	1	Pass
802.11n(HT40)	2422	2	23.20	±1	24.00	0.0792	1	Pass

The BT, Zigbee and WiFi can transmit simultaneously.

Mode	Frequency (MHz)	Antenna Gain (dBi)	Power Density at 20cm (mW/cm <sup>2</sup> )	Total Power density at 20cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
BT	2402	2	0.0022	0.0854	1	Pass
Zigbee	2440	2	0.0040			
802.11n(HT40)	2422	2	0.0792			

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\*\*\*\*\*

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



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