RF Exposure Evaluation

FCC ID: 2AX45-SAFETEC

1. Client Information

Applicant	:	Ladner Creek Enterprise Ltd.
Address	:	Suite 103, 12300 Horseshoe Way, Richmond, BC, Canada V7A 4Z1
Manufacturer	:	BEIJING BLUESTONE TECHNOLOGY CORP.
Address	:	Commercial Building 387, 3rd Floor, Building 1, Zhongxi Garden, Haidian District, Beijing, China

2. General Description of EUT

EUT Name	:	THERMAL SECURITY SYSTEM	
Models No.	:	SAFETEC V1, SAFETEC V1-D, SAFETEC V1-K, SAFETEC V1-O, SAFETEC V1-W	
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, The only difference is way to install.	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz Bluetooth 4.1: 2402MHz~2480MHz
		Modulation Type:	802.11b: DSSS(CCK, DQPSK, DBPSK) 802.11g/n: OFDM(BPSK,QPSK,16QAM,64QAM) BLE: GFSK BT:GFSK (1 Mbps) Pi/4-DQPSK (2 Mbps) 8-DPSK (3 Mbps)
		Antenna Gain:	2dBi Internal Antenna
Power Rating		Adapter(XED-UL120200CC) Input: AC 100~240V, 50/60Hz 0.6A Output: DC 12V, 2A.	
Software Version		2.0.8	
Hardware Version		N/A	
Remark		The antenna gain provided by the applicant, the verified for the RF conduction test provided by TOBY test lab.	

Note: More test information about the EUT please refer the RF Test Report.

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MPE Calculations for WIFI

1. Antenna Gain:

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	Model	Frequency Range
Internal Ant:	N/A	2400~2483.5MHz
		2dBi

2. EUT Operation Condition:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S=(PG)/4\pi R^2$$

Where

S: power density

P: power input to the antenna

G: power gain of the antenna in the direction of interest relative to an isotropic radiator.

R: distance to the center of radiation of the antenna

4. Test Result:

2.4G WIFI&BLE

Mode	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/cm^2) [S]	Limit of Power Density (mW/cm^2) (S)
BLE	0.211	**0±1**	**1**	**2**	**20**	**0.0004**	**1**
802.11B	17.30	**17±1**	**18**	**2**	**20**	**0.0199**	**1**
802.11G	15.59	**15±1**	**16**	**2**	**20**	**0.0125**	**1**
802.11N(HT20)	14.94	**14±1**	**15**	**2**	**20**	**0.0099**	**1**

BT BER+EDR

Mode	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) Numeric [G]	Distance (cm) [R]	Power Density (mW/ cm^2) [S]
GFSK	8.404	8±1	9	2	20	0.0025
Pi/4-DQPSK	8.731	8±1	9	2	20	0.0025
8-DPSK	7.501	7±1	8	2	20	0.0019

The worst RF Exposure Evaluation			
Worst Calculation Value		Total Calculation Value	Threshold Value
2.4WiFi Mode	Bluetooth Mode		
0.0199	0.0025	0.0224	1.0

5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm^2)
300-1,500	F/1500
1,500-100,000	1.0

For BT&BLE:2402~2480 MHz
For WIFI: 802.11b/g/n(HT20): 2412MHz~2462MHz

MPE limit S: $1mW/ cm^2$
The MPE is calculated as ***0.0224mW / cm2 < limit 1mW / cm^2***. So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

Note

For a more detailed features description, please refer to the RF Test Report.

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