



Maximum Permissible Exposure Evaluation FCC ID: 2AU4DDCE

1. Client Information

Applicant	:	X-Sense Innovations Co., Ltd.
Address	:	B4 503D, Tower B, Kexing, Science Park, No. 15 Keyuan Road, Technology Park Community, Yuehai Avenue, Nanshan District, Shenzhen 518057, Guangdong, P.R. China
Manufacturer	:	X-Sense Innovations Co., Ltd.
Address	:	B4 503D, Tower B, Kexing, Science Park, No. 15 Keyuan Road, Technology Park Community, Yuehai Avenue, Nanshan District, Shenzhen 518057, Guangdong, P.R. China

2. General Description of EUT

EUT Name	:	Wi-Fi Combination Smoke and Carbon Monoxide Alarm	
Models No.	:	SC07-WX	
Model Different	:	----	
Product Description	:	Operation Frequency:	802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40):2422~2452MHz Bluetooth&LE 4.2: 2402-2480MHz
	:	Number of Channel:	802.11b/g/n(HT20):11 channels 802.11n(HT40):7 channels 40 channels for Bluetooth LE 79 channels for Bluetooth
	:	Antenna Gain:	3.42dBi PCB Antenna
Power Rating	:	Input: DC CR123A 3V	
Software Version	:	V1.0.0	
Hardware Version	:	V1.1	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark	:	the evaluation report used the EUT(TBR-C-202308-0143-7#).	

MPE Calculations for WIFI

1. EUT Operation Condition:

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

2. 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

3. Simultaneous transmission MPE Considerations

According to KDB447498: All transmitters and antennas in the host must be either evaluated for MPE compliance, by measurement or computational modeling, or qualify for the standalone MPE test exclusion in section 7.1. Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0 .

This means that:

$$\sum \text{ of MPE ratios } \leq 1.0$$



4. Test Result:

Bluetooth LE worst reported.

Test separation: 5mm						
Bluetooth Mode (GFSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	8.755	8±1	9	7.943	2.462	3.0
2.441	8.659	8±1	9	7.943	2.482	3.0
2.480	7.484	7±1	8	6.310	1.987	3.0
Bluetooth Mode (Pi/4-DQPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	8.038	8±1	9	7.943	2.462	3.0
2.441	7.945	7±1	8	6.310	1.972	3.0
2.480	6.948	6±1	6	3.981	1.254	3.0
Bluetooth Mode (8-DPSK)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	8.475	8±1	7	5.012	1.554	3.0
2.441	8.351	8±1	8	6.310	1.972	3.0
2.480	7.327	7±1	8	6.310	1.987	3.0
Bluetooth LE Mode(1Mbps)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	8.889	8±1	9	7.943	2.462	3.0
2.440	8.038	8±1	9	7.943	2.482	3.0
2.480	6.998	6±1	7	5.012	1.579	3.0



2.4GWiFi worst reported

Mode	Frequency (MHz)	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)
802.11b	2412	16.334	16±1	17	3.42	20	0.0219	1
	2437	18.187	18±1	19	3.42	20	0.0347	1
	2462	16.279	16±1	17	3.42	20	0.0219	1
802.11g	2412	13.279	13±1	14	3.42	20	0.0110	1
	2437	15.726	15±1	16	3.42	20	0.0174	1
	2462	13.528	13±1	14	3.42	20	0.0110	1
802.11 n(HT20)	2412	12.995	12±1	13	3.42	20	0.0087	1
	2437	14.924	14±1	15	3.42	20	0.0138	1
	2462	9.951	9±1	10	3.42	20	0.0044	1
802.11 n(HT40)	2422	8.735	8±1	9	3.42	20	0.0035	1
	2437	10.46	10±1	11	3.42	20	0.0055	1
	2452	9.521	9±1	10	3.42	20	0.0044	1

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 2.4WIFI:2412~2462 MHz and Bluetooth LE
MPE limit S: 1mW/ cm²

The MPE is calculated as **0.0347 < limit 1mW / cm²**. 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.

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device.

-----END OF REPORT-----

