

## RF EXPOSURE EVALUATION

### EUT Specification

<b>EUT</b>	Smart Badge
<b>Model Number</b>	LW006
<b>FCC ID</b>	2AO94- LW006
<b>Antenna gain (Max)</b>	2.58dBi
<b>Operation Frequency</b>	2402-2480MHz, 915MHz
<b>Input Rating</b>	DC 3.7V
<b>Standard</b>	47 CFR Part 1.1307 47 CFR Part 1.1310 KDB447498D01 General RF Exposure Guidance v06
<b>Modulation</b>	BLE(GFSK), LoRa

### Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:  $[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$  for 1-g SAR and  $\leq 7.5$  for 10-g extremity SAR, where  $f(\text{GHz})$  is the RF channel transmit frequency in GHz. Power and distance are rounded to the nearest mW and mm before calculation. The result is rounded to one decimal place for comparison. The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

According to KDB447498D01 General RF Exposure Guidance v06

Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

### Calculated Result and Limit

Operation Mode: BLE(GFSK)						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
GFSK -Lowest (2402MHz)	2.41	3±1	4	2.51	0.78	3.0
GFSK -Middle (2440MHz)	3.55	3±1	4	2.51	0.78	
GFSK -Highest (2480MHz)	3.67	3±1	4	2.51	0.79	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

The Maximum power is less than the limit, complies with the exemption requirements, SAR is exempted.

For 915MHz :

Ant gain=1.01dBi

Ant numeric gain= 1.26

Field strength = 88.28dBuV/m@3m

EIRP=E-104.7+20logD=88.28-104.7+20log3=-6.88dBm

Maximum Conducted Output Power:-3.35dBm

Tune-up:-3.35±1

Channel	Antenna Distance (mm)	Maximum tune-up Power		Calculated value	Exclusion threshold
		(dBm)	(mW)		
915MHz	5	-2.35	0.5821	0.0002	3.0
Conclusion: the calculated value ≤3.0, SAR is exempted.					

BLE and LoRa can be launched simultaneously. Simultaneous evaluation of compliant RF

exposure: Sum of Maximum Ratios:0.79+0.0002=0.7902<3.0

Remark: The Max Conducted Peak Output Power data refer to report Report No.:

91275-23-72-23-PP001 , 91275-23-72-23-PP002

The Maximum power is less than the limit, complies with the exemption requirements, SAR is exempted.