

RF EXPOSURE EVALUATION

EUT Specification

EUT	Wireless Mouse
Frequency band (Operating)	<input type="checkbox"/> 2.408GHz ~ 2.474GHz <input type="checkbox"/> WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz <input type="checkbox"/> WLAN: 5.745GHz ~ 5.825GHz <input checked="" type="checkbox"/> Others(2402-2480MHz)
Device category	<input checked="" type="checkbox"/> Portable (<20cm separation) <input type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
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
Max. output power	88.46dBuV/m (-6.80dBm(0.21mW) for 2.4G -1.99dBm (0.632mW) for BLE
Antenna gain	0.9dBi
Evaluation applied	<input type="checkbox"/> MPE Evaluation <input checked="" type="checkbox"/> SAR Evaluation

Standard Requirement

Portable Device

According to §15.247(i) and §1.1307b(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See KDB 447498 D01 General RF Exposure Guidance v05, section 4.3.1.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 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 ≤ 7.5 for 10-g extremity SAR,¹⁶ where

- f(GHz) is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation¹⁷
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 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.

Measurement Result for 2.4G

At separation distance $\leq 5\text{mm}$

Channel Frequency (MHz)	Max Output power (dBuV/m)	Max Output power (dBm)	Tolerance	Max Tune-up power (mW)	Calculation Value (Note 1)	Threshold Value
2402	85.16	-10.10	± 0.5	0.110	0.034	3
2440	86.46	-8.80	± 0.5	0.148	0.046	3
2480	88.46	-6.80	± 0.5	0.234	0.074	3

$$E = \text{EIRP} - 20\log D + 104.8$$

where:

E = electric field strength in dB μ V/m,

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

$$\text{EIRP} = E - 104.8 + 20\log D = 88.46 - 104.8 + 20\log 3 = -6.80\text{dBm}$$

Note 1: Calculation Value = [(max. power of channel, mW)/(min. test separation distance, mm)] $\cdot \sqrt{f(\text{GHz})}$.
Fox example: $0.234/5 \cdot \sqrt{2.48} = 0.074 \leq 3.0$

Measurement Result for BLE

At separation distance $\leq 5\text{mm}$

Channel Frequency (MHz)	Max Output power (dBm)	Tolerance	Max Output power (mW)	Calculation Value ^(Note 1)	Threshold Value
GFSK					
2402	-2.19	± 0.5	0.678	0.210	3
2440	-1.99	± 0.5	0.710	0.222	3
2480	-2.65	± 0.5	0.610	0.192	3

Note 1: Calculation Value = [(max. power of channel, mW)/(min. test separation distance, mm)] $\cdot \sqrt{f(\text{GHz})}$.
For example: $0.710/5 \cdot \sqrt{2.44} = 0.222 \leq 3.0$

According to KDB447498 D01 V06, threshold at which no SAR required is ≤ 3.0 for 1-g SAR, separation distance is 5mm, and no SAR measurement is required.

The SAR measurement is not necessary.