

RF EXPOSURE EVALUATION

EUT Specification

EUT	Multi-host mechanical keyboard
Model Name	3098B
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☒ Others(2402-2479MHZ)
Device category	☒ Portable (<20cm separation) ☐ Mobile (>20cm separation) ☐ Others ____
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	102.44 dBuV/m (7.183dBm)(5.227mW)
Antenna gain	-1 dBi
Evaluation applied	☐ MPE Evaluation ☒ 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 V6, 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

- $f(\text{GHz})$ 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

Channel (GHz)	Max output power (dBuV/m)	Max power + tune-up tolerance (dBm)	Max Tune up Power (dBm)	Distance (mm)	Calculation results	Limit
2.446	102.44	7.183 ±1	8.183	5	2.05	3.0

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

where:

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

EIRP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

$$\text{EIRP} = E - 104.8 + 20\log D = 102.44 - 104.8 + 20\log 3 = 7.183 \text{ dBm}$$

Note 1: Calculation Value = [(max. power of channel, including tune-up tolerance, mW)/(min.

test separation distance, mm)] • [√ f(GHz)].

$$\text{Fox example: } 6.58/5 \cdot \sqrt{2.446} = 2.05 \leq 3.0$$

Conclusion: Pass. The SAR measurement is not necessary.