

RF Exposure

Standard Applicable:

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in the manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Portable device with its physical nature to be used nearby, the distance between radiating structure and human is less than 20cm.

As per KDB 447498 D01 §4.3.1.1, The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm, and ≤ 5 m (not to exceed) are determined by:

$$\left[\frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] \cdot$$

$$\left[\sqrt{f(\text{GHz})} \right] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

f (GHz) is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation

The operational distance is 25mm with the verification of internal photo.

8.31

Bluetooth:

BR mode (GFSK):

Frequency (MHz)	Output Power (dBm)	Duty Cycle	Output Power (mW)
2402.00	6.48	0.008	0.03557
2441.00	7.17	0.008	0.04170
2480.00	7.15	0.008	0.04150

EDR mode ($\pi/4$ DQPSK):

Frequency (MHz)	Output Power (dBm)	Duty Cycle	Output Power (mW)
2402.00	7.23	0.008	0.04228
2441.00	7.94	0.008	0.04978
2480.00	7.92	0.008	0.04956

EDR mode (8DPSK):

Frequency (MHz)	Output Power (dBm)	Duty Cycle	Output Power (mW)
2402.00	7.59	0.008	0.04593
2441.00	8.31	0.008	0.05421
2480.00	8.27	0.008	0.05371

Step 1: (≤ 5 mm)

This is a portable device and the Max peak output power is (0.05421mW) lower than the threshold given and derived as formula given above, where

Bluetooth:

Mode	Frequency	Power (avg in dBm)	Power (avg mw)	Distance (mm)	Threshold (<10mm)
GFSK	2441	5.52	3.564511334	25	0.222763422
$\pi/4$ DQPSK	2441	6.11	4.083193863	25	0.255178383
8DPSK	2441	6.40	4.365158322	25	0.272799695

Conclusion:

As the result of calculation result indicates, the RF exposure generating from given transmitter (transmitter employed digital modulation) can be excluded from SAR measurement, (<0.3), and therefore is deemed compliant with RF exposure as per KDB 447498 D01, FCC.