

Appendix 5

Radio Frequency Exposure

Maximum transmitter power for BLE:

Frequency (MHz)	Maximum peak output power (dBm)	Output power(mW)
2402	-3.11	0.4887
2440	-4.66	0.3420
2480	-5.92	0.2559

Maximum transmitter power for ZigBee:

Frequency (MHz)	Maximum peak output power (dBm)	Output power(mW)
2402	-8.03	0.1574
2440	-8.45	0.1429
2480	-9.58	0.1102

According to KDB 447498 D01:

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, 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
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

Result for BLE:

$$(0.4887/5) \cdot \sqrt{2.405} = 0.1516 < 3.0$$

$$(0.3420/5) \cdot \sqrt{2.440} = 0.1068 < 3.0$$

$$(0.2559/5) \cdot \sqrt{2.480} = 0.0806 < 3.0$$

Result for ZigBee:

$$(0.1574/5) \cdot \sqrt{2.405} = 0.0488 < 3.0$$

$$(0.1429/5) \cdot \sqrt{2.440} = 0.0446 < 3.0$$

$$(0.1102/5) \cdot \sqrt{2.480} = 0.0347 < 3.0$$

Conclusion:

Since client declares that BLE and ZigBee will not operate at the same time, simultaneous simulation is not performed. According to calculation as shown above, no SAR is required.