

FCC SAR REQUIREMENTS

The EUT will have a separation distance from the user of 3.067 inches (7.79018 cm).

KDB 447498 section 4.3.2 (b) gives the following:

“When an antenna qualifies for the standalone SAR test exclusion of 4.3.1 and also transmits simultaneously with other antennas, the standalone SAR value must be estimated according to the following to determine the simultaneous transmission SAR test exclusion criteria:”

a. $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})/x}] \text{ W/kg}$, for test separation distances $\leq 50 \text{ mm}$;

b. or 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distance is $> 50 \text{ mm}$.

The worst case configuration is when the RedPine is in BLE mode at the high channel and the Nordic is in Thread Mode at the middle channel.

RedPine BLE = 17.47 dBm (Conducted) + 2.00 dB (Tune Up) = 19.49 dBm (88.51 mW)

Nordic Thread = 17.55 dBm (Conducted) + 2.00 dB (Tune Up) = 19.55 dBm (90.16 mW)

SAR value estimate for RedPine BLE = $(88.51 \text{ mW}) / (77.9018 \text{ mm}) \cdot 0.4 = 0.4545 \text{ W/kg}$

SAR value estimate for Nordic Thread = $(90.55 \text{ mW}) / (77.9018 \text{ mm}) \cdot 0.4 = 0.4695 \text{ W/kg}$

Total value = $0.4545 + 0.4695 = 0.924 \text{ W/kg}$

Please note that for the WiFi configurations on the RedPine, the WiFi will not transmit at the same time as the Nordic chip. This means that for WiFi, only one transmitter will ever be active at that time.

A diagram that shows that worst case separation distance of 3.067 inches away from the user is shown in the internal photos exhibit.