

## SAR Evaluation for extremity conditions

### 1. Extremity exposure conditions

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity *SAR Test Exclusion Thresholds* should be applied to determine SAR test requirements.

### 2. Standalone SAR test exclusion considerations

- 1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances*  $\leq$  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  $\leq 7.5$  for 10-g extremity SAR, where

$f_{(\text{GHz})}$  is the RF channel transmit frequency in GHz

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- 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

The test exclusions are applicable only when the minimum *test separation distance*  $\leq$  50 mm and for transmission frequencies between 100 MHz and 6 GHz

- 2) At 100 MHz to 6 GHz and for *test separation distances*  $>$  50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B of KDB 447498 D01 v05r02
- [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) (f(MHz)/150)] mW, at 100 MHz to 1500 MHz
  - [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)  $\cdot$  10] mW at  $>$  1500 MHz and  $\leq$  6 GHz

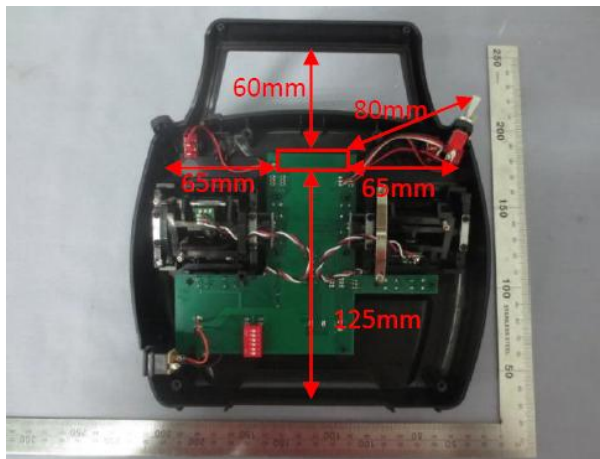
### 3. EUT Description



EUT top view



EUT Bottom view



Distance to Antenna

Closest Distance of antenna to extremity exposure positions(mm)					
Front	Back	Top	Bottom	Left	Right
20	30	60	125	65	65

Table 1

Conducted power of EUT				
Frequency (MHz)	Power in dBm	Power in mW	Tune-up power (dBm)	Tune-up power (mW)
2403	16.74	47.21	18	63.10
2441	17.42	55.21	18	63.10
2480	4.70	2.95	18	63.10

Table 2

#### **4. Extremity SAR test exclusion calculation**

According to appendix B of KDB 447498 D01v05r02, Peak spatial average SAR for any body tissue including the hands, wrists, forearms, feet, ankles, lower legs and pinnate, is required to be determined over 10 g of tissue in the shape of a cube. When test separation distance is 20mm, the factor is  $4.97 (63.1/20 * (2.48)^{1/2}) < 7.5$ , less than 10-g SAR test exclusion thresholds.

#### **5. Conclusion**

SAR test for 10-g extremity of this device is exempted.