

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 ≤ 7.5 for 10-g extremity SAR, where

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot \sqrt{f_{(\text{GHz})}} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

- $f_{(\text{GHz})}$ 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

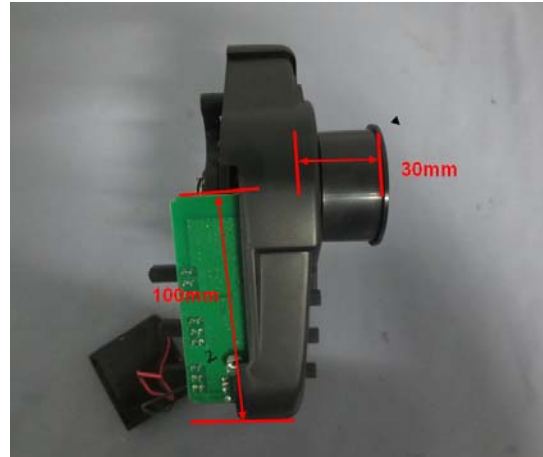
The test exclusions are applicable only when the minimum *test separation distance* \leq 50 mm and for transmission frequencies between 100 MHz and 6 GHz

- 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 v05r01
 - [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) · 10] mW at $>$ 1500 MHz and \leq 6 GHz

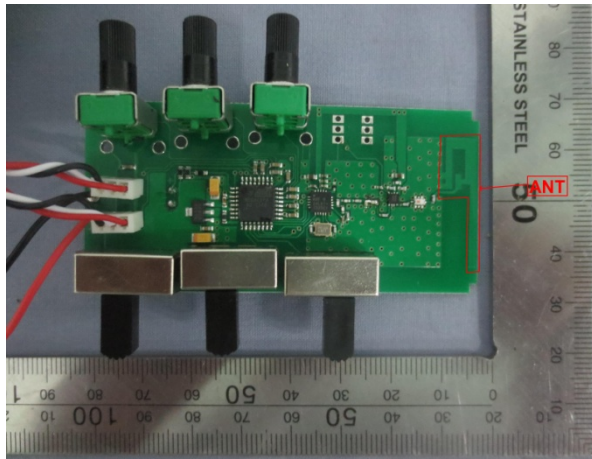
3. EUT Description



Hand hold positions



Hand hold positions



Antenna Location

Distance of antenna to extremity exposure positions(mm)		
Back	Direction knob	Pull buckle switch
100	30	55

Table 1

Frequency (MHz)	Power in dBm	Power in mW
2403	18.70	74.13
2441	18.97	78.89
2480	5.29	3.38

Table 2

4. Extremity SAR test exclusion calculation

According to appendix B of KDB 447498 D01v05r02.

According to above when test separation distance is 30mm

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 SAR¹⁶ where

- f_{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

5. Conclusion

$(78.89\text{mW}/30\text{mm})/\sqrt{2.441} = 4.1 < 7.5$ for 10-g extremity SAR