

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:

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

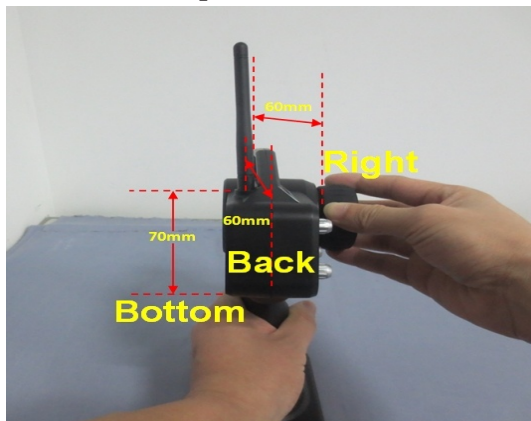
- $f_{(\text{GHz})}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

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



Antenna Location

| Distance of antenna to extremity exposure positions(mm) | | |
|---|--------|-------|
| Back | Bottom | Right |
| 60 | 70 | 60 |

Table 1

| Conducted power of EUT | | | | |
|------------------------|--------------|-------------|---------------------|--------------------|
| Frequency (MHz) | Power in dBm | Power in mW | Tune-up power (dBm) | Tune-up power (mW) |
| 2403 | 17.66 | 58.34 | 19 | 79.43 |
| 2441 | 18.28 | 67.30 | 19 | 79.43 |
| 2480 | 18.55 | 76.61 | 19 | 79.43 |

Table 2

4. Extremity SAR test exclusion calculation

According to appendix B of KDB 447498 D01v05r01, Power allowed at numeric threshold for 2450 MHz at 60 mm is 196 mW for 1-g SAR, 340 mW for 10-g extremity SAR, and the maximum tune-up power of EUT is 79.43 mW, so the 1-g SAR and 10-g extremity SAR test is exclusion.

5. Conclusion

SAR test for 1-g and 10-g extremity is exclusion.