

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:

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

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

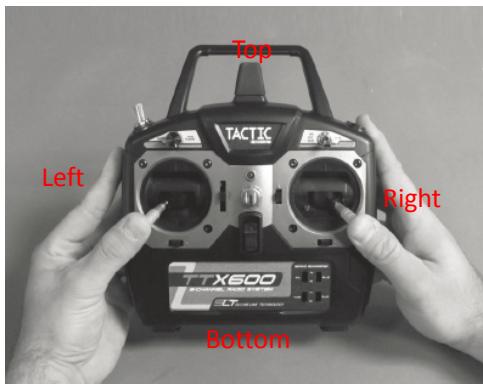
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

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

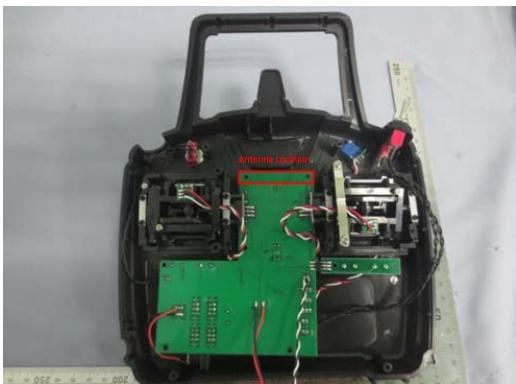
- 2) At 100 MHz to 6 GHz and for *test separation distances* $>$ 50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B of KDB 447498 D01 v05r01
 - $[\text{Power allowed at numeric threshold for 50 mm in step 1} + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)] \text{ mW, at 100 MHz to 1500 MHz}$
 - $[\text{Power allowed at numeric threshold for 50 mm in step 1} + (\text{test separation distance} - 50 \text{ mm}) \cdot 10] \text{ mW at } > 1500 \text{ MHz and } \leq 6 \text{ GHz}$

3. EUT Description

The Tactic TTX600 handheld airplane radio system uses an advanced 2.4GHz spread spectrum technology to prevent unwanted outside interference from interrupting control of the model, ensuring error-free flying and eliminating the need to pull frequency pins before every flight. Tactic 2.4GHz transmitters and receivers are not compatible with other brands of 2.4GHz equipment.



EUT Front view



Antenna Location

Distance of antenna to extremity exposure positions(mm)			
Top	Bottom	Left	Right
55	117	69	71

Table 1

Conducted power of EUT				
Frequency(MHz)	Power in dBm	Power in mW	Tune-up power (dBm)	Tune-up power (mW)
2403	14.26	26.67	15	31.62
2441	14.18	26.18	15	31.62
2480	14.19	26.24	15	31.62

Table 2

4. Extremity SAR test exclusion calculation

According to appendix B of KDB 447498 D01v05r01, Power allowed at numeric threshold for 50 mm for 2450 MHz is 96 mW for 1-g SAR, 242 mW for 10-g extremity SAR, so the SAR exclusion threshold for Top position (worst case) is 146 mW for 1-g SAR, and 272mW for 10-g extremity SAR, and the maximum tune-up power of EUT is 36.62 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.