

## SAR test exclusion considerations

**Guidance Applied: KDB 447498 D01v06**

### KDB 447498 D01 Section 4.3.1 Standalone SAR test exclusion considerations

a) For 100 MHz to 6 GHz and test separation distances  $\leq$  50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following:

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

- $f_{(\text{GHz})}$  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
- The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below

The test exclusions are applicable only when the minimum test separation distance is  $\leq$  50 mm, and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $<$  5 mm, a distance of 5 mm according to 4.1 f) is applied to determine SAR test exclusion.

b) For 100 MHz to 6 GHz and test separation distances  $>$  50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following (also illustrated in Appendix B):

- 1)  $\{[\text{Power allowed at numeric threshold for 50 mm in step a}]] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f_{(\text{MHz})}/150)]\} \text{ mW, for 100 MHz to 1500 MHz}$
- 2)  $\{[\text{Power allowed at numeric threshold for 50 mm in step a}]] + [(\text{test separation distance} - 50 \text{ mm}) \cdot 10]\} \text{ mW, for } > 1500 \text{ MHz and } \leq 6 \text{ GHz}$

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

- 1) For test separation distances  $>$  50 mm and  $<$  200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by  $[1 + \log(100/f_{(\text{MHz})})]$
- 2) For test separation distances  $\leq$  50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by  $\frac{1}{2}$
- 3) SAR measurement procedures are not established below 100 MHz.

### Determination of exemption according to KDB 447498 D01 Section 4.3.1 c) 2)

Transmitting Frequency (MHz)	Field strength (dB $\mu$ V/m @3m)	Max Power[EIRP] (dBm)	Max power[EIRP] (mW)	Separation distance (mm)	Threshold at 50mm 4.3.1 a) In mW	Threshold per 4.3.1 c)1) in mW	Threshold per 4.3.1 c)2) in mW
<b>0.134</b>	<b>104.6</b>	9.4	8.7	5.0	474.3	1837.1	918.5

Note: EIRP was calculated using the following.

$$\text{EIRP} = E_{\text{Meas}} + 20\log(d_{\text{Meas}}) - 104.7$$

EIRP: equivalent isotropically radiated power, in dBm

$E_{\text{Meas}}$ : field strength of the emission at the measurement distance, in dB $\mu$ V/m

$d_{\text{Meas}}$ : measurement distance, in m

**Conclusion:** SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.