

Appendix G:**SAR Exclusion & MPE Calculation****KDB 447498**

Section 4.3 General SAR test reduction and exclusion guidance

For Standalone SAR exclusion consideration, when SAR exclusion Threshold requirement in KDB 447498 is satisfied, standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

In the frequency range 100 MHz to 6 GHz and test separation distance of $\leq 50\text{mm}$, the SAR Test Exclusion Threshold will be determined as follows

SAR Exclusion Threshold (SARET)

SAR Exclusion Threshold = Step 1 + Step 2

Step 1

$$NT = [(MP/TSD^A) * \sqrt{f_{\text{GHz}}}]$$

NT = Numeric Threshold (3.0 for 1-g SAR and 7.5 for 10-g SAR)

MP = Max Power of channel (mW) (inc tune up)

TSD^A = Min Test separation Distance or 50mm (whichever is lower) = 5mm (in this case)

We can transpose this formula to allow us to find the maximum power of a channel allowed and compare this to the measured maximum power.

$$= [(NT * TSD^A) / \sqrt{f_{\text{GHz}}}]$$

For Distances Greater than 50 mm Step 2 applies

Step 2

$$(TSD^B - 50\text{mm}) * 10\}$$

Where:

TSD^B = Min Test separation Distance (mm) = 50

Note: Step 2 is not required here as the TSD^A is less than 50mm.

Operating Frequency 2.402 GHz

$$\begin{aligned} \text{SARET} &= [(3.0 \times 5) / \sqrt{2.402}] \\ \text{SARET} &= 9.68\text{mW} \end{aligned}$$

Operating Frequency 2.440 GHz

$$\begin{aligned} \text{SARET} &= [(3.0 \times 5) / \sqrt{2.440}] \\ \text{SARET} &= 9.60\text{mW} \end{aligned}$$

Operating Frequency 2.480 GHz

$$\begin{aligned} \text{SARET} &= [(3.0 \times 5) / \sqrt{2.480}] \\ \text{SARET} &= 9.53\text{mW} \end{aligned}$$

Channel Frequency (MHz)	EIRP (mW)	SAR Exclusion Threshold	SAR Evaluation
2402	2.34	9.68	Not Required
2440	2.09	9.60	Not Required
2480	1.82	9.53	Not Required

Therefore standalone SAR evaluation for general population exposure conditions by measurement or numerical simulation is not required.

Prediction of MPE limit at a given distance

$$S = \frac{EIRP}{4\pi R^2} \text{ re - arranged } R = \sqrt{\frac{EIRP}{S4\pi}}$$

Where:

S = power density

R = distance to the centre of radiation of the antenna

EIRP = EUT Maximum power

Note:

The EIRP was calculated by addition of the maximum conducted carrier power and the maximum antenna gain.

Result

Prediction Frequency (MHz)	Maximum EIRP (mW)	Power density limit (S) (mW/cm ²)	Distance (R) cm Required to be less than 1 mW/cm ²
2402	2.34	1	0.44