

General SAR test reduction & exclusion guidance / 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.

The SAR Test Exclusion Threshold for operation in the 2400 – 2483.5 MHz band will be determined as follows

SAR Exclusion Threshold (SARET)

SAR Exclusion Threshold = Step 1 + Step 2

Step 1

$$NT = [(MP/TSDA) * \sqrt{fGHz}]$$

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)

TSDA = 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.

$$= [(NT \times TSA) / \sqrt{fGHz}]$$

For Distances Greater than 50 mm Step 2 applies

Step 2

$$(TSDB - 50mm) * 10$$

Where:

TSDB = Min Test separation Distance (mm) = 50

Note: Step 2 is not required here as the TSA is 5mm.

Operating Frequency 2.405 GHz

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

Operating Frequency 2.440 GHz

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

Operating Frequency 2.480 GHz

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

Channel Frequency (MHz)	<i>Maximum Conducted Power (mW)</i>	SAR Exclusion Threshold (mW)	SAR Evaluation
2405	0.793	9.68	Not Required
2440	0.798	9.60	Not Required
2480	0.678	9.53	Not Required

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

RF Exposure Technical Brief

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2.5.1 Exemption Limits for Routine Evaluation – SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance.

Channel Frequency (MHz)	EIRP (mW)	SAR Exclusion Threshold at distance of ≤ 5 mm (mW)	SAR Evaluation
2405	1.26	4.26	Not Required
2440	1.26	4.05	Not Required
2480	1.07	3.94	Not Required

Note: EIRP is calculated by adding maximum conducted power and antenna gain of 2 dBi