17 RF Exposure: General SAR test reduction and exclusion guidance

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 between 100 MHz and 6 GHz and test separation distance <50 mm, 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

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

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

According to KDB447498 section 4.3.1 (a), when the minimum test separation distance is <5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

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.

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

Since the Min test separation is less than 50mm, there is no need for Step 2.

Calculations:

Operating Frequency 2.402 GHz
SARET = [(3.0 x 5) / √2.402]
SARET = 9.7 mW

Operating Frequency 2.440 GHz
SARET = [(3.0 x 5) / √2.442]
SARET = 9.6 mW

Operating Frequency 2.480 GHz
SARET = [(3.0 x 5) / √2.480]
SARET = 9.5 mW

Channel Frequency (MHz)	EIRP (mW)	SAR Exclusion Threshold (mW)	SAR Evaluation
2402	0.22	9.7	Not Required
2442	0.20	9.6	Not Required
2480	0.47	9.5	Not Required

Remarks:
Max. EIRP power of 0.47mW is below the SARET, exempted from stand-alone SAR test.

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

At a distance of 5 mm, which is the usual distance for using the inhaler, it is the distance between the transmitter and the user skin, separated by gaps between the antenna, housing and thickness of material.