

RF Exposure Evaluation

According to KDB 447498 and part 2.1093, Unless specifically required by the *published RF exposure KDB procedures*, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding *SAR Test Exclusion Threshold* condition(s), listed below, is (are) satisfied.

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

Here,

For Zigbee mode

Max Power(mW)	Frequency(MHz)	Min. distance(mm)	Calc. thresholds	limit
2.15	2480	5	0.667	3.0

according to ANSI C63.10

where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, --- $10^{((\text{dBuV/m})/20)}/10^6$

d = measurement distance in meters (m) --- 3m

Field strength = 100.24 dBuV/m @ 3m

Ant gain = 1.69 dBi, so gt = 1.48

So pt = $(E \times d)^2 / 30 \times gt = \{ [10^{(100.24/20)} / 10^6 \times 3]^2 / 30 \times 1.48 \} \times 1000 \text{ mW} = 2.15 \text{ mW}$

So a SAR test is not required.