

RF Exposure Evaluation

According to KDB 447498 D01 General RF Exposure Guidance v06 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,

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

For BLE

Max Conducted Power(dBm)	Tune-up Power(dBm)	Max Tune-up Power(dBm)	Max Power(W)	Frequency(MHz)	Min. distance(mm)	Calc. thresholds	limit
1.59	1(± 1)	2	0.001585	2480	5	0.4992	3.0

$$\text{EIRP} = \text{EMeas} + 20\log(\text{dMeas}) - 104.7$$

EIRP is the equivalent isotropically radiated power, in dBm

EMeas is the field strength of the emission at the measurement distance, in dB μ V/m

dMeas is the measurement distance, in m

NFC:

Field strength (dB μ V/m)	EIRP (dBm)	Max tune-up (mW)	Frequency (MHz)	Min. distance(mm)	Calc. thresholds	limit
59.17	-35.99	0.000252	13.56	5	0.0002	3.0

RFID

Field strength (dB μ V/m)	EIRP (dBm)	Max tune-up (mW)	Frequency (MHz)	Min. distance(mm)	Calc. thresholds	limit
72.83	-19.33	0.011668	0.125	5	0.0008	3.0

simultaneous transmission MPE: BLE: $0.4992 / 3.0 = 0.1664$

NFC(13.56MHz): $0.0002 / 3.0 \approx 0.0001$ RFID(125KHz): $0.0008 / 3.0 \approx 0.0003$

BLE + NFC + RFID = $0.1664 + 0.0001 + 0.0003 = 0.1668 < 1.0$

So a SAR test is not required