



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.

SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f_{\text{(GHz)}}}] \leq 3.0$ 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 BLE

Mode	Frequency (MHz)	Power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Min. Distance (mm)	Calc. thresholds	limit
GFSK	2402	-1.923	-1 ± 1	0	1.00	5	0.3100	3.0

For EDR

Mode	Frequency (MHz)	Power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Min. Distance (mm)	Calc. thresholds	limit
GFSK	2441	3.458	3 ± 1	4	2.51	5	0.7843	3.0
$\pi/4$ -DQPSK	2402	3.445	3 ± 1	4	2.51	5	0.7780	3.0
8-DPSK	2441	3.801	3 ± 1	4	2.51	5	0.7843	3.0

For WIFI 2.4G

Mode	Frequency (MHz)	Power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Min. Distance (mm)	Calc. thresholds	limit
802.11b	2412	7.507	7 ± 1	8	6.31	5	1.9600	3.0
802.11g	2412	7.282	7 ± 1	8	6.31	5	1.9600	3.0
802.11n 20	2412	6.206	6 ± 1	7	5.01	5	1.5562	3.0
802.11n 40	2422	5.744	5 ± 1	6	3.98	5	1.2388	3.0



For WIFI 5.8G

Mode	Frequency (MHz)	Power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Max tune-up power (mW)	Min. Distance (mm)	Calc. thresholds	limit
802.11 a	5745	7.318	6.5 ± 1	7.5	5.62	5	2.6941	3.0
802.11 n20	5785	6.529	6 ± 1	7	5.01	5	2.4100	3.0
802.11 n40	5785	6.165	6 ± 1	7	5.01	5	2.4100	3.0
802.11 ac20	5785	6.558	6 ± 1	7	5.01	5	2.4100	3.0
802.11 ac40	5785	7.069	6.5 ± 1	7.5	5.62	5	2.7034	3.0
802.11 ac80	5775	7.070	6.5 ± 1	7.5	5.62	5	2.7011	3.0

Conclusion:

1. $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] < 3.0$.
2. SAR Test Exclusion Thresholds is 3.0 for separation distance 5mm. Therefore, SAR test is not required.
3. BT & 2.4GHz WiFi & 5.8GHz WiFi can not support simultaneous transmission.