

**RF EXPOSURE EVALUATION METHOD****SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and  $\leq 50$  mm**

According to §15.247(e)(i) and §1.1307(b)(1) systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

| MHz  | 5  | 10 | 15  | 20  | 25  | mm                                      |
|------|----|----|-----|-----|-----|---|
| 150  | 39 | 77 | 116 | 155 | 194 | SAR Test<br>Exclusion<br>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  |   |

According to KDB447498 D01 General RF Exposure Guidance V06

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm are determined by:

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

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.



## WIFI

|           | Frequency | Maximum Conducted Output Power(PK) | LIMIT |
|-----------|-----------|------------------------------------|-------|
|           | (MHz)     | (dBm)                              | dBm   |
| 802.11b   | 2412      | 9.35                               | 30    |
|           | 2437      | 9.66                               | 30    |
|           | 2462      | <b>9.68</b>                        | 30    |
| 802.11g   | 2412      | 8.69                               | 30    |
|           | 2437      | 9.65                               | 30    |
|           | 2462      | 9.08                               | 30    |
| 802.11n20 | 2412      | 8.92                               | 30    |
|           | 2437      | 9.60                               | 30    |
|           | 2462      | 9.08                               | 30    |
| 802.11n40 | 2422      | 8.14                               | 30    |
|           | 2437      | 8.74                               | 30    |
|           | 2452      | 8.52                               | 30    |

WIFI max possible output power (PK,conducted) :  $8.7 \pm 1$ dbm

9.7dBm=9.33mW

0dBi logarithmic terms convert to numeric result is nearly 1.0

2412MHz

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance,mm})] \cdot [\sqrt{f(\text{GHz})}] = 9.33/5 \cdot \sqrt{2.412} = 2.898 \leq 3.0$$

2437MHz



$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] \cdot [\sqrt{f(\text{GHz})}] = 9.33/5 \cdot \sqrt{2.437} = 2.912 \leq 3.0$$

2462MHz

$$\left[ \frac{\text{(max. power of channel, including tune-up tolerance, mW)}}{\text{(min. test separation distance, mm)}} \right] \cdot [\sqrt{f(\text{GHz})}] = 9.33/5 \cdot \sqrt{2.462} = 2.927 \leq 3.0$$

Conclusion: No SAR is required.