

RF EXPOSURE EVALUATION METHOD**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.

| 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 | |

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

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where } f(\text{GHz}) \text{ is the RF channel transmit frequency in GHz}$

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 ≤ 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.

2.4GWIFI

| frequency | Maximum Peak Conducted Output Power | Max Antenna Gain |
|-----------|-------------------------------------|------------------|
| GHz | dBm | dBi |
| 2412 | 8.525 | 1.92 |
| 2437 | 8.394 | 1.92 |
| 2462 | 8.428 | 1.92 |

5GWIFI

| frequency | Maximum Peak Conducted Output Power | Max Antenna Gain |
|-----------|-------------------------------------|------------------|
| GHz | dBm | dBi |
| 5745 | 6.18 | 1.6 |
| 5785 | 6.30 | 1.6 |
| 5825 | 6.26 | 1.6 |

For BT mode

Field strength = 95.08dBuV/m @3m

$$\text{EIRP} = E + 20\log(d) - 104.8 = 95.08 + 20\log(3) - 104.8 = -0.177 \text{ dBm} = 0.96 \text{ mW}$$

For BLE mode

Field strength = 94.69dBuV/m @3m

$$\text{EIRP} = E + 20\log(d) - 104.8 = 94.69 + 20\log(3) - 104.8 = -0.567 \text{ dBm} = 0.87 \text{ mW}$$

IEEE 802.11b

max possible output power (PK,conducted) : $8 \pm 1 \text{ dbm}$

1.92dBi logarithmic terms convert to numeric result is nearly 1.55

$$9 \text{ dbm} = 7.94 \text{ mW}$$

2412MHz

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation

$$\text{distance,mm}) \cdot [\sqrt{f(\text{GHz})}] = 7.94/5 \cdot \sqrt{2.412} = 2.46 \leq 3.0$$

Threshold at which no SAR required is 10mw and ≤ 3.0 for 1-g SAR, Separation

distance is 5mm.

2437MHz

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation

distance,mm)] · [$\sqrt{f(\text{GHz})}$]= $7.94/5 \cdot \sqrt{2.437} = 2.47 \leq 3.0$

Threshold at which no SAR required is 10mw and ≤ 3.0 for 1-g SAR, Separation

distance is 5mm.

2462MHz

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation

distance,mm)] · [$\sqrt{f(\text{GHz})}$]= $7.94/5 \cdot \sqrt{2.462} = 2.49 \leq 3.0$

Threshold at which no SAR required is 10mw and ≤ 3.0 for 1-g SAR, Separation

distance is 5mm.

IEEE 802.11a

max possible output power (PK, conducted) : $6 \pm 1 \text{ dbm}$

1.60dBi logarithmic terms convert to numeric result is nearly 1.44

$7 \text{ dbm} = 5.01 \text{ mW}$

5745MHz

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] = 5.01 / 5 \cdot \sqrt{5.745} = 2.40 \leq 3.0$

Threshold at which no SAR required is 10mw and ≤ 3.0 for 1-g SAR, Separation distance is 5mm.

5785MHz

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] = 5.01 / 5 \cdot \sqrt{5.785} = 2.41 \leq 3.0$

Threshold at which no SAR required is 10mw and ≤ 3.0 for 1-g SAR, Separation distance is 5mm.

5825MHz

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] = 5.01 / 5 \cdot \sqrt{5.825} = 2.42 \leq 3.0$

Threshold at which no SAR required is 10mw and ≤ 3.0 for 1-g SAR, Separation distance is 5mm.

Conclusion: No SAR is required.