**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:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] • [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,where
f(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 ≤ 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.

Maximum measured transmitter power.

**BT4.0+EDR The Worst Case**

| | |
|---|---|
| Mode | 2402-2480MHz |
| Detector | PEAK |
| GFSK | 5±1dBm |
| π/4-DQPSK | 1±1dBm |
| 8DPSK | 1±1dBm |

Remark: The worst case gain of the antenna is 0dBi.

0dBi logarithmic terms convert to numeric result is nearly 1

| Mode | frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power(dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|---|
| GFSK | 2.402 | 5.41 | 6 | 3.98107171 | 1.2340 | 3 |
| π/4-DQPSK | 2.441 | 1.8 | 2 | 1.58489319 | 0.4952 | 3 |
| 8DPSK | 2.441 | 1.82 | 2 | 1.58489319 | 0.4952 | 3 |

Threshold at which no SAR required is 1.234≤ 3.0 for 1-g SAR, Separation distance is 5mm.

**BT4.0 The Worst Case**

| | |
|---|---|
| Mode | 2402-2480MHz |
| Detector | PEAK |
| 2402MHz | 5±1dBm |
| 2440MHz | 4±1dBm |
| 2480MHz | 5±1dBm |

Remark: The worst case gain of the antenna is 0dBi.

0dBi logarithmic terms convert to numeric result is nearly 1

| frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power (dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|
| 2.402 | 5.62 | 6 | 3.981071706 | 1.2340 | 3 |
| 2.44 | 4.81 | 5 | 3.16227766 | 0.9879 | 3 |
| 2.48 | 5.33 | 6 | 3.981071706 | 1.2539 | 3 |

Threshold at which no SAR required is 1.2539≤ 3.0 for 1-g SAR, Separation distance is 5mm.

**2.4GWIFI The Worst Case**

| | |
|---|---|
| Mode | 802.11b/g/n20:<br>2412-2462MHz<br>802.11n40:<br>2422-2452MHz |
| Detector | PEAK |
| 802.11b | 5±1dBm |
| 802.11g | 5±1dBm |
| 802.11n20 | 5±1dBm |
| 802.11n40 | 4±1dBm |

Remark: The worst case gain of the antenna is 0dBi.
0dBi logarithmic terms convert to numeric result is nearly 1

| Mode | frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power (dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|---|
| 802.11b | 2.437 | 5.63 | 6 | 3.98107171 | 1.2430 | 3 |
| 802.11g | 2.462 | 5.44 | 6 | 3.98107171 | 1.2493 | 3 |
| 802.11n20 | 2.462 | 5.18 | 6 | 3.98107171 | 1.2493 | 3 |
| 802.11n40 | 2.452 | 4.16 | 5 | 3.16227766 | 0.9904 | 3 |

Threshold at which no SAR required is 1.2493≤ 3.0 for 1-g SAR, Separation distance is 5mm.

**5GWIFI The Worst Case**

| | |
|---|---|
| Mode | IEEE 802.11a/n/ac(HT20)<br>5.180GHz-5.240GHz<br>IEEE 802.11n/ac(HT40)<br>5.190GHz-5.230GHz<br>IEEE 802.11ac(HT80) 5.210GHz |
| Detector | PEAK |
| 802.11 a/n/ac(HT20) | -1±1dBm |
| 802.11 n/ac(HT40) | -2±1dBm |
| 802.11 ac(HT80) | -2±1dBm |

Remark: The worst case gain of the antenna is 0dBi.
0dBi logarithmic terms convert to numeric result is nearly 1

| Mode | frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power (dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|---|
| 802.11 a/n/ac(HT20) | 5.18 | -0.54 | 0 | 1 | 0.4552 | 3 |
| 802.11 n/ac(HT40)) | 5.19 | -2.15 | -1 | 0.79432823 | 0.3619 | 3 |
| 802.11ac(HT80) | 5.21 | -2.56 | -1 | 0.79432823 | 0.3626 | 3 |

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

**5GWIFI The Worst Case**

| Mode | IEEE 802.11a/n/ac(HT20) 5.260GHz-5.320GHz<br>IEEE 802.11n/ac(HT40) 5.270GHz-5.310GHz<br>IEEE 802.11ac(HT80) 5.290GHz |
|---|---|
| Detector | PEAK |
| 802.11 a/n/ac(HT20) | -1±1dBm |
| 802.11 n/ac(HT40) | -2±1dBm |
| 802.11 ac(HT80) | -2±1dBm |

Remark: The worst case gain of the antenna is 0dBi.
0dBi logarithmic terms convert to numeric result is nearly 1\

| Mode | frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power (dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|---|
| 802.11 a/n/ac(HT20) | 5.26 | -0.73 | 0 | 1 | 0.4587 | 3 |
| 802.11 n/ac(HT40)) | 5.27 | -2.34 | -1 | 0.79432823 | 0.3647 | 3 |
| 802.11ac(HT80) | 5.29 | -2.75 | -1 | 0.79432823 | 0.3654 | 3 |

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

**5GWIFI The Worst Case**

| | |
|---|---|
| Mode | IEEE 802.11a/n/ac(HT20) 5.50GHz-5.70GHz<br>IEEE 802.11n/ac(HT40) 5.510GHz-5.670GHz<br>IEEE 802.11ac(HT80) 5.530-5610GHz |
| Detector | PEAK |
| 802.11 a/n/ac(HT20) | -1±1dBm |
| 802.11 n/ac(HT40) | -1±1dBm |
| 802.11 ac(HT80) | -2±1dBm |

Remark: The worst case gain of the antenna is 0dBi.

0dBi logarithmic terms convert to numeric result is nearly 1

| Mode | frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power (dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|---|
| 802.11 a/n/ac(HT20) | 5.5 | -0.84 | 0 | 1 | 0.4690 | 3 |
| 802.11 n/ac(HT40)) | 5.51 | -1.81 | 0 | 1 | 0.4695 | 3 |
| 802.11ac(HT80) | 5.53 | -2.64 | -1 | 0.79432823 | 0.3736 | 3 |

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

**5GWIFI The Worst Case**

| | |
|---|---|
| Mode | IEEE 802.11a/n/ac(HT20) 5.745GHz-5.825GHz<br>IEEE 802.11n/ac(HT40) 5.755GHz-5.795GHz<br>IEEE 802.11ac(HT80) 5.775GHz |
| Detector | PEAK |
| 802.11 a/n/ac(HT20) | -1±1dBm |
| 802.11 n/ac(HT40) | -2±1dBm |
| 802.11 ac(HT80) | -3±1dBm |

Remark: The worst case gain of the antenna is 0dBi.

0dBi logarithmic terms convert to numeric result is nearly 1

| Mode | frequency (GHz) | Maximum Peak Conducted Output Power (dBm) | Tune up Power (dBm) | Tune up Power (mW) | Result | Limit |
|---|---|---|---|---|---|---|
| 802.11 a/n/ac(HT20) | 5.745 | -1.18 | 0 | 1 | 0.4794 | 3 |
| 802.11 n/ac(HT40)) | 5.755 | -2.31 | -1 | 0.79432823 | 0.3811 | 3 |
| 802.11ac(HT80) | 5.775 | -3.72 | -1 | 0.79432823 | 0.3818 | 3 |

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