

FCC ID: 2AD99B009E

According to KDB447498 D01 General RF Exposure Guidance V06

RFID

According 447498 D01 General RF Exposure Guidance v06 – 4.3. General SAR test exclusion guidance 4.3.1 c) can be exempted as follows using a test separation distances of < 200 mm:

Appendix C

SAR Test Exclusion Thresholds for < 100 MHz and < 200 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 | < 30 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | mm |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----|
| 100 | 237 | 474 | 481 | 487 | 494 | 501 | 507 | 514 | 521 | 527 | 534 | 541 | 547 | 554 | 561 | 567 | mW |
| 50 | 308 | 617 | 625 | 634 | 643 | 651 | 660 | 669 | 677 | 686 | 695 | 703 | 712 | 721 | 729 | 738 | |
| 10 | 474 | 948 | 961 | 975 | 988 | 1001 | 1015 | 1028 | 1041 | 1055 | 1068 | 1081 | 1095 | 1108 | 1121 | 1135 | |
| 1 | 711 | 1422 | 1442 | 1462 | 1482 | 1502 | 1522 | 1542 | 1562 | 1582 | 1602 | 1622 | 1642 | 1662 | 1682 | 1702 | |
| 0.1 | 948 | 1896 | 1923 | 1949 | 1976 | 2003 | 2029 | 2056 | 2083 | 2109 | 2136 | 2163 | 2189 | 2216 | 2243 | 2269 | |
| 0.05 | 1019 | 2039 | 2067 | 2096 | 2125 | 2153 | 2182 | 2211 | 2239 | 2268 | 2297 | 2325 | 2354 | 2383 | 2411 | 2440 | |
| 0.01 | 1185 | 2370 | 2403 | 2437 | 2470 | 2503 | 2537 | 2570 | 2603 | 2637 | 2670 | 2703 | 2737 | 2770 | 2803 | 2837 | |

| Frequency (MHz) | Distance (mm) | Exclusion Threshold(mW) | Max Power (dBuV/m) | Max Power (dBm) | Max Power(mW) | SAR Exemption fulfilled |
|-----------------|---------------|-------------------------|--------------------|-----------------|---------------|-------------------------|
| 0.125 | <50 | 941 | 55.22 | -44.68 | 0.000034 | Yes |
| 13.56 | <50 | 459 | 36.83 | -63.07 | 0.000005 | Yes |

According to the calculation formula of power:

Below 1GHz: dBm=dBuV/m-95.2-4.7

WiFi and Bluetooth LE:

According 447498 D01 General RF Exposure Guidance v06 – 4.3. General SAR test exclusion guidance 4.3.1 b) can be exempted as follows using a test separation distances of > 50 mm:

Appendix B

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 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | mm |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|----|
| 100 | 474 | 481 | 487 | 494 | 501 | 507 | 514 | 521 | 527 | 534 | 541 | 547 | 554 | 561 | 567 | mW |
| 150 | 387 | 397 | 407 | 417 | 427 | 437 | 447 | 457 | 467 | 477 | 487 | 497 | 507 | 517 | 527 | |
| 300 | 274 | 294 | 314 | 334 | 354 | 374 | 394 | 414 | 434 | 454 | 474 | 494 | 514 | 534 | 554 | |
| 450 | 224 | 254 | 284 | 314 | 344 | 374 | 404 | 434 | 464 | 494 | 524 | 554 | 584 | 614 | 644 | |
| 835 | 164 | 220 | 275 | 331 | 387 | 442 | 498 | 554 | 609 | 665 | 721 | 776 | 832 | 888 | 943 | |
| 900 | 158 | 218 | 278 | 338 | 398 | 458 | 518 | 578 | 638 | 698 | 758 | 818 | 878 | 938 | 998 | |
| 1500 | 122 | 222 | 322 | 422 | 522 | 622 | 722 | 822 | 922 | 1022 | 1122 | 1222 | 1322 | 1422 | 1522 | |
| 1900 | 109 | 209 | 309 | 409 | 509 | 609 | 709 | 809 | 909 | 1009 | 1109 | 1209 | 1309 | 1409 | 1509 | |
| 2450 | 96 | 196 | 296 | 396 | 496 | 596 | 696 | 796 | 896 | 996 | 1096 | 1196 | 1296 | 1396 | 1496 | |
| 3600 | 79 | 179 | 279 | 379 | 479 | 579 | 679 | 779 | 879 | 979 | 1079 | 1179 | 1279 | 1379 | 1479 | |
| 5200 | 66 | 166 | 266 | 366 | 466 | 566 | 666 | 766 | 866 | 966 | 1066 | 1166 | 1266 | 1366 | 1466 | |
| 5400 | 65 | 165 | 265 | 365 | 465 | 565 | 665 | 765 | 865 | 965 | 1065 | 1165 | 1265 | 1365 | 1465 | |
| 5800 | 62 | 162 | 262 | 362 | 462 | 562 | 662 | 762 | 862 | 962 | 1062 | 1162 | 1262 | 1362 | 1462 | |

BLE

| Frequency (MHz) | Distance (mm) | Exclusion Threshold(mW) | Max Power (dBuV/m) | Max Power (dBm) | Max Power(mW) | SAR Exemption fulfilled |
|-----------------|---------------|-------------------------|--------------------|-----------------|---------------|-------------------------|
| 2402 | 50 | 97 | 90.62 | -4.54 | 0.35 | Yes |
| 2440 | 50 | 96 | 90.38 | -4.78 | 0.33 | Yes |
| 2480 | 50 | 95 | 90.24 | -4.92 | 0.32 | Yes |

Data sources FCC ID: 2AA9B04, Test report number: CGZ3160202-00109-EF1

According to the calculation formula of power:

$$E.I.R.P.[dBm] = E[dBuV/m] + 20\log(d[m]) - 104.7$$

Where:

E is electric field strength in dBuV/m;

d is measurement distance in meters (m);

E.I.R.P.[dBm] is the equivalent isotropically radiated power in dBm(above 1GHz);

WIFI_802.11b

| Frequency (MHz) | Distance (mm) | Exclusion Threshold(mW) | Max Power(dBm) | Max Power(mW) | SAR Exemption fulfilled |
|-----------------|---------------|-------------------------|----------------|---------------|-------------------------|
| 2412 | 50 | 97 | 15.18 | 32.96 | Yes |
| 2437 | 50 | 96 | 15.50 | 35.48 | Yes |
| 2462 | 50 | 95 | 15.67 | 36.90 | Yes |

Simultaneous Transmission:

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

| | Max Power(mW) | Threshold ERP or Exemption limit (mW) | Ratio of MPE-Value/Limit |
|----------------|---------------|---|-----------------------------|
| RFID: 125kHz | 0.000034 | 941 | 0.000000036 |
| RFID: 13.56MHz | 0.0000005 | 459 | 0.000000001 |
| BLE | 0.35 | 95 | 0.003684211 |
| WIFI | 36.90 | 95 | 0.388421053 |
| Total | | | 0.392105301 |

Conclusion: SAR-Based Exemption fulfilled