

For FCC Standalone SAR test exclusion considerations

FCC ID: TLZ-CM2XXNF

WIFI Range	
F(GHz) Low	F(GHz) High
2.412	2.462
5.18	5.825
BT Range	
2.402	2.480

According to **KDB 447498 D01 General RF Exposure Guidance v05**

4.3.1 Standalone SAR test exclusion considerations

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:

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

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:

a) $[\text{Power allowed at numeric threshold for 50 mm in step 1}] + (\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz}) / 150)$ mW, at 100 MHz to 1500 MHz

b) $[\text{Power allowed at numeric threshold for 50 mm in step 1}] + (\text{test separation distance} - 50 \text{ mm}) \cdot 10$ mW at > 1500 MHz and ≤ 6 GHz

Based on the Maximum measured transmitter power:

Antenna	Pout Conducted (dBm)	Maximum Antenna Gain (dBi)	Pout EIRP (mW)
2.4GHz WIFI	23.71	2.98	467
5GHz WIFI	17.35	5.16	178
BT	5.63	2.98	7.26

Note: WIFI and BT antenna share the same antenna, so simultaneous transmission is not applied.

The distance between the antenna to the bottom of the device is 184mm.

For 2.4GHz WIFI:

Maximum TX Power is 467 mW EIRP

The Maximum exclusion power at 2.4GHz is 1446mW

Conclusion: 2.4GHz WIFI SAR was not required.

For 5GHz WIFI:

Maximum TX Power is 178 mW EIRP

The Maximum exclusion power at 5GHz is 1412mW

Conclusion: 5GHz WIFI and BT SAR was not required.

For BT:

Maximum TX Power is 7.26 mW EIRP

The Maximum exclusion power at 2.4GHz is 1446mW

Conclusion: BT SAR was not required.

Exclusion distance:

For 2.4GHz WIFI:

Maximum TX Power is 467 mW EIRP

According to the Maximum EIRP, the exclusion distance should be calculate use the formula below:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR for distance $\leq 50\text{mm}$

$[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot 10]$ mW at $> 1500 \text{ MHz}$ and $\leq 6 \text{ GHz}$ for distance $\geq 50\text{mm}$ at $> 1500 \text{ MHz}$ and $\leq 6 \text{ GHz}$

The Maximum exclusion distance at 2.4GHz is 87.09mm.

Conclusion: 2.4GHz WIFI SAR was not required when the distance is higher than 87.09mm.

For 5GHz WIFI:

Maximum TX Power is 178 mW EIRP

According to the Maximum EIRP, the exclusion distance should be calculate use the formula below:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR for distance $\leq 50\text{mm}$

$[\text{Power allowed at numeric threshold for 50 mm in step 1}) + (\text{test separation distance} - 50 \text{ mm}) \cdot 10]$ mW at $> 1500 \text{ MHz}$ and $\leq 6 \text{ GHz}$ for distance $\geq 50\text{mm}$ at $> 1500 \text{ MHz}$ and $\leq 6 \text{ GHz}$

The Maximum exclusion distance at 5GHz is 61.56mm.

Conclusion: 5GHz WIFI BT SAR was not required when the distance is higher than 61.56mm.

For BT:

Maximum TX Power is 7.26 mW EIRP

According to the Maximum EIRP, the exclusion distance should be calculate use the formula below:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR for distance $\leq 50\text{mm}$

mm)] · [√ f(GHz)] ≤ 3.0 for 1-g SAR for distance ≤ 50mm

[Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz for distance ≥ 50mm at > 1500 MHz and ≤ 6 GHz

The Maximum exclusion distance at BT is 3.81mm, in other words, the BT transmitter always satisfy the SAR exclusion regardless of the distance between the transmitter to user.

Conclusion: BT SAR was not required.