

FCCID: OQ5TX3010N

RF Exposure evaluation

According to 447498 D01 General RF Exposure Guidance v06

4.3. General SAR test exclusion guidance

4.3.1. Standalone SAR test exclusion considerations

- a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR,³⁰ where
- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
 - Power and distance are rounded to the nearest mW and mm before calculation³¹
 - The result is rounded to one decimal place for comparison
 - The values 3.0 and 7.5 are referred to as numeric thresholds in step b) below
- 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 according to 4.1 f) is applied to determine SAR test exclusion.

³⁰ This is equivalent to the formula written as: $[(\text{max. power of channel, including tune-up tolerance, mW}) / (60 / \sqrt{f(\text{GHz})} \text{ mW})] \cdot [20 \text{ mm} / (\text{min. test separation distance, mm})] \leq 1.0$ for 1-g SAR; also see Appendix A for approximate exclusion threshold numerical values at selected frequencies and distances.

$$\text{eirp} = \text{pt} \times \text{gt} = (\text{EXd})^2 / 30$$

where:

pt = transmitter output power in watts,

gt = numeric gain of the transmitting antenna (unitless),

E = electric field strength in V/m, --- $10^{[(\text{dBuV/m})/20]}/10^6$

d = measurement distance in meters (m)---3m

$$\text{So pt} = (\text{EXd})^2 / 30 \times \text{gt}$$

RF Exposure evaluation

Copied from the FCC test report:

Radiated spurious emissions:

| 520.600 MHz, Horizontal | | | | | | | |
|-----------------------------------|------------------|-----------------|---------------------|----------------------------|------------------|------------|------------|
| Spurious Emission Frequency (MHz) | Read value (dBm) | Cable Loss (dB) | Antenna Factor (dB) | 1-18GHz Pre-amplifier (dB) | Ture value (dBm) | Limit/ dBm | Margin(dB) |
| Fundamental: 520.0 | -18.2 | 2.8 | 19.3 | 0 | 3.9 | 24 | -20.1 |
| 531.2 | -55.8 | 2.9 | 19.5 | 0 | -33.4 | -13 | -20.4 |
| 1731.0 | -46.9 | 5.4 | 26.2 | 30 | -45.3 | -13 | -32.3 |
| 2603.0 | -35.6 | 6.8 | 28.3 | 30 | -30.5 | -13 | -17.5 |
| 520.600 MHz, Vertical | | | | | | | |
| Fundamental: 520.0 | -19.0 | 2.8 | 19.3 | 0 | 3.1 | 24 | -20.9 |
| 1884.0 | -44.1 | 5.7 | 27.3 | 30 | -41.1 | -13 | -28.1 |
| 521.325, Horizontal | | | | | | | |
| Fundamental: 521.3 | -17.9 | 2.8 | 19.3 | 0 | 4.2 | 24 | -19.8 |
| 532.5 | -55.9 | 2.9 | 19.5 | 0 | -33.5 | -13 | -20.5 |
| 1731.0 | -48.2 | 5.4 | 26.2 | 30 | -46.6 | -13 | -33.6 |
| 2598.0 | -35.2 | 6.8 | 28.3 | 30 | -30.1 | -13 | -17.1 |
| 521.325, Vertical | | | | | | | |
| Fundamental: 521.3 | -18.8 | 2.8 | 19.3 | 0 | 3.3 | 24 | -20.7 |
| 1884.0 | -43.9 | 5.7 | 27.3 | 30 | -40.9 | -13 | -27.9 |

| 541.625 MHz, Horizontal | | | | | | | |
|-------------------------|-------|-----|------|----|-------|-----|-------|
| Fundamental: 541.6 | -18.2 | 2.8 | 19.4 | 0 | 4.0 | 24 | -20.0 |
| 531.2 | -55.5 | 2.9 | 19.5 | 0 | -33.1 | -13 | -20.1 |
| 1731.0 | -47.9 | 5.4 | 26.2 | 30 | -46.3 | -13 | -33.3 |
| 2708.1 | -35.3 | 6.8 | 28.3 | 30 | -30.2 | -13 | -17.2 |
| 541.625 MHz, Vertical | | | | | | | |
| Fundamental: 541.6 | -18.8 | 2.8 | 19.4 | 0 | 3.4 | 24 | -20.6 |
| 1884.0 | -44.2 | 5.7 | 27.3 | 30 | -41.2 | -13 | -28.2 |

tune-up tolerance = ± 1 dB,

min. test separation distance = 5 mm, since the min distance from the antenna to the outer = 1.0 mm

The max Field strength = 4.2 dBm in 521.325 MHz

Max. power of channel after included tune-up tolerance

Field strength = 5.2 dBm = 3.31 mW in 521.325 MHz

So $(3.31 \text{ mW}) / (5.0 \text{ mm}) \times \sqrt{0.521325 \text{ GHz}} = 0.478 < 3$

Then SAR evaluation is not required