

## FCCID: 2AGF2X-011

### 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  $\leq 50$  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  $\leq 7.5$  for 10-g extremity SAR,<sup>30</sup> where
- $f(\text{GHz})$  is the RF channel transmit frequency in GHz
  - Power and distance are rounded to the nearest mW and mm before calculation<sup>31</sup>
  - 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  $\leq 50$  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.

<sup>30</sup> 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:

Carrier Frequency (MHz)	Reading Value conducted output power dBm (mW)	Cable loss (dB)	True Value conducted output power dBm (mW)	Limit in 74.861 e) 1)
174.200	10.4dBm(i.e.10.96mW)	0.4	10.8dBm(i.e.12.02mW)	17dBm (i.e. 50mW)
181.424	10.4dBm(i.e.10.96mW)	0.4	10.8dBm(i.e.12.02mW)	
215.800	9.8dBm(i.e.9.55mW)	0.4	10.2dBm(i.e.10.47mW)	

tune-up tolerance= $\pm 1$ dB,

min. test separation distance = 5 mm, since the min distance from the antenna to the outer = 4.0 mm

Field strength = 10.8 dBm=12.02 mW in 174.200MHz

Field strength = 10.8 dBm=12.02 mW in 181.424MHz

Field strength = 10.2 dBm=10.47 mW in 215.800MHz

Max. power of channel after included tune-up tolerance

Field strength = 11.8 dBm=15.14 mW in 174.200MHz

Field strength = 11.8 dBm=15.14 mW in 181.424MHz

Field strength = 11.2 dBm=13.18 mW in 215.800MHz

So ( 15.14 mW )/5.0mm)x  $\sqrt{0.174200 \text{ GHz}}$  = 1.263 <3

So ( 15.14 mW )/5.0mm)x  $\sqrt{0.181424 \text{ GHz}}$  = 1.289 <3

So ( 13.18 mW )/5.0mm)x  $\sqrt{0.215800 \text{ GHz}}$  = 1.225 <3

Then SAR evaluation is not required