



SAR EXCLUSION JUSTIFICATION

Manufacturer Ekahau Inc.
Device WLAN tag 2.4 GHz
FCC ID TA7UA5
IC 6864A-UA5

FCC:

SAR EXCLUSION JUSTIFICATION

Guidance document reference: KDB447498 D01 General RF Exposure Guidance v05r02, page 11, paragraph 4.3.1(1).

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:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] \leq 3.0$ 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
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 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 5) in section 4.1 is applied to determine SAR test exclusion.

These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

CALCULATIONS AND ASSUMPTIONS

Since the exact distance from the body may vary during use the worst possible distance where the device is in direct contact with the skin will be chosen as test separation distance in calculations. In this condition the antenna is 5 mm away from the body.

A source-based time-averaged maximum conducted output power (duty cycle 0.88%, see Duty cycle explanation) with antenna gain (2.26 dBi) and power tune-up (1.5 dB) added:

$$P_{MAX} = (19.57 \text{ dBm} + 2.26 \text{ dB} + 1.5 \text{ dB}) \times 0.0088 = 23.33 \text{ dBm} \times 0.0088 = 215.28 \text{ mW} \times 0.0088 = 1.89 \text{ mW}$$

Actual evaluation:

$$\frac{1.89 \text{ mW}}{5 \text{ mm}} \times \sqrt{2.412 \text{ GHz}} \approx 0.6 \leq 3.0$$

CONCLUSION

The analysis shows that the device qualifies for exemption from SAR testing.

Date: June 11, 2015

IC:

SAR EXCLUSION JUSTIFICATION

RSS-102 Issue 5:

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

CALCULATIONS AND ASSUMPTIONS

Since the exact distance from the body may vary during use the worst possible distance where the device is in direct contact with the skin will be chosen as test separation distance in calculations. In this condition the antenna is 5 mm away from the body.

A source-based time-averaged maximum conducted output power (duty cycle 1.04%, see Duty cycle explanation) with antenna gain (2.26 dBi) and power tune-up (1.5 dB) added:

$$P_{MAX} = (19.57 \text{ dBm} + 2.26 \text{ dB} + 1.5 \text{ dB}) \times 0.0088 = 23.33 \text{ dBm} \times 0.0088 = 215.28 \text{ mW} \times 0.0088 = 1.89 \text{ mW}$$

The exemption limit value at 2450 MHz: 4.0 mW

CONCLUSION

The analysis shows that the device qualifies for exemption from SAR testing.

Date: June 11, 2015