SAR Exclusion Justification

Test exclusion thresholds for <100 MHz at distances ≤ 50 mm

Guidance document reference: 447498 D01 General RF Exposure Guidance v05r01, page 11, paragraph 4.3.1(3)(b).

The power threshold is determined by:

[475 mW * [1 + log(1)] * 0.5] = 238 mW for 1-g SAR exclusion and

[1186 mW * [1 + log(1)] * 0.5] = 593 mW for 3-g SAR exclusion

- 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 numeric thresholds

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies <100 MHz. 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.

SAR test exclusion analysis:

Assumptions: Since the exact separation distance may vary from sensor to sensor, the minimum separation distance of 5 mm is assumed per the guidance document.

Measured field strength at a distance of 3 meters is 81.8 dBuV/m (12, 303 uV/m or 0.012 V/m)
Using the relation $V^2R^2/30$ to determine the equivalent isotropic radiated power:
$0.012^2 \times 3^2/30 = 4.5 \times 10^{-5}$ watts or 0.045 mW

Measured power of rf carrier: 0.05 mW.

The result of the above SAR threshold calculation demonstrates that the rf carrier power is less than the SAR threshold levels calculated above for frequencies less than 100 MHz and distances ≤ 50 mm.

Conclusion: The above analysis shows that the evaluated device qualifies for exemption from SAR testing.

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