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RF Exposure Analysis

FCC ID: 2AVM3BLK100

Analysis for FCC portable use

KDB 447498 Section: 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:

Power Thereshold = [(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] * $[\sqrt{f}(\text{GHz})]$

Which gives 3
 \leq 3.0 for 1-g SAR, and \leq 7.5 for 10-g extremity SAR, 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
- 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.

b) 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 (also illustrated in Appendix B):³²

- 1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz
- 2) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·10]} mW, for $>$ 1500 MHz and \leq 6 GHz

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion (also illustrated in Appendix C):

- 1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(\text{MHz}))]$
- 2) For test separation distances ≤ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$

The SAR test exclusion power threshold at 13.56 MHz when the minimum test separation is < 50 mm can be calculated as follows:

Initially, the maximum power for the power threshold of 3 at 50 mm and 100 MHz is calculated in accordance with step a). The max power to achieve is calculated from a manipulation of formula

$$\text{Power Threshold} = [(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}]$$

$$\text{Power Threshold} * (\text{min. test separation distance, mm}) / [\sqrt{f(\text{GHz})}] = (\text{max. power of channel, including tune-up tolerance, mW})$$

$$(3 * 50) / \sqrt{0.1} = \text{Max Power.} = 474 \text{ (rounded to nearest mW)}$$

For frequencies below 100 MHz, this maximum power is multiplied by $[1 + \log(100/f(\text{MHz}))]$

$$\begin{aligned} \text{Power threshold @ 13.56 MHz} &= 474 * [1 + \log(100/f(\text{MHz}))] \\ &= 474 * [1 + \log(100/13.56)] \\ &= 474 * [1 + 0.868] \\ &= 885.31 \text{ mW} \end{aligned}$$

For test separation distances ≤ 50 mm, this power threshold is multiplied by $\frac{1}{2}$

$$\begin{aligned} \text{Power threshold @ 13.56 MHz \& } \leq 50 \text{ mm} &= 885.31 * 0.5 \\ \text{Power threshold @ 13.56 MHz \& } \leq 50 \text{ mm} &= 443 \text{ (rounded to nearest mW)} \end{aligned}$$

For the wh Muenzpruefer Dietmar Trenner GmbH, the maximum conducted output power is 8.07 dBm (6.41 mW)

Since the source-based time-averaging conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

Conclusion

This demonstrates the wh Muenzpruefer Dietmar Trenner GmbH, BLK100 meets the criteria for 1-g head / body at a 0mm separation distance and 10-g extremity SAR test exemption at a separation distance of 0mm.

Signature:



Date:

