

RF exposure calculations of LM DTS reader

Standalone SAR test exclusion based on FCC document “RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES”

SAR test exclusion threshold (4.3.1 b):

$\{[\text{Power allowed at numeric threshold for 50 mm in step a)}] + [(\text{test separation distance} - 50 \text{ mm}) \cdot (f(\text{MHz})/150)]\}$ mW, for 100 MHz to 1500 MHz

Threshold: $158\text{mW} + (200-50) \cdot (900/150)\text{mW} = 1058\text{mW}$

Actual output power of 125mW is well below the threshold.

The device exposure also satisfies SAR test exclusion threshold (4.3.1 a) with 50mm separation distance:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

Result: $(125\text{mW}/50) \cdot 0.928 = 2.32$, which is below 3.0.

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For IC:

RS-102 2.5.2 Exemption Limits for Routine Evaluation

- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz

Limit: $1.31 \times 10^{-2} \cdot 9000^{0.6834} \text{W} = 1.368 \text{W}$

Actual output power of 125mW is well below the threshold.