

RF Exposure Exemption Calculations

This exemption calculation is for the 13.56 MHz passive implant. The 13.56 MHz reader/ transmitter is categorically exempted from RF exposure. Please refer to the manufacturer provided operational description of this filing for additional timing and duty cycle detail.

Assuming 100 % efficiency, the passive implant can only re-transmit the maximum power as transmitted from the 13.56 MHz reader

The measured maximum field strength of the 13.56 MHz reader is 34.7 dBuV@30m as presented in the test reports 97782-7_Final, 97782-24_Final. Using 40 dB/decade roll off to convert measured radiated field strength reference to 3 meter,

$$34.7 \text{ dBuV/m@30m} = 74.7 \text{ dBuV/m@ 3m.}$$

Using the Power density formula, the power at source is $-20.9 \text{ dBm} / 0.000008 \text{ W} / 0.0082 \text{ mW}$.

The device only transmits 50 ms every 5 minutes/300 sec, the device only has 20 minutes of use during its life cycle of 90 days.

For Evaluation over 6 minutes, total transmit = $2 \times 50 \text{ ms.}$, duty cycle = 0.03%

From numerical calculation above, the power of $-20.9 \text{ dBm} / 0.000008 \text{ W} / 0.0082 \text{ mW}$, in addition with duty cycle of 0.03%, $10 \log (2 \times 50 \text{ ms}) / (6 \times 60 \text{ sec}) = -36 \text{ dB}$ of duty cycle correction, which would result in time average power of **-56.9 dBm** over 6 minutes

US Exemption

. With this extreme low power, the implant is deemed exempted from routine evaluation.

IC Exemption

From RSS-102:

"For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation." With the extreme low power as demonstrated in the calculation, the implant is deemed exempted from routine evaluation.

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Use this page for exemption calculations

Delete any region's sections if demonstration of compliance is shown on either Single TX / Stand Alone or Multi TX / Simultaneous Transmission pages.