

Human Exposure to Electromagnetic Fields

This document demonstrates that the Ocean Signal rescueME MOB1 Maritime Survivor Location Device is in compliance with US requirements for protection of the general public (uncontrolled) from exposure to electromagnetic fields.

In the US regulation 47CFR chapter 1.1310¹ specifies that in the bands 30 – 300MHz the exposure limit is 0.2mW/cm²;

From Test Report TA0004² the measured EIRP at 156.525MHz is stated as 0.48mW.

$$\text{Duty Cycle} = 0.5/300 = 0.0016$$

$$\therefore \text{Average power} = 0.8\text{mW}$$

Distance at which the power density meets the 0.2mW/cm² limit is given by:

$$r = \sqrt{(0.8/(4 \times \pi \times 0.2))}$$

$$r = 0.6\text{cms} (=0.2\text{inches})$$

From Test Report TA0004³ the measured EIRP at 161.975/162.025MHz is stated as 1580mW, with a duty cycle of (26ms*8)/(60000ms) = 0.00003.

Distance at which the power density meets the 0.2mW/cm² limit is given by

$$r = \sqrt{(0.05/(4 \times \pi \times 0.2))}$$

$$r = 0.14\text{cms} (= 0.1\text{inches})$$

According to the procedure in KDB447498 (v05r02) section 4.3, SAR testing is excluded if the following criteria is met.

$$(P/d) * \sqrt{f} \leq 3.0 \text{ for 1-g SAR}$$

Where

P is the time averaged maximum conducted power in mW

d minimum separation distance in mm

f is the frequency in GHz

¹ 1.1310 Radiofrequency radiation exposure limits

² Tested by Ocean Signal Ltd.

³ Tested by Ocean Signal Ltd

Power and distance are rounded values.

For $d = 20\text{mm}$, $f = 162\text{MHz}$ and $P = 0.85\text{mW}$ (0.8 ± 0.05)

$$(0.85/20) * \sqrt{0.162} = 0.017$$

Which is much less the value of 3 specified for exemption to 1-g SAR evaluation.

Therefore the rescueME MOB1 meets the requirements for exposure to radiated electromagnetic fields at a worst case distance of 6.8cms from the transmitting antenna in both the USA and Europe.

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