

INTERTEK TESTING SERVICES

Analysis Report

The equipment under test (EUT) is a transmitter for a Nano Sub operating at 49.860 MHz which is controlled by a crystal. The EUT is powered by four 1.5 AA batteries. For more detail information pls. refer to the user manual.

Antenna Type: integral antenna

Antenna Gain: 0dBi

Modulation Type: Pulse modulation

The nominal conducted output power specified: -37.0dBm (+/- 3dB)

The nominal radiated output power (e.r.p) specified: -39.15dBm (+/- 3dB)

According to the KDB 447498:

The worst-case peak radiated emission for the EUT is 55.9dBuV/m at 3m in the frequency 49.86MHz

The EIRP = $[(FS \cdot D)^2 / 30]$ mW = -39.33dBm

The ERP = EIRP - 2.15 = -41.48dBm

which is within the production variation.

The maximum conducted output power specified is -34.0dBm = 0.0004mW

The source-based time-averaging conducted output power = $0.0004 \cdot \text{Duty Cycle mW} < 0.0004\text{mW}$ (Duty Cycle < 100%)

The SAR Exclusion Threshold Level for 49.860MHz when the minimum test separation distance is < 50mm:

= $474 \cdot [1 + \log(100/f(\text{MHz})]/2$

= 308.6 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.

Transmitter Duty Cycle Calculation

The duration of one cycle = 60.435ms

Effective period of the cycle = $1.2174\text{ms} \times 2 + 826.1\mu\text{s} \times 8 + 391.3\mu\text{s} \times 9 = 12.5653\text{ms}$

DC = $12.5653\text{ms} / 60.435\text{ms} = 0.2079$ or 20.79%