

INTERTEK TESTING SERVICES

Analysis Report

The equipment under test (EUT) is a transmitter for an Nano Sub operating at 27.145 MHz which is controlled by a crystal. The EUT is powered by four 1.5V 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: -43.0dBm (+/- 3dB)

The nominal radiated output power (e.r.p) specified: -45.15dBm (+/- 3dB)

According to the KDB 447498:

The worst-case peak radiated emission for the EUT is 52.1dBuV/m at 3m in the frequency 27.145MHz

The EIRP = $[(FS \cdot D)^2 / 30]$ mW = -43.13dBm

The ERP = EIRP - 2.15 = -45.28dBm

which is within the production variation.

The maximum conducted output power specified is -40.0dBm = 0.0001mW

The source-based time-averaging conducted output power = $0.0001 \cdot \text{Duty Cycle mW} < 0.0001\text{mW}$ (Duty Cycle < 100%)

The SAR Exclusion Threshold Level for 27.145MHz when the minimum test separation distance is < 50mm:

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

= 371.2 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 = 60.87ms

Effective period of the cycle = $1.2174\text{ms} \times 2 + 0.7826\text{ms} \times 8 + 0.3913\text{ms} \times 9 = 12.2173\text{ms}$

DC = $12.2173\text{ms} / 60.435\text{ms} = 0.2022$ or 20.22%