

INTERTEK TESTING SERVICES

RF Exposure

The equipment under test (EUT) is an Volkswagen My First Electric Car operating at 2.4G Band. The EUT can be powered by DC 4.5V (3 x 1.5V AA batteries). For more detail information pls. refer to the user manual.

Antenna Type: Integral antenna

Modulation Type: GFSK

Antenna Gain: 0dBi

The nominal conducted output power specified: -7.0 dBm (± 3 dB)

The nominal radiated output power (e.i.r.p) specified: -7.0 dBm (± 3 dB)

According to the KDB 447498:

The Maximum peak radiated emission for the EUT is 87.4 dB μ V/m at 3m in the frequency 2408MHz

The EIRP = $[(FS \cdot D)^2 / 30]$ mW = -7.83dBm
which is within the production variation.

The Minimum peak radiated emission for the EUT is 86.9 dB μ V/m at 3m in the frequency 2472MHz

The EIRP = $[(FS \cdot D)^2 / 30]$ mW = -8.33dBm
which is within the production variation.

The maximum conducted output power specified is -4.0dBm= 0.398mW

The source- based time-averaging conducted output power
= $0.398 \cdot \text{Duty cycle}$ mW < $0.398 \text{ mW} \cdot (\text{Duty cycle} < 100\%)$

The SAR Exclusion Threshold Level:

$$\begin{aligned} P_{th}(\text{mW}) &= ERP_{20\text{cm}} \cdot (d/20\text{cm})^x \quad \left(X = -\log_{10} \left(\frac{60}{ERP_{20\text{cm}} \sqrt{f}} \right) \right) \\ &= 3060 \cdot (0.5/20)^{1.9} \text{ mW} \\ &= 2.72 \text{ mW} \end{aligned}$$

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.

The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 19.9565ms

Effective period of the cycle = $1000\mu\text{s} \times 1 = 1.0\text{ms}$

DC = $1.0\text{ms} / 19.9565\text{ms} = 0.0501$ or 5.01%