

INTERTEK TESTING SERVICES

RF Exposure

The Equipment Under Test (EUT) is a Smoke/CO Detector operating at 433.95MHz. The EUT is powered by DC 3V by CR123A Battery. For more detailed features description, please refer to the user's manual.

MPE evaluation for Sub-GHz function

433.95MHz:

Antenna Type: Internal Integral Antenna

Antenna Gain: -6.2dBi Max.

Modulation Type: OOK

The normal radiated output power (e.i.r.p) is: -17.0dBm (tolerance: ±1dB).

The normal conducted output power is -10.8dBm (tolerance: ±1dB).

The Maximum peak radiated emission for the EUT is 77.7 dBμV/m at 3m in the frequency 433.95MHz

The EIRP = $[(FS * D)^2 / 30]$ W = -17.5 dBm

which is within the production variation.

According to FCC Part 2.1091, this unlicensed transmitting devices is categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use, according to the KDB 447498 and OET 65, the simple calculation as below:

The source-based time averaged maximum conducted output power = -10.8dBm+1dB = -9.8dBm = 0.105mW

At the distance (R) of 20cm to 40cm and in 0.3 GHz to 6 GHz, MPE Exclusion Threshold Level:

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

The MPE limit is 885.258mW for general population and uncontrolled exposure in the 0.43395GHz frequency range according to FCC Part 1.1307. As The source-based time averaged maximum conducted output power at 20cm from the transmitter is lower than the MPE limit, the compliance to the MPE limit can be ensured by indicating the minimum 20cm separation between the transmitter's radiating structure and body of the user or nearby persons.