RF Exposure report

The Equipment Under Test (EUT) is a WiFi & Bluetooth Enabled Leak Detector with WiFi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and Bluetooth 4.0 BLE operating at 2402-2480MHz, 40 channels with 2MHz channel spacing, for more detailed features description, please refer to the user manual.

2.4G WiFi
Modulation Type:
802.11b: DSSS (CCK, DQPSK, DBPSK)
802.11g: OFDM (64QAM, 16QAM, QPSK, BPSK)
802.11n (HT20): OFDM (64QAM, 16QAM, QPSK, BPSK)
Antenna Type: PCB antenna
Antenna Gain: 3.3dBi
The nominal conducted output power specified: 12dBm (Tolerance: +/-5dB)

The maximum conducted output power for the WiFi is 15.94dBm in the frequency 2.412GHz 802.11b mode which is within the production variation.

The minimum conducted output power for the WiFi is 7.91dBm in the frequency 2.437GHz 802.11n (HT20) mode which is within the production variation.

Bluetooth 4.0 BLE
Modulation Type: GFSK.
Antenna Type: PCB antenna
Antenna Gain: 3.3dBi
The nominal conducted output power specified: 2dBm (Tolerance: +/-3dB)

The maximum conducted output power for the Bluetooth is 2.28dBm in the frequency 2.480Hz which is within the production variation.

The minimum conducted output power for the Bluetooth is 1.38dBm in the frequency 2.402Hz 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:

For Maximum Permissible Exposure (MPE) evaluation of the product, the maximum power density at 20 cm from this transmitter shall be less than the General Population / Uncontrolled MPE limit in FCC Part 1.1310.

The maximum E.I.R.P= 12+5+3.3=22.3dBm=107.15 mW
The source-based time averaged maximum radiated power = 107.15 x Duty Cycle = 107.15 mW

From above data, the exposed power density at a distance (R) of 20cm from the center of radiation of the antenna can be calculated according to OET Bulletin 65 as follow:
= 107.15 / 4πR^2
= 0.0213 mW/cm^2

The MPE limit is 1.0 $mWcm^{-2}$ for general population and uncontrolled exposure in the WiFi frequency range according to FCC Part 1.1310. As the measured power density 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.

Transmitter Duty Cycle Calculation
The EUT transmit continuously during the test, the duty cycle is 1.0.

The following RF exposure statement or similar sentence is proposed to be included in the user manual:

"FCC RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."