

FCC ID: 2BBAS-GEMTONESPRO

RF exposure evaluation

According to §15.247(i), §1.1307 (b) and KDB447498, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidance.

The SAR-based exemption formula of §1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B.2})$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right)$$

f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. We use 5mm as separation distance to calculate BT

Antenna gain: 3.59 dBi

Conducted Transmit Power Max: = 2.79dBm = 1.9 mW

EIRP = 2.79dBm + 3.59 dBi = 6.38dBm

ERP = 6.38 - 2.15dB = 4.23 dBm

The maximum ERP power specified is 4.23 dBm = 2.65mW

The source-based time-averaging conducted output power

= 2.65 * Duty factor mW (where Duty Factor ≤ 1)

= 2.65 Mw



BLE

Antenna gain: 3.59 dBi

Conducted Transmit Power Max: = 0.57dBm = 1.14 mW

EIRP=0.57dBm + 3.59 dBi=4.16dBm

ERP= 4.16-2.15dB= 2.01 dBm

The maximum ERP power specified is 2.01 dBm = 1.59mW

The source- based time-averaging conducted output power

=1.59 * Duty factor mW (where Duty Factor ≤ 1)

= 1.59 Mw

The SAR Exclusion Threshold Level:

$$P_{th}(mW) = ERP_{20cm} * (d/20cm)^x \quad (X = -\log_{10} \left(\frac{60}{ERP_{20cm} \sqrt{f}} \right))$$
$$= 2.72 \text{ mW}$$

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.