

FCC ID: 2BAR8-GD006A

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).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$



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

Portable device

Main Power: $81.28 \text{ dB}\mu\text{V/m} = 81.28 - 95.2 = -13.92 \text{ dBm}$
30MHz-1G: $-13.92 + 4.7 = -9.2 \text{ dBm}$

Antenna gain: 0 dBi

Conducted Transmit Power Max: $= -9.2 \text{ dBm} = 0.12 \text{ mW}$

EIRP $= -9.2 \text{ dBm} + 0 \text{ dBi} = -9.2 \text{ dBm}$

ERP $= -9.2 - 2.15 \text{ dB} = -11.35 \text{ dBm}$

The maximum ERP power specified is $-11.35 \text{ dBm} = 0.07 \text{ mW}$

The source-based time-averaging conducted output power
 $= 0.07 \times \text{Duty factor mW}$ (where Duty Factor ≤ 1)
 $= 0.07 \text{ mW}$

The SAR Exclusion Threshold Level

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

$= 2.72 \text{ mW}$

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.