RF Exposure

FCC ID : ZNFTONETF8QC

According to KDB 447498 D04 General RF Exposure Guidance.

SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time averaged power or maximum time-averaged ERP, whichever is greater. If the ERP of a device is not easily determined, such as for a portable device with a small form factor, the applicant may use the available maximum time-averaged power exclusively if the device antenna or radiating structure does not exceed an electrical length of λ /4. As for devices with antennas of length greater than λ /4 where the gain is not well defined, but always less than that of a half-wave dipole (length λ /2), the available maximum time-averaged power generated by the device may be used in place of the maximum time-averaged ERP, where that value is not known. The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna. 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 Pth (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). Pth is given by Formula (B.2).

$$P_{th}(\text{mW}) = ERP_{20cm}(\frac{d}{20cm})^x \rightarrow d \leq 20cm$$

$$\text{x} = -\log_{10}\left[\frac{60}{ERP_{20cm}\sqrt{f}}\right] \text{ and } f \text{ is in GHz.}$$

$$ERP_{20cm} = 1.5GHz \leq f \leq 6GHz \rightarrow 3060(mW)$$

Frequency : 2 480MHz (min. separation distances =0 mm)

Max. conducted power : 12.59 (mW)

f is in GHz, d is the separation distance (cm)

SAR test exclusion thresholds(5mm) =

$$\text{x} = -\log\left(\frac{60}{3060*(\sqrt{2.80})}\right) = 1.93$$

$$P_{th} = 3060 * \left(\frac{0.5}{20}\right)^{1.93} = 2.48 \; mW$$

Maximum tolerance power of EUT $=$ (11 dBm)or (12.59mW)

ERP = EIRP(EUT Power + Antenna gain) -2.15dB = 11dBm - 3dBi -2.15dB = 5.85 dBm

5.85dBm = 3.85 mW -> 3.85mW > 2.48mW, So SAR test is required.

- When the minimum test separation distance is < 5 mm, a distance of 5mm is applied to determine SAR test exclusion.

Conclusion : SAR test is required.