

RF Exposure Requirements

Product Description: Smart Access Control Terminal

Model No.: OmniAC30

FCC ID: 2A5UQ-OMNIAC30

According to the KDB 447498 D01 V06, clause 4.3, the following RF exposure evaluation shall to demonstrate RF exposure compliance.

13.56 MHz

Tx frequency: 13.56 MHz Type of Modulation: ASK

Antenna Type: Loop antenna (Gain: 0 dBi)

Nominal rated field strength: 56.87 dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 3dB

Based on the Maximum allowed field strength of production tolerance was 59.87dB μ V/m at 3m in frequency 13.56MHz, thus;

The EIRP = $[(FS \cdot D)^2 \cdot 1000 / 30] = 0.00029 \text{ mW}$

Thus;

Conducted power = Radiated Power (EIRP) – Antenna Gain

So;

Conducted Power = 0.00029 mW.

The SAR Exclusion Threshold Level for 13.56MHz when the minimum test separation distance is < 50mm:

$$= [474 * (1 + \log_{10}(f(\text{MHz}))) / 2]$$
$$= 443 \text{ mW}$$

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.

125 kHz

Tx frequency: 125kHz Type of Modulation: ASK

Antenna Type: coil antenna (Gain: 0 dBi)

Nominal rated field strength: 71.15 dB μ V/m at 3m

Maximum allowed field strength of production tolerance: +/- 3dB

Based on the Maximum allowed field strength of production tolerance was 74.15dB μ V/m at 3m in frequency 125kHz, thus;

The EIRP = $[(FS \cdot D)^2 \cdot 1000 / 30] = 0.0078 \text{ mW}$

Thus;

Conducted power = Radiated Power (EIRP) – Antenna Gain

So;

Conducted Power = 0.0078mW.

The SAR Exclusion Threshold Level for 13.56MHz when the minimum test separation distance is < 50mm:

$$= [948 * (1 + \log_{10}(f(\text{MHz})))]/2$$

$$= 1850\text{mW}$$

simultaneous transmission operations

the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

MPE Ratios are Calculated as $[(\text{MPE1}/\text{Limit}) + (\text{MPE2}/\text{Limit}) + \dots] \leq 1.0$

$$\text{MPE Ratio} = (0.00029/443) + (0.0078/1850) = 00.00000487 < 1.0$$

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.