

Maximum Permissible Exposure Evaluation

1. General information

Product: UHF-Band RFID Reader

FCC ID: S8NKIS900W-4CH

Device category: Mobile device per part 2.1091

Environment: General Population/Uncontrolled Exposure

2. Antenna

The device has 3 type of fixed antenna to be used for the purpose of reading tags.

Configuration	Model	Type	Max. Gain (dBi)	Remarks
Indoor	KIS900-AE	Flat Panel 420x215x55	6.0	-
Indoor	KIS900-AN-2H02 KIS900-AN-2V02	Flat Panel 454x215x55	6.0	Same but the element is positioned perpendicularly.

3. Radio Frequency Exposure Evaluation

The highest RF output power of the unit was measured at 29.91 dBm at 927.4 MHz. According to section 1.1310 of the FCC rules, the power density limit for General Population/Uncontrolled Exposure at 927.4 MHz is 0.618 mW/cm². The MPE is calculated to show the required separation distance that must be maintained during installation to maintain compliance with the power density limit.

The following formula was used to calculated the power density.

$$S = PG/4\pi R^2$$

where,

S: power density (mW/cm²)

P: output power at the antenna terminal (mW)

G: gain of transmit antenna (numeric)

R: distance from transmitting antenna (cm)

To solve for the minimum mounting distance required;

$$R = \sqrt{(PG/4\pi S)}$$

For this device, the calculation is as follows;

$$S = 0.618 \text{ mW/cm}^2$$

$$P = 979 \text{ mW}$$

$$G = \text{max. gain of antenna} = 6 \text{ dBi} = 4.0 \text{ (numeric)}$$

$$R = \sqrt{(1000 \times 4 / 4\pi \times 0.618)} = 22.7 \text{ cm (Based on continuous transmission)}$$

Based on the above calculation the UHF-Band RFID Reader antenna must be mounted such that it provides a minimum separation distance of 23 cm. The user's manual addresses the mounting location in the instructions for mounting the reader.