



EUT Description: Smart Lock

Test type.: P01-K10C

Series model: P01-K10, P01-K10B, P01-K10D, P01-205, P01-205A, P01-205B, P01-205C, P01-206, P01-206A, P01-206B, P01-206C, P01-207, P01-207A, P01-207B, P01-207C, P02-K10, P02-K10B, P02-K10C, P02-K10D, P02-205, P02-205A, P02-205B, P02-205C, P02-206, P02-206A, P02-206B, P02-206C, P02-207, P02-207A, P02-207B, P02-207C, P01-K10A

Equipment type: Mobile equipment

#### RF Exposure Evaluation

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) Radiation as specified in §1.1307(b)

#### Limits for Maximum Permissible Exposure (MPE)

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (0) Limits for Occupational/Controlled Exposure         |                               |                               |                                     |                          |
| 0.3-3.0                                                 | 614                           | 1.63                          | *(100)                              | ≤6                       |
| 3.0-30                                                  | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | <6                       |
| 30-300                                                  | 61.4                          | 0.163                         | 1.0                                 | <6                       |
| 300-1,500                                               |                               |                               | f/300                               | <6                       |
| 1,500-100,000                                           |                               |                               | 5                                   | <6                       |
| (d) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
| 0.3-1.34                                                | 614                           | 1.63                          | *(100)                              | <30                      |
| 1.34-30                                                 | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | <30                      |
| 30-300                                                  | 27.5                          | 0.073                         | 0.2                                 | <30                      |
| 300-1,500                                               |                               |                               | f/1500                              | <30                      |
| 1,500-100,000                                           |                               |                               | 1.0                                 | <30                      |

f = frequency in MHz. \* = Plane-wave equivalent power density.

F = frequency in MHz

Formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where :

$P_d$  = power density in mW/cm<sup>2</sup>,

$P_{out}$  = output power to antenna in mW;

G = gain of antenna in linear scale,

$\pi$  = 3.14;

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.



Measurement Result:

TX frequency range: 13.56MHz

Operation Frequency: NFC: 13.56MHz Power density limited: 1mW/cm<sup>2</sup> Antenna

Type: Induction coil

R=20cm

$EIRP = E - 104.7 + 20 \log D = 62.45 - 104.7 + 20 \log 3 = -32.707 \text{ dBm}$

Maximum Conducted Output Power: -32.707dBm

#### NFC

| Frequency(MHz) | EIRP<br>Power<br>(dBm) | EIRP<br>Power<br>(mW) | Turn-up<br>(dBm) | Max Turn-up<br>(dBm) | Evaluation<br>result<br>(mW/cm <sup>2</sup> ) | Power density<br>Limits<br>(mW/cm <sup>2</sup> ) |
|----------------|------------------------|-----------------------|------------------|----------------------|-----------------------------------------------|--------------------------------------------------|
| 13.56          | -32.70                 | 0.0005                | -32± 1           | -31                  | 0.0000001                                     | 0.0090                                           |

Conclusion: the max result :  $\leq 1.0$  compliance with FCC's RF Exposure.

So a SAR test is not required