Exhibit: RF Exposure – FCC

FCC ID: 2ASNP-E79X3562018
IC: 24793-E79X3562018

RF Exposure – FCC

The EUT contains a 13.56 MHz RFID reader. The minimum separation distance from the radiating structure to the extremity of a user is 5 mm. This distance is the shortest distance from any antenna to the surface as stated by the manufacturer during normal operation.

Therefore SAR test exclusion was evaluated according to FCC KDB 447498 D01 v06 Sections 4.3.2 and 4.3.1.

General SAR test exclusion guidance:

13.56 MHz Transmitter

As per FCC KDB 447498 Section and 4.3.1 c) 2), the 10-g extremity SAR Test Exclusion Threshold is given by

c).2) For *test separation distances* ≤ 50 mm, the power threshold determined by the equation in c).1) for 50 mm and 100 MHz is multiplied by ½

c).1) For *test separation distances* > 50 mm and < 200 mm, the power threshold at the corresponding test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f_{(MHz)})]$

b).1) {[Power allowed at *numeric threshold* for 50 mm in step a)] + [(test separation distance − 50mm)·$(f_{(MHz)}/150)$]} mW, for 100 MHz to 1500 MHz

The formula will be then:
½ ({[Power allowed at *numeric threshold* for 50 mm in step 4.3.1 a)] + [(test separation distance − 50mm)·$(f_{(MHz)}/150)$]} { $[1 + \log(100/f_{(MHz)})]$ })mW

Where:
Test separation distance is 50 mm and f = 100 MHz.

Which results in
½ [Power allowed at *numeric threshold* for 50 mm in step 4.3.1 a)] mW

SAR Calculations: 13.56 MHz transmitter

The power allowed for *numeric threshold* of 7.5, for f = 0.1 GHz, and for a min. test distance of ≤ 5mm

$$\frac{(max.power, mW)}{(min.test\ distance, mm)} \times \sqrt{f} = 7.5$$

$$(max.power, mW) = \frac{7.5 \times 50\ mm}{\sqrt{0.1}}$$

$$(max.power, mW) = 1185.8\ mW$$

And therefore, ½ power allowed is 592.9 mW

The EIRP of the transmitter is calculated from field strength at 3 m using Equation 22 and guidance form Annex G of ANSI C63.10

EIRP = E_{Meas} − 95.2

The transmitter has a field strength of 56 dBuV/m @ 3 m

EIRP = 56 − 95.2 = -39.2 dBm = 0.0001 mW

SAR Exclusion Threshold condition is met with peak EIRP.

2.4 GHz Transmitter

As per FCC KDB 447498 Section and 4.3.1 a), the 10-g extremity SAR Test Exclusion Threshold is given by

For 100 MHz to 6 GHz and *test separation distances* ≤ 50 mm, the 10-g *SAR test exclusion thresholds* are determined by the following:
[(*max. power of channel, including tune-up tolerance, mW)* / (*min. test separation distance, mm)]*[√*f($_{GHz}$)] ≤ 7.5 for 10-g extremity SAR
where
•f($_{GHz}$) is the RF channel transmit frequency in GHz

SAR Calculations: 2.4 GHz transmitter

The power allowed for *numeric threshold* of 7.5, for f = 2.4 GHz, and for a min. test distance of ≤ 5mm

$$\frac{(max.\,power,mW)}{(min.\,test\,distance,mm)} \times \sqrt{f} = 7.5$$

The 2.4GHz transmitter maximum power as per certification report # EI0036-2 issued by Bureau Veritas on 2018-07-23, is 22dBm (158.5mW).
The maximum duty cycle declared by the manufacturer is 9.5%, which leads to a correction factor of 10 x log (9.5/100) = -10.2dB.
Applying the correction factor, the formula above will be:

(11.8 dBm / min test distance, mm)x√2.4 = 15.1/5 *1.55 = 4.7 ≤ 7.5

SAR Exclusion Threshold condition is met with peak conducted power.