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)

FCC ID: 2AU3H-ESECUFIDO2

EUT Specification

EUT	FIDO Authenticator
Frequency band (Operating)	☐ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5825GHz ☒ Others: 2402-2480MHz & 13.56MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others ___
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm2) ☒ General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☒ Single antenna ☐ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☐ Tx/Rx diversity
Max. output power	BLE:-3.991dBm (0.0004W); NFC:87.02dBuV/m(0.00015W)
Antenna gain (Max)	2.5 dBi
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Limits for Maximum Permissible Exposure(MPE)

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density(mW/cm^2)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	**--**	**--**	**F/300**	**6**
1500-100000	**--**	**--**	**5**	**6**
(B) Limits for General Population/Uncontrol Exposures				
300-1500	**--**	**--**	**F/1500**	**6**
1500-100000	**--**	**--**	**1**	**30**

Friis transmission formula: Pd=(Pout*G)\(4*pi*R2)

Where

Pd= Power density in mW/cm^2

Pout=output power to antenna in Mw

G= gain of antenna in linear scale

Pi=3.1416

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

Pd the limit of MPE, 1mW/cm2. If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

Measurement Result

BLE:

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain (dBi)	Power density at 20cm (mW/cm^2)	Power density Limits (mW/cm^2)
BLE	2402	-4.347	-4.347±1	-3.347	2.5	0.0002	1
	2440	-3.991	-3.991±1	-2.991	2.5	0.0002	1
	2480	-4.348	-4.348±1	-3.348	2.5	0.0002	1

13.56MHz :

Channel Frequency (MHz)	Antenna Gain (dBi)	Max Output power (dBuV/m)	Max Output power (dBm)	Max. Tune up Power (dBm)	Power density at 20cm (mW/cm2)	Power density Limits (mW/cm2)
13.56	2.5	87.02	-8.24	-7.24	0.00007	1

MPE Calculation Method

P = Peak RF output power (W)

G = EUT Antenna numeric gain (numeric)

R = Separation distance between radiator and human body (m)=0.2m

The formula can be changed to

Pd =Pout*G/(4*Pi*R2)

EIRP=E-104.8+20logD=87.02-104.8+20log3=-8.24dBm

(Note: BLE and NFC not support simultaneous transmission.)

The SAR measurement is not necessary.