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: 2AFDGVA-HS002B

EUT Specification

EUT	Base Station
Frequency band (Operating)	☒WLAN: 2.412GHz ~ 2.462GHz ☐WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐WLAN: 5.745GHz ~ 5825GHz ☒Others: 915MHz
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	WiFi:21.36 dBm (136.8mW) ;951MHz:79.62dBuV/m(0.027mW)
Antenna gain (Max)	WiFi:2 dBi;915MHz: 1dBi
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

WiFi:

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)
802.11b	2412	20.11	20.11±1	21.11	2	0.0407	1
	2437	20.42	20.42±1	21.42	2	0.0437	1
	2462	20.30	20.30±1	21.3	2	0.0425	1
802.11g	2412	21.09	21.09±1	22.09	2	0.0510	1
	2437	21.36	21.36±1	22.36	2	0.0543	1
	2462	20.92	20.92±1	21.92	2	0.0491	1
802.11n (HT20)	2412	20.80	20.80±1	21.8	2	0.0477	1
	2437	20.98	20.98±1	21.98	2	0.0497	1
	2462	20.79	20.79±1	21.79	2	0.0476	1

915MHz:

Channel Frequency (MHz)	Max Output Power (dBuV/m)	Max Output Power (dBm)	Tolerance	Max. Tune up Power (dBm)	Max. Tune up Power (mW)	Antenna Gain (dBi)	Power density at 20cm (mW/ cm^2)	Power density Limits (mW/cm^2)
915	79.62	-15.64	±1	-14.64	0.034	1	0.000009	1

$$E = EIRP - 20\log D + 104.8$$

where:

E = electric field strength in dBµV/m,

$EIRP$ = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

$EIRP = E - 104.8 + 20\log D = 79.62 - 104.8 + 20\log 3 = -15.64 dBm$

WiFi+915MHz simultaneous（802.11g is the worst case for WiFi）:

$0.0543 + 0.000009 = 0.054309 < 1$

The SAR is not necessary.