

FCC ID : 2AQ5R-WF-M6822-UWP1

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 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

11.1 Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π =3.1416

R = distance between observation point and center of the radiator in 20cm

P_d 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.

11.2 Measurement Result

For module 1 tested in test report ES210402016W01 and ES210402016W02

Wifi 2.4G

Antenna gain: 2.7 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
14.74	14 to 16	16	1.862	0.0147	1

Wifi 5G

Antenna gain: 3.4 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
16.39	16 to 18	18	2.188	0.0275	1

For module 2 tested in test report 210109012RFC-1, 210109012RFC-2, 210109012RFC-3 and 210109012RFC-4

BT

Antenna gain: 1.7 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
9.703	9 to 11	11	1.479	0.0037	1

BLE

Antenna gain: 1.7 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
7.1	7 to 9	9	1.479	0.0023	1

Wifi 2.4G

Antenna gain: 2.7 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
27.01	27 to 29	29	1.862	0.2942	1

Wifi 5G

Antenna gain: 2.7 dBi

Measured power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
17.77	16 to 18	18	1.862	0.0234	1

MAX RF EXPOSURE EVALUATION

Module 1 Max WIFI 5G band Evaluation result (mW/cm2)	Module 2 Max WIFI 2.4G band Evaluation result (mW/cm2)	Summation of Evaluation result (mW/cm2)	Power density Limits (mW/cm2)
0.0275	0.2942	0.3217	<1