

FCC ID:2ABU6MBM01

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: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

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 cm(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.

$mW = 10^{(dBm/10)}$

11.2 Measurement Result

Operation Frequency: 2402MHz~2480MHz

Power density limited: 1mW/ cm²

Antenna Type: PCB Antenna

Antenna gain: 1.72dBi

Operation Frequency: 6500MHz, 8000MHz

Power density limited: 1mW/ cm²

Antenna Type: PCB Antenna

Antenna gain: 6.5GHz:2.3dbi;8GHz:5.5dBi

R=20cm

mW=10^(dBm/10)

Maximum Single sources

BLE

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
2402	BLE(1M)	6.01	6±1	7	5.012	1.72	1.49	0.0015	1
2440		6.83	6±1	7	5.012	1.72	1.49	0.0015	1
2480		6.92	6±1	7	5.012	1.72	1.49	0.0015	1
2402	BLE(2M)	6.01	6±1	7	5.012	1.72	1.49	0.0015	1
2441		6.82	6±1	7	5.012	1.72	1.49	0.0015	1
2480		6.93	6±1	7	5.012	1.72	1.49	0.0015	1

UWB

Channel Freq. (MHz)	modulation	conducted power (dBm)	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm ²)	Power density (mW/cm ²)
				tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
6500	Pulse	-41.591	-41±1	-40	0.00010	2.30	1.70	0.000000034	1
8000	Pulse	-40.271	-41±1	-40	0.00010	5.50	3.55	0.000000071	1

Multiple Evaluation result= Evaluation result1/ Power density Limits+ Evaluation result2/ Power density Limits

Maximum Multiple sources

	MAX Evaluation result	Multiple Evaluation result	Power density Limits
	(mW/cm ²)	(mW/cm ²)	(mW/cm ²)
BLE	0.0015	0.001500071	1
UWB	0.000000071		

Conclusion:

For the max result : $0.001500071 \leq 1 \text{mW/ cm}^2$ for Power density, compliance with RF exposure.



Signature:

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