

FCC ID : 2AGNC-C5

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 cm ($R=20$ cm)

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

BT DSS

Channel Freq. (MHz)	modulation	conducted 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)
2402	GFSK	2.572	2±1	3	1	0.0004	1
2441	GFSK	4.743	4±1	5	1	0.0006	1
2480	GFSK	5.752	5±1	6	1	0.0008	1
2402	$\pi/4$ -DQPSK	0.392	0±1	1	1	0.0003	1
2441	$\pi/4$ -DQPSK	2.973	2±1	3	1	0.0004	1
2480	$\pi/4$ -DQPSK	4.234	4±1	5	1	0.0006	1
2402	8DPSK	0.951	0±1	1	1	0.0003	1
2441	8DPSK	3.399	3±1	4	1	0.0005	1
2480	8DPSK	4.646	4±1	5	1	0.0006	1

BT DTS

Channel Freq. (MHz)	modulation	conducted 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)
2402	GFSK	4.097	4±1	5	1	0.0006	1
2441	GFSK	5.337	5±1	6	1	0.0008	1
2480	GFSK	6.224	6±1	7	1	0.0010	1

WIFI

Antenna gain: WIFI antenna A: 2.7dBi WIFI antenna B: 2.7dBi Array gain: ≈ 5.71 dBi

Antenna A

Mode	Channel Freq. (MHz)	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)
802.11b	2412	17.24	17±1	18	1.862	0.0234	1
	2437	17.52	17±1	18	1.862	0.0234	1
	2462	17.36	17±1	18	1.862	0.0234	1
80.11g	2412	17.15	17±1	18	1.862	0.0234	1
	2437	17.28	17±1	18	1.862	0.0234	1
	2462	17.29	17±1	18	1.862	0.0234	1
802.11n (ht20)	2412	16.57	17±1	18	1.862	0.0234	1
	2437	16.91	17±1	18	1.862	0.0234	1
	2462	17.05	17±1	18	1.862	0.0234	1
802.11n (ht40)	2422	16.16	17±1	18	1.862	0.0234	1
	2437	16.42	17±1	18	1.862	0.0234	1
	2452	16.36	17±1	18	1.862	0.0234	1

Antenna B

Mode	Channel Freq. (MHz)	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)
802.11b	2412	16.82	17.5±1	18.5	1.862	0.0262	1
	2437	16.85	17.5±1	18.5	1.862	0.0262	1
	2462	16.80	17.5±1	18.5	1.862	0.0262	1
80.11g	2412	17.21	17.5±1	18.5	1.862	0.0262	1
	2437	17.27	17.5±1	18.5	1.862	0.0262	1
	2462	17.70	17.5±1	18.5	1.862	0.0262	1
802.11n (ht20)	2412	17.82	17.5±1	18.5	1.862	0.0262	1
	2437	17.88	17.5±1	18.5	1.862	0.0262	1
	2462	18.02	17.5±1	18.5	1.862	0.0262	1
802.11n (ht40)	2422	17.02	17.5±1	18.5	1.862	0.0262	1
	2437	17.11	17.5±1	18.5	1.862	0.0262	1
	2452	17.15	17.5±1	18.5	1.862	0.0262	1

802.11n HT20: Antenna A+B

Evaluation result (mW/cm ²) Ant A	Evaluation result (mW/cm ²) Ant B	Evaluation result (mW/cm ²) Ant A+B	Power density Limits (mW/cm ²)
0.0234	0.0262	0.0496	1

802.11n HT40 : Antenna A+B

Evaluation result (mW/cm ²) Ant A	Evaluation result (mW/cm ²) Ant B	Evaluation result (mW/cm ²) Ant A+B	Power density Limits (mW/cm ²)
0.0234	0.0262	0.0496	1

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