



FCC §15.247 (i), §2.1091 – RF Exposure

FCC ID: 2BRBY-PRZM01A

Applied procedures / limit

According to FCC §15.247(i) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f)*	6
30-300	61.4	0.163	1.0	6
300-1500			F/300	6
1500-100,000			5	6

Note: f is frequency in MHz

* = Power density limit is applicable at frequencies greater than 100 MHz

Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500			F/1500	30
1500-100,000			1.0	30

Note: f = frequency in MHz

* = Plane-wave equivalent power density

MPE PREDICTION

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna, R=0.2m

TEST RESULTS

Tune up

Mode	Tune up Power
GFSK	1±1dBm

Protocol	Separation distance (cm)	Max Tune up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Ratio	Result
GFSK	20	2	-4.08	-2.08	0.619	0.0001	1	0.0001	Pass

For Module:

WIFI:

Maximum peak output power at antenna input terminal (dBm):	20.12
Maximum peak output power at antenna input terminal (mW):	102.801
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	1.68
Maximum Antenna Gain (numeric):	1.4723
The worst case is power density at predication frequency at 20 cm (mW/cm ²):	0.0301
MPE limit for general population exposure at prediction frequency (mW/cm ²):	1.0

The max power density 0.0301 (mW/cm²) < 1 (mW/cm²)

Result: Compliant

BLE:

Calculated Data for BLE

Maximum peak output power at antenna input terminal (dBm):	5.85
Maximum peak output power at antenna input terminal (mW):	3.8459
Prediction distance (cm):	20
Antenna Gain, typical (dBi):	1.68
Maximum Antenna Gain (numeric):	1.4723
The worst case is power density at predication frequency at 20 cm (mW/cm ²):	0.0011
MPE limit for general population exposure at prediction frequency (mW/cm ²):	1.0

The max power density 0.0011 (mW/cm²) < 1 (mW/cm²)

Result: Compliant

For Module, Bluetooth and 2.4G Wi-Fi can transmit simultaneously.

For simultaneous transmission: the ratio=0.0001/1+0.0301/1=0.0302≤1

Conclusion:

For the max result ≤ 1.0, compliance with FCC's RF Exposure