

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

FCC ID: 2AEX3-74XX

IC: 20267-74XX

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=20cm

Test Result of RF Exposure Evaluation

2AC7Z-ESP32WROVERB:

21098- ESP32WROVERB:

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
BT3.0	2402-2480	3.74	2.37	5.50	3.55	20	0.0017	1.00

Mode	Frequency Range (MHz)	Antenna Gain		Tune-up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
Wi-Fi	2412-2462	3.74	2.37	24.00	251.19	20	0.1182	1.00
BLE	2402-2480	3.74	2.37	2.00	1.58	20	0.0007	1.00

2AC7Z-ESP32WROVERE:

21098- ESP32WROVERE:

Mode	Frequency Range (MHz)	Antenna Gain		Tune up Conducted Power		Evaluation Distance (cm)	Power Density (mW/cm ²)	MPE Limit (mW/cm ²)
		(dBi)	(numeric)	(dBm)	(mW)			
802.11b	2412~2462	3.40	2.19	27.00	501.19	20	0.2183	1.0
802.11g		3.40	2.19	26.00	398.11	20	0.1734	1.0
802.11n-HT20		3.40	2.19	26.00	398.11	20	0.1734	1.0
802.11n-HT40	2422~2452	3.40	2.19	27.00	501.19	20	0.2183	1.0
BLE	2402~2480	3.40	2.19	7.00	5.01	20	0.0022	1.0
BT	2402~2480	3.40	2.19	9.00	7.94	20	0.0035	1.0