



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

## FCC ID: 2A49R-UMP

### 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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> 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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> 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 Produce power	Maximum output power (dBm)	Output power to antenna (mW)	Antenna Gain (numeric)	Power Density (S) (mW/ cm <sup>2</sup> )	Limit (mW / cm <sup>2</sup> )	Result
BLE	2±1	3	2.0	1.64(2.15dBi)	0.000653	1	Pass
BLE	12±1	13	19.95	1.64(2.15dBi)	0.006511	1	Pass
2.4G WIFI	19±1	20	100	1.64(2.15dBi)	0.032636	1	Pass
5.1G WIFI	17±1	18	60.10	2.77(4.43dBi)	0.033129	1	Pass
5.3G WIFI	16±1	17	50.12	2.77(4.43dBi)	0.027628	1	Pass
5.6G WIFI	17±1	18	60.10	2.77(4.43dBi)	0.033129	1	Pass
5.8G WIFI	17±1	18	60.10	2.77(4.43dBi)	0.033129	1	Pass
U-NII-5	8±1	9	7.94	1.84(2.64dBi)	0.002907	1	Pass
U-NII-6	7±1	8	6.31	1.51(1.79dBi)	0.001896	1	Pass
U-NII-7	7±1	8	6.31	1.51(1.79dBi)	0.001896	1	Pass
U-NII-8	7±1	8	6.31	1.56(1.93dBi)	0.001959	1	Pass

### For the Max simultaneous transmission:

BT+2.4G WIFI+5G WIFI+6XD

Simultaneous transmitting =  $0.006511 / 1 + 0.032636 / 1 + 0.033129 / 1 + 0.002907 / 1 = 0.075183 \leq 1.0$



For the max result :  $0.075183 \leq 1.0$ , compliance with FCC's RF Exposure