



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

# FCC ID: 2AMUU-MSH24

### 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 peak 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	3±1	4	2.51	1.67 (2.24dBi)	0.00419	1	Pass
802.11 b	16±1	17	50.12	1.67 (2.24dBi)	0.01665	1	Pass

## 434M

Below 1GHz: dBm=dBuV/m-95.2

Modulation	Channel Freq. (MHz)	Output Power (dBuV/m)	Output Power (dBm)	Tune up Produce power
ASK	434	97.87	2.67	2±1

Maximum peak output power (dBm)	Output power to antenna (mW)	Power Density (S) (mW/ cm <sup>2</sup> )	Limit (mW/ cm <sup>2</sup> )	Result
3	2.0	0.0004	0.29	Pass

## For the Max simultaneous transmission MPE

Evaluation mode	Power Density (S) (mW/ cm <sup>2</sup> )
802.11 b	0.01665
434M	0.0004

Simultaneous transmitting = 0.01665/1+0.0004/0.29=0.01803 < 1

## Conclusion:

For the 0.01803 < 1, the SAR testing is not required.