

Maximum Permissible Exposure (MPE)

Standard Applicable

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

RSS 102 issue 5.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

Tune-Up Power and Tolerance:

Frequency Range:	2402 – 2480MHz
Bluetooth Version:	V4.0
Modulation type:	GFSK
Tune-up power	0dBm
Power Tolerance:	+/- 1dBm
Measured Transmitter Power:	0.33 dBm Peak
Antenna Designation:	Dipole Ant , 2.0dBi

FCC: 2.4GHz mode: Dipole Antenna

Maximum Permissible Exposure (MPE) Evaluation

The worst case of average power: refer to FCC P15C test report for detail measurement date.

Power measurement:

Frequency (MHz)	Peak Reading Power (dBm)	Cable Loss	Output Power (dBm)	Output Power (W)	Limit (W)
Low	0.33	0.00	0.33	0.00108	1
Mid	0.15	0.00	0.15	0.00104	1
High	-0.22	0.00	-0.22	0.00095	1

Prediction of MPE limit at a given distance

Equation from page 18 of 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

	CH 0-78	
Tune-Up power at antenna input terminal:	0.00	(dBm)
Tune-Up power at antenna input terminal:	1.00	(mW)
Tune-Up power Tolerance:	1.00	dB
Duty cycle:	76.00	(%)
Maximum Pav :	0.96	(mW)
Antenna gain (typical):	2.00	(dBi)
Maximum antenna gain:	1.58	(numeric)
Prediction distance:	20.00	(cm)
MPE limit for uncontrolled exposure at prediction frequency:	1.00	(mW/cm ²)
Power density at predication frequency at 20 (cm) distance	0.0003	(mW/cm ²)

Measurement Result:

The worst power density is 0.0003 mW/cm² which is less than 1 mW/cm².