4 FCC §15.247(i) & §2.1091 - RF Exposure Information

4.1 Applicable Standard

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 General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minutes)
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
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

4.2 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

4.3 MPE Results

DSSS:

Main Antenna

Maximum peak output power at antenna input terminal (dBm):	4.35
Maximum peak output power at antenna input terminal (mW):	2.723
Prediction distance (cm):	20
Prediction frequency (MHz):	2475
Maximum Antenna Gain, typical (dBi):	5
Maximum Antenna Gain (numeric):	3.162
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00171
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.00171mW/cm^2 .Limit is $1mW/cm^2$.

Bottom Antenna

Maximum peak output power at antenna input terminal (dBm):	4.35
Maximum peak output power at antenna input terminal (mW):	2.723
Prediction distance (cm):	20
Prediction frequency (MHz):	2475
Maximum Antenna Gain, typical (dBi):	2
Maximum Antenna Gain (numeric):	1.585
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00086
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.00086mW/cm^2 .Limit is $1mW/cm^{2.}$

Back Antenna at Vertical Polarity

Maximum peak output power at antenna input terminal (dBm):	4.35
Maximum peak output power at antenna input terminal (mW):	2.723
Prediction distance (cm):	20
Prediction frequency (MHz):	2475
Maximum Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00108
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.00108mW/cm^2.Limit is $1mW/cm^{2.}$

Back Antenna at Horizontal Polarity

Maximum peak output power at antenna input terminal (dBm):	4.35
Maximum peak output power at antenna input terminal (mW):	2.723
Prediction distance (cm):	20
Prediction frequency (MHz):	2475
Maximum Antenna Gain, typical (dBi):	3
Maximum Antenna Gain (numeric):	1.995
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00108
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1.0

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.00108mW/cm^2 .Limit is $1mW/cm^2$

FHSS Mode:

Main Antenna

Maximum peak output power at antenna input terminal (dBm):	0.32
Maximum peak output power at antenna input terminal (mW):	1.076
Prediction distance (cm):	20
Prediction frequency (MHz):	2479
Maximum Antenna Gain, typical (dBi):	5
Maximum Antenna Gain (numeric):	3.162
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00068
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is 0.00068mW/cm^2.Limit is $1mW/cm^{2.}$

Bottom Antenna

Maximum peak output power at antenna input terminal (dBm):	0.32
Maximum peak output power at antenna input terminal (mW):	1.076
Prediction distance (cm):	20
Prediction frequency (MHz):	2479
Maximum Antenna Gain, typical (dBi):	2
Maximum Antenna Gain (numeric):	1.585
Power density of prediction frequency at 20.0 cm (mW/cm^2):	0.00034
MPE limit for uncontrolled exposure at prediction frequency (mW/cm^2):	1

The device is compliant with the requirement MPE limit for uncontrolled exposure. The maximum power density at the distance of 20 cm is0.00034mW/cm^2 .Limit is $1mW/cm^{2.}$