



Prediction of MPE limit at given distance

Product Description: industrial HSUPA router

FCC ID: Y2BR1H1

1. Introduction

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4 \pi R^2}$$

Where:

S = power density

P = power input to the 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

2. Limits for Maximum Permissible Exposure

According to FCC Part 1.1307, 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.

According to FCC Part 1.1310 RF exposure is calculated.

Limits for General Population/ Uncontrolled Exposure

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)
0.3-1.34	614	1.63	(100)*
1.34-30	824/f	2.19/f	(180/f ²)*
30-300	27.5	0.073	0.2
300-1500			f/1500
1500-100,000			1.0



3. Test result

GPRS 850MHz

Maximum peak output power at antenna input terminal(dBm):	32.24
Maximum peak output power at antenna input terminal(mW):	1674
Source-based time-averaged output power(Duty Cycle 50%):	837
Prediction distance(cm):	20
Predication frequency(MHz):	836.5
Antenna Gain (typical) (dBi):	2
Power density at predication frequency at <u>20</u> cm(mW/cm^2):	0.333
MPE limit for RF exposure at prediction frequency(mW/cm^2):	0.558

GPRS 1900MHz

Maximum peak output power at antenna input terminal(dBm):	30.18
Maximum peak output power at antenna input terminal(mW):	1042
Prediction distance(cm):	20
Predication frequency(MHz):	1880
Antenna Gain (typical) (dBi):	2
Power density at predication frequency at <u>20</u> cm(mW/cm^2):	0.415
MPE limit for RF exposure at prediction frequency(mW/cm^2):	1.0

HSUPA 850MHz

Maximum peak output power at antenna input terminal(dBm):	26.13
Maximum peak output power at antenna input terminal(mW):	410
Prediction distance(cm):	20
Predication frequency(MHz):	836.5
Antenna Gain (typical) (dBi):	2
Power density at predication frequency at <u>20</u> cm(mW/cm^2):	0.163
MPE limit for RF exposure at prediction frequency(mW/cm^2):	0.558

**HSUPA 1900MHz**

Maximum peak output power at antenna input terminal(dBm):	25.08
Maximum peak output power at antenna input terminal(mW):	322
Prediction distance(cm):	20
Predication frequency(MHz):	1880
Antenna Gain (typical) (dBi):	2
Power density at predication frequency at <u>20</u> cm(mW/cm^2):	0.128
MPE limit for RF exposure at prediction frequency(mW/cm^2):	1.0

4. Conclusion

Test result is passed.