



FCC ID: ZMOH330

## Prediction of MPE limit at given distance

**Product Description: UMTS/HSPA+ Module**

**Type: H330**

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



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### 3. Test result

#### GSM 850MHz

Maximum peak output power at antenna input terminal(dBm):	<b>32.22</b>
Maximum peak output power at antenna input terminal(mW):	<b>1667.25</b>
Source-based time-averaged output power:	--
Prediction distance(cm):	<b>20</b>
Predication frequency(MHz):	<b>836.5</b>
Antenna Gain (typical) (dBi):	<b>2.5</b>
Power density at predication frequency at <u>20</u> cm(mW/cm <sup>2</sup> ):	<b>0.333</b>
MPE limit for RF exposure at prediction frequency(mW/cm <sup>2</sup> ):	<b>0.558</b>

#### GSM 1900MHz

Maximum peak output power at antenna input terminal(dBm):	<b>28.43</b>
Maximum peak output power at antenna input terminal(mW):	<b>696.63</b>
Source-based time-averaged output power:	--
Prediction distance(cm):	<b>20</b>
Predication frequency(MHz):	<b>1880</b>
Antenna Gain (typical) (dBi):	<b>2.5</b>
Power density at predication frequency at <u>20</u> cm(mW/cm <sup>2</sup> ):	<b>0.139</b>
MPE limit for RF exposure at prediction frequency(mW/cm <sup>2</sup> ):	<b>1.0</b>

### 4. Conclusion

Since WCDMA conducted power is deemed to be less than GSM mode, the test result is passed.