

## RF Exposure

Test Requirement: FCC Part 1.1307

Evaluation Method: FCC Part 2.1091

### Requirements

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 levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

### The procedures / limit

#### (A) Limits for Occupational / Controlled Exposure

FrequencyRange (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

#### (B) Limits for General Population / Uncontrolled Exposure

FrequencyRange (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 Calculation Method

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P**= Peak RF output power (W)

**G**= EUT Antenna numeric gain (numeric)

**d**= Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained

### 2G/3G module: RI7HE910

GSM850 Power Density (mW/cm <sup>2</sup> )	BT Power Density (mW/cm <sup>2</sup> )	WIFI Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
0.079	0.002	0.049	0.130	0.567
PCS1900 Power Density (mW/cm <sup>2</sup> )	BT Power Density (mW/cm <sup>2</sup> )	WIFI Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
0.050	0.002	0.049	0.101	1
WCDMA850 Power Density (mW/cm <sup>2</sup> )	BT Power Density (mW/cm <sup>2</sup> )	WIFI Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
0.013	0.002	0.049	0.064	0.567
WCDMA1900 Power Density (mW/cm <sup>2</sup> )	BT Power Density (mW/cm <sup>2</sup> )	WIFI Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
0.071	0.002	0.049	0.122	1

2G/3G module: RI7HE910-DUAL

GSM850 Power Density (mW/cm <sup>2</sup> )	BT Power Density (mW/cm <sup>2</sup> )	WIFI Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
0.075	0.002	0.049	0.126	0.567
PCS1900 Power Density (mW/cm <sup>2</sup> )	BT Power Density (mW/cm <sup>2</sup> )	WIFI Power Density (mW/cm <sup>2</sup> )	Total Power Density (mW/cm <sup>2</sup> )	Limit of Power Density (mW/cm <sup>2</sup> )
0.069	0.002	0.049	0.12	1

Note: RF safe distance of 20 cm.