

## RF Exposure Evaluation

### Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f <sup>2</sup> )	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				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

**Pd** = power density in mW/cm<sup>2</sup>, **Pout** = output power to antenna in mW;

**G** = gain of antenna in linear scale, **Pi** = 3.1416;

**R** = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

## Test Result of RF Exposure Evaluation

The maximum tune-up power for GSM 850 and PCS 1900 is 33dBm and 29dBm.

The maximum tune-up power for Bluetooth is 4dBm.

The RF exposure evaluation as below:

Mode	Maximum tune-up power (mW)	Power Density at R=25cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
GSM 850	1995.262	0.40263	0.5495 (note1)	PASS
PCS 1900	794.328	0.16029	1.0	PASS
Bluetooth	2.512	0.00051	1.0	PASS

Note:

Note 1: The power density limit at 300MHz~1500MHz is f/1500. Due to the lowest frequency of GSM 850 is 824.20MHz, the limit is 0.5495mW/cm<sup>2</sup>.