

RF Exposure Evaluation

LIMIT

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 ²)	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 ²)	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 ²)	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

EVALUATION METHOD

Transmission formula: $Pd = (Pout * G) / (4 * \pi * r^2)$

Where

Pd = power density in mW/cm², **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

TEST RESULT

☒ **Passed**

☐ **Not Applicable**

Frequency range (MHz)	Type	Conducted Power (dBm)	Maximum Tune-up (dBm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
836.6	GSM850	32.84	33.00	0.5273	0.5577	Fail
1909.8	PCS1900	29.00	29.50	0.2178	1.0000	Pass
1907.6	WCDMA Band 2	24.43	24.50	0.0760	1.0000	Pass
1752.6	WCDMA Band 4	23.25	23.50	0.0580	1.0000	Pass
836.4	WCDMA Band 5	24.67	25.00	0.0804	0.5576	Pass
1909.3	LTE Band 2	24.25	24.50	0.0730	1.0000	Pass
1732.5	LTE Band 4	23.60	24.00	0.0628	1.0000	Pass
829.0	LTE Band 5	25.29	25.50	0.0927	0.5527	Pass
707.5	LTE Band 12	26.23	26.50	0.1151	0.4717	Pass
782.0	LTE Band 13	26.30	26.50	0.1170	0.5213	Pass
709.0	LTE Band 17	25.55	26.00	0.0984	0.4727	Pass
2437.0	802.11g	12.81	13.00	0.0052	1.0000	Pass

Considering that GSM850 and 802.11g can transmit simultaneously, the total transmission MPE rate is as follows:

$$(\text{GSM850 power density} / \text{limit}) + (\text{802.11g power density} / \text{limit}) < 1$$

The worst case is GSM850, 802.11g transmitting simultaneously, the result as below:

Evaluation mode	Power density/limit	Sum of the MPE rate	limit
GSM850	0.9455	0.9504	1
802.11g	0.0049		

Note:

- 1) The maximum antenna gain is 4dBi (2G,3G,4G,2.4G WiFi)
- 2) The exposure evaluation safety distance is 27cm.