

FCC ID:2ADWUPSMMAA10NA

RF EXPOSURE EVALUATION

According to FCC 1.1310: 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)	Average Time
(A) Limits for Occupational/Control Exposures				
300-1500	--	--	F/300	6
1500-1000000	--	--	5	6
(B) Limits for General Population/Uncontrol Exposures				
300-1500	--	--	F/1500	6
1500-1000000	--	--	1	30

11.1 Friis transmission formula: $P_d = \frac{P_{out} \cdot G}{4 \cdot \pi \cdot R^2}$

Where

P_d = Power density in mW/cm²

P_{out} =output power to antenna in mW

G = Numeric gain of the antenna relative to isotropic antenna

π =3.1416

R = distance between observation point and center of the radiator in cm(20cm)

P_d the limit of MPE, 1mW/cm². If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

mW=10^(dBm/10)

11.2 Measurement Result

Operation Frequency:

GSM850: TX824.2MHz~848.8MHz,

UMTS FDD Band V: TX826.4MHz~846.6MHz

Power density limited: 0.55mW/cm^2

Antenna Type: FPCB Antenna

Antenna gain: 1.0dBi,

R=20cm

$\text{mW}=10^{(\text{dBm}/10)}$

Channel Freq. (MHz)	modulation	conducted power (mW)	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
824.2	GSM850	1870.68	32.72	32±1	33	1.26	0.499712	0.55
836.6	GSM850	1936.42	32.87	32±1	33	1.26	0.499712	0.55
848.8	GSM850	1940.89	32.88	32±1	33	1.26	0.499712	0.55
826.4	WCDMA BAND V	199.99	23.01	22.5±1	23.5	1.26	0.056069	0.55
835	WCDMA BAND V	218.27	23.39	22.5±1	23.5	1.26	0.056069	0.55
846.6	WCDMA BAND V	211.84	23.26	22.5±1	23.5	1.26	0.056069	0.55

PCS1900: TX1850.2MHz~1909.8MHz

UMTS FDD Band II: TX1852.4MHz~1907.6MHz

Power density limited: 1mW/cm^2

Antenna Type: FPCB Antenna

Antenna gain: 1.0dBi,

R=20cm

$\text{mW}=10^{(\text{dBm}/10)}$

Channel Freq. (MHz)	modulation	conducted power (mW)	conducted power (dBm)	Tune-up power (dBm)	Max tune-up power (dBm)	Antenna Gain Numeric	Evaluation result (mW/cm ²)	Power density Limits (mW/cm ²)
1850.2	GSM 1900	1064.14	30.27	30±1	31	1.26	0.315297	1
1880	GSM 1900	1109.17	30.45	30±1	31	1.26	0.315297	1
1909.8	GSM 1900	972.75	29.88	30±1	31	1.26	0.315297	1
1852.4	WCDMA Band II	205.12	23.12	22.5±1	23.5	1.26	0.056069	1
1880	WCDMA Band II	206.06	23.14	22.5±1	23.5	1.26	0.056069	1
1907.6	WCDMA Band II	211.84	23.26	22.5±1	23.5	1.26	0.056069	1

Conclusion:

For the max result : $0.499712 \leq 0.55$, $0.315297 \leq 1$ compliance with FCC's RF Exposure.

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Signature:

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