MPE Calculation

Mode	Frequency range (MHz)			Tune-up Max. Power(dBm)	ANT Gain (dBi)	Duty Factor(dB)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm^2)	Requriment (mW/cm^2)
GSRS850 (1TX)	824.20	~	848.80	35.00	1.84	-9.03	27.81	603.949	0.1202	0.5490
GSRS850 (4TX)	824.20	~	848.80	30.00	1.84	-3.01	28.83	763.836	0.1520	0.5490
GSRS1900 (1TX)	1850.20	~	1909.80	27.80	2.98	-9.03	21.75	149.624	0.0298	1.0000
GSRS1900 (4TX)	1850.20	~	1909.80	26.80	2.98	-3.01	26.77	475.336	0.0946	1.0000
WCDMA850	826.40	~	846.60	25.00	1.84	-	26.84	483.059	0.0962	0.5500
WCDMA1700	1712.40	~	1752.60	25.00	2.50	-	27.50	562.342	0.1119	1.0000
WCDMA1900	1852.40	~	1907.60	25.00	2.98	-	27.98	628.059	0.1250	1.0000
LTE B12	699.70	~	715.30	25.00	0.40	-	25.40	346.737	0.0690	0.4660
LTE B13	779.50	~	784.50	25.00	1.96	-	26.96	496.593	0.0988	0.5190
LTE B26	814.70	~	823.30	25.00	0.70	-	25.70	371.536	0.0740	0.5430
LTE B26(5)	824.70	~	848.30	25.00	1.84	-	26.84	483.059	0.0962	0.5490
LTE B4	1710.70	~	1754.30	25.00	2.50	-	27.50	562.342	0.1119	1.0000
LTE B25(2)	1850.70	~	1914.30	25.00	2.98	-	27.98	628.059	0.1250	1.0000
LTE B41(38)	2498.50	~	2687.50	25.00	1.46	-	26.46	442.589	0.0881	1.0000
LTE B7	2502.50	~	2567.50	25.00	1.46	-	26.46	442.589	0.0881	1.0000

Note1: Please refer to the operation description for Max tune-up power.

Note2: For GSM, duty factor was applied.

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The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user.

The MPE sample calculation for this exposure is shown below.

▪ **S =** EIRP / (4 R^2 π)

= 603.949 / (4 X 20^2 X π)

= 0.1202 mW/cm^2

- Note

S= Maximum power density(mW/cm^2)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(20cm)

▪ **Limits for Maximum Permissible Exposure (MPE)**

Frequency range (MHz)	Electric Field strength (V/m)	Magnetic field strength (A/m)	Power Density (mW/cm^2)	Averageing time (minutes)
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 ~ 1,500			f / 1500	30
1,500 ~ 100,000			1.0	30

Conclusion : **The exposure condition of this device is compliant with FCC**

MPE Calculation

Mode	Frequency range (MHz)			Tune-up Max. Power(dBm)	ANT Gain (dBi)	Duty Factor(dB)	Maximum EIRP (dBm)	Maximum EIRP (mW)	Maximum power density (mW/cm^2)	Requriment (mW/cm^2)
Satellite	1616.02	~	1625.98	33.00	3.65	-10.36	26.29	425.599	0.0847	1.0000
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-		~								
-		~								
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-		~								

Note1: Please refer to the operation description for Max tune-up power.

Note2: Duty factor was applied.(Duty cycle: 9.2%)

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The EUT will only be used with a separation of 20 centimeters or greater between the antenna and the body of the user.

The MPE sample calculation for this exposure is shown below.

▪ **S =** EIRP / (4 R^2 π)

= 425.599 / (4 X 20^2 X π)

= 0.0847 mW/cm^2

- Note

S= Maximum power density(mW/cm^2)

EIRP= Equivalent Isotropic Radiated Power(mW)

R= Distance to the center of the radiation of the antenna(20cm)

▪ **Limits for Maximum Permissible Exposure (MPE)**

Frequency range (MHz)	Electric Field strength (V/m)	Magnetic field strength (A/m)	Power Density (mW/cm^2)	Averageing time (minutes)
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 ~ 1,500			f / 1500	30
1,500 ~ 100,000			1.0	30

Conclusion : **The exposure condition of this device is compliant with FCC**

RF Exposure Compliance for simultaneous operations

- **Worst case for simultaneous operations**
- GPRS850(4TX) + Satellite

Mode	GSRS850 (4TX)	Satellite	-	-	-	-	-	Σ of MPE ratios
Power Density (mW/cm^2)	0.1520	0.0847	-	-	-	-	-	
Requirement (mW/cm^2)	0.5490	1.0000	-	-	-	-	-	
MPE ratio (Power Density/Requirement)	0.2769	0.0847	-	-	-	-	-	
Worst case(MPE ratio)	0.2769	0.0847	-	-	-	-	-	0.3616

- **Requirment = Σ of MPE ratios ≤ 1**

Conclusion : The exposure condition of this device is compliant with FCC rules.