

# FCC ID: 2AX5VHUB2JNA

## Maximum Permissible Exposure (MPE)

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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
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
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz \* = Plane-wave equivalent power density

## MPE Calculation Method

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

E = Electric field (V/m)

P = Average 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

$$Pd = \frac{30 * P * G}{377 * D^2}$$

From the 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.

Operation Frequency: GFSK: 905 MHz~926.5MHz

Antenna Type: Antenna 1Type: Planar Inverted L- Antenna(ocw=120k)

Antenna 2Type: Planar Inverted F- Antenna(ocw=120k)

Antenna 3Type: Planar Inverted F- Antenna(ocw=140k)

Antenna 4Type: Planar Inverted F- Antenna(ocw=140k)

R=20cm

Module 1:

ant 1

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
905.00	GFSK-120K	13.156	12.5±1	13.5	22.387	-5.00	0.32	0.0014	0.60
915.85		13.008	12.5±1	13.5	22.387	-5.00	0.32	0.0014	0.61
926.50		13.137	12.5±1	13.5	22.387	-5.00	0.32	0.0014	0.62

ant 2

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
905.00	GFSK-120K	17.105	17±1	18	63.096	-6.00	0.25	0.0032	0.60
915.85		16.704	17±1	18	63.096	-6.00	0.25	0.0032	0.61
926.50		16.754	17±1	18	63.096	-6.00	0.25	0.0032	0.62

Module 2:

ant 3

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
905.00	GFSK-140K	17.044	16.5±1	17.5	56.234	-6.00	0.25	0.0028	0.60
915.85		16.661	16.5±1	17.5	56.234	-6.00	0.25	0.0028	0.61
926.50		16.307	16.5±1	17.5	56.234	-6.00	0.25	0.0028	0.62

ant 4

Channel Freq. (MHz)	modulation	conducted power	Tune-up power (dBm)	Max		Antenna		Evaluation result (mW/cm <sup>2</sup> )	Power density Limits (mW/cm <sup>2</sup> )
		(dBm)		tune-up power		Gain			
				(dBm)	(mW)	(dBi)	Numeric		
905.00	GFSK-140K	14.023	14±1	15	31.623	-6.00	0.25	0.0016	0.60
915.85		13.594	14±1	15	31.623	-6.00	0.25	0.0016	0.61
926.50		13.285	14±1	15	31.623	-6.00	0.25	0.0016	0.62

**Conclusion:**

For the max result :  $0.0032 \leq 0.60$  for Max Power Density, compliance RF exposure..

Note: This product does not support simultaneous delivery.

GSM

Antenna Type: Planar Multiband Antenna

Antenna Gain: -1dBi

modulation	Max		Antenna		Evaluation result	Power density
	tune-up power		Gain			
	(dBm)	(mW)	(dBi)	Numeric	(mW/cm2 )	(mW/cm2)
GPRS850	33.82	2409.905	-1	0.79	0.3808	1
GPRS1900	28.81	760.326	-1	0.79	0.1201	1

### SIMULTANEOUS TRANSMISSIONS

When a number of sources at different frequencies, and/or broadband sources, contribute to the total exposure, it becomes necessary to weigh each contribution relative to the MPE. To comply with the MPE, the fraction of the MPE in terms of  $E^2$ ,  $H^2$  (or power density) incurred within each frequency interval should be determined and the sum of all such fractions should not exceed unity. In order to ensure compliance with the MPE for a controlled environment, the sum of the ratios of the power density to the corresponding MPE should not exceed unity. That is

$$\sum_{i=1}^n \frac{S_i}{MPE_i} \leq 1$$

### Max. SIMULTANEOUS TRANSMISSIONS MODE

Band	SISO					MIMO		Verdict
	Max EIRP	Antenna	Separation distance (cm)	Evaluation result	Power density	Evaluation result	Power density Limits	
	(dBm)	Gain (dBi)		(mW/cm2 )	(mW/cm2)			
SRD 905 + GPRS 850	11.105	-6	20	0.002566	0.6	0.677104	1	PASS
	32.82	-1	20	0.38082	0.566			

Signature:

Date: 2023-6-01



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