

# Maximum Permissible Exposure Evaluation

## FCC ID: 2AKMD-S921

### 1. Client Information

**Applicant** : ShenZhen Megastek Electronics Co. Ltd.  
**Address** : RmB1111, Niulanqian Building, Minzhi Road, Longhua Town, Baoan District, Shenzhen, China  
**Manufacturer** : Megastek Technologies Electronics (ShenZhen) Co. Ltd .  
**Address** : Qiangcheng Technologis Park, Xinglang Road, Xingguang village, HuangjiangTown, DongguanCity, China

### 2. General Description of EUT

<b>EUT Name</b>	:	Home base unit	
<b>Models No.</b>	:	S921, MT200-HBU, MT200XF	
<b>Model Difference</b>	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.	
<b>Product Description</b>	:	Frequency Bands: GPRS 850: 824.20MHz-848.80MHz GPRS 1900: 1850.20MHz-1909.80MHz Bluetooth V3.0: 2402~2480 MHz 802.11b/g/n(HT20): 2412MHz~2462MHz 802.11n(HT40): 2422MHz~2452MHz	
		GPRS 850 Power :	Cond:31.18 dBm ERP:30.89 dBm
		GPRS 1900 Power :	Cond:28.30 dBm EIRP:27.84 dBm
		Max Peak Output Power:	802.11b: 19.78 dBm 802.11g: 18.66 dBm 802.11n (HT20): 17.81 dBm 802.11n (HT40): 17.46 dBm Bluetooth: -6.115 dBm(GFSK)
		Antenna Gain:	GPRS 850: 2 dBi PIFA Antenna GPRS 1900: 2 dBi PIFA Antenna BT 3.0: 3 dBi Internal Antenna 802.11b/g/n: 3 dBi External Antenna

<b>Power Supply</b>	:	AC power by AC cable. DC power by Li-ion battery.
<b>Power Rating</b>	:	AC 100-240V, 50/60Hz DC 3.7V by 100mAh Li-ion battery.
<b>Connecting I/O Port(S)</b>	:	Please refer to the User's Manual

**Note:** More test information about the EUT please refer the RF Test Report.

## MPE Calculations for GSM

### 1. Antenna Gain:

GPRS 850: 2 dBi PIFA Antenna  
 GPRS 1900: 2 dBi PIFA Antenna  
 BT 3.0: 3 dBi Internal Antenna  
 802.11b/g/n: 3 dBi External Antenna

### 2. EUT Operation Condition:

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

### 3. Exposure Evaluation:

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = (PG) / 4\pi R^2$$

Where

**S:** power density

**P:** power input to the antenna

**G:** power gain of the antenna in the direction of interest relative to an isotropic radiator.

**R:** distance to the center of radiation of the antenna

### 4. Test Result:

Worst Maximum MPE Result							
Mode	N <sub>TX</sub>	Conducted Power(max) (dBm)	Turn-up Power (dB)	Max tune up power (dBm) [P]	ANT Gain (dBi) [G]	Distance (cm) [R]	Power Density (mW/ cm <sup>2</sup> ) [S]
802.11b	1	19.78	20±1	21	3	20	0.0500
802.11g	1	18.66	18±1	19	3	20	0.0315
802.11n (HT20)	1	17.81	18±1	19	3	20	0.0315
802.11n (HT40)	1	17.46	18±1	19	3	20	0.0315
GFSK	1	-6.115	-6±1	-5	3	20	0.0001
π/4-DQPSK	1	-6.583	-6±1	-5	3	20	0.0001
8-DPSK	1	-6.498	-6±1	-5	3	20	0.0001
GPRS 850	1	31.18	31±1	32	2	20	0.4997
GPRS 1900	1	28.30	28±1	29	2	20	0.2505

Note:  
 (1) N<sub>TX</sub>= Number of Transmit Antennas  
 RF Output power specifies that Maximum Conducted Peak Output Power.

### 5. Conclusion:

As specified in Table 1B of 47 CFR 1.1310- Limits for Maximum Permissible Exposure (MPE),

#### Limits for General Population/ Uncontrolled Exposure

Frequency Range (MHz)	Power density (mW/ cm <sup>2</sup> )
300-1,500	F/1500
1,500-100,000	1.0

#### 300-1500MHz:

The worst MPE is calculated as  $0.4997 \text{ mW} / \text{cm}^2 < \text{limit } 824.0/1500=0.5494 \text{ mW/cm}^2$ . So, RF exposure limit warning or SAR test are not required.

#### 1500-100000MHz:

The worst MPE is calculated as  $0.2505 \text{ mW} / \text{cm}^2 < \text{limit } 1\text{mW/cm}^2$ . So, RF exposure limit warning or SAR test are not required.

The EUT will only be used with a separation of 20cm or greater between the antenna and nearby persons and can therefore be considered a mobile transmitter per 47 CFR2.1091 (b).

The RF Exposure Information page from the manual is included here for reference.

#### Note

For a more detailed features description, please refer to the RF Test Report.

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