

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

EUT Name	:	Home base unit
Models No.	:	S921, MT200-HBU, MT200XF
Model Difference	:	All these models are identical in the same PCB, layout and electrical circuit, the only difference is model name for commercial.
Product Description	:	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

TB-RF-075-1.0

Power Supply	:	AC power by AC cable. DC power by Li-ion battery.
Power Rating	:	AC 100-240V, 50/60Hz DC 3.7V by 100mAh Li-ion battery.
Connecting I/O Port(S)	:	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 _{TX}	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 ²) [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 _{TX} = 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 ²)
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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