

1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant: Shenzhen Concox Information Technology Co., Ltd
Address of applicant: Floor 4th, Building B, Gaoxinqi Industrial Park, Liuxian 1st Road,
District 67, Bao'an, Shenzhen, China

Manufacturer: Shenzhen Concox Information Technology Co., Ltd
Address of manufacturer: Floor 4th, Building B, Gaoxinqi Industrial Park, Liuxian 1st Road,
District 67, Bao'an, Shenzhen, China

General Description of EUT:

Product Name: Vehicle gps tracker
Trade Name: /
Model No.: MOPLUS
Adding Model(s): MT200, MT200N
FCC ID: X7IMOPLUS
Rated Voltage: DC 9-18V, Battery DC 3.7V for backup

Technical Characteristics of EUT:

Support Networks: GSM, GPRS
Support Band: GSM850/PCS1900
Uplink Frequency: GSM/GPRS 850: 824~849MHz
GSM/GPRS 1900: 1850~1910MHz
Downlink Frequency: GSM/GPRS 850: 869~894MHz
GSM/GPRS 1900: 1930~1990MHz
Max RF Output Power: GSM850: 32.44dBm, GSM1900: 30.59dBm
Type of Modulation: GMSK
Type of Antenna: Integral Antenna
Antenna Gain: GSM850: -1.14dBi; GSM1900: 1.19dBi
GPRS Class: Class 12
Device Category: Mobile Device

Note 1: The EUT Main board support GSM850/900/DCS1800/PCS1900 function. It is intended for Multimedia Message Service (MMS) transmission. It is equipped with GPRS class 12 for GSM850/900/DCS1800/PCS1900, GPS functions.

Note 2: The test data is gathered from a production sample provided by the manufacturer. The appearance of others models listed in the report is different from main-test model MOPLUS, but the circuit and the electronic construction do not change, declared by the manufacturer.

1.2 Standard Applicable

According to § 1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz; * = Plane-wave equivalent power density

1.3 MPE Calculation Method

$$S = (30 * P * G) / (377 * R^2)$$

S = power density (in appropriate units, e.g., mw/cm²)

P = power input to the antenna (in appropriate units, e.g., mw)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm)

1.4 MPE Calculation Result

For GSM850:

Maximum Tune-Up output power: 32.5 (dBm)

Maximum peak output power at antenna input terminal: 1778.58 (mW)

Prediction distance: >20(cm)

Prediction frequency: 824.2 (MHz)

Antenna gain: -1.14 (dBi)

Directional gain (numeric gain): 0.77

The worst case is power density at prediction frequency at 20cm: 0.27(mw/cm²)

MPE limit for general population exposure at prediction frequency: 0.55 (mw/cm²)

For GSM1900:

Maximum Tune-Up output power: 31.0 (dBm)

Maximum peak output power at antenna input terminal: 1258.93 (mW)

Prediction distance: >20(cm)

Prediction frequency: 1880 (MHz)

Antenna gain: 1.19 (dBi)

Directional gain (numeric gain): 1.32

The worst case is power density at prediction frequency at 20cm: 0.33(mw/cm²)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm²)

Result: Pass

1.5 Test Setup Photos

