1. MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 General Information

Client Information

Applicant:	PAJ GPS Inc.
Address of applicant:	444 Brickell Ave, Suite 51270 Miami, FL 33131 USA
Manufacturer:	PAJ GPS Inc.
Address of manufacturer:	444 Brickell Ave, Suite 51270 Miami, FL 33131 USA

General Description of EUT:

Product Name:	GPS Tracker
Trade Name:	PAJ GPS
Model No.:	PAJ GPS Finder 01, GPS Tracker 01
FCC ID:	2ASPJPAJGPS319
Rated Voltage:	DC 12V/24V/Battery:DC3.7V
Battery Capacity:	200mAh

Technical Characteristics of EUT:	
2G	
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: 32.94dBm, GSM1900: 29.70dBm
Type of Emission:	GSM850: 253KGXW, GSM1900: 251KGXW
Type of Modulation:	GMSK
Type of Antenna:	Integral Antenna
Antenna Gain:	GSM850: -2dBi; GSM1900: -3dBi
GPRS Class:	Class 12
3G	
Support Networks:	WCDMA, HSDPA, HSUPA
Support Band:	WCDMA Band 2, WCDMA Band 5
Uplink Frequency:	WCDMA Band 2: 1850~1910MHz WCDMA Band 5: 824~849MHz
Downlink Frequency:	WCDMA Band 2: 1930~1990MHz WCDMA Band 5: 869~894MHz
RF Output Power:	WCDMA Band 2: 22.94dBm, WCDMA Band 5: 22.14dBm

Type of Emission:	WCDMA Band 2: 4M22F9W
	WCDMA Band 5: 4M20F9W
Type of Modulation:	BPSK,QPSK
Antenna Type:	Integral Antenna
Antenna Gain:	WCDMA Band 2: -3dBi, WCDMA Band 5: -2dBi

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 $\lvert E \rvert^2$, $\lvert H \rvert^2$ 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 $\lvert E \rvert^2$, $\lvert H \rvert^2$ 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 equivalents power density

1.3 MPE Calculation Method

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

S = power density (in appropriate units, e.g., mw/cm^2)

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

GSM850:

Maximum Tune-Up output power: 33(dBm)

Maximum peak output power at antenna input terminal: 1995.26 (mW)

Prediction distance: >20(cm)

Prediction frequency: 824.2 (MHz)

Antenna gain: -2 (dBi)

Directional gain (numeric gain): 0.63

The worst case is power density at prediction frequency at 20cm: 0.25 (mw/cm^2)

MPE limit for general population exposure at prediction frequency: 0.55 (mw/cm^2)

GSM1900:

Maximum Tune-Up output power: 30 (dBm)

Maximum peak output power at antenna input terminal: 1000 (mW)

Prediction distance: >20(cm)

Prediction frequency: 1850.2(MHz)

Antenna gain: -3 (dBi)

Directional gain (numeric gain): 0.50

The worst case is power density at prediction frequency at 20cm: 0.10 (mw/cm^2)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm^2)

WCDMA B5:

Maximum Tune-Up output power: 22.5(dBm)

Maximum peak output power at antenna input terminal: 177.83 (mW)

Prediction distance: >20(cm)

Prediction frequency: 826.4 (MHz)

Antenna gain: -2 (dBi)

Directional gain (numeric gain): 0.63

The worst case is power density at prediction frequency at 20cm: 0.05 (mw/cm^2)

MPE limit for general population exposure at prediction frequency: 0.55 (mw/cm^2)

WCDMA B2:

Maximum Tune-Up output power: 23 (dBm)

Maximum peak output power at antenna input terminal: 199.53 (mW)

Prediction distance: >20(cm)

Prediction frequency: 1852.4(MHz)

Antenna gain: -3 (dBi)

Directional gain (numeric gain): 0.50

The worst case is power density at prediction frequency at 20cm: 0.02(mw/cm^2)

MPE limit for general population exposure at prediction frequency: 1 (mw/cm^2)

Result: Pass