

## RF EXPOSURE EVALUATION

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)

FCC ID: 2ALPD-TK228

### EUT Specification

<b>EUT</b>	<b>OBD-II GPS Tracker</b>
<b>Frequency band (Operating)</b>	<input checked="" type="checkbox"/> GSM: 850/1900 <input checked="" type="checkbox"/> WCDMA: UMTS FDD Band II, UMTS FDD Band V <input checked="" type="checkbox"/> Bluetooth: 2.402GHz ~ 2.48GHz <input type="checkbox"/> Others
<b>Device category</b>	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others ____
<b>Exposure classification</b>	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm <sup>2</sup> ) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm <sup>2</sup> )
<b>Antenna diversity</b>	<input type="checkbox"/> Single antenna <input checked="" type="checkbox"/> Multiple antennas <input type="checkbox"/> Tx diversity <input type="checkbox"/> Rx diversity <input type="checkbox"/> Tx/Rx diversity
<b>Max. output power</b>	32.86dBm (1.932W)
<b>Antenna gain (Max)</b>	1.0 dBi
<b>Evaluation applied</b>	<input checked="" type="checkbox"/> MPE Evaluation <input type="checkbox"/> SAR Evaluation

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> )	Average Time
<b>(A) Limits for Occupational/Control Exposures</b>				
<b>300-1500</b>	--	--	<b>F/300</b>	<b>6</b>
<b>1500-100000</b>	--	--	<b>5</b>	<b>6</b>
<b>(B) Limits for General Population/Uncontrol Exposures</b>				
<b>300-1500</b>	--	--	<b>F/1500</b>	<b>6</b>
<b>1500-100000</b>	--	--	<b>1</b>	<b>30</b>

## Friis transmission formula: $P_d = \frac{P_{out} * G}{4 * \pi * R^2}$

Where

$P_d$  = Power density in  $mW/cm^2$

$P_{out}$  = output power to antenna in Mw

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = distance between observation point and center of the radiator in cm

$P_d$  the limit of MPE,  $1mW/cm^2$ . If we know the maximum gain of the antenna and total power input to the antenna, through the calculation, we will know the distance where the MPE limit is reached.

## Measurement Result

Operating Mode	Channel Frequency (MHz)	Measured Power (dBm)	Tune up tolerance (dBm)	Max. Tune up Power (dBm)	Antenna Gain	Power density at 20cm ( $mW/cm^2$ )	Power density Limits ( $mW/cm^2$ )
GSM850	824.2	32.54	32.0±1	33	1	0.4997	0.55
	836.6	32.33	32.0±1	33	1	0.4997	0.56
	848.8	32.26	32.0±1	33	1	0.4997	0.57
GPRS850	824.2	32.43	32.0±1	33	1	0.4997	0.55
	836.6	32.26	32.0±1	33	1	0.4997	0.56
	848.8	32.59	32.0±1	33	1	0.4997	0.57
EGPRS	824.2	32.35	32.0±1	33	1	0.4997	0.55
	836.6	32.86	32.0±1	33	1	0.4997	0.56
	848.8	32.45	32.0±1	33	1	0.4997	0.57
PCS1900	1850.2	29.15	29±1	30	1	0.2505	1
	1880.0	28.48	29±1	30	1	0.2505	1
	1909.8	29.64	29±1	30	1	0.2505	1
GPRS 1900	1850.2	28.52	28±1	29	1	0.1989	1
	1880.0	28.31	28±1	29	1	0.1989	1
	1909.8	28.54	28±1	29	1	0.1989	1
EGPRS 1900	1850.2	29.45	29±1	30	1	0.2505	1
	1880.0	29.38	29±1	30	1	0.2505	1
	1909.8	29.57	29±1	30	1	0.2505	1
WCDMA 850	826.4	22.16	22±1	23	1	0.0500	0.55
	835.0	22.37	22±1	23	1	0.0500	0.56
	846.6	22.08	22±1	23	1	0.0500	0.56
WCDMA	1852.4	21.54	22±1	23	1	0.0500	1

1900	1880.0	21.63	22±1	23	1	0.0500	1
	1907.6	21.42	22±1	23	1	0.0500	1
BT4.0	2402	-0.367	0±1	1	1	0.0003	1
	2442	-0.105	0±1	1	1	0.0003	1
	2480	0.616	0±1	1	1	0.0003	1

Conclusion: No SAR is required.