

# RF Exposure Evaluation Declaration

Product Name : GPS Locator

Model No. : GV75W

FCC ID: YQD-GV75W

Applicant : Queclink Wireless Solutions Co.,Ltd.

Address : Room 501, Building 9, No. 99, TianZhou Road, Shanghai, China

Date of Receipt : 11/14/2016

Issued Date : 12/05/2016

Report No. : UL12620161114FCC019-4

Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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# RF Exposure Evaluation Declaration

Issued Date : 12/05/2016  
Report No. : UL12620161114FCC019-04

Product Name : GPS Locator  
Applicant : Queclink Wireless Solutions Co.,Ltd  
Address : Room 501, Building 9, No 99, TianZhou Road, Shanghai, China  
Manufacturer : Queclink Wireless Solutions Co.,Ltd.  
Address : Room 501, Building 9, No 99, TianZhou Road, Shanghai, China  
Model No. : GV75W  
EUT Voltage : Extreme Low:8V, Nominal:12/24V, Extreme High:32V  
Brand Name : Queclink  
Applicable Standard : FCC's Rules (47 C.F.R. §1.1310 and 2.1091)  
Industry Canada RSS-102, Issue 5  
Test Result : Complied  
Performed Location : Unilab (Shanghai) Co.,Ltd.  
FCC 2.948 register number is 714465  
IC register number is 11025A-1  
No.1350, Lianxi Road, Pudong New District, Shangha, China  
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## 1. EUT Description

|                          |                                                                   |
|--------------------------|-------------------------------------------------------------------|
| Product Name:            | GPS Locator                                                       |
| Model Name:              | GV75W                                                             |
| Hardware Version:        | V1.02                                                             |
| Software Version:        | A01V09                                                            |
| RF Exposure Environment: | Uncontrolled                                                      |
| <b>GSM/ EDGE</b>         |                                                                   |
| Support Band:            | GSM850/PCS1900                                                    |
| GPRS Class:              | 12                                                                |
| Tx Frequency Range:      | GSM 850: 824.2MHz to 848.8MHz<br>PCS 1900: 1850.2MHz to 1909.8MHz |
| Rx Frequency Range:      | GSM 850: 869.2MHz to 893.8MHz<br>PCS 1900: 1930.2MHz to 1989.8MHz |
| Type of modulation:      | GSM/GPRS for GMSK<br>EDGE for 8PSK                                |
| Antenna Type:            | Internal Antenna                                                  |
| Antenna Peak Gain:       | GSM 850:-1.8/PCS 1900: 3.1dBi                                     |
| <b>WCDMA</b>             |                                                                   |
| Support Band:            | WCDMA Band II                                                     |
| Tx Frequency Range:      | WCDMA Band II : 1850MHz ~1910MHz                                  |
| Rx Frequency Range:      | WCDMA Band II : 1930MHz ~1990MHz                                  |
| Type of modulation:      | WCDMA(UMTS): QPSK                                                 |
| Antenna Type:            | Connector                                                         |
| Antenna Peak Gain:       | WCDMA Band II : 3.5dBi                                            |
| Support Band:            | WCDMA Band V                                                      |
| Tx Frequency Range:      | WCDMA Band V: 824MHz ~849MHz                                      |
| Rx Frequency Range:      | WCDMA Band V: 869MHz ~894MHz                                      |
| Type of modulation:      | WCDMA(UMTS): QPSK                                                 |
| Antenna Type:            | Connector                                                         |
| Antenna Peak Gain:       | WCDMA Band V: -1.8dBi                                             |

## 2. RF Exposure Evaluation

### 2.1 Limits

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)

#### 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 (Minutes) |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A)Limits for Occupation/Control Exposures              |                               |                               |                                     |                        |
| 300-1500                                                | --                            | --                            | F/300                               | 6                      |
| 1500-100,000                                            | --                            | --                            | 5                                   | 6                      |
| (B)Limits for General Occupation/UnControlled Exposures |                               |                               |                                     |                        |
| 300-1500                                                | --                            | --                            | F/1500                              | 6                      |
| 1500-100,000                                            | --                            | --                            | 1                                   | 30                     |

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

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

### 2.2. Test Procedure

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

The temperature and related humidity: 22°C and 45% RH.

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### 2.3.Test Result of RF Exposure Evaluation

This device is evaluated by mobile device with general population/uncontrolled exposure condition  
For this device, the calculation is using the most conservative values, and the results are as follows:

| Test Mode          | Antenna Gain (dBi) | Maximum Output Power (dBm) | Averaged Power (dBm) | Average EIRP Power (dBm) | Average EIRP Power (mW) | Calculated RF Exposure at d = 20cm (mW/cm2) | MPE Limit (mW/cm2) |
|--------------------|--------------------|----------------------------|----------------------|--------------------------|-------------------------|---------------------------------------------|--------------------|
| GSM 850            | -1.8               | 33.5                       | 24.5                 | 22.7                     | 185                     | 0.04                                        | 0.55               |
| GPRS 850 1 TX slot | -1.8               | 33.0                       | 24.0                 | 22.2                     | 165                     | 0.03                                        | 0.55               |
| GPRS 850 2 TX slot | -1.8               | 32.0                       | 26.0                 | 24.2                     | 262                     | 0.05                                        | 0.55               |
| GPRS 850 3 TX slot | -1.8               | 31.0                       | 26.7                 | 24.9                     | 312                     | 0.06                                        | 0.55               |
| GPRS 850 4 TX slot | -1.8               | 30.0                       | 27.0                 | 25.2                     | 330                     | 0.07                                        | 0.55               |
| PCS 1900           | 3.1                | 30.5                       | 21.5                 | 24.6                     | 286                     | 0.06                                        | 1.00               |
| GPRS PCS 1 TX slot | 3.1                | 30.0                       | 21.0                 | 24.1                     | 255                     | 0.05                                        | 1.00               |
| GPRS PCS 2 TX slot | 3.1                | 29.0                       | 23.0                 | 26.1                     | 405                     | 0.08                                        | 1.00               |
| GPRS PCS 3 TX slot | 3.1                | 28.0                       | 23.7                 | 26.8                     | 483                     | 0.10                                        | 1.00               |
| GPRS PCS 4 TX slot | 3.1                | 27.0                       | 24.0                 | 27.1                     | 512                     | 0.10                                        | 1.00               |

The averaged power calculated method are shown as below:

1 Tx Slot: Averaged power=Maximum Output power + (10lg(1/8))dB, Duty cycle =12.5%

2 Tx Slot: Averaged power=Maximum Output power + (10lg(2/8))dB, Duty cycle =25.0%

3 Tx Slot: Averaged power=Maximum Output power + (10lg(3/8))dB, Duty cycle =37.5%

4 Tx Slot: Averaged power=Maximum Output power + (10lg(4/8))dB, Duty cycle =50.0%

Average EIRP Power=Average Power + Antenna Gain

Calculated RF Exposure = Average EIRP Power / (4\*Pi\*d<sup>2</sup>)

| Test Mode  | Antenna Gain (dBi) | Maximum Output Power (dBm) | Maximum EIRP Power (dBm) | Maximum EIRP Power (mW) | Calculated RF Exposure at d = 20cm (mW/cm2) | MPE Limit (mW/cm2) |
|------------|--------------------|----------------------------|--------------------------|-------------------------|---------------------------------------------|--------------------|
| WCDMA 850  | -1.8               | 24                         | 22.2                     | 166.0                   | 0.03                                        | 0.55               |
| WCDMA 1900 | 3.5                | 24                         | 27.5                     | 562.3                   | 0.11                                        | 1.00               |

| Test Mode          | Antenna Gain (dBi) | Maximum Output Power (dBm) | Averaged Power (dBm) | Average EIRP Power (dBm) | Average EIRP Power (mW) | Calculated RF Exposure at d = 20cm (mW/cm2) | MPE Limit (mW/cm2) |
|--------------------|--------------------|----------------------------|----------------------|--------------------------|-------------------------|---------------------------------------------|--------------------|
| GSM 850            | -1.8               | 33.5                       | 23.7                 | 21.9                     | 156                     | 0.03                                        | 0.55               |
| GPRS 850 1 TX slot | -1.8               | 33.0                       | 23.5                 | 21.7                     | 149                     | 0.03                                        | 0.55               |
| GPRS 850 2 TX slot | -1.8               | 32.0                       | 25.2                 | 23.4                     | 218                     | 0.04                                        | 0.55               |
| GPRS 850 3 TX slot | -1.8               | 31.0                       | 26.1                 | 24.3                     | 270                     | 0.05                                        | 0.55               |
| GPRS 850 4 TX slot | -1.8               | 30.0                       | 25.6                 | 23.8                     | 238                     | 0.05                                        | 0.55               |
| PCS 1900           | 3.1                | 30.5                       | 20.8                 | 23.9                     | 248                     | 0.05                                        | 1.00               |
| GPRS PCS 1 TX slot | 3.1                | 30.0                       | 20.4                 | 23.5                     | 223                     | 0.04                                        | 1.00               |
| GPRS PCS 2 TX slot | 3.1                | 29.0                       | 23.4                 | 26.5                     | 451                     | 0.09                                        | 1.00               |
| GPRS PCS 3 TX slot | 3.1                | 28.0                       | 23.6                 | 26.7                     | 469                     | 0.09                                        | 1.00               |
| GPRS PCS 4 TX slot | 3.1                | 27.0                       | 23.5                 | 26.6                     | 454                     | 0.09                                        | 1.00               |

The averaged power calculated method are shown as below:  
 1 Tx Slot: Averaged power=Maximum Output power + (10lg(1/8))dB, Duty cycle =12.5%  
 2 Tx Slot: Averaged power=Maximum Output power + (10lg(2/8))dB, Duty cycle =25.0%  
 3 Tx Slot: Averaged power=Maximum Output power + (10lg(3/8))dB, Duty cycle =37.5%  
 4 Tx Slot: Averaged power=Maximum Output power + (10lg(4/8))dB, Duty cycle =50.0%  
 Average EIRP Power=Average Power + Antenna Gain  
 Calculated RF Exposure = Average EIRP Power / (4\*Pi\*d<sup>2</sup>)

| Test Mode                  | Antenna Gain (dBi) | Maximum Output Power (dBm) | Maximum EIRP Power (dBm) | Maximum EIRP Power (mW) | Calculated RF Exposure at d = 20cm (mW/cm2) | MPE Limit (mW/cm2) |
|----------------------------|--------------------|----------------------------|--------------------------|-------------------------|---------------------------------------------|--------------------|
| WACDMA 850 HSDPA Subtest-1 | -1.8               | 23.57                      | 21.8                     | 150.3                   | 0.03                                        | 0.55               |
| WACDMA 850 HSDPA Subtest-2 | -1.8               | 23.50                      | 21.7                     | 147.9                   | 0.03                                        | 0.55               |
| WACDMA 850 HSDPA Subtest-3 | -1.8               | 23.35                      | 21.6                     | 142.9                   | 0.03                                        | 0.55               |
| WACDMA 850 HSDPA Subtest-4 | -1.8               | 23.27                      | 21.5                     | 140.3                   | 0.03                                        | 0.55               |
| WCDMA 1900 HSDPA Subtest-1 | 3.5                | 23.57                      | 27.1                     | 509.3                   | 0.10                                        | 1.00               |
| WCDMA 1900 HSDPA Subtest-2 | 3.5                | 23.48                      | 27.0                     | 498.9                   | 0.10                                        | 1.00               |
| WCDMA 1900 HSDPA Subtest-3 | 3.5                | 23.33                      | 26.8                     | 481.9                   | 0.10                                        | 1.00               |
| WCDMA 1900 HSDPA Subtest-4 | 3.5                | 23.27                      | 26.8                     | 475.3                   | 0.09                                        | 1.00               |

This device can pass RF exposure limit.