



# A Test Lab Techno Corp.

Changan Lab : No. 140 -1, Changan Street, Bade City, Taoyuan County, Taiwan R.O.C.  
Tel : 886-3-271-0188 / Fax : 886-3-271-0190



## MPE Report

Test Report No.	: 1409RS13
Applicant	: Quirky, Inc.
Manufacturer	: FLEXComputing (suzhou) Co.Ltd
Product Type	: Wink Relay
Trade Name	: Wink
Model Number	: PRLAY-WH01
Date of Received	: Aug. 15, 2014
Test Period	: Sep. 11, 2014
Date of Issued	: Sep. 12, 2014
Test Specification	: 47 CFR § 2.1091 47 CFR §1.1310 ANSI / IEEE Std.C95.1-1992 H46-2/99-237E CANADA RSS-102 Issue 4 March 2010
Location of Test Lab.	: Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
3. The measurement report has to be written approval of A Test Lab Techno Corp. It may only be reproduced or published in full. This report shall not be reproduced except in full, without the written approval of A Test Lab Techno Corp.
4. This document may be altered or revised by A Test Lab Techno. Corp. personnel only, and shall be noted in the revision section of the document.

Approved By :

Bill Hu  
(Bill Hu)

Tested By :

Sky Chou  
(Sky Chou)



# Contents

1.	Description of Equipment under Test (EUT).....	3
2.	Human Exposure Assessment .....	4
3.	RF Output Power.....	5
4.	Test Result.....	6



## 1. Description of Equipment under Test (EUT)

Applicant	Quirky, Inc.
Applicant Address	606 W. 28th St., Apt. 4FW, New York New York 10001 United States
Manufacturer	FLEXComputing (suzhou) Co.Ltd
Manufacturer Address	No.1 Guanpu Road, Guoxiang Street, Wuzhong District, Suzhou, Jiangsu, China
Product Type	Wink Relay
Trade Name	Wink
Model Number	PRLAY-WH01
IC	11309A-WR001
Frequency Range	2412 - 2462 MHz IEEE 802.11b / IEEE 802.11g 2412 - 2462 MHz IEEE 802.11n (2.4GHz) 20MHz 2405 - 2470 MHz Zigbee 2402 - 2480 MHz Bluetooth v3.0, Bluetooth v4.0 LE
Transmit Power (conducted power)	IEEE 802.11b: 0.033 W / 15.13 dBm IEEE 802.11g: 0.018 W / 12.64 dBm IEEE 802.11n (2.4GHz) 20MHz: 0.019 W / 12.68 dBm Zigbee: 0.009 W / 9.74 dBm Bluetooth v3.0: 0.008 W / 8.99 dBm Bluetooth v4.0 LE: 0.004 W / 6.01 dBm
Antenna Specification	IEEE 802.11b, IEEE 802.11g: 3.4 dBi IEEE 802.11n (2.4GHz) 20MHz: 3.4 dBi Zigbee: 3.07 dBi Bluetooth v3.0, Bluetooth v4.0 LE: 3.4 dBi
Antenna Designation	PCB Antenna
Temperature Range	-30 ~ +70°C
RF Evaluation	0.15 W/m <sup>2</sup>

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 & 47 CFR § 1.1310. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties



## 2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR §1.1310 titled "Radiofrequency radiation exposure limits", generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as "a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. " This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: "IMPORTANT: To meet the FCC's RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna". Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a "mobile device" as defined in section § 2.1091 paragraph (b).

### Exposure evaluation

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{PG}{4\pi R^2}$$

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.



### 3. RF Output Power

Band	Date Rate	CH	Frequency (MHz)	Average Conducted power (dBm)
IEEE 802.11b	1M	Lowest	2412.0	14.42
		Middle	2437.0	14.92
		Highest	2462.0	<b>15.13</b>
IEEE 802.11g	6M	Lowest	2412.0	12.26
		Middle	2437.0	12.34
		Highest	2462.0	<b>12.64</b>
IEEE 802.11n (2.4GHz) 20MHz	6.5M	Lowest	2412.0	12.07
		Middle	2437.0	12.36
		Highest	2462.0	<b>12.68</b>
Zigbee	---	Lowest	2405.0	7.95
		Middle	2440.0	7.97
		Highest	2470.0	<b>9.74</b>
Bluetooth v3.0	1M	Lowest	2402.0	8.65
		Middle	2441.0	<b>8.99</b>
		Highest	2480.0	8.29
Bluetooth v4.0 LE	---	Lowest	2402.0	5.61
		Middle	2440.0	6.01
		Highest	2480.0	<b>5.66</b>



#### 4. Test Result

Band	Data Rate	Frequency (MHz)	Limit (mw)	Distance [R] (cm)	Max tune-up Power (upper limit) [P] (dBm)	ANT Gain (dBi)	Numeric Gain [G] (dBi)	Duty Cycle	[P] x [G] with Duty cycle [TP] (mW)	Power Density [S] (mw)/cm <sup>2</sup>
IEEE 802.11b	1M	2412.0	1.000	20	15.5	3.40	2.19	1	77.70	0.015
		2437.0	1.000	20	15.5	3.40	2.19	1	77.70	0.015
		2462.0	1.000	20	15.5	3.40	2.19	1	77.70	0.015
IEEE 802.11g	6M	2412.0	1.000	20	13.0	3.40	2.19	1	43.70	0.009
		2437.0	1.000	20	13.0	3.40	2.19	1	43.70	0.009
		2462.0	1.000	20	13.0	3.40	2.19	1	43.70	0.009
IEEE 802.11n (2.4GHz) 20MHz	6.5M	2412.0	1.000	20	13.0	3.40	2.19	1	43.70	0.009
		2437.0	1.000	20	13.0	3.40	2.19	1	43.70	0.009
		2462.0	1.000	20	13.0	3.40	2.19	1	43.70	0.009
Zigbee	---	2405.0	1.000	20	9.8	3.07	2.03	1	19.39	0.004
		2440.0	1.000	20	9.8	3.07	2.03	1	19.39	0.004
		2470.0	1.000	20	9.8	3.07	2.03	1	19.39	0.004
Bluetooth v3.0	1M	2402.0	1.000	20	9.0	3.40	2.19	1	17.40	0.003
		2441.0	1.000	20	9.0	3.40	2.19	1	17.40	0.003
		2480.0	1.000	20	9.0	3.40	2.19	1	17.40	0.003
Bluetooth v4.0 LE	---	2402.0	1.000	20	6.5	3.40	2.19	1	9.78	0.002
		2440.0	1.000	20	6.5	3.40	2.19	1	9.78	0.002
		2480.0	1.000	20	6.5	3.40	2.19	1	9.78	0.002