

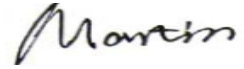
RF EXPOSURE REPORT

FCC Per 47 CFR 2.1093(d)

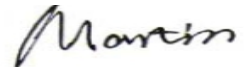
Report Reference No...... : **MWR1407002802**

FCC ID..... : **ZGAGX-7012**

Compiled by
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Date of issue.....: July 09, 2014

Representative Laboratory Name : **Maxwell International Co., Ltd.**

Address.....: Room 509, Hongfa center building, Baoan District, Shenzhen, Guangdong, China

Testing Laboratory Name: **Shenzhen CTL Testing Technology Co., Ltd.**

Address.....: Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen, China

Applicant's name.....: **Gardex electronics company Limited**

Address.....: No.0309 Bldg B, Marina Bay center, Haixiu Rd, Baoan District Center

Test specification :

Standard: **FCC Per 47 CFR 2.1093(d)**

TRF Originator.....: Maxwell International Co., Ltd.

Master TRF.....: Dated 2011-05

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Test item description : MID

Trade Mark: /

Model/Type reference.....: UDI7012

Listed Models: /

Manufacturer: **Gardex electronics company Limited**

Modulation Type: DSSS(CCK,DQPSK,DBPSK),OFDM(64QAM,16QAM,QPSK,BPSK)

Operation Frequency.....: From 2412MHz to 2462MHz

Rating: DC 3.70V

Result.....: **PASS**

RF EXPOSURE REPORT

Test Report No. :	MWR1407002802	July 09, 2014
		Date of issue

Equipment under Test : MID

Model /Type : UDI7012

Listed Models : /

Applicant : **Gardex electronics company Limited**

Address : No.0309 Bldg B,Marina Bay center,Haixiu Rd,Baoan District Center

Manufacturer : **Gardex electronics company Limited**

Address : No.0309 Bldg B,Marina Bay center,Haixiu Rd,Baoan District Center

Test Result :	PASS
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

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1. SUMMARY

1.1. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○ - supplied by the lab

○	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
○	Multimeter	Manufacturer :	/
		Model No. :	/

- AC Adapter
Model: HNB050200U
Input: 100-240V~50/60Hz 0.35A MAX
Output: OUTPUT: 5.0V DC 2A
Power Cable: 60cm
○ Shielded ● Unshielded

1.2. Product Description

The **Gardex electronics company Limited's** Model: UDI7012 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	MID
Model Number	UDI7012
FCC ID	ZGAGX-7012
WLAN	Supported 802.11b/802.11g/802.11n
Antenna Type	Internal
WLAN FCC Operation frequency	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz IEEE 802.11n HT40: 2422MHz—2452MHz
WLAN Modulation	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) IEEE 802.11n HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)
Android Version	Android 4.2.2

1.3. NOTE

1. The EUT is a MID with WiFi fuction,The functions of the EUT listed as below:

	Test Standards	Reference Report
WiFi	FCC Part 15 C 15.247	MWR1407002801
RF Exposure	FCC Part 2 §2.1093	MWR1407002802

2. The frequency bands used in this EUT are listed as follows:

Frequency Band(MHz)	2400-2483.5	5150-5350	5470-5725	5725-5850
802.11b	✓	—	—	—
802.11g	✓	—	—	—
802.11n(20MHz)	✓	—	—	—
802.11n(40MHz)	✓	—	—	—

3. The EUT incorporates a SISO function, physically; the EUT provides one completed transmitter and one completed receiver.

Modulation Mode	TX Function
802.11b	1TX
802.11g	1TX
802.11n (20MHz)	1TX
802.11n (40MHz)	1TX

2. TEST ENVIRONMENT

2.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

2.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 950-1050mbar

2.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTL Testing Technology Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

3. Method of measurement

3.1. Applicable Standard

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §RSS-102, Devices that have a radiating element normally operating at separation distances greater than 20 cm between the user and the device shall undergo an RF exposure evaluation. SAR evaluation may be performed in lieu of an RF exposure evaluation for devices operating below 6 GHz with a separation distance of greater than 20 cm between the user and the device.

According to §1.1310, KDB447498 and §2.1093 RF exposure is required.

OET Bulletin 65 Supplement C [June 2001]: Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields

447498 D01 General RF Exposure Guidance v05r01: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies

3.2. Limit

According to KDB447498 D01 General RF Exposure Guidance v05r01 Section 4.3.1 Standalone SAR test exclusion considerations: “ Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.²² The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander (see 5) of section 4.1). To qualify for SAR test exclusion, the test separation distances applied must be fully explained and justified by the operating configurations and exposure conditions of the transmitter and applicable host platform requirements, typically in the SAR measurement or SAR analysis report, according to the required published RF exposure KDB procedures. When no other RF exposure testing or reporting is required, a statement of justification and compliance must be included in the equipment approval, in lieu of the SAR report, to qualify for the SAR test exclusion. When required, the device specific conditions described in the other published RF exposure KDB procedures must be satisfied before applying these SAR test exclusion provisions; for example, handheld PTT two-way radios, handsets, laptops & tablets etc.²³ “

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR,}^{24} \text{ where}$$

- $f_{(\text{GHz})}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

According to KDB447498 D01 General RF Exposure Guidance v05r01 Appendix A: SAR Test Exclusion Thresholds for 100 MHz-6 GHz and ≤ 50 mm, Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	

3.3. RF Exposure

TEST RESULTS

From the EUT RF average output power and power drift from Tune-up Procedure provide by manufacturer as following states:

Manufacturing tolerance

WLAN

802.11b (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8.70	8.70	8.70
Tolerance $\pm$ (dB)	1	1	1
802.11g (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8.70	8.70	8.70
Tolerance $\pm$ (dB)	1	1	1
802.11n(20MHz) (Peak)			
Channel	Channel 1	Channel 6	Channel 11
Target (dBm)	8.70	8.70	8.70
Tolerance $\pm$ (dB)	1	1	1
802.11n(40MHz) (Peak)			
Channel	Channel 3	Channel 6	Channel 9
Target (dBm)	8.70	8.70	8.70
Tolerance $\pm$ (dB)	1	1	1

For 802.11b @ WLAN

Test Frequency (MHz)	Output Power (dBm)	Output Power including Power Drift (dBm)	Output Power including Power Drift (mW)	Evaluated SAR test exclusion	SAR test exclusion thresholds	Verdict
2412	9.12	9.70	9.33	2.9	3.0	PASS
2437	9.56	9.70	9.33	2.9	3.0	PASS
2462	9.41	9.70	9.33	2.9	3.0	PASS

For 802.11g @ WLAN

Test Frequency (MHz)	Output Power (dBm)	Output Power including Power Drift (dBm)	Output Power including Power Drift (mW)	Evaluated SAR test exclusion	SAR test exclusion thresholds	Verdict
2412	9.56	9.70	9.33	2.9	3.0	PASS
2437	9.63	9.70	9.33	2.9	3.0	PASS
2462	9.24	9.70	9.33	2.9	3.0	PASS

For 802.11n (20MHz) @ WLAN

Test Frequency (MHz)	Output Power (dBm)	Output Power including Power Drift (dBm)	Output Power including Power Drift (mW)	Evaluated SAR test exclusion	SAR test exclusion thresholds	Verdict
2412	9.08	9.70	9.33	2.9	3.0	PASS
2437	9.66	9.70	9.33	2.9	3.0	PASS
2462	9.32	9.70	9.33	2.9	3.0	PASS

For 802.11n (40MHz) @ WLAN

Test Frequency (MHz)	Output Power (dBm)	Output Power including Power Drift (dBm)	Output Power including Power Drift (mW)	Evaluated SAR test exclusion	SAR test exclusion thresholds	Verdict
2422	9.34	9.70	9.33	2.9	3.0	PASS
2437	9.53	9.70	9.33	2.9	3.0	PASS
2452	9.47	9.70	9.33	2.9	3.0	PASS

4. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v05r01.

.....End of Report.....