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### MPE TEST REPORT

### FCC Per 47 CFR 2.1091(b)

Report Reference No.....: CTL1406231413-WM  
 FCC ID.....: 2ACSIDWA-N223SERIES  
 Compiled by  
 ( position+printed name+signature)...: File administrators Jennifer NI *Jennifer NI*  
 Name of the organization performing the tests  
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 Approved by  
 ( position+printed name+signature)...: Manager Tracy Qi *Tracy Qi*  
 Date of issue.....: July 15, 2014

Test Firm.....: **Shenzhen CTL Testing Technology Co., Ltd.**  
 Address.....: Floor 1-A, Baisha Technology Park, No.3011, Shahehexi Road, Nanshan District, Shenzhen, China 518055

Applicant's name.....: **Shenzhen Yingdakang Technology Co., LTD**  
 Address.....: Room 8004, B/51, 2<sup>nd</sup> Dist., Shangtang Songzi Park, Minzhi, Longhua, Shenzhen, China

Test specification:  
 Standard.....: **FCC Per 47 CFR 2.1091(b)**  
 TRF Originator.....: Shenzhen CTL Testing Technology Co., Ltd.  
 Master TRF.....: Dated 2011-01

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Test item description .....: 802.11b/g/n wireless router  
 Trade Mark .....: N/A  
 Model/Type reference.....: DWA-N223SERIES  
 Listed Models .....: DWA-N115SERIES  
 Power Supply.....: DC 12V from adapter input AC120V/60Hz  
 Result.....: **Positive**

# Test Report

<b>Test Report No. :</b> CTL1406231413-WM	July 15, 2014
	Date of issue

Equipment under Test : 802.11b/g/n wireless router

Model /Type : DWA-N223SERIES

Listed Modes : DWA-N115SERIES

Difference Description : The models have same electrical, PCB and BOM, only the model's name and color are different for marketing requirements.

**Applicant** : **Shenzhen Yingdakang Technology Co., LTD**

Address : Room 8004, B/51, 2<sup>nd</sup> Dist., Shangtang Songzi Park, Minzhi, Longhua, Shenzhen, China

**Manufacturer** : **Shenzhen Yingdakang Technology Co., LTD**

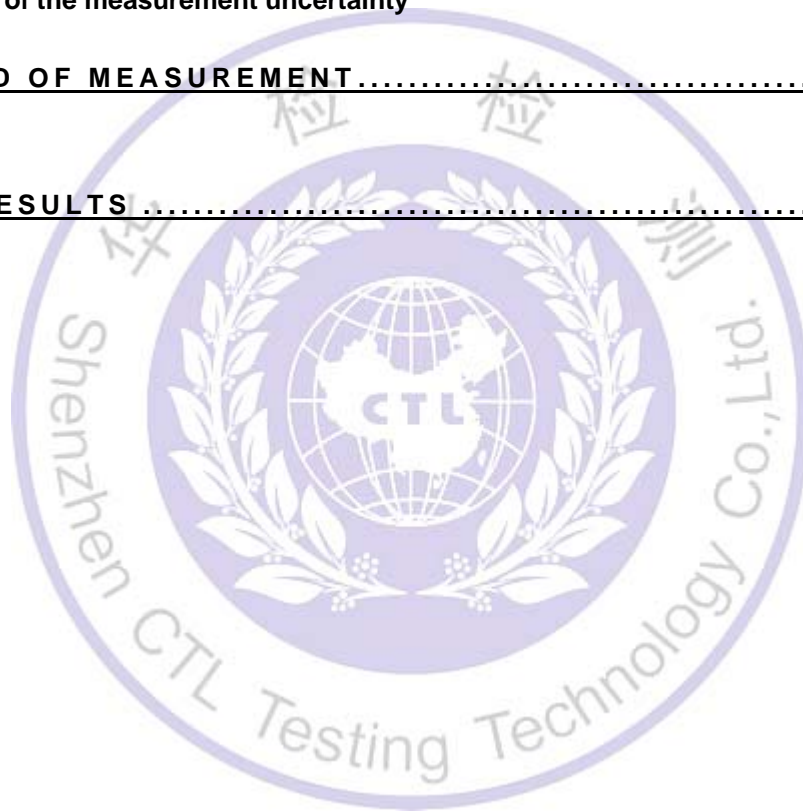
Address : Room 8004, B/51, 2<sup>nd</sup> Dist., Shangtang Songzi Park, Minzhi, Longhua, Shenzhen, China

<b>Test Result</b> according to the standards on page 4:	<b>Positive</b>
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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
- o - supplied by the lab

## 1.2. Equipment Under Test

### Power supply system utilised

Power supply voltage :  120V / 60 Hz  115V / 60Hz  
 12 V DC  24 V DC  
 Other (specified in blank below)

## 1.3. Description of the test mode

IEEE 802.11b/g/n: Thirteen channels are provided to the EUT, but only eleventh channels used for USA.

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432		
6	2437		
7	2442		

For 20MHz bandwidth systems, use channel 1~11.

For 40MHz bandwidth systems, use channel 3~9.

## 1.4. NOTE

The EUT is an 802.11b/g/n wireless router, The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN 802.11b/g, 802.11n	FCC Part 15 Subpart C (Section15.247)	CTL1406231413-WF
WLAN 802.11b/g, 802.11n	FCC Per 47 CFR 2.1091(b)	CTL1406231413-WM

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)	√	-	-	-

Modulation Mode	TX Function
802.11b	1 TX
802.11g	1 TX
802.11n(20MHz)	2 TX
802.11n(40MHz)	2 TX

## **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 District, Shenzhen, China 518055

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements

### **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 CTL laboratory is reported:

<b>Test</b>	<b>Range</b>	<b>Measurement Uncertainty</b>	<b>Notes</b>
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~26.5GHz	4.32dB	(1)
Conducted Disturbance	0.15~30MHz	3.22dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

### 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 §1.1310 and §2.1091 RF exposure is calculated.

#### 3.2. Limit

Limits for Maximum Permissible Exposure (MPE)/Controlled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
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 – 100,000	/	/	5	6

Limits for Maximum Permissible Exposure (MPE)/Uncontrolled Exposure

Frequency Range(MHz)	Electric Field Strength(V/m)	Magnetic Field Strength(A/m)	Power Density (mW/cm <sup>2</sup> )	Averaging Time (minute)
Limits for Occupational/Controlled Exposure				
0.3 – 3.0	614	1.63	(100) *	30
3.0 – 30	824/f	2.19/f	(180/f)*	30
30 – 300	27.5	0.073	0.2	30
300 – 1500	/	/	f/1500	30
1500 – 100,000	/	/	1.0	30

F=frequency in MHz

\*=Plane-wave equivalent power density

#### 3.3. MPE Calculation Method

Predication of MPE limit at a given distance

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

$$S=PG/4\pi R^2$$

Where: S=power density

P=power input to 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

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna is 2.0 dBi, the RF power density can be obtained.

## 4. TEST RESULTS

### For 802.11b

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (W/m <sup>2</sup> )	Power Density At 20 cm (W/m <sup>2</sup> )	Test Results
2412	20.00	15.72	37.3250	1.5849	10	0.1177	Pass
2437	20.00	15.77	37.7572	1.5849	10	0.1191	Pass
2462	20.00	15.55	35.8922	1.5849	10	0.1132	Pass

### For 802.11 g

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (W/m <sup>2</sup> )	Power Density At 20 cm (W/m <sup>2</sup> )	Test Results
2412	20.00	14.90	30.9030	1.5849	10	0.0974	Pass
2437	20.00	14.80	30.1995	1.5849	10	0.0952	Pass
2462	20.00	14.75	29.8538	1.5849	10	0.0941	Pass

### For 802.11 n (20MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)			Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (W/m <sup>2</sup> )	Power Density At 20 cm (W/m <sup>2</sup> )	Test Results
		Antenna 1	Antenna 2	Total					
2412	20.00	14.64	14.95	17.81	60.3949	1.5849	10	0.1904	Pass
2437	20.00	14.14	14.24	17.20	52.4807	1.5849	10	0.1655	Pass
2462	20.00	14.24	14.25	17.26	53.2108	1.5849	10	0.1678	Pass

### For 802.11 n (40MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)			Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (W/m <sup>2</sup> )	Power Density At 20 cm (W/m <sup>2</sup> )	Test Results
		Antenna 1	Antenna 2	Total					
2422	20.00	14.24	14.46	17.36	54.4503	1.5849	10	0.1717	Pass
2437	20.00	14.60	14.87	17.75	59.5662	1.5849	10	0.1878	Pass
2452	20.00	14.14	14.32	17.24	52.9663	1.5849	10	0.1670	Pass

**Note:**

The detector type for output power: Peak

## 4. Conclusion

The measurement results comply with the FCC Limit per 47 CFR 2.1091 (b) for the controlled RF Exposure.

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