



### MPE TEST REPORT

#### FCC PART 2.1091(b)

**Report Reference No.....: CTL11068338-S-WM**

Compiled by  
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Date of issue.....: June 11, 2011

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

Address.....: Zone B, 4/F, Block 20, Guangqian Industrial Park, Longzhu Road,Nanshan,Shenzhen 518055 China.

**Test Firm.....: Bontek Compliance Testing Laboratory Ltd**

Address.....: 1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

**Applicant's name .....: SHENZHEN MTN ELECTRONICS CO.,LTD.**

Address.....: MTN Industrial Park, No. 3 Fuhua Road, Pingxi Neighborhood, Pingdi Town , Longgang District, Shenzhen

#### Test specification:

Standard .....: **FCC Part 15C**

**ANSI C63.4: 2003**

TRF Originator.....: Shenzhen CTL Electromagnetic Technology Co., Ltd.

Master TRF.....: Dated 2011-01

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**Test item description .....: Wireless AP**

**FCC ID.....: ZBXMT0-WA718N-A1**

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

Modulation mode: .....: DSSS, OFDM

Trade Mark .....: /

Model/Type reference.....: MTO-WA718N-A1

Power Supply.....: DC 12V from adapter

Antenna Type.....: N-SMA connector

Result.....: **Positive**

## TEST REPORT

<b>Test Report No. :</b> CTL11068338-S-WM	June 14, 2011 Date of issue
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Equipment under Test : Wireless AP

Model /Type : MTO-WA718N-A1

Listed Models : /

**Applicant** : SHENZHEN MTN ELECTRONICS CO.,LTD.

Address : MTN Industrial Park, No. 3 Fuhua Road, Pingxi  
Neighborhood, Pingdi Town , Longgang District, Shenzhen

**Manufacturer** : SHENZHEN MTN ELECTRONICS CO.,LTD.

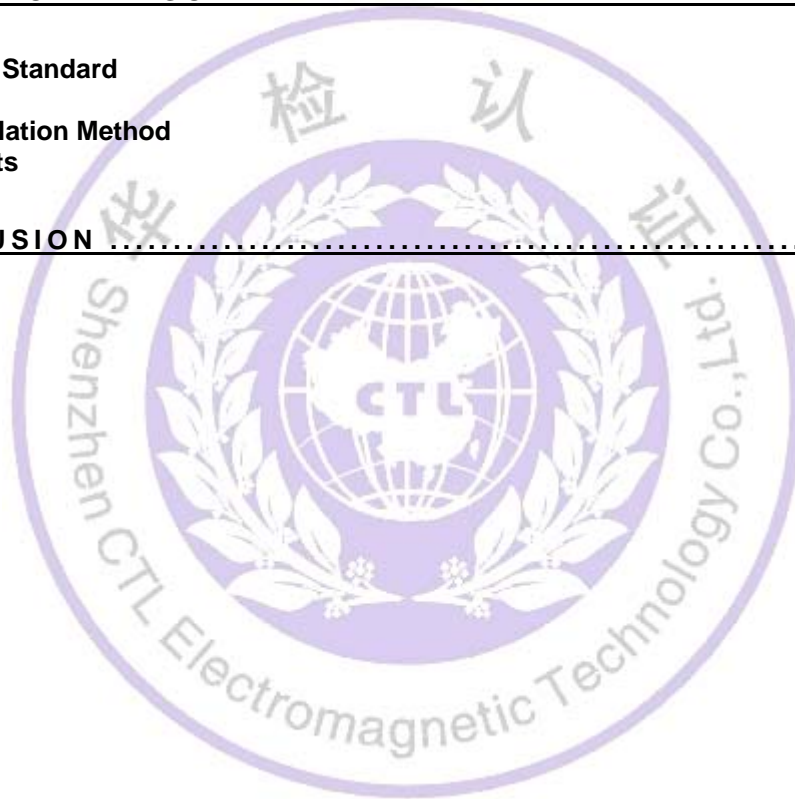
Address : MTN Industrial Park, No. 3 Fuhua Road, Pingxi  
Neighborhood, Pingdi Town , Longgang District, Shenzhen

<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

○ - supplied by the lab

○ Power Cable Length (m) : /

Shield : /

Detachable : /

○ Multimeter Manufacturer : /

Model No. : /

● AC Adapter

MODEL: GP301E-020-015

INPUT: 100-240V ~ 50/60Hz 0.3A

OUTPUT: 12.0V  $\equiv$  0.8A

Power Cable: 150cm

◇ Shield      ◆ Unshield

## 1.2. Note

1. The EUT is an 802.11b/g/n Home Gateway Wireless AP, 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)	CTL11068338-S-WF
WLAN 802.11b/g, 802.11n	FCC Part 2.1091(b)	CTL11068338-S-WM

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 two completed transmitter and two completed receivers.

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**

Bontek Compliance Testing Laboratory Ltd  
1/F, Block East H-3, OCT Eastern Ind. Zone, Qiaocheng East Road, Nanshan, Shenzhen, China

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. Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

#### **FCC-Registration No.: 338263**

Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 338263, March 24, 2008.

#### **IC Registration No.: 7631A**

The 3m alternate test site of Bontek Compliance Testing Laboratory Ltd EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 7631A on March, 2008.

### **2.3. Environmental conditions**

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

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

### **2.4. 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 Bontek Compliance Testing Laboratory 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 Bontek laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(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=20cm, as well as the maximum gain of the used antenna is 2dBi, the RF power density can be obtained.

### 3.4. Test Results

#### For 802.11 b

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2412	20.00	16.21	41.7830	1.5849	1.0000	0.01318106
2437	20.00	16.18	41.4954	1.5849	1.0000	0.01309032
2462	20.00	16.35	43.1519	1.5849	1.0000	0.01361289

#### For 802.11 g

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2412	20.00	15.03	31.8420	1.5849	1.0000	0.01004501
2437	20.00	15.16	32.8095	1.5849	1.0000	0.01035024
2462	20.00	15.22	33.2660	1.5849	1.0000	0.01049422

#### For 802.11 n (20MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2412	20.00	14.56	28.5759	1.5849	1.0000	0.00901468
2437	20.00	14.41	27.6058	1.5849	1.0000	0.00870864
2462	20.00	14.63	29.0402	1.5849	1.0000	0.00916116

#### For 802.11 n (40MHz)

Test Frequency (MHz)	Minimum Separation Distance (cm)	Output Power (dBm)	Output Power (mW)	Antenna Gain (Nemeric)	Power Density Limit (mW/cm <sup>2</sup> )	Power Density At 20 cm (mW/cm <sup>2</sup> )
2422	20.00	12.45	17.5792	1.5849	1.0000	0.00554562
2437	20.00	12.36	17.2187	1.5849	1.0000	0.00543188
2452	20.00	12.58	18.1134	1.5849	1.0000	0.00571413

## 4. CONCLUSION

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

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