



**EN 50371: 2002**

**TEST REPORT**

**For**

**108M Wireless Router**

**Model: MR0-WR641G / MR0-WR642G**

**Trade Name: TP-LINK**

*Prepared for*

**TP-LINK TECHNOLOGIES CO., LTD.**

**BUILDING 7, SECTION 2, HONGHUALING INDUSTRIAL PARK, XILI,  
NANSHAN DISTRICT, SHENZHEN, P. R. C.**

*Prepared by*

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# 1. TEST RESULT CERTIFICATION

**Applicant:** TP-LINK TECHNOLOGIES CO., LTD.  
 BUILDING 7, SECTION 2, HONGHUALING  
 INDUSTRIAL PARK, XILI, NANSHAN DISTRICT,  
 SHENZHEN, P. R. C.

**Equipment Under Test:** 108M Wireless Router

**Trade Name:** TP-LINK

**Model:** MR0-WR641G / MR0-WR642G

**Date of Test:** November 15-December 06, 2006

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
EN 50371: 2002	No non-compliance noted

The above equipment was tested by Compliance Certification Services Inc. for compliance with the requirements set forth in EN 50371: 2002. 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.

Approved by:

Tested By: Henry Ding

\_\_\_\_\_  
**Clinton Kao/ Manager**  
**COMPLIANCE CERTIFICATION**  
**SERVICES (SHENZHEN) INC.**

Reviewed By: \_\_\_\_\_  
**Eric Wong / Assistant manager**  
**COMPLIANCE CERTIFICATION**  
**SERVICES (SHENZHEN) INC.**



## 2. EUT DESCRIPTION

<b>Product</b>	108M Wireless Router
<b>Trade Name</b>	TP-LINK
<b>Model Number</b>	MR0-WR641G / MR0-WR642G
<b>Model Difference</b>	MR0-WR641G are fixed antenna, MR0-WR642G are detachable antenna. Others are the same each other.
<b>EUT Power Rating</b>	Powered by the adapter
<b>Frequency Range</b>	IEEE 802.11b: 2400 ~ 2483.5 MHz IEEE 802.11g: 2400 ~ 2483.5 MHz
<b>Modulation Technique</b>	IEEE 802.11b: DSSS (CCK; DQPSK; DBPSK) IEEE 802.11g: OFDM
<b>Transmit Power</b>	802.11b mode: 18.76dBm 802.11g mode: 19.50 dBm
<b>Number of Channels</b>	IEEE 802.11b: 13 CH IEEE 802.11g: 13 CH
<b>Air Data Rate</b>	802.11b: 11Mbps(CCK) with fall back rates of 5.5, 2, and 1Mbps 802.11g: 54Mbps with fall back rates of 54/48/36/24/18/12/9/6 Mbps (OFDM)
<b>Antenna Specification</b>	RF Antenna Assembly Gain: 5 dBi (Max)
<b>Temperature Range</b>	0 ~ +55°C

*Note: for more details, please refer to the User's manual of the EUT.*



### **3. TEST METHODOLOGY**

#### **3.1 GENERAL DESCRIPTION OF APPLIED STANDARDS**

According to its specifications, the EUT must comply with the requirements of the following standards:

EN 50371: 2002 – Generic standard to demonstrate the compliance of low power electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (10MHz – 300GHz) – General public

#### **3.2 DESCRIPTION OF TEST MODES**

The EUT has been tested under its typical operating condition.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.



## **4. FACILITIES AND ACCREDITATIONS**

### **4.1 FACILITIES**

All measurement facilities used to collect the measurement data are located at

No. 5, Jinao industrial park, No.35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China

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

### **4.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### **4.3 LABORATORY ACCREDITATIONS AND LISTINGS**

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200577-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.



## 5. EN 50371 REQUIREMENT

### 5.1 HUMAN EXPOSURE TO THE ELECTROMAGNETIC FIELDS

#### LIMIT

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 levels in excess of the following limits.

#### **For frequency range 10 MHz to 10 GHz**

The basic restriction at frequencies between 10 MHz and 100 GHz is on localized SAR in the head. Any device with output power below 20 mW cannot produce an exposure exceeding this restriction under the most pessimistic exposure conditions.

The basic restriction is 2 W/kg so any unit which supplies less than 20 mW (=2/100W) from its antenna port, averaged over 6 minutes, will meet the basic restriction.

#### **For frequency range 10 GHz to 300 GHz**

The most conservative assumption is that all the transmitted power is absorbed within the specified area, therefore any device which supplies less than 20 mW will meet the basic restriction. The average time is equal to  $68/f^{1.05}$  minutes (where f is in GHz)

In the frequency range 10 GHz to 300 GHz, the basic restriction is  $10 \text{ Wm}^{-2}$  averaged over any  $20 \text{ cm}^2$  of exposed area with a spatial maximum of  $200 \text{ Wm}^{-2}$  averaged over  $1 \text{ cm}^2$

#### **Criteria A: All electromagnetic fields**

If the average power emitted by apparatus operating in the frequency range 10 MHz – 300GHz is less than or equal to 20 mW and the transmitting peak power is less than 20W then the apparatus is deemed to comply with the basic restrictions without testing. Averaging time is 6 minutes in the frequency range 10 MHz to 10 GHz. The average time is equal to  $68/f^{1.05}$  minutes (where f is in GHz) in the frequency range 10 GHz to 300 GHz.

If the total supply power or the input power to the circuitry producing the greatest emissions in the device is less than or equal to 20 mW then it is assumed that the emitted power is less than 20 mW.

#### **Criteria B: Pulse modulated electromagnetic fields with pulse duration less than 30 microseconds**

For pulses of duration less than 30 microseconds at frequencies between 300 MHz and 10 GHz, there is also a basic restriction on Specific energy absorption (SA). This is  $2 \text{ mJ kg}^{-1}$  in any 10g of tissue in the head. For most pulses, the SAR restriction will be more stringent, but for pulses with a repetition frequency of less than 100 Hz, the SA restriction will predominate. For devices producing pulses with repetition rates below 100 Hz, the average power should be less than  $20 \times \text{prf mW}$  (pulse repetition frequency, prf in Hz).

**TEST RESULTS***No non-compliance noted*

Since average output power at wireless is **19.50dBm (89.13mW)** which exceed the exempt condition, 20mW specified in EN50371. RF exposure assessment has been performed below to prove that this unit will not generate the harmful EM emission above the reference level as specified in EC Council Recommendation (1999/519/EC).

**5.2 HUMAN EXPOSURE ASSESSMENT**

<i>EUT parameter (data from the separate report)</i>	
Max average output power in Watt (TP)	19.50dBm (0.08913W)
Antenna gain (G)	5.00 dBi (Numeric gain: 3.16)
Minimum distance in meter (D) (from transmitting structure to the human body)	1.5cm

<i>Exposure evaluation</i>	
<p><i>Given</i></p> $E = \frac{\sqrt{30 \times G \times TP}}{D}$ <p>yield <math>E = \frac{\sqrt{30 \times 3.16 \times 0.089}}{1.5} = 1.94V/m</math></p>	<p><i>Where</i></p> <p><i>G: numerical gain of transmitting antenna;</i></p> <p><i>TP: Transmitted power in watt;</i></p> <p><i>D: distance from the transmitting antenna in meter</i></p>
<p><b>Conclusion:</b></p> <p>→ <math>E=1.94 V/m</math> is significant lower than the 61V/m as required in Annex III table 2 of EC Council Recommendation (1999/519/EC). This proves that the unit complies with the EN50371 for RF exposure requirement.</p>	