

# RF Exposure Evaluation Declaration

Product Name : 2.4GHz 300Mbps 9dBi Outdoor CPE

Model No. : CPE210

FCC ID : TE7CPE210V2

Applicant : TP-Link Technologies Co.,Ltd.

Address : Building 24(floors1,3,4,5) and 28(floors1-4) Central  
Science and Technology Park, Shennan Rd, Nanshan,  
Shenzhen, China

Date of Receipt : Oct. 09, 2016

Test Date : Oct. 09, 2016~ Oct. 31, 2016

Issued Date : Nov. 04, 2016

Report No. : 16A2003R-RF- US-P20V01

Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by TAF, CNAS or any agency of the government.

The test report shall not be reproduced without the written approval of Quietek Corporation.

# Test Report Certification

Issued Date : Nov. 04, 2016

Report No. : 16A2003R-RF-US-P20V01



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Applicant : TP-Link Technologies Co.,Ltd.  
Address : Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China  
Manufacturer : TP-Link Technologies Co.,Ltd.  
Address : Building 24(floors1,3,4,5) and 28(floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China  
Model No. : CPE210  
FCC ID : TE7CPE210V2  
EUT Voltage : POE(24V)  
Applicable Standard : KDB 447498D01V06  
FCC Part1.1310(b)  
Test Result : Complied  
Performed Location : Quietek Corporation - Suzhou EMC Laboratory  
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China  
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098  
FCC Registration Number: 800392

Documented By : Kathy Feng  
(Adm. Specialist: Kathy Feng )

Reviewed By : Frank He  
(Senior Engineer: Frank He )

Approved By : Harry Zhao  
(Engineering Manager: Harry Zhao )

## Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

<b>Taiwan R.O.C.</b>	<b>:</b>	<b>BSMI, NCC, TAF</b>
<b>USA</b>	<b>:</b>	<b>FCC</b>
<b>Japan</b>	<b>:</b>	<b>VCCI</b>
<b>China</b>	<b>:</b>	<b>CNAS</b>

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/english/about/certificates.aspx?bval=5>  
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : [http://www.quietek.com/index\\_en.aspx](http://www.quietek.com/index_en.aspx)

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

### **HsinChu Testing Laboratory :**

No.75-2, 3rd Lin, Wangye Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.  
TEL:+886-3-592-8858 / FAX:+886-3-592-8859      E-Mail : [service@quietek.com](mailto:service@quietek.com)

### **LinKou Testing Laboratory :**

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.  
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789      E-Mail : [service@quietek.com](mailto:service@quietek.com)

### **Suzhou Testing Laboratory :**

No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China  
TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098      E-Mail : [service@quietek.com](mailto:service@quietek.com)

### History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
16A2003R-RF-US-P20V01	V1.0	Initial Issued Report	Nov. 04, 2016

## 1. RF Exposure Evaluation

### 1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

#### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
<b>(A) Limits for Occupational/ Control Exposures</b>				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
<b>(B) Limits for General Population/ Uncontrolled Exposures</b>				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

### 1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

### 1.3. Test Result of RF Exposure Evaluation

Product	:	2.4GHz 300Mbps 9dBi Outdoor CPE
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

● Antenna Gain:

Antenna manufacturer	TP-Link		
Antenna Delivery	<input type="checkbox"/> 1*TX+1*RX	<input checked="" type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX
Antenna technology	<input type="checkbox"/> SISO		
	<input checked="" type="checkbox"/> MIMO	<input type="checkbox"/> Basic	
		<input type="checkbox"/> Sectorized antenna systems	
		<input checked="" type="checkbox"/> Cross-polarized antennas	
		<input type="checkbox"/> Unequal antenna gains, with equal transmit powers	
		<input type="checkbox"/> Spatial Multiplexing	
		<input type="checkbox"/> CDD	
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole	
		<input type="checkbox"/> PIFA	
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PCB	
		<input type="checkbox"/> Ceramic Chip Antenna	
		<input type="checkbox"/> Metal plate type F antenna	
		<input checked="" type="checkbox"/> Cross-polarize Antenna	
Antenna Gain #0	9dBi		
Antenna Gain #1	9dBi		
Antenna Technology	Directional Gain (dBi)		
		For Power	For PSD
<input checked="" type="checkbox"/> Cross-polarize Antenna		9	9

- Output Power into Antenna & RF Exposure Evaluation Distance:

Test Mode	Frequency Band (MHz)	Maximum Output Power to Antenna (dBm)	Directional Gain (dBi)	Power Density at R = 22 cm (mW/cm <sup>2</sup> )	Limit of Power Density S(mW/cm <sup>2</sup> )
802.11b/g/n(20MHz)	2412 ~ 2462	28.81	9	0.993	1.0
802.11n(40MHz)	2422 ~ 2422	24.65	9	0.381	1.0

Note: The power density is 0.993mW/cm<sup>2</sup> for 2.4GHz 300Mbps 9dBi Outdoor CPE without any other radio equipment. And the safety distance is 22cm without any other radio equipment.

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