CE MPE TEST REPOR

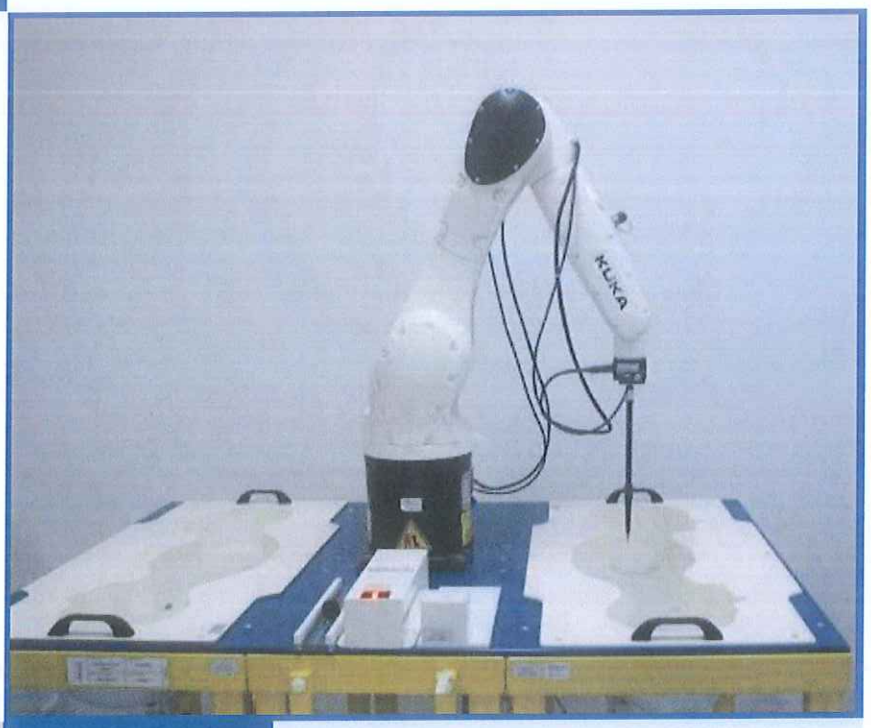
ISSUED BY
Shenzhen BALUN Technology Co., Ltd.

FOR

AC1200 Wireless Dual Band Router

ISSUED TO
TP-Link Technologies Co., Ltd.

Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China



Tested by: Zong Liyao
Zong Liyao
(Engineer)
Date Jul. 28, 2017

Approved by:
Wei Yanquan
(Chief Engineer)
Date Jul. 28, 2017

Report No.:	BL-SZ1760077-701
EUT Name:	AC1200 Wireless Dual Band Router
Model Name:	Archer C50
Brand Name:	tp-link
Test Standard:	EN 50385: 2002
Test Conclusion:	Pass
Test Date:	Jul. 03, 2017 ~ Jul. 10, 2017
Date of Issue:	Jul. 28, 2017

Block B, 1st FL,Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong, P. R. China 518055
TEL: +86-755-66850100, FAX: +86-755-61824271
Email: info@baluntek.com
www.baluntek.com

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Jul. 20, 2017	Initial Issue
Rev. 01	Jul. 28, 2017	Added transmission simultaneous evaluation for 2.4G WLAN and 5G WLAN in page 9

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1 GENERAL INFORMATION

1.1 Identification of the Testing Laboratory

Company Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100
Fax Number	+86 755 6182 4271

1.2 Identification of the Responsible Testing Location

Test Location	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1st FL, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 11524A-1. The laboratory has been listed by US Federal Communications Commission to perform electromagnetic emission measurements. The recognition numbers of test site are 832625. The laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L6791.
Description	All measurement facilities used to collect the measurement data are located at Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055

1.3 Test Environment Condition

Ambient Temperature	21 to 23 ℃
Ambient Relative Humidity	40 to 50%
Ambient Pressure	100 to 102 KPa

1.4 Announce

(1) The test report reference to the report template version v1.2.

(2) The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.

(3) The test report is invalid if there is any evidence and/or falsification.

(4) The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.

(5) This document may not be altered or revised in any way unless done so by BALUN and all revisions are duly noted in the revisions section.

(6) Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.2 Manufacturer Information

Manufacturer	TP-Link Technologies Co., Ltd.
Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Shennan Rd, Nanshan, Shenzhen, China

2.3 Factory Information

Factory	N/A
Address	N/A

2.4 General Description for Equipment under Test (EUT)

EUT Name	AC1200 Wireless Dual Band Router
EUT Model Name Under Test	Archer C50
Series Model Name	N/A
Description of Model Name Differentiation	N/A
Hardware Version	N/A
Software Version	N/A
Dimensions (Approx)	N/A
Weight (Approx)	N/A
Network and Wireless connectivity	WIFI 802.11a, 802.11b, 802.11g, 802.11n(HT20/40) and 802.11ac

2.5 Ancillary Equipment

Ancillary Equipment 1	Adapter 1	
	Brand Name	TP-Link
	Model No.	T090085-2C1 (EU) Note
	Serial No.	N/A
	Rated Input	100-240 V~, 300 mA, 50/60 Hz
	Rated Output	9 V⎓, 850 mA
Ancillary Equipment 2	Adapter 2	
	Brand Name	TP-Link
	Model No.	T090085-2D1(UK) Note
	Serial No.	N/A
	Rated Input	100-240 V~, 300 mA, 50/60 Hz
	Rated Output	9 V⎓, 850 mA
Ancillary Equipment 3	Adapter 3	
	Brand Name	TP-Link
	Model No.	T090085-2E1(AU) Note
	Serial No.	N/A
	Rated Input	100-240 V~, 300 mA, 50/60 Hz
	Rated Output	9 V⎓, 850 mA
Note: The adapter are same with electrical parameters and internal circuit structure, only differ in model name and adapter plug, T090085-2C1 (EU Plug) as the main for tested in this report.		

2.6 Technical Information

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode		2.4G WLAN, 5G WLAN
Frequency Range		2.4G WLAN: 2400MHz ~ 2483.5MHz 5G WLAN: 5150MHz ~ 5250MHz
Antenna Type		Dipole Antenna
2.4G WLAN Antenna Gain	Antenna 0 (ANT 0)	1.8 dBi
	Antenna 1 (ANT 1)	1.8 dBi
5G WLAN Antenna Gain	Antenna 0 (ANT 0)	2.74 dBi
	Antenna 1 (ANT 1)	2.99 dBi
Exposure Category		General Population/Uncontrolled Exposure
EUT Stage		Fixed Device

3 STANDARD INFORMATION

3.1 Test Standard

No.	Identity	Document Title
1	EN 50385: 2002	Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz) - General public

4 DEVICE CATEGORY AND LEVELS LIMITS

The field calculation does not take into account the antenna size, which is assumed to be a point source. An ideal isotropic antenna is used as a reference to compare the performance of practical antennas: P watts is radiated, from a point, uniformly over the surface of sphere of radiusr. The POINTING VECTOR gives the power density:

Assumed use distance from EUT to Human, **20 cm** separation distance warning is required. In this section, the power density at 20 cm location is calculated to examine if it is lower than the limit.

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density

P = output power (W)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Separation distance between radiator and human body (m)

4.1 Reference Levels Limits

According to Council Recommendation 99/519/EC Annex III.

Reference levels limits for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz)

Frequency Range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Power Density (S)(W/m^2)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2\times10^4/f^2$	$4\times10^4/f^2$	-
8-25 Hz	10000	4000/f	5000/f	-
0.025-0.8 kHz	250/f	4/f	5/f	-
0.8-3 kHz	250/f	5	6.25	-
3-150 kHz	87	5	6.25	-
0.15-1 MHz	87	0.73/f	0.92/f	-
1-10 MHz	$87/f^{1/2}$	0.73/f	0.92/f	-
10-400 MHz	28	0.073	0.095	2
400-2000 MHz	$1.375\ f^{1/2}$	$0.0037\ f^{1/2}$	$0.0046\ f^{1/2}$	f/200
2-300 GHz	61	0.16	0.2	10

5 MPE ASSESSMENT

5.1 Output Power

2.4G WLAN				
Mode	80.211b	80.211g	80.211n-20	80.211n-40
EIRP (dBm)	18.20	19.90	19.80	19.90
5G WLAN				
Mode	802.11a	802.11ac(20)	802.11ac(40)	802.11ac(80)
EIRP (dBm)	20.70	20.70	22.60	**22.60**

Note:

1. This report listed the worst case EIRP power value, please refer to RF test report for more details.
2. All the configuration were tested, but only the Antenna 0+ Antenna 1 was shown in this report.

5.2 Assessment Result

Mode	Max. EIRP (dBm)	Antenna Gain(dB)		Distance (cm)	Power Density (W/m²)	Limit of Power Density (W/m²)
		ANT0	ANT1			
2.4G WLAN	19.90	1.80	1.80	20	0.194	10
5G WLAN	22.60	2.74	2.99	20	0.362	10

Collocated Power Density Calculation

Evolution mode	Frequency(MHz)	Power Density/Limit	Σ(Power Density / Limit) of WIFI 2.4GHz+WIFI 5.3GHz	Verdict
2.4G WIFI	2412MHz ~ 2462MHz	0.0194	0.056	Pass
5.3G WIFI	5150MHz ~ 5350MHz	0.0362		Pass

Note:

1. Σ(Power Density / Limit): This is a summation of [(power density for each transmitter/ antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WLAN 2.4GHz+WLAN 5GHz.
2. Both of the 2.4GHz/5GHz can transmit simultaneously, the formula of calculated the Power Density is
   CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1
   CPD = Calculation power density
   LPD = Limit of power density
3. The worst-case situation is 0.056, which is less than “1”. This confirmed that the device comply with 1999-519-EC Power Density limit.
4. The AC1200 Wireless Dual Band Router work frequency range used is 2400 MHz ~ 2483.5 MHz and 5150 MHz~ 5350 MHz the result close to the limit by the above formula so, we select worst case power to calculate the exclusion power threshold.

5.3 Conclusion

This EUT is deemed to comply with the reference level limits by Council Recommendation 99/519/EC, therefore the basic restrictions are compliant with human exposure limits.

--END OF REPORT--