RF EXPOSURE REPORT

REPORT NO.:	SA140626C16A
MODEL NO.:	C9
FCC ID:	TE7C9
RECEIVED:	Sep. 03, 2014
TESTED:	Sep. 18, 2014
ISSUED:	Oct. 09, 2014

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

ISSUED BY:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
LAB ADDRESS :	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (1):	No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.
TEST LOCATION (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA140626C16A	Original release	Oct. 09, 2014

1. CERTIFICATION

PRODUCT:	AC1900 Wireless Dual Band Gigabit Router
BRAND NAME:	TP-LINK
MODEL NO.:	C9
TEST SAMPLE:	PROTOTYPE
APPLICANT:	TP-LINK TECHNOLOGIES CO., LTD.
TESTED DATE:	Sep. 18, 2014
STANDARDS:	FCC Part 2 (Section 2.1091)
	KDB 447498 D03
	IEEE C95.1

The above equipment (Model: C9) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : _____ , **DATE:** Oct. 09, 2014
(Elsie Hsu, Specialist)

APPROVED BY : _____ , **DATE:** Oct. 09, 2014
(May Chen, Manager)

2. RF EXPOSURE LIMIT

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (mW/cm^2)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	…	…	F/1500	30
1500-100,000	…	…	1.0	30

F = Frequency in MHz

3. MPE CALCULATION FORMULA

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

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

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 27cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

1. The antennas provided to the EUT, please refer to the following table:

Transmitter Circuit	Peak Gain (dBi)	Frequency range (MHz to MHz)	Ant. Type	Connecter Type
Chain 0	2.4GHz: 2.1 5GHz:1.7	2400~2483.5 5150~5250 5250~5350 5470~5725 5725~585	Omni directional	R-SMA
Chain 1				
Chain 2				

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For WLAN 2.4GHz (15.247)

802.11b

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2412 - 2462	563.777	6.87	27	0.29934	1

NOTE: Directional gain = 2.1dBi + 10log(3) = 6.87dBi

802.11g

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2412 - 2462	980.641	6.87	27	0.52068	1

NOTE: Directional gain = 2.1dBi + 10log(3) = 6.87dBi

802.11n (HT20)

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2412 - 2462	880.076	6.87	27	0.46728	1

NOTE: Directional gain = 2.1dBi + 10log(3) = 6.87dBi

802.11n (HT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
2422 - 2452	352.236	6.87	27	0.18702	1

NOTE: Directional gain = 2.1dBi + 10log(3) = 6.87dBi

For WLAN 5GHz (15.247)

802.11a

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5745 - 5825	894.156	6.47	27	0.43299	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

802.11ac (VHT20)

FREQUENCY (MHz)	MAX POWER (mW))	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5745 - 5825	888.31	6.47	27	0.43016	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

802.11ac (VHT40)

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5755 - 5795	866.479	6.47	27	0.41958	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

802.11ac (VHT80)

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5775	426.245	6.47	27	0.20641	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

For WLAN 5GHz (15.407)

802.11a

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5180 – 5240	183.92	6.47	27	0.08906	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

802.11ac (VHT20)

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5180 – 5240	178.434	6.47	27	0.08641	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

802.11ac (VHT40)

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5190 – 5230	108.435	6.47	27	0.05251	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

802.11ac (VHT80)

FREQUENCY (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm^2)	LIMIT (mW/cm^2)
5210	91.922	6.47	27	0.04451	1

NOTE: Directional gain = 1.7dBi + 10log(3) = 6.47dBi

CONCLUSION:

Both of the 2.4GHz and 5GHz can transmit simultaneously, the formula of calculated the MPE is:

$CPD_1 / LPD_1 + CPD_2 / LPD_2$ + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

Therefore, the worst-case situation is 0.52068 / 1 + 0.43299 / 1 = 0.954, which is less than “1”. This confirmed that the device comply with FCC 1.1310 MPE limit.

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