A Test Lab Techno Corp.

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MPE Report

Test Report No.	：	1509FS17-01
Applicant	：	TP-LINK TECHNOLOGIES CO., LTD.
Manufacturer	：	TP-LINK TECHNOLOGIES CO., LTD.
Product Type	：	300Mbps High Power Wireless N Router
Trade Name	：	TP-LINK
Model Number	：	TL-WR841HP
Date of Received	：	Jun. 08, 2015
Test Period	：	Aug. 13, 2015
Date of Issued	：	Sep. 30, 2015
Test Specification	：	IEEE Std. 1528-2013
		47 CFR § 2.1091
		47 CFR §1.1310
		ANSI / IEEE Std.C95.1-1992
Location of Test Lab.	：	Chang-an Lab.

1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
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4. This document may be altered or revised by A Test Lab Techno. Corp. personnel only, and shall be noted in the revision section of the document.

Approved By ： Bill Hu (Bill Hu)　　Tested By ： Sky Chou (Sky Chou)

Contents

1. Description of Equipment under Test (EUT)

Applicant	TP-LINK TECHNOLOGIES CO., LTD.
Applicant Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Shennan Rd, Nanshan, Shenzhen,China
Manufacturer	TP-LINK TECHNOLOGIES CO., LTD.
Manufacturer Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park,Shennan Rd, Nanshan, Shenzhen,China
Product Type	300Mbps High Power Wireless N Router
Trade Name	TP-LINK
Model Number	TL-WR841HP
FCC ID	TE7WR841HPV2
Frequency Range	IEEE 802.11b / 802.11g / 802.11n 2.4GHz 20MHz: 2412 ~ 2462 MHz IEEE 802.11n 2.4GHz 40MHz: 2422 ~ 2452 MHz
Transmit Power (conducted power)	IEEE 802.11b: 0.204 W / 23.10 dBm IEEE 802.11g: 0.250 W / 23.98 dBm IEEE 802.11n 2.4GHz 20MHz: 0.246 W / 23.91 dBm IEEE 802.11n 2.4GHz 40MHz: 0.076 W / 18.80 dBm
Antenna Type	External dismountable Antenna
Antenna Peak Gain	9 dBi
Antenna Delivery	2TX + 2RX
Temperature Range	0 ~ +40°C
RF Evaluation	3.95 W/m^2

The above equipment was tested by A Test Lab Techno Corp. For compliance with the requirements set forth in 47 CFR § 2.1091 & 47 CFR § 1.1310. 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

2. Human Exposure Assessment

Due to the design and installation of this product, it is not possible to conduct SAR evaluation. This is because client either manufactures or supplies the antenna(s) that will be used in the installation of this product. Therefore, this product will be evaluated as a mobile device per 47 CFR §1.1310 titled “Radiofrequency radiation exposure limits”, generally referred to as MPE limits.

In 47 CFR § 2.1091, paragraph (b) defines a mobile device as “a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the transmitter’s radiating structure(s) and the body of the user or nearby persons. ” This product is intended to be installed into a vehicle such that the unit is physically secured at one location. In the installation guide supplied with the product,

Client has made the following statement: “IMPORTANT: To meet the FCC’s RF Exposure Guidelines, the antenna should be installed so there is at least 20 cm of separation between the body of the user and nearby persons and the antenna”. Based on the installation of the transceiver and the antenna, the transmitters radiating structure is more than 20 cm from the user. Thus, this product is a “mobile device” as defined in section § 2.1091 paragraph (b).

Exposure evaluation
$$S = \frac{PG}{4\pi R^2}$$ Where S: power density P: power input to the 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.

3. RF Output Power

Band	Data Rate	CH	Frequency (MHz)	Average Power (dBm)		
				ANT-0	ANT-1	ANT-0+1
IEEE 802.11b	1M	1	2412.0	19.90	20.27	23.10
		6	2437.0	19.97	20.21	23.10
		11	2462.0	19.76	19.72	22.75
	2M	6	2437.0	19.95	20.19	23.08
	5.5M	6	2437.0	19.94	20.18	23.07
	11M	6	2437.0	19.93	20.16	23.06
IEEE 802.11g	6M	1	2412.0	15.83	16.46	19.17
		6	2437.0	20.82	21.12	23.98
		11	2462.0	17.01	16.91	19.97
	9M	6	2437.0	20.80	21.11	23.97
	12M	6	2437.0	20.79	21.09	23.95
	18M	6	2437.0	20.77	21.08	23.94
	24M	6	2437.0	20.74	21.06	23.91
	36M	6	2437.0	20.73	21.05	23.90
	48M	6	2437.0	20.71	21.02	23.88
	54M	6	2437.0	20.70	20.01	23.38
IEEE 802.11n 2.4 GHz 20MHz	13M	1	2412.0	14.55	15.84	18.25
		6	2437.0	20.74	21.06	23.91
		11	2462.0	15.87	16.38	19.14
	26M	6	2437.0	20.73	21.05	23.90
	39M	6	2437.0	20.71	21.03	23.88
	52M	6	2437.0	20.69	21.02	23.87
	78M	6	2437.0	20.66	21.00	23.84
	104M	6	2437.0	20.65	20.97	23.82
	117M	6	2437.0	20.63	20.96	23.81
	130M	6	2437.0	20.61	20.94	23.79
IEEE 802.11n 2.4 GHz 40MHz	27M	3	2422.0	9.69	11.09	13.46
		6	2437.0	15.54	16.02	18.80
		9	2452.0	9.84	10.86	13.39
	54M	6	2437.0	15.53	15.99	18.78
	81M	6	2437.0	15.52	15.98	18.77
	108M	6	2437.0	15.50	15.96	18.75
	162M	6	2437.0	15.47	15.93	18.72
	216M	6	2437.0	15.46	15.92	18.71
	243M	6	2437.0	15.44	15.91	18.69
	270M	6	2437.0	15.41	15.89	18.67

4. Test Result

Band	Data Rate	Frequency (MHz)	Limit (mw/cm^2)	Distance (cm) [R]	Max Tune-up power (dBm) [P]	ANT Gain (dBi)	Numeric Gain [G] (dBi)	Duty Cycle	[P] x [G] With Duty Cycle (mW) [TP]	Power Density [S] (mw/cm^2)
IEEE 802.11b (MIMO)	1 M	2412.0	1	20	23.1	9	7.94	1	1620.860	0.322
		2437.0	1	20	23.1	9	7.94	1	1621.870	0.323
		2462.0	1	20	22.8	9	7.94	1	1495.740	0.298
IEEE 802.11g (MIMO)	6 M	2412.0	1	20	19.2	9	7.94	1	655.380	0.130
		2437.0	1	20	24.0	9	7.94	1	1986.600	0.395
		2462.0	1	20	20.0	9	7.94	1	788.640	0.157
IEEE 802.11n 2.4GHz 20MHz (MIMO)	13 M	2412.0	1	20	18.3	9	7.94	1	531.030	0.106
		2437.0	1	20	23.9	9	7.94	1	1954.990	0.389
		2462.0	1	20	19.1	9	7.94	1	651.780	0.130
IEEE 802.11n 2.4GHz 40MHz (MIMO)	27 M	2422.0	1	20	13.5	9	7.94	1	175.980	0.035
		2437.0	1	20	18.8	9	7.94	1	601.880	0.120
		2452.0	1	20	13.4	9	7.94	1	173.320	0.034

Note: The Numeric Gain calculated by 10^(ant. Gain(dBi) /10).