



中国认可
国际互认
检测
TESTING
CNAS L2264

MPE TEST REPORT

Applicant ADTRAN, Inc.
FCC ID HDC6304W
Product EPON RG ONU
Model 6304W
Report No. RXA1704-0118MPE01R2
Issue Date August 17, 2017

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC 47 CFR Part 1 1.1310**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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1 Test Laboratory

1.1 Notes of the Test Report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above. This report must not be used by the client to claim product certification, approval, or endorsement by any government agencies.

1.2 Test facility

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (recognition number is 428261)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.



1.3 Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China
City: Shanghai
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1.4 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5 Ω
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

2 Description of Equipment under Test

Client Information

Applicant	ADTRAN, Inc.
Applicant address	901 Explorer Blvd, Huntsville AL 35806
Agent	ubiQuoss, Inc.
Agent Address	83,Saneop-ro 155beon-gil, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea,16648
Manufacturer	Shenzhen Gongjin Electronics Co.,Ltd.
Manufacturer address	B116,B118,A211-A213,B201-B213,A311-A313,B411-413,BF08-09 Nanshan Medical Instrument Industry Park,1019# Nanhai Road, Nanshan District, Shenzhen, Guangdong, 518067, P.R.China

General Technologies

Model	6304W
Hardware Version	V01
Software Version	V1.4
Date of Testing:	May 16, 2017~ June 8, 2017

3 Maximum conducted output power (measured) and antenna Gain

the numeric gain (G) of the antenna with a gain specified in dB is determined by

$$\text{Numeric gain (G)} = 10^{(\text{antenna gain}/10)}$$

Band		Maximum Conducted Output Power (dBm)	Antenna Gain (dBi)	Numeric gain (dB)
Wifi 2.4G	802.11b	19	4.5	2.818
	802.11g	21	4.5	2.818
	802.11n HT20	20	4.5	2.818
	802.11n HT40	20	4.5	2.818
Wifi 5G	802.11a	21	3	1.995
	802.11n HT20	20	3	1.995
	802.11n HT40	20	3	1.995
	802.11ac HT20	20	3	1.995
	802.11ac HT40	20	3	1.995
	802.11ac HT80	18	3	1.995

According to section 1.1310 of FCC 47 CFR Part 1, limits for maximum permissible exposure (MPE) are as following

TABLE 1 – LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Note1. Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational / controlled limits apply provided he or she is made aware of the potential for exposure.

Note2: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

The maximum permissible exposure for 1500~100,000MHz is 1.0. So

Band	The maximum permissible exposure
Wi-Fi 2.4G	1.0mW/cm ²
Wi-Fi 5G	1.0mW/cm ²



IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. No change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

RF Exposure Calculations:

The following information provides the minimum separation distance for the highest gain antenna provided. This calculation is based on the conducted power, considering maximum power and antenna gain. The formula shown in KDB 447498 D01 is used in the calculation.

Equation from KDB 447498 D01 General RF Exposure Guidance v06 (10/23/2015) is:

$$S = PG / 4\pi R^2$$

Where: S = power density (in appropriate units, e.g. mW/cm²)

P = Time-average maximum tune up procedure (in appropriate units, e.g., mW)

G = the numeric gain of the antenna

R = distance to the center of radiation of the antenna (20 cm = limit for MPE)

Wi-Fi 2.4G

802.11b: PG = 19dBm + (2.818dB) = 21.818dBm = 151.98mW

802.11g: PG = 21dBm + (2.818dB) = 23.818dBm = 240.88mW

802.11n HT20: PG = 20dBm + (2.818dB) = 22.818dBm = 191.34mW

802.11n HT40: PG = 20dBm + (2.818dB) = 22.818dBm = 191.34mW

Wi-Fi 5G

802.11a: PG = 21dBm + (1.995dB) = 22.995dBm = 199.30mW

802.11n HT20: PG = 20dBm + (1.995dB) = 21.995dBm = 158.31mW

802.11n HT40: PG = 20dBm + (1.995dB) = 21.995dBm = 158.31mW

802.11ac HT20: PG = 20dBm + (1.995dB) = 21.995dBm = 158.31mW

802.11ac HT40: PG = 20dBm + (1.995dB) = 21.995dBm = 158.31mW

802.11ac HT80: PG = 18dBm + (1.995dB) = 19.995 dBm = 99.88mW

Band		PG (mW)	Test Result (mW/cm ²)	Limit Value (mW/cm ²)	The MPE ratio
WiFi 2.4G	802.11b	151.98	0.030	1.0	0.030
	802.11g	240.88	0.048	1.0	0.048
	802.11n HT20	191.34	0.038	1.0	0.038
	802.11n HT40	191.34	0.038	1.0	0.038
WiFi 5G	802.11a	199.30	0.040	1.0	0.040
	802.11n HT20	158.31	0.031	1.0	0.031
	802.11n HT40	158.31	0.031	1.0	0.031
	802.11ac HT20	158.31	0.031	1.0	0.031
	802.11ac HT40	158.31	0.031	1.0	0.031
	802.11ac HT80	99.88	0.020	1.0	0.020
Note: The MPE ratio = Mac Test Result ÷ Limit Value					

So the simultaneous transmitting antenna pairs as below:

Σ of MPE ratios = WiFi 2.4G + WiFi 5G = 0.048 + 0.040 = 0.088 < 1

Note: For transmitters, minimum separation distance is 20cm, even if calculations indicate MPE distance is less.