EN 50385 & EN 62311 Test Report

Project No.	:	1710C164
Equipment	:	AC1200 Dual Band WiFi Repeater, AC750 Dual Band WiFi Repeater
Test Model	:	A18
Series Model	:	A15
Applicant	:	SHENZHEN TENDA TECHNOLOGY CO.,LTD
Address	:	6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052

Date of Receipt	:	Oct. 18, 2017
Date of Test	:	Oct. 18, 2017 ~ Nov. 15, 2017
Issued Date	:	Nov. 16, 2017
Tested by	:	BTL Inc.

Testing Engineer : Welly Zhou
(Welly Zhou)

Technical Manager : Shawn Xiao
(Shawn Xiao)

Authorized Signatory : David Mao
(David Mao)

BTL INC.

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

TEL: +86-769-8318-3000 FAX: +86-769-8319-6000

Testing Laboratory 2640

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-ETSP-3-1710C164	Original Issue	Nov. 16, 2017

1. CERTIFICATION

Equipment	:	AC1200 Dual Band WiFi Repeater, AC750 Dual Band WiFi Repeater
Brand Name	:	Tenda
Test Model	:	A18
Series Model	:	A15
Applicant	:	SHENZHEN TENDA TECHNOLOGY CO.,LTD
Manufacturer	:	SHENZHEN TENDA TECHNOLOGY CO.,LTD
Address	:	6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052
Date of Test	:	Oct. 18, 2017 ~ Nov. 15, 2017
Standard(s)	:	EN 50385: 2002 EN 62311:2008

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.
The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-ETSP-3-1710C164) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	AC1200 Dual Band WiFi Repeater, AC750 Dual Band WiFi Repeater	
Brand Name	Tenda	
Test Model	A18	
Series Model	A15	
Model Difference	Only differ in product name and model name.	
Power Source	AC Mains.	
Power Rating	AC100-240V 50/60Hz 0.3A	
Product Description for WIFI 2.4G	Operation Frequency	2412~2472MHz
	Modulation Technology	802.11b: DSSS 802.11g: OFDM 802.11n: OFDM
	Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n: up to N/A Mbps
	EIRP Power (Max.)	802.11b: 18.24 dBm 802.11g: 19.74 dBm 802.11n (20MHz): 19.76 dBm 802.11n (40MHz): 19.85 dBm
Product Description for WIFI 5G	Operation Frequency	5150MHz~5250MHz
	Modulation Technology	802.11a:OFDM 802.11n:OFDM 802.11ac:OFDM
	Bit Rate of Transmitter	802.11a: 54/48/36/24/18/12/9/6 Mbps 802.11n: up to N/A Mbps 802.11ac: up to N/A Mbps
	E.I.R.P. Power (Max.) (For 1TX)	802.11a: 20.87 dBm
	E.I.R.P. Power (Max.) (For 2TX)	802.11n(20 MHz): 19.87 dBm 802.11n(40 MHz): 19.87 dBm 802.11ac(20 MHz): 19.97 dBm 802.11ac(40 MHz): 19.76 dBm 802.11ac(80 MHz): 19.67 dBm

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

For WIFI 2.4G:

CH01 - CH13 for 802.11b, 802.11g, 802.11n(20MHz) CH03 - CH11 for 802.11n(40MHz)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	06	2437	11	2462
02	2417	07	2442	12	2467
03	2422	08	2447	13	2472
04	2427	09	2452		
05	2432	10	2457		

For RLAN 5G:

802.11a 802.11n 20MHz 802.11ac 20MHz		802.11n 40MHz 802.11ac 40MHz		802.11ac 80MHz	
Band 1		Band 1		Band 1	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

3. Table for Filed Antenna:
For WIFI 2.4G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	3.5
2	N/A	N/A	Dipole	N/A	3.5

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R).

For RLAN 5G:

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Dipole	N/A	3
2	N/A	N/A	Dipole	N/A	3

Note: The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and receivers (2T2R)

4. The worst case for 1TX/ 2TX as follow:
For WIFI 2.4G:

Operating Mode / TX Mode	1TX	2TX
802.11b	V (ANT 1)	-
802.11g	V (ANT 1)	-
802.11n(20MHz)	-	V (ANT 1+ANT 2)
802.11n(40MHz)	-	V (ANT 1+ANT 2)

For RLAN 5G:

Operating Mode / TX Mode	1TX	2TX
802.11a	V (ANT 1)	-
802.11n(20MHz)	-	V (ANT 1 + ANT 2)
802.11n(40MHz)	-	V (ANT 1 + ANT 2)
802.11ac(20MHz)	-	V (ANT 1 + ANT 2)
802.11ac(40MHz)	-	V (ANT 1 + ANT 2)
802.11ac(80MHz)	-	V (ANT 1 + ANT 2)

3. MAXIMUM PERMISSIBLE EXPOSURE

For EN 50385:
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.
Since average output power at worst case is 979.490 mW which exceeds the exempt condition, 20 mW specified in EN50385. So, the electric field was calculated, please refer to next page.

For EN 62311:
According to its specifications, the EUT must comply with the requirements of the following standards:

EN 62311 –Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

LIMIT

For frequency range 10 MHz to 10 GHz

The basic restriction at frequencies between 10 MHz and 100 GHz is on localized SAR in the head. Any device with output power below 20 mW cannot produce an exposure exceeding this restriction under the most pessimistic exposure conditions. The basic restriction is 2 W/kg so any unit which supplies less than 20 mW (=2/100W) from its antenna port, averaged over 6 minutes, will meet the basic restriction.

For frequency range 10 GHz to 300 GHz

The most conservative assumption is that all the transmitted power is absorbed within the specified area, therefore any device which supplies less than 20 mW will meet the basic restriction. The average time is equal to $68/f_{1.05}$ minutes (where f is in GHz) In the frequency range 10 GHz to 300 GHz, the basic restriction is 10 Wm^{-2} averaged over any 20 cm^2 of exposed area with a spatial maximum of 200 Wm^{-2} averaged over 1 cm^2

2 MPE Calculation Method

E (V/m) = (30*P*G) 0.5/d

E = Electric Field (V/m)

P = Peak RF output Power (W)

G = EUT Antenna numeric gain (numeric)

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

From the peak EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the gain of the used antenna, the RF power density can be obtained.

4. EUT OPERATING CONDITION

The software provided by Manufacturer enabled the EUT to transmit data at lowest, middle and highest channel individually.

5. CALCULATED RESULT AND LIMIT

For WIFI 2.4G:

MAX. EIRP Power (dBm)	E.I.R.P. Power (mW)	Electric Field (V/m)	Limit of Electric Field(V/m)	Result
19.86	96.828	8.522	61	Pass

For RLAN 5G:

MAX. EIRP Power (dBm)	E.I.R.P. Power (mW)	Electric Field (V/m)	Limit of Electric Field(V/m)	Result
20.87	122.180	9.573	61	Pass

RF exposure assessment has been performed above to prove that this unit will not generate the harmful EM emission above the reference level as specified in EC Council Recommendation (1999/519/EC)