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EN 50385:2017

BS EN 50385:2017

ASSESSMENT REPORT

For

SHENZHEN TENDA TECHNOLOGY CO.,LTD.

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Tested Model: A23

Report Type:	**Product Type:**
Original Report	AX1500 Wi-Fi 6 Range Extender

Report Number:	DG2230214-06388E
Report Date:	2023/3/15
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
1.0	DG2230214-06388E	Original Report	2023/3/15

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product Name:	AX1500 Wi-Fi 6 Range Extender
Tested Model:	A23
Rated Input Voltage:	100-240Vac
Serial Number:	21C4
EUT Received Date:	2023/2/16
EUT Received Status:	Good

Objective

This report is prepared on behalf of ***SHENZHEN TENDA TECHNOLOGY CO.,LTD.*** in accordance with EN 50385: 2017 & BS EN 50385: 2017 Product standard to demonstrate the compliance of base station equipment with radiofrequency electromagnetic field exposure limits (110 MHz - 100 GHz), when placed on the market.

The objective is to determine the compliance of EUT with EN 50385: 2017& BS EN 50385: 2017.

Test Methodology

All measurements contained in this report were conducted with EN 50385: 2017 & BS EN 50385: 2017.

Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol "▲". Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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RF EXPOSURE ASSESSMENT METHOD

1. Introduction

This product standard is related to human exposure to radiofrequency electromagnetic fields transmitted by base station equipment in the frequency range 110 MHz to 100 GHz.

The object is to assess the compliance of such equipment with the general public basic restrictions (directly or indirectly via compliance with reference levels) and the workers' exposure limit values (directly or indirectly via compliance with action levels), when it is placed on the market.

2. Limit

2.1 **General Public/Uncontrolled Environment Exposure Limits** - For the assessment of general public exposure from the product, the relevant limits specified as basic restrictions, in Council Recommendation 1999/519/EC Annex II Table 1, or reference levels, in Council Recommendation 1999/519/EC Annex III Table 2, and the accompanying notes to these tables, shall be applied.

Table 2 **Reference levels for electric, magnetic and electromagnetic fields**

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m²)
0-1 Hz	—	$3{,}2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3{,}2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	4 000/f	5 000/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	0,092	2
400-2 000 MHz	$1{,}375\ f^{1/2}$	$0{,}0037\ f^{1/2}$	$0{,}0046\ f^{1/2}$	f/200
2-300 GHz	61	0,16	0,20	10

Notes:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, S_{eq}, E^2, H^2, and B^2 are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, S_{eq}, E^2, H^2, and B^2 are to be averaged over any $68/f^{1.05}$ -minute period (f in GHz).
4. No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

(0 Hz to 300 GHz, unperturbed rms values)

2.2 **Occupational/Controlled Environment Exposure Limits** - For the assessment of worker exposure from the product, the relevant limits specified as exposure limit values, in Directive 2013/35/EU Annex III Tables A.1 and A.3, or action levels in Directive 2013/35/EU Annex III Table B1, and the accompanying notes to these tables, shall be applied.

Table B1

ALs for exposure to electric and magnetic fields from 100 kHz to 300 GHz

Frequency range	Electric field strength ALs(E) [Vm^{-1}] (RMS)	Magnetic flux density ALs(B) [μT] (RMS)	Power density ALs(S) [Wm^{-2}]
100 kHz ≤ f < 1 MHz	$6{,}1 \times 10^2$	$2{,}0 \times 10^6/f$	—
1≤ f < 10 MHz	$6{,}1 \times 10^8/f$	$2{,}0 \times 10^6/f$	—
10 ≤ f < 400 MHz	61	0,2	—
400 MHz ≤ f < 2 GHz	$3 \times 10^{-3}\ f^{½}$	$1{,}0 \times 10^{-5}\ f^{½}$	—
2 ≤ f < 6 GHz	$1{,}4 \times 10^2$	$4{,}5 \times 10^{-1}$	—
6 ≤ f ≤ 300 GHz	$1{,}4 \times 10^2$	$4{,}5 \times 10^{-1}$	50

Note B1-1: f is the frequency expressed in hertz (Hz).

Note B1-2: $[ALs(E)]^2$ and $[ALs(B)]^2$ are to be averaged over a six-minute period. For RF pulses, the peak power density averaged over the pulse width shall not exceed 1 000 times the respective ALs(S) value. For multi-frequency fields, the analysis shall be based on summation, as explained in the practical guides referred to in Article 14.

Note B1-3: ALs(E) and ALs(B) represent maximum calculated or measured values at the workers' body position. This results in a conservative exposure assessment and automatic compliance with ELVs in all non-uniform exposure conditions. In order to simplify the assessment of compliance with ELVs, carried out in accordance with Article 4, in specific non-uniform conditions, criteria for the spatial averaging of measured fields based on established dosimetry will be laid down in the practical guides referred to in Article 14. In the case of a very localised source within a distance of a few centimetres from the body, compliance with ELVs shall be determined dosimetrically, case by case.

Note B1-4: The power density shall be averaged over any 20 cm^2 of exposed area. Spatial maximum power densities averaged over 1 cm^2 should not exceed 20 times the value of 50 Wm^{-2}. Power densities from 6 to 10 GHz are to be averaged over any six-minute period. Above 10 GHz, the power density shall be averaged over any $68/f^{1,05}$-minute period (where f is the frequency in GHz) to compensate for progressively shorter penetration depth as the frequency increases.

3. Classification of the assessment methods

Far Field Calculation Formula

E-Field strength(Els(E)):

$$E = \frac{\sqrt{30PG(\theta,\phi)}}{r}$$

Where:
P= Tune-up average conducted power
G= antenna gain relative to an isotropic antenna
θ,ϕ= elevation and azimuth angles to point of investigation
r= distance from observation point to the antenna

Power density(Els(S)):

$$S = \frac{PG_{(\theta,\phi)}}{4\pi r^2}$$

Where:

P = Input Power of the antenna (W)
G = antenna gain relative to an isotropic antenna(numeric)
θ,ϕ = elevation and azimuth angles to point of investigation
r = distance from observation point to the antenna(m)
ηo = characteristic impedance of free space

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \le 1$$

4. Test Results

RF Mode	Frequency	Tune-up EIRP Power	E-Field Strength	Limit	Result
	(MHz)	(dBm)	(V/m)	(V/m)	
Wi-Fi 2.4G	2412-2472	20	8.66	61	Pass
Wi-Fi 5.2G	5150-5250	22	10.9	61	Pass

Notes:
1. **General Public/Uncontrolled Environment Exposure Limits** applied to the EUT;
2. The distance from observation point to the antenna is 20cm, which was declared by the manufacturer.

Conclusion: Compliant

EXHIBIT A - EUT PHOTOGRAPHS

For photos in this section, please refer to report No.: DG2230214-06388E-02 EXHIBIT A.

*******END OF REPORT*******