



## FCC PART 15 CLASS B MEASUREMENT AND TEST REPORT

For

**SHENZHEN TENDA TECHNOLOGY CO.,LTD.**

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P.R.China

**FCC ID: V7TA3**

<b>Report Type:</b> Original Report	<b>Product Type:</b> 150Mbps Wireless Range Extender
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<b>Report Number:</b> <u>R1DG120710003-00B</u>	
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\* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk “★” (Rev.2)

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## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

The *SHENZHEN TENDA TECHNOLOGY CO.,LTD.*’s product, model number: A3 (*FCC ID: V7TA3*) or (“EUT”) in this report is a 150Mbps Wireless Range Extender, which was measured approximately:28.0 cm (L) x9.5cm (W) x2.0cm (H), rated input voltage: DC 9V from adapter.

Adapter information:

Model: TEA09U-09060

Input: 100-240V, 50/60Hz,0.3A

Output: 9V, 0.6A

Frequency Range:

802.11b/g/n20: 2412-2462MHz

802.11n40: 2422-2452MHz

*\* All measurement and test data in this report was gathered from production sample serial number:120710003 (Assigned by BACL,Dongguan). The EUT was received on 2012-07-11.*

### Objective

This report is prepared on behalf of *SHENZHEN TENDA TECHNOLOGY CO.,LTD.* in accordance with Part 2- Subpart J, Part 15- Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15 Class B.

### Related Submittal(s)/Grant(s)

FCC Part 15C DSS submissions with FCC ID: V7TA30.

### Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

Test site at Bay Area Compliance Laboratories Corp. (Dongguan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 02, 2012. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 273710. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratories Corp. (Shenzhen) is an ISO/IEC 17025 accredited laboratory, and is accredited by National Voluntary Laboratory Accredited Program (Lab Code 200707-0).



The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2007070.htm>

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical mode which is provided by manufacturer.

### EUT Exercise Software

The test was performed under “Lantest.exe”.

### Equipment Modifications

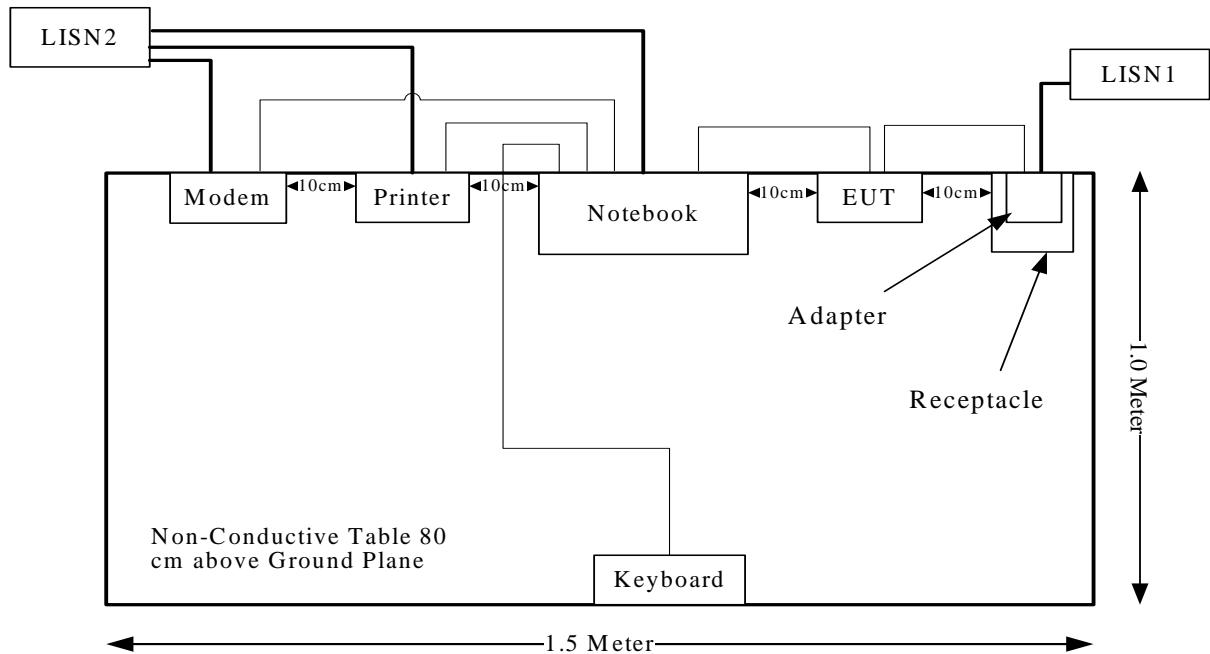
No modification was made to the EUT tested.

### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Dell	Notebook	PP11L	N/A
DELL	Keyboard	SK-8115	CN-ODJ313-716716-05A-0DS0
HP	Printer	C3941A	JPTVO13237
SAST	Modem	AEM-2100	090200213

### External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable Printer Cable	1.2	Parallel Port of PC	Printer
Shielded Detachable Serial Cable	1.2	Serial Port of PC	Modem
RJ45 cable	1.5	RJ45 port of PC	EUT
Shielded Detachable Keyboard Cable	1.5	Keyboard Port of PC	Keyboard

**Block Diagram of Test Setup**

## **SUMMARY OF TEST RESULTS**

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

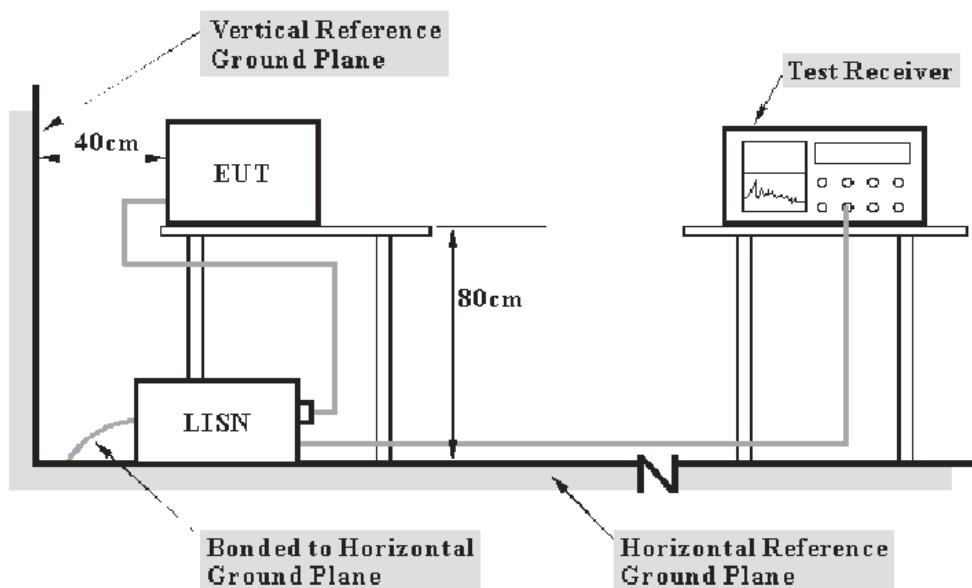
## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at Bay Area Compliance Laboratories Corp. (Dongguan) is 2.4 dB.(k=2, 95% level of confidence)

### EUT Setup



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2009 measurement procedure. The specification used was with the FCC Part 15.107 Class B limits.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

<b>Frequency Range</b>	<b>IF BW</b>
150 kHz – 30 MHz	9 kHz

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS 30	830245/006	2011-10-08	2012-10-07
Rohde & Schwarz	LISN	ESH3-Z5	843331/015	2011-10-08	2012-10-07
Rohde & Schwarz	LISN	ESH3-Z5	100113	2011-10-08	2012-10-07

\* **Statement of Traceability:** Bay Area Compliance Laboratory Corp.(Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Test Procedure

During the conducted emission test, the adapter was connected to the outlet of the first LISN, the printer, notebook and modem were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

## Test Results Summary

According to the recorded data in following table, the EUT complied with the [FCC Part 15.107](#), with the worst margin reading of:

**12.69 dB at 0.730 MHz** in the **Neutral** conducted mode

## Test Data

### Environmental Conditions

<b>Temperature:</b>	25 ° C
<b>Relative Humidity:</b>	48 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Ares Liu on 2012-07-23.*

*Test Mode: Operating*

**120 V, 60 Hz, Line:**

Frequency (MHz)	Corrected Result (dB $\mu$ V)	Correction Factor (dB)	Limit (dB $\mu$ V)	Margin (dB)	Detector (PK /QP/Ave.)
0.495	42.37	0.42	56.14	13.77	QP
0.495	30.00	0.42	46.14	16.14	Ave.
0.675	38.35	0.44	56.00	17.65	QP
1.170	37.64	0.46	56.00	18.36	QP
1.815	37.61	0.47	56.00	18.39	QP
0.885	36.97	0.45	56.00	19.03	QP
1.170	26.70	0.46	46.00	19.30	Ave.
1.820	25.60	0.47	46.00	20.40	Ave.
0.885	25.02	0.45	46.00	20.98	Ave.
0.675	24.91	0.44	46.00	21.09	Ave.
0.290	38.64	0.42	62.00	23.36	QP
0.290	27.98	0.42	52.00	24.02	Ave.

**120V, 60 Hz, Neutral:**

Frequency (MHz)	Corrected Result (dB $\mu$ V)	Correction Factor (dB)	Limit (dB $\mu$ V)	Margin (dB)	Detector (QP/Ave.)
0.730	43.31	0.44	56.00	12.69	QP
0.520	43.18	0.42	56.00	12.82	QP
0.520	33.01	0.42	46.00	12.99	Ave.
1.285	31.76	0.46	46.00	14.24	Ave.
0.730	31.54	0.44	46.00	14.46	Ave.
1.285	40.87	0.46	56.00	15.13	QP
2.135	29.97	0.48	46.00	16.03	Ave.
0.350	44.25	0.42	60.29	16.04	QP
2.130	39.54	0.48	56.00	16.46	QP
0.350	33.32	0.42	50.29	16.97	Ave.
0.290	42.69	0.42	62.00	19.31	QP
0.290	31.72	0.42	52.00	20.28	Ave.

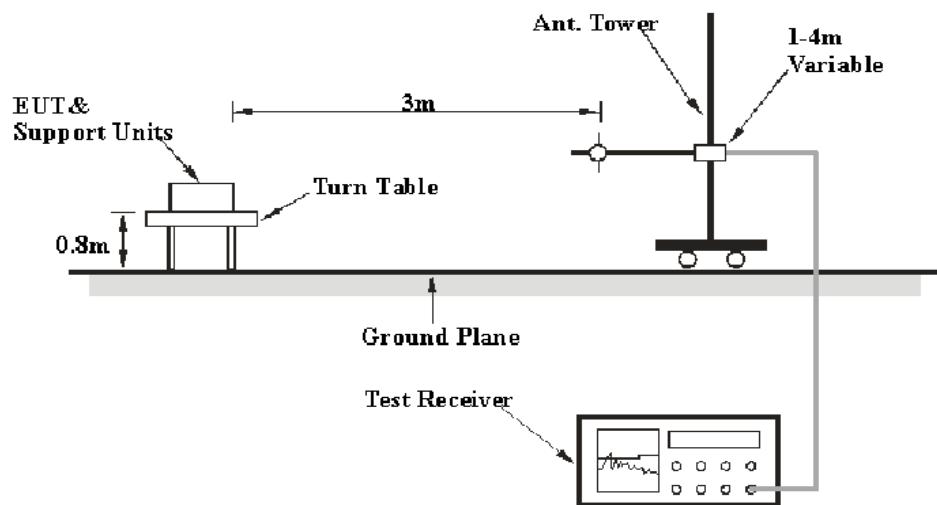
## FCC §15.109 - RADIATED EMISSIONS

### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Dongguan) is  $\pm 4.0$  dB. (k=2, 95% level of confidence)

### EUT Setup



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.4-2009. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to a 120 VAC/60 Hz power source.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 1000 MHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

<b><i>Frequency</i></b>	<b><i>RBW</i></b>	<b><i>VBW</i></b>	<b><i>Detection</i></b>
30 MHz-1 GHz	100 kHz	300 kHz	Quasi-peak

## Test Procedure

During the radiated emissions test, the adapter, notebook, modem and the printer were connected to AC floor outlet

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all Install combinations.

All data was recorded in the Quasi-peak detection mode from 30 MHz to 1 GHz.

## Test Equipment List and Details

<b>Manufacturer</b>	<b>Description</b>	<b>Model</b>	<b>Serial Number</b>	<b>Calibration Date</b>	<b>Calibration Due Date</b>
Rohde & Schwarz	EMI Test Reciever	ESCI	1166.5950.03	2011-10-08	2012-10-07
Sunol Sciences	Hybrid Antennas	JB3	A060611-1	2011-09-06	2012-09-05
HP	Pre-amplifier	8447E	2434A02181	2011-10-08	2012-10-07

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp (Dongguan) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Loss and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC §15.109 Class B, with the worst margin reading of:

**3.60 dB at 30.9700 MHz in the Vertical polarization**

## Test Data

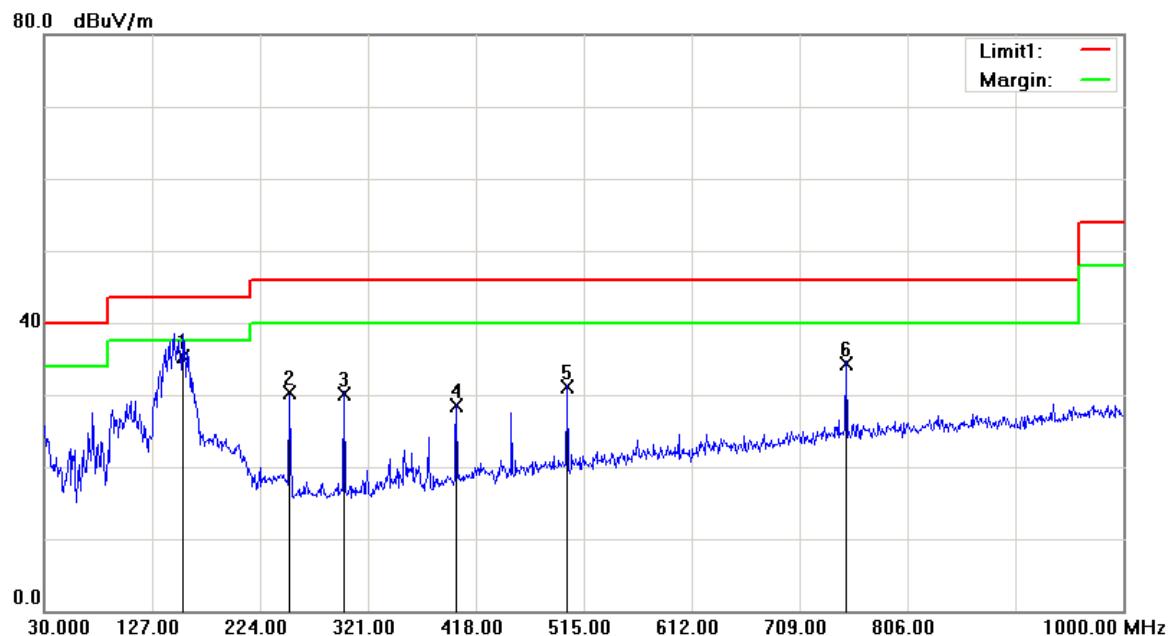
### Environmental Conditions

Temperature:	26 °C
Relative Humidity:	60 %
ATM Pressure:	100.0 kPa

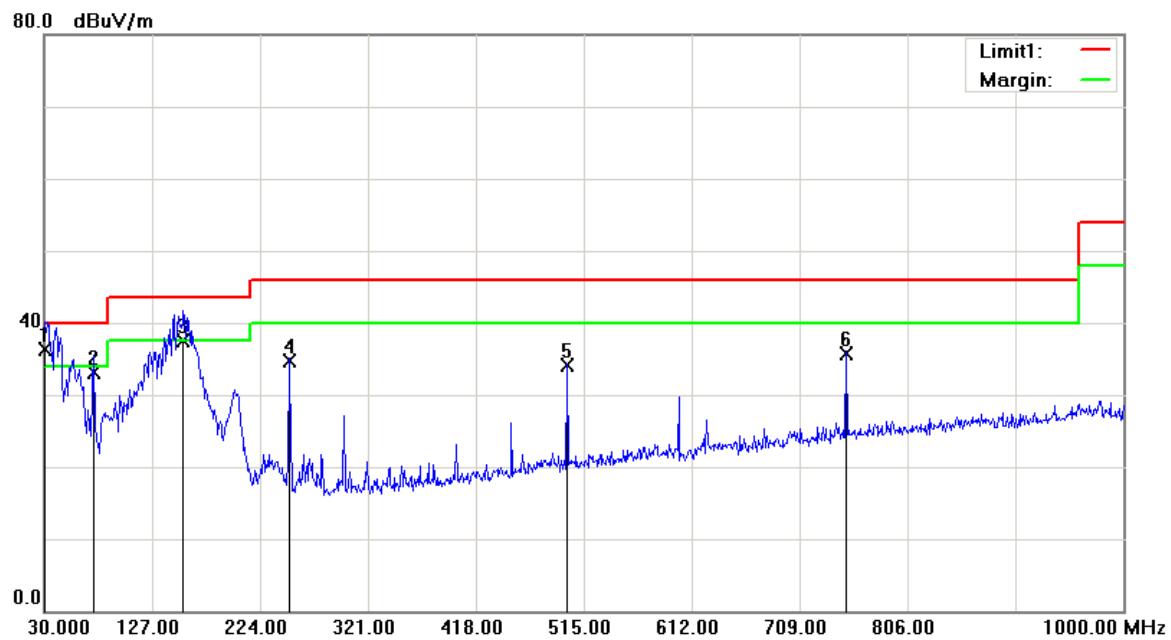
The testing was performed by Ares Liu on 2012-07-16.

Test Mode: Operating

### Horizontal



Frequency (MHz)	Reading (dB $\mu$ V)	Detector	Correction Factor (dB)	Corrected Amplitude (dB $\mu$ V/m)	Limit (dBuV/m)	Margin (dB)
155.1300	42.49	QP	-7.09	35.40	43.50	8.10
750.7100	31.89	QP	2.41	34.30	46.00	11.70
500.4500	32.30	QP	-1.20	31.10	46.00	14.90
250.1900	37.80	QP	-7.40	30.40	46.00	15.60
299.6600	35.52	QP	-5.42	30.10	46.00	15.90
400.5400	31.64	QP	-3.14	28.50	46.00	17.50

**Vertical**

Frequency (MHz)	Reading (dB $\mu$ V)	Detector	Correction Factor (dB)	Corrected Amplitude (dB $\mu$ V/m)	Limit (dBuV/m)	Margin (dB)
30.9700	35.48	QP	0.92	36.40	40.00	3.60*
155.1300	44.69	QP	-7.09	37.60	43.50	5.90
74.6200	44.96	QP	-11.86	33.10	40.00	6.90
750.7100	33.39	QP	2.41	35.80	46.00	10.20
250.1900	42.20	QP	-7.40	34.80	46.00	11.20
500.4500	35.30	QP	-1.20	34.10	46.00	11.90

\* Within measurement uncertainty.

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