

**FCC PART 15B  
TEST REPORT**

For

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

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**FCC ID: V7TS16**

<b>Report Type:</b> Original Report	<b>Product Type:</b> 16-Port 10/100M Desktop Switch
<b>Test Engineer:</b> Star Xie	star xie
<b>Report Number:</b> R1DG120723004-00	
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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: *S16 (FCC ID: V7TS16)* (the "EUT") in this report is a 16-Port 10/100M Desktop Switch, which was measured approximately:21.8 cm (L) x13.5 cm (W) x 41.2 cm (H), rated input voltage: DC 9V from adapter, the highest operating frequency is 25MHz.

Adapter information:

Model: TEA09U-09100

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

Output: 9V, 1.0A

*All measurement and test data in this report was gathered from production sample serial number: 120723004 (Assigned by BACL, Dongguan). The EUT was received on 2012-07-24.*

### 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 compliance with FCC Part 15 Class B.

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

No Related Submittal(s)/Grant(s)

### 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 (FCC §15.27)****Justification**

The system was configured for testing in a typical fashion (as normally used by a typical user).

**EUT Exercise Software**

Traffic generator VER 1.00 was used.

**Equipment Modifications**

No modification was made to the EUT.

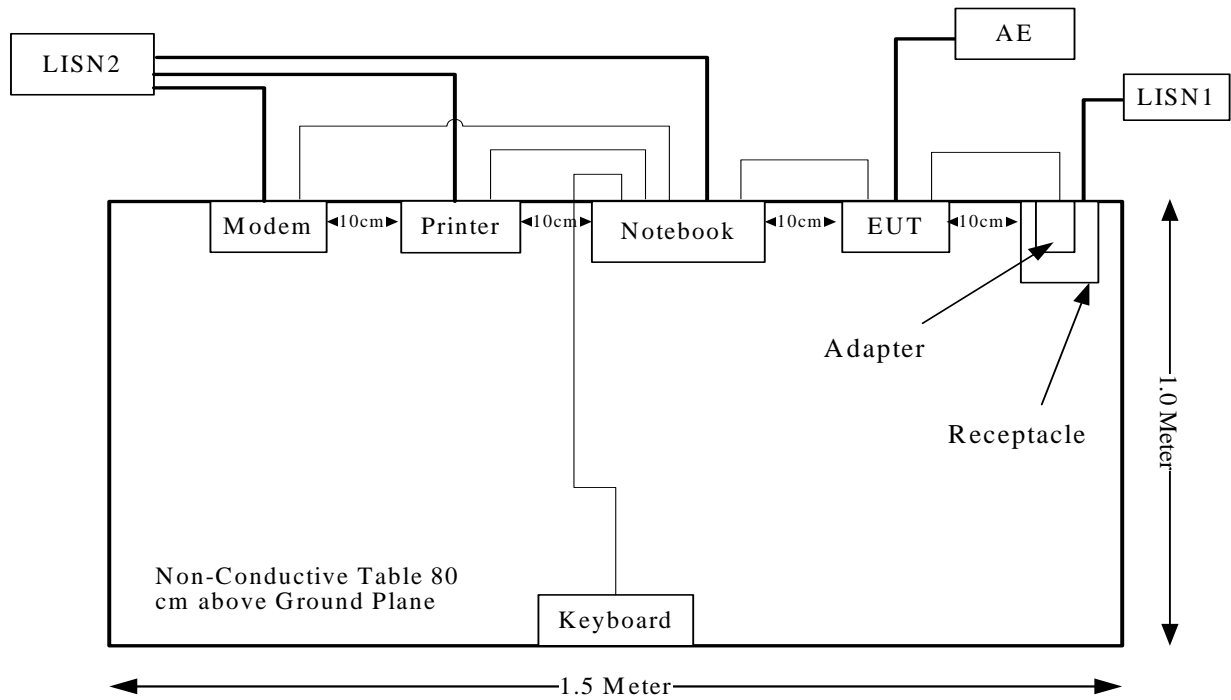
**Local Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
DELL	Notebook computer	PP11L	QDS-BRCM1017
HP	Laser Jet5L	C3941A	JPTVOB2337
DELL	Keyboard	L100	CNORH656658907BL 05DC
SAST	Modem	AEM-2100	0293

**External I/O Cable**

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

## 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
§15.33	Frequency range of radiated measurements	Compliance
§15.27	Special Accessories	Compliance

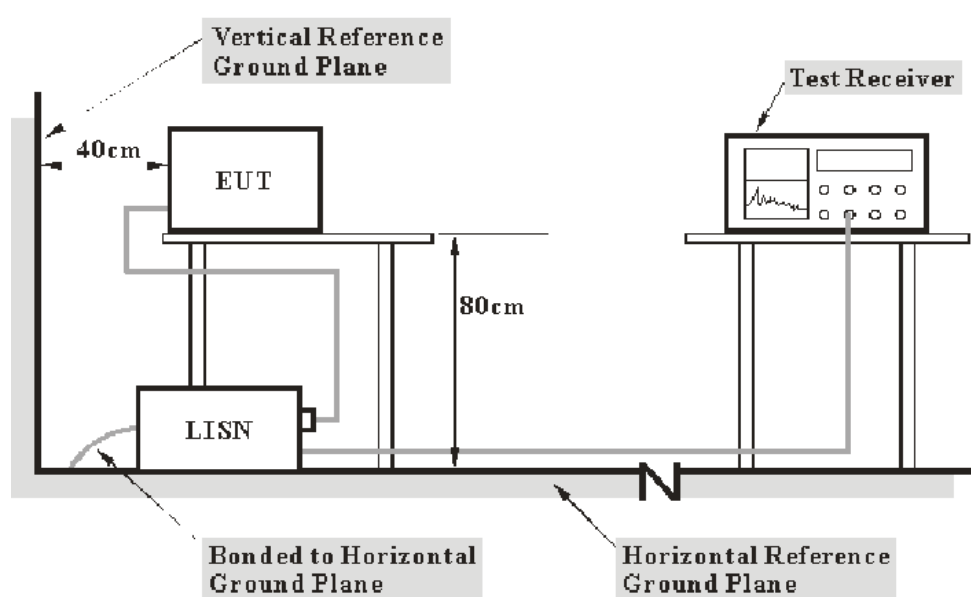
## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### 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 1.5 dB.

### 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 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:

<u>Frequency Range</u>	<u>IF B/W</u>
150 kHz – 30 MHz	9 kHz

## Test Procedure

During the conducted emission test, the adapter of EUT was connected to the outlet of the first LISN and the other support equipments 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Reciever	ESCS 30	830245/006	2011-10-08	2012-10-07
R&S	LISN1	ESH3-Z5	843331/015	2011-10-08	2012-10-07
R&S	LISN2	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 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:

**2.57 dB at 14.295 MHz in the Neutral** conducted

## Test Data

### Environmental Conditions

Temperature:	25 °C
Relative Humidity:	48 %
ATM Pressure:	100.0 kPa

*The testing was performed by Star Xie on 2012-08-02.*



Test mode: Running

120 V, 60 Hz, Line:



Frequency (MHz)	Reading (dBμV)	Correction (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
14.315	46.78	1.18	50.00	3.22	Ave.
12.810	45.47	1.00	50.00	4.53	Ave.
15.820	45.28	1.34	50.00	4.72	Ave.
0.200	43.70	0.42	54.57	10.87	Ave.
0.265	41.51	0.42	52.71	11.20	Ave.
12.810	48.35	1.00	60.00	11.65	QP
14.315	47.94	1.18	60.00	12.06	QP
15.820	47.29	1.34	60.00	12.71	QP
0.240	39.13	0.42	53.43	14.30	Ave.
0.265	46.46	0.42	62.71	16.25	QP
0.240	46.32	0.42	63.43	17.11	QP
0.200	46.42	0.42	64.57	18.15	QP

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

Frequency (MHz)	Reading (dBμV)	Correction (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/AV/QP)
14.295	47.43	1.18	50.00	2.57	Ave.
12.790	46.42	1.00	50.00	3.58	Ave.
16.175	43.77	1.37	50.00	6.23	Ave.
14.295	49.34	1.18	60.00	10.66	QP
12.790	48.10	1.00	60.00	11.90	QP
16.175	47.04	1.37	60.00	12.96	QP
0.165	47.25	0.41	65.57	18.32	QP
0.165	34.87	0.41	55.57	20.70	Ave.
0.195	43.63	0.42	64.71	21.08	QP
0.195	32.25	0.42	54.71	22.46	Ave.
20.610	23.58	1.81	50.00	26.42	Ave.
20.590	30.72	1.81	60.00	29.28	QP

## FCC §15.109 - RADIATED EMISSIONS

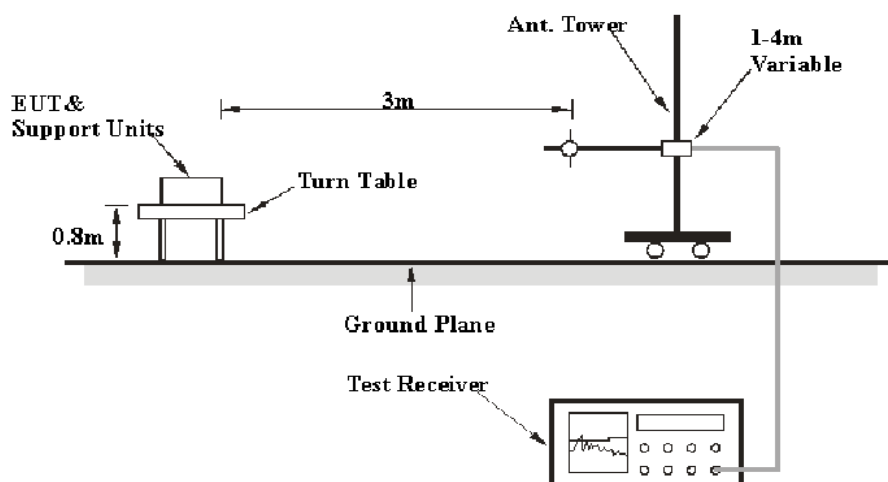
### Measurement Uncertainty

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 from 30 MHz to 1 GHz at Bay Area Compliance Laboratories Corp. (Dongguan) is 4.9 dB.

### EUT Setup

Below 1 GHz:



The radiated emission tests were performed in the 3 meters chamber 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 adapter connected to a 120 VAC/60 Hz power source.

### EMI Test Receiver Setup

According to FCC 15.33 requirements, the system was measured from 30 MHz to 1 GHz.

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

<b><i>Frequency Range</i></b>	<b><i>RBW</i></b>	<b><i>Video B/W</i></b>	<b><i>Detector</i></b>
30MHz – 1000 MHz	120 kHz	300 kHz	QP

## Test Procedure

For the radiated emissions test, the adapter of EUT was connected to the first AC floor outlet and the other support equipments were connected to the second AC floor outlet.

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

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz

## 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 Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R&S	EMI Test Receiver	ESCI	100224	2011-11-11	2012-11-10
Sunol Sciences	Hybrid Antennas	JB3	A060611-1	2011-09-06	2012-09-05
HP	Pre-amplifier	8447E	2434A02181	2011-10-08	2012-10-07
R&S	Spectrum Analyzer	FSEM	1079 8500	2011-10-09	2012-10-08
Beijingdayang	Horn Antenna	OMCDH10180	10279001B	2010-07-30	2015-07-29
Mini-Circuits	Wideband Amplifier	ZVA-183-S+	96901149	N/A	N/A

\* **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 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:

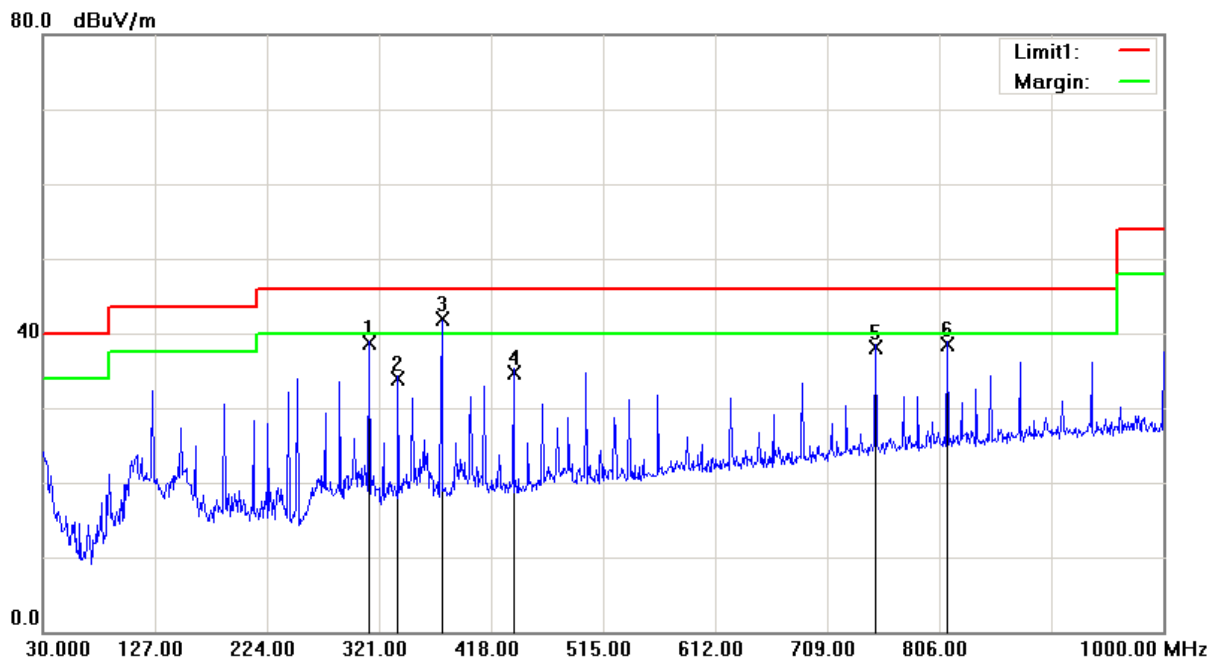
**4.10 dB at 375.3200 MHz in the Horizontal polarization**

**Test Data****Environmental Conditions**

<b>Temperature:</b>	26°C
<b>Relative Humidity:</b>	60 %
<b>ATM Pressure:</b>	100.0 kPa

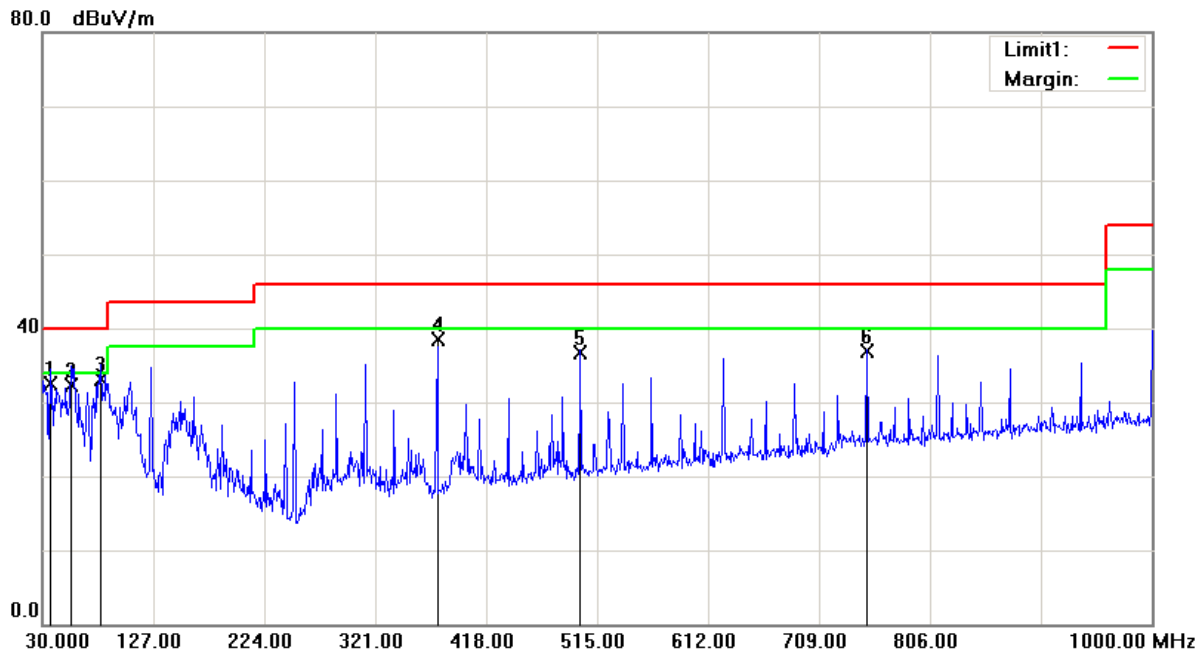
The testing was performed by Star Xie on 2012-08-02.

Test mode: Running

**Horizontal:**

Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
375.3200	45.54	QP	-3.64	41.90	46.00	4.10*
312.2700	43.68	QP	-4.98	38.70	46.00	7.30
812.7900	35.36	QP	3.24	38.60	46.00	7.40
750.7100	35.69	QP	2.41	38.10	46.00	7.90
437.4000	37.22	QP	-2.42	34.80	46.00	11.20
337.4900	38.55	QP	-4.65	33.90	46.00	12.10

\*Within measurement uncertainty!

**Vertical:**

Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
80.4400	45.38	QP	-12.28	33.10	40.00	6.90
36.7900	36.24	QP	-3.74	32.50	40.00	7.50
375.3200	42.14	QP	-3.64	38.50	46.00	7.50
55.2200	45.17	QP	-12.87	32.30	40.00	7.70
750.7100	34.49	QP	2.41	36.90	46.00	9.10
500.4500	37.90	QP	-1.20	36.70	46.00	9.30

\*Within measurement uncertainty!

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