

**FCC PART 15 CLASS B
MEASUREMENT AND TEST REPORT**

For

SHENZHEN TENDA TECHNOLOGY CO.,LTD.

Tenda Industrial Park, No. 34-1, Shilong Rd., Shiyan Town, Bao'an District, Shenzhen,
P.R.China

FCC ID: V7TN3

Report Type: Original Report	Product Type: Wireless N Broadband Router
Test Engineer:	Ares Liu <i>Ares Liu</i>
Report Number:	R1DG120710001-00B
Report Date:	2012-07-27
Reviewed By:	Ivan Cao EMC Engineer <i>Ivan Cao</i>
Test Laboratory:	Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 www.baclcorp.com.cn

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, or any agency of the Federal Government.

* This report contains data that are not covered by the NVLAP accreditation and are marked with an asterisk "★" (Rev.2)

TABLE OF CONTENTS

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION	5
DESCRIPTION OF TEST CONFIGURATION	5
EUT EXERCISE SOFTWARE	5
EQUIPMENT MODIFICATIONS	5
SUPPORT EQUIPMENT LIST AND DETAILS	5
EXTERNAL I/O CABLE.....	5
PRINTER	5
BLOCK DIAGRAM OF TEST SETUP	6
SUMMARY OF TEST RESULTS	7
FCC §15.107 – AC LINE CONDUCTED EMISSIONS.....	8
MEASUREMENT UNCERTAINTY.....	8
EUT SETUP	8
EMI TEST RECEIVER SETUP.....	9
TEST EQUIPMENT LIST AND DETAILS.....	9
TEST PROCEDURE	9
TEST RESULTS SUMMARY	9
TEST DATA	9
FCC §15.109 - RADIATED EMISSIONS	12
MEASUREMENT UNCERTAINTY.....	12
EUT SETUP	12
EMI TEST RECEIVER SETUP.....	13
TEST PROCEDURE	13
TEST EQUIPMENT LIST AND DETAILS.....	13
CORRECTED AMPLITUDE & MARGIN CALCULATION	13
TEST RESULTS SUMMARY	13
TEST DATA	14

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *SHENZHEN TENDA TECHNOLOGY CO.,LTD.*'s product, model number: N3 (*FCC ID: V7TN3*) or ("EUT") in this report is a Wireless N Broadband Router, 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: 120710001 (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 DTS submissions with FCC ID: V7TN3.

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 manufacture.

EUT Exercise Software

The test was performed under “Lantest.exe”.

Equipment Modifications

No modification was made to the EUT tested.

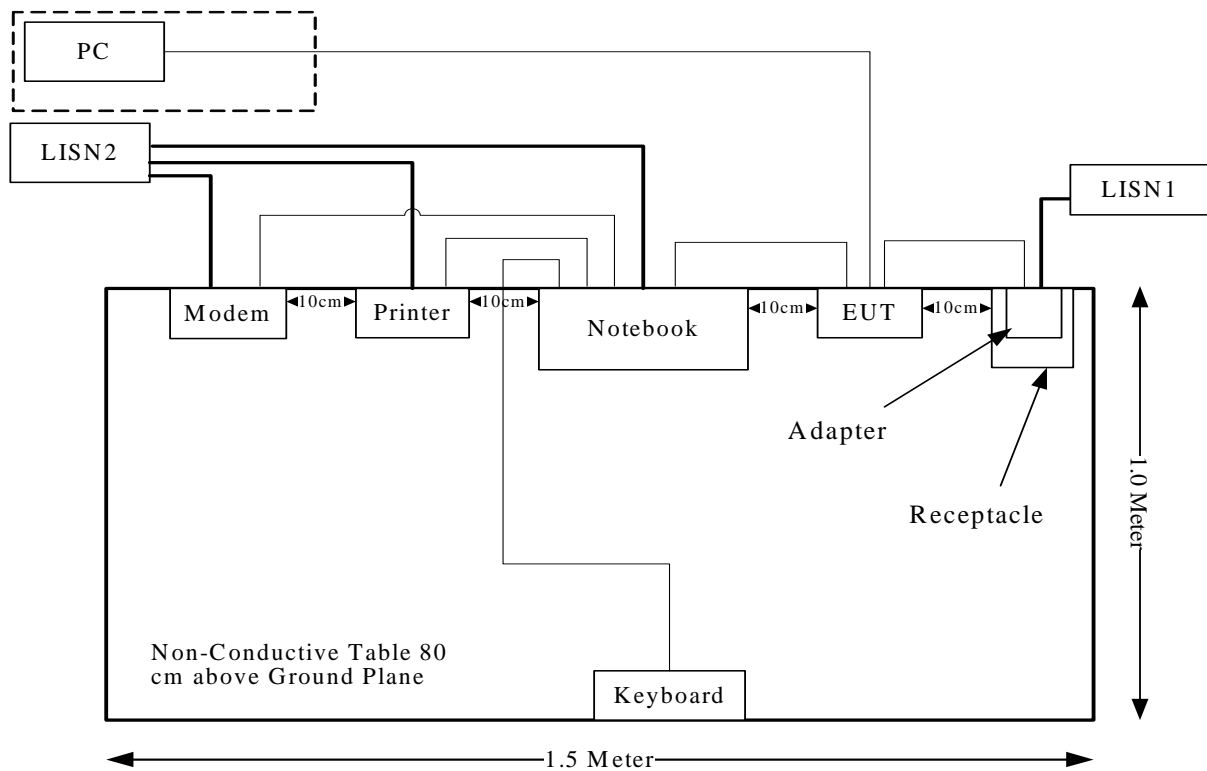
Support Equipment List and Details

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
DELL	PC	GX620	CK2Z891

External I/O Cable

Cable Description	Length (m)	From Port	To
Shielded Detachable Printer Cable	1.2	Parallel Port of Notebook	Printer
Shielded Detachable Serial Cable	1.2	Serial Port of Notebook	Modem
RJ45 cable	1.2	RJ45 port of Notebook	EUT
RJ45 cable	10	RJ45 port of PC	EUT
Shielded Detachable Keyboard Cable	1.5	Keyboard Port of Notebook	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

Measurement Uncertainty

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)

Vertical Reference Ground Plane

40cm

EUT

80cm

LISN

Test Receiver

Bonded to Horizontal Ground Plane

Horizontal Reference Ground Plane

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 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:

<i>Frequency Range</i>	<i>IF BW</i>
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:

10.03 dB at 0.495 MHz in the **Neutral** conducted mode

Test Data

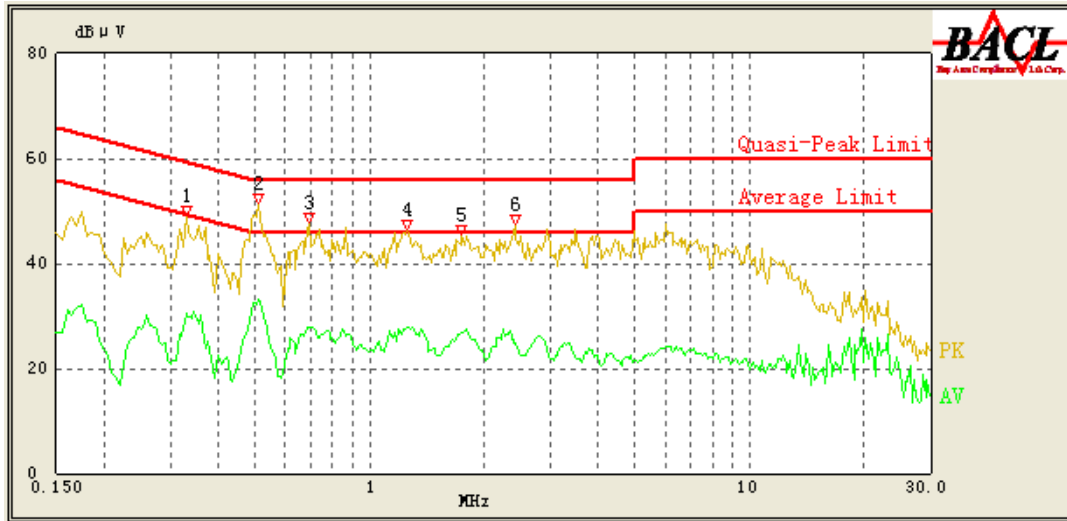
Environmental Conditions

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

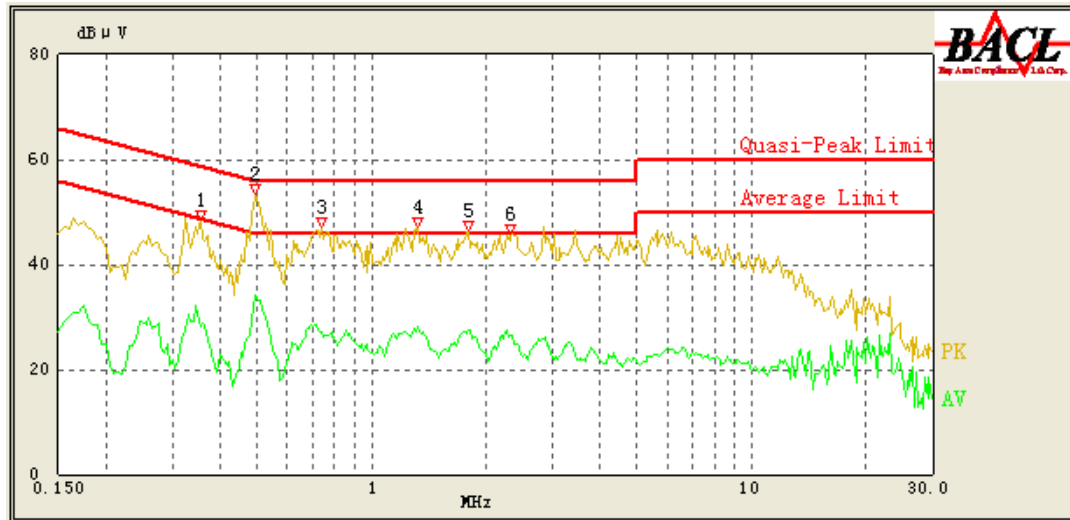
The testing was performed by Ares Liu on 2012-07-26.

Test Mode: Operating

120 V, 60 Hz, Line:



Frequency (MHz)	Corrected Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.510	44.46	0.42	56.00	11.54	QP
0.510	33.01	0.42	46.00	12.99	Ave.
0.690	39.89	0.44	56.00	16.11	QP
1.260	38.19	0.46	56.00	17.81	QP
0.695	28.00	0.44	46.00	18.00	Ave.
1.745	37.96	0.47	56.00	18.04	QP
1.260	27.90	0.46	46.00	18.10	Ave.
0.330	42.20	0.42	60.86	18.66	QP
1.755	26.75	0.47	46.00	19.25	Ave.
2.410	36.67	0.48	56.00	19.33	QP
0.330	30.64	0.42	50.86	20.22	Ave.
2.400	25.39	0.48	46.00	20.61	Ave.

120V, 60 Hz, Neutral:

Frequency (MHz)	Corrected Result (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/QP/Ave.)
0.495	46.11	0.42	56.14	10.03	QP
0.495	34.16	0.42	46.14	11.98	Ave.
0.740	40.12	0.44	56.00	15.88	QP
1.800	38.91	0.47	56.00	17.09	QP
1.330	38.37	0.46	56.00	17.63	QP
1.320	28.30	0.46	46.00	17.70	Ave.
2.330	38.08	0.48	56.00	17.92	QP
1.800	27.52	0.47	46.00	18.48	Ave.
0.740	27.10	0.44	46.00	18.90	Ave.
0.355	40.81	0.42	60.14	19.33	QP
2.335	26.49	0.48	46.00	19.51	Ave.
0.355	28.15	0.42	50.14	21.99	Ave.

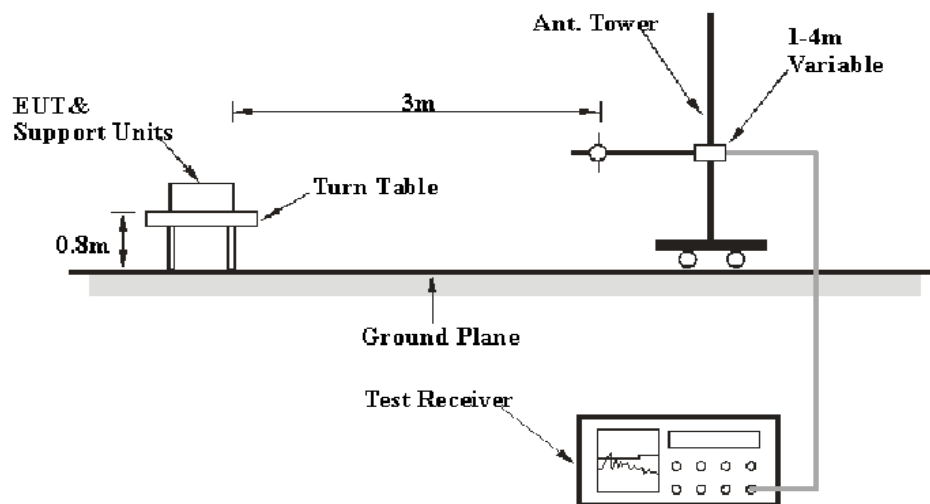
FCC §15.109 - RADIATED EMISSIONS

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 ± 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:

<u>Frequency</u>	<u>RBW</u>	<u>VBW</u>	<u>Detection</u>
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

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	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:

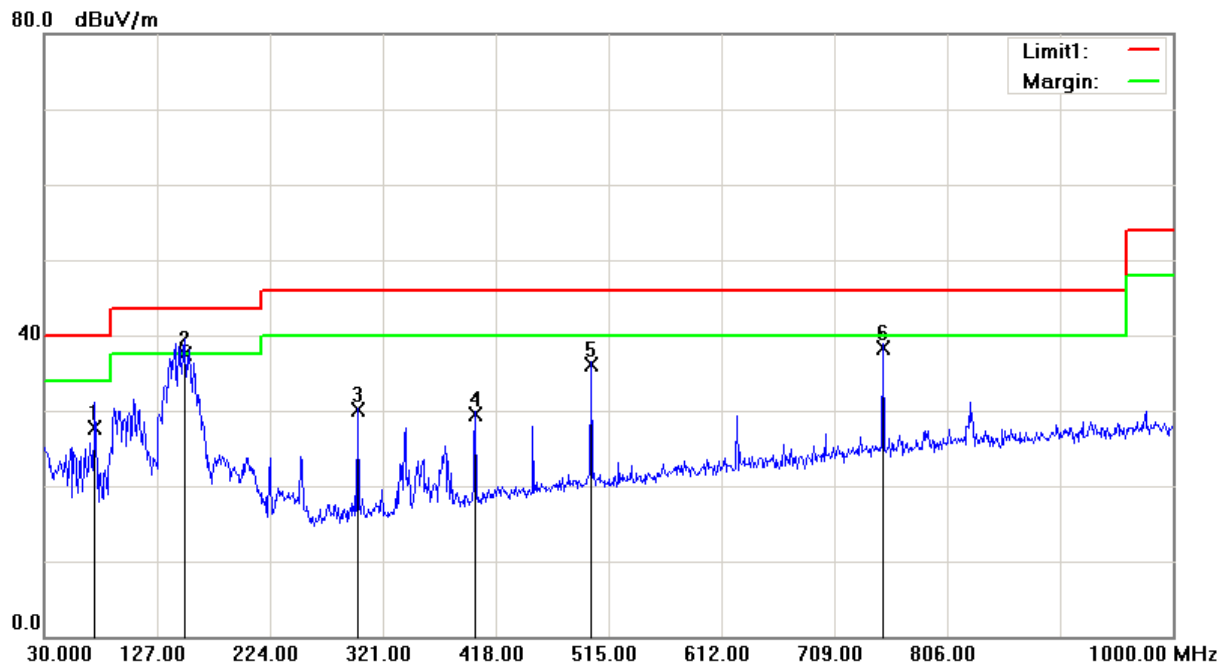
5.20 dB at 44.5500 MHz in the Vertical polarization

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.

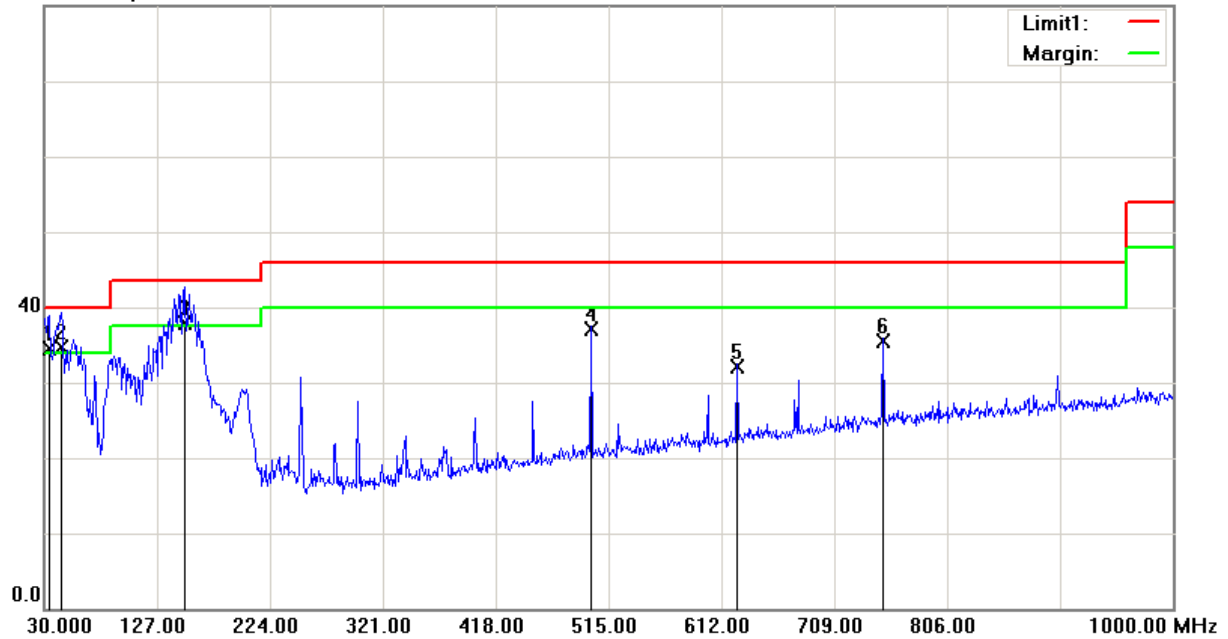
Test Mode: Operating

Horizontal

Frequency (MHz)	Reading (dBμV)	Detector	Correction Factor (dB)	Corrected Amplitude (dBμV/m)	Limit (dBuV/m)	Margin (dB)
150.2800	44.71	QP	-7.21	37.50	43.50	6.00
750.7100	35.99	QP	2.41	38.40	46.00	7.60
500.4500	37.40	QP	-1.20	36.20	46.00	9.80
73.6500	39.62	QP	-11.82	27.80	40.00	12.20
299.6600	35.52	QP	-5.42	30.10	46.00	15.90
400.5400	32.64	QP	-3.14	29.50	46.00	16.50

Vertical

80.0 dBuV/m



Frequency (MHz)	Reading (dBμV)	Detector	Correction Factor (dB)	Corrected Amplitude (dBμV/m)	Limit (dBuV/m)	Margin (dB)
44.5500	44.04	QP	-9.24	34.80	40.00	5.20
33.8800	35.97	QP	-1.37	34.60	40.00	5.40
150.2800	45.11	QP	-7.21	37.90	43.50	5.60
500.4500	38.30	QP	-1.20	37.10	46.00	8.90
750.7100	33.19	QP	2.41	35.60	46.00	10.40
625.5800	31.52	QP	0.68	32.20	46.00	13.80

* Within measurement uncertainty.

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