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Report On

FCC Testing of the Wuxi MitraStar Technology Co.Ltd
2.4GHz Wireless ADSL2+ Router
DSL-100FN-T1

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FCC ID: 2AC9MDSL100FNT1

Document 708881499001 Report 02 Issue 1

March 2016



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REPORT ON

FCC Testing of the Wuxi MitraStar Technology Co.Ltd
2.4GHz Wireless ADSL2+ Router
DSL-100FN-T1
In accordance with FCC CFR 47 Part 15B

Document 708881499001 Report 02 Issue 1

March 2016

PREPARED FOR

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PREPARED BY

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APPROVED BY

Hui TONG
Project Engineer

DATED

22 March, 2016

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Wenwen CHENG

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SECTION 1

REPORT SUMMARY

FCC Testing of the Wuxi MitraStar Technology Co.Ltd
2.4GHz Wireless ADSL2+ Router
DSL-100FN-T1
In accordance with FCC CFR 47 Part 15B



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the Wuxi Mitrasstar Technology Co.Ltd 2.4GHz Wireless ADSL2+Router DSL-100FN-T1 to the requirements of FCC CFR 47 Part 15B.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Wuxi Mitrasstar Technology Co.Ltd
Model Number(s)	DSL-100FN-T1
Serial Number(s)	Engineering sample
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2014)
Incoming Release Date	Application Form 21 August 2014
Order Number	708881499001
Date	10 September 2014
Start of Test	16 September 2014
Finish of Test	18 September 2014
Name of Engineer(s)	Wenwen CHENG



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B:2012 is shown below.

Configuration - Short Range Device Wireless USB Receiver				
Section	FCC Clause	Test Description	Result	Comments/Base Standard
2.1	15.107	AC Line Conducted Emissions	Pass	
2.2	15.109	Radiated Emissions	Pass	



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1.3 APPLICATION FORM

APPLICANT'S DETAILS	
COMPANY NAME :	Wuxi Mitrastar Technology Co.Ltd
ADDRESS :	60#-E Minshan Road, High and New Technology Industrial Development Zone,Wuxi Jiangsu Province, China
NAME FOR CONTACT PURPOSES :	Forest.Xue
TELEPHONE NO:	+86-510-8523-2888-15753
FAX NO:	+86-510-8522-2690
E-MAIL:	Forest.Xue@mitrastar.cn

EQUIPMENT INFORMATION	
MANUFACTURING DESCRIPTION	2.4GHz Wireless ADSL2+Router
MANUFACTURING	Wuxi Mitrastar Technology Co.Ltd
TYPE	DSL-100FN-T1
SERIAL NUMBER	S140Y22060379
CONUTRY OF ORIGIN	America
FCC ID	2AC9MDSL100FNT1
TECHNICAL DESCRIPTION	2.4GHz Wireless ADSL2+Router
MANUFACTURING DESCRIPTION	The 2.4GHz Wireless ADSL2+Router rated with input voltage: DC 12V form adapter
Adapter information	Brand name: AMIGO Model: AMS20-1200500FV2 Input: 100-240V~50/60 Hz, 0.2A Output: DC 12V, 0.5A

No responsibility will be accepted by TÜV SÜD Certification and Testing (China) Co., Ltd. Shanghai Branch as to the accuracy of the information declared in this document by the manufacturer.



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) Wuxi Mitrastar Technology Co.Ltd, 2.4GHz Wireless ADSL2+Router DSL-100FN-T1. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

Test Mode:

Test mode 1: RJ45 Network port communication with laptop;

FCC Measurement Facility Registration Number
809388 MRT Technology (Suzhou) Co., Ltd
D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong
Economic Development Zone, Suzhou,
P.R. China

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

FCC Testing of the Wuxi MitraStar Technology Co.Ltd
2.4GHz Wireless ADSL2+ Router
DSL-100FN-T1
In accordance with FCC CFR 47 Part 15B



Product Service

2.1 AC LINE CONDUCTED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.107

2.1.2 Equipment Under Test and Modification State

DSL-100FN-T1 S/N: S140Y22060379 - Modification State 0

2.1.3 Date of Test

16 September 2014

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The EUT is set up on a test table 800mm above a horizontal ground plane. A vertical ground plane is also required and is placed 400mm from the EUT. Where a EUT is floor standing it will be stood on but insulated from the ground plane by up to 12mm.

The EUT is powered through a Line Impedance Stabilisation Network (LISN) which is bonded to the ground plane. The EUT is located so that the distance between the EUT and the LISN is no less than 800mm. Where possible the cable between the mains input of the EUT and the LISN is 1m. Where this is not possible the cable is non inductively bundled with the bundle not exceeding 400mm in length.

A preliminary profile of the Conducted Emissions is obtained over the frequency range 150kHz to 30MHz. Any points of interest are noted for formal measurements.

During formal measurements, the measuring receiver is tuned to the emission of interest where Quasi – Peak and Average measurements are performed in a 9kHz Video and Resolution Bandwidth.

2.1.6 Environmental Conditions

Ambient Temperature	24.5°C
Relative Humidity	28.0%

**2.1.7 Test Results**

Test mode 1: Idle / receiver & charging mode

Live Line

Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.435	50.50	57.16	-6.66	36.55	47.16	-10.61
0.495	50.20	56.08	-5.88	30.04	46.08	-16.04
0.57	50.18	56.00	-5.82	35.71	46.00	-10.29
0.69	43.14	56.00	-12.86	28.43	46.00	-17.57
0.885	37.98	56.00	-18.02	22.23	46.00	-23.77
1.14	38.55	56.00	-17.45	23.70	46.00	-22.30
1.65	36.41	56.00	-10.59	23.05	46.00	-22.95



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Neutral Line

Frequency (MHz)	QP Level (dBμV)	QP Limit (dBμV)	QP Margin (dBμV)	AV Level (dBμV)	AV Limit (dBμV)	AV Margin (dBμV)
0.445	46.96	56.97	-10.01	34.15	46.97	-12.82
0.48	53.66	56.34	-2.68	41.22	46.34	-5.12
0.535	51.22	56.00	-4.78	38.36	46.00	-7.64
1.01	42.87	56.00	-13.13	30.05	46.00	-15.95
1.52	37.03	56.00	-18.97	26.52	46.00	-19.48



Product Service

2.2 RADIATED EMISSIONS

2.2.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

2.2.2 Equipment Under Test and Modification State

DSL-100FN-T1 S/N: S140Y22060379 - Modification State 0

2.2.3 Date of Test

16 September 2014

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Procedure

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 5th harmonic of the EUT's highest internally generated fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on a test table 800mm above the ground plane. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m. Above 18GHz this distance may be reduced to 1m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 40GHz require Peak and Average measurements. The Peak measurements are made using a peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

2.2.6 Environmental Conditions

Ambient Temperature	24.5°C
Relative Humidity	28.0%

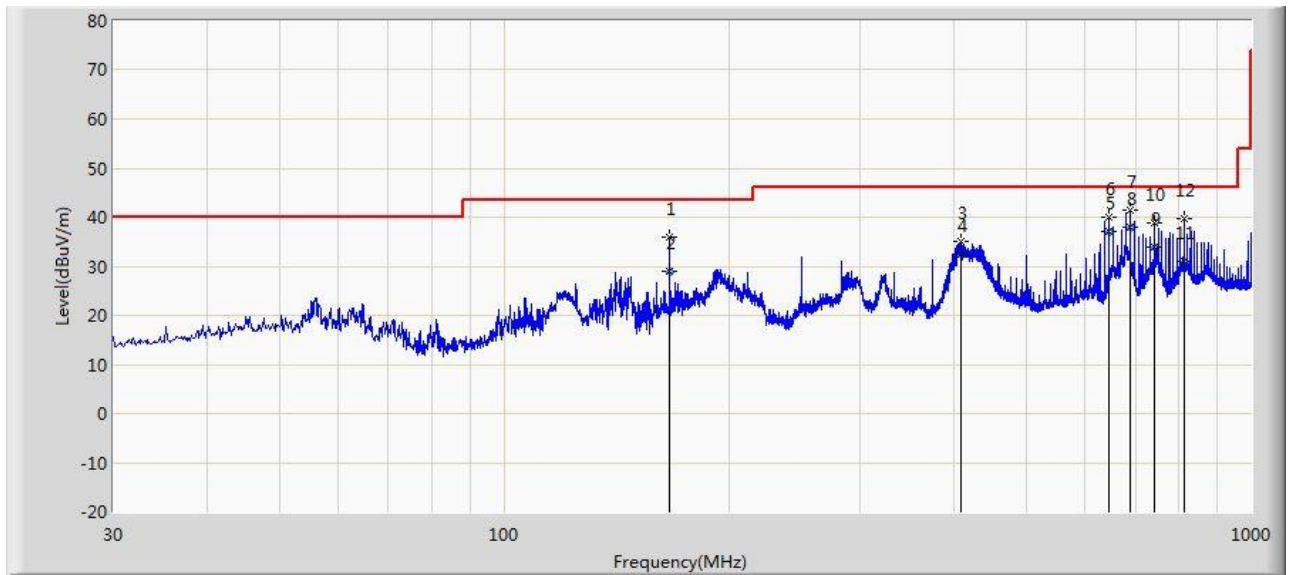


2.2.7 Test Results

Test mode 1: Communication mode

30 MHz to 1 GHz

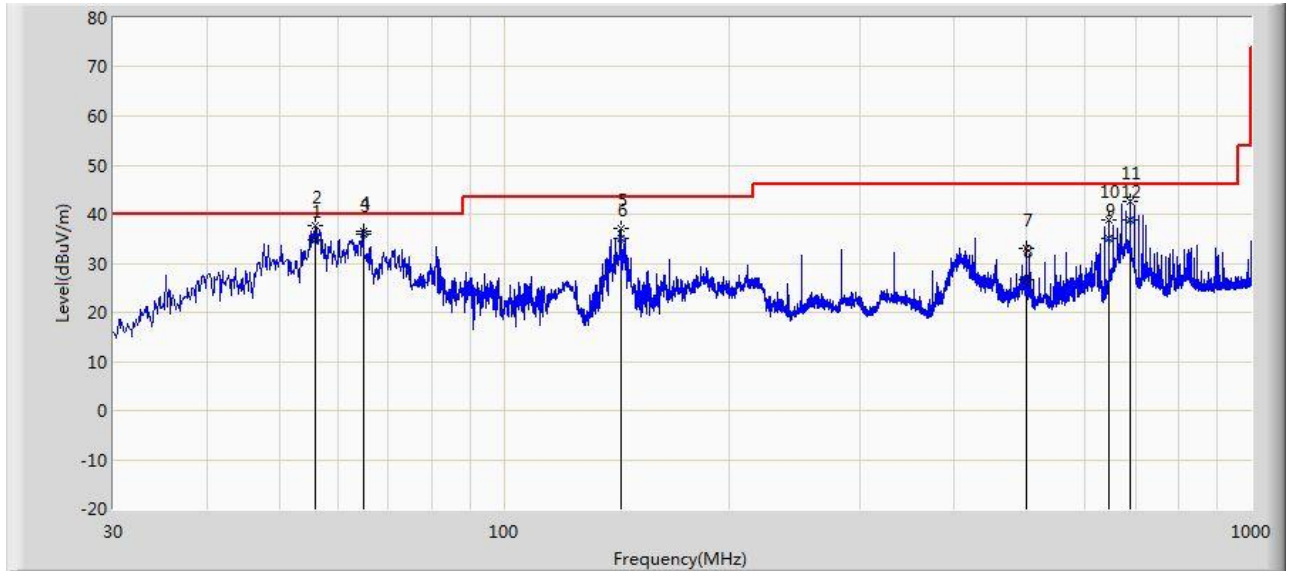
Horizontal Polarisation



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			166.649	35.907	26.122	-7.593	43.500	9.784	PK
2			166.665	28.986	19.200	-14.514	43.500	9.785	QP
3			409.634	34.932	18.573	-11.068	46.000	16.359	PK
4			409.770	32.461	16.100	-13.539	46.000	16.361	QP
5			644.733	37.036	17.100	-8.964	46.000	19.936	QP
6			644.737	39.992	20.056	-6.008	46.000	19.936	PK
7		*	688.872	41.592	20.893	-4.408	46.000	20.699	PK
8			688.895	37.999	17.300	-8.001	46.000	20.699	QP
9			741.851	33.839	12.400	-12.161	46.000	21.439	QP
10			741.859	38.926	17.487	-7.074	46.000	21.439	PK
11			812.529	30.994	8.700	-15.006	46.000	22.294	QP
12			812.547	39.673	17.379	-6.327	46.000	22.294	PK



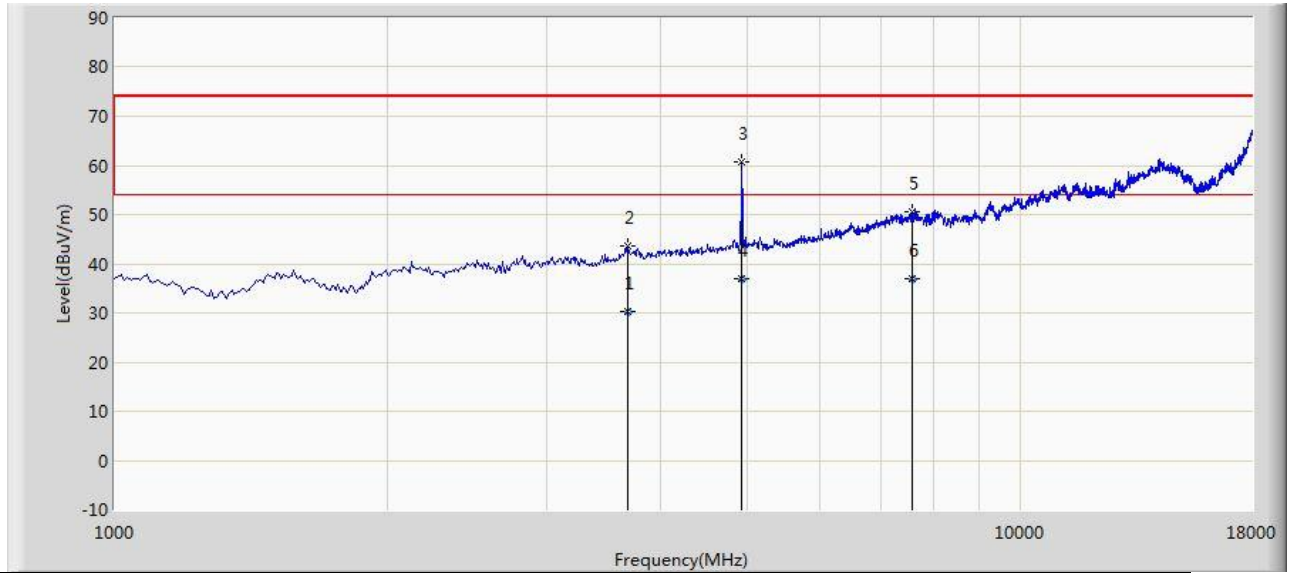
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Vertical Polarisation

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			55.862	34.763	20.400	-5.237	40.000	14.362	QP
2		*	55.947	37.770	23.421	-2.230	40.000	14.349	PK
3			64.783	35.912	23.500	-4.088	40.000	12.411	QP
4			64.799	36.389	23.983	-3.611	40.000	12.406	PK
5			143.247	37.208	28.062	-6.292	43.500	9.146	PK
6			143.279	35.046	25.900	-8.454	43.500	9.146	QP
7			499.965	32.902	15.160	-13.098	46.000	17.742	PK
8			500.009	26.642	8.900	-19.358	46.000	17.742	QP
9			644.732	35.036	15.100	-10.964	46.000	19.936	QP
10			644.737	38.733	18.797	-7.267	46.000	19.936	PK
11			688.872	42.745	22.046	-3.255	46.000	20.699	PK
12			688.902	38.799	18.100	-7.201	46.000	20.699	QP



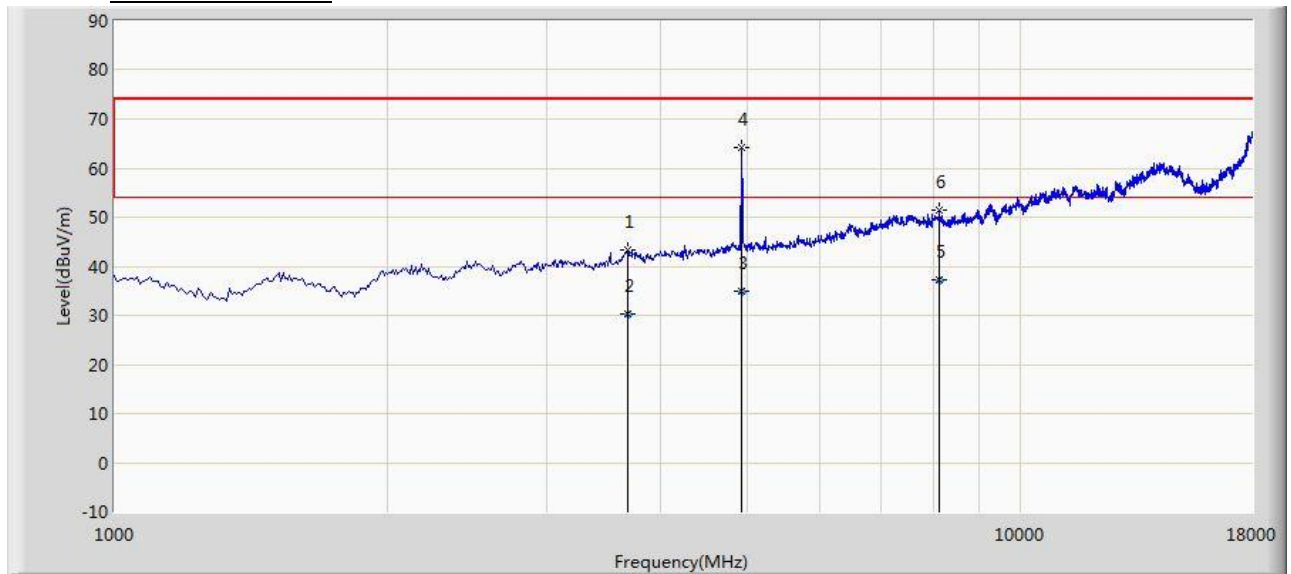
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1 GHz to 18 GHzHorizontal Polarisation

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			3685.505	30.232	26.228	-23.768	54.000	4.004	AV
2			3686.000	43.492	39.488	-30.508	74.000	4.004	PK
3		*	4927.000	60.771	54.047	-13.229	74.000	6.724	PK
4			4927.007	37.024	30.300	-16.976	54.000	6.724	AV
5			7587.500	50.722	36.078	-23.278	74.000	14.644	PK
6			7587.995	36.813	22.171	-17.187	54.000	14.642	AV



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Vertical Polarisation

No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Type
1			3686.000	43.442	39.438	-30.558	74.000	4.004	PK
2			3686.329	30.235	26.230	-23.765	54.000	4.005	AV
3			4926.864	35.047	28.323	-18.953	54.000	6.724	AV
4		*	4927.000	64.241	57.517	-9.759	74.000	6.724	PK
5			8131.102	37.285	22.272	-16.715	54.000	15.014	AV
6			8131.500	51.409	36.397	-22.591	74.000	15.012	PK



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SECTION 3

TEST EQUIPMENT USED



Product Service

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Conducted Emissions

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	1 year	2014/11/08
Two-Line V-Network	R&S	ENV216	1 year	2014/11/08
Two-Line V-Network	R&S	ENV216	1 year	2014/11/08
Temperature/ Meter Humidity	Anymetre	TH101B	1 year	2014/11/15

Radiated Emission

Instrument	Manufacturer	Type No.	Cali. Interval	Cali. Due Date
Spectrum Analyzer	Agilent	E4447A	1 year	2014/11/18
EMI Test Receiver	R&S	ESR7	1 year	2014/11/08
Preamplifier	MRT	AP18G40	1 year	2014/10/07
Preamplifier	MRT	AP01G18	1 year	2014/10/07
Loop Antenna	Schwarzbeck	FMZB1519	1 year	2014/11/24
TRILOG Antenna	Schwarzbeck	VULB9162	1 year	2014/11/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	1 year	2014/11/24
Broadband Horn Antenna	Schwarzbeck	BBHA9170	1 year	2014/12/11
Temperature/Humidity Meter	Anymetre	TH101B	1 year	2014/11/15

Auxiliary Device

	Model Number	Manufacturer	Description
■ -	X23-	LENOVO	Laptop



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3.2 MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k = 2$.

AC Conducted Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 150kHz~30MHz: $\pm 3.46\text{dB}$
Radiated Emission Measurement
Measuring Uncertainty for a Level of Confidence of 95% ($U=2U_c(y)$): 9kHz ~ 1GHz: $\pm 4.18\text{dB}$ 1GHz ~ 40GHz: $\pm 4.76\text{dB}$



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SECTION 4

DISCLAIMERS AND COPYRIGHT



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4.1 DISCLAIMERS AND COPYRIGHT

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