



Product Service

EMC TEST REPORT

Report Number : **68.760.0.025.01** Date of Issue: 3 March 2010

Model : **LEICA mojoMINI**

Product Type : GPS

Applicant : Leica Geosystems AG

Address : Heinrich-Wild-Strasse, Heerbrugg, CH-9435, Switzerland

Production Facility : Wanlida Group Co., Ltd.

Address : Wanlida Industry Zone, Nanjing, Fujian, China 363601

Test Result : **■ Positive** Negative

Total pages including Appendices : 18

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2 Details about the Test Laboratory

Details about the Test Laboratory

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Telephone: 86 755 2694 1599
Fax: 86 755 2694 1545



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3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product: GPS

Model no.: LEICA mojoMINI

Serial number: NIL

Options and accessories: NIL

Rating: DC 5V 2A
Test with Car Charger:
Input: DC 12-24V, 1.2A Max
Output: DC 5V, 2A

Antenna: Integral antenna inside enclosure of EUT, NOT accessible by end user

RF Transmission
Frequency: 2400-2483.5MHz

Description of the EUT: NIL

Auxiliary Equipment and Cable Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
LCD monitor	Lenovo	9227-AE1	V1TDB38
Keyboard	Lenovo	SK-8825 (L)	02553778
Mouse	Lenovo	MO28UOL	4418011108
PC host	Lenovo	9439	L3BDF2K
Headphone	Ouyun	OH601	----
SD card	Kingston	SD4/4GBFE	----
VGA cable	Lenovo	Shield	140cm
AC Power cable	Lenovo	Unshield	180cm



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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart B	PART 15 - RADIO FREQUENCY DEVICES Subpart B - Unintentional Radiators



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5 Summary of Test Results

Technical Requirements					
FCC Part 15 Subpart B		Pages	Test Result		
Test Condition			Pass	Fail	N/A
15.107 Conducted Emission AC Power Port		8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15.109 Spurious radiated emissions		12	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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6 General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: RFD-LEICAMOJOMINI filing to comply with Section 15.107, 15.109 of the FCC Part 15, Subpart B Rules.

SUMMARY:

All tests according to the regulations cited on page 5 were

- Performed
- Not Performed

The Equipment Under Test

- **Fulfills** the general approval requirements.
- **Does not** fulfill the general approval requirements.

Sample Received Date: 3 February 2010

Testing Start Date: 8 February 2010

Testing End Date: 26 February 2010

- Jiangsu TÜV Product Service Ltd. – Shenzhen Branch -

Reviewed by: Prepared by:

Paul Yu
EMC Project Manager

Ken Li
EMC Project Engineer



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7 Technical Requirement

7.1 Conducted Emission

Test Method

- 1 The EUT was placed on a table, which is 0.8m above ground plane
- 2 The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.).
- 3 Maximum procedure was performed to ensure EUT compliance
- 4 A EMI test receiver (R&S Test Receiver ESCS30) is used to test the emissions from both sides of AC line

Test Mode

Run Test Program

-The test program BIT.exe exercises all the drive and ports of the EUT, and displaying scrolling H on the screen.

Limit

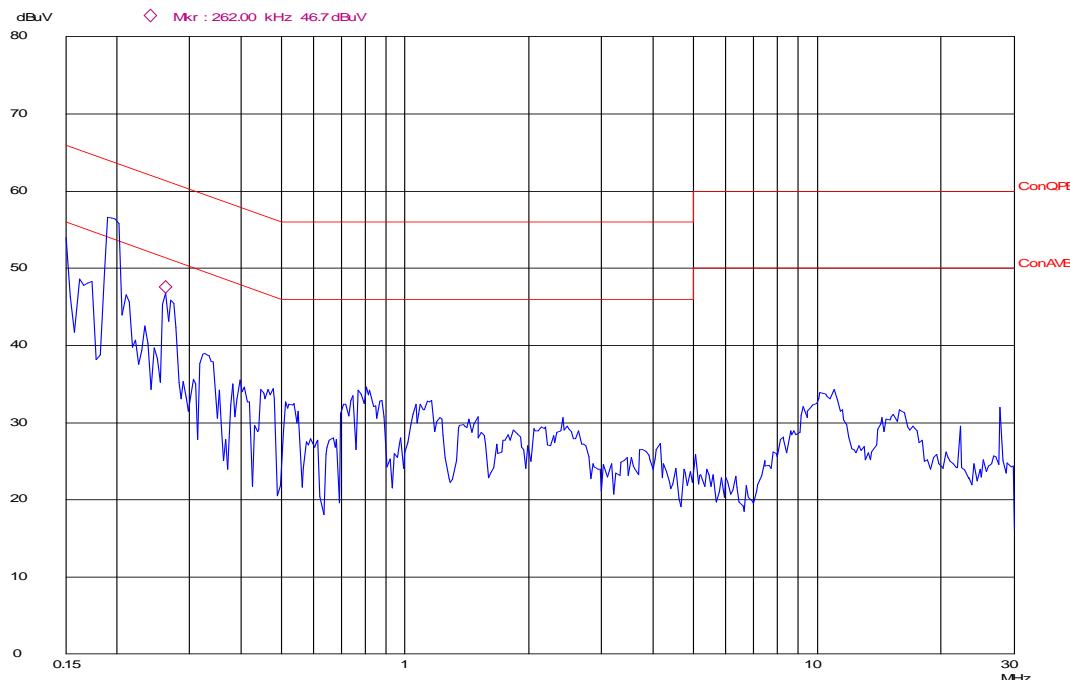
Frequency MHz	QP Limit dB μ V	AV Limit dB μ V
0.150-0.500	66-56*	56-46*
0.500-5	56	46
5-30	60	50

Decreasing linearly with logarithm of the frequency

Conducted Emission

Conducted Disturbance

EUT: MN.LBCAmojOMINI
 Op Cond: Connect to PC
 Test Spec: L
 Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dBµV	QP Test result dBµV	QP Limit dBµV	Margin dB
0.192	9.8	43.0	52.8	63.9	11.1
0.265	9.8	32.5	42.3	61.3	19.0

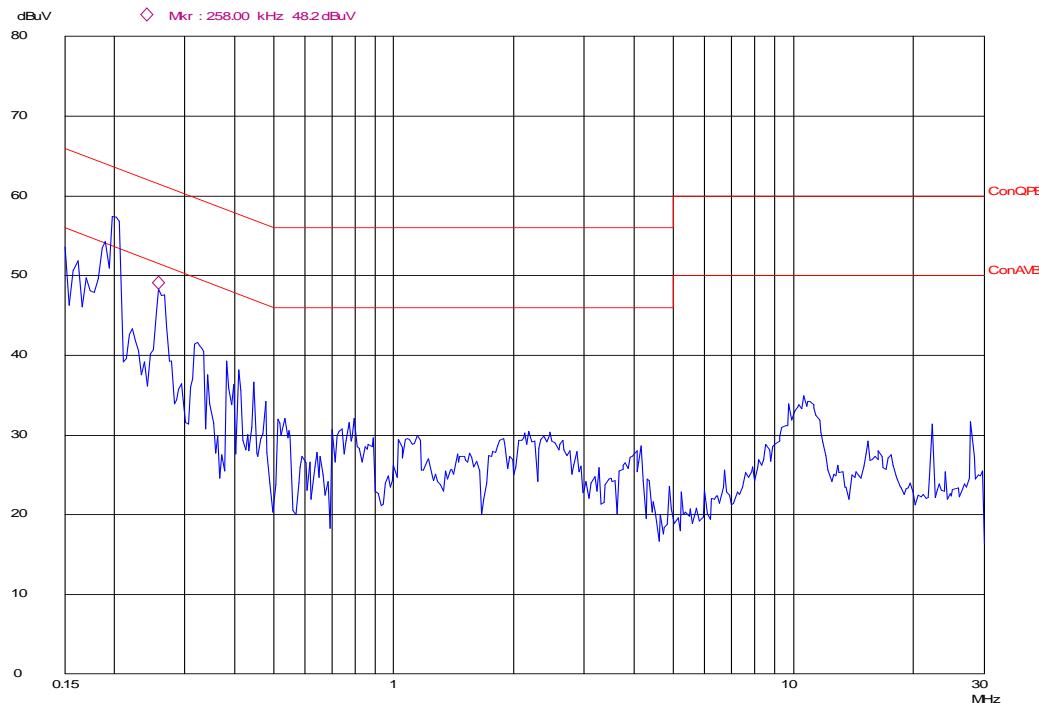
Frequency MHz	Cable Loss dB	Reading dBµV	AV Test result dBµV	AV Limit dBµV	Margin dB
0.192	9.8	25.0	34.8	53.9	19.1
0.265	9.8	16.8	26.6	51.3	24.7

Remark: Test Result= Reading + Cable Loss

Conducted Emission

Conducted Disturbance

EUT: MN:LBCAmojoMINI
 Op Cond: Connect to PC
 Test Spec: N
 Comment: AC 120V/60Hz



Frequency MHz	Cable Loss dB	Reading dB μ V	QP Test result dB μ V	QP Limit dB μ V	Margin dB
0.198	9.8	44.3	54.1	63.7	9.6
0.261	9.8	34.2	44.0	61.4	17.4

Frequency MHz	Cable Loss dB	Reading dB μ V	AV Test result dB μ V	AV Limit dB μ V	Margin dB
0.198	9.8	25.4	35.2	53.7	18.5
0.261	9.8	15.3	25.1	51.4	26.3

Remark: Test Result= Reading + Cable Loss



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Test Equipment List

Conducted Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESCS30	100003	Dec 23 2010
AMN	Rohde & Schwarz	ESH3-Z5	100229	Dec 23 2010
AMN	Rohde & Schwarz	ENV216	100042	Dec 23 2010

7.2 Radiated emissions

Test Method

- 1 The EUT is placed on a turntable, which is 0.8m above ground plane.
- 2 The turntable shall be rotated for 360 degrees to determine the position of maximum emission level
- 3 EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
- 4 Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5 Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

Test Mode

Run Test Program

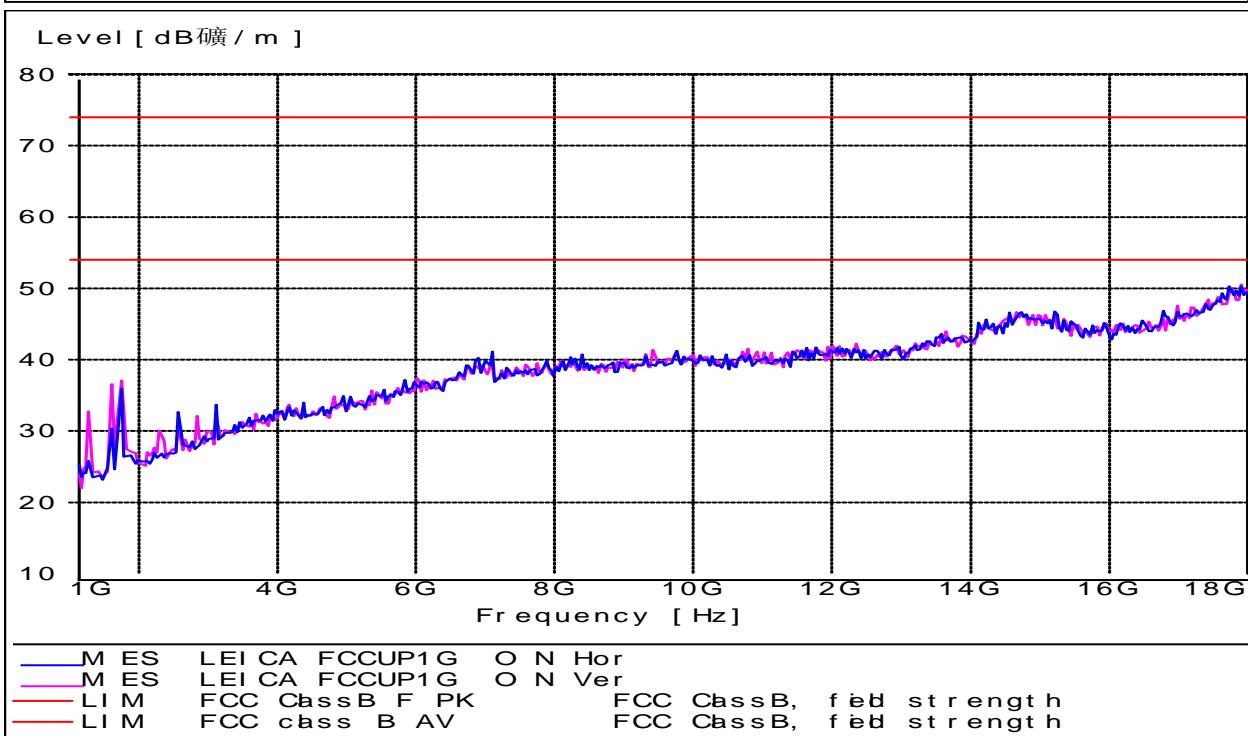
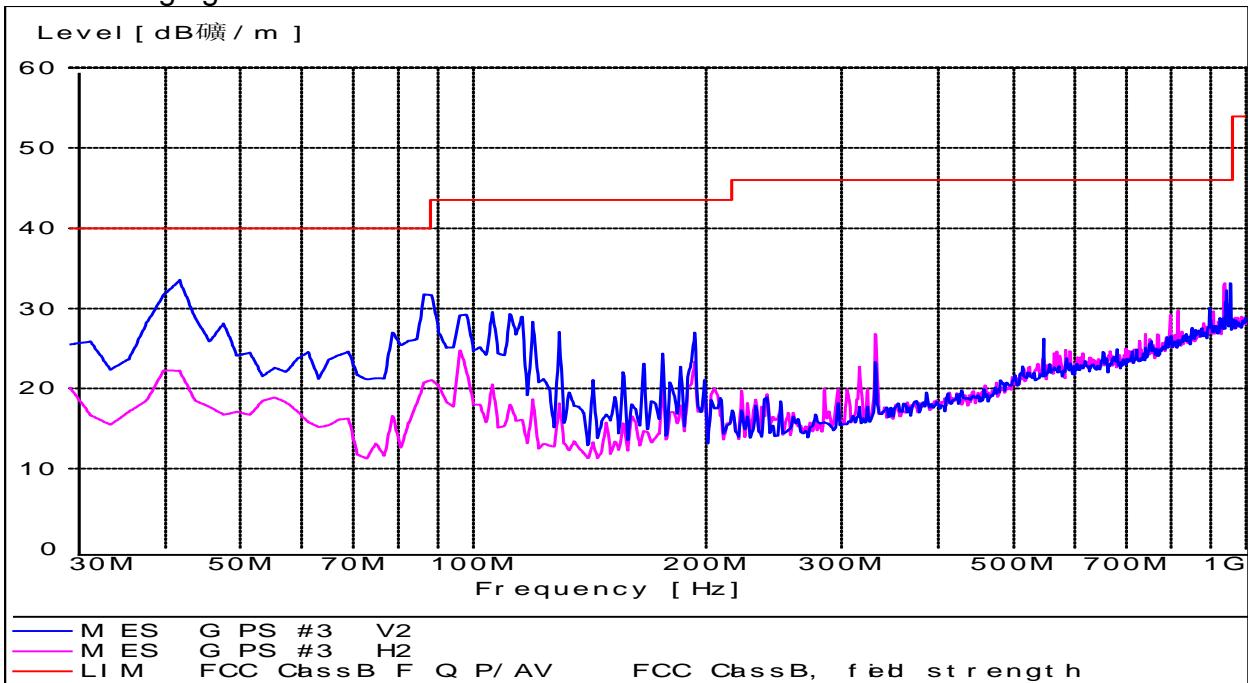
-The test program BIT.exe exercises all the drive and ports of the EUT, and displaying scrolling H on the screen.

Limit

Frequency MHz	Field Strength uV/m	Field Strength dB μ V/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

Radiated Emission

ON and Charging Mode test result:





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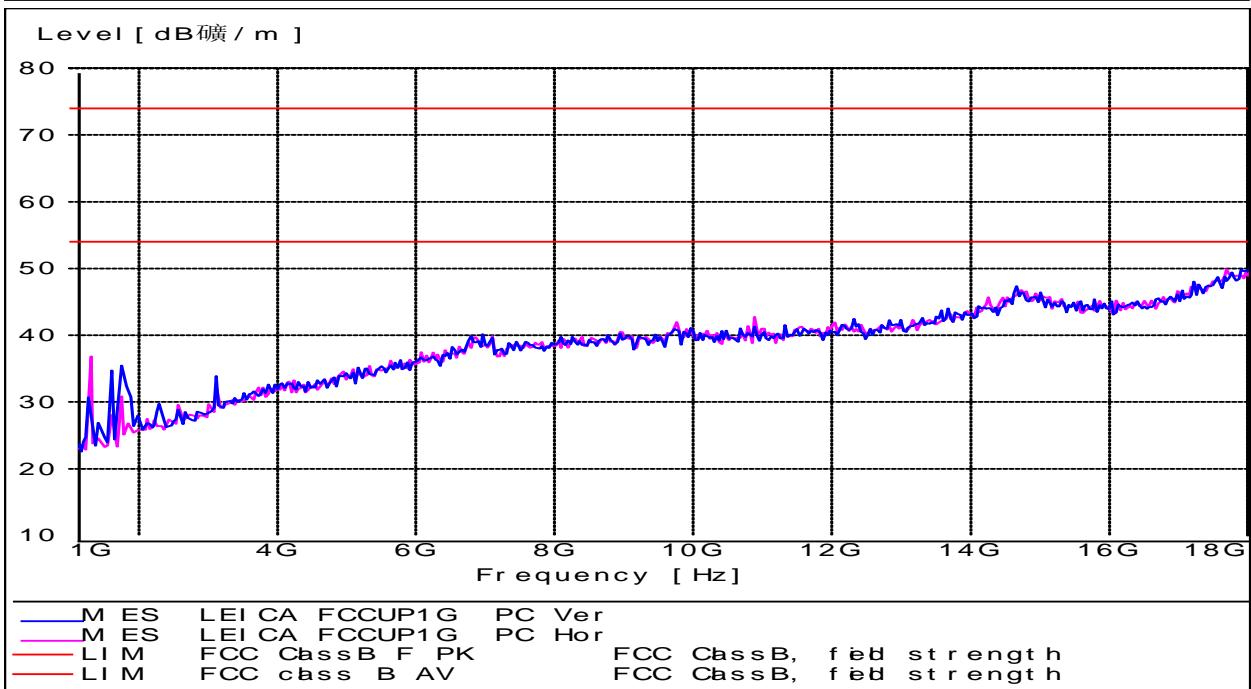
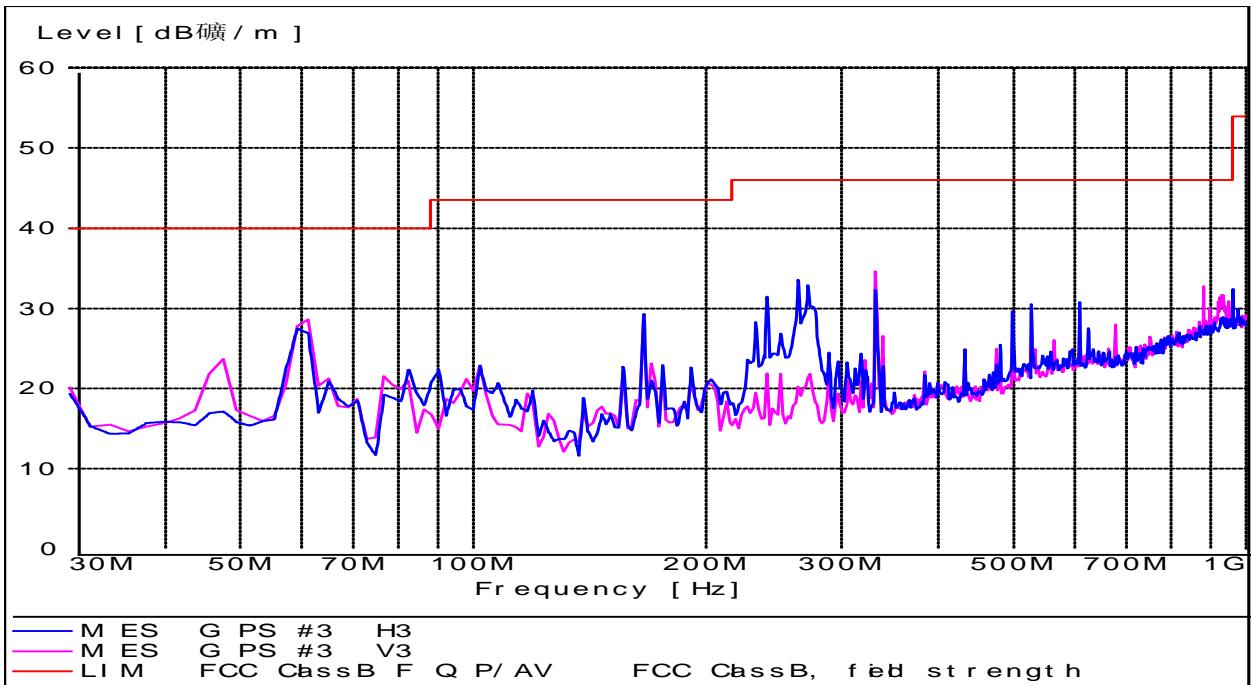
Radiated Emission

ON and Charging mode Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dB μ V/m	Detector	Result
41.663	1.2	12.8	17.2	31.2	Vertical	40.0	QP	Pass
88.316	1.6	10.7	17.8	30.1	Vertical	43.5	QP	Pass
2012.786	5.6	28.5	3.3	37.4	Vertical	74.0	PK	Pass
2012.786	5.6	28.5	1.2	35.3	Vertical	54.0	AV	Pass

Radiated Emission

Connect to PC Mode test result:





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Radiated Emission

Connect to PC mode Test Result

Frequency MHz	Cable Loss dB	Antenna Factor dB/m	Reading dBuV	Emission Level dBuV/m	Polarization	Limit dB μ V/m	Detector	Result
61.102	1.4	5.9	19.2	26.5	Vertical	40.0	QP	Pass
166.072	2.2	10.6	16.1	28.9	Horizontal	43.5	QP	Pass
263.266	2.8	13.7	14.7	31.2	Horizontal	46.0	QP	Pass
1312.886	4.5	25.1	8.9	38.5	Horizontal	74.0	QP	Pass
1312.886	4.5	25.1	4.5	34.1	Horizontal	54.0	QP	Pass



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Test Equipment List

Radiated Emission Test

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESI26	838786/013	Dec 23 2010
Bilog Antenna	Chase	CBL6112B	2591	Dec 23 2010
Signal Generator	Rohde & Schwarz	SMR20	100047	Dec 23 2010
Antenna	Schwarzbeck	VUBA9117	115	Dec 23 2010
Horn Antenna	Rohde & Schwarz	HF906	100013	Dec 23 2010



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8 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	$U=4.6\text{dB; } k=2(30\text{MHz-1GHz})$
CE	Disturbance Voltage (dB μ V)	$U=3.3\text{dB; } k=2$