



This document shall only be reproduced in full  
unless otherwise approved by this laboratory

## **TEST REPORT 47551.2**

### **SUBJECT**

OLPC Laptop model XO-1

### **CLIENT**

**Name:** OLPC Australia

**Address:** 15/758 Bourke St, Surry Hills, NSW 2010, Australia

**Order No:** Signed quote

**Date of Order/Letter:** 9<sup>th</sup> July 2008

**Attention:** Pia Waugh

### **NATURE OF TEST**

Testing for compliance with Australian Standard:  
AS/NZS CISPR 22:2004

### **RESULT**

The equipment under test complied with the Class B requirements.

### **DATE OF COMPLETION OF TESTS**

21<sup>st</sup> July 2008

### **DATE OF ISSUE**

28<sup>th</sup> July 2008

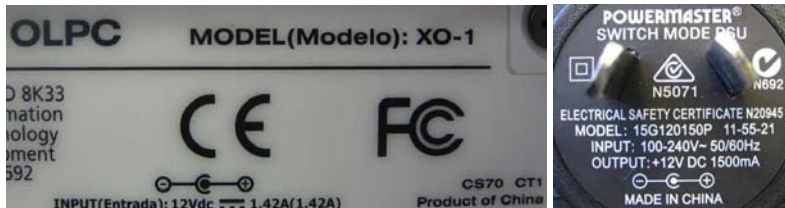
---

Xuan Liu  
Approved Signatory

This document shall only be reproduced in full  
unless otherwise approved by this laboratory

## **DESCRIPTION AND DETAILS OF EQUIPMENT UNDER TEST (EUT)**

Equipment : OLPC Laptop  
Manufacturer : OLPC Australia  
Model Number : XO-1  
Serial Number : SHF81502CAB  
Rated Voltage : 100-240 Vac, 50/60 Hz (Adaptor); 12 Vdc (Laptop)



The Equipment Under Test is an ordinary notebook PC with dual mode TFT LCD display and wireless networking interface. It can work under either battery powered or mains powered. Both of modes have been tested, but only worst results have been recorded in this report.

## **SELECTION OF SAMPLES**

The test sample was selected and delivered to the laboratory by the client.

## **LABORATORY IDENTIFICATION OF SAMPLES**

Adhesive labels bearing job number 47551 affixed to the sample.

## **DATE SAMPLES RECEIVED**

9<sup>th</sup> July 2008

## **SUMMARY OF RESULTS**

Terminal Voltages (0.15 to 30 MHz) Complied with a margin of at least 18.53 dB  
Radiated Emissions (30 to 1000 MHz) Complied with a margin of at least 7.68 dB

Measurement uncertainties at a 95% confidence level are:

Terminal Disturbance Voltage :  $\pm 1.6$  dB

Radiated Emissions :  $\pm 4.7$  dB



This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

## **TEST EQUIPMENT**

The following test equipment was used during these tests. All instruments within their specified calibration periods and traceable to Australian national standards of measurement.

<u>Manufacturer</u>	<u>Model</u>	<u>Description</u>	<u>Serial Number</u>	<u>Instrument #</u>	
Rohde & Schwarz	ESHS10	EMI Receiver	844591/027	13951	<input checked="" type="checkbox"/>
Rohde & Schwarz	ESVS10	EMI Receiver	844594/018	13952	<input checked="" type="checkbox"/>
Rohde & Schwarz	FSP3	Spectrum Analyser	1093.4495.03	105755	<input type="checkbox"/>
Rohde & Schwarz	ESH2-Z5	Artificial Mains Network	845268/004	14086	<input checked="" type="checkbox"/>
Rohde & Schwarz	ESH3-Z2	Pulse Limiter		100792	<input checked="" type="checkbox"/>
Rohde & Schwarz	SMT-06	Signal Generator	1039.2000.06	13975	<input type="checkbox"/>
Rohde & Schwarz	HK116	Biconical Antenna	849075/011	105762	<input type="checkbox"/>
Rohde & Schwarz	HL223	Log-periodic Antenna	848953/018	105763	<input type="checkbox"/>
Rohde & Schwarz	ENY22	Double 2-Wire ISN	100076	105760	<input type="checkbox"/>
Rohde & Schwarz	ENY41	4-Wire ISN	100075	105761	<input type="checkbox"/>
Schwarzbeck	MDS-20	Absorbing Clamp		100789	<input type="checkbox"/>
PMM	SHC-02	RF Voltage Probe	1022K70308	100791	<input type="checkbox"/>
Tektronix	TDS-460A	Oscilloscope		14353	<input type="checkbox"/>
Promax	GV-798	TV Pattern Generator	011009310009	105756	<input type="checkbox"/>
Suhner	4901.01.A	Power Divider		105757	<input type="checkbox"/>
Singer Instrumentation	91550-1	RF Current Probe	1058	105776	<input type="checkbox"/>
Schaffner	NSG-1025	Fast Transient Generator		12701	<input type="checkbox"/>
Schaffner	NSG-435	ESD Generator		12740	<input type="checkbox"/>
PMM	6600	RF Power Meter		14202	<input type="checkbox"/>
PMM	3000	Signal Generator		14203	<input type="checkbox"/>
PMM	6000	RF Power Amplifier		14204	<input type="checkbox"/>
Keytek	801-Plus	Surge Generator		11525	<input type="checkbox"/>
Kikusui	PCR2000	Power Supply		12205	<input type="checkbox"/>
Fischer Custom Com.	FCC-801-M3-16	Power line CDN	9764	105764	<input type="checkbox"/>
Fischer Custom Com.	FCC-801-M1-16	Power line CDN	9716	105765	<input type="checkbox"/>
Fischer Custom Com.	FCC-801-T2	Signal line CDN	9747	105766	<input type="checkbox"/>
Fischer Custom Com.	FCC-801-AF2	Signal line CDN	9734	105767	<input type="checkbox"/>
EMTest	UCS 500-M	Fast Transient Generator	0304-06	105775	<input type="checkbox"/>
Norma	D6000	Power Analyser		18006	<input type="checkbox"/>
Norma	DM-950	Multimeter		14337	<input type="checkbox"/>
Siemens	Q61	Moving Iron Voltmeter	Q61W7-438	8021	<input checked="" type="checkbox"/>
Rohde & Schwarz	ESxS-K1	EMI Software		V 2.20	<input checked="" type="checkbox"/>
TCA EMC	EMC-4-6	61000-4-6 Software		V 1.0	<input type="checkbox"/>



This document shall only be reproduced in full  
unless otherwise approved by this laboratory

## **AS/NZS CISPR 22:2004 REQUIREMENTS**

1.	Scope and object	Noted
2.	Normative references	Noted
3.	Definitions	Noted
4.	Classification of ITE	Noted
5.	Limits for conducted disturbance at mains terminals and telecommunication ports	Noted
5.1.	Limits of mains terminal disturbance voltage	Complies Class B
5.2.	Limits of conducted common mode (asymmetric mode) disturbance at telecommunications ports	Not applicable
6.	Limits for radiated disturbance	Complies Class B
8.	General measurement conditions	Noted
9.	Method of measurement of conducted disturbance at mains terminals and telecommunication ports	Noted
10.	Method of measurement of radiated disturbance	Noted



This document shall only be reproduced in full  
unless otherwise approved by this laboratory

## **INTERPRETATION OF EMISSION RESULT INFORMATION**

### ***Scan Configuration Data***

Start : The start frequency of the scan.

Stop : The stop frequency of the scan.

Step : The step size used during the scan.

IF BW : The IF Bandwidth used for the measurements.

Detector : The detectors selected on the receiver. PK = Peak Detector, AV = Average Detector.

M-Time : The measurement time at each step.

Atten : The attenuation setting on the receiver.

Preamp : Whether the pre-amplifier is turned on or off.

OpRge : The operating range of the receiver, either 60 dB range or 30 dB range.

### ***Limits***

Quasi Peak limit line : Red dashed line on graph.

Average limit line : Pink dashed line on graph.

### ***Results***

The blue line on the graph is the peak scan measurements. The corresponding quasi peak final measurements are represented by the red 'x' marked on the graph. The actual data for these points is in the measurement table for the relevant graph.

The green line on the graph is the average scan measurements. The corresponding average final measurements are represented by the pink '+' marked on the graph. The actual data for these points is in the measurement table for the relevant graph.



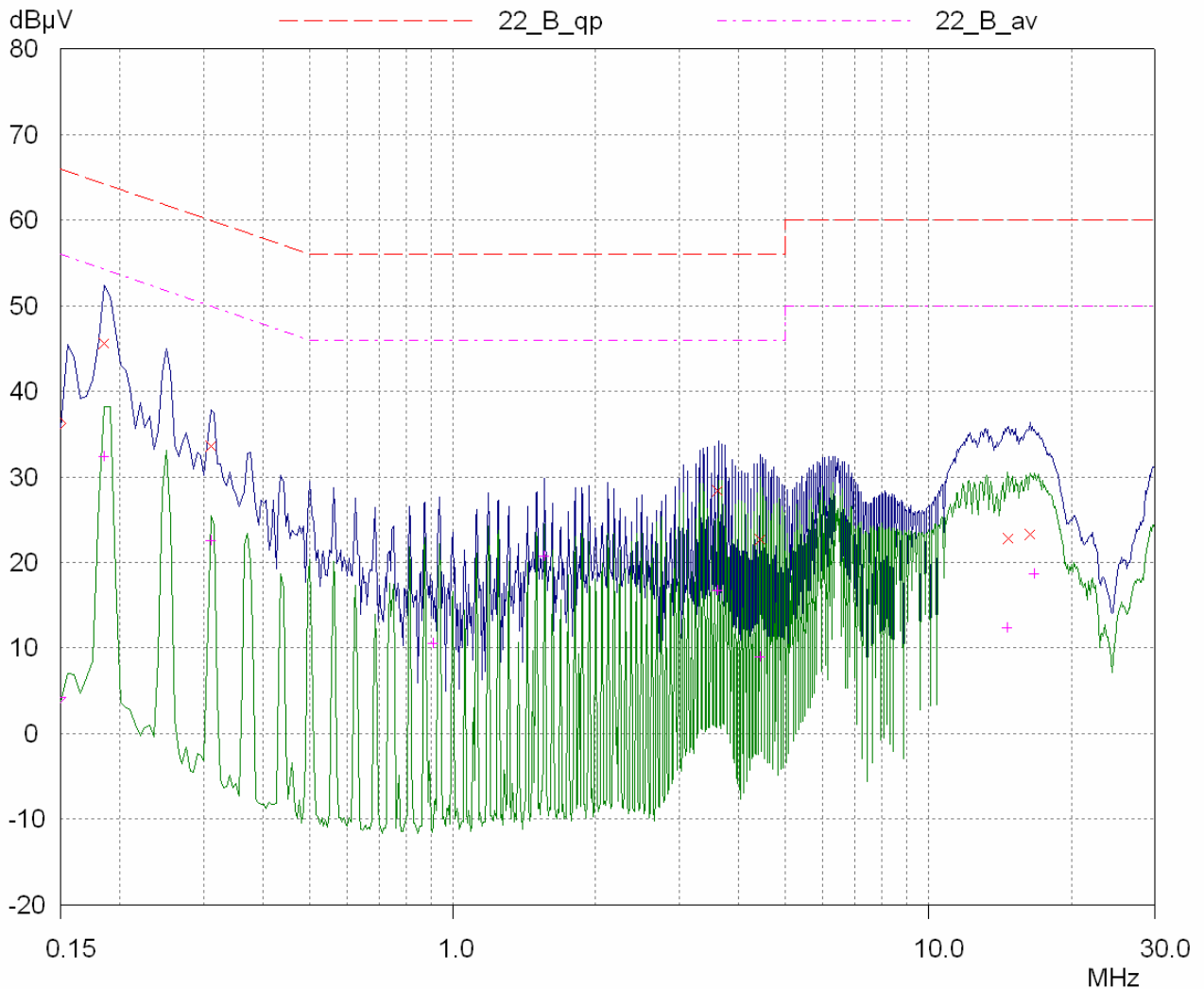
This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

**EMISSIONS RESULTS**

**Active Terminal**

Test: Terminal Disturbance Voltage Test 47551/001  
 Equipment: OLPC Laptop model XO-1  
 Manufacturer: OLPC Australia  
 Operating Condition: On  
 Testing Officer: X. Liu  
 Standard: AS/NZS CISPR 22:2004 Class B  
 Comments: Test Voltage : 240 V. (See Active Terminal Measurement Results  
 Table next page for measurements)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	ON	60dB



— : Peak scan result                      - - - : Quasi Peak Limit  
— : Average scan result                      - - - : Average limit  
x : Quasi peak final measurements  
+ : Average final measurements

The tests reported herein relate only to the samples tested.



This document shall only be reproduced in full  
unless otherwise approved by this laboratory

**Active Terminal Measurement Results Table**

Final Measurement Results Test

Measurement time for final measurements : 15 seconds

**Quasi Peak Detector**

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB
0.185	45.65	64.26	18.61
0.3101	33.53	59.97	26.44
3.60124	28.37	56.00	27.63
4.425	22.71	56.00	33.29
14.74953	22.84	60.00	37.16
16.375	23.31	60.00	36.69

**Average Detector**

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB
0.18491	32.42	54.26	21.84
0.3101	22.60	49.97	27.37
0.91102	10.54	46.00	35.46
1.55332	20.74	46.00	25.26
3.60124	16.68	46.00	29.32
4.425	9.01	46.00	36.99
14.65	12.31	50.00	37.69
16.68499	18.61	50.00	31.39

**Note:** A positive delta indicates compliance.

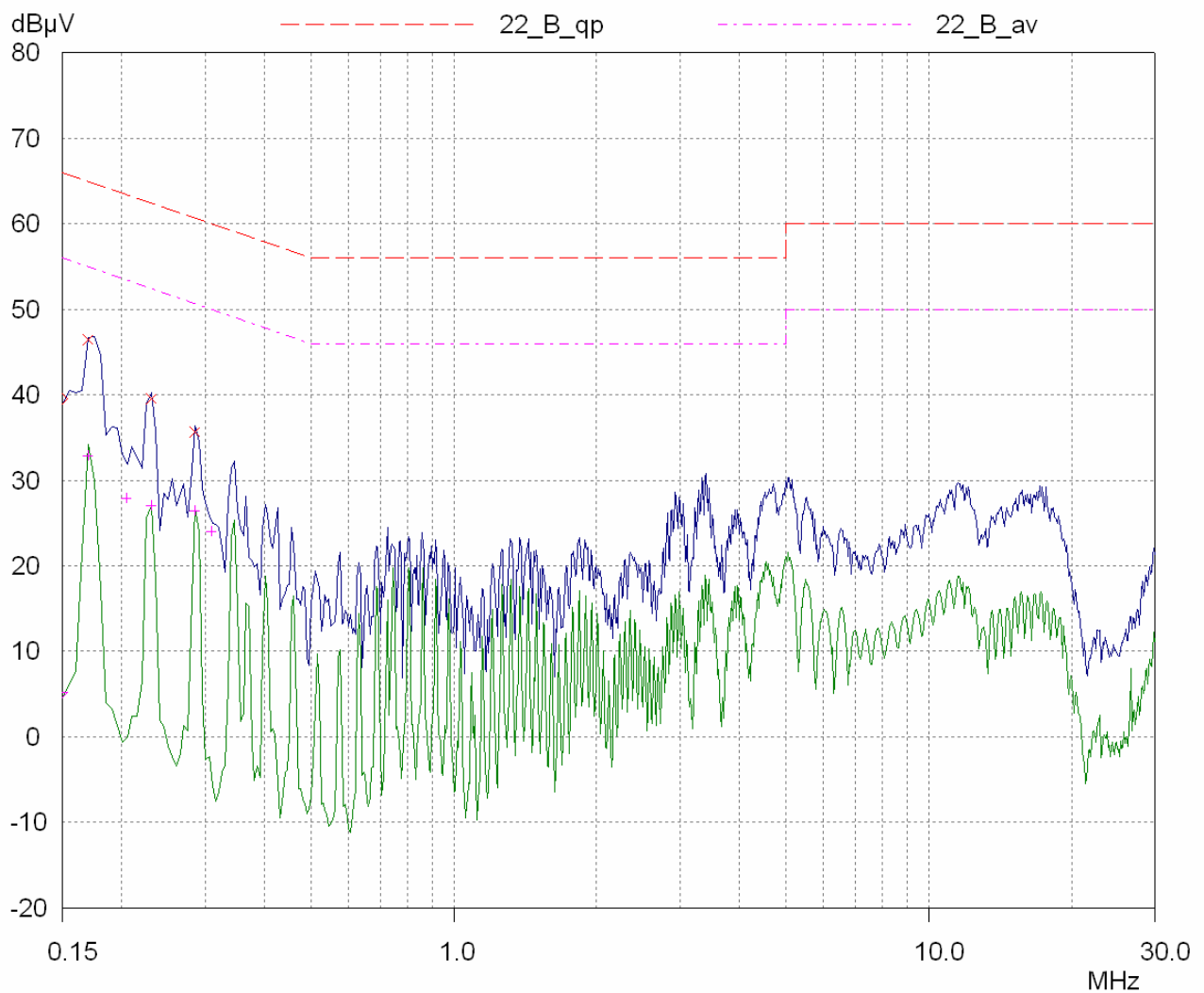


This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

**Neutral Terminal**

Test: Terminal Disturbance Voltage Test 47551/002  
 Equipment: OLPC Laptop model XO-1  
 Manufacturer: OLPC Australia  
 Operating Condition: On  
 Testing Officer: X. Liu  
 Standard: AS/NZS CISPR 22:2004 Class B  
 Comments: Test Voltage : 240 V. (See Active Terminal Measurement Results  
 Table next page for measurements)

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	30MHz	5kHz	10kHz	PK+AV	20msec	Auto	ON	60dB



— : Peak scan result                      - - - : Quasi Peak Limit  
— : Average scan result                      - - - : Average limit  
x : Quasi peak final measurements  
+ : Average final measurements

The tests reported herein relate only to the samples tested.



This document shall only be reproduced in full  
unless otherwise approved by this laboratory

### ***Neutral Terminal Measurement Results Table***

Final Measurement Results Test

Measurement time for final measurements : 15 seconds

#### ***Quasi Peak Detector***

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB
0.17	46.43	64.96	18.53
0.23	39.56	62.45	22.89
0.285	35.63	60.67	25.04

#### ***Average Detector***

Frequency MHz	AV Level dBuV	AV Limit dBuV	AV Delta dB
0.17	32.84	54.96	22.12
0.20483	27.93	53.41	25.48
0.23	27.08	52.45	25.37
0.285	26.39	50.67	24.28
0.30838	24.00	50.01	26.01

**Note:** A positive delta indicates compliance.

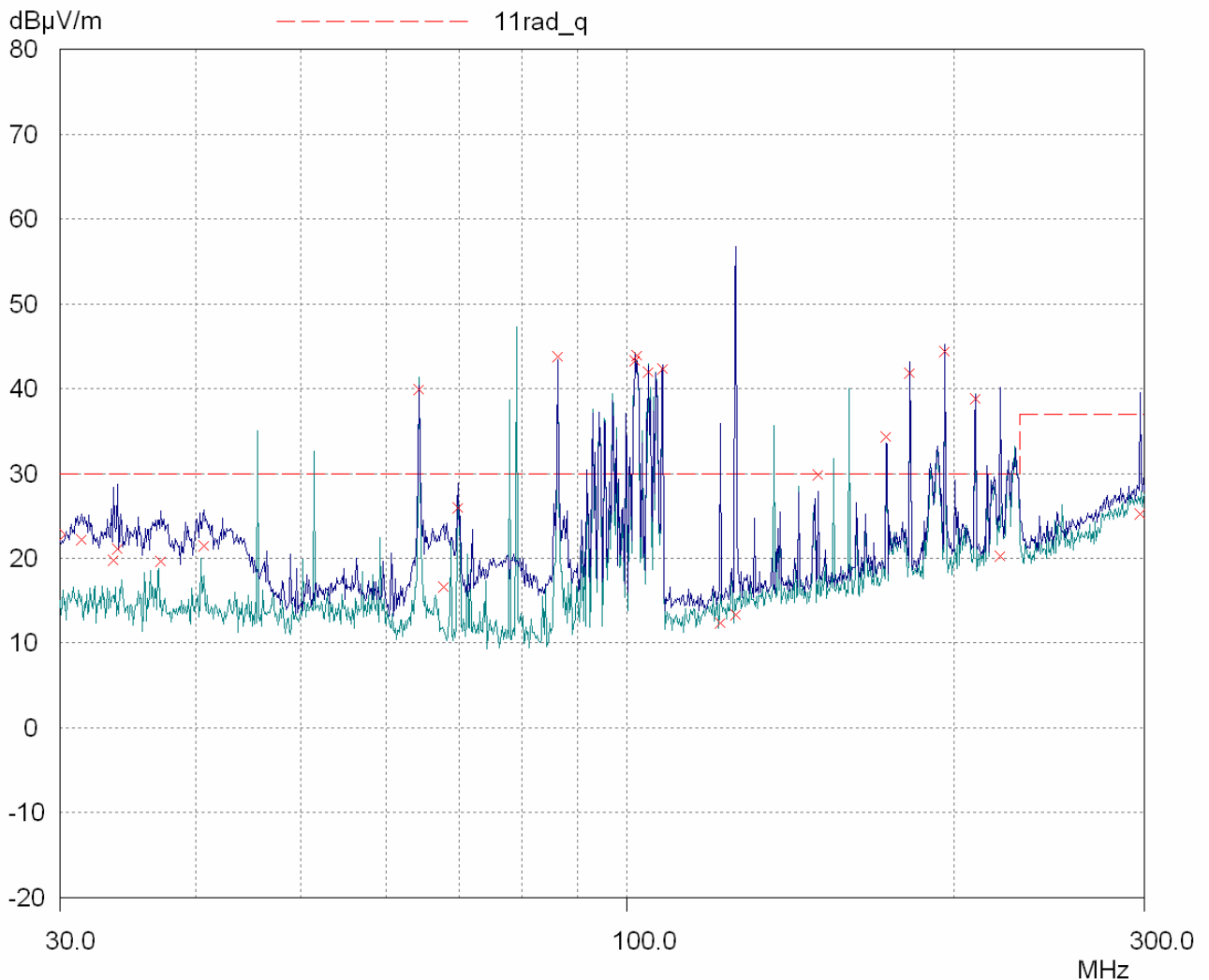


This document shall only be reproduced in full  
unless otherwise approved by this laboratory

### **Radiated Emissions – Vertical 30 to 300 MHz**

Test: Radiated Emission Test 47551/003  
Equipment: OLPC Laptop model XO-1  
Manufacturer: OLPC Australia  
Operating Condition: On  
Testing Officer: X. Liu  
Standard: AS/NZS CISPR 22:2004 Class B  
Comments: Using Austest Laboratories Yarramalong 10m OATS.

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	300MHz	50kHz	120kHz	PK	2msec	Auto	ON	60dB



The tests reported herein relate only to the samples tested.



This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

**Radiated Emissions Measurement Results Table**

Final Measurement Results Test

Measurement time for final measurements : 15 seconds

**Quasi Peak Detector**

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	
31.35	22.18	30.00	7.82	
33.55	19.79	30.00	10.21	
33.9	21.05	30.00	8.95	
37.1	19.63	30.00	10.37	
40.7	21.45	30.00	8.55	
64.25	39.90			Ambient
67.75	16.61	30.00	13.39	
69.8	26.00			Ambient
86.25	43.82			Ambient
101.65	43.23			Ambient
102.1	43.84			Ambient
104.55	42.00			Ambient
107.75	42.30			Ambient
121.9	12.37			Ambient
125.8	13.31			Ambient
149.85	25.83			Ambient
173.35	34.33			Ambient
182.25	41.83			Ambient
196.25	44.34			Ambient
209.25	38.86			Ambient
220.6	20.25			Ambient
297.0	25.24			Ambient

**Note:** A positive delta indicates compliance.

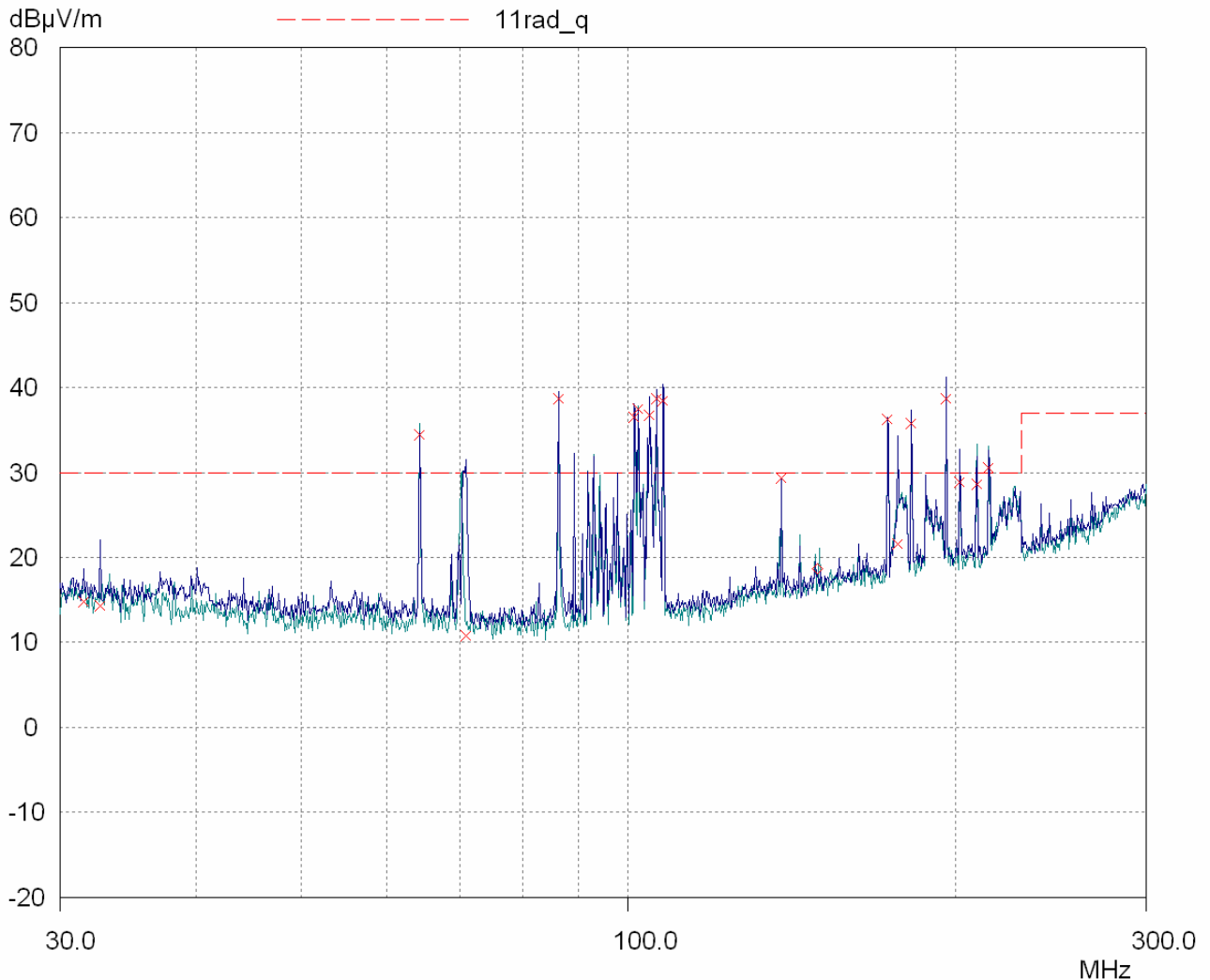


This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

**Radiated Emissions – Horizontal 30 to 300 MHz**

Test: Radiated Emission Test 47551/004  
 Equipment: OLPC Laptop model XO-1  
 Manufacturer: OLPC Australia  
 Operating Condition: On  
 Testing Officer: X. Liu  
 Standard: AS/NZS CISPR 22:2004 Class B  
 Comments: Using Austest Laboratories Yarramalong 10m OATS.

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
30MHz	300MHz	50kHz	120kHz	PK	2msec	Auto	ON	60dB



— : Peak scan result  
 — : Ambient peak scan result  
 - - - : Quasi Peak Limit  
 x : Quasi peak final measurements

The tests reported herein relate only to the samples tested.

This document shall only be reproduced in full  
unless otherwise approved by this laboratory

### ***Radiated Emissions Measurement Results Table***

Final Measurement Results Test

Measurement time for final measurements : 15 seconds

#### ***Quasi Peak Detector***

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	
31.5	14.78			Ambient
32.65	14.30			Ambient
64.25	34.45			Ambient
70.85	10.83			Ambient
86.25	38.67			Ambient
101.25	36.55			Ambient
102.1	37.44			Ambient
104.55	36.71			Ambient
106.1	38.70			Ambient
107.65	38.46			Ambient
138.3	29.37			Ambient
173.35	36.24			Ambient
177.0	21.54			Ambient
182.25	35.80			Ambient
196.25	38.74			Ambient
201.7	28.83			Ambient
209.25	28.57			Ambient
214.75	30.55			Ambient

**Note:** A positive delta indicates compliance.

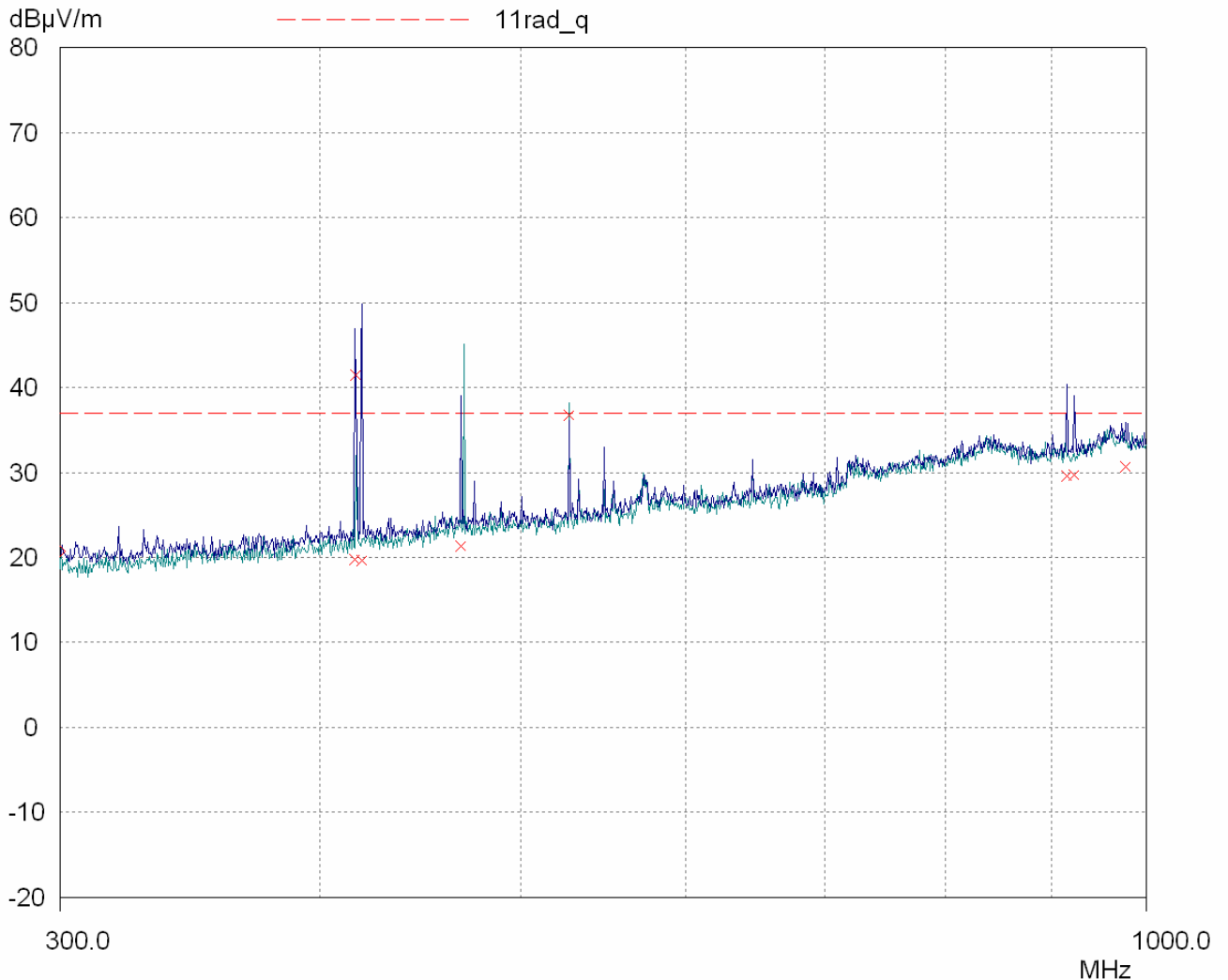


This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

**Radiated Emissions – Vertical 300 to 1000 MHz**

Test: Radiated Emission Test 47551/005  
 Equipment: OLPC Laptop model XO-1  
 Manufacturer: OLPC Australia  
 Operating Condition: On  
 Testing Officer: X. Liu  
 Standard: AS/NZS CISPR 22:2004 Class B  
 Comments: Using Austest Laboratories Yarramalong 10m OATS.

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
300MHz	1000MHz	50kHz	120kHz	PK	2msec	Auto	ON	60dB



— : Peak scan result                      - - - - - : Quasi Peak Limit  
— : Ambient peak scan result                      x : Quasi peak final measurements

The tests reported herein relate only to the samples tested.

14 Nelson Street, Chatswood  
NSW 2067, Australia  
Telephone: +61 2 9410 5111  
Facsimile: +61 2 9415 1567



**Testing &  
Certification  
Australia**

This document shall only be reproduced in full  
unless otherwise approved by this laboratory

### ***Radiated Emissions Measurement Results Table***

Final Measurement Results Test

Measurement time for final measurements : 15 seconds

#### ***Quasi Peak Detector***

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	
415.8	19.71			Ambient
416.35	41.47			Ambient
418.8	19.66			Ambient
467.45	21.31			Ambient
527.25	36.74			Ambient
915.65	29.55			Ambient
922.9	29.69			Ambient
976.4	30.71			Ambient

**Note:** A positive delta indicates compliance.

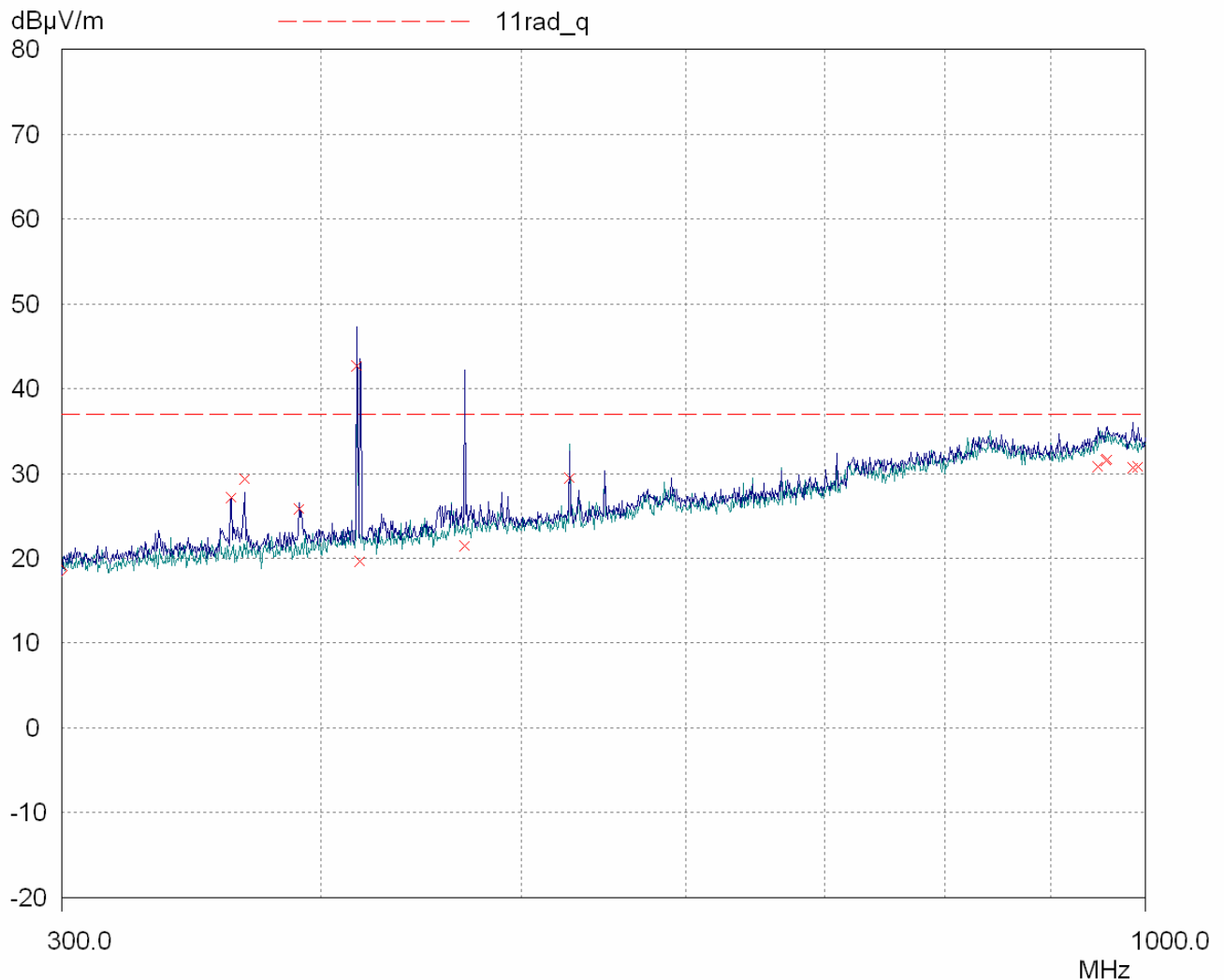


This document shall only be reproduced in full  
 unless otherwise approved by this laboratory

**Radiated Emissions – Horizontal 300 to 1000 MHz**

Test: Radiated Emission Test 47551/006  
 Equipment: OLPC Laptop model XO-1  
 Manufacturer: OLPC Australia  
 Operating Condition: On  
 Testing Officer: X. Liu  
 Standard: AS/NZS CISPR 22:2004 Class B  
 Comments: Using Austest Laboratories Yarramalong 10m OATS.

Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
300MHz	1000MHz	50kHz	120kHz	PK	2msec	Auto	ON	60dB



— : Peak scan result                      - - - - - : Quasi Peak Limit  
— : Ambient peak scan result            x : Quasi peak final measurements

The tests reported herein relate only to the samples tested.





This document shall only be reproduced in full  
unless otherwise approved by this laboratory

***Radiated Emissions Measurement Results Table***

Final Measurement Results Test

Measurement time for final measurements : 15 seconds

***Quasi Peak Detector***

Frequency MHz	QP Level dBuV	QP Limit dBuV	QP Delta dB	
361.9	27.21	37.00	9.79	
367.4	29.32	37.00	7.68	
390.55	25.85	37.00	11.15	
416.3	42.65			Ambient
417.8	19.64			Ambient
469.2	21.42			Ambient
527.25	29.43			Ambient
948.8	30.79			Ambient
956.65	31.47			Ambient
958.2	31.61			Ambient
985.35	30.69			Ambient
991.55	30.75			Ambient

**Note:** A positive delta indicates compliance.

This document shall only be reproduced in full  
unless otherwise approved by this laboratory

## **PHOTOGRAPHS**



General view (close)



General view (open)

The tests reported herein relate only to the samples tested.



This document shall only be reproduced in full  
unless otherwise approved by this laboratory



Conducted emission test setup



Radiated emission test setup