Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	
Contact:	Tim Cyr		
Emissions Spec:	FCC / EN55022 B	Class:	B
Immunity Spec:		Environment:	

EMC Test Data

For The

Aperto

Model

PacketWave 100 Series Subscriber Equipment

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	
Contact:	Tim Cyr		
Emissions Spec:	FCC / EN55022 B	Class:	B
Immunity Spec:	Enter immunity spec on cover	Environment:	

TEST SUMMARY

Date	Test Performed	Level	Results	Margin	
7/9/01	RE, Preliminary Scan 30 - 1000 MHz	FCC B	Eval	Refer to individual runs	EE
7/16/01	CE, AC Power 230V/50Hz	EN55022 B	Fail	+ 2.6dB @ 1.5624MHz	
7/16/01	CE, AC Power 120V/60Hz	EN55022 B	Fail	+ 2.6dB @ 1.5624MHz	
7/16/01	CE, AC Power 230V/50Hz	EN55022 B	Fail	+ 4.1dB @ .8859MHz	
7/16/01	CE, AC Power 120V/60Hz	EN55022 B	Pass	-3.3dB @ .7456MHz	
7/16/01	CE, AC Power 230V/50Hz	EN55022 B	Pass	-6.5dB @ .1716MHz	
7/16/01	CE, AC Power 120V/60Hz	EN55022 B	Pass	-13.5dB @ .1707MHz	
7/16/01	RE, Preliminary Scan 30 - 1000 MHz	EN55022 B	Eval	-7.8dB @ 50.163MHz	
7/16/01	RE, 30 - 1000MHz - Maximized Emissions	EN55022 B	Pass	-7.8dB @ 50.163MHz	
7/16/01	RE, 1000 - ??? MHz Maximized Emissions	FCC B	Pass	-15.9dB @ 1000MHz	
7/16/01	CE, AC Power 230V/50Hz	EN55022 B	Fail	+ 3.2dB @ 1.224MHz	EVAL
7/16/01	CE, AC Power 120V/60Hz	EN55022 B	Fail	+ 1.5dB @ 1.563MHz	EVAL
7/16/01	RE, Preliminary Selected Frequencies	EN55022 B	Eval	Refer to individual runs	EVAL
7/19/01	CE, AC Power 230V/50Hz	EN55022 B	FAIL	+ 2.4dB @ .888MHz	FQ
7/19/01	CE, AC Power 230V/50Hz	EN55022 B	FAIL	+ 3dB @ 4.183MHz	FQ
7/19/01	CE, AC Power 230V/50Hz	EN55022 B	FAIL	+ 1.6dB @ 4.061MHz	FQ

Abbreviations Used: RE - Radiated Emissions, CE- Conducted Emissions, RI - Radiated Immunity, CI - Conducted Immunity, ESD - Electrostatic Discharge, EFT - Electrical Fast Transients, VDI - Voltage Dips and Interrupts

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	
Contact:	Tim Cyr		
Emissions Spec:	FCC / EN55022 B	Class:	B
Immunity Spec:	Enter immunity spec on cover	Environment:	

General Description

The EUT is a modem which is designed to control data flow. Normally, the EUT would be placed on a table top during operation. The EUT was, therefore, treated as table-top equipment during testing to simulate the end user environment. The electrical rating of the EUT is 120/240 V, 50/60 Hz, 1 Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Aperto	Packet Wave 100	Modem	C13R10121X000009	

Other EUT Details

EUT Enclosure

The EUT enclosure is primarily constructed of fabricated sheet steel. It measures approximately 0 cm wide by 0 cm deep by 0 cm high.

Modification History

Mod. #	Test	Date	Modificaiton
1			
2			
3			

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	
Contact:	Tim Cyr		
Emissions Spec:	FCC / EN55022 B	Class:	B
Immunity Spec:	Enter immunity spec on cover	Environment:	

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None				

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Aperto	R5800 WSS3	Radio	T58R10137X000004	
Aperto	R5800 WSS4	Radio	T58R10137X000002	
Aperto	PW1000	Base Station	00013B00001C	
Toshiba	Satellite	Laptop	6456273	
Toshiba	Satellite	Laptop	40579653 V	

EUT Interface Ports

		Cable(s)		
EUT Port	Connected To	Description	Shielded or Unshielded	Length(m)
44 MHz port	Radio Transmitter	UTP	Shielded	15
Ethernet 10/100	Remote laptop	UTP	Unshielded	15
IF port	Radio Transmitter	Coax	Shielded	15
Power port	AC/DC Power supply	Power cable	Unshielded	1

EUT Operation During Emissions

The EUT was receiving data from support equipment and data being loop back to support equipment.

EUT Operation During Immunity

Performance Criteria for Immunity

Criterion A:

Criterion B:

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EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	
Contact:	Tim Cyr		
Emissions Spec:	FCC / EN55022 B	Class:	B
Immunity Spec:	Enter immunity spec on cover	Environment:	

Criterion C:

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EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Radiated Emissions

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/25/01
Test Engineer: egarcia
Test Location: SVOATS #3

Config. Used:
Config Change:
EUT Voltage: As noted in individual test run

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing. Remote support equipment was located approximately 30 meters from the test area with all I/O connections routed overhead.

On the OATS, the measurement antenna was located 10 meters from the EUT for the measurement range 30 - 1000 MHz and 3m from the EUT for the frequency range 1 - 10 GHz.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Note, for testing above 1 GHz, the FCC specifies the limit as an average measurement. In addition, the FCC states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Ambient Conditions:

Temperature: 20°C
Rel. Humidity: 41%

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	RE, Preliminary Scan 30 - 300 MHz		Eval	Refer to individual runs
	RE, Preliminary Scan 30 - 300 MHz		Pass	

Modifications Made During Testing:

Modifications are detailed under each run description.

Deviations From The Standard

No deviations were made from the requirements of the standard.

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #1: Preliminary Radiated Emissions, 30-300 MHz
for Fairway power supply Model # VE50-180A S/N 10012900001-00 230V / 50Hz
RE-measured top 6 signals from IPS power supply and re-scanned for broadband noise

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
138.500	34.6	v	30.0	4.6	QP	212	1.4	
86.991	24.1	v	30.0	-5.9	QP	234	1.1	
109.900	22.6	v	30.0	-7.4	QP	215	1.4	
43.200	22.5	v	30.0	-7.5	QP	2	1.0	
44.000	21.6	v	30.0	-8.4	QP	360	1.0	
117.100	21.5	v	30.0	-8.5	QP	96	1.0	
85.500	20.9	v	30.0	-9.1	QP	144	1.0	
66.300	19.7	v	30.0	-10.3	QP	356	1.0	
64.800	19.4	v	30.0	-10.6	QP	359	1.0	
70.000	19.0	v	30.0	-11.0	QP	166	1.0	
68.800	18.0	v	30.0	-12.0	QP	257	1.0	
50.000	16.0	v	30.0	-14.0	QP	134	1.0	

Run #2a: Preliminary Radiated Emissions, 30-300 MHz 230V / 50Hz
RE-measured top 6 signals from IPS power supply and re-measured broadband from pre-scan performed 7-24-01
UMEC Model: UP0451E-18P, s/n: TA064808

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
64.800	21.0	v	30.0	-9.0	QP	210	1.0	
117.100	21.0	v	30.0	-9.0	QP	217	1.0	
70.000	18.7	v	30.0	-11.3	QP	0	1.0	
80.030	18.5	V	30.0	-11.5	QP	122	1.0	
70.120	18.2	V	30.0	-11.8	QP	141	1.0	
44.000	18.0	v	30.0	-12.0	QP	274	1.0	
50.000	15.9	v	30.0	-14.1	QP	193	1.0	
120.710	14.8	V	30.0	-15.2	QP	180	1.0	

Run #2b: Preliminary Radiated Emissions, 30-300 MHz 120V / 60Hz
RE-measured top 6 signals from Run 2a
UMEC Model: UP0451E-18P, s/n: TA064808

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
64.800	18.5	v	30.0	-11.5	QP	210	1.0	
117.100	19.6	v	30.0	-10.4	QP	217	1.0	
70.000	15.0	v	30.0	-15.0	QP	0	1.0	
80.030	13.7	V	30.0	-16.3	QP	122	1.0	
70.120	16.9	V	30.0	-13.1	QP	141	1.0	
44.000	12.4	v	30.0	-17.6	QP	274	1.0	

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Radiated Emissions

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/25/01
Test Engineer: Elijah G.
Test Location: SVOATS #3

Config. Used: 1
Config Change:
EUT Voltage: As noted in individual test runs.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing. Remote support equipment was located approximately 30 meters from the test area with all I/O connections routed overhead.

On the OATS, the measurement antenna was located 10 meters from the EUT for the measurement range 30 - 1000 MHz.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Note, for testing above 1 GHz, the FCC specifies the limit as an average measurement. In addition, the FCC states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Ambient Conditions:

Temperature: 20°C
Rel. Humidity: 41%

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1b	RE, Preliminary Scan 30 - 1000 MHz	EN 55022 B	Eval	-6.8dB @ 68.8MHz
2	RE, 30 - 1000MHz - Maximized Emissions	EN 55022 B	Pass	-5dB @ 64.8MHz
	RE, 1000 - ??? MHz Maximized Emissions	FCC B	Pass	Scan performed by Juan Gonzalez 7/16/01

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #1a: Preliminary Radiated Emissions, 30-1000 MHz
230V / 50 Hz
Used IPS power supply model CUP45-13-2 S/N A-45-0004006

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
117.100	22.2	v	30.0	-7.8	QP	360	1.1	Broadband
70.000	21.9	v	30.0	-8.1	QP	9	1.0	
64.800	21.4	v	30.0	-8.6	QP	0	1.0	Broadband
44.000	21.4	v	30.0	-8.6	QP	3	1.0	
50.000	20.9	v	30.0	-9.1	QP	195	1.0	
68.800	20.5	v	30.0	-9.5	QP	336	1.0	Broadband
110.900	20.2	v	30.0	-9.8	QP	358	1.0	Broadband
110.000	20.2	v	30.0	-9.8	QP	0	1.0	
150.000	19.5	v	30.0	-10.5	QP	289	1.0	
60.300	19.2	v	30.0	-10.8	QP	189	1.0	Broadband
130.000	18.7	v	30.0	-11.3	QP	291	1.0	
250.000	22.0	v	37.0	-15.0	QP	135	1.0	
300.000	21.5	h	37.0	-15.5	QP	81	2.5	
430.000	20.0	v	37.0	-17.0	QP	219	1.0	
356.000	14.4	h	37.0	-22.6	QP	72	1.0	

Run #1b: Preliminary Radiated Emissions, 30-1000 MHz
120 / 60Hz, re-measured top 6 signals from run 1a and re-scanned for broadband noise

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
68.800	23.2	v	30.0	-6.8	QP	250	1.0	Broadband
117.100	21.9	v	30.0	-8.1	QP	0	1.0	Broadband
70.000	21.6	v	30.0	-8.4	QP	62	1.0	
64.800	21.4	v	30.0	-8.6	QP	286	1.0	Broadband
110.900	21.4	v	30.0	-8.6	QP	307	1.0	Broadband
44.000	19.8	v	30.0	-10.2	QP	29	1.0	
60.300	19.5	v	30.0	-10.5	QP	96	1.0	Broadband
50.000	19.0	v	30.0	-11.0	QP	219	2.3	

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EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #2: Maximized Readings From Run #1a

Frequency	Level	Pol	EN55022 B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
64.800	25.0	v	30.0	-5.0	QP	0	1.0	
68.800	23.0	v	30.0	-7.0	QP	336	1.0	
117.100	22.4	v	30.0	-7.6	QP	360	1.0	
70.000	22.0	v	30.0	-8.0	QP	9	1.0	
44.000	21.4	v	30.0	-8.6	QP	3	1.0	
50.000	20.9	v	30.0	-9.1	QP	195	1.0	

Note 1:	Did not perform emisssions scan above 1 GHz as the only modification to the EUT since the power supply was changed and that would not affect emissions above 1 GHz.

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Conducted Emissions - Signal Ports

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/25/01
Test Engineer: Elijah G.
Test Location: SVOATS #3

Config. Used:
Config Change:
EUT Voltage: As noted in individual test runs.

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. LISN was Remote support equipment was located approximately 30 meters away from the test area, with all I/O connections running on top of the groundplane.

For conducted voltage emissions on unshielded signal and data leads a suitable ISN was placed in series with the cable from the port under test and 80cm from the device under test. Where no suitable ISN was available, a voltage probe meeting the requirements of CISPR 22: 1997 and EN 55022: 1998 was used.

Ambient Conditions:

Temperature: ??°C
Rel. Humidity:

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, ??? Port	EN 55022 B	Pass	-13.6dB @ .309MHz
2	CE, ??? Port	EN 55022 B	Pass	-3.1dB @ .3121MHz
3	CE, ??? Port	EN 55022 B	Pass	-19.8dB @ 16.288MHz
4	CE, ??? Port	EN 55022 B	Pass	-7.8dB @ 2.5MHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #1: Signal Port Conducted Voltage Emissions, 0.15 - 30 MHz: Radio Port
Measured using 150 ohm termination to ground

Frequency	Level	Line	EN 55022 B		Detector	Comments
MHz	dBµV		Limit	Margin	QP/Ave	
0.309	54.400		68.0	-13.6	AV	
0.309	54.300		78.0	-23.7	QP	
2.188	58.900		64.0	-5.1	AV	
2.188	58.700		74.0	-15.3	QP	
1.875	53.600		64.0	-10.4	AV	
1.875	53.200		74.0	-20.8	QP	

Run #2: Signal Port Conducted Voltage Emissions, 0.15 - 30 MHz: Coaxial Port
Measured using 150 ohm termination to ground

Frequency	Level	Line	EN 55022 B		Detector	Comments
MHz	dBµV		Limit	Margin	QP/Ave	
0.312	64.700		67.8	-3.1	AV	
0.312	65.600		77.8	-12.2	QP	
3.145	45.800		64.0	-18.2	AV	
3.145	46.900		74.0	-27.1	QP	
2.511	31.400		64.0	-32.6	AV	
2.511	37.000		74.0	-37.0	QP	

Run #3: Signal Port Conducted Voltage Emissions, 0.15 - 30 MHz: Ethernet Port 100Mbps
Measured using ISN meeting requirements for Category 5 cables

Frequency	Level	Line	EN 55022 B		Detector	Comments
MHz	dBµV		Limit	Margin	QP/Ave	
16.288	44.2		64.0	-19.8	AV	
0.311	44.7		67.8	-23.1	AV	
23.221	40.9		64.0	-23.1	AV	
16.288	46.5		74.0	-27.5	QP	
18.332	45.6		74.0	-28.4	QP	
23.221	44.3		74.0	-29.7	QP	
0.311	46.9		77.8	-30.9	QP	
18.332	26.3		64.0	-37.7	AV	

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EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #4: Signal Port Conducted Voltage Emissions, 0.15 - 30 MHz: Ethernet Port 10Mbps

Measured using ISN meeting requirements for Category 5 cables

Frequency	Level	Line	EN 55022 B		Detector	Comments
MHz	dBµV		Limit	Margin	QP/Ave	
2.500	56.2		64.0	-7.8	AV	
2.500	55.9		74.0	-18.1	QP	
7.469	35.0		64.0	-29.0	AV	
8.094	42.5		74.0	-31.5	QP	
20.031	41.0		74.0	-33.0	QP	
8.094	29.1		64.0	-34.9	AV	
7.469	37.1		74.0	-36.9	QP	
7.191	24.3		64.0	-39.7	AV	
7.191	28.0		74.0	-46.0	QP	
20.031	13.1		64.0	-50.9	AV	

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Conducted Emissions - Power Ports

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 7/25/01
Test Engineer: Elijah G.
Test Location: SVOATS #3

Config. Used:
Config Change:
EUT Voltage: As noted in individual test runs.

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. Remote support equipment was located approximately 30 meters away from the test area, with all I/O connections running on top of the groundplane.

Ambient Conditions:

Temperature: ??°C
Rel. Humidity:

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power 230V/50Hz	EN55022 A	Pass	-2.9dB @ 2.5036MHz
2	CE, AC Power 120V/60Hz	EN55022 A	Pass	-4.4dB @ 2.5001MHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30 MHz 230 V / 50 Hz

Frequency	Level	Interface	EN55022 A		Detector	Comments
MHz	dBµV	Port	Limit	Margin	QP/Ave	
2.5036	43.1	Line 1	46.0	-2.9	AV	
2.5000	42.4	Neutral	46.0	-3.6	AV	
2.1906	40.8	Line 1	46.0	-5.2	AV	
0.5468	40.0	Neutral	46.0	-6.0	AV	
3.3893	38.3	Neutral	46.0	-7.7	AV	
0.2735	41.4	Neutral	51.0	-9.6	AV	
2.5036	43.3	Line 1	56.0	-12.7	QP	
2.5000	42.1	Neutral	56.0	-13.9	QP	
0.5468	40.9	Neutral	56.0	-15.1	QP	
2.1906	40.4	Line 1	56.0	-15.6	QP	
3.3893	39.4	Neutral	56.0	-16.6	QP	
0.2013	36.2	Line 1	53.4	-17.2	AV	
0.2735	43.7	Neutral	61.0	-17.3	QP	
0.2013	41.3	Line 1	63.4	-22.1	QP	

Run #2: I/O and Signal Port Conducted Current Emissions, 0.15 - 30 MHz: ??? Port

The shield of the cable was terminated to the ground plane via 150 ohms.

Frequency	Level	Interface	EN55022 A		Detector	Comments
MHz	dBµA	Port	Limit	Margin	QP/Ave	
2.500	41.6	Neutral	46.0	-4.4	AV	
0.413	40.7	Neutral	47.5	-6.8	AV	
0.550	38.8	Line 1	46.0	-7.2	AV	
0.549	38.6	Line 1	46.0	-7.4	AV	
2.500	41.3	Neutral	56.0	-14.7	QP	
0.206	38.3	Neutral	53.2	-14.9	AV	
0.206	37.6	Line 1	53.2	-15.6	AV	
0.550	39.8	Line 1	56.0	-16.2	QP	
0.549	39.2	Line 1	56.0	-16.8	QP	
0.413	40.5	Neutral	57.5	-17.0	QP	
3.435	28.3	Neutral	46.0	-17.7	AV	
0.206	44.9	Line 1	63.2	-18.3	QP	
0.206	44.8	Neutral	63.2	-18.4	QP	
3.435	33.4	Neutral	56.0	-22.6	QP	

Elliott

EMC Test Data

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Conducted Emissions - Power Ports

Test Specifics

Objective: The objective of this test session is to perform engineering evaluation testing of the EUT with respect to the specification listed above.

Date of Test: 7/24/01
Test Engineer: Mark Hill
Test Location: 3m Lab

Config. Used:
Config Change:
EUT Voltage: Refer to individual run

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table 80cm from the LISN. Remote support equipment was located approximately 5 meters away from the test area, with all I/O connections running on top of the groundplane.

Ambient Conditions:

Temperature: ??°C
Rel. Humidity:

Summary of Results

Run #	Test Performed	Limit	Result	Margin
See Below	CE, AC Power	EN55022 B	Eval	

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz
Only AC power cable connected, no power supply

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz
IPS Model: CUP45-13-2 B2, s/n A-45-0004006

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
1.0095	39.7	Line	46.0	-6.3	Pk	PK reading vs. average limit
1.2190	33.0	Line	46.0	-13.0	PK	PK reading vs. average limit
0.2030	42.4	Line	53.5	-11.1	PK	PK reading vs. average limit
1.5010	41.3	Neutral	46.0	-4.7	Pk	PK reading vs. average limit
1.5010	40.3	Neutral	46.0	-5.8	QP	QP reading vs. average limit
1.2190	38.8	Line	46.0	-7.2	PK	PK reading vs. average limit
0.2030	48.3	Neutral	53.5	-5.2	PK	PK reading vs. average limit
0.2030	45.4	Neutral	53.5	-8.1	QP	QP reading vs. average limit

Run #3: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
IPS Model: CUP45-13-2 B2, s/n A-45-0004006

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.202	45.7	Line1	53.5	-7.8	Pk	PK reading vs. average limit
0.751	35.5	Line1	46.0	-10.5	Pk	PK reading vs. average limit
0.824	34.3	Line1	46.0	-11.7	Pk	PK reading vs. average limit
1.168	35.2	Line2	46.0	-10.8	Pk	PK reading vs. average limit

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #4: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

Powdec Model: WP30180I, no serial number

Frequency	Level	AC	EN55022 B		Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.421	40.7	Line1	57.4	-16.7	QP			
0.421	39.0	Line1	47.4	-8.4	Average			
0.606	41.8	Line1	56.0	-14.2	QP			
0.606	37.3	Line1	46.0	-8.7	Avg			
0.853	42.4	Line1	56.0	-13.6	QP			
0.852	37.9	Line1	46.0	-8.1	Avg			
0.427	43.0	Line2	57.3	-14.3	QP			
0.427	41.1	Line2	47.3	-6.2	Avg			
0.551	44.8	Line2	56.0	-11.2	QP			
0.551	43.7	Line2	46.0	-2.3	Avg			

Run #4a: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

Powdec Model: WP30180I, no serial number

Frequency	Level	AC	EN55022 B		Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.546	48.7	Line1	56.0	-7.3	QP			
0.546	47.0	Line1	46.0	1.0	Avg			

Run #5: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

UMEC Model: UP0451E-18P, s/n: TA064808

Frequency	Level	AC	EN55022 B		Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.205	47.6	Line1	53.4	-5.8	PK	Pk reading vs. Average Limit		
4.189	42.9	Line1	46.0	-3.1	PK	Pk reading vs. Average Limit		
4.186	41.0	Line1	56.0	-15.0	QP			
4.188	32.3	Line1	46.0	-13.7	Avg			
0.206	47.7	Line2	63.4	-15.7	QP			
0.206	40.1	Line2	53.4	-13.3	Avg			
3.848	39.9	Line2	56.0	-16.1	QP			
3.850	32.1	Line2	46.0	-13.9	Avg			

Client:	Aperto	Job Number:	J44068
Model:	PacketWave 100 Series Subscriber Equipment	T-Log Number:	T44079
		Proj Eng:	Enter on cover sheet
Contact:	Tim Cyr		
Spec:	FCC / EN55022 B	Class:	B

Run #5a: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

UMEC Model: UP0451E-18P, s/n: TA064808

Frequency	Level	AC	EN55022 B		Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.209	48.6	Line1	63.2	-14.6	QP			
0.209	44.3	Line1	53.2	-8.9	Avg			
1.987	43.9	Line1	56.0	-12.1	QP			
1.988	41.7	Line1	46.0	-4.3	Avg			
1.496	43.5	Line2	56.0	-12.5	QP			
1.497	39.8	Line2	46.0	-6.2	Avg			
1.927	43.4	Line2	56.0	-12.6	QP			
1.927	41.1	Line2	46.0	-4.9	Avg			

Run #6: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

EDAC Model: EA1050B, s/n: 4

Frequency	Level	AC	EN55022 B		Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
0.167	59.9	Line1	65.1	-5.2	QP			
0.167	48.4	Line1	55.1	-6.7	Avg			
0.224	50.4	Line1	62.7	-12.3	QP			
0.224	39.3	Line1	52.7	-13.4	Avg			

Run #7: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

APS Model: AD-740U-1180, no serial number noted

Frequency	Level	AC	EN55022 B		Detector	Comments		
MHz	dBµV	Line	Limit	Margin	QP/Ave			
16.771	47.4	Line1	60.0	-12.6	QP			
16.780	40.9	Line1	50.0	-9.1	Avg			
0.185	47.9	Line1	64.3	-16.4	QP			
0.192	34.7	Line1	53.9	-19.2	Avg			