

COVER PAGE FOR TEST REPORT

Product Category:	Medical Electrical Equipment
Product Category CCN:	PIDF, PIDF7
Test Procedure:	Classification
Product:	Panel PC
Model/Type Reference:	POC-123xxxxxxx and POC-125xxxxxxx, where x may be any alphanumeric character or blank.
Rating(s):	24 Vdc, 3.5 A
Standards:	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Applicant Name and Address:	ADVANTECH CO LTD 1 ALLEY 20 LANE 26 RUEIGUANG RD NEIHU DISTRICT TAIPEI 114 TAIWAN
This Report includes the following parts, in addition to this cover page:	
<ol style="list-style-type: none">1. Specific Technical Criteria2. Clause Verdicts3. Critical Components4. Test Results5. Enclosures	

Issue Date: 2004-03-05
Amendment 3 2007-10-02

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Report Reference #

E214164-A1-UL-1

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of Underwriters Laboratories Inc. ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

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Test Report By:



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Reviewed By:



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SPECIFIC TECHNICAL CRITERIA

TEST REPORT UL 60601-1 Medical Electrical Equipment Part 1: General requirements for safety	
Report Reference No.....	E214164-A1-UL-1
Compiled by	David Shih
Reviewed by	Thomas Huang
Date of issue	2004-03-05
Standards	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Test procedure	Classification
Non-standard test method	N/A
Test item description	Panel PC
Trademark	None
Model and/or type reference	POC-123xxxxxxx and POC-125xxxxxxx, where x may be any alphanumeric character or blank.
Rating(s)	24 Vdc, 3.5 A

GENERAL INFORMATION			
Test item particulars (see also clause 5):			
Classification of installation and use	:	Portable	
Supply connection	:	Appliance coupler	
Accessories and detachable parts included in the evaluation	:	None	
Options included	:	None	
Possible test case verdicts:			
- test case does not apply to the test object	:	N / A	
- test object does meet the requirement	:	P(Pass)	
- test object does not meet the requirement	:	F(Fail) (acceptable only if a corresponding, less stringent national requirement is "Pass")	
Abbreviations used in the report:			
- normal condition	:	N.C. - single fault condition	S.F.C.
- operational insulation	:	OP - basic insulation	BI
- basic insulation between parts of opposite polarity:		BOP - supplementary insulation	SI
- double insulation	:	DI - reinforced insulation	RI
General remarks:			
- "(see Enclosure #)" refers to additional information appended to the Test Report			
- "(see appended table)" refers to a table appended to the Test Report			
- Throughout the Test Report a point is used as the decimal separator			

General Product Information:	
CA1.0	Report Summary
CA1.1	N/A
CB1.0	Product Description
CB1.1	Consists of a LCD Module, DVD drive, HDD, Floppy Drive, CPU, Battery pack. Base and electronic component mounted on PWB and enclosed in plastic enclosure, supplied by external Listed adapter.
CC1.0	Model Differences
CC1.1	Model POC-123xxxxxxx is the basic model. Model POC-125-xxxxxxx is the same as POC-123-xxxxxxx except for the external power supplies that can be used and the battery pack.
CD1.0	Additional Information

CD1.1	<p>This report was modified with Amendment 1 to include an alternate Panel and Inverter Board. Additional Leakage current tests, including separation by protective impedance (17g.5), were conducted to verify components. Corresponding Table 19 was amended to include the supporting data as well as the critical components table. Some minor corrections were also made to the Critical Components table.</p> <p>This report was modified with Amendment 2 to include new Model POC-125-xxxxxxx, with alternate power supplies and battery pack. Also revised the original Model Number to POC-123xxxxxxx.</p> <p>Amendment 3 - Correct plastic enclosure material description from Chi Mei Corporation, PA-765A to GE Plastics Global Products for Worldwide Procurement, C2800, and add Enclosure Metalized Coating, Basictak Co., Ltd., model 599-B3730 and 599-B4540.</p>	
CE1.0	Technical Considerations	
CE1.1	The product was investigated to the following additional standards:	UL 60601-1, EN 60601-1: 1990 + A1:1993 + A2:1995 + A13:1996, CAN/CSA C22.2 No. 601.1-M90 (R1997), CAN/CSA C22.2 No. 601.1S1-94, and CAN/CSA C22.2 No. 601.1B-98 (National Differences for Canada), (except EMC limitations, EN 60601-1-2, Biocompatibility, EN 10993-1, Programmable Electronic Systems, IEC 60601-1-4)
CE1.2	The product was not investigated to the following standards or clauses:	Clause 52.1, Programmable Electronic Systems (IEC 601-1-4), Clause 48, Biocompatibility (ISO 10993-1), Clause 36, Electromagnetic Compatibility (IEC 601-1-2)
CE1.3	The product is Classified only to the following hazards:	Shock, Fire
CE1.4	The degree of protection against harmful ingress of water is:	Ordinary
CE1.6	The mode of operation is:	Continuous
CE1.7	Software is relied upon for meeting safety requirements related to mechanical, fire and shock:	No
CE1.8	The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:	No

IEC 60601			
Clause	Requirement + Test	Result - Remark	Verdict
6.1u	Limited mechanical stability	Equipment not overbalance during normal use when tilted through an angle of 10°X, no limited mechanism required.	N/A
6.8.3d	Environmental conditions for transport and storage specified in accompanying documents and marked on packaging	Storage and transportation: Temperature: -20°C ~ 60°C (-4°F ~ 140°F).	Pass
10.1	Equipment is capable while packed for transport or storage of being exposed to the conditions stated by the manufacturer	Storage and transportation: Temperature: -20°C ~ 60°C (-4°F ~ 140°F), Humidity: 10% ~ 90%	Pass

IEC 60601		
Clause	Requirement + Test	Result - Remark
		Verdict

56.1	TABLE: list of critical components					Pass
Object/part No.	Manufacturer/ trademark	type/model	technical data	Product Category CCN(s)	Required Marks of Conformity	
Power Adapter for use with POC-123	Hitron Electronics Corp	HES49-24021	Input 100-240 Vac, 50/60 Hz Output 24 Vdc, 2.1 A	QQHM2	UL R/C	3-01
Alternate Power Adapter for use with POC-125	XPIQ Inc.	PCM80PS24	Input 100-240 Vac, 47-63 Hz Output 24 Vdc, 3.33 A	QQHM2	UL R/C	3-01
Alternate Power Adapter for use with POC-125	Sinpro	MPU50-108	Input 100-240 Vac, 47-63 Hz Output 24 Vdc, 2.08 A	QQHM2	UL R/C	3-01
Enclosure	GE PLASTICS GLOBAL PRODUCTS FOR WORLDWIDE PROCUREMENT	C2800 (1) (5) (6) (7) (9) (11)	V-0 or better, minimum 2.3mm thick, 65 °C min. See Enclosure 4-01 for details.	QMEZ2	UL R/C	4-01
Enclosure Metalized Coating	Basictak Co., Ltd. Taipei, Taiwan	599-B3730 & 599- B4540	Only Spray on inside of enclosure GE PLASTICS GLOBAL PRODUCTS FOR WORLDWIDE PROCUREMENT, model C2800, maximum operating temperature 80 degree C.	QMRX2	UL R/C	3-11
Base	Various	Various	Metal, overall 286 by 193 by 179 mm, weighted 1.75 kg.	N/A	N/A	3-04
PWB	Various	Various	V-1 or better, 105°C min.	ZPMV2	UL R/C	3-03
LCD Panel	IMES Co., Ltd.	M121-53DR	TFT type, SVGA 12.1 inch	N/A	N/A	3-03
Alternate	Tottori SANYO	MXS121022010	TFT type, SVGA 12.1 inch	N/A	N/A	3-03

IEC 60601				
Clause	Requirement + Test		Result - Remark	Verdict
Alternate	Electric Co., Ltd	TM121SV-22L11A	TFT type, SVGA 12.1 inch	N/A
Alternate	Tottori SANYO Electric Co., Ltd	G121SN01	TFT type, SVGA 12.1 inch	N/A
HDD Drive (Optional)	AU Optonics Corporation	Various	Generic, 5 Vdc, 0.55 A max.	N/A
CD / DVD-ROM / CD-RW Drive (Optional)	Various	Various	Generic, 5 Vdc, 0.9 A, laser Class I	UL R/C
Lithium Battery	Toshiba Battery Co Ltd	CR2032	3 Vdc, Max. Abnormal Charging Current 10 mA	UL R/C
Alternate	Rayovac Corp	BR2032	3 Vdc, Max. Abnormal Charging Current 4 mA	UL R/C
Inverter	Lecerf Technology Co., Ltd	1201-C-1	I/P: 12 V, 1300 mA, Output: 560 Vrms, 5.3 mA	Suitability of this component determined during this evaluation
- Transformer (T1, T2) (for Inverter)	Lecerf Technology Co., Ltd	X03	Class 105°C. See Enclosure Diagrams for Construction Details	Suitability of this component determined during this evaluation
- Capacitor (C6, C8)	--	--	27 pF, 3000 V	N/A
Alternate Inverter	Lecerf Technology Co., Ltd	LV-12DLC-A	Input: 12 V, 1000 mA, Output: 560 Vrms, 6 mA	Suitability of this component determined during this evaluation
Alternate Transformer	Lecerf Technology Co., Ltd	X09	Class 105°C. See Enclosure Diagrams for Construction details	Suitability of this component determined during this evaluation

IEC 60601		
Clause	Requirement + Test	Result - Remark
		Verdict

						determined during this evaluation	
Polyswitch (FS5, FS6) (for USB connector)	Tyco Corp. (Raychem)	miniSMDC110	8 Vdc, 1.1 A(lh), 2.2 A(It)	XGPU2	UL R/C	3-03	
Polyswitch (FS7) (for keyboard and mouse connector)	Tyco Corp. (Raychem)	miniSMDC110	8 Vdc, 1.1A (lh), 2.2A (It)	XGPU2	UL R/C	3-03	
Battery Pack for POC-123	Advantech	PPC-L126-BP	11.10 V, 4000 mAh	N/A	Suitability of this component determined during this evaluation	3-07	
- Battery cell (Li-Ion type) (6 cells provide, 2 parallel, 3 series)	Samsung Sdi Co Ltd	ICR18650-20	3.7 V, 2000 mAh	BBCV2	UL R/C	3-07	
- PTC device (polyswitch)	Raychem Corp.	LR4-550	20 Vdc, 5.5 A	XGPU2	UL R/C	3-07	
- Fuse Cut-off (TF12)	Uchihashi Estec Co., Ltd.	448	4 A, 50 Vdc, 135°C	XCMQ2	UL R/C	3-07	
Battery Pack for POC-125. Consists of items below -	Advantech (Manufactured by: Perfect Source Co., Ltd)	POC-125 (PN 0262AT0125311J)	11.10 V, 2400 mAh	N/A	Suitability of this component determined during this evaluation	3-08	
- Battery cell (Li-Ion type) (6 cells provide, 1 parallel, 3 series)	Samsung Sdi Co Ltd	ICR18650-24	2.4 V, 2000 mAh	BBCV2	UL R/C	3-08	
- Thermal Cut-off (SCP1)	NEC Schott Components Corp	D6X	12 A, 32 Vdc, 139°C	XCMQ2	UL R/C	3-08	
- Thermal Protector (TH1)	Uchiya Thermostat Co., Ltd	BPF2	80°C, 15A, 18V	XAPX2	UL R/C	3-08	

IEC 60601			
Clause	Requirement + Test	Result - Remark	Verdict

Label Material	Various	Various	Minumum 40°C	PGDQ2	UL R/C	3-05
Power Cord	Various	Various	Listed Hospital grade, type SJE, SJT or SJO min. 18AWG, 10A, 60 °C	ELBZ	UL	

IEC 60601			
Clause	Requirement + Test	Result - Remark	Verdict

7	TABLE: power input					Pass
Operating condition	Voltage (V)	Frequency (Hz)	Current (A)	Power (W)	Remarks	
--	90	63	0.70	71	--	
--	100	47	0.70	72	--	
--	100	63	0.72	70	--	
--	240	47	0.32	72	--	
--	240	63	0.33	72	--	
--	264	47	0.29	72	--	
--	264	63	0.30	72	--	
--	90	63	1.26	71	--	
--	100	47	1.16	71	--	
--	100	63	1.18	71	--	
--	240	47	0.62	67	--	
--	240	63	0.61	67	--	
--	264	47	0.56	66	--	
--	264	63	0.50	54	--	
supplementary information:						

15b	TABLE: residual voltage in attachment plug										Pass
Voltage measured between:	Measurements [V]										Remarks
	1	2	3	4	5	6	7	8	9	10	
supplementary information:											

19	TABLE: leakage current				Pass
Type of leakage current and test condition (including single faults)		Supply voltage (V)	Supply frequency (Hz)	Measured max. value (µA)	Remarks
ER, NC (S1, S2, S3=1) S5=1, MD1		264	60	113/115	--
supplementary information:					
ER - Earth leakage current			A - After humidity conditioning		
EN - Enclosure leakage current			B - Before humidity conditioning		
P - Patient leakage current			1 - Switch closed or set to normal polarity		
PM - Patient leakage current with mains on the applied parts			0 - Switch open or set to reversed polarity		
PA - Patient auxiliary current			NC - Normal condition		
Fig. 15 - refers to Fig. 15 in IEC601-1			SFC - Single fault condition		
MD - Measuring device					

IEC 60601			
Clause	Requirement + Test	Result - Remark	Verdict

42	TABLE: normal temperature		Pass
Supply voltage: See Below		Test Condition: See Below	
Ambient temperature: See Below			
Measuring location		Measured temperature (°C)	Remarks
Ambient		23	--
Cell 1		56	--
Cell 2		56	--
Cell 3		55	--
Thermal cutoff (SCP1)		57	--
Thermostat (BPF2)		55	--
Q1 body		56	--
Q2 Body		56	--
U3 body		56	--
Ambient		23	--
Cell 1		59	--
Cell 2		60	--
Cell 3		59	--
Thermal cutoff (SCP1)		61	--
Thermostat (BPF2)		59	--
Q1 body		60	--
Q2 Body		60	--
U3 body		59	--
Enclosure inside above battery pack		42	--
Enclosure outside above battery pack		31	--
COR - indicates measurements taken using change-of-resistance method			
supplementary information:			

57.9.1a	TABLE: transformer short circuit					Pass
Winding under test	Protection	Measured temperatures (°C)			Test duration	Remarks
		Primary	Secondary	Ambient		
supplementary information:						

57.9.1b	TABLE: overload						Pass
Winding under test	Protection	Measured temperatures (°C)			Test duration	Test current or thermal cutout temp.	Remarks
		Primary	Secondary	Ambient			

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IEC 60601			
Clause	Requirement + Test	Result - Remark	Verdict

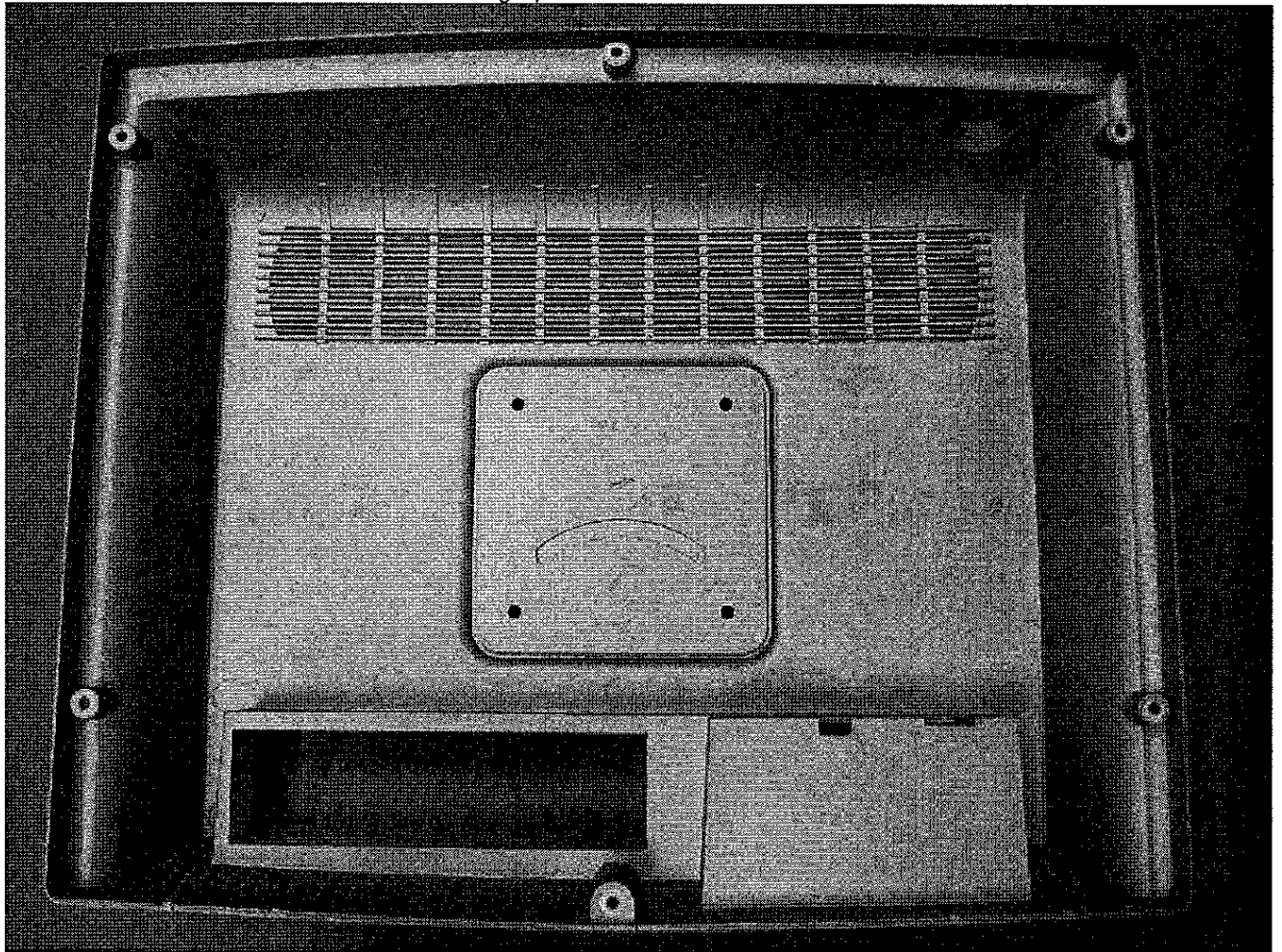
supplementary information:

Enclosure

Photographs

Supplement Id	Description
3-01	Front View
3-02	Rear View
3-03	Inside View
3-04	Base
3-05	Battery front view
3-06	Battery rear view
3-07	Battery inside view
3-08	Battery Pack for use with POC125
3-09	New Battery Pack PCB, for use with POC125
3-10	POC-125 Rear View with new battery pack
3-11	Plastic enclosure inside with metal coating

Photographs ID 3-11



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Enclosure

Test Record

Description
Test Record 1
Test Record 2
Datasheets
Construction Review Datasheet
Test Record 3
POC-125 Datasheets
Construction Review Datasheet
Test Record 4
CRD form

Test Record No. 4

The manufacturer submitted representative production sample of Panel PC, model POC-125. Amendment 3 - Correct plastic enclosure material description from Chi Mei Corporation, PA-765A to GE Plastics Global Products for Worldwide Procurement, C2800, and add Enclosure Metalized Coating, Basicpak Co., Ltd., model 599-B3730 and 599-B4540. No test was considered necessary for correct plastic enclosure material description from Chi Mei Corporation, model PA-765A to GE Plastics Global Products for Worldwide Procurement, model C2800, base on previously tests of subject model, see test record 2 for details. The results of this investigation, including construction review, indicate that the products evaluated comply with the applicable requirements in the standard for Medical Electrical Equipment, Part 1: General Requirements for Safety, UL 60601-1, First Edition, including revisions through revision date April 26, 2006, which includes the Second Amendment of IEC60601-1, and Canadian Standard for Medical Electrical Equipment, CAN/CSA C22.2, No. 60601.1-M90, including Update No. 2 through revision date November, 2003.