Issued date : 2001/12/26

New date : 2002/6/10

# TEST REPORT

## IEC60 950

## Safety of information technology equipment

| | |
|---|---|
| **Report Reference No.....:** | SPCLVD11138-1 |
| **Compiled by (+ signature).....:** | *Lily Huang*<br>Engineer |
| **Reviewed by (+ signature).....:** | *Charles. Chang*<br>Assistant Manager |
| **Date of issue.....:** | December 26, 2001 |
| **Modify describe.....:** | The report modify SPCLVD11138 to up date some components CPU of Inverter test. |
| **Testing laboratory name.....:** | Advantech QA _ Lab |
| **Testing laboratory address.....:** | No.1, Alley 20, Lane 26, Rueiguang Road Neihu District, Taipei ,Taiwan 14, R.O.C. |
| **Client name.....:** | Advantech Co., Ltd |
| **Address.....:** | 4th Fl, No. 108-3, Ming-Chuan Rd, Shing-Tien City, Taipei Hsien, Taiwan |
| **Standard.....:** | IEC 60 950:1991 + A1:1992 + A2:1993 + A3:1995 + A4:1996<br>EN 60 950:1992 + A1:1993 + A2:1993 + A3:1995 +A4:1997 + A11:1997 |
| **Test procedure .....:** | Personal Digital Assistant |
| **Procedure deviation .....:** | N/A |
| **Non-standard test method.....:** | N/A |
| **Test Report Form/blank test report** | |
| **Test Report Form No. .....:** | I950___D/97-06 |
| **TRF originator.....:** | FIMKO |
| **Master TRF .....:** | reference No. I950 D, dated 97-02 |



| | |
|---|---|
| **Test item description.....:** | Informative test report |
| **Trademark.....:** | ADVANTECH. |
| **Model and/or type reference ....:** | MPC-100-xxxxxxx, where x can be 0-9, a-z or blank |
| **Manufacturer .....:** | Advantech Co., Ltd |
| **Rating(s).....:** | 19.5 V dc, 2.0 A |

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

| 1.5.1 | **TABLE: list of critical components** | | | | Pass |
|---|---|---|---|---|---|
| object/part No. | manufacturer/ trademark | type/model | technical data | standard | mark(s) of conformity[1]) |
| Battery charger | Advantech | MPC-100-909 | For battery pack MA1000 | — — | — — |
| Remark : | | | | | |

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

| 1.6 | **TABLE: electrical data (in normal conditions)** | | | | | N/A |
|---|---|---|---|---|---|---|
| fuse # | I rated (A) | U (V) | P (W) | I (mA) | I fuse (mA) | condition/status |
| | | | | | | See enclosed No.1 UL test report |
| | | | | | | |

supplementary information:

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

File Date: / /
Pages to File:

UNDERWRITERS LABORATORIES INC.
DATA PACKAGE INFORMATION SHEET

Dept:
Applicant: Advantech Coy Ltd
Proj. Handler/Ext.:
Resp. Engr./Ext.:
Test Technician/Ext.: Zero Lee / Zero Lee
Standard(s) No.: ~~1950~~ UL60950
Peter Lai / Peter Lai
Data Sheets Reviewed by:
on / /
Prior to Lab Submittal

File No.: E884881
Proj. No.: 02SC02681
Product: Personal Digital Assistant
Model(s): MPC-100-XXXXXXX

SAMPLES

| Description | Date Rec'd | Sample Tag # | Location |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

Task Allocation
Due Date: / /

Completed Test Results Reviewed by: on 5/7/02

| Test | Pg # |
|---|---|
| 1. Input Test | 8 |
| 2. Heating Test | 9-11 |
| 3. Abnormal Operation Test | 12-15 |
| 4. Overload of Operator Accessible Connector Test | 16-18 |
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| Test | Pg # |
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Pages to Lab: Pages from Lab:

Page 1 / 18
Document: 001.Eng

TB:vc/jl (10-97)
~~ULS1950~~-TNWGQ002
~~1950~~(2)-X0695XXX-7
60950

Document: 1950-2DS.DOC
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Page 7

SPC Project No: 20566

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

Measuring and Test Instruments

Applied For Safety Inspection

02SC02681

2/18

**Company/Test Institute**: Superior Product Consulting, Inc

**Address of Test Site**: 3FL,No. 10, Alley 6,Lane 235, Pao Chiao Road, Hsin Tien City, Taipei, Taiwan, R.O.C.

**Person responsible for**

**Maintenance & Calibration**: Peter Lai/ Group Leader

**Division/Department**: Test Lab.

**Date and Signature**:

Per Lai 4/16/02

**REV: A** **DATE: April 16, 2002**

| Item | Kind of Instrument Precision Class SPC Property No. | Manufacturer | Model Serial No. | Range Used &Function | Calibrated until |
|---|---|---|---|---|---|
| 1 | AC Power Meter SPC029 | YOKOGAWA | 2433 | 20A 600V | 08, JUL. 2002 |
| 2 | AC Power Meter SPC009 | YOKOGAWA | 68LD0039 2433 | 20A 600V | 09, JUL. 2001 08, JUL. 2002 |
| 4 * | LEAKAGE CURRENT METER SPC103 | SIMPSON | 61LD0248 228 | 0-100mA | 09, JUL. 2001 |
| 5 | PUSH/PULL SCALE SPC004 | IMADA | 20433 FB-30 | 30KG | 14, APR. 2003 15, APR. 2002 |
| 7 | X-RAY METER SPC026 | VICTOREEN | 207330 440RF/D | 0-100mR/h | 10, JUL. 2002 11, JUL. 2001 |
| 8 | DC ELECTRONIC LOAD SPC069 | PRODIGIT | 597 3301A | 60V/60A | 07, AUG. 2001 08, FEB. 2001 |
| 9 | CALIPER SPC019 | MITUTOYO | 80201A011 500-321 | 150mm | 05, FEB. 2003 06, FEB. 2002 |
| 10 | TEMP. RECORDER SPC014 | YOKOGAWA | 7217225 UR180 | -200℃ TO 400℃ | 03, FEB. 2003 04, FEB. 2002 14, OCT. 2002 |
| 11 | TEMP. RECORDER SPC012 | YOKOGAWA | 48YP0718 UR180 | -200℃ TO 400℃ | 15, OCT. 2001 19, NOV. 2002 |
| 12 | TEMP. RECORDER SPC033 | YOKOGAWA | 48YP0719 UR180 | -200℃ TO 400℃ | 20, NOV. 2001 15, AUG. 2002 |
| 13 | TEMP. RECORDER SPC099 | FLUKE | 42YS0028 52 | -200℃ TO 760℃ | 16, AUG. 2001 01, AUG. 2002 |
| 14 | DIGITIZING OSCILLOSCOPE SPC047 | TEKTRONIX | 4795005 TDS410 | 150MHz 100MS/s | 02, AUG. 2001 07, JAN. 2003 |
| 15 | DUAL DISPLAY MULTIMETER SPC018 | FLUKE | B010359 45 | 750Vac 10A | 08, JAN. 2002 29, JAN. 2003 |
| 16 | HIGH VOLTAGE PROBE SPC104 | FLUKE | 5120082 80K-40 | 40KVpk | 30, JAN. 2002 28, MAY. 2002 |
| 17 | THERMO-HYGROMETER SPC067 | ISUZU | 72940016 3-3122 | -15℃ - +40℃ 0-100% RH | 29, MAY. 2001 03, FEB. 2003 |
| 18 | DC ELECTRONIC LOAD SPC028 | PRODIGIT | 80660571 3301 | 60V/60A 250V/10A | 04, FEB. 2002 24, MAY. 2002 |
| 19 | DC ELECTRONIC LOAD SPC035 | PRODIGIT | 205010035 3301 | 60V/60A 250V/10A | 25, MAY. 2001 24, MAY. 2002 |
| 20 | AC/DC CURRENT PROBE SPC047 | TEKTRONIX | 210010074 A622 | 70Arms 100Apk | 25, MAY. 2001 25, MAY. 2002 |
| 21 | DC ELECTRONIC LOAD SPC057 | PRODIGIT | 06-14-94 3321 | 60V/60A | 26, MAY. 2001 06, AUG. 2002 |
| 22 | DC ELECTRONIC LOAD SPC089 | PRODIGIT | 607020098 3321 | 60V/60A | 07, AUG. 2001 06, AUG. 2002 |
| 23 | DIGITIZING POWER METER SPC059 | PRODIGIT | 607020097 4011 | 600V/20A | 07, AUG. 2001 05, AUG. 2002 |
| 24 * | STOP WATCH SPC068 | CASIO | 964011133 HS-20 | 0 S-10HOURS | 06, AUG. 2001 11, APR. 2003 |
| 25 | DIGITIZING MUTIMETER SPC060 | GOOD WILL | --- GDM-8055 | 750Vac | 12, APR. 2002 08, JUL. 2002 |
| 27 * | POWER ANALYSER SPC063 | AVPOWER | 6040254 PA2100 | 2A 20MΩ 650Vrms | 09, JUL. 2001 11, APR. 2003 |
| 28 | DC ELECTRONIC LOAD SPC066 | PRODIGIT | 621-0597 3301A 70601A022 | 20A 60V/60A 250V/10A | 12, APR. 2002 14, OCT. 2002 15, OCT. 2001 |

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

3/18 02SC02681

| Item | Kind of Instrument Precision Class SPC Property No. | Manufacturer | Model Serial No. | Range Used &Function | Calibrated until |
|---|---|---|---|---|---|
| 29 * | TEST FINGER SPC039 | UL | SM471 | UL1950 FIG. 19 | 21. MAR. 2004 |
| | | | S002 | | 22. MAR. 2002 |
| 30 * | BALL PRESSURE SPC041 | UL | S1598 | UL1950 FIG. 21 | 21. MAR. 2004 |
| | | | S004 | | 22. MAR. 2002 |
| 31 * | IMPACT BALL ---- | UL | ---- | 50mm 500g | 21. MAR. 2004 |
| | | | S003 | | 22. MAR. 2002 |
| 32 * | TEST PIN SPC040 | UL | S2962 | UL1950 FIG. 20 | 21. MAR. 2004 |
| | | | S001 | | 22. MAR. 2002 |
| 33 | DC ELECTRONIC LOAD SPC077 | PRODIGIT | 3301A | 60V/60A | 22. AUG. 2002 |
| | | | 80701A043 | | 23. AUG. 2001 |
| 34 | DC ELECTRONIC LOAD SPC079 | PRODIGIT | 3301A | 60V/60A | 29. AUG. 2002 |
| | | | 80701A042 | | 30. AUG. 2001 |
| 35 | DC ELECTRONIC LOAD SPC080 | PRODIGIT | 3302A | 60V/30A | 22. AUG. 2002 |
| | | | 808020375 | | 23. AUG. 2001 |
| 36 | DC ELECTRONIC LOAD SPC081 | PRODIGIT | 3302 | 60V/30A | 14. OCT. 2002 |
| | | | 808020378 | | 15. OCT. 2001 |
| 37 | DC ELECTRONIC LOAD SPC078 | ZENTECH | 2600R | 60V/60A 300V/10A | 22. AUG. 2002 |
| | | | 809055 | | 23. AUG. 2001 |
| 38 | TEMP. RECORDER SPC082 | YOKOGAWA | UR1800 | -200℃ TO 400 | 03. JAN. 2003 |
| | | | 4370GE038 | | 04. JAN. 2002 |
| 39 | TEMP. RECORDER SPC083 | YOKOGAWA | UR1800 | -200℃ TO 400 | 03. JAN. 2003 |
| | | | 4370GE037 | | 04. JAN. 2002 |
| 40 | TEMP. RECORDER SPC090 | YOKOGAWA | UR1800 | -200℃ TO 400 | 03. JAN. 2003 |
| | | | 4370GE046 | | 04. JAN. 2002 |
| 41 | DC ELECTRONIC LOAD SPC091 | PRODIGIT | 3302A | 60V/30A | 14. OCT. 2002 |
| | | | 811020578 | | 15. OCT. 2001 |
| 42 | DC ELECTRONIC LOAD SPC088 | PRODIGIT | 3302A | 60V/30A | 14. OCT. 2002 |
| | | | 811020580 | | 15. OCT. 2001 |
| 43 | DC ELECTRONIC LOAD SPC098 | PRODIGIT | 3301A | 60V/60A | 14. OCT. 2002 |
| | | | 80901A045 | | 15. OCT. 2001 |
| 44 * | TEST FINGER SPC070 | UL | FIGURE 19 | UL1950 FIG. 19 | 21. MAR. 2004 |
| | | | 2346 | | 22. MAR. 2002 |
| 45 | DC ELECTRONIC LOAD SPC092 | PRODIGIT | 3301A | 60V/60A | 14. OCT. 2002 |
| | | | 80901A046 | | 15. OCT. 2001 |
| 46 | DIGITIZING OSCILLOSCOPE SPC093 | TEKTRONIX | TDS360 | 200MHz 1GS/s | 27. AUG. 2002 |
| | | | B019983 | | 28. AUG. 2001 |
| 47 | DUAL DISPLAY MULTIMETER SPC094 | FLUKE | 45 | 750Vac 10A | 07. JAN. 2003 |
| | | | 7079032 | | 08. JAN. 2002 |
| 48 | HI-POT TESTER SPC095 | ZENTECH | ZT9072A | 10mA 5KV | 29. AUG. 2002 |
| | | | 809549 | | 30. AUG. 2001 |
| 49 | GROUNDING TESTER SPC096 | ZENTECH | ZT9570 | 12V 40A | 22. NOV. 2002 |
| | | | 807786 | | 23. NOV. 2001 |
| 50 | LEAKAGE CURRENT METER SPC097 | SIMPSON | 228 | 0-100mA | 14. OCT. 2002 |
| | | | 20988 | | 15. OCT. 2001 |
| 51 | DIGITIZING POWER METER SPC094 | PRODIGIT | 4011 | 600V/20A | 04. FEB. 2003 |
| | | | 984011034 | | 05. FEB. 2002 |
| 52 | CALIPER SPC084 | MITUTOYO | CD-6"CS | 150mm | 19. NOV. 2002 |
| | | | 0305366 | | 20. NOV. 2001 |
| 53 | TEMP. RECORDER SPC072 | YOKOGAWA | UR1800 | -200℃ TO 400 | 19. NOV. 2002 |
| | | | 4370GC179 | | 20. NOV. 2001 |
| 54 | AC POWER METER SPC101 | YOKOGAWA | 2433 | 20A 600V | 06. JAN. 2003 |
| | | | 68LD0040 | | 07. JAN. 2002 |
| 56 | TEMP. RECORDER SPC104 | YOKOGAWA | UR1800 | -200℃ TO 400 | 04. FEB. 2003 |
| | | | 12W732059 | | 05. FEB. 2002 |
| 57 | TEMP. RECORDER SPC106 | FLUKE | 52 | -200℃ TO 760℃ | 26. FEB. 2003 |
| | | | 73990047 | | 27. FEB. 2002 |
| 58 | DIGITIZING POWER METER SPC107 | CHYNG HONG | CP-350 | 500V/50A | 03. MAR. 2003 |
| | | | 355952 | | 04. MAR. 2002 |
| 59 | DIGITIZING POWER METER SPC105 | CHYNG HONG | CP-350 | 500V/50A | 03. MAR. 2003 |
| | | | 355953 | | 04. MAR. 2002 |

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Page 4/18

Advantech Co., Ltd.

TEST RECORD NO. ____ Vol. 3 Sec. 1 Issued: 12-14-01

SAMPLES:

( ) The manufacturer submitted
(X) a sample representing production of
(X) representative production samples of Personal Digital Assistant
Model(s) MPC-(ΦΦ-XXXXXXX
employing the alternate Battery Charger

(X) The following tests were conducted in accordance with
(X) The Standard for Safety of Information Technology Equipment.
(X) CSA C22.2, No. 950 + UL 1950, Third Edition.
( ) Including considerations for Fourth Amendment.
( ) UL 1950, _____ Edition
( ) CSA-C22.2, No. 950-93
( ) CSA-C22.2, No. 234-M90
( ) IEC 950, _____ Edition ( ) Including Amendments
( ) EN 60 950 : 1988 ( ) Including National Deviations From
( ) VDE 0805/05.90
( ) AS 3260
( ) EN 41 003
( ) TS 001-1990
( ) *Test results relates only to the items tested*

(X) Only the following tests were deemed necessary.

(X) Tests were conducted by (co. name & location) *Superior Product Consulting, Inc, Taipei, Taiwan, R.O.C.*
( ) and witnessed by a member of the UL staff.

(X) Tests were conducted under *CTDP/COMPASS Program/TCP/CAP.*
( ) Tests noted by the initials "UL" were conducted at UL/witnessed by UL staff member.

( ) The following tests were conducted by
Memorandum of Understanding (MOU)/CB Scheme under the
(CB Certificate No. _____ Tracking No. _____)

Document: 004.Eng

Document: 1950-2b8.pcf
M:\WORD\SHARED\1950MISC

60950

SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Page 5/18

The test methods and results of the above tests have been reviewed and found to be in accordance with the requirements in the Standards noted above. Test results are valid only for the tested equipment.

( ) The following 03 Deviations from UL 1950, Second Edition, were used for testing: _____, _____, _____, _____, _____, _____, _____, _____.

( ) The card cage contained _____ boards and had _____ empty slots.

(X) The unit was configured as follows: Max. normal load.

"Maximum normal load" was defined as follows: See Power Supply Refrang Page

( ) Horizontal scanning frequency: _____ KHz
Vertical scanning frequency: _____ Hz

(X) The unit weighs approximately 4.25 kg and was considered ~~handheld~~/movable/~~fixed/stationary~~ with exposed/~~unexposed~~ SELV/~~secondary~~ ~~low voltage/TNV~~ circuits.

( ) The unit was considered rack-mountable.

(X) Maximum operating ambient 50 ~~25~~ °C.

( ) Unless otherwise indicated, all tests were conducted on Model _____.

( ) Tests performed on Model _____ were considered to be representative of Model(s) _____.

Document: 004.Eng

FB:vc/j1 (10-97)
01.02.2002 TNWGQ00D2
J1-X0695XXX-8
C0950

Document: 1950-2US.DOC
M:\WORD\SHARED\1950MISC

SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Page 6/18

D.a 5/9/02

( ) Only limited tests/No tests were performed on Model _____ because of similarity in construction to ( ) Model _____, see Report dated _____. ( ) previously evaluated unit.

(X) Only limited tests/~~No tests~~ were performed on Model MPC-1ΦΦ-XXXXXXX employing alternate battery charger due to testing previously performed on the subject unit.

Document: 004.Eng

TB:VC/1 (1e-97)
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60950

Document: 1950-2DS.DOC
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Page 2/18

POWER SUPPLY REFERENCE PAGE

MODEL: MPC-1ΦΦ-XXXXXXX

Rated Input:

| Volts | Amperes | Watts | Hz | Phase |
|---|---|---|---|---|
| 19.5Vdc | 2 | — | — | — |
| | | | | |

Rated Output:

| V1 | A1 | V2 | A2 | V3 | A3 | V4 | A4 | V5 | A5 | V6 | A6 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |

( ) Output Test Load:

Condition A

Condition B

(X) Maximum Output Power: — W

Maximum Operating Ambient: 5Φ25 °C

( ) Sample Operation Position:

( ) External Forced Air Cooling:

1. Fan CFM:
2. Fan Distance from Unit: cm
3. Fan Location:
4. Air-flow Direction:

( ) The following output terminals were connected to earth:

Document: 006.Eng

TB:VC/11 (10-97)
ULS~~1950~~-TNWCC002
~~1950~~(2)-X0695XXX-11
60950

Document: 1950-2DS.DOC
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

6.a
5/7/02

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee / Zero Lee Page 8/18
Ricky Liu Ricky Liu
Sample # 1/1 Instr Code/Range: 25.22

1.6.1 - INPUT TEST
SINGLE-PHASE
METHOD

The unit was connected to a variable voltage as indicated and then operated normally under the conditions noted below until well warmed. The input current and average power were measured.

RESULTS

| Operating Condition | Input Condition Volts | Hz | Input Current, A Rated | Measured | Avg. Power Watts |
|---|---|---|---|---|---|
| Max. normal load | 90 | 50 | — | 0.69 | 34 |
| " | 90 | 60 | — | 0.68 | 34 |
| " | 100 | 50 | 1.5 | 0.64 | 34 |
| " | 100 | 60 | 1.5 | 0.63 | 34 |
| " | 240 | 50 | 1.5 | 0.32 | 33 |
| " | 240 | 60 | 1.5 | 0.31 | 33 |
| " | 264 | 50 | — | 0.30 | 33 |
| | 264 | 60 | — | 0.29 | 34 |

Computer: Persanal Digital Assistant

Input To Notebook

| Operating Condition | Input Condition Volts | DC | Input Current, A Rated | Measured | Power Watts |
|---|---|---|---|---|---|
| Max. normal load | 20.13 | DC | 2 | 1.48 | 29.79 |
| " | 20.13 | " | (2)1.452 | 1.45 | 29.18 |
| " | 20.14 | " | 2 | 1.45 | 29.20 |
| " | 20.13 | " | 2 | 1.45 | 29.19 |
| " | 20.13 | " | 2 | 1.46 | 29.39 |
| " | 20.15 | " | 2 | 1.46 | 29.42 |
| " | 20.16 | " | 2 | 1.46 | 29.43 |
| | 20.13 | " | 2 | 1.46 | 29.39 |

The steady state input current ~~did~~/did not exceed the rated current at the rated voltage by more than 10 percent under the maximum normal load.

Comments:

Document: 040.Eng

TB:vc/jl (10-97)
ULS~~1950~~-TNWG0002
~~1950~~(2)-X0695XXX-115
60950

Document: 1950-2DS.DOC
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee / Zero Lee Page 9/18
Ricky Liu Ricky Liu
Sample # Instr Cod~/Range: 0.a 5/9/02

5.1, 1.4.8, 3.3.2 - HEATING TEST:

METHOD

The sample was connected to a source of supply as noted below and operated until temperatures became stable. Temperatures were measured using the thermocouple method ( ) and change-of-resistance method where indicated.

( ) Before starting the Heating Test, each special non-detachable power supply cord connection was pulled with a force of 5 N (1.12 lbs) for one minute. During the Heating Test, the temperature of its connections were recorded. (Maximum 60°C rise per 3.3.2.)

The sample operated under normal load as follows:

(X) Continuous operation, until steady conditions were established.

( ) Rated intermittent operation of ____ on ____ off, until steady conditions were established.

( ) Rated short-time operation of ____.

( ) The test conditions were as follows:

Tmra was 25 50 °C.

( ) #note

Cooling fan CFM (min):"

Document: 450.Eng

TR:vc/jl (10-97)
~~UL1950~~-TNWGC002
~~1950~~(2)-X0695XXX-58
60950

Document: 1950-2DS.DOC
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

[illegible] LABORATORIES INC.
Data Sheet

File: E 180881 Project: 02SC02681 Date: 5/8/02
Tested by: Zaro Lee / Ricky Liu / Zero Lee / Ricky Liu Page: 14/18
Sample #: 1/4 Instr Code/Range: 23, 56, 24, 46 05/9/02

RESULTS

| Test | Operating Condition | Input Conditions Volts | Hz | Duration |
|---|---|---|---|---|
| A | Max. normal load. | 19.5 | Vdc | 2hrs |
| B | 11 (Block Openings) | 19.5 | Vdc | 1 hr |
| C | | | | |
| D | | | | |
| E | | | | |
| F | | | | |

| Thermocouple Locations | Maximum Temperature °C Test A | Test B | Test C | Test D | Test E | Test F |
|---|---|---|---|---|---|---|
| 1. L1 Coil | 52 | 52 | | | | |
| 2. L2 Coil | 54 | 54 | | | | |
| 3. L3 Coil | 54 | 54 | | | | |
| 4. PCB near U1 | 49 | 49 | | | | |
| 5. PCB near U4 | 52 | 51 | | | | |
| 6. PCB near U5 | 40 | 40 | | | | |
| 7. Enclosure near Battery Pack (outside) | 33 | 32 | | | | |
| 8. Ambient | 23 | 22 | | | | |

TB:vc/jl (10-97)
ULS~~1950~~-TNWGQ002
~~1950~~(2)-X0695XXX-59
60950

Document: 450.Eng
Document: 1950-2DS.DOC
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

HEATING (TEMPERATURE) TEST (FOR ENGINEER REFERENCES ONLY)

| Thermocouple Locations MPC-1ΦΦ-XXXXXXX | dT (K) 19.5 V/ dc Hz | ____V/____ Hz | ____V/____ Hz | ____V/____ Hz | Required dT (K) |
|---|---|---|---|---|---|
| 1. L1 Coil | 29 | | | | 55 |
| 2. L2 Coil | 31 | | | | 55 |
| 3. L3 Coil | 31 | | | | 55 |
| 4. PCB near U1 | 26 | | | | 55 |
| 5. PCB near U4 | 29 | | | | 55 |
| 6. PCB near U5 | 17 | | | | 55 |
| 7. Enclosure near Battery Park (outside) | 1Φ | | | | 45 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Room ambient | 23 °C | °C | °C | °C | |

Max. ambient temperature ..... : 5Φ °C (Manufacturer's specification)

Insulating winding component s(Transformer):

☐ Class A (T ) ..... : 75K - 10K - (____ – 25)K = ____ K

☐ Class B (T ) ..... : 95K - 10K - (____ – 25)K = ____ K

*變壓器使用Triple wire且用UL R/C (OBJY2) Insulation System時, 須確認是否只有Class 120 °(E)?

☐ Class E (T ) ..... : 90K - 10K - (____ – 25)K = ____ K

Components:

☒ PCB ( 1Φ5 °C) ..... : (1Φ5 – 5Φ)K = 55 K

☒ Choke ( 1Φ5 °C) ..... : (1Φ5 – 5Φ)K = 55 K

* 如Choke之溫度等級(Class)於120°C以上, 必須量測PCB之溫度。

☐ Electrolyte cap. ( °C) ..... : (____ – ____)K = ____ K

☐ FBT (120°C) ..... : (120°C – ____)K = ____ K

☐ Yoke coil (105°C) ..... : (105°C – ____)K = ____ K

User Touchable Surface:

☒ Plastic ..... : 70K – (5Φ – 25)K = 45 K

☐ Metal ..... : 45K – (____ – 25)K = ____ K

Notes:

1. For plastic Enclosure (Stress Relief Test)
   ☐ The oven temperature is ____°C (ΔT ____ + 10°C + max ambient ____°C ) or
   ☐ 70°C
2. 如果Heat Sink量測得之溫度超過PCB之限制值, 則必須量測PCB之溫度。

Prepared by: Zero Lee
\\SERVER\實驗室\Lab 常用表格\Temp_dt (06-06-2001).doc

Reviewed by: Peter Lai

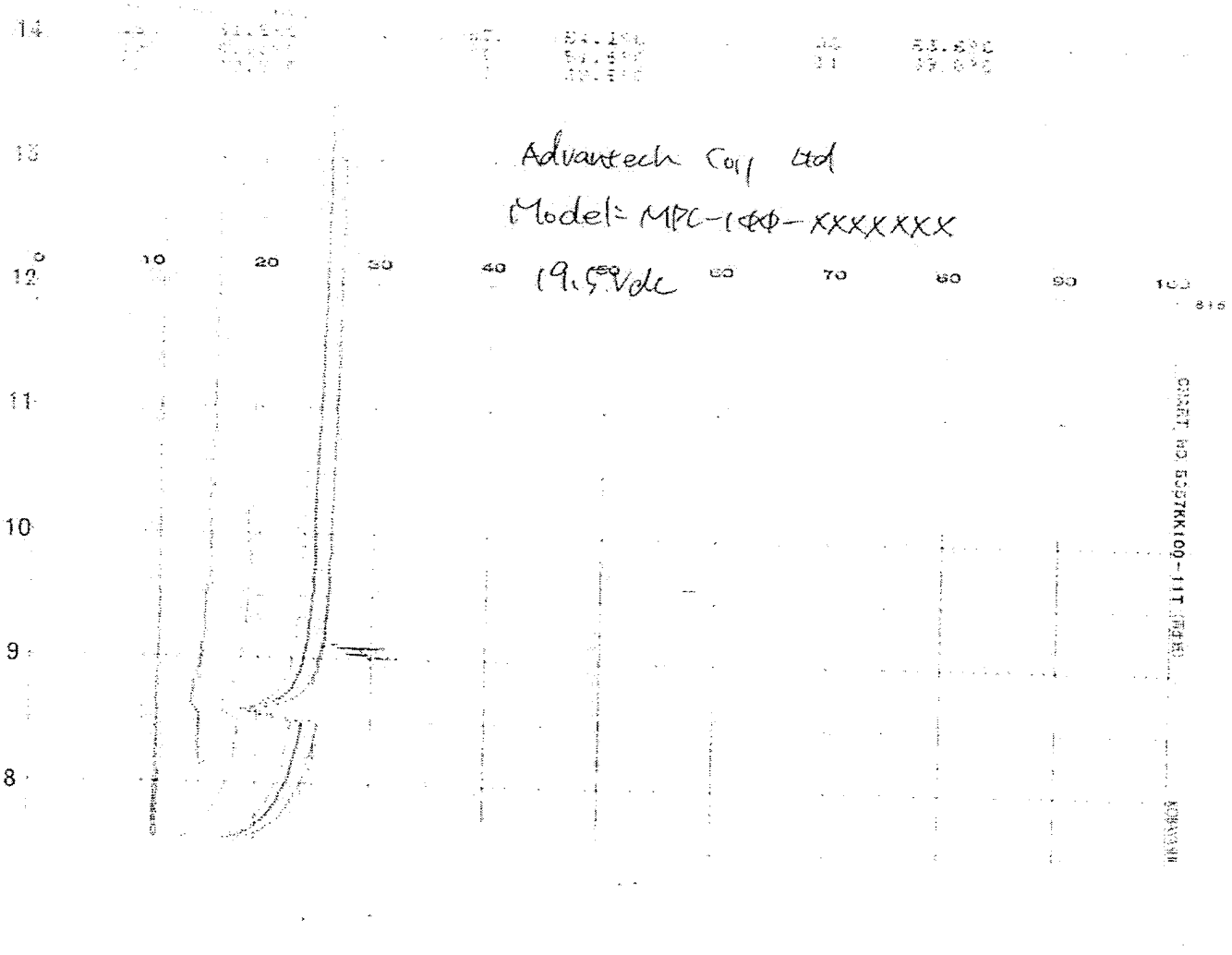
| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

SPC PROJECT NO. : 20506

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee Zero Lee Page 17/18
Ricky Liu Ricky Liu
Sample # 4 Instr Code/Range: 23,56,24,46

0.22
5/9/02



| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

SUPERIOR PRODUCT CONSULTING, INC.
Data Sheet Φ25C Φ2681 11a/18

File E184881 Project ~~SPCLVD11138~~ Page
Tested by: Tim Lu Tim Lu Date 11/23 /01
(Printed Name) Zeo Lee (Signature) Zeo Lee

Sample # 1/1 Instr Code/Range: 8/644, 60A, 53/62, 24/1hrs, 1/Auto range

RESULTS

0.0 SPC102

| Test | Operating Condition | Input Conditions Volts | Hz | Duration |
|---|---|---|---|---|
| A | Max. normal Load | 19.5 | dc | 3hrs |
| B | " " (Battery mode) | — | — | 1.5hrs |
| C | | | | |
| D | | | | |
| E | | | | |
| F | | | | |

| Thermocouple Locations | Maximum Temperature °C Test A | Test B | Test C | Test D | Test E | Test F |
|---|---|---|---|---|---|---|
| 1. PCB near U1 | 34 | 36 | | | | |
| 2. Inveter PT1 coil | 37 | 36 | | | | |
| 3. Panel | 34 | 27 | | | | |
| 4. Enclosure near Power in | 25 | 24 | | | | |
| 5. T1 coil | 47 | — | | | | |
| 6. T1 core | 45 | — | | | | |
| 7. L6 coil | 42 | — | | | | |
| 8 LP1 coil | 43 | — | | | | |
| 9 Enclosure (outside) | 33 | — | | | | |
| 10. ~~Ambient~~ Battery body | 29 | 30 | | | | |
| 11. Ambient | 25 | 24 | | | | |
| | | | | | | |
| | | | | | | |

Note: ( ) Test on model:

Note: Thermocouple Locations 1, 2, 3, 4, 10 (9,10) for PDA
" " 5, 6, 7, 8 for power Adapter

TB:bd - UL 60950, 3rd Data Sheets Adapter: Lien Electronics Form Issued: 10-02-00
Document: 010.Eng Type LE-9728B-014 Revised: 00-00-00

Form Page 70



SPC PROJECT NO.: 11138

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

HEATING (TEMPERATURE) TEST (FOR ENGINEER REFERENCES ONLY)

0.A Sinofei

| Thermocouple Locations | (Battery) dT (K) | | | | |
|---|---|---|---|---|---|
| | 19.5 V/ dc Hz | — V/ — Hz | ____V/____ Hz | ____V/____ Hz | Required dT (K) |
| 1. PCB near U1 | 9 | 12 | | | 55 |
| 2. Inver PT1 coil | 12 | 12 | | | 55 |
| 3. Panal | 5 | 3 | | | — |
| 4. Enclosure near Power in | Φ | Φ | | | 45 |
| 5. T1 coil | 22 | — | | | 40 |
| 6. T1 core | 2Φ | — | | | — |
| 7. L6 coil | 17 | — | | | 55 |
| 8. LP1 coil | 18 | — | | | 55 |
| 9. Enclosure (outside) | 8 | — | | | 45 |
| 10. Battery body | 4 | 6 | | | — |
| 11. | | | | | |
| Test mode1: MPC-1ΦΦ7 | | | | | |
| | | | | | |
| | | | | | |
| Room ambient | 25 °C | 24 °C | °C | °C | |

Max. ambient temperature .....: 50 °C (Manufacturer's specification)

Insulating winding component s(Transformer):

☒ Class A ($T_1$, $PT_1$) .....: 75K - 10K - (50 – 25)K = 40 K

☐ Class B (T ) .....: 95K - 10K - (____ – 25)K = ____ K

*變壓器使用Triple wire且用UL R/C (OBJY2) Insulation System時，須確認是否只有Class 120 °(E)?

☐ Class E (T ) .....: 90K - 10K - (____ – 25)K = ____ K

Components:

☒ PCB ( 105 °C) .....: (105 – 50)K = 55 K

☒ Choke ( 105 °C) .....: (105 – 50)K = 55 K

* 如Choke之溫度等級(Class)於120°C以上，必須量測PCB之溫度。

☐ Electrolyte cap. ( °C) .....: (____ – ____)K = ____ K

☐ FBT (120°C) .....: (120°C – ____)K = ____ K

☐ Yoke coil (105°C) .....: (105°C – ____)K = ____ K

User Touchable Surface:

☒ Plastic.....: 70K – (50 – 25)K = 45 K

☐ Metal.....: 45K – (____ – 25)K = ____ K

Notes:

1. For plastic Enclosure (Stress Relief Test)
   ☐ The oven temperature is ____°C (ΔT ____+ 10°C + max ambient ____°C ) or
   ☒ 70°C
2. 如果Heat Sink量測得之溫度超過PCB之限制值，則必須量測PCB之溫度。

Prepared by: Tim Lu
\\SERVER\實驗室\Lab 常用表格\Temp_dt (06-06-2001).doc

Reviewed by: Zao Lee

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: ~~Zero Lee~~ / Zero Lee Page 17/18
~~Ricky Liu~~ Ricky Liu
Sample # _____ Instr Code/Range: _____ 5/9/02

5.4.1 - 5.4.9 - ABNORMAL OPERATION TESTS:

METHOD

The unit was operated continuously under the abnormal condition(s) noted below. (X) The unit was placed on a tissue paper covered softwood surface and covered with cheesecloth.

( ) The following unreliable controls, thermostats and/or thermal cutouts were short circuited: _____

( ) If a wire or printed wiring board trace in the primary circuit opened, the gap was electrically shorted and the test continued until a ultimate results occurred.

( ) If a trace in a secondary circuit designed to intentionally open in a reliable manner operated during the test, the test was repeated two time (three times total).

| | Test No. | |
|---|---|---|
| ( ) | ____ | Mechanical movement disabled. |
| ( ) | ____ | Misloaded unit. |
| ( ) | ____ | Drive motor stalled or overloaded (i.e., paper jam). |
| ( ) | ____ | Stalled fan or blower. |
| ( ) | ____ | Disconnected fan or blower. |
| ( ) | ____ | Foreseeable misuse of operating devices (knobs, levers, keys, etc.). |
| (X) | 1 | Blocked ventilation openings. |
| ( ) | ____ | Disabled timer switch. |
| ( ) | ____ | Contact(s) malfunctioned. |
| ( ) | ____ | Thermostat(s) malfunctioned. |
| ( ) | ____ | Thermal cutout(s) malfunctioned. |
| ( ) | ____ | Solenoid plunger locked. |
| ( ) | ____ | Clutch - continuous operation. |
| ( ) | ____ | Voltage mismatch. |
| ( ) | ____ | _____ |

Document: 490.Eng

YB:vc/jl (10-97)
~~ULS 1950~~-TNWCQ002
~~1950~~(2)-X0699XXX-71
60950

Document: 1950-PUS.DOC
M:\WORD\SHARED\1950MISC

SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee / Zero Lee Page 13/15
Ricky Liu Ricky Liu

Sample # Instr Code/Range: 5/9/02

( ) At the end of the test, an Electric Strength (ES) potential was applied as indicated below for one minute.

| ES Code | Location From | To | Potential Used (V) |
|---|---|---|---|
| A | | | ( ) ac ( ) dc |
| B | | | ( ) ac ( ) dc |

The following key and corresponding comments may be used to describe the final results.

Comments Key:

NB - No indication of dielectric breakdown
YB - Dielectric breakdown (indicate time and location)
NC - Cheesecloth remained intact
YC - Cheesecloth charred or flamed
NT - Tissue paper remained intact
YT - Tissue paper charred or flamed

Document: 490.Eng

TB;VC/1[illegible] (10-97)
[illegible]-TNWG(10)
[illegible]-XXX-72
60950

Document: 1950-2DS.DOC
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

UNDERWRITERS LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee / Zero Lee Page 14/18
Ricky Liu Ricky Liu
Sample # 1 Instr Code/Range: 23.Th.24.25
RESULTS

| Test | Component | Abnormal Condition | Input V/Hz | Duration | ES Code |
|---|---|---|---|---|---|
| 1 | Unit | Block Opening's | ~~110/60~~ 115Vac | 1hr | — |

Comments: Temp. was stable. Input current = 1.51A. See Heating Test Result for details. N/C. NT

Comments:

Comments:

Comments:

Comments:

Document: 490.Eng

YB:vc/31 (10-97)
ULS~~1950~~-TNWSQD02
~~1995~~(12)-X0695XXX-73
60950

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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

SPC PROJECT NO. : 20506

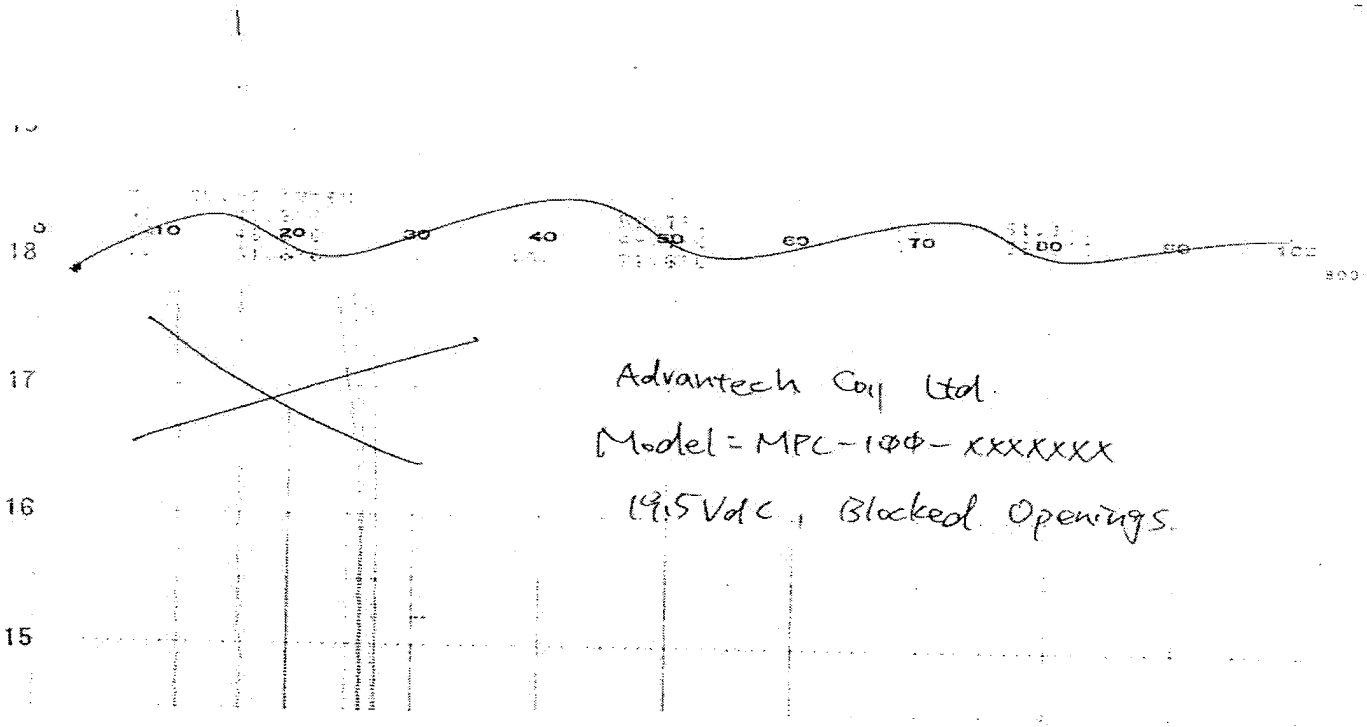
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02

Tested by: Zero Lee / Zero Lee Page 15/18

Ricky Liu Baby Chen

Sample # 1/1 Instr Code/Range: 23,56,24,46 OK 5/9/02



| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

[illegible] LABORATORIES INC.
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee / Ricky Liu Zero Lee / Ricky Liu Page 16/18
Sample # Instr Code/Range: 5/14/02

5.4.6 - OVERLOAD OF OPERATOR ACCESSIBLE CONNECTOR TEST:

METHOD

The sample was covered with one layer of cheesecloth and placed on a pinewood board covered with one layer of tissue paper. The sample had a complete enclosure.

The sample was connected to 19.5 V ~~ac~~ ~~Hz~~/dc.

The voltage potential was measured on the connector pins. Circuits that measured 0 V were not tested.

(X) The impedance was measured between each accessible connector pin that had a potential of greater than 0 V and its power supply voltage source. Where there was 10,000 ohm or more of series impedance between the output connector pin and the power supply voltage source of 125 V or less, the circuit was not tested. Where there was 20,000 ohm or more of series impedance between the output connector pin and the power supply voltage source was greater than 125 V but not greater than 250 V, the circuit was not tested.

A suitable variable resistor was connected between the connector pin tested and ground. The maximum available current was measured at each pin. If the current was less than or equal to 12.9 mA, the circuit was not tested.

When the maximum available current was greater than 12.9 mA, the load was adjusted for maximum available current and maintained for one hour.

The maximum available current was considered to be the lower of (1) the short circuit current, (2) that current just below the trip point of any overcurrent or overtemperature protective device, or (3) that current that was just below the point at which the power supply circuitry limited the output current. The trip point of overcurrent protective devices was considered to be 110 percent of their current rating.

Document: 520.Eng

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60950

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SPC PROJECT NO. : 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

THERMWTEST (Version 4.11) 12/...
Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02
Tested by: Zero Lee / Zero Lee Page 12/18
Ricky Liu Ricky Liu

Sample # ____ Instr Code/Range: ____ 5/9/02

If the circuit was interrupted by the opening of an unreliable component, the test was repeated twice (three times total) using new components as necessary. If a wire or printed wiring board trace in the primary circuit opened, the gap was electrically shorted and the test continued until ultimate results occurred.

( ) If a trace in a secondary circuit designed to intentionally open in a repeatable manner operated during the test, the test was repeated two time (three times total).

If after one hour there was no indication of an abnormal condition, but it appeared possible that a condition of risk would result, the test was continued for 7 hours.

( ) At the end of the test, an Electric Strength (ES) potential was applied as indicated below for one minute.

| ES Code | Location From | Location To | Potential Used (V) |
|---|---|---|---|
| A | | | ( ) ac ( ) dc |
| B | | | ( ) ac ( ) dc |

The following key and corresponding comments may be used to describe the final results:

Comments Key:

Nb - No indication of dielectric breakdown
Yb - Dielectric breakdown (indicate time and location)
NC - Cheesecloth remained intact
YC - Cheesecloth charred or flamed
NT - Tissue paper remained intact
YT - Tissue paper charred or flamed
A - Circuit measures 10 kS or more series impedance
B - Circuit measures less than 12.5 mA
C - Circuit measures 0 Volts
D - Other. Please explain.

Document: 520.Eng

TBIVc/11 (10-97)
(UL1950-TNW(0001))
~~Type~~ 1-A(~~1XXX~~-81)
60950

Document: 1950-2DS.lex
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SPC PROJECT NO.: 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

Data Sheet

File E 180881 Project 02SC02681 Date 5/8/02

Tested by: Zero Lee / Zero Lee Page 18/18

Ricky Liu Ricky Liu

Sample # 1/1 Instr Code/Range: 25. 24. 46. 5/14/02

RESULTS

| Connector | Pin #s | Open Circuit Voltage (V) | Maximum Available Current (mA) | Length of Test | Comments |
|---|---|---|---|---|---|
| Rechargable | 1 | 20.14 | 9322 | 1hr | NC, NT |
| " | 2 | 0 | — | — | C |
| " | 3 | 0 | — | — | C |
| " | 4 | 0 | — | — | C |
| " | 5 | 0 | — | — | C |
| " | 6 | 0 | — | — | C |

Note: Not describe parts were not tested. Because the results were comply with not tested rules in this test. (The results refer to Energy Hazard Measurements)

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1011111 J3

TB:vc/jl (10-97)
US[illegible]-[illegible]002
[illegible]-5086*XXX-#2
60950

Document : I50.Rqq
Document: I950-CB[illegible]
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SPC PROJECT NO. : 20506

| IEC60 950 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result – Remark | Verdict |

Model : MPC-100-909