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RE: Project Number(s) - 02NK95889

Your most recent Certification is shown below. You may also view this information, or a portion of this information (depending on the product category), on UL's Online Certifications Directory at www.ul.com/database. Please review the text and contact the Conformity Assessment Services staff member who handled your project if revisions are required. For instructions on placing an order for this information in a 3 x 5-inch format, you may refer to the enclosed order form for UL Card Service.

NWGQ2 November 11, 2002
Information Technology Equipment Including Electrical Business Equipment - Component

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Panel computers, Model(s) AMB-2023XXX-XX, AMB-2053XXX-XX.
X - Where X can be any alphanumeric character or blank.
Marking: Company name and model designation.

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X - Where X can be any alphanumeric character or blank.
Marking: Company name and model designation.

See General Information Preceding These Recognitions
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UL International Services Ltd.--Taiwan Branch
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No. 260 Da-Yeh Road
Pei Tou, Taipei, Taiwan 112
Telephone: 886-2-2896-7790
Fax: 886-2-2891-7644
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VP Engineering
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135 LANE 235 PAO CHIAO RD
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TAIPEI TAIWAN

Date: 10/30/2002
Subscriber: 368202001
File No: E231775
Project No: 02NK95889
PD No: 02011373
Type: R
PO Number:

Subject: Procedure And/Or Report Material

The following material resulting from the investigation under the above numbers is enclosed.

Issue Date	Vol	Sec	Pages	Revised Date
11/21/2002	1	1	Add New Proc/Report Sect	

Inspections at your plant will be conducted under the supervision of Mr. Jesse Wong, Field Supervisor, UL International Services Ltd., 5th Floor, 260 Da-Yeh Road, Peitou, Taipei City, Taiwan 112, PHONE: 886 2 28938033, FAX: 886 2 28978628.

Marks as needed may be obtained from: UL International Service Ltd., 4th Fl., 260 Da-Yeh Road, Peitou, Taipei City, Taiwan 112, PHONE: 886 2 28967790, FAX: 886 2 28917644, ATTN: Iris Tseng.

Please file revised pages and illustrations in place of material of like identity. New material should be filed in its proper numerical order.

NOTE: Follow-Up Service Procedure revisions DO NOT include Cover Pages, Test Records and Conclusion Pages. Report revisions DO NOT include Authorization Pages, Indices, Section General Pages and Appendixes.

Please review this material and report any inaccuracies to MARTIN LIN (886-2-2896-7790), referring to the above Project and/or PD Numbers.

c: TPI File

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Subscriber No.: 368202-001
Aaeon Technology Inc
5th Fl
135 Lane 235 Pao Chiao Rd
Hsin-Tien
Taipei Taiwan

FILE NO. E231775	VOL 1
PROJECT NO. 02NK95889	DATE 10-31-2002

Issued From

- ☐ 333 Pfingsten Rd. Northbrook, IL 60062
- ☐ 1655 Scott Blvd. Santa Clara, CA 95050
- ☒ TAIWAN
- ☐ 1285 Walt Whitman Rd. Melville, NY 11747
- ☐ 12 Laboratory Dr., Research Triangle Park, NC 27709

In correspondence please refer to the above file & project numbers

Mfgr's REP: Mr. Rex Chang (張德昌先生) PHONE NO: (02)8919-1234 Ext. 673 FAX NO: (02)8919-1049

INITIAL PRODUCTION INSPECTION NOTIFICATION AND/OR FINAL OR TEMPORARY PROCEDURE

Product Categories: NWGQ2 NWGQ8

Cat/Model No(s): COMPONENT - INFORMATION TECHNOLOGY EQUIPMENT INCLUDING ELECTRICAL BUSINESS EQUIPMENT

Scheduled First Production Date: Unknown

1. An Initial Production Inspection is required before shipping the product with the UL Mark. A ☐ Temporary ☒ Final Procedure describing the product has been attached and forwarded to the UL Representative who will contact the factory.
2. A Temporary Procedure should be destroyed upon receipt of the Final Procedure.
3. After the UL Representative has verified that all specifications of this Procedure and all applicable requirements of the Procedure materia covering the product category have been met, authorization will be granted for shipment of the subject product(s) bearing the UL:
   ☐ Listing Mark ☐ Classification Mark ☒ Recognized Component Mark/Marking

Very truly yours,

Martin Lin
Associate Project Engineer

Reviewed by:

Stephen Ho
Associate Project Engineer

Reviewed by:

Grace Yeh
FUS Engineering Group Leader

For Office Use — **IMPORTANT** — See instructions on back of File Copy.
☐ New Factory ☒ New Category - Existing Factory

☒ FUS Agreement signed. Type of Follow-Up Service R
If Type L Service, Label Center must be notified using "FUS Records Copy."

TO: 張榮昌 先生
(UL合格証明)

UL International Services Ltd. – Taiwan Branch
An Affiliate of
Underwriters Laboratories Inc.
Tel: 886-2-2896-7790 Fax: 886-2-2891-7644

Date - October 23, 2002

FILE NO.: E231775
PROJECT NO.: 02NK95889

Company: Aaeon Technology Inc.
c/o: Universal Testing Inc.
Fax No.: (02)8797-1945
Attention: Mr. Alan Ho
Subject: Notice of Completion of Engineering Investigation
Reference: Panel Computer, Models AMB-2023XXX-XX and AMB-2053XXX-XX, where X can be any alphanumeric character or blank.

Dear Mr. Alan Ho:

This letter is sent on behalf of Underwriters Laboratories Inc. pursuant to the Corporate Services Agreement between UL International Services Ltd.- Taiwan Branch and UL.

We have completed our engineering investigation under the above project number and find the product to be eligible for Follow-Up Service subject to the applicable Follow-Up Service Agreement. Records covering the product is now being prepared and will be sent to you soon.

Within Canada, there are federal and local statutes and regulations, such as the Consumer Packaging and Labeling Act, requiring the use of bilingual product markings on products intended for the Canadian market. It is the responsibility of the manufacturer (or distributor) to comply with this law. The UL Follow-Up Service Procedures will only include the English version of the markings.

Please note that the authorization to use the marking specified by Underwriters Laboratories Inc. on the products evaluated under the above referenced project is not extended unless and until an initial production inspection (IPI) is conducted and your manufacturer has demonstrated to the satisfaction of our Field Representative, by means of production samples, that the products are being produced in accordance with the Underwriters Laboratories Inc.'s requirements. A copy of temporary Procedure pages is being delivered to our Field Representative for the IPI, please direct your manufacturer to contact our local inspection center for an initial production inspection on the products. The time necessary to conduct this inspection will be arranged in the best way possible to accommodate your production schedule.

Very truly yours,

Martin Lin (Ext. 62269)
Conformity Assessment Services, 3000ATPI

CC: Aaeon Technology Inc.
Attn : Mr. Rex Chang
Fax : (02)8919-1049

333 Pfingsten Road
Northbrook, Illinois 60062-2096
United States Country Code(1)
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FAX No. (847) 272-8129
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File E231775
Project 02NK95889

November 21, 2002

REPORT

on

COMPONENT - INFORMATION TECHNOLOGY EQUIPMENT
INCLUDING ELECTRICAL BUSINESS EQUIPMENT

Aaeon Technology Inc.
Taipei Hsien Taiwan 231

DESCRIPTION

PRODUCT COVERED:

USR, CNR - Panel Computer, Models AMB-2023XXX-XX and AMB-2053XXX-XX, where X can be any alphanumeric character or blank.

ELECTRICAL RATING:

Voltage: 100-250 V ac
Current: 2 A
Frequency: 47-63 Hz

ENGINEERING CONSIDERATIONS: (Not For Field Representative's Use)

Special Considerations - The following items are considerations that were used when this product was evaluated.

USR, CNR indicates investigation to the U.S. and Canadian (Bi-National) Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment, CAN/CSA C22.2 No. 60950/UL 60950 Third Edition including revisions version dated March 15, 2002.

The equipment was submitted by the manufacturer for use in a maximum air ambient of 45°C.

This component is considered movable, Class I (Earth), pluggable Type A or B, uses detachable power cord, intended for use on a TN power system.

Disconnect device - The following component is considered the equipment disconnect device: Appliance Coupler.

Limited Power Source Circuits - The following accessible locations are part of a limited power source circuits:

Location	Circuit (Schematic) Designation
PS/2 Connector	CN15
Video Connector	CN8
USB Connectors	CN1
Panel Connector	CN1 (different PWB)

Condition of Acceptability - When installed in the end product, consideration shall be given to the following:

1. This equipment has been judged on the basis of required spacing in the Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment, CAN/CSA C22.2 No. 60950/UL 60950 Third Edition including revisions version dated March 15, 2002.

2. The equipment was tested on a 20 A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary.

3. The terminals and connectors are suitable for factory wiring only.

4. The equipment has been evaluated for use in a Pollution Degree 2 environment.

5. All user accessible connectors have been evaluated for potential overloading. The following outputs, if present, are provided with current limiting devices: PS/2, Video, USB and Panel.

6. Heating test and abnormal operation test should be taken into account in the end application.

7. A suitable Electrical, Fire and Mechanical enclosure shall be provided in end product.

CONSTRUCTION DETAILS:

See Section General for additional details.

Power Supply Cord - Optional, Listed, CN, detachable, maximum 4.5 m long, rated minimum 125 V, 10 A, type SVT flexible cord, No. 18 AWG/3C; one end terminates in parallel blade (NEMA 5-15P), grounding type attachment plug, other end in appliance coupler.

Alternate - Same as above, except for rated 250 V, 10 A, minimum having attachment plug with a 15 A, 250 V (NEMA 6-15P) configuration.

Replaceable Battery Markings - Following statement provided in user and service manuals: "CAUTION: Danger of Explosion if Battery is Incorrectly Replaced. Replace Only With the Same or Equivalent Type Recommended by the Manufacturer. Dispose of Used Batteries According to the Manufacturer's Instructions."

Operating/Instruction/Safety Manual - Optional, provided with each unit.

Printed Wiring Board - See Sec. Gen. For details. Rated minimum V-1, 105°C.

PERSONAL COMPUTER, MODEL AMB-2053XXX-XX - FIGS. 1 & 2

General - Figs. 1 & 2 illustrates the overall view of unit.

Front Panel - Optional, aluminum. Overall 44.5 by 33.8 cm, 6.2 mm thick. Secured to metal enclosure for LCD panel by screws.

Enclosure For LCD Panel - Plated steel. Overall 43.0 by 32.0 by 4.5 cm, 0.8 mm thick minimum, provided with numerous circular ventilation openings, each measured maximum 3.0 mm diameter, covering two areas, each area 6.7 by 6.7 cm.

Enclosure For Power/Main Boards - Plated steel. Overall is 30.0 by 22.0 by 10.2 cm, 0.8 mm thick minimum. Secured to LCD Panel Enclosure by screws. Provided with ventilation openings as follows:

Top Fan-Guard Openings: Provided with numerous circular ventilation openings, each measured maximum 4.8 mm diameter, covering two areas, each area measured maximum 5.8 cm diameter.

Bottom Fan-Guard Openings: Provided with numerous circular ventilation openings, each measured maximum 4.8 mm diameter, covering an area measured maximum 5.8 cm diameter.

Rear Ventilation Openings: Provided with numerous circular ventilation openings, each measured maximum 5.0 mm diameter, covering an area of 11.5 by 3.0 cm.

Left Side Ventilation Openings: Provided with numerous circular ventilation openings, each measured maximum 5.0 mm diameter, covering two areas, one is 7.3 by 2.0 cm; the other is 15.5 by 2.5 cm.

Right Side Ventilation Openings: Provided with numerous circular ventilation openings, each measured maximum 5.0 mm diameter, covering two areas, each area 12.5 by 1.8 cm.

Appliance Inlet - Listed or (AXUT2), Supercom Wire & Cable Co. Ltd., Type SC-9F, rated 250 V ac, 10 A minimum. Secured to Power/Main Boards Enclosure by screws.

Power ON-OFF Switch - (WOYR2), CN, rocker type, DPST, Solteam Electronics Co. Ltd., Type MR-21, rated 250 V ac, 5 A minimum. Secured to Power/Main Boards Enclosure by snap-fit.

DC Fan - Three provided. SELV, (GPWV2), Sunonwealth Electric Machine Industry Co. Ltd., Type KD1206PFV2, rated 12 V dc, 0.08 A, 14 CFM, secured to Power/Main Boards Enclosure by screws. One is located on power board side; others are located on main board side.

Connectors - SELV, provided with an PS2, RJ-45, LPT, COM1, VGA, Panel and two USB (optional) connectors.

PERSONAL COMPUTER, MODEL AMB-2053XXX-XX - FIG. 3

General - Fig 3 illustrates the internal view of unit.

Switching Power Supply - (QQGQ2), American Skynet Electronic Co., Type SNP-8071-A, rated input 100-250 V ac, 2 A, 47-63 Hz; output 5 V dc/10 A, 12 V dc/1.5 A, -12 V dc/0.3 A.

Insulation Sheet between Power Supply Board and Metal Enclosure - Molded of (QMFZ2), General Electric Co., Type FR700, rated VTM-0, 125° C, minimum 0.4 mm thick, located on trace side of power supply board.

Hard Disk Drive - Optional, (NWGQ2), generic, input voltage 5/12 V dc, loading current maximum 1.5 A.

CD-ROM Drive - Optional, (NWGQ2), generic, input voltage 5/12 V dc, loading current maximum 1.5 A, labeled laser Class I product.

Floppy Disk Drive - Optional, (NWGQ2), generic, input voltage 5/12 V dc, loading current maximum 1.5 A.

Keyboard - Optional, (NWGQ2), generic, input voltage 5 V dc, loading current maximum 1.1 A, enclosure F/R minimum HB.

Mouse - Optional, (NWGQ2), generic, input voltage 5 V dc, loading current maximum 1.1 A, enclosure F/R minimum HB.

Mother Board - (SELV), See Sec. Gen., consists of the following critical components:

CPU Heatsink - Aluminum, fin-shaped, overall 6.0 by 5.0 by 1.4 cm, body 0.7 mm thick minimum, secured to CPU by clamp-fits. Heatsink is floating. Provided with a cooling fan, (GPWV2), Everflow Precision Industrial Co. Ltd., Type R126010BU, rated 12 V dc, 0.25 A, 20.2 CFM, secured to upper of CPU heatsink by screws.

Alternate - Same as above, except for the overall 5.3 by 4.9 by 1.7 cm, body 0.7 mm thick minimum. Provided with a cooling fan, (GPWV2), Motor-One Electronics Inc., Type N5010B1, rated 12 V dc, 0.13 A, 10.5 CFM

Real Time Clock Battery -(BBCV2), Non-rechargeable, replaceable, Rayovac Corp., Type BR2335. Reverse current protection is accomplished by series circuit of a transistor D5 and a resistor R122. See "Replaceable Battery Markings" in CONSTRUCTION DETAILS. Provided with polarized compartment design against reverse installation 5 mA maximum abnormal charging current.

Polyswitch (FS1, FS2, FS3, FS4) - (XGPU2), Raychem Corp., Type miniSMD110, rated 1.1 A, 6 V. Provided for limiting current of USB connectors, PS/2 and Video port connector.

Alternate - Same as above, except Bourns Inc., Type MF-MSMD110.

D/A Inverter Assembly - (Manufactured by Si Jing Harng Ltd., Part No. 8592F-01). Inverter provided with two outputs and consists of the following major components:

Capacitors (C23, C24, C25 and C26): Each rated maximum 22 pF.

Transformers (T1, T2): Open type construction as follows:

Core: Ferrite, overall 23.0 by 20.0 by 5.6 mm.

Coil: Cooper magnet wire wound on bobbin, rated 130° C minimum.

Insulation Tape: (OANZ2), Polyester or polyimide film. Wrapped around transformers as outerwrap.

Bobbin: (QMFZ2), eight-flange, Liquid Crystal Polymer (LCP), Sumitomo Chemical Co. Ltd., Type E4008 or E4008L, or E I Dupont De Nemours & Co., Inc., Type 7130L, rated V-2 minimum, 0.4 mm thick minimum.

Winding information as follows:

Pin No.	Diameter (mm)	No. of Turns
5 - 3	0.35 or 0.37	8
4 - 2	0.35 or 0.37	8
1 - 6	0.25	3
7 - 8	0.06 or 0.07	1300

PERSONAL COMPUTER, MODEL AMB-2023XXX-XX

General - Model AMB-2023XXX-XX is similar to Model AMB-2053XXX-XX except for the following constructions:

Front Panel - Optional, aluminum. Overall 44.5 by 33.8 cm, 6.2 mm thick. Secured to metal Enclosure by screws.

LCD Panel Enclosure - Plated steel. Overall is 43.0 by 32.0 by 4.5 cm, 0.8 mm thick minimum, provided with numerous circular ventilation openings, each measured maximum 3.0 mm diameter, covering two areas, each area 6.7 by 6.7 cm.

D/A Inverter Assembly - (Manufactured by Chi Sam Electronic Enterprise Co., Ltd., Part No. CDA-084A). Inverter provided with one output and consists of the following major components:

Capacitors (C6, C6A): Each rated maximum 22 pF.

Transformer (T1): Open type construction as follows:

Core: Ferrite, overall 20.0 by 15.0 by 4.0 mm.

Coil: Cooper magnet wire wound on bobbin.

Insulation Tape: (OANZ2), Polyester or polyimide film. Wrapped around transformers as outerwrap.

Bobbin: (QMFZ2), seven-flange, Liquid Crystal Polymer (LCP), Sumitomo Chemical Co. Ltd., Type E4008 or E4008L, or E I Dupont De Nemours & Co., Inc., Type 7130L, rated V-2 minimum, 0.4 mm thick minimum.

Winding information as follows:

Pin No.	Diameter (mm)	No. of Turns
5 - 1	0.35	3
4 - 3	0.35	11
2 - 3	0.35	11
7 - 10	0.06	1680

CONCLUSION

A sample of the product covered by this Report has been found to comply with the requirements covering the class and the product is judged to be eligible for Component Recognition and Follow-Up Service. Under the Service the manufacturer is authorized to use the Recognized Marking described in the Follow-Up Service Procedure on such products which comply with said Procedure and any other applicable requirements of Underwriters Laboratories Inc. Only those products which properly bear the Recognized Marking are considered as Recognized Components by Underwriters Laboratories Inc.

Report by:

Martin Lin / ac

MARTIN LIN
Associate Project Engineer
Conformity Assessment Services
UL International Services Ltd.
Taiwan Branch

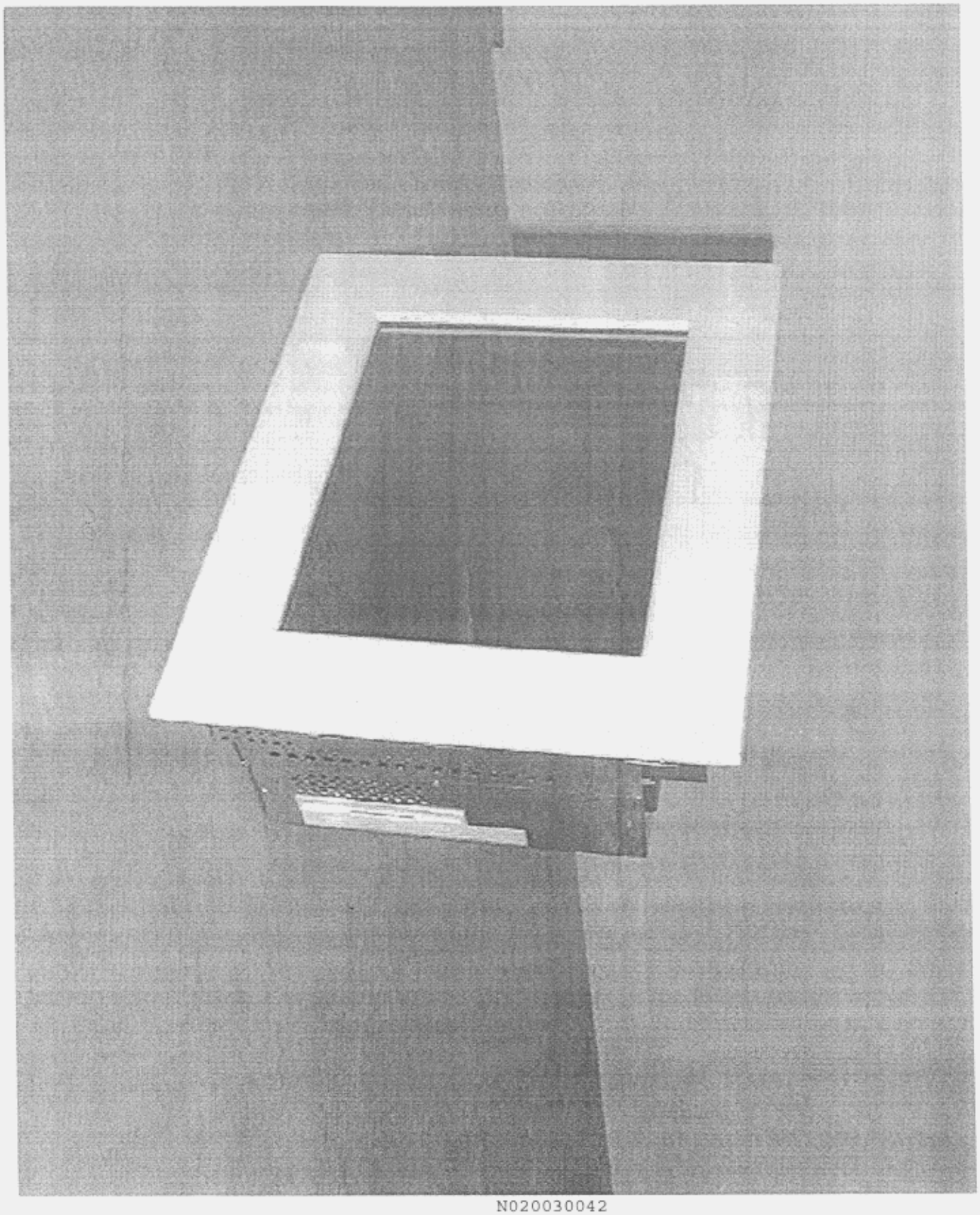
Reviewed by:

Stephen Ho / ac

STEPHEN HO
Associate Project Engineer
Conformity Assessment Services
UL International Services Ltd.
Taiwan Branch

Pursuant to the Corporate Services Agreement between UL International Services Ltd. - Taiwan Branch and Underwriters Laboratories Inc., ("UL"), UL hereby accepts and issues this Report.

And Report



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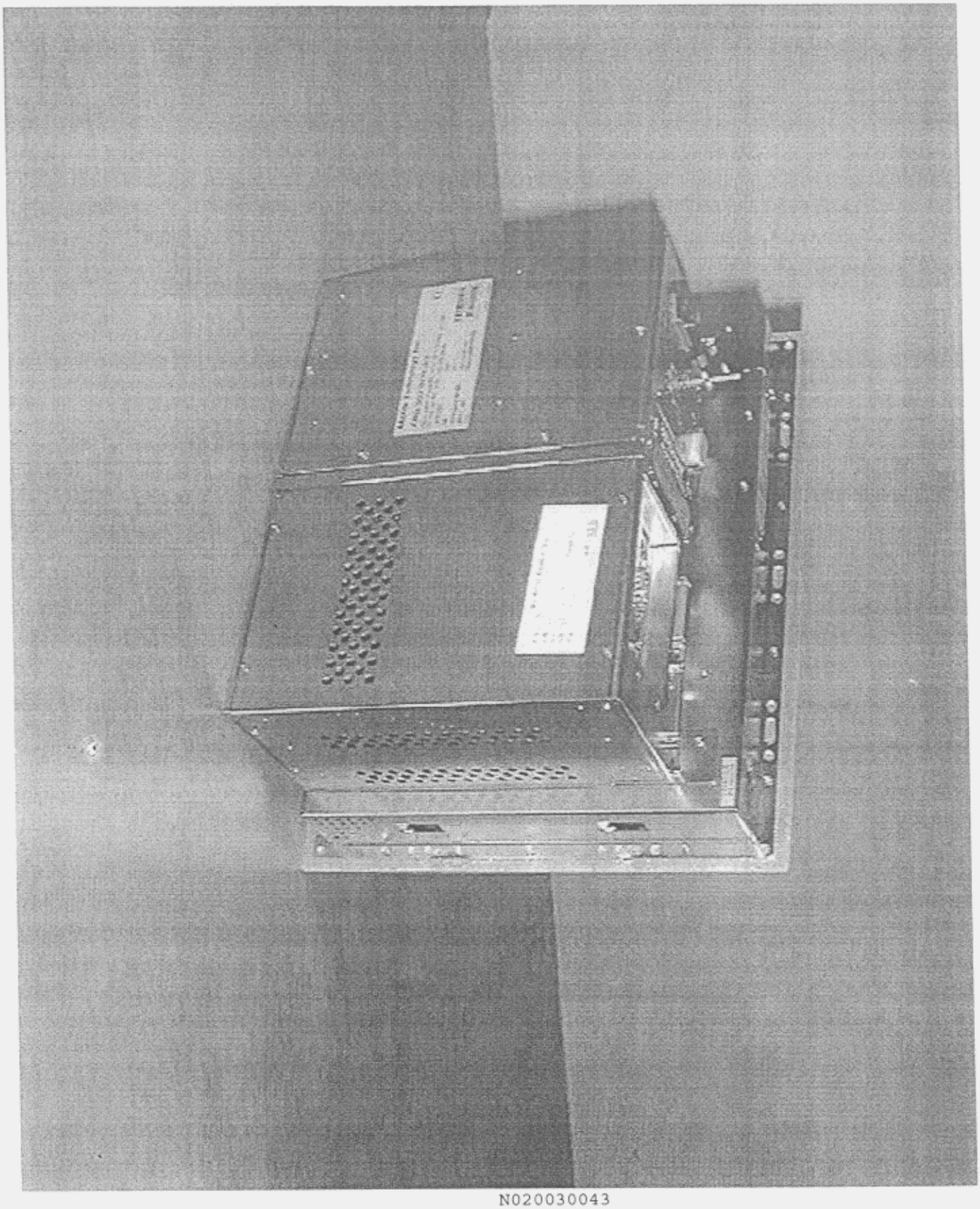

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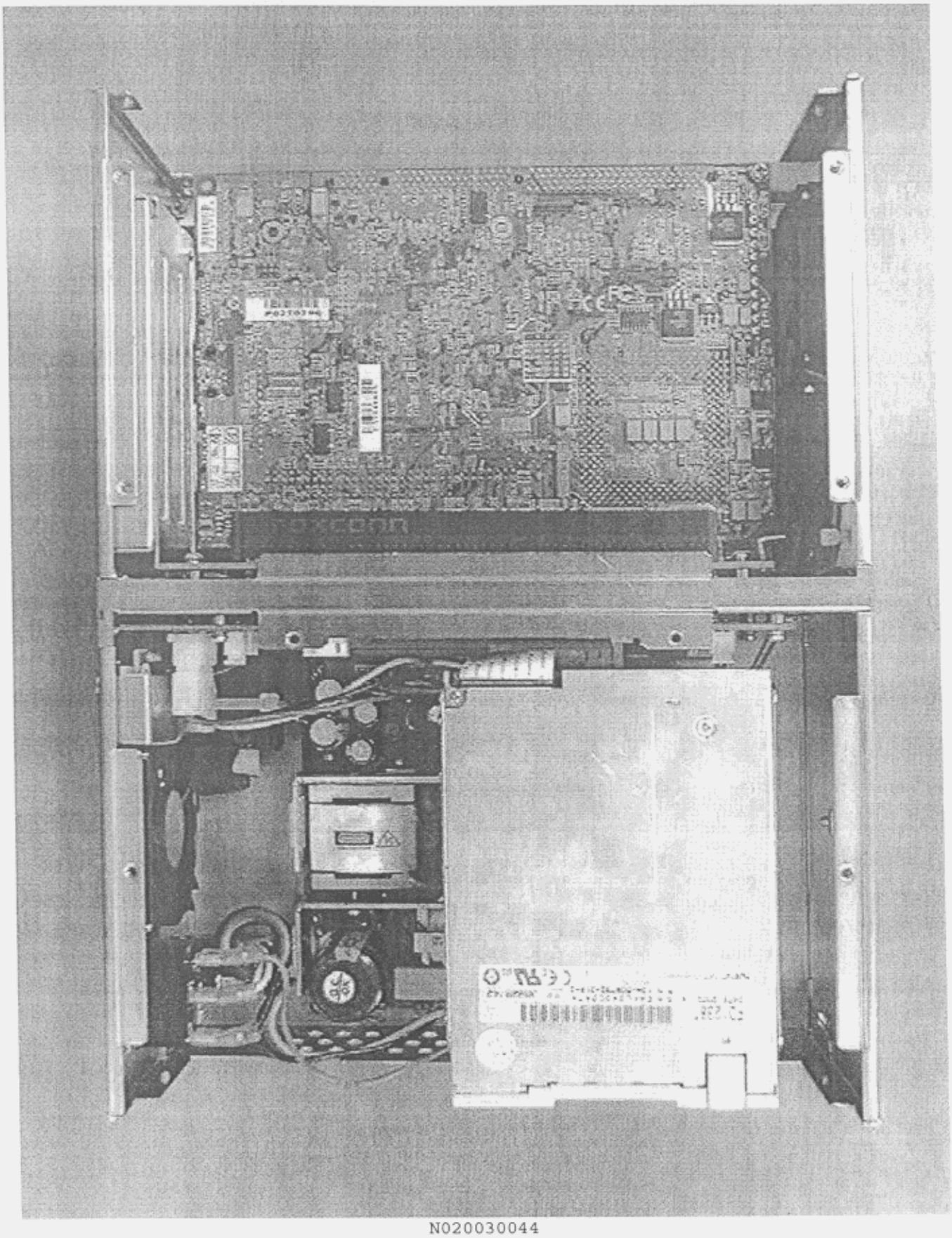

N020030044

TEST RECORD NO. 1

TEST PROGRAM DETAILS:

The manufacturer submitted representative production sample of open frame panel computer, Models AMB-2053XXX-XX and AMB-2023XXX-XX.

The following tests were conducted in accordance with the Standard for Safety of Information Technology Equipment, CSA C22.2, No. 60950/UL 60950, Third Edition, including revisions version dated March 15, 2002.

Only the following tests were deemed necessary.

Tests were conducted by Universal Testing Inc., located in Taipei and witnessed by a member of the UL staff under UL's Witnessed Test Data Program.

"Maximum normal load" was defined as follows: Fixed with each one of HDD, FDD, CD-ROM drive and two dummy cards, each dummy card is 11 W. Data was read and write between HDD and FDD and activate CD-ROM drive then operated continuously.

The unit weighs approximately 13.6 kg (for Model AMB-2053XXX-XX), 10 Kg (For Model AMB-2023XXX-XX) and were considered rack-mountable with exposed SELV circuits.

Maximum operating ambient: 45° C.

Unless otherwise indicated, all tests were conducted on Model AMB-2053XXX-XX.

Test results reported relate only to the items tested.

1.6.2 - 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

(Model AMB-2053XXX-XX)

Operating Condition	Input Condition		Input Current, A		Avg. Power Watts
	Volts	Hz	Rated	Measured	
Maximum normal load	90	50/60	-	1.83/1.82	100/100
	100	50/60	2.0	1.70/1.70	98/98
	250	50/60	2.0	0.80/0.80	96/96
	265	50/60	-	0.76/0.75	96/96

(Model AMB-2023XXX-XX)

Operating Condition	Input Condition		Input Current, A		Avg. Power Watts
	Volts	Hz	Rated	Measured	
Maximum normal load	90	50/60	-	1.46/1.45	88/88
	100	50/60	2.0	1.32/1.31	88/87
	250	50/60	2.0	0.61/0.60	85/85
	265	50/60	-	0.58/0.58	85/85

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

2.1.1.7 - CAPACITANCE DISCHARGE TEST:

METHOD

The unit was connected to 265 V ac, 60 Hz. A storage oscilloscope was connected across the external point of disconnection of the mains supply. With all switches in the unit initially set to the "OFF" position, the unit was disconnected from the supply source. The voltage at the time of disconnection, V_o, and the voltage, V_{tc}, at 1.0 second were recorded.

A photograph or printout of the scope waveform was provided.

RESULTS

Measurement Locations	Fuse In/Out	Switch Position	V_o (V pk)	37%V_o (V pk)	V_{tc} (V pk)
Line-Neutral	In	On	372	138	-10
Line-Neutral	In	Off	362	134	-76

The voltage across-line capacitors did decay to less than 37 percent of its original value in 1.0 second.

2.4.1, 2.4.2 - LIMITED CURRENT CIRCUIT MEASUREMENTS:

METHOD I

The unit was connected to 250 V ac, 60 Hz. A 2000 ohms non-inductive resistor and a switch were connected between the user accessible part of a limited current circuit and either pole of the limited current circuit earth as noted under RESULTS Part I. A storage oscilloscope was connected across the points under consideration. The switch was closed and the following values were recorded:

VP - Peak Voltage
V dc - dc Voltage
Ap - Peak current = Vp/2000 Ω
dc - dc current = V dc/2000 Ω
kHz - Circuit frequency in kilohertz

Measurements were made under both normal and single fault conditions as noted below.

RESULTS PART I

Oscilloscope Method: (D/A inverter: Si Jing Harng Co., Ltd., P/N: 8592F-01)

User Accessible Live Part: CN2-1 to Pole 1: CN2-4.

Fault	Volts, Peak	mAp	Frequency kHz
None	28.0	14.0	50.8
C23 short	32.4	16.2	103.7
L1 short	30.8	15.4	63.3
# D12 short	0.0	0.0	0.0

User Accessible Live Part: CN2-1 to Pole 2: Earth.

Fault	Volts, Peak	mAp	Frequency kHz
# None	0.0	0.0	0.0
# C23 short	0.0	0.0	0.0
# L1 short	0.0	0.0	0.0
# D12 short	0.0	0.0	0.0

User Accessible Live Part: CN2-4 to Earth

Fault	Volts, Peak	mAp	Frequency kHz
None	13.0	6.5	51.4
C23 short	14.0	7.0	60.6
L1 short	13.0	6.5	46.2
# D12 short	0.0	0.0	0.0

Note: D/A inverter provided with two outputs. Tests performed on output CN2 were represented to output CN3.

(D/A inverter: Chi Sam Electronic Enterprise Co. Ltd., P/N: CDA-084A)

User Accessible Live Part: JP2-1 to Pole 1: JP2-4.

Fault	Volts, Peak	mAp	Frequency kHz
None	23.2	11.6	39.8
C6 short	34.2	17.1	99.5
L1 short	30.4	15.2	40.3
Q3 c-e short	48.8	24.4	44.7

User Accessible Live Part: JP2-1 to Pole 2: Earth.

Fault	Volts, Peak	mAp	Frequency kHz
None	45.6	22.8	42.4
# C6 short	0.0	0.0	0.0
L1 short	41.2	20.6	40.2
Q3 c-e short	49.6	24.8	45.2

User Accessible Live Part: JP2-4 to Earth

Fault	Volts, Peak	mAp	Frequency kHz
None	8.0	4.0	40.2
C6 short	7.9	4.0	56.6
L1 short	7.7	3.9	40.1
Q3 c-e short	12.2	6.1	43.5

Note: D/A inverter provided with two outputs. Tests performed on output J2 were represented to output J3.

Comments: "#" Indicates the unit shut down immediately.

METHOD II

For the following accessible live part tested under METHOD PART I, the capacitances, stored charge or energy of that circuit was determined.

If the voltage was less than 450 V peak or dc the capacitance in microfarads was recorded.

If the voltage exceeded 450 V peak or dc but was less than 15,000 V peak or dc, the stored charge was recorded by using the formula $\mu C = (\mu F)$ V.

RESULTS II

D/A Inverter PN	Location		Fault	Voltage	pF	μC
	User Part	To				
8592F-01	CN2 P1	CN2 P4	None	950	22	0.02
CDA-084A	JP2 P1	JP2 P4	None	950	22	0.02

The circuit complied with the other requirements of limited current circuit.

2.5 - LIMITED POWER SOURCE MEASUREMENTS:

METHOD (Inherently Limited)

The unit was connected to 250 V ac, 60 Hz. After each of the following output measurements, the values were compared with the appropriate tables:

A. The open circuit voltage (U_{oc}), with all load circuits disconnected.

B. The output current (I_{sc}) after 60 seconds of operation with the load adjusted to maintain the I_{sc} current limi t (8.0 A or 150/U_{oc}, as applicable). Output circuits other than the circuit under test were unloaded during the I_{sc} measurements.

C. The maximum output Volt-Ampere (VA), after 60 seconds of operation with the load adjusted to maintain the VA limit (5 x U_{oc}, or 100, as applicable). Output circuits other than the circuit under test were unloaded during the VA measurement.

If a regulating network limited the output in compliance with Table 2B under normal operating conditions, then measurements (A), (B), and (C) were repeated under single fault conditions. The faults were placed in any part of the regulating network, including power supply pulse width modulation circuitry.

RESULTS

Output Tested	Measured From	Measured To	Single Fault Condition	Maximum U_{oc}	Maximum I_{sc}	Maximum VA
USB connector	Pin 4	Earth	None	4.9	1.9	5.92
PS2 connector	Pin 3	Earth	None	4.9	1.45	5.44
Panel connector	Pin 30	Earth	None	4.9	4.94	13.54
Video connector	Pin 9	Earth	None	4.9	1.76	7.01

All outputs complied with the limited power source requirements:

2.6.3.3, 2.6.1 - EARTHING TEST I:

METHOD I - For circuit under test with a current rating of 16 A or less.

Using a maximum 12 V dc power source, a current of 30 A, was passed between the equipment earthing terminal and the part in the equipment that is required by 2.6.1 to be earthed listed below for a period of 120 second(s). The voltage drop from the earthing terminal to the accessible metal part required to be earthed was recorded and the resistance was calculated.

The resistance reading was recorded.

RESULTS I

Accessible Conductive Part	Current (Amps)	Voltage Drop (Volts)	Resistance (Ohms)
Earthing pin of appliance inlet to metal enclosure	30	-	0.03

The resistance did not exceed 0.1 ohm from any accessible conductive part and earth.

2.9.1, 2.9.2, 5.2.2 - HUMIDITY TEST:

METHOD

A humidity chamber was maintained within 25 ±2°C of temperature. The unit was brought to a temperature between t°C and t°C + 4°C. They were then placed in the chamber and held at a relative humidity of 93 ± 2 percent for a period of 48 hours. Prior to conditioning, parts of the unit (covers) which could be removed without the use of tools were removed and separately placed in the chamber. During conditioning, cable entrances and/or a conduit opening were left open. During this treatment, the unit was not energized.

While still in the humidity chamber, but after all parts have been placed back on the unit, a dielectric potential was applied and maintained for a period of one minute between the points indicated below. During this test, all switching devices (switches, relays, triacs, etc.) in the primary circuit were closed.

	Location		
	From	To	Potential Used, (V)
A	Primary	SELV	4242 V dc
B	Primary	Earth	2800 V dc

RESULTS

The chamber temperature was 25° C.

The relative humidity was 93 percent.

There was no indication of dielectric breakdown.

4.2.3, 4.2.4, 4.2.1 - ENCLOSURE PUSH TEST:

METHOD

Using a test tool having a 30 mm (1.2 in.) circular diameter contact surface, a force of 250 ± 10 N (56 lbs) was applied to external covers or guards for a period of 5 seconds. After the application of the test force, clearances were measured with the external covers or guards deflected. During the application of the test force, clearances behind earthed or unearthed, conductive enclosures were not reduced to a level that would result in an energy hazard.

RESULTS

Part/Location	Thickness	Force	Observation
Top of enclosure	0.8 mm	250 N	No distortion
Sides of enclosure	0.8 mm	250 N	No distortion
Rear of enclosure	0.8 mm	250 N	No distortion

During the applications of the test force, clearance behind earthed or unearthed conductive enclosure did not reduced to a level that would result in an energy hazard.

4.2.5, 4.2.1 - IMPACT TEST:

METHOD

The unit was placed on a solid supporting surface with the surface that was impacted positioned horizontally. One impact was imparted to the surface by a smooth steel sphere 50 mm (2 in.) in diameter and weighing 0.5 kg (1-3/16 lbs). The sphere was allowed to fall freely through a distance of 1.3 m (51-3/16 in.) and/or swung as a pendulum when it was difficult to place the surface in a horizontal position.

Following the impacts, the unit was subjected to an Electric Strength Test for one minute.

	Location		
	From	To	Potential Used, (V)
A	Primary	SELV	4242 V dc
B	Primary	Earth	2800 V dc

RESULTS

Material	Impact Area	Observations
Plated steel	Top enclosure	No deformation
Plated steel	Sides enclosure	No deformation
Plated steel	Rear enclosure	No deformation

It was not possible to access hazardous parts.

There was no indication of a dielectric breakdown.

4.3.8 - LITHIUM BATTERY REVERSE CURRENT MEASUREMENT TEST:

METHOD

With the lithium battery removed from the circuit, the sample was connected to 250 V ac, 60 Hz. A dc ammeter replaced the battery in the circuit and the normal reverse (charging) current was measured. The reverse current protection component was shorted and the abnormal reverse (charging) current was measured.

RESULTS

Battery Type	Normal Reverse (Charging) Current (mA)	Abnormal Condition	Abnormal Reverse Current (mA)
BR2335	0.035	-	-
		D5 pin 1-3short	0.045
		R122 short	0.035

The abnormal charging current did not exceed 5 mA.

4.5.1, 1.4.12, 1.4.13 - 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.

The sample operated under maximum normal load as follows:

Continuous operation, until steady conditions were established.

Tmra was 45°C

RESULTS

(Model AMB-2053XXX-XX)

Test	Operating Condition	Input Conditions Volts	Hz	Duration
A	Maximum normal load	90	60	2.5 hrs
B	Maximum normal load	265	50	2.0 hrs
C	Maximum normal load & blocked ventilation openings	250	60	2.0 hrs
D	Maximum normal load & stalled Power DC fan	250	60	2.0 hrs
E	Maximum normal load & stalled Main Board DC fan	250	60	2.0 hrs
F	Maximum normal load & stalled CPU DC fan	250	60	2.0 hrs

Thermocouple Locations	Maximum Temperature °C Test A	Test B	Test C	Test D	Test E	Test F
D/A Inverter						
T1 coil	70.9	70.6	80.9	72.7	76.3	69.9
L1	61.8	61.5	71.6	63.6	67.0	61.1
PWB near L1	65.6	65.4	76.0	68.2	71.2	64.9
Main Board						
U3 body	40.6	40.5	72.5	44.1	60.2	41.2
Heat Sink of CPU	40.7	40.7	74.3	44.0	57.4	64.6
PWB under CPU	41.5	41.5	76.1	44.7	61.8	51.8
Power Supply						
L1 coil	46.4	35.8	68.4	51.1	43.4	35.1
BD1 body	69.1	47.4	75.9	66.8	57.9	46.9
Heat Sink (HS1)	48.0	43.1	67.8	52.3	51.9	42.4
T1 coil	67.2	68.0	79.5	76.0	79.7	65.6
T1 core	63.8	65.3	83.7	80.2	80.2	59.9
Heat Sink (HS2)	64.7	63.7	79.5	79.4	79.0	62.9
C7 body	37.0	32.7	66.3	44.9	40.2	32.1
PWB near R1	41.1	34.0	66.4	45.3	42.7	33.0
HDD	28.8	28.9	61.4	35.1	43.0	27.6
FDD	27.2	27.3	60.1	32.9	38.6	26.5
CD-ROM	26.8	26.9	58.3	31.5	36.6	26.2
Outside of enclosure (top)	27.5	27.7	50.2	30.3	40.7	27.5
Ambient	24.4	24.9	24.7	25.2	25.0	24.6

(Model AMB-2023XXX-XX)

Test	Operating Condition	Input Conditions Volts	Hz	Duration
A	Maximum normal load	90	60	2.5 hrs
B	Maximum normal load	265	50	1.5 hrs
C	Maximum normal load & blocked ventilation openings	250	60	2.0 hrs
D	Maximum normal load & stalled Power DC fan	250	60	2.0 hrs
E	Maximum normal load & stalled Main Board DC fan	250	60	2.0 hrs
F	Maximum normal load & stalled CPU DC fan	250	60	2.0 hrs

Thermocouple Locations	Maximum Temperature °C Test A	Test B	Test C	Test D	Test E	Test F
D/A Inverter						
T1 coil	68.3	67.7	80.8	69.2	72.7	67.5
L1	59.2	58.5	70.5	60.1	63.1	58.3
PWB near L1	58.4	57.6	69.3	59.0	62.0	57.3
Main Board						
U3 body	45.9	44.9	84.1	48.8	67.4	48.4
Heat Sink of CPU	46.4	45.8	84.4	50.9	63.8	67.2
PWB under CPU	44.3	43.4	83.4	48.5	65.9	52.9
Power Supply						
L1 coil	49.3	37.7	71.0	56.1	45.3	35.4
BD1 body	66.3	46.5	80.2	68.0	54.1	45.3
Heat Sink (HS1)	44.9	40.2	67.8	53.5	47.1	40.6
T1 coil	63.8	63.2	78.0	75.3	75.6	63.0
T1 core	62.7	62.8	77.5	81.1	80.5	63.5
Heat Sink (HS2)	62.6	59.9	76.9	75.4	40.7	31.2
C7 body	37.4	33.2	67.1	49.8	40.0	33.2
PWB near R1	52.6	39.9	68.0	53.9	47.1	39.6
HDD	32.2	29.8	62.5	41.3	46.6	30.4
FDD	31.1	29.2	59.7	40.0	41.9	29.7
CD-ROM	29.6	28.7	56.6	36.6	38.0	28.6
Outside of enclosure (top)	30.5	29.8	53.9	33.4	37.5	29.5
Ambient	25.7	26.0	26.6	27.1	25.4	26.7

5.1, ANNEX D - TOUCH CURRENT TEST:
(Single-Phase/Polyphase; TN/TT System)

METHOD

The equipment was connected to 265 V ac, 60 Hz. The equipment was placed on an insulating surface and all connections to external equipment were disconnected to prevent stray leakage paths. The unit protective earthing connection was broken during the test. An isolating transformer was used.

The tests were conducted using the measuring instrument for touch current tests, described in Annex D of UL 60950, Third Edition. Terminal B of the measuring instrument was connected to the earthed (neutral) conductor of the supply (see Figure 5A).

Primary power switches (i.e., "ON/OFF" switches and voltage selector switches) which can be operated during normal use, were opened and closed in all possible combinations.

Accessible conductive parts that are incidentally connected to other parts were tested both as connected and disconnected parts.

For equipment having a protective earthing connection or a functional earthing connection, terminal A of the measuring instrument was connected via measurement switch "s" to the equipment earthing terminal of the EUT, with the earthing conductor switch "e" open.

The test was conducted on all equipment, with terminal A of the measuring network connected via measurement switch "s" to each unearthed or non-conductive accessible part and each unearthed accessible circuit, in turn, with the earthing conductor switch "e" closed.

Measuring instrument used: Annex D.1, Simpson Meter 228

For single-phase equipment, the test circuit of Fig. 5A was used.

The test was made in all combinations to the normal and reverse polarity of the supply circuit (Polarity Switch P1).

Terminal A of Measuring Instrument Connected to	Switch "e" Position	Touch Current (mA, r.m.s) Polarity P1/Primary Switch Condition			
		Normal/On	Normal/Off	Reverse/On	Reverse/Off
Metal enclosure	open	0.80	0.03	0.80	0.02

The touch current did not exceed 3.5 mA r.m.s.

5.2.2 - ELECTRIC STRENGTH TEST:

METHOD

While the unit was in a well heated condition, an ac or dc potential was gradually increased from zero to the test potential given below. The voltage was applied and maintained for a period of one minute between the points indicated. All switches, relays, contactors, triacs or equivalent in the test circuit were closed or shunted.

Product/ Component	Unit	Unit
From	Primary	Primary
To	SELV	Earth
Insl. Type (O, B, S, R)	R	B
Test Voltage	4242	2800
ac/dc	dc	dc
Breakdown?	No	No

There was no indication of breakdown.

5.3.1 - 5.3.8.1 - ABNORMAL OPERATION TESTS:

METHOD

The unit was operated continuously under the abnormal condition(s) noted below.

Test No.

1 Blocked ventilation openings.
2 Stalled power DC Fan.
3 Stalled main board DC Fan.
4 Stalled CPU DC Fan.

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

	Location		
	From	To	Potential Used, (V)
A	Primary	SELV	4242 V dc
B	Primary	Earth	2800 V dc

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

Comments Key:

IP - Internal protection operated (list component)
CT - Constant temperatures were obtained
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

RESULTS

Test	Component	Abnormal Condition	Input V/Hz	Duration	ES Code
1	Ventilation openings	Blocked	250/60	2.0 hrs	A, B
Comments: NB, NC, NT, CT, See Heating Test for temperature.					
2	Power DC Fan	Stalled	250/60	2.0 hrs	A, B
Comments: NB, NC, NT, CT, See Heating Test for temperature.					
3	Main Board DC Fans	Stalled	250/60	2.0 hrs	A, B
Comments: NB, NC, NT, CT, See Heating Test for temperature.					
4	CPU DC Fan	Stalled	250/60	2.0 hrs	A, B
Comments: NB, NC, NT, CT, See Heating Test for temperature.					

5.3.6 - 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 250 V ac, 60 Hz.

The voltage potential was measured on the connector pins. Circuits that measured 0 V were 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 12.5 mA, the circuit was not tested. When the maximum available current was greater than 12.5 mA, the load was adjusted for maximum available current and maintained for one hour.

Output circuits, which exceeded LPS limits in Clause 2.5 testing, were subjected to this test for at least one hour. The non-LPS output was loaded to draw the maximum current.

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.

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 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.

	Location		
ES Code	From	To	Potential Used (V)
A	Primary	SELV	4242 dc
B	Primary	Earth	2800 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 O Volts
D - Other. Please explain.

RESULTS

Connector	Pin #s	Open Circuit Voltage (V)	Maximum Available Current (mA)	Length Of Test	Comments
Video connector	9	4.9	00	1 hr	NB, NC
	12, 15	4.7	0.0	-	B
	1-8, 10-11, 13-14	0.0	-	-	C
COM port connectors	1-2, 5-6, 8-9	0.0	-	-	C
	3-4, 7	8.9	0.0	-	B
USB connectors	4	4.9	1.81	1 hr	NB, NC
	1-3	0.0	-	-	C
PS2 connectors	3	4.9	1.35	1 hr	NB, NC
	1, 2	4.9	0.0	-	B
	4-6	0.0	-	-	C

Connector	Pin #s	Open Circuit Voltage (V)	Maximum Available Current (mA)	Length Of Test	Comments
LPT connector	1, 4, 10-16	4.9	0.0	-	B
	2-3, 5-9, 17-25	0.0	-	-	C
Lan connector	1-8	0.0	-	-	C
Panel connector	1	3.3	0	-	B
	2-4, 6, 8-13, 20, 23, 25-28, 32, 34, 37-40, 42, 44-50	0	-	-	C
	5, 7, 14-19, 21-22, 24	1.8	0	-	B
	29, 41, 43	4.9	0	-	B
	30	4.9	4.94	1 hr	NB, NC
	31, 33	11.5	0	-	B
	35-36	8.0	0	-	B