

## DESCRIPTION

## PRODUCT COVERED

USL, CNL - Switching Power Supply, **Models AD10048P3, AD10048P3L-403** for use in Information Technology Equipment.

## ELECTRICAL RATINGS:

MODEL	INPUT	OUTPUT
AD10048P3	100 - 240 V ac 1.8 A 50/60 Hz	+48 V dc, 2.08 A
<b>AD10048P3L-403</b>	<b>100 - 240 V ac</b> <b>1.8 A</b> <b>50/60 Hz</b>	<b>+48 V dc, 2.08 A.</b>

## ENGINEERING CONSIDERATIONS : (NOT FOR UL REPRESENTATIVE'S USE)

The **units** covered in this report **are** switching-mode type power supply and **employ** an isolating type transformer. The **units use** a detachable power supply cord for connection to a wall receptacle. The **units have** a thermoplastic enclosure.

The output voltage is considered SELV non-energy hazard. A length of flexible cord with thermoplastic insulation and terminated in a connector is provided for connection to Information Technology Equipment. The power supply is intended for use in a controlled environment.

USL, CNL indicate the unit has been found to comply with UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements), CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements)

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

The equipment is considered movable, Pluggable Type A, Class I equipment, intended for use on a TN power system and pollution degree 2 environment.

**The units were** evaluated for use in 25°C and 45°C ambient with rated load. At 55°C ambient, it was evaluated with 90% of the rated load.

The transformers, T1 employ Class F electrical insulation system.

Disconnect Device - The Attachment Plug in the equipment is considered as the disconnect device.

This unit was evaluated for use to an altitude of 3050m.

## CONSTRUCTION DETAILS:

Section General - The following construction items are described in the Sec. Gen.

Multiple Manufacturing Locations	Abbreviations
C-UL Requirements	Connectors and Receptacles
Corrosion Protection	Insulating Tubing / Sleeving
Internal Plastic Part Materials	Internal Wiring
Mechanical Assembly	Printed Wiring Boards
Soldered Connections	Wire Positioning Devices
Wiring Terminals	Capacitors
Insulating Tape	Segregation
Marking	Marking Methods
Warning and Cautionary Markings	Optocouplers

Spacing - The following spacings are maintained in the power supply.

Minimum 5.3 mm creepage distance and minimum 5.3 mm clearance distance between primary and secondary traces for optocoupler IC4.

Minimum 2.6 mm creepage distance and minimum 2.6 mm clearance distance between Live before Fuse and Neutral.

Minimum 6.8 mm creepage distance and minimum 6.0 mm clearance distance between primary and secondary traces.

See ILL. 1 for details.

## ILLUSTRATIONS:

ILL. 1 - Printed Wiring Board Trace Layout (Solder side)

General - The general design, shape and arrangement shall be as illustrated, in the following figures, except where variations are specifically described.

## MODEL AD10048P3 - FIG. 1

General - Fig. 1 shows the overall view of Model AD10048P3. **Also represents Model AD10048P3L-403.**

1. Top Enclosure - R/C (QMFZ2), GE Plastics or Sabic Innovative Plastics US L L C ( E121562), Type SE1X, rated V-1. Overall 156 by 65 by 18.4 mm, min.2.0 mm thick. Secured to Bottom Enclosure by ultrasonic welding.
2. Bottom Enclosure - R/C (QMFZ2), GE Plastics or Sabic Innovative Plastics US L L C ( E121562), Type SE1X, rated V-1. Overall 156 by 65 by 18.4 mm, min.2.0 mm thick.
3. Attachment Plug - R/C (AXUT2), Rong Feng Industrial Co., Ltd., Type RF-190. Rated minimum 2.5 A, 250 V ac. Secured to the opening provided by Top and Bottom Enclosure.
4. Output Cord - (AVLV3), style 1185 covered in File E132002, Vol. 11. Rated 60 V, 80°C, terminated in a molded-on non-standard polarized output connector.
5. Output Cord Strain Relief Bushing - (Not Shown), PVC bushing. Integrally molded with Output Cord. Provided with a stopper overall 12.3 by 10 by 2.3 mm and a neck overall 6.5 by 6.5 by 2.5 mm. Physically secured to opening, formed by Top and Bottom Enclosure.

## MODEL AD10048P3 - FIG. 2

General - Fig. 2 shows the internal view of Model AD10048P3. **Also represents Model AD10048P3L-403.**

1. Printed Wiring Board (PWB) - See Section General for details. Measured 147.5 by 55.4 mm, minimum 1.6 mm thick. See ILL. 1 for trace layout.
2. Capacitor (C1) (**For Model AD10048P3**) - (Primary to Protective Earth). Marked "Y1" or "Y2". See Section General for manufacturer and catalog number. Each rated maximum 1000 pF, minimum 250 Vac, min 105°C.

**Alternate - Capacitor (C1) (For Model AD10048P3L-403) - (Primary to Protective Earth). Marked "Y1" or "Y2". See Section General for manufacturer and catalog number. Each rated maximum 3300 pF, minimum 250 Vac, min 105°C.**

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3. Capacitor (C3) - (Across the line). Marked "X1" or "X2". See Section General for manufacturer and catalog number. Rated maximum 0.47  $\mu$ F, minimum 250 V ac, min 105°C.
4. Capacitor (C25) (**For Model AD10048P3 only**) - (Primary to Secondary). Marked "Y1". See Section General for manufacturer and catalog number. Rated maximum 1000 pF, minimum 250 V ac, min 125°C.
5. Fuse (F1) - (JDYX2), Wickmann-Werke GMBH, Type 392, rated 3.15 A, 250 V. Secured on PCB by soldering. Fuse rating is permanently marked on PWB adjacent to fuse.
6. Common Mode Choke (L1) - Astec or Artesyn P/N : 852-70007520, 801-001543-0000
7. Common Mode Choke (L2) - Astec or Artesyn P/N : 852-70007510 801-001542-0000
8. Differential Mode Choke (L3) - Astec or Artesyn P/N : 852-70007490, 801-001540-0000
9. PFC Choke (L4) - Astec or Artesyn P/N : 852-70007500 ,852-001541-0000
10. Differential Mode Choke (L5) - Astec or Artesyn P/N: 852-70007480,801-001539-0000
11. Bridge Rectifier (DB1) - Rated minimum 4 A, minimum 600 V,
12. Electrolytic Capacitors (C20) - With integral pressure relief, rated minimum 120  $\mu$ F, minimum 400 V, minimum 105°C.
13. Power Transistor (Q10) - Rated minimum 4.0 A, minimum 650 V.
14. Power Transformer (T1) - Astec or Artesyn P/N: 852-70007530 ,801-001544-0000 Provided with (OBJY2), Astec International Ltd. (E94225), Class 155 (F) insulation system, designated 155-10C.
15. Optocoupler (IC3,IC4) - See Section General for manufacturer and catalog number. Each rated minimum 3000 V ac isolation test voltage.

17. Heat Sink for Q10 and DB1 - (Primary) Aluminium, measures 86.9 by 24.3 mm, minimum 1.5 mm thick. Secured on PWB by solder pins.
18. Heatsink for Q8 - (Primary) Aluminium, measures 93.2 by 24.3 mm, minimum 1.5 mm thick. Secured on PWB by solder pins.
19. Heat Sink for D8 - (Secondary) Aluminium, shape "L" overall 43 by 26.6 BY 24.3 mm height, minimum 1.5 mm thick. Secured on PWB by solder pins.
20. EMI Shield Insulator - Hollow cuboid shaped, three layer construction, consist of one piece of polyester film, R/C(QMFZ2), Toray Industries Inc., Type Lumirror, rated VTM-2, minimum 0.023 mm thick. Overall 147.5 by 56.2 by 31 mm. Laminated between 2 layers of polyester tape, R/C (OANZ2), min 130°C. Provided between whole assembly and EMI shield to maintain minimum 5 mm creepage at primary circuit.
21. Insulator between Q8/Q10 and Heat Sink - R/C(QMFZ2), rated minimum V-2, min.130°C.
22. Gap pad - R/C (QMFZ2), Bergquist Co. (E59150), Type Gap Pad VO ultra Soft, rated V-0, measured 2.0 mm thick. Filled the gap between Power Transformer (T1) and EMI Shield Insulator, overall 19 mm by 30 mm minimum. Filled the gap between electrolytic capacitor (C20) and EMI shield insulators, overall 17 mm x 32 mm minimum. Filled the gap between capacitor (C3) and EMI shield insulator, overall 12 mm x 18 mm minimum.  
**Alternate - Same as above, except Bergquist Co. (E59150), Type Gap Pad 1500, rated V-0, overall 20.0 by 10.0 mm minimum, 2.0 mm thick.**
23. EMI Shield PWB - See Section General for details. Measured 147.5 by 55.4 mm, minimum 1.0 mm thick.