File E183744
Project 00SC07511

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REPORT

ON

POWER SUPPLY ADAPTER
INFORMATION TECHNOLOGY EQUIPMENT,
INCLUDING ELECTRICAL BUSINESS EQUIPMENT

Sinpro Electronics Co. Ltd.
Ping Tong Hsien, Taiwan

DESCRIPTION

PRODUCT COVERED:

USL/CNL: Switching Power Supply Adapter, Models SPU65-x (x = 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 200, 201, 202, 203, 204, 215, 300, 301, 302, 303, 304, 305, 306, 403). PSE60-512, PSE60-5125, PSE65-1xx where x may be any number.

ELECTRICAL RATING:

Input: 100-240 V ac, 47-63 Hz, 1.9 A

Output:

	DC Output Rating				
Model	V dc/A	V dc/A	V dc/A	V dc/A	Watt (max.)
SPU65-101	3-5/16.6	-	-	-	-
SPU65-102	5-6/13	-	-	-	-
SPU65-103	6-8/11.6	-	-	-	-
SPU65-104	8-11/9.37	-	-	-	-
SPU65-105	11-13/7.27	-	-	-	-
SPU65-106	13-16/6.15	-	-	-	-
SPU65-107	16-21/5	-	-	-	-
SPU65-108	21-27/3.8	-	-	-	-
SPU65-109	27-33/2.96	-	-	-	-
SPU65-110	33-40/2.42	-	-	-	-
SPU65-111	40-48/2-1.66	-	-	-	80
SPU65-200	3.3/7	12/2.75	-	-	56.1
SPU65-201	5.0/7	12/3	-	-	60
SPU65-202	5.0/7	15/3	-	-	60
SPU65-203	5.0/7	24/2	-	-	60
SPU65-204	3.3/7	5/3	-	-	38.1
SPU65-215	5/7	-24/2	-	-	60
SPU65-300	3.3/7	12/3	-12/0.8	-	65
SPU65-301	5/6	12/2.75	-5/0.325	-	-
SPU65-302	5/6	12/2.125	-12/0.325	-	-
SPU65-303	5/6	15/2.125	-15/0.208	-	-
SPU65-304	5/7	24/2	-24/0.5	-	-
SPU65-305	5/6	24/1.25	-12/0.416	-	-
SPU65-306	3.3/7	12/3	-5/0.8	-	-
SPU65-403	5/3.5	24/1.5	12/0.25	-12/0.15	65

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

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

USL, CNL indicates investigation to the U.S. and Canadian (Bi-National) Standard for Safety of Information Technology Equipment, Including Electrical Business Equipment, CSA C22.2 No. 950 * UL 1950, Third Edition, including revisions through revision date June 22, 1998, which are based on the Fourth Amendment to IEC 950, Second Edition.

The equipment is considered: Movable, Class I (earthed) pluggable Type A, uses detachable power cord, intended for use on a TN power system.

The equipment was submitted by the manufacturer for use in a maximum air ambient of 28°C.

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

CONSTRUCTION DETAILS:

See Section General for details.

Printed Wiring Board - See Section General, Printed Wiring Board. See ILL. 1 for trace layout.

* Alternate – (For Model SPU65-403) Same as above except ILL. 4.

Nameplate Marking - Listee's name or File No. E183744, model number, and input and output electrical ratings provided on each unit. May be provided on more than one label. Located where tools are not necessary for gaining access. Located on parts not likely to be discarded or lost. May be directly molded on to the enclosure.

CN Product Marking – Optional. Month and year of manufacturing or traceable series number or date coded and output classification "LEVEL 3" marked on unit.

Instruction Safety Manual - Provided with unit.

Model Difference - All models are identical, except for output rating, model designation and as described in the report.

Model PSE65-1xx is identical to Model SPU65-101 except for model designation.

Model PSE60-512 is identical to Model SPU65-201 except for model designation.

Model PSE60-5125 is identical to Model SPU65-301 except for model designation.

* Model SPU65-403 is identical to Model SPU65 Series except for minor change on secondary of PWB and transformer.

MODEL SPU65-x - FIG. 1 (S00-09170)

General - Shows overall external view of unit.

1. Enclosure - (QMFZ2) GE Plastics, Type 940, rated 94V-0. Overall *measures 165 by 45 by 76 mm, minimum 2.8 mm thick. Constructed of two parts secured together by screws. May be provided with following openings on each side: 4 groups, 34 openings, each measures 1 by 7 mm.

   Alternate - Same as above, except GE Plastics, Type 940-940A.

   Alternate - Same as above, except GE Plastics, Type SE100.

   Alternate - Same as above, except Teijn, Type SNAV125.

   *Alternate – Same as above, except 'Dow Europe S A', Type 890, or 891.

   *Alternate – Same as above, except 'Teijin Chemicals Ltd.', Type LN-1250G.

2. Appliance Inlet - Listed or (AXUT2), Rong Feng, Type SC-9R, rated minimum 250 V, 10 A. Secured to PWB by soldering.

   Alternate - Same as above, except Supercom (AXUT2), Type SC-8R.

3. Output Cable - AWM, Style No. 2464, VW-1, 80°C, 300 V, minimum, provided with a polarized molded on connector at one end, mechanically secured and soldered to PWB. Minimum 6 ft long.

4. Strain Relief of Output Cable - Integral to Output Cable. Strain Relief provided with a molded-on anti-kink bushing held in place by integral slots in top and bottom enclosure. Opening is 9.5 by 8.1 mm. See ILL. 2 for details.

5. Power Switch (PRI) - Optional. (WOYR2), Pronic, Type BR1, rated 5 A, 250 V minimum. Secured to top enclosure by snap-fit, in an opening 18.8 by 12.2 mm. Wired in hot (non-identified) side of line. (Minimum 3 mm clearance between contacts in off position). "0/1" for OFF/ON Marking (IEC 417, Nos. 5008/5007), on or adjacent to actuator.

MODEL SPU65-x - FIG. 2 (S00-09171)

General - Figure shows internal view of unit. Also represents all models.

1. Fuse (F1) - Listed, (JDYX), rated 250 V, 2 A. Wired in hot side of Line. Fuse current and voltage rating are permanently marked adjacent to fuse. Fuse is directly soldered to PWB.

   Alternate - Same as above, except (JDYX2), Sleek, Type 36ES.

   Alternate - Same as above, except (JDYX2), Triad, Type 52S.

   Alternate - Same as above, except (JDYX2), Wickmann, Type 19374.

   Alternate - Same as above, except (JDYX2), Bel, Type MRT.

* Alternate – Same as above, except (JDYX2), Tai Shi An, Type 2000+.

* Alternate – Same as above, except (JDYX2), Wickmann-Werke, Type 19372.

* Alternate – Same as above, except (JDYX2), Cooper Industries, Type S506.

2. Line Choke (L1) - Optional. Toroidal type construction. Ferrite core, size 20 mm OD, 15 mm ID, 8 mm thick, coil of copper magnet wire-wound on core. Provided with tubing, See Section General, Insulating Tubing.

3. Line Choke (L2) - Optional. Open-type construction. Ferrite core, size 24.2 by 20 by 3.7 mm, coil of copper magnet wire-wound on three-flange bobbin of (QMFZ2), Phenolic, rated minimum 94V-1, minimum 0.71 mm thick. (Class 130°C)

4. X-Capacitors (C1, C2) - Optional. (Line-to-Line), (FOWX2), and VDE or SEV, marked X1 to indicate compliance with IEC 384-14, C1, rated maximum 0.22 μF, C2, rated 0.1 μF, 250 V minimum.

   Alternate - Same as above, except X2 capacitor, marked X2 to indicate compliance to IEC 384-14, X2 Capacitor:

CCN	Manufacturer / Type
FOWX2/FOKY2	Arcotronics/1.58,1.47, 1.40
FOWX2	Pilkor/PCX series
FOKY2	Philips/MKP or PCX series
FOWX2/FOKY2	Okay/RE or PA series
FOWX2/FOKY2	Iskra/KNB series
FOKY2	Roederstein/F1772 series
FOWX2	Siemens/MKP/SH
FOWX2	Cheng Tung/CTX

5. Y-Capacitors (C3, C4, C6) - Optional. (Line-to-Earth.), (FOWX2) or (FOKY2), and VDE or SEV, marked Y2 to comply with IEC 384-14.C3, C4, rated minimum 250 V, maximum 2200 pF. C6, rated minimum 250 V, maximum 4700 pF. Provided with tubing, see Section General, Insulating Tubing.

6. Bulk Capacitor (C5) - Rated 220 µF maximum, 400 V, 105°C minimum. Electrolytic Type, provided with integral pressure relief. Provided with tubing adjacent to Heat Sink (HS2), see Section General, Insulating Tubing.

7. Bleeder Resistors (R1, R2) - Rated 470 Kilohm, 1/4 W (In Series).

8. Bridge Diode (DB1) - Rated 600 V, minimum 6 A.

9. Transformer (T1) - (OBJY2), Class B insulation system, Xepex, designation XPB-5. Open-type construction. Core: Ferrite core. Overall 42 by 36 by 11.3 mm thick. Coil: Copper magnet wire-wound concentrically on two-flanged bobbin. Bobbin: (QMFZ2) Phenolic, minimum 0.71 mm thick. Leads exit directly through integral flanges in bobbin and are mechanically secured and soldered to pins which are molded into bobbin. Core including bobbin to PWB are covered with one layer of polyester tape and top side of Transformer is covered with silicon rubber sheet.

Location	#Layer/Total Thickness (mm)/ Material
Outer wrap	2 layer / min. 0.050 thick / polyester tape
Pri./Sec.	3 layer / min. 0.075 thick / polyester tape.
Pri./Core	Bobbin, 0.71 mm thick.
Sec./Core	Bobbin, 0.71 mm thick.
Margin tape	3.2 mm wide between winding and bobbin edge. Exit leads provided with tubing, See Section General, Insulating Tubing.

Alternate Transformer (T1) – Same as above, except (OBJY2), Wenhao Electronics Co., Ltd. Class 130(B), Designated Wenhao-01, differences as described below:

Coil: (OBMW2), copper magnet wire wound on bobbin.

Bobbin: (QMFZ2), Hitachi Chemical Co., Ltd., Type CP-J-8800, phenolic, 0.71 mm thick minimum.

Insulation Tape: (QANZ2), Minnesota Mining & Mfg Co., Type No. 1350F-1, or 1350F-2, or Four pillars Enterprise Co., Ltd. Type No. MY130, polyester film tape.

Alternate – Same as above, except (OBJY2), Horng Wei Electronic Enterprise Co., Ltd., designated 130 or HIS-8A, Class 130(B).

Alternate – Same as above, except (OBJY2), Cormex Electronics Ind. Co., Ltd., designated DV-130-1, Class 130(B).

Alternate – Same as above, except (OBJY2), Long Sail Electronic Co., Ltd., designated DV-130-1, Class 130(B).

Alternate – Same as above, except (OBJY2), Gain South Ltd., designated GS-0001, Class 130(B).

Alternate – Same as above, except (OBJY2), Newline Universal, designated HIS-8A or Viking B-2, Class 130(B).

10. Transistor (Q1) - Rated minimum 600 V, 7 A. Secured to plastic insulation then secured to Primary Heat Sink (HS2) by screws. See ILL. 3 for details.

11. Heat Sink (HS2) - Aluminum, size 125 by 20 mm, 3 mm thick. Secured and soldered to PWB and raised 4 mm off PWB. (Heat Sink is grounded.) An insulation sheet, minimum 0.2 mm, provided between Q1 and HS2. Insulation Sheet is (QMFZ2), Fu-Da, Type P-100.

12. Heat Sink (HS1) - Aluminum, size 135 by 20 mm, 3 mm thick. Secured and soldered to PWB and raised 4 mm off PWB (Heat Sink is grounded.). An insulation sheet, minimum 0.2 mm provided between L2 and heat sink or two layers polyester tape between L2 and heat sink.

13. Optical Isolators (IC2, IC3) – (FPQU2) and VDE, Sharp, Type PC817. (Rated isolation 3000 V ac, insulation thickness 0.4 mm).

Alternate - Same as above, except Liteon, Type LTV817.

Alternate - Same as above, except Vishay, Type TCET110 or TCET1109.

Alternate – Same as above, except for QT Optoelectronics (E90700), Type H11A817AC (Package code T).

14. Varistor (MOV1) - (FOWX2), or (XUHT2), Uppermost, Type V10K300, rated 300 V minimum, 45 J minimum.

Alternate - Same as above, except Pan Overseas, Type PVR10D471K.

Alternate - Same as above, except Thinkking, Type TVR10471.

15. Earthing - A green/yellow wire minimum No. 18 AWG is mechanically secured and soldered to the ground pin of AC input receptacle. The other end is secured and soldered to PWB. A ferrite core of 15 mm long, 12 mm diameter provided.

16. Chassis - Aluminum, U-shaped, overall 68 by 158 by 30 mm maximum, 1.3 mm thick, provided between solder side of PWB and edges of PWB, secured to heat sinks by screws.

17. Insulation Barrier - (QMFZ2), Fastex, Type FORMEX, PBTP, rated 94V-0, overall 158 by 61 mm, 0.4 mm thick, provided between solder side of PWB and Chassis.

    Alternate - Same as above, except General Electric, Type FR7.

18. Capacitor (C10) - Provided with insulating tubing. See Section General, Insulating Tubing Sleeving.

19. Diodes (D8, D10) – For Model SPU65-403. (SEC). D8 rated 5 A, 200 V minimum; D10 rated 1 A, 100 V minimum (SELV Limiting Component).