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REPORT

ON

POWER SUPPLIES, INFORMATION TECHNOLOGY EQUIPMENT,  
INCLUDING ELECTRICAL BUSINESS EQUIPMENT

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## DESCRIPTION

## PRODUCT COVERED:

USL/CNL: Power Supply, Models SPU45-X, SPU45E-X (X = 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 200, 201, 202, 203, 204, 209, 210, 215, 216, 300, 301, 302, 303, 304, 305, 306). PSE45-1xx, PSE45-512, PSE45-5125 where x may be any number.

## ELECTRICAL RATING:

Input - 100-240 V ac, 47-63 Hz, 1.35 A maximum.  
105-125 V dc, 1.35 A (for Model SPU45E-102)

Output -

Model	V dc / A (max)	V dc / A	V dc / A	Maximum (W)
SPU45-100, SPU45E-100	2-3 / 8.0			
SPU45-101, SPU45E-101	3-5 / 8.0			
SPU45-102, SPU45E-102	5-6 / 8.0			<u>40</u>
SPU45-103, SPU45E-103	6-8 / 7.0			
SPU45-104, SPU45E-104	8-11 / 5.63			
SPU45-105, SPU45E-105	11-13 / 4.0			
SPU45-106, SPU45E-106	13-16 / 3.46			
*SPU45-107, SPU45E-107	16-21 / 3.12			50
SPU45-108, SPU45E-108	21-27 / 2.3			
SPU45-109, SPU45E-109	27-33 / 1.85			
SPU45-110, SPU45E-110	33-40 / 1.51			
SPU45-111, SPU45E-111	40-50 / 1.25			
SPU45-200, SPU45E-200	3.3 / 5	12 / 2		40
SPU45-201, SPU45E-201	5 / 5	12 / 2		42
SPU45-202, SPU45E-202	5 / 5	15 / 1.5		42
SPU45-203, SPU45E-203	5 / 5	24 / 1		42
SPU45-204, SPU45E-204	3.3/5	5 / 2		26.5
SPU45-209, SPU45E-209	12 / 3	-12 / 1		42
SPU45-210, SPU45E-210	15 / 2	-15 / 1		42
SPU45-215, SPU45E-215	5 / 5	-24 / 1		42
SPU45-216, SPU45E-216	5.1 / 1	7.2 / 2.6		23.82
SPU45-300, SPU45E-300	3.3 / 5	12 / 2	-12 / 0.8	42
SPU45-301, SPU45E-301	5 / 5	12 / 2	-5 / 0.8	42
SPU45-302, SPU45E-302	5 / 5	12 / 2	-12 / 0.8	42
SPU45-303, SPU45E-303	5 / 5	15 / 2	-15 / 0.8	42
SPU45-304, SPU45E-304	5 / 5	24 / 1	-24 / 0.5	42
SPU45-305, SPU45E-305	5 / 5	24 / 1	-12 / 0.8	42
SPU45-306, SPU45E-306	3.3 / 5	12 / 2	-5 / 0.8	42

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

Special Considerations - 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, CAN/CSA C22.2 No. **60950-1 and UL 60950-1, First Edition, dated April 1, 2003.**

The equipment was submitted and tested for a maximum manufacturer recommended ambient (Tmra) of **40°C**.

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

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

## CONSTRUCTION DETAILS:

See Section General for additional details.

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

Operating/Instruction/Safety Manual - Provided with each unit.

Printed Wiring Board - See Section General for details. General appearance of trace layout same as in ILL. 1.

Non-LPS Marking - The power supply has a marking - "Non-LPS" or the following statement or equivalent is provided in the Operating/Instruction/Safety Manual, "The output of this power supply is not a Limited Power Source."

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

\*Model PSE45-1xx is identical to Model SPU45-101 except for model designation.

\*Model PSE45-512 is identical to Model SPU45-201 except for model designation.

\*Model PSE45-5125 is identical to Model SPU45-301 except for model designation.

## MODEL SPU45-X - FIG. 1 (S00-03306)

General - Overall view of the subject unit. Also represent all models.

1. Enclosure - (QMFZ2) GE Plastic, Type SE100V. Rated 94V-1 minimum. Overall **146** by **76** by **43** mm, minimum 2.4 mm thick. Consist of top enclosure and bottom enclosure. Secured together by screws. Alternate - Same as above, except GE Plastic, Type 940A.

Alternate - Same as above, except GE Plastic, Type 940(f1).

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

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

**Alternate - Same as above, except GE Plastic, Type SE1.**

2. Appliance Inlet - (AXUT2) Supercom, Type SC-9R, rated 250 V, 15 A. Secured to enclosure by physical-fit and to PWB by soldering of integral pins.

Alternate - Same as above, except Rong Feng, Type SS-7B-1.

Alternate - Listed, rated 250 V, 15 A. Secured to enclosure by physical-fit and to PWB by soldering of integral pins.

3. 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 by 9 mm. See ILL. 2 for details.
4. 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.

## MODEL SPU45-X - FIG. 2 (S00-03307)

General - Internal view of the subject unit. Also represent all models.

1. Earthing - (AVLV2) Green/yellow lead, No. 18 AWG minimum; one end mechanically secured then soldered to earthing terminal of Appliance Inlet; other end mechanically secured then soldered to PWB.
2. Fuse (F1) - Listed (JDYX). Rated 250 V, 2 A. Fuse is directly soldered to PWB. Wired in hot (non-identified) side of line. Fuse rating marking provided adjacent to fuse or provided in service documentation.

Alternate - Same as above, except (JDYX2), Wickmann-Werke, Type 382.

- \* Alternate - Same as above, except (JDYX2), Tai Shi An, Type 2000+.
  - \* Alternate - Same as above, except (JDYX2), Bel, Type MRT.
  - \* Alternate - Same as above, except (JDYX2), Wickmann-Werke, Type 19372.
  - \* Alternate - Same as above, except (JDYX2), Cooper Industries, Type S506.
3. Y-Capacitors (C3, C4, C6) - Optional, (Pri. - Earth). (FOKY2) or (FOWX2), Marked with a "Y1" or "Y2" or "Y4" (to indicate compliance with IEC 384-14) and Certified by VDE or DEMKO or SEV. C3, C4 rated minimum 250 V, maximum 2200 pF. C6 rated minimum 250 V, maximum 4700 pF. C3 and C6 provided with tubing. See Section General, Insulating Tubing/Sleeving.
  4. Bleeder Resistors (R1, R2) - Rated 470 kilohm, 1/4 W.
  5. X-Capacitors (C1, C2) - Optional, (Line-to-Line). (FOWX2) and Certified by VDE or DEMKO or SEV, marked with a "X1" (to indicate compliance with IEC 384-14). Rated maximum 0.22  $\mu$ F, 250 V minimum.

Alternate - Same as above, except X2 capacitor. Manufacturers as noted below:

CCN	Manufacturer / Type
FOWX2/FOKY2	Arcotronics / 1.40 or 1.47
FOWX2	Pilkor / PCX series
FOWX2	Cheng Tung / CTX
FOWX2/FOKY2	Philips / MKP or PCX series
FOWX2/FOKY2	Okaya / PA or RE series
FOWX2/FOKY2	Iskra / KNB series
FOKY2	Eichhoff / MKT
FOWX2	Teapo / XG-V series
FOWX2	Taishing / MEX
FOWX2	Nitsuko / CFKC or CFJC
FOWX2/FOKY2	Evov Rifa / PHE series
FOWX2/FOKY2	Matsushita / ECQ-UV

6. Line Choke (L1) - Open-type construction. Core: Ferrite, overall 20 by 15.7 by 6 mm. Coil: Copper magnet wire-wound on three-flanged bobbin of (QMFZ2), PBT, Chang Chun, Type PBT-4130. Materials rated minimum 130°C.
7. Line Choke (L2) - Optional, Toroidal-type. Core: Ferrite, **20** mm OD by **9** mm wide. Coil of copper magnet wire-wound around the core. Secured to PWB by solder. Provided with (QMFZ2) tubing. See Section General, Insulating Tubing/Sleeving. Materials rated minimum 130°C.
8. Thermistor (TH1) - NTC. Rated minimum 3 A, minimum 5 ohms at 25°C. Mounted minimum 10 mm above PWB. Provided with tubing. See Section General, Insulating Tubing/Sleeving.
9. Diode (D6) - SELV, rated minimum 30 V, 5 A.
10. Diode (D8) - **Optional**. SELV, rated minimum 3 A, 200 V.
11. Bridge Rectifier (DB1) - Rated minimum 2 A, 600 V. Mounted minimum 10 mm above PWB.
12. Electrolytic Capacitor (C7) - Integral pressure relief. Rated minimum 400 V, 85°C minimum, 100  $\mu$ F **minimum**. Provided with tubing. See Section General, Insulating Tubing/Sleeving.
13. Switching Transistor (Q1) - Rated minimum 3 A, 600 V. Secured to plastic insulation then secured to Heat Sink (HS2) by screw. See ILL. 3 for details.
14. Heat Sink (HS2) - Aluminum, overall 121 by 18 mm, 2.9 mm thick, secured to PWB by soldering of integral pins. (Heat sink is earth.) An insulation sheet, minimum 0.2 mm, provided between Q1 and HS2. Insulation Sheet: (QMFZ2), Fu-Da, Type P-100.
15. Heat Sink (HS1) - Aluminum, overall 121 by 18 mm, 2.9 mm thick, secured to PWB by soldering of integral pins. (Heat sink is earthed.)
16. Bottom Chassis - Aluminum, U-shape. Overall 136 by 65 by 30 mm, 1.0 mm thick. Secured to Heat Sinks (HS1 and HS2) by screws.
17. Insulation Sheet - (QMFZ2) Fastex, Type Formex, rated minimum 94V-2, overall **136** by 62 mm, minimum 0.2 mm thick. Provided between solder side of PWB and Bottom Chassis.

18. Optical Isolators (IC2, IC3) - **Optional**. (FPQU2) Lite-On, Type 817. (Rated isolation 3000 V ac. Insulation thickness 0.4 mm. Compliance with reinforced insulation requirements.) **IC3 not provided for Model SPU45E-X.**

Alternate - Same as above, except Sharp, Type PC123 or PC 817.

Alternate - Same as above, except NEC, Type PS2501-2.

Alternate - Same as above, except Vishay, Type TCET1100 or TCET1109.

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

19. Transformer (T1) - (OBJY2), Xepex Electronic Co., Ltd., designated XPB-5, Class B insulation system. Open-type construction. Core: Ferrite, overall 28.8 by 34.2 by 11 mm. Coil: Copper magnet wire-wound on two-flanged bobbin. Bobbin: (QMFZ2), Phenolic, minimum 0.71 mm thick, rated minimum 94V-2.

Insulation:

Location	#Layers / Total Thickness (mm) / Material
Outer wrap	3 / 0.15 / Polyester film tape
Cross-over	1 / 0.05 / Polyester film tape
Pri/Sec.	3 / 0.15 / Polyester film tape
Pri/Core	1 / 0.71 / Bobbin
Sec/Core	1 / 0.71 / Bobbin

Margin tape, polyester film, minimum 3 mm wide, between windings and bobbin edge.

Exit leads provided with tubing. See Section General, Insulating Tubing/Sleeving.

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).

Alternate - Same as above, except (OBJY2), Yu Jing Technology Co. Ltd., Designated SBI4.2, Class 130(B).