

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
<b>Product:</b>	Switching Power Supply
<b>Model:</b>	GT-91125-15005
<b>Rating:</b>	Input: 42 - 60 Vdc, 5.25 A Max.  Output: 5.4 Vdc, 30 A, 162 W Max.
<b>Applicant Name and Address:</b>	GLOBTEK (HONG KONG) LTD UNIT 1402, BENSON TOWER 74 HUNG TO RD KWUN TONG KOWLOON HONG KONG

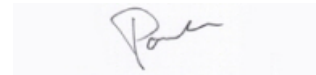
This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of Underwriters Laboratories Inc. ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

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Prepared by: Paul Wan  
Underwriters Laboratories Inc.

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Reviewed by: Henry Ho  
Underwriters Laboratories Inc.

A handwritten signature in black ink, appearing to read 'Henry Ho', on a light gray rectangular background.

**Supporting Documentation**

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
  - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
  - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
  - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

**Product Description**

The subject equipment is an dc-dc switching mode building-in power supply. Reinforced insulation is provided between DC input and output circuit. Basic insulation is provided between DC input and PE.

**Model Differences**

NA

**Technical Considerations**

- Equipment mobility : for building-in
- Connection to the mains : Equipment is for building-in. Must be checked in the end system.
- Operating condition : continuous
- Access location : Equipment is for building-in. Must be checked in the end system.
- Over voltage category (OVC) : Equipment is for building-in. Must be checked in the end system.
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Equipment is for building-in. Must be checked in the end system.
- Considered current rating (A) : 5.25

- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : < 2000
- Altitude of test laboratory (m) : <500
- Mass of equipment (kg) : < 18
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C
- The product is intended for use on the following power systems: DC supply by other ITE.
- The equipment disconnect device is considered to be: Switch
- The class of laser product is: Class 1 (I)
- The following were investigated as part of the protective earthing/bonding: Quick connect terminal
- The following are available from the Applicant upon request: Specific data sheets for LED indicators that are class I and operate at wavelength in the 400-710 nm range.

**Engineering Conditions of Acceptability**

For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. When installed in an end-product, consideration must be given to the following:

- The following Production-Line tests are conducted for this product: Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 73.5 Vrms, 189 Vpk
- The following secondary output circuits are SELV: 5.4 V dc, 30 A,
- The following secondary output circuits are at non-hazardous energy levels: 5.4 Vdc, 30 A
- The power supply terminals and/or connectors are: Not investigated for field wiring



- The investigated Pollution Degree is: 2
- Proper bonding to the end-product main protective earthing termination is: Required
- An investigation of the protective bonding terminals has: Not been conducted
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The equipment is suitable for direct connection to: DC supply by other ITE.
- The power supply is considered as secondary component. The DC input of the power supply shall be separated from the AC mains by reinforced insulation. Input and output are considered SELV.
- The subject product is a Class I equipment as defined in UL 60950-1, Second Edition, and shall be properly earth or bonded to earth in the end use. Additional evaluation is required if the power supply is intended for use other than Class I equipment.
- These DC-DC converters have been judged on the basis of the required creepages and clearances in the Second Edition of the Standard for Safety of Information Technology Equipment, UL 60950-1 and CAN/CSA-C22.2 No. 60950-1-07, Sub-clause 2.10, which covers the end-use product for which the component was designed. The functional insulations have been evaluated by conducting Component Failure Test per sub clause 5.3.4 (c) of UL60950-1 and CAN/CSAC22.2 No. 60950-1-07.
- The power supply was not evaluated for end system mounting.

**Additional Information**

NA

**Markings and instructions**

Clause Title	Marking or Instruction Details
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.

Symbols - On/Off switch	All other controls to be marked with  symbol for "ON" (60417-2-IEC-5007) and  symbol for "OFF" (60417-2-IEC-5008)
<b>Special Instructions to UL Representative</b> N/A	

**Production-Line Testing Requirements**

**Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.**

Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
N/A	-	-	-	-	-	-

**Earthing Continuity Test Exemptions - This test is not required for the following models:**

-

**Electric Strength Test Exemptions - This test is not required for the following models:**

-

**Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:**

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**Sample and Test Specifics for Follow-Up Tests at UL**

Model	Component	Material	Test	Sample(s)	Test Specifics
-	-	-	-	-	-

**TABLE: List of Critical Components**

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
Enclosure	Various	Various	Steel, Overall 181 mm by 156.6 mm by 87 mm, 0.8mm thickness.  110 hexagonal ventilation openings provided on front enclosure.  290 circular ventilation openings provided on rear enclosure.  120 circular ventilation openings provided on each side of enclosure.  See Enclosure ID7-01 for detail.	-	-
DC Fan	Adda Corp (E132139)	AD0812MB-A70GL	Rated 12 Vdc, max 0.15 A	GPWV2	UL
DC Fan - Alternate	Sunonwealth Electric Machine Industry Co Ltd (E77551)	EE80251BX(Y)	Rated 12 Vdc, max 0.15 A	GPWV2	UL
Power Switch	Zhejiang Leci Electronics Co Ltd. (E258800)	RS601	Rated Min 10A, 125Vac, 105 deg C	WOYR2	UL
Power Switch - Alternate	Zhejiang Chuangye Electronics Co Ltd (E301054)	XW-601	Rated Min 10A, 125Vac, 85 deg C	WOYR2	UL
Power Switch - Alternate	Various	Various	Rated Min 10A, 125Vac, 85 deg C	WOYR2	UL
Input Connector (J6)	Various	Various	Rated min 5A, 300Vac, min 70 deg C	ECBT2	UL
Output Connector (J8)	Various	Various	Rated min 30A, 300Vac, min 60 deg C	ECBT2	UL
Terminal Block	Various	Various	Rated min 6A, 300Vac, min 60 deg C	XCFR2	UL
Fuse (FS1)	Sun Electric Co (E166522)	5H	Rated 8A, 150Vdc. Covered by Heat shrinkable tube (YDPU2), rated min. 300 V, 105 deg C. Marked with VW-1.	JDYX2	UL
Alternate Fuse (FS1)	Various	Various	Rated 8 A, 150 Vdc. Covered by Heat shrinkable	JDYX	UL

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
			tube (YDPU2), rated min. 300 V, 105 deg C. Marked with VW-1.		
Varistor (MOV1) (optional)	JOYIN CO LTD (E325508)	7N471K, 10N471K, 14N471K,	300Vac	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Centra Science Corp. (E316325)	CNRV-07D471K, CNRV-10D471K, CNRV-14D471K	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Thinking Electronic Industrial Co Ltd (E314979)	TVR07471K, TVR10471K, TVR14471K	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Success Electronics Co Ltd (E330256)	SVR-07D471K, SVR-10D471K, SVR-14D471K	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Brightking (Shenzhen) Co Ltd (E327997)	07D471K, 10D471K, 14D471K	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Uppermost Electronic Industries Co Ltd (E330441)	V07K471, V10K471, V14K471	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Jya-Nay Co Ltd. (E333951)	7D471K, 10D471K, 14D471K	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Walsin TechnologyCorp. (E309297)	VZ07D471K, VZ10D471K, VZ14D471K	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Feng Hua Advance Technology (Holding) Co Ltd (E325462)	FNR-07K471, FNR-14K471,	300Vac,	VZCA2	UL
Alternate Varistor (MOV1) (optional)	Lien Shun Electronics Co Ltd (E315524)	07D471K, 10D471K, 14D471K,	300Vac,	VZCA2	UL
X-cap (CX1) (optional)	Cheng Tung	CTX	Max.1uF Min250VAac marked X1 (meets IEC	FOWX2	UL, VDE



Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
	Industrial Co., Ltd. (E193049)		60384-14)		
Alternate X-cap (CX1) (optional)	Winday Electronic Industrial Co Ltd (E302125)	MPX	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	ULTRA TECH XIPHI ENTERPRISE CO LTD (E183780)	HQX	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	Okaya Electric Industries Co. LTD (E47474)	RE series	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	VISHAY Capacitors Belgium NV (E100682)	F1772	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	Tenta Electric Industrial Co Ltd (E186475)	MEX	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	DAIN ELECTRONICS CO LTD (E147776)	MPX, NPX, MEX	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	Sinhua Electronics (Huzhou) Co. Ltd. (E237560)	MPX	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	FOSHAN SHUNDE CHUANG GE ELECTRONIC INDUSTRIAL CO LTD (E308832)	MKP-X2	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX1) (optional)	SHUN DE DAHUA ELECTRIC CO LTD (E227157)	HD	Max.1uF Min250Vac, marked X2. (meets IEC 60384-14)	FOWX2	UL, VDE
X-cap (CX2, CX3) (optional)	Cheng Tung Industrial Co., Ltd.	CTX	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
	(E193049)				
Alternate X-cap (CX2, CX3) (optional)	Winday Electronic Industrial Co Ltd (E302125)	MPX	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	ULTRA TECH XIPHI ENTERPRISE CO LTD (E183780)	HQX	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	Okaya Electric Industries Co. LTD (E47474)	RE series	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	VISHAY Capacitors Belgium NV (E100682)	F1772	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	Tenta Electric Industrial Co Ltd (E186475)	MEX	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	DAIN ELECTRONICS CO LTD (E147776)	MPX, NPX, MEX	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	Sinhua Electronics (Huzhou) Co. Ltd. (E237560)	MPX	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	FOSHAN SHUNDE CHUANG GE ELECTRONIC INDUSTRIAL CO LTD (E308832)	MKP-X2	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Alternate X-cap (CX2, CX3) (optional)	SHUN DE DAHUA ELECTRIC CO LTD (E227157)	HD	Max.0.47uF Min250VAac marked X1 (meets IEC 60384-14)	FOWX2	UL, VDE
Bleeder Resistors (R1, R1001)	Various	Various	Each rated 340kohm, 1/4W	-	-
E-Cap (C5, C6, C7)	Various	Various	Each rated max 1000 uF, min 100 V, 105 deg C.	-	-

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
Choke (L1, L2)	Various	Various	Open type construction. Rated 105°C. See Enclosure ID4-01 for detail.	-	-
Choke (L100)	Various	Various	Open type construction. Rated 105°C. Enclosure ID4-02 for detail.	-	-
Optical Isolators (U2, U10)	Cosmo Electronics Corp. (E169586)	K1010, KP1010	Minimum 5000 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators(U2, U10) (Alternate)	Everlight Electronics Co., Ltd. (E214129)	EL817	Minimum 5000 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators (U2, U10) (Alternate)	Sharp Corp., Electronic Components And Devices Group (E64380)	PC 817, PC817U, PC123, PC1231	Minimum 5000 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators (U2, U10) (Alternate)	Bright LED Electronics Corp. (E236324)	BPC-817B, BPC-817MB, BPC-817S	Minimum 3000 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators (U2, U10) (Alternate)	Lite-On Technology Corp. (E113898)	LTV-817	Minimum 5300 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators (U2, U10) (Alternate)	Toshiba Corp Semiconductor Co Discrete Semiconductor Div (E67349)	TLP721	Minimum 4000 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators (U2, U10) (Alternate)	Fairchild Semiconductor Corp (E90700)	H11A817B, H11A817C	Minimum 5000 V ac isolation. Double protection.	FPQU2	UL
Optical Isolators (U2, U10) (Alternate)	Lite-On Technology Corp. (E113898)	LTV-357, LTV-357T	Isolation voltage 3750 Vac minimum	FPQU2	UL
Transistor (Q1, Q4)	Various	Various	Each rated 200V, 25A	-	-
Transistor (Q2, Q3)	Various	Various	Each rated 60V, 0.6A	-	-
Transistor (Q5)	Various	Various	Rated 100V, 6A	-	-
IC (U5)	Various	Various	Rated 15V, 1A	-	-
Transformer (T1)	Various	GS-388	Class A Insulation Open type construction.	-	-

Object/part or Description	Manufacturer/ trademark	type/model	technical data	CCN	Marks of Conformity
			Core - Ferrite, overall 40.2 mm by 39.5mm by 12.6mm. See Enclosure ID4-03 for detail.		
Bobbin used in T1	Chang Chun Plastics Co Ltd. (E59481)	T373J	Phenolic, rated V-1, 150deg C, minimum 1.0mm.	QMFZ2	UL
Magnet wire used in T1	Various	Various	Rated 130 deg C	OBMW2	UL
Marginal Tape used in T1	Various	Various	Rated 130 deg C. min 2 mm wide.	OANZ2	UL
Polyester Tape used in T1	3M Company Electrical Markets Div (EMD) (E17385)	1350F-1,	Rated 130deg C	OANZ2	UL
Varnish used in T1	Various	Various	Rated 130 deg C	OBOR2	UL
Sleeving used in T1	Various	Various	Rated 150V min, 200deg C min	YDPU2	UL
HS1	Various	Various	Aluminium, measured 22 by 15.5 by 6mm. Mounting against U5, Q5. See Enclosure ID-7-02 for detail.	-	-
HS2	Various	Various	Aluminium, measured 50 by 44.5 by 30mm. Mounting against Q1, Q4. See Enclosure ID-7-03 for detail.	-	-
Supplementary Tubing	Various	Various	Rated 125deg Cmin, 0.4mm thickness min, marked VW-1. For LED wire, DC Fan wire,	YDPU2	UL
Earthing Conductor	Various	Various	Rated min 300V, min 80deg C, 18AWG provided with Green / yellow strip.	AVLV2	UL
Input wire	Various	Various	Rated min 300V, min 80deg C, 20 AWG	AVLV2	UL
Marking Label	Various	Various	Suitable for use on specific surface type	PGDQ2/ PGJ12	UL
PWB	Various	Various	Rated 94V-1, 105 deg C	ZPMV2	UL

## **Enclosures**

<u>Type</u>	<u>Supplement Id</u>	<u>Description</u>
Photographs	3-01	Overall View (Front)
Photographs	3-02	Overall View (Back)
Photographs	3-03	Internal View
Photographs	3-04	Internal View without PWB
Photographs	3-05	PWB Component Side
Photographs	3-06	PWB Soldering Side
Diagrams	4-01	Choke (L1, L2) Specification
Diagrams	4-02	Choke (L100) Specification
Diagrams	4-03	Transformer (T1) Specification
Schematics + PWB	5-01	PWB Component and Soldering Side
Schematics + PWB	5-02	Schematic
Manuals		
Miscellaneous	7-01	Enclosure Drawing
Miscellaneous	7-02	Heatsink (HS1) Drawing
Miscellaneous	7-03	Heatsink (HS2) Drawing
Miscellaneous	7-11	Marking Plate