

UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Listing
CCN:	QQGQ, QQGQ7 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Switching Power Adapter
Model:	GT-41080-WWVV-X.X
Rating:	<p>WW is the rated output wattage designation, with a maximum value of "18". VV is the standard rated output voltage designation, with a maximum value of "48". X.X designates the optional deviation, Actual voltage range is 9 - 48 volts only.</p> <p>Input: 100 - 240 Vac, 50-60 Hz, 0.6 A;</p> <p>Output:</p> <p>GT-41080-1817.9-X.X for 9 -17.9 volts DC. GT-41080-1824-X.X for 18 - 24 volts DC.</p> <p>GT-41080-1817.9 - 8.9 for 9Vdc/2A. GT-41080-1824 for 24Vdc/0.75A. GT-41080-1848 for 48Vdc/0.375A.</p>
Applicant Name and Address:	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 UL LLC ('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: Brian Wong

Reviewed by: Alex Liu

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

Electronic Components mounted on PWB and housed in plastic enclosure.

Model Differences

All models are similar to each other except for transformer(T1), resistor (RS17, RS18) and output rating. (See enclosure 7-01 for details)

Technical Considerations

- Equipment mobility : direct plug-in
- Connection to the mains : pluggable A
- Operating condition : continuous
- Access location : operator accessible
- Over voltage category (OVC) : OVC II
- Mains supply tolerance (%) or absolute mains supply values : +10%, -10%
- Tested for IT power systems : N/A
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class II (double insulated)
- Considered current rating of protective device as part of the building installation (A) : 20 A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : ≤ 2000 m
- Altitude of test laboratory (m) : ≤ 2000 m
- Mass of equipment (kg) : max. 0.12 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 40 degree C
- The means of connection to the mains supply is: Pluggable A, Direct Plug-In Unit
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: Plug

- The product was investigated to the following additional standards: The unit was evaluated to the maximum acceptable moment, center of gravity, dimensions and weight of the unit in accordance with UL 1310 and CSA C22.2 No. 223 and the blade dimension was evaluated to be complied with NEMA configurations in accordance with Wiring Devices-Dimensional Specifications, ANSI/NEMA WD6.
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): Output for all models

Additional Information

Revision: SR8227620-T001

Transfer File from the File E336418, Vol. X2, E336418-A16 into the File E341351, Vol. X3, E341351-A17.

Revision: 13CA34516

1. Add alternate enclosure material type SE1, CX7211
2. Add alternate Fuse Type SMT and 392
3. Add alternate Y capacitor Type SB, WD, KX, JN, JX, AH
4. Add alternate Optical isolator Type TLP721, BPC-817
5. Add alternate insulation system designated GTX-130-TM, ZT-130 and BOAM-01
6. Upgrading standard to UL60950-1, 2nd Edition, dated 2011-12-19 and CSA C22.2 No. 60950-1-07, dated 2011-12-19.

Additional Standards

The product fulfills the requirements of: N/A

Markings and instructions

Clause Title	Marking or Instruction Details
LPS	(Optional) Marked "LPS" or "Limited Power Supply".
1.7.1 Power rating - Ratings	Ratings (voltage, frequency/dc, current)
1.7.1 Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
1.7.1 Power rating - Model	Model Number
1.7.1 Power rating - Class II symbol	Symbol for Class II construction
1.7.6 Fuses - Rating	Rated current and voltage and type located on or adjacent to fuse or fuseholder.

1.7.2 Disconnect device - Pluggable equipment	Statement indicating that the socket-outlet shall be installed near the equipment and shall be easily accessible. (Instruction)
1.5.5 Inter-connecting cables - External detachable	Listee's Name and Part number (Marking or Instruction)
Special Instructions to UL Representative - Inspect the transformer (T1) listed in BD1.1 per AA1.1- (C). - When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. - Verify the specification sheet indicates 100% routine test specified in BD1.1 be conducted at the component manufacturer.	

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
All models	Transformer (T1)	N/A	Primary to Secondary	300 0	4242	1

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

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

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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
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1.5.1	TABLE: list of critical components					Pass
Object/part or Description	Manufacturer/ trademark	type/model	technical data	Product Category CCN(s)	Required Marks of Conformity	Supplement ID
Input Blades	--	--	Non-polarized, solid copper alloy (NEMA 1-15P configuration), integrally molded on plug holder. From any point of either blade to the plug face section of the edge of enclosure is spaced minimum 5.1 mm perimeter.	--	--	
Enclosure	SABIC INNOVATIVE PLASTICS B V	SE1X, SE1, CX7211	Two pieces construction, rated V-1 or better, minimum 2.0 mm rated min. 90 degree C, Secured together by ultrasonic welding. Overall see enclosure 4-01 for detail.	QMFZ2	UL	4-01
Plug Holder	SABIC INNOVATIVE PLASTICS B V	SE1X, SE1, CX7211	Rated minimum V-1, minimum 2.0 mm thick, min. 90 degree C, Secured on enclosure by mold fit. Overall see enclosure 4-07 for detail.	QMFZ2	UL	4-07
P.W.B	Various	Various	V-1 or better, minimum 130 degree C	ZPMV2	UL	3-05
Label (Optional)	Various	Various	Minimum 80 degree C.	PGDQ2, PGJI2	UL	
Fuse (FS1)	Conquer Electronics Co Ltd	MST	T1.6A/250Vac	JDYX2	UL	3-04
Fuse(FS1) (Alternate)	Ever Island Electric Co Ltd & Walter Electric	2010	T1.6A/250Vac	JDYX2	UL	
Fuse(FS1) (Alternate)	COOPER BUSSMANN INC	SS-5	T1.6A/250Vac	JDYX2	UL	
Fuse(FS1) (Alternate)	Bel Fuse Ltd.	RST	T1.6A/250Vac	JDYX2	UL	

Fuse(FS1) (Alternate)	Nippon Seisen Cable Ltd	SLT	T1.6A/250Vac	JDYX2	UL	
Fuse(FS1) (Alternate)	A Electronics Co Ltd	SMT	T1.6A/250Vac	JDYX2	UL	
Fuse(FS1) (Alternate)	LITTELFUSE WICKMANN WERKE	392	T1.6A/250Vac	JDYX2	UL	
Fuse (FS1) (Alternate)	Various	Various	Listed, T1.6A/250Vac	JDYX	UL	
Bleeder Resistor (RS1, RS2)	--	--	Rated maximum 1.5M ohm, min. 1/4W, SMD type.	--	--	3-04
Y capacitor (CY1) (optional)	TDK Corp	CD	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	3-04
Y capacitor (CY1) (optional) (Alternate)	SUCCESS ELECTRONICS CO LTD	SE, SB	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	WALSIN TECHNOLOGY CORP	AH	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	HAOHUA ELECTRONIC CO	CT 7	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	WELSON INDUSTRIAL CO LTD	WD	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	MURATA MFG CO LTD	KX	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	JYA-NAY CO LTD	JN	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	JERRO ELECTRONICS CORP	JX	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
Y capacitor (CY1) (optional) (Alternate)	mitsubishi MATERIALS CORP	AH	Max. 2200pF, min. 250 Vac, 85 degree C min., Y1 type	FOWX2	UL	
X capacitor	Various	Various	Max. 0.22 uF, min. 275 Vac,	FOWX2	UL	3-04

(CX1) (optional)			100 degree C, X1 or X2 type. Provided with 21 days damp heat condition.			
Varistor (MOV1) (Optional)	Various	Various	Rated minimum 300 Vac, 385 Vdc	XUHT2	UL	
Noise Filter (LF1) (Optional)	--	--	See enclosure for 4-05 details, class 130 degree C minimum.	--	--	4-05
- Bobbin	Various	Various	V-0, 130degree C, Phenolic, thickness 0.71mm minimum	QMFZ2	UL	
- Core	--	--	Ferrite, overall dimension 17.5mm by 4.0mm by 15.0mm	--	--	
- Coil	--	--	130 degree C, ANSI TYPE MW28 or MW75 or MW79 or MW80	OBMW2	UL	
Varnish (Optional)	John C. Dolph Co.	BC-346A	Rated minimum 200 degree C.	OBOR2	UL	
Varnish (Optional) (Alternate)	P D GEORGE/VIKING	V1630FS	Rated minimum 130 degree C.	OBOR2	UL	
Varnish (Optional) (Alternate)	Various	Various	Rated minimum 130 degree C.	OBOR2	UL	
Bridge Diode (D1, D2, D3, D4)	--	--	Rated min. 1A, 600 V minimum	--	--	
Storage Capacitor (C1)	--	--	Rated min. 400 V, max 33uf, min 105 degree C, provided with integral pressure relief	--	--	3-04
Optical Isolator (U1)	Sharp Corp., Electronic Components Group	PC817	Isolation voltage minimum 3000 Vac, minimum 100 degree C.	FPQU2	UL	3-04
Optical Isolator(U1) (alternate)	Everlight Electronics Co., Ltd.	EL817	Isolation voltage minimum 5000 Vac, minimum 100 degree C.	FPQU2	UL	
Optical Isolator(U1) (alternate)	Lite-On Technology Corp.	LTV-817	Isolation voltage minimum 3000 Vac, minimum 100 degree C.	FPQU2	UL	
Optical Isolator(U1) (alternate)	Toshiba Corp., Semiconductor Co, Discrete	TLP721	Double protection. Isolation voltage minimum 3000 Vac, minimum 100 degree C.	FPQU2 VDE	UL	

	Semiconductor Div.					
Optical Isolator(U1) (alternate)	BRIGHT LED ELECTRONICS CORP	BPC-817	Double protection. Isolation voltage minimum 3000 Vac, minimum 100 degree C.	FPQU2 VDE	UL	
Transformer (T1) For Models with ouput voltage less than 18V.	Electric Co., Ltd.	XF00579	See below	--	--	4-02
Transformer (T1) For Models with ouput voltage less than 48V.	Electric Co., Ltd.	XF00590	See below	--	--	4-03
Transformer (T1) For Models with ouput voltage equal to 48V.	Electric Co., Ltd.	XF00682	See below	--	--	4-08
Insulation system for Transformer (T1)	Electric Co., Ltd.	ENG130-1	Insulation system Class B (130 degree C)	OBJY2	UL	
Core	--	--	EE type, Ferrite, dimension 22.7mm by 6.5mm by 19.6mm	--	--	
Coil	Various	Various	130 degree C, ANSI TYPE MW28 or MW75 or MW79 or MW80	OBMW2	UL	
Bobbin	Chang Chun Plastics Co., Ltd.	T375J, T375HF	V-0, 150degree C, Phenolic, thickness 0.8mm minimum	QMFZ2	UL	
Bobbin (Alternate)	SUMITOMO BAKELITE CO LTD	PM-9820	V-0, 150degree C, Phenolic, thickness 0.71mm minimum	QMFZ2	UL	
Tubing/Sleeving	Great Holding Industrial Co. Ltd.	TFL, TFS, TFT	Rated 200 degree C, 600V max.	YDPU2	UL	
Triple Insulated Wire	Great Leoflon Industrial Co. Ltd.	TRW-B	130 degree C	OBJT2	UL	
Varnish	John C. Dolph Co.	BC-346A	Rated minimum 200 degree C.	OBOR2	UL	
Varnish (Alternate)	P D GEORGE/VIKING	V1630FS	Rated minimum 130 degree C.	OBOR2	UL	
Insulation Tape	3M Company	1350T-1	130 degree C.	OANZ2	UL	
Insulation Tape (Alternate)	3M Company	1350F(#)	130 degree C.	OANZ2	UL	

Insulation Tape (Alternate)	3M Company	44	130 degree C.	OANZ2	UL	
Insulation Tape (Alternate)	Bondtec Pacific Co., Ltd.	370S	130 degree C.	OANZ2	UL	
Insulation system for Transformer (T1) - Alternate	GlobTek Inc (E243347)	GTX-130-TM	Insulation system Class B (130 degree C). The material of transformer should be constructed under same table.	OBJY2	UL	
Insulation system for Transformer (T1) – Alternate	WUXI ZHONGTONG ELECTRONICS CO LTD (E315275)	ZT-130	Insulation system Class B (130 degree C). The material of transformer should be constructed under same table.	OBJY2	UL	
Coil	Various	Various	130 degree C, ANSI TYPE MW28 or MW75 or MW79 or MW80. Table IV and Table VII	OBMW2	UL	
Triple Insulated Wire	GREAT LEOFLON INDUSTRIAL CO LTD	TRW(B)	Rated 130 deg C Triple insulated wire. Table IV and Table VII	OBJT2	UL (E211989)	
Triple Insulated Wire(Alternate)	TOTOKU ELECTRIC CO LTD	TIW-2	Rated 130 degC Triple insulated wire. Table IV	OBJT2	UL(E166483)	
Bobbin	Chang Chun Plastics Co., Ltd.	T375J	V-0, 150degree C, Phenolic, thickness 0.8mm minimum. Table IV and Table VII	QMFZ2	UL(E59481)	
Bobbin (Alternate)	Chang Chun Plastics Co., Ltd.	T375HF	V-0, 150degree C, Phenolic, thickness 0.8mm minimum. Table VII	QMFZ2	UL(E59481)	
Bobbin (Alternate)	Sumitomo Bakelite Co Ltd	PM-9820	Phenolic, Three flanges, rated V-0, minimum 1.0 mm thick. Table IV and Table VII	QMFZ2	UL(E41429)	
Insulation Tape	JINGJIANG YAHUA PRESSURE SENSITIVE GLUE CO LTD	PZ, CT, WF	Rated 130 deg C. Table IV and Table VII	OANZ2	UL (E165111)	
Insulation Tape (Alternate)	JINGJIANG JINGYI ADHESIVE PRODUCT CO LTD	JY25-A	Rated 130 deg C. Table IV and Table VII	OANZ2	UL (E246950)	

Insulation Tape (Alternate)	SYMBIO INC	35660Y	Rated 130 deg C. Table IV and Table VII	OANZ2	UL(E50292)	
Insulation Tape (Alternate)	CHANG SHU LIANG YI TAPE INDUSTRY CO LTD	LY-XX	Rated 130 deg C. Table IV and Table VII	OANZ2	UL(E246820)	
Varnish	WU JIANG TAIHU INSULATING MATERIAL CO LTD	T-4260(a)	MW 28. Rated 130 deg C. Table IV and Table VII	OBOR2	UL (E228349)	
Tube	SHENZHEN WOER HEAT-SHRINKABLE MATERIAL CO LTD	WF	VW-1. Rated Min.150V,Min. 200 Vdc. Table IV and Table VII	YDPU2	UL (E203950)	
Tube (Alternate)	CHANGYUAN ELECTRONICS (SHENZHEN) CO LTD	CB-TT-L CB-TT-S CB-TT-T	VW-1. Rated Min.150V,Min. 200 Vdc. Table VII	YDPU2	UL(E180908)	
Tube (Alternate)	GREAT HOLDING INDUSTRIAL CO LTD	TFL, TFT	VW-1. Rated Min.150V,Min. 200 Vdc. Table IV	YDPU2	UL(E156256)	
Insulation system for Transformer (T1) – Alternate	Shan Dong Boam Electric Co Ltd (E252329)	BOAM-01	Insulation system Class B (130 degree C). The material of transformer should be constructed under same table.	OBJY2	UL	
Coil	Various	Various	130 degree C, ANSI TYPE MW28 or MW75 or MW79 or MW80	OBMW2	UL	
Secondary winding used in T1	FURUKAWA ELECTRIC CO LTD	TEX-E	Rated 130 deg C Triple insulated wire	OBJT2	UL (E206440)	
Bobbin	Sumitomo Bakelite Co Ltd	PM-9820	Phenolic, Three flanges, rated V-0, minimum 1.0 mm thick.	QMFZ2	UL(E41429)	
Insulation Tape	JINGJIANG YAHUA PRESSURE SENSITIVE	PZ, CT, WF	Rated 130 deg C.	OANZ2	UL (E165111)	

	GLUE CO LTD					
Varnish	NOROO PAINT & COATINGS CO LTD	DVB-2085(1) DVB-2085(C)	MW 28. Rated 130 degC.	OBOR2	UL (E93947)	
Tube	GREAT HOLDING INDUSTRIAL CO LTD	TFL, TFT	VW-1. Rated Min.150V,Min. 200 Vdc	YDPU2	UL (E156256)	
Tube (Alternate)	WOER HEAT-SHRINKABLE MATERIAL CO LTD	WF	VW-1. Rated Min.150V,Min. 200 Vdc	YDPU2	UL (E203950)	
Heat Sink (HS1) (Primary)(optional)	--	--	Aluminum, overall dimension see enclosure 4-06 for detail.	--	--	4-06
Output Cord	Various	Various	FEP, PTFE, PVC, TFE, Neoprene, Polyimide or marked FT-1, VW-1; max.3.05 m length, 80 degree C.	ZJCZ, AVL V2	UL	
Insulating Tubing/Sleeving (Optional)	Various	Various	FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1; 105 degree C, min., 300 V min.	UZFT2, YDPU2, YDTU2	UL	
Internal Glue Materials	Various	Various	Rated V-2 minimum.	QMFZ2	UL	3-04

Enclosures

<u>Type</u>	<u>Supplement Id</u>	<u>Description</u>
Photographs	3-01	Unit overview - 01
Photographs	3-02	Unit overview - 02
Photographs	3-03	Internal view of unit
Photographs	3-04	Component side of PWB
Photographs	3-05	Solder side of PWB
Photographs	3-06	Trace side of PWB of model GT-41080-1848
Diagrams	4-01	Enclosure dimension
Diagrams	4-02	Transformer (T1) Spec. (P/N: XF00579)
Diagrams	4-03	Transformer (T1) Spec. (P/N: XF00590)
Diagrams	4-04	Dimension of input blade
Diagrams	4-05	Inductor (LF1) Spec.
Diagrams	4-06	Heatsink (HS1) dimension
Diagrams	4-07	Dimension of Plug Holder
Diagrams	4-08	Transformer (T1) Spec. (P/N: XF00682)
Schematics + PWB	5-01	Layout of PWB
Schematics + PWB	5-02	Layout of PWB of model: GT-41080-1848
Manuals		
Miscellaneous	7-01	Model Difference List