# UL TEST REPORT AND PROCEDURE

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|---|---|
| **Standard:** | UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements)<br>CAN/CSA C22.2 No. 62368-1-14, 2nd Ed-(Audio/video, information and communication technology equipment Part 1: Safety requirements) |
| **Certification Type:** | Listing |
| **CCN:** | QQJQ, QQJQ7 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment) |
| **Complementary CCN:** | N/A |
| **Product:** | ICT/ITE POWER SUPPLY |
| **Model:** | GT-46200-***-T**<br><br>The 1st “*” denotes the rated output wattage, with a maximum value of "20",<br>The 2nd “*” denotes the standard rated output voltage designation, with a value of "05" and "06",<br>The 3rd “*” is optional deviation, subtracted from standard output voltage, which can be “-0.05” to “-0.99” with interval of 0.01, or blank to indicate no voltage different,<br>The 2nd and 3rd together denote the output voltage, with a range of 5-5.95Vdc<br>The 4th “*” can be 2 means C8 inlet type.<br>The last * denote any six character = 0-9 or A-Z or ()[] or – or blank for marketing purposes. |
| **Rating:** | Input: 100-240V~, 50/60Hz or 50-60Hz, 0.5A<br>Output :<br>5-5.95Vdc, Max 4.0A, Max. 20W<br>See model differences for output rating |
| **Applicant Name and Address:** | GLOBTEK (HONG KONG) LTD<br>UNIT 1402, BENSON TOWER<br>74 HUNG TO RD<br>KWUN TONG<br>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: | Amy Wong / Suki Kwong / Project Handler | Reviewed By: | Brian Wong / Reviewer |

**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 product is a Class II ICT/ITE POWER SUPPLY intended to be used for information technology equipment or audio/video equipment, all electronic components are mounted on PWB and housed in a plastics enclosure which is secured by ultrasonic welding, output by non-detachable wire.

**Model Differences**

The models GT-46200-*05-T2* and GT-46200-*06-T2* are identical to each other except for type designation, output rating.

| Model | Output Voltage | Max.Output Current | Max.Output Wattage |
|---|---|---|---|
| GT-46200-*05-T2* | 5V | 4.0A | 20W |
| GT-46200-*06*-T2* | 5.01-5.95V | 3.59A | 18W |

**Test Item Particulars**

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| Classification of use by | Ordinary person<br>Children likely to be present |
| Supply Connection | AC Mains |
| Supply % Tolerance | +10%/-10% |
| Supply Connection – Type | pluggable equipment type A - appliance coupler |
| Considered current rating of protective device as part of building or equipment installation | 20 A;<br>building; |
| Equipment mobility | movable<br>transportable |
| Over voltage category (OVC) | OVC II |
| Class of equipment | Class II |
| Access location | N/A |
| Pollution degree (PD) | PD 2 |
| Manufacturer's specified maximum operating ambient (°C) | 40 |
| IP protection class | IPX0 |
| Power Systems | TN |

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| Altitude during operation (m) | 2000 m or less |
| Altitude of test laboratory (m) | 2000 m or less |
| Mass of equipment (kg) | approx.0.17 Kg |

**Technical Considerations**

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 40°C
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-10%
- The equipment disconnect device is considered to be : Appliance inlet
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS) : Output terminal
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual

**Additional Information**

Revision: 4789507340

Model GT-46200-***-T** copy from the File E163743-A6007 Vol. X9 to E341351-A6005 Vol. X10.
Model name change from 6A-201DA05, 6A-201DA06 to GT-46200-***-T**.

**Additional Standards**

The product fulfills the requirements of: --

**Markings and Instructions**

| Clause Title | Marking or Instruction Details |
|---|---|
| Equipment identification marking – Manufacturer identification | Listee's or Recognized companys name, Trade Name, Trademark or File Number |
| Equipment identification marking – model identification | Model Number |
| Fuses – replaceable by ordinary or instructed person | (component ID:F1), "Ratings (T2A, 250Vac)", (component ID:F102), "Ratings (T3.15A, 250V)",and (symbol of required characteristics) located on or adjacent to fuse or fuseholder |
| LPS(optional) | Unit may be optionally marked with "Limited Power Source", "L.P.S" or "LPS". |
| Equipment rating marking – ratings | "Input Ratings (voltage, frequency/dc, current/power)", "Output Ratings (voltage, frequency/dc, current/power)" , polarity |

**Special Instructions to UL Representative**

[X] For transformer test - 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 Production-Line Testing Requirements be conducted at the component manufacturer.

| **BD1.0** | **TABLE: Production-Line Testing Requirements** | | | | | |
|---|---|---|---|---|---|---|
| **BD1.1** | **Electric Strength Test Special Constructions – Refer to Generic Inspection Instructions, Part AC for further information.** | | | | | |
| Model | Component | Removable parts | Test probe location | Test V rms | Test V dc | Test Time, s |
| All Models | Transformer | N/A | Primary to secondary | 4000Vpeak | 4000Vdc | Min. 1s |
| **BD1.2** | **Earthing Continuity Test Exemptions – This test is not required for the following models:** | | | | | |
| | None | | | | | |
| **BD1.3** | **Electric Strength Test Exemptions – This test is not required for the following models:** | | | | | |
| | None | | | | | |
| **BD1.4** | **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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| **BE1.0** | **Sample and Test Specifics for Follow-Up Tests at UL** | | | | |
|---|---|---|---|---|---|
| Model | Component | Material | Test | Sample (s) | Test Specifics |
| -- | -- | -- | -- | -- | -- |

| **4.1.2** | **TABLE: List of critical components** | | | | | **Pass** |
|---|---|---|---|---|---|---|
| Object / part No. | Manufacturer/ trademark | Type / model | Technical data | Product Category CCN(s) | Mark(s) of conformity | Supplement ID |
| 01. Label （optional） | Interchangeable | Interchangeable | Minimum 70 degree C, suitable for its application surface. | PGDQ2/8, PGJI2/8 | UL | |
| 01a. Label (Alternate) | -- | -- | Required markings are molded, permanently ink stamped, silkscreened or laser carved on plastic enclosure. | -- | -- | |
| 02. Enclosure | SABIC JAPAN L L C | 945 (GG) | Rated V-0, 120 degree C. Minimum 2.0 thickness. Two parts secured together by ultrasonic welding. See supplementary 7-01 for details. | QMFZ2 | UL E207780 | |
| 02a. Enclosure (Alternate) | SABIC INNOVATIVE PLASTICS US L L C | 915R(GG) | Rated V-0, 120 degree C. Minimum 2.0 thickness. Two parts secured together by ultrasonic welding. See supplementary 7-01 for details. | QMFZ2 | UL E121562 | |
| 02b. Enclosure (Alternate) | LG CHEM (GUANGZHOU) ENGINEERING PLASTICS CO LTD | LUPOY EF-1006F(m) | Rated V-0, 115 degree C. Minimum 2.0 thickness. Two parts secured together by ultrasonic welding. See supplementary 7-01 for details. | QMFZ2 | UL E248280 | |

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| 02c. Enclosure (Alternate) | COVESTRO DEUTSCHLAND AG [PC RESINS] | FR6005 + (z) | Rated V-0, 105 degree C. Minimum 2.0 thickness. Two parts secured together by ultrasonic welding. See supplementary 7-01 for details. | QMFZ2 | UL E41613 | |
| 02d. Enclosure (Alternate) | SILVER AGE ENGINEERING PLASTICS (DONGGUAN) CO LTD | PC2330 | Rated V-0, 115 degree C. Minimum 2.0 thickness. Two parts secured together by ultrasonic welding. See supplementary 7-01 for details. | QMFZ2 | UL E225348 | |
| 03. AC inlet (For Models GT-46200-***-T2*) | TECX-UNIONS TECHNOLOGY CORP | SO-222 | 2.5A, 250Vac, min. 70 degree C (Standard sheet C8) | AXUT2 | UL E220004 | |
| 03a. AC inlet (For Models GT-46200-***-T2*) (Alternate) | ZHEJIANG LECI ELECTRONICS CO LTD | DB-8 | 2.5A, 250Vac, min. 70 degree C (Standard sheet C8) | AXUT2 | UL E302229 | |
| 03b. AC inlet (For Models GT-46200-***-T2*) (Alternate) | ZHE JIANG BEI ER JIA ELECTRONIC CO LTD | ST-A03-005 | 2.5A, 250Vac, min. 70 degree C (Standard sheet C8) | AXUT2 | UL E225980 | |
| 03c. AC inlet (For Models GT-46200-***-T2*) (Alternate) | SUN FAIR ELECTRIC WIRE & CABLE (HK) CO LTD | S-01 | 2.5A, 250Vac, min. 70 degree C (Standard sheet C8) | AXUT2 | UL E226643 | |
| 04. PWB | Interchangeable | Interchangeable | V-1 or better, minimum 130 degree C. | ZPMV2 | UL | |
| 05. Fuse (F1) | Interchangeable | Interchangeable | T2AL, 250Vac | JDYX | UL | |
| 05a.Fuse (F1) (Alternate) | Interchangeable | Interchangeable | T2AL, 250Vac | JDYX2 | UL, VDE, SEMKO, BSI, TUV, NEMKO | |
| 05b.Fuse (F1) (Alternate) | SUZHOU WALTER ELECTRONIC CO LTD | 2010 | T2AL, 250Vac | JDYX2 | UL E56092 | |

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| 05c.Fuse (F1) (Alternate) | CONQUER ELECTRONICS CO LTD | MST | T2AL, 250Vac | JDYX2 | UL E82636 | |
| 05d.Fuse (F1) (Alternate) | HOLLYLAND CO LTD | 5ET | T2AL, 250Vac | JDYX2 | UL E156471 | |
| 05e.Fuse (F1) (Alternate) | COOPER BUSSMANN LLC | SS-5 | T2AL, 250Vac | JDYX2 | UL E19180 | |
| 05f.Fuse (F1) (Alternate) | BEL FUSE INC | RST | T2AL, 250Vac | JDYX2 | UL E20624 | |
| 06. X-Cap. (CX1) (Optional) | ULTRA TECH XIPHI ENTERPRISE CO LTD | HQX | Min. 250Vac, max. 0.22uF±20%uF, min.100 degree C, X2 type | FOWX2 | UL E183780 | |
| 06a. X-Cap. (CX1) (Optional) (Alternate) | TENTA ELECTRIC INDUSTRIAL CO LTD | MEX | Min. 250Vac, max. 0.22uF±20%uF, min.100 degree C, X1 or X2 type | FOWX2 | UL E222911 | |
| 06b. X-Cap. (CX1) (Optional) (Alternate) | CHENG TUNG INDUSTRIAL CO LTD | CTX | Min. 250Vac, max. 0.22uF±20%uF, min.100 degree C, X1 or X2 type | FOWX2 | UL E193049 | |
| 06c. X-Cap. (CX1) (Optional) (Alternate) | JOEY ELECTRONICS (DONG GUAN) CO LTD | MPX | Min. 250Vac, max. 0.22uF±20%uF, min.100 degree C, X1 or X2 type | FOWX2 | UL E216807 | |
| 06d. X-Cap. (CX1) (Optional) (Alternate) | XIANGTAI ELECTRONIC (SHENZHEN) CO LTD | MPX/MKP | Min. 250Vac, max. 0.22uF±20%uF, min.100 degree C, X1 or X2 type | FOWX2 | UL E357475 | |
| 06e. X-Cap. (CX1) (Optional) (Alternate) | CARLI ELECTRONICS CO LTD | MPX | Min. 250Vac, max. 0.22uF±20%uF, min.100 degree C, X2 type | FOWX2 | UL E120045 | |
| 07. Bleeder resistor (R1, R2) | TZAI YUAN ENTERPRISE CO LTD | HSMD, SMD | Each max. 2.0Mohm, min. 1/4W | AZSQ2 | UL E354677 | |

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| 07a. Bleeder resistor (R1, R2) (Alternate) | PROSPERITY DIELECTRICS CO LTD | FVS06, TF12V, FVS20, TF20V, FVS25, TF25V | Each max. 2.0Mohm, min. 1/4W | AZSQ2 | UL E358325 | |
| 07b. Bleeder resistor (R1, R2) (Alternate) | Yageo Corporation | RV1206 | Each max. 2.0Mohm, min. 1/4W | -- | Test in the unit | |
| 08. Bridge Diode (DB1) | Interchangeable | Interchangeable | Minimum 2A , Minimum 600V | -- | -- | |
| 09. Ripple Capacitor (C1) | Interchangeable | Interchangeable | Each maximum 47uF, minimum 400V, 105 degree C. | -- | -- | |
| 10. MOSF (Q1) | Interchangeable | Interchangeable | Minimum 4A , Minimum 600V | -- | -- | |
| 11. Current sensor resistor (R10) | Interchangeable | Interchangeable | Minimum 0.91 ohm , Minimum 1W | -- | -- | |
| 12. Line choke(NF1) (Optional) | Interchangeable | Interchangeable | Minimum 130 degree C, See supplement 4-02 for detail. | -- | -- | |
| 12-01. Magnet wire | Interchangeable | Interchangeable | Minimum 130 degree C | OBMW2 | UL E225143 | |
| 12-02. Core | Interchangeable | Interchangeable | Ferrite | -- | -- | |
| 12-03. Bobbin (Alternate) | Interchangeable | Interchangeable | Phenolic, V-0, 150 degree C. | QMFZ2 | UL | |
| 12-04. Insulation tape (Alternate) | Interchangeable | Interchangeable | 130 degree C | OANZ2 | UL | |
| 13. Bridge - capacitor (CY1, CY2) (Optional) | SUCCESS ELECTRONICS CO LTD | SE, SB, SF, SL | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E114280 | |
| 13a. Bridge - capacitor (CY1, CY2) (Optional) (Alternate) | WALSIN TECHNOLOGY CORP | AH Series | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E146544 | |

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| 13b. Bridge - capacitor (CY1, CY2) (Optional) (Alternate) | TDK CORPORATION | CD | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E37861 | |
| 13c. Bridge - capacitor (CY1, CY2) (Optional) (Alternate) | JUHONG ELE COMPANY | JB | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E253194 | |
| 13d. Bridge - capacitor (CY1, CY2) (Optional) (Alternate) | MURATA MFG CO LTD | KX | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E37921 | |
| 13e. Bridge - capacitor (CY1, CY2) (Optional) (Alternate) | XIANGTAI ELECTRONIC (SHENZHEN) CO LTD | YOB, YOF, YOE | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E319473 | |
| 13f. Bridge - capacitor (CY1, CY2) (Optional) (Alternate) | HAOHUA ELECTRONIC CO | CT7 | CY1 maximum 1000pF, CY2 maximum 100pF, minimum 250V, minimum 125 degree C, Y1 type. | FOWX2 | UL E233106 | |
| 14. Opto coupler (PC1) | COSMO ELECTRONICS CORP | KPC817, K1010 | Double-protection. Providing 5000Vac isolation. minimum 100 degree C. | FPQU2 | UL E169586 | |
| 14a. Opto coupler (PC1) (Alternate) | EVERLIGHT ELECTRONICS CO LTD | EL817 | Double-protection. Providing 5000Vac isolation. minimum 100 degree C. | FPQU2 | UL E214129 | |
| 14b. Opto coupler (PC1) (Alternate) | BRIGHT LED ELECTRONICS CORP | BPC-817MXXXXXX*, BPC-817SXXXXXX*, BPC-817XXXXXX* | Double-protection. Isolation voltage 5000Vac, minimum 100 degree C. | FPQU2 | UL E236324 | |

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| 14c. Opto coupler (PC1) (Alternate) | SHENZHEN ORIENT COMPONETS CO LTD | ORPC-817Mx@, ORPC-817Sx@, ORPC-817x@ | Double-protection. Isolation voltage 5000Vac, minimum 100 degree C. | FPQU2 | UL E323844 | |
| 14d. Opto coupler (PC1) (Alternate) | LITE-ON TECHNOLOGY CORP | LTV-817 | Double-protection. Isolation voltage 5300Vac, minimum 100 degree C. | FPQU2 | UL E113898 | |
| 14e. Opto coupler (PC1) (Alternate) | RENESAS ELECTRONICS CORPORATION | PS2561-1 | Double-protection. Isolation voltage 5000 Vac, minimum 100 degree C. | FPQU2 | UL E72422 | |
| 15. Transformer (T1) | ENG Electric Co Ltd | XF00916 | Class B. See supplement 4-01 for details. | -- | -- | |
| 15-01. Insulation system | ENG ELECTRIC CO LTD | ENG130-1 | Class B | OBJY2 | UL E308897 | |
| 15-02. Magnet wire | Interchangeable | Interchangeable | Minimum 130 degree C, MW28, MW75, MW79, MW80, MW82, MW83 | OBMW2 | UL E225143 | |
| 15-03. Core | Interchangeable | Interchangeable | Ferrite, two pieces provided. Overall approx. dimension 22.6 mm by 18.7mm by 5.8mm | -- | -- | |
| 15-04. Bobbin | Sumitomo Bakelite Co Ltd | PM-9820 | Phenolic, V-0, Minimum 0.71mm thick, 150 degree C. | QMFZ2 | UL E41429 | |
| 15-04a. Bobbin (Alternate) | Chang Chun Plastics Co., Ltd. | T375J | Phenolic, V-0, Minimum 0.71mm thick, 150 degree C. | QMFZ2 | UL E59481 | |
| 15-05. Insulation tape | 3M COMPANY ELECTRICAL MARKETS DIV (EMD) | 1350F-1 (b), 1350T-1 (b) | 130 degree C | OANZ2 | UL E17385 | |

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| 15-05a. Insulation tape (Alternate) | BONDTEC PACIFIC CO LTD | 370S (b) | 130 degree C | OANZ2 | UL E175868 | |
| 15-06.Triple insulated wire | GREAT LEOFLON INDUSTRIAL CO LTD | TRW(B) | 130 degree C | OBJT2 | UL E211989 | |
| 15-07. Varnish | ELANTAS ELECTRICAL INSULATION ELANTAS PDG INC | V1630FS | 130 degree C | OBOR2 | UL E75225 | |
| 16-08. Teflon tube | GREAT HOLDING INDUSTRIAL CO LTD | TFL, TFS, TFT | Rated 200 degree C, VW-1 | YDPU2 | UL | |
| 17. Output cord | Interchangeable | Interchangeable | VW-1, 80 degree C, minimum 24AWG minimum 60V, maximum 3.05 m long, and maximum 35 mm inside enclosure. | AVLV2, ZJCZ | UL | |
| 18. Strain Relief | Interchangeable | Interchangeable | Minimum. V-1. See supplement 7-02 for detail. | QMFZ2 | UL | |
| 19. Primary Heat Sink (HS1) | -- | -- | Aluminum, secured to Q1 by screw and soldered to PCB, see supplement 7-03 for dimension. | -- | -- | |
| 20. Secondary Heat Sink (HS2) | -- | -- | Aluminum, secured to Q2 by screw and soldered to PCB, see supplement 7-04 for dimension. | -- | -- | |
| 21. Glue | Interchangeable | Interchangeable | V-2 or better. | QMFZ2 | UL | |

**Enclosures**

| Type | Supplement Id | Description |
|---|---|---|
| Photographs | 03-01 | Overall view 1 |
| Photographs | 03-02 | Overall view 2 |
| Photographs | 03-04 | Internal view |
| Photographs | 03-06 | PCB component side view |
| Photographs | 03-08 | PCB trace side view |
| Photographs | 03-09 | Transformer view 1 |
| Photographs | 03-10 | Transformer view 2 |
| Photographs | 03-11 | Transformer view 3 |
| Diagrams | 04-01 | Transformer Spec. |
| Diagrams | 04-02 | NF1 Spec. |
| Schematics + PWB | 05-01 | PCB layout |
| Miscellaneous | 07-01 | Enclosure drawing |
| Miscellaneous | 07-02 | Strain relief |
| Miscellaneous | 07-03 | HS1 |
| Miscellaneous | 07-04 | HS2 |