

## UL TEST REPORT AND PROCEDURE

|                                    |   |
|------------------------------------|---|
| <b>Standard:</b>                   | UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements)<br>CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements) |
| <b>Certification Type:</b>         | Listing   |
| <b>CCN:</b>                        | QQGQ, QQGQ7 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)   |
| <b>Product:</b>                    | Switching Power Supply  |
| <b>Model:</b>                      | 1.BP(a)*040(b)*(c)**(d)*(e)**<br>2.(a)*ENB1040(b)*(c)**(d)**(e)*(f)**<br>(Where * may be alphanumeric, for marketing purpose and no impact safety related critical components and constructions)  |
| <b>Rating:</b>                     | Input Rating: 100-240Vac, 50-60Hz, 1.2A<br>Output Rating: 5Vdc, 5.0A or<br>9Vdc, 4.0A or<br>12Vdc, 3.4A or<br>15Vdc, 2.7A or<br>18Vdc, 2.2A or<br>24Vdc, 1.7A or<br>48Vdc, 0.83A  |
| <b>Applicant Name and Address:</b> | BRIDGEPOWER CORP<br>964 GOSAEK-DONG<br>GWONSEON-GU<br>SUWON-SI GYEONGGI-DO 441-813 KOREA  |

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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Underwriters Laboratories Inc.



**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**

Switching Mode Power Supply(AC/DC adaptor), consists of electronic components mounted on PWB, a switching transformer and electronic components mounted on PWB, housed with a plastic enclosure.

**Model Differences**

BP(a)\*040(b)\*(c)\*\*(d)\*(e)\*\*

- (a) Family Related Designs: \* is A-Z  
(b) Output: \* is S (S=Single)  
(c) Output Voltage: 05, 09, 12, 15, 18, 24, 48  
(d) Standard Input Cord Options can be F or Q or N for input plug type.  
F : (Class I - IEC320-C14),  
Q: (Class II - IEC320-C18),  
N: ((Class II - IEC320-C8)
- (e) Custom Options (Marking, Cord etc.) Number : 00 thru 99

(a)\*ENB1040(b)\*(c)\*\*(d)\*\*(e)\*(f)\*\*

- (a) Family Related Designs : \* is A-Z  
(b) Design Revision Changes: A to Z (Standard)  
(c) Output Voltage: 05, 09, 12, 15, 18, 24, 48  
(d) Standards Output Cord Options: Number : 00 thru 99  
(e) Standard Input Cord Options can be F or Q or Nfor input plug type.  
F : (Class I = IEC320-C14)  
Q: (Class II = IEC320-C18)  
N: ((Class II = IEC320-C8)
- (f) Custom Options (Marking, Cord etc.) Number : 00 thru 99

**Technical Considerations**

- Equipment mobility : movable
- 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 : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I (earthed) or Class II (double insulated)
- Considered current rating (A) : 20A
- Pollution degree (PD) : PD 2
- IP protection class : IP X0
- Altitude of operation (m) : Up to 2000m
- Altitude of test laboratory (m) : Less than 2000m
- Mass of equipment (kg) : 240g
- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>ma</sub>) permitted by the manufacturer's specification of: 40 °C
- The means of connection to the mains supply is: Detachable power cord, Pluggable A
- The product is intended for use on the following power systems: TN
- The equipment disconnect device is considered to be: Appliance inlet
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: CY2
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS): All outputs

**Additional Information**


Original, 11CA06784

Max. Normal Load Condition: Rated output current (See Cover Page for detail).

#### Additional Standards

The product fulfills the requirements of: N/A

#### Markings and instructions

| Clause Title                             | Marking or Instruction Details  |
|--|---|
| Power rating - Ratings                   | Ratings (voltage, frequency/dc, current)  |
| Power rating -<br>Company identification | Listee's or Recognized company's name, Trade Name, Trademark or File Number   |
| Power rating -<br>Model                  | Model Number  |
| Power rating -<br>Class II symbol        | Symbol for Class II construction<br><br>(60417-2-IEC-5172) |
| Warning to service<br>personnel          | "CAUTION: Double pole/neutral fusing"   |

#### Special Instructions to UL Representative

Inspect the transformer(s) listed in BD1.1 per AA 1.1-(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 BD 1.1 be conducted at the component manufacturer.

| <b>Production-Line Testing Requirements</b>   |           |                 |                     |           |                |              |
|---|-----------|-----------------|---------------------|-----------|----------------|--------------|
| <b><u>Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.</u></b>   |           |                 |                     |           |                |              |
| Model   | Component | Removable Parts | Test probe location | V rms     | V dc           | Test Time, s |
| BP(a)*040(b)<br>*(c)**(d)*(e)*<br>*<br>(a)*ENB1040<br>(b)*(c)**(d)**(<br>e)*(f)**   | T1        | N/A             | N/A                 | 300<br>0  | 4242           | 1s           |
| <b><u>Earthing Continuity Test Exemptions - This test is not required for the following models:</u></b>   |           |                 |                     |           |                |              |
| Class II model only   |           |                 |                     |           |                |              |
| <b><u>Electric Strength Test Exemptions - This test is not required for the following models:</u></b>   |           |                 |                     |           |                |              |
| -   |           |                 |                     |           |                |              |
| <b><u>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:</u></b> |           |                 |                     |           |                |              |
| -   |           |                 |                     |           |                |              |
| <b><u>Sample and Test Specifics for Follow-Up Tests at UL</u></b>   |           |                 |                     |           |                |              |
| Model   | Component | Material        | Test                | Sample(s) | Test Specifics |              |
| N/A   |           |                 |                     |           |                |              |

**TABLE: List of Critical Components**

| Object/part or Description             | Manufacturer/ trademark        | type/model  | technical data  | CCN     | Marks of Conformity |
|--|--------------------------------|-------------|---|---------|---------------------|
| Appliance Inlet (Class I)              | Rong Feng Industrial Co., Ltd. | SS-120      | Rated 15 A / 250 V.   | AXUT2/8 | USR/CNR             |
| Appliance Inlet (Class II)             | Rong Feng Industrial Co., Ltd. | RF-180      | Rated 2.5 A / 250 V.  | AXUT2/9 | USR/CNR             |
| Appliance Inlet (Class II) - Alternate | Rong Feng Industrial Co., Ltd. | SS-120A     | Rated 15 A / 250 V.   | AXUT2/8 | USR/CNR             |
| Enclosure(Fire/Mech./Elec.)            | CHEIL INDUSTRIES.              | HN-1064W(+) | Overall Sized approx. 102.0 by 60.0 by 32.5mm. Min 2.0mm thickness, V-1, RTI 80 degree C. Composed of two pieces, secured together by ultrasonic welding. | QMFZ2/8 | USR/CNR             |
| Fuse (F1)                              | Save fusetech Inc              | SS-5        | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F1) - Alternate                  | LITTELFUSE WICKMANN WERKE      | 392         | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F1) - Alternate                  | Hollyland co., ltd.            | 5ET         | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F1) - Alternate                  | NIPPON SEISEN CABLE, LTD.      | SLT         | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F2) (Optional)                   | Save fusetech Inc              | SS-5        | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F2) (Optional) - Alternate       | LITTELFUSE WICKMANN WERKE      | 392         | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F2) (Optional) - Alternate       | Hollyland co., ltd.            | 5ET         | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Fuse (F2) - Alternate                  | NIPPON SEISEN CABLE, LTD.      | SLT         | Rated 250V, T3.15AL   | JDYX2/8 | USR/CNR             |
| Varistor (ZNR4) (Optional)             | Success Electronics            | SVR14D471K  | Rated 470 V, (line-to-line), Overall dimension 14 mm.   | VZCA2/8 | USR/CNR             |
| Varistor (ZNR4) (Optional) - Alternate | AMOTECH CO LTD                 | INR14D471   | Rated 470 V, (line-to-line), Overall dimension 14 mm.   | VZCA2   | USR                 |
| Varistor (ZNR4) (Optional) - Alternate | HONGZHI ENTERPRISES LTD        | HEL14D471K  | Rated 470 V, (line-to-line), Overall dimension 14 mm.   | VZCA2   | USR                 |
| Thermistor (TH1)                       | Various                        | Various     | NTC, 5ohm at 25deg.C  | XGPU2   | USR                 |
| Line Filter (LF1)                      | Bridgepower or Wendeng Jeil    | 3025634     | Ferrite Core; 14mm by 8mm by 7mm, Coils: Polyurethane Enamelled Wire Min.130degree C. Bobbin: (QMFZ2) Bakelite, type PM9820@, V-0,                        | -       | -                   |

| Object/part or Description                   | Manufacturer/ trademark     | type/model               | technical data  | CCN   | Marks of Conformity |
|--|-----------------------------|--------------------------|---|-------|---------------------|
|  |                             |                          | 150 deg C   |       |                     |
| X-capacitor (CX1) (Line to Line) - Alternate | Iskra                       | KNB 1530 or 1562 or 1563 | Rated 250V, Max.. 0.47 uF. Marked with X1 or X2. Meets IEC/EN60384-14.  | FOWX2 | USR/CNR             |
| X-capacitor (CX1) (Line to Line) - Alternate | Pilkor                      | PCX2 335M or PCX2 337    | Rated 250V, Max.. 0.47 uF. Marked with X1 or X2. Meets IEC/EN60384-14.  | FOWX2 | USR/CNR             |
| X-capacitor (CX1) (Line to Line) - Alternate | Okaya                       | LE                       | Rated 250V, Max.. 0.47 uF. Marked with X1 or X2. Meets IEC/EN60384-14.  | FOWX2 | USR/CNR             |
| X-capacitor (CX1) (Line to Line) - Alternate | Sunil                       | 436D                     | Rated 250V, Max.. 0.47 uF. Marked with X1 or X2. Meets IEC/EN60384-14.  | FOWX2 | USR/CNR             |
| X-capacitor (CX1) (Line to Line) - Alternate | Tenta                       | MEX                      | Rated 250V, Max.. 0.47 uF. Marked with X1 or X2. Meets IEC/EN60384-14.  | FOWX2 | USR/CNR             |
| BridgeDiode(BD1)                             | Various                     | Various                  | Min. 4.0A, Min. 600V.   | FOWX2 | USR/CNR             |
| Discharging Resister (PR1, PR2)              | Various                     | Various                  | 510Kohm 1/8W  | -     | -                   |
| Electrolytic Capacitor (C1)                  | Various                     | Various                  | Max. 82 uF, Min. 400 V, min. 105 degree.  | -     | -                   |
| Switching IC (U1)                            | Various                     | Various                  | Max 30V, Max.4mA  | -     | -                   |
| FET (Q1)                                     | Various                     | Various                  | Min 650V, Max.7.2A  | -     | -                   |
| Main Transformer(T1) for output 5 V          | Bridgepower or Wendeng Jeil | 3025688001               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg C.Bobbin:(QMFZ2), V-0, 130 degC. | -     | -                   |
| Main Transformer(T1) for output 9V           | Bridgepower or Wendeng Jeil | 3025688002               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg C.Bobbin:(QMFZ2), V-0, 130 degC. | -     | -                   |
| Main Transformer(T1) for output 12 V         | Bridgepower or Wendeng Jeil | 3025688003               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg C.Bobbin:(QMFZ2), V-0, 130 degC. | -     | -                   |
| Main Transformer(T1) for output 15V          | Bridgepower or Wendeng Jeil | 3025688004               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg C.Bobbin:(QMFZ2), V-0, 130 degC. | -     | -                   |
| Main Transformer(T1) for output 18 V         | Bridgepower or Wendeng Jeil | 3025688005               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg C.Bobbin:(QMFZ2), V-0, 130 degC. | -     | -                   |
| Main Transformer(T1) for output 24 V         | Bridgepower or Wendeng Jeil | 3025688006               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg                                  | -     | -                   |

| Object/part or Description           | Manufacturer/ trademark                | type/model               | technical data   | CCN     | Marks of Conformity |
|--------------------------------------|--|--------------------------|--|---------|---------------------|
|                                      |  |                          | C.Bobbin:(QMFZ2), V-0, 130 degC.   |         |                     |
| Main Transformer(T1) for output 48 V | Bridgepower or Wendeng Jeil            | 3025688007               | JEC(B), Class B. Core: Ferrite, size 28 by 20 mm. Coils: TIW:Furukawa, TEXE, 130 deg C.Bobbin:(QMFZ2), V-0, 130 degC.            | -       | -                   |
| Optical Isolator (U2)                | Vishay Semiconductor                   | TCET1103(G)D or TCET1103 | Double protection optical isolator. Providing isolation voltage 5000 Vac, Internal Creepage ; 8.0mm<br>External Creepage ; 6.0mm | -       | -                   |
| Optical isolator (U2) - Alternate    | COSMO ELECTRONICS CORP                 | KP1010X                  | Double protection optical isolator. Providing isolation voltage 5000 Vac,Internal Creepage ; 6.5mm<br>External Creepage ; 6.5mm  | FPQU2/8 | USR/CNR             |
| Optical isolator (U2) - Alternate    | SHARP CORP ELECTRONIC COMPONENTS GROUP | PC123                    | Double protection optical isolator. Providing isolation voltage 5000 Vac,Internal Creepage ; 6.4mm<br>External Creepage ; 6.4mm  | FPQU2/8 | USR/CNR             |
| Optical isolator (U2) - Alternat     | LITE-ON TECHNOLOGY CORP                | LTV-817                  | Double protection optical isolator. Providing isolation voltage 5000 Vac,Internal Creepage ; 7.0mm<br>External Creepage ; 7.0mm  | FPQU2   | US                  |
| Optical isolator (U2) - Alternate    | KODENSHI KOREA                         | PC-17K                   | Double protection optical isolator. Providing isolation voltage 5000 Vac.,Internal Creepage ; 7.0mm<br>External Creepage ; 7.0mm | FPQU2/8 | USR/CNR             |
| Bridging Capacitor (CY1, CY2)        | SUCCESS ELECTRONICS CO LTD             | SE & CB                  | 250Vmin, 1000 pF. Marked with Y1 & Y2.   | FPQU2/8 | USR/CNR             |
| Bridging Resistor(R4,R5) (Optional)  | Various                                | Various                  | 4.7M Ohm, 1/4W   | -       | -                   |
| PWB                                  | Various                                | Various                  | Min. V-1, min 130°C.   | ZPMV2   | USR                 |
| Heatsink(HS1)-Primary                | Various                                | Various                  | Metal, overall sized approx. 54 by 22 mm, 2 mm thickness.<br>Wound by polyester film tape OANZ2), Min. 130 deg C,                | -       | -                   |



| Object/part or Description | Manufacturer/ trademark | type/model | technical data   | CCN           | Marks of Conformity |
|----------------------------|-------------------------|------------|--|---------------|---------------------|
| Heatsink(HS2)-Secondary    | Various                 | Various    | Metal, overall sized approx. 35 by 22 mm, 2 mm thickness. Wound by polyester film tape OANZ2), Min. 130 deg C, | -             | -                   |
| Output cable(LPS)          | Various                 | Various    | For use of external interconnection, max 3.05 m long, max. 300 V, 80 °C, min.20 AWG, Marked with VW-1 or FT-1. | AVLV2 or ZJCZ | USR                 |
| Nameplate Label            | Various                 | Various    | Suitable for use on surface of Polycarbonate (PC) with max. 60 °C surface temperature.                         | PGDQ2, PGJI2  | USR                 |
| Bonding Glue               | Various                 | Various    | Min. V-2, min. 100 °C for additional secureness of internal conductor.   | QMFZ2         | USR                 |
| Wiring, internal (Primary) | Various                 | Various    | Max. 300 V, 80 °C, min.20 AWG, Marked with VW-1 or FT-1.   | AVLV2         | USR                 |
| Bonding conductor          | Various                 | Various    | Mechanically clamped or secured on PWB from Appliance Inlet. Min 18 AWG, Green-and-Yellow Insulation.          | AVLV2         | USR                 |

## Enclosures

| <u>Type</u>      | <u>Supplement Id</u> | <u>Description</u>              |
|------------------|----------------------|---------------------------------|
| Photographs      | 3-13                 | External View F type (Class I)  |
| Photographs      | 3-17                 | External View N type (Class II) |
| Photographs      | 3-23                 | External View Q type (Class I)  |
| Photographs      | 3-29                 | Internal View Top_ClassI        |
| Photographs      | 3-30                 | Internal View Bottom_ClassI     |
| Photographs      | 3-31                 | Internal View Top_ClassII       |
| Photographs      | 3-32                 | Internal View Bottom_ClassII    |
| Diagrams         | 4-01                 | Component Layout_ PWB Pattern   |
| Schematics + PWB |                      |                                 |
| Manuals          |                      |                                 |
| Miscellaneous    | 7-01                 | Label Drawing_ClassI            |
| Miscellaneous    | 7-18                 | Label Drawing_ClassII           |