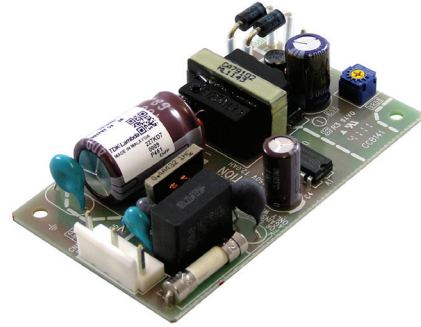


## 6.6 to 30W Single Output, High Reliability Power Supplies



Industrial

Test

COMM

Broadcast

The ZWS-B industrial grade power supplies are used in a wide range of applications where equipment down-time cannot be tolerated during years of operation. Globally, process control, machinery, semiconductor fabrication and test and measurement equipment manufacturers depend upon the ZWS-B to provide a reliable source of power. Conservatively rated electrolytic capacitor temperatures offer improved field life-times of up to 10 years. Available in three power levels, 10W, 15W and 30W, the series provides a choice of 3.3 to 24V outputs. L bracket and cover mechanical configurations are available, in addition to a double sided board coating option.

### Features

- 10 Year Electrolytic Capacitor Lifetimes
- Convection Cooled
- Curve B Radiated and Conducted EMI
- 5 year Warranty

### Benefits

- Improved Field Life
- Reduced Dirt and Dust Contamination
- Easier System Compliance
- Low Cost of Ownership

### Model Selector

| Model     | Output Voltage (V) | Adjustment Range (V) | Maximum Current (A) | Maximum Output Power (W) | Maximum Ripple & Noise (mV) | Over Current Protection (A) | Over Voltage Protection (V) | Efficiency (Typ) (%) (100/200Vac) |
|-----------|--------------------|----------------------|---------------------|--------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------------|
| ZWS10B-3  | 3.3                | 2.97-3.63            | 2                   | 6.6                      | 120                         | >2.1                        | 4.0-5.25                    | 70 / 70                           |
| ZWS15B-3  | 3.3                | 2.97-3.63            | 3                   | 9.9                      | 120                         | >3.15                       | 4.0-5.25                    | 70 / 71                           |
| ZWS30B-3  | 3.3                | 2.97-3.63            | 6                   | 19.8                     | 120                         | >6.3                        | 4.0-5.25                    | 75 / 77                           |
| ZWS10B-5  | 5                  | 4.5-5.5              | 2                   | 10                       | 120                         | >2.1                        | 5.75-7.0                    | 77 / 78                           |
| ZWS15B-5  | 5                  | 4.5-5.5              | 3                   | 15                       | 120                         | >3.15                       | 5.75-7.0                    | 76 / 78                           |
| ZWS30B-5  | 5                  | 4.5-5.5              | 6                   | 30                       | 120                         | >6.3                        | 5.75-7.0                    | 80 / 82                           |
| ZWS10B-12 | 12                 | 10.8-13.2            | 0.9                 | 10.8                     | 150                         | >0.95                       | 13.8-16.2                   | 82 / 83                           |
| ZWS15B-12 | 12                 | 10.8-13.2            | 1.3                 | 15.6                     | 150                         | >1.37                       | 13.8-16.2                   | 80 / 83                           |
| ZWS30B-12 | 12                 | 10.8-13.2            | 2.5                 | 30                       | 150                         | >2.63                       | 13.8-16.2                   | 84 / 86                           |
| ZWS10B-15 | 15                 | 13.5-16.5            | 0.7                 | 10.5                     | 150                         | >0.74                       | 17.3-20.3                   | 83 / 84                           |
| ZWS15B-15 | 15                 | 13.5-16.5            | 1                   | 15                       | 150                         | >1.05                       | 17.3-20.3                   | 81 / 84                           |
| ZWS30B-15 | 15                 | 13.5-16.5            | 2                   | 30                       | 150                         | >2.1                        | 17.3-20.3                   | 85 / 87                           |
| ZWS10B-24 | 24                 | 21.6-26.4            | 0.5                 | 12                       | 150                         | >0.53                       | 27.6-32.4                   | 84 / 85                           |
| ZWS15B-24 | 24                 | 21.6-26.4            | 0.7                 | 16.8                     | 150                         | >0.74                       | 27.6-32.4                   | 82 / 85                           |
| ZWS30B-24 | 24                 | 21.6-26.4            | 1.3                 | 31.2                     | 150                         | >1.37                       | 27.6-32.4                   | 86 / 88                           |

| <b>ZWS</b> | <b>30</b>                    | <b>-B</b> | <b>-</b> | <b>3</b>                                   | <b>/</b> |  |        |             |       |            |    |                   |    |           |      |                          |
|------------|------------------------------|-----------|----------|--|----------|--|--------|-------------|-------|------------|----|-------------------|----|-----------|------|--------------------------|
|            | Nominal power:<br>10, 15, 30 |           |          | Output voltage:<br>3 (3.3V), 5, 12, 15, 24 |          |  |        |             |       |            |    |                   |    |           |      |                          |
|            |                              |           |          |  |          | <table border="1"> <thead> <tr> <th>Suffix</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Blank</td> <td>Open frame</td> </tr> <tr> <td>/A</td> <td>L-bracket &amp; cover</td> </tr> <tr> <td>/L</td> <td>L-bracket</td> </tr> <tr> <td>/CO2</td> <td>Double sided PCB coating</td> </tr> </tbody> </table> | Suffix | Description | Blank | Open frame | /A | L-bracket & cover | /L | L-bracket | /CO2 | Double sided PCB coating |
| Suffix     | Description                  |           |          |  |          |  |        |             |       |            |    |                   |    |           |      |                          |
| Blank      | Open frame                   |           |          |  |          |  |        |             |       |            |    |                   |    |           |      |                          |
| /A         | L-bracket & cover            |           |          |  |          |  |        |             |       |            |    |                   |    |           |      |                          |
| /L         | L-bracket                    |           |          |  |          |  |        |             |       |            |    |                   |    |           |      |                          |
| /CO2       | Double sided PCB coating     |           |          |  |          |  |        |             |       |            |    |                   |    |           |      |                          |

Option combinations are available, please contact your local sales office

| Specifications                                 |     |   |   |                                       |
|--|-----|---|---|---------------------------------------|
| Model  |     | ZWS10B  | ZWS15B                                  | ZWS30B                                |
| <b>Input</b>                                   |     |   |   |                                       |
| Input Voltage Range (Operating) <sup>(1)</sup> | Vac | 85 - 265  |   |                                       |
| Nominal Input Voltage Range                    | Vac | 100 - 240 (Note: Safety certified for 90-264Vac only)                   |   |                                       |
| Input Frequency                                | Hz  | 47 - 63   |   |                                       |
| DC Input Voltage Range                         | Vdc | 120 - 370 (Note: Safety certified for AC input only)                    |   |                                       |
| Input Current (100/200Vac)                     | A   | 3.3V: 0.18 / 0.11<br>5-24V: 0.25 / 0.13                                 | 3.3V: 0.24 / 0.15<br>5-48V: 0.34 / 0.17 | 3.3V: 0.5 / 0.3<br>5-48V: 0.65 / 0.35 |
| Inrush Current at 200Vac (typ) (Cold Start)    | A   | 30  |   |                                       |
| Leakage Current (230Vac 60Hz)                  | mA  | <0.3  |   |                                       |
| No Load Power Consumption                      | W   | <0.5  |   |                                       |
| Hold Up Time (typ) at 100Vac, 100% load        | ms  | 20  |   |                                       |
| Efficiency                                     | -   | See Model Selector Table  |   |                                       |
| Conducted & Radiated EMI                       | -   | EN55011 / EN55032-B, FCC-B, VCCI-B                                      |   |                                       |
| Immunity                                       | -   | IEC61000-6-2, EN61000-4-2, -3, -4, -5, -6, -8, -11 (See immunity table) |   |                                       |
| Insulation Class                               | -   | Class I   |   |                                       |
| Safety Certifications and Markings             | -   | IEC/UL/CSA/EN62368-1, 60950-1, EN50178(OV II), CE Mark and UKCA Mark    |   |                                       |

| Immunity                        |              |  |          |  |
|---------------------------------|--------------|--|----------|--|
| Test                            | Standard     | Test Level   | Criteria | Notes  |
| ESD                             | EN61000-4-2  | Air ± 8kV and contact ± 4kV                                  | A        | See IEC61000 immunity test report on website |
| Radiated Susceptibility         | EN61000-4-3  | 80M -1GHz: 10V/m<br>1.4 - 2.0GHz: 3V/m<br>2.0 - 2.7GHz: 1V/m | A        |  |
| Electrical Fast Transient Burst | EN61000-4-4  | ± 2kV  | A        |  |
| Surge                           | EN61000-4-5  | Normal ± 2kV<br>Common ± 4kV                                 | A        |  |
| Conducted Susceptibility        | EN61000-4-6  | 10Vrms   | A        |  |
| Magnetic Fields                 | EN61000-4-8  | 30A/m  | A        |  |
| Voltage Dips                    | EN61000-4-11 | 30% 500ms  | B        |  |
|                                 |              | 60% 200ms  | B        |  |
|                                 |              | 100% 20ms  | B        |  |
|                                 |              | 100% 5000ms  | B        |  |

| Specifications            |      |  |  |  |
|---------------------------|------|--|--|--|
| Model                     |      | ZWS10B   | ZWS15B   | ZWS30B   |
| <b>Output</b>             |      |  |  |  |
| Output Voltage Adjustment | -    | See Model Selector Table                           |  |  |
| Switching Frequency       | kHz  | 100  |  |  |
| Line Regulation           | mV   | 3.3-5V: 20, 12V: 48, 15V: 60, 24V: 96              |  |  |
| Load Regulation           | mV   | 3.3-5V: 40, 12V: 96, 15V: 120, 24V: 150            |  |  |
| External Load Capacitance | µF   | 3.3/5V: 10,000, 12V: 2,000,<br>15V:1,400, 24V: 300 | 3.3/5V: 10,000, 12V: 2,500,<br>15V:1,000, 24V: 500 | 3.3/5V: 10,000, 12V: 2,700,<br>15V:1,500, 24V: 600 |
| Ripple & Noise            | -    | See Model Selector Table                           |  |  |
| Temperature Coefficient   | %/°C | 0.02   |  |  |
| Minimum Load              | -    | No minimum load required                           |  |  |
| Overcurrent Protection    | -    | See Model Selector Table                           |  |  |
| Overvoltage Protection    | V    | See Model Selector Table                           |  |  |
| Remote Sense              | -    | -  |  |  |
| Remote On/Off             | -    | -  |  |  |
| Parallel Operation        | -    | Not possible                                       |  |  |

| Specifications  |        |  |   |   |
|---|--------|--|---|---|
| Model   |        | ZWS10B   | ZWS15B  | ZWS30B  |
| <b>Environmental</b>  |        |  |   |   |
| Operating Temperature <sup>(2)</sup><br>(Convection Cooling, Horizontal Mounting) | °C     | -10 to +70, derate from 100% to 20%<br>load from 50 to 70                    | -10 to +70, derate from 100% to 40%<br>load from 50 to 70 | -10 to +70, derate from 100% to 20%<br>load from 50 to 70 |
| Operating Temperature <sup>(2)</sup><br>(Forced Air Cooling, 0.7m/s)              | °C     | -10 to +70, derate linearly from 100% to 70% load from 60 to 70              |   |   |
| Storage Temperature   | °C     | -30 to +75   |   |   |
| Humidity (non condensing)   | %RH    | 30 - 90 operating, 10 - 95 storage   |   |   |
| Cooling   | -      | Convection. (Forced air will reduce derating at high ambient temperatures)   |   |   |
| Altitude  | m      | 3,000  |   |   |
| Withstand Voltage (For 1 minute)  | Vac    | Input to Ground 2,000, Input to Output 3,000, Output to Ground 500           |   |   |
| Isolation Resistance  | MΩ     | >100 at 25°C, 70%RH & 500VDC   |   |   |
| Vibration (Non operating)   | -      | 10-55Hz (Sweep for 1min.)<br>19.6m/s <sup>2</sup> Constant X,Y,Z 1 hour each |   |   |
| Shock (Non operating)   | -      | Less than 196m/s <sup>2</sup>  |   |   |
| <b>Other</b>  |        |  |   |   |
| Weight (Typ) (Open frame models)  | g      | 45   | 55  | 105   |
| Size (LxWxH) (Open frame models)  | mm     | 73.5 x 50 x 22   | 87.5 x 50 x 22  | 105 x 50 x 26   |
| Size (LxWxH) (Open frame models)  | Inches | 2.89 x 1.97 x 0.87   | 3.44 x 1.97 x 0.87  | 4.13 x 1.97 x 1.02  |
| Connectors  | -      | JST  |   |   |
| MTBF - JEITA RCR-9102B <sup>(3)</sup>   | Hours  | 433,084  | 399,466   | 336,105   |
| Warranty  | Years  | 5  |   |   |

**Notes:**

See website for detailed specifications, test methods and installation manual

(1) Derate linearly to 90% load from 90 to 85Vac input

(2) See Instruction manual for further details and mounting orientations

(3) Component count method, ground fixed. Note the JEITA RCR-9102B calculation method produces figures significantly lower than Telcordia

**Outline Drawing ZWS10B (Open Frame)**

4mm max(Surface Mount Device)

PCB t=1.6mm

18±1

50±1

40±0.5

5

(4)

5

63.5±0.5

SEE NOTE D

SEE NOTE B,C

NAME PLATE

COMPONENT SIDE

INPUT

1

3

5

OUTPUT

1

2

CN51(CN2)

VR51

(68.5)

(6)

(27)

(18)

SEE NOTE A

73.5±1

SEE NOTE E

CONNECTORS USED:

| PART DESCRIPTION                  | PART NAME | MANUFACT. | QTY |
|-----------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1)       | B3P5-VH   | JST       | 1   |
| PIN HEADER(OUTPUT SIDE CN51(CN2)) | B2P-VH    | JST       | 1   |

MATCHING HOUSINGS AND PINS(NOT INCLUDED WITH THE PRODUCT):

|                            |              |     |   |
|----------------------------|--------------|-----|---|
| SOCKET HOUSING (CN1)       | VHR-5N       | JST | 1 |
| SOCKET HOUSING (CN51(CN2)) | VHR-2N       | JST | 1 |
| TERMINAL PINS              | SVH-21T-P1.1 | JST | 5 |

HAND CRIMPING TOOL : YC-160R CN1,CN51(CN2) MANUFACTURER : JST

NOTES:

A: THE 2- $\phi$ 3.5 HOLE ARE CUSTOMER CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.

B: MODEL NAME, MAXIMUM OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND SAFETY MARKING(FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.

D:  $\downarrow$  IS PROTECTIVE BONDING TERMINAL.

E: TO KEEP THE DISTANCE MORE THAN 4mm BETWEEN PC-BOARD EDGE AND CUSTOMER'S CHASSIS.

**Outline Drawing ZWS15B (Open Frame)**

4mm max(Surface Mount Device)

PCB t=1.6mm

18±1

50±1

40±0.5

5

(4)

5

77.5±0.5

SEE NOTE D

SEE NOTE B,C

NAME PLATE

COMPONENT SIDE

INPUT

1

3

5

OUTPUT

1

2

CN51

VR51

(82.5)

(4.5)

(32)

(17)

SEE NOTE A

87.5±1

SEE NOTE E

CONNECTORS USED:

| PART DESCRIPTION             | PART NAME | MANUFACT. | QTY |
|------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1)  | B3P5-VH   | JST       | 1   |
| PIN HEADER(OUTPUT SIDE CN51) | B2P-VH    | JST       | 1   |

MATCHING HOUSINGS AND PINS(NOT INCLUDED WITH THE PRODUCT):

|                       |              |     |   |
|-----------------------|--------------|-----|---|
| SOCKET HOUSING (CN1)  | VHR-5N       | JST | 1 |
| SOCKET HOUSING (CN51) | VHR-2N       | JST | 1 |
| TERMINAL PINS         | SVH-21T-P1.1 | JST | 5 |

HAND CRIMPING TOOL : YC-160R CN1,CN51 MANUFACTURER : JST

NOTES:

A: THE 2- $\phi$ 3.5 HOLE ARE CUSTOMER CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.

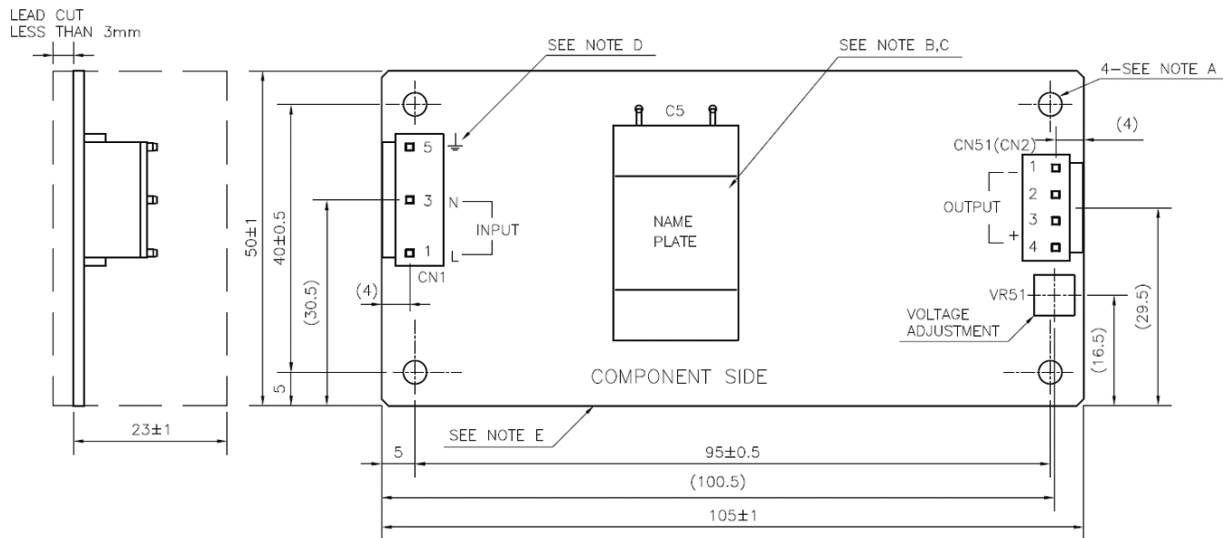
B: MODEL NAME, MAXIMUM OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND SAFETY MARKING(FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.

D:  $\downarrow$  IS PROTECTIVE BONDING TERMINAL.

E: TO KEEP THE DISTANCE MORE THAN 4mm BETWEEN PC-BOARD EDGE AND CUSTOMER'S CHASSIS.

## Outline Drawing ZWS30B (Open Frame)



**CONNECTORS USED:**

| PART DESCRIPTION                  | PART NAME | MANUFACT. | QTY |
|-----------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1)       | B3P5-VH   | JST       | 1   |
| PIN HEADER(OUTPUT SIDE CN51(CN2)) | B4P-VH    | JST       | 1   |

\*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

**MATCHING HOUSINGS AND PINS(NOT INCLUDED WITH THE PRODUCT):**

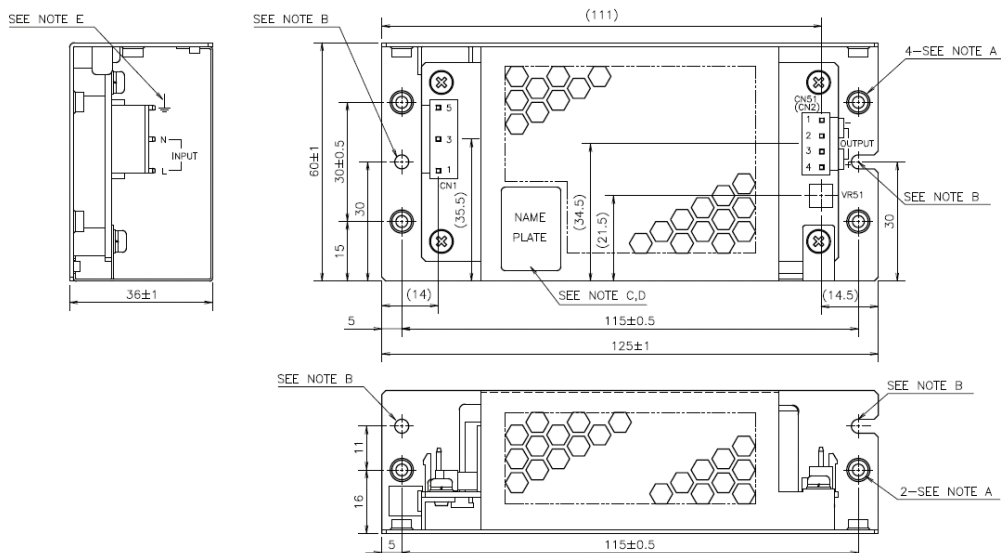
|                            |              |     |   |
|----------------------------|--------------|-----|---|
| SOCKET HOUSING (CN1)       | VHR-5N       | JST | 1 |
| SOCKET HOUSING (CN51(CN2)) | VHR-4N       | JST | 1 |
| TERMINAL PINS              | SVH-21T-P1.1 | JST | 7 |

HAND CRIMPING TOOL : YC-160R CN1,CN51(CN2) MANUFACTURER : JST

**NOTES**

- A: THE 4- $\phi$ 3.5 HOLE ARE CUSTOMER CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, MAXIMUM OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND SAFETY MARKING(FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D:  $\downarrow$  IS PROTECTIVE BONDING TERMINAL.
- E: TO KEEP THE DISTANCE MORE THAN 4mm BETWEEN PC-BOARD EDGE AND CUSTOMER'S CHASSIS.

## Outline Drawing ZWS30B/A



**CONNECTORS USED:**

| PART DESCRIPTION                   | PART NAME | MANUFACT. | QTY |
|------------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1)        | B3P5-VH   | J.S.T.    | 1   |
| PIN HEADER (OUTPUT SIDE CN51(CN2)) | B4P-VH    | J.S.T.    | 1   |

\*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

**MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):**

|                            |              |        |   |
|----------------------------|--------------|--------|---|
| SOCKET HOUSING (CN1)       | VHR-5N       | J.S.T. | 1 |
| SOCKET HOUSING (CN51(CN2)) | VHR-4N       | J.S.T. | 1 |
| TERMINAL PINS              | SVH-21T-P1.1 | J.S.T. | 7 |
| HAND CRIMPING TOOL         | YC-160R      | J.S.T. | - |

**NOTES**

- A: M3 EMBOSSED TAPPED & COUNTERSINK HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING.
- B:  $\phi$ 3.5 HOLES (2) AND R1.75 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING.
- C: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND SAFETY MARKING(FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- D: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- E:  $\downarrow$  IS PROTECTIVE BONDING TERMINAL.



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