

# KHWS-100W SERIES

90W-100W WIDE INPUT RANGE

# DANUBE

## FEATURES

- 90W-100W DIL PACKAGE
- INDUSTRY STANDARD PACKAGE
- 18V-36V,36V-75V WIDE INPUT RANGE
- 100% BURN IN
- UL 94V-0 PACKAGE MATERIAL
- CUSTOM SOLUTIONS AVAILABLE
- 3 YEARS WARRANTY



## OUTPUT SPECIFICATIONS

|                                       |                  |
|---------------------------------------|------------------|
| Voltage Setpoint Accuracy             | +/-2% max.       |
| Temperature Coefficient               | +/-0.03%/°C      |
| Ripple & Noise(20MHz BW) <sup>1</sup> | 150mVp-p max.    |
| Line Regulation <sup>2</sup>          | +/-0.5% max.     |
| Load Regulation <sup>3</sup>          | +/-0.5% max.     |
| Minimum load                          | 10% of Full Load |
| Short Circuit Protection              | Continuous       |
| Short Circuit Restart                 | Automatic        |
| External Trim Adj. Range              | +/-10%           |
| Over Load Protection                  | 150% typ.        |
| Transient Response <sup>5</sup>       | 500uS max.       |

## ENVIRONMENTAL SPECIFICATIONS

|                       |                     |
|-----------------------|---------------------|
| Operating Temperature | -40 °C to +25 °C    |
| Case Temperature      | +110 °C max.        |
| Storage Temperature   | -55 °C to +110 °C   |
| Humidity              | 95% max.            |
| Cooling               | Free-Air Convection |

## INPUT SPECIFICATIONS

|                             |                  |
|-----------------------------|------------------|
| Input Voltage Range         | 2:1              |
| Input Filter                | Pi Network       |
| Protection                  | Fuse Recommended |
| OVLO(Over Voltage Lockout)  | See Page 4       |
| UVLO(Under Voltage Lockout) | See Page 4       |
| OVLO & UVLO Circuit Restart | Automatic        |
| Remote ON/OFF Control       | Table 1          |

## GENERAL SPECIFICATIONS

|                                |                           |
|--------------------------------|---------------------------|
| Efficiency                     | 92% typ.                  |
| Isolation Voltage <sup>4</sup> | 1500 VDC min.             |
| Isolation Resistance           | 10 <sup>9</sup> ohms min. |
| Isolation Capacitance          | 2500pF max.               |
| Switching Frequency            | 250KHz typ.               |
| Weight                         | 67g typ.                  |
| Case Material                  | Six-Side Shielded Case    |
| Case Size                      | 50.8mm*50.8mm*11mm        |
| Potting Material               | Epoxy(UL94-V0)            |
| Conducted Emissions            | EN55022 Class A           |
| Radiated Emissions             | EN55022 Class A           |

ALL SPECIFICATIONS TYPICAL AT NOMINAL LINE, FULL LOAD , AND 25 °C UNLESS OTHERWISE NOTED.

<sup>1</sup> Measured with 1uF ceramic capacitor connect to the output pins.

<sup>2</sup> High Line to Low Line.

<sup>3</sup> Load Regulation is for output load current change from 10% to 100%.

<sup>4</sup> For 10 seconds.

<sup>5</sup> 50% Step Load Change.

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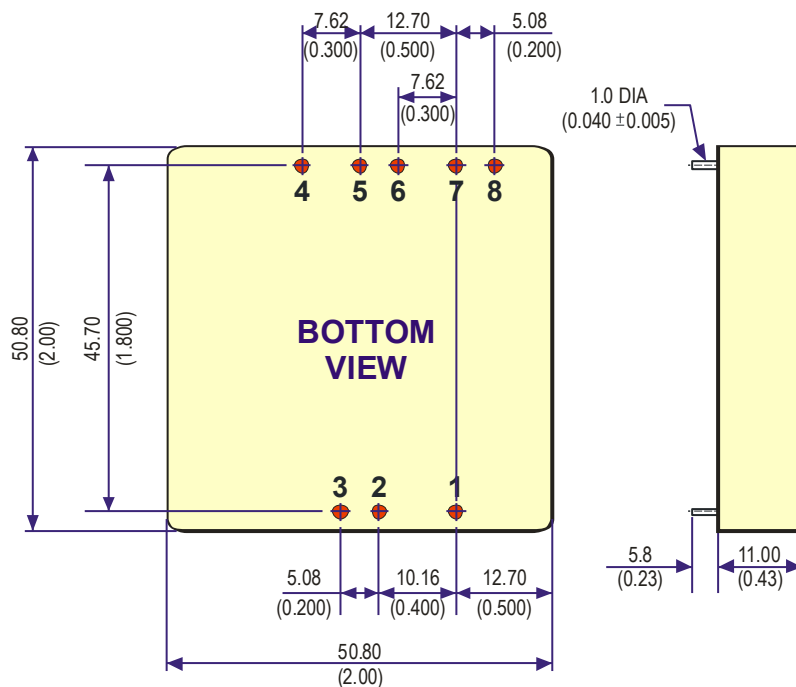
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2013/10/22

## ● SELECTION GUIDE 2:1 100W OUTPUT

| MODEL NUMBER   | INPUT VOLTAGE (VDC) | OUTPUT VOLTAGE (VDC) | OUTPUT CURRENT (mA) | INPUT <sup>6</sup> CURRENT(mA) |         | EFF (%) <sup>7</sup> | CAPACITOR LOAD (Max) |
|----------------|---------------------|----------------------|---------------------|--------------------------------|---------|----------------------|----------------------|
|                |                     |                      |                     | FULL LOAD                      | NO LOAD |                      |                      |
| KHWS-2405-90W  | 18-36               | 5                    | 18000               | 4076                           | 100     | 92                   | 1000uF               |
| KHWS-2412-100W | 18-36               | 12                   | 8333                | 4529                           | 100     | 92                   | 220uF                |
| KHWS-2415-100W | 18-36               | 15                   | 6666                | 4529                           | 100     | 92                   | 100uF                |
| KHWS-4805-90W  | 36-75               | 5                    | 18000               | 2038                           | 50      | 92                   | 1000uF               |
| KHWS-4812-100W | 36-75               | 12                   | 8333                | 2264                           | 50      | 92                   | 220uF                |
| KHWS-4815-100W | 36-75               | 15                   | 6666                | 2264                           | 50      | 92                   | 100uF                |

## ● MECHANICAL DIMENSIONS



All dimensions in mm(inches).

| PIN | SINGLE        |
|-----|---------------|
| 1   | Remote On/Off |
| 2   | -Vin          |
| 3   | +Vin          |
| 4   | -Sense        |
| 5   | +Sense        |
| 6   | +Vout         |
| 7   | -Vout         |
| 8   | Trim          |

### NOTE:

Pin Size is Tolerance 1.0Φ ±0.10mm

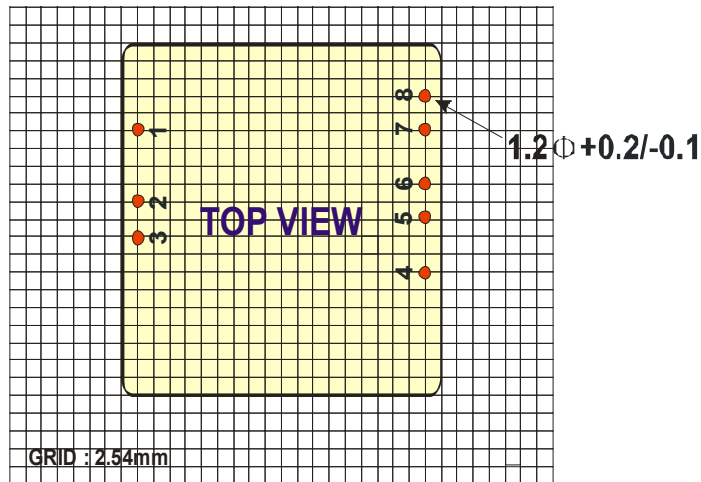
All Dimensions In mm(Inches)

Tolerance .X or .XX= ±0.5mm

<sup>6</sup> NOMINAL INPUT VOLTAGE.

<sup>7</sup> NOMINAL INPUT VOLTAGE, FULL LOAD.

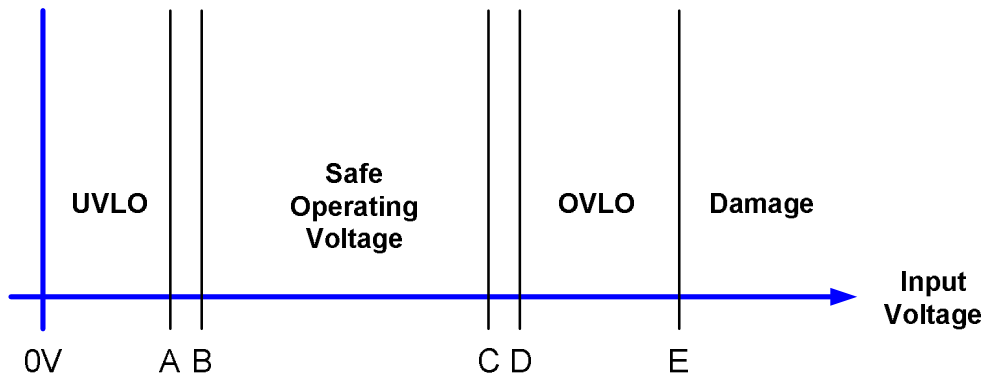
● **RECOMMENDED FOOTPRINT DETAILS**



● **Table1 (Remote On/Off Control)**

| Remote On/Off Control |                            |                                 |               |
|-----------------------|----------------------------|---------------------------------|---------------|
| Control Input         | PIN1                       | Control Common                  | PIN2          |
| Control Voltage       |                            | Converter Shutdown Idle Current | 10mA          |
| ON                    | >+2.5VDC or Open Circuit   | Logic Compatibility             | CMOS or Open  |
| OFF                   | <+0.9VDC or Jumper to PIN2 |                                 | Collector TTL |

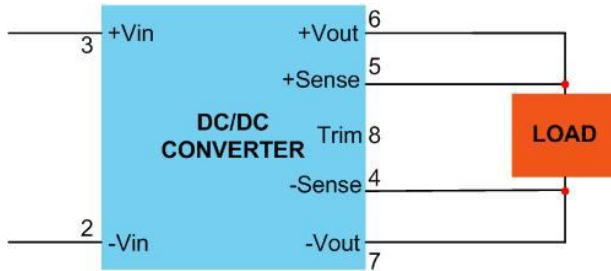
● **INPUT OPERATING VOLTAGE**



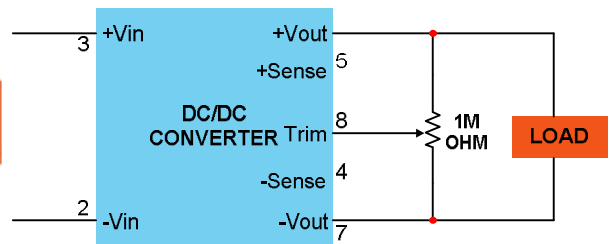
|                    | A        | B   | C   | D        | E    |
|--------------------|----------|-----|-----|----------|------|
| <b>KHWS-24****</b> | 16V typ. | 18V | 36V | 40V typ. | 50V  |
| <b>KHWS-48****</b> | 34V typ. | 36V | 75V | 80V typ. | 100V |

## TYPICAL APPLICATIONS

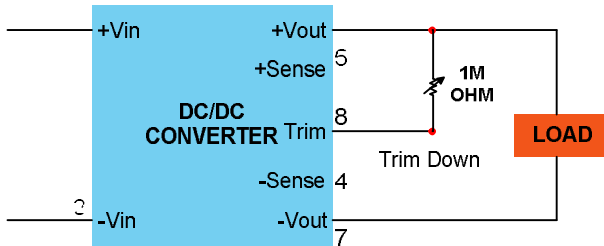
### FIXED VOLTAGE OUTPUT



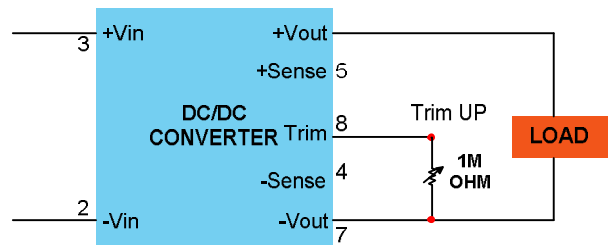
### TRIM CONNECTIONS USING A TRIMPOT



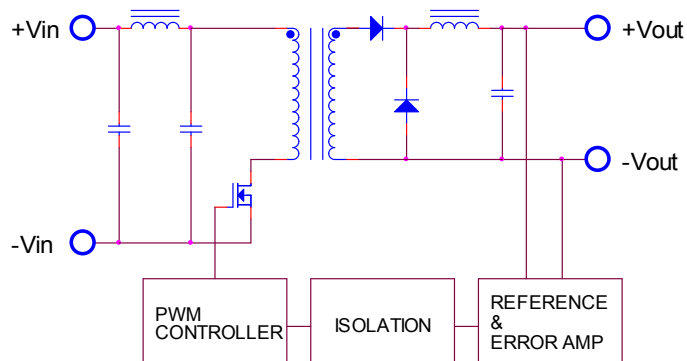
### FIXED-VALUE TRIM DOWN RESISTOR



### FIXED-VALUE TRIM UP RESISTOR



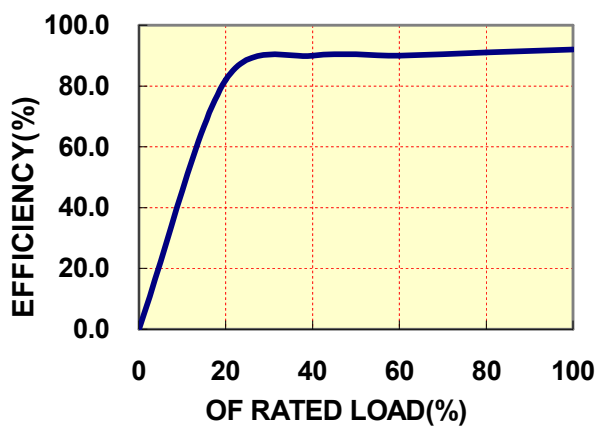
## SIMPLIFIED SCHEMATIC



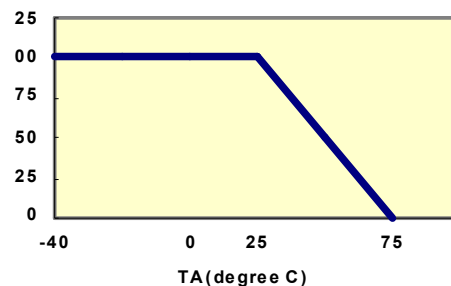
## TYPICAL PERFORMANCE CURVES

Specifications typical at  $T_a=25^\circ\text{C}$ , nominal input voltage, rated output current unless otherwise specified.

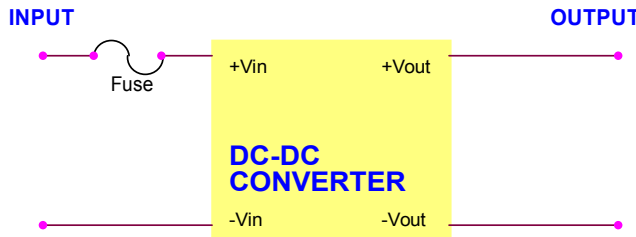
### OUTPUT LOAD VS EFFICIENCY



### TEMPERATURE DERATING



## ● INPUT FUSE SELECTION GUIDE

| 18-36V<br>INPUT VOLTAGE(VDC)   | 36-75V<br>INPUT VOLTAGE(VDC) |
|--|------------------------------|
| 10000mA Slow-Blow Type   | 5000mA Slow-Blow Type        |
|  <p>The diagram shows a yellow rectangular block labeled 'DC-DC CONVERTER'. On the left side, there are two terminals: '+Vin' at the top and '-Vin' at the bottom. On the right side, there are two terminals: '+Vout' at the top and '-Vout' at the bottom. A blue line labeled 'INPUT' enters from the left, passing through a 'Fuse' symbol before connecting to the '+Vin' terminal. A blue line labeled 'OUTPUT' exits from the right, connecting to the '+Vout' terminal. There are also pink lines connecting the '-Vin' and '-Vout' terminals to the ground plane.</p> |                              |

**Note:** Certain applications may require the installation of external fuse in front of the input.

### **KHWS-100W SERIES APPLICATION NOTES:**

#### **EXTERNAL CAPACITANCE REQUIREMENTS:**

External output capacitance is not required for operation, however it is recommended that 10uF MLCC and 0.1uF ceramic capacitance be selected for reduced system noise.

Additional output capacitance may be added for increased filtering, but should not exceed 1000uF.

#### **Negative Outputs:**

A negative output voltage may be obtained by connecting the +OUT to circuit ground and connecting -OUT as the negative output.

#### **Remote ON/OFF:**

The remote ON/OFF pin may be left floating if this function is not use. It is recommended to drive this pin with an open collector arrangement or a relay contact. When the ON/OFF pin is pulled low with respect to the -Vin , the converter is placed in a low power drain state.

#### **Output TRIM:**

The TRIM pin may be used to adjust the output +/-10% from the nominal setting .this function allows adjustment for voltage drops in the system wiring. If the TRIM function is not required the pin may be left floating.

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### **FOR MORE INFORMATION CALL:**

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