

SHINDENGEN ELECTRIC MFG. CO., LTD.

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HRD05003

Specifications

1. Maximum ratings

| | | |
|---|------------------|--------------------------------------|
| Input Voltage | 0 to 50 VDC | |
| Remote On/Off Terminals Impressed Voltage | 0 to $V_{in}-2V$ | |
| Operating Ambient Temperature | -10°C to 80°C | Refer to the Derating Chart (Fig. 2) |
| Storage Temperature | -30°C to 100°C | |
| Operating Surface Temperature | Max. 100°C | |

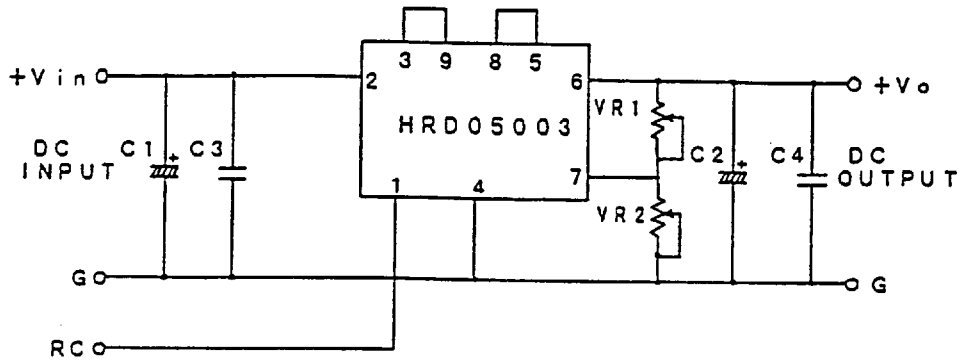
2. Characteristics (at 25°C)

| Input | | |
|---|--|---|
| Voltage Range | 8 to 40VDC | |
| Efficiency | 80%(Avr.) 73%(Min.) | $V_{in} = 24V, I_o = 3A$ |
| Operating Frequency | 240 to 360 kHz | $V_{in} = 24V, I_o = 3A$ |
| Output | | |
| Regulation | 4.8V to 5.3V | Note 1 |
| Deviation from Output Voltage Setting Point (at 5V) | 4.82 to 5.18V | $V_{in} = 24V, I_o = 3A$ |
| Output Voltage Fluctuation | Line | 38mV $V_{in} = 8V \text{ to } 40V$ |
| | Load | 95mV $I_o = 0A \text{ to } 3A$ |
| | Temp. drift coefficient | $\pm 0.33 \text{ mV}/^\circ\text{C}$ |
| Output Current | 0A to 3A | |
| Ripple and Noise | 25(Avr.) 60(Max.)mVp-p | $V_{in} = 24V, I_o = 3A$ (Note 2) |
| Variable Output Voltage Range | 3.3V to 24V | Using recommended external parts (Note 3) |
| Remote On/Off Control Voltage | | |
| Output Power On | Max. 0.9V | |
| Output Power Off | Min. 1.0V | |
| Protection | | |
| Over Load Protection | More than 3A | Auto reset |
| Humidity | | |
| Operating | 20% to 90% | Non-condensing |
| Storage | 10% to 95% | Non-condensing |
| Others | | |
| Weight | 25g | |
| Vibration | Amplitude 1.5mm, 10 to 55Hz/min. 2 hours each for X, Y, Z directions | |
| Shock | 100G, 3 times each for X, Y, Z directions | |
| Soldering Conditions | 260°C, 10 sec. | |
| Dimensions | Refer to the outline drawing | |

Note 1: The value includes the deviation from output voltage setting point, line and load.
 Note 2: Value at standard connection with recommended external parts (Refer to Fig.1)
 Note 3: Refer to "Output voltage variation"



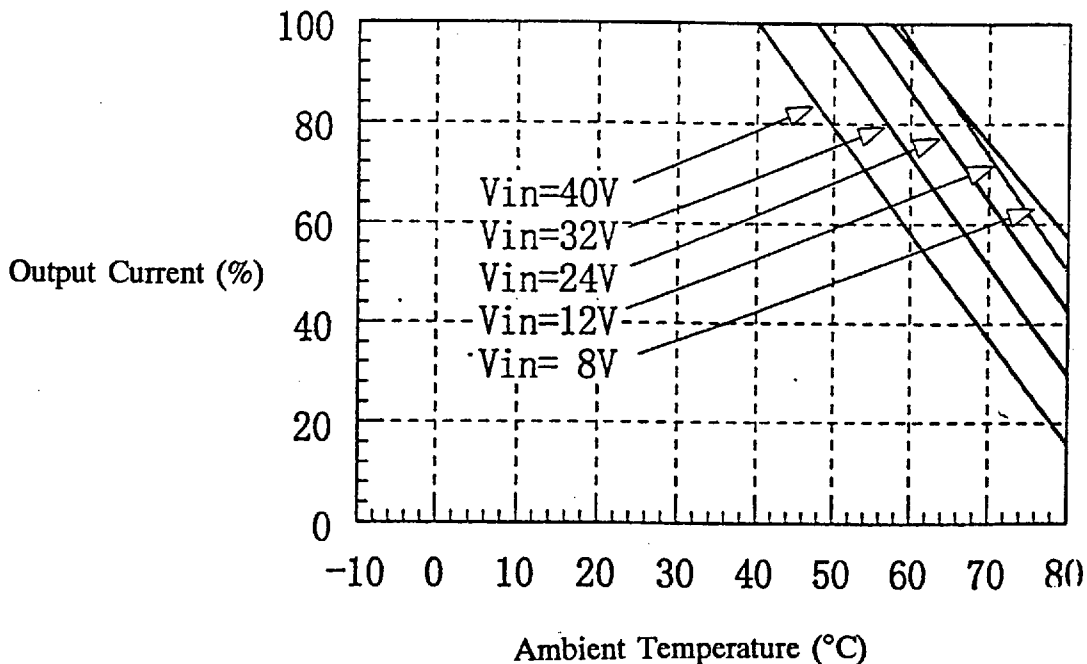
Connection



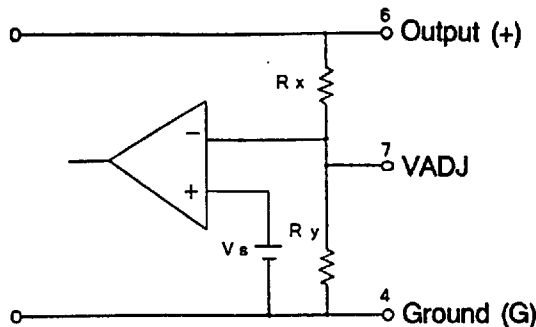
VR1: Vout Down C1: 50V or more, 390 μ F or more, ESR 47m Ω or less at 100kHz
 VR2: Vout Up C2: 50V or more, 220 μ F \times 2 or more, ESR 85m Ω /2 or less at 100kHz

- Note 1: Connect the RC terminal to the ground line when not using remote on/off.
- Note 2: The VADJ terminal should be open when not changing the output voltage.
- Note 3: Connect a film or ceramic capacitor at the C3(50V 0.1 – 1 μ F) and C4(50V 0.01 – 0.1 μ F) when the noise is high.
- Note 4: Connect the input and output capacitors as near the terminals as possible.

Derating (Vo = 5V)



Output voltage variation



| | |
|----|----------------------------|
| Vs | 2.5V |
| Rx | 6.2kΩ |
| Ry | 6.2kΩ |
| Vo | Required output voltage(V) |

The value of the resistor is calculated by following formula.

- a. Vout down: Connect a resistor VR1 between the terminal 6 and the terminal 7. Do not connect VR2.

$$VR1 = \frac{Rx * Ry(Vo - Vs)}{Rx * Vs - Ry(Vo - Vs)}$$

- b. Vout up: Connect a resistor VR2 between the terminal 4 and the terminal 7. Do not connect VR1.

$$VR2 = \frac{Rx * Ry * Vs}{Ry(Vo - Vs) - Rx * Vs}$$

Note 1: Output voltage deviation

When the resistor's stability is +/- 1% : approximately +/- 4.5%
When the resistor's stability is +/- 5% : approximately +/- 8%

Note 2: The temperature at surface of the case should be less than 100°C when operating.

Note 3: A certain voltage difference between input and output is required. The minimum required voltage difference can be calculated by following formula.

$$Vin = \frac{Vo + K}{D}$$

| | |
|-----|------------------------------|
| Vin | Minimum DC input voltage (V) |
| Vo | Required output voltage(V) |
| D | 0.85(Max. duty) |
| K | 0.8(factor) |

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Others

Do not use a IC connector to the ground terminal No. 4. When the connector opens, the DC/DC converter will be broken.