

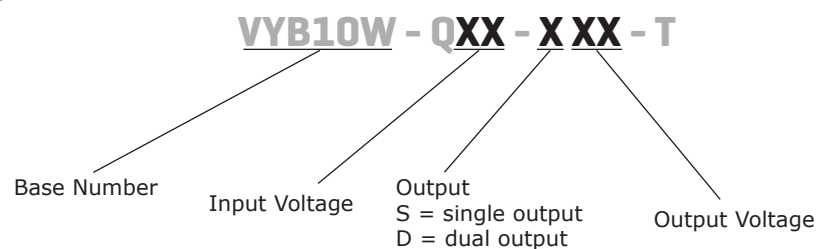
**SERIES: VYB10W-T | DESCRIPTION: DC-DC CONVERTER**
**FEATURES**

- chassis mount with screw terminal connectors
- up to 10 W output
- compact size
- 4:1 input range (9 ~ 36 V, 18 ~ 72 V)
- single and dual outputs
- 1,500 V isolation
- short circuit protection
- wide temperature operation (-40 ~ 85°C)
- efficiency up to 83%



| MODEL                        | input<br>voltage<br>range<br>(Vdc) | output<br>voltage<br>(Vdc) | output<br>current |             | output<br>power<br>max<br>(W) | ripple <sup>1</sup><br>max<br>(mVp-p) | noise <sup>1</sup><br>max<br>(mVp-p) | efficiency<br>typ<br>(%) |
|------------------------------|------------------------------------|----------------------------|-------------------|-------------|-------------------------------|---------------------------------------|--------------------------------------|--------------------------|
|                              |                                    |                            | min<br>(mA)       | max<br>(mA) |                               |                                       |                                      |                          |
| VYB10W-Q24-S3-T <sup>2</sup> | 9 ~ 36                             | 3.3                        | 240               | 2,400       | 8                             | 50                                    | 150                                  | 76                       |
| VYB10W-Q24-S5-T              | 9 ~ 36                             | 5                          | 200               | 2,000       | 10                            | 50                                    | 150                                  | 79                       |
| VYB10W-Q24-S12-T             | 9 ~ 36                             | 12                         | 83                | 833         | 10                            | 50                                    | 150                                  | 81                       |
| VYB10W-Q24-S15-T             | 9 ~ 36                             | 15                         | 67                | 666         | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q24-D5-T              | 9 ~ 36                             | ±5                         | ±100              | ±1,000      | 10                            | 50                                    | 150                                  | 80                       |
| VYB10W-Q24-D12-T             | 9 ~ 36                             | ±12                        | ±42               | ±416        | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q24-D15-T             | 9 ~ 36                             | ±15                        | ±33               | ±333        | 10                            | 50                                    | 150                                  | 83                       |
| VYB10W-Q48-S3-T <sup>2</sup> | 18 ~ 72                            | 3.3                        | 240               | 2,400       | 8                             | 50                                    | 150                                  | 77                       |
| VYB10W-Q48-S5-T <sup>2</sup> | 18 ~ 72                            | 5                          | 200               | 2,000       | 10                            | 50                                    | 150                                  | 78                       |
| VYB10W-Q48-S12-T             | 18 ~ 72                            | 12                         | 83                | 833         | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q48-S15-T             | 18 ~ 72                            | 15                         | 67                | 666         | 10                            | 50                                    | 150                                  | 83                       |
| VYB10W-Q48-D5-T <sup>2</sup> | 18 ~ 72                            | ±5                         | ±100              | ±1,000      | 10                            | 50                                    | 150                                  | 78                       |
| VYB10W-Q48-D12-T             | 18 ~ 72                            | ±12                        | ±42               | ±416        | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q48-D15-T             | 18 ~ 72                            | ±15                        | ±33               | ±333        | 10                            | 50                                    | 150                                  | 83                       |

Notes: 1. Ripple and noise are measured at 20 MHz BW with 10μF tantalum capacitor and 1μF ceramic capacitor across output  
2. PWM mode, others PFM mode

**PART NUMBER KEY**


## INPUT

| parameter               | conditions/description | min | typ | max | units |
|-------------------------|------------------------|-----|-----|-----|-------|
| operating input voltage |                        | 9   | 24  | 36  | Vdc   |
|                         |                        | 18  | 48  | 72  | Vdc   |

## OUTPUT

| parameter               | conditions/description                 | min | typ  | max             | units |
|-------------------------|----------------------------------------|-----|------|-----------------|-------|
| line regulation         | measured from low line to high line    |     | ±0.2 | ±0.5            | %     |
| load regulation         | measured from 10% to full load         |     | ±0.5 | ±1 <sup>1</sup> | %     |
| voltage accuracy        | positive, refer to recommended circuit |     | ±1   | ±3              | %     |
|                         | negative, refer to recommended circuit |     | ±3   | ±5              | %     |
| switching frequency     | 100% load, input voltage range         |     | 300  |                 | kHz   |
| temperature coefficient |                                        |     |      | ±0.03           | %/°C  |

Notes: 1. Dual output models unbalanced load: ±5%

## PROTECTIONS

| parameter                | conditions/description         | min | typ | max | units |
|--------------------------|--------------------------------|-----|-----|-----|-------|
| short circuit protection | continuous, automatic recovery |     |     |     |       |

## SAFETY AND COMPLIANCE

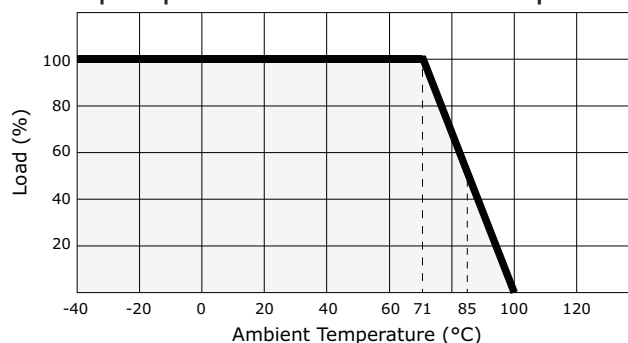
| parameter             | conditions/description           | min       | typ   | max | units |
|-----------------------|----------------------------------|-----------|-------|-----|-------|
| isolation voltage     | tested for 1 minute at 1 mA max. | 1,500     |       |     | Vdc   |
| isolation resistance  | at 500 Vdc                       | 1,000     |       |     | MΩ    |
| isolation capacitance | input to output, 100 kHz / 1 V   |           | 1,000 |     | pF    |
| RoHS compliant        | yes                              |           |       |     |       |
| MTBF                  |                                  | 1,000,000 |       |     | hours |

## ENVIRONMENTAL

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curve     | -40 |     | 100 | °C    |
| storage temperature   |                        | -55 |     | 125 | °C    |
| storage humidity      | non-condensing         |     |     | 95  | %     |
| temperature rise      | 100% load              |     | 40  |     | °C    |

## DERATING CURVES

output power vs. ambient temperature



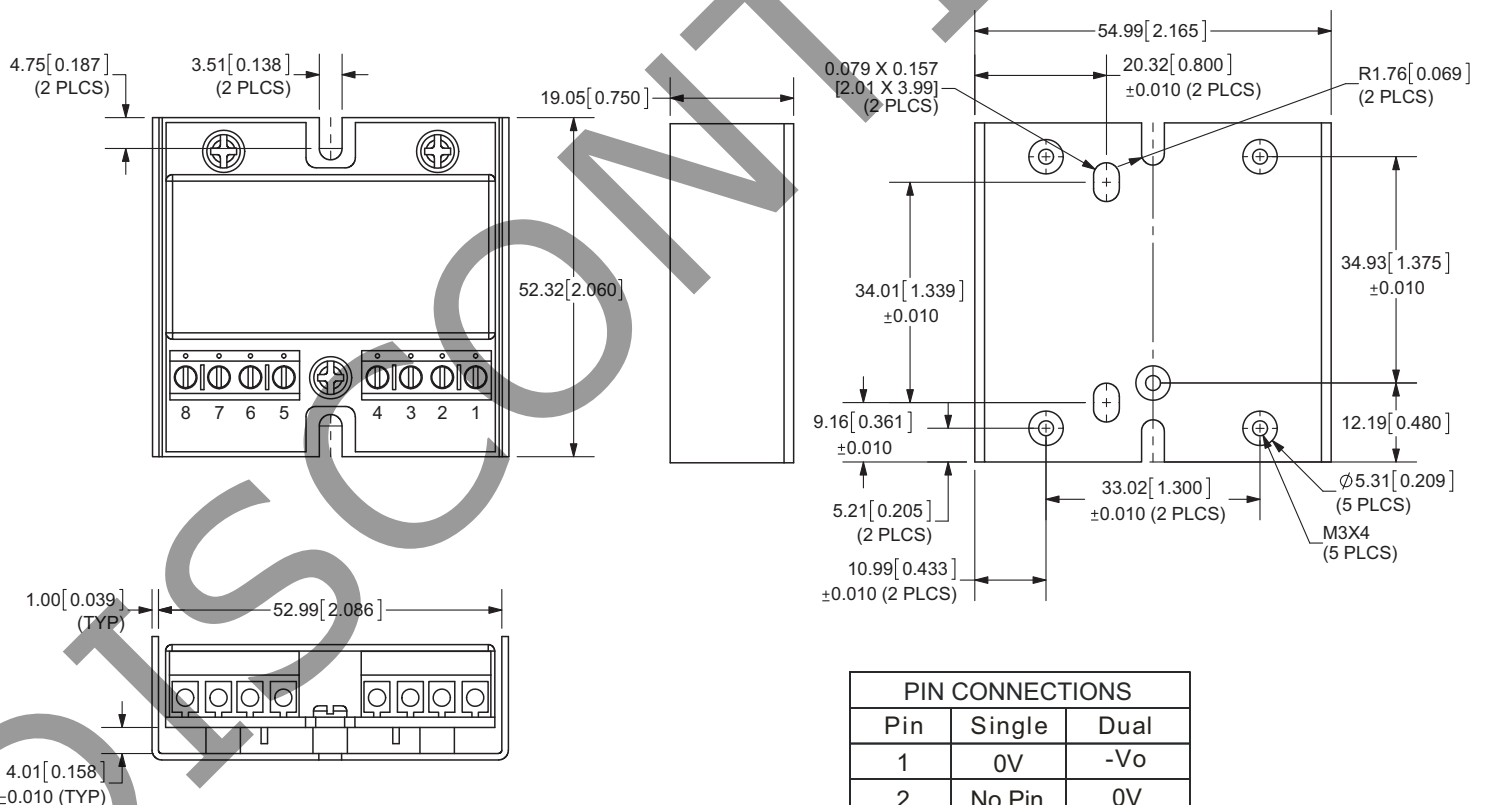
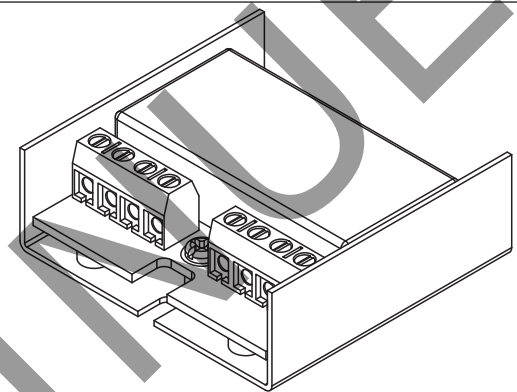
| parameter     | conditions/description                       | min | typ | max | units |
|---------------|----------------------------------------------|-----|-----|-----|-------|
| dimensions    | 55.0 x 52.3 x 19.1 (2.17 x 2.06 x 0.75 inch) |     |     |     | mm    |
| case material | aluminum                                     |     |     |     |       |
| weight        |                                              |     | 50  |     | g     |

## MECHANICAL DRAWING

units: mm [inch]

tolerance:  $\pm 0.5$  [ $\pm 0.020$ ] unless otherwise specified

screw terminals: Degson Electronics terminal block  
part number DG301-5.0-04P-12 or equivalent (4 pin,  
M2.5 screw) 5.0 mm spacing DIN rail mounting kit  
available (part # STK-DIN)



| PIN CONNECTIONS |        |        |
|-----------------|--------|--------|
| Pin             | Single | Dual   |
| 1               | 0V     | -Vo    |
| 2               | No Pin | 0V     |
| 3               | +Vo    | +Vo    |
| 4               | No Pin | No Pin |
| 5               | Case   | Case   |
| 6               | No Pin | No Pin |
| 7               | Vin    | Vin    |
| 8               | GND    | GND    |

## APPLICATION NOTES

### 1. Requirement on Output Load

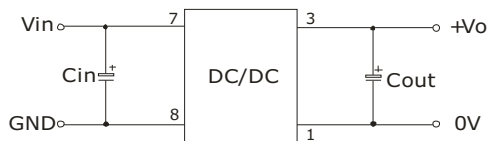
In order to ensure the product operates efficiently and reliably, make sure the specified range of input voltage is not exceeded and the minimum output load is not less than 10% load. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading.

### 2. Recommended Circuit

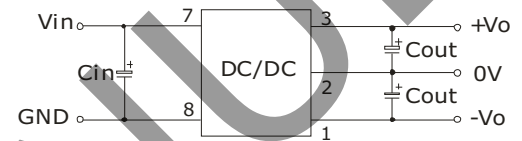
The VYB10W series has been tested according to the following recommended testing circuit. This series should be tested under load. (see Figure 1)

Single Output

Figure 1



Dual Output



If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. If the capacitance is too big, a startup problem might arise. The maximum allowable capacitance to ensure safe and reliable operation is listed in Table 1.

General:

Cin: 10 ~ 47  $\mu$ F  
Cout: 10  $\mu$ F / 100 mA

Table 1

| Single Vout (Vdc) | Cout ( $\mu$ F) | Dual Vout (Vdc) | Cout ( $\mu$ F) |
|-------------------|-----------------|-----------------|-----------------|
| 3.3               | 2,200           | --              | --              |
| 5                 | 1,000           | $\pm 5$         | 680             |
| 12                | 470             | $\pm 12$        | 330             |
| 15                | 330             | $\pm 15$        | 220             |

### 3. Input Current

When using an unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current  $I_p$ .

General:  $I_p \leq 1.6 \cdot I_{in-max}$

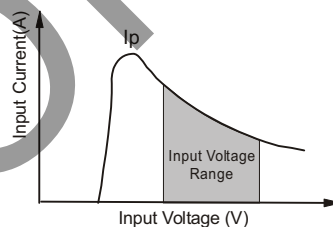


Figure 2

- Notes:
1. Operation under minimum load will not damage the converter; however, they may not meet all specifications listed.
  2. All specifications measured at:  $T_a = 25^\circ\text{C}$ , humidity < 75%, nominal input voltage and rated output load, unless otherwise specified.
  3. No parallel connection

## REVISION HISTORY

| rev. | description                                 | date       |
|------|---------------------------------------------|------------|
| 1.0  | initial release                             | 08/08/2011 |
| 1.01 | V-Infinity branding removed                 | 08/29/2012 |
| 1.02 | removed on/off control option, updated spec | 04/05/2013 |

The revision history provided is for informational purposes only and is believed to be accurate.

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