

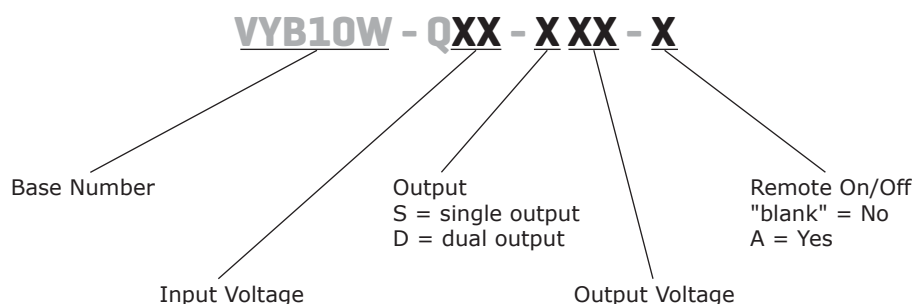
**SERIES: VYB10W | DESCRIPTION: DC-DC CONVERTER**
**FEATURES**

- 8 ~ 10 W output
- industry standard pinout
- 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 <sup>2</sup> | 9 ~ 36                             | 3.3                        | 240               | 2,400       | 8                             | 50                                    | 150                                  | 76                       |
| VYB10W-Q24-S5              | 9 ~ 36                             | 5                          | 200               | 2,000       | 10                            | 50                                    | 150                                  | 79                       |
| VYB10W-Q24-S12             | 9 ~ 36                             | 12                         | 83                | 833         | 10                            | 50                                    | 150                                  | 81                       |
| VYB10W-Q24-S15             | 9 ~ 36                             | 15                         | 67                | 666         | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q24-D5              | 9 ~ 36                             | ±5                         | ±100              | ±1,000      | 10                            | 50                                    | 150                                  | 80                       |
| VYB10W-Q24-D12             | 9 ~ 36                             | ±12                        | ±42               | ±416        | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q24-D15             | 9 ~ 36                             | ±15                        | ±33               | ±333        | 10                            | 50                                    | 150                                  | 83                       |
| VYB10W-Q48-S3 <sup>2</sup> | 18 ~ 72                            | 3.3                        | 240               | 2,400       | 8                             | 50                                    | 150                                  | 77                       |
| VYB10W-Q48-S5 <sup>2</sup> | 18 ~ 72                            | 5                          | 200               | 2,000       | 10                            | 50                                    | 150                                  | 78                       |
| VYB10W-Q48-S12             | 18 ~ 72                            | 12                         | 83                | 833         | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q48-S15             | 18 ~ 72                            | 15                         | 67                | 666         | 10                            | 50                                    | 150                                  | 83                       |
| VYB10W-Q48-D5 <sup>2</sup> | 18 ~ 72                            | ±5                         | ±100              | ±1,000      | 10                            | 50                                    | 150                                  | 78                       |
| VYB10W-Q48-D12             | 18 ~ 72                            | ±12                        | ±42               | ±416        | 10                            | 50                                    | 150                                  | 82                       |
| VYB10W-Q48-D15             | 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<br>18 | 24<br>48 | 36<br>72 | Vdc<br>Vdc |
| start up time           | nominal input, full load |         | 180      |          | ms         |
| filter                  | PI type                  |         |          |          |            |

## 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              | %     |
| transient recovery time  | 25% load step change (PWM type)                  |     | 200  | 500             | ms    |
|                          | 25% load step change (PFM type)                  |     | 10   | 20              | ms    |
| transient peak deviation |                                                  |     | ±3   | ±5              | %     |
| cross regulation         | main output 55% supplemental output from 10-100% |     |      | ±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 |     |     |     |       |

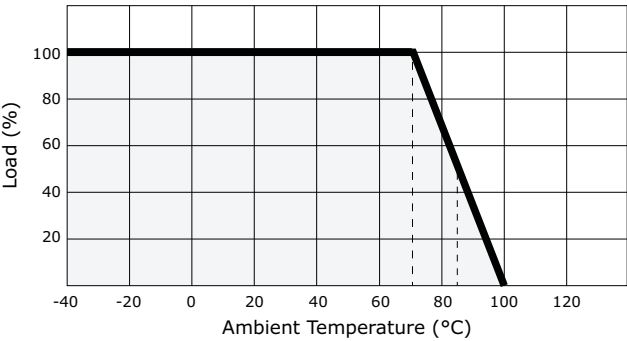
## SAFETY AND COMPLIANCE

| 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 |
|----------------------------|-------------------------------------|-----|-----|-----|-------|
| case operating temperature |                                     | -40 |     | 85  | °C    |
| maximum case temperature   | during operation                    |     |     | 105 | °C    |
| storage temperature        |                                     | -55 |     | 105 | °C    |
| storage humidity           | non-condensing                      |     |     | 95  | %     |
| temperature rise           | 100% load                           |     | 40  |     | °C    |
| lead temperature           | 1.5 mm from the case for 10 seconds |     |     | 300 | °C    |

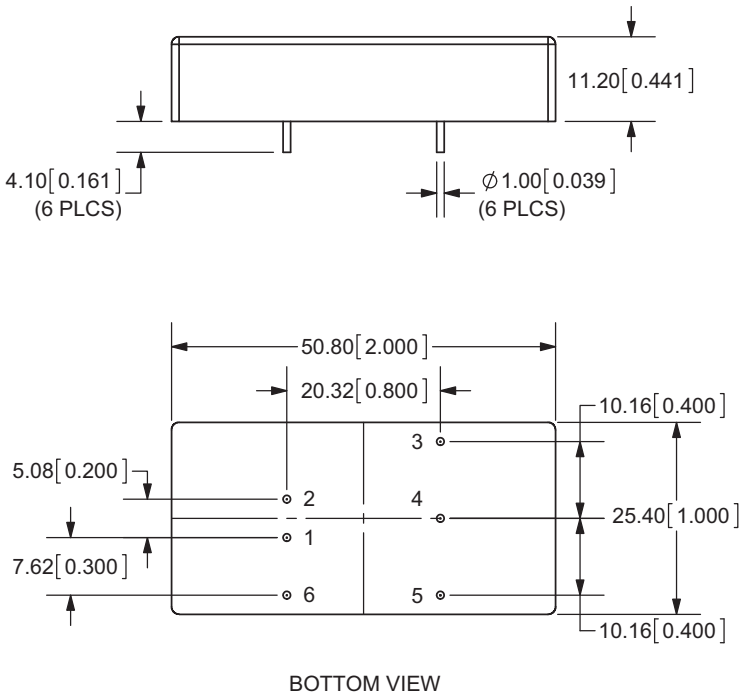
DERATING CURVES



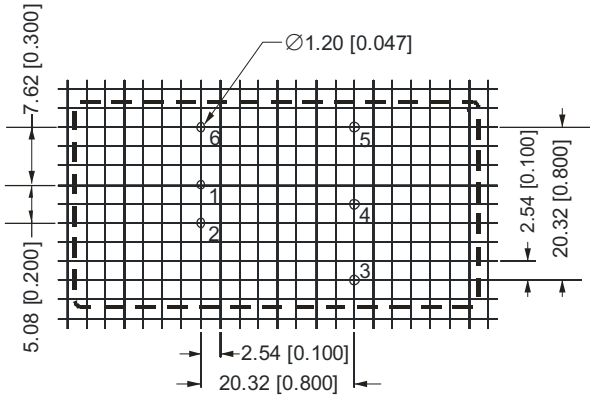
MECHANICAL

| parameter     | conditions/description                          | min | typ  | max | units |
|---------------|-------------------------------------------------|-----|------|-----|-------|
| dimensions    | 2.00 x 1.00 x 0.44 inch (50.8 x 25.4 x 11.2 mm) |     |      |     |       |
| case material | aluminum                                        |     |      |     |       |
| weight        |                                                 |     | 23.5 |     | g     |

MECHANICAL DRAWING



RECOMMENDED FOOTPRINT (TOP VIEW)



Pin section tolerances:  $\pm 0.10\text{mm} [\pm 0.004\text{inch}]$   
General tolerances:  $\pm 0.25\text{mm} [\pm 0.010\text{inch}]$

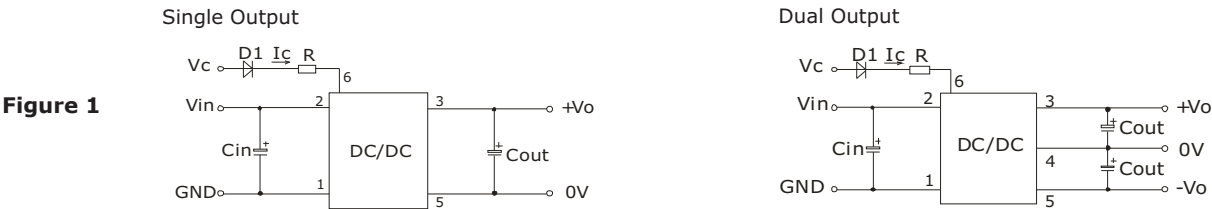
| PIN CONNECTIONS |         |         |
|-----------------|---------|---------|
| Pin             | Single  | Dual    |
| 1               | GND     | GND     |
| 2               | Vin     | Vin     |
| 3               | +Vo     | +Vo     |
| 4               | No Pin  | 0V      |
| 5               | 0V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

\*Pin 6 added for optional Remote on/off

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)



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

| 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. **Remote On/Off**  
When open or high impedance,the converter will be on; When this pin is 'high'; the converter will shutdown; It should be noted that the input current (Ic) should between 5 ~ 10 mA, exceeding the maximum 20 mA will cause permanent damage to the converter. The value of R Can be derived as follows :

$$R = \frac{V_c - V_D - 1.0}{I_c}$$

4. **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 Ip.

General: Ip  $\leq$ 1.6\*Iin-max

5. **No parallel connection or plug and play**

## REVISION HISTORY

| rev. | description                 | date       |
|------|-----------------------------|------------|
| 1.0  | initial release             | 08/08/2011 |
| 1.01 | V-Infinity branding removed | 08/29/2012 |

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

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