

**SERIES:** VHK50W | **DESCRIPTION:** DC-DC CONVERTER

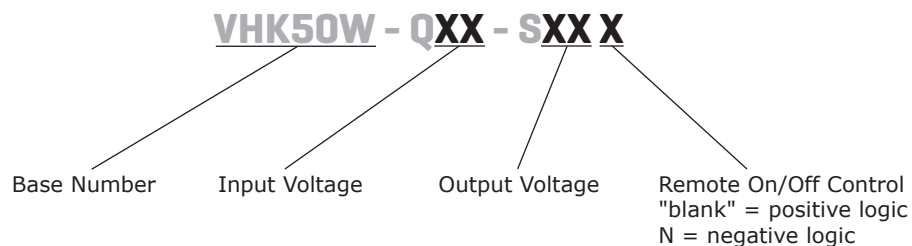
**FEATURES**

- up to 50 W isolated output
- rugged metal enclosure with integrated heat sink
- 4:1 input range (9~36 V, 18~75 V)
- single output from 3.3~48 V
- 1,500 V isolation
- over current, over temperature, over voltage, and short circuit protections
- remote on/off
- efficiency up to 83%



| MODEL           | input voltage | output voltage | output current | output power | ripple and noise <sup>1</sup> | efficiency |
|-----------------|---------------|----------------|----------------|--------------|-------------------------------|------------|
|                 | range (Vdc)   | (Vdc)          | max (A)        | max (W)      | max (mVp-p)                   | typ (%)    |
| VHK50W-Q24-S3R3 | 9 ~ 36        | 3.3            | 10             | 33           | 100                           | 75         |
| VHK50W-Q24-S5   | 9 ~ 36        | 5              | 10             | 50           | 100                           | 79         |
| VHK50W-Q24-S12  | 9 ~ 36        | 12             | 4.16           | 50           | 150                           | 82         |
| VHK50W-Q24-S15  | 9 ~ 36        | 15             | 3.33           | 50           | 150                           | 82         |
| VHK50W-Q24-S24  | 9 ~ 36        | 24             | 2.08           | 50           | 240                           | 82         |
| VHK50W-Q24-S28  | 9 ~ 36        | 28             | 1.78           | 50           | 280                           | 82         |
| VHK50W-Q24-S48  | 9 ~ 36        | 48             | 1.04           | 50           | 480                           | 82         |
| VHK50W-Q48-S3R3 | 18 ~ 75       | 3.3            | 10             | 33           | 100                           | 76         |
| VHK50W-Q48-S5   | 18 ~ 75       | 5              | 10             | 50           | 100                           | 80         |
| VHK50W-Q48-S12  | 18 ~ 75       | 12             | 4.6            | 50           | 150                           | 83         |
| VHK50W-Q48-S15  | 18 ~ 75       | 15             | 3.33           | 50           | 150                           | 83         |
| VHK50W-Q48-S24  | 18 ~ 75       | 24             | 2.08           | 50           | 240                           | 83         |
| VHK50W-Q48-S28  | 18 ~ 75       | 28             | 1.78           | 50           | 280                           | 83         |
| VHK50W-Q48-S48  | 18 ~ 75       | 48             | 1.04           | 50           | 480                           | 83         |

Notes: 1. ripple and noise are measured at 20 MHz BW with 10µF tantalum capacitor and 1µF ceramic capacitor across output

**PART NUMBER KEY**


## INPUT

| parameter                  | conditions/description  |            | min | typ | max | units |
|----------------------------|---|------------|-----|-----|-----|-------|
| operating input voltage    |   |            | 9   | 24  | 36  | Vdc   |
|                            |   |            | 18  | 48  | 75  | Vdc   |
| under voltage lockout      | power up  | 24 V input |     | 8.8 |     | Vdc   |
|                            |   | 48 V input |     | 17  |     | Vdc   |
|                            | power down  | 24 V input |     | 8   |     | Vdc   |
|                            |   | 48 V input |     | 16  |     | Vdc   |
| remote on/off <sup>1</sup> |   |            |     |     |     |       |
| filter                     | PI type   |            |     |     |     |       |
| Notes:                     | 1. logic compatibility, open collector ref to -input<br>Module ON, >2.4 Vdc or open circuit<br>Module OFF, <0.8 Vdc |            |     |     |     |       |

## OUTPUT

| parameter                  | conditions/description  |  | min | typ   | max  | units |
|----------------------------|---|--|-----|-------|------|-------|
| line regulation            | measured from high line to low line   |  |     |       | ±0.2 | %     |
| load regulation            | measured from full load to zero load  |  |     |       | ±1   | %     |
| voltage accuracy           |   |  |     |       | ±1   | %     |
| transient response         | 25% step load change  |  |     |       | 500  | µs    |
| adjustability <sup>2</sup> |   |  |     | ±10   |      | %     |
| switching frequency        | 100% load, input voltage range  |  |     | 300   |      | kHz   |
| temperature coefficient    |   |  |     | ±0.03 |      | %/°C  |
| Notes:                     | 2. trim-up: connect a resistor between the trim pin and +Sense<br>trim-down: connect a resistor between the trim pin and -Sense |  |     |       |      |       |

## PROTECTIONS

| parameter                | conditions/description   | min | typ | max | units |
|--------------------------|--------------------------|-----|-----|-----|-------|
| over voltage protection  | %Vo                      | 115 |     | 140 | %     |
| over current protection  | % nominal output current | 110 |     | 160 | %     |
| short circuit protection | continuous               |     |     |     |       |

## SAFETY AND COMPLIANCE

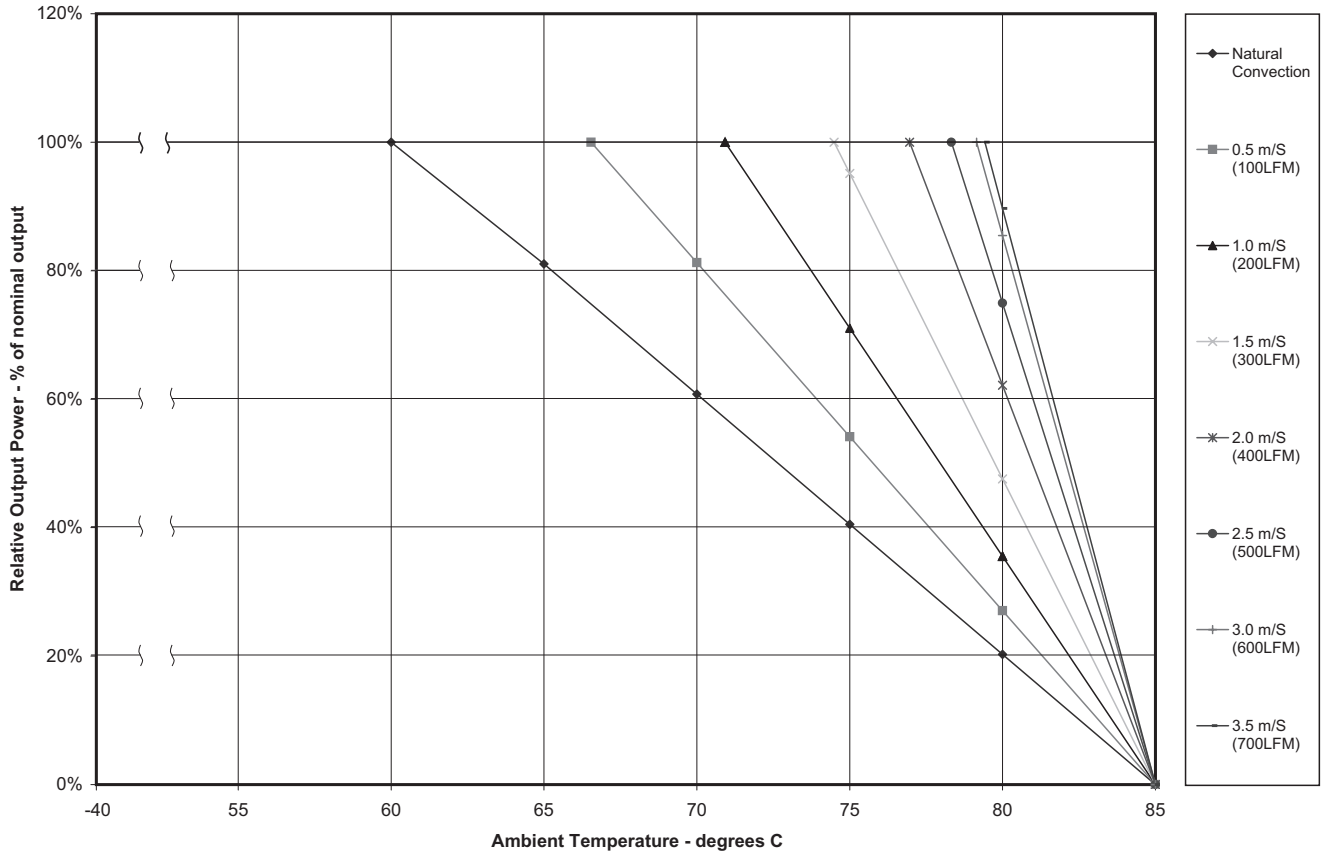
| parameter            | conditions/description | min   | typ | max | units |
|----------------------|------------------------|-------|-----|-----|-------|
| isolation voltage    | input to output        | 1,500 |     |     | Vdc   |
|                      | input to case          | 1,500 |     |     | Vdc   |
|                      | output to case         | 1,500 |     |     | Vdc   |
| isolation resistance |                        | 100   |     |     | MΩ    |
| RoHS compliant       | yes                    |       |     |     |       |

## ENVIRONMENTAL

| parameter                  | conditions/description | min | typ | max | units |
|----------------------------|------------------------|-----|-----|-----|-------|
| case operating temperature | see derating curve     | -40 |     | 85  | °C    |
| storage temperature        |                        | -55 |     | 105 | °C    |

# DERATING CURVES

## VHK50W POWER DERATING CURVES AT NOMINAL INPUT

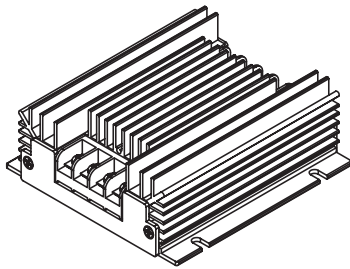


## MECHANICAL

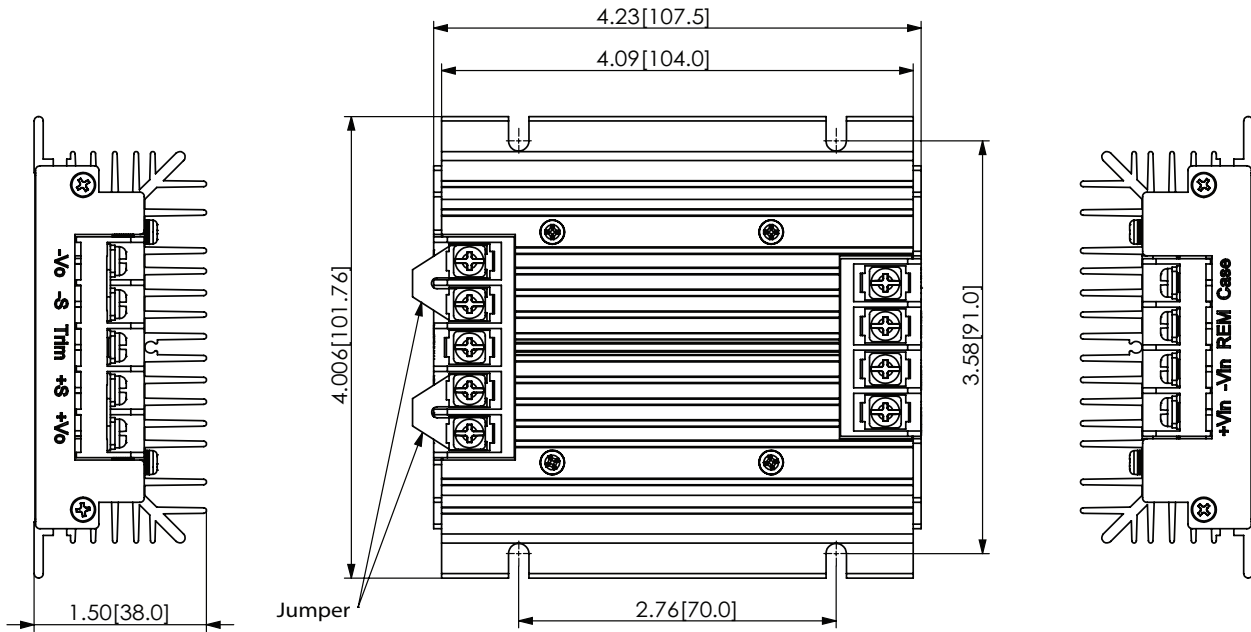
| parameter     | conditions/description                           | min | typ | max | units |
|---------------|--|-----|-----|-----|-------|
| dimensions    | 101.76 x 107.5 x 38.0 (3.34 x 4.232 x 1.50 inch) |     |     |     | mm    |
| case material | steel and aluminum extrusion                     |     |     |     |       |
| weight        |  |     | 502 |     | g     |

## MECHANICAL DRAWING

units: mm[inch]  
 tolerance:  
 X.X = ±0.3mm  
 X.XX = ±0.25mm



| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | FUNCTION |
| 1               | -Vo      |
| 2               | -S       |
| 3               | trim     |
| 4               | +S       |
| 5               | +Vo      |
| 6               | case     |
| 7               | on/off   |
| 8               | -Vin     |
| 9               | +Vin     |



\*DIN rail mounting kit available (part# VHK-DIN)

Note: All specifications measured at 25°C, nominal input voltage, and full load unless otherwise noted.

## REVISION HISTORY

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| rev. | description                   | date       |
|------|-------------------------------|------------|
| 1.0  | initial release               | 10/11/2006 |
| 1.01 | new template applied          | 12/21/2011 |
| 1.02 | misc. updates and corrections | 03/13/2012 |
| 1.03 | updated mechanical drawing    | 03/27/2012 |
| 1.04 | V-Infinity branding removed   | 06/27/2012 |
| 1.05 | updated spec                  | 03/14/2013 |

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



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