

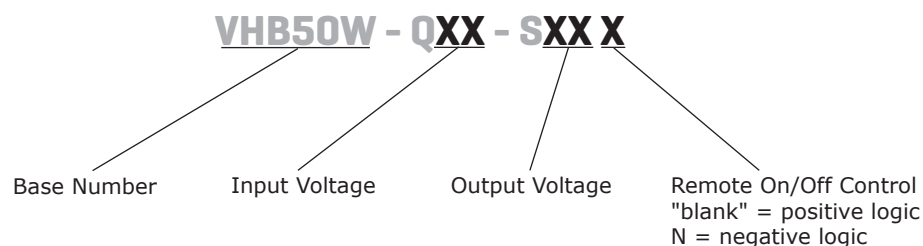
**SERIES: VHB50W | DESCRIPTION: DC-DC CONVERTER**
**FEATURES**

- up to 50 W isolated output
- industry standard half brick package
- 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 87%



| MODEL           | input<br>voltage<br>range<br>(Vdc) | output<br>voltage<br>(Vdc) | output<br>current<br>max<br>(A) | output<br>power<br>max<br>(W) | ripple<br>and noise <sup>1</sup><br>max<br>(mVp-p) | efficiency<br><br>typ<br>(%) |
|-----------------|------------------------------------|----------------------------|---------------------------------|-------------------------------|----------------------------------------------------|------------------------------|
| VHB50W-Q24-S3R3 | 9 ~ 36                             | 3.3                        | 10                              | 33                            | 100                                                | 77                           |
| VHB50W-Q24-S5   | 9 ~ 36                             | 5                          | 10                              | 50                            | 100                                                | 81                           |
| VHB50W-Q24-S12  | 9 ~ 36                             | 12                         | 4.16                            | 50                            | 150                                                | 83                           |
| VHB50W-Q24-S15  | 9 ~ 36                             | 15                         | 3.33                            | 50                            | 150                                                | 83                           |
| VHB50W-Q24-S24  | 9 ~ 36                             | 24                         | 2.08                            | 50                            | 240                                                | 83                           |
| VHB50W-Q24-S28  | 9 ~ 36                             | 28                         | 1.78                            | 50                            | 280                                                | 83                           |
| VHB50W-Q24-S48  | 9 ~ 36                             | 48                         | 1.04                            | 50                            | 480                                                | 83                           |
| VHB50W-Q48-S3R3 | 18 ~ 75                            | 3.3                        | 10                              | 33                            | 100                                                | 78                           |
| VHB50W-Q48-S5   | 18 ~ 75                            | 5                          | 10                              | 50                            | 100                                                | 82                           |
| VHB50W-Q48-S12  | 18 ~ 75                            | 12                         | 4.16                            | 50                            | 150                                                | 84                           |
| VHB50W-Q48-S15  | 18 ~ 75                            | 15                         | 3.33                            | 50                            | 150                                                | 84                           |
| VHB50W-Q48-S24  | 18 ~ 75                            | 24                         | 2.08                            | 50                            | 240                                                | 84                           |
| VHB50W-Q48-S28  | 18 ~ 75                            | 28                         | 1.78                            | 50                            | 280                                                | 84                           |
| VHB50W-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                   | 24 V input                                                                                                          |            | 9   | 24  | 36  | Vdc   |
|                                           | 48 V input                                                                                                          |            | 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   |
| positive logic remote on/off <sup>1</sup> |                                                                                                                     |            |     |     |     |       |
| filter                                    | PI type                                                                                                             |            |     |     |     |       |
| Notes:                                    | 1. logic compatibility, open collector ref to -input<br>Module ON, >3.5 Vdc or open circuit<br>Module OFF, <1.8 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                                                                                            |  |     |       | ±0.2 | %     |
| 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 | %     |
| short circuit protection    | continuous               |  |     |     |     |       |
| current limit               | % nominal output current |  | 110 |     | 160 | %     |
| thermal shutdown case temp. |                          |  |     | 100 |     | °C    |

## 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  |                        |  | 10    |       |     | MΩ    |
| isolation capacitance |                        |  |       | 1,000 |     | pF    |
| safety approvals      | UL 60950-1             |  |       |       |     |       |
| RoHS compliant        | yes                    |  |       |       |     |       |

## ENVIRONMENTAL

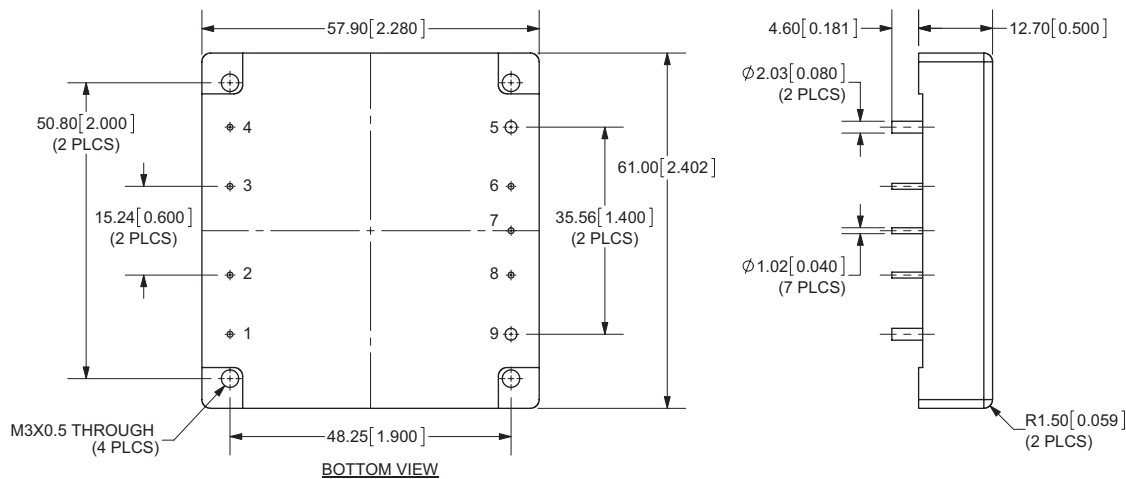
| parameter                  | conditions/description | min | typ | max | units |
|----------------------------|------------------------|-----|-----|-----|-------|
| case operating temperature |                        | -40 |     | 100 | °C    |
| storage temperature        |                        | -55 |     | 105 | °C    |
| humidity                   | non-condensing         |     |     | 95  | %     |

## MECHANICAL

| parameter     | conditions/description                      | min | typ | max | units |
|---------------|---------------------------------------------|-----|-----|-----|-------|
| dimensions    | 57.9 x 61.0 x 12.7 (2.28 x 2.40 x 0.5 inch) |     |     |     | mm    |
| case material | aluminum                                    |     |     |     |       |
| weight        |                                             |     | 94  |     | g     |

## MECHANICAL DRAWING

units: mm [inches]

tolerance:  $\pm 0.25\text{mm}$  [ $\pm 0.01$  inches]pin tolerance:  $\pm 0.5\text{mm}$  [ $\pm 0.02$  inches]

| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | FUNCTION |
| 1               | +Vin     |
| 2               | On/Off   |
| 3               | CASE     |
| 4               | -Vin     |
| 5               | -Vo      |
| 6               | -S       |
| 7               | TRIM     |
| 8               | +S       |
| 9               | +Vo      |

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

## REVISION HISTORY

| rev. | description                                      | date       |
|------|--------------------------------------------------|------------|
| 1.0  | initial release                                  | 09/07/2006 |
| 1.01 | new template applied                             | 08/05/2011 |
| 1.02 | add remote on/off control to the part number key | 11/23/2011 |
| 1.03 | features updated                                 | 12/20/2011 |
| 1.04 | updated trim note, updated pin references        | 04/20/2012 |
| 1.05 | updated spec                                     | 04/01/2013 |

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



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