

**SERIES:** VHB75W | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

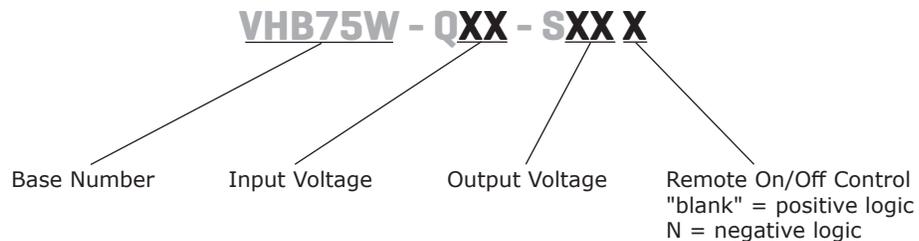
- up to 75 W isolated output
- industry standard half brick package
- 4:1 input range (9~36 V, 18~75 V)
- single output from 3.3~48 V
- 1,500 V isolation
- over current, over temperature, over voltage, and short circuit protections
- remote on/off
- efficiency up to 85%



MODEL	input voltage range	output voltage	output current max	output power max	ripple and noise <sup>1</sup> max	efficiency typ
	(Vdc)	(Vdc)	(A)	(W)	(mVp-p)	(%)
VHB75W-Q24-S3R3	9 ~ 36	3.3	15.0	50	100	79
VHB75W-Q24-S5	9 ~ 36	5	15.0	75	100	82
VHB75W-Q24-S12	9 ~ 36	12	6.25	75	150	83
VHB75W-Q24-S15	9 ~ 36	15	5.0	75	150	84
VHB75W-Q24-S24	9 ~ 36	24	3.12	75	240	84
VHB75W-Q24-S48	9 ~ 36	48	1.56	75	480	82
VHB75W-Q48-S3R3	18 ~ 75	3.3	15.0	50	100	80
VHB75W-Q48-S5	18 ~ 75	5	15.0	75	100	83
VHB75W-Q48-S12	18 ~ 75	12	6.25	75	150	84
VHB75W-Q48-S15	18 ~ 75	15	5.0	75	150	85
VHB75W-Q48-S24	18 ~ 75	24	3.12	75	240	85
VHB75W-Q48-S48	18 ~ 75	48	1.56	75	480	84

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	17.0		Vdc
	power down	24 V input	8.0		Vdc
		48 V input	16.0		Vdc
positive logic remote on/off <sup>1</sup>					
filter	pi type				
Notes:	1. logic compatibility, open collector ref to -input Module ON, >3.5 Vdc or open circuit 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 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		100			MΩ
safety approvals	certified to 60950-1: UL				
RoHS compliant	yes				

## ENVIRONMENTAL

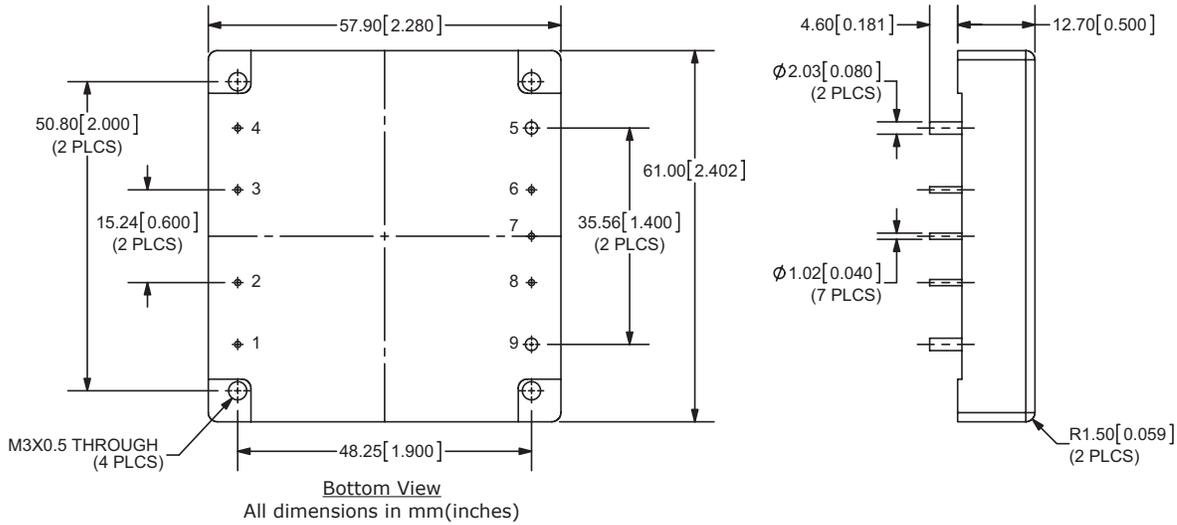
parameter	conditions/description	min	typ	max	units
case operating temperature		-40		100	°C
storage temperature		-55		105	°C
humidity	non-condensing			95	%

## 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:  $\pm 0.25$  [ $\pm 0.01$ ]



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.

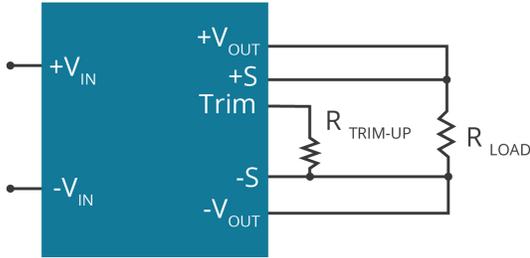
## APPLICATION NOTES

To adjust the output voltage, connect a trim resistor as follows:

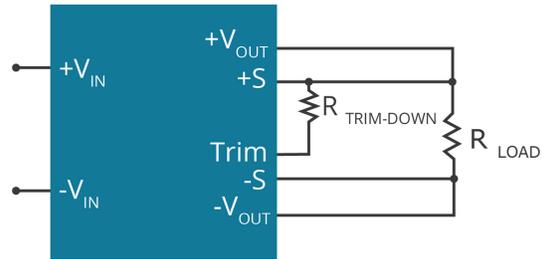
- For voltage increase, place the resistor between the Trim pin and -Vo.
- For voltage decrease, place the resistor between the Trim pin and +Vo.

The output voltage can be adjusted within a range of ±10%.

### Trim up



### Trim down



5V output model

$$R_{TRIM} = \left( \frac{R_{TOP} \cdot V_{REF}}{V_{OUT} - V_{OUT, NOM}} \right) - R_{BOTTOM} \quad (K \Omega)$$

All other output models

$$R_{TRIM} = \left( \frac{R_{TOP} \cdot (V_{REF} - V_F \cdot \left( \frac{R_{BOTTOM}}{R_{BOTTOM} + R_O} \right))}{V_{OUT} - V_{OUT, NOM}} \right) - \frac{R_{BOTTOM} \cdot R_O}{R_{BOTTOM} + R_O} \quad (K \Omega)$$

Formula for Trim up

$$R_{TRIM} = \frac{R_{TOP} \cdot (V_{OUT} - V_{REF})}{V_{OUT, NOM} - V_{OUT}} - R_{BOTTOM} \quad (K \Omega)$$

Formula for Trim down

V <sub>NOM</sub> (Vdc)	R <sub>TOP</sub> (kΩ)	R <sub>BOTTOM</sub> (kΩ)	R <sub>O</sub> (kΩ)	V <sub>REF</sub> (V)	V <sub>F</sub> (V)
3.3	3.0	12.0	18	1.24	0.46
5	2.32	8.2	0	2.5	0
12	9.1	51.0	18	2.5	0.46
15	12.0	82.0	18	2.5	0.46
24	20.0	100.0	20	2.5	0.46
28	23.7	150.0	16	2.5	0.46
48	36.0	270.0	14	2.5	0.46

Note: Value for R<sub>TOP</sub>, R<sub>BOTTOM</sub>, R<sub>O</sub>, and V<sub>REF</sub> refer to the table (fixed internal values).

R<sub>TRIM</sub>: Trim resistance

V<sub>NOM</sub>: Nominal output voltage

V<sub>OUT</sub>: Target output voltage

## REVISION HISTORY

rev.	description	date
1.0	initial release	10/01/2008
1.01	applied new spec template	09/28/2011
1.02	add remote on/off control to the part number key	11/23/2011
1.03	updated features	12/20/2011
1.04	misc. updates and corrections	02/14/2012
1.05	new template applied, updated trim note, updated pin references	06/07/2012
1.06	updated spec	04/01/2013
1.07	company logo updated	02/12/2021
1.08	company address updated	11/14/2024
1.09	datasheet updated	05/02/2025
1.10	application notes added	09/24/2025

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



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