



PART NUMBER: VHB75 series

DESCRIPTION: DC/DC converter

Features

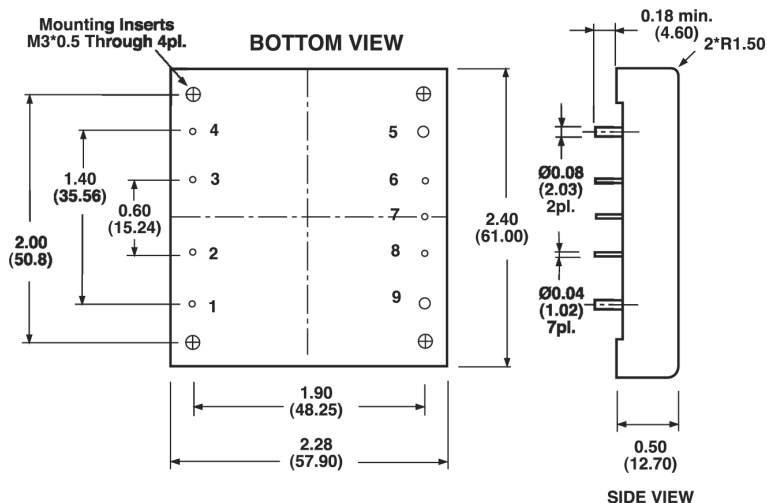
- 37.5W-75W isolated output
- Efficiency to 85%
- 300KHz switching frequency
- 2:1 input range
- Regulated outputs
- Continuous short circuit protection
- Industry standard half-brick package
- Five-sided metal case
- Safety approvals on 24V and 48V input models



Model Number	Input Voltage	Output Voltage	Output Current	Input Current		
				No Load	Full Load	Efficiency
VHB75-D12-S2R5	9-18 VDC	2.5VDC	15A	50mA	4110mA	76%
VHB75-D12-S3R3	9-18 VDC	3.3VDC	15A	50mA	5290mA	78%
VHB75-D12-S5	9-18 VDC	5VDC	15A	50mA	7715mA	81%
VHB75-D12-S12	9-18 VDC	12VDC	6.25A	50mA	7440mA	84%
VHB75-D12-S15	9-18 VDC	15VDC	5A	50mA	7440mA	84%
VHB75-D12-S24	9-18 VDC	24VDC	3.13A	50mA	7440mA	84%
VHB75-D24-S2R5	18-36 VDC	2.5VDC	15A	50mA	2029mA	77%
VHB75-D24-S3R3	18-36 VDC	3.3VDC	15A	50mA	2610mA	79%
VHB75-D24-S5	18-36 VDC	5VDC	15A	50mA	3810mA	82%
VHB75-D24-S12	18-36 VDC	12VDC	6.25A	50mA	3675mA	85%
VHB75-D24-S15	18-36 VDC	15VDC	5A	50mA	3675mA	85%
VHB75-D24-S24	18-36 VDC	24VDC	3.13A	50mA	3640mA	86%
VHB75-D48-S2R5	36-75 VDC	2.5VDC	15A	50mA	1015mA	77%
VHB75-D48-S3R3	36-75 VDC	3.3VDC	15A	50mA	1305mA	79%
VHB75-D48-S5	36-75 VDC	5VDC	15A	50mA	1883mA	83%
VHB75-D48-S12	36-75 VDC	12VDC	6.25A	50mA	1838mA	85%
VHB75-D48-S15	36-75 VDC	15VDC	5A	50mA	1838mA	86%
VHB75-D48-S24	36-75 VDC	24VDC	3.13A	50mA	1820mA	86%

All Dimensions In Inches(mm)

Tolerances Inches .XX±.02 .XXX±.010 ±0.02
Millimeters .X±.5 .XX±.25 ±0.5



PIN CONNECTION

Pin	Function
1.	+Vin
2.	ON/OFF
3.	CASE
4.	-Vin
5.	-Vout
6.	-Sense
7.	Trim
8.	+Sense
9.	+Vout



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Input

Input Voltage Range	12V:	9-18V
	24V:	18-36V
	48V:	36-75V
Under Voltage Lockout	12 Vin:	power up 8.8V power down 8V
	24Vin:	power up 17V power down 16V
	48Vin:	power down 34V power down 32.5V
ON/OFF Control		see notes 3&4
Input Filter		PI Type

Output

Voltage Accuracy		±1% max.
Transient Response: 25% Step Load Change		<500μ sec.
External Trim Adj. Range		±10%
Ripple & Noise 20MHz BW	2.5V, 3.3V, 5V	20mV RMS., max 75mV pk-pk., max
	12V & 15V	30mV RMS., max 100mV pk-pk., max
	24V	100mV RMS., max 240mV pk-pk, max
Temperature Coefficient		±0.03%/°C
Short Circuit Protection		Continuous
Safety		approved to UL1950 (E222736)
Line Regulation ¹		±0.2% max
Load Regulation ²		±0.2% max
Over Voltage Protection trip Range, % Vo nom.		115-140%
Current Limit		110-150% Nominal Output

General Specifications

Efficiency		see table
Isolation Voltage	Input/Output	1500VDC min.
	Input/Case	1500VDC min.
	Output/Case	1500VDC min.
Isolation Resistance		10 ⁷ Ohm min.
Switching Frequency	12-24Vin	400KHz, Typ.
	48Vin	300KHz, Typ
Operating Case Temperature		-40°C to +100°C
Storage Temperature		-55°C to +105°C
Thermal Shutdown, Case Temp.		100°C Typ.
Dimensions		2.28x2.40x0.50 inches (57.9x61.0x12.7mm)
Case Material		aluminum

NOTES:

1. Measured from high line to low line
2. Measured from full load to zero load
3. On/Off Control: Positive logic default. Referenced to -Vin. Open collector.
Module ON...open circuit
Module OFF...<0.8Vdc
4. For negative logic On/Off control, add suffix "N" to the model number



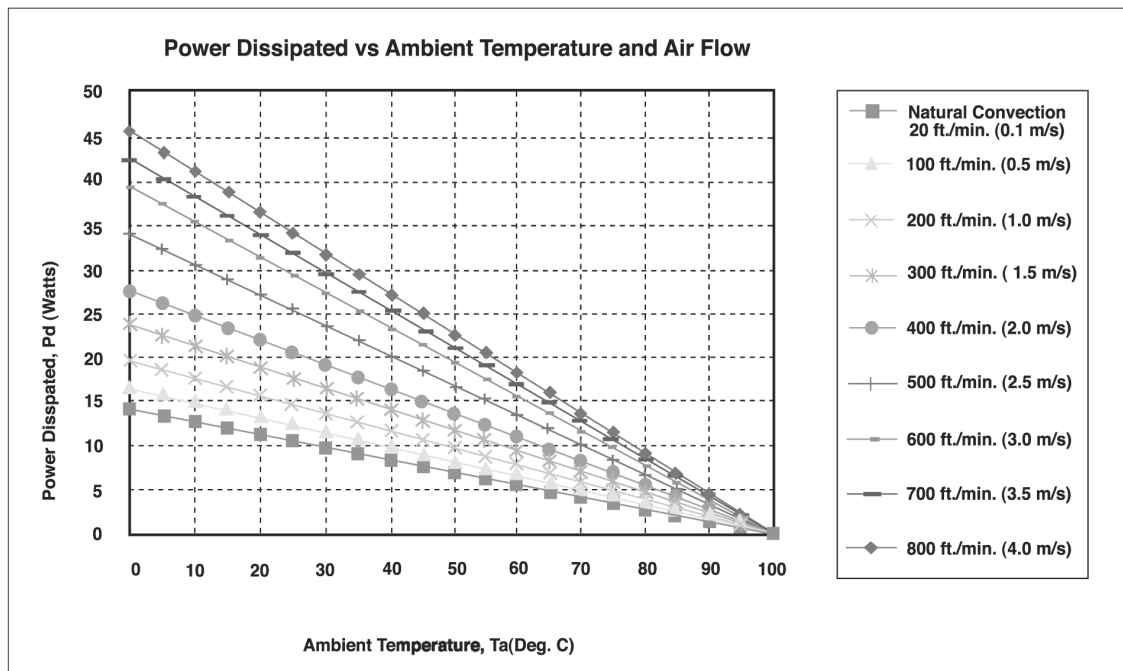
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Application Notes

Derating:

The operating case temperature range of the VHB75 series is -40°C to +100°C. When operating the VHB75, proper derating or cooling is needed. Following is the derating curve of VHB75 without heat sink.



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd) is

$$P_d = P_i - P_o = P_o (1 - \eta) / \eta$$

The thermal resistances are listed below.

Chart of Thermal Resistance vs Air Flow:

AIR FLOW RATE	TYPICAL R _{ca}
Natural Convection 20ft./min. (0.1m/s)	7.12 °C/W
100 ft./min. (0.5m/s)	6.21 °C/W
200 ft./min. (1.0m/s)	5.17 °C/W
300 ft./min. (1.5m/s)	4.29 °C/W
400 ft./min. (2.0m/s)	3.64 °C/W
500 ft./min. (2.5m/s)	2.96 °C/W
600 ft./min. (3.0m/s)	2.53 °C/W
700 ft./min. (3.5m/s)	2.37 °C/W
800 ft./min. (4.0m/s)	2.19 °C/W

The temperature rise (ΔT):

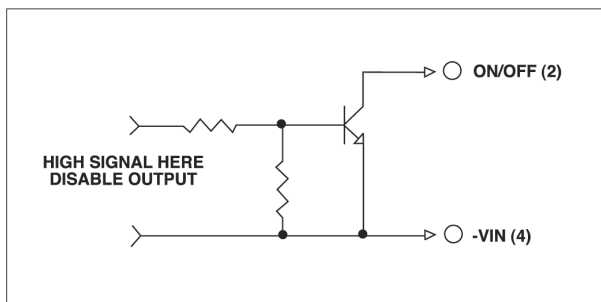
$$\Delta T = P_d * R_{ca}$$

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Remote On/Off Control

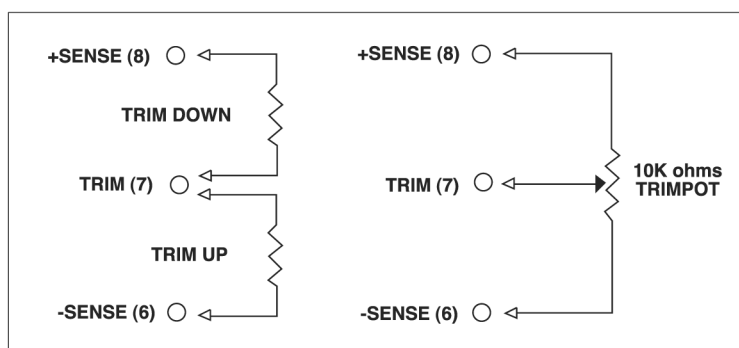
The VHB75 series allows the user to switch the module on and off electronically with the remote on/off feature. Logic control defaults to “positive” logic. The diagram shows the recommended circuits for positive logic. The “negative logic” option is also available.


Logic Table

Logic State (PIN 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

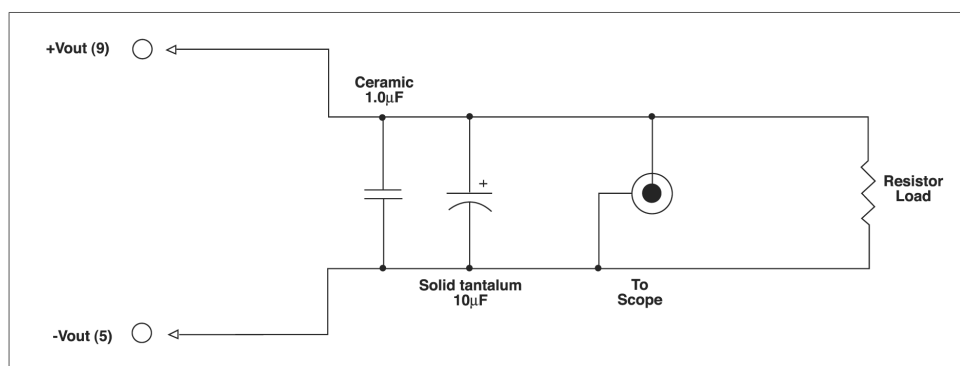
External Output Trimming

Output may optionally be trimmed ($\pm 10\%$) with external fixed resistors or an external trimpot as shown.



Output Noise

The output noise is measured with a 10uF tantalum capacitor and a 1.0uF ceramic capacitor across the output.



Output Noise Test Circuit schematic