

CHB75

37.5 TO 75 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT



Only for Nominal Input Voltage 24 & 48 VDC

Features

- 37.5W-75W Isolated Output
- Efficiency to 85%
- 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case
- Industry Standard Half-Brick Package



MODEL NUMBER	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT NO LOAD	INPUT CURRENT FULL LOAD	%EFF	CASE
CHB75-12S25	9-18 VDC	2.5 VDC	15A	50 mA	4110 mA	76	HB
CHB75-12S33		3.3 VDC	15A		5290 mA	78	
CHB75-12S05		5 VDC	15A		7715 mA	81	
CHB75-12S12		12 VDC	6.25A		7440 mA	84	
CHB75-12S15		15 VDC	5A		7440 mA	84	
CHB75-12S24		24 VDC	3.13A		7440 mA	84	
CHB75-24S25	18-36 VDC	2.5 VDC	15A	50 mA	2029 mA	77	HB
CHB75-24S33		3.3 VDC	15A		2610 mA	79	
CHB75-24S05		5 VDC	15A		3810 mA	82	
CHB75-24S12		12 VDC	6.25A		3675 mA	85	
CHB75-24S15		15 VDC	5A		3675 mA	85	
CHB75-24S24		24 VDC	3.13A		3640 mA	86	
CHB75-48S25	36-75 VDC	2.5 VDC	15A	50 mA	1015 mA	77	HB
CHB75-48S33		3.3 VDC	15A		1305 mA	79	
CHB75-48S05		5 VDC	15A		1883 mA	83	
CHB75-48S12		12 VDC	6.25A		1838 mA	85	
CHB75-48S15		15 VDC	5A		1838 mA	85	
CHB75-48S24		24 VDC	3.13A		1820 mA	86	

NOTE : 1. Nominal Input Voltage 12, 24 & 48 VDC

Specifications

INPUT SPECIFICATIONS:

Input Voltage Range.....	12V.....9-18V
	24V.....18-36V
	48V.....36-75V
Undervoltage lockout	12Vin power up8.8V
	power down8.8V
	24Vin power up17V
	power down16V
	48Vin power up34V
	power down32.5V
Positive Logic Remote ON/OFF (see note 3 & 4)	
Input Filter	PI Type

OUTPUT SPECIFICATIONS:

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 & 15V30mV RMS., max.
	100mV pk-pk, max.
	24V100mV RMS., max.
	240mV pk-pk, max.
Temperature Coefficient.....	±0.03%/°C
Short Circuit Protection.....	Continuous
Line Regulation ¹	±0.2% max.
Load Regulation ²	±0.2% max.
Over Voltage Protect 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	(12/24)Vin.....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
	(57.9x61.0x12.7 mm)
Case Material	Aluminum

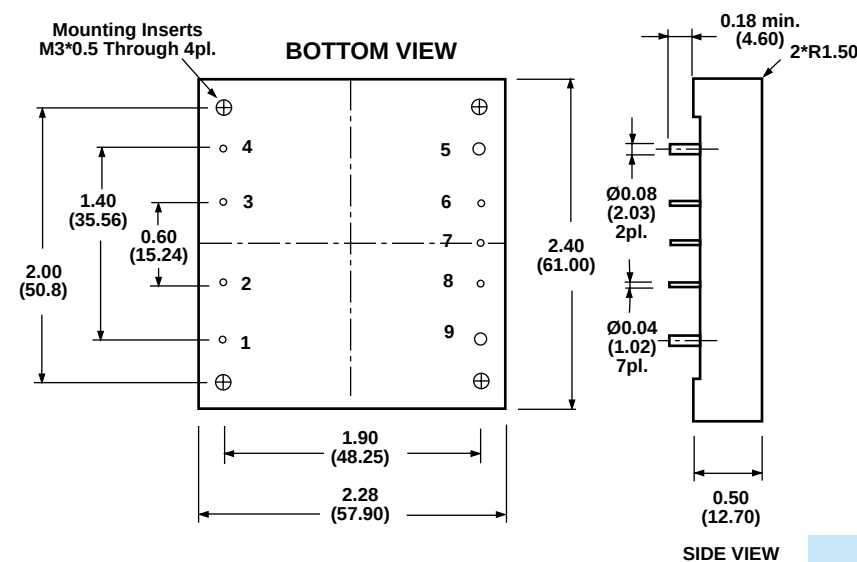
NOTE:

1. Measured From High Line to Low Line.
2. Measured From Full Load to Zero Load.
3. Logic Compatibility Open Collector ref to -Input
Module ON Open Circuit
Module OFF < 0.8Vdc
4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

CASE HB

All Dimensions In Inches(mm)

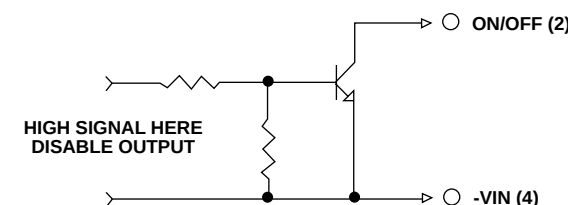
Tolerances	Inches	XX±.02	.XXX±.010	Pin ±0.02
	Millimeters	.X±.5	.XX±.25	±0.5



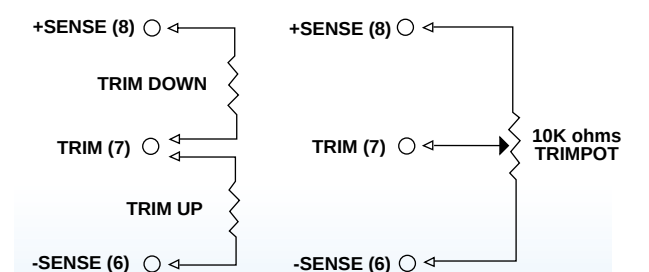
PIN CONNECTION

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

Remote ON/OFF Control



External Output Trim

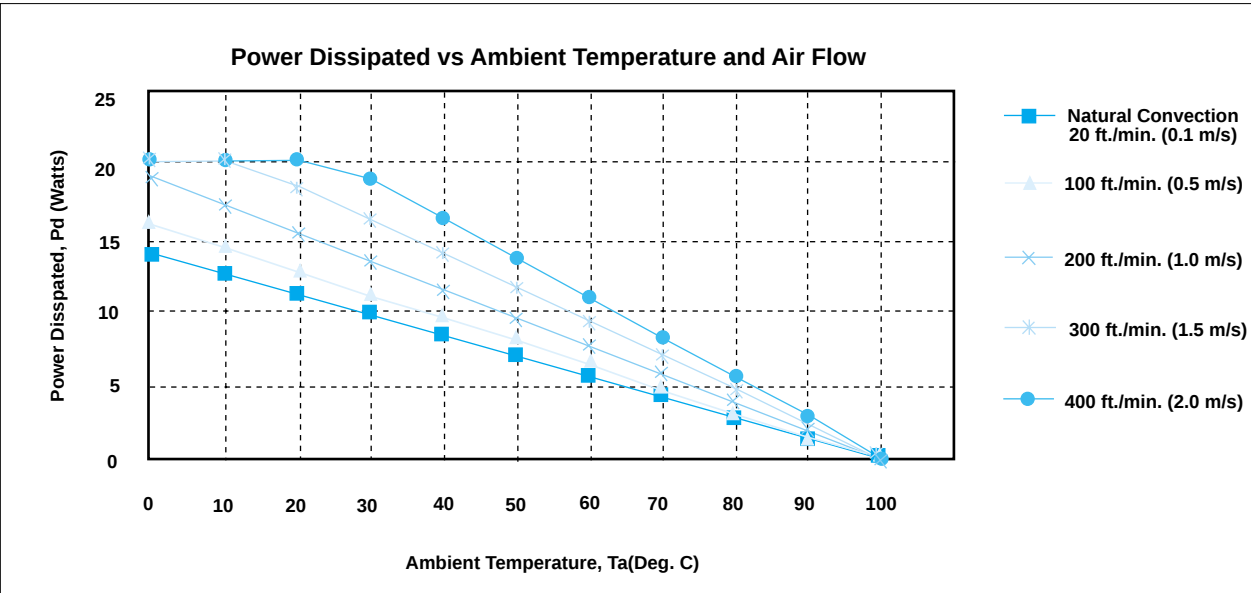


Application Note

Derating

The operating case temperature range of the CHB75 series is -40°C to +100°C. When operating the CHB75 , proper derating or cooling is needed .

Following is the derating curve of CHB75 without heat sink



Forced Convection Power Derating with No Heat Sink

Where:

The power dissipation (Pd):

$$Pd = Pi - Po = Po (1-\eta) / \eta$$

The thermal resistance are list below:

Chart of Thermal Resistance vs Air Flow:

AIR FLOW RATE	TYPICAL Rca
Natural Convection	7.12 °C/W
100 ft./min.	6.21 °C/W
200 ft./min.	5.17 °C/W
300 ft./min.	4.29 °C/W
400 ft./min.	3.64 °C/W

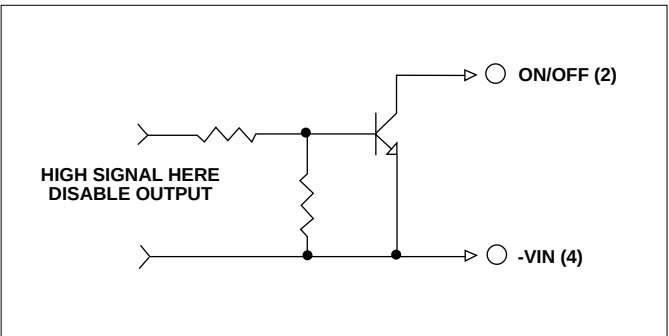
The temperature rise (ΔT):

$$\Delta T = Pd * Rca$$

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Remote ON/OFF Control

The CHB75 series allows the user to switch the module on and off electronically with remote on/off feature. The CHB75 series are available with "positive logic" or "negative logic" (option).

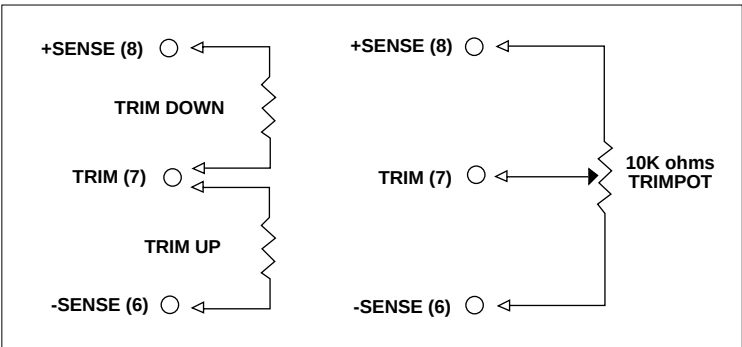


Logic Table

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

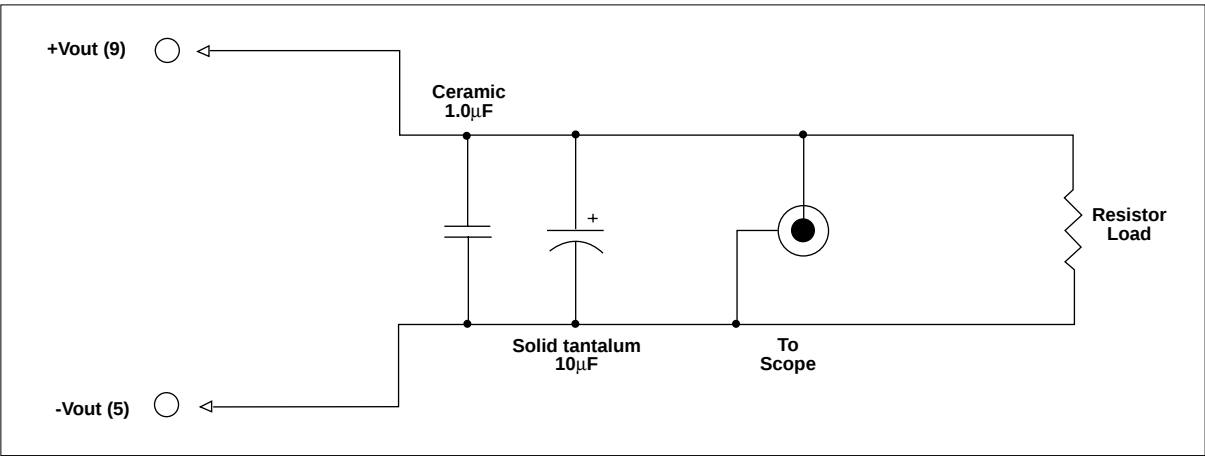
External Output Trimming

Output may optionally be externally trimmed ($\pm 10\%$) with a fixed resistor or an external trim-pot as shown.



Output Noise

The output noise is measured with 10μF tantalum capacitor and 1.0μF ceramic capacitor across output.



Output Noise Test Circuit schematic

CHB75 - DUAL

75 WATT WIDE INPUT DC-DC CONVERTERS DUAL OUTPUT



- 75W Isolated Output
- Efficiency to 84 %
- 400KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Industrial Standard Half-Brick Package
- Total power 75W with 15A Maximum Per Channel

CHB75-48D05-36-75 VDC	5.0 VDC	1 A	15000.0 mA	30.0 mA	1.86 A	84 %	HB
2V5	2.5 VDC	0 A					
CHB75-48D05-36-75 VDC	5.0 VDC	1 A	15000.0 mA	30.0 mA	1.86 A	84 %	HB
3V3	3.3 VDC	0 A					

Note: 1. Nominal Input Voltage : 48 VDC
2. Measured with 15A load on VO1

Input Voltage Range
Under voltage lockout

48V-----36-75V
48Vin power up-----34V
48Vin power down-----32.5V

Positive Logic Remote ON/OFF (see note 3 & 4)
Input Filter

PI Type

Voltage Accuracy
Transient Response:25% Step Load Change
External Trim Adj. Range
Ripple & Noise, 20MHz BW
2.5V & 3.3V & 5V

+/-2.0% max.
<500us
+/- 5.0%

Temperature Coefficient
Short Circuit Protection
Line Regulation¹, Single/Dual
Load Regulation², Single/Dual
Over Voltage Protection trip Range ,% Vo nom
Current Limit³

40mV RMS, max.
100mV pk-pk, max.
+/- 0.03% / °C
Continuous
+/-0.2% max.
+/-0.5% max.
115-140%
110% ~140% Nominal Output

Efficiency
Isolation Voltage Input/Output
Input/Case
Output/Case
Isolation Resistance
Switching Frequency
Operating Case Temperature
Storage Temperature
Thermal Shutdown, Case Temp
Dimensions

See Table
1500VDC min.
1500VDC min.
1500VDC min.
10⁷ ohms min.
400KHz ,Typ.
-40°C to +100°C
-55°C to +105°C
100°C Typ
2.28X2.40X0.50 inches
(57.9X61.0X12.7mm)

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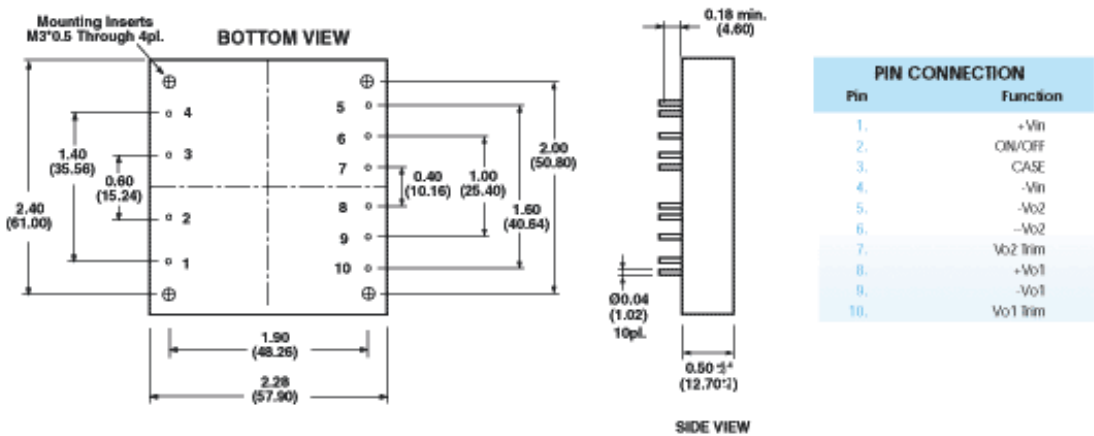
Case Material

Aluminum baseplate with plastic case

Notes

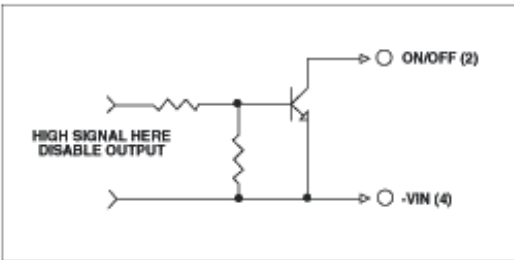
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

Measured From High Line to Low Line
Measured From Full Load to Min. Load
Measured with Output Current on Output1 (VO1)
Logic Compatibility ----- Open Collector ref to -Input
Module ON ----- Open Circuit
Module OFF ----- < 0.8Vdc
Suffix "N" to the Model Number with Negative Logic Remote ON/OFF
The output noise is measured with 10uf tantalum and 1uf ceramic capacitor across output.



Remote ON/OFF Control

The CHB75 Dual series allows the user to switch the module on and off electronically with remote on/off feature. The CHB75 Dual series are available with "positive logic" or "negative logic" (option).

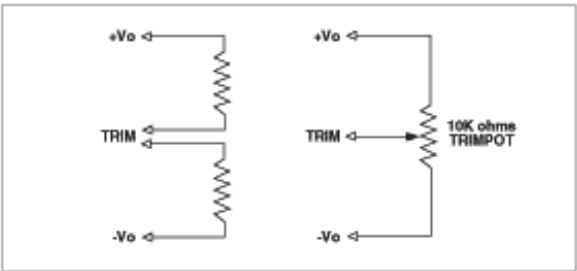


Logic Table

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

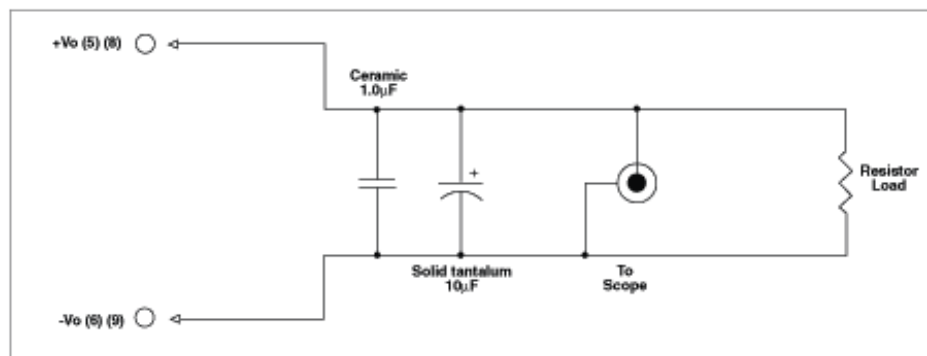
External Output Trimming

Output may optionally be externally trimmed (±5%) with a fixed resistor or an external trimpot as shown.



Output Noise

The output noise is measured with 10µF tantalum capacitor and 1.0µF ceramic capacitor across output.



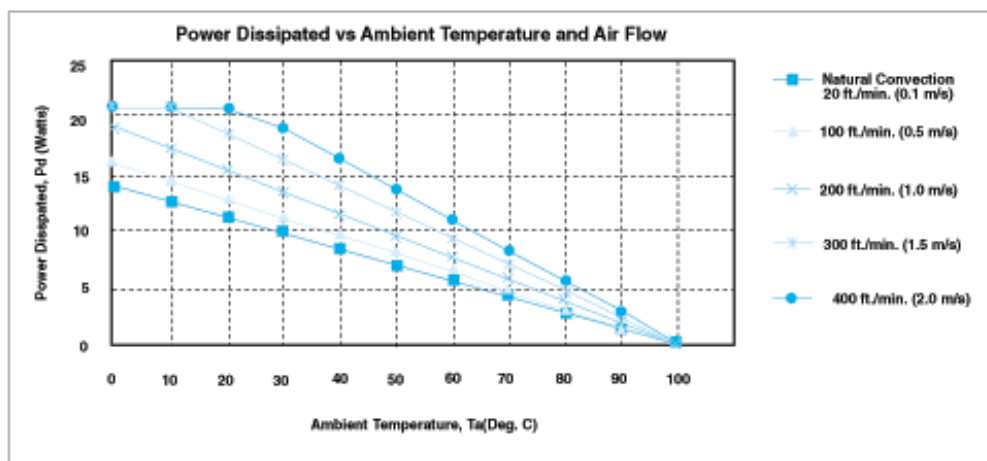
Output Noise Test Circuit schematic

Application Note

Derating

The operating case temperature range of the CHB75 Dual series is -40°C to +100°C. When operating the CHB75 Dual, proper derating or cooling is needed.

Following is the derating curve of CHB75 Dual without heat sink



Forced Convection Power Derating with No Heat Sink

Where:

The power dissipation (Pd):

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

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AIR FLOW RATE	TYPICAL Rca
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300 ft./min.	4.29 °C/W
400 ft./min.	3.64 °C/W

The temperature rise (ΔT):

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