S E R I E S

CHB50

25 TO 50 WATT WIDE INPUT DC-DC CONVERTERS SINGLE OUTPUT

c UL us E176177 | TÜV Rheinland BAUART GEPRÜFT TYPE APPROVED

Only for Nominal Input Voltage 24 & 48 VDC

Features

- 25W/50W 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
CHB50-12S25	9-18 VDC	2.5 VDC	10A	50 mA	2740 mA	76	HB
CHB50-12S33		3.3 VDC	10A		3525 mA	78	
CHB50-12S05		5 VDC	10A		5145 mA	81	
CHB50-12S12		12 VDC	4.16A		4950 mA	84	
CHB50-12S15		15 VDC	3.33A		4950 mA	84	
CHB50-12S24		24 VDC	2.08A		4950 mA	84	
CHB50-24S25	18-36 VDC	2.5 VDC	10A	50 mA	1353 mA	77	HB
CHB50-24S33		3.3 VDC	10A		1740 mA	79	
CHB50-24S05		5 VDC	10A		2540 mA	82	
CHB50-24S12		12 VDC	4.16A		2450 mA	85	
CHB50-24S15		15 VDC	3.33A		2450 mA	85	
CHB50-24S24		24 VDC	2.08A		2419 mA	86	
CHB50-48S25	36-75 VDC	2.5 VDC	10A	50 mA	676 mA	77	HB
CHB50-48S33		3.3 VDC	10A		870 mA	79	
CHB50-48S05		5 VDC	10A		1250 mA	83	
CHB50-48S12		12 VDC	4.16A		1220 mA	85	
CHB50-48S15		15 VDC	3.33A		1220 mA	85	
CHB50-48S24		24 VDC	2.08A		1209 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 up 8.8V
power down 8V
24Vin power up 17V
power down 16V
48Vin power up 34V
power down 32.5V
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 & 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
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

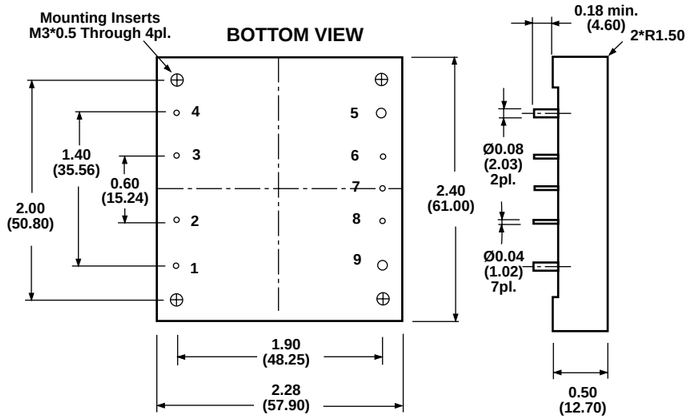
NOTE:

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)

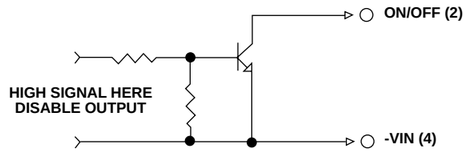
Tolerances		Pin
Inches	.XX±.02 .XXX±.01	±0.02
Millimeters	.X±.5 .XX±.25	±0.5



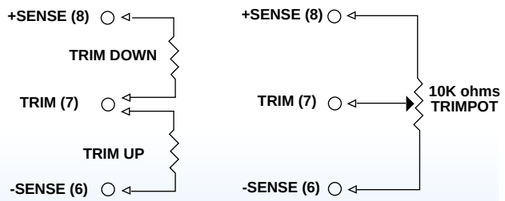
PIN CONNECTION

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

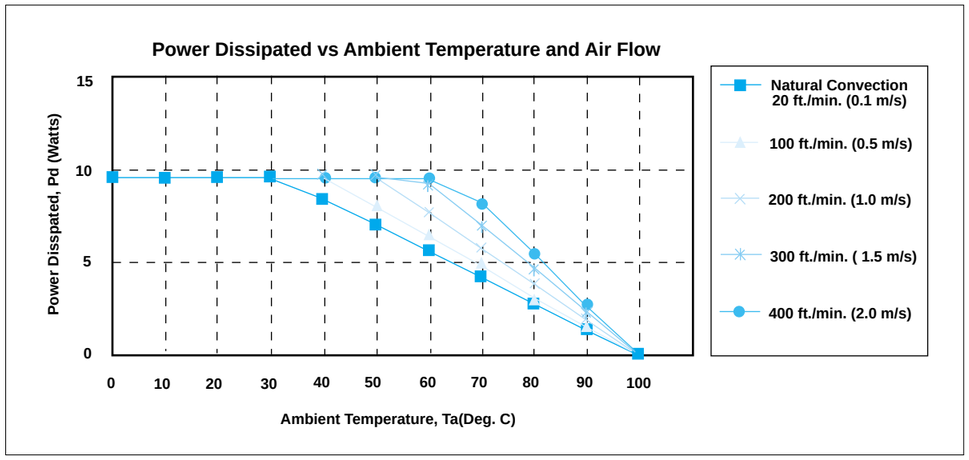


All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

Application Note

Derating

The operating case temperature range of the CHB50 series is -40˚C to +100˚C. When operating the CHB50 , proper derating or cooling is needed .
Following is the derating curve of CHB50 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:

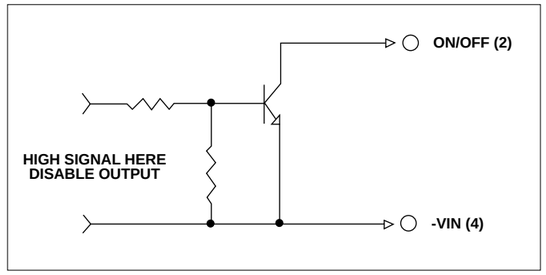
AIR FLOW RATE	TYPICAL Rca
Natural Convection	7.12 ˚C/W
100 ft./min.	6.21 ˚C/W
200 ft./min.	5.17 ˚C/W
300 ft./min.	4.29 ˚C/W
400 ft./min.	3.64 ˚C/W

The temperature rise ($\triangle T$):

$$\triangle T = Pd * Rca$$

Remote ON/OFF Control

The CHB50 series allows the user to switch the module on and off electronically with remote on/off feature. The CHB50 series are available with "positive logic" or "negative logic" (option).

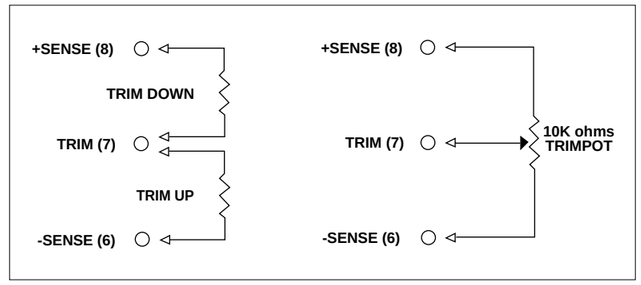


Logic Table

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

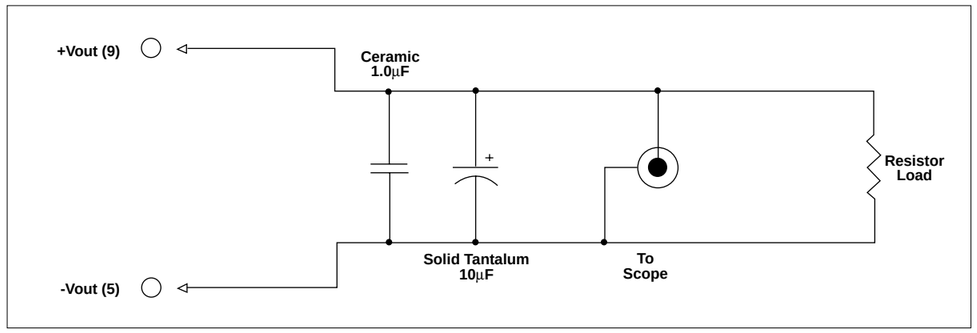
Output may optionally be externally trimmed (±10%) with a fixed resistor or an external trimpot as shown.



External Output

Output Noise

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



Output Noise Test Circuit schematic