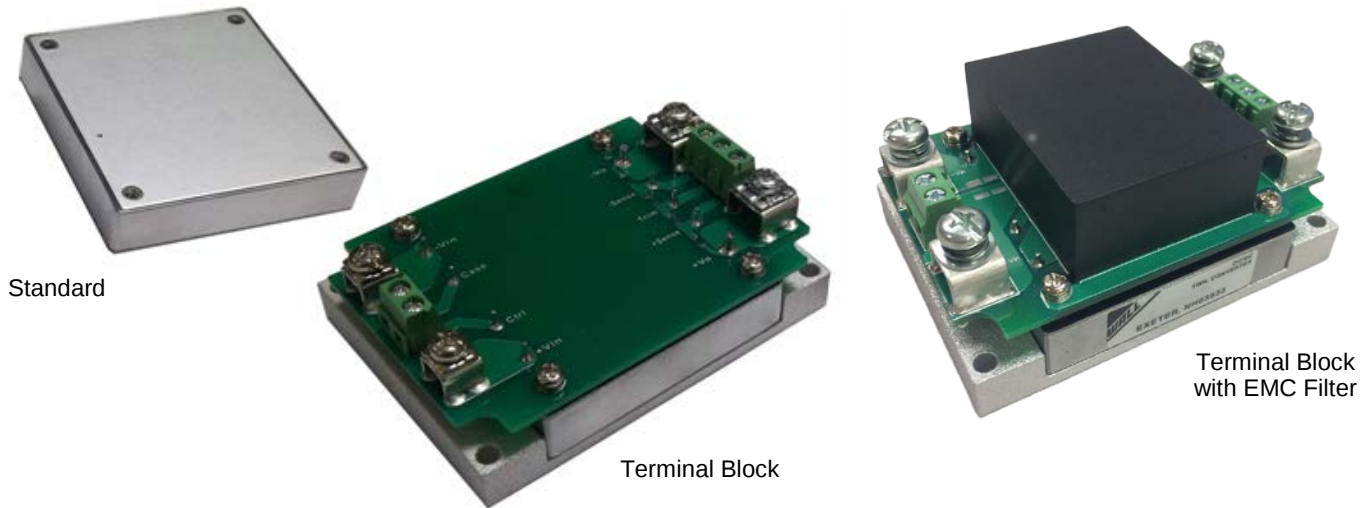




Size: 2.4in x 2.28in x 0.5in (61mm x 57.9mm x 12.7in)

OPTIONS

- Pin Length
- Heatsinks
- Thru-Hole Inserts
- Negative Logic Remote On/Off
- Terminal Block
- Terminal Block with EMC Filter

FEATURES

- Soft-Start
- RoHS II and REACH Compliant
- 4:1 Ultra Wide Input Voltage Ranges
- Up to 76.8 Watts of Output Power
- Single Outputs Ranging from 3.3VDC to 48VDC
- Output Current up to 20A
- Under Voltage Lockout
- UL60950-1, EN60950-1, IEC60950-1, EN45545-2 and EN50155 Safety Approvals
- Six-Sided Shielding
- High Efficiency up to 91%
- No Minimum Load Requirements
- Adjustable Output Voltage
- Industry Standard Half-Brick Footprint
- Remote On/Off Control
- Threaded Inserts and Thru-Hole Inserts Available
- Short Circuit, Over Voltage, Over Load, and Over Temperature Protection

APPLICATIONS

- Railway Systems
- Wireless Networks
- Telecom/Datacom
- Industry Control Systems
- Semiconductor Equipment
- Distributed Power Architectures
- Military Applications

DESCRIPTION

The DCHBW75 series of DC/DC power converters provides up to 76.8 Watts of output power in an industry standard half-brick package and footprint. This series consists of single output models ranging from 3.3VDC to 48VDC with 4:1 ultra wide input voltage ranges of 9~36VDC, 18~75VDC and 43~160VDC. Some features include high efficiency up to 91%, adjustable output voltage, positive remote on/off control, and under voltage lockout. These converters also have short circuit, over voltage, over load, and over temperature protection. The DCHBW75 series is RoHS compliant and has UL60950-1, EN60950-1, IEC60950-1, EN45545-2 and EN50155 safety approvals. Several different options are available for this series including negative remote on/off, terminal block, pin length, heatsinks, and thru-hole inserts. Please call factory for more details.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise	No Load Input Current ⁽¹⁾	Output Power	Maximum Capacitive Load ⁽²⁾	Efficiency ⁽³⁾
			Min Load	Max Load					
DCHBW75-24S3.3	24VDC (9–36VDC)	3.3VDC	0mA	20A	75mVp-p	85mA	66W	60600μF	87%
DCHBW75-24S05		5VDC	0mA	15A	75mVp-p	120mA	75W	30000μF	88%
DCHBW75-24S12		12VDC	0mA	6.3A	100mVp-p	185mA	75.6W	5250μF	88%
DCHBW75-24S15		15VDC	0mA	5A	100mVp-p	185mA	75W	3330μF	88%
DCHBW75-24S24		24VDC	0mA	3.2A	200mVp-p	85mA	76.8W	1330μF	87%
DCHBW75-24S28		28VDC	0mA	2.7A	200mVp-p	85mA	75.6W	960μF	87%
DCHBW75-24S48	48VDC (18–75VDC)	48VDC	0mA	1.6A	300mVp-p	85mA	76.8W	330μF	87%
DCHBW75-48S3.3		3.3VDC	0mA	20A	75mVp-p	60mA	66W	60600μF	88%
DCHBW75-48S05		5VDC	0mA	15A	75mVp-p	60mA	75W	30000μF	90%
DCHBW75-48S12		12VDC	0mA	6.3A	100mVp-p	90mA	75.6W	5250μF	90%
DCHBW75-48S15		15VDC	0mA	5A	100mVp-p	50mA	75W	3330μF	89%
DCHBW75-48S24		24VDC	0mA	3.2A	200mVp-p	50mA	76.8W	1330μF	88%
DCHBW75-48S28	110VDC (43–160VDC)	28VDC	0mA	2.7A	200mVp-p	50mA	75.6W	960μF	88%
DCHBW75-48S48		48VDC	0mA	1.6A	300mVp-p	50mA	76.8W	330μF	87%
DCHBW75-110S3.3		3.3VDC	0mA	20A	75mVp-p	10mA	66W	60600μF	89%
DCHBW75-110S05		5VDC	0mA	15A	75mVp-p	10mA	75W	30000μF	91%
DCHBW75-110S12		12VDC	0mA	6.3A	100mVp-p	10mA	75.6W	5250μF	91%
DCHBW75-110S15		15VDC	0mA	5A	100mVp-p	10mA	75W	3330μF	91%
DCHBW75-110S24		24VDC	0mA	3.2A	200mVp-p	10mA	76.8W	1330μF	90%
DCHBW75-110S28		28VDC	0mA	2.7A	200mVp-p	10mA	75.6W	960μF	90%
DCHBW75-110S48		48VDC	0mA	1.6A	300mVp-p	10mA	76.8W	330μF	90%

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION		TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS							
Input Voltage Range	24VDC Nominal Input Models		9	24	36	VDC	
	48VDC Nominal Input Models		18	48	75		
	110VDC Nominal Input Models		43	110	160		
Start-Up Voltage	24VDC Nominal Input Models				9	VDC	
	48VDC Nominal Input Models				18		
	110VDC Nominal Input Models				43		
Shutdown Voltage	24VDC Nominal Input Models			7.5		VDC	
	48VDC Nominal Input Models			16			
	110VDC Nominal Input Models			36			
Input Surge Voltage (1 sec max.)	24VDC Nominal Input Models				50	VDC	
	48VDC Nominal Input Models				100		
	110VDC Nominal Input Models				185		
Input Current	No Load		See Table				
Input Filter ⁽⁴⁾			Pi Type				
OUTPUT SPECIFICATIONS							
Output Voltage			See Table				
Voltage Accuracy			-1.0		+1.0	%	
Line Regulation	Low Line to High Line at Full Load		-0.1		+0.1	%	
Load Regulation	No Load to Full Load		-0.1		+0.1	%	
Voltage Adjustability ⁽⁵⁾			-20		+10	%	
Remote Sense ⁽⁶⁾					10	%Vo	
Output Power			See Table				
Output Current			See Table				
Minimum Load			0			%	
Maximum Capacitive Load	Minimum Input and Constant Resistive Load		See Table				
Ripple & Noise (20MHz bandwidth)	4.7μF/50V X7R MLCC		3.3V and 5V Models		75	100	mVp-p
	4.7μF/50V X7R MLCC		12V and 15V Models		100	125	
	4.7μF/50V X7R MLCC		24V and 28V Models		200	250	
	2.2μF/100V X7R MLCC		48V Models		300	350	
Transient Response Recovery Time	25% Load Step Change			200	250	μs	
Start-Up Time	110VDC Input Models	Nominal Input and Constant Resistive Load Power Up or Remote On/Off		60		Ms	
	Others			25			
Temperature Coefficient			-0.02		+0.02	%/°C	

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

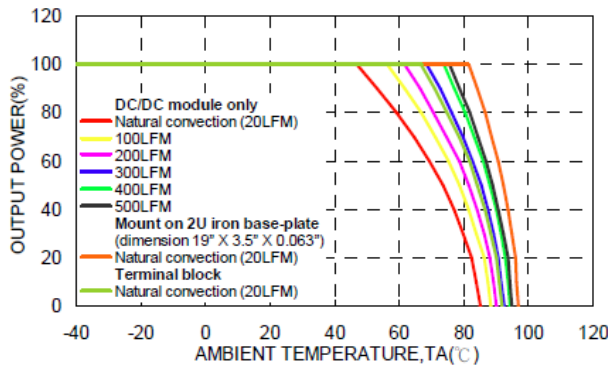
SPECIFICATION		TEST CONDITIONS		Min	Typ	Max	Unit
REMOTE ON/OFF CONTROL ⁽⁷⁾							
Positive Logic (Standard)		DC-DC ON		Short or 0~1.2VDC			
		DC-DC OFF		Open or 3~12VDC			
Negative Logic (Optional)		DC-DC ON		Open or 3~12VDC			
		DC-DC OFF		Short or 0~1.2VDC			
Input Current of CTRL Pin				-0.5		1	mA
Remote OFF Input Current					3		mA
PROTECTION							
Short Circuit Protection				Continuous, Automatic Recovery			
Over Load Protection		% of Iout rated; Hiccup mode	110Vin (Nominal)		150		%
			Others	110		140	
Over Voltage Protection		% of Vout (nominal); Hiccup Mode		115		130	%
Over Temperature Protection					+115		°C
ENVIRONMENTAL SPECIFICATIONS							
Operating Case Temperature		Base-Plate		-40		+105	°C
Storage Temperature		Standard		-55		+125	°C
		Terminal Block Type		-40		+105	
Thermal Impedance ⁽⁸⁾		Standard			6.7		°C/W
		With 0.24" Heatsink			5.4		
		With 0.45" Heatsink			4.7		
Relative Humidity				5		95	%RH
Thermal Shock				MIL-STD-810F			
Shock				EN61373, MIL-STD-810F			
Vibration				EN61373, MIL-STD-810F			
MTBF		MIL-HDBK-217F, Full Load		336,200 hours			
GENERAL SPECIFICATIONS							
Efficiency		Nominal Input Voltage and Full Load		See Table			
Switching Frequency				270	300	330	kHz
Isolation Voltage	110VDC Input Models	1 minute (reinforced insulation)	Input to Output	3000			VAC
			Input (Output) to Case	1500			
	Others	1 minute (basic insulation)	Input to Output	2250			VDC
			Input (Output) to Case	1600			
Isolation Resistance		500VDC		1			GΩ
Isolation Capacitance						2500	pF
PHYSICAL SPECIFICATIONS							
Weight		Standard		3.42oz (97g)			
		Terminal Block ("T" Suffix)		7.05oz (200g)			
		Terminal Block with EMC Filter ("TF" suffix)		9.88oz (280g)			
		Terminal Block with EMC Filter, connected to PE ("TF1" suffix)		10.12oz (287g)			
Dimensions (L x W x H)		Standard		2.4in x 2.28in x 0.5in (61mm x 57.9mm x 12.7mm)			
		Terminal Block ("T" Suffix)		3.35in x 2.4in x 1.17in (85mm x 61mm x 28mm)			
		Terminal Block with EMC Filter ("TF" suffix)		3.35in x 2.4in x 1.54in (85mm x 61mm x 32.3mm)			
		Terminal Block with EMC Filter, connected to PE ("TF1" suffix)		3.35in x 2.40in x 1.59in (85.0mm x 61.0mm x 40.5mm)			
Case Material		24VDC and 48VDC Nominal Input Voltage Models		Metal			
		110VDC Nominal Input Voltage Models		Aluminum Base-Plate with Plastic Case			
Base Material		24VDC and 48VDC Nominal Input Voltage Models		FR4 PCB			
Potting Material				Silicone (UL94 V-0)			
Shielding		24VDC and 48VDC Nominal Input Models		Six-Sided			
SAFETY & EMC CHARACTERISTICS							
Safety Approvals		UL60950-1, EN60905-1, IEC60950-1, EN50155, EN45545-2					
EMI ⁽⁹⁾		EN55011, EN55022		Class A, Class B			
ESD		EN61000-4-2		Air ±8KV Contact ±6KV		Perf. Criteria A	
Radiated Immunity		EN61000-4-3		20 V/m		Perf. Criteria A	
Fast Transient ⁽¹⁰⁾		EN61000-4-4		±2KV		Perf. Criteria A	
Surge ⁽¹⁰⁾		EN61000-4-5	EN55024 EN50155	±2KV ±2KV		Perf. Criteria A	
Conducted Immunity		EN61000-4-6		10Vr.m.s		Perf. Criteria A	
Power Frequency Magnetic Field		EN61000-4-8		100A/m continuous; 1000A/m 1 second		Perf. Criteria A	

NOTES

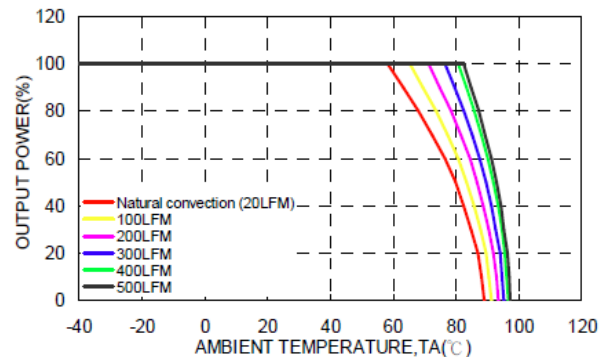
- (1) Typical Value at Nominal Input Voltage and No Load.
- (2) Test by minimum input and constant resistive load.
- (3) Typical Value at Nominal Input Voltage and Full Load.
- (4) Input source impedance: The power module will operate as specifications without external components, assuming that the source voltage has a very low impedance and reasonable input voltage regulation. Highly inductive source impedances can affect the stability of the power module. An external input capacitor is recommended for 24VDC nominal input models. We suggest 4.7 μ F/50V X7R MLCC or Nippon chemi-con KY series, 68 μ F/100V, ESR 110m Ω or better capacitor. For terminal block versions, the capacitor is included as standard and an external capacitor is not necessary.
- (5) Output voltage is adjustable for 10% trim up or -20% down of nominal output voltage by connecting a single resistor between TRIM and +SENSE pins for trim up or between TRIM and -SENSE pins for trim down. To calculate the value of the resistor R_U and R_D for a particular output voltage see page 5/6.
- (6) Maximum output deviation is +10% inclusive of remote sense and trim. If remote sense is not being used, the +SENSE should be connected to its corresponding +OUTPUT and likewise the -SENSE should be connected to its corresponding -OUTPUT.
- (7) The CTRL pin voltage is referenced to -INPUT. To order negative logic remote on/off control add the suffix "R" to the model number.
- (8) 1. The thermal test conditions for vertical direction are by natural convection (20LFM)
2. Heat sink is optional. See the "Product Options" table for suffix options.
- (9) The standard module meets EMI Class A or Class B with external components.
- (10) An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. For 24 & 48VDC nominal input models, we recommend connecting one aluminum electrolytic capacitor (Nippon chemi-con KY series, 220 μ F/100V, ESR 48m Ω) in parallel. For 110VDC nominal input models, we recommend connecting three aluminum electrolytic capacitors (Ruby-con BXF series, 100 μ F/250V) in parallel.
- (11) CASE GROUNDING: EMI can be reduced when you connect the four screw bolts to the shield plane.
- (12) This series comes with several different options: Negative remote on/off control, heatsinks, pin length, thru-hole inserts, and terminal blocks. See the "Product Options" table on page 6 for more ordering information.
- (13) **CAUTION:** This power converter is not internally fused. An input line fuse must always be used.

DERATING CURVES

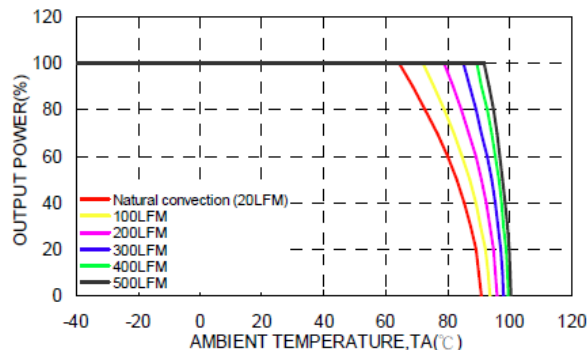
DCHBW75-48S05 Derating Curve



DCHBW75-48S05 Derating Curve
With 0.24" Height Heatsink (See Note 8)

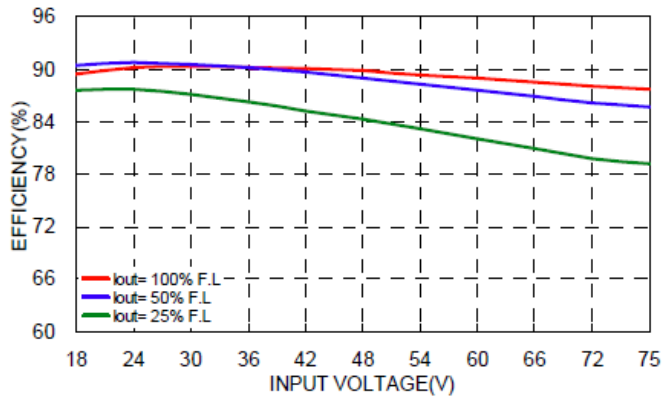


DCHBW75-48S05 Derating Curve
With 0.45" Height Heatsink (See Note 8)

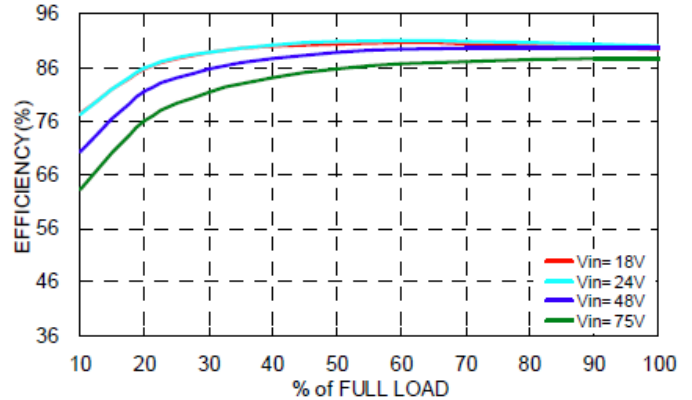


EFFICIENCY GRAPHS

DCHBW75-48S05 Efficiency vs. Input Voltage

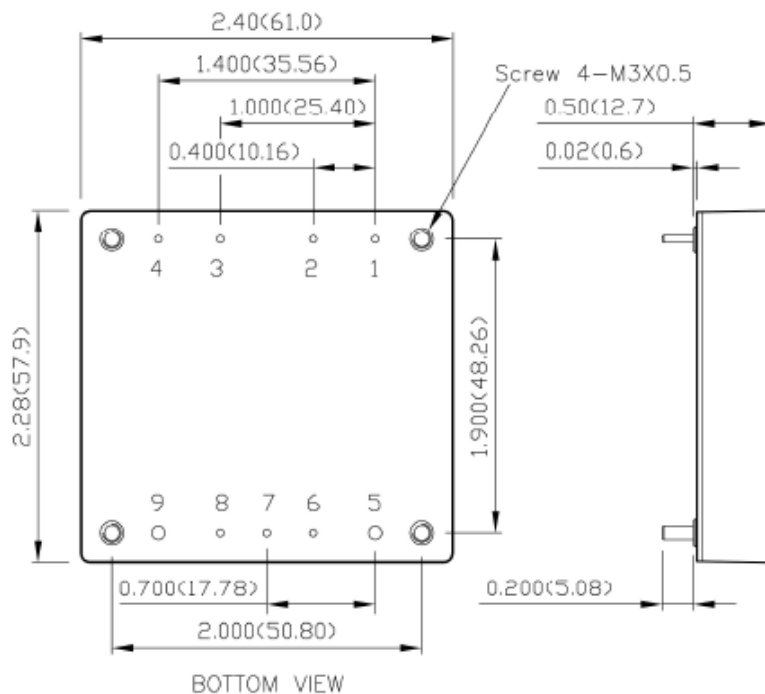


DCHBW75-48S05 Efficiency vs. Output Load



MECHANICAL DRAWINGS

METAL CASE (24VDC & 48VDC Nominal Input Models)

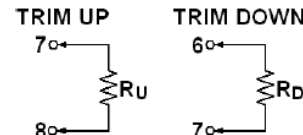


PIN CONNECTION

PIN	DEFINE	DIAMETER
1	-Vin	0.04 Inch
2	Case	0.04 Inch
3	Ctrl	0.04 Inch
4	+Vin	0.04 Inch
5	-Vout	0.08 Inch
6	-Sense	0.04 Inch
7	Trim	0.04 Inch
8	+Sense	0.04 Inch
9	+Vout	0.08 Inch

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below



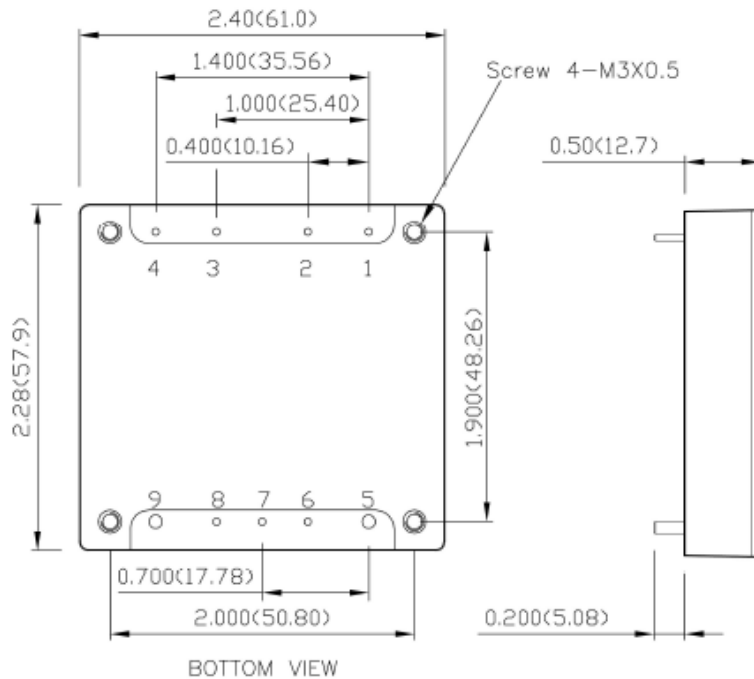
$$R_U = \left(\frac{V_{OUT} (100 + \Delta\%)}{1.225 \Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%} \right) k\Omega$$

$$R_D = \left(\frac{100}{\Delta\%} - 2 \right) k\Omega$$

Notes:

1. All dimensions in inch (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
3. Pin Pitch Tolerance ±0.01 (0.25)
4. Pin Dimension Tolerance ±0.004 (0.1)
5. Mounting Screws should always be used
6. The screw locked torque: MAX 5.0kgf-cm(049N-m)

PLASTIC CASE (110VDC Nominal Input Models)

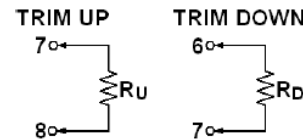


PIN CONNECTION

PIN	DEFINE	DIAMETER
1	-Vin	0.04 Inch
2	Case	0.04 Inch
3	Ctrl	0.04 Inch
4	+Vin	0.04 Inch
5	-Vout	0.08 Inch
6	-Sense	0.04 Inch
7	Trim	0.04 Inch
8	+Sense	0.04 Inch
9	+Vout	0.08 Inch

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below



$$R_U = \left(\frac{V_{OUT} (100 + \Delta\%)}{1.225 \Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%} \right) k\Omega$$

$$R_D = \left(\frac{100}{\Delta\%} - 2 \right) k\Omega$$

Notes:

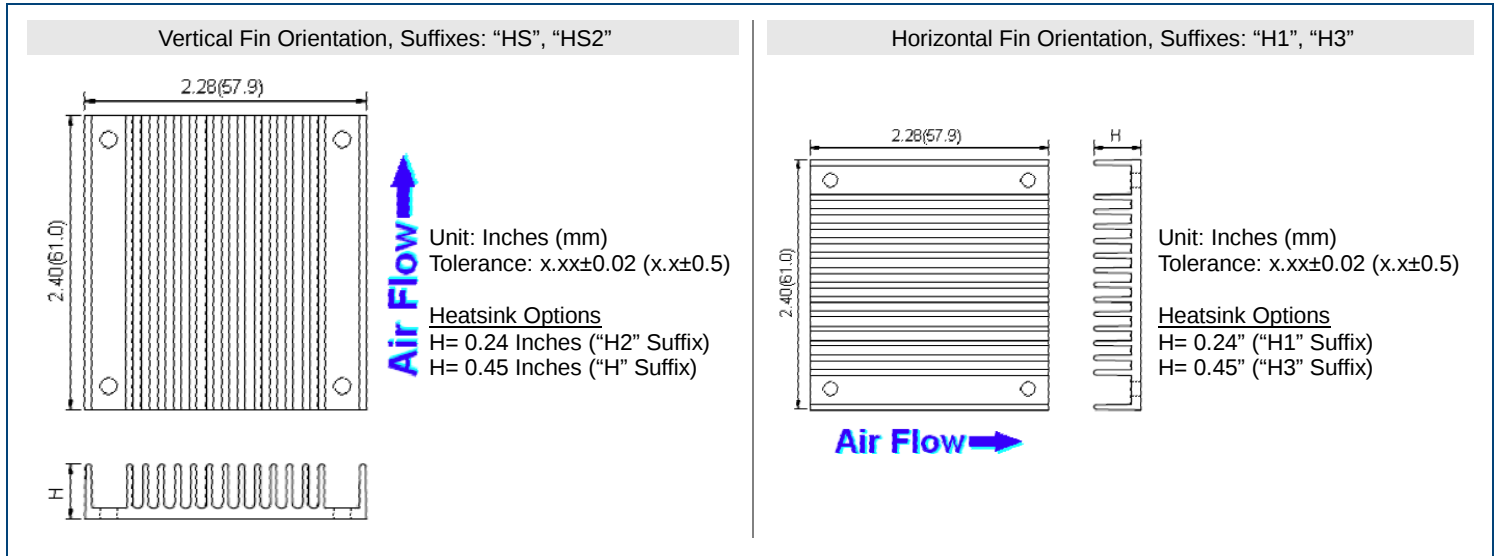
1. All dimensions in inch (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
3. Pin Pitch Tolerance ±0.01 (0.25)
4. Pin Dimension Tolerance ±0.004 (0.1)
5. Mounting screws should always be used.
6. The screw locked torque: MAX 3.5kgf-cm(0.34N-m)

Product Options		Suffix	Product Options		Suffix
Negative Remote ON/OFF Logic	0.200" pin length	R	Heatsink ⁽¹⁾	H = 0.45" Vertical	H
	0.145" pin length	RL		H = 0.24" Horizontal	H1
Positive Remote ON/OFF Logic	0.200" pin length	None		H = 0.24" Vertical	H2
	0.145" pin length	S		H = 0.45" Horizontal	H3
Thru-Hole Inserts (No Thread) ⁽¹⁾	00.126 thru-hole (no thread) inserts	TH	Terminal Block ^{(2) (3)}	Wall Mounted	T
				Wall Mounted with EMC Filter	TF
				Wall mounted with EMC Filter can be connected to PE	TF1

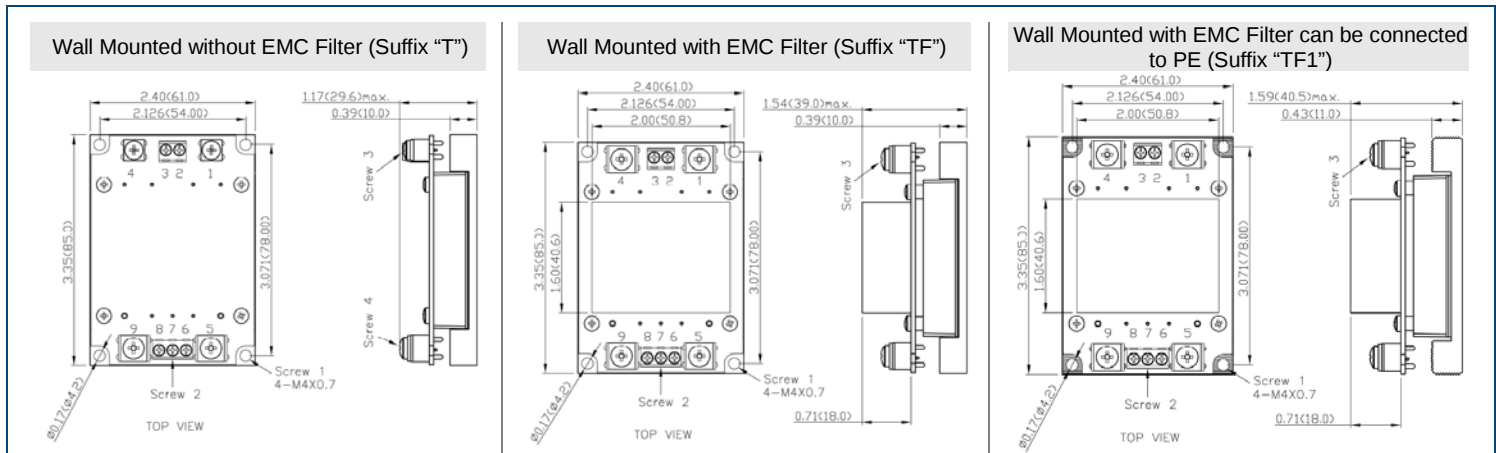
Notes:

1. Models with thru-hole inserts cannot be equipped with heatsink.
2. Terminal block models have 0.200" pin lengths. 0.145" pin lengths are not available for terminal block models
3. EMI filter meets EN55011, EN55022 Class A/

HEATSINK OPTIONS



TERMINAL BLOCK OPTIONS

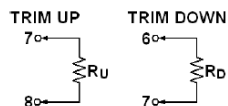


TERMINAL CONNECTION: -T, -TF

NO.	DEFINE
1	-Vin
2	Case
3	Ctrl
4	+Vin
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using the method shown below.



$$R_U = \left(\frac{V_{OUT} (100 + \Delta\%)}{1.225 \Delta\%} - \frac{(100 + 2 \Delta\%)}{\Delta\%} \right) k\Omega$$

$$R_D = \left(\frac{100}{\Delta\%} - 2 \right) k\Omega$$

TERMINAL CONNECTION: -TF1

NO.	DEFINE
1	-Vin
2	NC
3	Ctrl
4	+Vin
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

Notes:

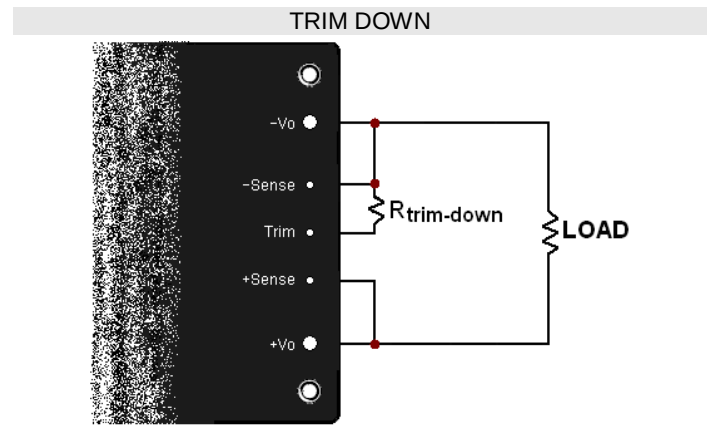
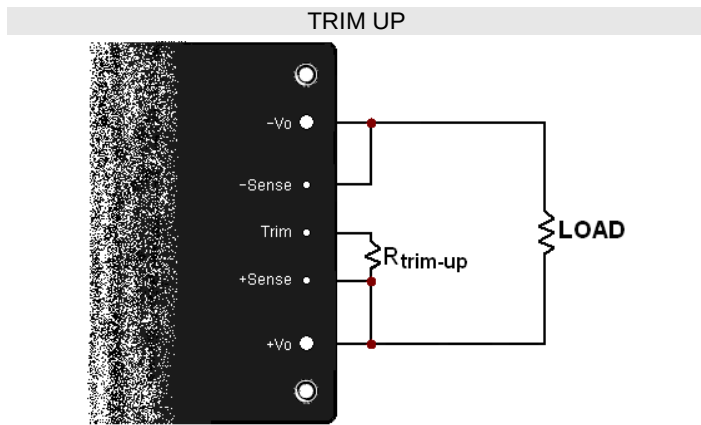
- All dimensions in inch (mm)
- Tolerance: x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
- Screw 1 locked torque: MAX 11.2kgf-cm/ 1.10N-m
- Screw 2 locked torque: MAX 5.2kgf-cm/ 0.51N-m
- Screw 3,4 locked torque: MAX 12.0kgf-cm/ 1.18N-m

OUTPUT VOLTAGE ADJUSTMENT

Output is adjustable for 10% trim up or -20% trim down of nominal output voltage by connecting an external resistor between the TRIM pin and either the +SENSE or -SENSE pins. With an external resistor between the TRIM and -SENSE pin, the output voltage set decreases. With an external resistor between the TRIM and +SENSE pin, the output voltage set point increases. Maximum output deviation is +10% inclusive of remote sense. The value of the external resistor can be obtained by the equations below. The external TRIM resistor needs to be at least 1/8W resistor.

$$R_U = \left(\frac{V_{OUT}(100 + \Delta\%)}{1.225\Delta\%} - \frac{(100 + 2\Delta\%)}{\Delta\%} \right) K\Omega$$

$$R_D = \left(\frac{100}{\Delta\%} - 2 \right) K\Omega$$



MODEL NUMBER SETUP

DCHBW	75	-	48	S	05
Series Name	Output Power		Input Voltage	Output Quantity	Output Voltage
	75: 75 Watts		24: 9~36VDC 48: 18~75VDC 110: 43~160VDC	S: Single	3.3: 3.3VDC 05: 5VDC 12: 12VDC 15: 15VDC 24: 24VDC 28: 28VDC 48: 48VDC

R	TH	H	TF
Remote On/Off & Pin Length	Thru-Hole Inserts ⁽¹⁾	Heatsink ⁽¹⁾	Terminal Block ⁽²⁾
None: Positive Logic, 0.200" pin length S: Positive Logic, 0.145" pin length R: Negative Logic, 0.200" pin length RL: Negative Logic, 0.145" pin length	None: Threaded Inserts TH: Ø0.126 thru-hole inserts ⁽¹⁾	None: No Heatsink H: 0.45" Vertical 7G-0021A-F H1: 0.24" Horizontal 7G-0022A-F H2: 0.24" Vertical 7G0023A-F H3: 0.45" Horizontal 7G-0024A-F	None: No Terminal Block T: Wall Mounted TF: Wall Mounted with EMC Filter ⁽³⁾ T1: Wall Mounted with EMC filter can be connected to PE ⁽³⁾

NOTES

- Models with thru-hole inserts cannot be equipped with a heatsink.
- Only 0.200" pin length is available with terminal block options.
- EMI Filter meets EN55011, EN55022 Class A

COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
Toll Free: ☎(888)597-9255
Fax: ☎(603)778-9797
E-mail: sales@wallindustries.com
Web: www.wallindustries.com
Address: 37 Industrial Drive
Exeter, NH 03833