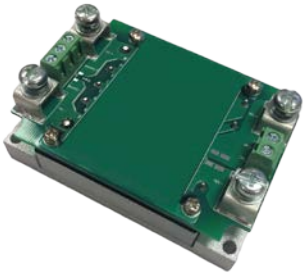
Standard

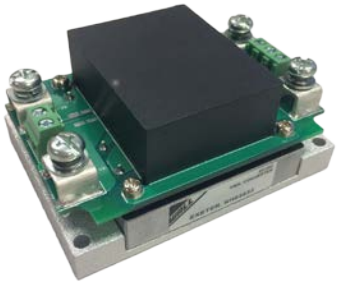
Size: 2.4in x 2.28in x 0.5in

Terminal Block ("T" Suffix)



Size: 3.35in x 2.4in x 1.27in

Terminal Block w/ EMC Filter ("TF" Suffix)



Size: 3.35in x 2.4in x 1.47in

Terminal Block w/ EMC Filter ("TF1" Suffix)

Size: 4in x 3.5in x 3.5in

OPTIONS

- Pin Length
- Sync Pin
- Case Pin
- Heatsinks
- Thru-Hole Inserts
- Negative Logic Remote On/Off
- Terminal Block
- Terminal Block with EMC Filter (EN55022 Class A)

APPLICATIONS

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

FEATURES

- Soft Start
- 2:1 Wide Input Voltage Ranges
- 132~196 Watts output Power
- Single Outputs Ranging from 3.3VDC to 48VDC
- Output Current up to 40A
- Under Voltage Lockout
- Six-Sided Shielding
- High Efficiency up to 93%
- UL60950-1, EN60950-1, IEC60950-1, & EN50155 Safety Approvals
- No Minimum Load Requirements
- Adjustable Output Voltage
- Industry Standard Half-Brick Footprint
- Remote On/Off Control
- Input to Output Basic Insulation: 2250VDC
- Threaded Inserts and Thru-Hole Inserts Available
- Short Circuit, Over Voltage, Over Current, and Over Temperature Protection
- RoHS II & Reach Compliant
- Several Mechanical Options Available

DESCRIPTION

The DCHB150 series of DC/DC power converters provides up to 196 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 2:1 wide input voltage ranges. Some features include high efficiency up to 93%, adjustable output voltage, positive remote on/off control, and six-sided shielding. These converters also have short circuit, over voltage, over current, and over temperature protection. The DCHB150 series is RoHS compliant and has UL60950-1, EN60950-1, IEC60950-1, and EN50155 safety approvals. Several different options are available for this series including negative remote on/off control, terminal block, pin length, heatsinks, sync pin, case pin, and thru-hole inserts. Please call factory for more details.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current		Ripple & Noise[2] [3]	No Load Input Current[1]	Output Power	Maximum Capacitive Load[4]	Efficiency[2]
			Min Load	Max Load					
DCHB150-12S3.3	12VDC (9-22VDC)	3.3 VDC	0mA	40A	75mVp-p	30mA	132W	121000µF	88%
DCHB150-12S05		5 VDC	0mA	28A	75mVp-p	50mA	140W	56000µF	90%
DCHB150-12S12	12VDC (8.5-22VDC)	12 VDC	0mA	12A	100mVp-p	50mA	144W	10000µF	91%
DCHB150-12S15		15 VDC	0mA	9.5A	100mVp-p	80mA	142.5W	6300µF	91%
DCHB150-12S24		24 VDC	0mA	6A	200mVp-p	60mA	144W	2500µF	90%
DCHB150-12S28		28 VDC	0mA	5A	200mVp-p	60mA	140W	1700µF	91%
DCHB150-12S48		48 VDC	0mA	3A	300mVp-p	80mA	144W	620µF	90%
DCHB150-24S3.3	24VDC (16.5-36VDC)	3.3 VDC	0mA	40A	75mVp-p	20mA	132W	121000µF	90%
DCHB150-24S05		5 VDC	0mA	30A	75mVp-p	30mA	150W	60000µF	91%
DCHB150-24S12		12 VDC	0mA	13A	100mVp-p	35mA	156W	10800µF	92%
DCHB150-24S15		15 VDC	0mA	10A	100mVp-p	35mA	150W	6600µF	92%
DCHB150-24S24		24 VDC	0mA	6.5A	200mVp-p	35mA	156W	2700µF	93%
DCHB150-24S28		28 VDC	0mA	5.5A	200mVp-p	50mA	154W	1900µF	93%
DCHB150-24S48		48 VDC	0mA	3.3A	300mVp-p	50mA	158.4W	680µF	92%
DCHB150-48S3.3	48VDC (33-75VDC)	3.3 VDC	0mA	45A	75mVp-p	20mA	148.5W	136000µF	91%
DCHB150-48S05		5 VDC	0mA	34A	75mVp-p	20mA	170W	68000µF	92%
DCHB150-48S12		12 VDC	0mA	16A	100mVp-p	25mA	192W	13300µF	92%
DCHB150-48S15		15 VDC	0mA	13A	100mVp-p	25mA	195W	8600µF	93%
DCHB150-48S24		24 VDC	0mA	8A	200mVp-p	25mA	192W	3300µF	92%
DCHB150-48S28		28 VDC	0mA	7A	200mVp-p	25mA	196W	2500µF	92%
DCHB150-48S48		48 VDC	0mA	4A	300mVp-p	25mA	192W	830µF	92%
DCHB150-48S53		53 VDC	0mA	3.7A	300mVp-p	25mA	196W	690µF	92%

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							
Operating Input Voltage Range		12VDC nominal input models	3.3 & 5VDC models	9	12	22	VDC
			Others	8.5	12	22	
		24VDC nominal input models		16.5	24	36	
		48VDC nominal input models		33	48	75	
Start-Up Voltage		12VDC nominal input models				9	VDC
		24VDC nominal input models				18	
		48VDC nominal input models				34	
Shutdown Voltage		12VDC nominal input models		7.3		8.1	VDC
		24VDC nominal input models		15.5		16.3	
		48VDC nominal input models		31.6		32.5	
Input Surge Voltage (1 Sec)		12VDC nominal input models				30	VDC
		24VDC nominal input models				50	
		48VDC nominal input models				100	
Input Current		No Load		See Table			
Sync Pin Signal[14]				-0.3		5.6	VDC
Input Filter[13]				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[6]		Maximum output deviation is inclusive of remote sense		-20		+10	%
Remote Sense[7]		% of Vout(nom)				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 (peak to peak)		20MHz bandwidth		See Table			
Transient Response Recovery Time		25% load step change			200	250	µS
Start-Up Time	Power Up	Nominal input and constant resistive load			75		mS
	Remote On/Off				75		
Temperature Coefficient				-0.02		+0.02	%/ºC
REMOTE ON/OFF CONTROL[5]							
Positive Logic (Option)	DC/DC ON			Open or 3~12VDC			
	DC/DC OFF			Short or 0~1.2VDC			
Negative Logic (Standard)	DC/DC ON			Short or 0~1.2VDC			
	DC/DC OFF			Open or 3~12VDC			
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		120		150	%
Over Voltage Protection		% of Vout(nom); Hiccup mode		115		130	%
Over Temperature Protection					+120		ºC
ENVIRONMENTAL SPECIFICATIONS							
Operating Case Temperature				-40		+115	ºC
Storage Temperature		Terminal Block Type		-40		+105	ºC
		Others		**-55**		**+125**	
Thermal Impedance[8]		Standard			6.1		ºC/W
		Only mount on the iron base-plate			2.8		
		With 0.24" Heatsink			5.1		
		With 0.45" Heatsink			4.6		
Thermal Shock				MIL-STD-810F			
Vibration				MIL-STD-810F			
Relative Humidity				5		95	%
MTBF		MIL-HDBK-217F, Full Load			381,800		

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
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load			See Table		
Switching Frequency			225	250	275	kHz
Isolation Voltage	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			3.70oz (105g)		
	"T" suffix models			8.29oz (235g)		
	"TF" suffix models			9.88oz (280g)		
	"TF1" suffix models			26.10oz (740g)		
Dimensions (L x W x H)	Standard			2.4x2.28x0.5 inches (61x57.9x12.7 mm)		
	"T" suffix models			3.35x2.4x1.27 inches (85x61x32.3 mm)		
	"TF" suffix models			3.35x2.4x1.47 inches (85x61x37.3 mm)		
	"TF1" suffix models			4x3.5x3.5 inches (101.6x88.9x88.9 mm)		
Case Material				Metal		
Base Material				FR4 PCB		
Potting Material				Silicone (UL94 V-0)		
Shielding				Six-sided		
SAFETY & EMC CHARACTERISTICS						
Safety Approvals	UL60950-1, EN60950-1, IEC60950-1, EN50155					
EMI[9]	EN55022					Class A Class B
ESD	EN61000-4-2	Air ±8KV Contact ±6KV				Perf. Criteria A
Radiated Immunity	EN61000-4-3	20V/m				Perf. Criteria A
Fast Transient[10]	EN61000-4-4	±2KV				Perf. Criteria A
Surge[10]	EN61000-4-5	EN55024 ±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

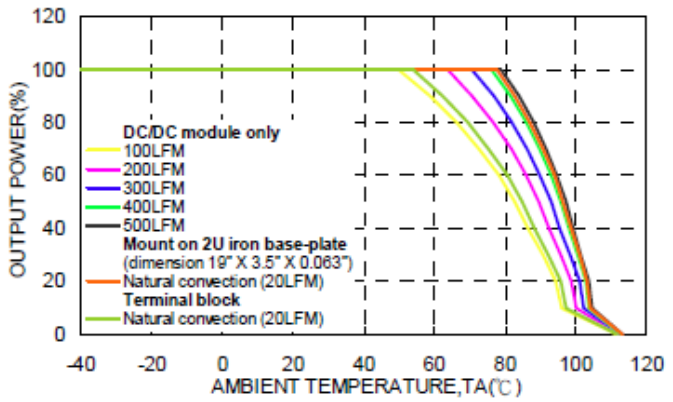
NOTES

(1) Typical value at nominal input voltage and no load.
(2) Typical voltage at nominal input voltage and full load.
(3) The ripple and noise of output voltages 24VDC and 28VDC is measured with a 4.7µF/50V 1812 X7R MLCC;
The ripple and noise of output voltages 48VDC and 53VDC is measured with a 2.2µF/100V 1812 X7R MLCC.
The ripple and noise of all other output voltages is measured with a 1µF/25V X7R MLCC and a 22µF/25V D-type POS-CAP.
(4) Test by minimum input and constant resistive load.
(5) The CTRL pin voltage is referenced to –INPUT. To order negative logic remove on/off control add the suffix "R" to the model number (Ex: DCHB150-48S12R).
(6) Output voltage is adjustable for 10% trim up or -20% trim 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. Maximum output deviation is inclusive of remote sense. To calculate the value of the resistor R_U and R_D for a particular output voltage see page 6.
(7) 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.
(8) - Thermal test conditions for vertical direction are by natural convention (20LFM)
- The iron base-plate dimensions are 19" x 3.5" x 0.063" (the height is EIA standard 2U).
- Heat sink is optional.
(9) The DCHB150 series can only meet EN55022 Class A or Class B with external components added. Please contact factory for more information.
(10) An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5. We recommend connecting two aluminum electrolytic capacitors (Nippon chemi-con KY series, 220µF /100V, ESR 48mΩ) in parallel.
(11) CASE GROUNDING: EMI can be reduced when you connect the four screw bolts to the shield plane.
(12) Input Source Impedance: These converters will meet all listed specifications without external components assuming that the source voltage has very low impedance and reasonable input voltage regulation. Highly inductive source impedances can affect the stability of the converter. Since real-world voltage sources have finite impedance, performance can be improved by adding an external filter capacitor. We recommend Nippon chemi-con KY series, 100µF/100V, ESR 110mΩ.
(13) - Multiple DCHB150 series modules can be synchronized together simply by connecting the module SYNC pins together. Care should be taken to ensure the ground potential differences between the modules are minimized.
- In this configuration all of the modules will be synchronized together to the highest frequency module.
- Up to three modules can be synchronized using this technique.
- More relevant information in application notes.
(14) This series comes with several different options: negative remote on/off control, heatsinks, case pin, sync pin, pin length, terminal block, and thru-hole inserts. See the "Product Options" table on page 6 for more ordering information.

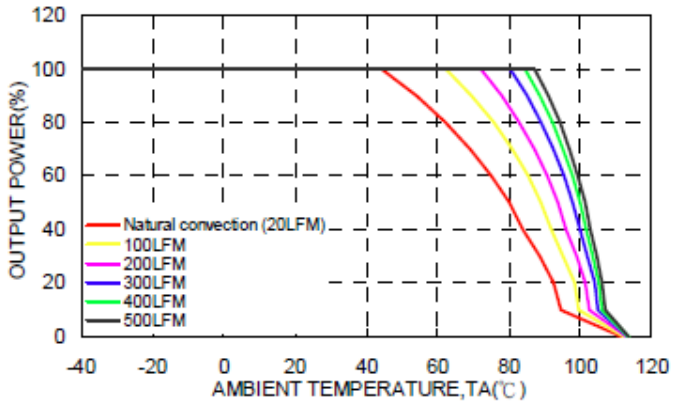
CAUTION: This power converter is not internally fuses. An input line fuse must always be used
Due to advances in technology, specifications subject to change without notice.

DERATING CURVES

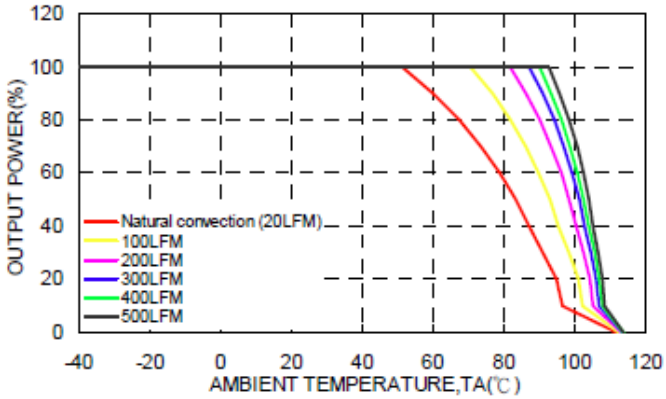
DCHB150-48S05 Derating Curve



DCHB150-48S05 Derating Curve With 0.24" Height Heat-Sink

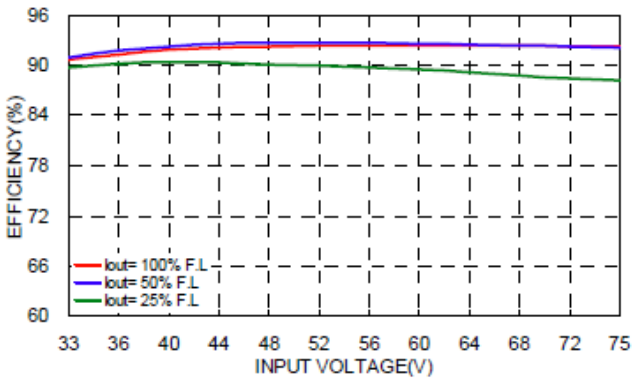


DCHB150-48S05 Derating Curve With 0.45" Height Heat-Sink

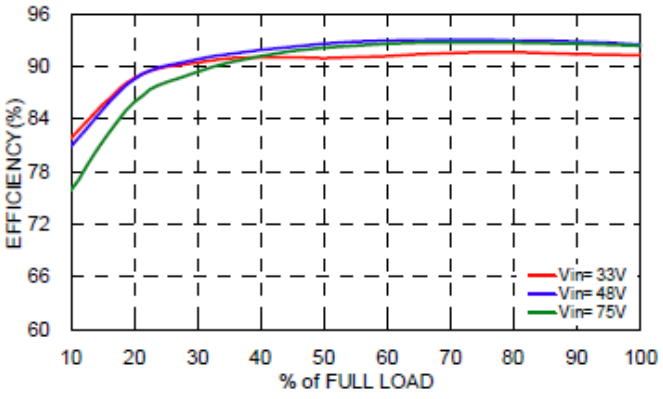


EFFICIENCY GRAPHS

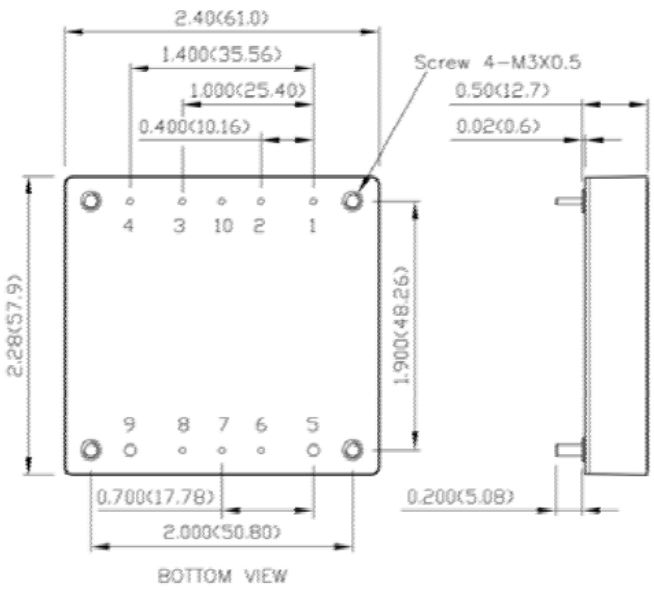
DCHB150-48S05 Efficiency vs. Input Voltage



DCHB150-48S05 Efficiency vs. Output Load



MECHANICAL DRAWINGS



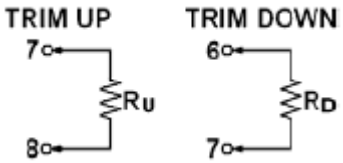
1. All dimensions in inch (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)
5. Mounting screw should always be used.
6. The screw locked torque: MAX 5.0kgf-cm (0.49N-m)

PIN CONNECTION

PIN	DEFINE	DIAMETER
1	-Vin	0.04 Inch
2	Case (option)	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
10	Sync (option)	0.04 Inch

EXTERNAL OUTPUT TRIMMING

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

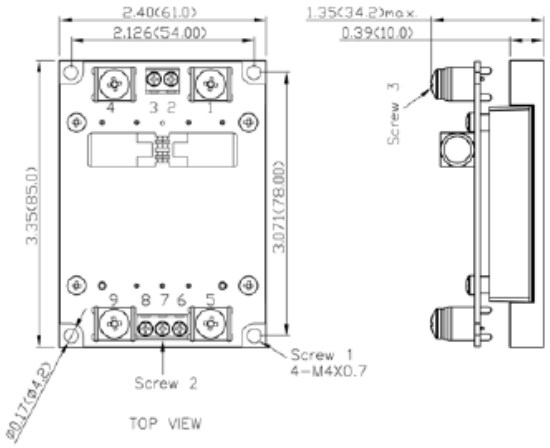


$$R_U = \left(\frac{V_{OUT}\ (100\ + \Delta\%)}{1.225\ \Delta\%} - \frac{(100\ + 2\Delta\%)}{\Delta\%} \right) k\Omega$$

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

DCHB150-xxSxx-T

Terminal Block without EMC Filter, Suffix: -T



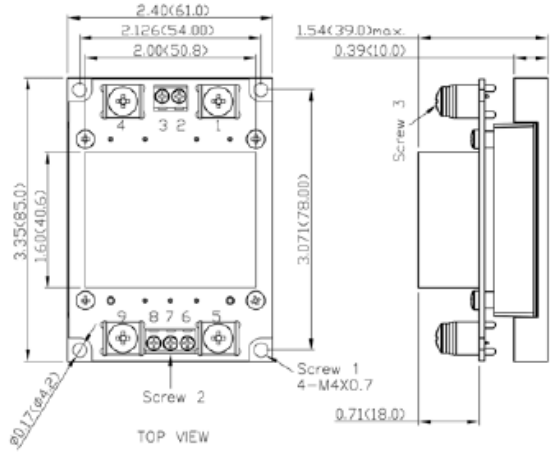
TERMINAL CONNECTION

NO.	DEFINE	WIRE RANGE
1	-Vin	8AWG to 9AWG
2	NC	NA
3	Ctrl	14AWG to 18AWG
4	+Vin	8AWG to 9AWG
5	-Vout	4AWG to 5AWG
6	-Sense	14AWG to 18AWG
7	Trim	14AWG to 18AWG
8	+Sense	14AWG to 18AWG
9	+Vout	4AWG to 5AWG

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. The screw 1 locked torque: MAX 11.2kgf-cm(1.10N-m)
4. The screw 2 locked torque: MAX 5.2kgf-cm(0.51N-m)
5. The screw 3 locked torque: MAX 16.8kgf-cm(1.65N-m)

DCHB150-xxSxx-TF

Terminal Block with EMC filter (EN55022 Class A) , Suffix: -TF



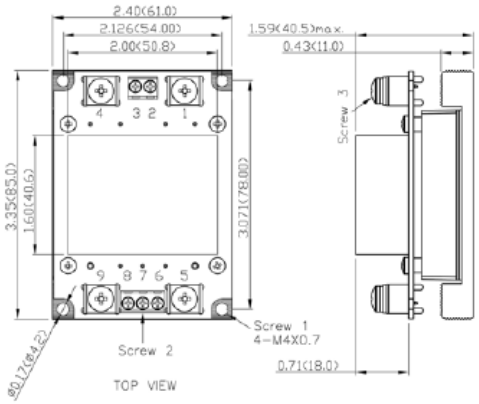
TERMINAL CONNECTION

NO.	DEFINE	WIRE RANGE
1	-Vin	8AWG to 9AWG
2	NC	NA
3	Ctrl	14AWG to 18AWG
4	+Vin	8AWG to 9AWG
5	-Vout	4AWG to 5AWG
6	-Sense	14AWG to 18AWG
7	Trim	14AWG to 18AWG
8	+Sense	14AWG to 18AWG
9	+Vout	4AWG to 5AWG

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. The screw 1 locked torque: MAX 11.2kgf-cm(1.10N-m)
4. The screw 2 locked torque: MAX 5.2kgf-cm(0.51N-m)
5. The screw 3 locked torque: MAX 16.8kgf-cm(1.65N-m)

DCHB150-xxSxx-TF1

Terminal Block with EMC filter (EN55022 Class A) can be connected to PE ⏚, Suffix: -TF1



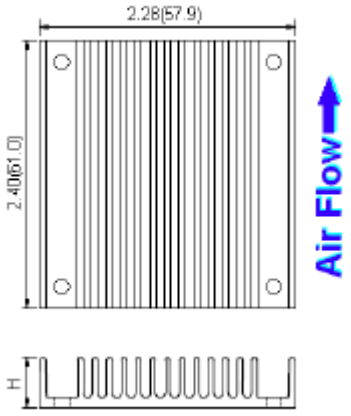
TERMINAL CONNECTION

NO.	DEFINE	WIRE RANGE
1	-Vin	8AWG to 9AWG
2	NC	NA
3	Ctrl	14AWG to 18AWG
4	+Vin	8AWG to 9AWG
5	-Vout	4AWG to 5AWG
6	-Sense	14AWG to 18AWG
7	Trim	14AWG to 18AWG
8	+Sense	14AWG to 18AWG
9	+Vout	4AWG to 5AWG

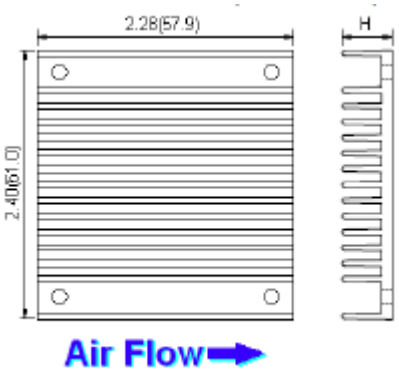
1. All dimensions in inch (mm)
2. Tolerance: X.XX±0.02 (X.X±0.5)
   X.XXX±0.01 (X.XX±0.25)
3. The screw 1 locked torque: MAX 11.2kgf-cm(1.10N-m)
4. The screw 2 locked torque: MAX 5.2kgf-cm(0.51N-m)
5. The screw 3 locked torque: MAX 16.8kgf-cm(1.65N-m)

HEATSINK OPTIONS

Vertical Fin Orientation, Suffix: -HS, HS2



Horizontal Fin Orientation, Suffix: -HS1, HS3



HS:	Height H=0.45" vertical fin, 7G-0021A-F
HS1:	Height H=0.24" horizontal fin, 7G-0022A-F
HS2:	Height H=0.24" vertical fin, 7G-0023A-F
HS3:	Height H=0.45" horizontal fin, 7G-0024A-F

1. All dimensions in inch (mm)
2. Tolerance :x.xx±0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)

MODEL NUMBER SETUP

DCHB	150	-	24	S	12	P
Series Name	Output Power		Input Voltage	Output Quantity	Ouptut Voltage	Remote On/Off & Pin Length
	150: 150 Watts		**12:** 8.5~22 VDC 9~22 VDC **24:** 16.5~36 VDC **48:** 33~75 VDC	**S:** single	**3.3:** 3.3 VDC **05:** 5 VDC **12:** 12 VDC **15:** 15 VDC **24:** 24 VDC **28:** 28 VDC **48:** 48 VDC **53:** 53 VDC	**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

Y	C	TH	H	TF
Sync Pin	Case Pin	Thru-Hole Inserts(1)	Heatsink	Terminal Block(2)
Blank: No Pin **SY:** sync pin	**Blank:** No Pin **CP:** case pin	**None:** threaded inserts **TH:** No Thread	**None:** no heatsink **H:** 0.45" vertical 7G-0021A-F **H1:** 0.24" horizontal 7G-0022A-F **H2:** 0.24" vertical 7G-0023A-F **H3:** 0.45" horizontal 7G-0024A-F	**None:** No terminal block **T:** wall mounted **TF:** wall mounted with EMC filter (3) **TF1:** wall mounted with EMC filter can be connected to PE (3)

NOTES
1. The module can't equip Heat-Sink with TH option
2. No Y and C function for terminal block type, and terminal block type only for 0.200" pin length.
3. EMI filter meets 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.

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