



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

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
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		75		mS		
	Remote On/Off	Nominal input and constant resistive load	75				
Temperature Coefficient		-0.02		+0.02	%/°C		
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		°C		

ENVIRONMENTAL SPECIFICATIONS					
Operating Case Temperature		-40		+115	°C
Storage Temperature	Terminal Block Type	-40		+105	°C
	Others	-55		+125	
Thermal Impedance ⁽⁸⁾	Standard		6.1		°C/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				

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 Contact	±8KV ±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

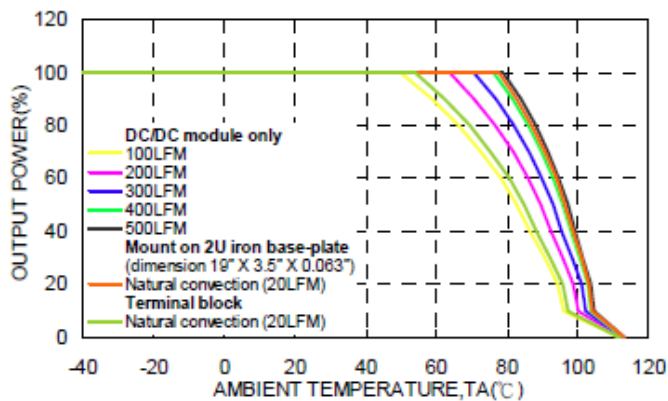
NOTES

- (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 convection (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.

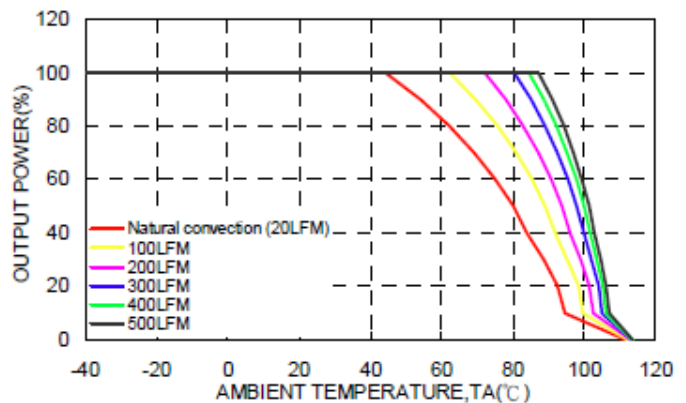
CAUTION: This power converter is not internally fuses. An input line fuse must always be used

DERATING CURVES

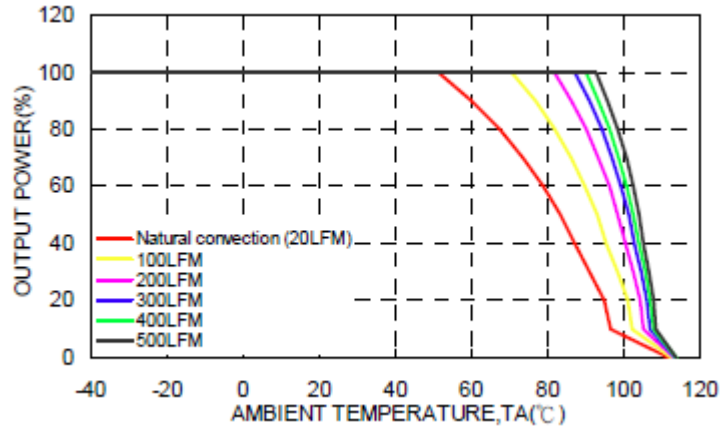
DCHB150-48S05 Derating Curve



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

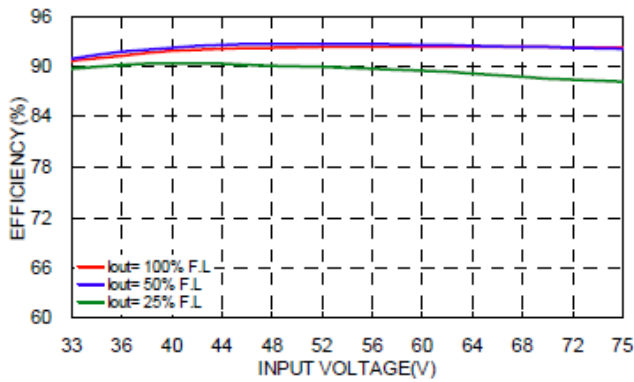


DCHB150-48S05 Derating Curve With 0.45" Height Heat-Sink

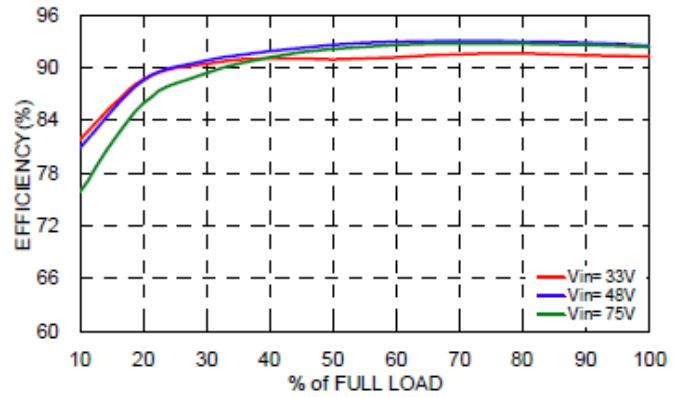


EFFICIENCY GRAPHS

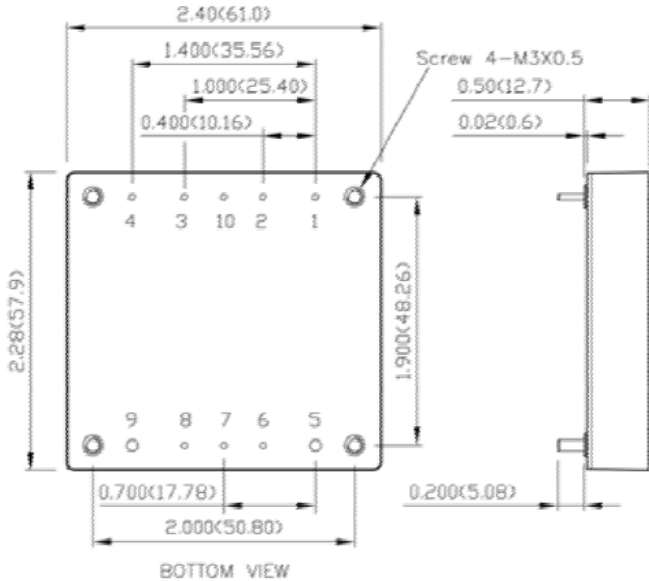
DCHB150-48S05 Efficiency vs. Input Voltage



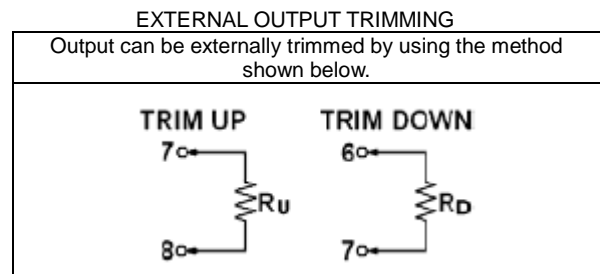
DCHB150-48S05 Efficiency vs. Output Load



MECHANICAL DRAWINGS



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



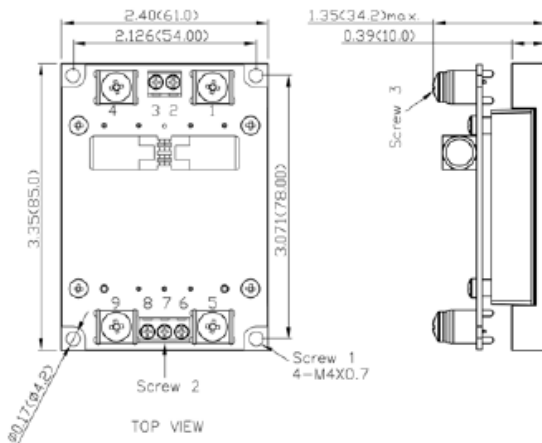
1. All dimensions in inch (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)
x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)
5. Mounting screw should always be used.
6. The screw locked torque: MAX 5.0kgf-cm (0.49N-m)

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

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

DCHB150-xxSxx-T

Terminal Block without EMC Filter, Suffix: -T

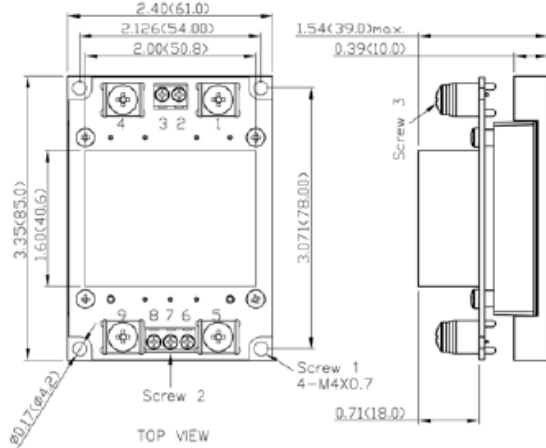


TERMINAL CONNECTION		
NO.	DEFINE	WIRE RANGE
1	-Vin	8AWG to 9AWG
2	NC	NA
3	Ctrl	14AWG to 18AWG
4	+Vin	8AWG to 9AWG
5	-Vout	4AWG to 5AWG
6	-Sense	14AWG to 18AWG
7	Trim	14AWG to 18AWG
8	+Sense	14AWG to 18AWG
9	+Vout	4AWG to 5AWG

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



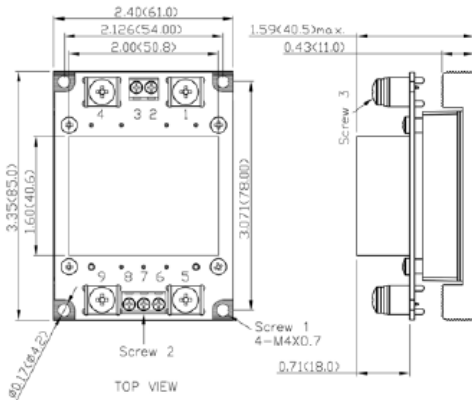
TERMINAL CONNECTION

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

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

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

HEATSINK OPTIONS

<p>Vertical Fin Orientation, Suffix: -HS, HS2</p>	<p>Horizontal Fin Orientation, Suffix: -HS1, HS3</p>
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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	Output 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⁾ wall mounted with EMC filter can TF1: 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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