



DCW150

Size: 2.56in x 3.86in x 0.67in (65mm x 98mm x 17mm)



DCWD150

Size: 2.07in x 3.86in x 0.67in (52.5mm x 98mm x 17mm)



OPTIONS

- Negative Logic Remote ON/OFF
- Heatsink

FEATURES

- 200 Watts Maximum Output Power
- 4:1 Wide Input Voltage Range
- High Efficiency up to 89%
- CV+CC Mode
- No Minimum Load Required
- 2250VDC Input to Output Isolation
- Adjustable Output Voltage
- Reverse Polarity Protection
- Remote On/Off
- Six-Sided Continuous Shield
- Built-In EN55032 Class A Filter
- Over Voltage, Over Load, Short Circuit, Over Temperature and Under Voltage Protection
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals
- CE Marked
- Compliant to RoHS & REACH
- Compliance to EN50155 and EN45545-2 Railway Standard

APPLICATIONS

- Railway System
- Automation
- Telecom/Datacom
- Industrial
- IPC
- Measurement
- Battery Charger

DESCRIPTION

The DCW150 and DCWD150 series of DC/DC converters provides up to 200 watts of output power. This series consists of single output models with a wide 4:1 input voltage range. Each model in this series features an adjustable output voltage, constant current mode output limit, and 2250VDC input to output isolation. The models are also protected against over voltage, over load, short circuit, over temperature, and under voltage conditions and are compliant to both RoHS and REACH. The DCW150 and DCWD150 series are CE marked, have UL60950-1, EN60950-1 and IEC60950-1 safety approvals, and meet EN50155 and EN45545-2 railway standards.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current ⁽¹⁾	Ripple & Noise	No Load Input Current	Maximum Capacitive Load	Efficiency
DCW24S12-150 DCWD24S12-150	24VDC (9~36VDC)	12VDC	12.5A	100mVp-p	70mA	40000µF	86%
DCW24S15-150 DCWD24S15-150		15VDC	10A	100mVp-p	80mA	26000µF	86%
DCW24S24-150 DCWD24S24-150		24VDC	6.3A	200mVp-p	95mA	10000µF	87%
DCW24S28-150 DCWD24S28-150		28VDC	5.4A	200mVp-p	120mA	7600µF	87%
DCW24S48-150 DCWD24S48-150		48VDC	3.2A	350mVp-p	130mA	2600µF	86%
DCW48S12-150 DCWD48S12-150		48VDC (18~75VDC)	12VDC	12.5A	100mVp-p	50mA	40000µF
DCW48S15-150 DCWD48S15-150	15VDC		10A	100mVp-p	60mA	26000µF	89%
DCW48S24-150 DCWD48S24-150	24VDC		6.3A	200mVp-p	60mA	10000µF	89%
DCW48S28-150 DCWD48S28-150	28VDC		5.4A	200mVp-p	70mA	7600µF	89%
DCW48S48-150 DCWD48S48-150	48VDC		3.2A	350mVp-p	70mA	2600µF	88%
DCW110S12-150 DCWD110S12-150	110VDC (43~160VDC)		12VDC	12.5A	100mVp-p	25mA	40000µF
DCW110S15-150 DCWD110S15-150		15VDC	10A	100mVp-p	25mA	26000µF	89%
DCW110S24-150 DCWD110S24-150		24VDC	6.3A	200mVp-p	25mA	10000µF	89%
DCW110S28-150 DCWD110S28-150		28VDC	5.4A	200mVp-p	25mA	7600µF	89%
DCW110S48-150 DCWD110S48-150		48VDC	3.2A	350mVp-p	35mA	2600µF	88%

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input, and Full Load 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	24Vin (Nominal)	9	24	36	VDC
	48Vin (Nominal)	18	48	75	
	110Vin (Nominal)	43	110	160	
Start-Up Voltage	24Vin (Nominal)			9	VDC
	48Vin (Nominal)			18	
	110Vin (Nominal)			43	
Shutdown Voltage	24Vin (Nominal)	7.9	8.2	8.5	VDC
	48Vin (Nominal)	15.6	16.2	16.8	
	110Vin (Nominal)	33.0	34.5	36.0	
Input Surge Voltage	1 second, max.	24Vin (Nominal)		50	VDC
		48Vin (Nominal)		100	
		110Vin (Nominal)		185	
Input Filter		Pi Type			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Accuracy		-1.0		+1.0	%
Line Regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load Regulation	No Load to Full Load	-0.4		+0.4	%
Voltage Adjustability	Use a resistor across on the Trim1 and Trim2 to adjust the output voltage			+20	%
Output Power				200	W
Output Current		See Table			
Maximum Capacitive Load		See Table			
Ripple & Noise (20MHz bandwidth)	Measured by 20MHz bandwidth	12V, 15V	100		mVp-p
		24V, 28V	200		
		48V	350		
Transient Response Recovery Time	25% Load Step Change		200		µS
Start-Up Time	Constant Resistive Load	Power Up	35		ms
		Remote ON/OFF	35		
Temperature Coefficient		-0.02		+0.02	%/°C
REMOTE ON/OFF CONTROL⁽²⁾					
Positive Logic (Standard)	DC-DC ON	Open or 3~12VDC			
	DC-DC OFF	Short or 0~1.2VDC			
Negative Logic (Option)	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			3.5		mA
PROTECTION					
Short Circuit Protection		Continuous, Automatic Recovery			
Over Load Protection	% of Iout rated, CC Mode	105		120	%
Over Voltage Protection	% of Vout (nominal); Hiccup	125		140	%
Over Temperature Protection			+110		°C
ENVIRONMENTAL SPECIFICATIONS					
Operating Case Temperature		-40		+100	°C
Maximum Case Temperature			+100		°C
Storage Temperature Range		-55		+125	°C
Relative Humidity		5		95	%RH
Thermal Shock		MIL-STD-810F			
Shock		EN61373, MIL-STD-810F			
Vibration		EN61373, MIL-STD-810F			
Thermal Impedance	Only mount on the iron base-plate		2.55		°C/W
	Mount on the iron base-plate and top side with 7G-0058A heat-sink		2.0		
MTBF	MIL-HDBK-217, Full Load		495,400		Hours

SPECIFICATIONS

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

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
GENERAL SPECIFICATIONS						
Efficiency			See Table			
Switching Frequency	24VDC Input	48Vout	248	275	303	kHz
		Others	270	300	330	
	48VDC Input	48Vout	248	275	303	
		Others	270	300	330	
	110VDC Input	All	203	225	248	
Isolation Voltage	1 minute	Input to Output	2250			VDC
		Input (Output) to Case	1600			
Isolation Resistance	500VDC		1			GΩ
Isolation Capacitance					3500	pF
PHYSICAL SPECIFICATIONS						
Weight	DCW150		7.94oz (225g)			
	DCWD150		7.76oz (220g)			
	With Filter ("-F" Suffix)		11.46oz (325g)			
Dimensions (L x W x H)	DCW150		2.56in x 3.86in x 0.67in (65mm x 98mm x 17mm)			
	DCWD150		2.07in x 3.86in x 0.67in (52.5mm x 98mm x 17mm)			
Case Material			Aluminum			
Base Material			Aluminum			
Potting Material			Silicone (UL94 V-0)			
Shielding			Six-Sided			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals			IEC/UL/EN60950-1 ⁽³⁾		CB:UL (Demko)	
Standard Approvals			EN50155 EN45545-2			
EMI	EN55011, EN550322 without external components		DC-DC Module		Class A	
ESD	EN61000-4-2	Air ±8kV and Contact ±6kV			Perf. Criteria A	
Radiated Immunity	EN61000-4-3	10 V/m			Perf. Criteria A	
Fast Transient ⁽⁴⁾	EN61000-4-4	±2kV			Perf. Criteria A	
Surge ⁽⁴⁾	EN61000-4-5	EN55024 ±1kV and EN50155 ±2kV			Perf. Criteria A	
Conducted Immunity	EN61000-4-6	10 Vr.m.s			Perf. Criteria A	
Power Frequency Magnetic Field	EN61000-4-8	100A/m continuous; 1000A/m 1 second			Perf. Criteria A	

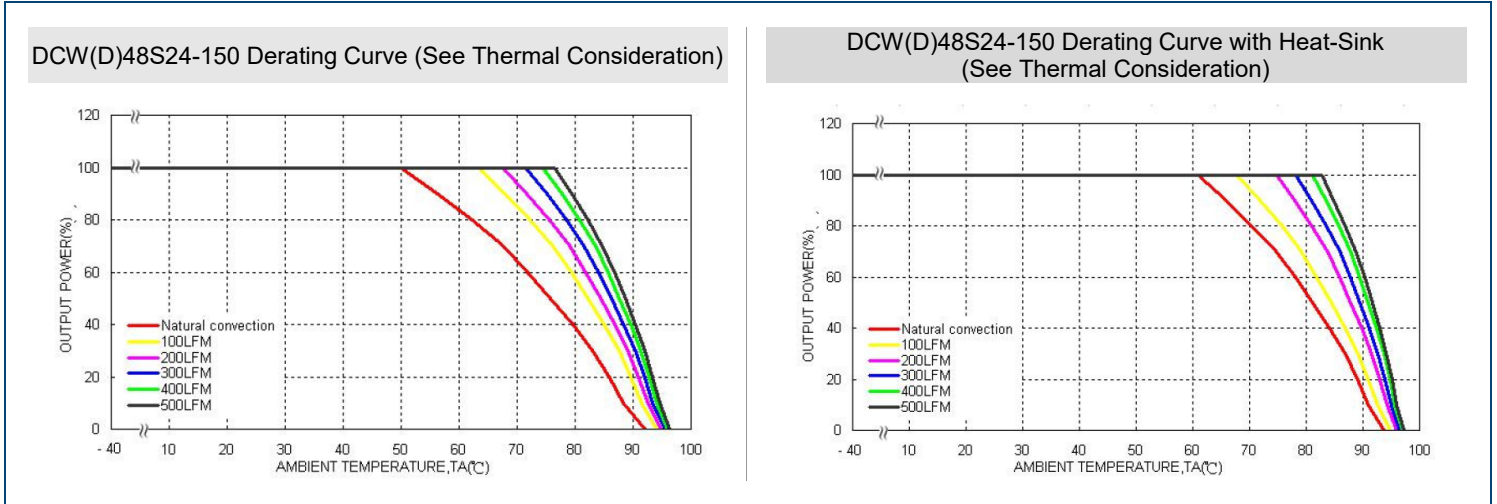
NOTES

- (1) Measured at Full Load.
- (2) The remote ON/OFF control pin voltage is referenced to -Vin. The negative logic is optional.
- (3) This product is Listed to applicable standards and requirements by UL.
- (4) An external input filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5. We suggest the following:
DCW(D)150-24Sxx: Nippon chemi-con KY series, 470µF/50V
DCW(D)150-48Sxx: Nippon chemi-con KY series, 220µF/100V
DCW(D)150-110Sxx: Nippon chemi-con KXJ series, 150µF/200V

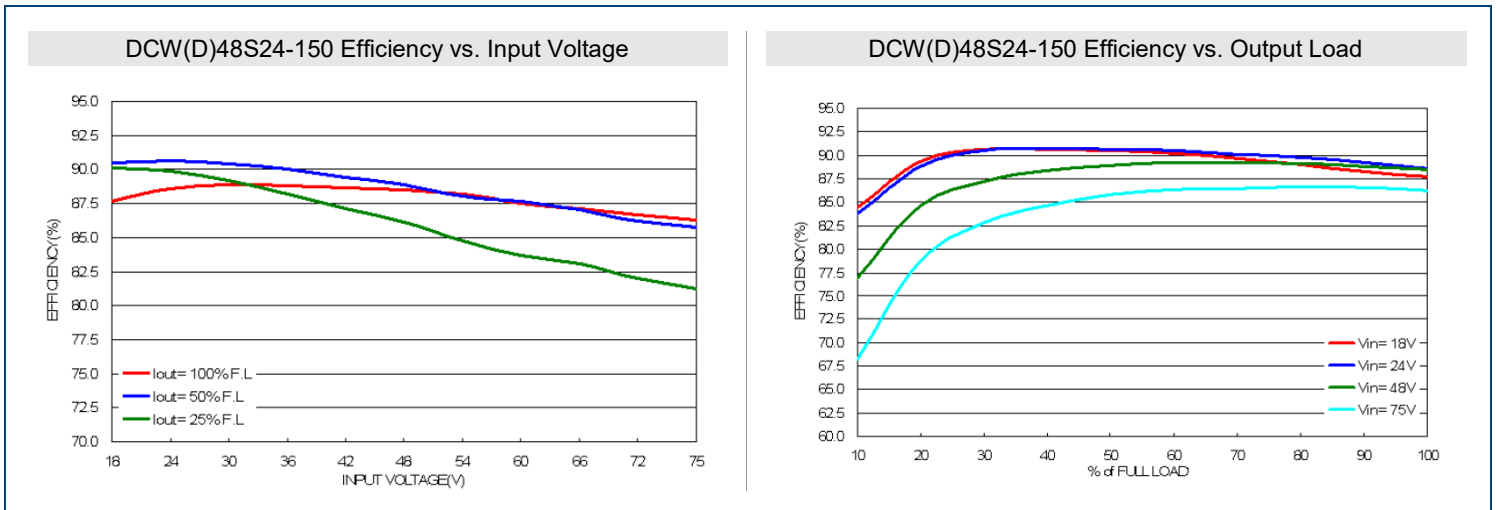
CAUTION: This power module is not internally fused; an input line fuse must always be used. If the load has sourcing capability (ex. Battery or super capacitor), an output line fuse must always be used.

**Due to advances in technology, specifications subject to change without notice.*

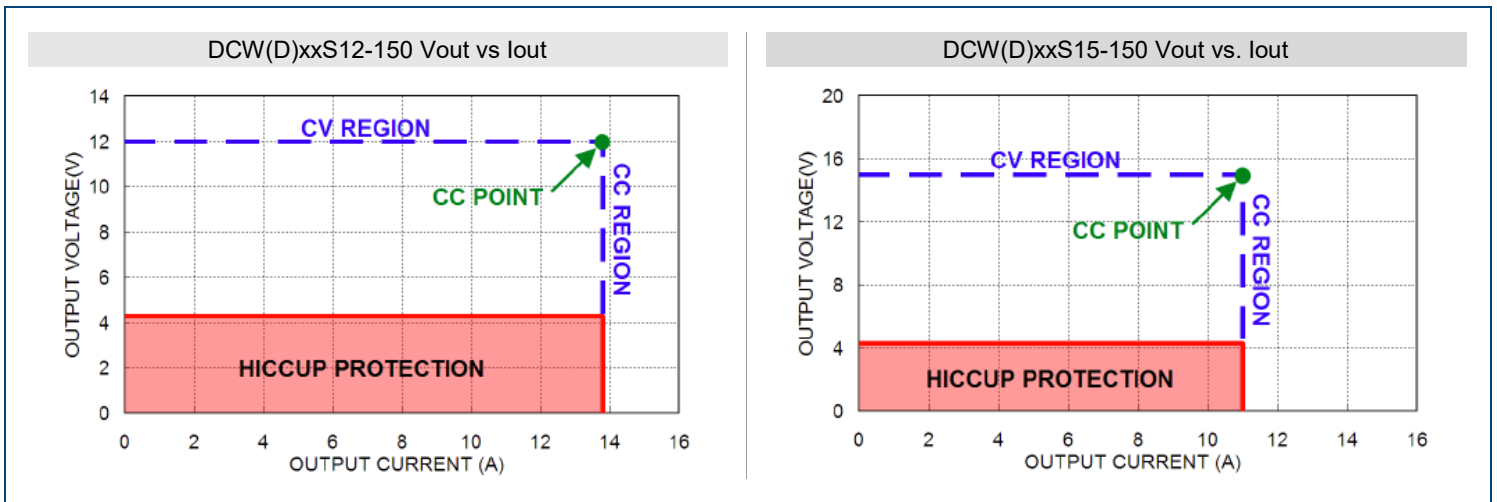
DERATING CURVES

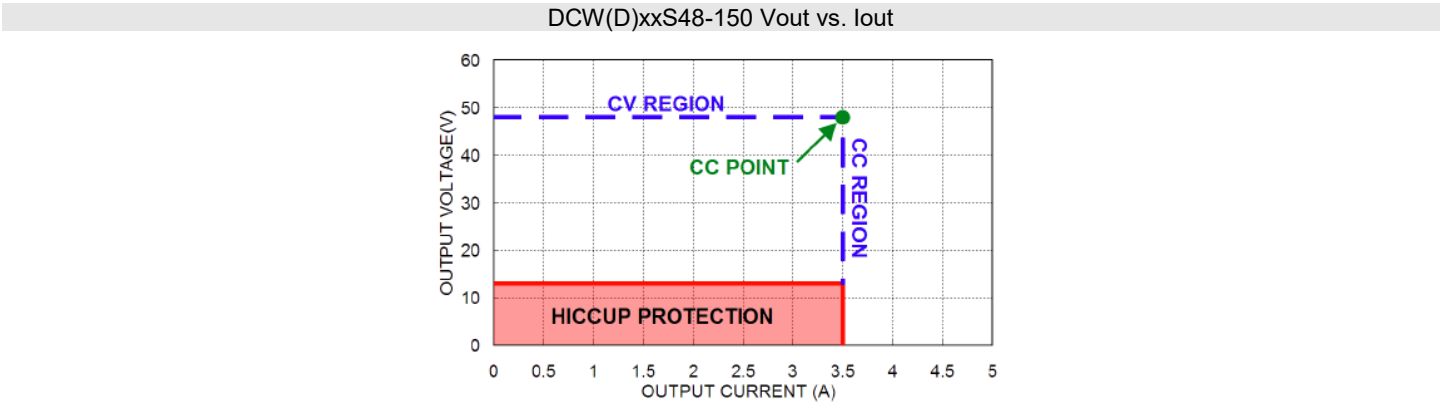
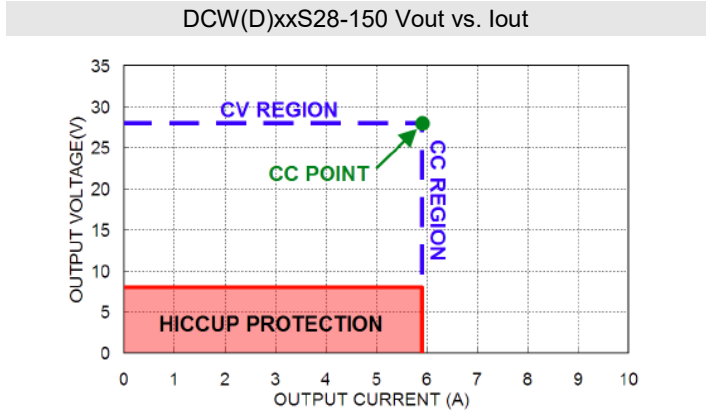
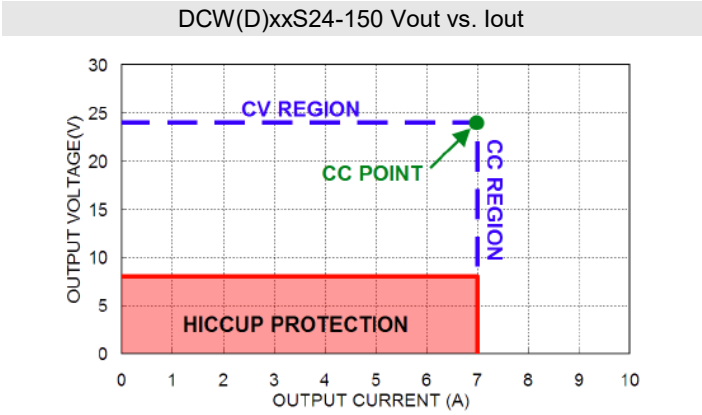


EFFICIENCY GRAPHS



CHARACTERISTIC CURVE





MODE	DESCRIPTION	CONDITION
CV Region	In normal operation. The output current is shown in data sheet.	Resistance Load > Vout/Iout (CC Point)
CC Region	If the output load current are over rating, the output current will keep in a constant value and output voltage will fall	Resistance Load < Vout/Iout (CC Point)
Hiccup Protection	If the output resistance becomes short, it will operate in hiccup protection	DCW(D)xxS12-150, DCW(D)xxS15-150: Vout < 4.3V (typ.) to Output Short DCW(D)xxS24-150, DCW(D)xxS28-150: Vout < 8.0V (typ.) to Output Short DCW(D)xxS48-150: Vout < 13V (typ.) to Output Short

FUSE CONSIDERATION

This power module is not internally fused. An input line fuse must always be used. This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture. To maximum flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

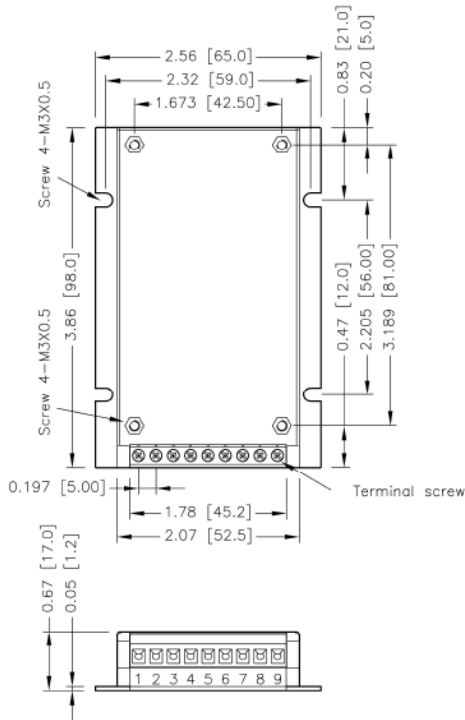
The suggested input line fuse is below:

Model	Fuse Rating (A)	Fuse Type
DCW(D)150-24Sxx	30	Fast-Acting
DCW(D)150-48Sxx	15	Fast-Acting
DCW(D)150-110Sxx	6.3	Slow-Blow

The table is based on the information provided in this data sheet on inrush energy and maximum DC input current at low Vin.

MECHANICAL DRAWINGS

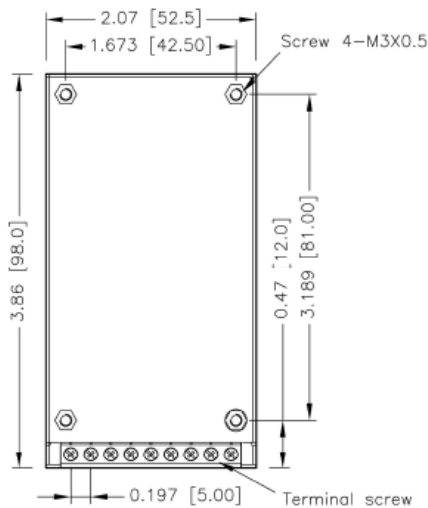
DCW150 Mechanical Drawing



TERMINAL CONNECTION

PIN	DEFINE	WIRE GAUGE RECOMMENDATIONS
1	+Vin	14~16AWG
2	+Vin	14~16AWG
3	-Vin	14~16AWG
4	-Vin	14~16AWG
5	Ctrl	14~24AWG
6	+Vout	14~16AWG
7	-Vout	14~16AWG
8	Trim 1	14~24AWG
9	Trim 2	14~24AWG

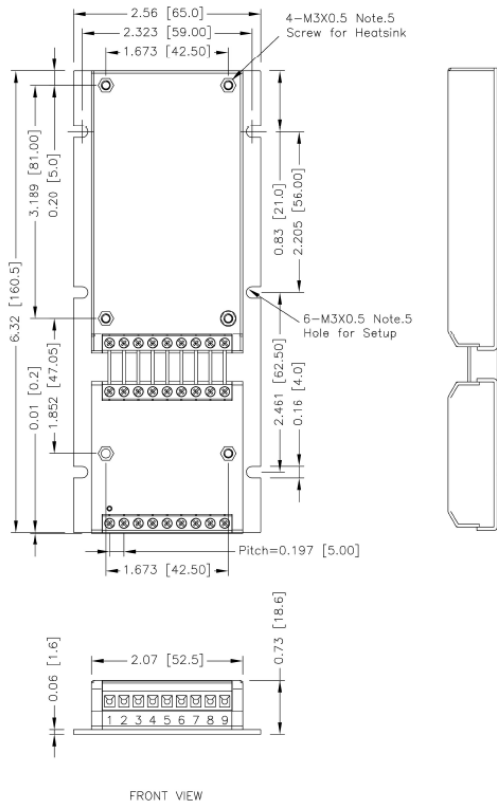
DCWD150 Mechanical Drawing



Notes:

1. All dimensions in inch (mm)
2. Tolerance: $x.xx \pm 0.02$ ($x.x \pm 0.5$)
 $x.xxx \pm 0.01$ ($x.xx \pm 0.25$)
3. Pole pitch tolerance ± 0.01 (0.25)
4. Screw locked torque: MAX 5.0kgf-cm (0.49N-m)
5. Terminal screw locked torque: MAX 2.5kgf-cm (0.25N-m)

With EMI Filter Module



TERMINAL CONNECTION

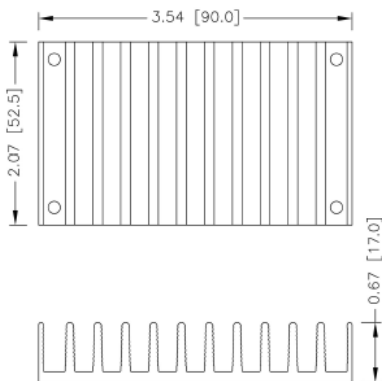
PIN	DEFINE	WIRE GAUGE RECOMMENDATIONS
1	+Vin	14~16AWG
2	+Vin	14~16AWG
3	-Vin	14~16AWG
4	-Vin	14~16AWG
5	Ctrl	14~24AWG
6	+Vout	14~16AWG
7	-Vout	14~16AWG
8	Trim 1	14~24AWG
9	Trim 2	14~24AWG

Notes:

1. All dimensions in inch (mm)
2. Tolerance: $x.xx \pm 0.02$ ($x.x \pm 0.5$)
 $x.xxx \pm 0.01$ ($x.xx \pm 0.25$)
3. Pole pitch tolerance ± 0.01 (0.25)
4. Screw locked torque: MAX 5.0kgf-cm(0.49N-m)
5. Terminal screw locked torque: MAX 2.5kgf-cm(0.25N-m)

HEATSINK OPTIONS

Heat-sink Part No: 7G-0058A-F, Suffix: -HC



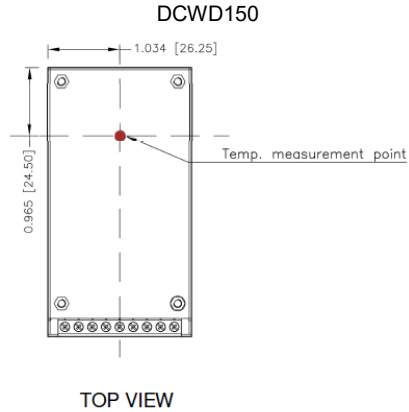
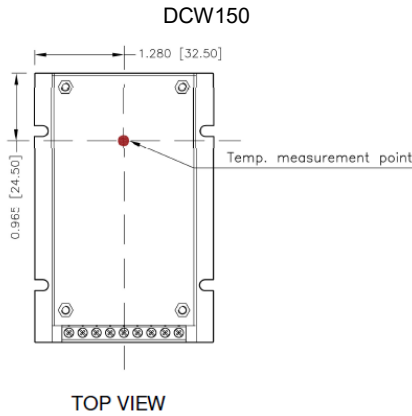
Notes:

1. All dimensions in inch (mm)

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding Environment. Proper cooling can be verified by measuring the point in the figure below. The temperature at this location should not exceed 100°C. When operating, adequate cooling must be provided to maintain the test point temperature at or below 100°C. Although the maximum point Temperature of the power module is 100°C, you can limit this Temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM)

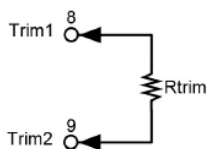


OUTPUT VOLTAGE ADJUSTMENT

The output voltage is adjustable from 0% to +20% trim up of nominal output voltage by connecting an external resistor between the Trim1 and Trim 2 pins. With an external resistor between the Trim1 and Trim2 pins, the output voltage set point increases. The maximum output deviation is +20%. The external TRIM resistor needs to be at least 1/16W resistors.

EXTERNAL OUTPUT TRIMMING

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



12V Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	12.12	12.24	12.36	12.48	12.6	12.72	12.84	12.96	13.08	13.2
RU (k Ω)	222.64	105.09	66.35	47.06	35.51	27.83	22.34	18.23	15.03	12.48
ΔV (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	13.32	13.44	13.56	13.68	13.8	13.92	14.04	14.16	14.28	14.4
RU (k Ω)	10.39	8.65	7.18	5.91	4.82	3.86	3.02	2.27	1.60	0.99

15V Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	15.15	15.3	15.45	15.6	15.75	15.9	16.05	16.2	16.35	16.5
RU (k Ω)	238.62	113.62	71.95	51.12	38.62	30.29	24.33	19.87	16.40	13.62
ΔV (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	16.65	16.8	16.95	17.1	17.25	17.4	17.55	17.7	17.85	18
RU (k Ω)	11.35	9.45	7.85	6.48	5.29	4.25	3.33	2.51	1.78	1.12

24V Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	24.24	24.48	24.72	24.96	25.2	25.44	25.68	25.92	26.16	26.4
RU (k Ω)	212.47	106.69	68.79	49.30	37.43	29.44	23.70	19.37	15.99	13.28
ΔV (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	26.64	26.88	27.12	27.36	27.6	27.84	28.08	28.32	28.56	28.8
RU (k Ω)	11.06	9.20	7.63	6.28	5.11	4.08	3.18	2.37	1.65	1.00

28V Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	28.28	28.56	28.84	29.12	29.4	29.68	29.96	30.24	30.52	30.8
RU (k Ω)	255.65	121.72	77.08	54.76	41.36	32.44	26.06	21.28	17.56	14.58
ΔV (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	31.08	31.36	31.64	31.92	32.2	32.48	32.76	33.04	33.32	33.6
RU (k Ω)	12.14	10.11	8.40	6.93	5.65	4.53	3.55	2.67	1.89	1.19

48V Models

ΔV (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	48.48	48.96	49.44	49.92	50.4	50.88	51.36	51.84	52.32	52.8
RU (k Ω)	268.86	127.44	80.57	57.19	43.17	33.84	27.17	22.18	18.29	15.18
ΔV (%)	11	12	13	14	15	16	17	18	19	20
Vout (V)	53.28	53.76	54.24	54.72	55.2	55.68	56.16	56.64	57.12	57.6
RU (k Ω)	12.64	10.52	8.73	7.20	5.87	4.70	3.67	2.76	1.94	1.21

MODEL NUMBER SETUP

DCW(D)	48	S	24	-	150	N	F ⁽¹⁾	HC
Series Name	Input Voltage	Output Quantity	Output Voltage		Output Power	Remote Control Option	Filter Option	Assembly Option
	24: 9~36VDC 48: 18~75VDC 110: 43~160VDC	S: Single	12: 12VDC 15: 15VDC 24: 24VDC 28: 28VDC 48: 48VDC			None: Positive Logic N: Negative Logic	None: NC F: EMI Filter Module	None: None HC: H=0.670" Horizontal, 7G-0058A-F

Notes:

- EMI filter meets EN55032 Class B
This EMI filter is used for DCWD-24Sxx-150 and DCWD-48Sxx-150 only, not for other items. (Ex: DCWD-24S24-150-F)

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: 2015 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:

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