

## Features

- 4:1 Wide Input Range
- Operating Temperature Range: -40~100°C
- Approved to UKCA, CB, CE, RoHS & REACH
- Approved to IEC/UL/EN62368-1 & EN50155
- Efficiency up to 89%
- EMC Class A
- Single 150W Output Models
- Six-Sided Shielding
- OCP, OTP, OVP, SCP & UVP



Ideal Power's 43WAF150-xSzW 150W Series DIP DC/DC Converters are certified to cURus, UKCA, CB, CE, RoHS, REACH & IEC/UL/EN 62368-1, EN 50155 Standards and comply with the relevant Efficiency Regulations. These are primarily used in ITE, Video & Audio, Railway Industries and customised solutions are available upon request.

### Part Number Structure

43WAF150	-	24	S	12	W	-	N	F	HC	S
Series Name		Output Power (VDC)	Output Quantity	Output Voltage (VDC)	Input Range		Remote Control Options	Filter Options	Assembly Options	Connector Options
		<b>24:</b> 3 ~ 36 <b>48:</b> 18 ~ 75 <b>110:</b> 43 ~ 160	<b>S:</b> Single	<b>3P3:</b> 3.3 <b>05:</b> 5 <b>12:</b> 12 <b>15:</b> 15 <b>24:</b> 24	4 : 1		<input type="checkbox"/> : Positive Logic <input type="checkbox"/> : Negative Logic	<input type="checkbox"/> : None <b>R:</b> Conformal Coating	<input type="checkbox"/> : None <b>HC:</b> H=0.670" Horizontal 7G-0058A-F	<input type="checkbox"/> : Euro Screw Type <b>S:</b> Spring Clamp Type
			<b>D:</b> Dual	<b>12:</b> ±12 <b>15:</b> ±15 <b>24:</b> ±24						

\*EMI filters meet EN55032 Class B  
 This EMI filter is only used for  
 WAD150-24S□□W and  
 WAD150-48S□□W  
 Not for other items  
 (Ex: WAD150-24S24W-F)

**Models**

Model Number	Input Range VDC	Output Voltage VDC	Output Current @ Full Load mA	Input Current @ No Load %	Efficiency %	Maximum Capacitor Load %
43WAF150-24S12W	9 ~ 36	12	12.5	70	86	40000
43WAF150-24S15W	9 ~ 36	15	10	80	86	26000
43WAF150-24S24W	9 ~ 36	24	6.3	95	87	10000
43WAF150-24S28W	9 ~ 36	28	5.4	120	87	7600
43WAF150-24S48W	9 ~ 36	48	3.2	130	86	2600
43WAF150-48S12W	18 ~ 75	12	12.5	50	88	40000
43WAF150-48S15W	18 ~ 75	15	10	60	89	26000
43WAF150-48S24W	18 ~ 75	24	6.3	60	89	10000
43WAF150-48S28W	18 ~ 75	28	5.4	70	89	7600
43WAF150-48S48W	18 ~ 75	48	3.2	70	88	2600
43WAF150-110S12W	43 ~ 160	12	12.5	25	88	40000
43WAF150-110S15W	43 ~ 160	15	10	25	89	26000
43WAF150-110S24W	43 ~ 160	24	6.3	25	89	10000
43WAF150-110S28W	43 ~ 160	28	5.4	25	89	7600
43WAF150-110S48W	43 ~ 160	48	3.2	35	88	2600

**Input Specifications**

Parameter	Conditions	Min	Typ	Max	Unit
Operating input voltage range	24Vin(nom)	9	24	36	
	48Vin(nom)	18	48	75	
	110Vin(nom)	43	110	160	
Start-up voltage	24Vin(nom)			9	VDC
	48Vin(nom)			18	
	110Vin(nom)			43	
Shutdown voltage	24Vin(nom)	7.9	8.2	8.5	
	48Vin(nom)	15.6	16.2	16.8	
	110Vin(nom)	33	34.5	36	
Start-up time	Constant resistive load	Power up	35		ms
		Remote ON/OFF	35		
Input surge voltage	100 ms, max.	24Vin(nom)		50	VDC
		48Vin(nom)		100	
		110Vin(nom)		185	
Remote ON/OFF	Referred to -Vin pin	Positive logic (Standard)	DC-DC ON	Open or 3.0 ~ 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 3.0 ~ 12VDC	
		Input current of Ctrl pin		-0.5	1
Remote off input current			3.5		

**Output Specifications**

Parameter	Conditions	Min	Typ	Max	Unit
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	
Ripple and Noise	Measured by 20MHz bandwidth				mVp-p
		12Vout, 15Vout	100		
		24Vout, 28Vout	200		
		48Vout	350		
Temperature coefficient		-0.02		+0.02	%/°C
Transient response recovery time	25% Load step change		200		µs
Over voltage protection	% of Vout(nom); Hiccup mode	125		140	%
Overload protection	% Of Iout rated	105		120	%
Short circuit protection		Continuous automatic recovery			

**General Specifications**

Parameter	Conditions	Min	Typ	Max	Unit	
Isolation voltage	1 minute	Input to Output			V DC	
	For Euro Screw Type terminal block	2250				
	1 minute	Input (Output) to Case				
	For Spring Clamp Type terminal block	1600				
		Input to Output				
		Input (Output) to Case				
Isolation resistance	500VDC	1			GΩ	
Isolation capacitance				3500	pF	
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	
	Safety approvals	IEC /EN/ UL62368-1				
Standard approvals	EN50155 EN45545-2					
Case material					Aluminum	
Base material					Aluminum	
Potting material					Silicone (UL94 V-0)	
Weight					220g (7.76oz.)	
MTBF	MIL-HDBK-217F, Full load				4.954 x 10 <sup>5</sup> hrs	

**Environmental Specifications**

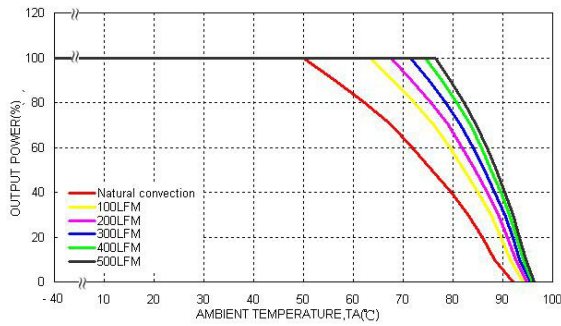
Parameter	Conditions	Min	Typ	Max	Unit
Operating ambient temperature		-40		+100	
Maximum case temperature			100		°C
Over temperature protection			110		
Storage temperature range		-55		+125	
Thermal impedance	Only mount on the iron baseplate		2.55		
	Mount on the iron baseplate and top side with 7G-0058A Heat-sink		2.0		
Thermal Shock					MIL-STD-810F
Shock					EN61373, MIL-STD-810F
Vibration					EN61373, MIL-STD-810F
Relative humidity					5% to 95% RH

**EMC Specifications**

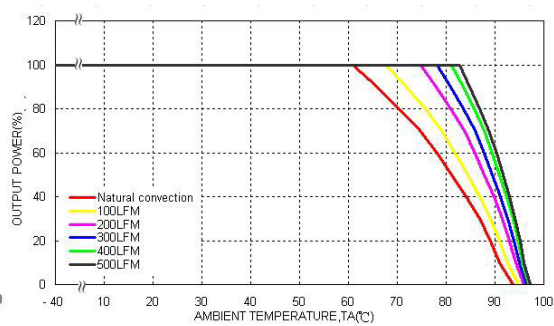
Parameter	Conditions	Level
EMI	EN55032, EN50121-3-2	Class B
EMS	EN55024, EN50121-3-2	
ESD	EN61000-4-2 Air ± 8kV and Contact ± 6kV	Perf. Criteria A
Radiated immunity	EN61000-4-3 20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV	Perf. Criteria A
	43WAF(D)150-24S□□W With an external input filter capacitor (Nippon chemi-con KY series, 470µF/50V.)	
	43WAF(D)150-48S□□W With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)	
	43WAF(D)150-110S□□W With an external input filter capacitor (Nippon chemi-con KXJ series, 150µF/200V.)	
Surge	EN61000-4-5 EN55024 ±1kV and EN50121-3-2 ±2kV	Perf. Criteria A
	43WAF(D)150-24S□□W With an external input filter capacitor (Nippon chemi-con KY series, 470µF/50V.)	
	43WAF(D)150-48S□□W With an external input filter capacitor (Nippon chemi-con KY series, 220µF/100V)	
	43WAF(D)150-110S□□W With an external input filter capacitor (Nippon chemi-con KXJ series, 150µF/200V.)	
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

**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.

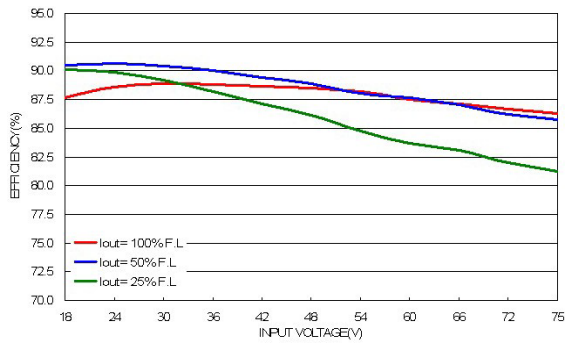
**Characteristic Curve**



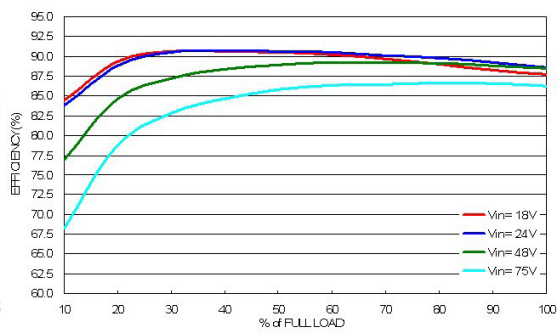
**43WAF(D)150-48S24W Derating Curve**  
(See Thermal Consideration)



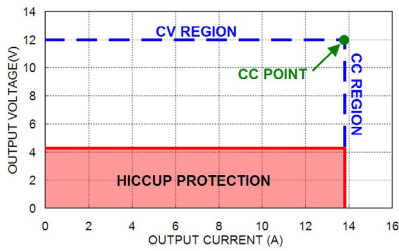
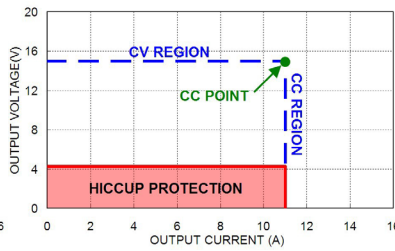
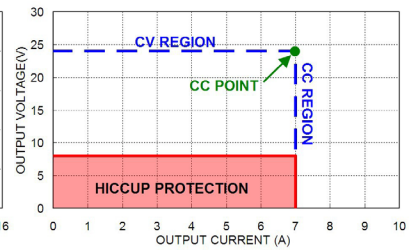
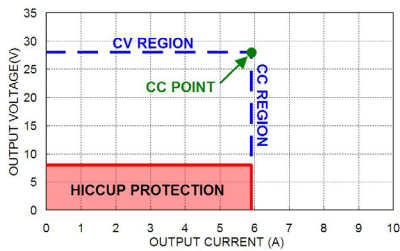
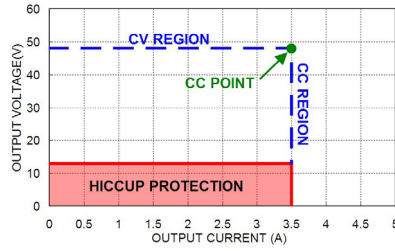
**43WAF(D)150-48S24W Derating Curve with Heat-sink**  
(See Thermal Consideration)



**43WAF(D)150-48S24W Efficiency vs. Input Voltage**



**43WAF(D)150-48S24W Efficiency vs. Output Load**

**Characteristic Curve (Continued)**

**43WAF(D)150-S12W**  
 Vout vs. Iout

**43WAF(D)150-S15W**  
 Vout vs. Iout

**43WAF(D)150-S24W**  
 Vout vs. Iout

**43WAF(D)150-S28W**  
 Vout vs. Iout

**43WAF(D)150-S48W**  
 Vout vs. Iout

Mode	Description	Condition
CV Region	In normal operation, the output current is shown in datasheet	Resistance Load > $V_{out} / I_{out}$ (CC Point)
CC Region	If the output load current is over rating, the output current will keep in a constant value, and the output voltage will fall.	Resistance Load < $V_{out} / I_{out}$ (CC Point)
Hiccup Protection	If the output resistance become short, it will operate in hiccup protection.	WAF(D)150-S12W, WAF(D)150-S15W: $V_{out} < 4.3V$ (typ.) to Output Short  WAF(D)150-S24W, WAF(D)150-S28W: $V_{out} < 8.0V$ (typ.) to Output Short.  WAF(D)150-S48W: $V_{out} < 13V$ (typ.) to Output Short.

**Fuse Consideration**

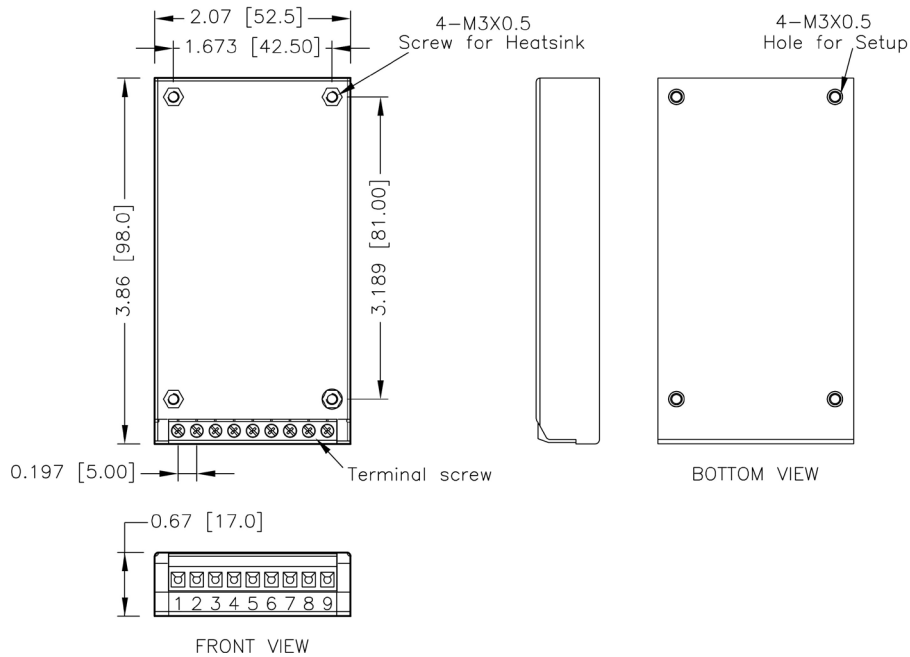
This power module is not internally fused. An input line fuse must always be used. This encapsulated power module can be used in a wide variety of applications, ranging from simple stand-alone operation to an integrated part of sophisticated power architecture. To maximum flexibility, internal fusing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

Model	Fuse Rating (A)	Fuse Type
43WAF(D)150-24S-W	30	Fast-Acting
43WAF(D)150-48S-W	15	Fast-Acting
43WAF(D)150-110S-W	6.3	Slow-Blow

The table based on the information provided in this data sheet on inrush energy and maximum DC input current at low  $V_{in}$ .

**Mechanical Drawing**

43WAD



All dimensions in inch [mm]

Tolerance :x.xx±0.02 [x.x±0.5]

x.xxx±0.010 [x.xx±0.25]

The screw locked torque: MAX 5.0kgf-cm[0.49N-m]

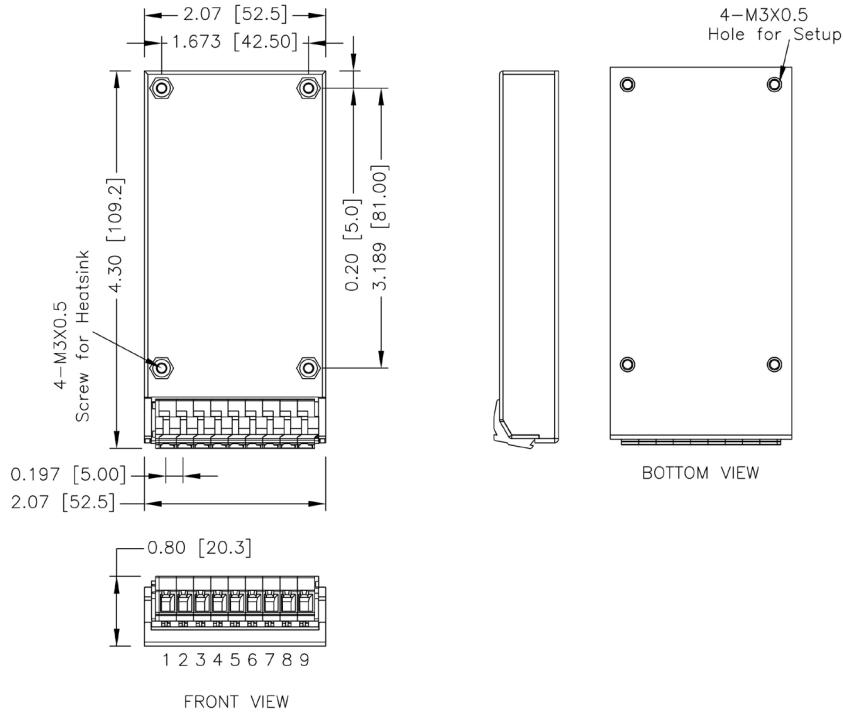
Terminal screw locked torque: MAX 2.5kgf-cm[0.25N-m]

**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

**Mechanical Drawing (Continued)**

43WAD-S



1. All dimensions in inch [mm]
2. Tolerance : x.xx±0.02 [x.x±0.5]  
 x.xxx±0.010 [x.xx±0.25]
3. The screw locked torque: MAX 5.0kgf-cm [0.49N-m]

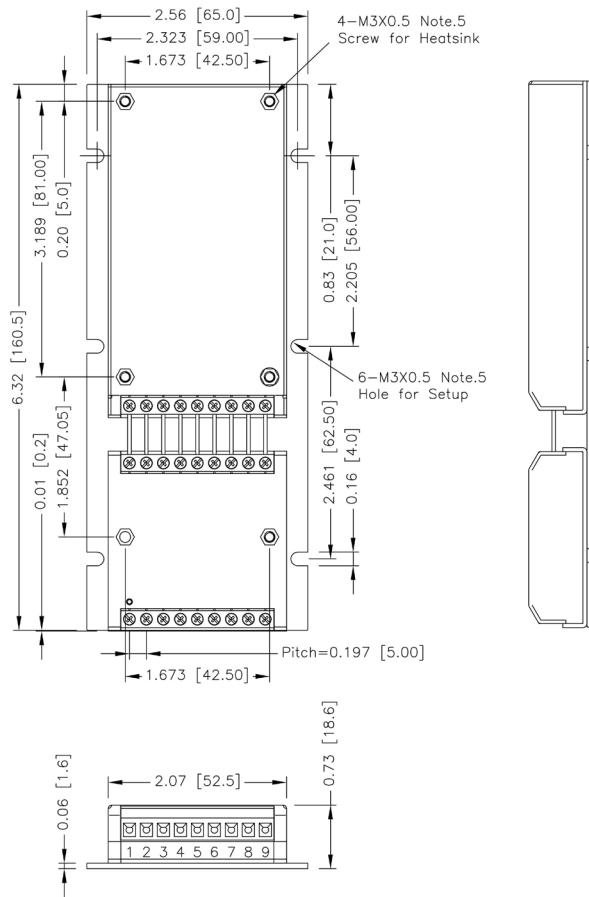
**Terminal Connection**

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



**Mechanical Drawing (Continued)**

43WAD150-24S□□W-F  
43WAD150-48S□□W-F



All dimensions in inch [mm]

Tolerance :x.xx±0.02 [x.xx±0.5]

x.xxx±0.01 [x.xx±0.25]

Pole pitch tolerance ±0.01 [0.25]

Screw locked torque: MAX 5.0kgf-cm[0.49N-m]

Terminal screw locked torque: MAX 2.5kgf-cm[0.25N-m]

FRONT VIEW

**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

**Connector Options**
**Blank:**

**Euro Screw Type**

Mates with  
 Screw locked torque  
 MAX 2.5Kgf.cm/0.25N.m  
 Wire dimension range  
 14 ~ 24AWG

**-S**

**Spring Clamp**

Mates with  
 Wire strip length  
 5 ~ 6mm  
 Wire dimension range  
 14 ~ 24AWG