

Size: 1.10 x 0.94 x 0.34 in
(27.9 x 23.9 x 8.5 mm)

OPTIONS

- SMD Type
- Without Trim Pin
- Without ON/OFF Pin
- Negative Logic Remote ON/OFF

APPLICATIONS

- Automation
- Datacom
- IPC
- Industry
- Measurement
- Telecom

FEATURES

- 15 Watts Max. Output Power
- Single Outputs
- Cost Efficient Open Frame Design
- Small Size and Low Profile: 1.10" x 0.94" x 0.34"
- High Efficiency up to 88%
- 2:1 Wide Input Voltage Ranges: 18-36VDC and 36-75VDC
- Input to Output Isolation: 2250VDC
- No Minimum Load Requirement
- Output Voltage Adjustability
- Industry Standard Pin-out
- Negative or Positive Remote ON/OFF Control
- Short Circuit, Over Current, and Over Voltage Protection
- RoHS Compliant
- IEC/EN/UL 62368-1 Safety Approvals
- Surface Mount and Through Hole Types Available

DESCRIPTION

The JF series of DC/DC power converters provides 15 Watts of output power in a low profile industry standard package and footprint. These converters have single outputs and operate over 2:1 input voltage ranges of 18-36VDC and 36-75VDC. These units are also protected against short circuit, over current, and over voltage conditions. Some features include high efficiency up to 88%, no minimum load requirement, and positive or negative remote ON/OFF control. These converters are RoHS compliant and have IEC/EN/UL 62368-1 safety approvals. Both surface mount ("S" suffix) and DIP (standard) packages are available.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current	Ripple & Noise	No Load Input Current	Output Power	Maximum Capacitive Load	Efficiency
JF24S12-1250	24VDC (18~36VDC)	12 VDC	1250mA	100mVp-p	15mA	Up to 15W	1000μF	87%
JF24S15-1000		15 VDC	1000mA	100mVp-p	15mA		660μF	88%
JF48S12-1250	48VDC (36~75VDC)	12 VDC	1250mA	100mVp-p	10mA	Up to 15W	1000μF	87%
JF48S15-1000		15 VDC	1000mA	100mVp-p	10mA		660μF	88%

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	24Vin(nom)		18	24	36	VDC	
	48Vin(nom)		36	48	75		
Start-Up Voltage	24Vin(nom)				18	VDC	
	48Vin(nom)				36		
Shutdown Voltage	24Vin(nom)		13	14.5	16	VDC	
	48Vin(nom)		28.5	30.5	33		
Input Surge Voltage	100ms, max.	24Vin(nom)			50	VDC	
		48Vin(nom)			100		
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		-0.2		+0.2	%	
Voltage Adjustability	Single Output	24Vout	-10		+10	%	
Output Power			See Table				
Output Current			See Table				
Maximum Capacitive Load			See Table				
Ripple & Noise (20MHz bandwidth)	Measured by 20MHz bandwidth with a 1μF M/C X7R and a 10μF T/C	12Vout, 15Vout		100		mVp-p	
Transient Response Recovery Time	25% load step change, ΔIo/Δt=0.1A/us			300		μs	
Start-Up Time	Constant Resistive Load	Power Up			30	ms	
		Remote On/Off			30		
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.
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SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
REMOTE ON/OFF CONTROL ⁽¹⁾						
Positive Logic (standard)	DC-DC ON		Open or 3~15VDC			
	DC-DC OFF		Short or 0~1.2VDC			
Negative Logic (option)	DC-DC ON		Short or 0~1.2VDC			
	DC-DC OFF		Open or 3~15VDC			
Input Current of CTRL Pin			-0.5		1.0	mA
Remote OFF Input Current					20	mA
PROTECTION						
Short Circuit Protection			Continuous, Automatic Recovery			
Over Load Protection	% of Lout Rated; Hiccup Mode				150	%
Over Voltage Protection	12Vout		13.5		19.6	VDC
	15Vout		16.8		20.5	
Output Voltage Overshoot				3		%
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	With Derating ⁽²⁾		+40		+105	°C
Maximum Case Temperature					120	°C
Storage Temperature Range			-55		+125	°C
Thermal Shock			MIL-STD-810F			
Relative Humidity			5		95	%RH
Vibration			MIL-STD-810F			
Lead-Free Reflow Solder Process	For SMD Type Only		IPC J-STD-020E			
Moisture Sensitivity Level (MSL)	For SMD Type Only		IPC J-STD-033C Level 2a			
MTBF	MIL-HDBK-217F, Full Load		3.438 x 10 ⁶ hrs			
GENERAL SPECIFICATIONS						
Efficiency			See Table			
Switching Frequency			423	470	517	kHz
Isolation Voltage	1 Minute	Input to Output	2250			VDC
Isolation Resistance	500VDC		10			MΩ
Isolation Capacitance				1000		pF
PHYSICAL SPECIFICATIONS						
Weight			0.36oz (10.5g)			
Dimensions (L x W x H)			1.10 x 0.94 x 0.34 inches (27.9 x 23.9 x 8.5 mm)			
SAFETY & EMC CHARACTERISTICS						
Safety Approvals			IEC/EN/UL 62368 ⁽³⁾			
EMI	With external components		EN55032		Class A, Class B	
EMS	EN55024					
Radiated Immunity	EN61000-4-3	10 V/m	Perf. Criteria A			
Fast Transient	EN61000-4-4	±2kV ⁽⁴⁾	Perf. Criteria B			
Surge	EN61000-4-5	±1kV ⁽⁴⁾	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) The ON/OFF Control pin voltage is referenced to -Vin pin.
- (2) The power module operates in a variety of thermal environments; however, sufficient cooling should be provided to help ensure reliable operation.
- (3) This product is Listed to applicable standards and requirements by UL.
- (4) With an external input filter capacitor (Nippon chemi-con KY series, 220μF/100V)

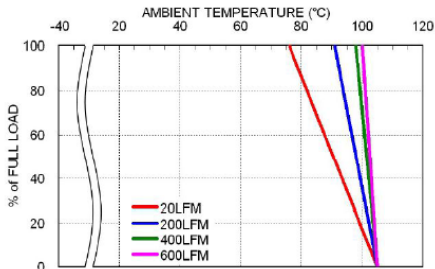
Caution: This power module is not internally fused. An input line fuse must always be used.

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

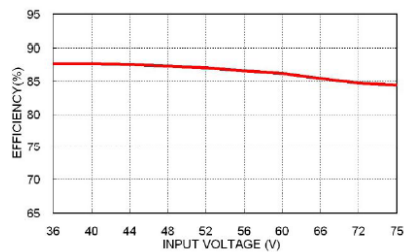
CHARACTERISTIC CURVES

All test conditions are at 25°C

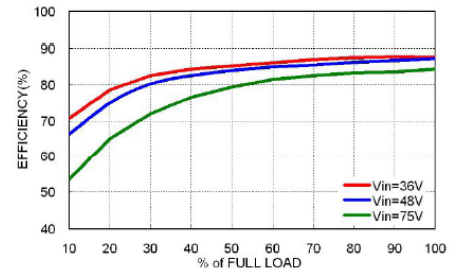
JF48S5-3000 Derating Curve



JF48S5-3000 Efficiency vs. Input Load

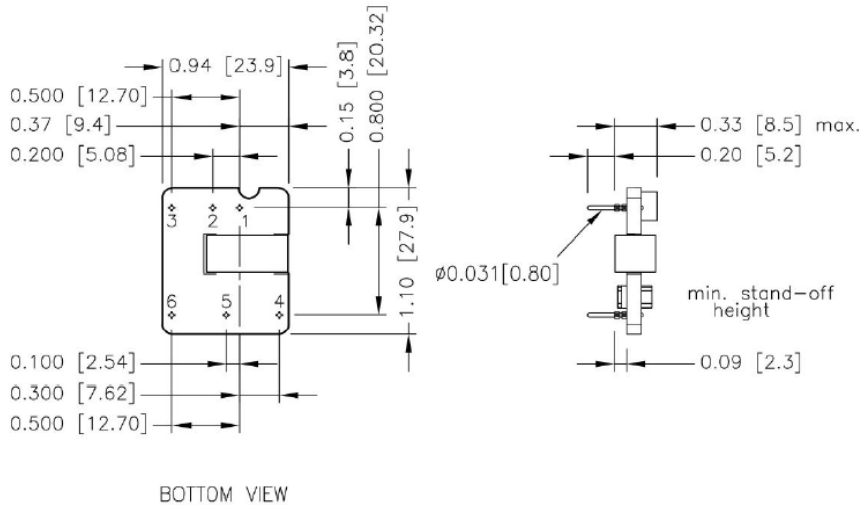


JF48S5-3000 Efficiency vs. Output Load



MECHANICAL DRAWINGS

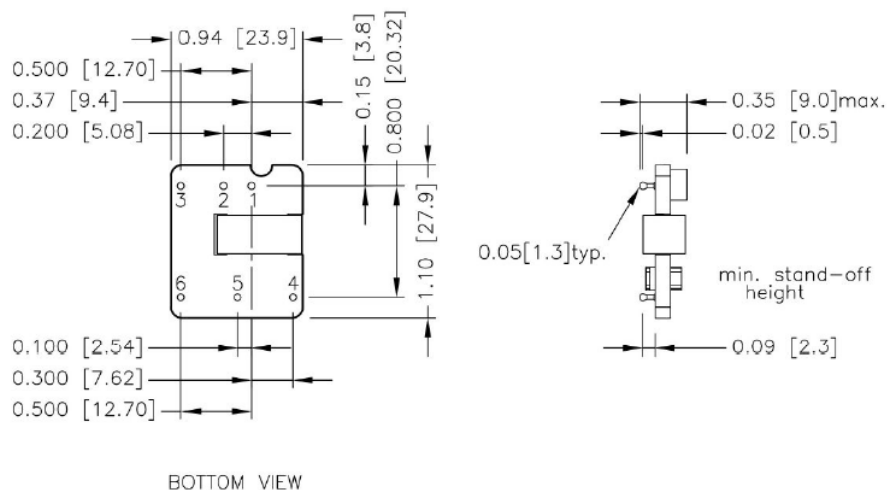
DIP Type (Standard)



PIN Connection

PIN	Definition
1	+Vin
2	-Vin
3	Ctrl
4	+Vout
5	Trim
6	-Vout

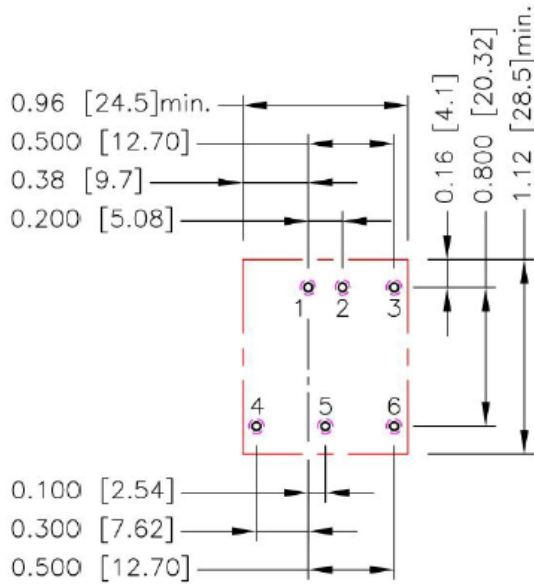
SMD Type ("S" Suffix)



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 dimension tolerance ±0.004 (0.1)

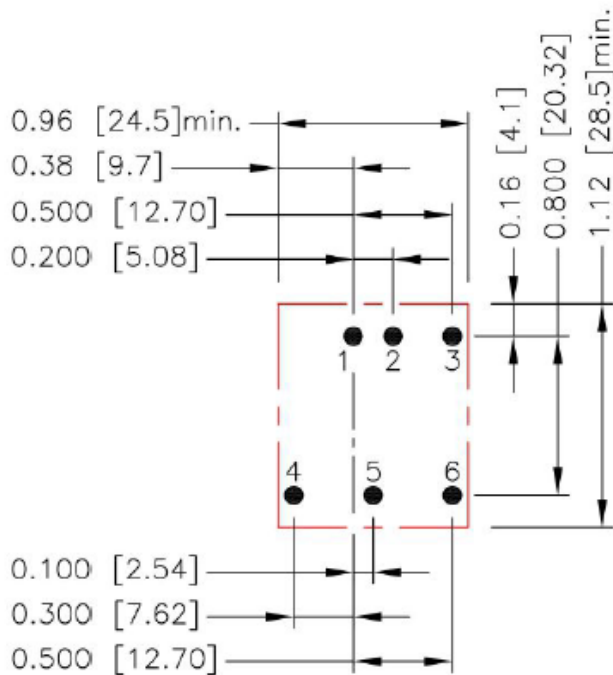
RECOMMENDED PAD LAYOUT

DIP Type (Standard)



All dimensions in inch [mm]
Pad size (lead free recommended)
Through hole 1.2.3.4.5.6: $\phi 0.043$ [1.10]
Top view pad 1.2.3.4.5.6: $\phi 0.054$ [1.38]
Bottom view pad 1.2.3.4.5.6: $\phi 0.087$ [2.20]

SMD Type ("S" Suffix)



All dimensions in inch [mm]
Pad size (lead free recommended)
Top view pad: $\phi 0.091$ [2.30]

FUSE CONSIDERATION

This power module is not internally fused. An input 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 maximize flexibility, internal fusing is not included; however, to achieve maximum safety and system protection, always use an input line fuse.

Suggested input line fuse below:

Model	Fuse Rating (A)	Fuse Type
24Vin	1.6	Slow-Blow
48Vin	1.0	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.

THERMAL CONSIDERATION

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.

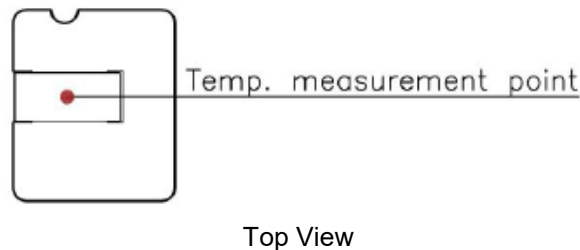
Proper cooling can be verified by measuring the point as the figure below.

The temperature at this location should not exceed "Maximum case temperature".

When Operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature".

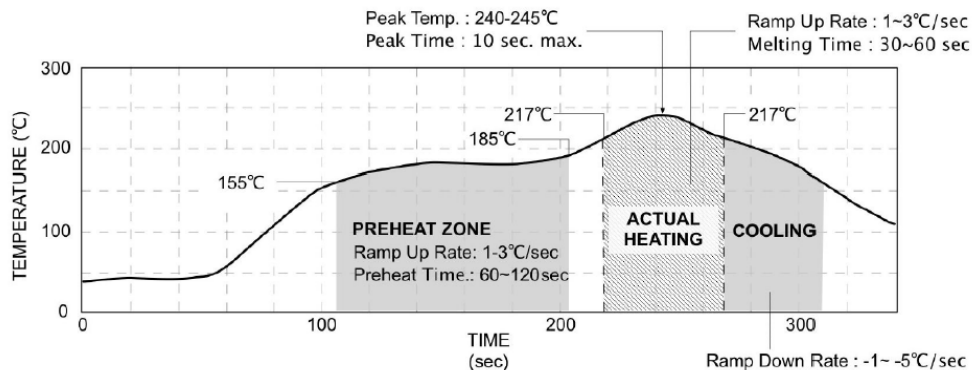
You can limit this Temperature to a lower value for extremely high reliability.

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



LEAD FREE REFLOW PROFILE

For SMD Type



The curves define the maximum peak reflow temperature permissible measured on pin1 or Vin pin.

OUTPUT VOLTAGE ADJUSTMENT

Output voltage set point adjustment allows the user to increase or decrease the output voltage set point of the module. This is accomplished by connecting an external resistor between the TRIM pin and either the +OUTPUT or –OUTPUT pins. With an external resistor between the TRIM and –OUTPUT pin, the output voltage set point increases. With an external resistor between the TRIM and +OUTPUT pin, the output voltage set point decreases. The external TRIM resistor needs to be at least 1/16W of rated power.

Trim Up Equation

$$R_U = \left[\frac{G \times L}{(V_{O,up} - L - K)} - H \right] \Omega$$

Trim Down Equation

$$R_D = \left[\frac{(V_{O,down} - L) \times G}{(V_O - V_{O,down})} - H \right] \Omega$$

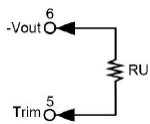
Trim Constants

Module	G	H	K	L
JFxxS12-1250	10000	5110	9.5	2.5
JFxxS15-1000	10000	5110	12.5	2.5

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed using method shown below.

Trim Up



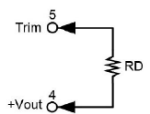
12VDC Output

Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	12.120	12.240	12.360	12.480	12.600	12.720	12.840	12.960	13.080	13.200
RU (kΩ)	203.223	99.057	64.334	46.973	36.557	29.612	24.652	20.932	18.038	15.723

15VDC Output

Trim-Up (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	15.150	15.300	15.450	15.600	15.750	15.900	16.050	16.200	16.350	16.500
RU (kΩ)	161.557	78.223	50.446	36.557	28.223	22.668	18.700	15.723	13.409	11.557

Trim Down



12VDC Output

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	11.880	11.760	11.640	11.520	11.400	11.280	11.160	11.040	10.920	10.800
RD (kΩ)	776.557	308.723	248.779	182.807	143.223	116.834	97.985	83.848	72.853	64.057

15VDC Output

Trim-Down (%)	1	2	3	4	5	6	7	8	9	10
Vout (V)	14.850	14.700	14.550	14.400	14.250	14.100	13.950	13.800	13.650	13.500
RD (kΩ)	818.223	401.557	262.668	193.223	151.557	123.779	103.938	89.057	77.483	68.223

MODEL NUMBER SETUP

JF	24	S	12	-	1250	S
Series Name	Input Voltage	Output Quantity	Output Voltage		Output Current	Suffix
	24: 18~36VDC 48: 36~75VDC	S: Single	12: 12VDC 15: 15VDC		1250: 1250mA 1000: 1000mA	No Suffix: Positive Remote ON/OFF with DIP (standard) S: Positive remote ON/OFF with SMD R: Negative Remote ON/OFF with DIP SR: Negative Remote ON/OFF with SMD D: DIP type without ON/OFF pin SD: SMD type without ON/OFF pin G: DIP type without ON/OFF & TRIM pin SG: SMD type without ON/OFF & TRIM pin F: DIP type, negative remote ON/OFF, without TRIM pin SF: SMD type, negative remote ON/OFF, without TRIM pin J: DIP type, positive remote ON/OFF, without TRIM pin SJ: SMD type, positive remote ON/OFF, without TRIM pin

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.

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