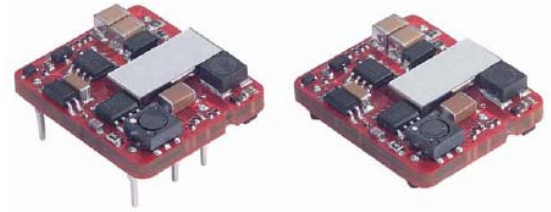


FEATURES

- Single Output up to 3.5A
- High Efficiency up to 88%
- Fixed Switching frequency
- 2:1 Wide Input Voltage Range
- Surface Mount or Through Hole
- 15 Watts Maximum Output Power
- Cost Efficient Open Frame Design
- Input to Output Isolation (Basic Insulation)
- ISO9001 Certified Manufacturing Facilities
- Compliant to RoHS EU Directive 2002/95/EC
- Small Size and Low Profile: 1.10" x 0.94" x 0.335"
- CE Mark Meets 2006/95/EC, 93/68/EEC, and 89/336 EEC

APPLICATIONS

- Measurement
- Telecom/Datacom
- Wireless Networks
- Industry Control System
- Semiconductor Equipment



DESCRIPTION

The JF series of single output DC/DC converters provides up to 15 watts of output power in a low profile industry standard package and footprint. All models feature a wide input range, trimmable output voltage, positive or negative remote on/off, and are protected against over-current, over-voltage and input under-voltage conditions.

SPECIFICATIONS: JF Series

All specifications apply @ 25°C ambient unless otherwise noted

INPUT SPECIFICATIONS

Input Voltage Range	24V nominal input	18-36VDC
	48V nominal input	36-75VDC
Input Voltage Variation	dv/dt	5V/ms max (Complies with EST300 132 part 4.4)
Input Surge Voltage (100ms max)	24V input	50VDC
	48V input	100VDC
Reflected Ripple Current	12µH source impedance	30mA p-p typ. (π filter with 220µF & 33µF)
Start Up Time (nominal Vin and constant resistive load)		
Power Up		30ms max.
Remote ON/OFF		30ms max.
Start-Up Voltage	24V input	17VDC
	48V input	33VDC
Shutdown Voltage	24V input	14.5VDC
	48V input	30.5VDC
Remote ON/OFF (See Note 7)		
Positive Logic	DC-DC ON	Open or 3V < Vr < 15V (standard) DC-DC OFF
		Short or -0.7V < Vr < 1.2V
Negative Logic	DC-DC ON	Short or -0.7V < Vr < 1.2V (option) DC-DC OFF
		Open or 3V < Vr < 15V
Input Current of Remote Control Pin (nominal Vin)		-0.5mA ~ +1.0mA
Remote Off Input Current (nominal Vin)		20mA max.

OUTPUT SPECIFICATIONS

Output Voltage	see table
Voltage Accuracy	±1%
Voltage Adjustability (See Note 6)	±10%
Output Current	see table
Output Power	15 watts max.
Output Voltage Overshoot	3%
Line Regulation (LL to HL at FL)	±0.2%
Load Regulation (no load to full load)	±0.2%
Minimum Load	0%
Ripple/Noise (20 MHz BW)	see table
(measured with a 1µF M/C and a 10µF T/C)	
Transient Response Recovery Time (25% load step)	300µs (ΔIo / Δt = 0.1A/µs)

PROTECTION SPECIFICATIONS

Over Voltage Protection	3.3V output	3.7V - 5.4V
(Voltage clamped)	5V output	5.6V - 7.0V
	12V output	13.5V - 19.6V
	15V output	16.8V - 20.5V
Over Load Protection		110% - 140%
Short Circuit Protection		Hiccup, automatic recovery

GENERAL SPECIFICATIONS

Efficiency	see table	
Switching Frequency	3.3V, 5V	270KHz typ.
	15V, 12V	470KHz typ.
Isolation Voltage (Input to Output)		2250VDC min..
Isolation Resistance		10MΩ min.
Isolation Capacitance		1000pF max.
ENVIRONMENTAL SPECIFICATIONS		
Operating Temperature (See Note 8)		-40°C ~ +85°C (with derating)
Storage Temperature		-55°C ~ +125°C
Relative Humidity		5% to 95% RH
Thermal Shock		MIL-STD-810F
Vibration		10~55Hz, 2G, 3 min period, 30 min along X, Y, and Z
Temperature Coefficient		±0.02% / °C max.
MTBF (See Note 1)		2.2 x 10 ⁶ hours

PHYSICAL SPECIFICATIONS

Weight	10.5g (0.36 oz)
Dimensions	1.10 x 0.94 x 0.335 inches (27.94 x 23.88 x 8.5 mm)

SAFETY & EMC

Approvals and Standards	IEC60950-1, UL60950-1, EN60950-1		
EMI (See Note 9)	EN55022	Class A	
ESD	EN61000-4-2	Air ±8KV	Perf. Criteria B
		Contact ±6KV	
Radiated Immunity	EN61000-4-3	10V/m	Perf. Criteria A
Fast Transient	EN61000-4-4	±2KV	Perf. Criteria B
Surge (See Note 10)	EN61000-4-5	±1KV	Perf. Criteria B
Conducted Immunity	EN61000-4-6	10 Vrms	Perf. Criteria A

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

OUTPUT VOLTAGE / CURRENT RATING CHART

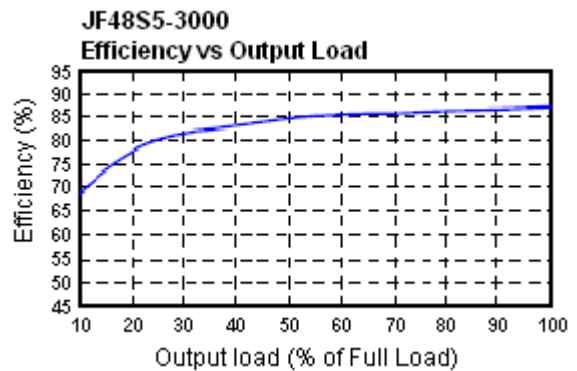
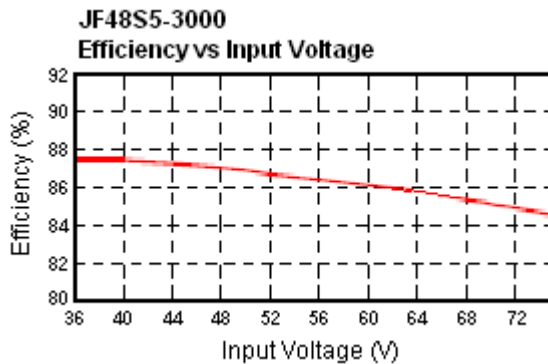
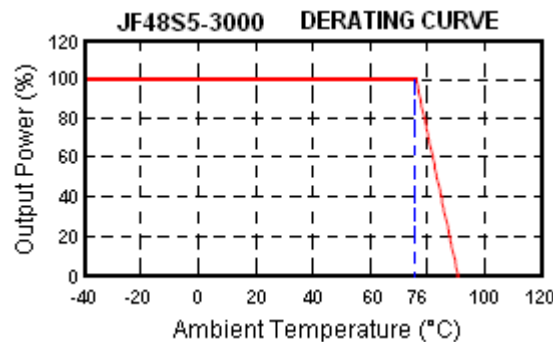
Model Number	Input Range	Output Voltage	Output Current		Output ⁽⁴⁾ Ripple & Noise	Input Current		Efficiency ⁽⁴⁾	Capacitor ⁽⁵⁾ Load max	Technical Datasheet
			Min. load	Full load		No load ⁽³⁾	Full load ⁽²⁾			
JF24S3.3-3500	24 VDC (18 – 36 VDC)	3.3 VDC	0mA	3500mA	75mVp-p	20mA	594mA	85%	1000µF	View PDF
JF24S5-3000		5 VDC	0mA	3000mA	75mVp-p	20mA	762mA	86%	1000µF	View PDF
JF24S12-1250		12 VDC	0mA	1250mA	100mVp-p	15mA	762mA	86%	330µF	View PDF
JF24S15-1000		15 VDC	0mA	1000mA	100mVp-p	15mA	753mA	87%	220µF	View PDF
JF48S3.3-3500	48 VDC (36 – 75 VDC)	3.3 VDC	0mA	3500mA	75mVp-p	15mA	297mA	85%	1000µF	View PDF
JF48S5-3000		5 VDC	0mA	3000mA	75mVp-p	15mA	381mA	86%	1000µF	View PDF
JF48S12-1250		12 VDC	0mA	1250mA	100mVp-p	10mA	377mA	87%	330µF	View PDF
JF48S15-1000		15 VDC	0mA	1000mA	100mVp-p	10mA	372mA	88%	220µF	View PDF

****See Product Standard Table for suffix options****

NOTES

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C. (Ground fixed and controlled environment).
- Maximum value at nominal input voltage and full load.
- Typical value at nominal input voltage and no load.
- Typical value at nominal input voltage and full load.
- Test by minimum Vin and constant resistive load.
- Trimming 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 +Vout pin or the -Vout pin.
- The ON/OFF control pin voltage is referenced to -Vin. (See the "Product Standard Table" below for suffix options).
- The power module operates in a variety of thermal environments; however, sufficient cooling should be provided to help ensure reliable operation.
- The JF Series meets EN55022 Class A and B only with external components connected to the input pins of the converter.
- An external filter capacitor is required if the module has to meet EN61000-4-5. The filter capacitor suggested: Nippon chemi-con KY Series, 220µF/100V, ESR 48mΩ.

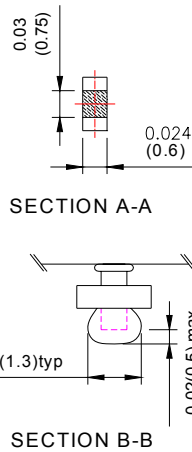
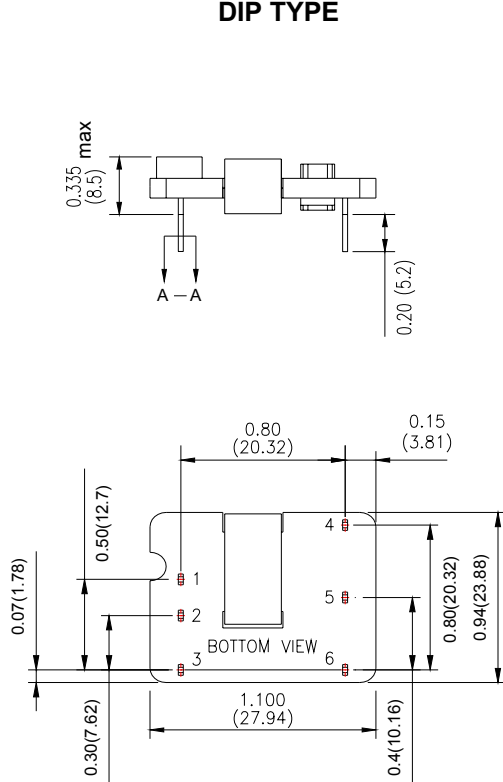
DERATING CURVES & EFFICIENCY GRAPHS



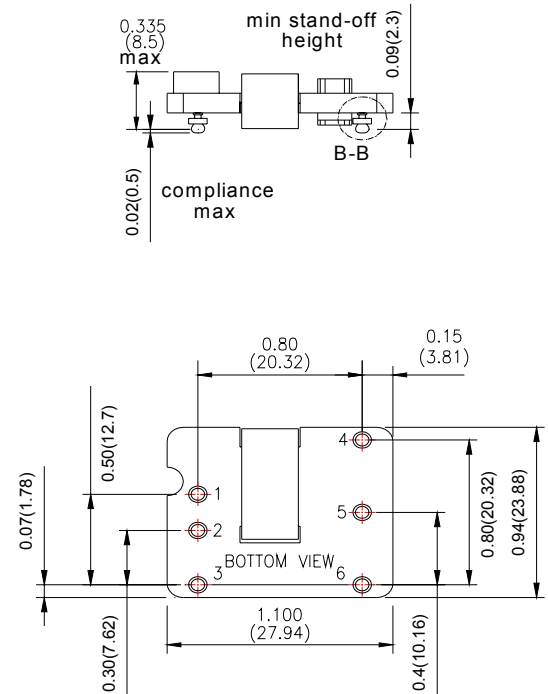
MECHANICAL DRAWING

Unit: inches (mm)

DIP TYPE



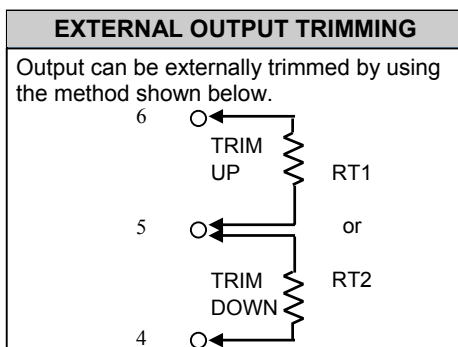
SMT TYPE
(Add suffix "S")



PIN CONNECTION	
PIN	JF SERIES
1	+INPUT
2	-INPUT
3	ON/OFF
4	+Vout
5	TRIM
6	-Vout

NOTES:

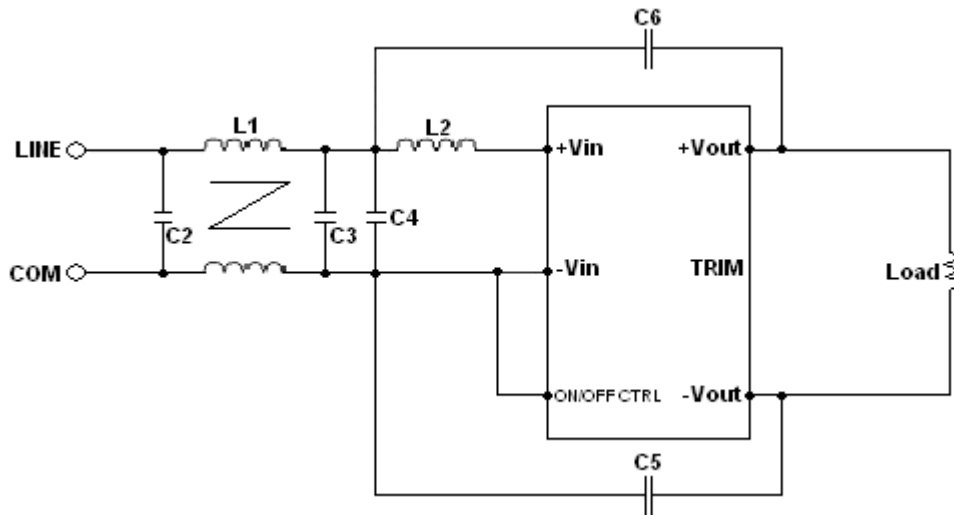
- All dimensions in inches (mm)
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
- Pin pitch tolerance: ±0.01 (0.25)
- Pin dimension tolerance ±0.004 (0.1)



PRODUCT STANDARD TABLE	
Option	Suffix
Negative Remote ON/OFF with DIP	R
Negative Remote ON/OFF with SMT	SR
Positive Remote ON/OFF with DIP	No Suffix
Positive remote ON/OFF with SMT	S
DIP type without ON/OFF pin	D
SMT type without ON/OFF pin	SD
DIP type without ON/OFF & TRIM pin	G
SMT type without ON/OFF & TRIM pin	SG
DIP type without TRIM pin	F
SMT type without TRIM pin	SF

Figure 1

Recommended Filter for EN55022 Class B Compliance



The components used in Figure 1, together with the manufacturers' part numbers for these components, are as follows:

	C2 & C3	C4	C5 & C6	L1	L2
JF24Sxx-xxxx	2.2 μ F/50V	2.2 μ F/50V	470pF/3KV	1170 μ H Common Choke	10 μ H Inductor
JF48Sxx-xxxx	2.2 μ F/100V	2.2 μ F/100V	1000pF/3KV	1170 μ H Common Choke	10 μ H Inductor

Figure 2

Recommended EN55022 Class B Filter Circuit Layout

