

1 Watt SPF

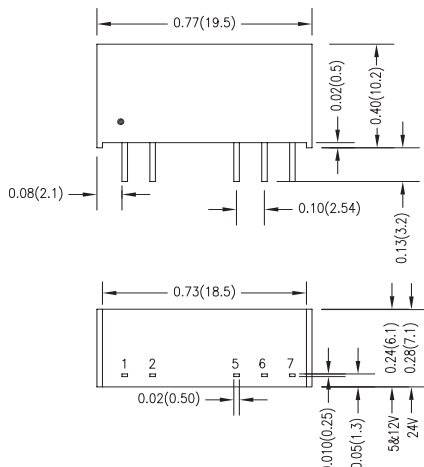
Single and Dual Series



- Efficiency up to 81%
- 3000VDC Isolation
- MTBF > 2,000,000 Hours
- RoHS Compliant



Model Number	Voltage			Current				Load Regulation	Input Overvoltage (1000ms)	Efficiency	Capacitive Load
	Input		Output	Input		Output					
	Nom. (VDC)	Range (VDC)	(VDC)	@ No Load (mA)	@ Max Load (mA)	Min (mA)	Max (mA)	% (Max)	Max (VDC)	@ Max Load (% Typ)	Max (Dual each output)
SPF1K5S3R3	5	4.5 - 5.5	3.3	30	235	5	260	10	9	73	220 μF
SPF1K5S5	5	4.5 - 5.5	5	30	281	4	200	10	9	71	220 μF
SPF1K5S9	5	4.5 - 5.5	9	30	260	2	110	8	9	76	220 μF
SPF1K5S12	5	4.5 - 5.5	12	30	258	1.5	84	7	9	78	220 μF
SPF1K5S15	5	4.5 - 5.5	15	30	258	1	67	7	9	78	220 μF
SPF1K5D5	5	4.5 - 5.5	±5	30	278	±2	±100	10	9	72	100 μF
SPF1K5D9	5	4.5 - 5.5	±9	30	262	±1	±56	8	9	77	100 μF
SPF1K5D12	5	4.5 - 5.5	±12	30	258	±0.8	±42	7	9	78	100 μF
SPF1K5D15	5	4.5 - 5.5	±15	30	258	±0.7	±34	7	9	79	100 μF
SPF1K12S3R3	12	10.8 - 13.2	3.3	12	96	5	260	8	18	74	220 μF
SPF1K12S5	12	10.8 - 13.2	5	12	114	4	200	8	18	73	220 μF
SPF1K12S9	12	10.8 - 13.2	9	12	106	2	110	5	18	78	220 μF
SPF1K12S12	12	10.8 - 13.2	12	12	105	1.5	84	5	18	80	220 μF
SPF1K12S15	12	10.8 - 13.2	15	12	104	1	67	5	18	80	220 μF
SPF1K12D5	12	10.8 - 13.2	±5	12	113	±2	±100	8	18	74	100 μF
SPF1K12D9	12	10.8 - 13.2	±9	12	106	±1	±56	5	18	79	100 μF
SPF1K12D12	12	10.8 - 13.2	±12	12	104	±0.8	±42	5	18	81	100 μF
SPF1K12D15	12	10.8 - 13.2	±15	12	105	±0.7	±34	5	18	81	100 μF
SPF1K24S3R3	24	21.6 - 26.4	3.3	7	49	5	260	8	30	73	220 μF
SPF1K24S5	24	21.6 - 26.4	5	7	59	4	200	8	30	71	220 μF
SPF1K24S9	24	21.6 - 26.4	9	7	54	2	110	5	30	76	220 μF
SPF1K24S12	24	21.6 - 26.4	12	7	54	1.5	84	5	30	78	220 μF
SPF1K24S15	24	21.6 - 26.4	15	7	53	1	67	5	30	79	220 μF
SPF1K24D5	24	21.6 - 26.4	±5	7	58	±2	±100	8	30	72	100 μF
SPF1K24D9	24	21.6 - 26.4	±9	7	55	±1	±56	5	30	76	100 μF
SPF1K24D12	24	21.6 - 26.4	±12	7	53	±0.8	±42	5	30	79	100 μF
SPF1K24D15	24	21.6 - 26.4	±15	7	53	±0.7	±34	5	30	80	100 μF



Pin Connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

Dimensions are inches (mm) unless noted

Tolerance: Inches Millimeters

X.XX ± 0.01 X.X ± 0.25

X.XXX ± 0.005 X.XX ± 0.13

Pin ± 0.002 ± 0.05

See Model Selection Table for Model Specific Parameters

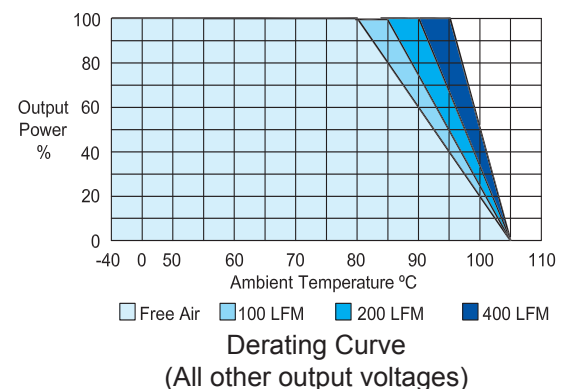
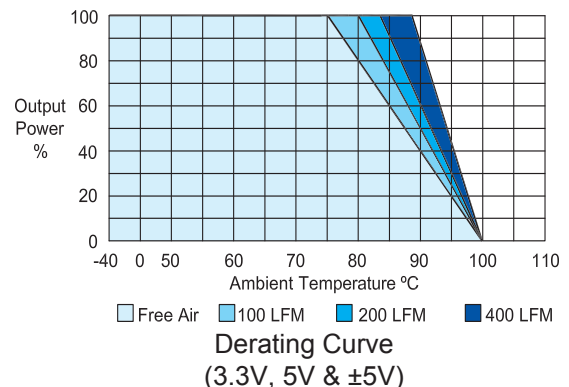
Input Parameters	Min	Typ	Max	Units
Reverse Polarity Input Current			0.3	A
Switching Frequency	70	100	120	kHz
Input Filter	Internal Capacitor			
Output Parameters	Min	Typ	Max	Units
Output Voltage Accuracy		±1.0	±3.0	%
Output Voltage Balance Dual Output, Balanced Loads		±0.1	±1.0	%
Load Regulation $I_o = 20\%$ to 100%	See Model Selection Guide			%
Line Regulation for V_{in} Change of 1%		±1.2	±1.5	%
Ripple & Noise (20MHz)		65	100	mV P-P
Ripple & Noise (20 MHz) Over Line, Load & Temp			150	mV P-P
Ripple & Noise (20 MHz)			15	mV RMS
Temperature Coefficient		±0.01	±0.02	% / °C
Short Circuit Protection	0.5 Second Max			
General Specifications	Min	Typ	Max	Units
Isolation Voltage, 60 seconds	3000			VDC
Isolation Resistance 500VDC	10			Gohms
Isolation Capacitance, 100kHz, 1V		60	100	pF
Operating Temperature (Ambient)	-40		+85	°C
Storage Temperature	-40		+125	°C
Humidity			95	%
MTBF MIL-HDBK-217F @25°C, Ground Benign	2000			K Hours
Cooling	Free-Air Convection			
Case Size 5V & 12V	0.77 x 0.24 x 0.40 inches 19.5 x 6.1 x 10.2 mm			
24V	0.77 x 0.28 x 0.40 inches 19.5 x 7.1 x 10.2 mm			
Case Material	Non Conductive Black Plastic (UL94V-0)			
Weight 5V & 12V	2.2g			
24V	2.6g			

Input Fuse Selection Table	
5V Input	500 mA Slow-Blow
12V Input	200 mA Slow-Blow
24V Input	100 mA Slow-Blow

External fusing should be used for system protection due to a catastrophic failure. See ConTech website for Fusing Application Notes to determine the correct fuse.

Notes:

- Specifications typical at $T_a = +25^\circ\text{C}$, resistive load, nominal input voltage, full rated output current unless otherwise noted.
- ConTech power converters require a minimum output loading to maintain specified regulation. Operation under no-load conditions will not damage these modules; however, they may not meet all specifications listed.
- The series has a limitation of a maximum connected capacitance at the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the startup time.
- When measuring peak-to-peak output noise, use a Cout 0.33 μF ceramic capacitor. Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20MHz. Position the load between 2" and 2.5" from the converter.
- Water washability - ConTech DC/DC converters are designed to withstand most solder/wash processes. Careful attention should be used when assessing the applicability in your specific manufacturing process. Converters are not hermetically sealed.
- See ConTech website for Definition of Terms, Application Notes, and Test Setups and Parameters. www.ConTech-us.com/appnotes.html.
- Specifications subject to change without notice.
- See ConTech website www.ConTech.com/pdf/rohs.pdf for RoHS Statement.



To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 90°C.

CONTECH



ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches

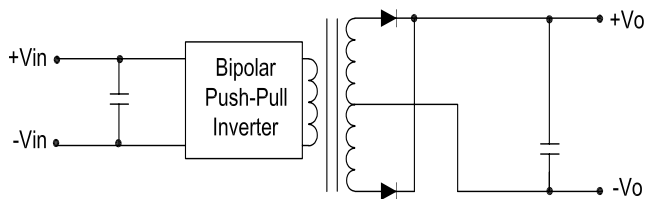


Tél. 01 47 95 99 89
Fax. 01 47 01 16 22

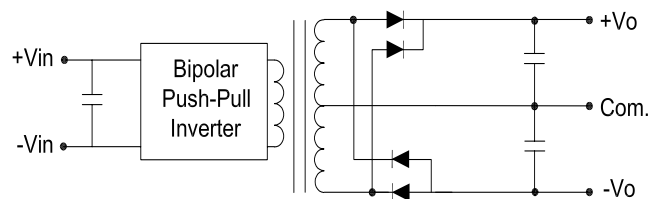


e-mail : comp@es-france.com
Site Web : www.es-france.com

Block Diagrams



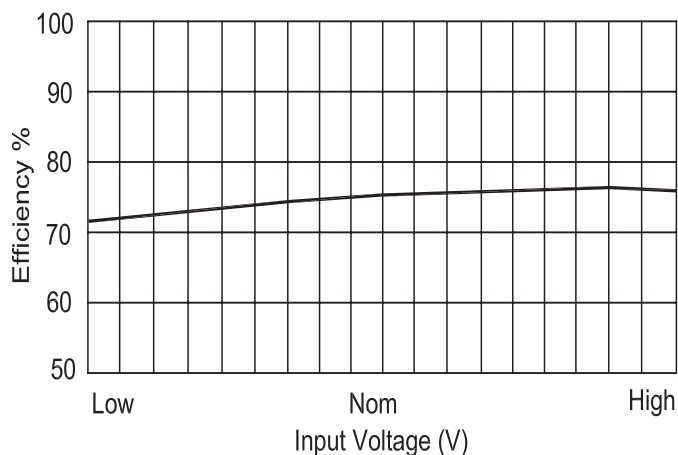
Single Output Block Diagram



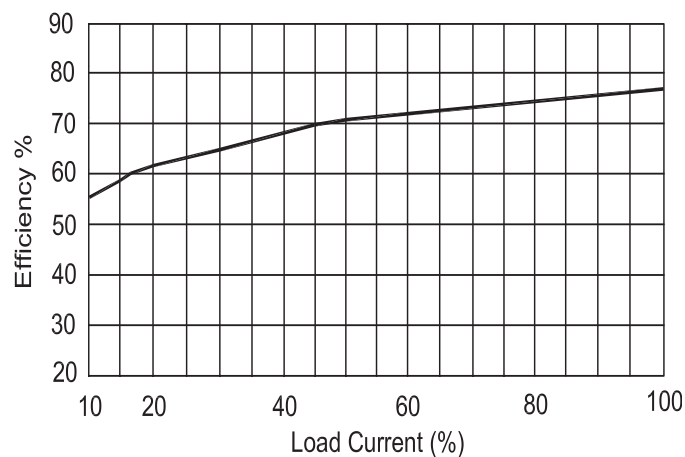
Dual Output Block Diagram

Efficiency Curves

Single Output

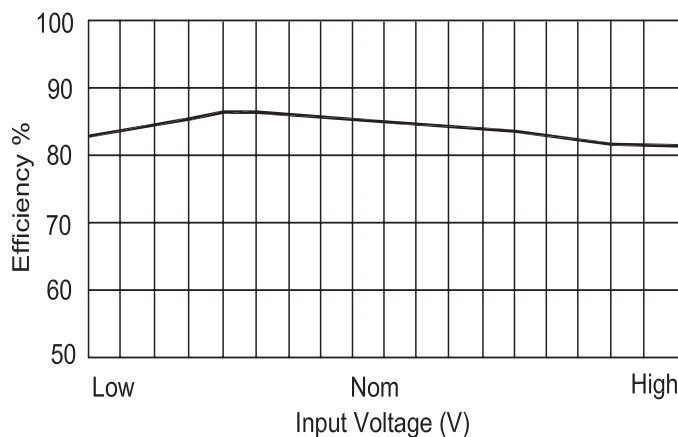


Efficiency vs Input Voltage

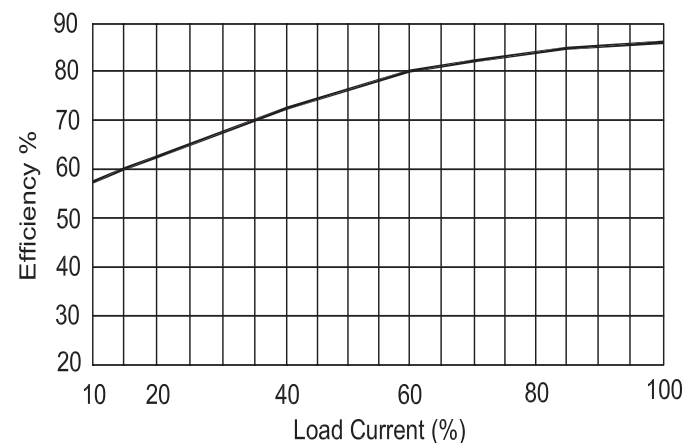


Efficiency vs Output Load

Dual Output



Efficiency vs Input Voltage



Efficiency vs Output Load

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ES France - Département Composants & Modules
127 rue de Buzenval BP 26 - 92380 Garches



Tél. 01 47 95 99 89
Fax. 01 47 01 16 22



e-mail : comp@es-france.com
Site Web : www.es-france.com