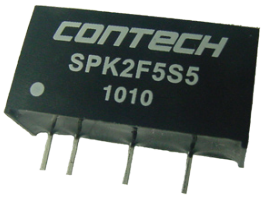
CONTECH
Division of Calex Mfg.

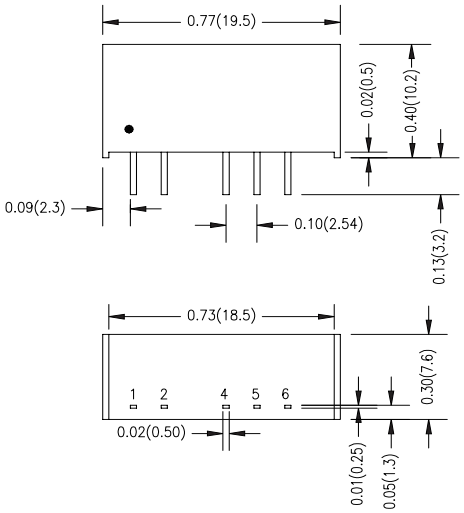
2 Watt SPK
Single and Dual Series

RoHS Compliant

- Efficiency up to 83%
- 1000VDC Isolation
- MTBF > 2,000,000 Hours
- Mini SIP Package
- 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)
SPK2F5S3R3	5	4.5 - 5.5	3.3	60	452	10	500	11	9	73	470 µF
SPK2F5S5	5	4.5 - 5.5	5	60	526	8	400	11	9	76	470 µF
SPK2F5S12	5	4.5 - 5.5	12	60	495	3	165	7	9	80	470 µF
SPK2F5S15	5	4.5 - 5.5	15	60	499	2.5	133	7	9	80	470 µF
SPK2F5D5	5	4.5 - 5.5	±5	60	519	±4	±200	10	9	77	390 µF
SPK2F5D12	5	4.5 - 5.5	±12	60	504	±1.5	±83	7	9	79	390 µF
SPK2F5D15	5	4.5 - 5.5	±15	60	501	±1	±66	7	9	79	390 µF
SPK2F12S3R3	12	10.8 - 13.2	3.3	30	185	10	500	8	18	74	470 µF
SPK2F12S5	12	10.8 - 13.2	5	30	212	8	400	8	18	78	470 µF
SPK2F12S12	12	10.8 - 13.2	12	30	200	3	165	5	18	82	470 µF
SPK2F12S15	12	10.8 - 13.2	15	30	200	2.5	133	5	18	83	470 µF
SPK2F12D5	12	10.8 - 13.2	±5	30	210	±4	±200	8	18	79	390 µF
SPK2F12D12	12	10.8 - 13.2	±12	30	201	±1.5	±83	5	18	82	390 µF
SPK2F12D15	12	10.8 - 13.2	±15	30	200	±1	±66	5	18	82	390 µF
SPK2F24S3R3	24	21.6 - 26.4	3.3	15	92	10	500	8	30	74	470 µF
SPK2F24S5	24	21.6 - 26.4	5	15	108	8	400	8	30	77	470 µF
SPK2F24S12	24	21.6 - 26.4	12	15	101	3	165	5	30	81	470 µF
SPK2F24S15	24	21.6 - 26.4	15	15	101	2.5	133	5	30	82	470 µF
SPK2F24D5	24	21.6 - 26.4	±5	15	105	±4	±200	8	30	79	390 µF
SPK2F24D12	24	21.6 - 26.4	±12	15	102	±1.5	±83	5	30	81	390 µF
SPK2F24D15	24	21.6 - 26.4	±15	15	100	±1	±66	5	30	82	390 µF



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

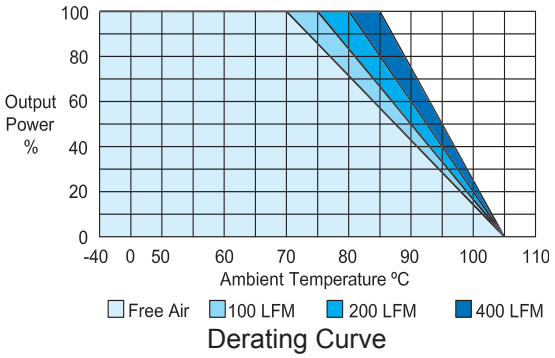
Pin Connections		
Pin	**Single**	**Dual**
1	+Vin	+Vin
2	-Vin	-Vin
4	-Vout	-Vout
5	No Pin	Common
6	+Vout	+Vout

See Model Selection Table for Model Specific Parameters

Input Parameters	Min	Typ	Max	Units
Reverse Polarity Input Current			0.3	A
Switching Frequency	50	80	100	kHz
Input Filter	Pi Filter			
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 Io = 20% to 100%	See Model Selection Guide			%
Line Regulation for Vin Change of 1%		±1.2	±1.5	%
Ripple & Noise (20MHz)		100	150	mV P-P
Ripple & Noise (20 MHz) Over Line, Load & Temp			200	mV P-P
Ripple & Noise (20 MHz)			15	mV RMS
Temperature Coefficient		±0.01	±0.02	% / ºC
Short Circuit Protection	0.5 Second Max			
General Specifications	**Min**	**Typ**	**Max**	**Units**
Isolation Voltage, 60 seconds	1000			VDC
Isolation Resistance 500VDC	1000			Mohms
Isolation Capacitance, 100kHz, 1V		80	120	pF
Operating Temperature (Ambient)	-40		+85	ºC
Storage Temperature	-40		+125	ºC
Humidity			95	%
MTBF MIL-HDBK-217F @25ºC, Ground Benign	2000			K Hours
Cooling	Free-Air Convection			
Case Size	0.77 x 0.30 x 0.40 inches 19.5 x 7.6 x 10.2 mm			
Case Material	Non Conductive Black Plastic (UL94V-0)			
Weight	2.7g			

Notes:

1. Specifications typical at Ta=+25ºC, resistive load, nominal input voltage, full rated output current unless otherwise noted.
2. 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.
3. 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.
4. When measuring peak-to-peak output noise, use a Cout 0.33µF 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.
5. 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.
6. See ConTech website for Definition of Terms, Application Notes, and Test Setups and Parameters. www.ConTech-us.com/appnotes.html.
7. Specifications subject to change without notice.
8. See ConTech website www.calex.com/pdf/rohs.pdf for RoHS Statement.



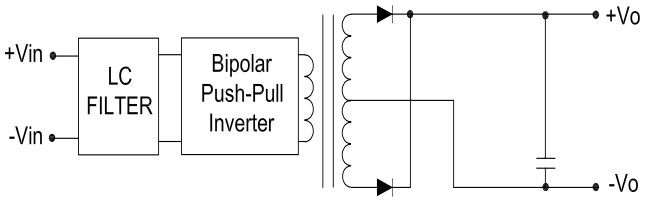
Derating Curve

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

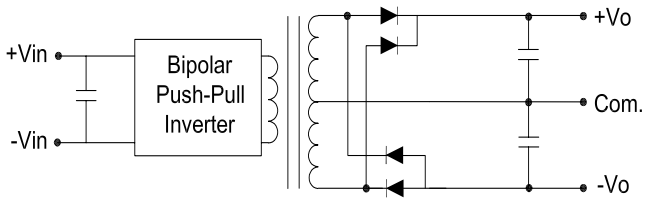
Input Fuse Selection Table	
5V Input	1000 mA Slow-Blow
12V Input	500 mA Slow-Blow
24V Input	200 mA Slow-Blow

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.

Block Diagrams



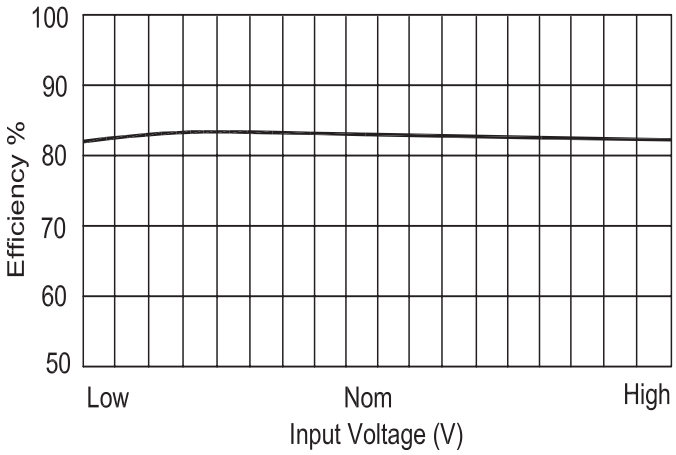
Single Output Block Diagram



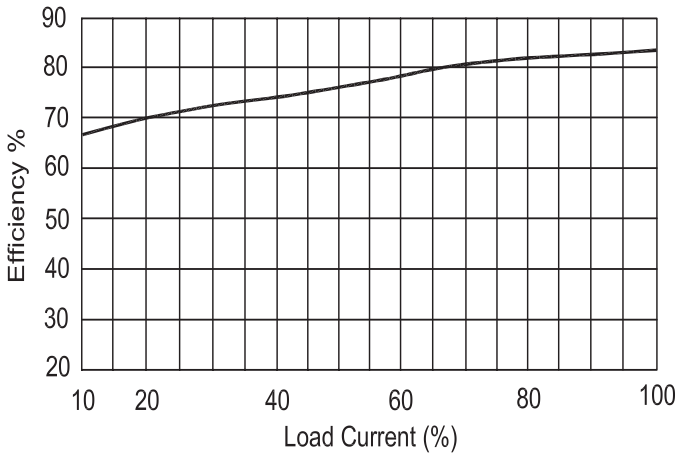
Dual Output Block Diagram

Efficiency Curves

Single Output

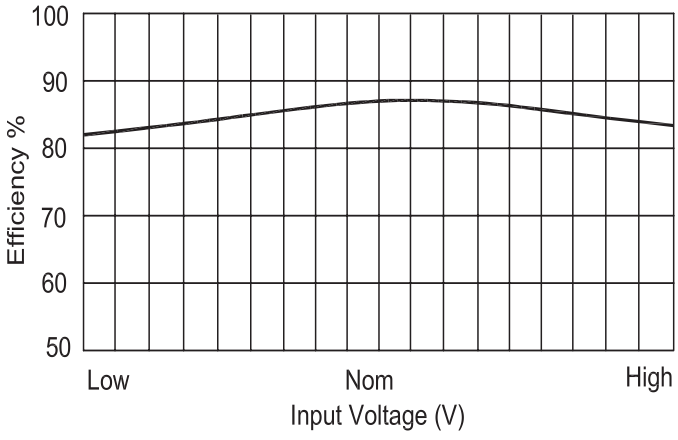


Efficiency vs Input Voltage

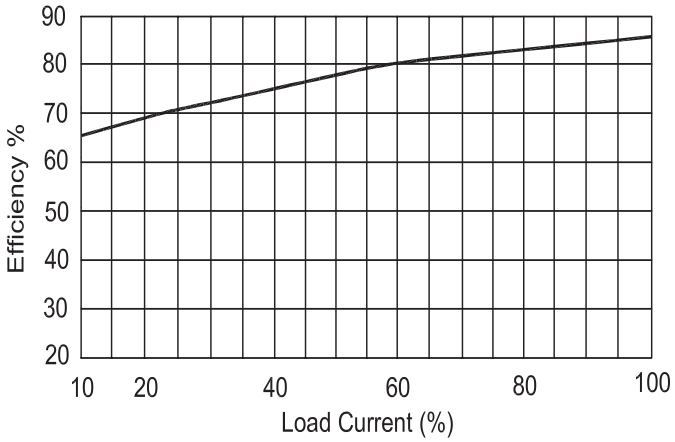


Efficiency vs Output Load

Dual Output



Efficiency vs Input Voltage



Efficiency vs Output Load