6 Watt Single Series DC/DC Converters

Features

- Low Profile Copper Case (0.375" High)
- Six-Sided Shielded Case
- Low Input/Output Noise Operation
- 500 VDC Minimum Input to Output Isolation
- Output Overvoltage Clamp
- Fixed Frequency Operation Independent of Line and Load
- Highly Regulated/Low Drift Output
- Rugged High Speed MOSFET Power Chopper
- 5 Year Warranty

Description

These 6 Watt Single Output DC/DC converters are suitable for telecommunications and industrial control applications that call for direct PCB mounting.

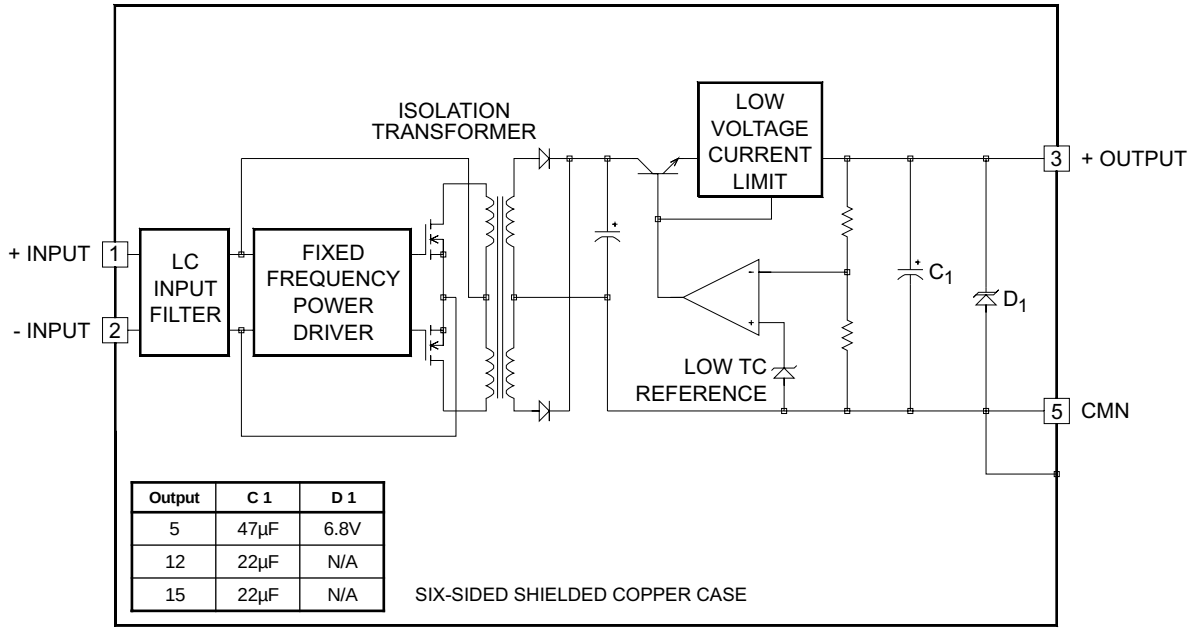
The converters in this series are designed with an LC input filter, a MOSFET push-pull power chopper, and an isolation transformer. A linear post regulator provides excellent line and load regulation.

Noise is reduced by housing each unit in a six-sided shielded copper case. The CALEX 5 Year Warranty covers all converters in this series.

Selection Chart

Model	Input Range VDC		Output VDC	Output mA
	Min	Max		
12S5.1000	11.16	13.20	5.0	1000
12S12.500	11.16	13.20	12.0	500
12S15.400	11.16	13.20	15.0	400
24S5.1000	22.32	26.40	5.0	1000
24S12.500	22.32	26.40	12.0	500
24S15.400	22.32	26.40	15.0	400
28S5.1000	26.04	30.80	5.0	1000
28S12.500	26.04	30.80	12.0	500
28S15.400	26.04	30.80	15.0	400
48S5.1000	44.64	52.80	5.0	1000
48S12.500	44.64	52.80	12.0	500
48S15.400	44.64	52.80	15.0	400

6 Watt Single Output Series Block Diagram



Output	C 1	D 1
5	47µF	6.8V
12	22µF	N/A
15	22µF	N/A

6 Watt Single Series DC/DC Converters

Input Parameters*								
Model		**12S5.1000**	**12S12.500**	**12S15.400**	**24S5.1000**	**24S12.500**	**24S15.400**	**Units**
Voltage Range (13)	MIN MAX		11.16 13.20			22.32 26.40		VDC
Reflected Ripple (2), 0-20MHz bw	TYP MAX		7 15			5 10		mA P-P
Input Current Full Load No Load	TYP TYP	700 43	740 43	720 54	330 20	370 23	360 27	mA
Efficiency	TYP	60	68	69	63	68	69	%
Switching Frequency	TYP			55				kHz
Maximum Input Overvoltage, 100ms No Damage	MAX		15			30		VDC
Turn-on Time, 1% Output Error (3)	TYP			1				ms
Recommended Fuse				Slow Blow Type (4)				
Model		**28S5.1000**	**28S12.500**	**28S15.400**	**48S5.1000**	**48S12.500**	**48S15.400**	**Units**
Voltage Range	MIN MAX		26.04 30.80			44.64 52.80		VDC
Reflected Ripple (2), 0-20MHz bw	TYP MAX		3 10			10 20		mA P-P
Input Current Full Load No Load	TYP TYP	288 19	318 19	309 21	170 16	190 16	185 17	mA
Efficiency	TYP	62	67	69	60	66	68	%
Switching Frequency	TYP			55				kHz
Maximum Input Overvoltage, 100ms No Damage	MAX		35			60		VDC
Turn-on Time, 1% Output Error (3)	TYP			1				ms
Recommended Fuse				Slow Blow Type (4)				

Output Parameters*								
Model		**12S5.1000 28S5.1000**	**24S5.1000 48S5.1000**	**12S12.500 28S12.500**	**24S12.500 48S12.500**	**12S15.400 28S15.400**	**24S15.400 48S15.400**	**Units**
Output Voltage		5		12		15		VDC
Rated Load (5)	MIN MAX	0 1000		0 500		0 400		mA
Voltage Range 100% Load	MIN TYP MAX	4.95 5.00 5.05		11.90 12.00 12.10		14.90 15.00 15.10		VDC
Load Regulation 0-100% Load	TYP MAX			0.02 0.15				%
Line Regulation Vin = Min-Max VDC	TYP MAX			0.02 0.10				%
Short Term Stability (6)	TYP			0.02				%
Long Term Stability	TYP			0.20				%/kHrs
Transient Response (7)	TYP			20				µs
Dynamic Response (8)	TYP	120		55		50		mV peak
Input Ripple Rejection (9)	TYP			60				dB
Noise, 0-20MHz bw (2)	TYP MAX			10 40				mV P-P
Temperature Coefficient	TYP MAX			50 200				ppm/°C
Overvoltage Clamp (10)	TYP	6.8		-		-		VDC
Short Circuit Protection to Common for all Outputs				Short Term, 1 Minute Maximum (4)				

NOTES

* **All parameters measured at Tc=25°C, nominal input voltage and full rated load unless otherwise noted. Refer to the CALEX Application Notes for the definition of terms, measurement circuits and other information.**

(2) Noise is measured per CALEX Application Notes.

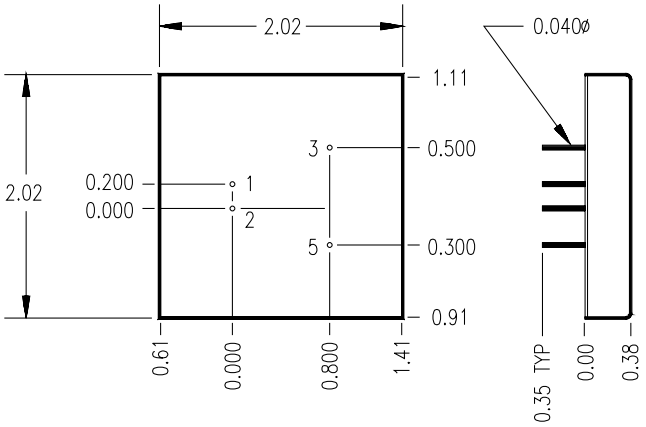
(3) Turn-on time is defined as the time from the application of power until the output is within 1% of its final value.

(4) For long term short circuit protection of the converters, install a slow blow fuse in the input circuit. Choose a fuse size that is 125% of your applications actual input current and does not exceed 115% of the full load input current.

(5) No minimum load required.

(6) Short term stability is specified after a 30 minute warm-up at full load, and with constant line, load and ambient conditions.

General Specifications*			
All Models			**Units**
Isolation			
Isolation Voltage 10µA Leakage Input-Output	MIN	700	VDC
Input to Output Capacitance	TYP	75	pF
Environmental			
Case Operating Range No Derating	MIN MAX	-25 80	°C
Case Functional Range (11)	MIN MAX	-40 85	°C
Storage Range	MIN MAX	-55 90	°C
Thermal Impedance (12)	TYP	10	°C/Watt
General			
Unit Weight	TYP	1.7	oz
Chassis Mounting Kits		MS6, MS8, MS15	



BOTTOM VIEW SIDE VIEW

Mechanical tolerances unless otherwise noted:

X.XX dimensions: ±0.020 inches

X.XXX dimensions: ±0.005 inches

Seal around terminals is not hermetic. Do not immerse units in any liquid.

Pin	Function
1	+INPUT
2	-INPUT
3	+OUTPUT
5	CMN

(7) After a 100% step change of the load, the output voltage will be within 1% of the final value within the transient response time.

(8) Dynamic response is the peak overshoot voltage during the transient response time defined in note 7 above.

(9) The input ripple rejection is specified for DC to 120Hz ripple with a modulation amplitude of 1% Vin.

(10) For module protection only, see also Note 4.

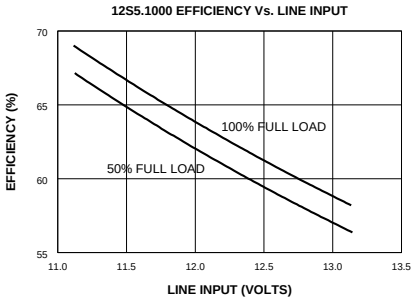
(11) The functional temperature range is intended to give an additional data point for use in evaluating this power supply. At the low functional temperature the power supply will function with no side effects, however sustained operation at the high functional temperature will reduce expected operational life. The data sheet specifications are not guaranteed over the functional temperature range.

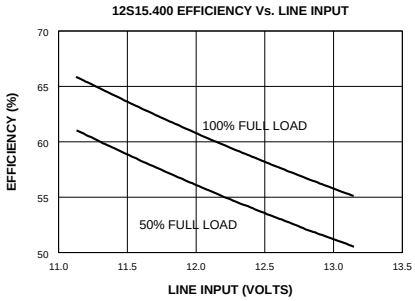
(12) The Case Thermal Impedance is specified as the case temperature rise over ambient per package watt dissipated.

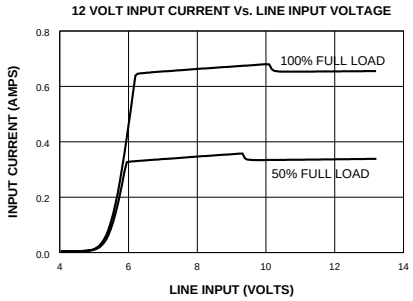
(13) Input voltage range is 10.56 - 15.60 VDC when total output power is 3 watts or less.

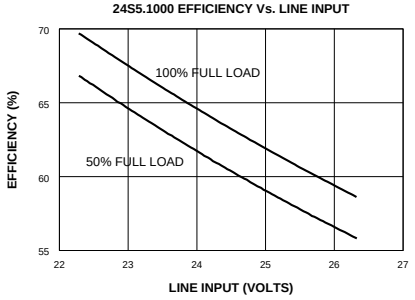
(14) Specifications subject to change without notice.

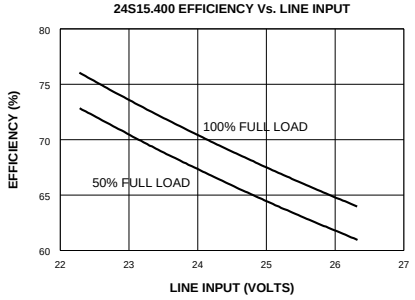
Typical Performance: (Tc = 25°C; Full Rated Load).

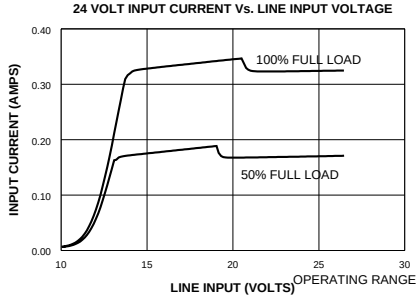






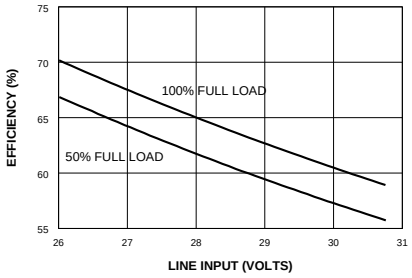




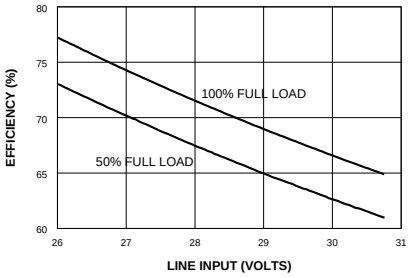


Typical Performance: (Tc = 25°C; Full Rated Load).

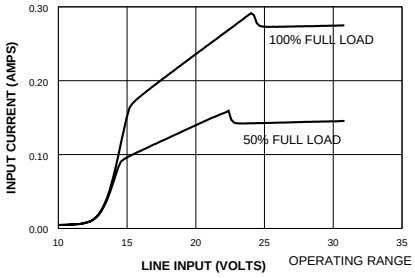
28S5.1000 EFFICIENCY Vs. LINE INPUT



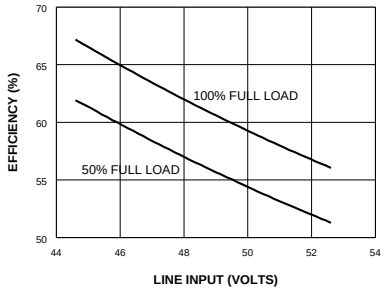
28S15.400 EFFICIENCY Vs. LINE INPUT



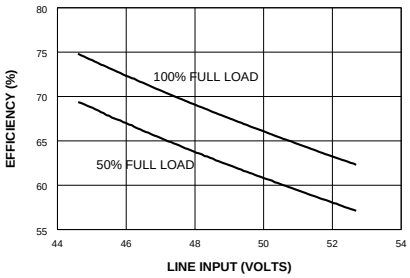
28 VOLT INPUT CURRENT Vs. LINE INPUT VOLTAGE



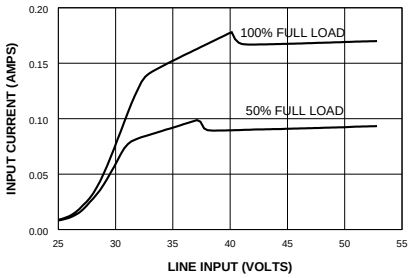
48S5.1000 EFFICIENCY Vs. LINE INPUT



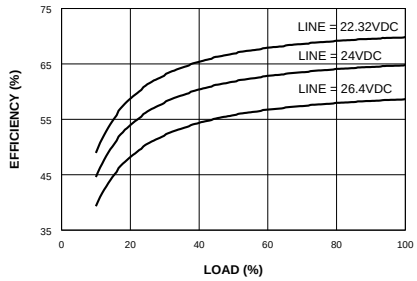
48S15.400 EFFICIENCY Vs. LINE INPUT



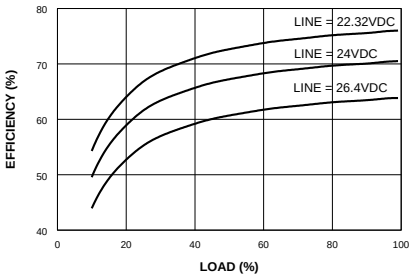
48 VOLT INPUT CURRENT Vs. LINE INPUT VOLTAGE



24S5.1000 EFFICIENCY Vs. LOAD



24S15.400 EFFICIENCY Vs. LOAD



OUTPUT IMPEDANCE Vs. FREQUENCY