

# 15 Watt SW Triple Series DC/DC Converters



## Features

- Wide 2:1 Input Voltage Range (9-18, 18-36 or 36-72VDC)
- Low Noise, Highly Regulated Triple Outputs
- Efficiency 78% for All Line Conditions
- No Derating to 80°C Case Temperature
- Six-Sided Shielded Low Thermal Gradient Copper Case
- 500 VDC Minimum Input to Output Isolation
- Overvoltage Protected Outputs
- Pulse by Pulse Digital Current Limiting
- Five Year Warranty

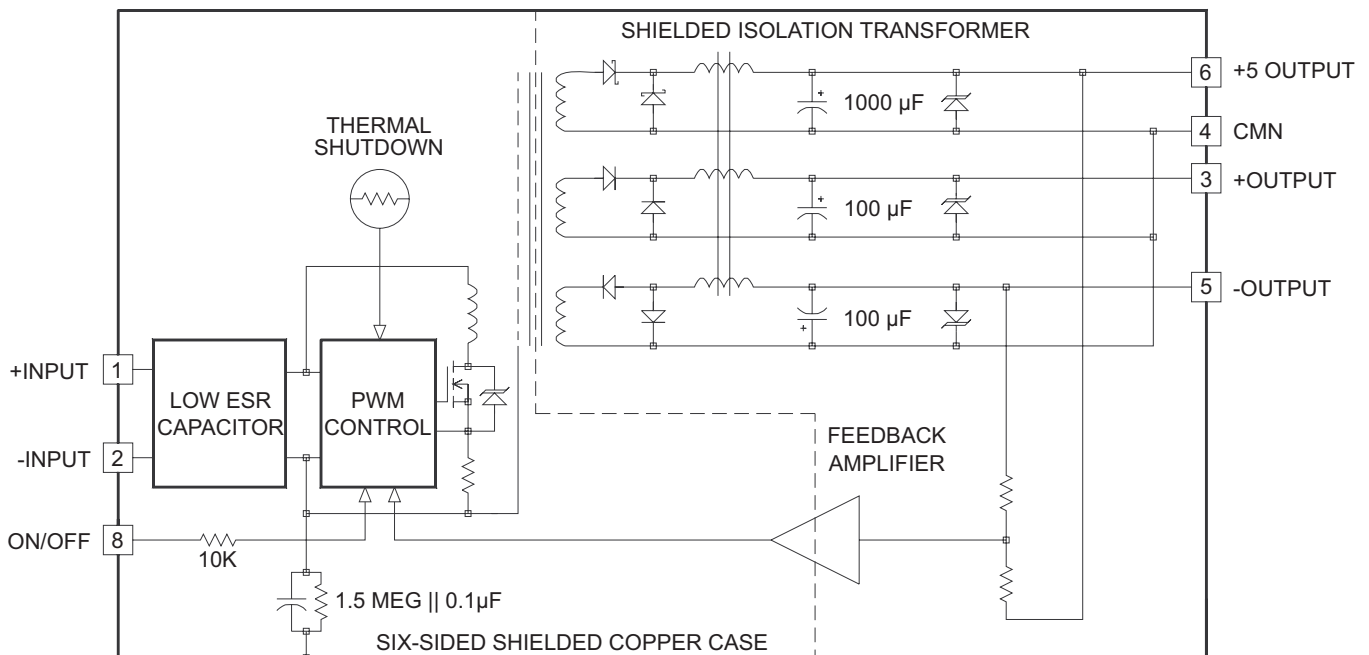
## Description

These triple output converters are designed for wide input range telecommunications, medical instrument and industrial control system applications. The converters have a high accuracy feedback control circuit and coupled inductor magnetics. This combination provides linear regulator type performance with switching topology efficiency. Outstanding line and load regulation are achieved over the full input range and under the specified load current range. A logic shutdown pin is also included to inhibit converter operation as is internal thermal overload protection. The outputs and the power switch are both overvoltage protected.

**Selection Chart**

Model	Input Range VDC		Outputs VDC	Outputs mA
	Min	Max		
12T5.12SW	9.00	18.00	5, ±12	1500, ±310
12T5.15SW	9.00	18.00	5, ±15	1500, ±250
24T5.12SW	18.00	36.00	5, ±12	1500, ±310
24T5.15SW	18.00	36.00	5, ±15	1500, ±250
48T5.12SW	36.00	72.00	5, ±12	1500, ±310
48T5.15SW	36.00	72.00	5, ±15	1500, ±250

**15 Watt SW Triple Series Block Diagram**



# 15 Watt SW Triple Series DC/DC Converters

Input Parameters*								
Model		12T5.12SW	12T5.15SW	24T5.12SW	24T5.15SW	48T5.12SW	48T5.15SW	Units
Voltage Range	MIN	9.0		18.0		36.00		VDC
	MAX	18.00		36.00		72.00		
Input Filter		Low ESR Capacitor						
Input Current Full Load	TYP	1600		780		380		mA
	TYP	25		18		16		
Efficiency		TYP 78						%
Switching Frequency		TYP 55						kHz
Maximum Input Overvoltage, 100ms No Damage		MAX 25		45		85		VDC
Turn-on Time, 1% Output Error		TYP 120						ms
Recommended Fuse		(2)						

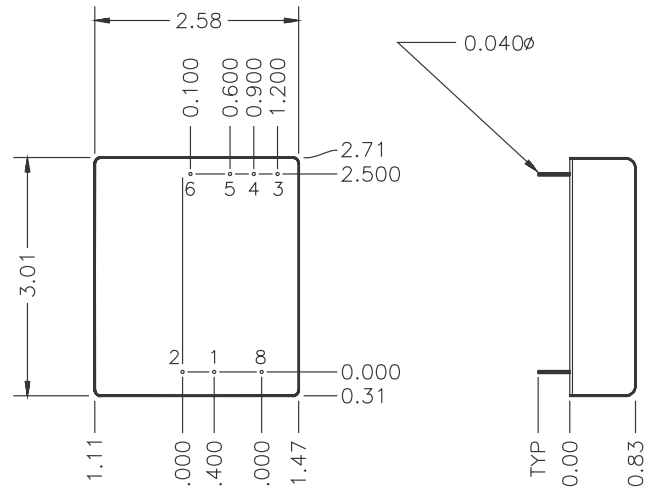
Output Parameters*					
Model		12T5.12SW 12T5.15SW 24T5.12SW 24T5.15SW 48T5.12SW 48T5.15SW	12T5.12SW 24T5.12SW 48T5.12SW	12T5.15SW 24T5.15SW 48T5.15SW	Units
Output Voltage		5	±12	±15	VDC
Rated Load (3)	MIN	250	100	100	mA
	MAX	1500	310	250	
Voltage Range 100% Load	MIN	4.900	11.640	14.550	VDC
	TYP	5.000	12.000	15.000	
	MAX	5.100	12.360	15.450	
Load Regulation Min-Max Load	TYP	2.0	1.5	1.5	%
	MAX	3.5	3.0	3.0	
Line Regulation Vin = Min-Max VDC	TYP	0.1			%
	MAX	0.5			
Short Term Stability (4)		TYP 0.02			%
Long Term Stability		TYP 0.2			%/kHrs
Transient Response (5)		TYP 50			µs
Dynamic Response (6)		85	75	70	mV peak
Input Ripple Rejection (7)		TYP 35			dB
Noise, 0-20MHz bw	TYP	25	20	20	mV P-P
	MAX	50	50	50	
Temperature Coefficient		TYP 120			ppm/°C
		MAX 250			
Overvoltage Clamp (8)		6.8	15.0	18.0	VDC
Short Circuit Protection to Common for all Outputs		Continuous, 8 Hours Minimum Current Limit and Thermal Overload			

## 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) Determine the correct fuse size by calculating the maximum DC current drain at low line input, maximum load then adding 20 to 25 percent. Slow blow type recommended.
- (3) The module will not be damaged if run at less than minimum load. Regulation can degrade with less than minimum load or substantial load imbalance.
- (4) Short term stability is specified after a 30 minute warm-up at full load and with constant line, load and ambient conditions.
- (5) The transient response is specified as the time required to settle from 50 to 75% step load change (rise time of step = 2µSec.) to a 1% error band.
- (6) Dynamic response is the peak overshoot voltage during the transient response time defined in note 5 above.
- (7) The input ripple rejection is specified for DC to 120Hz ripple with a modulation amplitude of 1% Vin.
- (8) For module protection only, see also note 2.
- (9) The logic shutdown pin is Open Collector TTL, CMOS, and relay compatible. The input to this pin is referenced to input minus.
- (10) 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.
- (11) The case thermal impedance is specified as the case temperature rise over ambient per package watt dissipated.
- (12) Specifications subject to change without notice.
- (13) Water Washability - Calex 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.

# 15 Watt SW Triple Series DC/DC Converters

General Specifications*			
All Models			Units
<b>Logic Shutdown (9)</b>			
ON Logic Level or Leave Pin open	MIN	2.4	VDC
OFF Logic Level	MAX	1.2	VDC
Input Resistance	TYP	10	k ohms
Converter Idle Current, Shut Down Pin Low	TYP	6	mA
<b>Isolation</b>			
Isolation Voltage			
10 $\mu$ A Leakage			
Input-Output			
12T & 24T Models	MIN	700	VDC
48T Models	MIN	1544	VDC
Input to Output Capacitance	TYP	190	pF
<b>Environmental</b>			
Case Operating Range	MIN	-25	$^{\circ}$ C
No Derating	MAX	80	$^{\circ}$ C
Case Functional Range (10)	MIN	-40	$^{\circ}$ C
	MAX	90	$^{\circ}$ C
Storage Range	MIN	-55	$^{\circ}$ C
	MAX	100	$^{\circ}$ C
Thermal Impedance (11)	TYP	4.4	$^{\circ}$ C/Watt
Thermal Shutdown Case Temperature	TYP	90	$^{\circ}$ C
<b>General</b>			
Unit Weight	TYP	7.0	oz
Mounting Kit		MS9	



BOTTOM VIEW

SIDE VIEW

Mechanical tolerances unless otherwise noted:

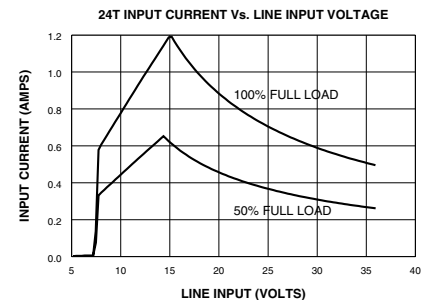
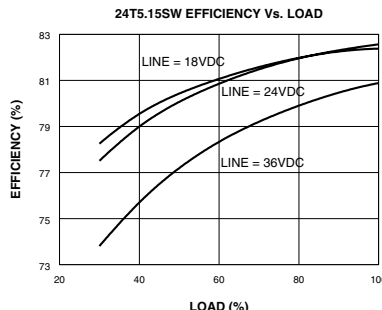
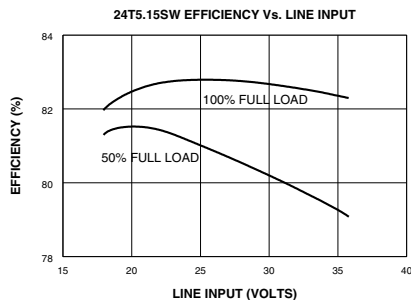
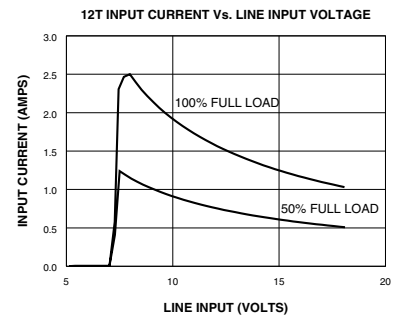
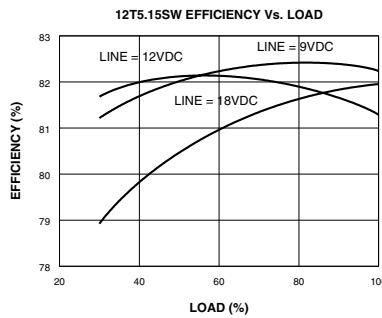
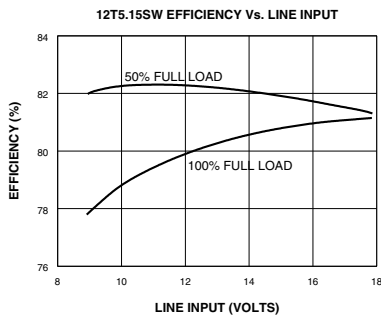
X.XX dimensions:  $\pm 0.020$  inches

X.XXX dimensions:  $\pm 0.005$  inches

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

Pin	Function
1	+INPUT
2	-INPUT
3	+12/ +15 OUTPUT
4	CMN
5	-12/-15 OUTPUT
6	+5 OUTPUT
8	ON/OFF

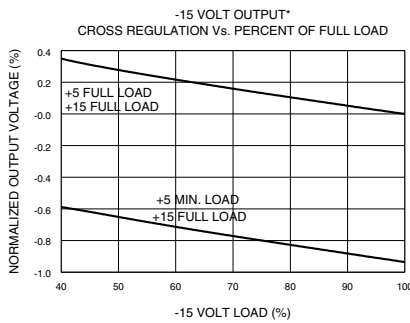
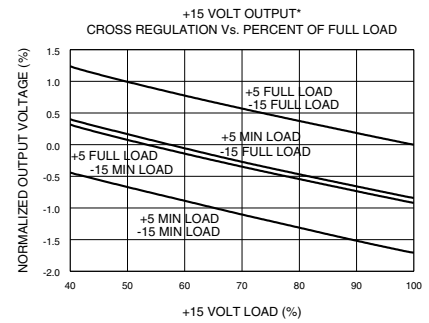
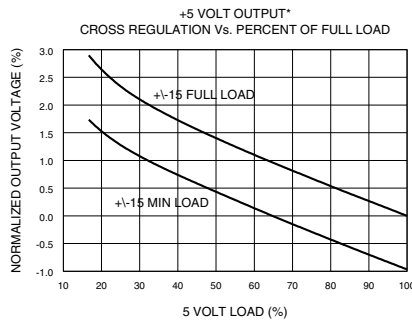
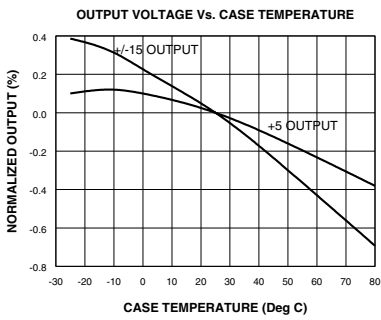
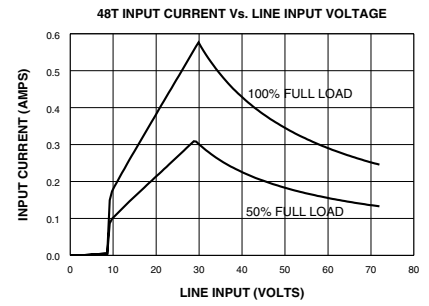
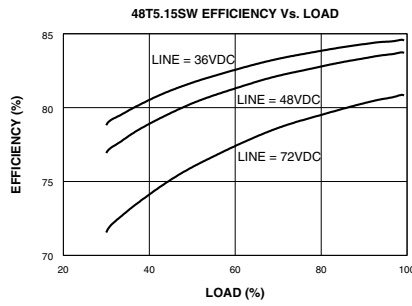
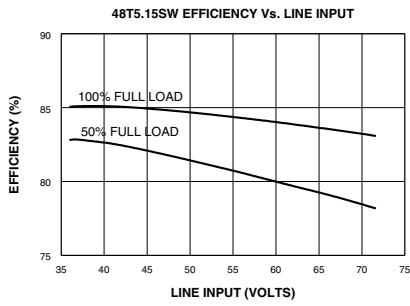
Typical Performance ( $T_c=25^{\circ}$ C,  $V_{in}=\text{Nom VDC}$ , Rated Load).



\* Curves are applicable to both outputs  $\pm 12$  and  $\pm 15$  VDC

# 15 Watt SW Triple Series DC/DC Converters

Typical Performance ( $T_c=25^\circ\text{C}$ ,  $V_{in}=\text{Nom VDC}$ , Rated Load).



\* Curves are applicable to both outputs  $\pm 12$  and  $\pm 15$  VDC