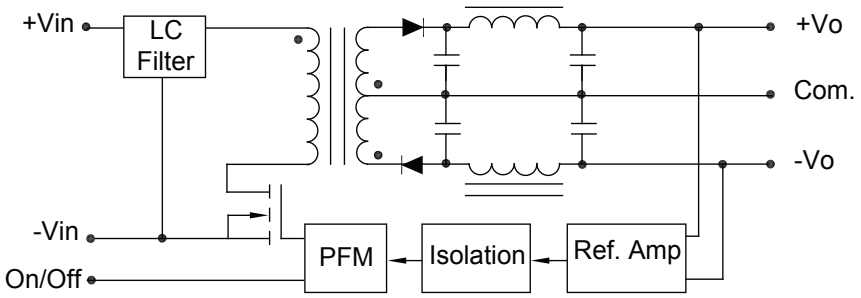
5 WATT SMT DUAL

Features

- SMT Technology
- 2:1 Input Range
- Efficiency up to 85%
- I/O Isolation 1500VDC
- Remote on/off Control
- Short Circuit Protection
- MTBF > 1,000,000 Hours
- RoHS Compliant
- MSL2 (Moisture Sensitivity Level) per IPC/JEDEC J-STD-020D

Selection Chart			
Model	Input Range	Output	
		VDC	mA
12D5.500SMT	9.0 - 18.0	±5	±500
12D12.208SMT	9.0 - 18.0	±12	±208
12D15.167SMT	9.0 - 18.0	±15	±167
24D5.500SMT	18.0 - 36.0	±5	±500
24D12.208SMT	18.0 - 36.0	±12	±208
24D15.167SMT	18.0 - 36.0	±15	±167
48D5.500SMT	36.0 - 75.0	±5	±500
48D12.208SMT	36.0 - 75.0	±12	±208
48D15.167SMT	36.0 - 75.0	±15	±167



Block Diagram

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Input Parameters					
Model		**12D5.500SMT**	**12D12.208SMT**	**12D15.167SMT**	**Units**
Voltage Range	MIN TYP MAX		9.0 12.0 18.0		VDC
Input Current No Load Full Load	TYP TYP	45 521	45 501	45 503	mA
Under Voltage Shutdown	MAX		8		VDC
Reverse Polarity Input Currrent	MAX		1		A
Input Filter			Pi Filter		
Efficiency	TYP	80	83	83	%
Switching Frequency	TYP		260		kHz
Input Surge Voltage (1000 ms)	MIN MAX		-0.7 25		VDC
Recommended Fuse			1500 mA Slow - Blow Type		mA
Model		**24D5.500SMT**	**24D12.208SMT**	**24D15.167SMT**	**Units**
Voltage Range	MIN TYP MAX		18.0 24.0 36.0		VDC
Input Current No Load Full Load	TYP TYP	15 254	15 245	15 246	mA
Under Voltage Shutdown	MAX		17		VDC
Reverse Polarity Input Currrent	MAX		1		A
Input Filter			Pi Filter		
Efficiency	TYP	82	85	85	%
Switching Frequency	TYP		260		kHz
Input Surge Voltage (1000 ms)	MIN MAX		-0.7 50		VDC
Recommended Fuse			700 mA Slow - Blow Type		mA
Model		**48D5.500SMT**	**48D12.208SMT**	**48D15.167SMT**	**Units**
Voltage Range	MIN TYP MAX		36.0 48.0 75.0		VDC
Input Current No Load Full Load	TYP TYP	6 127	6 122	6 123	mA
Under Voltage Shutdown	MAX		34		VDC
Reverse Polarity Input Currrent	MAX		1		A
Input Filter			Pi Filter		
Efficiency	TYP	82	85	85	%
Switching Frequency	TYP		260		kHz
Input Surge Voltage (1000 ms)	MIN MAX		-0.7 100		VDC
Recommended Fuse			350 mA Slow - Blow Type		mA

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Output Parameters					
Models		**12D5.500SMT 24D5.500SMT 48D5.500SMT**	**12D12.208SMT 24D12.208SMT 48D12.208SMT**	**12D15.167SMT 24D15.167SMT 48D15.167SMT**	**Units**
Output Voltage		±5	±12	±15	VDC
Output Current	MIN MAX	±50 ±500	±20.8 ±208	±16.7 ±167	mA
Output Voltage Accuracy	TYP MAX	±0.5 ±1.0			%
Load Regulation Io = 20% to 100%	TYP MAX	±0.3 ±1.0			%
Line Regulation Vin = Min. to Max.	TYP MAX	±0.1 ±0.3			%
Ripple & Noise (20MHz)	TYP MAX	50 85			mV P-P
Ripple & Noise (20MHz) Over Line, Load & Temp	MAX	100			mV P-P
Ripple & Noise (20MHz)	MAX	15			mV RMS
Capacitive Load	MAX	100			µF
Transient Recovery Time, 25% Load Step Change	TYP MAX	250 500			µs
Transient Response Deviation, 25% Load Step Change	TYP MAX	±2 ±6			%
Temperature Coefficient	TYP MAX	±0.01 ±0.02			% / ºC
Short Circuit Protection		Continuous			

Remote On/Off Control				
Parameter	Conditions	Min.	Max.	Unit
Supply On	2.5 to 5.5 VDC or Open Circuit			
Supply Off		-0.7	0.8	VDC
Device Standby Input Current		-----	10.0	mA
Control Input Current (on)	Vin = Min. to Max.	___	-200	µA
Control Input Current (off)	Vin = Min. to Max.	-----	-300	µA
Control Common	Referenced to Negative Input			

Notes:

(1) All parameters measured at Tc=+25ºC, resistive load, nominal input voltage, full rated output current unless otherwise noted.

(2) Transient recovery time is measured to within 1% error band for a step change in output load 75% to 100%

(3) The 5 Watt Dual series has limitation of 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. For optimum performance we recommend 100µF maximum capacitive load.

(4) When measuring output ripple & noise, an external 0.1µF ceramic capacitor is recommended to be placed from +Vout to -Vout.

(5) When measuring peak-to-peak output noise, use a Cout 0.47µF ceramic capacitor. Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20MHz. Posistion the load between 50mm and 75mm from the DC/DC converter.

(6) Specifications subject to change without notice

(7) 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.

(8) RoHS Compliance means conformity to EU Directive 2002/95/EC of 27 January 2003, on the restriction of the use of certain hazardous substances in electrical and electronic equipment, lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers are not present in quantities exceeding the following maximum concentrations in any homogeneous material, except for applicable exemptions.
0.1% (by weight of homogeneous material) lead, mercury, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers, or 0.01% (by weight of homogeneous material) cadmium. The RoHS marking is as follows.

Pb
RoHS

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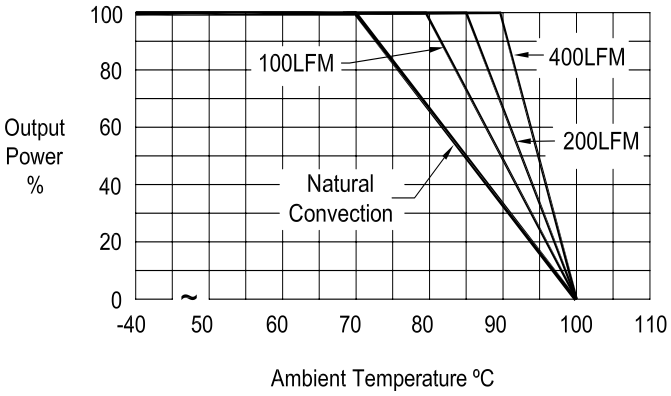
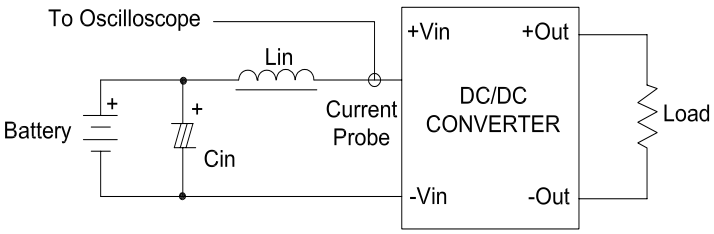
General Specifications			
All Models			**Units**
Isolation			
Isolation Voltage, 60 seconds	MIN	1500	VDC
Isolation Resistance, 500VDC	MIN	1000	Mohms
Isolation Capacitance, 100kHz, 1V	TYP MAX	650 750	pF
Environmental			
Operating Temperature Case	MIN MAX	-40 +90	ºC
Storage Temperature	MIN MAX	-50 +125	ºC
Humidity	MAX	95	%
MTBF MIL-HDBK-217F @25ºC, Ground Benign	MIN	1000	K Hours
Cooling		Free-Air Convection	
General			
Case Size		1.31 x 0.81 x 0.40 inches 33.4 x 20.6 x 10.2 mm	
Case Material		Non Conductive Black Plastic	
Weight		14g	

Derating Curve



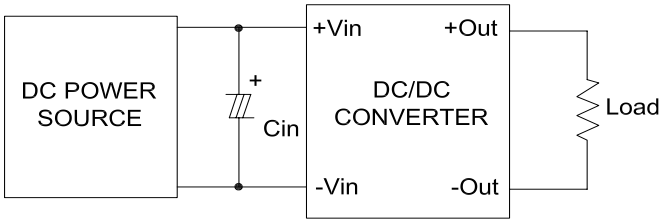
Testing

Input reflected-ripple current is measured with a inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100kHz) to simulate source impedance.
Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500kHz.



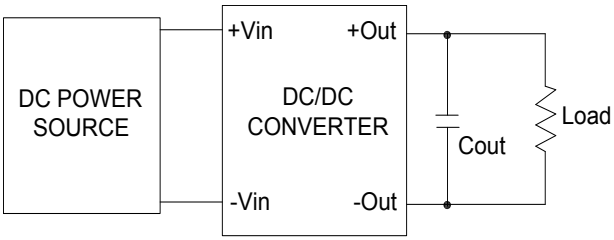
Input Source Impedance

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.
Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100kHz) capacitor of a 3.3µF for the 12V input devices and a 2.2µF for the 24V and 48V units.



Output Ripple Reduction

A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance.
To reduce output ripple, it is recommended to use 3.3µF capacitors at the output.



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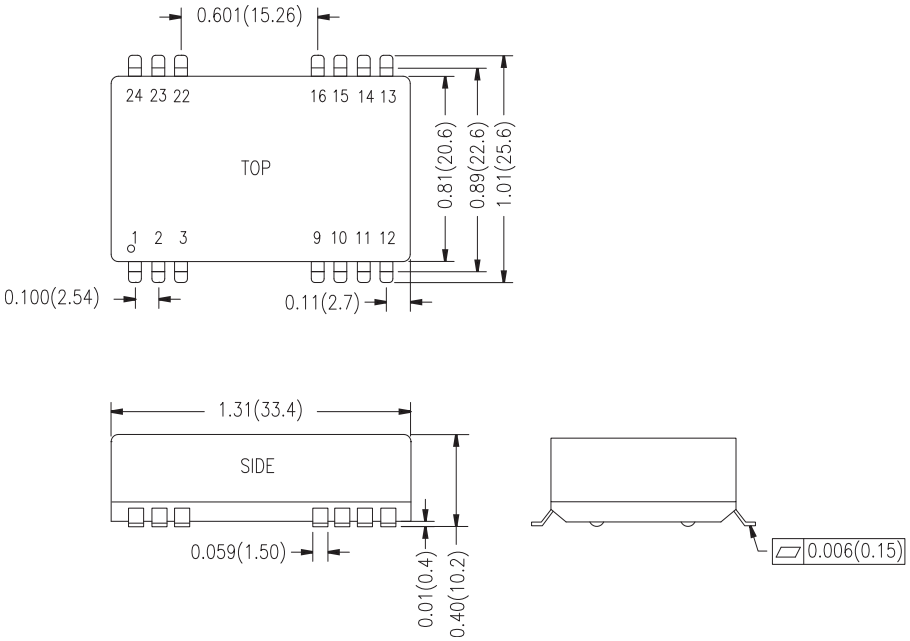
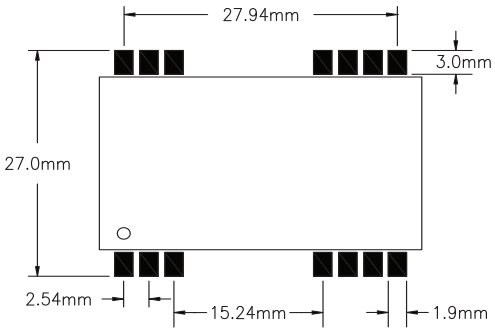
Case Mechanical Dimensions
inches (mm)



Pin	Name
1	Remote On/Off
2	-Vin
3	-Vin
9	Common
10	NC
11	-Vout
12	NC
13	NC
14	+Vout
15	NC
16	Common
22	+Vin
23	+Vin
24	NC

TOLERANCE: ALL DIMENSIONS ARE TYPICAL IN INCHES (mm) UNLESS OTHERWISE NOTED:	
X.X	±0.01 (0.25)
X.XX	±0.005 (0.13)
PINS	±0.002 (0.05)



Connecting Pin Pattern
Dimensions are mm (±0.05)

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