

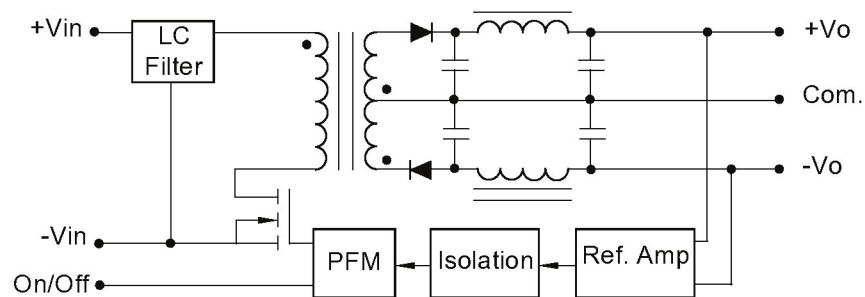
5 WATT SMT DUAL



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

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	9.0			VDC
	TYP	12.0			
	MAX	18.0			
Input Current	No Load	20	20	20	mA
	Full Load	521	501	503	
Under Voltage Shutdown	MAX	8			VDC
Reverse Polarity Input Current	MAX	1			A
Input Filter		Pi Filter			
Efficiency	TYP	80	83	83	%
Switching Frequency	TYP	260			kHz
Input Surge Voltage (1000 ms)	MIN	-0.7			VDC
	MAX	25			
Recommended Fuse		1500 mA Slow - Blow Type			mA
Model		24D5.500SMT	24D12.208SMT	24D15.167SMT	Units
Voltage Range	MIN	18.0			VDC
	TYP	24.0			
	MAX	36.0			
Input Current	No Load	5	5	5	mA
	Full Load	254	245	246	
Under Voltage Shutdown	MAX	17			VDC
Reverse Polarity Input Current	MAX	1			A
Input Filter		Pi Filter			
Efficiency	TYP	82	85	85	%
Switching Frequency	TYP	260			kHz
Input Surge Voltage (1000 ms)	MIN	-0.7			VDC
	MAX	50			
Recommended Fuse		700 mA Slow - Blow Type			mA
Model		48D5.500SMT	48D12.208SMT	48D15.167SMT	Units
Voltage Range	MIN	36.0			VDC
	TYP	48.0			
	MAX	75.0			
Input Current	No Load	3	3	3	mA
	Full Load	127	122	123	
Under Voltage Shutdown	MAX	34			VDC
Reverse Polarity Input Current	MAX	1			A
Input Filter		Pi Filter			
Efficiency	TYP	82	85	85	%
Switching Frequency	TYP	260			kHz
Input Surge Voltage (1000 ms)	MIN	-0.7			VDC
	MAX	100			
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 I _o = 20% to 100%	TYP MAX	±0.3 ±1.0			%
Line Regulation V _{in} = 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			% / °C
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)	V _{in} = Min. to Max.	---	-200	µA
Control Input Current (off)	V _{in} = Min. to Max.	----	-300	µA
Control Common	Referenced to Negative Input			

Notes:

- All parameters measured at T_c=+25°C, resistive load, nominal input voltage, full rated output current unless otherwise noted.
- Transient recovery time is measured to within 1% error band for a step change in output load 75% to 100%
- 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.
- When measuring output ripple & noise, an external 0.1µF ceramic capacitor is recommended to be placed from +V_{out} to -V_{out}.
- 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. Position the load between 50mm and 75mm from the DC/DC converter.
- Specifications subject to change without notice
- Water Washability - Calnex 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.
- 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.



RoHS

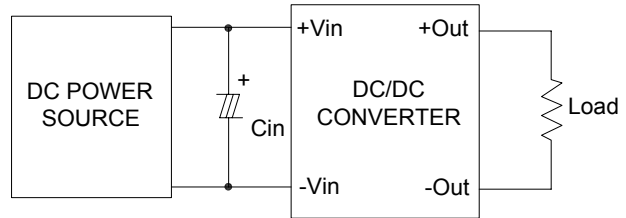
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General Specifications			
All Models			Units
Isolation			
Isolation Voltage, 60 seconds	MIN	1500	VDC
Isolation Resistance, 500VDC	MIN	1000	Mohms
Isolation Capacitance, 100kHz, 1V	TYP MAX	650 750	pF
Environmental			
Operating Temperature Case	MIN MAX	-40 +90	°C
Storage Temperature	MIN MAX	-40 +125	°C
Humidity	MAX	95	%
MTBF MIL-HDBK-217F @25°C, 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		

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.

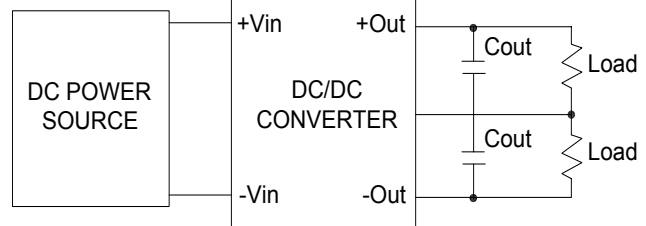
Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100kHz) capacitor of a 3.3μF for the 12V input devices and a 2.2μF for the 24V and 48V units.



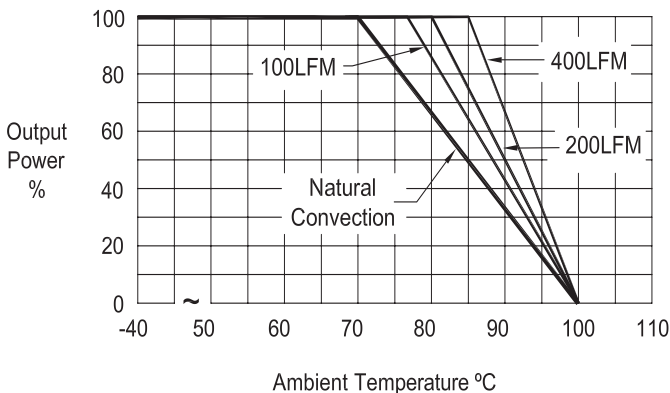
Output Ripple Reduction

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.



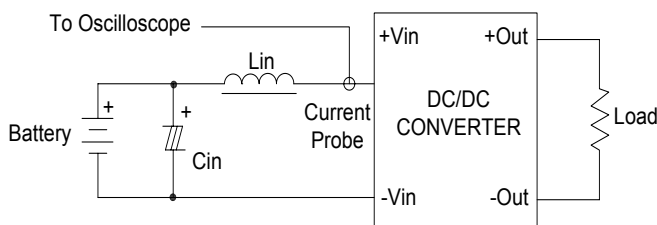
Derating Curve



Testing

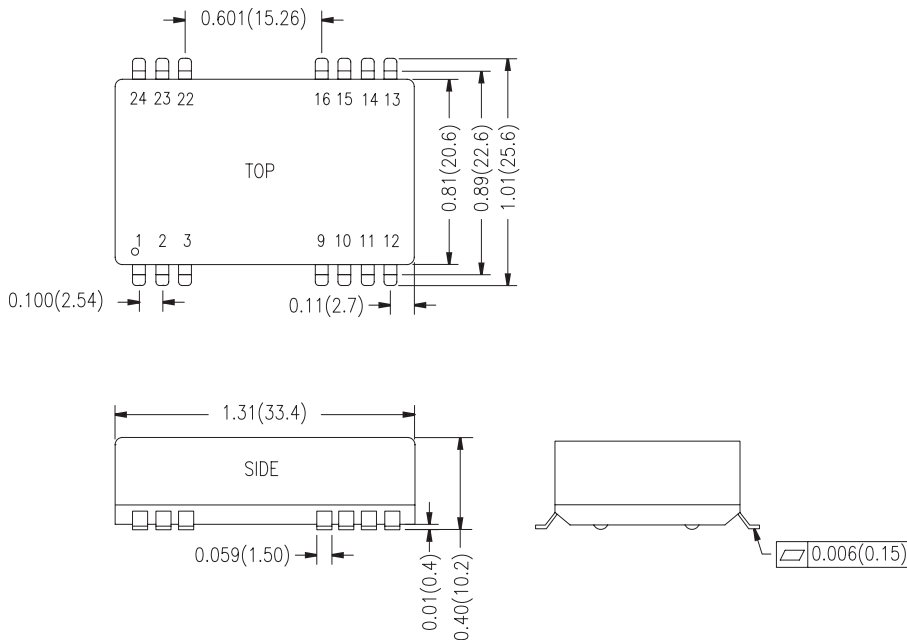
Input reflected-ripple current is measured with an inductor L_{in} (4.7μH) and C_{in} (220μF, ESR < 1.0Ω at 100kHz) to simulate source impedance.

Capacitor C_{in} , offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500kHz.



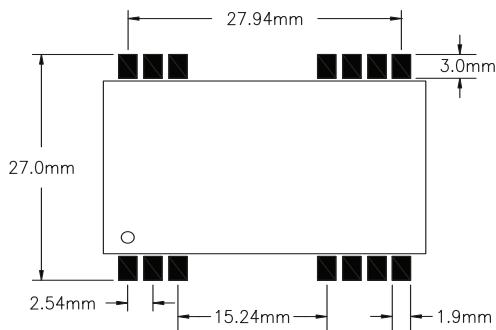
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Case Mechanical Dimensions inches (mm)



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)