

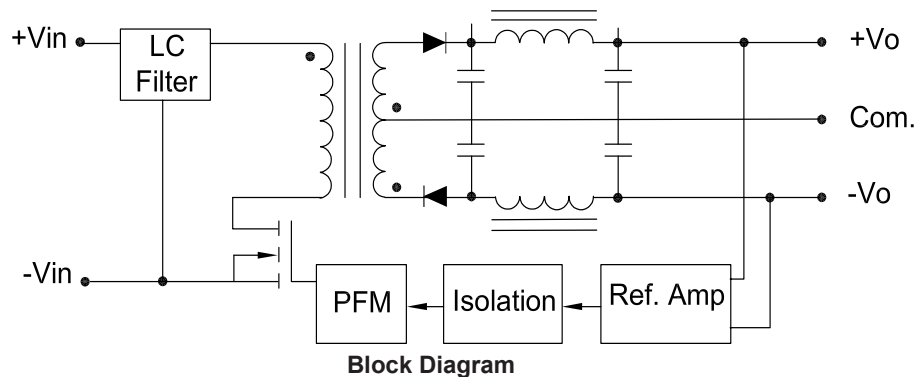
3 WATT SMT DUAL SERIES DC/DC CONVERTER



Features

- SMT Technology
- 2:1 Input Range
- Efficiency up to 83%
- I/O Isolation 1500VDC
- Short Circuit Protected
- MTBF > 1,000,000 Hours
- RoHS Compliant
- MSL2 (Moisture Sensitivity Level) per IPC/JEDEC J-STD-020D

Selection Chart					
Model	Input Range		Output		
	Min	Max	VDC	mA	Power W
12D5.300SMT	9	18	±5	±300	3
12D12.125SMT	9	18	±12	±125	3
12D15.100SMT	9	18	±15	±100	3
24D5.300SMT	18	36	±5	±300	3
24D12.125SMT	18	36	±12	±125	3
24D15.100SMT	18	36	±15	±100	3
48D5.300SMT	36	75	±5	±300	3
48D12.125SMT	36	75	±12	±125	3
48D15.100SMT	36	75	±15	±100	3



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Input Parameters						
Model		12D5.300SMT	12D12.125SMT	12D15.100SMT	Units	
Voltage Range	MIN TYP MAX	9.0 12.0 18.0			VDC	
Input Current	No Load Full Load	TYP TYP	20 321	20 309	20 309	mA
Reflected Ripple	TYP	25			mA	
Under Voltage Shutdown	MAX	8			VDC	
Reverse Polarity Input Current	MAX	0.5			A	
Short Circuit Input Power	MAX	1500			mW	
Input Filter		Pi Filter				
Efficiency	TYP	78	81	81	%	
Switching Frequency	TYP	300			kHz	
Input Surge Voltage (1000 ms)	MIN MAX	-0.7 25			VDC	
Internal Power Dissipation	MAX	2500			mW	
Recommended Fuse		750 mA Slow Blow Type			mA	
Model		24D5.300MT	24D12.125SMT	24D15.100SMT	Units	
Voltage Range	MIN TYP MAX	18.0 24.0 36.0			VDC	
Input Current	No Load Full Load	TYP TYP	5 158	5 152	5 152	mA
Reflected Ripple	TYP	15			mA	
Under Voltage Shutdown	MAX	16			VDC	
Reverse Polarity Input Current	MAX	0.5			A	
Short Circuit Input Power	MAX	1500			mW	
Input Filter		Pi Filter				
Efficiency	TYP	79	82	82	%	
Switching Frequency	TYP	300			kHz	
Input Surge Voltage (1000 ms)	MIN MAX	-0.7 50			VDC	
Internal Power Dissipation	MAX	2500			mW	
Recommended Fuse		350 mA Slow - Blow Type			mA	
Model		48D5.300SMT	48D12.125SMT	48D15.100SMT	Units	
Voltage Range	MIN TYP MAX	36.0 48.0 75.0			VDC	
Input Current	No Load Full Load	TYP TYP	3 79	3 76	3 76	mA
Reflected Ripple	TYP	10			mA	
Under Voltage Shutdown	MAX	32			VDC	
Reverse Polarity Input Current	MAX	0.5			A	
Short Circuit Input Power	MAX	1500			mW	
Input Filter		Pi Filter				
Efficiency	TYP	79	82	82	%	
Switching Frequency	TYP	300			kHz	
Input Surge Voltage (1000 ms)	MIN MAX	-0.7 100			VDC	
Internal Power Dissipation	MAX	2500			mW	
Recommended Fuse		200 mA Slow - Blow Type			mA	

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Output Parameters					
Models		12D5.300SMT 24D5.300SMT 48D5.300SMT	12D12.125SMT 24D12.125SMT 48D12.125SMT	12D15.100SMT 24D15.100SMT 48D15.100SMT	Units
Output Voltage		±5	±12	±15	VDC
Output Current	MIN MAX	±30 ±300	±12.5 ±125	±10 ±100	mA
Output Voltage Accuracy	TYP MAX		±0.5 ±1.0		%
Output Voltage Balance, Dual Output Balance Load			±0.5 ±2.0		%
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 75		mV P-P
Ripple & Noise (20MHz) Over Line, Load & Temp	MAX		100		mV P-P
Ripple & Noise (20MHz)	MAX		10		mV RMS
Over Load	MAX		120		%
Transient Recovery Time, 25% Load Step Change	TYP MAX		200 500		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			

Notes:

- Specifications typical at Ta=+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 3 Watt SMT 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 180µF maximum capacitive load.
- 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 - It is not recommended to use water-wash process on 3W SMT units.
- 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.

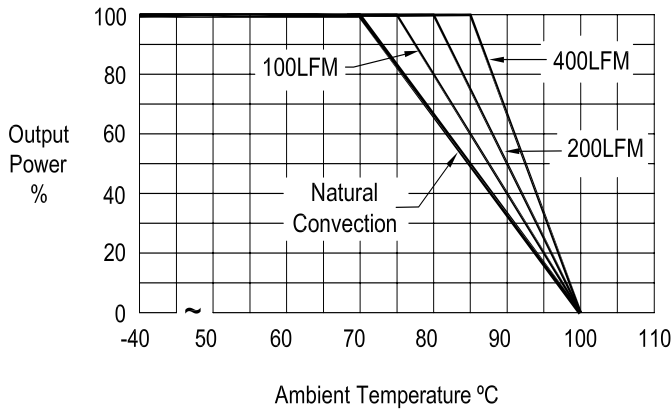


RoHS

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	65 100	pF
Environmental			
MTBF (Calculated), MIL-HDBK-217F @ 25°C, Ground Benign		1,000,000	h
Operating Temperature	MIN MAX	-40 +85	°C
Storage Temperature	MIN MAX	-50+125	°C
Humidity	MAX	95	%
Cooling	Free-Air Convection		
General			
Case Size	1.27 x 0.74 x 0.4 inches 32.3 x 18.8 x 10.2 mm		
Case Material	Non Conductive Black Plastic		
Weight	8.8g		

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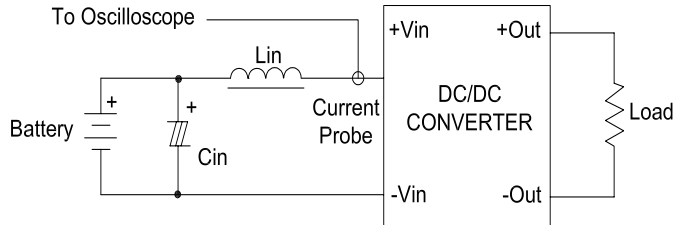
Derating Curve



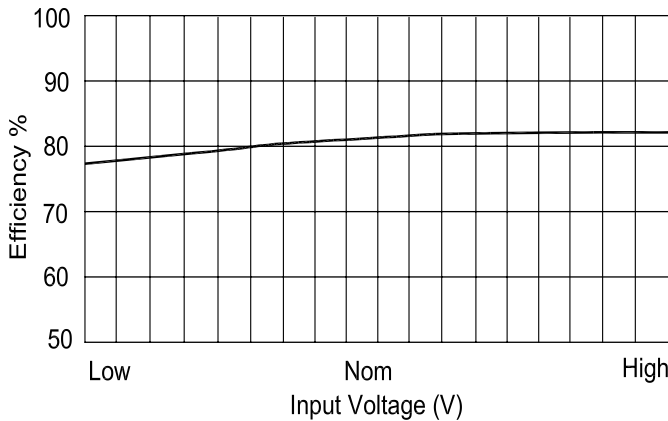
Testing

Input reflected-ripple current is measured with an inductor L_{in} ($4.7\mu H$) and C_{in} ($220\mu F$, $ESR < 1.0\Omega$ 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.



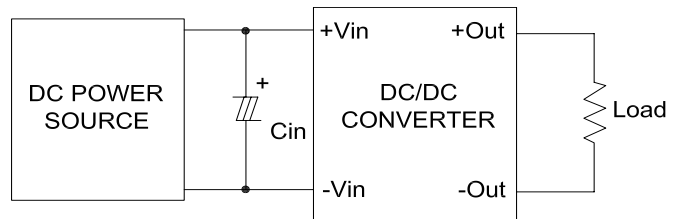
Efficiency vs Input Voltage



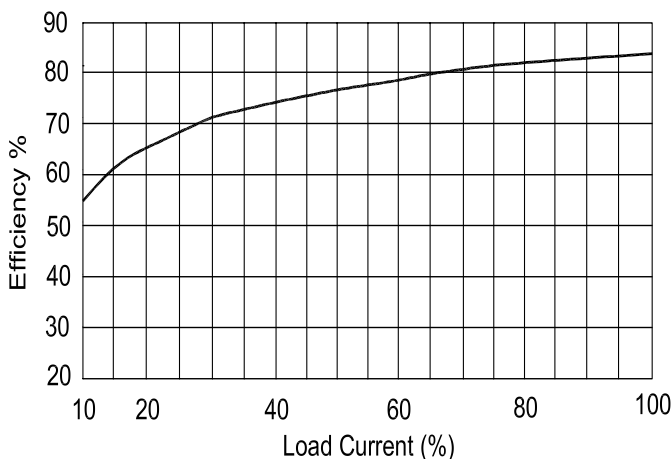
Input Source Impedance

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 ($ESR < 1.0\Omega$ at $100kHz$) capacitor of $3.3\mu F$ for the 12V input devices and a $1.5\mu F$ for the 24V and 48V devices..



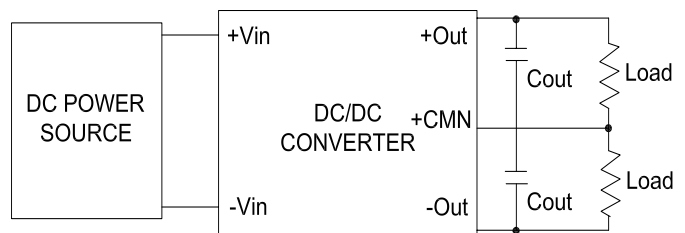
Efficiency vs Output Load



Output Ripple Reduction

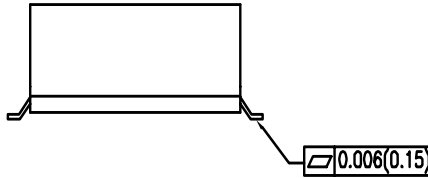
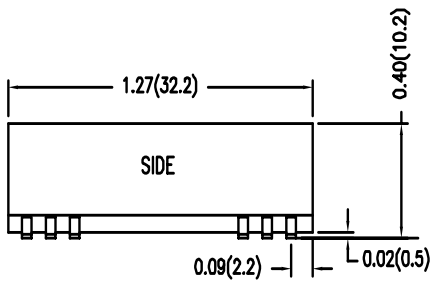
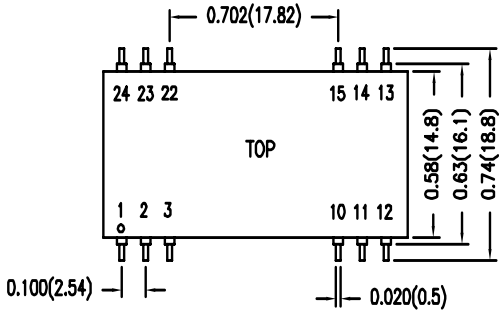
A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance.

To reduce output ripple, it is recommended to use $3.3\mu F$ capacitors at the output.



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Case Mechanical Dimensions inches (mm)

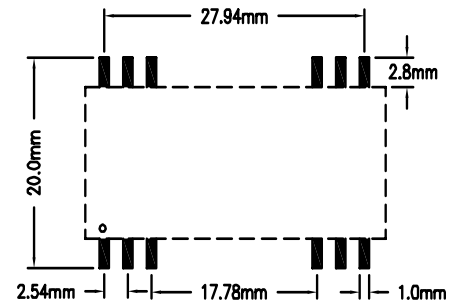


Pin	Name
1	-INPUT
2	-INPUT
3	NC
10	COMMON
11	NC
12	-OUTPUT
13	+OUTPUT
14	NC
15	COMMON
22	NC
23	+INPUT
24	+INPUT

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)



Typical Application

