Wall Industries, Inc.

DATASHEET
Rev. C

LANCW3 SERIES

2:1 & 3:1 Wide Input Voltage Ranges
Single & Dual Outputs
High Power Density in 24-Pin DIP Package
3 Watt DC/DC Power Converters

C US
UL 60950-1
CB

FEATURES

- RoHS Compliant
- 3 Watts Output Power
- 1.25” x 0.8” x 0.4” 24-Pin DIP Plastic Package
- 2:1 & 3:1 Wide Input Voltage Ranges
- 1500VDC I/O Isolation
- High Efficiency up to 81%
- Single & Dual Fully Regulated Outputs
- -40°C to +85°C Operating Temperature Range
- Short Circuit and Over Load Protection
- Input Filter meets EN55022 Class A and FCC Level A
- UL/cUL 60950-1 (CSA Certificate) & IEC/EN 60950-1 Safety Approvals

DESCRIPTION

The LANCW3 series of DC/DC power converters provides 3 Watts of output power in a 1.25” x 0.8” x 0.4” 24-pin DIP plastic package. This series consists of fully regulated single and dual output models with 2:1 wide input voltage ranges of 4.5~9VDC, 9~18VDC, 18~36VDC, and 36~75VDC and a 3:1 input voltage range of 10~30VDC. These converters operate over a temperature range of -40°C to +85°C while maintaining all specifications. This product features an input filter that meets EN 55022 Class A and FCC Level A requirements. Other features include efficiency up to 81%, 1500VDC I/O isolation, and over load and short circuit protection. These converters are RoHS compliant and have UL 60950-1 (CSA Certificate) and IEC/EN 60950-1 safety approvals. The LANCW3 series offers an economical solution for many cost critical applications in battery-powered equipment and instrumentation.

SPECIFICATIONS: LANCW3 SERIES

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	5VDC nominal input models		4.5	5	9	VDC
	12VDC nominal input models		9	12	18	
	20VDC nominal input models		10	20	30	
	24VDC nominal input models		18	24	36	
	48VDC nominal input models		36	48	75	
Input Surge Voltage (1s max.)	5VDC nominal input models		-0.7		11	VDC
	12VDC nominal input models		-0.7		25	
	20VDC nominal input models		-0.7		50	
	24VDC nominal input models		-0.7		50	
	48VDC nominal input models		-0.7		100	
Start-up Voltage	5VDC nominal input models		3.5	4	4.5	VDC
	12VDC nominal input models		4.5	7	9	
	20VDC nominal input models		4.5	7	9	
	24VDC nominal input models		8	12	18	
	48VDC nominal input models		16	24	36	
Under Voltage Shutdown	5VDC nominal input models			3.5	4	VDC
	12VDC nominal input models			6.5	8.5	
	20VDC nominal input models			6.5	8.5	
	24VDC nominal input models			11	17	
	48VDC nominal input models			22	34	
Input Current			See Table			
Reflected Ripple Current *(Page 5)*			See Table			
Reverse Polarity Input Current					1	A
Short Circuit Input Power				1000	1500	mW
Internal Power Dissipation					2500	mW
Input Fuse	5VDC nominal input models		1500mA slow-blow type			
	12VDC nominal input models		700mA slow-blow type			
	20VDC nominal input models		600mA slow-blow type			
	24VDC nominal input models		350mA slow-blow type			
	48VDC nominal input models		135mA slow-blow type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Line Regulation	Low line to high line at full load			±0.2	±0.5	%
Load Regulation	10% to 100% full load			±0.2	±0.5	%
Output Voltage Accuracy	Full load an nominal Vin			±0.5	±2.0	%
Output Voltage Balance	Dual Outputs, Balanced loads			±0.5	±2.0	%
Output Power			See Table			
Output Current			See Table			
Minimum Load *(Note 1)*			See Table			
Ripple & Noise (20MHz BW) *(Page 5)*				45	60	mVp-p
	Over line, load, and temperature				100	mVp-p
					15	mV_{rms}
Transient Recovery Time	Measured to within 1% error band for a step change in output load from 75% to 100%			300	500	µs
Transient Response Deviation	25% load step change			±3	±5	%
Temperature Coefficient				±0.01	±0.02	%/°C
PROTECTION						
Short Circuit Protection			continuous			
Over Load Protection	foldback		120	TBD		%
GENERAL SPECIFICATIONS						
Efficiency	Nominal input voltage and full load		See Table			
Switching Frequency				330		KHz
Isolation Voltage (Input to Output)	60 seconds		1500			VDC
Isolation Resistance	500VDC		1000			MΩ
Isolation Capacitance	20VDC nominal input models	100KHz, 1V			500	pF
	Others				150	
Maximum Capacitive Load *(Page 6)*			See Table			

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SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature Range	20VDC nominal input models	With derating	-25		+85	°C
	Others		-40		+85	
Case Temperature					+90	°C
Storage Temperature			-50		+125	°C
Humidity (non-condensing)					95	% RH
Cooling	"natural convection" is about 20LFM but is not equal to still air		Free air convection (20LFM)			
Lead Temperature	1.5mm from case for 10 seconds				260	°C
MTBF (calculated)	MIL-HDBK-217F at 25°C, Ground Benign		1,000,000 hours			
PHYSICAL SPECIFICATIONS						
Weight			0.44oz (12.4g)			
Dimensions (L x W x H)			1.25 x 0.80 x 0.40 inches (31.80 x 20.3 x 10.2 mm)			
Case Material			Non-conductive black plastic			
Flammability			UL 94V-0 rated			
SAFETY & EMI						
Safety Approvals	UL/cUL 60950-1 recognition (CSA certificate)[3]. IEC/EN 60950-1					
Conducted EMI	Compliance to EN 55022, class A and FCC part 15, class A					

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current (Typ)	Output Power	Efficiency	Maximum Capacitive Load	UL Approval [3]
			Min [1]	Max	No Load	Max Load					
LANC505W3	5 VDC (4.5 – 9 VDC)	5 VDC	60mA	600mA	40mA	857mA	100mA	3W	70%	2000µF	60950-1
LANC512W3		12 VDC	25mA	250mA		811mA		3W	74%		60950-1
LANC515W3		15 VDC	20mA	200mA		811mA		3W	74%		60950-1
LANC1205W3	12 VDC (9 – 18 VDC)	5 VDC	60mA	600mA	20mA	329mA	30mA	3W	76%	2000µF	60950-1
LANC1212W3		12 VDC	25mA	250mA		313mA		3W	80%		60950-1
LANC1215W3		15 VDC	20mA	200mA		313mA		3W	80%		60950-1
LANC2405W3	24 VDC (18 – 36 VDC)	5 VDC	60mA	600mA	5mA	162mA	15mA	3W	77%	2000µF	60950-1
LANC2412W3		12 VDC	25mA	250mA		154mA		3W	81%		60950-1
LANC2415W3		15 VDC	20mA	200mA		154mA		3W	81%		60950-1
LANC4805W3	48 VDC (36 – 75 VDC)	5 VDC	60mA	600mA	3mA	81mA	10mA	3W	77%	2000µF	60950-1
LANC4812W3		12 VDC	25mA	250mA		77mA		3W	81%		60950-1
LANC4815W3		15 VDC	20mA	200mA		77mA		3W	81%		60950-1
LANC2005W3	20 VDC (10 – 30 VDC)	5 VDC	60mA	600mA	5mA	188mA	20mA	3W	80%	4000µF	-
LANC2012W3		12 VDC	25mA	250mA		188mA		3W	80%		-
LANC2015W3		15 VDC	20mA	200mA		188mA		3W	80%		-

DUAL OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current (Typ)	Output Power	Efficiency	Maximum Capacitive Load	UL Approval [3]
			Min [1]	Max	No Load	Max Load					
LANC512DW3	5 VDC (4.5 – 9 VDC)	±12 VDC	±12.5mA	±125mA	40mA	811mA	100mA	3W	74%	±1000µF	-
LANC515DW3		±15 VDC	±10mA	±100mA		811mA		3W	74%		-
LANC1212DW3	12 VDC (9 – 18 VDC)	±12 VDC	±12.5mA	±125mA	20mA	313mA	30mA	3W	80%	±1000µF	60950-1
LANC1215DW3		±15 VDC	±10mA	±100mA		313mA		3W	80%		60950-1
LANC2412DW3	24 VDC (18 – 36 VDC)	±12 VDC	±12.5mA	±125mA	5mA	154mA	15mA	3W	81%	±1000µF	-
LANC2415DW3		±15 VDC	±10mA	±100mA		154mA		3W	81%		-
LANC4812DW3	48 VDC (36 – 75 VDC)	±12 VDC	±12.5mA	±125mA	3mA	77mA	10mA	3W	81%	±1000µF	60950-1
LANC4815DW3		±15 VDC	±10mA	±100mA		77mA		3W	81%		60950-1
LANC2012DW3	20 VDC (10 – 30 VDC)	±12 VDC	±12.5mA	±125mA	5mA	188mA	20mA	3W	80%	±470µF	-
LANC2015DW3		±15 VDC	±10mA	±100mA		188mA		3W	80%		-

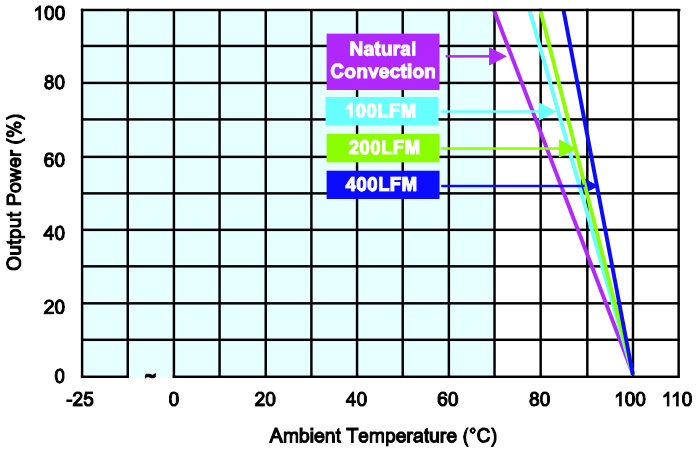
NOTES

1. These power converters require a minimum output loading to maintain all specified regulations. Operation under no-load conditions will not damage these devices; however, they may not meet all the listed specifications.
2. All DC/DC converters should be externally fused at the front end for protection.
3. UL approval can be added to any products not currently listed if required.

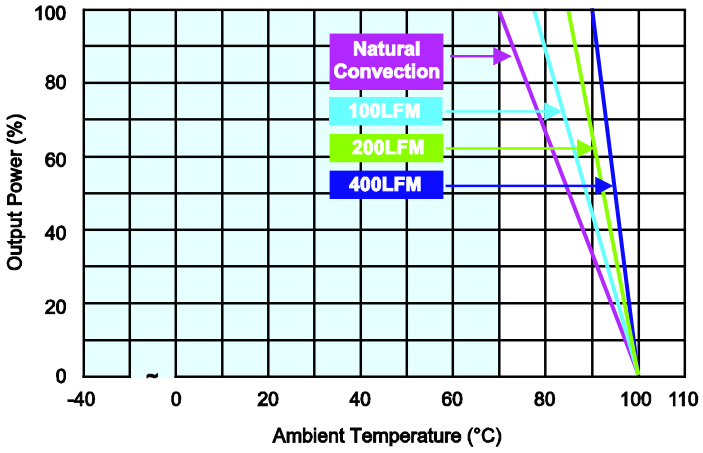
**Due to advances in technology, specifications are subject to change without notice.*

DERATING CURVES

20V Nominal Input Models

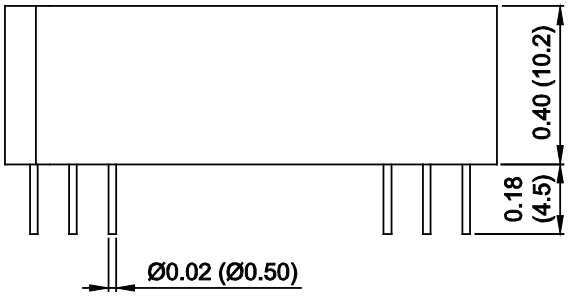


5V, 12V, 24V, and 48V Nominal Input Models



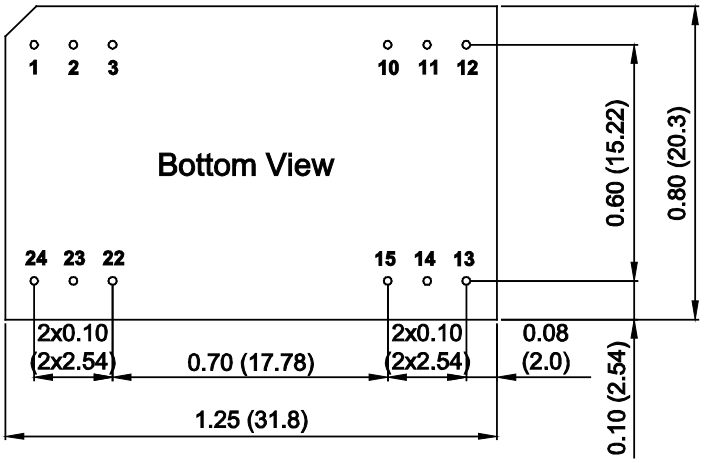
MECHANICAL DRAWING

Unit: inches (mm)



PIN CONNECTIONS		
Pin	Single Output	Dual Output
1	+Vin	+Vin
2	No Connection	-Vout
3	No Connection	Common
10	-Vout	Common
11	+Vout	+Vout
12	-Vin	-Vin
13	-Vin	-Vin
14	+Vout	+Vout
15	-Vout	Common
22	No Connection	Common
23	No Connection	-Vout
24	+Vin	+Vin

TEST CONFIGURATIONS



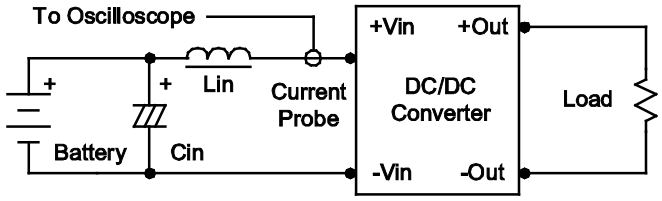
NOTES:

1. Tolerance: X.XX±0.01 (X.X±0.25) X.XXX±0.005 (X.XX±0.13)
2. Pin Diameter: 0.02±0.002 (0.5±0.05)
3. Case Size: 1.25 x 0.80 x 0.40 inches (31.8 x 20.3 x 10.2 mm)
4. Case Material: Non-conductive black plastic
5. Flammability: UL 94V-0 rated
6. Weight: 0.44oz (12.4g)

Input Reflected-Ripple Current Test Setup

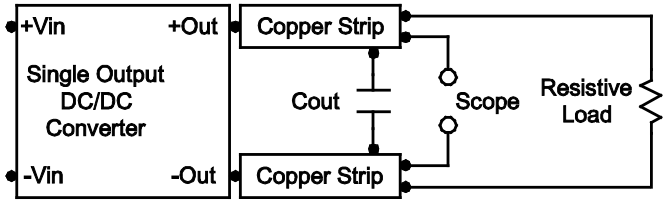
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100 KHz) to simulate source impedance. Capacitor Cin offsets possible battery impedance.

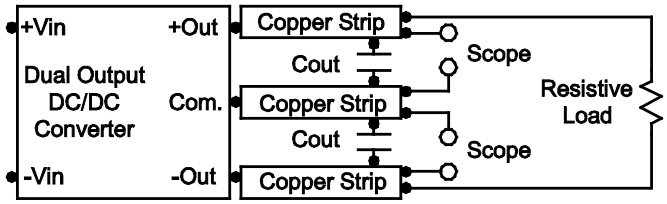
Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.



Peak-to-Peak Output Noise Measurement Test

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.





DESIGN & FEATURE CONSIDERATIONS

Over Current Protection

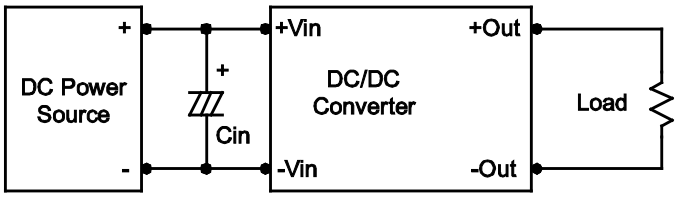
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally once the output current is brought back into its specified range.

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.

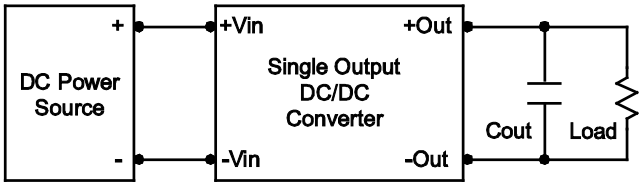
In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.

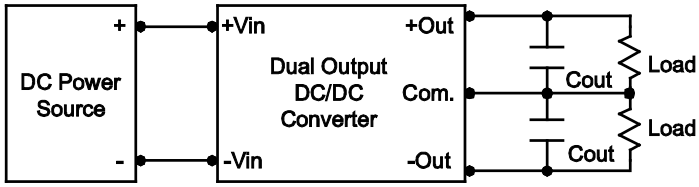
Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100 KHz) capacitor of 8.2µF for 5V nominal input models, a 3.3µF for 12V nominal input models, and a 1.5µF for 24V and 48V nominal input models.



Output Ripple Reduction

A good quality low ESR capacitor placed as close as possible 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.



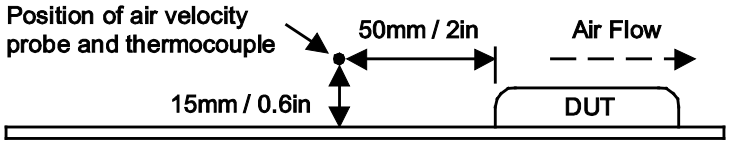


Maximum Capacitive Load

The LANCW3 series has a limitation of maximum connected capacitance on the output. The power module may be operated in current limiting mode during start-up, affecting the ramp-up and the start-up time. The maximum capacitance can be found in the model selection table.

Thermal Considerations

Many conditions affect the thermal performance of the power module, such as orientation, airflow over the module, and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 90°C. The derating curves are determined from measurements obtained in a test setup.



COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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