DATASHEET
Rev. B

Wall Industries, Inc.

LANEUW SERIES

4:1 Ultra Wide Input Voltage Ranges
Single & Dual Outputs
High Power Density in 9-Pin SIP Package
2 Watt DC/DC Power Converters



FEATURES

- RoHS Compliant
- UL 94V-0 Compliant
- High Power Density in 9-Pin SIP Package
- 2 Watts Output Power
- Small Footprint: 1.02” x 0.36” x 0.49”
- 4:1 Ultra Wide Input Voltage Ranges
- Single & Dual Fully Regulated Outputs
- Remote ON/OFF Control
- 1500VDC I/O Isolation
- High Efficiency up to 80%
- -40°C to +85°C Operating Temperature Range
- Over Load Protection

DESCRIPTION

The LANEUW series consists of isolated 2 Watt DC/DC power converters with fully regulated single and dual outputs and ultra wide 4:1 input voltage ranges of 9~36VDC and 18~75VDC. These converters operate over a temperature range of -40°C to +85°C while maintaining all specifications. The LANEUW series is RoHS compliant and includes remote on/off control, 1500VDC I/O isolation, and over load protection. These converters are housed in a 9-pin SIP package with a very small footprint occupying only 0.36in^2 on the PCB. The very compact dimensions of these DC/DC converters make them an ideal solution for many space critical applications in battery-powered equipment and instrumentation.

SPECIFICATIONS: *LANEUW 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	24VDC nominal input models	9	24	36	VDC
	48VDC nominal input models	18	48	75	
Input Surge Voltage (1s max.)	24VDC nominal input models	-0.7		50	VDC
	48VDC nominal input models	-0.7		100	
Start-up Voltage	24VDC nominal input models	4.5	6	8.5	VDC
	48VDC nominal input models	8.5	12	17	
Under Voltage Shutdown	24VDC nominal input models			8	VDC
	48VDC nominal input models			16	
Input Current		See Table			
Reflected Ripple Current *(Page 5)*	24VDC nominal input models		300		mA
	48VDC nominal input models		600		
Reverse Polarity Input Current				0.5	A
Short Circuit Input Power				1500	mW
Input Filter		Capacitor Type			
Internal Power Dissipation				2500	mW
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Line Regulation	Low line to high line at full load		±0.3	±0.5	%
Load Regulation	25% to 100% full load		±0.5	±0.75	%
Output Voltage Accuracy	Full load an nominal Vin		±1.0	±2.0	%
Output Voltage Balance	Dual Outputs, Balanced loads		±1.0	±2.0	%
Output Power				2	W
Output Current		See Table			
Minimum Load *(Note 1)*		See Table			
Ripple & Noise (20MHz) *(Page 5)*			30	50	mVp-p
	Over line, load, and temperature			75	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%		100	300	µs
Transient Response Deviation	25% load step change		±3	±5	%
Temperature Coefficient			±0.01	±0.02	%/°C
PROTECTION					
Short Circuit Protection		continuous			
Input Fuse *(Note 2)*	24VDC nominal input models	350mA slow-blow type			
	48VDC nominal input models	135mA slow-blow type			
GENERAL SPECIFICATIONS					
Efficiency	Nominal input voltage and full load	See Table			
Switching Frequency			300		KHz
Isolation Voltage (Input to Output)	60 seconds	1500			VDC
Isolation Resistance	500VDC	1000			MΩ
Isolation Capacitance			250	500	pF
Maximum Capacitive Load		See Table			
REMOTE ON/OFF ***(Page 5)***					
Negative Logic — Converter On		Under 6.0VDC or open circuit, drops down to 0VDC by 2mV/°C			
Negative Logic — Converter Off		2.9 to 15VDC			
Stand-by Input Current	Nominal Vin		1	3	mA
Control Input Current — On	Vin = 0V			-1	mA
Control Input Current — Off	Vin = 5.0V			1	
Control Common		Referenced to negative input			
ENVIRONMENTAL SPECIFICATIONS					
Operating Temperature Range (with derating)	ambient	-40		+85	°C
Case Temperature				+90	°C
Storage Temperature		-55		+105	°C
Humidity (non-condensing)				95	% RH
Cooling		Free air convection			
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		0.23oz (6.5g)			
Dimensions (L x W x H)		1.02 x 0.36 x 0.49 inches (25.95 x 9.25 x 12.45 mm)			
Case Material		Non-conductive black plastic			
Flammability		UL 94V-0 rated			

MODEL SELECTION TABLES

SINGLE OUTPUT MODELS										
Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current (Typ)	Output Power	Efficiency	Max Capacitive Load
			Min[1]	Max	No Load	Max Load				
LANEUW2433R	24 VDC (9 – 36 VDC)	3.3 VDC	125mA	500mA	20mA	97mA	300mA	1.65W	71%	2200µF
LANEUW2405R		5 VDC	100mA	400mA		110mA		2W	76%	1000µF
LANEUW2412R		12 VDC	42mA	167mA		106mA		2W	79%	170µF
LANEUW2415R		15 VDC	33mA	134mA		105mA		2W	80%	110µF
LANEUW4833R	48 VDC (18 – 75 VDC)	3.3 VDC	125mA	500mA	15mA	49mA	600mA	1.65W	70%	2200µF
LANEUW4805R		5 VDC	100mA	400mA		58mA		2W	72%	1000µF
LANEUW4812R		12 VDC	42mA	167mA		54mA		2W	78%	170µF
LANEUW4815R		15 VDC	33mA	134mA		54mA		2W	78%	110µF

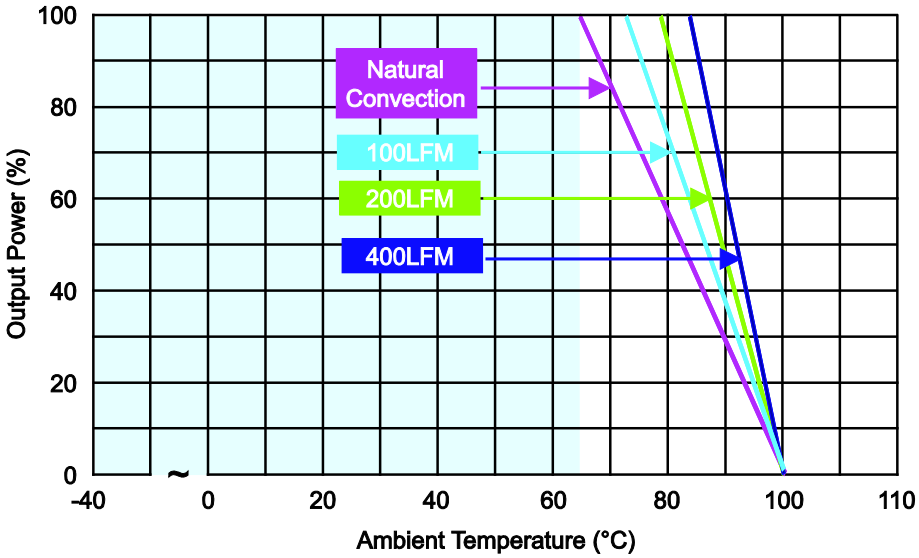
DUAL OUTPUT MODELS										
Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current (Typ)	Output Power	Efficiency	Max Capacitive Load
			Min[1]	Max	No Load	Max Load				
LANEUW2405RD	24 VDC (9 – 36 VDC)	±5 VDC	±50mA	±200mA	20mA	114mA	300mA	2W	73%	±470µF
LANEUW2412RD		±12 VDC	±21mA	±83mA		108mA		2W	77%	±100µF
LANEUW2415RD		±15 VDC	±17mA	±67mA		106mA		2W	79%	±47µF
LANEUW4805RD	48 VDC (18 – 75 VDC)	±5 VDC	±50mA	±200mA	15mA	60mA	600mA	2W	70%	±470µF
LANEUW4812RD		±12 VDC	±21mA	±83mA		55mA		2W	76%	±100µF
LANEUW4815RD		±15 VDC	±17mA	±67mA		55mA		2W	76%	±47µF

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.

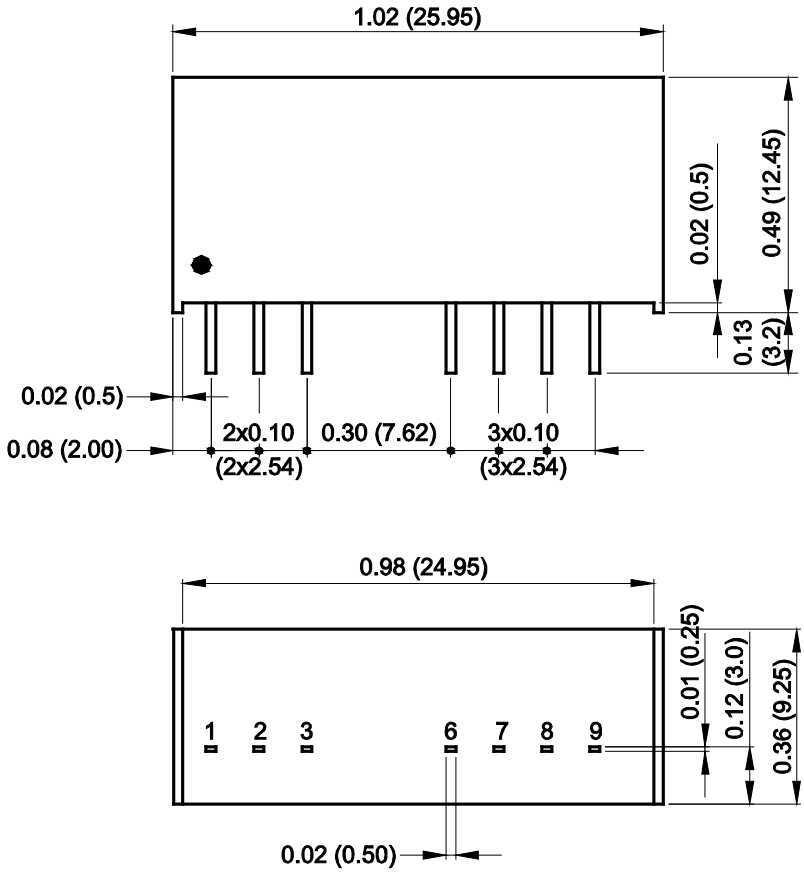
**Due to advances in technology, specifications are subject to change without notice.*

DERATING CURVE



MECHANICAL DRAWING

Unit: inches (mm)



PIN CONNECTIONS		
Pin	Single Output	Dual Output
1	-Vin	-Vin
2	+Vin	+Vin
3	Remote On/Off	Remote On/Off
6	+Vout	+Vout
7	NC	Common
8	NC	NC
9	-Vout	-Vout

NC: No Connection

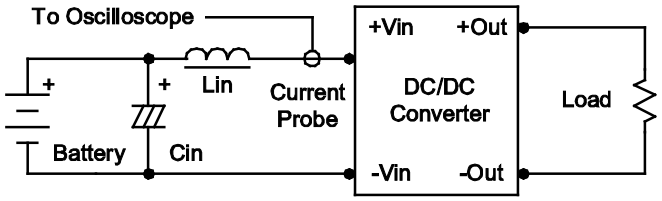
Tolerance: X.XX±0.02 (X.X±0.5)
X.XXX±0.01 (X.XX±0.25)
Pins: ±0.004 (±0.1)

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

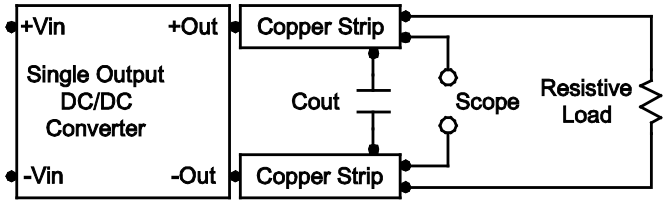
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100 KHz) to simulate source impedance. Capacitor Cin offsets possible battery impedance.

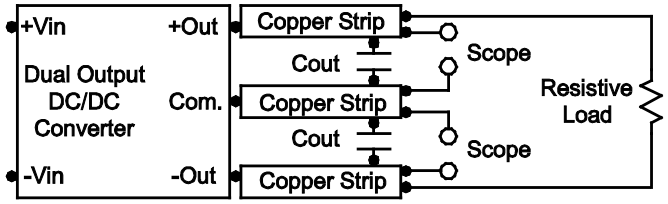
Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.



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

Remote On/Off

Negative logic remote on/off turns the module OFF during a logic high voltage on the remote on/off pin and ON during a logic low. To turn the module ON and OFF, the user must supply a switch to control the voltage between the on/off terminal and the –Vin terminal. The switch can be an open collector or equivalent. A logic high is 2.9V to 15V. A logic low is under 0.6VDC or open circuit, drops down to 0VDC by 2mV/°C. The maximum sink current at on/off terminal during a logic low is 1mA. The maximum allowable leakage current of the switch at on/off terminal = (under 0.6VDC or open circuit) is 1mA.

Maximum Capacitive Load

The LANEUW 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 tables.

Over Current Protection

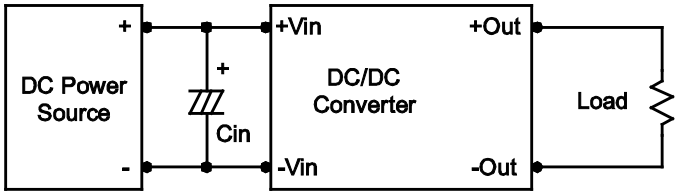
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration. At the point of current-limit inception, the unit shifts from voltage control to current control. The unit operates normally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

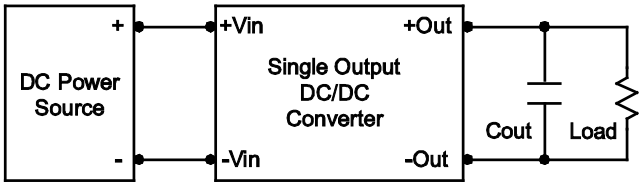
In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup.

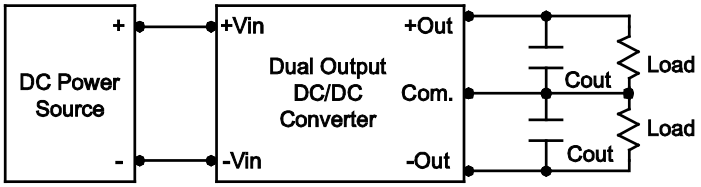
Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100 KHz) capacitor of 1.5µF for the 24V and 48V input devices.



Output Ripple Reduction

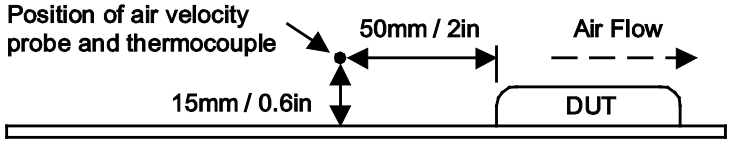
A good quality low ESR capacitor placed as close as possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 3.3µF capacitors at the output.





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 ISO9001-2008 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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