UL 60950-1
UL 60601-1

Size:
0.87 x 0.30 x 0.49 inches
22.0 x 7.5 x 12.5 mm

Weight:
0.14oz (3.9g)

FEATURES

- 1 Watt Output Power
- Small SIP Package
- Single & Dual Outputs
- Low Coupling Capacity
- Short Circuit Protection
- -25°C to +85°C Operating Temperature
- MTBF > 2,000,000 Hours
- 3000VACrms (6000VDC) I/O Isolation
- Reinforced Insulation Rated for 300VAC Working Voltage
- cUL/UL60950-1, CSA C22.2 No. 60950-1-03, IEC/EN 60950-1 Industrial Safety Approvals
- UL60601-1, CSA C22.2 No. 601-1, IEC/EN 60601-1 (3rd Edition) Medical Safety Approvals

DESCRIPTION

The LANE-6KV series of 1 watt DC/DC power converters are specially designed to provide ultra-high levels of isolation in a miniature SIP package. This series consists of 12 models with nominal input voltages of 5V and 12V and standard output voltages of 5V, 12V, and 15V in both single and dual output configurations. The LANE-6KV has both industrial and medical (3rd edition) approvals and offers an economical solution for many applications in industrial controls and instrumentation, consumer electronics, and wherever a certified supplementary or reinforced insulation system is required to comply with relative safety standards.

MODEL SELECTION TABLE

SINGLE OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current (Typ)		Load Regulation	Output Power	Efficiency (Typ)	Maximum Capacitive Load
			Min (1)	Max	No Load	Max Load				
LANE505N6KV	5 VDC (4.5 - 5.5 VDC)	5 VDC	4mA	200mA	55mA	303mA	10%	1W	66%	680µF
LANE512N6KV		12 VDC	2mA	80mA		291mA	8%	1W	66%	680µF
LANE515N6KV		15 VDC	1mA	65mA		295mA	8%	1W	66%	680µF
LANE1205N6KV	12 VDC (10.8 - 13.2 VDC)	5 VDC	4mA	200mA	30mA	126mA	10%	1W	66%	680µF
LANE1212N6KV		12 VDC	2mA	80mA		121mA	8%	1W	66%	680µF
LANE1215N6KV		15 VDC	1mA	65mA		123mA	8%	1W	66%	680µF

DUAL OUTPUT MODELS

Model Number	Input Voltage	Output Voltage	Output Current		Input Current (Typ)		Load Regulation	Output Power	Efficiency (Typ)	Maximum Capacitive Load
			Min (1)	Max	No Load	Max Load				
LANE505ND6KV	5 VDC (4.5 - 5.5 VDC)	±5 VDC	±2mA	±100mA	55mA	303mA	10%	1W	66%	±220µF
LANE512ND6KV		±12 VDC	±1mA	±40mA		267mA	8%	1W	72%	±220µF
LANE515ND6KV		±15 VDC	±1mA	±35mA		287mA	8%	1W	73%	±220µF
LANE1205ND6KV	12 VDC (10.8 - 13.2 VDC)	±5 VDC	±2mA	±100mA	30mA	126mA	10%	1W	66%	±220µF
LANE1212ND6KV		±12 VDC	±1mA	±40mA		108mA	8%	1W	74%	±220µF
LANE1215ND6KV		±15 VDC	±1mA	±35mA		117mA	8%	1W	75%	±220µF

TECHNICAL SPECIFICATIONS: LANE-6KV 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.

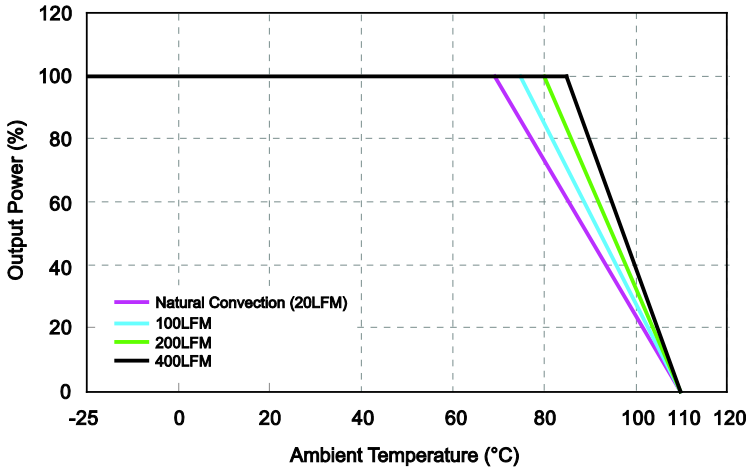
SPECIFICATION		TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS							
Input Voltage Range		5VDC nominal input models		4.5	5	5.5	VDC
		12VDC nominal input models		10.8	12	13.2	
Input Surge Voltage (1sec, max.)		5VDC nominal input models		-0.7		9	VDC
		12VDC nominal input models		-0.7		29	
Reverse Polarity Input Current						0.3	A
Input Current		No Load		See Table			
Internal Power Dissipation						650	mW
Input Filter Type				LC filter			
OUTPUT SPECIFICATIONS							
Output Voltage				See Table			
Voltage Accuracy					±1.0	±3.0	%
Line Regulation		For Vin change of 1%			±1.2	±1.5	%
Load Regulation		20% load to 100% load	5VDC and ±5VDC output models			10	%
			Others			8	
Cross Regulation		Dual output models; Balanced loads			±0.1	±1.0	%
Output Power						1	W
Output Current				See Table			
Minimum Load		See Note 1		See Table			
Maximum Capacitive Load				See Table			
Ripple & Noise		20MHz bandwidth				150	mVp-p
Temperature Coefficient					±0.01	±0.02	%/°C
PROTECTION							
Short Circuit Protection						0.5	s
GENERAL SPECIFICATIONS							
Efficiency		Nominal input voltage and full load		See Table			
Switching Frequency				50	80	100	KHz
Isolation Voltage (I/P to O/P)		60 seconds		3000			VACrms
Isolation Test Voltage (I/P to O/P)		Flash tested for 1 second		4500			V_{pk}
Isolation Resistance (I/P to O/P)		500VDC		10			GΩ
Isolation Capacitance (I/P to O/P)		100KHz, 1V			15	20	pF
ENVIRONMENTAL SPECIFICATIONS							
Operating Ambient Temperature		See power derating curve		-25		+85	°C
Case Temperature						+90	°C
Storage Temperature				-50		+125	°C
Relative Humidity		Non-condensing				95	% RH
Cooling		Natural convection is about 20LFM but is not equal to still air (0 LFM)		Free air convection			
Lead Temperature		1.5mm from case for 10 sec.				260	°C
MTBF		MIL-HDBK-217F at 25°C, ground benign		2,000,000 hours			
PHYSICAL SPECIFICATIONS							
Weight				0.14oz (3.9g)			
Dimensions (L x W x H)		0.87 x 0.30 x 0.49 inches (22.0 x 7.5 x 12.5 mm)					
Case Material		Flammability to UL 94V-0 rated		Non-conductive black plastic			
Pin Material				Alloy 42			
SAFETY							
Safety Approvals	Industrial	CUL/UL60950-1, CSA C22.2 No. 60950-1-03, IEC/EN 60950-1					
	Medical	UL 60601-1, CSA C22.2 No.601-1, IEC/EN 60601-1 (3rd edition)					

NOTES

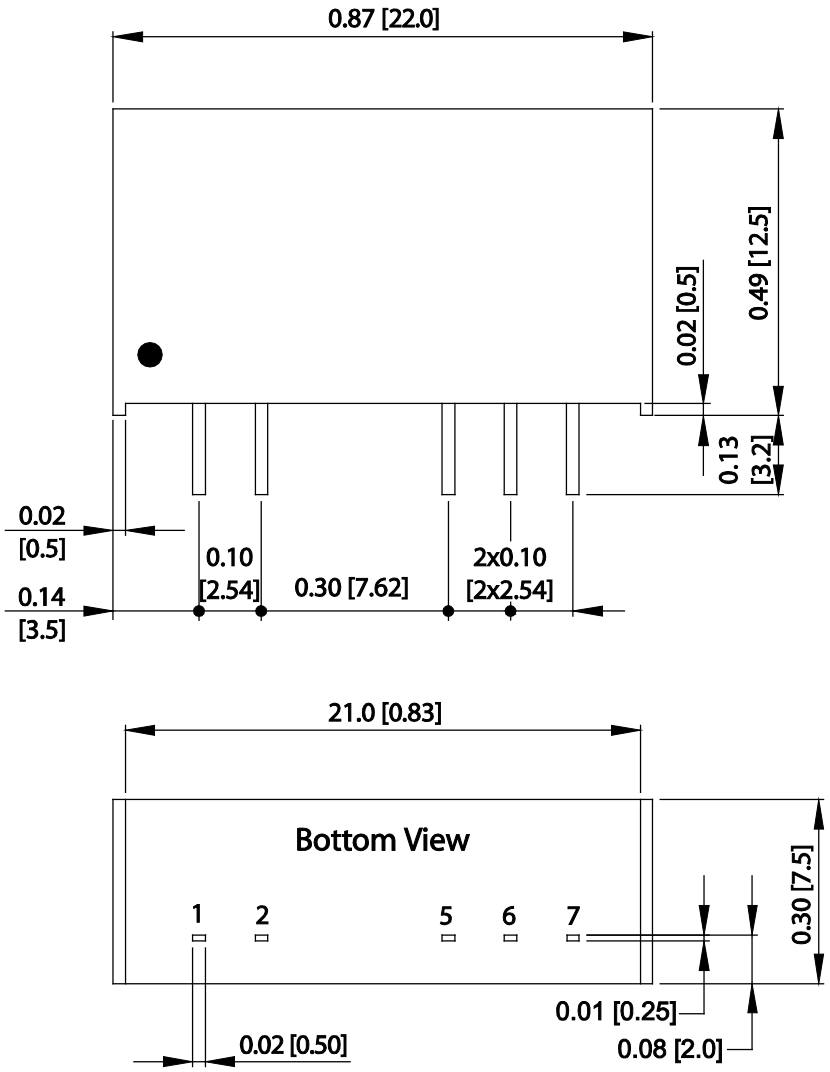
1. The LANE-6KV series requires a minimum load on the output to maintain specified regulation. Operation under no-load conditions will not damage these devices; however they may not meet all listed specifications.
2. All DC/DC converters should be externally fused at the front end for protection.
3. Other input and output voltages may be available, please contact factory.

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

DERATING CURVE



MECHANICAL DRAWING



PIN CONNECTIONS		
Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

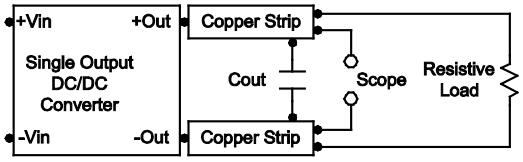
NOTES:

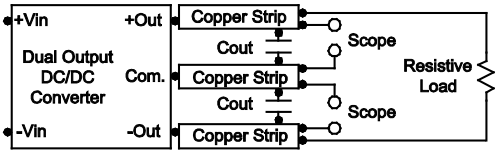
1. Unit: inches (mm)
2. Tolerance: X.X±0.25 (X.XX±0.01)
   X.XX±0.13 (X.XXX±0.005)
3. Pins: ±0.05 (±0.002)
4. Weight: 0.14oz (3.9g)
5. Pin Material: Alloy 42
6. Case Material: non-conductive black plastic
   (flammability to UL94V-0 rated)
7. All dimensions are for reference only

DESIGN CONSIDERATIONS

Peak-to-Peak Output Noise Measurement Test

Use a 0.33µF 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.

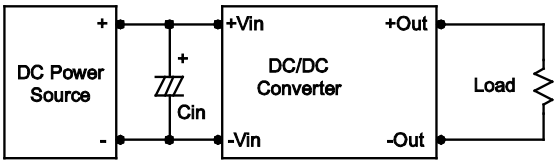




TEST SETUP

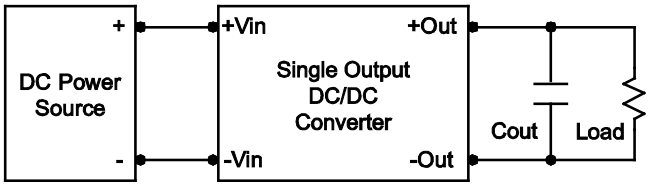
Input Source Impedance

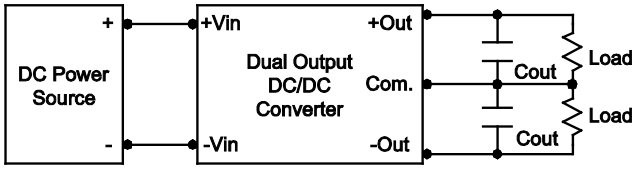
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup. 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 2.2µF for the 5V input devices and a 1.0µF for the 12V 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 1.5µF capacitors at the output.



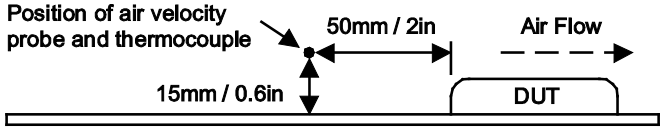


Maximum Capacitive Load

The LANE-6KV 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. For optimum performance we recommend 220µF maximum capacitive load for dual outputs and 680µF capacitive load for single outputs. 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 ISO9001-2008 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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