UL 60950-1 CB Scheme RoHS Compliant

Size: 1.25in x 0.80in x 0.40in (31.8mm x 20.3mm x 10.2mm)

OPTIONS

- Input Voltage
- Output Voltage
- Single or Dual

FEATURES

- Low cost
- RoHS Compliant
- 15000VDC Isolation
- Efficiency up to 84%
- MTBF > 1,000,000 Hours
- Industry Standard Pin-out
- Internal SMT Construction
- UL 94V-0 Package Material
- UL60950-1 Safety Approval
- Single and Dual Regulated Outputs
- Operating Temperature: -25ºC~+71ºC
- 2:1 and 4:1 Wide Input Voltages Ranges

APPLICATIONS

- Data Communication Equipment
- Mobile Battery Driven Systems
- Distributed Power Systems
- Telecommunication Equipment
- Mixed Analog/Digital Subsystems
- Process/Machine Control Equipment
- Computer Peripheral Systems
- Industrial Robot Systems

DESCRIPTION

LAN K series of DC/DC converters provide 2~4 watts of continuous output power in a low profile DIP package. These converters operate over 2:1 input voltage ranges of 4.5~9VDC, 9-18VDC, 18-36VDC, and 36-75VDC and 4:1 input voltage ranges of 9-36VDC and 18-75VDC. This series also has standard single output voltages of 3.3, 5, 12, 15VDC and dual output voltages of ±5, ±12, and ±15VDC. Some features include continuous short circuit protection, 1500VDC I/O isolation, -25°C~+71°C operating temperature, and built-in filtering for input and output. The LAN K series is an excellent selection for a variety of applications some of which include data communication equipment, mobile battery driven systems, distributed power systems, telecommunication equipment, mixed analog/digital subsystems, process/machine control equipment, computer peripheral systems, and industrial robot systems.

MODEL SELECTION TABLE

2:1 Input Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Output Power
LANK53.3W2	5VDC (4.5~9VDC)	3.3 VDC	600mA	2W
LANK505W3		5 VDC	500mA	2.5W
LANK512W3		12 VDC	250mA	3W
LANK515W3		15 VDC	200mA	3W
LANK505DW3		±5 VDC	±250mA	2.5W
LANK512DW3		±12 VDC	±125mA	3W
LANK515DW3		±15 VDC	±100mA	3W
LANK123.3W2	12VDC (9~18VDC)	3.3 VDC	600mA	2W
LANK1205W3		5 VDC	500mA	2.5W
LANK1212W3		12 VDC	250mA	3W
LANK1215W3		15 VDC	200mA	3W
LANK1205DW3		±5 VDC	±250mA	2.5W
LANK1212DW3		±12 VDC	±125mA	3W
LANK1215DW3		±15 VDC	±100mA	3W
LANK243.3W2	24VDC (18~36VDC)	3.3 VDC	600mA	2W
LANK2405W3		5 VDC	500mA	2.5W
LANK2412W3		12 VDC	250mA	3W
LANK2415W3		15 VDC	200mA	3W
LANK2405DW3		±5 VDC	±250mA	2.5W
LANK2412DW3		±12 VDC	±125mA	3W
LANK2415DW3		±15 VDC	±100mA	3W
LANK483.3W2	48VDC (18~75VDC)	3.3 VDC	600mA	2W
LANK4805W3		5 VDC	500mA	2.5W
LANK4812W3		12 VDC	250mA	3W
LANK4815W3		15 VDC	200mA	3W
LANK4805DW3		±5 VDC	±250mA	2.5W
LANK4812DW3		±12 VDC	±125mA	3W
LANK4815DW3		±15 VDC	±100mA	3W

MODEL SELECTION TABLE

4:1 Input Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Output Power
LANK243.3UW3	24VDC (9~36VDC)	3.3 VDC	900mA	3W
LANK2405UW3		5 VDC	660mA	3W
LANK2412UW4		12 VDC	333mA	4W
LANK2415UW4		15 VDC	267mA	4W
LANK2405DUW3		±5 VDC	±300mA	3W
LANK2412DUW4		±12 VDC	±167mA	4W
LANK2415DUW4		±15 VDC	±133mA	4W
LANK483.3UW3	48VDC (18~75VDC)	3.3 VDC	900mA	3W
LANK4805UW3		5 VDC	660mA	3W
LANK4812UW4		12 VDC	333mA	4W
LANK4815UW4		15 VDC	267mA	4W
LANK4805DUW3		±5 VDC	±300mA	3W
LANK4812DUW4		±12 VDC	±167mA	4W
LANK4815DUW4		±15 VDC	±133mA	4W

SPECIFICATIONS

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 (2:1 Input Models)	5V input models	4.5	5	9	VDC
	12V input models	9	12	18	
	24V input models	18	24	36	
	48V input models	36	48	75	
Input Voltage Range (4:1 Input Models)	24V input models	9	24	36	VDC
	48V input models	18	48	75	
Input Filter		Pi Filter			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Output Voltage Balance			±0.5	±2.0	%
Output Voltage Accuracy	Dual Output, Balanced Loads		±0.5	±1.0	%
Line Regulation	Vin=Min. to Max.		±0.2	±0.5	%
Load Regulation	Io=10% to 100%		±0.2	±0.5	%
Output Power		See Table			
Output Current		See Table			
Ripple & Noise (20MHz bandwidth)			1%		mV_{pk-pk}
Transient Recover Time	50% load step change		300	500	µS
Transient Response Deviation	5% load step change		±3	±5	%
Temperature Coefficient			±0.01	±0.02	%/ºC
PROTECTION					
Over Power Protection		120			%
Short Circuit Protection		Continuous			
ENVIRONMENTAL SPECIFICATIONS					
Operating Ambient Temperature		-25		+85	ºC
Operating Case Temperature		-25		+90	ºC
Storage Temperature		-40		120	ºC
Lead Temperature	1.5mm from case for 10 seconds			260	ºC
Humidity	Non-Condensing			95	% RH
Cooling		Free air convection			
MTBF	MIL-HDBK-217F @25ºC, Ground Benign	1,000,000			hours

SPECIFICATIONS

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.

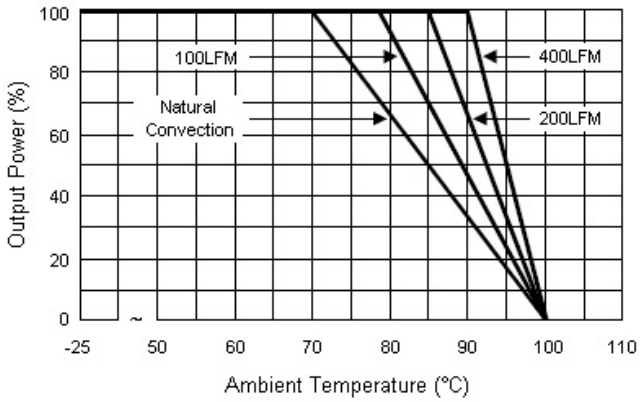
SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
GENERAL SPECIFICATIONS					
Efficiency			80		%
Switching Frequency			300		KHz
Isolation Voltage Rated	60 seconds	1500			VDC
Isolation Voltage Test	Flash Tested for 1 second	1650			VDC
Isolation Resistance	500VDC	1000			MΩ
Isolation Capacitance	100KHz, 1V		65	100	pF
Internal Power Dissipation				2500	mW
PHYSICAL SPECIFICATIONS					
Weight		0.44oz (12.4g)			
Dimensions (L x W x H)		1.25in x 0.80in x 0.40in (31.8mm x 20.3mm x 10.2mm)			
Case Material	2:1 Input Voltage Models	Non-Conductive Black Plastic			
	4:1 Input Voltage Models	Metal with Non-Conductive Base			
Flammability		UL94V-0			
SAFETY & EMC CHARACTERISTICS					
Conducted Immunity	UL60950-1				

NOTES

(1) Transient recovery time is measured to within 1% error for a step change in output load of 50% to 100%.
(2) The LAN K series requires a 10% 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.
(3) All DC/DC converters should be externally fused at the front end for protection.
(4) Due to advances in technology, specifications are subject to change without notice.

DERATING CURVES

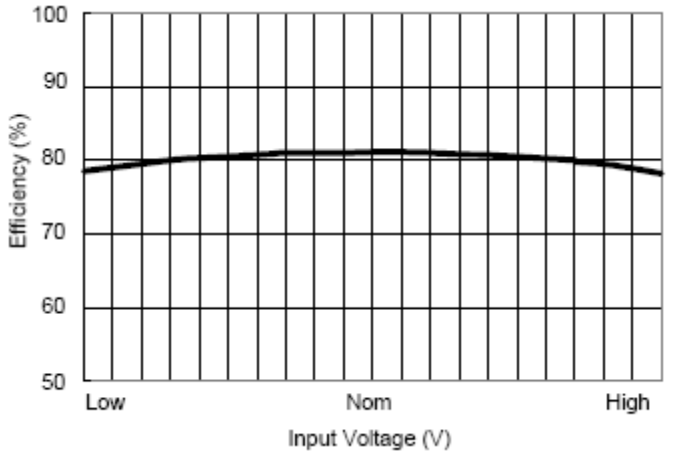
2:1 Input Voltage Range Derating Curve



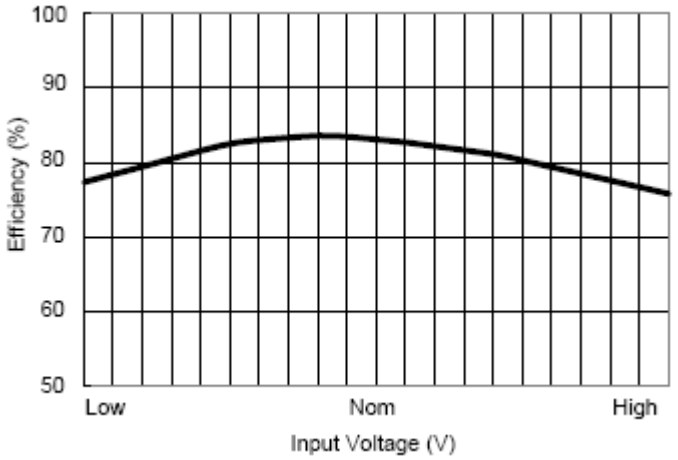
EFFICIENCY GRAPHS

2:1 Input Voltage Range Efficiency Graphs

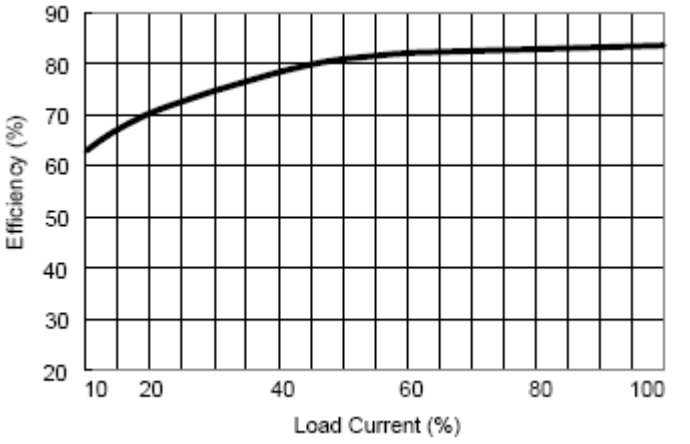
Efficiency vs Input Voltage (Single Output)



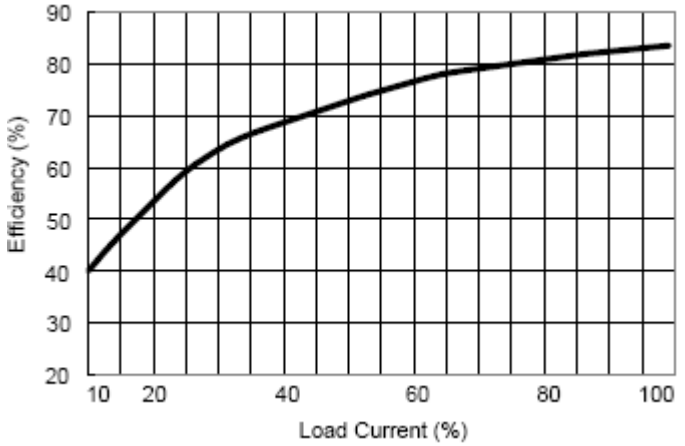
Efficiency vs Input Voltage (Dual Output)



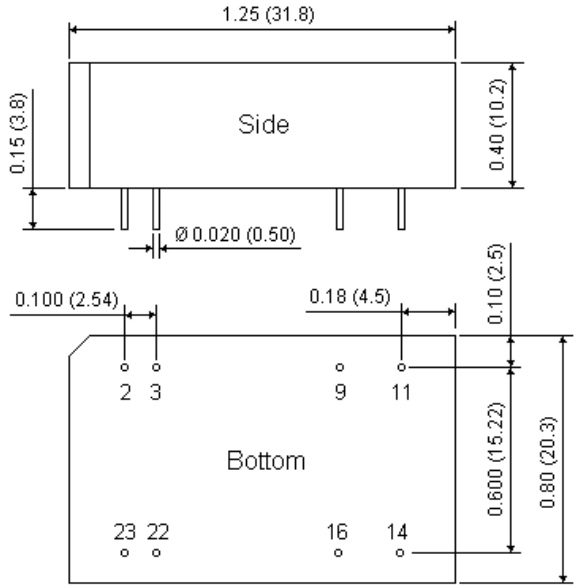
Efficiency vs Output Load (Single Output)



Efficiency vs Output Load (Dual Output)



MECHANICAL DRAWINGS



Pin	Single Output	Dual Output
2	-Vin	-Vin
3	-Vin	-Vin
9	No Pin	Common
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

1. Tolerance: X.XX±0.01 (X.X±0.25)
   X.XXX±0.005 (X.XX±0.13)
2. Pin Tolerance: ±0.002 (±0.05)

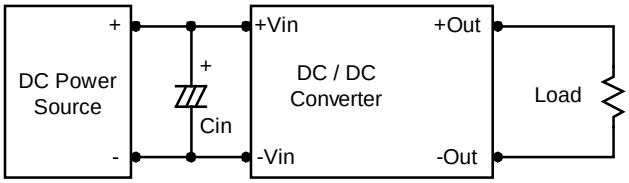
DESIGN & FEATURE CONSIDERATIONS

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 the 5V input devices, a 3.3µF for the 12V input devices, and a 1.5µF for the 24V and 48V devices.



Maximum Capacitive Load

The LAN K series has a 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 1000µF maximum capacitive load for dual outputs and 4000µF capacitive load for single outputs.

Over Current Protection

To provide protection in a fault (output over load) 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 shifts from voltage control to current control. The unit operates normally once the output current is brought back into its specific range.

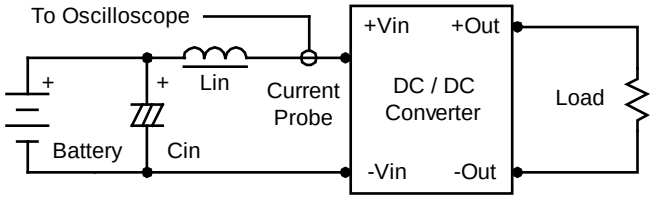
TEST CONFIGURATIONS

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 100KHz) to simulate source impedance.

Capacitor Cin offsets possible battery impedance.

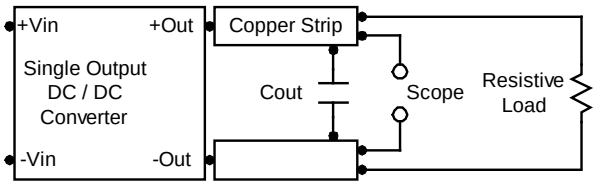
Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.

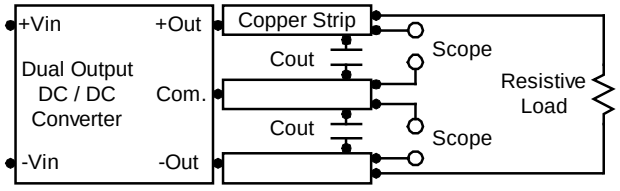


Peak-to-Peak Output Noise Measurement Test

Use Cout 0.47µF ceramic capacitor.

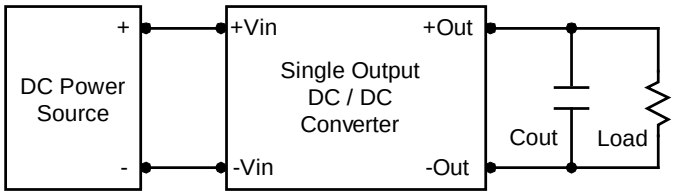
Scope measurement should be made by using BNC socket, measurement bandwidth is 0-20MHZ. Position the load between 50mm and 75mm from the Dc/DC Converter.

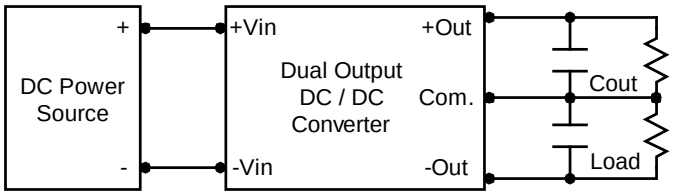




Output Ripple Reduction

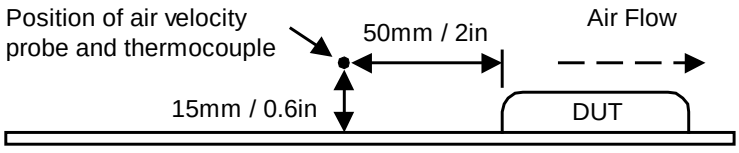
A good quality low ESR capacitor placed as close as possible across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 3.3µF capacitors at the output.





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 90ºC. The derating curves are determined from measurements obtained in an experimental apparatus.



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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