Wall Industries, Inc.

GA6KV Series
With 6KVDC Isolation
Single and Dual Output
2 Watt DC/DC Converter

FEATURES

- Low Cost
- 6000VDC Isolation
- Regulated Outputs
- Low Leakage Current
- MTBF > 600,000 Hours
- Input: 5, 12, and 24VDC
- Short Circuit Protection
- Low Isolation Capacitance
- Complies with EN55022 Class A
- Output: 5, 12, 15, ±5, ±12, and ±15VDC

SPECIFICATIONS: *GA6KV 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	Nom	Max	Unit
INPUT (V_{in})					
Input Voltage Range (5V input models)		4.5	5	5.5	VDC
Input Voltage Range (12V input models)		10.8	12	13.2	VDC
Input Voltage Range (24V input models)		21.6	24	26.4	VDC
Reverse Polarity Input Current				0.5	A
Input Surge Voltage (1000ms) (5V input models)		-0.7		7.5	VDC
Input Surge Voltage (1000ms) (12V input models)		-0.7		15	VDC
Input Surge Voltage (1000ms) (24V input models)		-0.7		30	VDC
Leakage Current	240VAC, 60Hz			2	µA
Reflected Ripple Current		See Table			
Short Circuit Input Power	All models			2000	mW
Input Filter	All models	Pi Filter			
OUTPUT (V_o)					
Output Voltage Range		See Table			
Output Voltage Accuracy			±2.0	±4.0	%
Output Voltage Balance	Dual Output, Balanced Loads		±2.0	±4.0	%
Load Regulation	Io = 10% to 100%		±0.5	±1.0	%
Line Regulation	Vin = Min to Max		±0.3	±0.5	%
Output Power				2	W
Output Current Range		See Table			
Ripple & Noise (20MHz)			30	50	mV_{pk-pk}
Ripple & Noise (20MHz)	Over Line, Load, and Temperature			100	mV_{pk-pk}
Ripple & Noise (20MHz)				5	mVrms
Transient Recovery Time	50% Load Step			50	µs
Transient Response Deviation	50% Load Step			±6	%
Temperature Coefficient			±0.01	±0.02	%/°C
PROTECTION					
Over Load		120			%
Short Circuit Protection		Continuous			
Input Fuse Recommendation (5V input models)		1000mA Slow-Blow Type			
Input Fuse Recommendation (12V input models)		500mA Slow-Blow Type			
Input Fuse Recommendation (24V input models)		250mA Slow-Blow Type			
GENERAL					
Efficiency		See Table			
Switching Frequency		25		80	KHz
Isolation Voltage Rated	60 seconds	6000			VDC
Isolation Voltage Test	Flash Tested for 1 second	8000			VDC
Isolation Resistance	500VDC	10			GΩ
Isolation Capacitance	100KHz, 1V		20	30	pF
Internal Power Dissipation				2,000	mW

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SPECIFICATION	TEST CONDITIONS	Min	Nom	Max	Unit
ENVIRONMENTAL					
Operating Temperature (Ambient)		-25		+60	°C
Operating Temperature (Case)		-25		+90	°C
Storage Temperature		-40		+125	°C
Humidity				95	%
Lead Temperature	1.5mm from case for 10 seconds			260	°C
Cooling		Free air convection			
MTBF	MIL-HDBK-217F @ 25°C, Ground Benign	600,000 hours			
PHYSICAL					
Weight		12.4 grams			
Dimensions		31.8(L) x 20.3(W) x 10.2(H) mm			
Case Material		Non-conductive black plastic			
SAFETY					
Conducted EMI		EN55022 Class A			

OUTPUT VOLTAGE / CURRENT RATING CHART

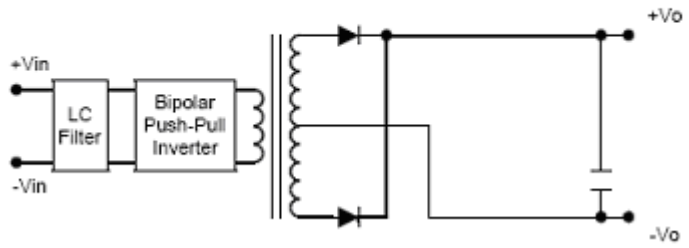
Model Number	Input Voltage	Output Voltage	Output Current		Input Current		Reflected Ripple Current	Efficiency (Typ)	Max Capacitive Load
			Min	Max	No Load	Max Load			
GA505R6KV	5 VDC (4.5 ~ 5.5 VDC)	5 VDC	0mA	400mA	100mA	645mA	15mA (Typ.)	62%	680µF
GA512R6KV		12 VDC		165mA		629mA		63%	680µF
GA515R6KV		15 VDC		133mA		623mA		64%	680µF
GA505RD6KV		±5 VDC		±100mA		476mA		42%	270µF
GA512RD6KV		±12 VDC		±83mA		699mA		57%	270µF
GA515RD6KV		±15 VDC		±66mA		695mA		57%	270µF
GA1205R6KV	12 VDC (10.8 ~ 13.2 VDC)	5 VDC	0mA	400mA	50mA	269mA	8mA (Typ.)	62%	680µF
GA1212R6KV		12 VDC		165mA		262mA		63%	680µF
GA1215R6KV		15 VDC		133mA		260mA		64%	680µF
GA1205RD6KV		±5 VDC		±100mA		185mA		45%	270µF
GA1212RD6KV		±12 VDC		±83mA		281mA		59%	270µF
GA1215RD6KV		±15 VDC		±66mA		280mA		59%	270µF
GA2405R6KV	24 VDC (21.6 ~ 26.4 VDC)	5 VDC	0mA	400mA	30mA	134mA	3mA (Typ.)	62%	680µF
GA2412R6KV		12 VDC		165mA		131mA		63%	680µF
GA2415R6KV		15 VDC		133mA		130mA		64%	680µF
GA2405RD6KV		±5 VDC		±100mA		93mA		45%	270µF
GA2412RD6KV		±12 VDC		±83mA		143mA		58%	270µF
GA2415RD6KV		±15 VDC		±66mA		142mA		58%	270µF

NOTES

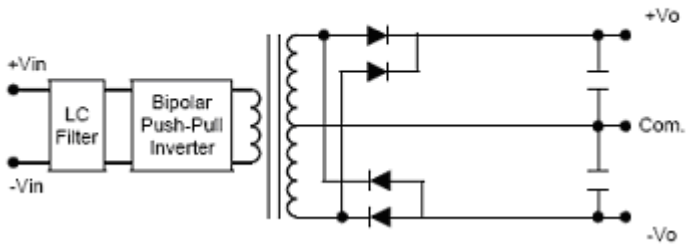
1. Specifications typical at +25°C, resistive load, nominal input voltage, rated output current unless otherwise noted.
2. Ripple and noise measured at 20MHz bandwidth.
3. Transient Recovery Time is measured to within 1% error band for a step change in output load of 50% to 100%.
4. All DC/DC converters should be externally fused at the front end for protection.
5. Other input and output voltages may be available, please contact factory.
6. Specifications subject to change without notice.

BLOCK DIAGRAMS

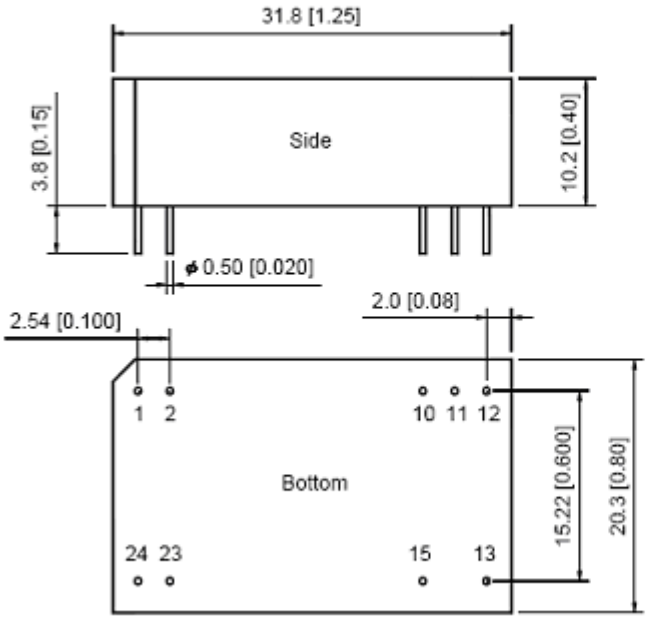
Single Output



Dual Output



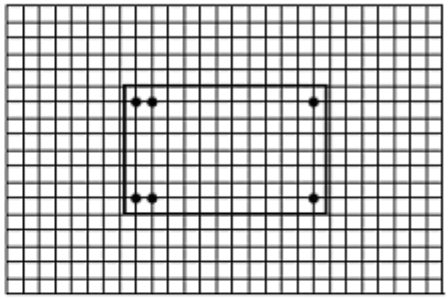
MECHANICAL DRAWING



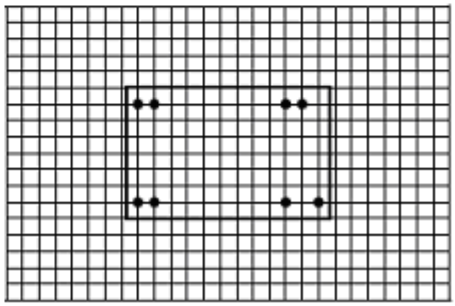
Tolerance:	Millimeters	Inches
	X.X±0.25	X.XX±0.01
	X.XX±0.13	X.XXX±0.005
Pin:	±0.05	±0.002

Connecting Pin Patterns
Top View (2.54 mm / 0.1 inch grids)

Single Output

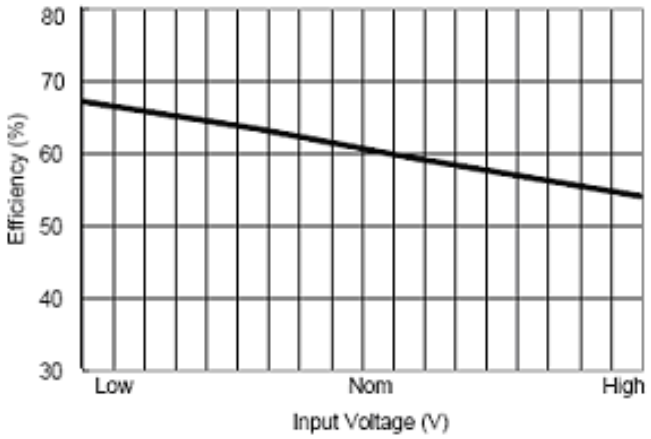


Dual Output

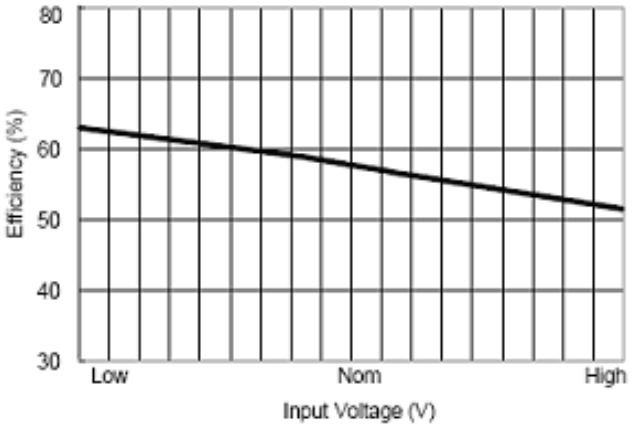


PIN CONNECTIONS		
Pin	**Single Output**	**Dual Output**
1	+Vin	+Vin
2	+Vin	+Vin
10	No Pin	Common
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23	-Vin	-Vin
24	-Vin	-Vin

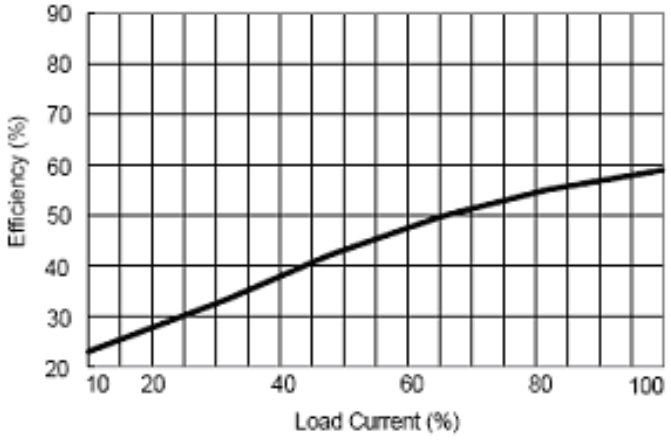
Efficiency vs Input Voltage (Single Output)



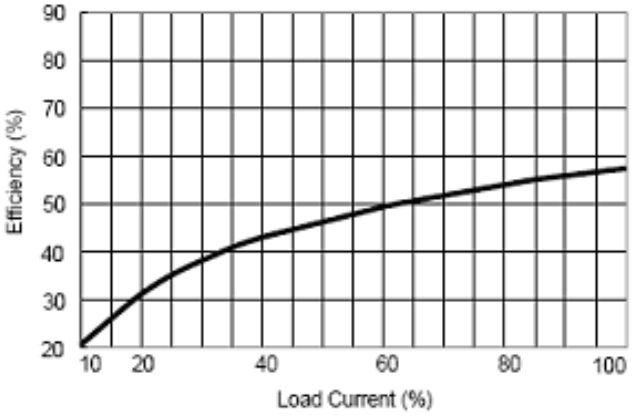
Efficiency vs Input Voltage (Dual Output)



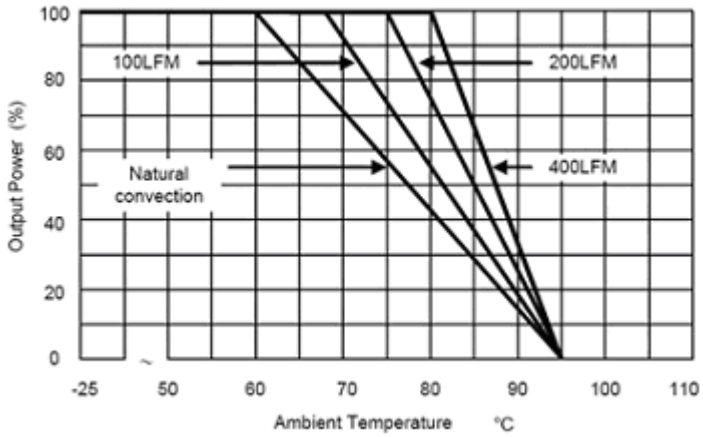
Efficiency vs Output Load (Single Output)



Efficiency vs Output Load (Dual Output)



Derating Curve



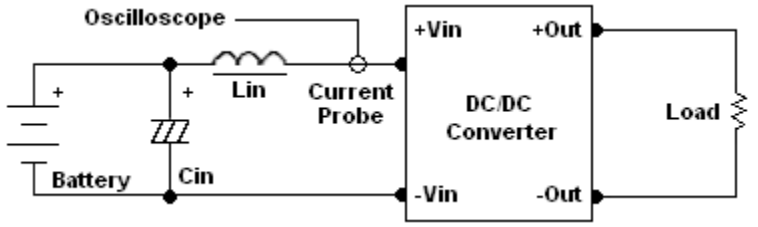
TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin (4.7uH) and Cin (220uF, ESR < 1.0Ω at 100 KHz) to simulate source impedance.

Capacitor Cin offsets possible battery impedance.

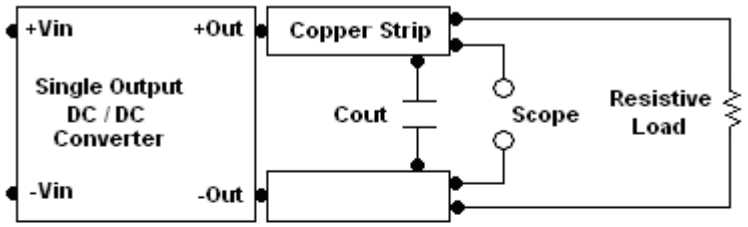
Current ripple is measured at the input terminals of the module. Measurement bandwidth is 0-500 KHz.

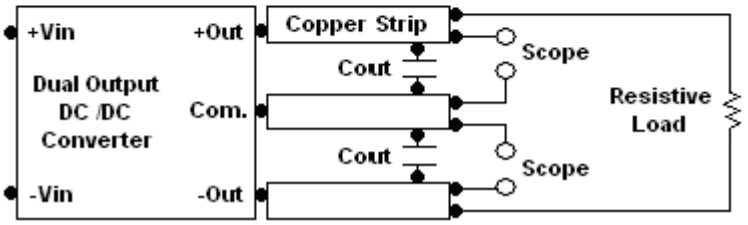


Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.33uF ceramic capacitor.

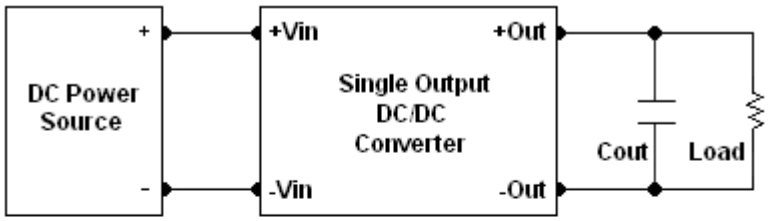
Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20MHz. Position the load between 50mm and 75mm from the DC/DC Converter.

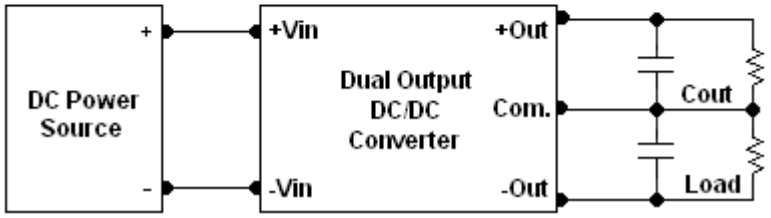




Output Ripple Reduction

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 1.5uF capacitors at the output.

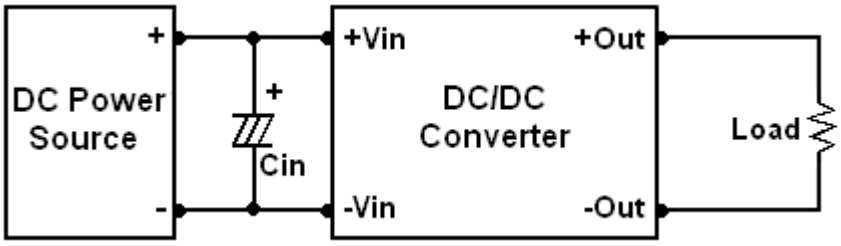




Input Source Impedance

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 a 4.7uF for the 5V input devices and a 2.2uF for the 12V and 24V input devices.



COMPANY INFORMATION:

Wall Industries, Inc. has created custom and modified units for over 40 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on time and on budget. Our ISO9001-2000 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.

Contact **Wall Industries** for further information:

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