

# 1W-5W

## MODULAR DC-DC CONVERTERS WITH 500V I/O ISOLATION

- ✓ Single and Dual Output Models
- ✓ Pi Input Filters—Built-in EMI Suppression
- ✓ 500 VDC Input/Output Isolation
- ✓ Short-Circuit/Over-Voltage Protection
- ✓ Compact Packages
- ✓ 2-Year Warranty
- ✓ 325,000 to 1,140,000-Hour Minimum MTBF



### CHARACTERISTICS

EMI Suppression.....	Pi input filter, standard.
Reflected Ripple Current.....	DC1-1, 30 mA <sub>pp</sub> , max. DC2-1, 35 mA <sub>pp</sub> , max. DC1-2 and DC2-2, 25 mA <sub>pp</sub> , max. DC1-5 and DC2-5, 40 mA <sub>pp</sub> , max.
Output Voltage Tolerance.....	DC1-1 and DC2-1, ±5%. DC2-1, ±5%. DC2-2, ±5%. DC1-5 and DC2-5, ±5%.
Isolation Voltage.....	500 VDC, input to output, for one minute.
Isolation Capacitance.....	100 pF, typical.
Output Noise and Ripple.....	DC1-1 and DC2-1, 35 mV <sub>pp</sub> , max. DC1-2 and DC2-2, 30 mV <sub>pp</sub> , max. DC1-5 and DC2-5, 30 mV <sub>pp</sub> , max.
Efficiency.....	DC1-1 and DC2-1, 50%, min. DC1-2 and DC2-2, 57%, min. DC1-5 and DC2-5, 63%, min.
Short-Circuit Protection.....	DC1-1 and DC2-1, thermal limited. DC1-2, pulsed overload type. DC2-2, thermal limited. DC1-5 and DC2-5, pulsed overload current limit.
Transient Response.....	50 μs recovery to within 1% of the regulation band with no more than 5% deviation.
Frequency of Operation .....	45-55 kHz.
Temperature Range .....	-25°C to +70°C, no de-rating.
Temperature Coefficient.....	±0.02%/°C over the entire operating temperature range.
Relative Humidity .....	0 to 95%, non-condensing.
Altitude .....	0 to 10,000 feet.
Cooling.....	Convection cooling is adequate. Moving air is recommended for operation in a confined area.
Storage Temperature .....	-40°C to +100°C.
Storage Humidity .....	0 to 95%, non-condensing.
Mean Time Between Failures ...	DC1-1, >1,140,000 hours. DC2-1, >737,000 hours. DC1-2 and DC2-2, >800,000 hours. DC1-5 and DC2-5, >330,000 hours.

Model	Input Voltage			Input Current		No Load Output Voltage (V)	Full Load Output Current (mA)	Max. Output Current (mA)	Line Reg.	Load Reg.	Cross-Reg.
	Min. (V)	Nom. (V)	Max. (V)	No Load (mA)	Full Load (mA)						
<b>DC-DC 1W Singles</b>											
DC1-1-5/5	4.5	5.0	5.5	50	200	5.0	100	0.2%	0.1%	—	—
DC1-1-12/5	10.8	12	13.2	15	84	5.0	100	0.2%	0.2%	—	—
<b>DC-DC 1W Duals</b> (Note 5)											
DC2-1-5/12A	4.5	5.0	5.5	35	370	±12	40	0.2%	0.2%	0.1%	0.1%
DC2-1-5/15A	4.5	5.0	5.5	55	370	±15	33	0.2%	0.2%	0.1%	0.1%
<b>DC-DC 2W Singles</b>											
DC1-2-5/5A	4.5	5.0	5.5	125	700	5.0	400	0.1%	0.1%	—	—
DC1-2-12/24A	10.8	12	13.2	68	275	24	83	0.1%	0.1%	—	—
<b>DC-DC 2W Duals</b> (Note 5)											
DC2-2-5/15*	4.5	5.0	5.5	115	700	±15	65	0.2%	0.2%	0.1%	0.1%
DC2-2-24/12*	21.6	24	26.4	20	138	±12	80	0.2%	0.2%	0.1%	0.1%
DC2-2-48/15*	43.2	48	52.8	14	70	±15	65	0.2%	0.2%	0.1%	0.1%

\*Units supplied with L-case pin configuration; 2W units with model numbers ending with the suffix "A" are furnished with M-case pin configuration.

# 1W-5W

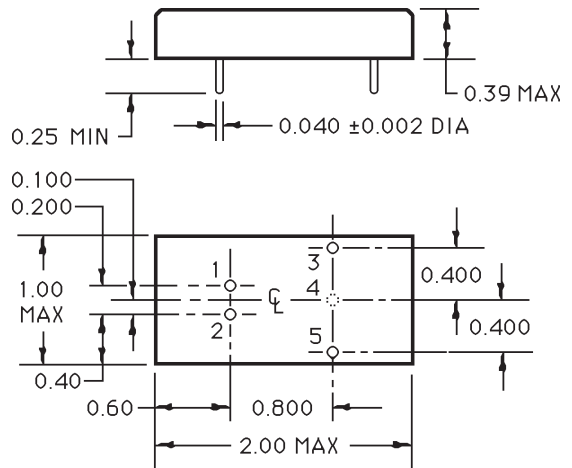
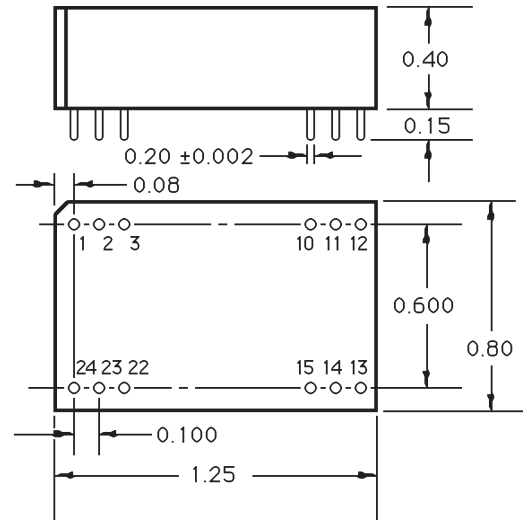
## MODULAR DC-DC CONVERTERS WITH 500V I/O ISOLATION

### DC1-1 AND DC2-1 SERIES

- A. Dimensions shown are in inches.
- B. Tolerances = 0.00 ±0.02 inch.  
0.000 ±0.005 inch.
- C. Module weight = 0.5 oz. (14.2g).
- D. All DC1-1 and DC2-1 models have a phenolic, UL94V-rated case and are encapsulated with a flame-retardant potting material
- E. Dual output ±12V or ±15V models can be used as single output 24V or 30V supplies.

#### Pin-Out—1W Models

Pin	DC1-1	DC2-1 No Suffix	DC2-1 With Suffix 'A'
1	+VIN	+VIN	+VIN
2	N/C	- V2OUT	+VIN
3	N/C	+V2OUT	+VIN
10	- VOUT	- V1OUT	Common
11	+VOUT	+V1OUT	Common
12	- VIN	- VIN	N/C
13	- VIN	- VIN	- VOUT
14	+VOUT	+V1OUT	N/C
15	- VOUT	- V1OUT	+VOUT
22	N/C	+V2OUT	- VIN
23	N/C	- V2OUT	- VIN
24	+VIN	+VIN	- VIN

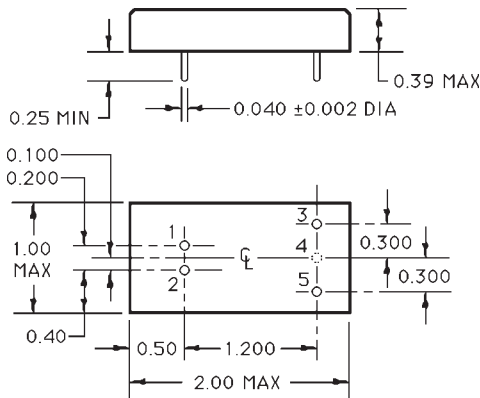


### DC1-2/DC2-2 SERIES—L CASE

- A. Dimensions shown are in inches.
- B. Tolerances = 0.00 ±0.02 inch.  
0.000 ±0.005 inch.
- C. Module weight = 0.9 oz. (25.5g).
- D. All DC1-2 and DC2-2 models have six-sided copper cases and are encapsulated with a flame retardant potting material.
- E. Dual output ±12V or ±15V models can be used as single output 24V or 30V supplies.

#### Pin-Out—2W Models

Pin	DC1-2 No Suffix 'A' (L Case)	DC1-2 With Suffix 'A' (M Case)	DC2-2 (L Case)
1	+VIN	- VIN	+VIN
2	- VIN	+VIN	- VIN
3	+VOUT	- VOUT	+VOUT
4	N/A	N/A	Common
5	- VOUT	+VOUT	- VOUT



### DC1-2 SERIES—M CASE

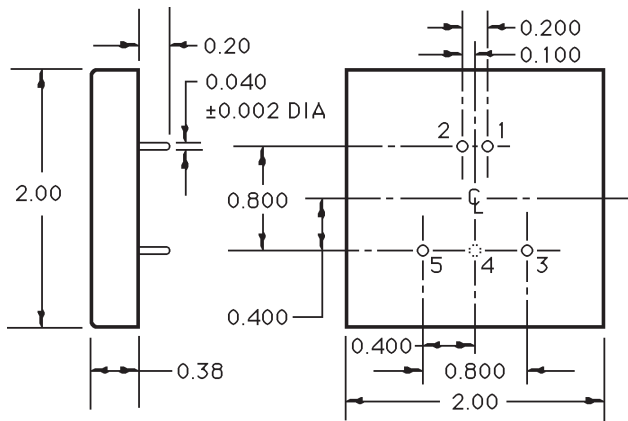
- A. Dimensions shown are in inches.
- B. Tolerances = 0.00 ±0.02 inch.  
0.000 ±0.005 inch.
- C. Module weight = 0.9 oz. (25.5g).
- D. All DC1-2 models have six-sided copper cases and are encapsulated with a flame retardant potting material.

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## MODULAR DC-DC CONVERTERS WITH 500V I/O ISOLATION

Model	Input Voltage			Input Current		Max. Output Voltage (V)	Max. Output Current (mA)	Line Reg.	Load Reg.	Cross-Reg.	Model	Input Voltage			Input Current		Max. Output Voltage (V)	Max. Output Current (mA)	Line Reg.	Load Reg.	Cross-Reg.
	Min. (V)	Nom. (V)	Max. (V)	No. Load (mA)	Full Load (mA)							Min. (V)	Nom. (V)	Max. (V)	No. Load (mA)	Full Load (mA)					
	<b>DC-DC 5W Singles</b>											<b>DC-DC 5W Duals</b> (Note 5)									
DC1-5-5/5	4.75	5.0	5.5	175	1500	5.0	1000	0.1%	0.1%	—	DC2-5-5/15	4.75	5.0	5.5	210	1850	±15	200	0.1%	0.1%	0.1%
DC1-5-5/12	4.75	5.0	5.5	175	1700	12	500	0.1%	0.1%	—	DC2-5-12/15	10.8	12	13.2	65	730	±15	200	0.1%	0.1%	0.1%
DC1-5-24/5	21.6	24	26.4	25	315	5.0	1000	0.1%	0.1%	—	DC2-5-24/12	21.6	24	26.4	35	355	±12	250	0.1%	0.1%	0.1%
											DC2-5-48/15	43.2	48	52.8	18	175	±15	200	0.1%	0.1%	0.1%

### 5W Models

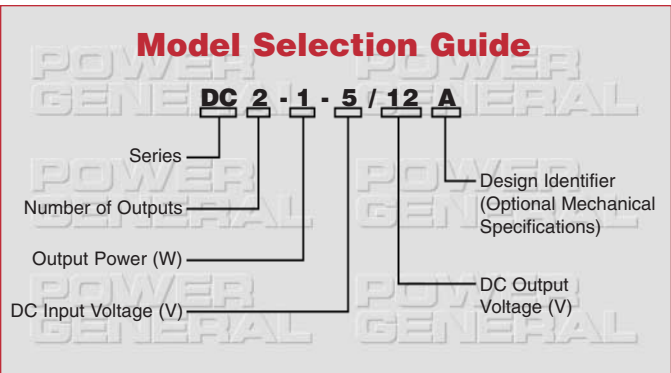


### DC1-5 AND DC2-5 SERIES

- A. Dimensions shown are in inches.
- B. Tolerances = 0.00 ±0.02 inch.  
0.000 ±0.005 inch.
- C. DC1-5 and DC2-5 module weight = 1.6 oz. (45.4g).
- D. All DC1-5 and DC2-5 models are supplied in a six-sided copper case.
- E. Applications-ready G10 sockets are available for DC1-5 and DC2-5 dc-dc converters. For more information, call Power General Applications Engineering.
- F. Dual output models with ±12V, ±15V or ±18V outputs can be used as single output 24V, 30V or 36V supplies.

### Pin-Out—5W Models

Pin	DC1-5	DC2-5
1	+VIN	+VIN
2	-VIN	-VIN
3	+VOUT	+VOUT
4	N/A	Common
5	-VOUT	-VOUT



### Notes

- Use of an external input line fuse is recommended:  
 1W series, 5V input models, use a 1.0A/125V fuse.  
 2W series, 5V input models, use a 1.5A/125V fuse.  
 1W and 2W series, all but 5V input models, use a 0.5A/125V fuse.  
 5W series, 5V input models, use a 2.5A/125V fuse.  
 5W series, 12V input models, use a 1.5A/125V fuse.  
 5W series, 24V input models, use a 1.0A/125V fuse.  
 5W series, 48V input models, use a 0.5A/125V fuse.
- Peak-to-peak and RMS metering equipment must have a 20 MHz frequency response with probes and cables that maintain a frequency response of 20 Hz to 20 MHz. Output ripple and spikes are measured directly at the output terminals of the converter with a 0.1 µF ceramic capacitor

- The probe ground band must make direct contact with the output return or the common terminal of the converter to prevent erroneous noise measurements.
- 3. DC2-6 short-circuit protection: 30 seconds, max. For all other models, protection period is unlimited.
- 4. MTBF is calculated using the parts stress method in MIL-HDBK 217F (ground benign, T<sub>A</sub> = +25°C).
- 5. Dual output converters with ±12V or ±15V output can be used as single output 24V or 30V supplies.
- 6. All measurements are at nominal input, full load, and +25°C unless otherwise specified.