

## **JASPER ELECTRONICS**

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General Specifications:

### **Model: PCI504-1022-4 Series**

CompactPCI® Power Supplies

# **500 Watt – 6U 8HP**

(PICMG® COMPLIANT\*)

*AC or DC Input; Four DC Outputs.*



### **FEATURES:**

- ✓ **Standard PCI Output Voltages: 5.0V, 3.3V, ±12.0V.**
- ✓ **Hot Swap, N+1 Redundant with Internal OR-ing MOSFETs.**
- ✓ **Input: >.99 Power Factor Corrected AC 90-264V, or DC 36-72V.**
- ✓ **Current Sharing on 5.0V, 3.3V and +12.0V Outputs.**
- ✓ **Standard 47 Pin Connector Configuration.**
- ✓ **Custom Configurations To Meet User Specified Requirements.**
- ✓ **Excellent Performance, Competitively Priced.**
- ✓ **2 Year Warranty.**
- ✓ **Complies With All Requirements Of PICMG Power Interface Specifications.**
- ✓ **Fully Compliant with the EU RoHS Directive.**
- ✓ **cCSAus, CE Marked.**



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*Cat.# 02127-049 C*

**GENERAL PRODUCT SPECIFICATIONS:**

**-INPUT-**

Voltage/Current ..... **AC** 90-264V, 8.0A max, 47-63Hz, 1 Phase, or **DC** 36-72V, 13.2A @ 48.0V (nom.)

Fusing ..... **AC**: 10.0A, 250V time lag internal line fuse provided, non-user serviceable.

AC Power Factor ..... Meets Harmonic Correction per IEC 1000-3-2. 0.99 line PFC typical at AC 115V, full load.

Efficiency..... **AC** 73% typical at 115V, full load. **DC** 77% typical at 48.0V

Inrush Current ..... Soft start, ~25°C cold start current: **AC** 30.6A (rms) @ 230V, **DC** 20.5ApK @ 48V.

Input Voltage Protection (UVP/OVP) .... Auto DC output shutdown when input rises or falls below safe operating limits. Automatic recovery when input returns to within normal operating range. **AC**: UVP ≈ 80V or 150V. **DC**: UVP ≈ 36V, OVP ≈ 75V.

**-OUTPUTS-**

Voltage/Current (V/A) ..... V1    V2    V3    V4  
**AC: PCI504-1022-4** 5.0/50, 3.3/30, +12/10(15pk), -12/3.0(5pk).  
 Total continuous loading on all outputs not to exceed 500W.  
 Peak loading <60sec., with a duty cycle <10%.

**DC: DPCI504-1022-4** 5.0/50, 3.3/30, +12/10(15pk), -12/3.0(5pk).  
 Total continuous loading on all outputs not to exceed 500W.  
 Peak loading <60sec., with a duty cycle <10%.

Line Regulation ..... At the sense point over full input range, ±0.10% typical, sense leads connected.

Load Regulation ..... **AC**: typical, V1, V2 ±0.5%; V3 ±1.0%; V4 ±3.0%. **DC**: typical, V1 ±1.0%; V2 ±1.5%; V3, V4 ±4.0%.

Minimum Loading ..... **AC**: None required in single unit applications. 4.0A minimum required on V1 in N+1 configurations. **DC**: 3~5A minimum required on V1.

Stability ..... Output drift <±0.2% after 20 minute warm-up.

Temp. Coefficient ..... 0° - 50°C, after 20 minute warm-up. **AC**: <±0.04%/°C; **DC**: <±0.02%/°C.

Dynamic Response ..... **AC**: Peak transient less than 250mV, recovers to within 1% in less than 0.5msec with a 50% load change. **DC**: Peak transient less than 250mV, recovers to within 1% in less than 1.0msec with a 25% load change.

Remote Sense..... V1, V2, V3 outputs compensate for up to 0.25V total line drop, in the load cables, sense leads connected. Outputs are internally sensed if the leads are opened.

Ripple and Noise (PARD)..... For all outputs, 50mV max or 1% peak-to-peak nominal, which ever is greater, DC to 20MHz bandwidth with a coaxial probe and 0.1µF/22µF capacitors at the output terminals.

Current Sharing/ Parallel N+1 Operation ... V1, V2, V3 outputs. Single wire connection for ±10% current sharing between any number of units.

Over/Under Shoot ..... None at turn-on or turn-off.

Hold-Up Time (AC) ..... Outputs remain in regulation following loss of AC power 22.8msec min @ 115V or 230V, full load.

Redundant/Hot Swap..... Full power N+1 redundant, hot swap capable.

Over Temperature Protection ..... Internal temperature sensing. Causes all outputs to latch off. Automatic recovery when the condition causing the overtemp is corrected.

Over Current/Short Circuit Protection ..... Current limit on all outputs, 120-130% max load typical. Automatic recovery when the overload is removed.

Over Voltage Protection ..... Non-crowbar type. Any output that exceeds 25% ±10% of nominal Vout will cause all outputs to latch off. Remote inhibit, enable or input recycle required to reset.

**-SIGNALS, INDICATORS and CONTROLS-**

Remote Enable ..... Enabled by closed circuit or TTL logic 0. Disabled by open circuit or TTL logic 1.

Remote Inhibit ..... Enabled by open circuit or TTL logic 1. Disabled by closed circuit or TTL logic 0.

Power Fail Warning ..... Loss of input AC causes a TTL compatible signal to go low >4msec prior to V1 or V2 output dropping out of regulation. At AC turn-on, signal stays low until outputs are in regulation. PF signal also triggered in both AC and DC input models by any output dropping below 10% of nominal.

LED Indicator ..... Dual uni-color LEDs. Normally On, Green "Power" indicates input power ON and outputs within regulation. Normally Off, Amber "Fault" indicates an output power fault or remote output inhibit enabled.

Output Adjust..... Remote electrical trim available for V1, V2. Manual adjust for V1, V2, V3, V4.

**CAUTION:** User adjustment of output voltage from factory set points is not recommended in order to maintain current sharing compatibility in N+1 applications.

Switch, On/Off (Optional)..... Integral with lower latch. Outputs are disabled with open (unlocked) latch.

**-OPERATING ENVIRONMENT-**

Operating Temperature .. **AC** -20° to +50°C ambient; **DC** 0° to +50°C at full load, with specified airflow. Derates linearly to 50% at +70°C.

Cooling ..... A minimum of 800 lfm direct forward airflow required to achieve full rated power and specified MTBF. Consult factory for derating guidelines with reduced or reversed airflow.

Relative Humidity..... Up to 90% RH, non-condensing.

Operational Vibration ..... 2.0G peak, 5 – 500Hz along three orthogonal axis.

Storage Temperature..... **AC**: -30° to 85°C. **DC**: -40° to 85°C.

Altitude ..... Operating to 10,000 ft; Storage to 30,000 ft.

MTBF ..... Designed for 100,000 hrs at 25°C.

Calibration ..... Modules will maintain the output voltage and load capacity over the life of the equipment. Annual re-calibration or other maintenance service is not required.

**-MECHANICAL-**

Outline..... 6U x 8HP x 233mm Eurocard. Complies with all current PICMG® CompactPCI specifications.

Power Density .....5.0 Watts/Cubic Inch.  
 Retaining Latches.....Supplied with dual Rittal #3686.135 Type VII (Telecom) latches. Other manufacturers and types available. Consult factory.  
 Guide Rails.....Supplied with .260[6.61] offset guide rails for use with Rittal 3687.832 (or equivalent) PSU guides.  
 Front Panel Overlay.....Supplied with Lexan overlay and JE Logo. May be deleted, or supplied with customer specified logo or other information. Consult factory.  
 Weight.....Approx: 4.8 lbs / 2.38 kg.

**-SAFETY, REGULATORY and EMC-**

Designed to comply with the relevant industry standards of the authorities having jurisdiction.

**AC:** Recognized to U.S. and Canadian Bi-National Standard UL 60950-1, 1<sup>st</sup>. Ed., 2007, and CSA C22.2 No. 60950-1-03, 2007 (cCSAus Mark). CE Marked.

**DC:** Pending JE engineering evaluation of the final design configuration, this model series may be submitted for certification to U.S. and Canadian Bi-National Standards; and for approval to IEC Standards. CE Mark pending final configuration acceptance.

EMI Filtering .....Meets FCC Class A, and CISPR EN 55022 Level A, radiated and conducted.

Transient Protection .....MOV. Withstands transients/bursts as specified by EN 61000-4-4. AC: Level 2; DC: Level 1.

Touch Current .....Typical 0.7mA @ 50/60Hz, 230V AC per UL 60950 test procedures (Sec. 5.0).

Dielectric Withstand.....Meets IEC 60950 regulations.

Routine Factory Tests ....Di-electric strength (hi-pot) input-to-chassis and input-to-outputs: **AC:** 2121V DC; **DC:** 1500V DC; MegOhm to 500V output-to-chassis.

**-MARKING and LABELING-**

Dual labels. A 2.40"x1.60" adhesive label is factory applied to the top cover. Imprinted with JE model identification data (black-on-white), including JE name, safety certified model name, input/output ratings, manufacturing facility identification code, safety and RoHS Marks. Open space to apply any future authorized product safety certification marks.

A second 2.35"x1.18" adhesive label is applied directly adjacent by the distribution center just prior to shipping. It includes the specific model configuration code, JE part number, revision letter code, serial number and 4-digit (week/year) manufacturing date code.

Space is available on labels for modified or custom models for a user specified part number or model description. Use of non-standard JE labels, or user required marking, such as bar codes, user revision codes, user name or logo, etc, is possible but may incur additional costs.

**-PACKAGING and SHIPPING-**

Every reasonable precaution is taken to ensure that the customer receives Jasper Electronics products in good condition. Each item was new when it left the factory and was packed in a container approved by the carrier.

JE makes shipments FOB from the Anaheim, CA, factory or other subsidiary facilities. When placed on board the carrier's vehicle, the equipment becomes the customer's property. The customer is responsible for examining each container when it arrives at the customer's facility, and for immediately reporting any damage to the delivering carrier. The customer shall make any and all subsequent claims for redress of in-transit damage directly to the carrier that delivered the shipment to the customer's facility and not to JE.

**-INTERCONNECT-**

Input/Output Connector ..47 circuit sequential contact, hot pluggable type. 2 AC input, 1 PE contact rated 40.0A. 20 DC output power contacts rated 28.0A each, 24 signal contacts rated 3.0A each. Ratings continuous, all contacts under load. UL94V-0 glass filled thermoplastic material, secured to the main circuit board assembly in the rear of the unit. Positronic Ind. P/N PCIH47M400A1 Mates with PI P/N PCIH47F300A1.

**Note:** .....Use of the specified mating connector is required to insure proper "make/break" sequential contact sequence.

**-I/O CONNECTOR FUNCTIONS-**

PIN#	SEQ <sup>(1)</sup>	FUNCTION
01-04	2	+5.0V V1 Output.
05-12	2	GND V1+V2 Return.
13-18	2	+3.3V V2 Output.
19	2	GND V3 Return.
20	2	+12.0V V3 Output.
21	2	-12.0V V4 Output.
22,23	2	N/C No Connection (Reserved).
24	2	GND V4 Return.
25,26	2	N/C No Connection (Reserved).
27	3	R/EN Remote Enable. Close circuit to GND.
28	2	N/C No Connection (Reserved).
29	2	V1-ADJ V1 Remote Voltage Adjust.
30	2	+S1 +5.0V (V1) Remote Sense.
31	2	N/C No Connection (Reserved).
32	2	V2-ADJ V2 Remote Voltage Adjust.
33	2	+S2 +3.3V (V2) Remote Sense.
34	2	S-RTN Sense Return for V1, V2, V3.
35	3	ISHR-1 +5.0V (V1) Current Share.
36	2	+S3 +12.0V (V3) Remote Sense.
37	2	N/C No Connection (Reserved).
38	2	DEG Thermal Degrad Signal.
39	2	R/INH Remote Inhibit. Close circuit to GND.
40	2	N/C No Connection (Reserved).
41	3	ISHR-2 +3.3V (V2) Current Share.
42	2	PF Power Fail Signal.
43	2	N/C No Connection (Reserved).
44	3	ISHR-3 +12.0V (V3) Current Share.
45	1	PE Protective Earth (chassis) Ground.
46	2	Input Pwr <b>AC:</b> Neutral (N/ACC) Input Power; <b>DC:</b> +Vin.
47	2	Input Pwr <b>AC:</b> Line (L/AC) Input Power; <b>DC:</b> -Vin.

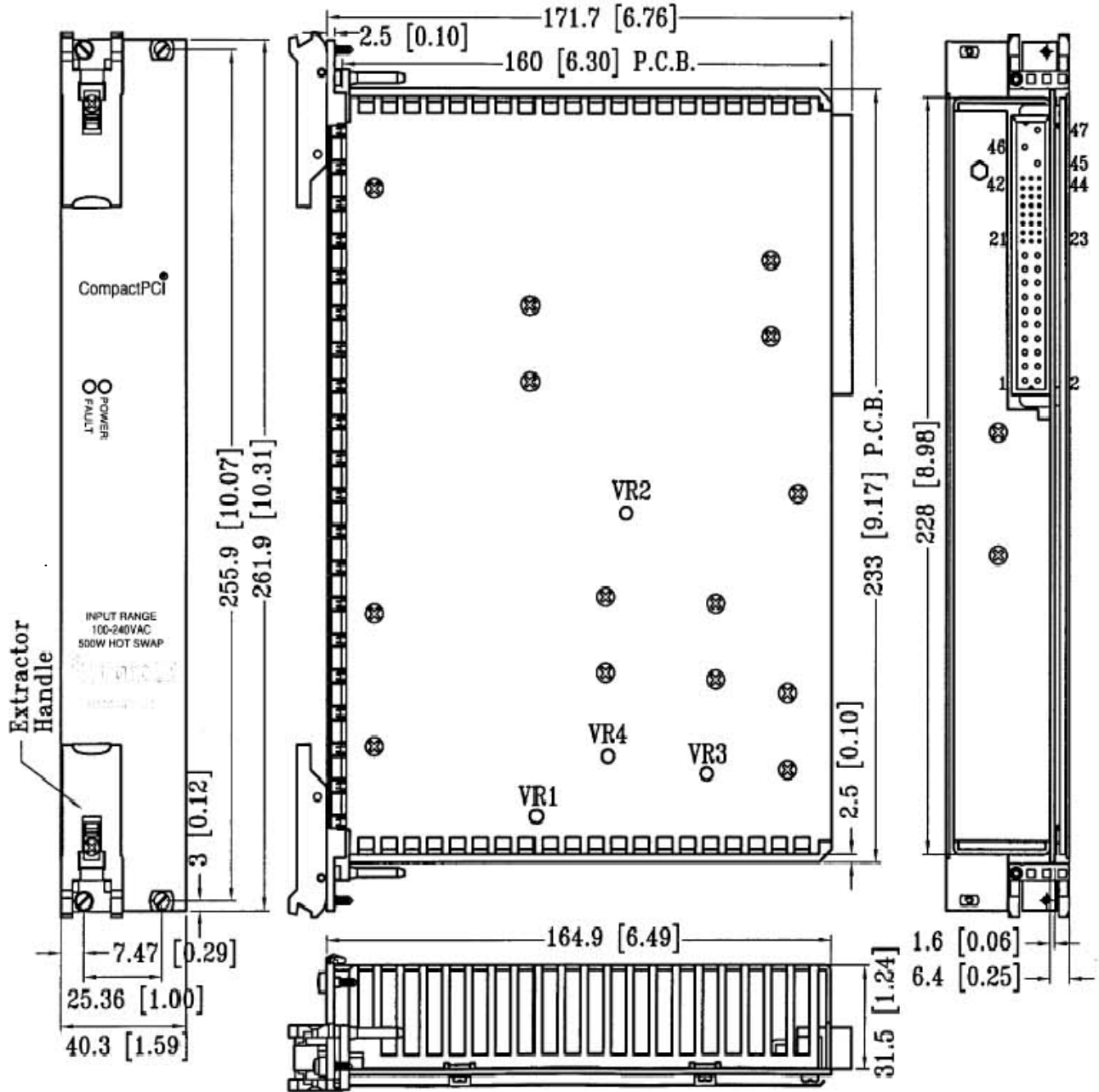
(1) Contact mating sequence. 1= First to make/Last to break.

**-LIMITED WARRANTY POLICY-**

All Jasper Electronics (JE) standard model power supplies and products are guaranteed to be free of defects in workmanship and materials for a minimum of two (2) years from the date of original shipment, when operated within specification. This warranty applies only to defects that result in a failure to comply or perform to published specifications. Non-standard (custom) power supplies and products may be warranted on an individual basis. The unused portion of this warranty is fully transferable with the original equipment in which the power supply is installed.

*Mechanical Outline*

(Dimensions in millimeters [inches])



**ORDERING INFORMATION:**

A multi-character option code is required following the base model description to define the desired model configuration. Codes added in the following sequence, 1 from each category:

*	PCI504-1022-	(1)-	(2)	(3)	(4)	-(5)	(6)
*Input: AC – Blank DC – D	Base Model w/ V <sub>out</sub> Code. 504 – 500W, 4 Output	4- Connector Type	Latch Type	On/Off Switch	Overlay Type	-MXXXX User Specified Config.	G RoHS Compliant Model

**- \* Configuration Options -**

Option:

Code:

- (1) Connector Type..... 4 = 47 pin PICMG standard. No other options currently available.
- (2) Latch Type ..... T = Telecom Type VII.  
N = None provided.
- (3) On/Off Switch ..... Blank = Not included (standard).  
I = Included option. Not available with option N latch.
- (4) Overlay..... S = Standard, with JE logo, model designation, etc.  
B = Blank overlay applied; no logo, model designation, etc.  
N = No overlay provided;  
M = Custom overlay – User specified. May require a factory assigned custom model code (5).
- (5) Custom  
Configuration ..... M = Modified, followed by a factory assigned 4-digit number to identify a user specified configuration. Such models may include special or non-standard features and/or options, or be in a configuration differing sufficiently from the design of the approved similar standard model from which it is derived to require re-evaluation of all or part of the design to insure continuing compliance with all safety requirements. Option codes 2, 3 and 4 may not be present in the model description as these requirements are generally included in the user specification documentation on file with the factory. Consult the factory for exact requirements.  
(May incur additional cost. Consult factory.)
- (6) RoHS Compliant..... G = Required code. All Jasper products in this series are fully compliant with the requirements of Directive 2002/95/EC Restrictions of Hazardous Substances (RoHS) and are identified with the letter code “G” in the JE part number and model description on the unit labels and related documents (sales orders, etc). All materials, processes and packaging used in the assembly and shipping of this product comply.

Examples: PCI504-1022-4-TSG (AC input, std model)  
DPCI504-1022-4-M4662G (DC input, custom model)

All statements and technical information contained herein are believed by JE to be reliable as of the publication date of this document, but the accuracy or completeness is not guaranteed, and JE reserves the right to change specifications without prior notification. However, every reasonable effort will be made by JE to inform users of JE products of changes to design form, fit or function that may affect the user's applications. JE manufactures a quality product, equal to any available in the marketplace; however, these products are intended to be used in accordance with the specifications described in this catalog. Any use or application that deviates from the stated operating specifications is not recommended and may be unsafe.