PCI500-4D

500W Quad Output Power Supply

FEATURES

- 500W power
- Widerange 36-72Vdc input range
- Hot-swap capable
- N+n redundant configurable
- No minimum load
- Active current sharing
- Status indicator LEDs
- Synchronous startup control
- DC OK & Fan Alarm signals
- PCI output voltage(+5/+3.3/+12/-12)
- UL, cUL, VDE, CE marked

DESCRIPTION

The PCI500-4D is a modular, hot-swap, 500W, quad output power supply with wide range 48Vdc input. This unit was designed specifically for redundant applications with active current sharing, synchronous starting, and output isolation diodes.

The PCI500-4D incorporates a unique architecture that supports migration of low-voltage requirements between the 5V and 3.3V rails by deriving both of these outputs from a common transformer winding.

The PCI500-4D is ideal for networking equipment, communications, and computer equipment where fault-tolerance is a necessity. All outputs have remote sense and are individually protected against overloads and short circuits. With UL/cUL approval to UL1950, VDE approval to EN60950, and the CE Mark, the PCI500-4D provides a truly global power solution for your PCI requirements..

SELECTION GUIDE

Model Number	Power	Output Current				Production Status	RoHS COMPLIANT 2002/95/EC
		5V	3.3V	12V	-12V		
PCI500D-1	500W	74A[2]	60A[2]	10A	2.5A	Consult Factory	No
PCI500D-1C	500W	74A[2]	60A[2]	10A	2.5A	**Active**	**Yes**

INPUT CHARACTERISTICS

Parameter	Conditions	Min	Typ	Max	Units
Input Operating Voltage		36		72	Vdc
Input Voltage Withstand		34		75	Vdc
Inrush Current	36Vdc input, cold start			25	A_{pk}
	72Vdc input, cold start			50	A_{pk}

OUTPUT CHARACTERISTICS

Output	Nominal Voltage	Output Current		Total Regulation[1]
		Min	Max	
V1	+5.0Vdc	0A	74A[2]	±2%
V2	+3.3Vdc	0A	60A[2]	±2%
V3	+12Vdc	0A	16A	±2%
V4	-12Vdc	0A	2.5A	±2%

Parameter	Conditions	Min	Typ	Max	Units
Temperature Coefficient	After 30-minute warmup			0.02	%/ºC
PARD (V1 & V2)	20MHz bandwidth			60	mV_{p-p}
PARD (V3 & V4)	20MHz bandwidth			120	mV_{p-p}
Output Power	40ºC ambient	0		500	W
Output Power	50ºC ambient	0		350	W
Transient Response	ΔV, 25% load step			±5	$\%V_{nom}$
	Settling time			400	µsec
Output Voltage Adjustment	All outputs		±5		$\%V_{nom}$
Over-Voltage Protection	Output V1, latching	6.0	6.5	7.0	Vdc
	Output V2, latching	3.9	4.3	4.7	Vdc
Minimum Load		0			A
Remote Sense Compensation	All outputs	700			mV
Current Share Tolerance	V1-V4; full load			±10	%
Isolation	Pri-Sec	3			Vdc
	Pri-Chassis	1.5			Vdc
	Sec-Chassis	500			Vdc

Notes:
1. Total regulation includes line, load, and cross regulation.
2. Combined current output of V1 & V2 not to exceed 83A total. Outputs V1, V2, and V3 share a common return. Outputs V4 has an isolated return.

GENERAL CHARACTERISTICS					
Parameter	Conditions	Min	Typ	Max	Units
Efficiency	48Vdc input, 500W load (dependent upon load profile)		65		%
Switching Frequency			72		kHz
MTBF	Calculated per MIL-HDBK-217F, 25ºC, ground benign	84			khrs
Weight	Unpackaged		3.6		kg

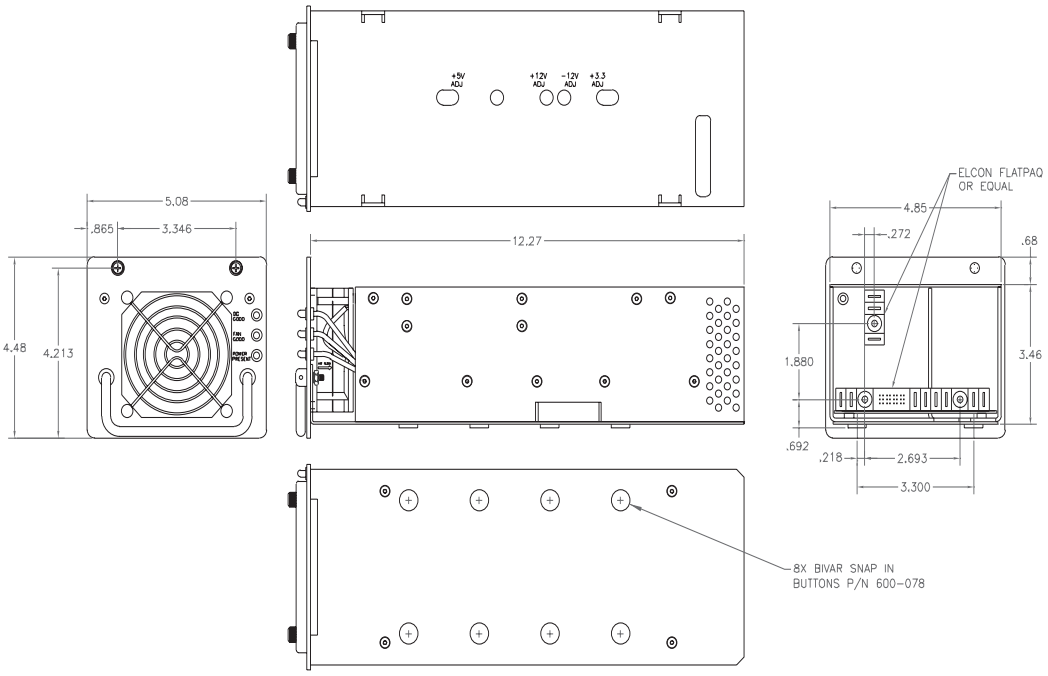
PROTECTION					
Parameter	Conditions/Response	Inception			
		Min	Typ	Max	Units
Thermal Shutdown	Automatic recovery upon restoration to operational temperatures		90		ºC
Output Power Limit	Automatic recovery		530		W
Input Protection	Internal line fuse, Littlefuse BLN 25P ROHS or equivalent			25	A
Over-Voltage Protection	Output V1, latching			6.5	Vdc
	Output V2, latching			4.3	Vdc
Parameter	Conditions/Response				
Output Overload Protection	Outputs are individually protected against overloads and indefinite short circuit with automatic recovery upon removal of the fault condition.				
Hot-Swap Capability	Design Verification Testing (DVT) confirms that voltage excursions on the output buses resulting from insertion/extraction events do not exceed the specified maximum of 5%. However, routing of power and signal lines in the mating backplane is critical to minimization of such excursions. In addition, performance can be critically affected by load characteristics including resistance, negative resistance, and reactive components. While the control loop responses have been designed for optimum hot-swap performance over a wide range of characteristics, there may be instances where the voltage excursions exceed published specifications. In such cases, the control loop responses can be modified to perform optimally.				
Output Fault Isolation	Output isolation devices are present in all outputs to isolate faults within a failed power supply.				

STATUS & CONTROL SIGNALS & INDICATORS	
Name	Description
Hot-Swap Enable	Short pin on connector will enable the outputs when the mating pin is tied to DC GND. Supply will not power up until this pin is engaged to its mate in the backplane. Unit output will be inhibited as pin is disengaged from the mating connector.
Output Inhibit	Secondary referenced; active low, TTL compatible. Logic “0” or short circuit to DC GND inhibits all outputs.
DC Good	Secondary referenced. Open collector signal with an internal 2.2k pull-up resistor is connected to the +5V output. TTL signal will transition high when all outputs are between 90% and 110% of their nominal voltage.
Remote Sense	Connection of the sense leads across the load at the desired point of regulation will compensate for voltage distribution drops up to 700mV between the output terminals of the power supply and the point of connection. The unit reverts to local sensing if the sense lines are opened for any reason. The output is protected against shorted or open leads. Applies to all outputs.
Fan Alarm	Secondary referenced; TTL compatible; active low. Signal transitions to a Logic 0 denotes a thermal warning.
Power Present Indicator LED	A green LED will be illuminated when the input voltage is present and above the minimum requirement.
DC Good Indicator LED	A green LED will be illuminated when the output voltages are within 90-110% of specification, coincident with assertion of the DC Good signal. This LED will be extinguished if any of the output voltages is outside of this range.
Fan Good Indicator LED	A green LED will be illuminated when the fan is operational, coincident with de-assertion of the Fan Alarm signal. This LED will be extinguished in the event of a fan failure.
Sync Start	A power supply generated signal used to simultaneously start power supplies connected in parallel when the load on any output exceeds a single power supply’s capacity for that output. These pins must be bused together at the backplane in parallel/redundant applications (N+n) when N>1. In simple redundant (1+1) or non-parallel applications (1+0), the pin can be ignored.
Power Supply Present	This pin presents a DC ground signal to the mating pin in the backplane. It is intended to be used by the system to detect the presence of a power supply when the supply is mated into an available position.

ENVIRONMENTAL CHARACTERISTICS					
Parameter	Conditions	Min	Typ	Max	Units
AmbientOperatingTemperature	De-rate output power linearly above 40ºC to 250W at 60ºC.	0		60	ºC
Ambient Storage Temperature		-25		+125	ºC
Humidity	Operating; non-condensing	10		95	%
	Storage; non-condensing	5		95	%
Altitude	Operating. De-rate ambient temperature by 2Cº per 1000ft above 5000ft.	-200		10000	ft
	Storage	-200		40000	ft
Cooling	Self-cooled by internal fan				

CERTIFICATIONS	
Agency/Characteristic	Standard
UL	UL1950
CSA	CSA950 (per cUL)
VDE	EN60950
CE	Self-certified
RoHS	EN Directive 2002/95/EC; self-certified; see Selection Guide table for specific model compliance
SELV	Certified
Vibration	MIL-STD-810, Method 514.3, Procedure 1; self-certified
Shock	MIL-STD-810, Method 516.3, Procedure I; self-certified
ELECTROMAGNETIC COMPATABILITY (EMC)	
Conducted Emissions	EN 300 386, NEBS GR-1089
Electrostatic Discharge (ESD)	EN61000-4-2, Level 3, Criteria B
Radiated Immunity	EN61000-4-3, Level 3, Criteria A
Conducted Immunity	EN61000-4-4, Level 3, Criteria A
Line Voltage Surge	EN61000-4-5, Class 3, Criteria B

MECHANICAL DIMENSIONS



CONNECTOR INFORMATION

CONNECTOR PIN ASSIGNMENT

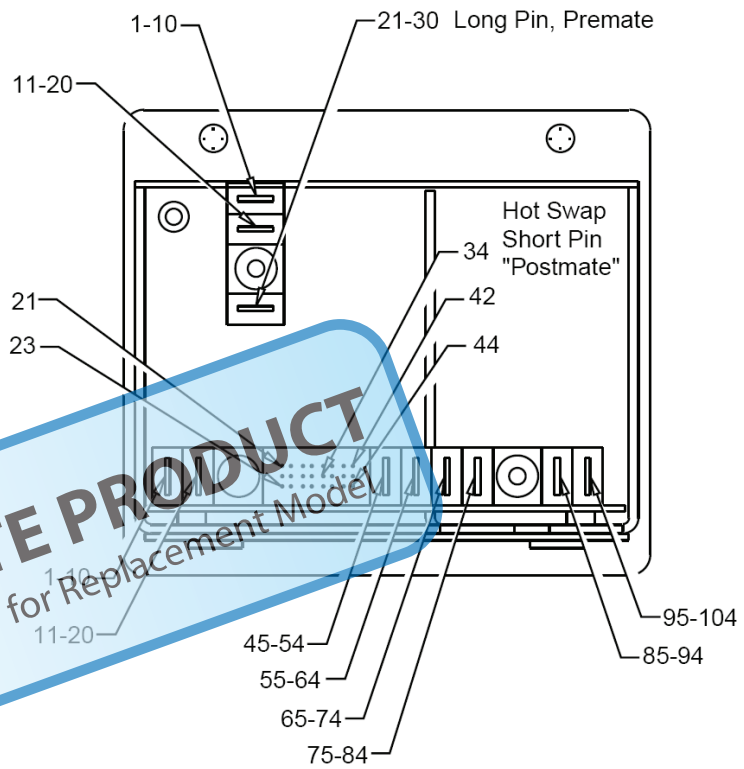
OUTPUT CONNECTOR WIRING

Pin Number	Function
45 to 54	+3.3V
55 to 64	+3.3V
85 to 94	+5V
95 to 104	+5V
65 to 74	GND (3.3V/5V)
75 to 85	GND (3.3V/5V)
1 to 10	+12V
11 to 20	GND (+12V)
24, 25, 28	-12V
21 to 23	GND (-12V)
29	+5V Sense
39	+3.3V Sense
41	+12V Sense
35	-12V Sense
34 (short)	Hot-Swap Enable
33	+5V Current Share
27	+3.3V Current Share
26	+5V Sense RTN
36	+3.3V Sense RTN
38	+12V Sense RTN
32	-12V Sense RTN
44	Fan Alarm
30	DC Good
42	Remote Inhibit
37	Power Supply Present (GND)
40	DC GND
43	DC GND
31	Sync Start

INPUT CONNECTOR WIRING

Pin Number	Function
1 to 10	-48Vdc
11 to 20	-48Vdc RTN
21 to 30 (long)	Chassis GND

CONNECTOR PINOUT DIAGRAM



MATING CONNECTORS (Backplane Mount)

Input: Elcon 278-0454-00200B9926

Output: Elcon 278-0453-00200B9925A

RoHS COMPLIANT 2002/95/EC

For further information, please visit www.cd4power.com/rohs

SAFETY AGENCY RATINGS	
Input Voltage	36-72Vdc
Input Current	25-12.5Adc

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