



### PRODUCT OVERVIEW

The **D1U-W-2000** is a 2000 Watt, power-factor-corrected (PFC) front-end power supply for hot-swapping redundant systems. The main output is 48V and standby output of either 12V, 5V or 3.3V. Packaged in 1U low profile, it is designed to deliver reliable bulk power to servers, workstations, storage systems or any 48V distributed power architecture systems requiring high power density. The highly efficient electrical and thermal design with internal cooling fans supports reliable operation conditions. The D1U-W-2000 is designed to auto-recover from over-temperature faults. Status information is provided with front panel LEDs, logic signals and I<sup>2</sup>C management interface. Three units can be packaged into a 19" 1U power shelf to provide up to 6.0kW of power.

### FEATURES

- RoHS compliant
- 2000W (220Vac), 1200W (110Vac) Output power
- 48V Main output, 3.3V, 5V or 12V standby output
- 1U sized; dimensions 4.75"x12.00"x1.61"
- 21.9 Watts per cubic inch density
- N+1 redundancy capable, including hot-docking
- Active current sharing on main output
- Over-voltage, over-current, over-temperature protection
- Internal cooling fans
- I<sup>2</sup>C Bus Interface with status indicators

### SELECTION GUIDE

Part Number	Power Output High Line AC	Power Output Low Line AC	Main Output	Standby Output	Airflow
D1U-W-2000-48-HC2C	2000W	1200W	48V	3.3V	Back to front
D1U-W-2000-48-HA2C	2000W	1200W	48V	5V	Back to front
D1U-W-2000-48-HB2C	2000W	1200W	48V	12V	Back to front
D1U-W-2000-48-HB4C	2000W	1200W	48V	12V	Back to front; variable speed fan

### INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Operating Range		90	115/230	264	Vac
Input Frequency		47	50/60	63	Hz
Turn-on Input Voltage	Ramp up	78.5		86.5	Vac
Turn-off Input Voltage	Ramp down	70.5		78	Vac
Maximum Input Current	Low Line AC 90Vac High Line AC 180Vac			15 10	Arms
Inrush Current	Cold start between 0-1msec			90	Apk
Power Factor	Output load >90% Output load >50%	95% 75%			

### OUTPUT VOLTAGE CHARACTERISTICS

Output Voltage	Parameter	Conditions	Min.	Typ.	Max.	Units
48V	Voltage Set Point Accuracy			48		Vdc
	Line and Load Regulation		46.54		49.44	Vdc
	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			480	mV p-p
	Output Current		2		41.3	A
	Load Capacitance				10000	µF
3.3Vsb	Voltage Set Point Accuracy			3.3		Vdc
	Line and Load Regulation		3.2		3.4	Vdc
	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			50	mV p-p
	Operating Range		0		4.5	A
	Load Capacitance				1530	µF
5Vsb	Voltage Set Point Accuracy			5		Vdc
	Line and Load Regulation		4.85		5.15	Vdc
	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			50	mV p-p
	Operating Range		0		4	A
	Load Capacitance				1530	µF
12Vsb	Voltage Set Point Accuracy			12		Vdc
	Line and Load Regulation		11.6		12.4	Vdc
	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			120	mV p-p
	Operating Range		0		1.7	A
	Load Capacitance				1530	µF



For full details go to  
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OUTPUT CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Remote Sense			240		mV
Efficiency	220Vac		90.6		%
Output Rise Monotonicity	Overshoot less than 10% for all outputs, no voltage negative between 10% to 95% during ramp up				
Start-up Time	AC ramp up		1.5		s
	PS_On activated		150		ms
Transient Response	48V Ramp 1A/μs, 50% load step			±2700	mV
	3.3Vsb Ramp 1A/μs, 50% load step			±165	
	5Vsb Ramp 1A/μs, 50% load step			±250	
	12Vsb Ramp 1A/μs, 50% load step			±600	
Current sharing accuracy (up to 6 in parallel)	At 100% load			±10	%
Hot Swap Transients	All outputs within regulation				
Hold-up Time	Max. load, nominal Vin	17			ms

GENERAL CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Storage Temperature Range	Non-condensing	-40		70	°C
Operating Temperature Range		0		50	
Operating Humidity	Non-condensing	10		90	%
Storage Humidity		5		90	
Shock	30G non operating				
Sinusoidal Vibration	0.5G, 5 – 500 Hz operating				
MTBF	Calculated per Bellcore at Ta=30°C	200			Khrs
	Demonstrated	200			Khrs
Acoustic	ISO 7779-1999			60	dB LpAm
Safety Approvals	c-CSA-us (CSA 60950-1-03/UL 60950-1, Second Edition) TUV approval (Bauart) EN 60950-1:2001				
Input Fuse	Power Supply has internal 20A/250V fast blow fuse on the AC line input				
Material Flammability	UL 94V-0				
Switching Frequency	90KHz for Boost PFC Converter 165KHz for Main Output Converter 200KHz for Standby Output Converter				
Weight	2.1kg				

PROTECTION CHARACTERISTICS						
Output Voltage	Parameter	Conditions	Min.	Typ.	Max.	Units
48V	Over-temperature	Auto-restart	55		65	°C
	Over Voltage	Latching	54		59	V
	Over Current	Latching	44		50	A
12Vsb	Over Voltage	Latching	13		14	V
	Over Current	Latching	2.5		3	A
3.3Vsb	Over Voltage	Latching	3.57		4.02	V
	Over Current	Latching	6.5		8	A
5Vsb	Over Voltage	Latching	5.6		6	V
	Over Current	Latching	5		7	A

<sup>1</sup> Ripple and noise are measured with 0.1 uF of ceramic capacitance and 10 uF of tantalum capacitance on each of the power supply outputs. The output noise requirements apply over a 0 Hz to 20 MHz bandwidth. A short coaxial cable with 50ohm scope termination is used.