



### FEATURES

- 400W continuous output power
- Low profile (1U)
- IEC EN61000-3-2 compliance
- Remote sense compensation
- AC Power Fail signal
- DC Power Good signal
- Remote Inhibit control
- Droop current share
- Built-in OR-ing FET
- I<sup>2</sup>C interface
- 5V Standby
- Integrated cooling fan (variable speed)
- Over-voltage protection
- Over-current protection
- Thermal overload protection

### DESCRIPTION

The CEF400-112C is a 400W active power-factor-corrected (PFC) front-end power supply for distributed power architecture (DPA) systems requiring high power density in a 1U low profile package. The built-in OR-ing FET allows the power supply to operate in active current sharing mode for redundant (N+1) operation. Additional features include I<sup>2</sup>C interface, built-in fan and a 5V standby auxiliary output. The CEF400-112 provides reliable 12V bulk power for Information Technology Equipment and Industrial Applications.



### PRODUCT SPECIFICATIONS

INPUT CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Input Voltage Operating Range (AC)		85		264	V <sub>AC</sub>
Input Frequency		47		63	Hz
Turn-on Input Voltage	Ramp up	76		85	V <sub>AC</sub>
Turn-off Input Voltage	Ramp down	63		78	
Maximum Input Current		1.75		6.5	Arms
Inrush Current				20	Apk
Power Factor	IEC EN61000-3-2 compliant				
Leakage Current	264 V <sub>AC</sub> input			0.90	mA

OUTPUT CHARACTERISTICS						
Output Voltage	Parameter	Conditions	Min.	Typ.	Max.	Units
12V	Voltage Set Point Accuracy	17A load	12.08	12.125	12.16	VDC
	Line and Load Regulation		11.75		12.45	
	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			175	mV p-p
	Rated Output Current		33.3			A
5Vsb	Voltage Set Point Accuracy		4.85	5	5.15	VDC
	Line and Load Regulation		4.85		5.15	
	Ripple Voltage & Noise <sup>1</sup>	20MHz Bandwidth			50	mV p-p
	Rated Output Current			1.3		A

GENERAL						
Parameter	Conditions	Min.	Typ.	Max.	Units	
Remote Sense	Sum of +ve & -ve drops		500		mV	
Efficiency	Full load, high line		83		%	
Turn on Delay			2		s	
Transient Response	12V Ramp 1A/μs 33% step			±375	mV	
	5Vsb Ramp 1A/μs 33% step			±40		
Current Sharing Accuracy	200-720W load (2 in parallel)		45/55		%	
	96-200W load (2 in parallel)		40/60			
	50-96W load (2 in parallel)		20/80			
	24-50W load (2 in parallel)		10/90			
Hold-up Time, to 10.8V	400W, 120V <sub>AC</sub> line	20			ms	
Isolation	Output to Chassis-Basic	500			Vrms	
	Input to Chassis-Basic	1500				
Temperature Coefficient	Full load and 100V <sub>AC</sub> input			0.02	% / °C	

<sup>1</sup> Ripple and noise are measured with 0.1 μF of ceramic capacitance and 10 μF 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 50Ω scope termination is used.

PROTECTION CHARACTERISTICS						
Parameter	Output Voltage	Conditions	Min.	Typ.	Max.	Units
Over Voltage	12V	Latching	14.065	14.5	14.935	V
Over Current		Auto-restart	36	38	42	A
Short Circuit		The 12V output shall current limit and shutdown during a shorted output condition, and shall automatically restart after the short is removed.				
Over Voltage	5Vsb	Latching	5.6		6	V
Over Current		Auto-restart	1.4	2.1	2.65	A
Over-temperature	Unit	Auto-restart	Unit shall self-protect against excessive internal temperatures and automatically recover.			
Input Undervoltage	No damage will be sustained by operation at voltages below the specified input operating voltage range.					

MONITORING AND CONTROL SIGNALS	
AC Fail	TTL logic signal goes high to denote loss of AC input. Power supply will provide a minimum of 5ms from loss of AC input before this signal goes high. Additionally a minimum of 3ms of holdup will be provided between the signal going high and the output going out of regulation. The signal will not go high when loss of AC input is less than 5ms in duration.
DC OK	TTL logic goes high after the output is in regulation. It goes low when there is loss of regulation.
Remote On/Off	TTL logic input signal disables the output when held low, and enables the output when held high.
Remote Sense	Compensates for 0.5 V lead drop min. Will operate without remote sense connected. Unit is protected against reverse connection of the remote sense lines.

SAFETY	
UL	UL60950-1 (E151252)
cUL	CSA C22.2 No. 60950-1 (E151252)
CB	US/13399/UL per IEC60950-1 (2001) 1st Ed.
Material Flammability	UL 94V-0

RELIABILITY		
MTBF	Calculated <sup>2</sup> per MIL-HDBK-217N2, GB, 25°C, Quality Level I	212khrs
	Calculated <sup>2</sup> per Telcordia SR-332, Issue 1, Method 1, Case 3, GFC, Ground fixed, Controlled, Quality Level I	293khrs

I <sup>2</sup> C INTERFACE	
Software Remote On/Off over I <sup>2</sup> C	Writing 0x7F at address 40 disables the output of the unit Writing 0xFF at address 40 enables the output of the unit
Parametric Reporting Read Byte	Reading at address 40 over I <sup>2</sup> C lines, give the 'Parametric Reporting Read Byte', which is detailed below

BIT 7	BIT 6	BIT 5	BIT 4	BIT 3	BIT 2	BIT 1	BIT 0
Output Enable	NOT USED (normal 1)	NOT USED (normal 1)	NOT USED (normal 1)	Over Temperature	Fan Fault	Output OK	Input Ok

BIT 7	Output Enable	1	Unit Enabled
		0	Unit Disabled
BIT 6	NOT USED	1	Set to 1
BIT 5	NOT USED	1	Set to 1
BIT 4	NOT USED	1	Set to 1

EMISSIONS AND IMMUNITY	
EMI	EN55022 Class B conducted
Electromagnetic Susceptibility	
ESD	IEC/EN 61000-4-2, Level 3
Electromagnetic Field	IEC/EN 61000-4-3, Level 3
Electrical Fast Transients/Burst	IEC/EN 61000-4-4, Level 3
Surge	IEC/EN 61000-4-5, Level 3
RF Conducted Immunity	IEC/EN 61000-4-6, Level 3
Magnetic Immunity	IEC/EN 61000-4-8, Level 3
Voltage Dips, Interruptions	IEC/EN 61000-4-11, Level 3

ENVIRONMENTAL CHARACTERISTICS					
Parameter	Conditions	Min.	Typ.	Max.	Units
Storage Temperature Range	Non-condensing	-40		+ 85	°C
Operating Temperature Range	w/o derating	0		50	
Operating Humidity	Non-condensing	10		90	%
Storage Humidity		5		95	

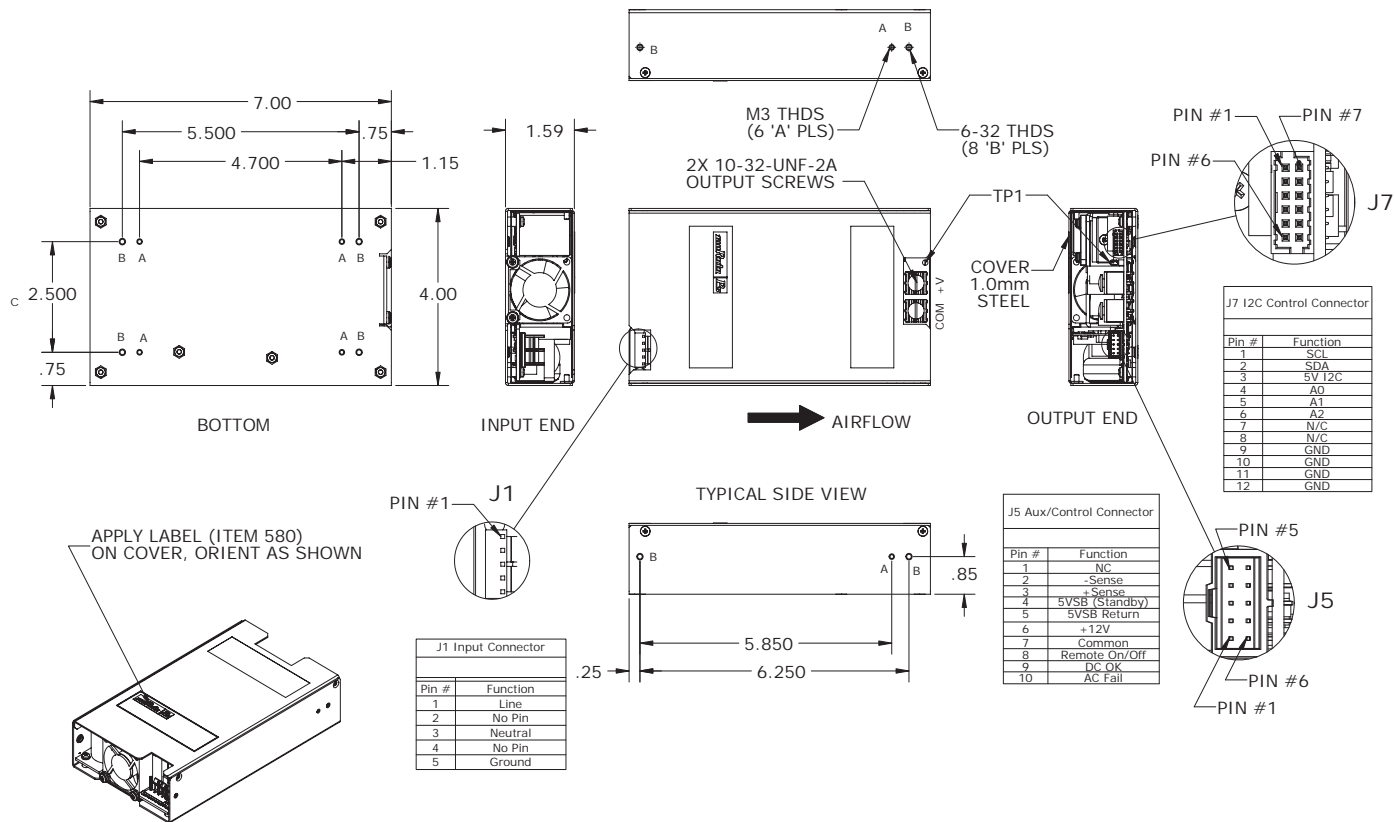
MECHANICAL	
Dimensions	4.0" × 7.0" × 1.59" (101.6mm × 177.8mm × 40.39mm)
Weight	2.0 lbs (0.91 kgs)
Vibration	Designed to meet IEC 68-2-6 to the levels from IEC 721-3-2
Shock	Designed to meet IEC 68-2-27
Drop	Designed to meet IEC 68-2-31
Tip over	Designed to meet IEC 68-2-31

BIT 3	Over Temperature	1	Over temperature exists
		0	No over temperature
BIT 2	Fan Fault	1	Fan locked rotor fault exists
		0	Fan OK
BIT 1	Output OK	1	Output fault exists
		0	Output OK
BIT 0	Input OK	1	Input fault exists
		0	Input OK

**Notes**  
 Specifications subject to change without notice.  
 Specifications are at factory settings.  
 Warranty: 1 year.

<sup>2</sup>Calculated figures exclude the integral fan.

### MECHANICAL DIMENSIONS



J1 (Molex #26-62-4051, 5 Position, 3-Pin, .156" Straight Header)  
 Mating Plug Housing Molex #09-50-8051  
 Mating Crimp Terminal Molex #08-52-0113

J5 (Molex #90130-3210, 10 Position C-Grid-III Receptacle, .100")  
 Mating Plug Housing Molex #90142-0012  
 Mating Crimp Terminal Molex #90119-0121

J7 (Molex #87833-1231, 12 Position 2mm Milli-Grid)  
 Mating Plug Housing Molex #51110-1260  
 Mating Crimp Terminal Molex #50394-8100

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