



### 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                 | Min.            | Typ.   | Max.  | Units  |
| 12V                    | Output Voltage            |                 | 12.125 | 12.16 | VDC    |
|                        | Output Current            | 1.75            |        | 12.45 | A      |
| 5Vsb                   | Output Voltage            |                 |        | 175   | mV p-p |
|                        | Output Current            | 33.3            |        |       | A      |
| 12V                    | Output Voltage            |                 | 4.85   | 5.15  | VDC    |
|                        | Output Current            | 4.85            |        | 5.15  | A      |
| 12V                    | Output Noise <sup>1</sup> | 20MHz Bandwidth |        | 50    | mV p-p |
|                        | Output Current            |                 | 1.3    |       | A      |

OBSOLETE PRODUCT

Recommended replacement MVAC400-12AFD

| 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.  |

| 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 Field Immunity                 | IEC/EN 61000-4-8, Level 3  |
| Power Frequency Magnetic Field Immunity | IEC/EN 61000-4-11, Level 3 |

| SAFETY                |                            | ENVIRONMENTAL OPERATING CONDITIONS |                | Min. | Typ. | Max. | Units |
|-----------------------|----------------------------|------------------------------------|----------------|------|------|------|-------|
| UL                    | UL60950-1 (E151252)        | Operating Temperature              | Non-condensing | -40  |      | + 85 | °C    |
| cUL                   | CSA C22.2 No. 60950-1      | Storage Temperature Range          | w/o derating   | 0    |      | 50   |       |
| CB                    | US/13399/UL per IEC60950-1 | Relative Humidity                  | Non-condensing | 10   |      | 90   | %     |
| Material Flammability | UL 94V-0                   | Moisture Humidity                  |                | 5    |      | 95   |       |

OBSOLETE PRODUCT

Recommended replacement MVAC400-12AFD

| 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 |

| 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                               |

| 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<br>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 |

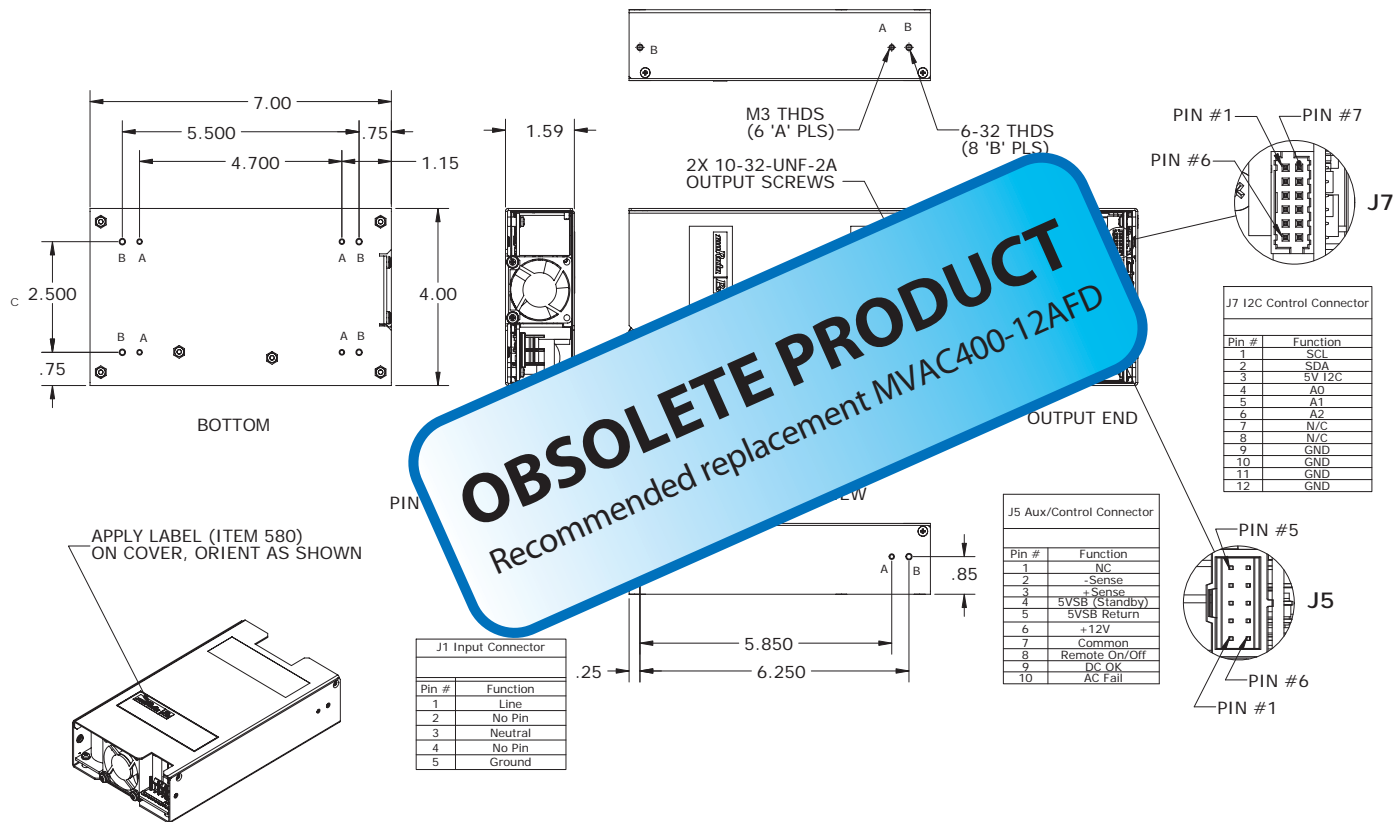
|       |               |   |               |
|-------|---------------|---|---------------|
| BIT 7 | Output Enable | 1 | Unit Enabled  |
|       |               | 0 | Unit Disabled |
| BIT 6 | NOT USED      | 1 | Set to 1      |
| BIT 5 | NOT USED      | 1 | Set to 1      |
| BIT 4 | NOT USED      |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

|       |                  |   |                               |
|-------|------------------|---|-------------------------------|
| 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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This product is subject to the following **operating requirements** and the **Life and Safety Critical Application Sales Policy**:  
Refer to: <http://www.murata-ps.com/requirements/>

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