

EP0500_UTEZ short-depth power supplies

90 - 264V_{AC} Input; 54V_{DC} Output; 540W Output Power



Applications

- Industrial equipment
- Telecommunications equipment

Features

- Compact size
126.5 mm x 206 mm x 41.6 mm (5 in x 8.1 in x 1.64 in)
- Universal AC Input Range (90 – 264V_{AC})
- Output voltage of 54V(42~58V_{DC} adjustable)
- 540W Max. from nominal 200-240V_{AC}
- 540W Max. from nominal 100-120V_{AC}
- Maximum output current of 11.25@ 48V_{out} (540W)
- Temperature controlled fan cooling, front to rear
- High efficiency (>92% at half load, 230V_{AC} in)
- Full load capability at 55°C with derating at higher temperatures
- Galaxy Protocol RS485 communications
- Output overcurrent protection (non-latching)
- Overtemperature protection
- Output overvoltage protection
- Minimum of 10ms of holdup time^{***}
- Parallelable with output current sharing
- Active power factor corrected input
- Conducted EMI - meets CISPR32 (EN55032) and FCC Class A requirements
- Meets IEC61000-4-5, Level 4 (2kV/4kV)
- Compliant to RoHS Directive 2011/65/EU and amended Directive (EU) 2015/863
- UL and cUL approved to UL/CSA*62368-1, TUV (EN62368-1), CE Mark (for) LVD and CB Report available.
- ISO** 9001 and ISO 14001 certified manufacturing facilities
- All PCBs are conformally coated

The EP0500_UTEZ is a single/dual phase, hot-pluggable, fan cooled AC DC power supply that provides highly reliable DC power. The EP0500_UTEZ is a cost-effective power supply that occupy just 1RU and its shallow depth is an ideal power solution for depth critical applications. The constant output power characteristics as well as the extended temperature range, universal AC input voltage range and compact size are key attributes that make this product the right choice for your power needs.

This power supply is applicable for indoor and outdoor environments. It communicates digitally to the Pulsar Edge controller family over a RS485 bus to add extensive monitoring and alarm management facilities. Its flexible and sophisticated feature set makes this front-end supply an excellent choice for power in a variety of applications. A large population in the field demonstrate excellent real-life reliability.

* UL is a registered trademark of Underwriters Laboratories, Inc.

† CSA is a registered trademark of Canadian Standards Association.

‡ VDE is a trademark of Verband Deutscher Elektrotechniker e.V.

** ISO is a registered trademark of the International Organization of Standards

*** 230V_{AC}, V_{OUT}=54V, P_O=540W, T_a>=-10deg, output voltage allowed to decay to 42V

Technical Specifications

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only, functional operation of the device is not implied at these or any other conditions in excess of those given in the operations sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect the device reliability.

| Parameter | Device | Min | Max | Unit |
|--|--------|------|---------------------------|-----------------|
| Input Voltage – Continuous operation | All | 90 | 264 | V _{AC} |
| Input Voltage – no damage | All | 0 | 320V (Shutdown permitted) | V _{AC} |
| Operating Ambient Temperature (see Thermal Considerations section) | All | -40 | 75 | °C |
| Storage Temperature | All | -40 | 85 | °C |
| Humidity (non-condensing) | All | 5 | 95 | % |
| Altitude | All | -400 | 4000 | m |
| Isolation Voltage – Input to output | All | | 3000 | V _{AC} |
| Input to safety ground | All | | 1500 | V _{AC} |
| Outputs to safety ground | All | | 1000 | V _{AC} |

Electrical Specifications

| Parameter | Device | Min | Typ. | Max | Unit |
|---|--------|------|---------|-------|-------------------|
| Operating Input Voltage | All | 90 | 115/230 | 264 | V _{AC} |
| Input Source Frequency | All | 47 | 50/60 | 63 | Hz |
| Input Current (V _{IN} = 90V _{AC}) | All | | 6.5 | | A _{RMS} |
| Input Power Factor (230V _{AC} , 50%~100% of full load) | All | 0.96 | 0.99 | | |
| Inrush Transient Current (V _{IN} = 265V _{AC} , Tamb = 25°C) | All | | | 25 | A _{Peak} |
| Leakage Current to earth ground (V _{IN} =250Vac,60Hz) | All | | | 3.5 | mA |
| Output Voltage Setpoint (as shipped by OmniOn) | All | | 54 | | V _{DC} |
| Output Voltage Tolerance (due to set point, temperature variations, load and line regulation) | All | -1 | | 1 | % |
| Output Voltage Adjustment Range | All | 42 | | 58 | V _{DC} |
| Output Power | | | | | W |
| High Line (nominal 200-240V _{AC}) | | 0 | | 540 | |
| Low Line (nominal 100-120V _{AC}) | | 0 | | 540 | |
| Overall Regulation (All conditions(temp,drift,load,line)) | All | -2 | | 2 | %V _{out} |
| Output Line Regulation | All | | | 0.5 | %V _{out} |
| Output Ripple and Noise – measured with 230V _{AC} in, 54V _{out} , 0.1μF ceramic capacitor in parallel with 10μF electrolytic capacitor Peak-to-peak (20MHz Bandwidth) | All | | | 500 | mV _{p-p} |
| Dynamic Load Response – 50% to 75% load transient, 1A/μs slew rate Output voltage deviation | All | | | 5 | % |
| Settling Time | All | | | 5 | ms |
| EP0500-UTEZ | | | | | |
| High Line (nominal 200-240V _{AC}) @54.0V | All | 10 | | | A _{DC} |
| Low Line (nominal 100-120V _{AC}) @48V | | 0 | | 11.25 | |

Technical Specifications (continued)

Electrical Specifications (continued)

| Parameter | Device | Min | Typ. | Max | Unit |
|--|--------|------|------|-------|-----------------|
| Output Current Limit Inception (Between 37 and 48V _{DC}) | All | 10.7 | 11.7 | 12.7 | A _{DC} |
| Output Capacitance (per unit) | All | 0 | | 10000 | μF |
| Overvoltage protection | All | 59 | 59.5 | 59.99 | V _{DC} |
| Current Share Accuracy | All | | +/-3 | +/-5 | %rated |
| Efficiency | | | | | |
| V _{IN} = 230V _{AC} , 20% load | All | | 86.9 | | % |
| 50% load | All | | 92.3 | | |
| 100% load | All | | 93.5 | | |
| V _{IN} = 115V _{AC} , 20% load | All | | 85.9 | | |
| 50% load | All | | 90.6 | | |
| 100% load | All | | 90.7 | | |
| Holdup Time – V _{IN} = 115V _{AC} , 54V, 10A, T _a >-10°C, output allowed to decay to 42V _{DC} | All | 10 | | | ms |
| V _{IN} = 230V _{AC} , 54V, 10A, T _a >-10°C, output allowed to decay to 42V _{DC} | All | 10 | | | ms |

General Specifications

| Parameter | Device | Symbol | Typ. | Unit |
|--|--------|--------|--------------|------------------|
| Calculated Reliability based on Telcordia SR-332 Issue 2: Method 1Case 3 (V _{IN} =230V _{AC} , I _o = 32A, T _A = 40°C, 90% confidence) | All | MTBF | >250,000 | Hours |
| Weight | All | | 1400 49.5 | g oz. |
| Service Life | All | | 10 | Years minimum |

Feature Specifications

| Parameter | Device | Min | Typ. | Max | Unit |
|---|--------|-------|------|-------|-----------------|
| Turn-on delay | All | | 5 | | s |
| Output Voltage Rise Time (walk-in disabled) | All | | 100 | | ms |
| Output Voltage Rise Time (walk-in enabled) | All | | 20 | | s |
| Output Overvoltage Protection | All | 59 | 59.5 | 59.99 | V _{DC} |
| Input Undervoltage lockout | | | | | |
| Turn-on Threshold (100% load) | All | 80 | 85 | 90 | V _{AC} |
| Turn-off Threshold (100% load) | All | 75 | 80 | 85 | V _{AC} |
| Input Overvoltage lockout | | | | | |
| Turn-off threshold | All | 304.5 | | 320 | V _{AC} |
| Turn-on threshold | All | | 270 | | V _{AC} |

Technical Specifications (continued)

Environmental Specifications

| Parameter | Device | Specification/Test |
|---------------------------------------|--------|--|
| Radiated Emissions | All | CISPR32 Class A with 3dB margin |
| Conducted Emissions | All | CISPR32 Class A with 6dB margin |
| ESD | All | IEC61000-4-2, Level 3 no errors, 4 no damage |
| Radiated Susceptibility | All | IEC61000-4-3, Level 3, 10V/m |
| Electrical Fast Transient Common Mode | All | IEC61000-4-4, Level 3, +/-2kV |
| Surge Immunity | All | IEC61000-4-5, Level 4 |
| Conducted RF Immunity | All | IEC61000-4-6, Level 3, no errors |
| Input Harmonics | All | IEC61000-3-2 |
| Shock and Vibration | All | Per IPC-9592B, Class II |
| Voltage Fluctuations | All | EN61000-3-3, no errors |
| Conducted RF | All | EN61000-4-6, level 3, no errors, 10Vrms |
| Radiated H field | All | EN61000-4-8, no errors, 30A/m |
| Ambient temperature, operating | All | -40°C to +75°C, start up at -40°C |
| Ambient temperature, transport | All | -40°C to +85°C, ETSI EN 300019-1 |
| Altitude | All | -400m to +4000m, derate by 1C for every 200m above 2000m |
| Audible noise | All | <55dBA, for 3 units in a shelf, to meet GR-63 Core |

Safety Specifications

| Parameter | Device | Specification |
|---|--------|--|
| Dielectric Withstand Voltage (between input and output) | All | Minimum of 4,250V _{DC} for 1 minute |
| Insulation Resistance (between input and output) | All | Minimum of 5 MW |
| Safety Standards | All | Class 1, IEC62368-1, EN62368, with the following deviations: Nemko, UL 62368-1 (Recognized Component), cUL (Canadian Approval by UL) |

Technical Specifications (continued)

Safety Considerations

The EP0500 power supply is intended for inclusion in other equipment and the installer must ensure that it is installed in compliance with all the requirements of the end application. This product is only for inclusion by professional installers within other equipment and must not be operated as a stand-alone product. The power supply meets Class 1, IEC62368, EN62368, with the following deviations: Nemko. UL62368 (Recognized Component) C-UL (Canadian Approval by UL).

This power supply has fuses in both the “Live” and “Neutral” input lines. Therefore, it may be connected in a phase to phase arrangement with safety, or via wall pugs where Live and Neutral cannot be resolved.

Feature Descriptions

Processor Back Bias Power Supply (A29)

The EP0500 has a back-bias which permits communication with and monitoring of a unit with AC input not present. A single unit shall be able to back-bias a minimum of four others in the same system. The back-bias shall be ~8V and assigned to A29 of the unit’s interface. This is not intended for any other use.

Enable (A26)

Connect this pin to GND (A27) to enable the unit to run.

Power supply off (B24)

This is a power supply disable signal. It is an opto-isolator diode with 1000R in series. Pass between 3mA and 6mA to turn the power supply off. This pin is referenced to the ALARM-GND (B23).

Power supply present (B26)

This pin is connected to the ALARM-GND pin (B23) inside the unit. Use it for external detection of the presence or absence of the unit.

Address 2, 1, 0 (B28, A28, B27 respectively)

Use the address pins to give each power supply in the system a unique address. If there is no controller, give the power supply the address 111 to stop the front panel LED flashing to indicate communications failure. The address lines have internal pullups. Pull them to GND to set them to 0.

RS485 A, B, gnd (B29, B30, A30 respectively)

Use these pins to communicate with the power supply. Either use a OmniOn controller or your own. If you are not using a OmniOn controller, there is a separate document which explains how OmniOn Galaxy Protocol runs over the RS485 hardware layer. Rectifier addressing and use of the RS485 is given in document 11ESTR000, available on request.

Output Voltage Adjustment

The output voltage is capable of being adjusted between 42V and 58V using RS485 communications. When the power supply first powers up it will produce the most recently programmed voltage. Our factory ships at 54V. After that it will revert to the most recently programmed voltage.

The frame grounding can be connected such that the power supply may have a positive, or negative, or no ground connection.

Current Share Bus

Pins A25 and B25 are a current sharing signal bus. If you are going to connect the power outputs of multiple units together in parallel, then connect the current share bus. If you have multiple units in the system feeding separate loads, do not connect the current share bus.

Overcurrent Protection

To provide protection in a fault condition (output overload), the power supply is equipped with internal current-limiting circuitry and can endure current limiting continuously. The power supply operates normally once the output current is brought back into its specified range.

Overvoltage Protection

Overvoltage protection is a feature of the power supply that protects both the load and the power supply from an output overvoltage condition. When an over-voltage occurs, the power supply shuts down its output. It shall then attempt to restart 3 times. Once 3 successive restarts have been attempted, the power supply shall be latched off. The power supply shall remain latched off until either the AC input is cycled or the RESTART_CMD is issued by the controller.

Overtemperature Protection

The EP0500 also features overtemperature protection in order to provide additional protection in a fault condition.

Technical Specifications (continued)

The power supply is equipped with a thermal shutdown circuit which detects excessive internal temperatures and shuts the unit down. Once the power supply goes into overtemperature shutdown, it will cool before attempting to restart.

Input Under-voltage Lockout

At input voltages below the input under-voltage lockout limit, power supply operation is disabled. The power supply will begin to operate at an input voltage above the under-voltage lockout turn-on threshold.

Fault signal (A23)

This is an open collector output, with 100R in series. Logic low indicates a healthy state. An open circuit indicates a fault state. Maximum current sink is 3mA. This signal is referenced to ALARM-GND (B23).

Alarm signal (A24)

This is an open collector output with 100R in series. Logic low indicates a healthy state. An open circuit indicates an alarm state. Maximum current sink is 3mA. This signal is referenced to ALARM-GND (B23).

Front Panel LEDs

Three LEDs are located on the front faceplate; run, alarm, and fault. These LEDs will indicate the status of the power supply. The power supply conditions for each LED are in order of priority. If a higher order condition exists then the LED shall take the status defined by that condition.

| LED Color | LED Status | Rectifier Condition |
|-----------|------------|---|
| Green | OFF | Rectifier off due to: <ul style="list-style-type: none"> AC and DC out of range Alarm LED is on, Except for output current overload conditions/constant power FAULT LED is on, Except for communications failure condition |
| | BLINK | Rectifier preparing / prepared to produce power <ul style="list-style-type: none"> Rectifier in STAND-BY (PS-OFF or GP command) Rectifier "walking in" |
| | ON | Rectifier on, producing power and: <ul style="list-style-type: none"> Alarm LED is off, Except for output current overload conditions FAULT LED is off, Except for communications failure condition |

| LED Color | LED Status | Rectifier Condition |
|-----------|------------|--|
| Yellow | OFF | Rectifier off due to AC out off range |
| | ON | Rectifier in one or more of the following recoverable conditions: <ul style="list-style-type: none"> Output current overload / constant power Over temperature warning |

| LED Color | LED Status | Rectifier Condition |
|-----------|------------|--|
| Red | OFF | Rectifier off due to AC out off range |
| | ON | Rectifier failure due to: <ul style="list-style-type: none"> Fan Failure AC Failure HVSD Overtemperature shutdown Output short circuit overload |
| | BLINK | Communications loss with the controller |

| Rectifier State | LED | | |
|-------------------------------|-------|-------|-------|
| | Run | Alarm | Fault |
| On and producing power | On | Off | Off |
| No AC | Off | Off | Off |
| Stand by GP | Blink | Off | Off |
| Stand by PS-OFF | Blink | Off | Off |
| Over current / constant power | On | On | Off |
| Over temperature warning | On | On | Off |
| Over temperature shutdown | Off | Off | On |
| AC failure | Off | Off | On |
| output short circuit | Off | Off | On |
| Output under voltage | Off | Off | On |
| Output over voltage | Off | Off | On |
| Communications loss | On | Off | Blink |

Paralleling Outputs

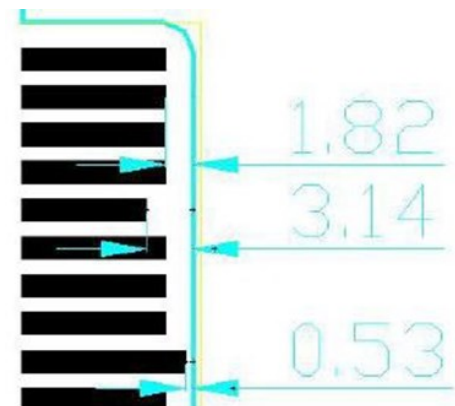
The EP0500 is designed to be connected in parallel with other identical units, and to current share with them. No external OR-ing devices are required.

PCB Conformal Coating

The PCBs inside the EP0500 are conformally coated to prevent mild solid and liquid pollution from affecting performance.

Gold Finger Pin Lengths

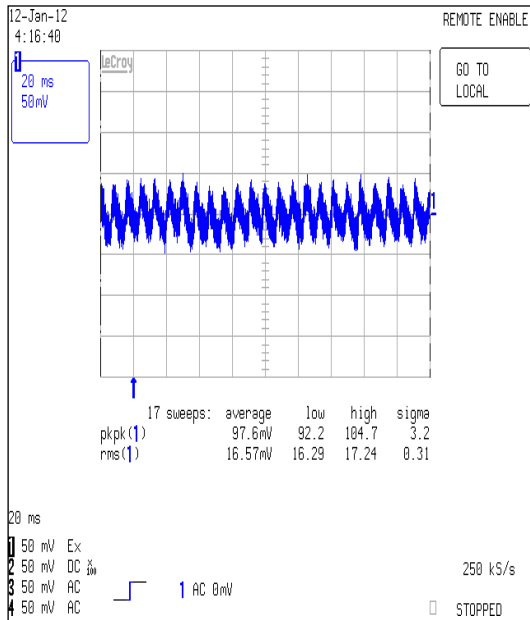
The power supply connector consists of gold plated fingers on the main PCB. They have different lengths, so that some can make first on insertion, and some can break first on extraction (dimensions in mm):-



Technical Specifications (continued)

Output voltage ripple

Here is the EP1600 output voltage ripple, with 230V_{IN}, +25°C, 54V, 10A:-

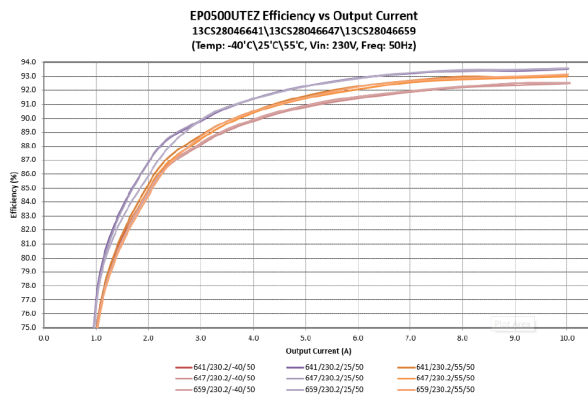


Thermal Considerations

The EP0500 is high efficiency and cools itself with a built-in fan. It will operate over the temperature range -40°C to +75°C, starting at -40°C and meeting specification once internal temperatures reach -20°C. It will dissipate up to 100W. Power supply orientation is unimportant. There is power derating of 2%/°C above Full power up to +55°(540W) Power derating from +55° to +75°(412W).

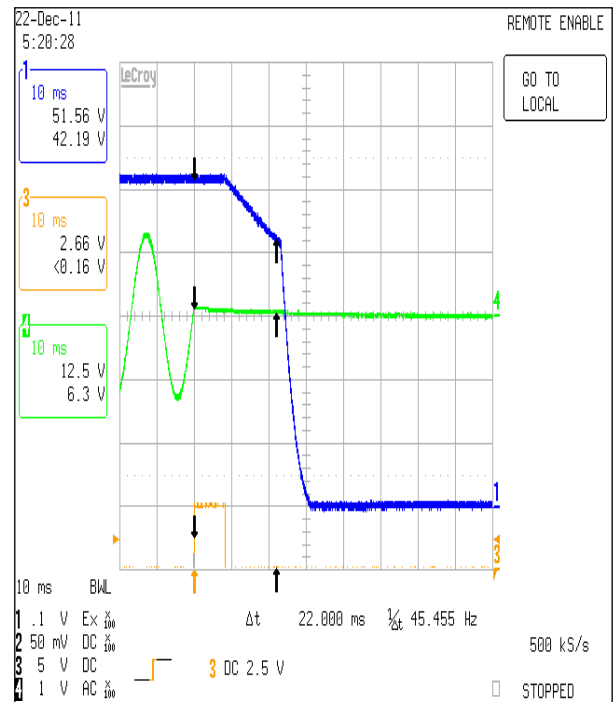
Efficiency Characteristic (To be updated)

Here is the efficiency characteristic of the EP0500, with 230V_{IN}, and at temperatures -40°C, +25°C, and +50°C:-



Holdup at 90V_{AC} input

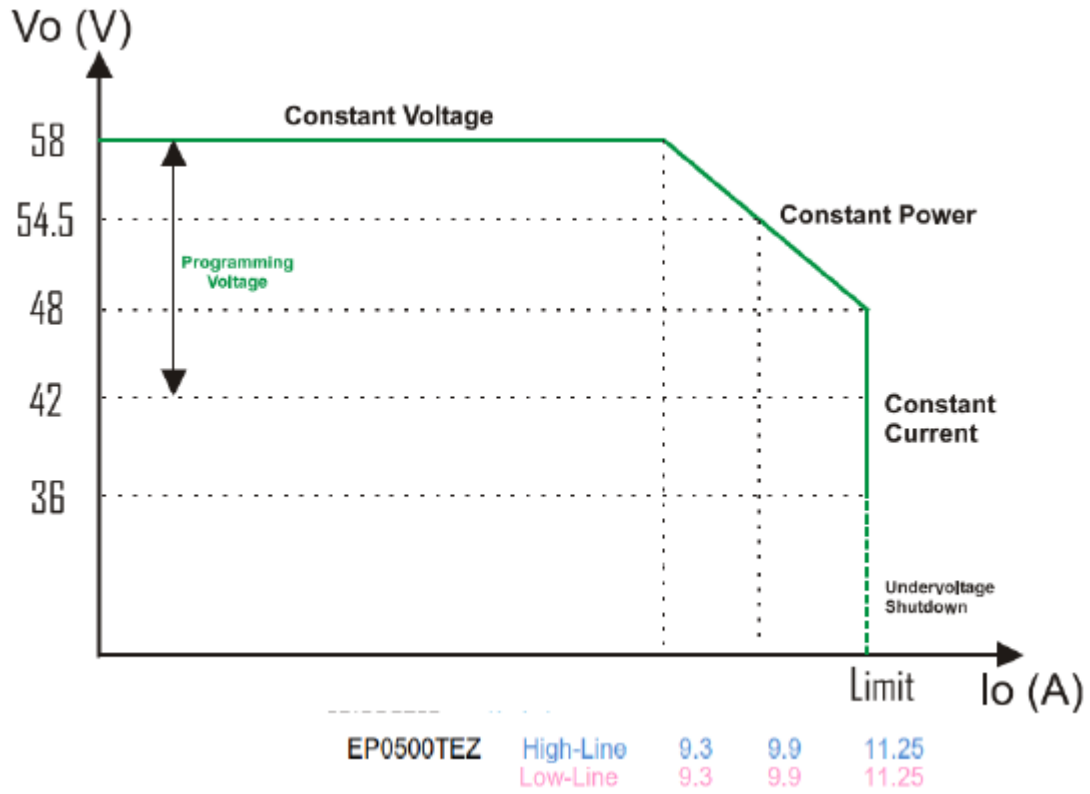
Here is the holdup characteristic of the EP0500, 25deg, 90Vin, 54Vo, 10A



Technical Specifications (continued)

Output Characteristic

Here are the output characteristics of the EP0500_UTEZ



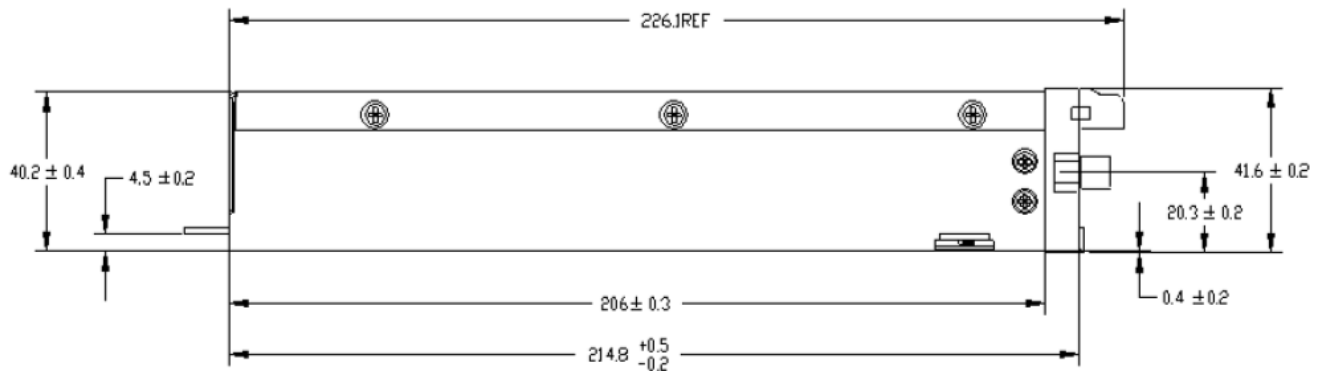
Technical Specifications (continued)

Mechanical Outline

TOP VIEW



SIDE VIEW



3D-VIEW

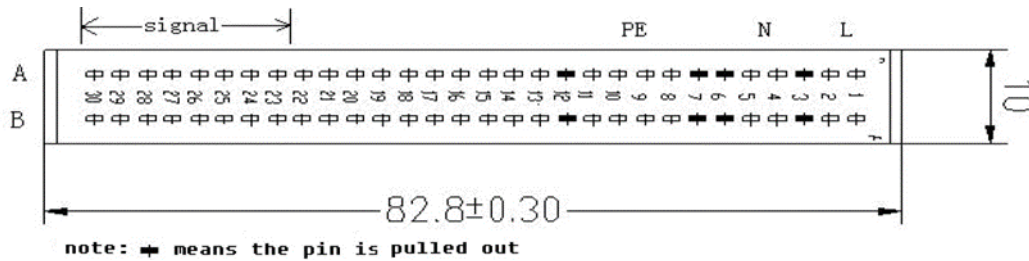


Technical Specifications (continued)

Connector Information

| Connector | Connector on Power Supply | Mating Connector |
|---------------------------------|-----------------------------|--|
| AC power, DC power, and Signals | PCB gold finger arrangement | Huafeng CY8-2.54-60(52)ZSWBJ |
| | | If you need this connector, buy it from OmniOn Or a franchised distributor of OmniOn |

Pinout Information



| Pin Number | Function |
|--------------------------|------------|
| A1, A2, B1, B2 | L |
| A4, A5, B4, B5 | N |
| A8 to A11 B8 to B11 | PE |
| A13 to A22 B13 to B22 | 48V+ |
| | 48V- |
| A23 | FAULT+ |
| A24 | ALARM+ |
| B23 | ALARM-GND |
| B24 | PS-off |
| B25 | SHARE+ |
| A25 | SHARE- |
| A26 | PS-enable |
| B26 | PS-present |
| A27 | GND |
| B27 | ADDR0 |
| A28 | ADDR1 |
| B28 | ADDR2 |
| A29 | 8V_INT |
| A30 | ComGND |
| B29 | RS485_A |
| B30 | RS485_B |

Technical Specifications (continued)

Ordering Information

Please contact your OmniOn Power Sales Representative for pricing, availability and optional features.

| Device Code | Input Voltage Range | Output Voltage | Output Current | RoHS | Output Power | Temperature Range | Ordering code |
|-------------|---------------------|----------------|----------------|------|--------------|-------------------|---------------|
| Slot Filler | NA | NA | NA | | NA | | CC848883297 |

Table 1. Device Codes

The slot filler, listed above, can be used in OmniOn Power SPS shelves where there is no intention to fit a power supply. It provides an aesthetic improvement over an empty slot, and it also prevents the insertion of foreign materials into the shelf – eg, tools, fasteners, documentation, or leads.

Change History (excludes grammar & clarifications)

| Revision | Date | Description of the change |
|----------|------------|---------------------------|
| 1.0 | 03/07/2024 | Initial Release |

OmniOn Power Inc.

601 Shiloh Rd.
Plano, TX USA

omnionpower.com

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