



### Features :

- 5 x 3 x 1.16 Inches Form Factor
- 350 Watts with Forced Air Cooling & 200 Watts Convection Cooling
- No Load Power < 0.5 W
- - 40°C to + 70°C Operating Temperature
- 12 V / 0.5 A Fan Output, Thermal Shut-Down Feature
- Efficiencies Up to 93 %
- Remote Inhibit Available
- Class II Option Available
- Medical ( BF ) Safety Approvals
- Approved to Household, ITAV and Medical Standards

### SPECIFICATIONS:

| MODEL              |  | OPS3x5-350-12   | OPS3x5-350-15 | OPS3x5-350-24 | OPS3x5-350-48   |
|--------------------|--|---|---------------|---------------|-----------------|
| OUTPUT             | NOMINAL DC VOLTAGE   | 12 V  | 15 V          | 24 V          | 48 V            |
|                    | RATED CURRENT (CONVECTION)   | 16.67 A   | 13.34 A       | 8.34 A        | 4.17 A          |
|                    | RATED CURRENT (FORCED AIR)   | 25.00 A   | 23.34 A       | 14.59 A       | 7.30 A          |
|                    | RATED POWER (CONVECTION)   | 200 W   | 200 W         | 200 W         | 200 W           |
|                    | RATED POWER (FORCED AIR)   | 300 W   | 350 W         | 350 W         | 350 W           |
|                    | RIPPLE & NOISE (Max)   | < 1 % of Vout   | < 1 % of Vout | < 1 % of Vout | < 1 % of Vout   |
|                    | VOLTAGE ADJ. RANGE   | 12 to 13 V  | 15 to 16.5 V  | 24 to 26 V    | 48 to 52 V      |
|                    | VOLTAGE TOLERANCE  | ± 1 %   |               |               |                 |
|                    | LINE REGULATION  | ± 0.5 %   |               |               |                 |
|                    | LOAD REGULATION  | ± 1 %   |               |               |                 |
|                    | TURN ON TIME   | < 2 sec; at full load   |               |               |                 |
|                    | HOLD UP TIME   | > 20 msec at convection load & > 10 msec at full load for nominal Vout  |               |               |                 |
|                    | RISE TIME  | < 100 msec  |               |               |                 |
|                    | FAN OUTPUT   | 12 V, 0.5 A output is available on a 2 pin connector header   |               |               |                 |
| TRANSIENT RESPONSE | Max excursion 5 % for step load change from 50 % to 100 % at 0.1 A / μsec slew rate, 50 % duty cycle, 50 / 60 Hz. Recovery time < 5 msec |   |               |               |                 |
| INPUT              | VOLTAGE RANGE *  | 90 - 264 VAC ( 127 - 370 VDC )<br><b>Note:</b> 90 - 305 VAC operation available on demand   |               |               |                 |
|                    | FREQUENCY RANGE  | 47 - 63 Hz  |               |               |                 |
|                    | EFFICIENCY @ 230V AC   | Up to 91 %  | Up to 91 %    | Up to 93 %    | Up to 93 %      |
|                    | AC CURRENT   | 3.6 A @ 115 VAC; 1.8 A @ 230 VAC  |               |               |                 |
|                    | POWER FACTOR   | > 0.95 at Full Load over entire input AC voltage range  |               |               |                 |
|                    | INRUSH CURRENT   | < 60 Amps; Measured at 264 VAC, 25°C Ambient, Cold start  |               |               |                 |
|                    | LEAKAGE CURRENT  | < 300 uA; 264 VAC input   |               |               |                 |
|                    | TOUCH CURRENT  | < 100 uA; 264 VAC input   |               |               |                 |
|                    | NO LOAD POWER CONSUMPTION  | < 0.5 W; 115 VAC input  |               |               |                 |
| PROTECTION         | OVERLOAD   | 110 % to 140 % of rated output current; Hiccup mode; Autorecovery type.   |               |               |                 |
|                    | OVERVOLTAGE  | 13.5 - 15.5 VDC   | 17 - 20.5 VDC | 27 - 31 VDC   | 53.5 - 62.5 VDC |
|                    | OUTPUT SHORT CIRCUIT   | Latched type; Input AC power to be recycled to recover the power supply<br>Hiccup mode when output is shorted; Autorecovery type.   |               |               |                 |
|                    | OVER TEMPERATURE   | Power supply shuts down when the temperature of PCB below main transformer reaches typically 120°C; Turns on only after the temperature falls below 90°C typically and AC power is recycled thereafter. |               |               |                 |
| SIGNALS            | REMOTE INHIBIT   | Available on a 2 pin connector header. Power Supply output is disabled when external 5 V is applied.  |               |               |                 |
| ENVIRONMENT        | OPERATING TEMP   | - 40°C to + 70°C; De-rate linearly above 50°C from 100 % load at 50°C to 50 % load at 70°C.<br><b>Note:</b> Only start up guaranteed at - 40°C with specification deterioration.                        |               |               |                 |
|                    | STORAGE TEMP   | - 40°C to + 85°C  |               |               |                 |
|                    | COOLING  | Natural convection cooled or Forced Air cooled ( minimum 13 CFM ) as per power requirements.  |               |               |                 |
|                    | HUMIDITY   | 5 to 95 % RH, Non condensing  |               |               |                 |
|                    | ALTITUDE   | 2000 m  |               |               |                 |
|                    | VIBRATION  | Component: 10 ~ 500 Hz, 2 G 10 min. / 1 cycle, Period for 60 min. each along X, Y, Z axes   |               |               |                 |

**Note:** \*Although power supply will work for the specified DC input voltage range, UL approval is only for the specified AC input voltage range.

| MODEL                       |              | OPS3x5-350-12  | OPS3x5-350-15 | OPS3x5-350-24 | OPS3x5-350-48 |
|-----------------------------|--------------|--|---------------|---------------|---------------|
| <b>DIELECTRIC WITHSTAND</b> | TEST VOLTAGE | I/P to Earth: 1500 VAC, I/P to O/P: 4000 VAC, O/P to Earth: 1500 VAC |               |               |               |
| <b>RELIABILITY</b>          | MTBF         | > 335K hrs. as per MIL-HDBK-217F (25°C)                              |               |               |               |
| <b>MECHANICAL</b>           | DIMENSION    | Overall: 5" x 3" x 1.16" ( L x W x H ); Height above PCB: 1"         |               |               |               |
|                             | WEIGHT       | < 300 gms  |               |               |               |
|                             | MOUNTING     | Open Frame   |               |               |               |

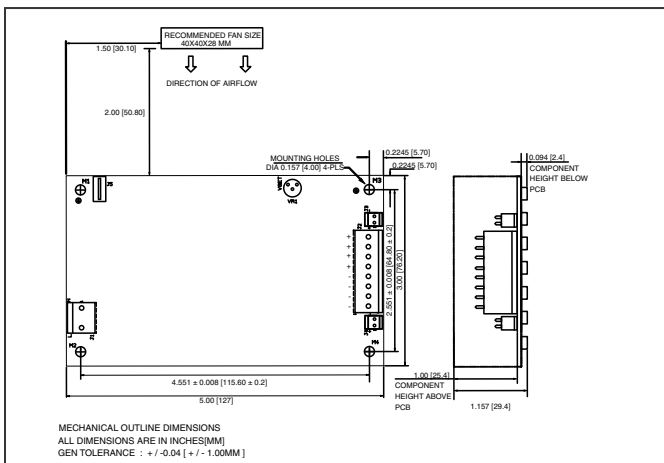
| Means of Protection  |  | Category         |
|----------------------|--|------------------|
| Primary to Secondary | 2 x MOPP ( Means of Patient Protection ) | IEC 60601-1 Ed 3 |
| Primary to Earth     | 1 x MOPP ( Means of Patient Protection ) |                  |
| Secondary to Earth   | 1 x MOPP ( Means of Patient Protection ) |                  |

### Connectors details

| Ref Des | Description                    | Type  | Pin number | Function       |
|---------|--------------------------------|---|------------|----------------|
| J1      | Input AC connector             | Tyco: 640445-3;<br>Mates with 647402-3;<br>Pin: 3-647409-1  | 1          | AC Neutral     |
|         |                                |   | 2          | Not connected  |
|         |                                |   | 3          | AC Line        |
| J2      | Output DC connector (option 1) | Tyco: 640445-8;<br>Mates with 647402-8;<br>Pin: 3-647409-1  | 1, 2, 3, 4 | V1 Negative    |
|         |                                |   | 5, 6, 7, 8 | V1 Positive    |
|         | Output DC connector (option 2) | Screw Terminal with M4 screw.<br>Mating: Ring Tongue Terminal TE / AMP: 8-31886-1 / equivalent.** | 1          | V1 Negative    |
|         |                                |   | 2          | V1 Positive    |
| J3      | Remote Inhibit                 | Molex: 22-04-1021;<br>Mates with 22-01-1022;<br>Pin: 08-50-0113                                   | 1          | Ext V Positive |
|         |                                |   | 2          | Ext V Negative |
| J4      | Fan connector                  | Molex: 22-04-1021;<br>Mates with 22-01-1022;<br>Pin: 08-50-0113                                   | 1          | V2 Positive    |
|         |                                |   | 2          | V2 Negative    |
| J5      | Earth*                         | Molex: 19705-4301;<br>Mates with 19003-0001   | -          | Earth          |

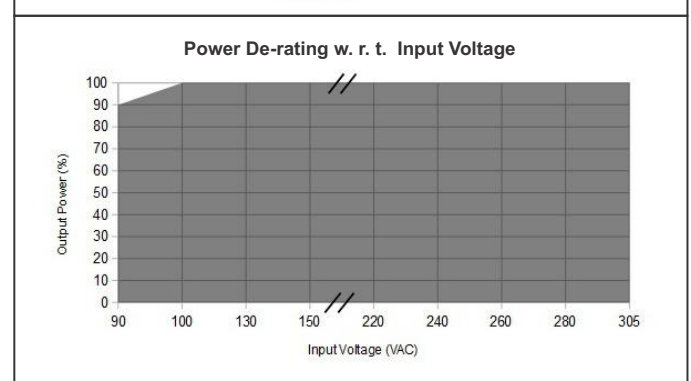
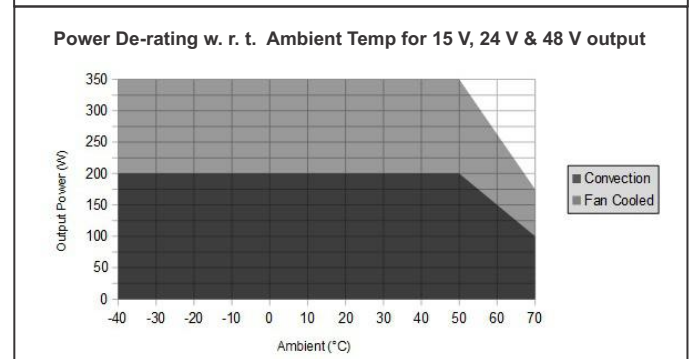
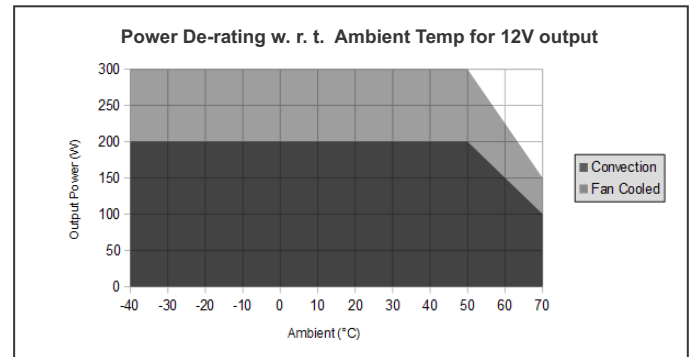
**Note:**  
 \* All the mounting holes marked with Earth symbol must be Earthed.  
 \*\* One Ring Tongue Terminal with 16 AWG is recommended for current up to 11 A only.  
 Use multiple tongue terminals with wire for more current.

### Mechanical dimensions



**Note:**  
 1. This open frame power supply should preferably be mounted horizontally on 4 metal stand-offs having diameter not more than 6 mm and height not less than 7 mm.  
 2. Screws used to fix PCB on stand-offs should not have head diameter more than 6 mm.  
 3. Washer used should not have diameter more than 6 mm.

### De-rating curve



## Compliance

| Applicable EMI / EMC Standards    |  |  |
|-----------------------------------|--|--|
| Category                          | Reference Standards  | Testing Level                              |
| Conducted Emission                | CISPR32  | CLASS B                                    |
| Radiated Emission                 | CISPR32  | CLASS A                                    |
| Electrostatic Discharge           | IEC 61000-4-2  | Level 4, Criteria A<br>Level 3, Criteria A |
| Radiated Susceptibility           | IEC 61000-4-3  | Level 3, Criteria B                        |
| Electrical Fast Transient / Burst | IEC 61000-4-4  | Level 3, Criteria A                        |
| Surge                             | IEC 61000-4-5  | Level 3, Criteria A                        |
| Conducted Susceptibility          | IEC 61000-4-6  | Level 3, Criteria B                        |
| Power Frequency Magnetic Field    | IEC 61000-4-8  | Level 4, Criteria A                        |
| Voltage Dips & Interruption       | IEC 61000-4-11   | Criteria A & B                             |
| Safety                            | Approved to IEC / EN / UL 62368-1;<br>IEC / EN 60601-1; IEC / EN 61558 |  |

## Ordering information

| Product Code         | Description  | Certification |
|----------------------|--|---------------|
| OPS3x5-350-12-A-1-CU | Open Frame Power Supply with 5 x 3 x 1.16" Form factor, 12 V / 25.00 A, 300 Watts with Forced Air Cooling & 12 V / 16.67 A, 200 Watts Convection Cooling |               |
| OPS3x5-350-15-A-1-CU | Open Frame Power Supply with 5 x 3 x 1.16" Form factor, 15 V / 23.34 A, 350 Watts with Forced Air Cooling & 15 V / 13.34 A, 200 Watts Convection Cooling |               |
| OPS3x5-350-24-A-1-CU | Open Frame Power Supply with 5 x 3 x 1.16" Form factor, 24 V / 14.59 A, 350 Watts with Forced Air Cooling & 24 V / 8.34 A, 200 Watts Convection Cooling  |               |
| OPS3x5-350-48-A-1-CU | Open Frame Power Supply with 5 x 3 x 1.16" Form factor, 48 V / 7.30 A, 350 Watts with Forced Air Cooling & 48 V / 4.17 A, 200 Watts Convection Cooling   |               |