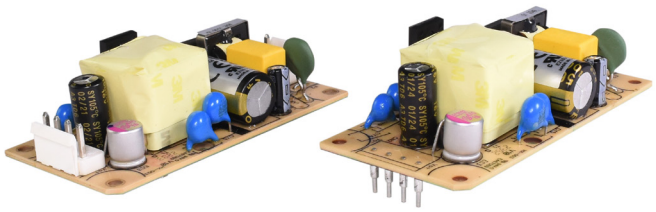
# **SERIES:** VOF-36E | **DESCRIPTION:** INTERNAL AC-DC POWER SUPPLY

## FEATURES

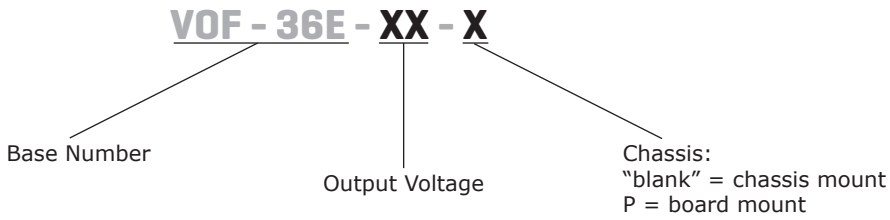
- universal input range (90 ~ 264 Vac)
- Class B emissions (EN 55032/CISPR)
- certified to IEC/EN/UL 62368-1
- designed to meet IEC/EN 60335
- short circuit, over voltage protection
- <0.1 W no-load power consumption
- Class II, Class I (determined at end use)
- 5,000 m operating altitude



| MODEL | output voltage typ (Vdc) | output current max (A) | output power max (W) | ripple and noise[1] max (mVp-p) | efficiency[2] typ (%) |
|---|---|---|---|---|---|
| VOF-36E-5 | 5 | 6.0 | 30 | 100 | 85 |
| VOF-36E-12 | 12 | 3.0 | 36 | 120 | 88 |
| VOF-36E-15 | 15 | 2.4 | 36 | 150 | 88 |
| VOF-36E-24 | 24 | 1.5 | 36 | 240 | 89 |
| VOF-36E-48 | 48 | 0.75 | 36 | 480 | 89 |

Notes: 1. At full load, nominal input, 20 MHz bandwidth oscilloscope with 0.1µF ceramic capacitor and 10 µF electrolytic capacitor.
2. At 230 Vac input.
3. All specifications are measured at Ta=25°C, humidity <75%, nominal input voltage, and rated output load unless otherwise specified.

## PART NUMBER KEY






Please read our datasheet & drawing disclaimer here.

## INPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| voltage[4] | ac input (safety approved)<br>dc input | 90<br>120 | 100~240 | 264<br>370 | Vac<br>Vdc |
| frequency | | 47 | 50~60 | 63 | Hz |
| current | at 100 Vac, full load | | | 0.9 | A |
| inrush current | at 240 Vac, full load | | | 90 | A |
| leakage current | | | | 0.25 | mA |
| no load power consumption | | | | 0.1 | W |

Notes: 1. See the derating curve for more details.

## OUTPUT

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| capacitive load | 5 Vdc output model<br>12 Vdc output model<br>15 Vdc output model<br>24 Vdc output model<br>48 Vdc output model | | | 6,000<br>3,000<br>2,400<br>1,500<br>750 | µF<br>µF<br>µF<br>µF<br>µF |
| output voltage set point | 5 Vdc output model<br>12 Vdc output model<br>15 Vdc output model<br>24 Vdc output model<br>48 Vdc output model | 4.90<br>11.76<br>14.70<br>23.52<br>47.02 | | 5.10<br>12.24<br>15.30<br>24.48<br>48.96 | Vdc<br>Vdc<br>Vdc<br>Vdc<br>Vdc |
| voltage accuracy | 5 Vdc output model<br>all other output models | | ±2<br>±1 | | %<br>% |
| line regulation | high line to low line | | | ±0.5 | % |
| load regulation | 10 % to 100 % load | | | ±1.0 | % |
| hold-up time | at 115 Vac | | 8 | | ms |
| switching frequency | | | 65 | | kHz |

## PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| over voltage protection | latch mode<br>5 Vdc output model<br>12 Vdc output model<br>15 Vdc output model<br>24 Vdc output model<br>48 Vdc output model | | | <br>7.44<br>16.8<br>21.5<br>31.5<br>63.0 | <br>Vdc<br>Vdc<br>Vdc<br>Vdc<br>Vdc |
| over current protection | auto recovery, hiccup | 110 | | 180 | % |
| short circuit protection | auto recovery | | | | |

## SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| isolation voltage | input to output, for 1 minunte | | | 4,000 | Vdc |
| safety approvals | certified to 62368-1: IEC, EN, UL<br>designed to meet 60335-1: EN | | | | |
| safety class | Class II, Class I (determined at end use) | | | | |
| EMC | EN 55032:2015+A11:2020, EN 61204-3:2018, EN IEC 61000-6-3:2021, EN IEC 61000-6-4:2019, EN IEC 61000-3-2:2019, EN 61000-3-3:2013+A1:2019, Class B | | | | |
| EMC immunity | EN 55035:2017+A11:2020, EN 61204-3:2018, EN 61000-6-1:2019, EN 61000-6-2:2019 | | | | |
| conducted emissions | EN 55032:2015+A11:2020, EN 61204-3:2018,<br>EN IEC 61000-6-3:2021, EN IEC 61000-6-4:2019, Class B | | | | |
| radiated emissions | EN 55032:2015+A11:2020, EN 61204-3:2018,<br>EN IEC 61000-6-3:2021, EN IEC 61000-6-4:2019, Class B | | | | |
| ESD | IEC 61000-4-2:2008, perf. Criteria A | | | | |

## SAFETY & COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| radiated immunity | IEC 61000-4-3:2020, perf. Criteria A | | | | |
| EFT/burst | IEC 61000-4-4:2012, ±1 kV, ±2 kV, perf. Criteria A | | | | |
| surge | IEC 61000-4-5:2014+A1:2017, L-N: ±0.5 kV, ±1 kV, L-E(Ground): ±0.5 kV, ±1 kV, ±2 kV, perf. Criteria A | | | | |
| conducted immunity | IEC 61000-4-6:2013+COR1:2015, perf. Criteria A | | | | |
| PFMF | IEC 61000-4-8:2009, perf. Criteria A | | | | |
| voltage dips | IEC 61000-4-11:2020, Dip: 30% Reduction, Dip >95% Reduction, perf. Criteria A | | | | |
| voltage interruption | IEC 61000-4-11:2020, >95% Reduction, perf. Criteria B | | | | |
| MTBF | as per MIL-HDBK-217F at 25°C | 700,000 | | | hours |
| RoHS | yes | | | | |

## ENVIRONMENTAL

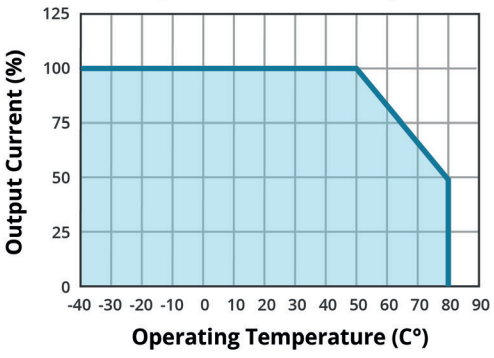
| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| operating temperature | see derating curve<br>(safety aproved at maximum 50°C) | -40 | | 80 | °C |
| storage temperature | | -40 | | 85 | °C |
| storage humidity | non-condensing | 0 | | 93 | % |
| altitude | IEC/EN/UL 62368-1 OVC II<br>designed to meet EN 60335-1 OVC II | | | 5,000<br>2,000 | m<br>m |

## MECHANICAL

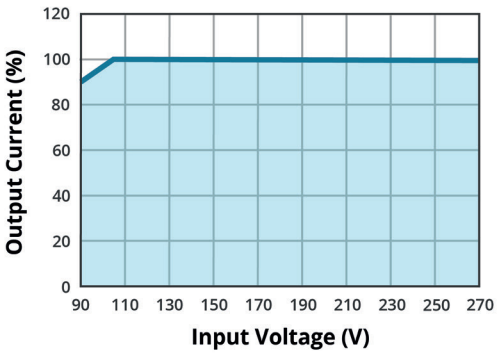
| parameter | conditions/description | min | typ | max | units |
|---|---|---|---|---|---|
| dimensions | chassis mount: 3.000 x 1.500 x 1.000 [76.2 x 38.1 x 25.40 mm]<br>board mount: 3.000 x 1.500 x 1.100 [76.2 x 38.1 x 27.94 mm] | | | | inch<br>inch |
| weight | chassis mount<br>board mount | | 55<br>55 | | g<br>g |

## DERATING CURVE

***TEMPERATURE DERATING CURVE (natural convection)***



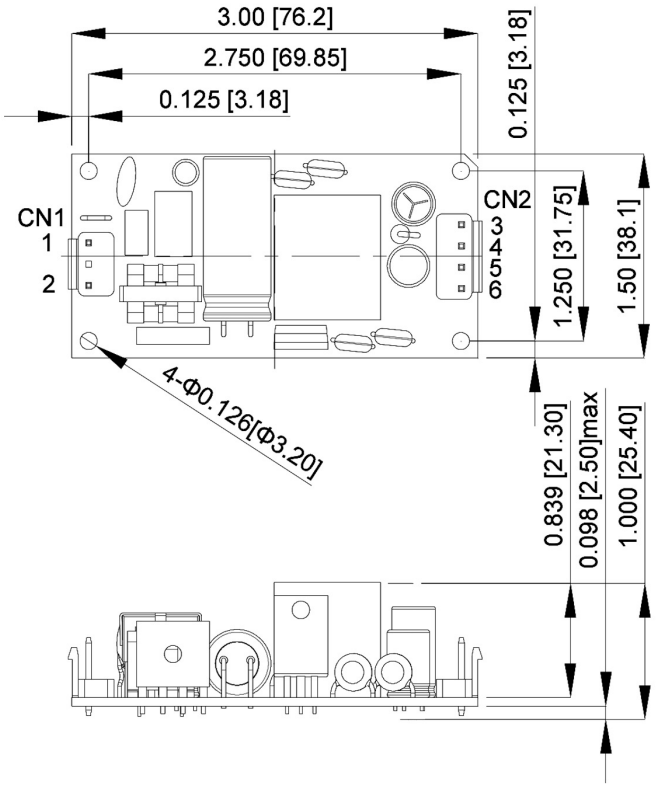

***INPUT VOLTAGE DERATING CURVE***



## MECHANICAL DRAWING

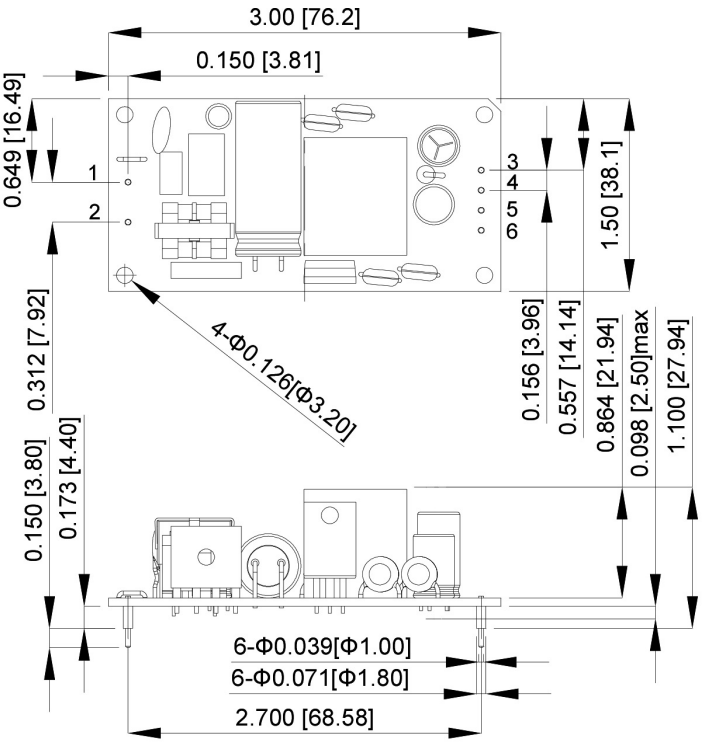
**Chassis mount**
units: inch [mm]
tolerance: inches: x.xx = ±0.03, x.xxx = ±0.020
mm: x.x - ±0.7, x.xx = ±0.50

| PIN CONNECTIONS | | |
|---|---|---|
| PIN | Function | Wafer |
| 1 | AC(N) | CN1 |
| 2 | AC(L) | |
| 3 | +Vout | CN2 |
| 4 | +Vout | |
| 5 | -Vout | |
| 6 | -Vout | |



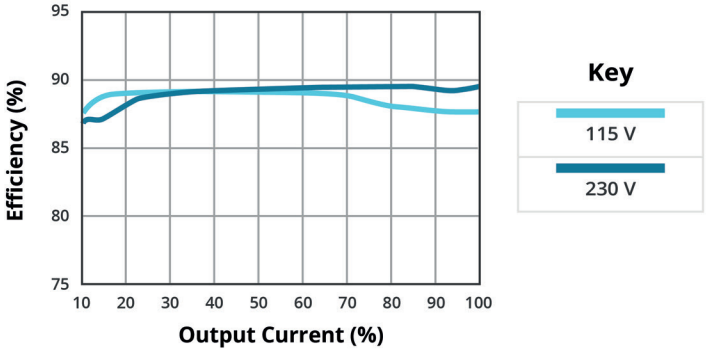

**Board mount**
units: inch [mm]
tolerance: inches: x.xx = ±0.03, x.xxx = ±0.020
mm: x.x - ±0.7, x.xx = ±0.50

| PIN CONNECTIONS | |
|---|---|
| PIN | Function |
| 1 | AC(N) |
| 2 | AC(L) |
| 3 | +Vout |
| 4 | +Vout |
| 5 | -Vout |
| 6 | -Vout |

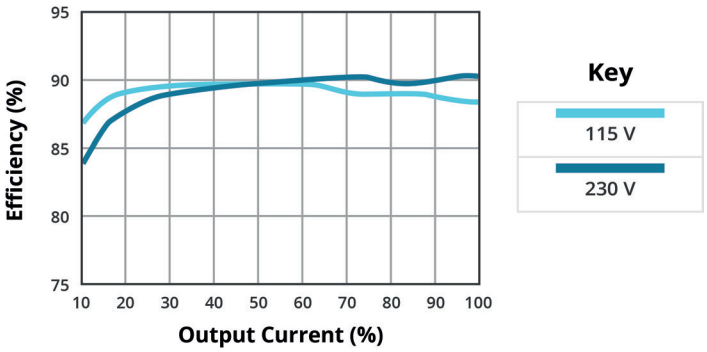


## EFFICIENCY CURVES

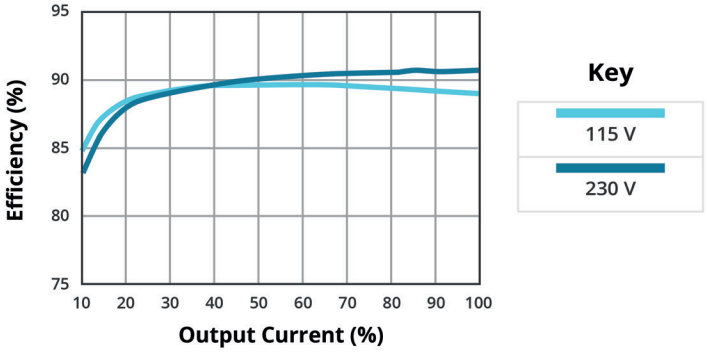
***EFFICIENCY VS OUTPUT LOAD (VOF-36E-5)***



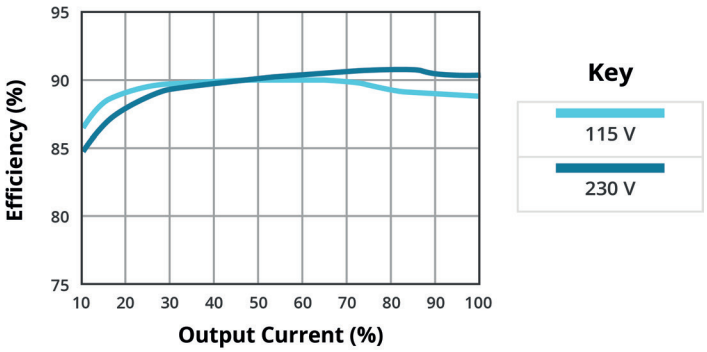

***EFFICIENCY VS OUTPUT LOAD (VOF-36E-12)***



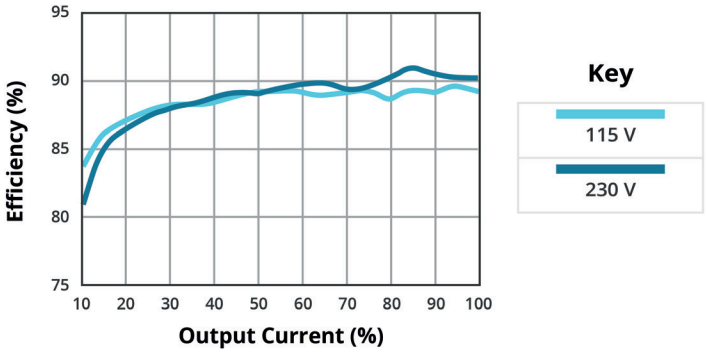

***EFFICIENCY VS OUTPUT LOAD (VOF-36E-15)***




***EFFICIENCY VS OUTPUT LOAD (VOF-36E-24)***

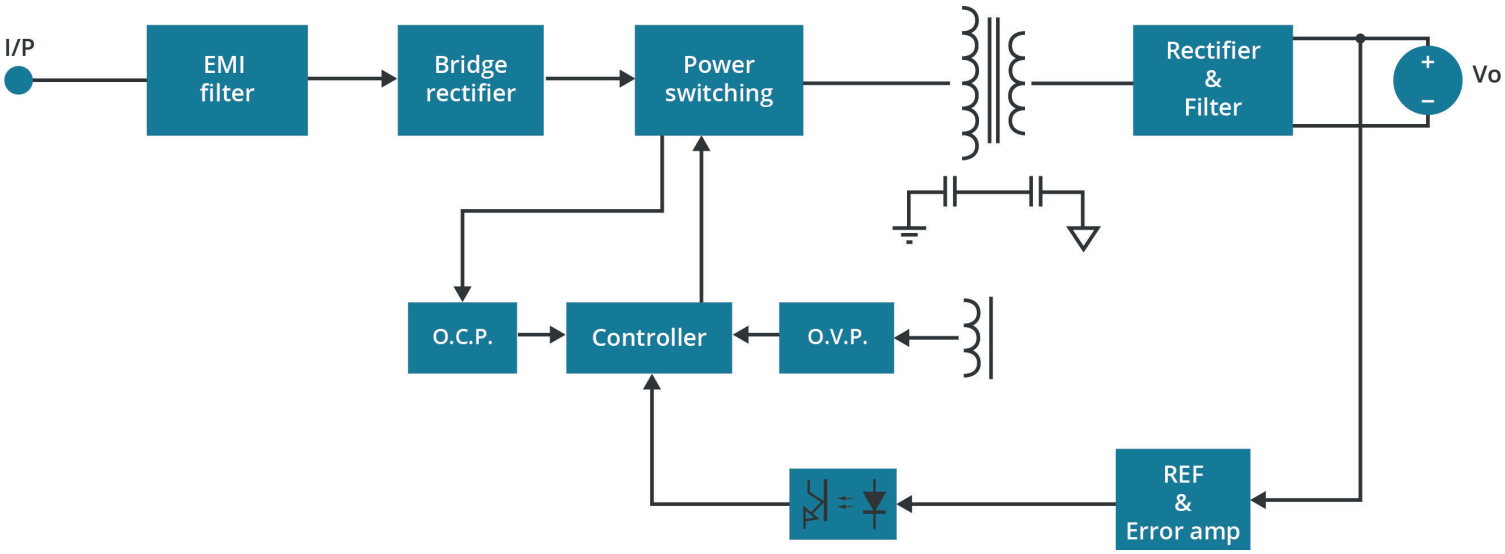



***EFFICIENCY VS OUTPUT LOAD (VOF-36E-48)***



## ELECTRICAL BLOCK DIAGRAM

**Figure 1**



## REVISION HISTORY

| rev. | description | date |
|---|---|---|
| 1.0 | initial release | 10/16/2024 |
| 1.01 | safeties updated | 12/20/2024 |

The revision history provided is for informational purposes only and is believed to be accurate.

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