

350 Watts

- Rugged Industrial Construction
- -40 °C to +70 °C Operation
- Screw Terminals
- High Efficiency
- Remote On/Off
- ITE/Industrial & Medical Approvals
- Low Leakage Current
- Class B Emissions
- 3 Year Warranty



Dimensions:

SMP350:
3.6 x 7.0 x 1.7" (91.4 x 177.8 x 43.1 mm)

The SMP350 series provides a range of rugged, enclosed, 300 – 350W supplies with integral fan, screw terminal connections and a wide operating temperature range of -40 °C to +70 °C ideally suited to a wide range of industrial applications. The SMP350 series features high efficiency and class B EMI emissions for ease of integration into the end application and offers remote On/Off to simplify system control. Packaged in a 3.6" x 7" x 1.7" enclosure the series offers power densities up to 13 W/in³ providing a compact, high efficiency, low noise power solution.

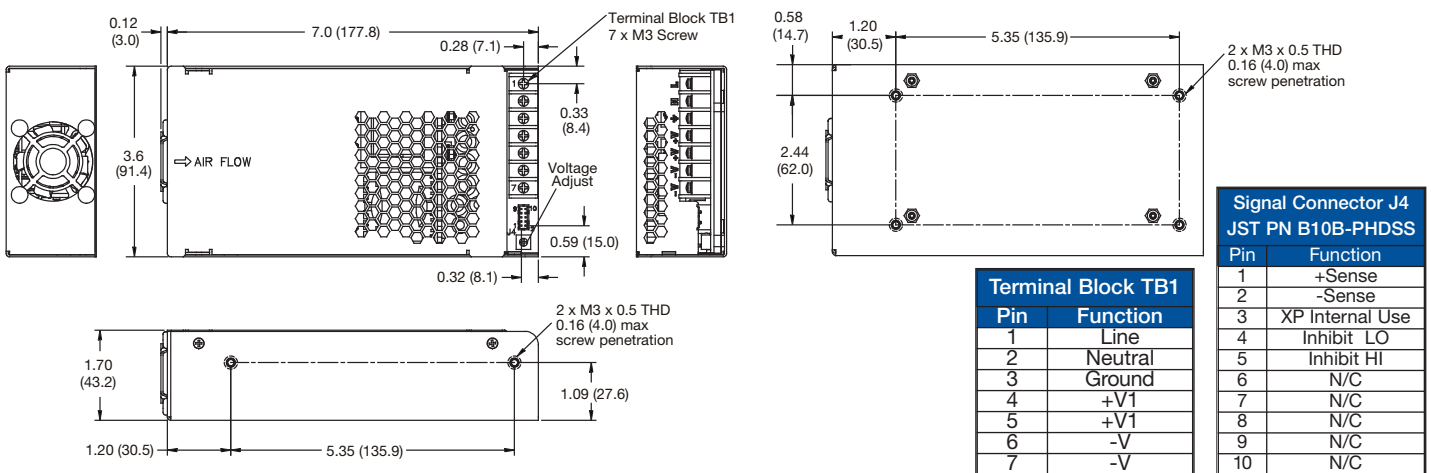
Models & Ratings

| Output Voltage V1 | 90-180 VAC | | 180-264 VAC | | Model Number ⁽¹⁾ |
|-------------------|----------------|--------------|----------------|--------------|-----------------------------|
| | Output Current | Output Power | Output Current | Output Power | |
| 12.0 VDC | 25.00 A | 300 W | 25.00 A | 300 W | SMP350PS12 |
| 15.0 VDC | 20.70 A | 310 W | 22.00 A | 330 W | SMP350PS15 |
| 18.0 VDC | 17.80 A | 320 W | 19.40 A | 350 W | SMP350PS18 |
| 24.0 VDC | 13.75 A | 330 W | 14.60 A | 350 W | SMP350PS24 |
| 28.0 VDC | 11.80 A | 330 W | 12.50 A | 350 W | SMP350PS28 |
| 36.0 VDC | 9.20 A | 330 W | 9.70 A | 350 W | SMP350PS36 |
| 48.0 VDC | 7.30 A | 350 W | 7.30 A | 350 W | SMP350PS48 |

Notes

1. For reduced leakage current versions (<300 µA) contact sales.

Mechanical Details



Notes

- All dimensions in inches (mm).
- Tolerance .xx = ±0.02 (0.50); .xxx = ±0.01 (0.25)
- Weight: 1.5 lbs (0.68 kg)
- J4 mates with JST Housing Pn. PHDR-10VS and with JST SPHD-001T-P0.5 crimp terminals.

Input

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|--|----------|---------|-------|--|
| Input Voltage | 85 | | 264 | VAC | Derate below 90 VAC to 90% load at 85 VAC |
| Input Frequency | 47 | | 63 | Hz | |
| Power Factor | | 0.9 | | | EN6100-3-2 for class A, Class C >125 W |
| Input Current | | | 4.7 | A | 90 VAC, 100% load |
| No Load Input Power | | 1.25/2.6 | | W | 115 VAC/230 VAC when inhibited |
| Inrush Current | | 130 | | A | 230 VAC, cold start 25 °C |
| Earth Leakage Current | | | 500 | µA | 264 VAC/60 Hz. For reduced leakage current medical versions (<300 µA) contact sales. |
| Fuse Protection | F5.0A/250V fitted in both line and neutral | | | | |

Output

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-------------------------------|---|---------|---------|-------|---|
| Output Voltage | 12 | | 48 | VDC | See Models and Ratings table |
| Initial Set Accuracy | | | ±1 | % | Of nominal at 50% load |
| Output Voltage Adjustment -V1 | ±2 | | | % | |
| Load Regulation | | | 1 | % | |
| Line Regulation | | | ±0.5 | % | Of nominal, for input voltage range of 90-264 VAC |
| Ripple and Noise | | | 1 | % | Pk-pk with 20 MHz bandwidth, 1.5% 12 V models |
| Hold Up Time | 10 | | | ms | |
| Minimum Load | | | | | No minimum load required |
| Transient Response | | | <4 | % | Deviation with a 50%-75%-50% load change. Output returns to within 1% in less than 500 µs |
| Overload Protection - V1 | 110 | | 150 | % | Trip and Restart |
| Overvoltage Protection - V1 | 115 | | 140 | % | Cycle AC to reset |
| Overtemperature Protection | | | | | Thermal protection fitted |
| Remote On/Off | <0.4 V to switch off, open cct or >4 V to switch on | | | | |
| Temperature Coefficient | | | 0.02 | %/°C | After 20 minute warm up |
| Start Up Time | | | 1 | s | 115/230 VAC, full load |
| Overshoot | | | 5 | % | |

General

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|---|---------|------------|---------|-------------------|------------------------------------|
| Efficiency | 87 | 90 | 93 | % | See figures 2 – 4 below |
| Isolation: Input to Output Input to Ground Output to Ground | 4000 | | | VAC | 2 x MOPP |
| | 1500 | | | VAC | 1 x MOPP |
| | 1500 | | | VAC | 1 x MOPP |
| Switching Frequency | 60 | | 200 | kHz | PFC |
| | 90 | | 150 | | Main Converter |
| Mean Time Between Failure | | 570 | | kHrs | MIL-HDBK-217F, notice 2, +25 °C GB |
| Power Density | | | 13 | W/in ³ | |
| Weight | | 1.5 (0.68) | | lb (kg) | |

Efficiency Vs Load

Figure 2
12 V Models

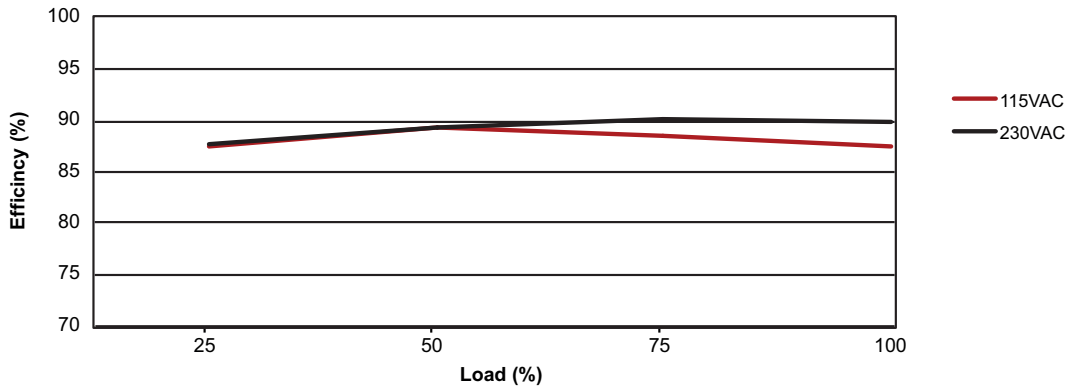


Figure 3
24 V Models

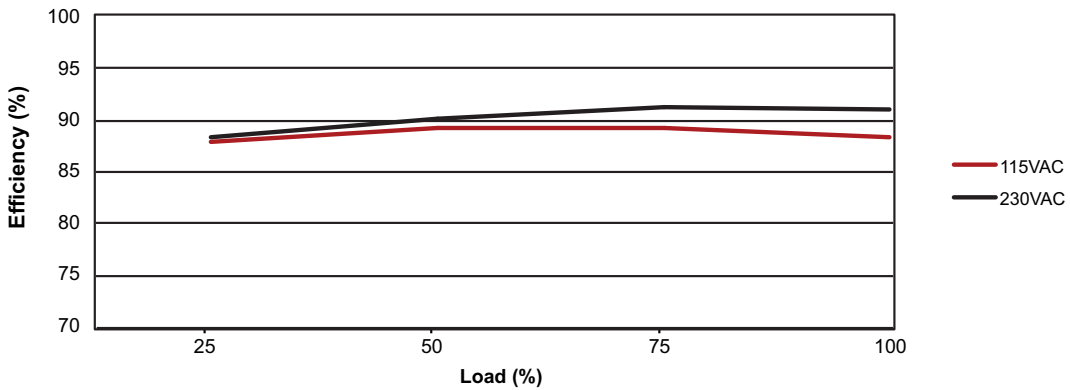
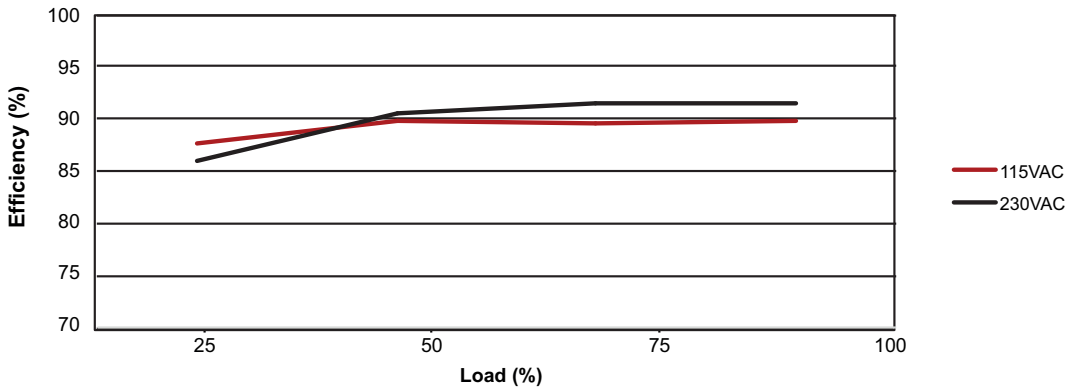


Figure 4
48 V Models

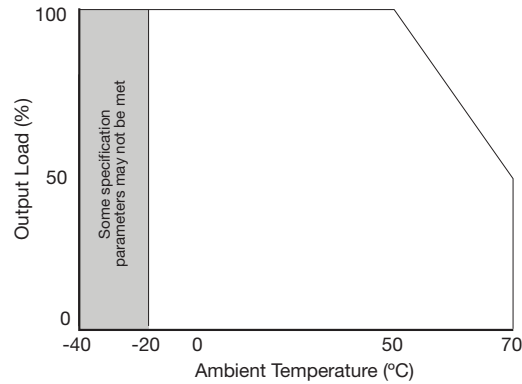


Environmental

| Characteristic | Minimum | Typical | Maximum | Units | Notes & Conditions |
|-----------------------|---|---------|---------|-------|---|
| Operating Temperature | -40 | | +70 | °C | Derate linearly above 50 °C to 50% of rated power at 70 °C, see fig 5 |
| Storage Temperature | -40 | | +85 | °C | |
| Operating Humidity | 5 | | 95 | % | RH, non-condensing |
| Storage Humidity | 5 | | 95 | % | RH, non-condensing |
| Shock | ±3 x 30 g shocks in each plane, total 18 shocks. 30 g = 11 ms (±0.5 ms), half sine. Conforms to EN60068-2-27 & EN60068-2-47 | | | | |
| Vibration | Single axis 10-500 Hz at 2 g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6 | | | | |

Thermal Derating Curve

Figure 5

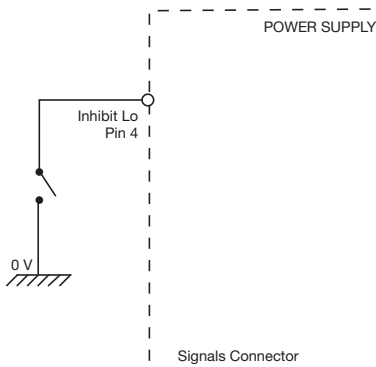


Signals & Controls

| Characteristic | | Notes & Conditions |
|----------------|---------|---|
| Remote Sense | | Compensates for 0.5 V total voltage drop |
| Remote On/Off | Inhibit | The inhibit lo (pin 4), should be pulled below 0.4 V to switch V1 & Vfan off. Open circuit or >4 V to switch on (see fig. 6) |
| | Enable | With the inhibit lo (pin 4) pulled low as detailed above, connecting inhibit hi (pin 5) to inhibit lo (pin 4) will enable V1 & V fan output. (see fig. 7) |

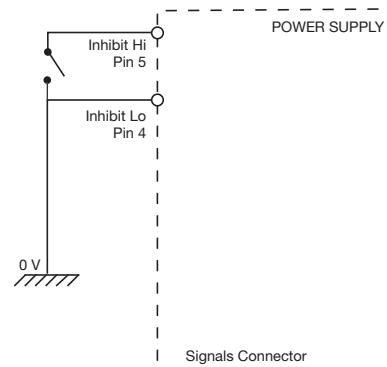
Remote On/Off (Inhibit)

Figure 6



Remote On/Off (Enable)

Figure 7



EMC: Emissions

| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|-----------------------|-------------|------------|----------|--------------------|
| Conducted | EN55011/32 | Class B | | |
| Radiated | EN55011/32 | Class A | | |
| Harmonic Fluctuations | EN61000-3-3 | | | |

EMC: Immunity

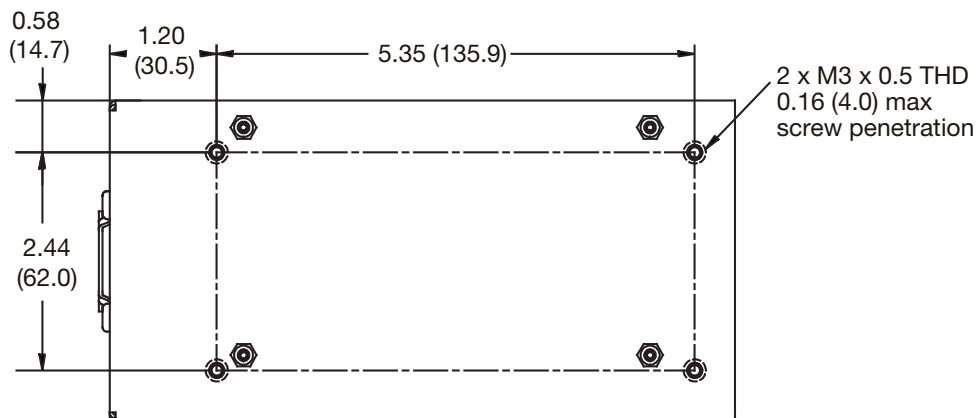
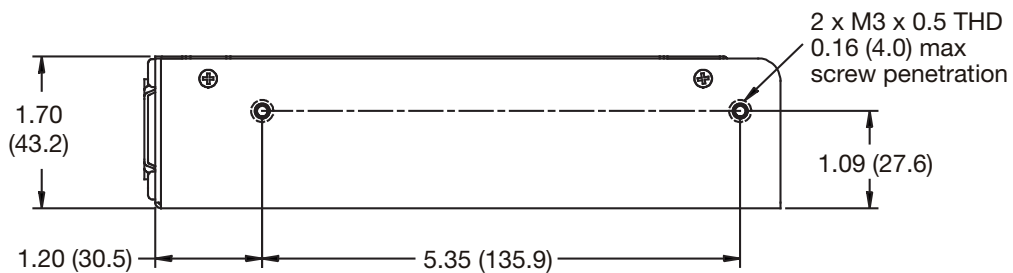
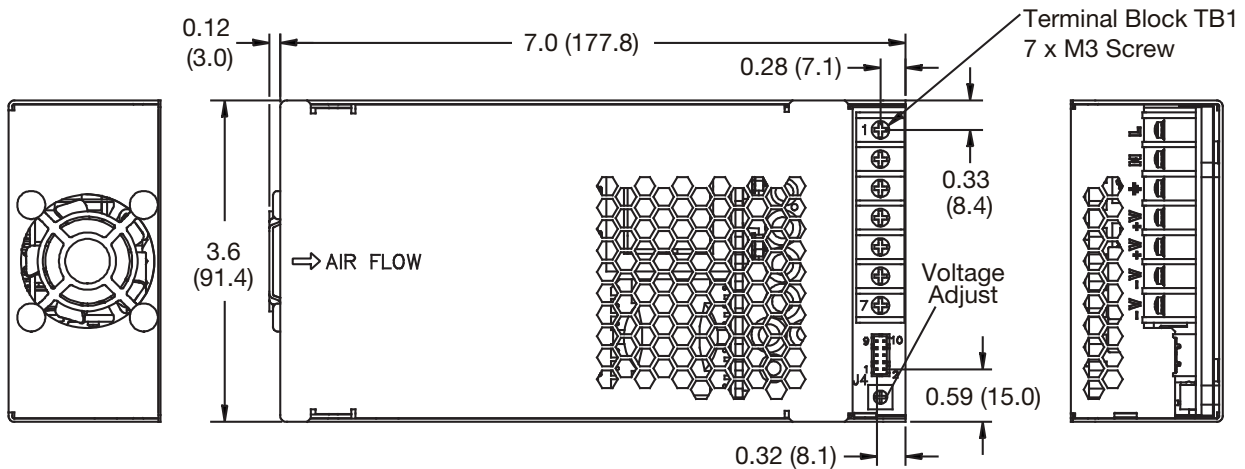
| Phenomenon | Standard | Test Level | Criteria | Notes & Conditions |
|------------------------|---------------------------|---------------------------|----------|-----------------------|
| Low Voltage PSU EMC | EN61204-3 | High severity level | as below | |
| Harmonic Current | EN61000-3-3 | Class A | | All models |
| | | Class C | | > 125 W |
| Radiated | EN61000-4-3 | 3 | A | |
| EFT | EN61000-4-4 | 3 | A | |
| Surges | EN61000-4-5 | Installation class 3 | A | |
| Conducted | EN61000-4-6 | 3 | A | |
| Dips and Interruptions | EN61000-4-11 (100 VAC) | Dip 100% (0 VAC), 8.4ms | A | |
| | | Dip 100% (0 VAC), 16.7ms | B | |
| | | Dip 60% (40 VAC), 200ms | B | |
| | | Dip 30% (70 VAC), 500ms | B | |
| | | Dip 20% (80 VAC), 5000ms | B | |
| | | Int 100% (0 VAC), 5000ms | B | |
| | EN61000-4-11 (240 VAC) | Dip 100% (0 VAC), 10ms | A | |
| | | Dip 100% (0 VAC), 20ms | B | |
| | | Dip 60% (96 VAC), 200ms | B | |
| | | Dip 30% (168 VAC), 500ms | B | |
| | | Dip 20% (192 VAC), 5000ms | B | |
| | | Int 100% (0 VAC), 5000ms | B | |
| | EN60601-1-2 (100 VAC) | Dip 100% (0 VAC), 10ms | A | |
| | | Dip 60% (40 VAC), 100ms | A | Derate Power to 150 W |
| | | Dip 30% (70 VAC), 500ms | A | |
| | | Int 100% (0 VAC), 5000ms | B | |
| | EN60601-1-2 (240 VAC) | Dip 100% (0 VAC), 10ms | A | |
| | | Dip 60% (96 VAC), 100ms | A | |
| | | Dip 30% (168 VAC), 500ms | A | |
| | | Int 100% (0 VAC), 5000ms | B | |
| SEMI F47 (100 VAC) | | Dip 33% (70 VAC), 500ms | A | |

Safety Approvals

| Safety Agency | Safety Standard | Notes & Conditions |
|----------------------------|---|---|
| CB Report | IEC60950-1:2005 Ed 2 | Information Technology |
| | IEC62368-1 Ed 2 | Information Technology |
| | IEC60601-1 Ed 3 Including Risk Management | Medical |
| UL | UL62368-1, CSA C22.2 No. 62368-1 | Information Technology |
| | ANSI/AAMI ES60601-1:2005 & CSA C22.2, No.60601-1:08 | Medical |
| TUV | EN62368-1 | Information Technology |
| | EN60601-1/2006 | Medical |
| CE | LVD & RoHS | |
| Equipment Protection Class | Class I | See safety agency conditions of acceptability for details |

| Means of Protection | | Category |
|----------------------|--|-----------------|
| Primary to Secondary | 2 x MOPP (Means of Patient Protection) | IEC60601-1 Ed 3 |
| Primary to Earth | 1 x MOPP (Means of Patient Protection) | |
| Secondary to Earth | 1 x MOPP (Means of Patient Protection) | |

Mechanical Details



Notes

- All dimensions in inches (mm).
- Tolerance .xx = ± 0.02 (0.50); .xxx = ± 0.01 (0.25)
- Weight: 1.5 lbs (0.68 kg)
- J4 mates with JST Housing Pn. PHDR-10VS and with JST SPHD-001T-P0.5 crimp terminals.

Terminal Block TB1

| Pin | Function |
|-----|----------|
| 1 | Line |
| 2 | Neutral |
| 3 | Ground |
| 4 | +V1 |
| 5 | +V1 |
| 6 | -V |
| 7 | -V |

Signal Connector J4
JST PN B10B-PHDSS

| Pin | Function |
|-----|-----------------|
| 1 | +Sense |
| 2 | -Sense |
| 3 | XP Internal Use |
| 4 | Inhibit LO |
| 5 | Inhibit HI |
| 6 | N/C |
| 7 | N/C |
| 8 | N/C |
| 9 | N/C |
| 10 | N/C |