

# 400 Watts

## SDL Series



- Single & Dual Outputs
- Up to 700 W Peak Power
- Fan Fail & Power Good Signals
- Variable Speed Fan
- Low Leakage Current Option
- Fits 1U Applications
- 3 Year Warranty

### Specification

#### Input

|                       |  |
|-----------------------|--|
| Input Voltage         | • 90-264 VAC   |
| Input Frequency       | • 47-63 Hz   |
| Input Current         | • 6 A at 90 VAC, 2.5 A at 230 VAC                        |
| Inrush Current        | • Max 70 A at 230 VAC, 35 A at 115 VAC, cold start       |
| Power Factor          | • EN61000-3-2 class A, >0.9                              |
| Earth Leakage Current | • <1.5 mA at 264 VAC, option '-L' 500 $\mu$ A at 240 VAC |
| Input Protection      | • T8 A/250 V fuse  |

#### Output

|                          |  |
|--------------------------|--|
| Output Voltage           | • See tables   |
| Output Voltage Trim      | • $\pm$ 5% on V1 (V2 of dual output models will track by same % of adjustment)   |
| Initial Set Accuracy     | • $\pm$ 1%   |
| Minimum Load             | • 1% on single output models, 10% on both output of dual output models in order to maintain ripple & noise and regulation specifications |
| Start Up Delay           | • 1.5 s max at 115 VAC   |
| Start Up Rise Time       | • 50 ms typical  |
| Hold Up Time             | • 16 ms min at 75% of full load at 115 VAC   |
| Line Regulation          | • $\pm$ 0.5%   |
| Load Regulation          | • $\pm$ 1% for single outputs, $\pm$ 3% V1, $\pm$ 7% V2 for dual outputs (except PD0512 version: $\pm$ 5% on V1 and $\pm$ 10% on V2)     |
| Over/Undershoot          | • 5% max   |
| Transient Response       | • $\pm$ 5% max deviation, recovery to within 1% in 500 $\mu$ s for a 50% load change   |
| Ripple & Noise           | • 1% pk-pk (see note 3)  |
| Overvoltage Protection   | • <130% on V1 recycle AC input to reset  |
| Overload Protection      | • 110-140%   |
| Short Circuit Protection | • Trip & restart, auto recovery  |
| Fan Supply               | • <5V at 300mA with 1% load rising to 12-13 V at 300mA with full load. Not available on '-F' & '-E' versions with built-in fans          |
| Remote On / Off          | • Applying short circuit between inhibit pin and signal return turns output off.   |

#### General

|                     |   |
|---------------------|---|
| Efficiency          | • Single output: 88% typical<br>Dual Output: 85% typical at 230 V & full load       |
| Isolation           | • 3000 VAC Input to Output, 1500 VAC Input to Ground, 250 VDC Output to Ground      |
| Switching Frequency | • PFC, 68 kHz PFC, PWM: 55 kHz for single output, & PD1224, 48 kHz for other parts. |
| Power Density       | • 11.11 W/In <sup>3</sup>   |
| Signals             | • Fan Fail & Power Good   |
| MTBF                | • >100 kHrs to MIL-HDBK-217F, at 25 $^{\circ}$ C GB                                 |

#### Environmental

|                       |  |
|-----------------------|--|
| Operating Temperature | • 0 $^{\circ}$ C to +70 $^{\circ}$ C, derate at 2.5%/ $^{\circ}$ C from +50 $^{\circ}$ C to +70 $^{\circ}$ C |
| Storage Temperature   | • -20 $^{\circ}$ C to +85 $^{\circ}$ C   |
| Operating Humidity    | • 5-90%, non-condensing  |
| Cooling               | • '-F' & '-E' versions have built-in variable speed fans, all other models require 15 CFM                    |
| Operating Altitude    | • 3000 m   |
| Shock                 | • 30 g, 11ms half sine, 6 axes   |
| Vibration             | • 2 g, 10-200 Hz, 3 axes   |

#### EMC & Safety

|                      |   |
|----------------------|---|
| Emissions            | • EN55022 Level B conducted & radiated                                    |
| Harmonic Currents    | • EN61000-3-2 class A<br>EN61000-3-2 class C for loads $\geq$ 30%         |
| Voltage Flicker      | • EN61000-3-3   |
| ESD Immunity         | • EN61000-4-2, level 3 Perf Criteria A                                    |
| Radiated Immunity    | • EN61000-4-3, 3 V/m Perf Criteria A                                      |
| EFT/Burst            | • EN61000-4-4, level 2 Perf Criteria A                                    |
| Surge                | • EN61000-4-5, installation class 3 Perf Criteria A                       |
| Conducted Immunity   | • EN61000-4-6, 3V Perf Criteria A   |
| Dips & Interruptions | • EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms Perf Criteria A, B, B |
| Safety Approvals     | • UL60950-1, CSA C22.2 No. 60950-1, EN60950-1                             |

**Models and Ratings**

| Output Power      |                   | Voltage | Output 1   |            |                     | Voltage | Output 2   |            |                           | Model Number                |
|-------------------|-------------------|---------|------------|------------|---------------------|---------|------------|------------|---------------------------|-----------------------------|
| Forced Air Cooled | Convection Cooled |         | Current    |            |                     |         | Forced Air | Convection | Peak <sup>(1)</sup>       |                             |
|                   |                   |         | Forced Air | Convection | Peak <sup>(1)</sup> |         |            |            |                           |                             |
| 400 W             | 220 W             | 12 V    | 33.33 A    | 18.33 A    | 58.33 A             |         |            |            | SDL400PS12                |                             |
| 400 W             | 220 W             | 15 V    | 26.67 A    | 14.67 A    | 46.77 A             |         |            |            | SDL400PS15 <sup>(4)</sup> |                             |
| 400 W             | 220 W             | 18 V    | 22.22 A    | 12.22 A    | 38.89 A             |         |            |            | SDL400PS18 <sup>(4)</sup> |                             |
| 400 W             | 220 W             | 24 V    | 16.67 A    | 9.17 A     | 29.17 A             |         |            |            | SDL400PS24                |                             |
| 400 W             | 220 W             | 28 V    | 14.29 A    | 7.86 A     | 25.00 A             |         |            |            | SDL400PS28 <sup>(4)</sup> |                             |
| 400 W             | 220 W             | 36 V    | 11.11 A    | 6.11 A     | 19.44 A             |         |            |            | SDL400PS36                |                             |
| 400 W             | 220 W             | 48 V    | 8.33 A     | 4.58 A     | 14.58 A             |         |            |            | SDL400PS48                |                             |
| 400 W             | 220 W             | 54 V    | 7.41 A     | 4.07 A     | 12.96 A             |         |            |            | SDL400PS54 <sup>(4)</sup> |                             |
| 400 W             | 220 W             | 60 V    | 6.67 A     | 3.67 A     | 11.61 A             |         |            |            | SDL400PS60 <sup>(4)</sup> |                             |
| 320 W             | 180 W             | +5 V    | 30.00 A    | 15.00 A    | 36.00 A             | +12 V   | 20.83 A    | 13.33 A    | 20.00 A                   | SDL400PD0512 <sup>(4)</sup> |
| 320 W             | 180 W             | +5 V    | 30.00 A    | 15.00 A    | 36.00 A             | +24 V   | 10.42 A    | 6.67 A     | 10.00 A                   | SDL400PD0524 <sup>(4)</sup> |
| 320 W             | 180 W             | +5 V    | 30.00 A    | 15.00 A    | 36.00 A             | +48 V   | 5.21 A     | 3.33 A     | 5.00 A                    | SDL400PD0548 <sup>(4)</sup> |
| 400 W             | 200 W             | +12 V   | 20.83 A    | 12.50 A    | 20.00 A             | +24 V   | 10.42 A    | 8.33 A     | 10.00 A                   | SDL400PD1224                |

**Notes**

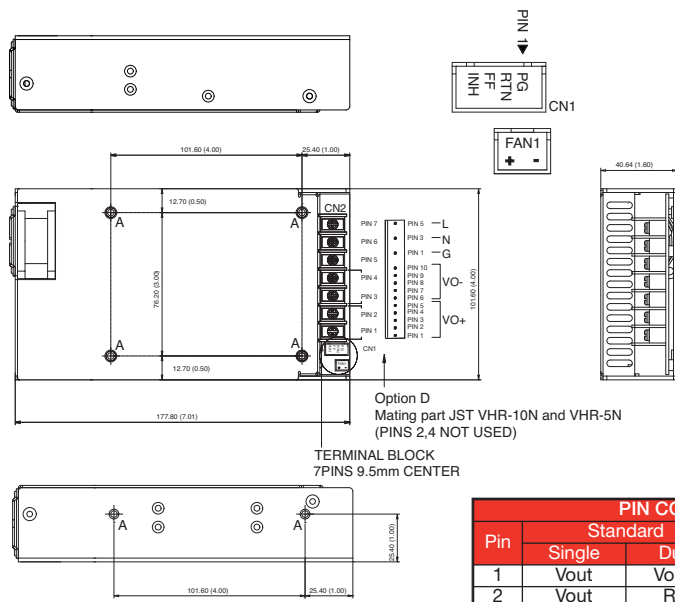
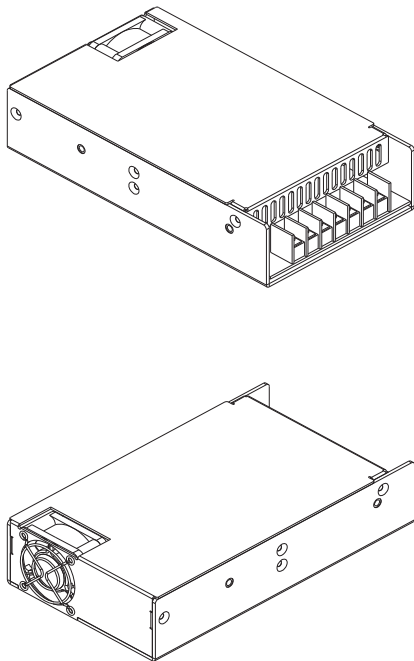
1. Peak load can be taken for 500  $\mu$ s. Average power not to exceed nominal power.
2. Add suffix '-L' to model number for optional 500  $\mu$ A leakage current<sup>(4)</sup>
3. Ripple & noise is measured using 0.1  $\mu$ F ceramic capacitor in parallel with 22  $\mu$ F electrolytic and 20 MHz bandwidth.
4. Available for OEM quantities, contact Sales.

**Mechanical Options**

- If no suffix is added to the model number the unit is a U-channel, convection-cooled ratings apply or external fan cooling required (15 CFM).
- Add suffix '-E' to the model number for an end fan cover (forced air cooled ratings apply).
- Add suffix '-F' to the model number for a top fan cover (forced air cooled ratings apply).
- Add suffix '-C' to the model number for a U-channel with vented cover. Convection cooled ratings apply or external fan cooling required (15 CFM).
- Add suffix 'D' to the model number for MOLEX connector for OEM quantities, contact Sales.

**Mechanical Details**

**Enclosed with End Fan (-E'Option)**



A: Mounting hole  
6 Places M4 x 0.7

Signal Connector mating part is JST XHP-4  
Crimp terminals SXH-002T-P0.6

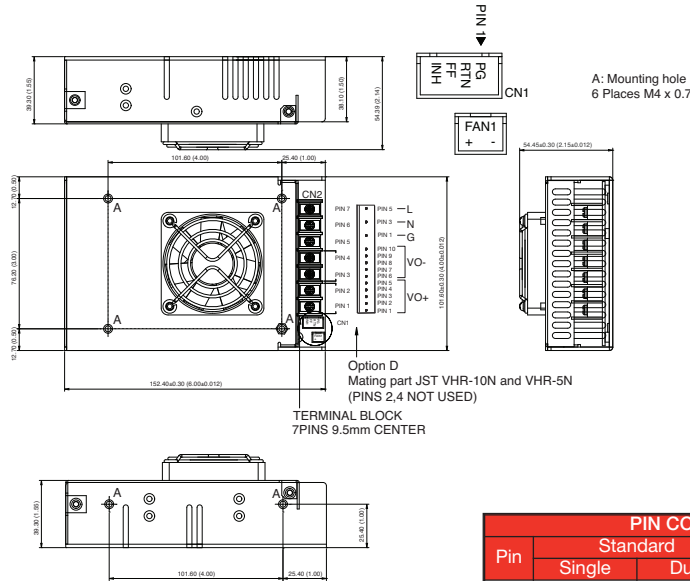
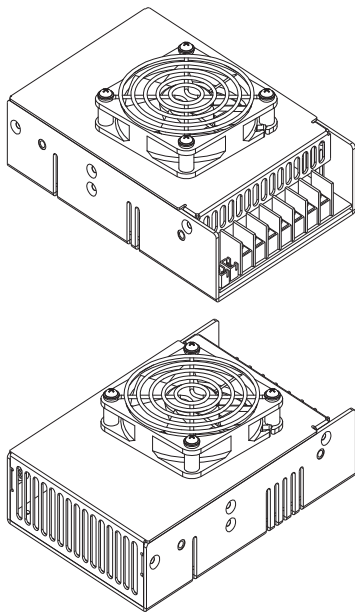
All dimensions are in inches (mm)  
Weight: 800 g (1.76 lbs)  
Tolerance:  $\pm 0.012$  in ( $\pm 0.3$  mm)  
Max screw terminal torque: 15.7 lbs-in (1.8 Nm)  
Max screw mount hole penetration : 0.16 (4.0)

| Pin | Standard |      | JST (Option D) |         |
|-----|----------|------|----------------|---------|
|     | Single   | Dual | Single         | Dual    |
| 1   |          |      | Ground         | Ground  |
| 3   |          |      | Neutral        | Neutral |
| 5   |          |      | Live           | Live    |

| Pin | PIN CONNECTIONS |         |                |       |
|-----|-----------------|---------|----------------|-------|
|     | Standard        |         | JST (Option D) |       |
|     | Single          | Dual    | Single         | Dual  |
| 1   | Vout            | Vout1   | Vout           | Vout1 |
| 2   | Vout            | Rtn     | Vout           | Vout1 |
| 3   | Rtn             | Rtn     | Vout           | Vout1 |
| 4   | Rtn             | Vout2   | Vout           | Rtn   |
| 5   | Ground          | Ground  | Vout           | Rtn   |
| 6   | Neutral         | Neutral | Rtn            | Rtn   |
| 7   | Live            | Live    | Rtn            | Rtn   |
| 8   |                 |         | Rtn            | Rtn   |
| 9   |                 |         | Rtn            | Vout2 |
| 10  |                 |         | Rtn            | Vout2 |

Mechanical Details

Enclosed with Top Fan (+F'Option)

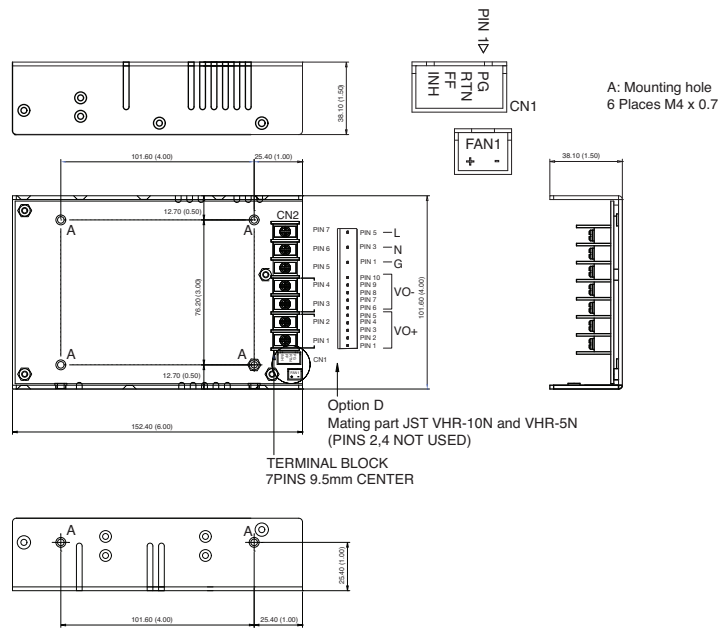
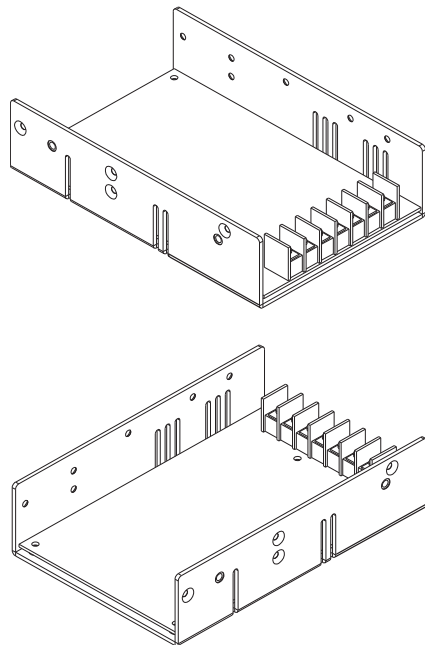


Signal Connector mating part is JST XHP-4  
Crimp terminals SXH-002T-P0.6  
All dimensions are in inches (mm)  
Weight: 770 g (1.70 lbs)  
Tolerance: ±0.012 in (±0.3 mm)  
Max screw terminal torque: 15.7 lbs-in (1.8 Nm)  
Max screw mount hole penetration : 0.16 (4.0)

| Pin | 5 PIN AC INPUT CONNECTIONS |      | JST (Option D) |         |
|-----|----------------------------|------|----------------|---------|
|     | Standard Single            | Dual | Single         | Dual    |
| 1   |                            |      | Ground         | Ground  |
| 3   |                            |      | Neutral        | Neutral |
| 5   |                            |      | Live           | Live    |

| Pin | PIN CONNECTIONS |         |                |       |
|-----|-----------------|---------|----------------|-------|
|     | Standard        |         | JST (Option D) |       |
|     | Single          | Dual    | Single         | Dual  |
| 1   | Vout            | Vout1   | Vout           | Vout1 |
| 2   | Vout            | Rtn     | Vout           | Vout1 |
| 3   | Rtn             | Rtn     | Vout           | Vout1 |
| 4   | Rtn             | Vout2   | Vout           | Rtn   |
| 5   | Ground          | Ground  | Vout           | Rtn   |
| 6   | Neutral         | Neutral | Rtn            | Rtn   |
| 7   | Live            | Live    | Rtn            | Rtn   |
| 8   |                 |         | Rtn            | Rtn   |
| 9   |                 |         | Rtn            | Vout2 |
| 10  |                 |         | Rtn            | Vout2 |

U-Channel



Signal Connector mating part is JST XHP-4  
Fan Connector mating part is JST XHP-2, Crimp terminals SXH-002T-P0.6

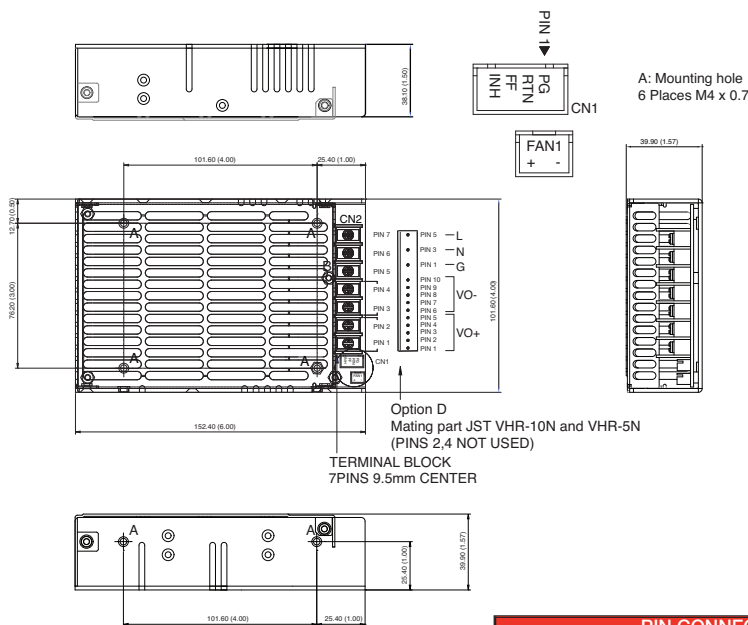
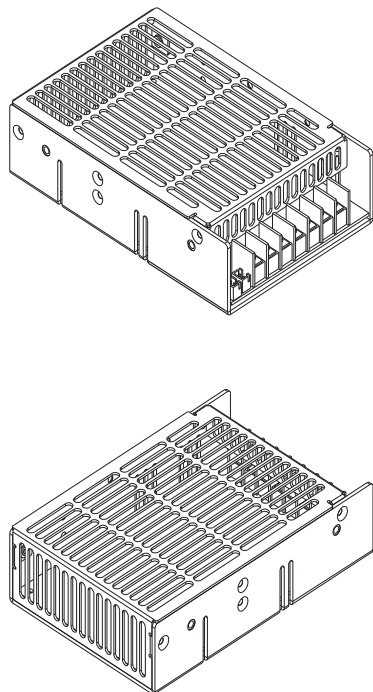
All dimensions are in inches (mm)  
Weight: 680 g (1.50 lbs)  
Tolerance: ±0.012 in (±0.3 mm)  
Max screw terminal torque: 15.7 lbs-in (1.8 Nm)  
Max screw mount hole penetration : 0.16 (4.0)

| Pin | 5 PIN AC INPUT CONNECTIONS |      | JST (Option D) |         |
|-----|----------------------------|------|----------------|---------|
|     | Standard Single            | Dual | Single         | Dual    |
| 1   |                            |      | Ground         | Ground  |
| 3   |                            |      | Neutral        | Neutral |
| 5   |                            |      | Live           | Live    |

| Pin | PIN CONNECTIONS |         |                |       |
|-----|-----------------|---------|----------------|-------|
|     | Standard        |         | JST (Option D) |       |
|     | Single          | Dual    | Single         | Dual  |
| 1   | Vout            | Vout1   | Vout           | Vout1 |
| 2   | Vout            | Rtn     | Vout           | Vout1 |
| 3   | Rtn             | Rtn     | Vout           | Vout1 |
| 4   | Rtn             | Vout2   | Vout           | Rtn   |
| 5   | Ground          | Ground  | Vout           | Rtn   |
| 6   | Neutral         | Neutral | Rtn            | Rtn   |
| 7   | Live            | Live    | Rtn            | Rtn   |
| 8   |                 |         | Rtn            | Rtn   |
| 9   |                 |         | Rtn            | Vout2 |
| 10  |                 |         | Rtn            | Vout2 |

## Mechanical Details

### U-Channel with cover (±C'Option)



Signal Connector mating part is JST XHP-4  
 Fan Connector mating part is JST XHP-2, Crimp terminals SXH-002T-P0.6

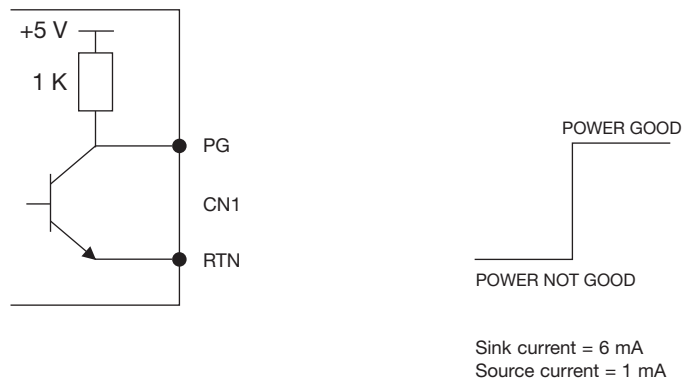
All dimensions are in inches (mm)  
 Weight: 720 g (1.59 lbs)  
 Tolerance: ±0.012 in (±0.3 mm)  
 Max screw terminal torque: 15.7 lbs-in (1.8 Nm)  
 Max screw mount hole penetration : 0.16 (4.0)

| Pin | Standard |      | JST (Option D) |         |
|-----|----------|------|----------------|---------|
|     | Single   | Dual | Single         | Dual    |
| 1   |          |      | Ground         | Ground  |
| 3   |          |      | Neutral        | Neutral |
| 5   |          |      | Live           | Live    |

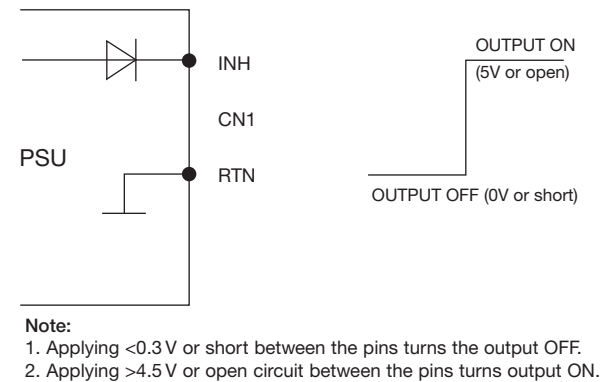
| Pin | Standard |         | JST (Option D) |       |
|-----|----------|---------|----------------|-------|
|     | Single   | Dual    | Single         | Dual  |
| 1   | Vout     | Vout1   | Vout           | Vout1 |
| 2   | Vout     | Rtn     | Vout           | Vout1 |
| 3   | Rtn      | Rtn     | Vout           | Vout1 |
| 4   | Rtn      | Vout2   | Vout           | Rtn   |
| 5   | Ground   | Ground  | Vout           | Rtn   |
| 6   | Neutral  | Neutral | Rtn            | Rtn   |
| 7   | Live     | Live    | Rtn            | Rtn   |
| 8   |          |         | Rtn            | Rtn   |
| 9   |          |         | Rtn            | Vout2 |
| 10  |          |         | Rtn            | Vout2 |

## Application Notes

### Power Good



### Remote On / Off



### Fan Fail

