

## SMM Series



- Industrial, IT & Medical Approvals
- Low Profile for 1U Applications
- Optional Current Share & AC Fail
- Output Voltages from 3.3 V to 54 V
- Enclosed with Internal Fan & U-Channel Versions
- Optional Connectors
- 3 Year Warranty

## Specification

## Input

Input Voltage	• 90-264 VAC (120-370 VDC)
Input Frequency	• 47-63 Hz
Input Current	• 6.35 A at 90 VAC, full load
Inrush Current	• 35 A peak max (cold start at 230 VAC & full load)
Power Factor	• EN61000-3-2 class A EN61000-3-2 class C for loads $\geq 40\%$
Earth Leakage Current UVLO	• <300 $\mu$ A max at 264 VAC/60 Hz • Shut down when 75 VAC < $V_{in}$ < 85 VAC & turns on when $V_{in}$ > 86 VAC
Input Protection	• Internal T8 A/250 VAC fuse in line and neutral

## Output

Output Voltage	• 3.3 to 54 VDC - see tables
Output Voltage Trim	• $\pm 5\%$ on V1
Initial Set Accuracy	• Within 1% of stated output voltage
Minimum Load	• Single output: 1%, Dual output (V1): 10%
Start Up Delay	• 2 s max at 120 VAC
Hold Up Time	• 20 ms min at 80% full load
Line Regulation	• 0.5%
Load Regulation	• $\pm 1\%$ (single outputs), $\pm 3\%$ V1, $\pm 7\%$ V2 (dual outputs)
Over/Undershoot	• Not to exceed 5% of nominal voltage
Transient Response	• 5% max deviation, recovery to within 1% in 500 $\mu$ s for a 50% load change
Ripple & Noise	• <1% of nominal output voltage, measured using 0.1 $\mu$ F ceramic and 22 $\mu$ F electrolytic capacitor, 20 MHz bandwidth.
Overvoltage Protection	• >130% $V_{nom}$ , recycle input to reset
Overtemperature Protection	• Shuts down at +85 $^{\circ}$ C, measured internally with auto recovery
Overload Protection	• 110-140%
Short Circuit Protection	• Constant current, auto recovery
Remote Sense	• Compensates for up to 0.5 V drop (not available with current share)
Remote On/Off	• On = TTL Logic High or Open Off = TTL Logic Low or Short
Current Share	• Option '-I' available on single output models only - see note 5
Fan Output	• 12 V at 400 mA

## General

Efficiency	• 3.3 & 5.0 V single output: 70% min, All other single output: 80% min, Dual outputs: 75% min at 230 VAC, full load
Isolation	• 4000 VAC Input to Output, 1500 VAC Input to Ground, 250 VDC Output to Ground
Switching Frequency	• 30 kHz PWM, 60 kHz PFC typical
Power Density	• 6.25 W/in <sup>3</sup>
Signals	• Power Good & Current Monitor as standard. AC Fail & Current Share are optional (see notes)
MTBF	• 140 kHrs to MIL-HDBK-217F at 25 $^{\circ}$ C, GB

## Environmental

Operating Temperature	• -0 $^{\circ}$ C to +70 $^{\circ}$ C, derate linearly from +50 $^{\circ}$ C to +70 $^{\circ}$ C at 2.5%/ $^{\circ}$ C
Cooling	• '-C' version has built-in fan, others require 23 CFM air flow to meet fan-cooled ratings
Operating Humidity	• 5-90% RH, non-condensing
Storage Temperature	• -20 $^{\circ}$ C to +85 $^{\circ}$ C
Vibration	• 5-50 Hz, acceleration 2 g, 3 minute sweep, 60 mins in 3 axes
Shock	• 15 g 11 ms 1/2 sine wave, 3 times in 6 axes
Bump	• 15 g 6 ms 1/2 sine 4000 bumps in 3 axes

## EMC &amp; Safety

Emissions	• EN55011/22 Level B conducted & radiated
Harmonic Currents	• EN61000-3-2 class A EN61000-3-2 class C for loads $\geq 40\%$
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, 3 V, Perf Criteria A
Dips & Interruptions	• EN61000-4-11, 30% 10 ms, 60% 100 ms, 100% 5000 ms Perf Criteria A, B, B
Safety Approvals	• UL60601-1, EN60601-1, EN60950-1:2001, UL60950, CSA C22.2 No. 60950-1-03, CSA C22.2 No. 601.1-M90

## Models and Ratings

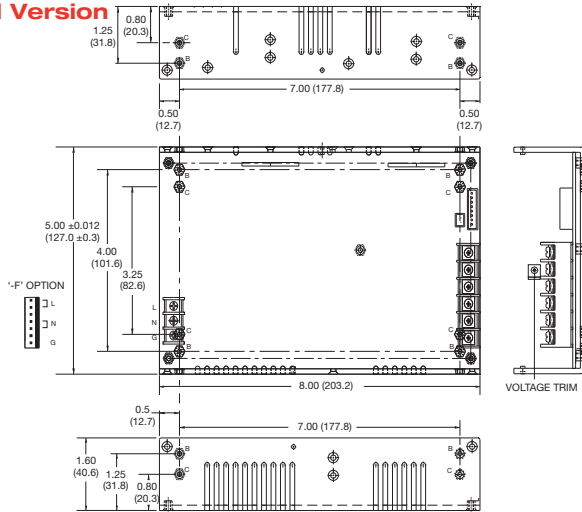
Output Voltage Range	Total Output Power <sup>(1)</sup>		Maximum Output Current				Model Number <sup>(2,3,4,5,6)</sup>
			Output 1		Output 2		
	Convection	Fan-Cooled	Convection	Fan-Cooled	Convection	Fan-Cooled	
3.3 V	148.5 W	198 W	45.00 A	60.00 A			SMM400PS03 <sup>(8)</sup>
5.0 V	225.0 W	300 W	45.00 A	60.00 A			SMM400PS05 <sup>(8)</sup>
12.0 V	250.0 W	400 W	20.80 A	33.34 A			SMM400PS12
15.0 V	250.0 W	400 W	16.60 A	26.60 A			SMM400PS15 <sup>(8)</sup>
18.0 V	250.0 W	400 W	13.90 A	22.20 A			SMM400PS18 <sup>(8)</sup>
24.0 V	250.0 W	400 W	10.40 A	16.70 A			SMM400PS24
27.0 V	250.0 W	400 W	9.20 A	14.80 A			SMM400PS27 <sup>(8)</sup>
36.0 V	250.0 W	400 W	6.90 A	11.10 A			SMM400PS36 <sup>(8)</sup>
48.0 V	250.0 W	400 W	5.20 A	8.30 A			SMM400PS48
54.0 V	250.0 W	400 W	4.60 A	7.40 A			SMM400PS54 <sup>(8)</sup>
3.3 V/12.0 V	200.0 W	300 W	30.00 A	40.00 A	16.70 A	25.00 A	SMM400PD21 <sup>(8)</sup>
3.3 V/24.0 V	200.0 W	300 W	30.00 A	40.00 A	8.30 A	12.50 A	SMM400PD22 <sup>(8)</sup>
5.0 V/12.0 V	200.0 W	300 W	30.00 A	40.00 A	16.70 A	25.00 A	SMM400PD23 <sup>(8)</sup>
5.0 V/24.0 V	200.0 W	300 W	30.00 A	40.00 A	8.30 A	12.50 A	SMM400PD24 <sup>(8)</sup>
12.0 V/24.0 V	250.0 W	400 W	16.70 A	25.00 A	8.30 A	12.50 A	SMM400PD25

### Notes

1. SMM400PDXX: 10% minimum load is required for all outputs to maintain the ripple and regulation. Outputs are fully isolated.
2. For cover version add -C to the model number
3. Standard output is screw terminal. For optional Molex output connector, add suffix '-G' to model number, OEM quantities, contact Sales.
4. For AC fail option, add suffix '-L' to model number (single output only). UVLO function is disabled. Output is low when input is <80 VAC, high (5 V) if input is >86 VAC, OEM quantities, contact Sales.
5. For current share option, add suffix '-I' to model number (remote sense not available). This option also adds internal blocking diodes, OEM quantities, contact Sales.
6. For U-Channel with optional solid cover, add suffix '-A' to the model number (external dimensions remain the same).
7. Standard input for U-Channel version is screw terminal. For optional IEC320 input, on/off switch and cover add suffix '-D' to model number.
8. Available for OEM quantities, contact Sales.
9. When ordering place option suffixes in alphabetical order, e.g. SMM400PS24-GI.

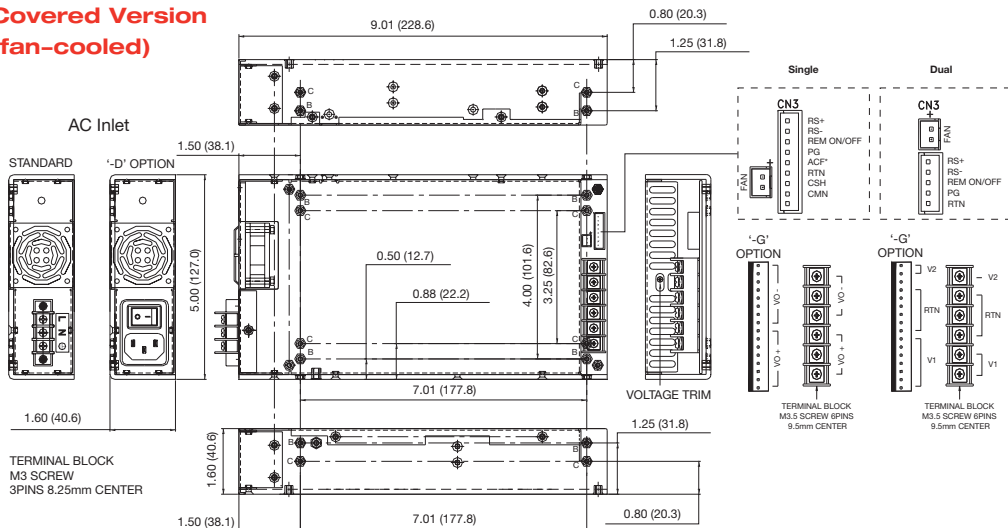
## Mechanical Details

### U-Channel Version



All dimensions in inches (mm).  
 Tolerance: ±0.012 (±0.3)  
 Weight: U-Channel - 2.20 lbs (1.0 kg). Covered - 3.53 lbs (1.6 kg).  
 Max screw penetration: 0.15 (3.81) on bottom, 0.25 (6.35) on sides.  
 Mounting holes B: 6-32, Mounting holes C: M4  
 Max screw terminal torque: 15.7 lbs-in (1.8 Nm)

### Covered Version (fan-cooled)



**Mating Connectors**  
 Signal Connector (Single): JST XHP-9  
 Signal Connector (Dual): JST XHP-5  
 Fan Connector: JST XHP-2  
 Crimp Terminals: SXH-002-P0.6  
 '-G' optional output: Molex No. 09-91-1600  
 Crimps: Molex Series 6838 (see note 3 above)

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