

High Density DC-DC Modules

**POWER
SOLVE**

www.powersolve.co.uk

PS50 Series
25 to 50 Watt Wide Input
DC-DC Converters
Single Output



Features

- 25W/50W Isolated Output
- Efficiency to 85%
- 300KHz Switching Frequency
- 2 : 1 Input Range
- Regulated Outputs
- Continuous Short Circuit Protection
- Five-Sided Metal Case



Only for Nominal Input Voltage 24 & 48 VDC

MODEL	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	INPUT CURRENT		%EFF
				NO LOAD	FULL LOAD	
PS50-12S25	9-18VDC	2.5 VDC	10 A	50 mA	2740 mA	76
PS50-12S33		3.3 VDC	10 A		3525 mA	78
PS50-12S05		5 VDC	10 A		5145 mA	81
PS50-12S12		12 VDC	4.16 A		4950 mA	84
PS50-12S15		15 VDC	3.33 A		4950 mA	84
PS50-12S24		24 VDC	2.08 A		4950 mA	84
PS50-24S25	18-36VDC	2.5 VDC	10 A	50 mA	1353 mA	77
PS50-24S33		3.3 VDC	10 A		1740 mA	79
PS50-24S05		5 VDC	10 A		2540 mA	82
PS50-24S12		12 VDC	4.16 A		2450 mA	85
PS50-24S15		15 VDC	3.33 A		2450 mA	85
PS50-24S24		24 VDC	2.08 A		2419 mA	86
PS50-48S25	36-75VDC	2.5 VDC	10 A	50 mA	676 mA	77
PS50-48S33		3.3 VDC	10 A		870 mA	79
PS50-48S05		5 VDC	10 A		1250 mA	83
PS50-48S12		12 VDC	4.16 A		1220 mA	85
PS50-48S15		15 VDC	3.33 A		1220 mA	85
PS50-48S24		24 VDC	2.08 A		1209 mA	86

NOTE: 1. Nominal Input Voltage 12, 24 & 48 VDC

High Density DC-DC Modules



www.powersolve.co.uk

Electrical Specification

INPUT

Input Voltage Range	12V	9-18V
	24V	18-36V
	48V	36-75V
Undervoltage lockout	12Vin power up	8.8V
	power down	8V
	24Vin power up	17V
	power down	16V
	48Vin power up	34V
	power down	32.5V

Positive Logic Remote ON/OFF^{3,4}

Input Filter Pi Type

OUTPUT

Voltage Accuracy :		±1% max.
Transient Response : 25% Step Load Change		<500µsec.
External Trim Adj. Range		±10%
Ripple & Noise, 20MHz BW,	2.5V & 3.3V & 5V	20mV RMS., max. 75mV pk-pk, max.
	12V & 15V	30mV RMS., max. 100mV pk-pk, max.
	24V	100mV RMS., max. 240mV pk-pk, max.

ENVIRONMENTAL

Temperature Coefficient		±0.03%/°C
Short Circuit Protection		Continuous
Line Regulation ¹		±0.2% max.
Load Regulation ²		±0.2% max.
Over Voltage Protection trip Range, % Vo nom.		115-140%
Current Limit		110% ~150% Nominal Output

GENERAL

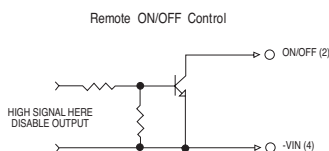
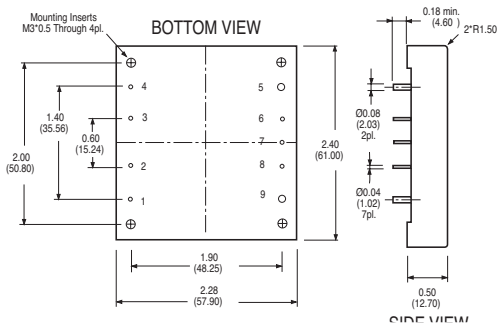
Efficiency		See Table
Isolation Voltage	Input/Output	1500VDC min.
	Input/Case	1500VDC min.
	Output/Case	1500VDC min.
Isolation Resistance		10 ⁷ ohm min.
Switching Frequency	12/24Vin	400KHz, Typ.
	48Vin	300KHz, Typ.
Operating case Temperature		-40°C to 100°C
Storage Temperature		-55°C to +105°C
Thermal Shutdown, Case Temp.		100°C Typ.
Dimensions		2.28x2.40x0.50 inches (57.9x61.0x12.7 mm)
Case Material		Aluminium

NOTE:

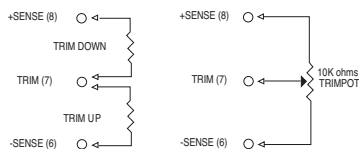
1. Measured From High Line to Low Line. 2. Measured From Full Load to Zero Load. 3. Logic Compatibility - Open Collector Ref. to -Input, Module ON - Open Circuit, Module OFF - < 0.8Vdc 4. Suffix "N" to the Model Number with Negative Logic Remote ON/OFF.

All Dimensions in Inches(mm)

Tolerances Inches .XX±.02 .XXX±.01 ±0.02
Millimeters .X±.5 .XX±.25 ±0.5



External Output Trim



Pin Connection

Pin	Function
1	+Vin
2	ON/OFF
3	CASE
4	-Vin
5	-Vout
6	-Sense
7	Trim
8	+Sense
9	+Vout

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.

2

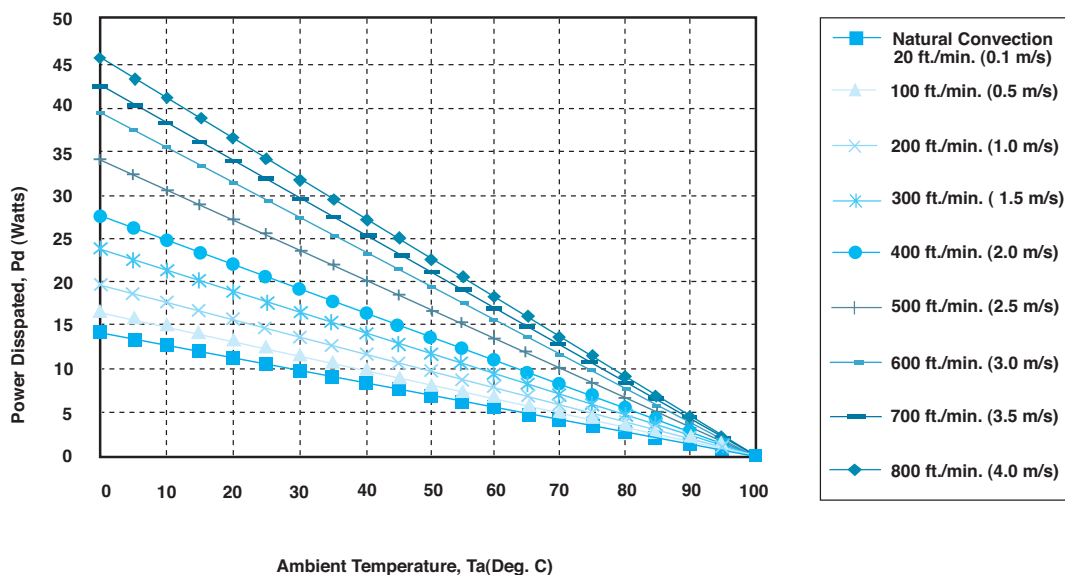
Application Note

Derating:

The operating case temperature range of the PS50 series is -40°C to +100°C. When operating the PS50 series, proper derating or cooling is needed.

The following curve is the derating curve of a PS50 without heat sink.

Power Dissipated vs Ambient Temperature and Air Flow



Forced Convection Power Derating without Heat Sink

Where:

The power dissipation (Pd):

$$Pd = Pi - Po = Po (1-n) / n$$

The thermal resistance are listed below:

Chart of Thermal Resistance vs Air Flow:

AIR FLOW RATE	TYPICAL Rca
Natural Convection 20ft./min. (0.1m/s)	7.12 °C/W
100 ft./min. (0.5m/s)	6.21 °C/W
200 ft./min. (1.0m/s)	5.17 °C/W
300 ft./min. (1.5m/s)	4.29 °C/W
400 ft./min. (2.0m/s)	3.64 °C/W
500 ft./min. (2.5m/s)	2.96 °C/W
600 ft./min. (3.0m/s)	2.53 °C/W
700 ft./min. (3.5m/s)	2.37 °C/W
800 ft./min. (4.0m/s)	2.19 °C/W

The temperature rise (ΔT):

$$\Delta T = Pd * Rca$$

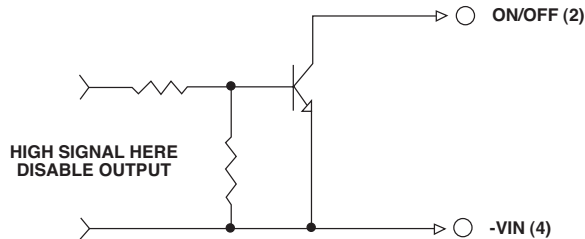
High Density DC-DC Modules



www.powersolve.co.uk

Remote ON/OFF Control

The PS50 series allows the user to switch the module on and off electronically with remote on/off feature. The PS50 series are available with "positive logic" or "negative logic" (option).

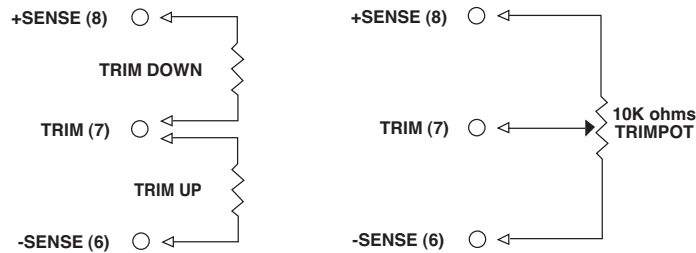


Logic Table

Logic State (Pin 2)	Negative Logic	Positive Logic
Logic Low - Switch Closed	Module on	Module off
Logic High - Switch Open	Module off	Module on

External Output Trimming

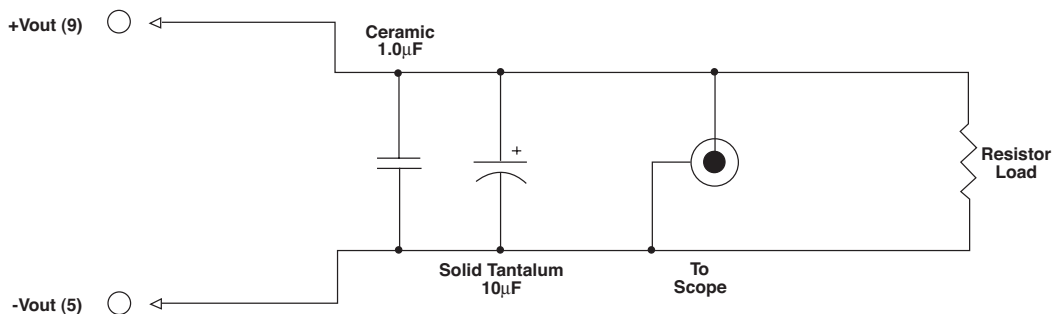
Output may optionally be externally trimmed ($\pm 10\%$) with a fixed resistor or an external trimpot as shown.



External Output

Output Noise

The output noise is measured with $10\mu\text{F}$ tantalum capacitor and $1.0\mu\text{F}$ ceramic capacitor across output.



Output Noise Test Circuit schematic

All Specifications Typical At Nominal Line, Full Load and 25°C Unless Otherwise Noted.