

APPLICATION NOTE

SWITCHING MODE POWER SUPPLY

PT series

POWER PLAZA CO., LTD

POWER **PLAZA**

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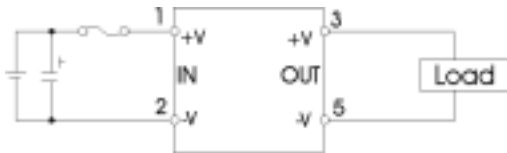
Block Diagrams

PT SERIES

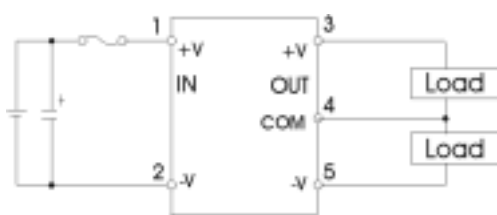
Appucaton notes

Basic Connection

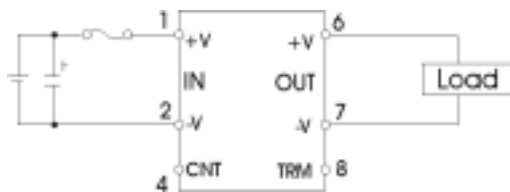
PTS10



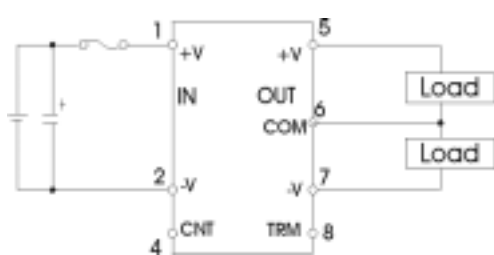
PTD10



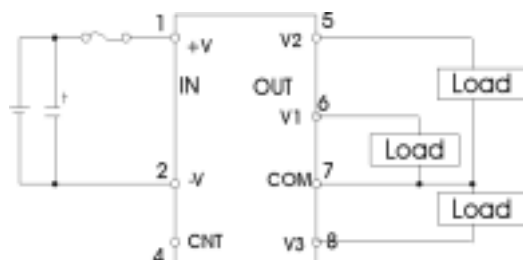
PTS15, PTS25



PTD15,PTD25

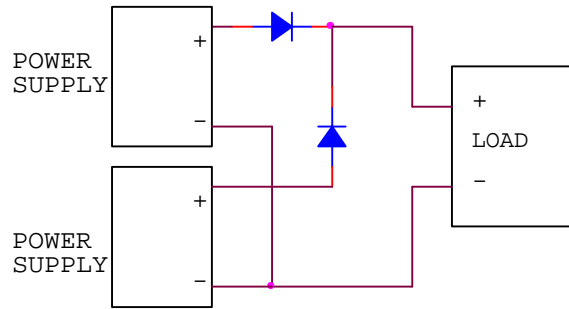


PT15,PT25



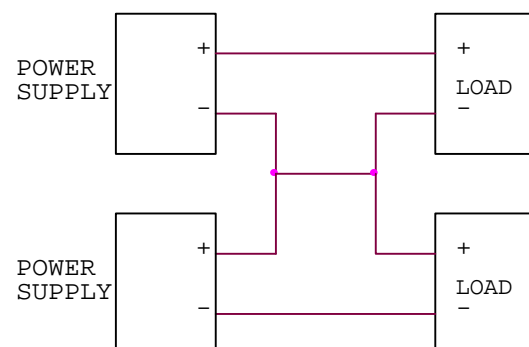
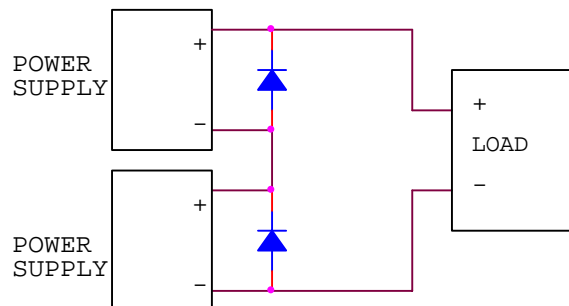
Parallel Operation

This supply can be operated the following ways.



Series Operation

This supply can be operated the following ways.



Choose a diode in accordance with voltage, power dissipation and heat radiation

PT SERIES

Applicaton notes

Input Fuse

PT Series input line should always be fused in order to ensure protection and safety.

Encapsulated power supplies, in general, do not have internal fuses and an external (Regular or Slow Blow Type)is should be used.

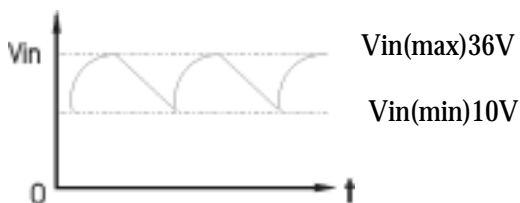
Recommended Fuse Ratings

	24VDC	48VDC
PT10	3.15A	1.5A
PT15	4A	2A
PT25	4A	2A

Unstable Input

Input voltage is comprised of both the DC voltage (average rectified voltage)and the peak to peak ripple voltage. Peak to peak ripple voltage should be minimized so that the input voltage is within the standard input voltage range as follows

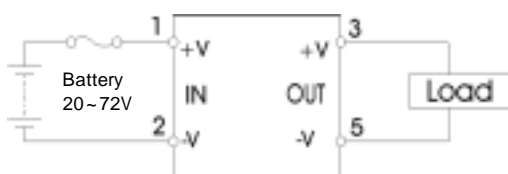
ex : PTS10-24-5



Battery Input

When using a battery as the input power supply, make sure that the maximum and minimum input voltage do not away out of the standard input voltage range

ex: PTS10-48-5



PT SERIES

Applicaton notes

Input Reversal

Accidently reversing the input connections could damage the module. Thus. If the connections may be accidently reversed. Please use a protective diode and an input fuse as shown below



Output Ripple & Noise Measurement Method

The standard measurement for output ripple and noise are based on normal probe with 20MHz bandwidth scope. Upon measurement of the ripple voltage, make sure that the oscilloscope probe leads are not too long.

Over Current Protection

The PT Series is equipped with an over current protection circuit. When the short or overload condition is removed, the output will automatically recover. This setting is fixed and cannot be varied externally. If the short or overload condition continues, the power module could be damaged due to the heat condition

Over Voltage Protection

The PT Series is equipped with an OVP(over voltage protection) circuit. When the OVP trigger, the output will be shut down. The input must be taken out(for at least five seconds), and than A52reinputted manually. Otherwise, the modyle will not output.

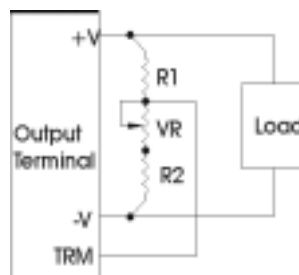
Output Voltage Variation(Trm)

The output voltage of power module can be adjusted by connecting and external resistor between the TRIM pin and either the +Vo or -Vo pin using the external potentionmeter the output voltage can be varied within $\pm 5\%$ of the standard output voltage. If the output voltage is raised too far up, the OVP will trigger

External part

Model	Output voltage	VR	R1	R2
PTS15	5V	1K	1.0K	680
PTS25	12V	1K	3.9K	680
	15V	1K	5.6K	680
PTD15	$\pm 5V(10V)$	1K	3.3K	680
PTD25	$\pm 12V(24V)$	5K	9.0K	820
	$\pm 15V(30V)$	5K	20K	910

External : Resistance tolerance $\pm 5\%$
Variable Resistor(VR) :Total resistance tolerance $\pm 20\%$
Remaining Resistance : Value less than 1%



PT SERIES

Applicaton notes

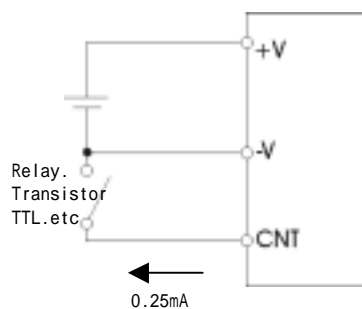
On/Off Control(CNT)

Without turning the input on and off, the output, can be enabled and disabled using this fuction. This fuction is useful for sequence control when building multiple output power supplies. This control circuit is on the input side using the CNT terminal pin. CNT's ground is the input -V terminal. When not using this fuction, open CNT to input -V terminal

TTL compatible. However, the maximum voltage applied to the CNT terminal is 7V, and the maximum reverse voltage is 0.7V. The sink current at CNT is 0.25mA.

. ON/OFF control can also be exercised by opening or closing the contacts of switch or relay, or by operating a transistor as a switch in series with the CNT terminal. (Openong -V to CNT will produce an output, shorting that short will cut the output)

. Standard remote, ON/OFF control circuit is provided in the primary circuit. For secondary control, isolation can be achieved through use of a potocoupler or relay.



CNT level for INPUT -V	OUTPUT
H(More than 2.5V) OR Open	ON
L(Less than 0.8V) OR Short	OFF

Maximum Line Regulation

Maximum line regulation is maximum output voltage change when the input volt is slowly varied within the input voltage range. The measurement point for the input and output voltage are $\pm V_{in}$, $\pm V_{out}$ respectively.

Maximum Load Regulation

Maximum load regulation is maximum output voltage value change when varing the load current slowly within the stadnard output current range. The measurement point for the input and output voltage are $\pm V_{in}$, $\pm V_{out}$ respectively

Operation Temperature

The basetemperature range for PT series is from -20 to 71

Operation Humidity

Avoid the buildup of condensation on or in the power module

Storage Temperature

Please note that sudden temperature changes can cause condensation buildup, and other harmful aff-ects to each terminal solder

Storage Humidity

High temperature and humidity can cause the terminal on the module to oxidize. The quality of the solder will become worse.

PT SERIES

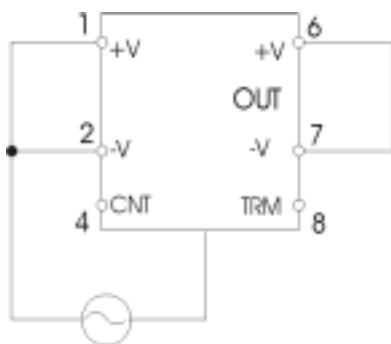
Applicaton notes

Withstand Voltage

The power module is designed to withstand 500V AC between the input to the case , input to output and output to case for 1 minute.

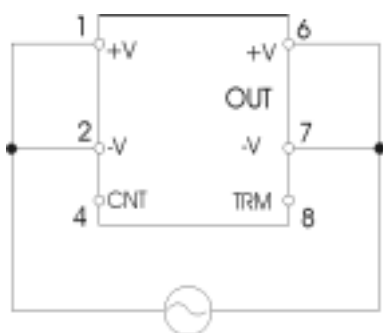
For the withstand voltage test, the applied voltage must be increased gradually from zero to the testing value, and then decreased gradually at shut down . Especially stay away from use of a timer. Where a pulse of several times the applied voltage can be generated

input-case



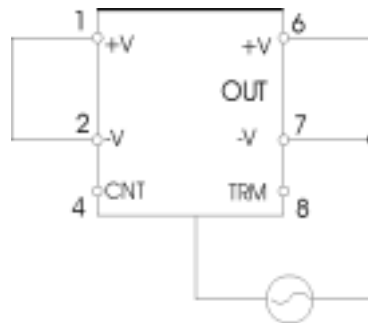
ex: PTS15
500VAC, one minute, 5mA

input-output



ex: PTS15
500VAC, one minute

output-case

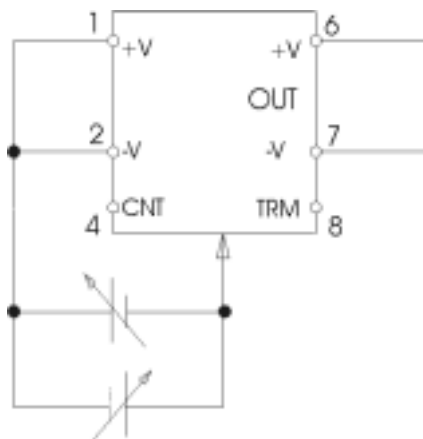


ex: PTS15
500VAC, one minute

Isolation Resistance

The isolation resistance is more than 100M at 500 VDC when tested with a DC isolation tester between the output and the case. Make sure that during testing, the isolation tester does not produce a high pulse when the applied voltage is varied. Ensure that the tester is fully discharged after the test.

input-case

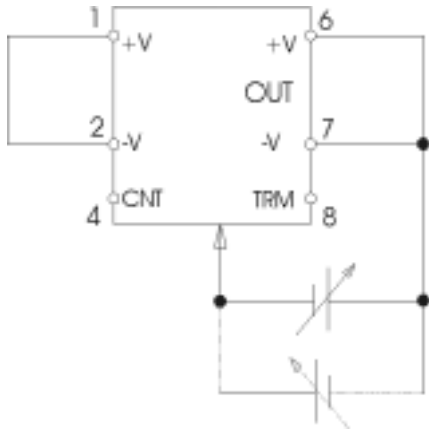


ex: PTS15
500VDC, more than 100M

PT SERIES

Applicaton notes

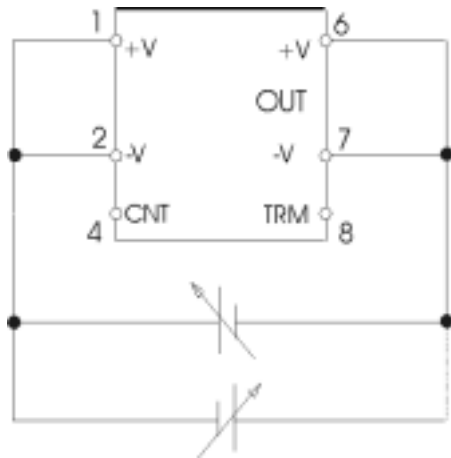
output-case



ex: PTS15

500VDC, more than 100M

output-case

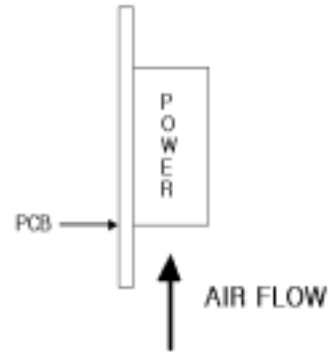


ex: PTS15

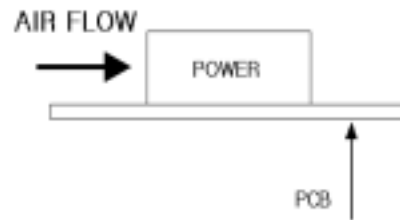
500VDC, more than 100M

Cooling

Please adjust air flow to prevent the temperature to rises during using this product.



VERTICAL MOUNTING



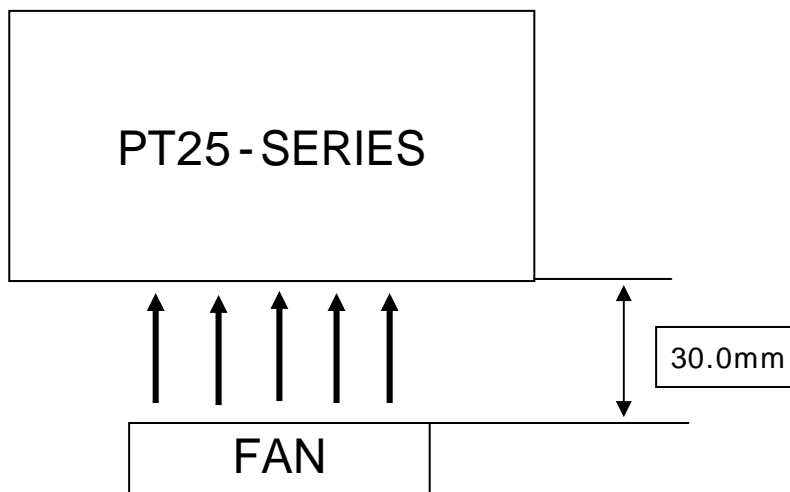
HORIZONTAL MOUNTING

PT SERIES

Application notes

FAN

PT25 Series where passed the CE Certificate conditionally under added external fan like below the structure diagram.



<TOP VIEW>

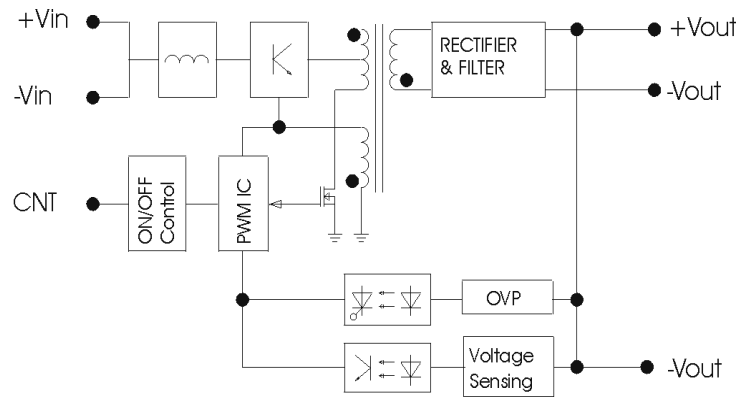
External fan: DC12V, min 0.7A, min 5.76cfm, UL recognized fan

PT SERIES

Applicaton notes

Block Diagrams

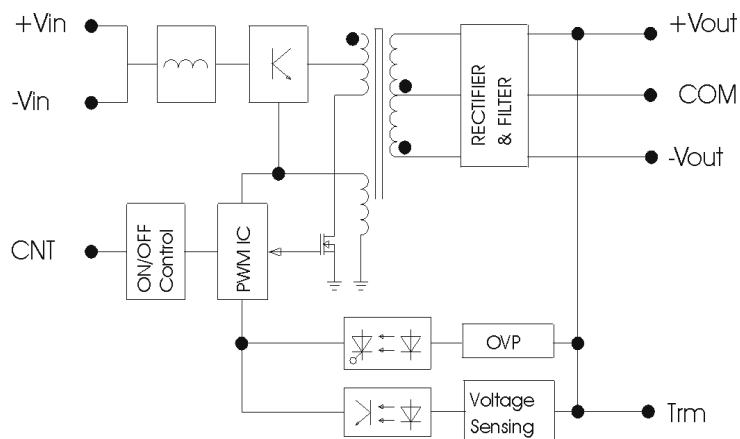
PTS15



Circuit topology : flyback

Switching Frequency : 250Khz(fixed)

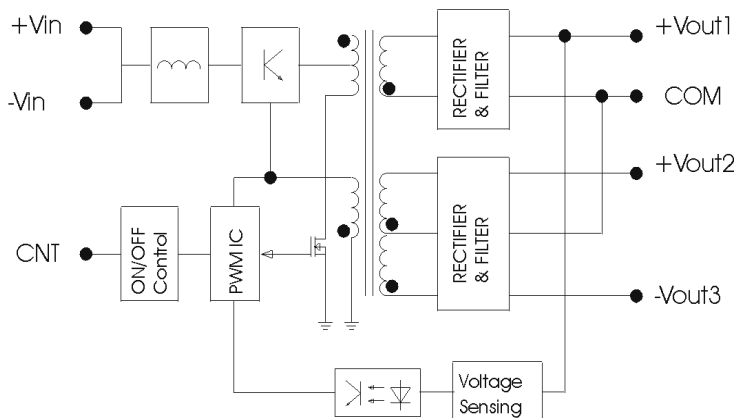
PTD15



Circuit topology : flyback

Switching Frequency : 250Khz(fixed)

PT15



Circuit topology : flyback

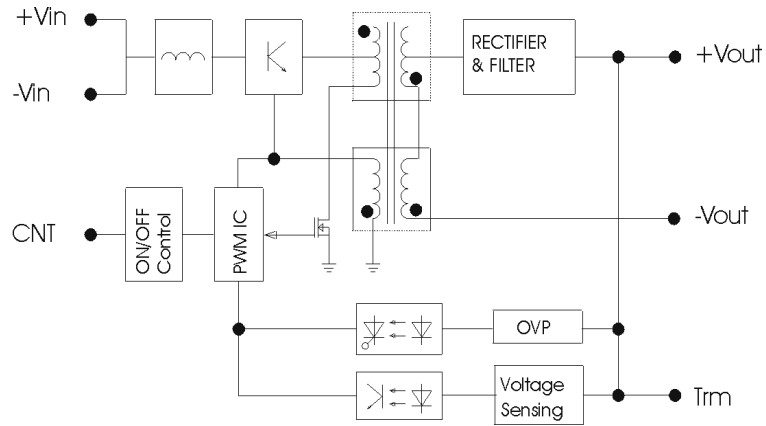
Switching Frequency : 250Khz(fixed)

PT SERIES

Applicaton notes

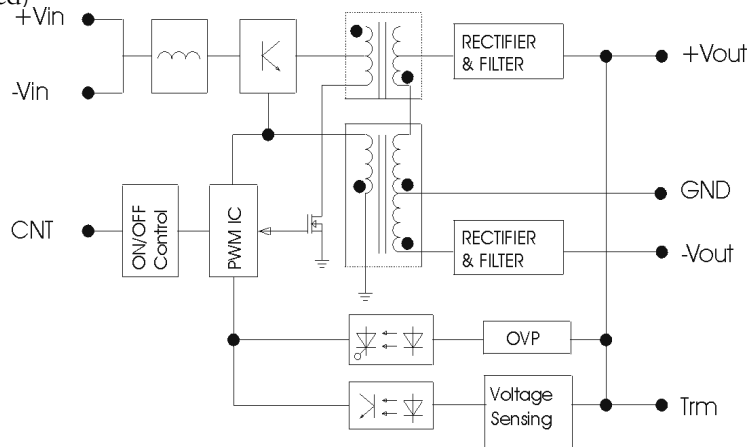
Block Diagrams

PTS25



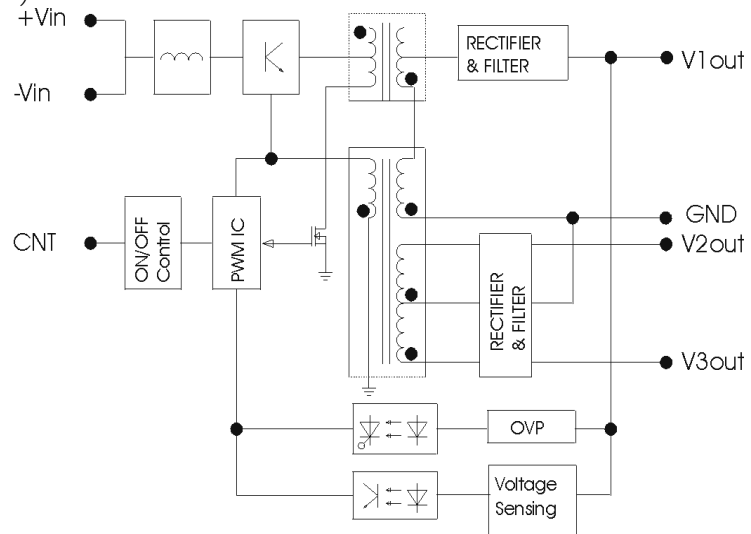
Circuit topology : flyback , forward
 Switching Frequency : 250Khz(fixed)

PTD25



Circuit topology : flyback
 Switching Frequency : 250Khz(fixed)

PT25



Circuit topology : flyback
 Switching Frequency : 250Khz(fixed)