

60W DC-DC Converter P60A-Series



PHI-CON

- Offer single, dual and triple output
- 50 to 60 W Output power
- 2:1 Wide input voltage range
- International safety standard approval
- Six-Sided continuous shield
- High efficiency up to 86%
- Short circuit protection



Model selection guide

Typ	Input		Output 1		Output 2 (or Dual Output)		Efficiency typ.	Output Power
	nominal voltage	current no load	voltage	current	voltage	current		
	[V _{DC}]	[mA]	[V _{DC}]	[A]	[V _{DC}]	[A]	[%]	[W]
Single output								
P60A12S05P	9-18	20	5.0	12.0			79	60
P60A12S12P	9-18	20	12.0	5.0			82	60
P60A12S15P	9-18	20	15.0	4.0			82	60
P60A12S24P	9-18	20	24.0	2.5			84	60
P60A24S05P	18-36	15	5.0	12.0			80	60
P60A24S12P	18-36	15	12.0	5.0			84	60
P60A24S15P	18-36	15	15.0	4.0			84	60
P60A24S24P	18-36	15	24.0	2.5			85	60
P60A48S05P	36-72	10	5.0	12.0			83	60
P60A48S12P	36-72	10	12.0	5.0			85	60
P60A48S15P	36-72	10	15.0	4.0			85	60
P60A48S24P	36-72	10	24.0	2.5			86	60
Dual output								
P60A12D05P	9-18	20	5.0	5.0	5.0	5.0	78	50
P60A12D12P	9-18	20	12.0	2.5	12.0	2.5	80	60
P60A12D15P	9-18	20	15.0	2.0	15.0	2.0	80	60
P60A12D512P	9-18	20	5.0	5.0	12.0	2.5	79	55
P60A24D05P	18-36	15	5.0	5.0	5.0	5.0	80	50
P60A24D12P	18-36	15	12.0	2.5	12.0	2.5	82	60
P60A24D15P	18-36	15	15.0	2.0	15.0	2.0	82	60
P60A24D512P	18-36	15	5.0	12.0	12.0	2.5	80	60
P60A48D05P	36-72	10	5.0	5.0	5.0	5.0	80	50
P60A48D12P	36-72	10	12.0	2.5	12.0	2.5	84	60
P60A48D15P	36-72	10	15.0	2.0	15.0	2.0	84	60
P60A48D512P	36-72	10	5.0	12.0	12.0	2.5	81	60
Triple output								
P60A12T512P	9-18	20	5.0	5.0	± 12.0	± 1.25	78	55
P60A24T512P	18-36	15	5.0	5.0	± 12.0	± 1.25	79	55
P60A48T512P	36-72	10	5.0	5.0	± 12.0	± 1.25	80	55

Suffix "P" PCB mounting type, heat sink will be added on module.

Suffix "T" Chassis mounting type, (terminal block) heat sink or fan force cooling.

Indicate suffix when order!

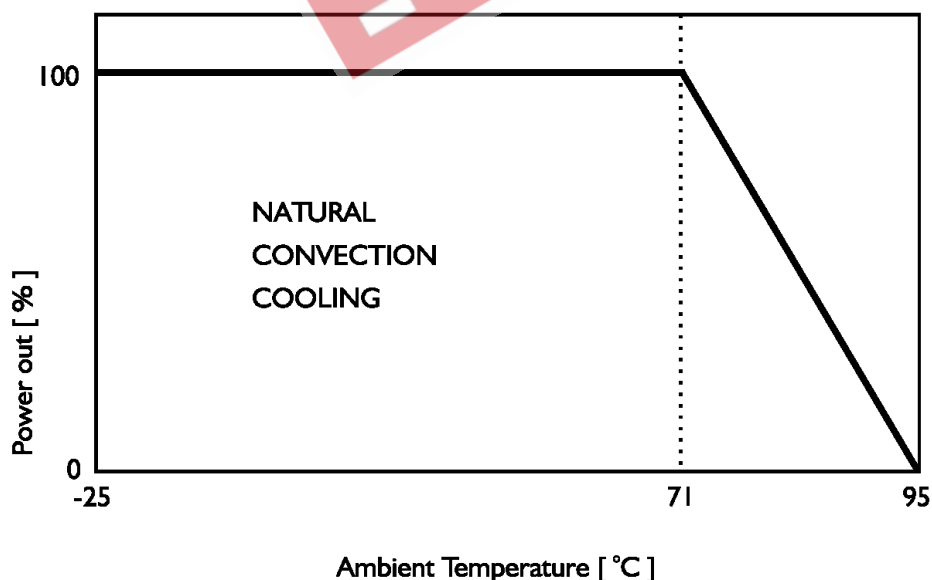
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Specifications

Input	
Voltage range	9-18 V _{DC} 18-36 V _{DC} 36-72 V _{DC}
Filter	Pi-type
Input reversed protection	Shunt diode built in, external fuse recommended !
Output	
Output Power	60 W max.
Voltage accuracy (full load and nominal V _{in})	±1%
Voltage adjustability	±10%
Ripple and noise (at 20 MHz BW)	± 1% of V _{out}
Short circuit	Continuous
Line voltage regulation (I _{out} nom, V _{in} min... V _{in} max)	±1%
Load voltage regulation (I _{out} min... I _{out} nom)	Single output model: ± 2% Dual output model: ±2% Triple output model: ±5%
Transient recovery time @ 25% load, step changed	500 μs
Temperature coefficient	± 0.02% / °C, max
Minimum load	Single: and Dual: 0% +5V of triple output 0% ±12V of triple output 20%

General	
Efficiency	See table
Switching frequency	80 kHz, typ.
Environmental	
Operating temperature ambient	-25°C to +95°C (with derating, see diagram)
Operating temperature case	+95 °C, max.
Storage temperature range	-25 °C to +100 °C
Cooling	Free air convection
MTBF according to MIL-HDBK-217F, GF40	122,500 hrs
Physical	
Dimensions "P" model	3.5 x 5.5 x 1.4 inches 88.9 x 139.7 x 35.6 mm
Dimensions "T" model	3.5 x 5.5 x 1.29 inches 88.9 x 139.7 x 32.9 mm
Weight	"P" Model 690 g "T" Model 570 g
Case material	metal
Isolation	
Rated voltage	1500 V _{DC} , min
Resistance	10 ⁹ Ω, min.
Remote control	
Remote control on	Open or > + 5.5 V _{DC}
Remote control off	Short or 0V ... < + 1.8 V _{DC} referenced to - Input, pin 2
Shutdown idle current	10mA

Derating

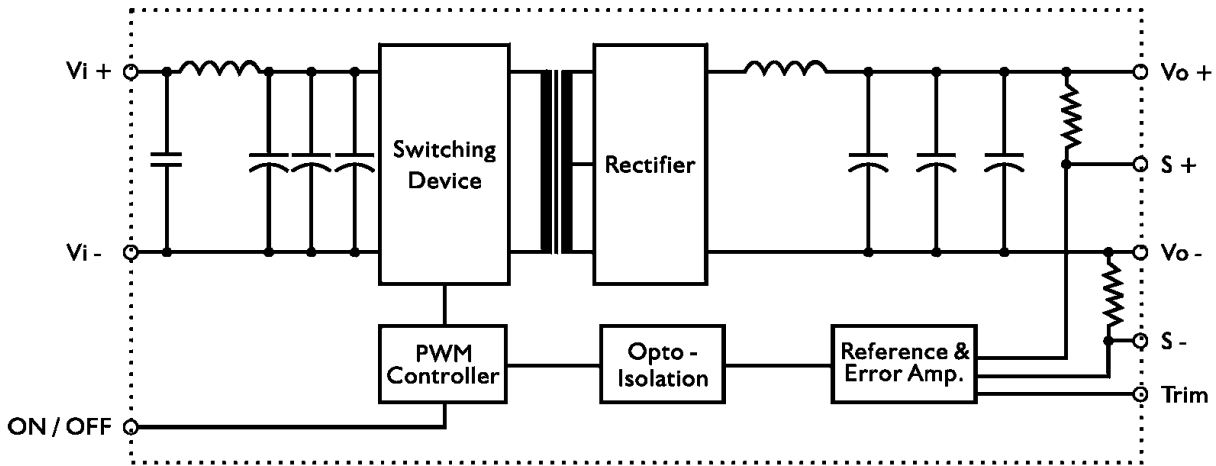


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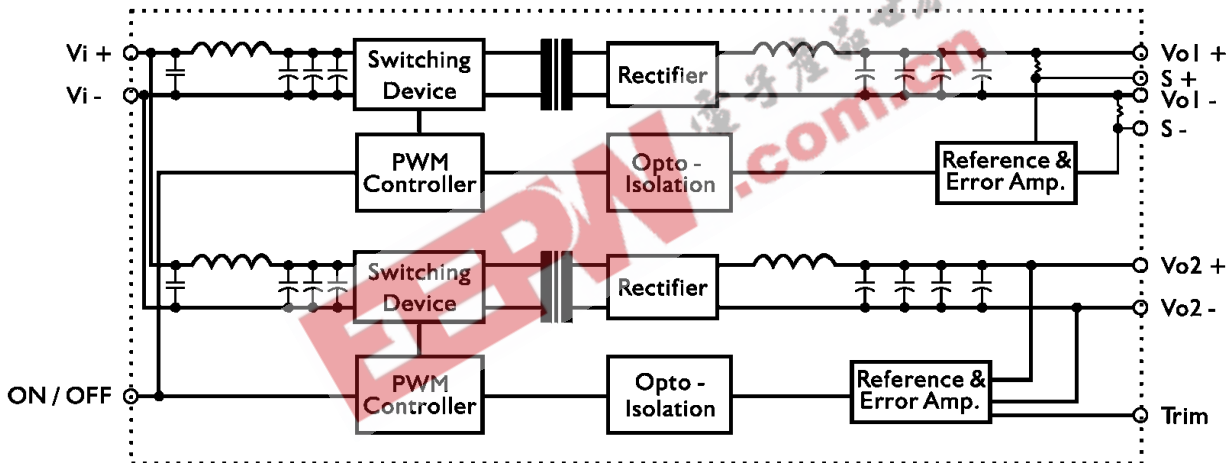


Internal circuit schematic

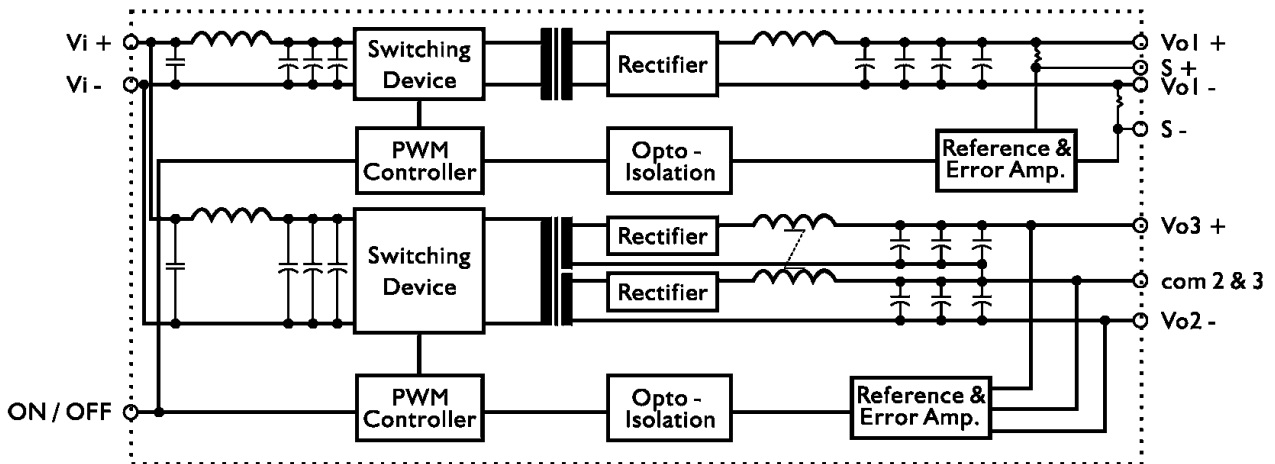
Block diagram for P60A series with single output



Block diagram for P60A series with double output



Block diagram for P60A series with triple output



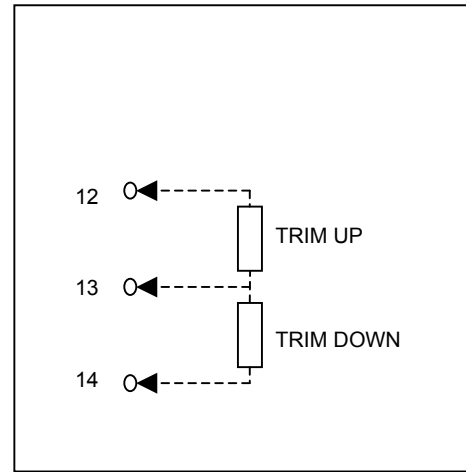
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Pin connections

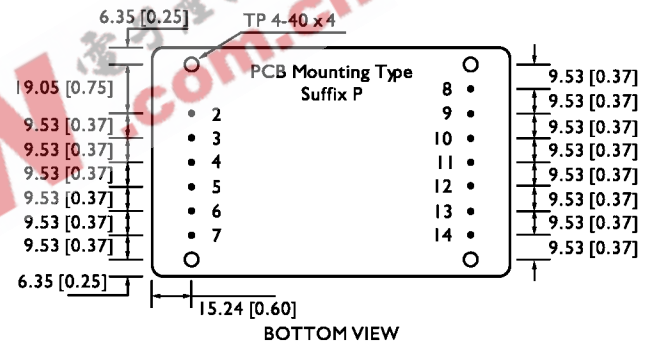
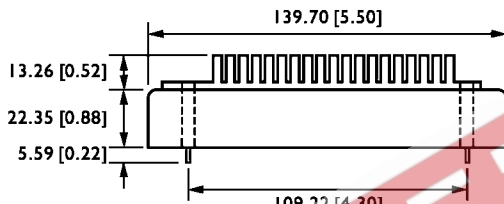
Pin	Single	Dual	Triple
1	Omitted	Omitted	Omitted
2	- Input	- Input	- Input
3	- Input	- Input	- Input
4	+ Input	+ Input	+ Input
5	+ Input	+ Input	+ Input
6	Remote CTRL	Remote CTRL	Remote CTRL
7	NC	NC	NC
8	- Output	- Sense / Trim up	- Sense / Trim up
9	- Output	- Output	- Output
10	+ Output	+ Output	+ Output
11	+ Output	+ Sense/ trim down	+ Sense/ trim down
12	- Sense / Trim up	- Output 2	- Output 2
13	TRIM	TRIM	Common -Vo 2 & +Vo 3
14	+ Sense/ trim down	+ Output 2	+ Output 3

Trimming

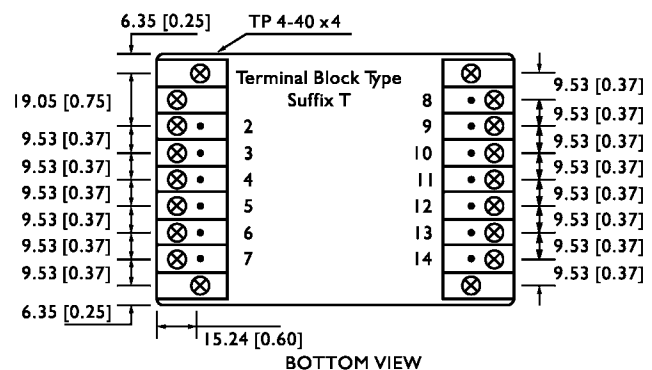
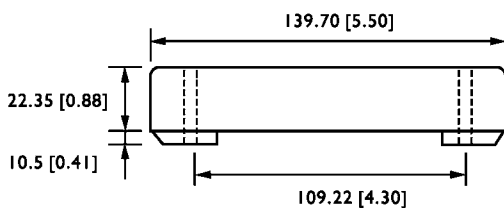


Dimensions

CASE : HH- P- 60



CASE : HH- T



Life Support Policy: HY-LINE does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user. Rev: 11 / 2004 f