

DC/DC

5 to 7.5 Watts

Single/Dual Outputs

HA/HP Series

- Surface mount technology
- MOSFET design
- 4:1 ultra-wide input range
- Continuous short circuit protection
- Six-sided shielding
- Regulated outputs
- Output voltage tracking (dual outputs)

The HA/HP Series features the latest in MOSFET design, state-of-the-art surface mount technology, and offers a 4:1 ultra-wide input range, efficiencies greater than 75% (typ). Features include Pi input filter to reduce input reflected ripple, continuous short circuit protection, and excellent line and load regulation of $\pm 0.25\%$ for line and $\pm 0.1\%$ load. Additional standard features include 500 Vdc input/output isolation and an operating temperature range of -25°C to $+71^{\circ}\text{C}$ with no derating. In addition, the HA/HP Series offers output voltage tracking to protect power sensitive devices requiring both plus and minus voltages. All models are packaged in a six-sided shielded miniature case measuring only 2.0" x 2.0" x 0.4" high.

Applications

The HA/HP Series is ideally suited for sensitive applications in digital and analog requiring low noise, i.e., telecommunication, process control, automatic and portable test equipment.

**SEMICONDUCTOR
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Specifications

INPUT

Reflected Ripple Filtering	< 10 mA p-p All Models
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OUTPUT

Voltage Balance	1% of absolute value of - Vdc Out
Voltage Tolerance	$\pm 1\%$
Voltage Tracking	Yes (ref. to - Vdc Out)
Ripple and Noise (PARD)	10 mV p-p (typ.); 30 mV p-p (max.)*
Short Circuit Protection	Current Limit, Continuous Auto Restart
Temperature Coefficient	0.02%/°C max.

GENERAL

Regulation:	Fixed 5 V In	Wide Range In
Line	$\pm 0.25\%$	$\pm 0.25\%$
Load Single	$\pm 0.1\%$	$\pm 0.1\%$
Load Dual	$\pm 0.1\%$	$\pm 0.1\%$
Efficiency	68% (typ.) Fixed Input	75% (typ.) Wide Input Range
I/O Isolation	500 Vdc	
Switching Frequency	50 kHz (typ.) Fixed Input	200 kHz (typ.) Wide Input Range

ENVIRONMENTAL

Operating Temperature Range	-25°C to $+71^{\circ}\text{C}$; No Derating
Storage Temperature Range	-40°C to $+105^{\circ}\text{C}$
Cooling	Free-air Convection

NOTE: * Measured with 3.3 MF 25V tantalum capacitor across each output.

All specifications are typical at nominal line and full load at $+25^{\circ}\text{C}$ unless otherwise noted. Specifications subject to change without notice.

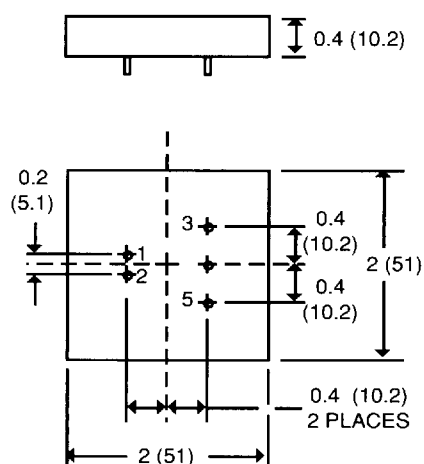


HA/HP Series Ordering Information

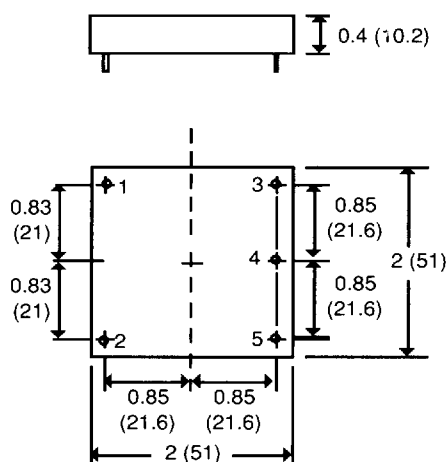
Input Voltage	Output Voltage	Output Current	Case 1 Model Number	Case 2 Model Number
4.5-5.5 Vdc	5 Vdc	1000 mA	HA11-100-5	HP11-100-5
9-36 Vdc	5 Vdc	1000 mA	HA11-100-18	HP11-100-18
20-72 Vdc	5 Vdc	1000 mA	HA11-100-48	HP11-100-48
4.5-5.5 Vdc	9 Vdc	660 mA	HA19-066-5	HP19-066-5
9-36 Vdc	9 Vdc	660 mA	HA19-066-18	HP19-066-18
20-72 Vdc	9 Vdc	660 mA	HA19-066-48	HP19-066-48
4.5-5.5 Vdc	12 Vdc	600 mA	HA12-060-5	HP12-060-5
9-36 Vdc	12 Vdc	600 mA	HA12-060-18	HP12-060-18
20-72 Vdc	12 Vdc	600 mA	HA12-060-48	HP12-060-48
4.5-5.5 Vdc	15 Vdc	500 mA	HA13-050-5	HP13-050-5
9-36 Vdc	15 Vdc	500 mA	HA13-050-18	HP13-050-18
20-72 Vdc	15 Vdc	500 mA	HA13-050-48	HP13-050-48
4.5-5.5 Vdc	±12 Vdc	±300 mA	HA22-060-5	HP22-060-5
9-36 Vdc	±12 Vdc	±300 mA	HA22-060-18	HP22-060-18
20-72 Vdc	±12 Vdc	±300 mA	HA22-060-48	HP22-060-48
4.5-5.5 Vdc	±15 Vdc	±250 mA	HA23-050-5	HP23-050-5
9-36 Vdc	±15 Vdc	±250 mA	HA23-050-18	HP23-050-18
20-72 Vdc	±15 Vdc	±250 mA	HA23-050-48	HP23-050-48

Dimensions and Connections

CASE 1



CASE 2



PIN CONNECTIONS

Single Output

- PIN 1. + Vdc In
2. - Vdc In
3. + Vdc Out
4. No Pin
5. - Vdc Out

Dual Output

- PIN 1. + Vdc In
2. - Vdc In
3. + Vdc Out
4. Common Out
5. - Vdc Out

NOTES:

- Five pins 0.040 (1.0) dia. x 0.20 (5.1) lg min.
- All dimensions are in inches and (mm).