

SINGLE OUTPUT 60A DC-DC CONVERTERS

— 36-75V Input, 3.3V or 5V Output —

Features

- Tightly Regulated 3.3V or 5V Output
- 36-75 VDC Input (48V Nominal)
- Up to 300W Continuous Output Power
- No Minimum Load Requirement
- High Efficiency
- Built-in EMI Suppression
- Remote On/Off
- Fixed Operating Frequency
- Fast Transient Response
- Power Good Signal
- Frequency Synchronization
- Under-Voltage Lockout
- Over-Voltage Shutdown
- Short-Circuit Protection
- Thermal Protection
- Industry Standard Full Brick Package
- Optional Installed Heat Sinks
- Two-Year Warranty
- 1 Million Hour MTBF



HD1-300 Characteristics

Input Voltage.....	36-75 VDC (48V, nominal).
EMI Suppression	Pi input filter, standard.
Isolation Voltage	1500V, input to output, for one minute.
Continuous Output Power	Total output power should not exceed 200W for model HD1-300-3D or 300W for model HD1-300-5D.
DC Output.....	See Electrical Characteristics table.
Base-Plate Temperature	+100°C, maximum (Note 2): Thermal shutdown circuitry with automatic recovery.
Output Voltage Adjustment.....	Adjustable by $\pm 10\%$.
Short-Circuit Protection	Continuous cycle-by-cycle current limiting with automatic recovery.
Under-Voltage Protection	Lockout activated at 34V-35.5V input; automatic recovery with 2V-3V hysteresis (typical).
Over-Voltage Protection	HD1-300-3D, shutdown at 3.9V, typical; HD1-300-5D, shutdown at 6.5V, typical; RESET at $V_{IN} = 0V$.
Transient Response.....	200 μs recovery after half-load to full load step change to within 1% of the regulation band with no more than 5% deviation.
Frequency of Operation.....	400 kHz, fixed.
Design Topology	Forward converter.
Remote Shutdown	CMOS and open-collector TTL compatible. Choice of active high or active low ENABLE: See following table for control conditions.
Power Good Signal	TTL HIGH = V_{OUT} within tolerance.
Operating Temperature Range.....	-40°C to +100°C (base plate).
Temperature Coefficient	$\pm 0.02\%/^{\circ}C$ over the operating temperature range.
Relative Humidity	0% to 95%, non-condensing.

HD1-300 Characteristics (Continued)

Relative Humidity	0% to 95%, non-condensing.
Altitude	0 to 10,000 feet.
Storage Temperature Range	-40°C to +100°C.
Storage Humidity	0% to 95%, non-condensing.
Mean Time Between Failures	>1,000,000 hours, calculated (ground benign, TA=+40°C).

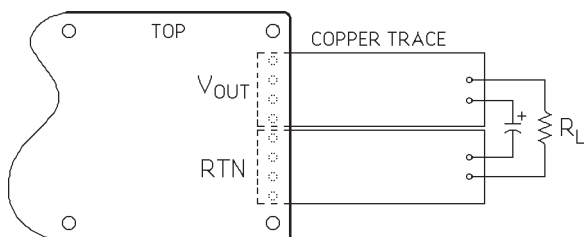
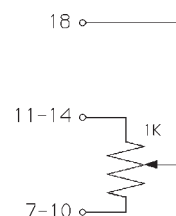
Electrical Characteristics

Model Number	Output Voltage (V)	Output Current Min. (A)	Output Current Max. (A)	Input Current (A)	Output Voltage Tolerance	Ripple & Noise ⁴ (mV _{pp})	Line Regulation	Load Regulation	Efficiency (Typ.)
HD1-300-3D	3.3	0	60	5.1	±1.0%	100	±0.2%	±0.5%	80%
HD1-300-5D	5.0	0	60	7.4	±1.0%	100	±0.2%	±0.5%	84%

Notes

1. Use of an external input line fuse is recommended: Use a 10A/125V slow-blow fuse.
2. For uncompromised operation, the base-plate temperature of HD1-300 must be kept below the maximum of +100°C. Good engineering practice in observation of that limit, including use of auxiliary heat sinks or forced air cooling, is entirely the responsibility of the user.
3. All measurements are at nominal input, full load, and +25°C, unless otherwise specified
4. Ripple and noise figures are maximum values. See application note below.
5. Peak-to-peak and RMS metering equipment must have a 20 MHz frequency response with probes and cables that maintain a frequency response of 20 Hz to 20 MHz. Output ripple and spikes are measured directly at the output terminals of the converter with a 0.1 µF ceramic capacitor. The probe ground band must make direct contact with the output return or the common terminal of the converter to prevent noise measurement errors.

Output Adjustment



Ripple/Noise Reduction

In applications with loads between two and three inches from the HD1-300 module, the circuit board's trace inductance can be used in conjunction with a 47 µF, low-ESR capacitor across each load to lower ripple and noise to 50 mVpp.

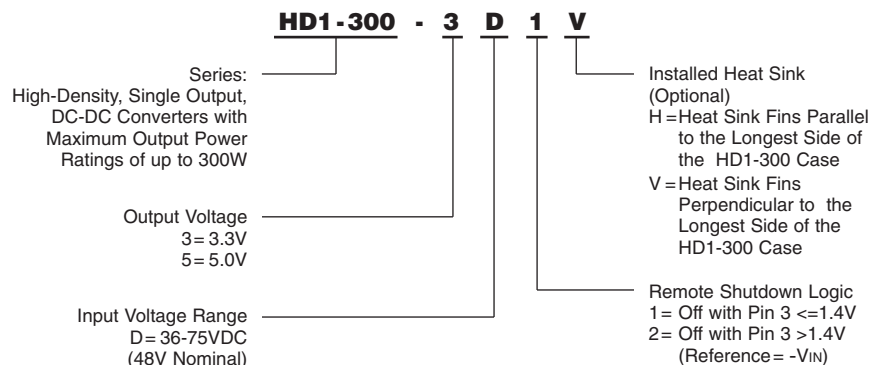
Remote On/Off

Model	V _{Pin3} *	Output
HD1-300-3D1	≤ 1.4V	Off
	> 1.4V to V _{IN(MAX)} §	On
HD1-300-3D2	≤ 1.4V	On
	> 1.4V to V _{IN(MAX)} §	Off
HD1-300-5D1	≤ 1.4V	Off
	> 1.4V to V _{IN(MAX)} §	On
HD1-300-5D2	≤ 1.4V	On
	> 1.4V to V _{IN(MAX)} §	Off

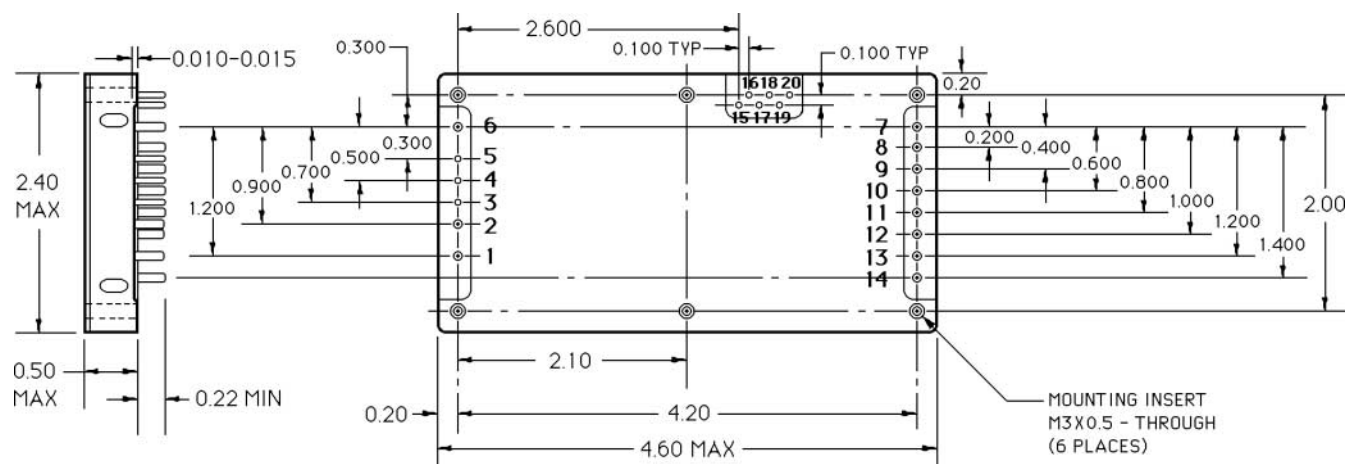
* Reference = -V_{IN}.

§ Or open.

Model Selection Guide



Mechanical Outline and Output Configuration



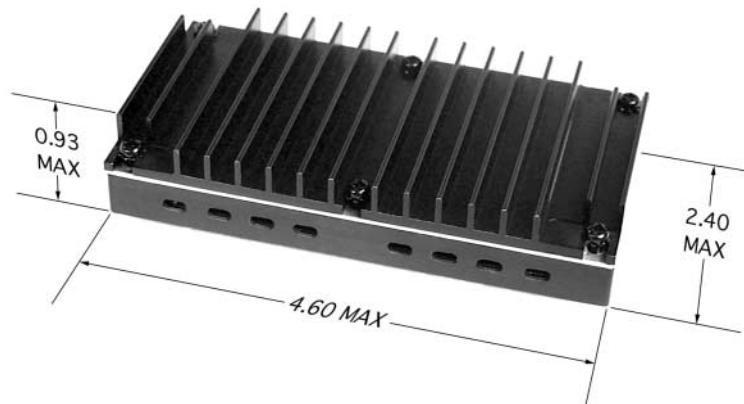
Pin-Out

Pin	Function	Diameter ³
1	+VIN	0.060
2	-VIN	0.060
3	On/Off	0.040
4	Sync In	0.040
5	Sync Out	0.040
6	Case	0.060
7	Return	0.060
8	Return	0.060
9	Return	0.060
10	Return	0.060
11	VOUT	0.060
12	VOUT	0.060
13	VOUT	0.060
14	VOUT	0.060
15	Power Good	0.040
16	No Connection	0.040
17	No Connection	0.040
18	Output Adj.	0.040
19	+Sense	0.040
20	-Sense	0.040

Notes:

1. Dimensions shown are in inches.
2. Outline tolerances = 0.00 ±0.010 inch.
0.000±0.007 inch.
3. Pin diameter tolerance = ±0.002 inch.

Optional Installed Heat Sinks



Option 'V'



Option 'H'