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- Low Profile, 2 x 2 x 0.375 Inch Package
- Wide -30°C to +75°C Temperature Range
- ± 0.03% Max. Line/Load Regulation
- Low Output Noise & Ripple, <10 mV Pk-Pk
- UL 1950 Approved, File No. E140645
- CSA 22.2 Approved, File No. LR89494
- >1,000,000 Hours MTBF

600H, 900H, 1200H Series

General Description

The **600H, 900H** and **1200H** series are a family of compact, high efficiency 6W, 9W and 12W DC/DC converters. All models have been approved to the latest revisions of UL 1950 and CSA 22.2 safety standards. High performance features include 500 VDC input/output isolation, efficiency as high as 75% and a maximum line/load regulation of only ±0.03%. Fifty four models provide single and dual outputs of 5, 12, 15, ±5, ±12 or ±15 VDC from input voltage busses of 5, 12, 18, 24, 28 or 48 VDC. Standard features include continuous short circuit protection with automatic recovery, an internal π filter to reduce reflected ripple current and maximum output ripple and noise of only 10 mV peak-to-peak.

Long field life is insured by the extensive reliability screening performed at **CDI**. As part of normal production processing, each unit is subjected to 72 hours of burn-in that includes power cycling and load switching. The MTBF, per MIL-HDBK-217F, is greater than 1,000,000 hours.

All **600H, 900H,** and **1200H** models are packaged in compact, low profile 2 x 2 x 0.375 inch metal cases. Continuous six-sided shielding virtually eliminates radiated emissions. This miniature size yields a power density as high as 8W/in³. Operation is specified over the wide operating temperature range of -30°C to +75°C with no derating required. Cooling is by free air convection.

Electrical Specifications

Input Specifications:

Input Voltage Range	See Table 1
Input Filter	π(Pi) Network
Reverse Polarity Input Current	5A
Reflected Ripple Current	See Model Selection Guide

Output Specifications:

Output Voltage and Current [1]	See Model Selection Guide
Output Voltage Accuracy	± 1%, Max.
Voltage Balance (Dual Outputs) [2]	± 50 mV Max.
Ripple & Noise (20 MHz BW)	10 mV Pk-Pk
Line Regulation	± 0.03% Max.
Load Regulation	± 0.03% Max.
Temperature Coefficient @ FL	± 0.01%/°C Max.
Temperature Coefficient Balance	± 0.005%/°C Max.
Voltage Stability Over 24 Hours	± 0.02%/kHrs.
Warm-up Drift @ FL	± 1.0% Max (Inc. TC)
Transient Response	20 µSec. Max.
Short Circuit Current Limit	Iout + 75%
Short Circuit Protection; Single Output Models	Continuous
Dual Output Models	Pout +75%
Short Circuit Restart	Automatic

General Specifications:

Efficiency	See Model Selection Guide
Isolation Voltage (1 min)	500 VDC, Min.
Isolation Resistance	10 °Ω
Isolation Capacitance	100 pF
CM Current Noise (20 MHz BW)	<1 mA Pk-Pk
Switching Frequency	125 kHz

Environmental Specifications:

Operating Temperature Range (Ambient)	-30°C to +75°C
Storage Temperature Range	-40°C to +125°C
Derating	None Required
Humidity	Up to 95% RH, Non-condensing
Cooling [3]	Free-air Convection
EMI/RFI	Six-Sided Continuous Metal Case

Physical Characteristics:

Size	2.0 x 2.0 x 0.375 inches (51 x 51 x 9.52 mm)
Weight	2.6 Oz (74g)
Case Material	Metal, Black Anodized
Shielding Connection	To Output Common

Reliability Specifications:

MTBF; Ground Benign, @ +25°C Ambient	1,053,086 Hours

Specifications typical @+25°C with nominal input voltage and under full output load conditions, unless otherwise noted. Specifications subject to change without notice.

Specification Notes

1. Total output power should not exceed the specified output ratings for any particular model.
2. Dual output units may be operated with unbalanced loads. Please contact the factory for information on the maximum power limits for individual outputs on specific models (again care must be taken not to exceed the overall power rating of a module.) Operating outputs in an unbalanced state may affect some specifications such as output accuracy. For more information on applying a specific model, please contact the factory.
3. Free-air convection cooling requires that the application be properly ventilated. Using a converter in a sealed application, or one in which air movement is severely restricted, could cause thermal runaway.

* For information on the standard conditions and methods used or approved by **CDI** to test DC/DC converter parameters, see the application note "Testing DC/DC converters" on page 92.

Table 1 - Input Voltage Range vs Output Load

Nominal Input (VDC)	Input Voltage Range (VDC) at:			
	20% Load	40% Load	60% Load	100% Load
5	4.30 - 6.00	4.40 - 5.70	4.55 - 5.60	4.65 - 5.25
12	10.3 - 15.0	10.4 - 14.6	10.6 - 13.6	10.9 - 13.2
18	15.5 - 22.5	15.7 - 21.6	15.8 - 20.4	16.4 - 19.8
24	20.4 - 30.0	20.6 - 29.0	21.0 - 27.0	21.6 - 26.4
28	24.2 - 36.0	24.5 - 34.0	24.9 - 31.8	25.2 - 30.8
48	41.3 - 60.0	42.0 - 58.0	42.3 - 54.4	43.2 - 52.8

Typical Applications:

- Telecommunications Equipment
- Data Processing Systems
- Mobile/Battery Powered Equipment
- Data Communications Equipment
- Distributed Power Networks

600H, 900H and 1200H Series

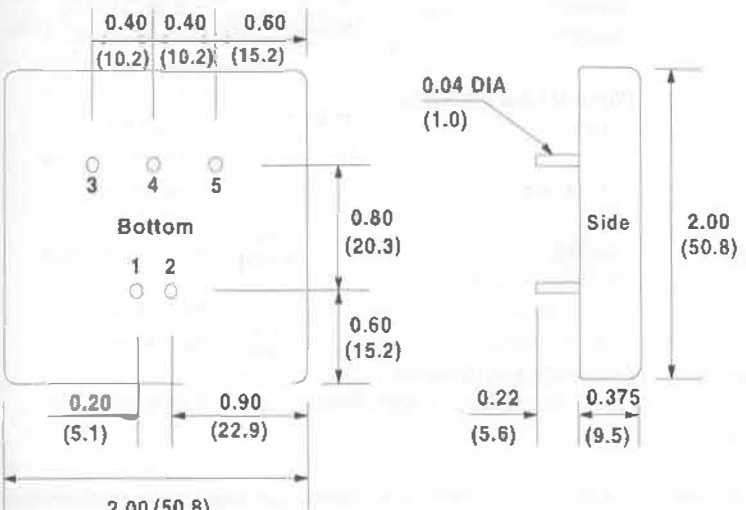
UL 1950 and CSA 22.2 APPROVED
6W, 9W & 12W SINGLE and DUAL OUTPUT
TIGHTLY REGULATED DC/DC CONVERTERS

Model Selection Guide

Model Number	Input				Output		Efficiency @FL (%)
	Nominal Voltage (VDC)	Current (mA)		Reflected Ripple (mA P-P)	Voltage (VDC)	Current (mA)	
		No-Load	Full-Load				
605D5H	5	140	1850	20	±5	±600	65
612D5H	5	140	1790	20	±12	±250	67
615D5H	5	140	1790	20	±15	±200	67
605D12H	12	60	765	10	±5	±600	65
612D12H	12	60	750	10	±12	±250	67
615D12H	12	40	685	10	±15	±200	73
605D18H	18	40	510	10	±5	±600	65
612D18H	18	40	475	10	±12	±250	70
615D18H	18	40	455	10	±15	±200	73
605D24H	24	30	385	5	±5	±600	65
612D24H	24	30	370	5	±12	±250	68
615D24H	24	30	335	5	±15	±200	75
605D28H	28	30	330	5	±5	±600	65
612D28H	28	30	285	5	±12	±250	75
615D28H	28	30	285	5	±15	±200	75
605D48H	48	20	190	5	±5	±600	65
612D48H	48	25	190	5	±12	±250	66
615D48H	48	20	170	5	±15	±200	73
905S5H	5	140	2770	20	5	1800	65
912S5H	5	140	2680	20	12	750	67
915S5H	5	140	2680	20	15	600	67
905S12H	12	40	1160	10	5	1800	65
912S12H	12	40	1000	10	12	750	75
915S12H	12	40	1000	10	15	600	75
905S18H	18	40	760	10	5	1800	66
912S18H	18	40	660	10	12	750	75
915S18H	18	40	660	10	15	600	75

Model Number	Input				Output		Efficiency @FL (%)
	Nominal Voltage (VDC)	Current (mA)		Reflected Ripple (mA P-P)	Voltage (VDC)	Current (mA)	
		No-Load	Full-Load				
905S24H	24	30	570	5	5	1800	66
912S24H	24	30	500	5	12	750	75
915S24H	24	30	490	5	15	600	75
905S28H	28	30	490	5	5	1800	66
912S28H	28	30	425	5	12	750	75
915S28H	28	30	425	5	15	600	75
905S48H	48	20	285	5	5	1800	66
912S48H	48	20	250	5	12	750	75
915S48H	48	20	250	5	15	600	75
1205D5H	5	160	3700	20	±5	±1200	65
1212D5H	5	160	3510	20	±12	±500	67
1215D5H	5	180	3400	20	±15	±400	70
1205D12H	12	40	1540	10	±5	±1200	65
1212D12H	12	40	1450	10	±12	±500	69
1215D12H	12	90	1360	10	±15	±400	73
1205D18H	18	40	1025	10	±5	±1200	65
1212D18H	18	40	955	10	±12	±500	70
1215D18H	18	40	965	10	±15	±400	70
1205D24H	24	25	750	5	±5	±1200	67
1212D24H	24	25	670	5	±12	±500	75
1215D24H	24	30	670	5	±15	±400	75
1205D28H	28	30	660	5	±5	±1200	65
1212D28H	28	30	580	5	±12	±500	74
1215D28H	28	30	560	5	±15	±400	76
1205D48H	48	20	390	5	±5	±1200	65
1212D48H	48	20	340	5	±12	±500	74
1215D48H	48	20	340	5	±15	±400	74

Mechanical Configuration



Pin-out

Pin	Single Output	Dual Output
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	N/C	Common
5	-V Output	-V Output

Note: All dimensions are typical in inches (mm).
Tolerance X.XX = ± 0.02, (± 0.5)
X.XXX = ± 0.010, (± 0.25)
N/C = No Connection

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