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- ▶ 0.360 inch Case Profile
- ▶ -55°C to +85°C Ambient Operation
- ▶ Wide 2:1 Input Voltage Range
- ▶ Input Filter meets requirements of MIL-STD-461C
- ▶ Meets MIL-STD-202 & MIL-STD-810F Test Conditions
- ▶ >700,000 Hours MTBF per MIL-HDBK-217F

## 1100 Series

### General Description

The **1100** series of 8W DC/DC converter modules combine innovative design techniques, conservative component selection and stringent test standards to achieve very high levels of reliability, performance and power density. Per MIL-HDBK-217F, the MTBF is greater than 700,000 hours (+25 °C ground benign) and greater than 125,000 hours for Airborne Inhabited. Twenty four models operate over 2:1 input ranges of 9 to 18, 18 to 36 or 36 to 72 VDC; providing single, dual or triple output combinations of 5, 12, 15,  $\pm 5$ ,  $\pm 12$ ,  $\pm 15$ ,  $5 \pm 12$  and  $5 \pm 15$  VDC. Standard features include 500 VDC input/output isolation, output ripple & noise of less than 1% and continuous short circuit protection. Efficiency is as high as 80%. A remote ON/OFF control input and internal  $\pi$  filter are standard on all units.

Long field life is insured by extensive reliability screening at CDI. All **1100** series units are manufactured to meet the stringent environmental test conditions of MIL-STD-202 and MIL-STD-810.

Each **1100** model is packaged in a very low profile 2.0 x 2.0 x 0.30 inch metal case. Six sided continuous shielding insures each converter meets the requirements of VDE 0871 Class B for radiated emissions. Full operation is specified over the wide temperature range of -55°C to +85°C with no derating or heatsinking required. Cooling is by free-air convection.

### Model Selection Guide

Model Number	Input				Output				Efficiency @FL (%)
	Voltage (VDC)		Current (mA)		Voltage (VDC) @ Current (mA)			Over Voltage (VDC)	
	Nominal	Range	No-Load	Full-Load	Primary	Aux #1	Aux #2		
1105S12	12	9 - 18	45	840	5 @ 1600			6.8	78
1112S12	12	9 - 18	45	877	12 @ 665			15.0	76
1115S12	12	9 - 18	45	877	15 @ 535			18.0	76
1105S24	24	18 - 36	34	422	5 @ 1600			6.8	79
1112S24	24	18 - 36	34	438	12 @ 665			15.0	76
1115S24	24	18 - 36	34	438	15 @ 535			18.0	76
1105S48	48	36 - 72	32	210	5 @ 1600			6.8	79
1112S48	48	36 - 72	32	220	12 @ 665			15.0	76
1115S48	48	36 - 72	32	220	15 @ 535			18.0	76
1105D12	12	9 - 18	45	830	±5 @ ±800			±6.8	80
1112D12	12	9 - 18	45	877	±12 @ ±335			±15.0	76
1115D12	12	9 - 18	45	877	±15 @ ±270			±18.0	76
1105D24	24	18 - 36	34	422	±5 @ ±800			±6.8	79
1112D24	24	18 - 36	34	438	±12 @ ±335			±15.0	76
1115D24	24	18 - 36	34	438	±15 @ ±270			±18.0	76
1105D48	48	36 - 72	32	210	±5 @ ±800			±6.8	79
1112D48	48	36 - 72	32	220	±12 @ ±335			±15.0	75
1115D48	48	36 - 72	32	220	±15 @ ±270			±18.0	75
1105/12T12	12	9 - 18	50	865	5 @ 1000	+12 @ 125	-12 @ 125	6.8/±15	77
1105/15T12	12	9 - 18	50	854	5 @ 1000	+15 @ 100	-15 @ 100	6.8/±18	78
1105/12T24	24	18 - 36	45	427	5 @ 1000	+12 @ 125	-12 @ 125	6.8/±15	78
1105/15T24	24	18 - 36	45	427	5 @ 1000	+15 @ 100	-15 @ 100	6.8/±18	78
1105/12T48	48	36 - 72	35	213	5 @ 1000	+12 @ 125	-12 @ 125	6.8/±15	78
1105/15T48	48	36 - 72	35	210	5 @ 1000	+15 @ 100	-15 @ 100	6.8/±18	79

## Typical Applications:

- ▶ Airborne/Avionics Equipment
- ▶ Automotive Equipment
- ▶ Process/Industrial Control Systems
- ▶ Medical Equipment
- ▶ Harsh Environments

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## 1100 Series ULTRA-LOW PROFILE HIGH RELIABILITY 8W DC/DC CONVERTERS

## Electrical Specifications

### Input Specifications:

Input Voltage Range	See Model Selection Guide
Input Filter	Dual input $\pi$ (Pi) Network. Differential and common mode type. Meets the conditions of MIL-STD-461C CE01 test methods.
Reverse Polarity Input Current	12A, Max.
Short Circuit Current Limit	150% of I Input
Reflected Ripple Current	10 mA, Pk-Pk
Transient Protection	600W @ 1mSec.
Remote On/Off Control;	
Supply On	Open Collector/Drain or Open Circuit
Supply Off	0 VDC to 0.8 VDC
Logic Input Reference	Negative (-) Input
Logic Compatibility	TTL Open Collector or CMOS Open Drain
Standby Current	32 mA

### Output Specifications:

Voltage and Current Ratings	See Model Selection Guide
Output Voltage Accuracy;	
Single Output Models	$\pm 1\%$ , Max.
Dual Output Models	$\pm 1\%$ , MAX.
Triple Output Models; Primary	$\pm 1\%$ , Max.
Auxiliaries	$\pm 5\%$ , Max.
Voltage Adjustment <sup>(1)</sup>	$\pm 5\%$
Voltage Balance <sup>(2)</sup> ;	
Dual Output Models	$\pm 1\%$ , Max.
Triple Output Models; Auxiliaries	$\pm 1\%$ , Max.
Ripple & Noise, 20 MHz BW	1% Pk-Pk of Vout
Line Regulation;	
Single Output Models	$\pm 0.5\%$
Dual Output Models	$\pm 0.5\%$ , Max.
Triple Output Models; Primary	$\pm 0.2\%$ , Max.
Auxiliaries	$\pm 5.0\%$ , Max.
Load Regulation;	
Single Output Models	$\pm 0.2\%$ , Max.
Dual Output Models	$\pm 1.0\%$ , Max.
Triple Output Models; Primary	$\pm 0.5\%$ , Max.
Auxiliaries	$\pm 5.0\%$ , Max.
Minimum Load	10%
Temperature Coefficient @ FL	$\pm 0.01\%/^{\circ}\text{C}$
Transient Recovery Time <sup>(3)</sup>	200 $\mu\text{Sec}$ Max. to 1% of Final Value
Short Circuit Protection <sup>(4)</sup>	All outputs, by input current limiting
Over Voltage Protection	See Model Selection Guide

### General Specifications:

Efficiency <sup>(5)</sup>	See Model Selection Guide
Dielectric Voltage Isolation	500 VDC, Min.; Primary to secondary for 1 minute, per the requirements of MIL-STD-202F, Method 301
Isolation Resistance	100 M $\Omega$ per requirements of MIL-STD-202F, Method 302, Test condition B.
Acceleration	Per MIL-STD-810E, Method 513.4, Procedure II. Operational test (Centrifuge) 12g's (Manned Aerospace Vehicles).
Shock	Per MIL-STD-810E, Method 516.4, Procedure I. Functional shock 40g's.
Vibration	Per MIL-STD-810E, Method 514.4, Procedure I, Category 6 (Equipment installed in Helicopters).
Altitude	Per MIL-STD-810E, Method 500.3, Procedure III. Rapid decompression, 40,000 ft.
Humidity	Per MIL-STD-810E, Method 507.3, Procedure I. Natural non-hazardous items, cycle 1, 240 hours.
Switching Frequency	100 kHz, Min.

### Environmental Specifications:

Operating Temperature Range	-55°C to +85°C Ambient
Storage Temperature Range	-60°C to +125°C
Thermal Resistance <sup>(6)</sup>	4°W (Internally Dissipated)
Cooling	Free-air Convection
EMI/RFI	Meets the requirements of MIL-STD-461C, RE01 and VDE 0871, class B for radiated emissions (see "Shielding" below)

### Physical Characteristics:

Case Size	2.0 x 2.0 x 0.30 inches (51 x 51 x 7.5 mm)
Case Material	Coated Metal
Weight	2.8 Oz (79g)
Shielding	Six-sided, Continuous
Shielding Connection;	
12V Input Models	Pin 3 (- Input)
24V Input Models	Pin 3 (- Input)
48V Input Models	Pin 4 (+ Input)

### Reliability Specifications:

MTBF, Ground Benign @+25°C Ambient	703,482 Hours
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