1000FPW Series

KEY FEATURES

- 10W Continuous Output Power
- Compact 1" x 2" x 0.40" Case
- Industry Standard Pin-Out
- 82% Efficiency
- -25°C to 71°C Operating Temperature Range
- 13.33W/In³ Power Density
- Low Cost
- >750,000 Hours MTBF

DC/DC CONVERTER MODEL 1015S24FPW MADE IN USA

DC/DC CONVERTER MODEL 1012S24FPW MADE IN USA

General Description

The **1000FPW** is a family of low cost single and dual output 10W DC/DC converters specifically designed for space-critical applications. These modules combine high power density; high performance features; and compact, industry standard packaging; with low cost.

Twenty one models operate from wide (2:1) input voltage ranges of 9 VDC to 18 VDC, 18 VDC to 36 VDC or 36 VDC to 72 VDC; and provide regulated outputs of 3.3 VDC, 5 VDC, 12 VDC, 15 VDC, ±5 VDC, ±12 VDC or ±15 VDC. Standard features include 1500 VDC input/output isolation, an internal input π (Pi) filter, line/load regulation of ±1.0% and a switching frequency of 400 kHz.

All models are packaged in a compact, low profile 1.0 x 2.0 x 0.40 inch metal case. This miniature size yields a power density as high as 13.33 W/In³. Operation is specified over the full operating temperature range of -25°C to +71°C with no derating required. Cooling is by free-air convection.

Electrical Specifications

Input Specifications:
Input Voltage Range .... 2:1, See Model Selection Guide
Input Filter .... π (Pi) Network
Reflected Ripple Current .... See Model Selection Guide

Output Specifications:
Output Voltage Accuracy .... ±1%, Max.
Voltage Balance (Dual Outputs) ...... ±1%, Max.
Minimum Load .... 10% of Full Load
Ripple & Noise (20 MHz BW) .... ±100 mV Pk-Pk of V$_{out}$, Max.
Line Regulation [1] .... ±0.5%, Max.
Load Regulation [2] .... ±0.5%, Max.
Transient Response [3] .... <500 µSec.
Temperature Coefficient @ FL .... ±0.02%/°C
Short Circuit Protection .... Current Limit, Continuous

General Specifications:
Efficiency [4] .... See Model Selection Guide
Isolation Voltage (1 min) .... 1500 VDC, Min.
Isolation Resistance 10⁹Ω
Switching Frequency .... >400 kHz

Environmental Specifications:
Operating Temperature Range .... -25°C to +71°C
Storage Temperature Range .... -40°C to +100°C
Maximum Case Temperature .... 100°C
Derating .... None Required
Humidity .... Up to 95%, Non-Condensing
Cooling [5] .... Free-air Convection

Physical Characteristics:
Size .... 1.0 x 2.0 x 0.40 inches
                                                               (25.4 x 50.8 x 10.2 mm)
Weight .... 0.5 Oz (14g)
Shielding .... Six Sided Continuous
Case Material .... Black Coated Copper
                                                               with Non-Conductive Base

Reliability Specifications [7]:
MTBF; Ground Benign, @ +25°C Ambient .... >750,000 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. Line regulation is measured by monitoring the output voltage while the module input voltage is varied from low line to high line.
2. Load regulation is measured at nominal input voltage while the output load is varied from 25% load to full load. Dual output models are loaded equally.
3. Transient response is measured to within a 1% error band with a 25% step load change applied.
4. Efficiency is specified at nominal input line and full load.
5. Free-air convection cooling requires 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.
6. Total output power should not exceed the specified output ratings for any particular model.
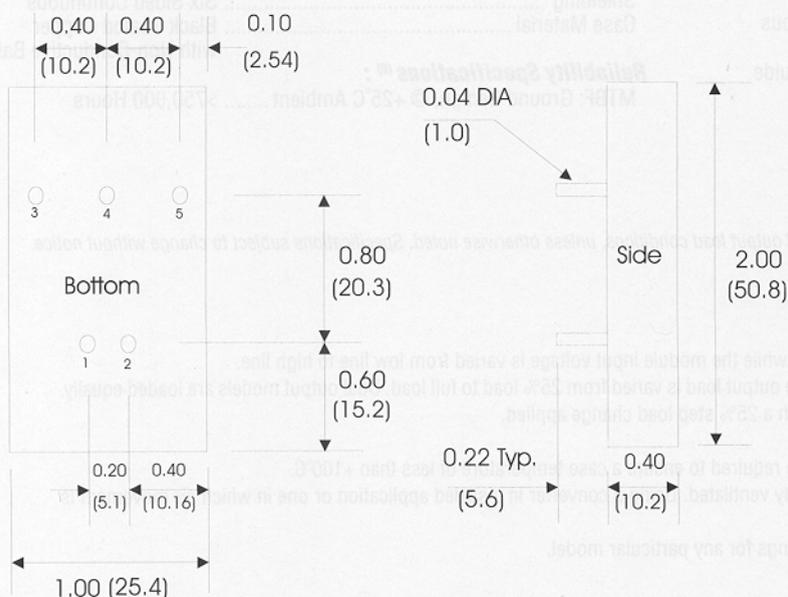7. MTBF calculations are made per MIL-HDBK-217F.

ULTRA-MINIATURE, HIGH DENSITY WIDE INPUT VOLTAGE RANGE 10W DC/DC CONVERTERS

1000FPW Series

Model Selection Guide

Model Number	Input				Reflected Ripple P-P (mA P-P)	Output		Efficiency @FL (%)
	Voltage (VDC)		Current (mA)			Voltage (VDC)	Current (mA)	
	Nominal	Range	No-Load	Full-Load				
1003S12FPW	12	9 to 18	40	917	120	3.3	2400	72
1005S12FPW	12	9 to 18	40	1096	120	5	2000	76
1012S12FPW	12	9 to 18	40	1025	120	12	830	81
1015S12FPW	12	9 to 18	40	1034	120	15	670	81
1005D12FPW	12	9 to 18	40	1096	120	±5	±1000	76
1012D12FPW	12	9 to 18	40	1027	120	±12	±416	81
1015D12FPW	12	9 to 18	40	1027	120	±15	±333	81
1003S24FPW	24	18 to 36	20	446	80	3.3	2400	74
1005S24FPW	24	18 to 36	20	534	80	5	2000	78
1012S24FPW	24	18 to 36	20	494	80	12	830	84
1015S24FPW	24	18 to 36	20	499	80	15	670	84
1005D24FPW	24	18 to 36	20	534	80	±5	±1000	78
1012D24FPW	24	18 to 36	20	495	80	±12	±416	84
1015D24FPW	24	18 to 36	20	495	80	±15	±333	84
1003S48FPW	48	36 to 72	10	223	30	3.3	2400	74
1005S48FPW	48	36 to 72	10	267	30	5	2000	78
1012S48FPW	48	36 to 72	10	247	30	12	830	84
1015S48FPW	48	36 to 72	10	249	30	15	670	84
1005D48FPW	48	36 to 72	10	267	30	±5	±1000	78
1012D48FPW	48	36 to 72	10	248	30	±12	±416	84
1015D48FPW	48	36 to 72	10	248	30	±15	±333	84

Application Notes:

1. Modules with ±12 VDC or ±15 VDC outputs may connected to provide 24 VDC or 30 VDC respectively. For example, to connect the **1012D24FPW** for -24 VDC operation, ground the - V input (pin 2) and connect it to the +V output (pin 3). With this reference, -24 VDC will be available at the -V output (pin 5) and -12 VDC will be available at the output common (pin 4).

2. These units operate as complete modules with no need for external components. However, in some noise sensitive analog applications it is recommended that a 15 µF, 25V tantalum electrolytic capacitor be placed in parallel with a 0.1 µF ceramic capacitor as close to the load as possible. This will reduce ripple significantly.

3. The use of a ground plane under the converter is recommended for heatsinking and to reduce EMI.

Mechanical Configuration:

0.40 (10.2)   0.40 (10.2)   0.10 (2.54)

0.04 DIA (1.0)

Bottom

Side

2.00 (50.8)

0.80 (20.3)

0.60 (15.2)

0.20 (5.1)   0.40 (10.16)

0.22 Typ. (5.6)

0.40 (10.2)

1.00 (25.4)

Pin-Out

Pin	Single Output	Dual Output
1	+V Input	+V Input
2	-V Input	-V Input
3	+V Output	+V Output
4	No Pin	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)