Size: 0.46in x 0.24in x 0.40in (11.6mm x 6.0mm x 10.10mm)

FEATURES

- 4Pin SIP Package
- Industry-Standard Footprint
- High Efficiency
- Lead Free Design
- RoHS Compliant
- Short Circuit Protection
- Compact Size
- Meets IEC/EN60950-1 Safety Approval

DESCRIPTION

The DCFP1 series of isolated DC/DC converters offers 1 watt of output power in an ultra-compact 0.46” x 0.24” x 0.40” SIP package. This series consists of single output models with wide input voltage ranges and high efficiency. Each model features a lead free design, short circuit protection, and an industry-standard footprint. This series meets IEC/EN60950-1 safety approval.

MODEL SELECTION TABLE

Model Number	Input Voltage Range	Output Voltage	Output Current[1]	Input Current		Maximum Capacitive Load[3]	Efficiency[2]	Output Power
				No Load	Full Load			
DCFP1-33S33	3.3VDC (2.97~3.63VDC)	3.3VDC	300mA	35	405mA	68µF	74%	1 Watt
DCFP1-33S05		5VDC	200mA		404mA	47µF	75%	
DCFP1-05S33	5VDC (4.5-5.5VDC)	3.3VDC	300mA	28mA	264mA	68µF	75%	1 Watt
DCFP1-05S05		5VDC	200mA		260mA	47µF	77%	
DCFP1R-05S05		5VDC	100mA		130mA	47 µF	77%	
DCFP1-05S09		9VDC	110mA		248mA	33µF	80%	
DCFP1-05S12		12VDC	83mA		246mA	22µF	81%	
DCFP1-05S15		15VDC	67mA		246mA	22µF	81%	
DCFP1-05S24		24VDC	42mA		246mA	10µF	81%	
DCFP1-12S33	12VDC (10.8~13.2VDC)	3.3VDC	300mA	17mA	109mA	68µF	76%	1 Watt
DCFP1-12S05		5VDC	200mA		107mA	47µF	78%	
DCFP1-12S09		9VDC	110mA		107mA	33µF	78%	
DCFP1-12S12		12VDC	83mA		104mA	22µF	80%	
DCFP1-12S15		15VDC	67mA		104mA	22µF	80%	
DCFP1-15S33	15VDC (13.5~16.5VDC)	3.3VDC	300mA	15mA	87mA	68µF	76%	1 Watt
DCFP1-15S05		5VDC	200mA		85mA	47µF	78%	
DCFP1-15S09		9VDC	110mA		85mA	33µF	78%	
DCFP1-15S12		12VDC	83mA		83mA	22µF	80%	
DCFP1-15S15		15VDC	67mA		83mA	22µF	80%	
DCFP1-24S33	24VDC (21.6~26.4VDC)	3.3VDC	300mA	8mA	54mA	68µF	77%	1 Watt
DCFP1-24S05		5VDC	200mA		53mA	47µF	79%	
DCFP1-24S09		9VDC	110mA		52mA	33µF	80%	
DCFP1-24S12		12VDC	83mA		51mA	22µF	81%	
DCFP1-24S15		15VDC	67mA		51mA	22µF	81%	

SPECIFICATIONS

All specifications are typical at 25°C, Nominal Input, and Full Load unless otherwise noted.
We reserve the right to change specifications based on technological advances.

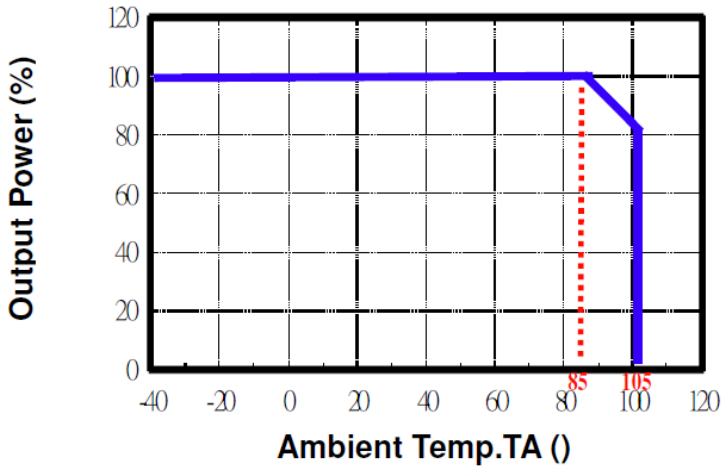
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	3.3V Nominal Input		2.97		3.63	VDC
	5V Nominal Input		4.5		5.5	
	12V Nominal Input		10.8		13.2	
	15V Nominal Input		13.5		16.5	
	24V Nominal Input		21.6		26.4	
Input Filter			Capacitor			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy	Nominal Vin and Full Load	3.3VDC Output	3.135		3.399	V
		5VDC Output	4.75		5.15	
		9VDC Output	8.73		9.18	
		12VDC Output	11.64		12.24	
		15VDC Output	14.55		15.30	
		24VDC Output	23.52		24.36	
Voltage Balance	Output				±1	%
Line Regulation	For Vin Charge of 1%			±1.2		%
Load Regulation	Nominal Vin and 10%-100% Load	3.3VDC Output		15		%
		5VDC Output		13		
		9VDC Output		9		
		12VDC Output		8		
		15VDC Output		7		
		24VDC Output		6		
Output Power					1	W
Output Current			See Table			
Minimum Load	At Full Load		10			% Load
Maximum Capacitive Load			See Table			
Ripple & Noise	20MHz bandwidth			50	120	mVp-p
Temperature Coefficient				±0.03		%/°C
PROTECTION						
Short Circuit Protection	3.3V Nominal Input & 24V Nominal Input Models				3	S
	Others		Continuous, Automatic Recovery			
ENVIRONMENTAL SPECIFICATIONS						
Operating Temperature			-40		+105	°C
Storage Temperature			-55		+125	°C
Maximum Case Temperature					+125	°C
Relative Humidity					95	%RH
MTBF	Calculated		2,000,000			Hrs
GENERAL SPECIFICATIONS						
Typical Efficiency[2]	Nominal Input and Full Load		See Table			
Switching Frequency				150	300	kHz
Isolation Voltage	Input to Output, 60 Seconds			1500		VDC
Isolation Resistance	500VDC		1000			MΩ
Isolation Capacitance				30		pF
PHYSICAL SPECIFICATIONS						
Weight			0.053oz (1.5g)			
Dimensions (L x W x H)			0.46in x 0.24in x 0.40in (11.6mm x 6.0mm x 10.10mm)			
Case Material			Plastic (UL94 V-0)			
Potting Material			PU (UL94 V-0)			
SAFETY CHARACTERISTICS						
Safety Approvals	IEC/EN60950-1					

NOTES

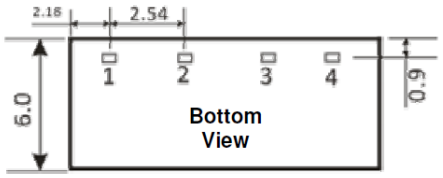
1. Io below this value will not damage these converters, however, they may not meet all listed specifications.
2. Typical value, tested at nominal input and full load.
3. For each output
4. In case of long input lines or hot plug-in requirements, we recommend using an external low ESR capacitor (22uF) near the converters input pins.

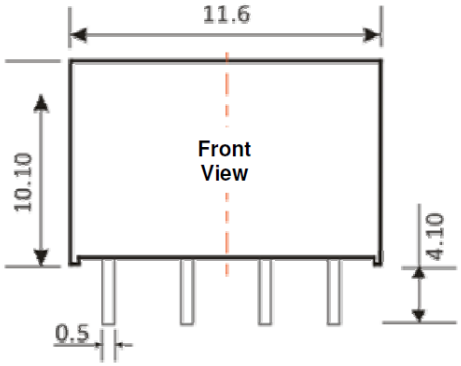
**Due to advances in technology, specifications subject to change without notice.*

POWER DERATING CURVE



MECHANICAL DRAWINGS





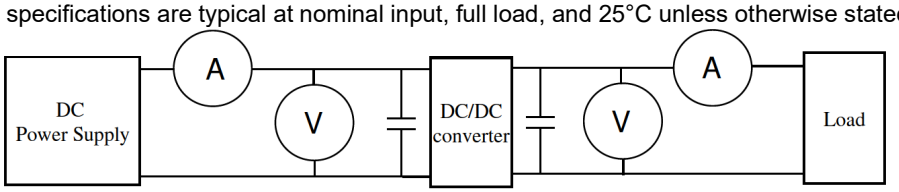
Pin Assignment

Pin	Single
1	-Vin
2	+Vin
4	-Vout
5	+Vout

Notes:
Unit: mm (inch)
Pin Section Tolerances: ±0.1 (±0.004)
General Tolerances: ±0.5 (±0.02)

TEST CONFIGURATIONS

All specifications are typical at nominal input, full load, and 25°C unless otherwise stated.



DC Power Supply: Offers wide voltage and current range precisely.
Current Meter (A): Accuracy → 200µA~200mA 4 ranges ± (0.2% rdg + 2 digits)
2000mA~20A 2 ranges ± (0.3% rdg + 2 digits)
Voltage Meter (V): Accuracy → ± (0.03% rdg + 4 digits)
Load: At Full Load
Wires: The resistance of the wires must be small.

Input Voltage Range- Narrow Input Voltage Range (±10%), Wide Input Voltage Range (2:1 and 4:1)

Ex: Narrow Input Voltage Range (±10%)
5V Nominal Input → 4.5~5.5V
12V Nominal Input → 10.8~13.2V
24V Nominal Input → 21.6~26.4V

Wide Input Voltage Range 2:1
5V Nominal Input → 4.5~9V
12V Nominal Input → 9~18V
24V Nominal Input → 18~36V
48V Nominal Input → 36~75V

Wide Input Voltage Range 4:1
24V Nominal Input → 9~36V
48V Nominal Input → 18~75V

Input Power

Pin=Vin x Iin

Vin: Input Voltage
Iin: Input Current

Output Power

Pout= Vout x Iout

Vout: Output Voltage
Iout: Output Current

Efficiency

$$\text{Efficiency} = \frac{\text{Pout}}{\text{Pin}} \text{ x } 100$$

Pout: Output Power
Pin: Input Power

Voltage Accuracy

$$\frac{\text{Vout} - \text{Vout (nominal)}}{\text{Vout}} \text{ x } 100$$

Vout: Output Voltage
Vout (nominal): Nominal Output Voltage

Line Regulation

Narrow Input Voltage Range (±10%) and unregulated output voltage series.

$$\text{Line Regulation} = \left|\frac{\Delta\text{Vout}}{\Delta\text{Vin}}\right|$$

$$\Delta\text{Vout} = \frac{\text{Vout (+10\%)} - \text{Vout(-10\%)}}{\text{Vout}} \text{x } 100\%$$

Vout(+10%): Output Voltage at Vin=1.1 x Vin(nominal) & Full Load
Vout(-10%): Output Voltage at Vin=0.9 x Vin(nominal) & Full Load
Vout: Output Voltage at Vin=Vin(nominal) & Full Load

$$\Delta\text{Vin} = \frac{\text{Vin(+10\%)} - \text{Vin(-10\%)}}{\text{Vin (nominal)}} \text{x } 100\%$$

Vin(+10%): Input Voltage=1.1 x Vin (nominal)
Vin(-10%): Input Voltage=0.9 x Vin (nominal)
Vin (nominal): Nominal Input Voltage

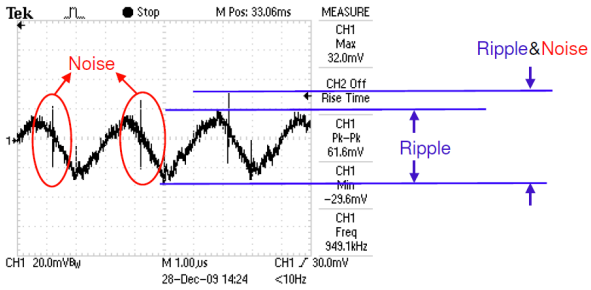
Load Regulation

$$\frac{|\text{Vout(FL)} - \text{Vout(NL)}|}{\text{Vout(FL)}} \text{ x } 100\%$$

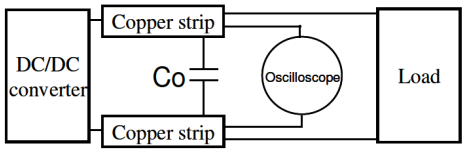
Vout (FL): Output Voltage at Full Load
Vout (NL): Output Voltage at 25% Full Load or 10% Full Load

Ripple and Noise

As Shown Below. Bandwidth is 0-20MHz



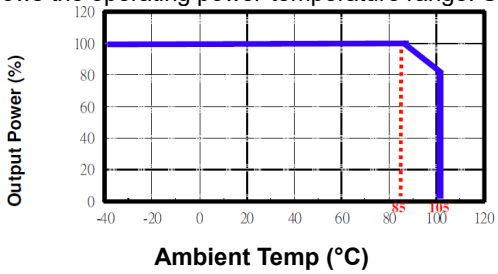
Output Ripple & Noise measurement test circuit: Shown Below



Co: Usually 0.47uF

Temperature Derating Curve

The DC/DC converter will operate over a wider temperature range if less power is drawn from the output and the device is already running. The temperature derating curve shows the operating power-temperature range. Shown below.



Switching Frequency

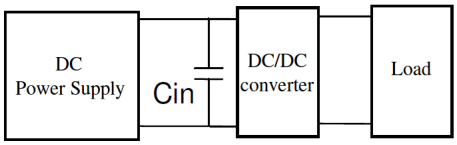
The nominal operating frequency of the DC/DC Converter

Input to Output Isolation

The dielectric breakdown strength test between input and output circuits. This is the isolation voltage the device is capable of withstanding for a specified time, usually 1 second or 1 minute.

Input Source Impedance

The power module should be connected to low ac-impedance input source.
Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor at the input to ensure startup. Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR < 0.1Ω at 100KHz) capacitor of a 22uF for the module.



COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001: 2015 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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