

Single Output Module



Dual Output Module



Size: 0.77in x 0.9in x 0.49in  
(19.5mm x 9.8mm x 12.5mm)

**FEATURES**

- Fixed Input Voltage
- Unregulated Dual and Single Outputs
- High Efficiency
- Isolation Voltage: 5000VAC or 6000VDC
- Isolation Capacitance as Low as 4pF
- Leakage Current <2μA
- Reinforced Insulation
- Continuous Short Circuit Protection
- Creepage & Clearance Distance >8mm
- RoHS Compliant
- Meets EN60601-1, ANSI/AAMI ES60601-1 Standard (2xMOPP)
- Meets IEC62368 Standard

**APPLICATIONS**

- Medical
- IGBT Driver

**DESCRIPTION**

The DCFVH2 series of DC/DC converters offers 2 watts of output power in a compact 0.77" x 0.9" x 0.49" through hole package. This series consists of unregulated single and dual output models with fixed input voltage. Each model features industry standard pin-out, isolation voltage of 5000VAC or 6000VDC, and high efficiency. This series is also RoHS compliant and meets EN60601-1, ANSI/AAMI ES60601-1, and IEC62368 standards.

**MODEL SELECTION TABLE**

Single Output Models

Model Number	Input Voltage	Output Voltage	Output Current		Max. Capacitive Load <sup>(1)</sup>	Full Load Efficiency		Output Power
			Min.	Max.		Min.	Typ.	
DCFVH2-12S05	12VDC (10.8-13.2VDC)	5VDC	40mA	400mA	1000μF	76%	80%	2W
DCFVH2-12S09		9VDC	22mA	222mA	680μF	78%	82%	
DCFVH2-12S12		12VDC	17mA	167mA	470μF	80%	84%	
DCFVH2-12S15		15VDC	14mA	133mA	470μF	80%	84%	
DCFVH2-15S05	15VDC (13.5-16.5VDC)	5VDC	40mA	400mA	1000μF	76%	80%	2W
DCFVH2-15S15		15VDC	14mA	133mA	470μF	79%	83%	
DCFVH2-24S05	24VDC (21.6-26.4VDC)	5VDC	40mA	400mA	2200μF	75%	79%	2W
DCFVH2-24S09		9VDC	22mA	222mA	680μF	77%	81%	
DCFVH2-24S12		12VDC	17mA	167mA	470μF	78%	82%	
DCFVH2-24S15		15VDC	14mA	133mA	470μF	80%	84%	
DCFVH2-24S24		24VDC	9mA	83mA	220μF	80%	84%	

**MODEL SELECTION TABLE**

Dual Output Models

Model Number	Input Voltage	Output Voltage	Output Current		Max. Capacitive Load <sup>(1)</sup>	Full Load Efficiency		Output Power
			Min.	Max.		Min.	Typ.	
DCFVH2-12D05	12VDC (10.8-13.2VDC)	±5VDC	±20mA	±200mA	1000μF	76%	80%	2W
DCFVH2-12D09		±9VDC	±11mA	±111mA	470μF	78%	82%	
DCFVH2-12D12		±12VDC	±9mA	±9mA	220μF	79%	83%	
DCFVH2-24D15		±15VDC	±7mA	±7mA	220μF	80%	84%	

**SPECIFICATIONS**

All specifications are based on 25°C, Humidity <75%RH, Operating Altitude within 2000m, Nominal Input Voltage, and Rated Output Load unless otherwise noted.  
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
<b>INPUT SPECIFICATIONS</b>						
Input Voltage Range			See Table			
Input Current	No Load	12V Input		15		mA
		15V Input		15		
		24V Input		15		
	Full Load	12V Input		210	220	mA
		15V Input		167	176	
		24V Input		106	111	
Surge Voltage (1 Sec. Max.)	12V Input		-0.7		18	VDC
	15V Input		-0.7		21	
	24V Input		-0.7		30	
Input Filter			Capacitance Filter			
Reflected Ripple Current <sup>(2)</sup>	Module On			200		mA
Hot Plug			Unavailable			
<b>OUTPUT SPECIFICATIONS</b>						
Output Voltage			See Table			
Voltage Accuracy			See Output Regulation Curve			
Linear Regulation	Input Voltage Range: ±1%				1.2	
Load Regulation	10-100% Load	5V Output			20	%
		Others			15	
Max. Capacitive Load			See Table			
Output Current			See Table			
Ripple & Noise <sup>(3)</sup>	20MHz Bandwidth	5VDC Output		100	150	mVp-p
		Others		80	120	
Temperature Coefficient	100% Full Load			±0.02		%/°C
<b>PROTECTION</b>						
Short Circuit Protection			Continuous, Self-Recovery			
<b>ENVIRONMENTAL SPECIFICATIONS</b>						
Operating Temperature			-40		105	°C
Storage Temperature			-55		125	°C
Casing Temperature Rise	Ta=25°C			25		°C
Storage Humidity	Non-Condensing		5		95	%RH
Pin Soldering Resistance Temperature	Welding spot is 1.5mm away from casing for 10 seconds				300	°C
Creepage & Clearance Distance			8			mm
Operating Altitude					5000	m
MTBF	MIL-HDBK-217F@25°C		19360			k hours
<b>GENERAL SPECIFICATIONS</b>						
Efficiency	@Full Load		See Table			
Switching Frequency	100% Load, Nominal Input Voltage			200		kHz
Isolation	Input-Output with the test time of 1 minute, the leakage current <1mA		5000			VAC
			6000			VDC
Insulation Resistance	Input-Output isolation voltage 500VDC		1000			MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V			4		pF
Leakage Current <sup>(4)</sup>	250VAC, 50/60Hz				2	μA
<b>PHYSICAL SPECIFICATIONS</b>						
Weight			0.14oz (4.0g)			
Dimensions (L x W x H)			0.77in x 0.9in x 0.49in (19.5mm x 9.8mm x 12.5mm)			
Case Material			Black Plastic, Flame-Retardant and Heat-Resistant (UL94-V0)			
Cooling Method			Free Air Convection			
<b>SAFETY CHARACTERISTICS</b>						
Safety			EN60601-1, ANSI/AAMI ES60601-1 (2xMOPP), IEC62368			
Emissions	CE	CISPR32/EN55032		Class B <sup>(5)</sup>		
		EN60601-1-2/CISPR 11 GROUP 1		Class B <sup>(5)</sup>		
	RE	CISPR32/EN55032		Class B <sup>(5)</sup>		
		EN60601-1-5/CISPR 11 GROUP 1		Class B <sup>(5)</sup>		
Immunity	ESD	EN60601-1-2 (IEC/EN61000-4-2)	Air ±15kV, Contact ±8kV		Perf. Criteria B	

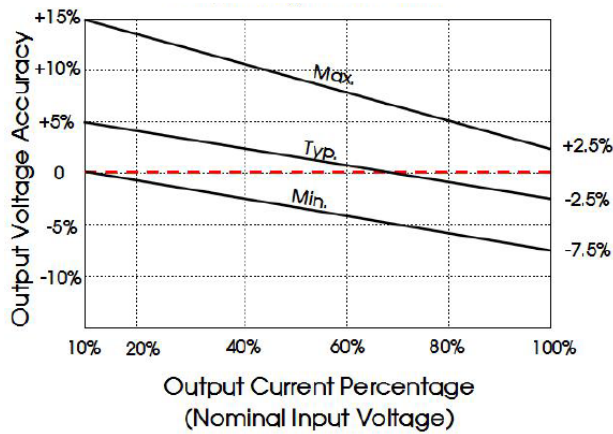
**NOTES**

1. Capacitive loads for positive and negative outputs are identical.
2. Contact factory for more details on the reflected ripple current test method.
3. 'Parallel cable' method is used for ripple and noise test. Contact factory for specific information.
4. Leakage current and reinforced insulation is based on 250VAC, 50/60Hz system input voltage.
5. Refer to 'EMC (Class B) compliance circuit' for recommended circuit test.
6. If product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet.
7. Maximum capacitive load offered were tested at input voltage range and full load.
8. Product customization is available. Contact factory for more information.
9. Products should be classified according to ISO14001 and related environmental laws and regulations and should be handled by qualified units.

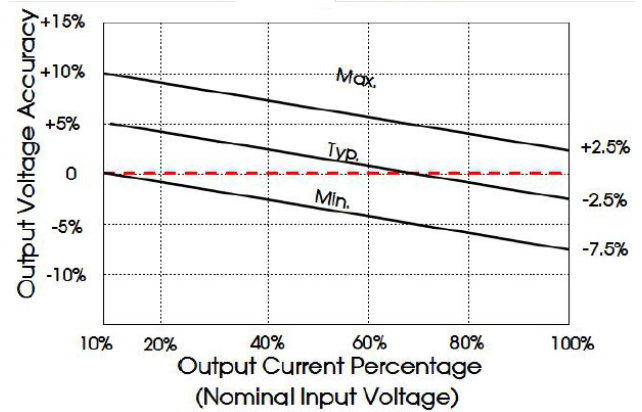
*\*Due to advances in technology, specifications subject to change without notice.*

**CHARACTERISTIC CURVES**

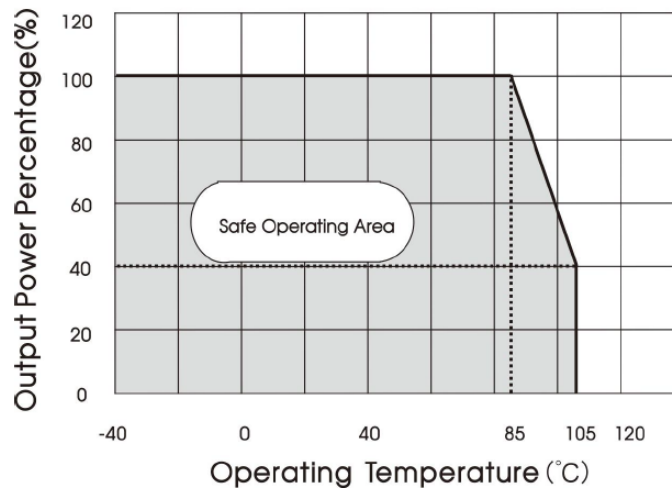
**Output Regulation Curve 5VDC Output**



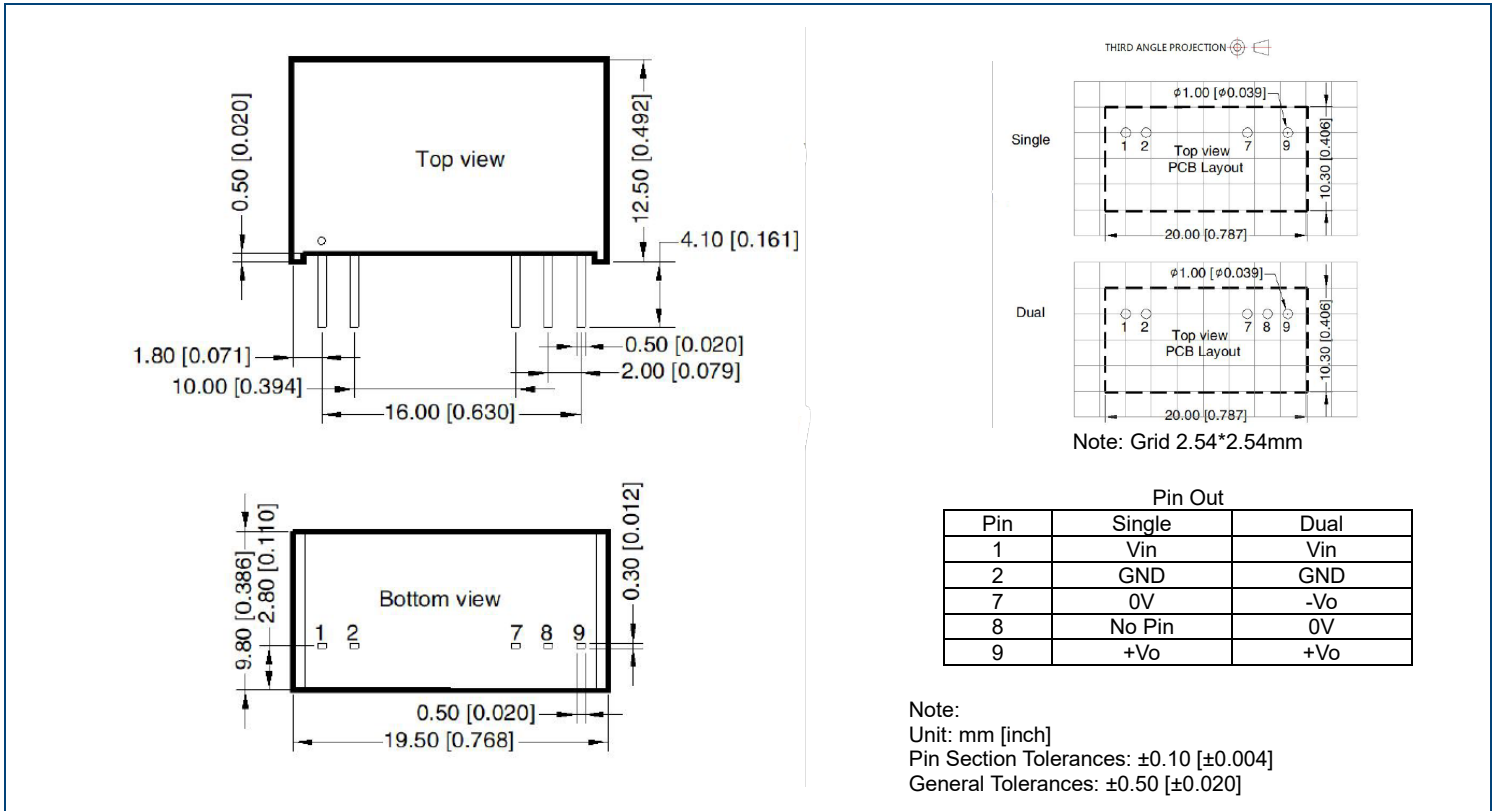
**Output Regulation Curve Other Outputs**



**Temperature Derating Curve**



MECHANICAL DRAWINGS



DESIGN REFERENCE

1. Typical Application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig. 1. Choosing suitable filter capacitor values is very important, start-up problems may be caused by too large capacitance. To ensure modules are running well, use the recommended capacitive load values as show in Table 1.

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear voltage regulator with overheat protection that is connected to the input or output end in series (see Fig. 2).

Single

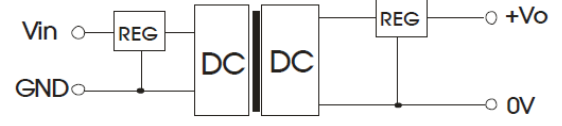


Dual



Fig. 1

Single



Dual

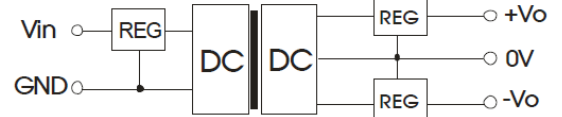


Fig. 2

Recommended Input and Output Capacitor Values (Table 1)

Vin	Cin	Single Vout	Cout	Dual Vout	Cout
12VDC	10µF/25V	5VDC	10µF/16V	-	-
15VDC	4.7µF/25V	9VDC	10µF/16V	±5/±9VDC	4.7µF/16V
24VDC	2.2µF/50V	12VDC	2.2µF/25V	±12/±15VDC	1µF/25V
-	-	15VDC	1µF/25V	-	-
-	-	24VDC	0.47µF/50V	-	-

Note: The capacitor value of the positive and negative output is identical.

2. EMC (CLASS B) Compliance Circuit

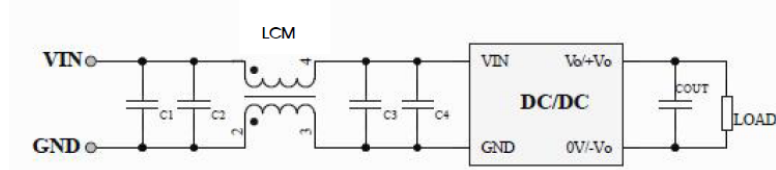


Fig. 3

EMC Recommended Circuit Value Table (Table 2)

		Input Voltage	12/15/24VDC
Emissions	C3	C1/C2	4.7µF/50V
		DCFVH2-24S24	100µF/50V
	Others	4.7µF/50V	
	C4	DCFVH2-24S24	-
		Others	4.7µF/50V
	Cout		Refer to Cout in Table 1
LCM		22µH (Nickel zinc inductance)	

Minimum Output Load Requirement

For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 10% minimum.

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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