

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
- RoHS Compliance
- Industry Standard Pin-Out
- Continuous Short Circuit Protection
- Creepage & Clearance Distance >8mm
- Meets EN60601-1, ANSI/AAMI ES60601-1 Standard (2xMOPP)
- Meets IEC62368 Standard

APPLICATIONS

- Medical
- IGBT Driver

DESCRIPTION

The DCFVH1 series of DC/DC converters offers 1 watt 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 ⁽¹⁾	Full Load Efficiency		Output Power
			Min.	Max.		Min.	Typ.	
DCFVH1-12S03	12VDC (10.8-13.2VDC)	3.3VDC	31mA	303mA	2200µF	72%	76%	1W
DCFVH1-12S05		5VDC	20mA	200mA	2200µF	75%	79%	
DCFVH1-12S09		9VDC	12mA	111mA	680µF	77%	81%	
DCFVH1-12S12		12VDC	9mA	84mA	470µF	79%	83%	
DCFVH1-12S15		15VDC	7mA	67mA	470µF	79%	83%	
DCFVH1-12S24		24VDC	4mA	42mA	220µF	78%	82%	
DCFVH1-24S05	24VDC (21.6-26.4VDC)	5VDC	20mA	200mA	2200µF	72%	79%	1W
DCFVH1-24S09		9VDC	12mA	111mA	680µF	72%	76%	
DCFVH1-24S12		12VDC	9mA	84mA	470µF	72%	76%	
DCFVH1-24S15		15VDC	7mA	67mA	470µF	72%	76%	
DCFVH1-24S24		24VDC	4mA	42mA	220µF	72%	76%	

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage	Output Voltage	Output Current		Max. Capacitive Load ⁽¹⁾	Full Load Efficiency		Output Power
			Min.	Max.		Min.	Typ.	
DCFVH1-12D05	12VDC (10.8-13.2VDC)	±5VDC	±10mA	±100mA	1000µF	75%	79%	1W
DCFVH1-12D12		±12VDC	±5mA	±42mA	220µF	77%	81%	
DCFVH1-12D15		±15VDC	±4mA	±34mA	220µF	77%	81%	
DCFVH1-24D05	24VDC (21.6-26.4VDC)	±5VDC	±10mA	±100mA	1000µF	71%	75%	1W
DCFVH1-24D12		±12VDC	±5mA	±42mA	220µF	72%	76%	
DCFVH1-24D24		±24VDC	±4mA	±34mA	220µF	82%	76%	

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
INPUT SPECIFICATIONS						
Input Voltage Range			See Table			
Input Current	No Load	12V Input		10		mA
		24V Input		12		
	Full Load	12V Input		106	116	mA
		24V Input		56	59	
Surge Voltage (1 Sec. Max.)	12V Input 24V Input		-0.7 -0.7		18 30	VDC
Input Filter			Capacitance Filter			
Reflected Ripple Current ⁽²⁾	Module On			200		mA
Hot Plug			Unavailable			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy			See Output Regulation Curve			
Linear Regulation	Input Voltage Range: ±1%	3.3V Output Others			1.5 1.2	%
Load Regulation	10-100% Load	3.3V/5V Output Others			20 15	%
Max. Capacitive Load			See Table			
Output Current			See Table			
Ripple & Noise ⁽³⁾	20MHz Bandwidth	3.3VDC Output Others		100 80	150 120	mVp-p
Temperature Coefficient	100% Full Load			±0.02		%/°C
PROTECTION						
Short Circuit Protection			Continuous, Self-Recovery			
ENVIRONMENTAL SPECIFICATIONS						
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
GENERAL SPECIFICATIONS						
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 6000			VAC VDC
Insulation Resistance	Input-Output, isolation voltage 500VDC		1000			MΩ
Isolation Capacitance	Input-Output, 100KHz/0.1V			4		pF
Leakage Current ⁽⁴⁾	250VAC, 50/60Hz				2	µA
PHYSICAL SPECIFICATIONS						
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			
SAFETY CHARACTERISTICS						
Safety			EN60601-1, ANSI/AAMI ES60601-1 (2xMOPP), IEC62368			
Emissions	CE	CISPR32/EN55032		Class B ⁽⁵⁾		
		EN60601-1-2/CISPR 11 GROUP 1		Class B ⁽⁵⁾		
	RE	CISPR32/EN55032		Class B ⁽⁵⁾		
		EN60601-1-5/CISPR 11 GROUP 1		Class B ⁽⁵⁾		
Immunity	ESD	EN60601-1-2 (IEC/EN61000-4-2)	Air ±15kV, Contact ±8kV		Perf. Criteria B	

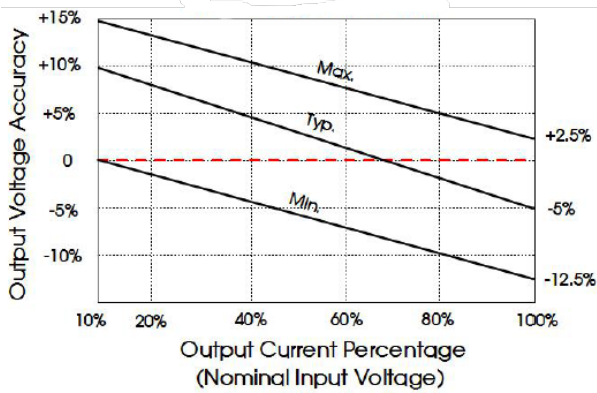
NOTES

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 operation methods.
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.

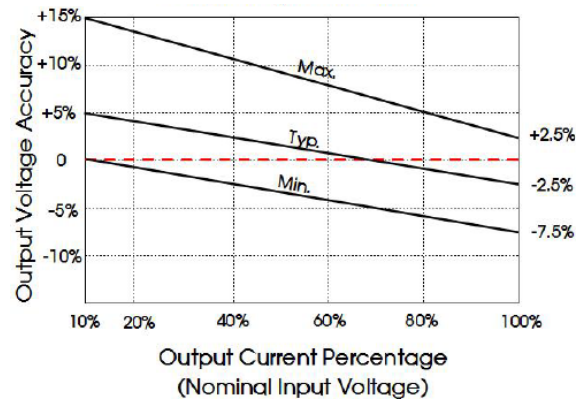
**Due to advances in technology, specifications subject to change without notice.*

CHARACTERISTIC CURVES

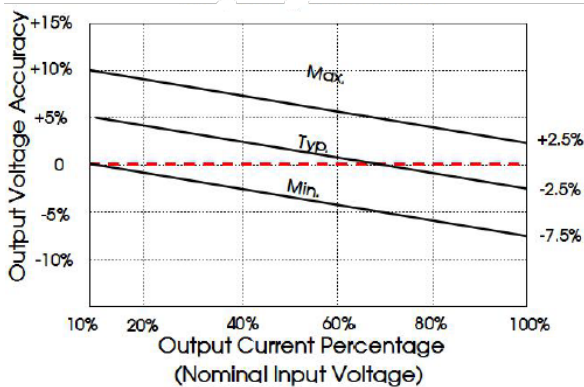
Output Regulation Curve 3.3VDC Output



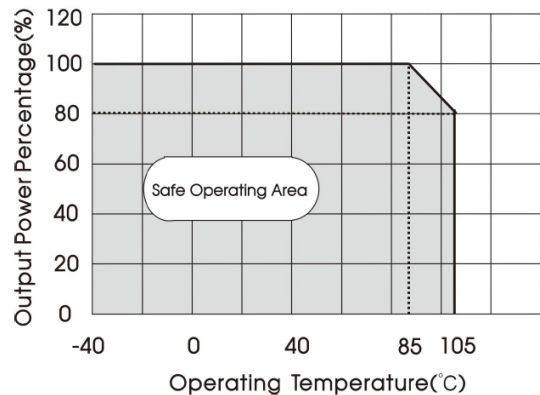
Output Regulation Curve 5VDC Output



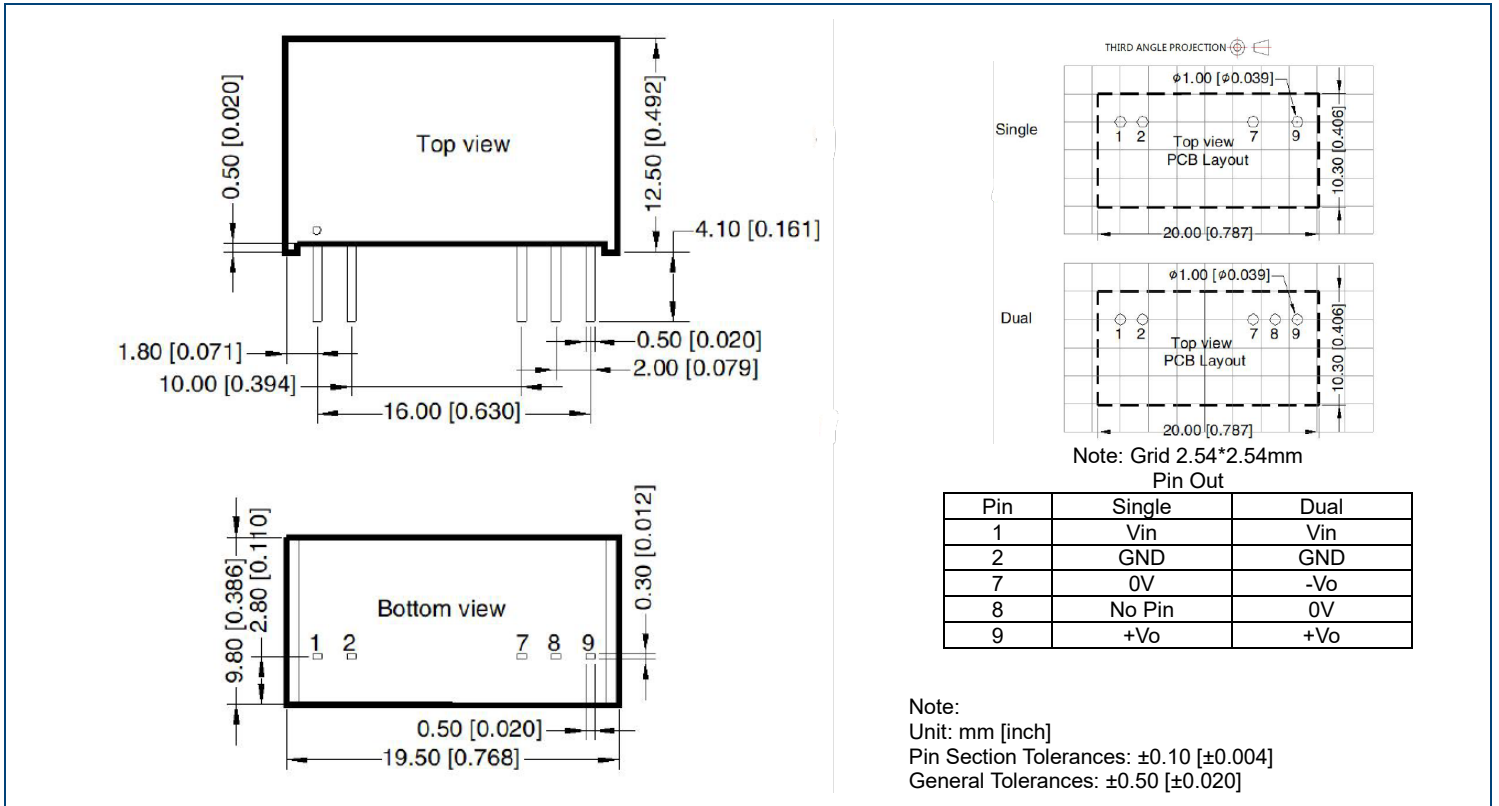
Output Regulation Curve Other Outputs



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

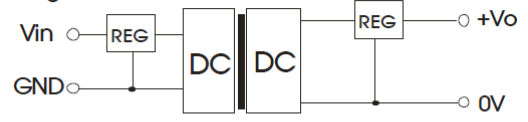


Dual



Fig. 1

Single



Dual

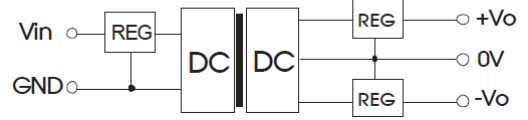


Fig. 2

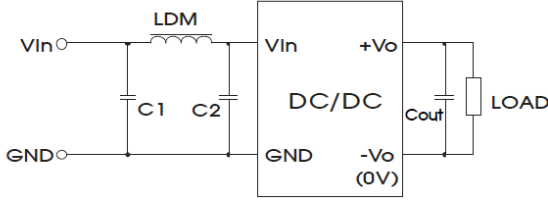
Recommended Input and Output Capacitor Values (Table 1)

Vin	Cin	Single Vout	Cout	Dual Vout	Cout
12VDC	10 μ F/25V	3.3/5VDC	10 μ F/16V	-	-
24VDC	2.2 μ F/50V	9VDC	10 μ F/16V	± 5 VDC	4.7 μ F/16V
-	-	12VDC	2.2 μ F/25V	$\pm 12/\pm 15$ VDC	1 μ F/25V
-	-	15VDC	1 μ F/25V	-	-
-	-	24VDC	0.47 μ F/50V	-	-

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

2. EMC (CLASS B) Compliance Circuit

12V Input



24V Input

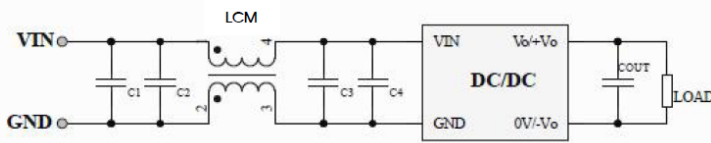


Fig. 3

EMC Recommended Circuit Value Table (Table 2)

Input Voltage		12VDC
Emissions	C1/C2	4.7µF/25V
	Cout	Refer to Cout in Table 1
	LDM	22µH

Input Voltage		24VDC	
Emissions	C1/C2	4.7µF/50V	
	C3	DCFVH1-24Dxx	100µF/50V
		Others	4.7µF/50V
	C4	DCFVH1-24Dxx	-
		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.

Contact **Wall Industries** for further information:

Phone: ☎(603)778-2300
 Toll Free: ☎(888)597-9255
 Fax: ☎(603)778-9797
 E-mail: sales@wallindustries.com
 Web: www.wallindustries.com
 Address: 37 Industrial Drive
 Exeter, NH 03833

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