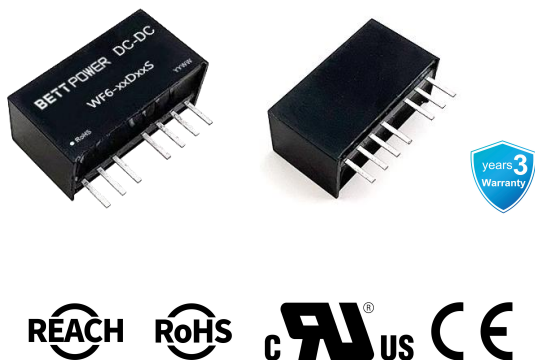


WF6-xxDxxS Series

DC-DC Converter | 6W | SIP8 | 2:1 Wide Input Voltage, Regulated Output | 3000VDC



Features

- SIP8 Package
- Operating Temperature Range: -40°C ~ +85°C
- 2:1 Wide Input Voltage Range
- Isolation Voltage: 3000VDC
- Full Load Efficiency: 86% (typ.)
- Input Under-voltage, Output Over-current, Output Short Circuit Protection
- Designed to meet IEC/EN/BS EN/UL 62368

Product Description



The WF6-xxDxxS series is an industrial-grade DC-DC converter module with 2:1 wide input voltage, regulated output. It features a compact SIP-8 plastic pin package, high efficiency, remote on/off control, and continuous short circuit protection. The small size and cost-effective design make this converter an ideal solution for communication equipment, instrumentation, and industrial electronics applications.

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency (%) Typ.	Capacitive Load (μF) Max.*
		Nominal (Range)	Max.	Output Voltage (VDC)	Max. Current (mA)		
EN/UL pending	WF6-05D03S	5(4.5~9)	11	±3.3	±675	78	560
	WF6-05D05S	5(4.5~9)	11	±5	±600	80	470
	WF6-05D06S	5(4.5~9)	11	±6	±500	80	330
	WF6-05D09S	5(4.5~9)	11	±9	±333	81	220
	WF6-05D12S	5(4.5~9)	11	±12	±250	81	150
	WF6-05D15S	5(4.5~9)	11	±15	±200	81	120
	WF6-05D24S	5(4.5~9)	11	±24	±125	81	120
	WF6-12D03S	12 (9~18)	20	±3.3	±675	80	560
	WF6-12D05S	12 (9~18)	20	±5	±600	82	470
	WF6-12D06S	12 (9~18)	20	±6	±500	82	330
	WF6-12D09S	12 (9~18)	20	±9	±333	84	220
	WF6-12D12S	12 (9~18)	20	±12	±250	85	150
	WF6-12D15S	12 (9~18)	20	±15	±200	85	120

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency (%) Typ.	Capacitive Load (μF) Max.*
		Nominal (Range)	Max.	Output Voltage (VDC)	Max. Current (mA)		
EN/UL pending	WF6-12D24S	12 (9~18)	20	±24	±125	85	120
	WF6-24D03S	24 (18~36)	40	±3.3	±675	81	560
	WF6-24D05S	24 (18~36)	40	±5	±600	83	470
	WF6-24D06S	24 (18~36)	40	±6	±500	83	330
	WF6-24D09S	24 (18~36)	40	±9	±333	85	220
	WF6-24D12S	24 (18~36)	40	±12	±250	86	150
	WF6-24D15S	24 (18~36)	40	±15	±200	86	120
	WF6-24D24S	24 (18~36)	40	±24	±125	86	120
	WF6-48D03S	48 (36~75)	80	±3.3	±675	78	560
	WF6-48D05S	48 (36~75)	80	±5	±600	80	470
	WF6-48D06S	48 (36~75)	80	±6	±500	80	330
	WF6-48D09S	48 (36~75)	80	±9	±333	81	220
	WF6-48D12S	48 (36~75)	80	±12	±250	82	150
	WF6-48D15S	48 (36~75)	80	± 15	±200	82	120
	WF6-48D24S	48 (36~75)	80	±24	± 125	82	120

Note:

1. The input voltage should not exceed the maximum value, otherwise it may cause permanent and irreparable damage;
2. The above efficiency values are measured at nominal input voltage and rated output load.
3. *The capacitive load for both positive and negative outputs is the same.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (Full Load/No-load)	5VDC Input	3.3V Output	--	1142/20	1172/40	mA
		Others	--	1500/50	1538/90	mA
	12VDC Input	3.3V Output	--	464/10	476/20	mA
		5/6V Output	--	610/15	625/30	mA
		Others	--	595/25	610/50	mA
	24VDC Input	3.3V Output	--	229/5	235/15	mA
		5/6/9V Output	--	301/10	309/20	
		Others	--	294/15	301/30	mA
	48VDC Input	3.3V Output	--	119/5	122/10	mA
		5/6V output	--	156/10	160/20	mA
		Others	--	154/15	158/30	mA
Reflected Ripple Current	Input nominal input series		--	50	--	mA
Surge Voltage (1sec.max.)	5VDC Input		-0.7	--	12	VDC
	12VDC Input		-0.7	--	25	VDC
	24VDC Input		-0.7	--	50	VDC
	48VDC Input		-0.7	--	100	VDC
Start-up Voltage	5VDC Input		--	--	4.5	VDC
	12VDC Input		--	--	9	VDC
	24VDC Input		--	--	18	VDC
	48VDC Input		--	--	36	VDC
Input Under-voltage Protection	5VDC Input		3.5	4	--	VDC
	12VDC Input		5.5	6.5	--	VDC
	24VDC Input		5.5	6.5	--	VDC
	48VDC Input		12	15.5	--	VDC
Ctrl	Turn on module		Ctrl pin open or pulled high (TTL2.7-12VDC)			
	Turn off module		Ctrl pin pulled low to GND (0-1.2VDC)			
Input Filter Type			Capacitance Filtering			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0%~100% load	Vo1	--	±1.0	±3.0	%
		Vo2	--	±3.0	±5.0	%
Line Regulation	Full load, input voltage from low limit to high limit	Vo1	--	±0.5	±1.0	%
		Vo2	--	±1.0	±2.0	%
Load Regulation	5% to 100% load		--	±1.0	±2.0	%

	0% to 100% load	--	±2.0	±4.0	%
Ripple & Noise	20MHz bandwidth, 5%-100% load	--	80	150	mVp-p
Transient Recovery Time	25% load step change, nominal input voltage	--	450	500	µs
Transient Response Deviation	25% load step change, nominal input voltage	--	±3	±5	%
Temperature Coefficient	Full Load	--	--	±0.03	%/°C
Over current Protection	Input Voltage Range	110	160	--	%
Short Circuit Protection	Input Voltage Range	Continuous short circuit, self-recovery			

Note: Ripple & noise are measured at 20MHz of bandwidth with a 10uF electrolytic capacitor and a 1uF ceramic capacitor connected inparallel at the output.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-Output, Test Time 1 minute, leakage current less than 1mA	3000	--	--	VDC
Insulation Resistance	Input-Output, Insulation Voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-Output,100KHz/0.1V	--	1000	--	pF
Operating Temperature	See: Temperature Derating Curve	-40	--	85	°C
Storage Temperature		-55	--	125	°C
Storage Humidity	No condensation	5	--	95	%RH
Soldering method	Wave soldering	260±5°C; Time: 5-10s			
	Manual soldering	360±10°C; Time: 3-5s			
Switching frequency	Full load, nominal input voltage	--	300	--	kHz
Vibration		10-150Hz, 5g, 0.75mm, along X, Y and Z			
MTBF	MIL-HDBK-217F@25°C	>1000Kh			

Mechanical Specifications

Case material	Black flame-retardant heat-resistant plastic (UL94V-0)
Mechanical dimensions	22.00 * 9.50 * 12.00mm
Weight	4.9g (typ.)
Cooling Method	Free air convection

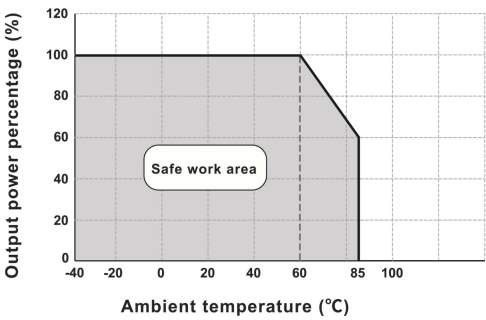
Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032 CLASS B (Recommended circuit see Figure 2-②)	
	RE	CISPR32/EN55032 CLASS B (Recommended circuit see Figure 2-②)	
EMS	ESD	IEC/EN61000-4-2 Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (Recommended circuit see Figure 2-①)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV (Recommended circuit see Figure 2-①)	perf. Criteria B

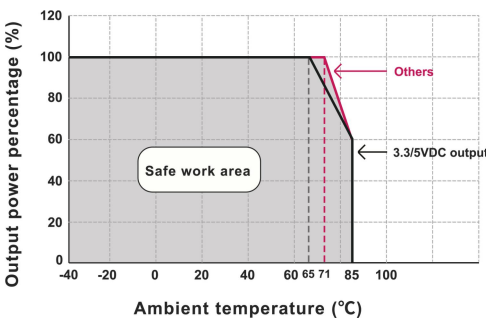
CS	IEC/EN61000-4-6 3Vr.m.s	perf. Criteria A
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Product Characteristic Curve

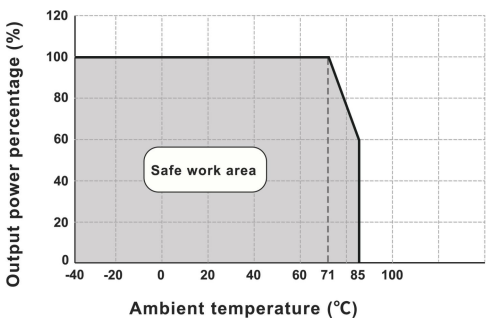
Temperature Derating Curve (5/12V Nominal Input)



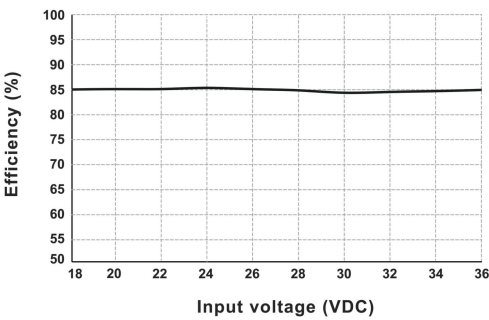
Temperature Derating Curve (24V Nominal Input)



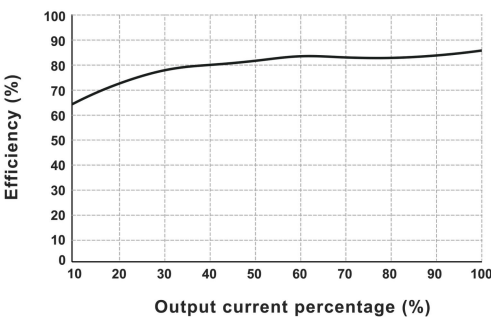
Temperature Derating Curve (48V Nominal Input)



Efficiency vs. Input Voltage Curve (Full Load, WF6-24D15S)

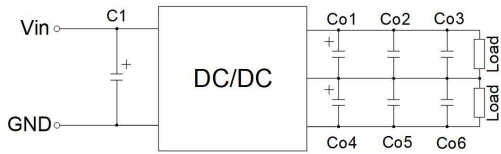


Efficiency vs. Output Load Curve (Vin=24V, WF6-24D15S)



Design Reference - Application circuit

Application circuit



(Figure 1)

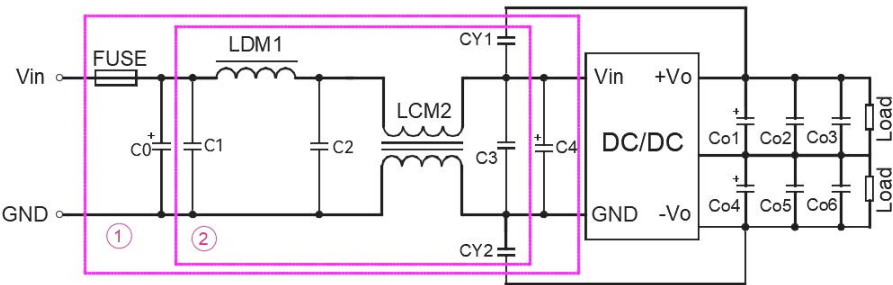
Recommended Capacitive Load Value Table

Vout	C1	Co1/Co4	Co2/Co5	Co3/Co6
3.3/5/6VDC	100μF/100V	100μF/16V	10μF/50V	0.1μF/16V
9/12/15VDC	100μF/100V	100μF/25V	10μF/50V	0.1μF/25V
18/24/28VDC	100μF/100V	100μF/50V	10μF/50V	0.1μF/50V

All DC/DC converters in this series are tested according to the recommended application circuit (Figure 1) before leaving the factory. If further reduction of input and output ripple is required, the external capacitors C1, Co1, Co2, Co3 at the input and output can be increased or capacitors with lower series equivalent impedance can be selected. For each output, under safe and reliable operating conditions, the maximum capacitance of the filter capacitor must not exceed the maximum capacitive load of the product.

Design Reference - EMC Solutions - Recommended Circuits

EMC Recommended Circuit Design and Application



(Figure 2)

Recommended Parameter Table

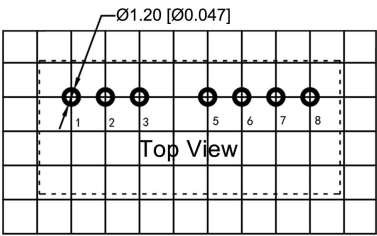
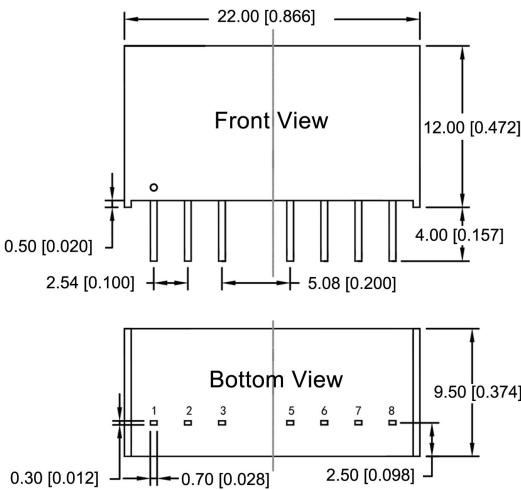
Part No.	Vin:5VDC	Vin:12VDC	Vin:24VDC	Vin:48VDC
FUSE	Select according to the actual input current			
C0/C4	330μF/25V	330μF/25V	330μF/50V	560μF/100V
C1/C2/C3	10μF/50V			10μF/100V
LDM1	10μH			
LCM2	470μH			
Co1/Co2/Co3	Refer to capacitor parameters in Figure 1			
CY1/CY2	1nF/400VAC			

Note: Part ① in Figure 2 is used for EMC testing; Part ② is used for EMI filtering, can be selected as needed.

Dimensions and Recommended Layout

WF6-xxDxxS Dimensions and Recommended Layout

Third Angle Projection 



The grid distance size is 2.54mm*2.54mm

Pin	Function
1	GND
2	Vin
3	CTRL
5	NC
6	+Vo
7	COM
8	-Vo

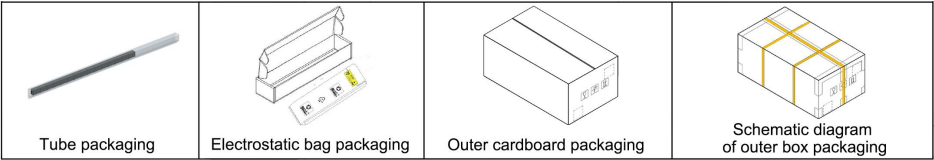
NC: Cannot be connected to any external circuit

Note:
Size unit: mm [inch]
Pin diameter tolerance: ± 0.10 [± 0.004]
Unmarked dimensional tolerance: ± 0.50 [± 0.020]

Packaging Information

Model series (Tube packaging)	Quantity per tube (pcs/ tube)	Quantity of electrostatic bag (pcs/ bag)	Quantity of inner box (pcs/ box)	Full box Quantity (pcs)
WF6-xxDxxS	23	230	920	3680

The schematic diagram of tube packaging is shown below:



Product precautions

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. The maximum capacitive load is tested within the input voltage range and under full load conditions;
4. Unless otherwise specified, all indicators in this manual are measured at Ta=25 °C, humidity<75% RH, nominal input voltage, and output rated load;
5. All indicator testing methods in this manual are based on our company's corporate standards;
6. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
7. Product specifications are subject to change without prior notice.

Manufacturer contact information

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