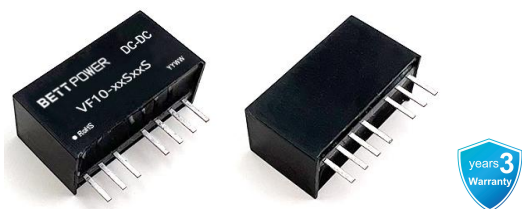


VF10-xxSxxS Series

DC-DC Converter | 10W | SIP8 | 4:1 Wide Input Voltage, Regulated Output | 3000VDC



Features

- SIP8 Package
- Operating Temperature Range: -40°C ~ +85°C
- 4:1 Wide Input Voltage Range
- Isolation Voltage: 3000VDC
- Full Load Efficiency: 88% (typ.)
- Input Under-voltage Protection, Output Short Circuit Protection, Over-current Protection
- Designed to meet IEC/EN/BS EN/UL 62368

Product Description



The VF10-xxSxxS series is an industrial-grade DC-DC converter module with 4:1 wide input voltage and 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 (%)	Capacitive Load (μF)
		Nominal (Range)	Max.	Output Voltage (VDC)	Max. Current (mA)		
EN/UL pending	VF10-24S03S	24(9~36)	40	3.3	2400	82	2200
	VF10-24S05S	24(9~36)	40	5	2000	84	2200
	VF10-24S06S	24(9~36)	40	6	1667	84	1800
	VF10-24S09S	24(9~36)	40	9	1111	86	680
	VF10-24S12S	24 (9~36)	40	12	833	87	470
	VF10-24S15S	24 (9~36)	40	15	667	87	330
	VF10-24S24S	24 (9~36)	40	24	417	87	220
	VF10-48S03S	48 (18~75)	80	3.3	2400	82	2200
	VF10-48S05S	48 (18~75)	80	5	2000	84	2200
	VF10-48S06S	48 (18~75)	80	6	1667	84	1800
	VF10-48S09S	48 (18~75)	80	9	1111	85	680
	VF10-48S12S	48 (18~75)	80	12	833	86	470

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	VF10-48S15S	48 (18~75)	80	15	667	86	330
	VF10-48S24S	48 (18~75)	80	24	417	85	220

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.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (Full Load/No-load)	24VDC Input	3.3V Output	--	402/10	413/25	mA
		5V/6VDC Output	--	496/10	508/25	mA
		Others	--	479/15	496/30	mA
	48VDC Input	3.3V Output	--	201/10	206/25	mA
		5V/6VDC Output	--	248/10	254/25	mA
		Others	--	242/15	251/30	mA
Reflected Ripple Current	Nominal Input Series		--	50	--	mA
Surge Voltage (1sec.max.)	24VDC Input		-0.7	--	50	VDC
	48VDC Input		-0.7	--	100	VDC
Start-up Voltage	24VDC Input		--	--	9	VDC
	48VDC Input		--	--	18	VDC
Input Under-voltage Protection	24VDC Input		5.5	6.5	--	VDC
	48VDC Input		13	16	--	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	5%~100% load		--	± 1.0	±3.0	%
Line Regulation	Full load, input voltage from low limit to high limit		--	±0.2	±0.5	%
Load Regulation	5% to 100% load		--	±0.5	±1.0	%
	0%-100% Load		--	±1.0	±3.0	%
Ripple & Noise	20MHz Bandwidth, 5% - 100% Load	24VDC Input	--	75	150	mVp-p
		48VDC Input	--	100	250	mVp-p
Transient Recovery Time	25% Load Step Change		--	300	500	ms
Transient Response Deviation	25% Load Step Change	3.3V/5V/6VDC Output	--	±5	±8	%
	Nominal Input Voltage	Others	--	±3	±5	%
Temperature Coefficient	Full Load		--	--	±0.03	%/℃
Over current Protection			110	160	--	%
Short Circuit Protection			Continuous short circuit, self-recovery			

Note:

- 0%-5%load ripple & noise ≤ 300mV
- 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
Safety Standard	Compliant with IEC/UL62368-1, IEC/EN60335-1, IEC/EN61558-1				
MTBF	MIL-HDBK-217F@25°C	>1000Kh			

Mechanical Specifications

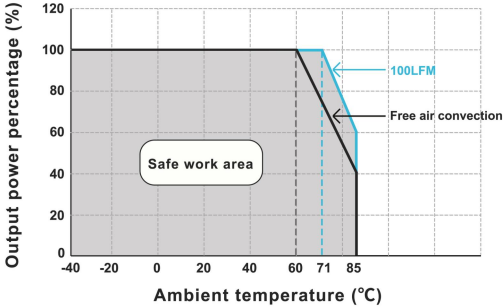
Case Material	Black Flame-Retardant Heat-Resistant Plastic (UL94V-0)
Mechanical Dimensions	22.00 * 9.50 * 12.00mm
Weight	4.8g (typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

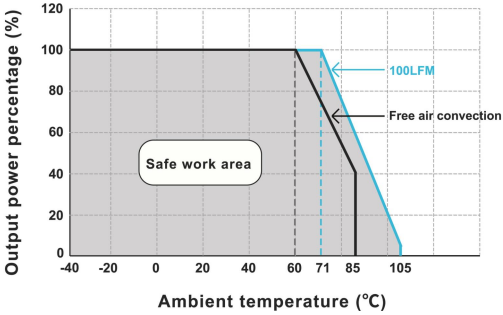
EMI	CE	CISPR32/EN55032 CLASS B (Recommended circuit see Figure 2/3-②)			
	RE	CISPR32/EN55032 CLASS B (Recommended circuit see Figure 2/3-②)			
EMS	ESD	IEC/EN61000-4-2 Contact±6KV			perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m			perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (Recommended circuit see Figure 2/3-①)			perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV (Recommended circuit see Figure 2/3-①)			perf. Criteria B
	CS	IEC/EN61000-4-6 3Vr.m.s			perf. Criteria A

Product Characteristic Curve

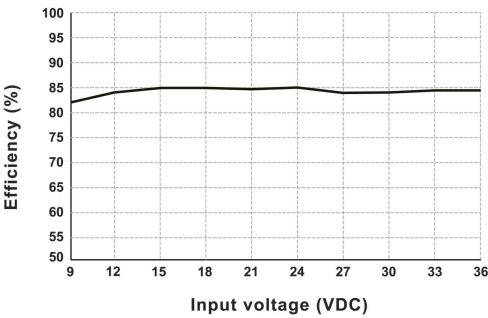
Temperature Derating Curve (24V Input)



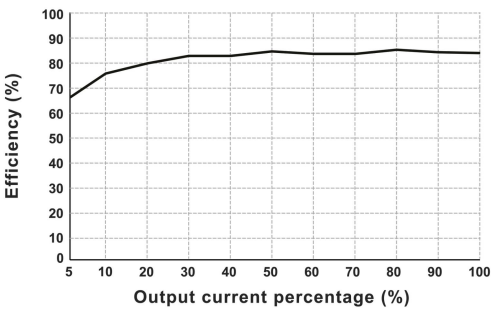
Temperature Derating Curve (48V Input)



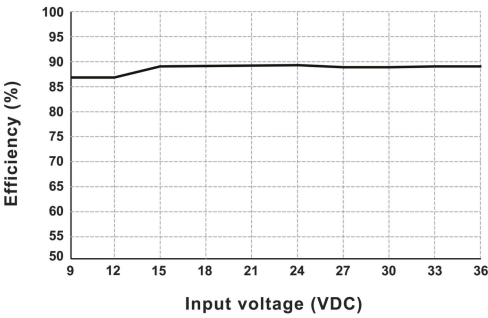
Efficiency VS Input Voltage (Full Load, VF10-24S05S)



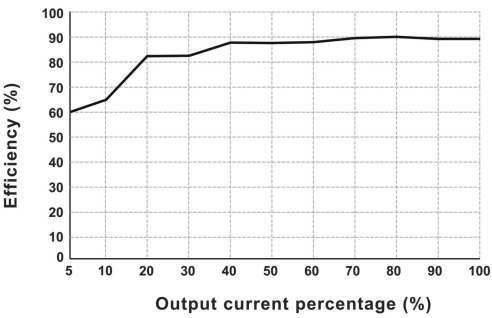
Efficiency VS Output Load (Vin=24V, VF10-24S05S)



Efficiency VS Input Voltage (Full Load, VF10-24S24S)

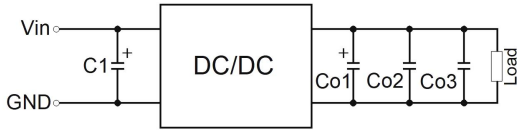


Efficiency VS Output Load (Vin=24V, VF10-24S24S)



Design Reference - Application Circuit

Application circuit



(Figure 1)

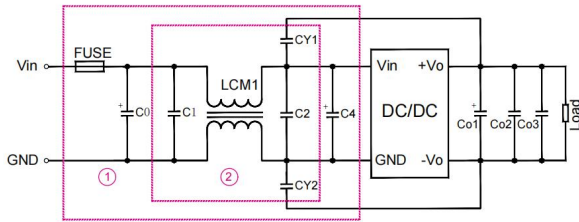
Recommended Capacitive Load Value Table

Vout(VDC)	C1(μ F)	Co1(μ F)	Co2(μ F)	Co3(μ F)
3.3/5/6VDC	100 μ F/100V	100 μ F/16V	10 μ F/50V	0.1 μ F/16V
9/12/15VDC	100 μ F/100V	47 μ F/25V	10 μ F/50V	0.1 μ F/25V
24VDC	100 μ F/100V	47 μ F/50V	10 μ F/50V	0.1 μ F/50V

Application Circuit Description: All DC/DC converters in this series are tested according to the recommended test circuit (Figure 1) before leaving the factory. To further reduce input and output ripple, the external capacitors $C1$, $Co1$, $Co2$, $Co3$ at the input and output can be increased or capacitors with lower equivalent series impedance can be selected, but the capacitance value 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

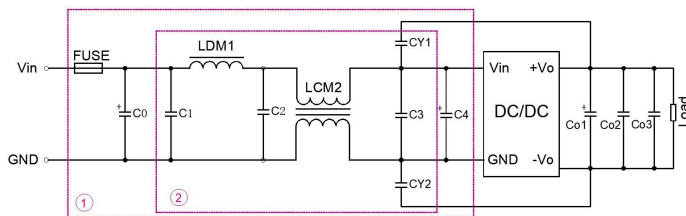
Input Voltage	V_{in} : 24V
FUSE	Select according to the actual input current
$C0$, $C4$	330 μ F/50V
$C1$, $C2$	10 μ F/50V
$LCM1$	470 μ H
$Co1/Co2/Co3$	Refer to capacitor parameters in Figure 1
$CY1$, $CY2$	1nF/2000VDC

Part ① is used for EMC testing;

Part ② is used for EMI filtering, selectable based on requirements.

EMC Recommended Circuit Design and Application II

Recommended Parameter Table



(Figure 3)

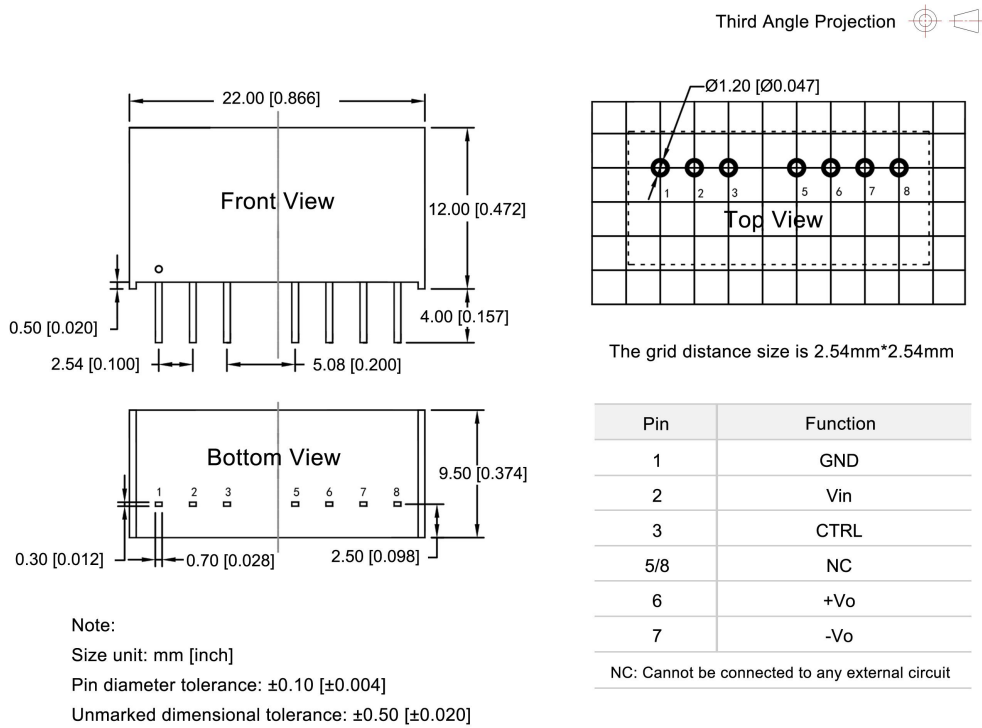
Model	V_{in} : 48VDC
FUSE	Select according to the actual input current
$C0/C4$	560 μ F/100V
$C1/C2$	10 μ F/100V
$C3$	27 μ F/100V
$LDM1$	4.7 μ H
$LCM2$	1mH
$Co1/Co2/Co3$	Refer to capacitor parameters in Figure 1
$CY1/CY2$	1nF/400VAC

Part ① is used for EMC testing;

Part ② is used for EMI filtering, selectable based on requirements.

Dimensions and Recommended Layout

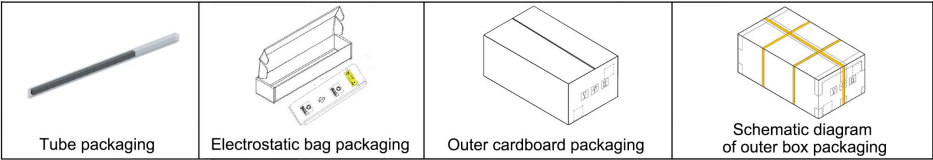
VF10-xxSxxS Dimensions and Recommended Layout



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)
VF10-xxSxxS	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 $T_a=25\text{ }^{\circ}\text{C}$, 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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