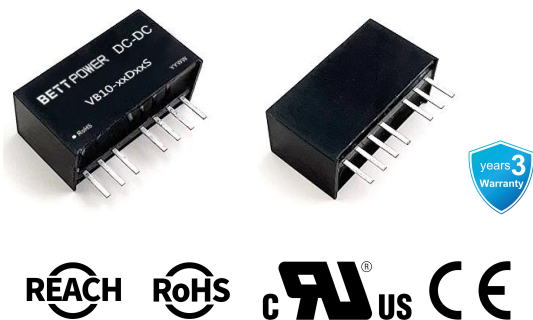


VB10-xxDxxS Series

DC-DC Converter | 10W | SIP8 | 4:1 Wide Input Voltage, Regulated Output | 1500VDC



Features

- SIP8 Package
- Operating Temperature Range: -40°C ~ +85°C
- 4:1 Wide Input Voltage Range
- Isolation Voltage: 1500VDC
- Full Load Efficiency: 86% (typ.)
- Designed to meet IEC/EN/BS EN/UL 62368

Product Description



The VB10-xxDxxS 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 applications in communication equipment, instrumentation, and industrial electronics.

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	VB10-24D03S	24 (9~36)	40	±3.3	±1200	82	1000
	VB10-24D05S	24 (9~36)	40	±5	±1000	82	1000
	VB10-24D06S	24 (9~36)	40	±6	±883	82	1000
	VB10-24D09S	24 (9~36)	40	±9	±556	83	330
	VB10-24D12S	24 (9~36)	40	±12	±417	85	220
	VB10-24D15S	24 (9~36)	40	±15	±333	85	100
	VB10-24D24D	24 (9~36)	40	±24	±208	85	47
	VB10-48D03S	48 (18~75)	80	±3.3	±1200	82	1000
	VB10-48D05S	48 (18~75)	80	±5	±1000	82	1000
	VB10-48D06S	48 (18~75)	80	±6	±883	82	1000
	VB10-48D09S	48 (18~75)	80	±9	±556	83	330
	VB10-48D12S	48 (18~75)	80	±12	±417	85	220
	VB10-48D15S	48 (18~75)	80	±15	±333	85	100
	VB10-48D24D	48 (18~75)	80	±24	±208	85	47

Note: *The capacitive load of both positive and negative outputs is the same

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (Full Load/No-load)	24VDC Input	3.3V Output	--	418/25	430/45	mA
		5/6/9V Output	--	521/25	530/45	mA
		Others	--	484/9	496/18	mA
	48VDC input	3.3V Output	--	206/25	211/45	mA
		5/6/9V output	--	254/25	265/45	mA
		Others	--	245/9	250/18	mA
Reflected Ripple Current			--	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 Filter			
Hot Plug			Unavailable			

Output Specifications

Item	Operating conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5%~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	--	±0.2	±0.5	%
		Vo2	--	±0.4	±1.0	%
Load Regulation	5% to 100% load	Vo1	--	±0.5	±1.0	%
		Vo2	--	±1.0	±1.5	%
Ripple & Noise	20MHz bandwidth, 5% - 100% load		--	75	150	mV
Transient Recovery Time	25% load step change		--	0.3	0.5	ms
Transient Response Deviation	25% load step change Nominal input voltage	3.3, 5V output	--	±5	±8	%
		Others	--	±3	±5	%
Temperature Coefficient	Full load		--	--	±0.03	%/°C
Over current Protection			110	160	230	%
Short Circuit Protection			Continuous short circuit, self-recovery			

Note:

- Under 0%-100% load conditions, the load regulation index is ±3%;
- 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	1500	--	--	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 Profile	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
Product Certification	Product design complies with: UL - 62368-1; CB - 62368-1; CE - 62368-1				
Safety Standard	Product design complies with: IEC/UL62368-1, IEC/EN60335-1, IEC/EN61558-1				
MTBF	MIL-HDBK-217F@25°C	>1000Kh			

Mechanical Specifications

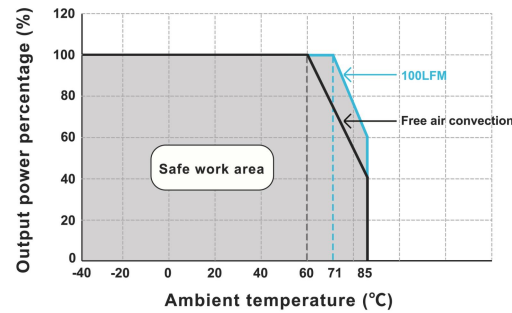
Case Material	Black flame-retardant heat-resistant plastic (UL94V-0)
Mechanical Dimensions	22.00 * 9.50 * 12.00mm
Weight	4.8g (typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

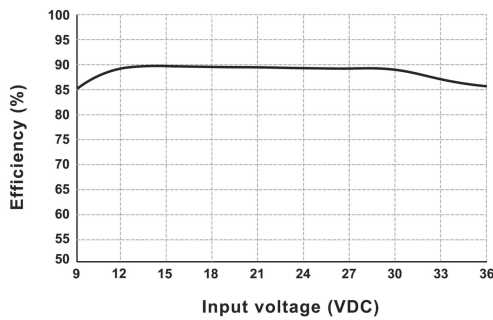
EMI	CE	CISPR32/EN55032 CLASS B (Recommended circuit see Fig.2)			
	RE	CISPR32/EN55032 CLASS B (Recommended circuit see Fig.2)			
EMS	ESD	IEC/EN61000-4-2 Contact±6KV			perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m			perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2KV (Recommended circuit see Fig.2-①)			perf. Criteria 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

Product Characteristic Curve

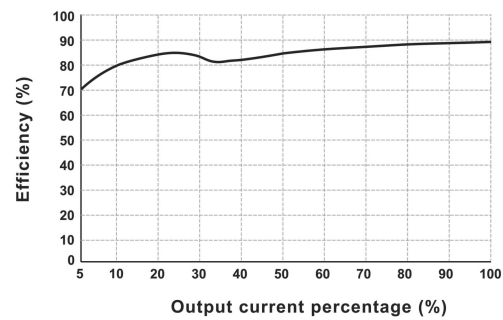
Temperature Derating Curve



Efficiency VS Input Voltage (Full load, VB10-24D05S)

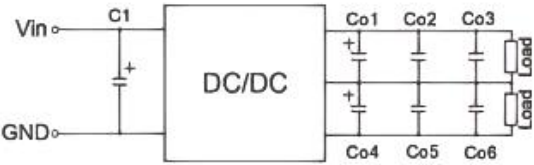


Efficiency VS Output Load Curve (Vin=24V, VB10-24D05S)



Design Reference - Application Circuit

Application circuit



(Figure 1)

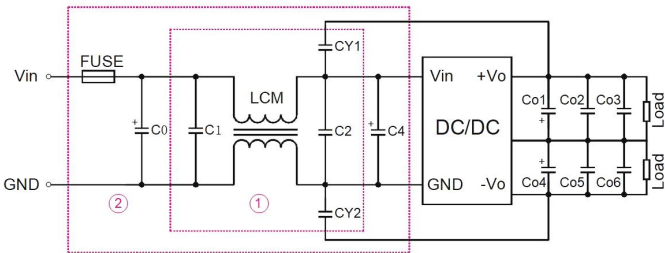
Recommended Capacitive Load Value Table

Vout	C1	Co1, Co4	Co2, Co5	Co3, Co6
3.3/5VDC	100μF/100V	100uF/16V	10uF/50V	0.1uF/16V
9/12/15VDC	100μF/100V	47μF/25V	10μF/50V	0.1μF/25V
24VDC	100μF/100V	47μF/50V	10μF/50V	0.1μF/50V

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 replaced with capacitors having lower equivalent series impedance, 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

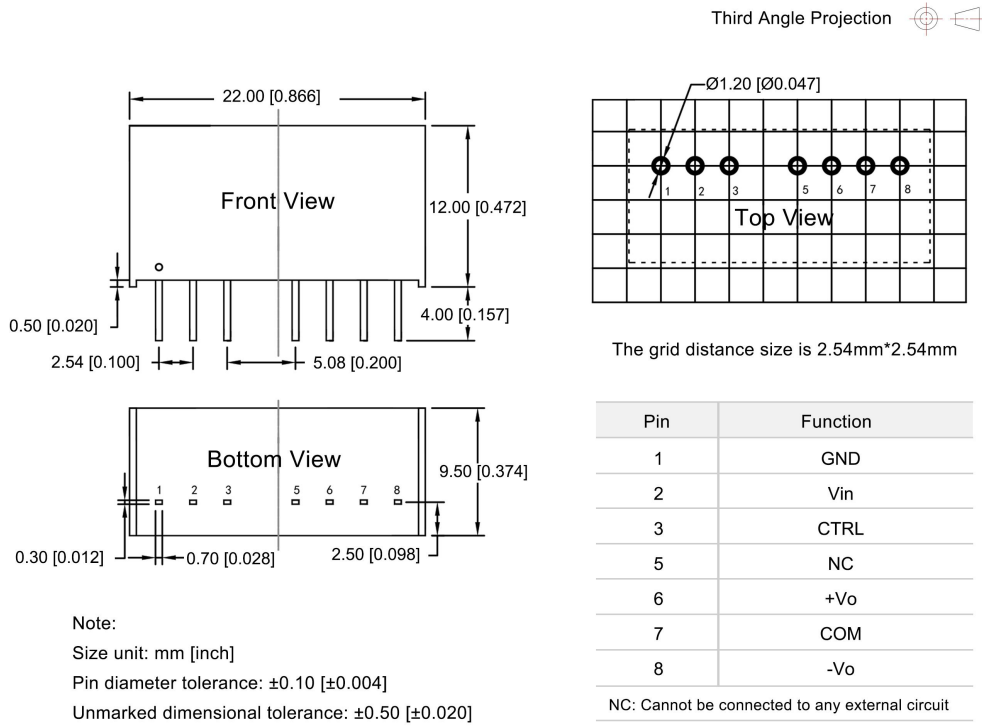
Input Voltage	Vin:24V	Vin:48V
FUSE	Select according to the actual input current	
C0, C4	330uF/50V	220uF/100V
C1, C2	10μF/50V	
LCM	1.4-1.7mH	
Co1/Co2/Co3/ Co4/Co5/Co6	Refer to Cout parameters in Figure 1	
CY1, CY2	1nF/400VAC	

Part ① is used for EMC testing;

Part ② is used for EMI filtering, can be selected as needed.

Dimensions and Recommended Layout

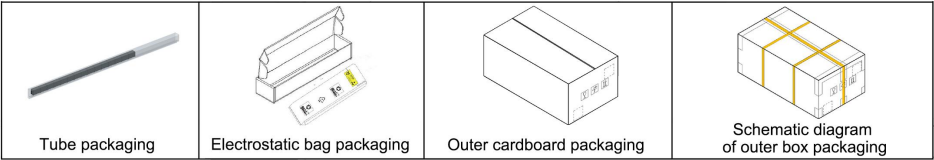
VB10-xxDxxS Dimensions and Recommended Layout



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)
VB10-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 $T_a=25\text{ }^{\circ}\text{C}$, 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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