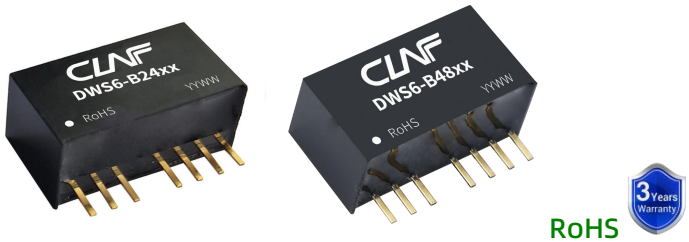
Descriptions

6W isolated，DC/DC Converter



RoHS

3 Years Warranty

CE Report EN 62368-1

UKCA Report BS EN 62368-1

Features

- Wide 4:1 input voltage range
- High efficiency up to 87%
- No-load power consumption bottom 0.12W
- I/O isolation test voltage 1.6k VDC
- Input under-voltage protection, output short-circuit, over-current protection
- Operating ambient temperature range: -40℃ to +105℃
- Small SIP packaging
- International Standard Pin out

Applications

- Industrial control
- Electric Power
- Medical
- Instrumentation
- Communication

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max. ①	Voltage (VDC)	Current(mA) Max./Min.		
EN/BS EN	DWS6-B2403	24 (9-36)	40	3.3	1350/0	76/78	1800
	DWS6-B2405			5	1200/0	80/82	1000
	DWS6-B2409			9	667/0	82/84	470
	DWS6-B2412			12	500/0	83/85	470
	DWS6-B2415			15	400/0	83/85	220
	DWS6-B2424			24	250/0	83/85	100
	DWS6-B4803	48 (18-75)	80	3.3	1600/0	76/79	1200
	DWS6-B4805			5	1200/0	80/83	680
	DWS6-B4809			9	667/0	82/84	330
	DWS6-B4812			12	500/0	84/86	330
	DWS6-B4815			15	400/0	85/87	150
	DWS6-B4824			24	250/0	85/87	68

Note:
①Exceeding the maximum input voltage may cause permanent damage;
②The above efficiency values are measured within 10 seconds of starting the product under the nominal input voltage and output rated load;
③.Product images are for reference only; the actual product shall prevail

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load /no load)	24VCD nominal input series nominal input voltage	3.3V Ouput	--	238/5	245/12	mA
			5V Ouput	--	305/5	313/12	
			Others	--	298/10	305/16	
		48VCD nominal input series nominal input voltage	3.3V, 5V Ouput	--	158/5	165/12	
			Others	--	143/10	156/16	
	Reflected Ripple Current			--	50	--	
	Surge Voltage (1sec. max.)	24VCD nominal input series		-0.7	--	50	VDC
		48VCD nominal input series		-0.7	--	100	
	Start-up Voltage	24VCD nominal input series		--	--	9	
		48VCD nominal input series		--	--	18	
	Input Under-voltage Protection	24VCD nominal input series		5.5	6.5	--	
		48VCD nominal input series		13	14.5	--	
	Input Filter			Capacitive filter			
	Hot Plug			Unavailable			
	Ctrl ①	Module on		Ctrl pin open or pulled high (TTL 3.5-12VDC)			
		Module off		Ctrl pin pulled low to GND (0-1.2VDC)			
		Input current when off		--	6	10	mA
Output Specifications	Output Voltage Accuracy②	24VCD nominal input series	5%-100% load	--	±1	±2	%
		48VCD nominal input series		--	--	±3	
	Linear Regulation	Input voltage variation from low to high at full load		--	±0.5	±1	
	Load Regulation③	5%-100% load		--	±0.5	±1.5	
	Transient Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
	Transient Response Deviation		3.3V/5V output	--	±5	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise④	20MHz bandwidth, 5%-100% load		--	50	100	mV p-p
	Over-current Protection	Input voltage range		110	160	230	%Io
	Short-circuit Protection			Continuous, self-recovery			
General Specifications	Isolation voltage	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.		1600	--	--	VDC
	Insulation Resistance	Input-output resistance at 500VDC		1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V		--	1000	--	pF
	Operating Temperature	See Fig. 1		-40	--	+105	℃
	Storage Humidity	Non-condensing		5	--	95	%RH
	Storage Temperature			-55	--	+125	℃
	Pin Soldering Resistance Temperature⑤	Soldering spot is 1.5mm away from the case, 10 seconds max.		--	--	+300	
		Wave soldering, maximum 10 seconds		255	260	265	
	Vibration			10-150Hz, 5G, 0.75mm. along X, Y and Z			

	Switching Frequency⑥	PWM mode	--	500	--	kHz
	MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Mechanical Specifications	Case Material	Black flame-retardant and heat-resistant plastic branch (UL94 V-0)				
	Dimensions	22 × 9.50 × 12.00 mm				
	Weight	4.7g (Typ.)				
	Cooling Method	Free air convection				

Note:
①The Ctrl pin voltage is referenced to input GND.
②Under 0%-5% load, the maximum output voltage accuracy is ±3%;
③Load regulation for 0%-100% load is ±3%;
④Under 0%-5% load conditions, ripple & noise does not exceed 150mV. The ”parallel cable” method is used for Ripple and Noise test, .
⑤The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection;
⑥Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (24VDC nominal input series: See Figure 4-② for the recommended circuit;48VDC nominal input series: See Figure 5-① for the recommended circuit;)	
	RE	CISPR32/EN55032 CLASS B (24VDC nominal input series: See Figure 4-② for the recommended circuit; 48VDC nominal input series: See Figure 5-① for the recommended circuit;)	
Immunity	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 (24VDC nominal input series: See Figure 4-① for the recommended circuit; 48VDC nominal input series: See Figure 5-① for the recommended circuit;)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2kV (24VDC nominal input series: See Figure 4-① for the recommended circuit; 48VDC nominal input series: See Figure 5-① for the recommended circuit;)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A

Characteristic Curve

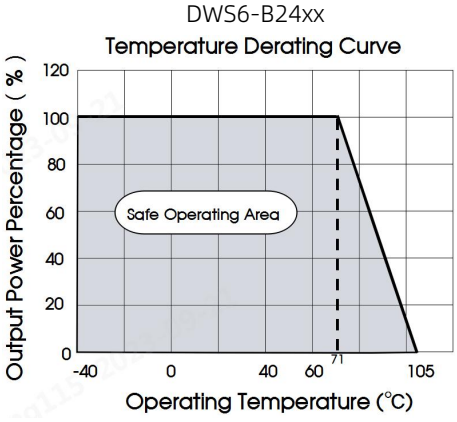


Fig. 1

DWS6-B48xx Temperature Derating Curves

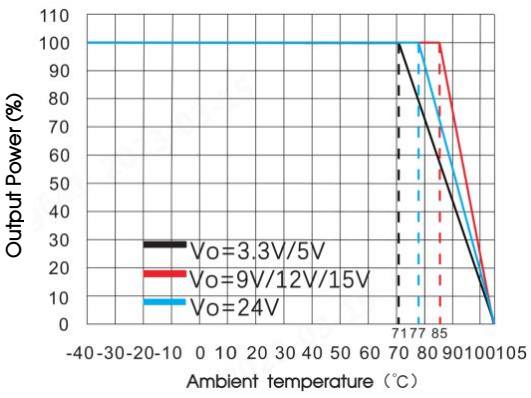


Fig. 1-①

DWS6-B48xx Temperature Derating Curves（1m/s）

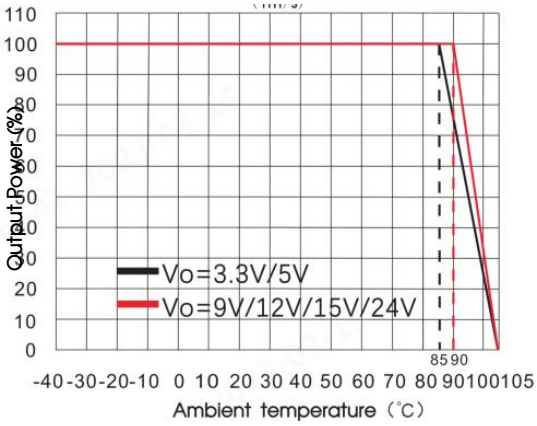


Fig. 1-②

Design Reference

1. Ripple & noise

The general performance of all DC/DC converters of this series is tested in accordance with the test circuit recommended in Figure 2 before leaving the factory. Figure 3 is used for ripple noise test.



Fig. 2

Cin		Vo(VDC)	Cout	Cout0	Cout1
Vin:24VDC	100μF/100V	3.3/5/9	22μF/16V	1μF/50V	10μF/50V Tantalum Capacitors
		12/15	22μF/25V	1μF/50V	10μF/50V Tantalum Capacitors
		24	22μF/50V	1μF/50V	10μF/50V Tantalum Capacitors
Vin:48VDC	100μF/100V	3.3/5	22μF/16V	1μF/50V	10μF/50V Tantalum Capacitors
		9/12/15/24	10μF/50V	1μF/50V	10μF/50V Tantalum Capacitors

2. Typical application

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.



Fig. 3

Cin		Vo(VDC)	Cout
Vin:24VDC	100μF/100V	3.3/5/9	22μF/16V
		12/15	22μF/25V
		24	22μF/50V
Vin:48VDC	100μF/100V	3.3/5	22μF/16V
		9/12/15/24	10μF/50V

3. EMC compliance circuit

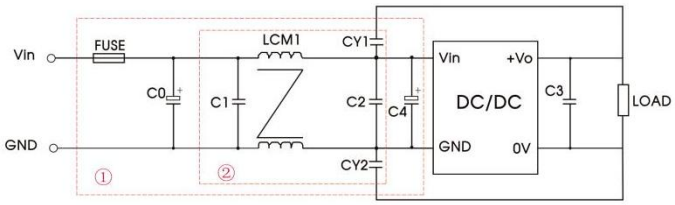


Fig. 4

Notes: We use Part ① in Fig. 4 for Immunity test and part ② for Emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 24VDC
FUSE	Choose according to actual input current
C0/C4	330μF/50V
C1/C2	10μF/50V
C3	22μF/50V
LCM1	470μH
CY1/CY2	1nF/400VAC

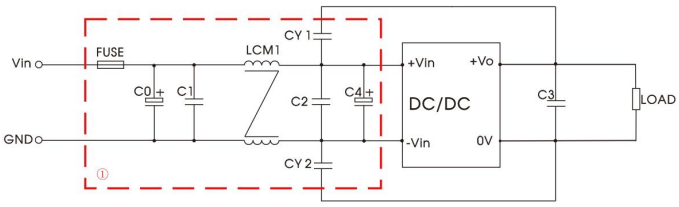


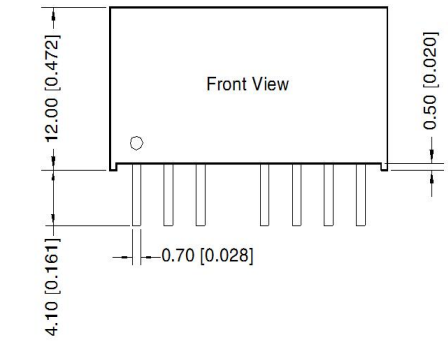
Fig. 5

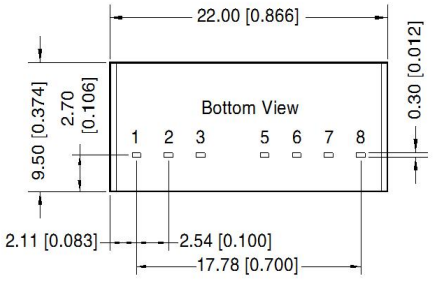
Notes: For EMC and EMI tests we use Part ① in Fig. 5.

Parameter description:

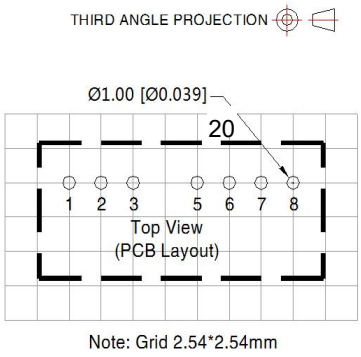
Model	Vin: 48VDC
FUSE	Choose according to actual input current
C0	200μF/100V
C1/C2	10μF/100V
C3	22μF/100V
LCM1	470μH
C4	330μF/100V
CY1/CY2	1nF/400VAC

Dimensions and Recommended Layout





Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
2	Vin
3	Ctrl
5	NC
6	+Vo
7	0V
8	NC

NC: Pin to be isolated from circuitry

Note:

1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. The products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified companies;
7. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.