Descriptions

10W, DC/DC Converter



RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Ultra-wide 4:1 input voltage range
- High efficiency up to 84%
- Low no-load power consumption
- Operating ambient temperature range: -40℃ to +85℃
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Industry standard pin-out

Applications

- Industrial control
- Electric power
- Instruments
- Communications applications

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.			
				Vo1	Vo2	Vo1	Vo2		
EN/BS EN	DWMD10-D480505	48 (18-75)	80	5	5	1000	1000	81/84	1000/1000
	DWMD10-D480512			5	12	1000	417	82/84	1000/470
	DWMD10-D480524			5	24	1000	209	82/84	1000/100

Notes:
①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured In nominal input voltage and rated output load;
③Product images are for reference only. Please refer to the actual product for details.

Specifications

Product Specifications	Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	Nominal input voltage		--	248/4	258/10	mA
	Reflected Ripple Current	Nominal input voltage		--	30	--	
	Surge Voltage (1sec. max.)			-0.7	--	100	VDC
	Start-up Voltage			--	--	18	
	Under-voltage Protection			12	15.5	--	
	Input Filter			Pi filter			
	Ctrl①	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		--	3	10	mA
	Hot Plug			Unavailable			
Output Specifications	Voltage Accuracy	0%-100% load	Vo1	--	±1	±3	%
		Input voltage, any balanced load	Vo2	--	±3	±6	
	Linear Regulation	Full load, Input voltage variation from low to high, dual output	Vo1	--	±0.3	±0.5	--
			Vo2	--	±2	±3	
	Load Regulation	10%-100% load, dual output, balanced power	Vo1	--	±0.5	±1	%
			Vo2	--	±3	±6	
	Transient Recovery Time②	25% load step change, nominal input voltage		--	300	500	μs
	Transient Response Deviation②			--	±5	±8	%
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise③	5%-100% load		--	75	150	mV p-p
	Over-voltage Protection	Input voltage range		110	--	160	%Vo
	Over-current Protection④			110	150	200	%Io
	Short-circuit Protection⑤			Continuous, self-recovery			
General Specifications	Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.		1500	--	--	VDC
		Vo1-Vo2 Electric Strength Test for 1 minute with a leakage current of 1mA max.		500	--	--	
	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	--	+85	℃
	Storage Humidity	Non-condensing		5	--	95	%RH
	Storage Temperature			-55	--	+125	℃
	Pin Soldering Resistance Temperature⑥	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, along X, Y and Z			
	Switching Frequency⑦	PWM mode		--	300	--	kHz
	MTBF	MIL-HDBK-217F@25℃		1000	--	--	k hours
Mechanical Specifications	Case Material	Aluminum alloy					
	Dimensions	25.40 × 25.40 × 11.70 mm					
	Weight	13.0g (Typ.)					

	Cooling method	Free air convection

Note:
①The voltage of Ctrl pin is relative to input pin GND;
②Dynamic load only for Vo1;
③The " parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information;
④Dual output with balanced-load;
⑤Any load short circuit, the two outputs both go into hiccup protection; The Vo2 could be short ciruit only Vo1 with load(10%-100%); The Vo1 could be shorted under condition of Vo2 load of 0%-100%;
⑥The 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;
⑦Switching 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 (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±4kV / Air ±6kV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

Characteristic Curve

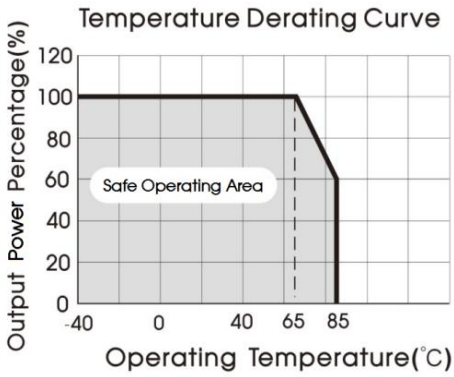
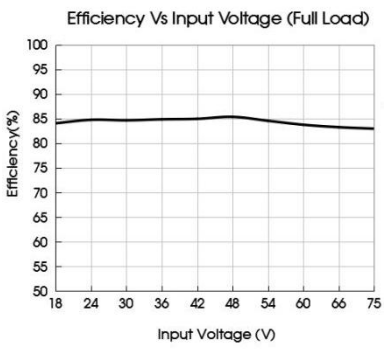
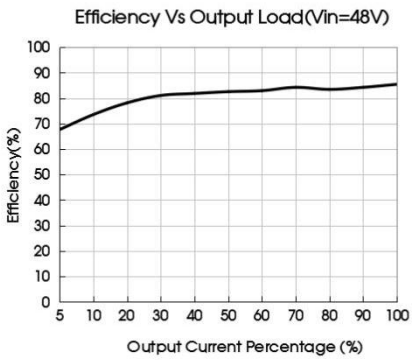


Fig. 1 (Vin=48V)

DWMD10-D480505



DWMD10-D480505



Design Reference

1. Typical application

①All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.
②Input 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 max. capacitive load value of the product.



Fig. 2

Vout(VDC)	Cin	Cout
5	100μF/100V	100μF/16V
12		22μF/25V
24		22μF/50V

2. EMC compliance circuit

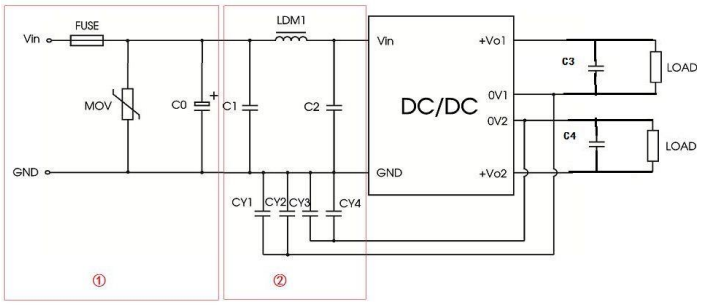


Fig. 3

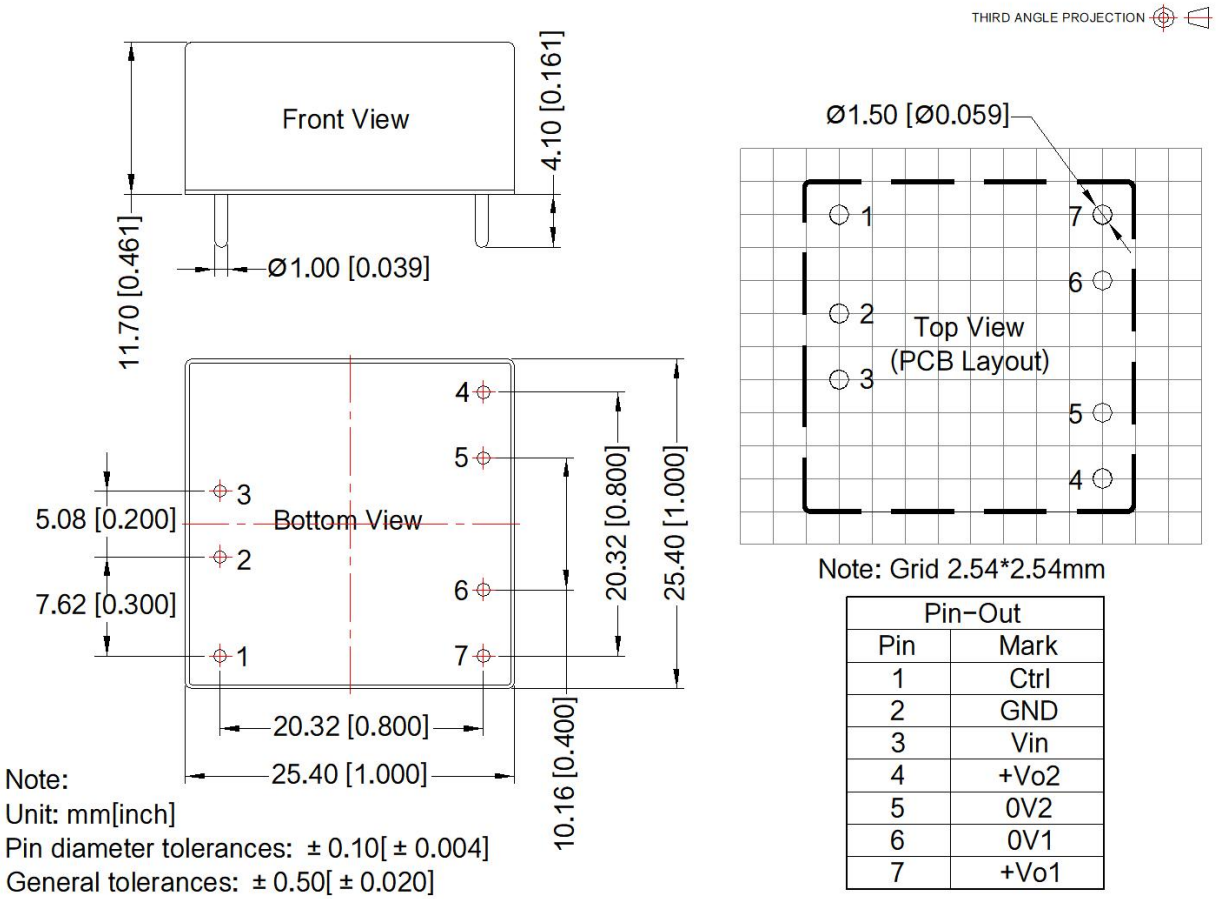
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

List of components:

Model	Vin: 48VDC
FUSE	Choose according to actual input current
MOV	S14K60
C0	330μF/100V
C1/ C2	4.7μF/100V
C3/ C4	Refer to the Cout in Fig.2
LDM1	15uH
CY1/ CY2/ CY3/ CY4	2.2nF/2000V

3. The products do not support parallel connection of their output

Dimensions and Recommended Layout



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

Pin-Out	
Pin	Mark
1	Ctrl
2	GND
3	Vin
4	+Vo2
5	0V2
6	0V1
7	+Vo1

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. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
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.