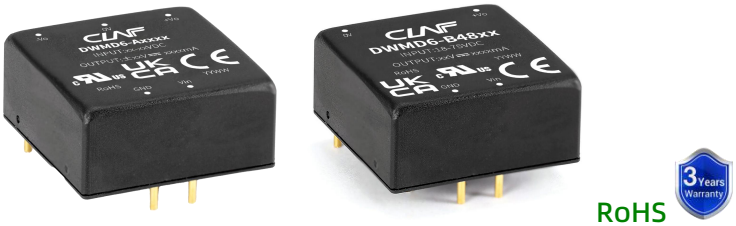
Descriptions

6W isolated, DC/DC Converter



RoHS

c UL us UL62368-1 | CE Report EN62368-1 | UK CA Report BS EN62368-1

Features

- Ultra-wide 4:1 input voltage range
- High efficiency up to 88%
- No-load power consumption as low as 0.12W
- I/O test isolation voltage: 1.5k VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40℃ to +85℃
- Meet CISPR32/EN55032 CLASS A, without extra components
- Input reverse polarity protection available with chassis(E2S) or Din-Rail mounting (D4S) version
- Industry standard pin-out

Applications

- medical care
- industrial control
- electric power
- instruments
- Communication
- Railway

Selection Guide

Certification	Part No. ①	Input Voltage (VDC)		Output		Full Load Efficiency④ (%) Min./Typ.	Capacitive Load⑤ (μF)Max.
		Nominal② (Range)	Max. ③	Voltage (VDC)	Current (mA) Max./Min.		
UL/EN/BS EN	DWMD6-A2405	24 (9-36)	40	±5	±600/0	81/83	470
EN/BS EN	DWMD6-A2412			±12	±250/0	84/87	100
UL/EN/BS EN	DWMD6-A2415			±15	±200/0	83/85	100
	DWMD6-A2424			±24	±125/0	85/87	100
EN/BS EN	DWMD6-B2403			3.3	1500/0	75/77	1800
UL/EN/BS EN	DWMD6-B2405			5	1200/0	80/83	1000
EN/BS EN	DWMD6-B2409			9	667/0	82/84	680
EN/BS EN	DWMD6-B2412			12	500/0	83/85	470
UL/EN/BS EN	DWMD6-B2415			15	400/0	84/86	220
	DWMD6-B2424			24	250/0	84/86	100
UL/EN/BS EN	DWMD6-A4805	48 (18-75)	80	±5	±600/0	81/83	470
EN/BS EN	DWMD6-A4812			±12	±250/0	85/87	100

	DWMD6-A4815			±15	±200/0	86/88	100
	DWMD6-B4803			3.3	1500/0	77/79	1800
UL/EN/BS EN	DWMD6-B4805			5	1200/0	81/83	1000
EN/BS EN	DWMD6-B4812			12	500/0	85/87	470
	DWMD6-B4815			15	400/0	86/88	220
	DWMD6-B4824			24	250/0	86/88	100

Notes:
①Use "E2S" suffix for chassis mounting and "D4S" suffix for Din-Rail mounting;
②The E2S and D4S Model's start-up and minimum input voltages are increased by 1VDC due to the input reverse polarity protection circuit;
③Exceeding the maximum input voltage may cause permanent damage;
④Efficiency is measured at nominal input voltage and rated output load; efficiencies for E2S and D4S Model's is decreased by 2% due to the input reverse polarity protection circuit;
⑤The specified maximum capacitive load value for Vo1 and Vo2 output is identical;
⑥Product 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)	24VDC nominal input series, nominal input voltage	3.3V output	--	268/5	275/12	mA
			Others	--	301/5	312/12	
		48VDC nominal input series, nominal input voltage	3.3V output	--	130/4	134/8	
			Others	--	150/4	155/8	
	Reflected Ripple Current	Nominal input voltage		--	20	--	
	Surge Voltage (1sec. max.)	24VDC nominal input series		-0.7	--	50	VDC
		48VDC nominal input series		-0.7	--	100	
	Start-up Voltage	24VDC nominal input series		--	--	9	
		48VDC nominal input series		--	--	18	
	Input Under-voltage Protection	24VDC nominal input series		5.5	6.5	--	
		48VDC nominal input series		12	15.5	--	
	Input Filter			Pi filter			
	Hot Plug			Unavailable			
Output Specifications	Voltage Accuracy①	0% - 100% load		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
			Vo2	--	±0.5	±1	
	Load Regulation②	5% -100% load	Vo1	--	±0.5	±1	
			Vo2	--	±0.5	±1.5	
	Cross Regulation	Dual outputs, Vo1 load at 50%, Vo2 load at range of 10% - 100%		--	--	±5	
	Transient Recovery Time	25% load step change, nominal input voltage	All	--	300	500	μs
	Transient Response Deviation		3.3V, 5V, ±5V output	--	±5	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise③	20MHz bandwidth, 5% - 100% load		--	60	85	mV p-p
	Over-voltage Protection	Input voltage range		110	--	160	%Vo

	Over-current Protection		110	140	190	%Io
	Short-circuit Protection		Continuous, self-recovery			
General Specifications	Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	--	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	--	+85	℃
	Storage Humidity	Non-condensing	5	--	95	%RH
	Storage Temperature		-55	--	+125	℃
	Pin Soldering Resistance Temperature④	Soldering spot is 1.5mm away from the case, 10 seconds max.	--	--	+300	
		Wave soldering, maximum 10 seconds	255	260	265	
	Vibration		IEC/EN61373 - Category 1, Grade B			
	Switching Frequency⑤	PWM mode	--	300	--	kHz
	MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours
Mechanical Specifications	Case Material	Aluminum alloy				
	Dimensions	Horizontal package	25.40 × 25.40 × 11.70 mm			
		E2S chassis mounting	76.00 × 31.50 × 21.20 mm			
		D4S DIN-rail mounting	76.00 × 31.50 × 25.80 mm			
	Weight	Horizontal package/E2S wiring package/D4S rail package	12.5g /36.0g /56.0g(Typ.)			
	Cooling method	Free air convection				

Note:

①Output voltage accuracy of ±5VDC/±9VDC output converter for 0%-5% load is ±5% max;

②Load regulation for 0%-100% load is ±5%;

③Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The " parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information;

④The 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;

⑤Switching 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 A (without extra components) CLASS B (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS A (without extra components) CLASS B (see Fig.3-② for 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 (see Fig.3-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-①for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29	0%, 70%	perf. Criteria B

Electromagnetic Compatibility (EMC) (EN50155)

Emissions	CE	EN50121-3-2 150kHz-500kHz 99dBuV (see Fig.3-② for recommended circuit) EN55016-2-1 500kHz-30MHz 93dBuV (see Fig.3-② for recommended circuit)	
	RE	EN50121-3-2 30MHz-230MHz 40dBuV/m at 10m (see Fig.3-② for recommended circuit) EN55016-2-1 230MHz-1GHz 47dBuV/m at 10m (see Fig.3-② for recommended circuit)	
Immunity	ESD	EN50121-3-2 Contact ±6kV/Air ±8kV	perf. Criteria A
	RS	EN50121-3-2 20V/m	perf. Criteria A
	EFT	EN50121-3-2 ±2kV 5/50ns 5kHz (see Fig.3-① for recommended circuit)	perf. Criteria A
	Surge	EN50121-3-2 line to line ±1kV (42Ω, 0.5μF) (see Fig.3-① for recommended circuit)	perf. Criteria A
	CS	EN50121-3-2 0.15MHz-80MHz 10V r.m.s	perf. Criteria A

Typical Characteristic Curve

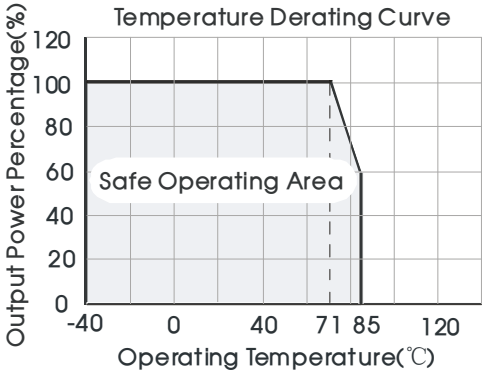
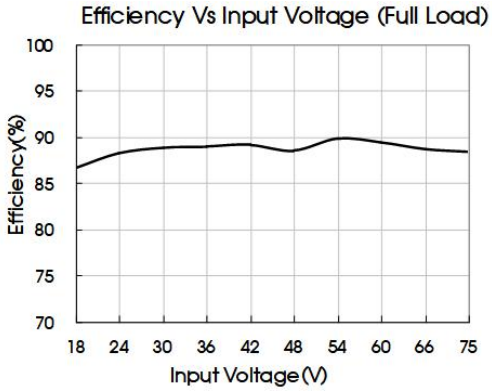
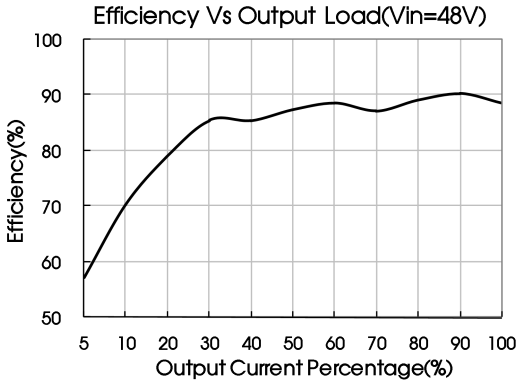


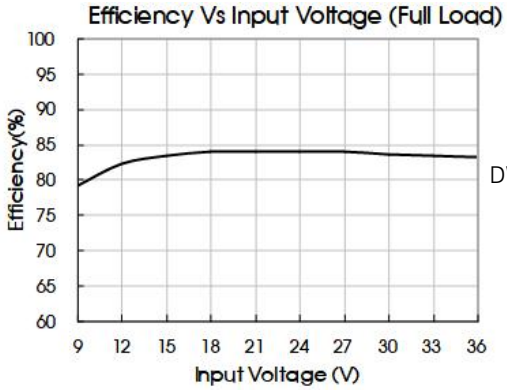
Fig. 1



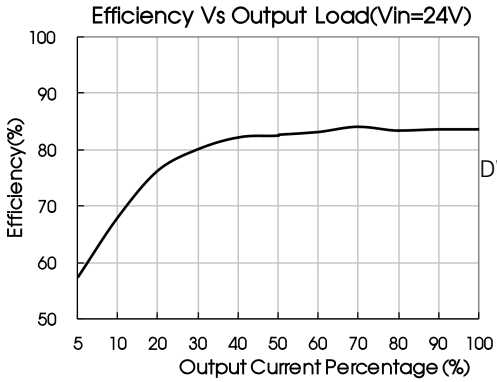
DWMD6-A4815



DWMD6-A4815



DWMD6-B2405



DWMD6-B2405

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 specified max. capacitive load value of the product.

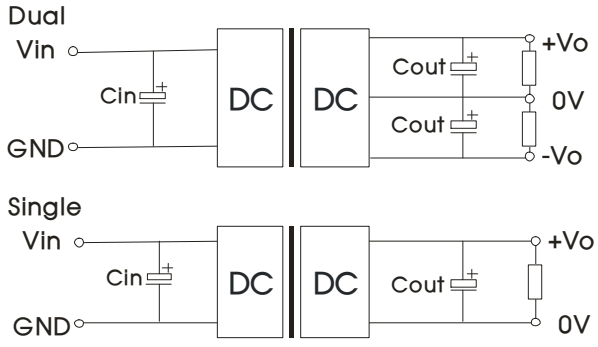


Fig. 2

Vin(VDC)	Cin	Cout
24	100μF/50V	10μF/50V
48	10 μF- 47μF/100V	10μF/50V

2. EMC compliance circuit

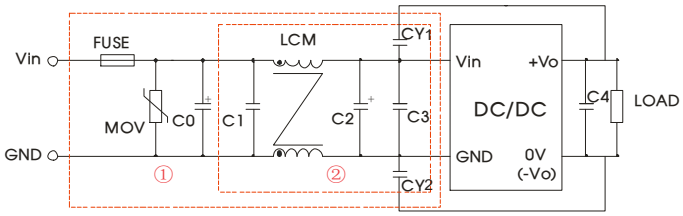


Fig. 3

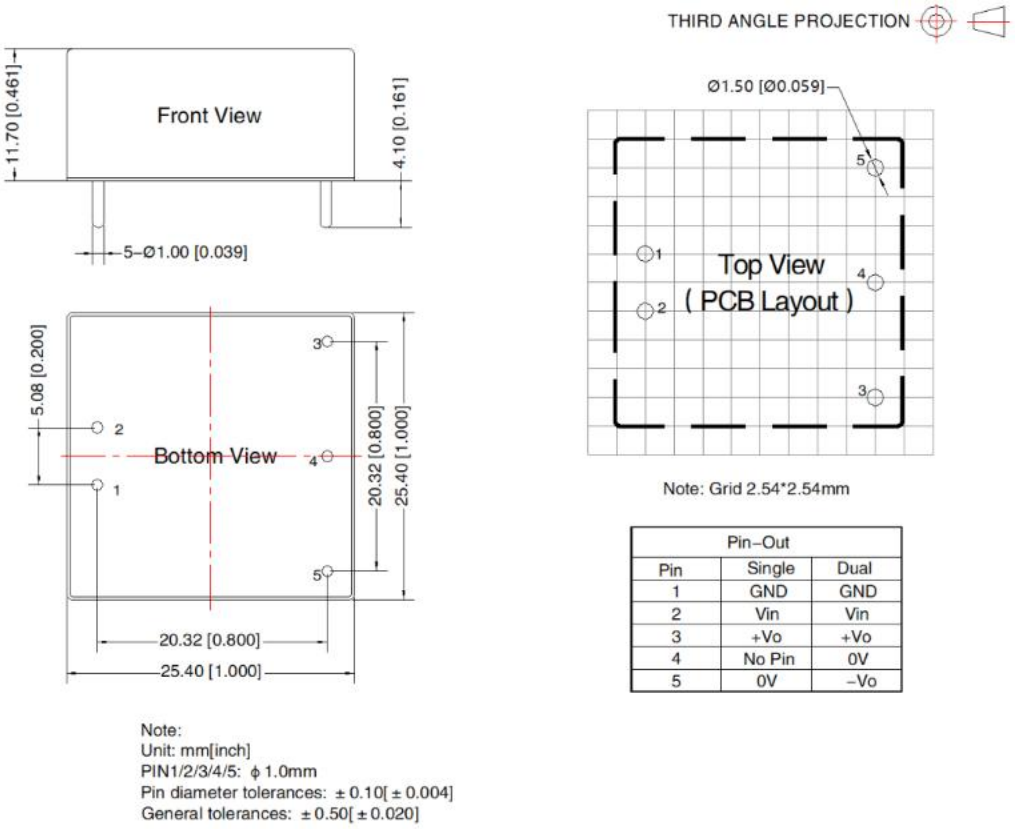
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 24VDC	Vin: 48VDC
FUSE	Choose according to actual input current	
MOV	S20K30	S14K60
C0	680μF/50V	680μF/100V
C1	1μF/50V	1μF/100V
C2	330μF/50V	330μF/100V
C3	4.7μF/50V	4.7μF/100V
C4	Refer to the Cout in Fig.2	
LCM	4.7mH	
CY1/CY2	1nF/2kV	

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

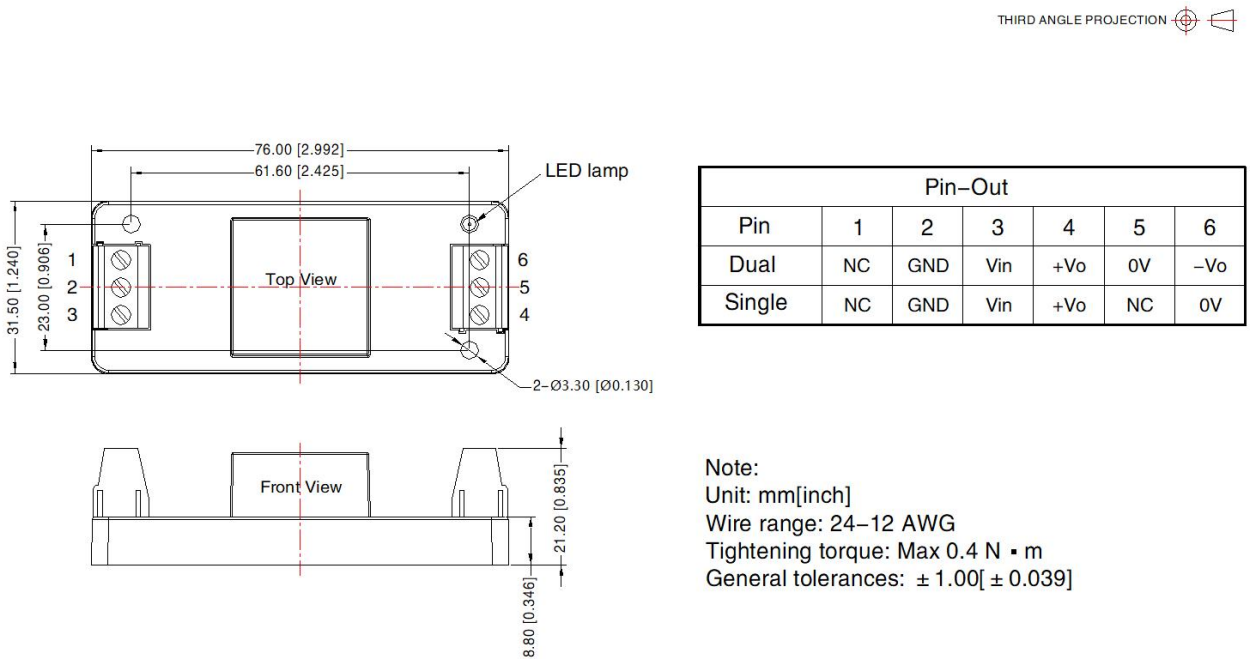
DWMD6-A&Bxxxx Dimensions and Recommended Layout



Pin-Out		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	No Pin	0V
5	0V	-Vo

Note:
Unit: mm[inch]
PIN1/2/3/4/5: ϕ 1.0mm
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]

DWMD6-A&BxxxxE2S Dimensions

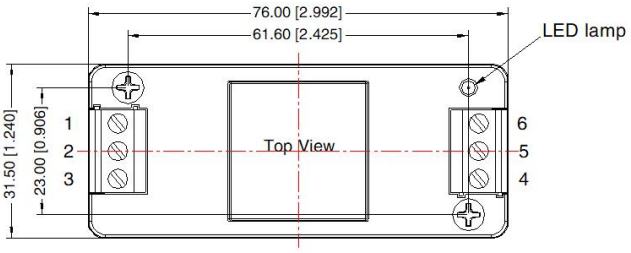


Pin-Out						
Pin	1	2	3	4	5	6
Dual	NC	GND	Vin	+Vo	0V	-Vo
Single	NC	GND	Vin	+Vo	NC	0V

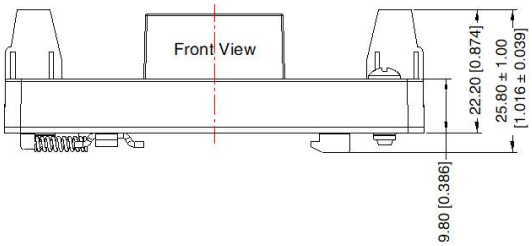
Note:
Unit: mm[inch]
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N ▪ m
General tolerances: ± 1.00[± 0.039]

DWMD6-A&BxxxxD4S Dimensions

THIRD ANGLE PROJECTION



Pin–Out						
Pin	1	2	3	4	5	6
Dual	NC	GND	Vin	+Vo	0V	–Vo
Single	NC	GND	Vin	+Vo	NC	0V



Note:
Unit: mm[inch]
Mounting rail: TS35
Wire range: 24–12 AWG
Tightening torque: Max 0.4 N ▪ m
General tolerances: ± 1.00[± 0.039]

Note:

1. It is recommended that the load imbalance of the dual output is ≤±5%. If it exceeds ±5%, the performance of the product cannot be guaranteed to meet as datasheet marked. For details, please contact our technical staff;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. 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;
4. All index testing methods in this datasheet are based on company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
8. 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.