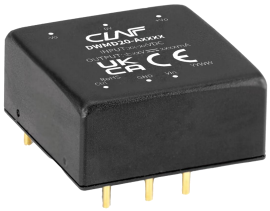
Descriptions

20W isolated，DC-DC converter



RoHS

CE Report EN 62368-1

UKCA Report BS EN 62368-1

Features

- Ultra-wide 4:1 input voltage range
- High efficiency up to 90%
- No-load power consumption as low as 0.24W
- I/O isolation test voltage 1.5k VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40℃ to +105℃
- E2S (wired) and D4S (TS35 rail type) product models have input anti reverse connection function
- Industry standard pin-out
- Meets EN50155 railway standard

Applications

- Industrial control
- Electric power
- Instrumentation
- 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.		
EN/BS EN	DWMD20-A2405	24 (9-36)	40	±5	±2000	84/86	2000
	DWMD20-A2412			±12	±833	88/90	800
	DWMD20-A2415			±15	±667	88/90	600
	DWMD20-A2424			±24	±417	86/88	300
	DWMD20-A4805	48 (18-75)	80	±5	±2000	84/86	2000
	DWMD20-A4812			±12	±833	87/89	800
	DWMD20-A4815			±15	±667	87/89	600
	DWMD20-A4824			±24	±417	88/90	300

Note:
①Use "E2S" suffix for chassis mounting and "D4S" suffix for DIN-Rail mounting;
②Minimum input voltage and start-up voltage are increased by 1VDC for all models with E2S (wiring) and D4S (rail) suffixes because of the input reverse polarity function;
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 positive and negative 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		--	958/10	--/20	mA
		48VDC nominal input series, nominal input voltage		--	485/5	--/11	
	Maximum input current	24VDC nominal input series, nominal input voltage		--	--	1100	
		48VDC nominal input series, nominal input voltage		--	--	550	
	Reflected Ripple Current			--	30	--	
	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	
	Under-voltage Protection	24VDC nominal input series		5.5	6.5	--	
		48VDC nominal input series		12	15.5	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	10	--	ms
	Input Filter			Pi filter			
	Hot Plug			Unavailable			
	Ctrl ①	Module on		Ctrl pin open or pulled high (3.5-12VDC)			
		Module off		Ctrl pin pulled low to GND (0-1.2VDC)			
		Input current when off		--	2	7	mA
Output Specifications	Voltage Accuracy②	5%-100% load		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load	Vo1	--	±0.2	±0.5	
			Vo2	--	±0.4	±1	
	Load Regulation③	5%-100% load		--	±0.5	±1	
	Cross Regulation	Dual output, Vo1 load at 50%, Vo2 load at range of 10%-100%		--	--	±5	
	Transient Recovery Time	25% load step change, nominal input voltage	All products	--	300	500	μs
	Transient Response Deviation		5VDC output	--	±3	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise④	20MHz bandwidth, 5%-100% load		--	100	200	mVp-p
	Over-voltage Protection	Input voltage range		110	--	160	%Vo
	Over-current Protection			110	150	200	%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
		Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.		1000	--	--	
	Insulation Resistance	Input-output resistance at 500VDC		1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V		--	2000	--	pF
	Operating Temperature	See Fig. 1		-40	--	+105	℃
	Storage Temperature			-55	--	+125	
	Storage Humidity	Non-condensing		5	--	95	%RH

	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		IEC/EN61373 - Category 1, Grade B			
	Switching Frequency⑥	PWM mode	--	270	--	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 chassis mounting/D4S DIN-rail mounting	15.0g/35.0g/58.0g (Typ.)			
	Cooling method	Free air convection				

Note:
①The Ctrl pin voltage is referenced to input GND;
②Output voltage accuracy for 0%-5% load is ±4% max;
③Load regulation for 0%-100% load is ±5%;
④Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. 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)

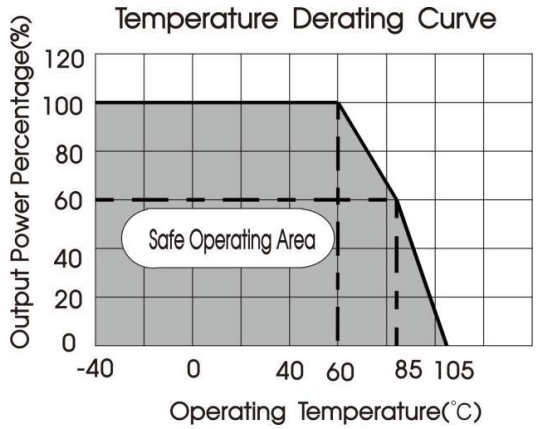
Emissions	CE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2 Contact ±4kV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m (Bare pager)	perf. Criteria A
	EFT	IEC/EN61000-4-4 ±2kV (see Fig.3-① for 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 3 Vr.m.s (Bare pager)	perf. Criteria A

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 (Bare pager)	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 10 Vr.m.s (Bare pager)	perf. Criteria A

Characteristic Curve

Nominal input series, ±5V output



Nominal input series, other output

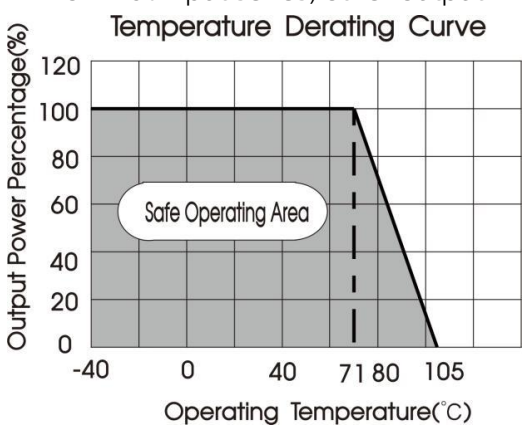
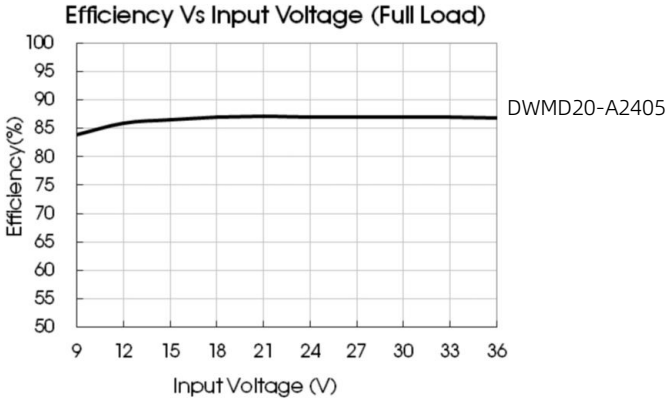
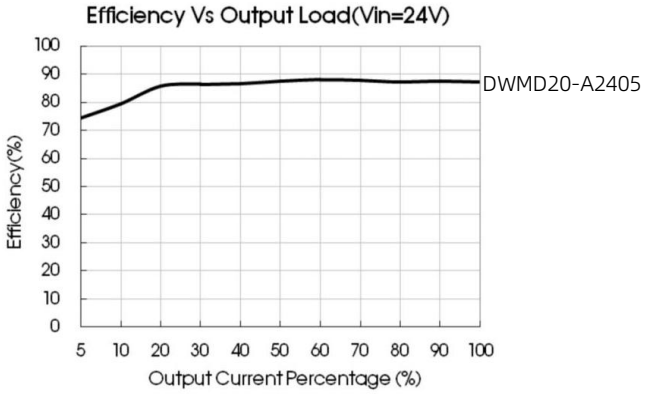
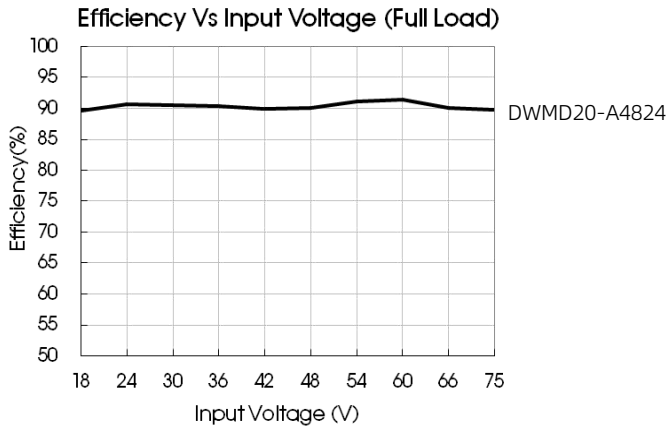
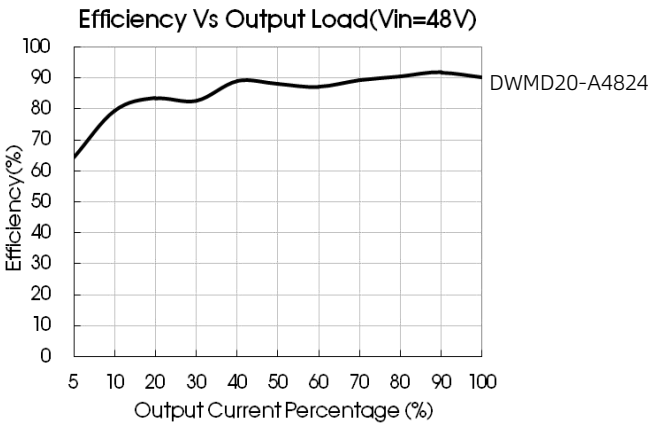


Fig. 1









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

Vin (VDC)	Vout (VDC)	Cin	Cout
24	±5	100μF/50V	10μF/16V
	±12/±15		10μF/25V
	±24		10μF/50V
48	±5	10μF - 47μF/100V	10μF/16V
	±12/±15		10μF/25V
	±24		10μF/50V

2. EMC compliance circuit

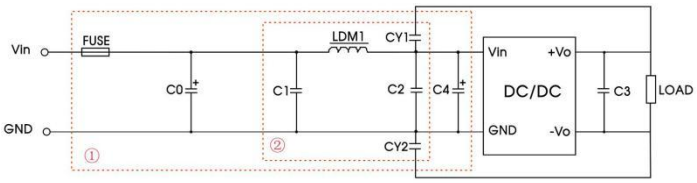


Fig. 3

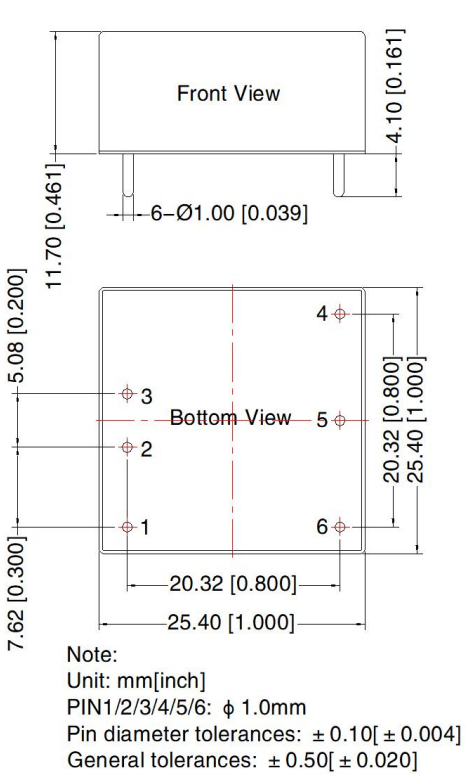
List of components:

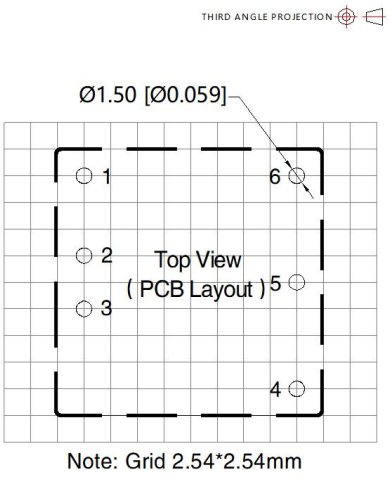
Model	Vin: 24VDC	Vin: 48VDC
FUSE	Choose according to actual input current	
C0, C4	330μF/50V	330μF/100V
C1, C2	4.7μF/50V	4.7μF/100V
C3	Refer to the Cout in Fig.2	
LDM1	4.7μH	
CY1, CY2	1nF/2kV	

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

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

Dimensions and Recommended Layout

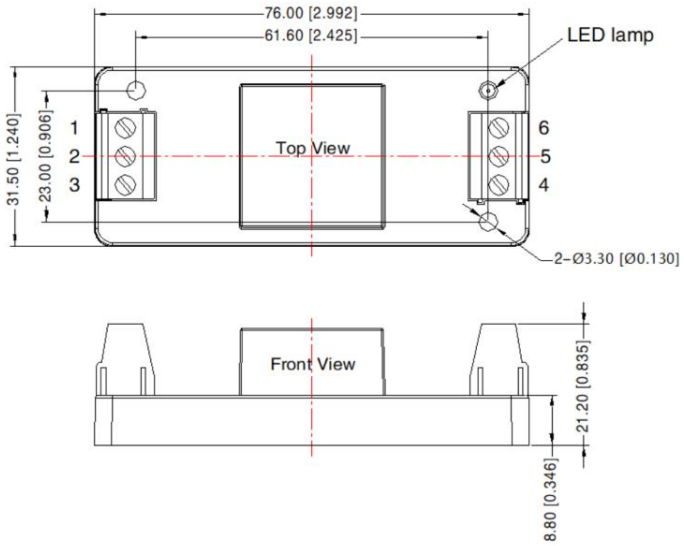




Pin-Out	
Pin	Mark
1	Ctrl
2	GND
3	Vin
4	+Vo
5	0V
6	–Vo

DWMD20-AxxxxE2S Dimensions

THIRD ANGLE PROJECTION

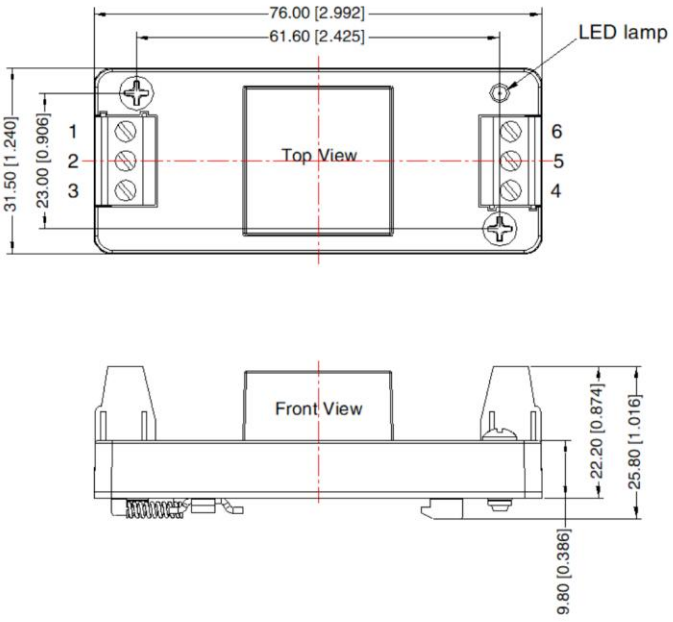


Pin–Out						
Pin	1	2	3	4	5	6
Mark	Ctrl	GND	Vin	+Vo	0V	−Vo

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

DWMD20-AxxxxD4S Dimensions

THIRD ANGLE PROJECTION



Pin–Out						
Pin	1	2	3	4	5	6
Mark	Ctrl	GND	Vin	+Vo	0V	−Vo

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. 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.