Descriptions

40W isolated, DC-DC Converter



RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Ultra-wide 4:1 input voltage range
- High efficiency up to 90%
- No-load power consumption as low as 0.19W
- I/O isolation test voltage 2250 VDC
- Input under-voltage protection, output short-circuit, over-current, over-voltage protection
- Operating ambient temperature range: -40℃ to +105℃
- Industry standard pin-out

Applications

- Industrial control
- Power
- Instrumentation
- Communication

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency② (%) Min./Typ.	Capacitive Load (μF)③ Max.
		Nominal (Range)	Max.①	Voltage (VDC)	Current (mA) Max./Min.		
EN/BS EN	DWLD40-A2412	24 (9-36)	40	±12	±1667/0	88/90	1500
--	DWLD40-A241(H)						
EN/BS EN	DWLD40-A2415			±15	±1333/0	88/90	1100
--	DWLD40-A2415H						
EN/BS EN	DWLD40-A2424			±24	±833/0	88/90	700
--	DWLD40-A2424H						

Note:
①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured at nominal input voltage and rated output load;
③Product 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)	nominal input voltage		--	1852/8	1894/20	mA
	Reflected Ripple Current	nominal input voltage, 100%load		--	100	--	
	Surge Voltage (1sec. max.)			-0.7	--	50	VDC
	Start-up Voltage			--	--	9	
	Input Filter			Pi filter			
	Hot Plug			Unavailable			
	Ctrl①	Module open		Ctrl pin open or TTL pulled high (3-12VDC)			
		Module shutdown		Ctrl pin pulled GND or pulled low (0-1.2VDC)			
Output Specifications	Voltage Accuracy	5%-100% load		--	±1	±2	%
		0%-5% load		--	±2	±5	
	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	
	Transient Response Deviation	25% load step change, nominal input voltage		--	±3	±5	
	Transient Recovery Time	25% load step change, input voltage range		--	250	500	μs
	Ripple & Noise③	20MHz bandwidth, 5%-100% load	±12V/±15V output	--	70	--	mVp-p
			±24V output	--	90	--	
	Over-voltage Protection			110	140	160	%Vo
	Over-current Protection			110	140	200	%Io
	Short-circuit Protection④			Continuous, self-recovery			
General Specifications	Isolation	Input-output Electric Strength test for 1 minute with a leakage current of 1mA max.		2250	--	--	VDC
		Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.		1500	--	--	
	Insulation Resistance	Input-output resistance at 500VDC		100	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V		--	1300	--	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			10-150Hz, 5G, 0.75mm. along X, Y and Z			
	Switching Frequency⑥	PWM mode		--	370	--	kHz
	MTBF	MIL-HDBK-217F@25℃		1000	--	--	k hours
Mechanical	Case Material	Aluminum alloy					
	Dimensions	Without heat sink	Horizontal package	50.80 × 25.40 × 11.80 mm			

Specifications		With heat sink		51.40 × 26.20 × 16.50 mm
	Weight	Without heat sink		41.0g
		With heat sink		50.8g
	Cooling Method	Free air convection		

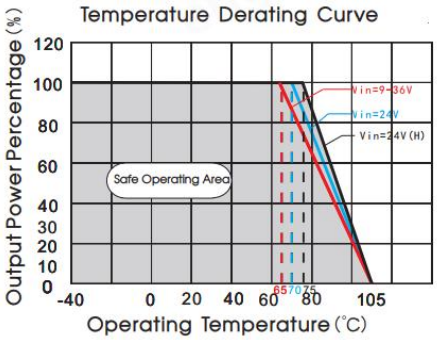
Note:
①The voltage of Ctrl pin is relative to input pin GND;
②When the test condition is 0%~100% load regulation ratio is ±5%, Vo1 is positive output, and Vo2 is negative output.
③The "Tip and barrel method" is used for ripple and noise test, please refer to Figure 2 for the recommended circuits. Ripple & noise value less than 5%Vo when with 0%~5% load.
④For dual output models, when short circuit test is performed on one output, the other output should be at least with 5% load.
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 selectio;
⑥Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

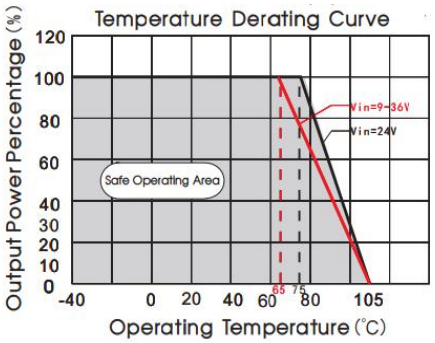
Emissions	CE	CISPR32/EN55032 CLASS A (see Fig.3-①) / CLASS B (see Fig.3-②)	
	RE	CISPR32/EN55032 CLASS A (see Fig.3-①) / CLASS B (see Fig.3-②)	
Immunity	ESD	IEC/EN61000-4-2 Contact ±6KV/Air ±8KV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 100KHz ±2KV (see Fig.3-②)	perf. Criteria A
	Surge	IEC/EN61000-4-5 line to line ±2KV (see Fig.3-②)	perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	perf. Criteria A

Characteristic Curve

DWLD40-A2412



DWLD40-A2415



DWLD40-A2424

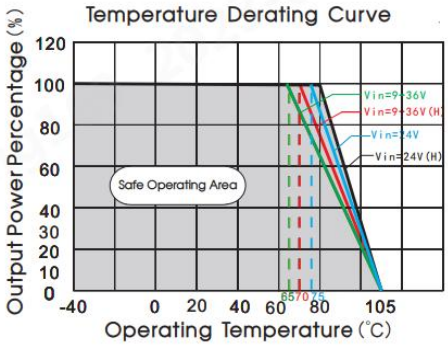


Fig. 1

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 specified max. capacitive load value of the product.



Fig. 2

Cin	Cout
100μF/50V	100μF/50V

2. EMC compliance circuit

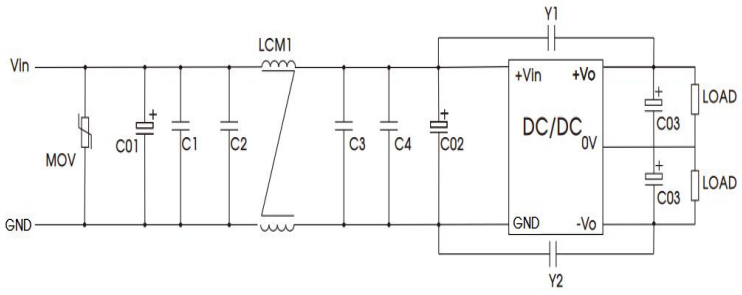


Fig.3-①

Parameter description:

Model	Parameter
C1/C2	4.7uF/50V
C3/C4	10uF/50V
C01	680uF/50V
C02	330uF/50V
C03	100uF/50V
Y1/Y2	2.2nF/Y1
LCM1	10.0mH (Min.)/180mΩ
MOV	14D470

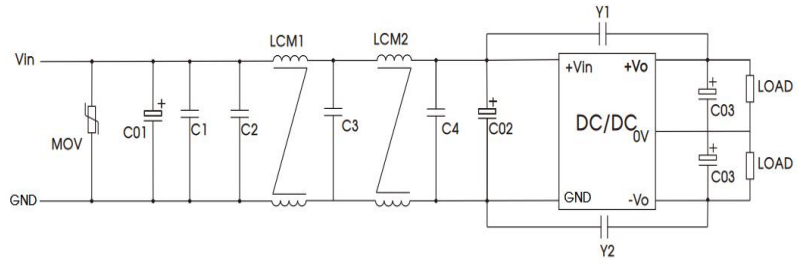


Fig.3-②

Parameter description:

Model	Parameter
C1/C2	4.7uF/50V
C3	10uF/50V
C4	47uF/50V
C01	680uF/50V
C02	330uF/50V
C03	100uF/50V
Y1/Y2	2.2nF/Y1
LCM1/LCM	10.0mH (Min.)/180mΩ
MOV	14D470

3. Recommended scheme for thermal testing

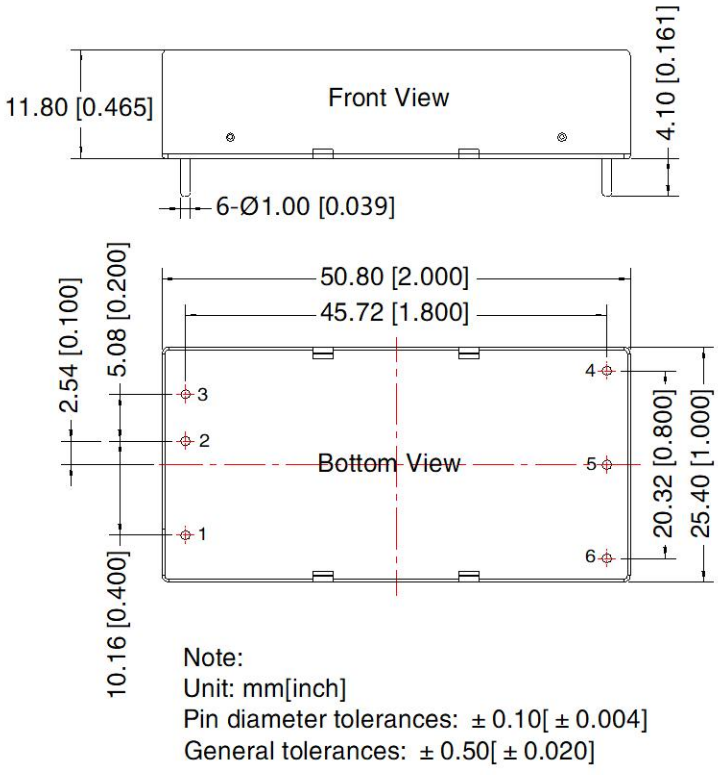
In the application process, the thermal design of the product can be evaluated with the product temperature derating curve; or by testing the temperature of point A in Fig.4 to determine the stable working range of the product, when the temperature of point A is lower than 100℃, it is the stable working range of the product.

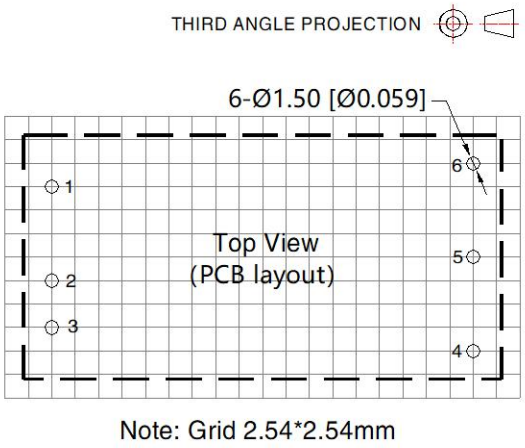


Fig.4

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

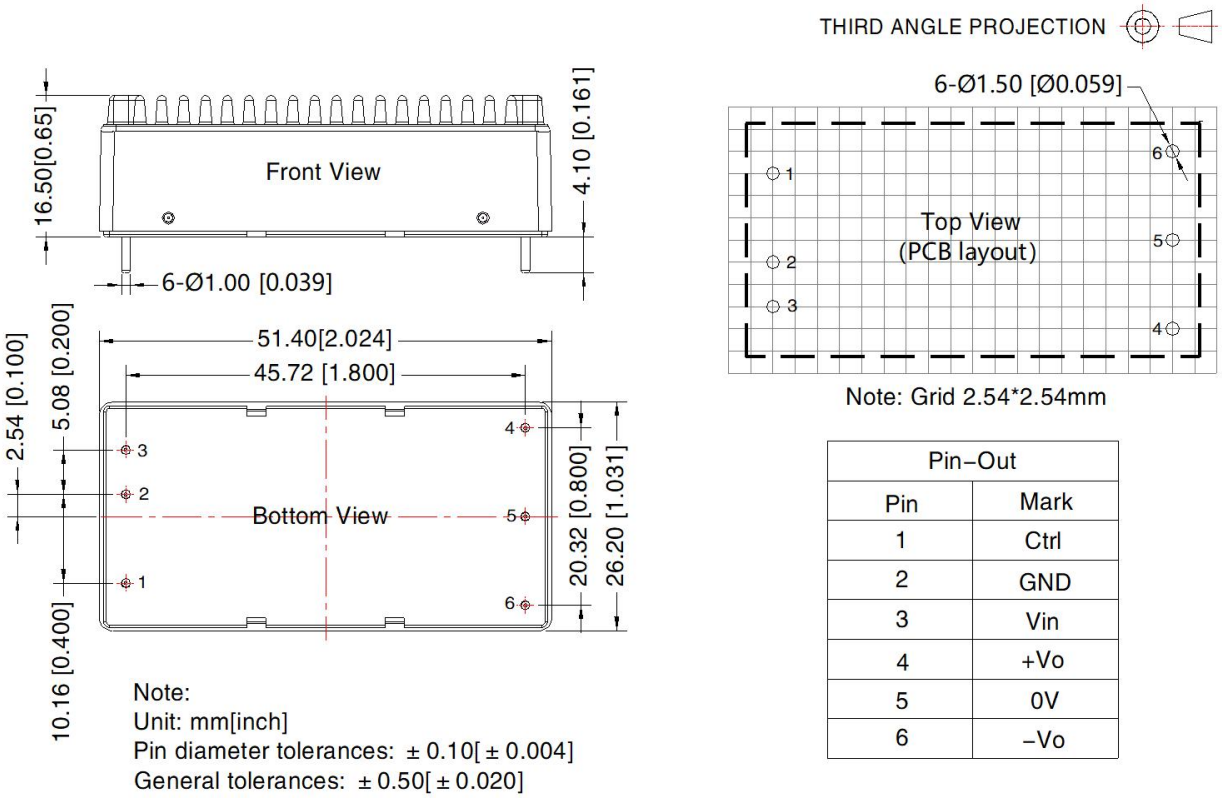
DWLD40-A24xx Dimensions and Recommended Layout





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

DWLD40-A24xxH Dimensions and Recommended Layout



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

Note:

1. It is recommendedd to use more than 5% load, if less than 5% load, the ripple index of product may exceed the specification, but does not affect the reliability of the product;
2. If the product works under the minimum required load, it is not guaranteed that the product performance meets all the performance indicators in this manual;
3. The maximum capacitive load offered were tested at input voltage range and full load;
4. 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;
5. All index testing methods in this datasheet are based on company corporate standards ;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
9. 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.