Descriptions

30W isolated，DC/DC Converter



RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

Features

- Wide 2:1 input voltage range
- High efficiency up to 90%
- No-load power consumption as low as 0.14W
- I/O isolation test voltage 1.5k VDC
- Output short-circuit, over-voltage, over-current protection
- Operating ambient temperature range: -40℃ to +80℃
- Meets CISPR32/EN55032 CLASS A EMI without extra components
- Six-sided metal shielded package

Applications

- data transmission device
- battery power supply device
- Telecommunication device
- distributed power supply system
- hybrid module system
- industrial robot fields

Selection Guide

Certification	Part No.	Input Voltage (VDC)		Output		Full Load Efficiency(%) Min./Typ.	Max. Capacitive Load(μF)
		Nominal (Range)	Max.①	Voltage (VDC)	Current (mA) Max./Min.		
EN/BS EN	DELD30-B2403	24 (18-36)	40	3.3	6000/0	83/85	10000
	DELD30-B2405			5	6000/0	86/88	10000
	DELD30-B2409			9	3333/0	84/86	4700
	DELD30-B2412			12	2500/0	86/88	2700
	DELD30-B2415			15	2000/0	88/90	1680
	DELD30-B2424			24	1250/0	88/90	680

Note:
①Exceeding the maximum input voltage may cause permanent damage;
②Product 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	3.3VDC output	--	1471/60	1507/100	mA
			5VDC output	--	1421/60	1453/100	
			Others	--	1389/6	1489/12	
	Reflected Ripple Current	Nominal input voltage		--	40	--	
	Surge Voltage (1sec. max.)	24VDC nominal input series		-0.7	--	50	VDC
	Start-up Voltage	24VDC nominal input series		--	--	18	
	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		--	5	8	mA
Output Specifications	Voltage Accuracy	5%-100% load		--	±1	±3	%
		0%-5% load		--	±1	±5	
	Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	
	Load Regulation②	5%-100% load		--	±0.5	±1	
	Transient Recovery Time			--	300	500	μs
	Transient Response Deviation	25% load step change, nominal input voltage	3.3V/5VDC output	--	±5	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise③	20MHz bandwidth, nominal input voltage, 100% load		--	50	100	mVp-p
	Trim	Input voltage range		90	--	110	%Vo
	Over-voltage Protection			110	--	160	
	Over-current Protection			110	--	190	%Io
	Short-circuit Protection			Hiccup, 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/60sec.		1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100KHz/0.1V		--	2000	--	pF
	Operating Temperature	See Fig. 1 and Fig. 2		-40	--	+80	℃
	Storage Temperature			-55	--	+125	
	Storage Humidity	Non-condensing		5	--	95	%RH
	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			10-55Hz, 2G, 30 Min. along X, Y and Z			
	Switching Frequency⑤	PWM mode		--	300	--	kHz

	MTBF	MIL-HDBK-217F@25℃	1000	--	--	k hours
Mechanical Specifications	Case Material	Aluminum alloy				
	Dimensions	50.80 × 25.40 × 11.80 mm				
	Weight	27.8g (Typ.)				
	Cooling Method	Free air convection				

Note:
①The Ctrl pin voltage is referenced to input GND;
②Load regulation for 0%-100% load is ±5%;
③The "parallel cable" method is used for Ripple and Noise test;
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.4-② for recommended circuit)	
	RE	CISPR32/EN55032 CLASS A (without extra components)/ CLASS B (see Fig.4-② 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.4-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±2KV (see Fig.4-①for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A

Characteristic Curve

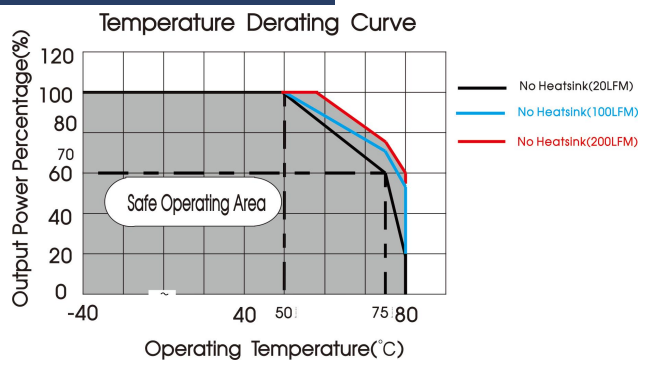


Fig. 1

Apply model:
DELD30-B2403、DELD30-B2405

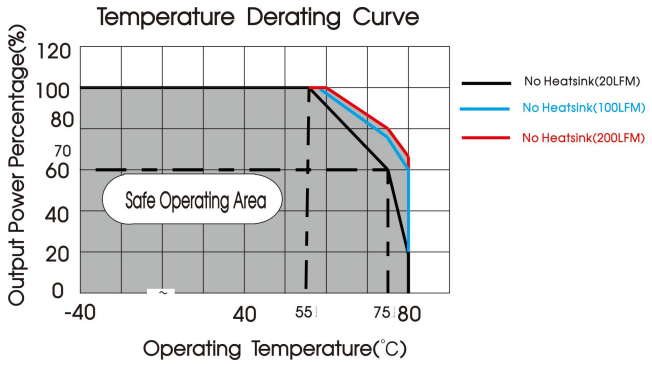
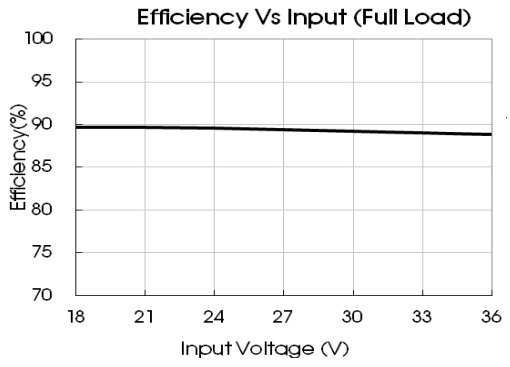
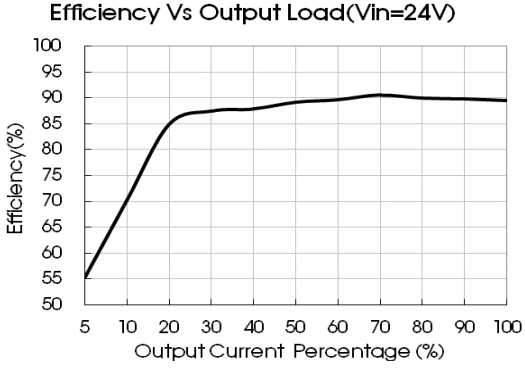


Fig. 2

Apply model:
DELD30-B2409、DELD30-B2412、DELD30-B2415、DELD30-B2424



DELD30-B2405



DELD30-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. 3.

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. 3

output voltage (VDC)	Cout (μF)	Cin (μF)
3.3/5/9	220	100
12/15/24	100	

2. EMC compliance circuit

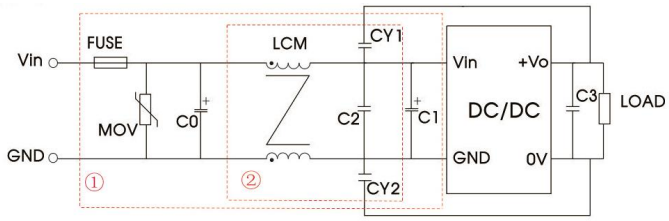


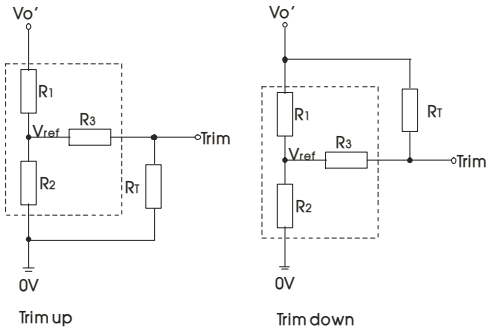
Fig. 4

Notes: For EMC tests we use Part ① in Fig. 4 for immunity and part ② for emissions test.

Parameter description

Model	Vin: 24V
FUSE	Choose according to actual input current
MOV	S20K30
C0	680μF/50V
C1	330μF/50V
C2	4.7μF/50V
C3	Refer to the Cout in Fig.3
LCM	1mH
CY1、CY2	1nF/2KV

3. Trim Function for Output Voltage Adjustment (open if unused)



TRIM resistor connection (dashed line shows internal resistor network)

Calculating Trim resistor values:

$$up:\ R_T=\frac{aR_2}{R_2-a}-R_3 \qquad a=\frac{Vref}{Vo'-Vref}\cdot R_1$$

$$down:\ R_T=\frac{aR_1}{R_1-a}-R_3 \qquad a=\frac{Vo'-Vref}{Vref}\cdot R_2$$

R_T=Trim resistance;

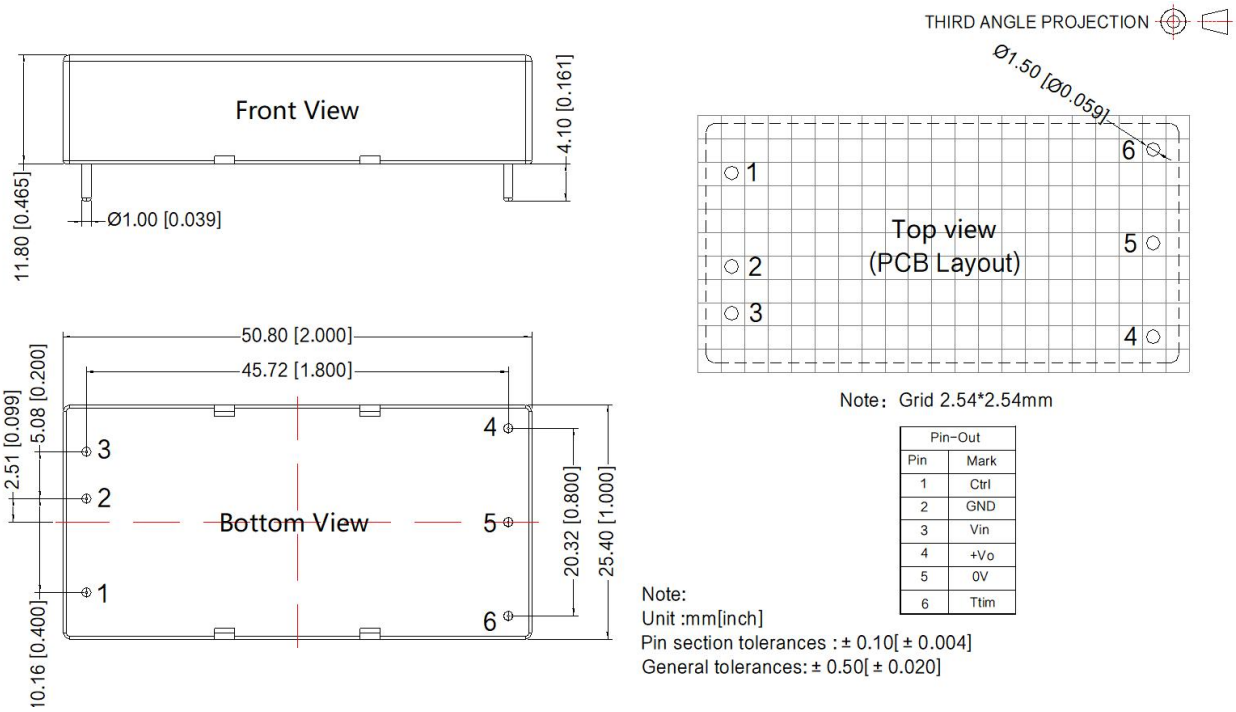
a=self-defined parameter;

Vo'= desired output voltage.

Vout(VDC)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.801	2.87	12.4	1.24
5	2.883	2.87	10	2.5
9	7.500	2.87	15	2.5
12	11.000	2.87	15	2.5
15	14.494	2.87	15	2.5
24	24.872	2.87	17.8	2.5

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

Horizontal Package Dimensions and Recommended Layout



Note：Grid 2.54*2.54mm

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

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

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.