DELD15-B24xx(H) Series

Descriptions

15W isolated，DC/DC Converter



RoHS

3 Years Warranty

CE Report EN62368-1

UKCA Report BS EN 62368-1

Features

- Wide 2:1 input voltage range
- High efficiency up to 90%
- No-load power consumption as low as 0.12W
- 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 +85℃
- Meets CISPR32/EN55032 CLASS A, without extra components
- Six-sided metal shielding package

Applications

- Data transmission device
- Battery powered supplies
- Telecommunication device
- Distributed power supply system
- Remote control system
- Industrial robot
- Hybrid modular/digital system

Selection Guide

Certification	Part No. ①	Input Voltage (VDC)		Output		Full Load Efficiency③(%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal (Range)	Max. ②	Voltage (VDC)	Current (mA) Max./Min.		
EN/BS EN	DELD15-B2405	24 (18-36)	40	5	3000/0	87/89	4700
--	DELD15-B2405H						
EN/BS EN	DELD15-B2412			12	1250/0	87/89	1000
--	DELD15-B2412H						
EN/BS EN	DELD15-B2415			15	1000/0	87/89	820
--	DELD15-B2415H						
EN/BS EN	DELD15-B2424			24	625/0	88/90	270
--	DELD15-B2424H						

Note:
①Use "H" suffix for heat sink mounting. We recommend to choose modules with a heat sink for enhanced heat dissipation and applications with extreme temperature requirements;
②Exceeding the maximum input voltage may cause permanent damage;
③Efficiency is measured at nominal input voltage and rated output load;
④Product 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)	5V output		--	702/30	718/75	mA
		Others		--	702/5	718/10	
	Reflected Ripple Current			--	30	--	
	Surge Voltage (1sec. max.)			-0.7	--	50	VDC
	Start-up Voltage			--	--	18	
	Under-voltage protection			12	15.5	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	10	--	ms
	Input Filter			Pi filter			
	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		--	4	7	mA
	Hot Plug			Unavailable			
Output Specifications	Voltage Accuracy	0% -100% load		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	
	Load Regulation	Nominal input voltage		--	±0.5	±1	
	Transient Recovery Time	25% load step change, Nominal input voltage		--	300	500	μs
	Transient Response Deviation		3.3V output	--	±5	±8	%
			Others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise②	20MHz bandwidth, 5% -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		1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	24V output	--	2050	--	pF
			Others	--	1050	--	
	Operating Temperature	See Fig. 1		-40	--	+85	℃
	Storage Temperature			-55	--	+125	
	Storage Humidity	Non-condensing		5	--	95	%RH
	Pin Soldering Resistance Temperature③	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 Frequency④	PWM mode		--	270	--	kHz
	MTBF	MIL-HDBK-217F@25℃		1000	--	--	k hours

Mechanical Specifications	Case Material	Aluminum alloy	
	Dimensions	Horizontal package (without heat sink)	50.80 × 25.40 × 11.80 mm
		Horizontal package (with heat sink)	51.40 × 26.20 × 16.50 mm
	Weight	Horizontal package (without heat sink)	26.0g (Typ.)
		Horizontal package (with heat sink)	34.0g (Typ.)
	Cooling Method	Free air convection	

Note:
①The Ctrl pin voltage is referenced to input GND;
②Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test;
③The 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;
④Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

Electromagnetic Compatibility (EMC)

Emissions	CE	Others	CISPR32/EN55032 CLASS A (without external components)/ CLASS B (see Fig.3-② for recommended circuit)	
		3.3V output	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)	
	RE	Others	CISPR32/EN55032 CLASS A (without external components)/ CLASS B (see Fig.3-② for recommended circuit)	
		3.3V output	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	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

Characteristic Curve

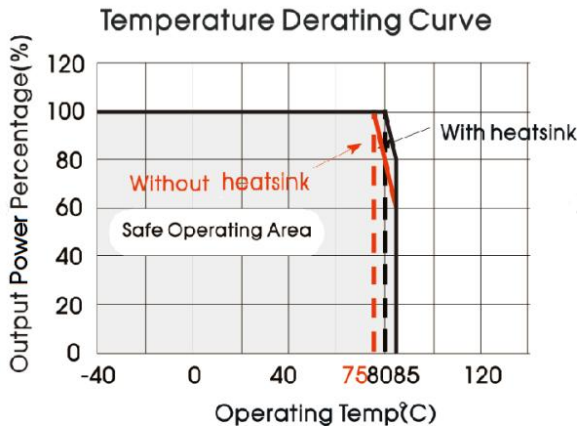
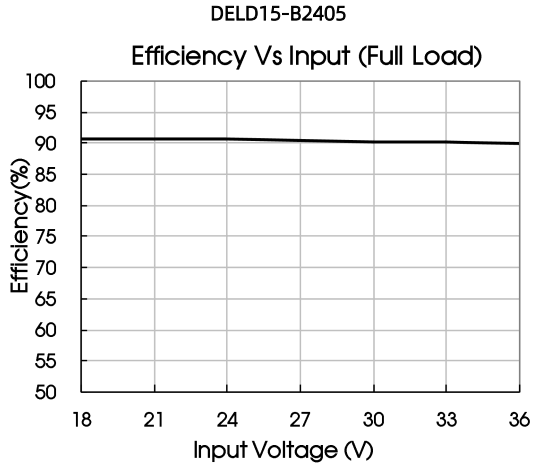
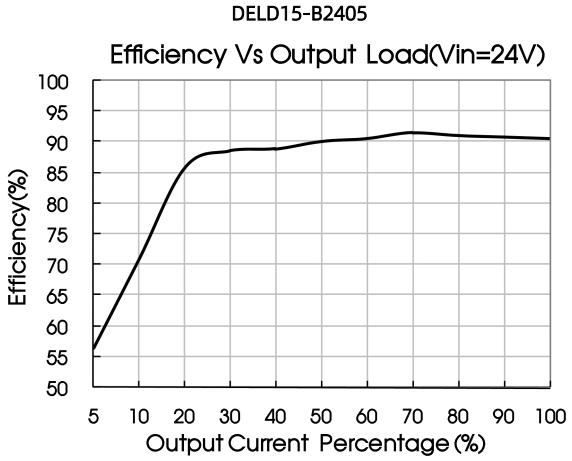


Fig. 1





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

Vout (VDC)	Cout(μF)	Cin(μF)
3.3/5	470	100
12/15	220	
24	100	

2. EMC compliance circuit

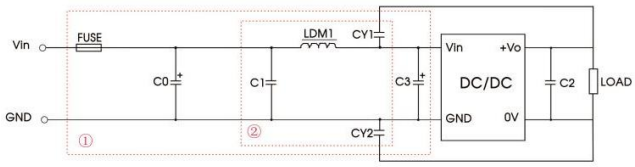


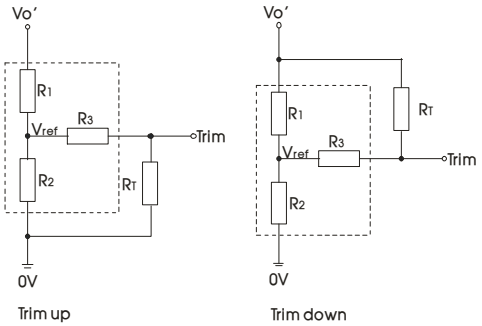
Fig. 3

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
FUSE	Choose according to actual input current
C0/C3	330μF/50V
C1	1μF/50V
C2	Refer to the Cout in Fig.2
LDM1	4.7μH/2.2A
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:

$$\text{up: } R_T = \frac{aR_2}{R_2 - a} - R_3 \qquad a = \frac{V_{ref}}{V_o' - V_{ref}} \cdot R_1$$

$$\text{down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \qquad a = \frac{V_o' - V_{ref}}{V_{ref}} \cdot R_2$$

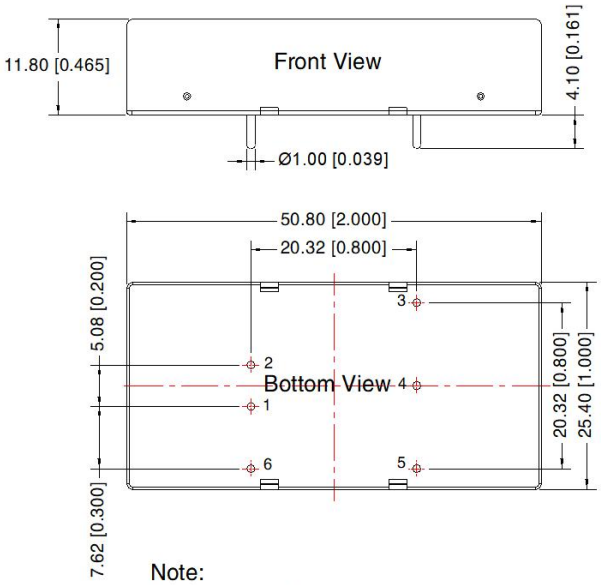
RT is Trim resistance

a is a self-defined parameter, with no real meaning.

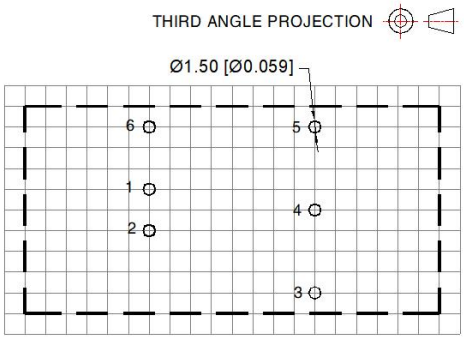
Vout(V)	R1(kΩ)	R2(kΩ)	R3(kΩ)	Vref(V)
3.3	4.775	2.87	12.4	1.25
5	2.883	2.87	10	2.5
12	11.000	2.87	15	2.5
15	14.494	2.87	15	2.5
24	24.872	2.87	17.8	2.5

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

Horizontal Package (without heat sink) Dimensions and Recommended Layout



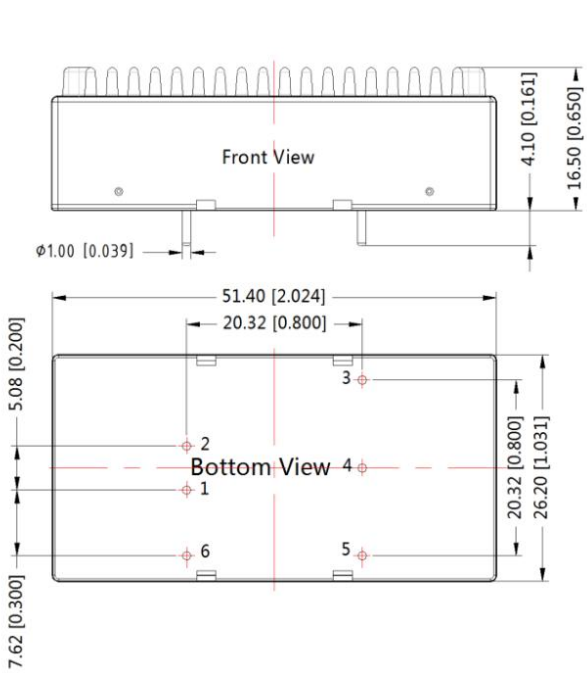
Note:
Unit: mm[inch]
Pin diameter tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]



Note：Grid 2.54*2.54mm

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

Horizontal Package (with heat sink) Dimensions



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

Note:
Unit :mm[inch]
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.