Descriptions

50W 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 92%
- 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℃
- No-load power consumption as low as 0.048W
- Six-sided metal shielding package
- Input reverse polarity protection available with chassis (E2S) or DIN-Rail mounting (D4S) version
- Industry standard pin-out
- Meets IEC62368, UL62368 standards

Applications

- Industrial Control
- Electric Power
- Instrumentation
- Communication

Selection Guide

Certification	Part No. ①	Input Voltage (VDC)		Output		Full Load Efficiency④ (%) Min./Typ.	Capacitive Load (μF)Max.
		Nominal② (Range)	Max.③	Voltage (VDC)	Current(mA) Max./Min.		
EN/ BS EN	DELD50-B4803(H)	48 (36-75)	80	3.3	10000/0	89/91	27000
	DELD50-B4805(H)			5	10000/0	89/91	18900
	DELD50-B4812(H)			12	4167/0	90/92	3700
	DELD50-B4815(H)			15	3333/0	90/92	2000
	DELD50-B4824(H)			24	2083/0	90/92	1000
	DELD50-B4803E2S/D4S	48 (36-75)	80	3.3	10000/0	89/91	27000
	DELD50-B4805E2S/D4S			5	10000/0	89/91	18900
	DELD50-B4812E2S/D4S			12	4167/0	90/92	3700
	DELD50-B4815E2S/D4S			15	3333/0	90/92	2000
	DELD50-B4824E2S/D4S			24	2083/0	90/92	1000

Note:
①Use "H" suffix for heat sink mounting, "E2S" suffix for chassis mounting and "D4S" suffix for DIN-Rail mounting. We recommend to choose modules with a heat sink for enhanced heat dissipation and applications with extreme temperature requirements;
②The minimum input voltage and starting voltage of E2S and D4S Model are 1VDC higher than those of DIP package due to input reverse polarity protection 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;
⑤Product 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	3.3V output	--	756/1	773/--	mA
			5V output	--	1145/2	1171/--	
			12V output	--	1133/4	1158/--	
			15V output	--	1133/4	1158/--	
			24V output	--	1133/3	1158/--	
	Surge Voltage (1sec. max.)			-0.7	--	80	VDC
	Start-up Voltage			--	--	36	
	Input Under-voltage Protection			26	30	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	10	120	ms
	Input Filter			PI filter			
	Hot Plug			Unavailable			
	Ctrl①	Module on		Ctrl pin open or pulled high (TTL 3.0-12VDC)			
		Module off		Ctrl pin pulled low to GND (0-1.2VDC)			
		Input current when off		--	2	12	mA
Output Specifications	Voltage Accuracy	5%-100% load		--	±1	±3	%
	Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	
	Load Regulation	5%-100% load		--	±0.5	±1	
	Transient Recovery Time	25% load step change, nominal input voltage		--	250	500	μs
	Transient Response Deviation	25% load step change, input voltage range	3.3V/5V output	--	±3	±8	%
			others	--	±3	±5	
	Temperature Coefficient	Full load		--	--	±0.03	%/℃
	Ripple & Noise②	20MHz bandwidth, 5%-100% load	3.3V/5V output	--	170	200	mV p-p
			12V/15V output	--	200	250	
			24V output	--	180	350	
	Trim	Input voltage range		90	--	110	%Vo
	Over-voltage Protection			110	140	160	
	Over-current Protection			110	140	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-Housing Electric Strength Test for 1 minute with a leakage current of 1mA max.		1000	--	--	
	Insulation Resistance	Input-output resistance at 500VDC		100	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V		--	2200	--	pF
	Operating Temperature	See Fig. 1		-40	--	+105	℃

	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			10-150Hz, 5G, 0.75mm. along X, Y and Z			
	Switching Frequency④	PWM mode		--	300	--	kHz
	MTBF	MIL-HDBK-217F@25℃		1000	--	--	khours
Mechanical Specifications	Case Material	Aluminum alloy					
	Dimensions	Without heat sink	Horizontal package	50.80 × 25.40 × 11.80 mm			
			E2S chassis mounting	76.00 × 31.50 × 21.20 mm			
			D4S DIN-Rail mounting	76.00 × 31.50 × 25.80 mm			
		With heat sink	Horizontal package	51.40 × 26.20 × 16.50 mm			
			E2S chassis mounting	76.00 × 31.50 × 25.30 mm			
			D4S DIN-Rail mounting	76.00 × 31.50 × 29.90 mm			
	Weight	Without heat sink	Horizontal package/E2S chassis mounting/D4S DIN-Rail mounting	39g/62g/82g (Typ.)			
		With heat sink	Horizontal package/E2S chassis mounting/D4S DIN-Rail mounting	47g/70g/90g (Typ.)			
	Cooling Method	Free air convection					

Note:
①The Ctrl pin voltage is referenced to input GND.
②The ＂parallel cable＂ method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.
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 selection;
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	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 ±6kV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4 100kHz ±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 10 Vr.m.s	perf. Criteria A

Characteristic Curve

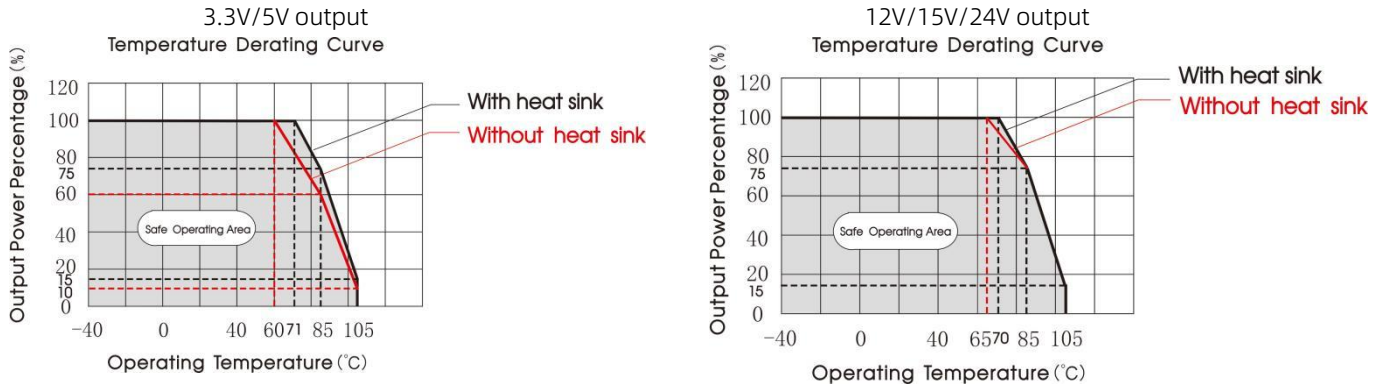


Fig. 1

Design Reference

1. Typical application

①All 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)	Cin (μF)	Cout (μF)
3.3	200μF/100V	470μF/10V
5	100μF/100V	470μF/10V
12/15		100μF/25V
24		47μF/50V

2. EMC compliance circuit

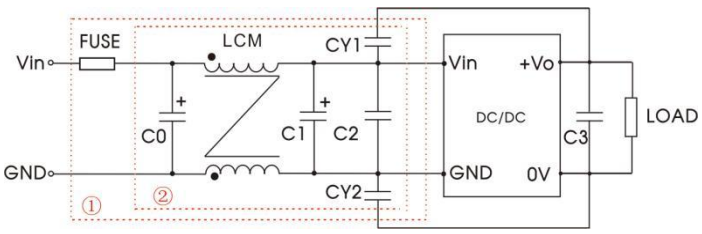


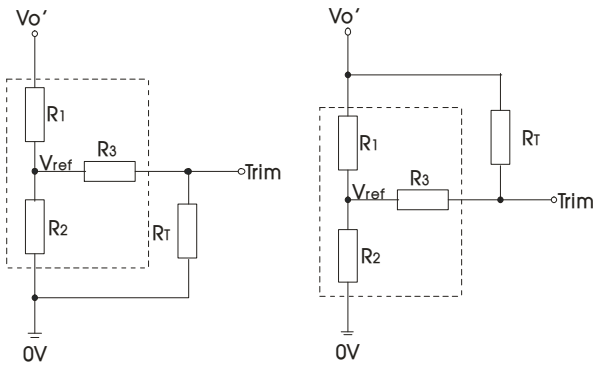
Fig. 3

Notes: We use Part ① in Fig. 3 for Immunity tests and Part ② for Emissions test. Selecting based on needs.

Parameter description:

Model	Vin: 48V
FUSE	T/2A/250VAC
C0	330μF/100V
LCM	2.2mH
C1	330μF/100V
C2	2.2uF/100V
CY1, CY2	Y1 Safety capacitor 3.3nF/250VAC
C3	Refer to the Cout in Fig.2

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



TRIM resistor connection (dashed line shows internal resistor network)

Calculating Trim resistor values:

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

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

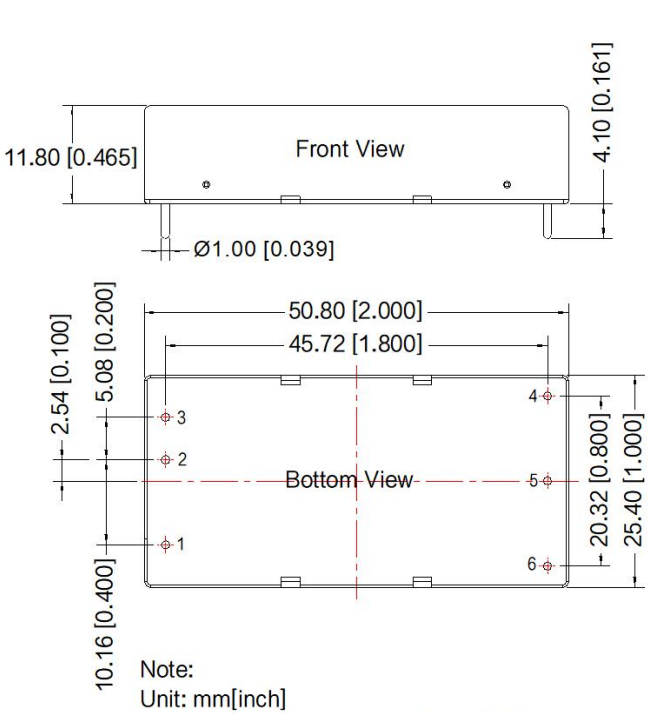
R_T is Trim resistance

a is a self-defined parameter,

Vout(V)	Vout adjustable value(V)	RT(kΩ)	R1(kΩ)	R2(kΩ)	R3(kΩ)	Vref(V)
3.3	Up: 3.63	10	4.83	2.87	10	1.24
	Down: 2.97	13.5	4.83	2.87	10	1.24
5	Up: 5.5	4.3	2.87	2.87	10	2.5
	Down: 4.5	1.5	2.87	2.87	10	2.5
12	Up: 13.2	7.6	10.90	2.87	15	2.5
	Down: 10.8	60.7	10.90	2.87	15	2.5
15	Up: 16.5	8.9	14.35	2.87	15	2.5
	Down: 13.5	90.2	14.35	2.87	15	2.5
24	Up: 26.4	21.6	24.77	2.87	5.1	2.5
	Down: 21.6	185.9	24.77	2.87	5.1	2.5

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

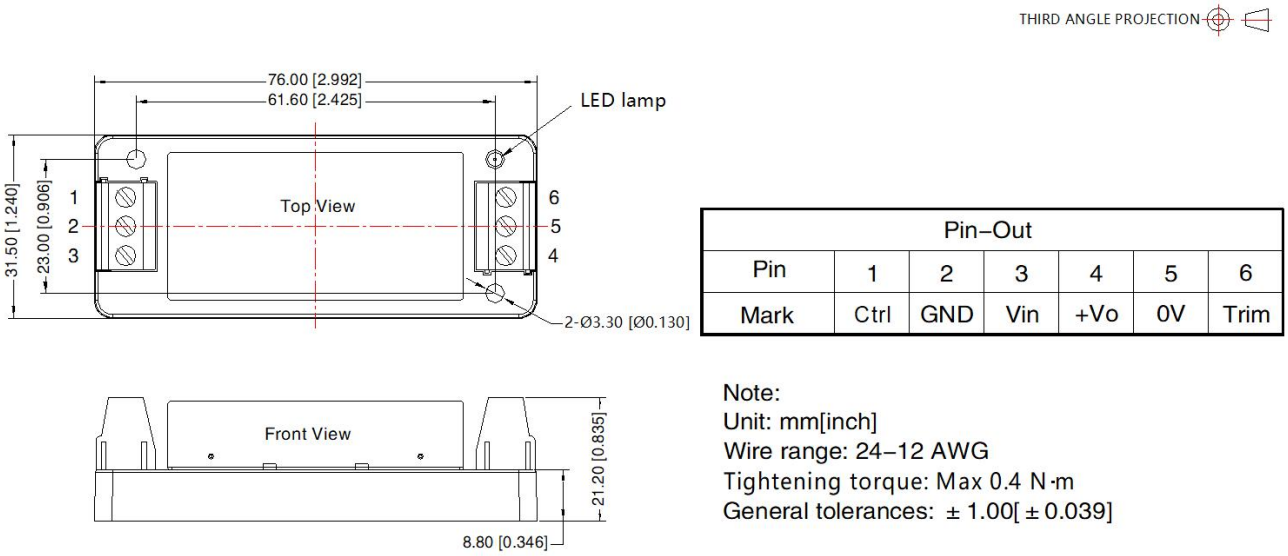
DELD50-B48xx Dimensions and Recommended Layout



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

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

DELD50-B48xxE2S Dimensions and Recommended Layout

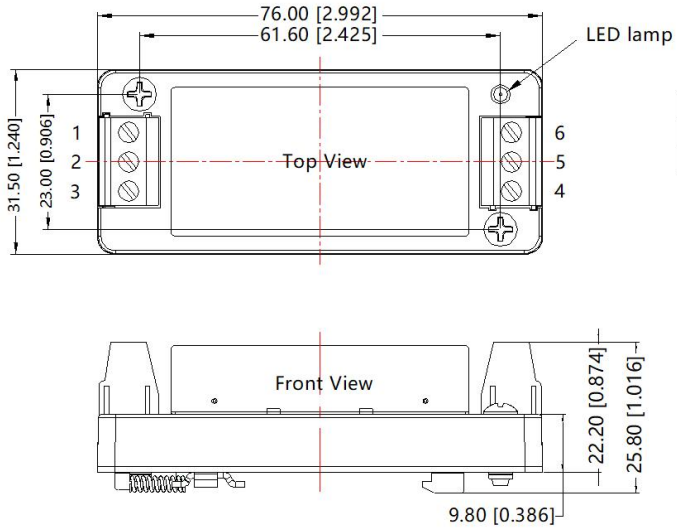


Pin-Out						
Pin	1	2	3	4	5	6
Mark	Ctrl	GND	Vin	+Vo	0V	Trim

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

DELD50-B48xxD4S Dimensions and Recommended Layout

THIRD ANGLE PROJECTION

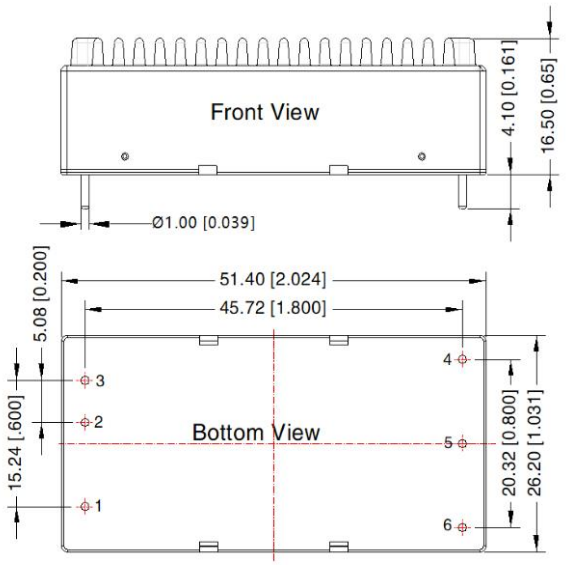


Pin-Out						
Pin	1	2	3	4	5	6
Mark	Ctrl	GND	Vin	+Vo	0V	Trim

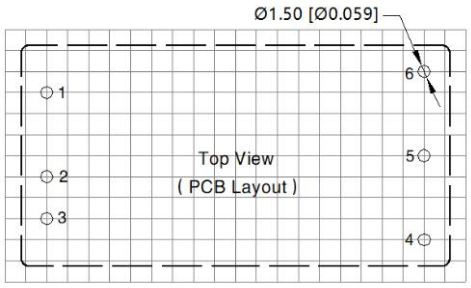
Note:
Unit: mm[inch]
Mounting rail: TS35
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

DELD50-B48xxH Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



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

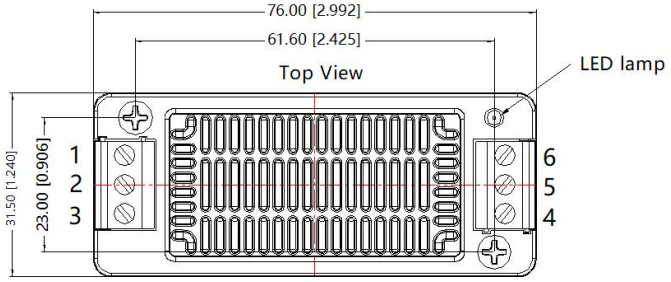


Note: Grid 2.54*2.54mm

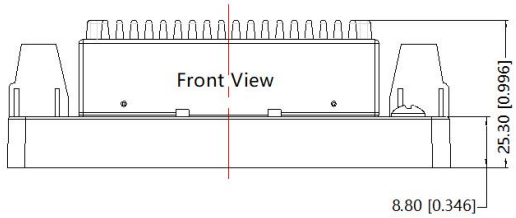
Pin–Out	
Pin	Mark
1	Ctrl
2	GND
3	Vin
4	+Vo
5	0V
6	Trim

DELD50-B48xxHE2S Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



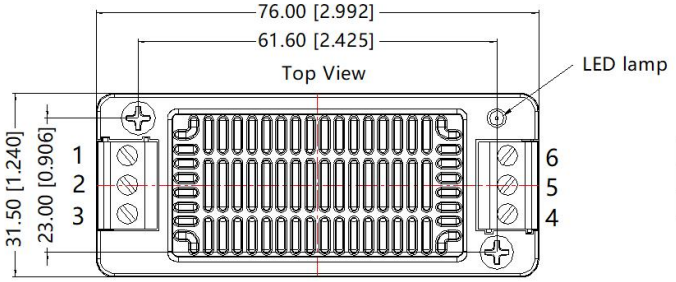
Pin-Out						
Pin	1	2	3	4	5	6
Mark	Ctrl	GND	Vin	+Vo	0V	Trim



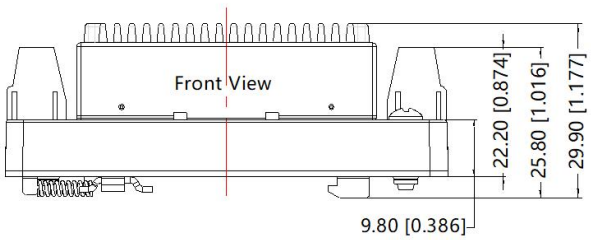
Note:
Unit: mm[inch]
Mounting rail: TS35
Wire range: 24-12 AWG
Tightening torque: Max 0.4 N·m
General tolerances: ±1.00[±0.039]

DELD50-B48xxHD4S Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



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



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 to use at more than 10% load. If the load is lower than 10%, the ripple of the product may exceed the specifications, but the reliability of the product is not affected.
2. The maximum capacitive load offered were tested at nominal input voltage 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.