Descriptions

10W 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 88%
- 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
- Input reverse polarity protection available with chassis(E2S) or Din-Rail mounting(D4S) version
- Industry standard pin-out

Applications

- Industrial control
- Power
- Instrumentation
- Communication

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	DEMD10-A0505	5 (4.5-9)	12	±5	±1000/0	76/78	1000
	DEMD10-A0512			±12	±417/0	81/83	470
	DEMD10-A0515			±15	±334/0	82/84	330
	DEMD10-A0524			±24	±209/0	81/83	100
--	DEMD10-B0503			3.3	2500/0	82/84	470
EN/BS EN	DEMD10-B0505			5	2000/0	83/85	470
	DEMD10-B0512			12	834/0	81/83	470
--	DEMD10-B0515			15	667/0	82/84	330
	DEMD10-B0524			24	417/0	81/83	100
	DEMD10-B1205	12 (9-18)	20	5	2000/0	79/81	2200
EN/BS EN	DEMD10-B2405	24	40	5	2000/0	80/82	2200

	DEMD10-B2412	(18-36)		12	833/0	85/87	470
	DEMD10-B2415			15	667/0	85/87	330
	DEMD10-B2424			24	416/0	86/88	100
--	DEMD10-B4803	48 (36-75)	80	3.3	2400/0	77/79	2200
	DEMD10-B4805			5	2000/0	81/83	2200
	DEMD10-B4812			12	833/0	85/87	470
	DEMD10-B4815			15	667/0	85/87	330
	DEMD10-B4824			24	416/0	86/88	100

Note:
①Use "E2S" suffix for chassis mounting and "D4S" suffix for Din-Rail mounting;
②The E2S and D4S Model's start-up and minimum input voltages are increased by 0.5VDC due to the input reverse polarity protection circuit;
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. The efficiencies of DEMD10-B1205 E2S and D4S Model's efficiency is decreased by 4%, and that of efficiencies DEMD10-A/B05xx E2S and D4S Model's efficiency is decreased by 7% ;
⑤The specified maximum capacitive load value for Vo1 and Vo2 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)	5VDC nominal input series, nominal input voltage	3.3V output	--	1964/100	2012/150	mA
			5V output	--	2353/100	2410/150	
			Others	--	2500/10	2564/30	
		12VDC nominal input series, nominal input voltage		--	1004/5	1029/12	
		24VDC nominal input series, nominal input voltage		--	502/5	515/12	
		48VDC nominal input series, nominal input voltage	3.3V output	--	208/4	215/8	
			Others	--	251/4	258/8	
	Reflected Ripple Current	5VDC / 12VDC nominal input series		--	50	--	
		24VDC nominal input series		--	40	--	
		48VDC nominal input series		--	30	--	
	Surge Voltage (1sec. max.)	5VDC nominal input series		-0.7	--	16	VDC
		12VDC nominal input series		-0.7	--	25	
		24VDC nominal input series		-0.7	--	50	
		48VDC nominal input series		-0.7	--	100	
	Start-up Voltage	5VDC nominal input series		--	--	4.5	
		12VDC nominal input series		--	--	9	
		24VDC nominal input series		--	--	18	
		48VDC nominal input series		--	--	36	
	Input Under-voltage Protection	5VDC nominal input series		3	3.5	--	
		12VDC nominal input series		5.5	6.5	--	
		24VDC nominal input series		12	15.5	--	
		48VDC nominal input series		26	30	--	
	Start-up Time	Nominal input voltage & constant resistance load		--	10	--	ms
	Input Filter			Pi filter			
	Hot Plug			Unavailable			

	Ctrl①	Module on			Ctrl pin open or pulled high TTL (3.5-12VDC)		
		Module off			Ctrl pin pulled low to GND (0-1.2VDC)		
		Input current when off			--	6	10	mA
Output Specifications	Voltage Accuracy	0%-100% load	5VDC input, 3.3VDC output		--	±1	±3	%
			5VDC input, other output	Positive output	--	±1	±2	
				Negative output	--	±1	±3	
			Others		--	±1	±3	
	Linear Regulation	Input voltage variation from low to high at full load	5VDC input	Singe output	--	--	±0.5	
				Dual output	--	--	±1	
			Others		--	±0.2	±0.5	
	Load Regulation②	0%-100% load	5VDC input, 3.3VDC output		--	--	±2	
			5VDC input, other output	Singe output	--	--	±1	
				Dual output	--	--	±1.5	
			24VDC input		--	±0.5	±1	
		5%-100% load	12VDC/48VDC input		--	±0.5	±1	
			DEMD10-B0503		--	--	±1	
	Cross Regulation	Input voltage range, 25%-100% load			--	--	±5	
	Transient Recovery Time	25% load step change, nominal input voltage			--	300	500	μs
	Transient Response Deviation	25% load step change, nominal input voltage	±5V output, DEMD10-B4803 DEMD10-B4805, DEMD10-B0503		--	±5	±8	%
			Others		--	±3	±5	
	Temperature Coefficient	Full load			--	--	±0.03	%/℃
	Ripple & Noise③	20MHz bandwidth, 5%-100% load			--	40	100	mV p-p
	Over-voltage Protection	Input voltage range			110	--	160	%Vo
	Over-current Protection				110	140	190	%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
	Insulation Resistance	Input-output resistance at 500VDC			1000	--	--	MΩ
	Isolation Capacitance	Input-output capacitance at 100kHz/0.1V			--	1000	--	pF
	Operating Temperature	See Fig. 1			-40	--	+85	℃
	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				10-150Hz, 5G, 90 Min. along X, Y and Z			
	Switching Frequency⑤	PWM mode			--	350	--	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	DEMD10-B0505	Horizontal package/E2S		15.0g /38.5g /58.5g (Typ.)			

		DEMD10-B0503	wiring package/D4S rail package	
		Others		12.5g /36.0g /56.0g (Typ.)
	Cooling Method	Free air convection		

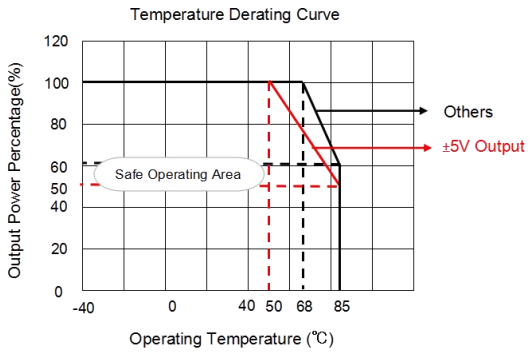
Note:
①The Ctrl pin voltage is referenced to input GND.
②Load regulation for 0% -100% for 12VDC/48VDC nominal input series parts to ±5%;
③Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The ” parallel cable” method is used for Ripple and Noise test.
④The pin soldering temperature tolerance 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)

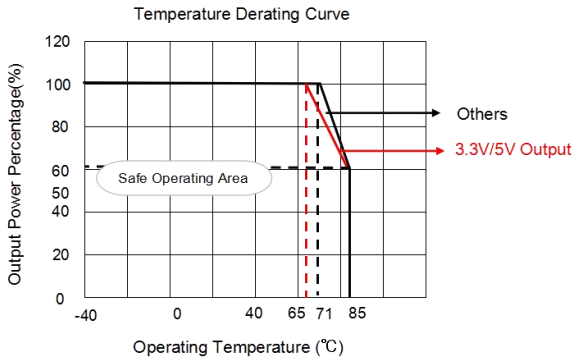
Emissions	CE	5VDC nominal input	CISPR32/EN55032 CLASS B (see Fig.5-② for recommended circuit)	
		12VDC nominal input	CISPR32/EN55032 CLASS A (without extra components.)/ CLASS B (see Fig.4-② for recommended circuit)	
		24VDC nominal input	CISPR32/EN55032 CLASS A (without extra components.)/ CLASS B (see Fig.3-② for recommended circuit)	
		48VDC nominal input	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)	
	RE	5VDC nominal input	CISPR32/EN55032 CLASS B (see Fig.5-② for recommended circuit)	
		12VDC nominal input	CISPR32/EN55032 CLASS A(without extra components.)/CLASS B(see Fig.4-② for recommended circuit)	
		24VDC nominal input	CISPR32/EN55032 CLASS A(without extra components.)/CLASS B(see Fig.3-② for recommended circuit)	
		48VDC nominal input	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)	
Immunity	ESD	5VDC nominal input	IEC/EN61000-4-2 Contact ±6kV	perf. Criteria B
		Others	IEC/EN61000-4-2 Contact ±4kV	perf. Criteria B
	RS		IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	Others	IEC/EN61000-4-4 ±2kV (see Fig.3-① for recommended circuit)	perf. Criteria B
		5VDC nominal input	IEC/EN61000-4-4 ±2kV (see Fig.5-① for recommended circuit)	perf. Criteria B
		12VDC nominal input	IEC/EN61000-4-4 ±2kV (see Fig.4-① for recommended circuit)	perf. Criteria B
	Surge	Others	IEC/EN61000-4-5 line to line ±2kV (see Fig.3-①for recommended circuit)	perf. Criteria B
		5VDC nominal input	IEC/EN61000-4-5 line to line ±2kV (see Fig.5-①for recommended circuit)	perf. Criteria B
		12VDC nominal input	IEC/EN61000-4-5 line to line ± 2kV (see Fig.4- ① for recommended circuit)	perf. Criteria B
	CS		IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A

Characteristic Curve

5VDC input series, except 3.3VDC output



Others



5VDC input series, 3.3VDC output

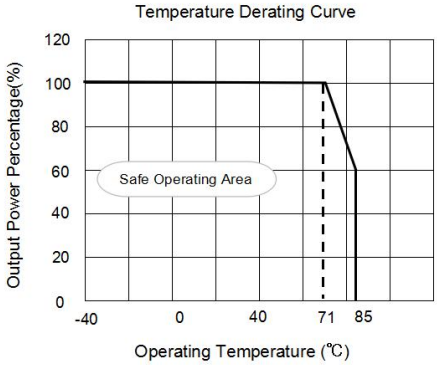
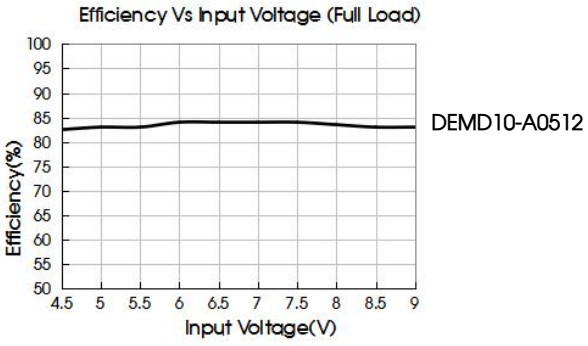
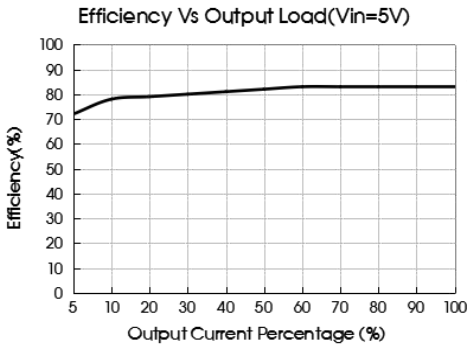


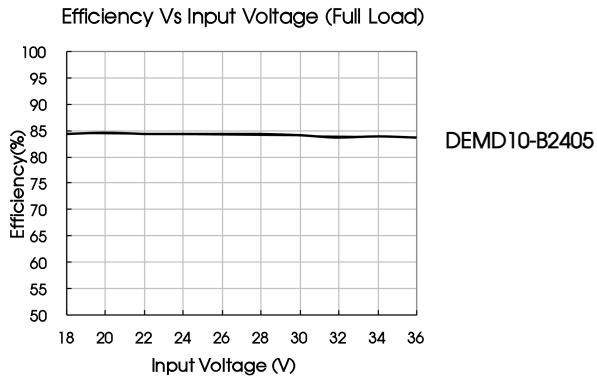
Fig. 1



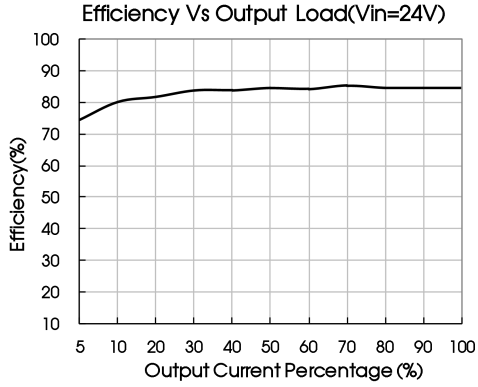
DEMD10-A0512



DEMD10-A0512



DEMD10-B2405



DEMD10-B2405

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.

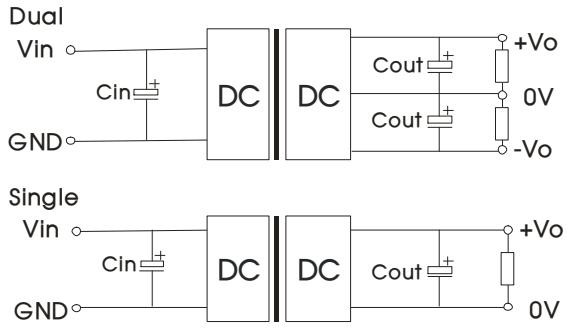


Fig. 2

Vin(VDC)	Cin	Cout
5	100μF/16V	Vo(3.3/5/±5): 10μF/16V
12	100μF/25V	Vo(12/±12/15/±15V): 10μF/25V
24	100μF/50V	
48	100μF/100V	Vo(24/±24V): 10μF/50V

2. EMC compliance circuit

24VDC/48VDC nominal input series

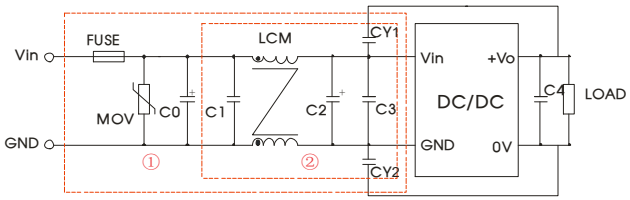


Fig. 3

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	Vin: 48VDC
FUSE	Select fuse value according to actual input current	
MOV	S20K30	S14K60
C0	680μF/50V	680uF/100V
C1	1μF/50V	1uF/100V
C2	330μF/50V	330μF/100V
C3	4.7μF/50V	4.7uF/100V
C4	Refer to the Cout in Fig.2	
LCM	4.7mH	
CY1, CY2	1nF/2kV	

12VDC nominal input series

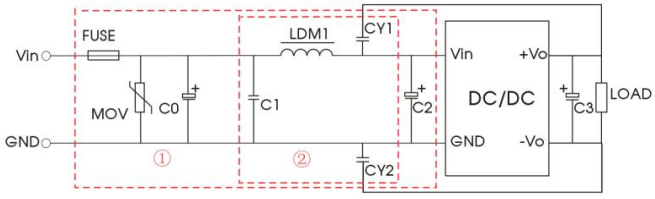


Fig. 4

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

Parameter description:

Model	Vin: 12VDC
FUSE	Select fuse value according to actual input current
MOV	S20K30
C0, C2	330μF/50V
C1	1μF/50V
C3	Refer to the Cout in Fig.2
LDM1	4.7μH
CY1, CY2	1nF/2kV

5VDC nominal input series

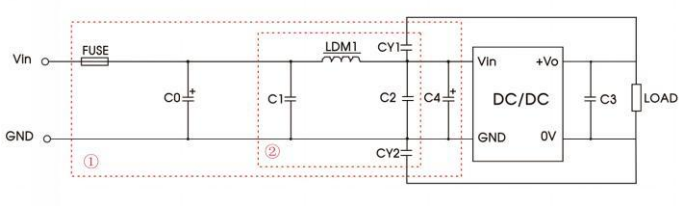


Fig. 5

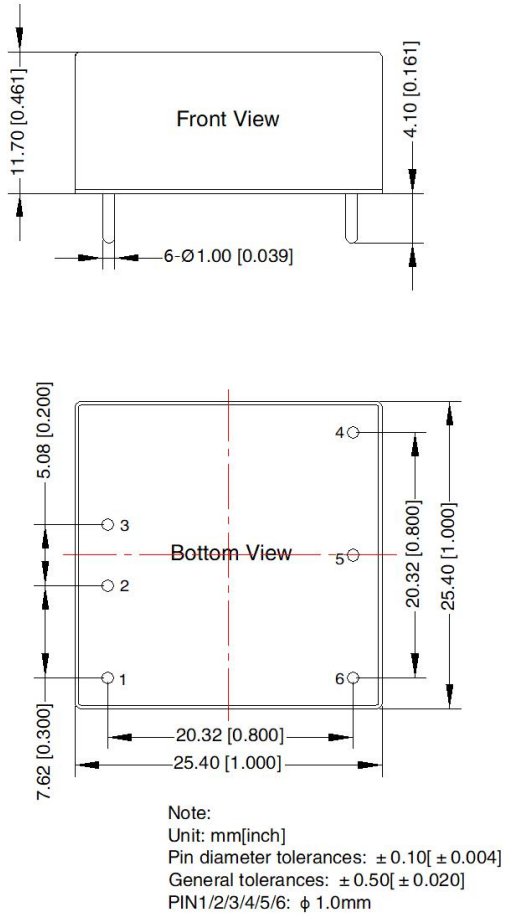
Notes: For EMC tests we use Part ① in Fig. 5 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

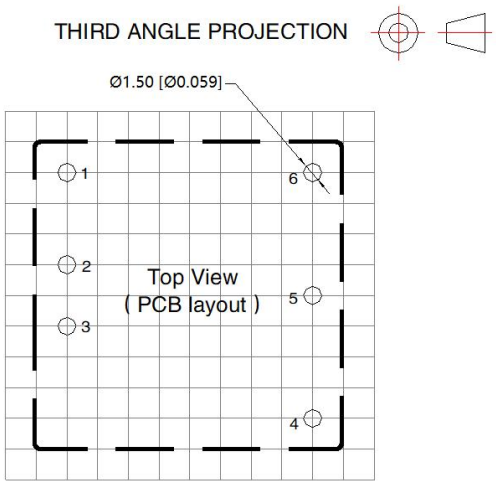
Model	Vin: 5VDC
FUSE	Select fuse value according to actual input current
C0	2200μF/35V
C1, C2	4.7μF/50V
C3	Refer to the Cout in Fig.2
C4	1000μF/35V
LDM1	4.7μH
CY1, CY2	1nF/2kV

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

DEMD10-A & Bxxxx Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]
PIN1/2/3/4/5/6: ϕ1.0mm

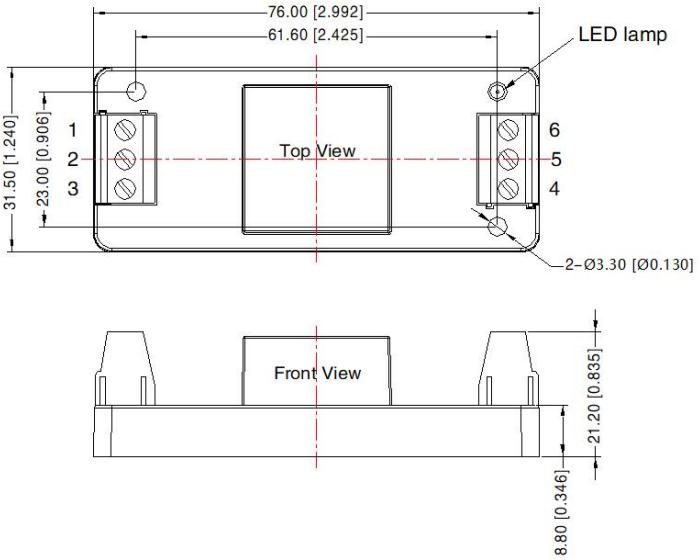


Note: Grid 2.54*2.54mm

Pin–Out		
Pin	Single	Dual
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	No Pin	0V
6	0V	–Vo

DEMD10-A & BxxxxE2S Dimensions and Recommended Layout

THIRD ANGLE PROJECTION

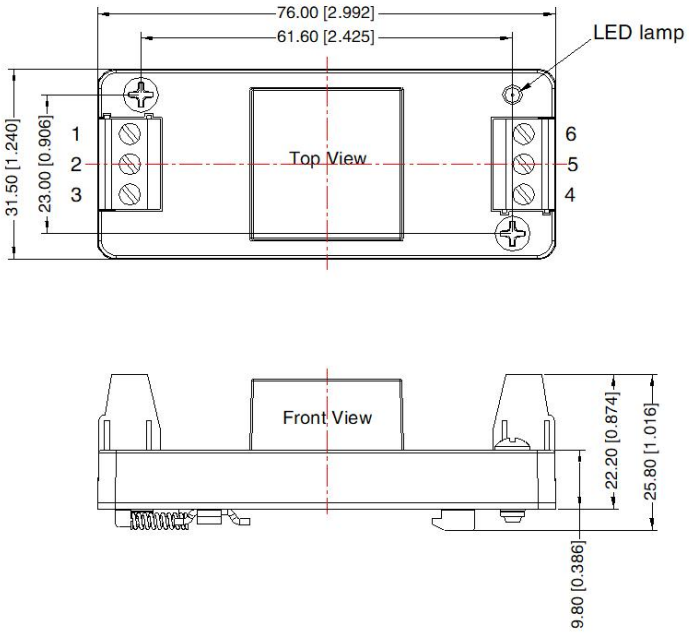


Pin–Out						
Pin	1	2	3	4	5	6
Single	Ctrl	GND	Vin	+Vo	NC	0V
Dual	Ctrl	GND	Vin	+Vo	0V	–Vo

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

DEMD10-A & BxxxxD4S Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



Pin–Out						
Pin	1	2	3	4	5	6
Single	Ctrl	GND	Vin	+Vo	NC	0V
Dual	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. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
2. The maximum capacitive load offered were tested at input voltage range 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.