

DCMB_LD-40W Series



CE Report RoHS



FEATURES

- Wide input voltage range (2:1)
- High efficiency up to 91%
- Industry standard pin-out
- No-load power consumption as low as 0.3W
- Isolation voltage :1.5K VDC
- Operating temperature range: -40°C To +85°C
- Output short-circuit, over-voltage, over-current protection
- Metal shielded package

DESCRIPTION

DC-DC Module Power Supply, Wide Voltage Input, Power 40W, Isolated, Regulated, Single Output, DIP Packaging.

MODEL NUMBERING

DCMBxxxxLD-40W



SELECTION GUIDE

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μF)
DCMB2405LD-40W	24VDC (18-36)	5	8000/0	86/88	10000
DCMB2412LD-40W		12	3333/0	88/90	2700
DCMB2415LD-40W		15	2667/0	90/91	1680
DCMB2424LD-40W		24	1667/0	90/91	680

Note: Use suffix "H" for heatsink, suffix "ST" for screw terminal, suffix "DR" for DIN-Rail

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μ F)
DCMB4812LD-40W	48VDC (36-75)	12	3333/0	88/90	2700
DCMB4815LD-40W		15	2667/0	90/91	1680
DCMB4824LD-40W		24	1667/0	90/91	680

Note: Use suffix "H" for heatsink, suffix "ST" for screw terminal, suffix "DR" for DIN-Rail

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input Current (Rated load)	Nominal voltage input 24VDC	--	1894	1938	mA
	Nominal voltage input 48VDC	--	962	947	mA
Input Current (No load)	Nominal voltage input 24VDC	--	12	100	mA
	Nominal voltage input 48VDC	--	12	25	mA
Reflected Ripple Current	Nominal input voltage	--	30	--	mA
Input impulse voltage (1Sec. max.)	Nominal voltage input 24VDC	-0.7	--	50	VDC
	Nominal voltage input 48VDC	-0.7	--	100	VDC
Starting voltage	Nominal voltage input 24VDC	--	--	18	VDC
	Nominal voltage input 48VDC	--	--	36	VDC
Under voltage protect	Nominal voltage input 24VDC	13	15.5	--	VDC
	Nominal voltage input 48VDC	26	33	--	VDC
Start Time	Nominal Input Voltage & Constant Resistance Load	--	10	150	ms
Remote control foot (Some models are applicable)	Module On	Ctrl hovering or connected to TTL high level (3.5 12VDC)			
	Module shutdown	Ctrl connected to GND or low level (0 1.2VDC)			
	Input current during shutdown	--	5	10	mA
Input filter		PI type			

Remarks: This product does not support hot plug

OUTPUT CHARACTERISTICS

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
Output Voltage Accuracy	5%-100% Load	--	± 1	± 3	%

Parameter	Operating Conditions		Min.	Typ.	Max.	Units
Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	%
Load Regulation	5%-100% load		--	±0.5	±1	%
Dynamic Response Recovery Time	25% load step change, nominal input voltage		--	300	500	μs
Dynamic Response Step Deviation	25% load step change, input voltage range	3.3V, 5V,output	--	±5	±8	%
		Others	--	±3	±5	%
Temperature Drift Coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise *	20MHz bandwidth, nominal input voltage, 5%-100% load		--	50	100	mVp-p
Trim			--	±10	--	%Vo
Over Voltage Protection	Input voltage range		110	--	160	%Vo
Over Current Protection			110	--	190	%Io
Short Circuit Protection			Continuous, self-recovery			

Note: *Ripple & Noise at < 5% load is 300mV max. The "parallel cable" method is used for Ripple and Noise test.

GENERAL CHARACTERISTIC

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
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	--	2000	--	pF
Working Temperature		-40	--	+85	°C
Storage Humidity	Without condensation	5	--	95	%RH
Storage Temperature		-55	--	+125	°C
Soldering Temperature Resistance Of Pins	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Vibration		10-55Hz, 10G, 30 Min. along X, Y & Z			
Switching Frequency *	PWM mode	--	300	--	KHz
MTBF	MIL-HDBK-217F@25°C	500	--	--	Khours

Note: *Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

PHYSICAL CHARACTERISTICS

Parameter	Conditions		
Case Material	Aluminum alloy		
Overall dimensions	Without heatsink	Horizontal package	50.80 × 25.40 × 11.80 mm
		Screw Terminal (ST)	76.00 × 31.50 × 21.20 mm
		DIN Rail (DR)	76.00 × 31.50 × 25.80 mm
	With heatsink	Horizontal package	51.40 × 26.20 × 16.50 mm
		Screw Terminal (ST)	76.00 × 31.50 × 25.30 mm
		DIN Rail (DR)	76.00 × 31.50 × 29.90 mm
Weight	Without heatsink	Horizontal package	26.8g (Typ.)
		Screw Terminal (ST)	49.8g (Typ.)
		DIN Rail (DR)	69.8g (Typ.)
	With heatsink	Horizontal package	36.0g (Typ.)
		Screw Terminal (ST)	59.0g (Typ.)
		DIN Rail (DR)	79.0g (Typ.)
Cooling Method	Free air convection		

EMC CHARACTERISTICS

Parameters		Model	Category	Content	
EMI	CE		CISPR32/EN55032	CLASS B (see Fig.2-② for recommended circuit)	
	RE		CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)	
	ESD	DCMB2405LD-40W(H)(ST/DR)	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
		Others	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria A
EMS	RS		IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	DCMB2405LD-40W(H)(ST/DR)	IEC/EN61000-4-4	±2KV (see Fig.2-① for recommended circuit)	perf. Criteria B
		Others	IEC/EN61000-4-4	±2KV (see Fig.2-① for recommended circuit)	perf. Criteria A
	Surge	DCMB2405LD-40W(H)(ST/DR)	IEC/EN61000-4-5	line to line ±2KV (see Fig.2-① for recommended circuit)	perf. Criteria B
		Others	IEC/EN61000-4-5	line to line ±2KV (see Fig.2-① for recommended circuit)	perf. Criteria A
	CS	DCMB2405LD-40W(H)(ST/DR)	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
		Others	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

CIRCUIT DESIGN AND APPLICATION

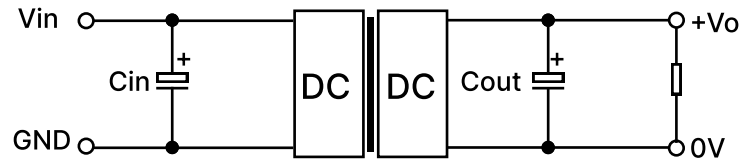
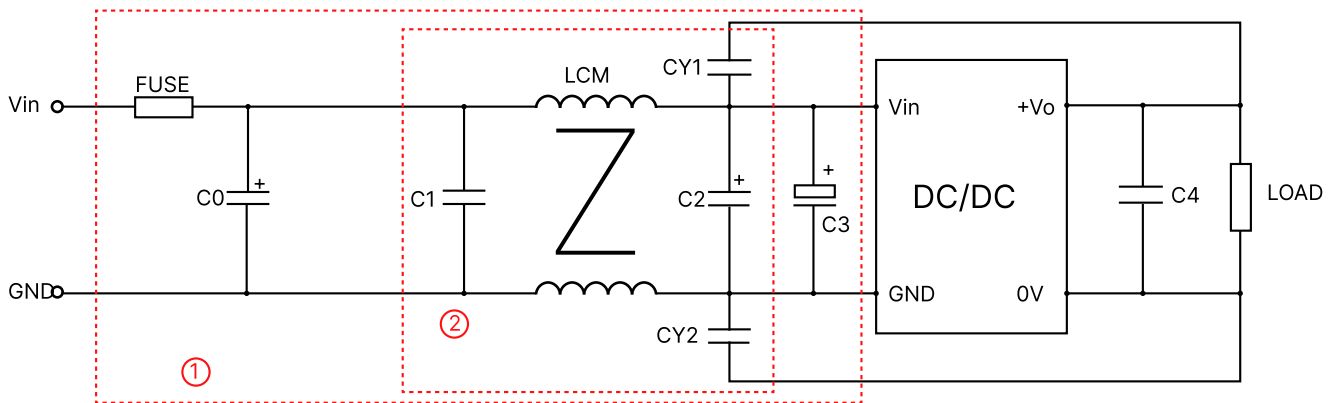


Figure 1: Application circuit

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

Table 1: Recommended Capacitive Load Values

2. EMC compliance circuit

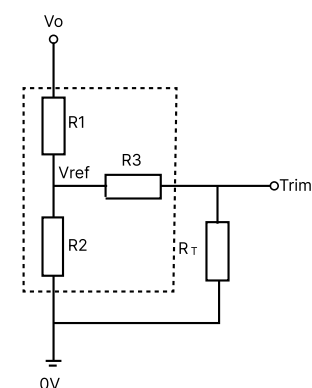


Notes: Part ① in the Fig. 2 is used for EMC test and part ② for EMI filtering; selected based on needs.

Figure 2 Parameter description

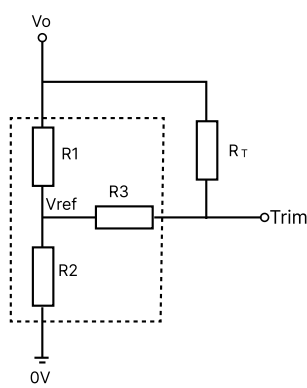
Model	Vin:24Vdc	Vin:48Vdc
FUSE	Choose according to actual input current	
C0	680μF/50V	680μF/100V
C1, C3	4.7μF/50V	4.7μF/100V
C2	330μF/50V	330μF/100V
C4	Refer To The Cout In Fig.2	
CY1, CY2	2.2nF/2KV	
LCM	2.2mH	

TRIM FUNCTION FOR OUTPUT VOLTAGE ADJUSTMENT (OPEN IF UNUSED)



Trim up

Fig. 3



Trim Down

Fig. 4

TRIM resistor connection (dashed line shows internal resistor network)

The Calculation formula for trip resistance

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

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

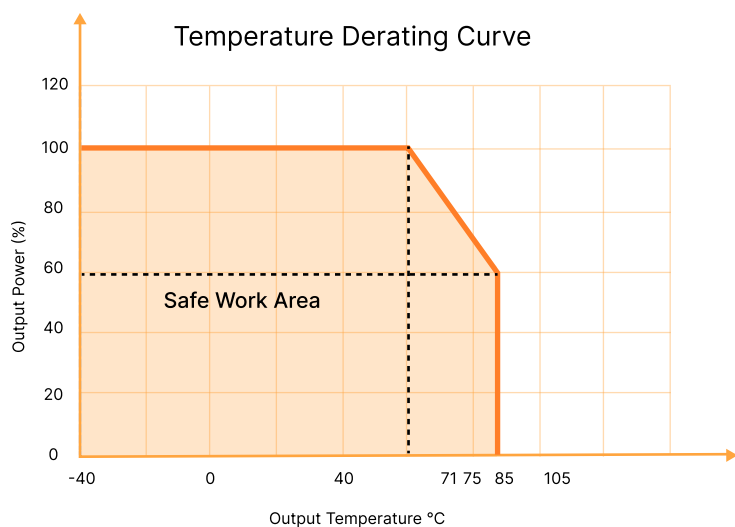
R_T = Trim resistance

a = is a self-defined parameter,

V_o' = desired output voltage

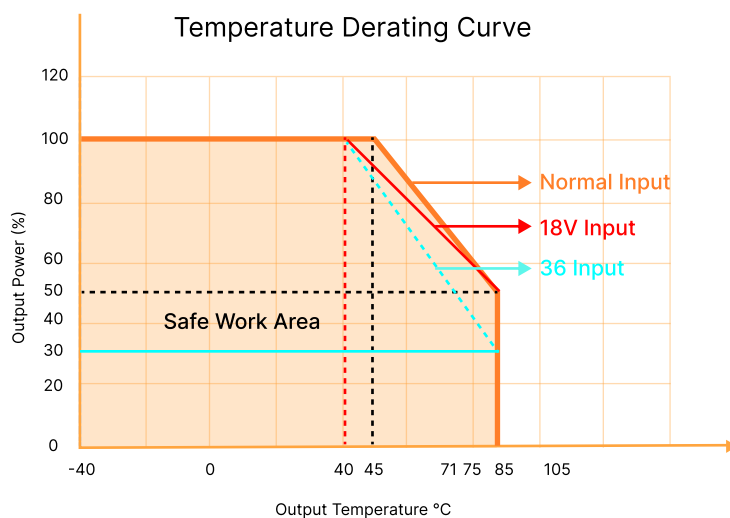
Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
5	2.894	2.87	10	2.5
12	11.000	2.87	15	2.5
15	14.494	2.87	15	2.5
24	24.872	2.87	15	2.5

PRODUCT CHARACTERISTIC CURVE



Other outputs(with heatsink)

Figure 5



Output 5V (DR Package)

Figure 5

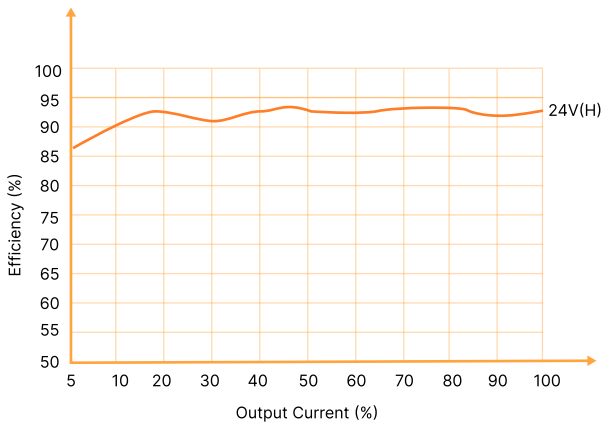


Figure 6: Efficiency Vs Output Load (Vin=24V)

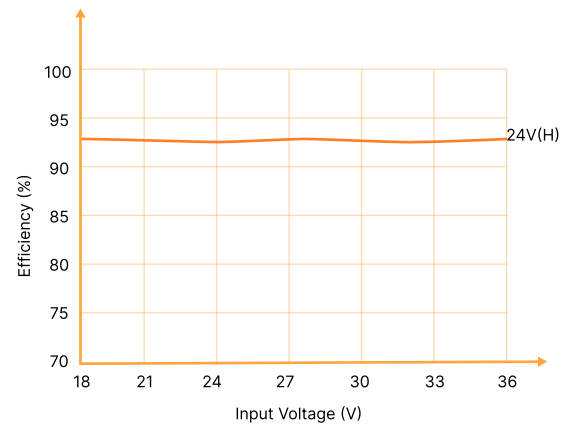


Figure 7: Efficiency Vs Input Voltage (100% Load)

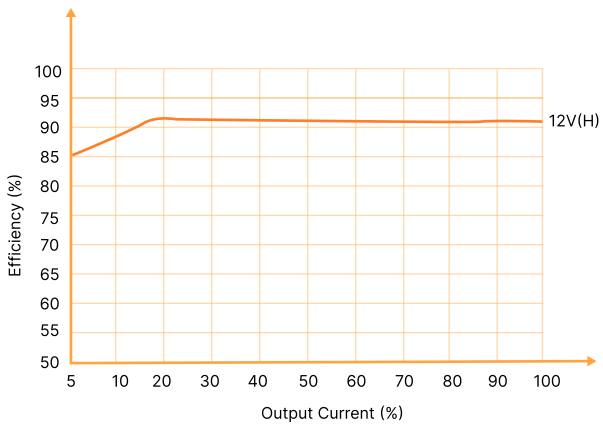


Figure 8: Efficiency Vs Output Load (Vin=48V)

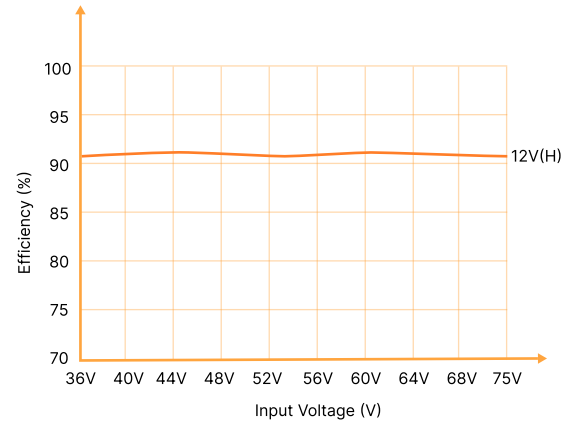
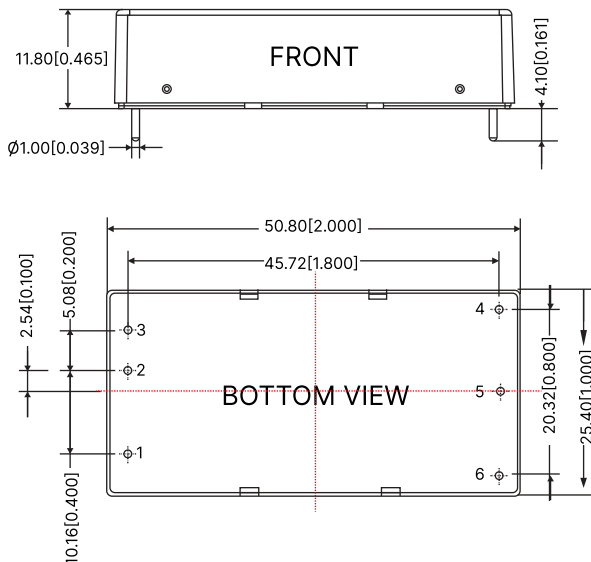


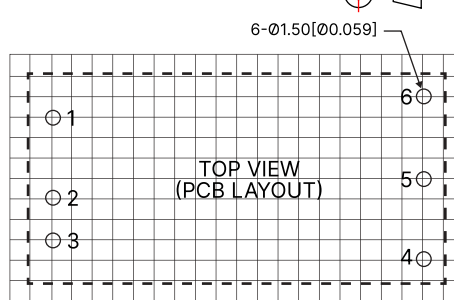
Figure 9: Efficiency Vs Input Voltage (100% Load)

OVERALL DIMENSIONS AND PIN FUNCTIONS

DCMB_LD-40W (without heatsink)



THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54

Note:

Unit: mm[inch]

Pin diameter tolerances: ± 0.10 [± 0.004]

General tolerances: ± 0.50 [± 0.020]

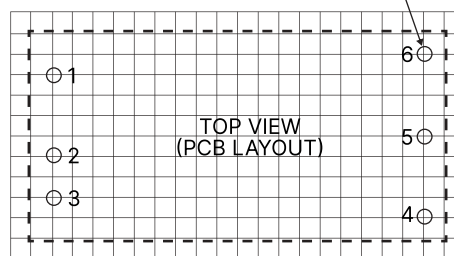
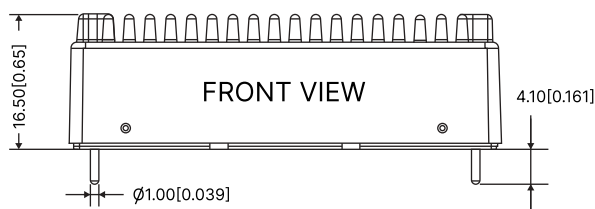
Table 3: Pin Function Table

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

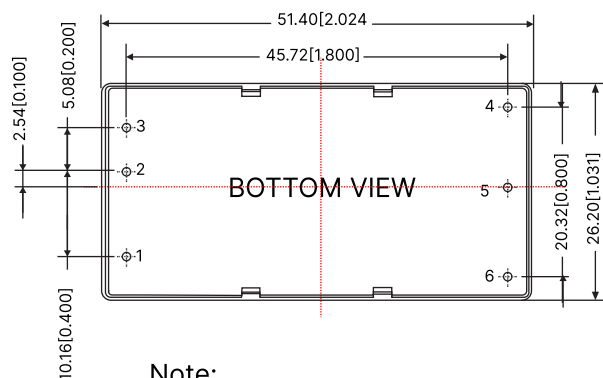
DCMB_LD-40WH (with heatsink)

THIRD ANGLE PROJECTION

6-Ø1.50[Ø0.059]



Note: Grid 2.54*2.54



Note:

Unit: mm[inch]

Pin diameter tolerances: ± 0.10 [± 0.004]

General tolerances: ± 0.50 [± 0.020]

Table 2: Pin Function Table

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

DCMB_LD-40WST (without heatsink)

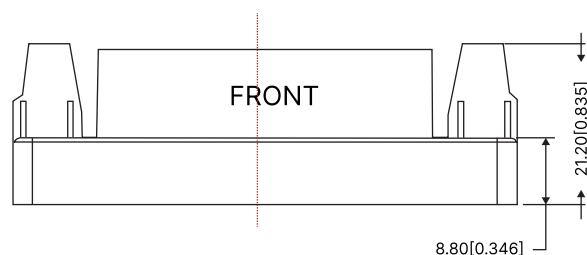
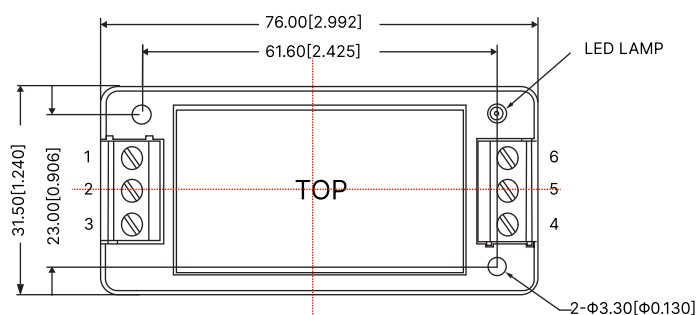


Table 3: Pin Function Table

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

Note:

Unit: mm[inch]

Wide range: 24-12 AWG

Tightening torque: Max 0.4 N-m

General tolerances: ± 1.00 [± 0.039]

DCMB_LD-40WHST (with heatsink)

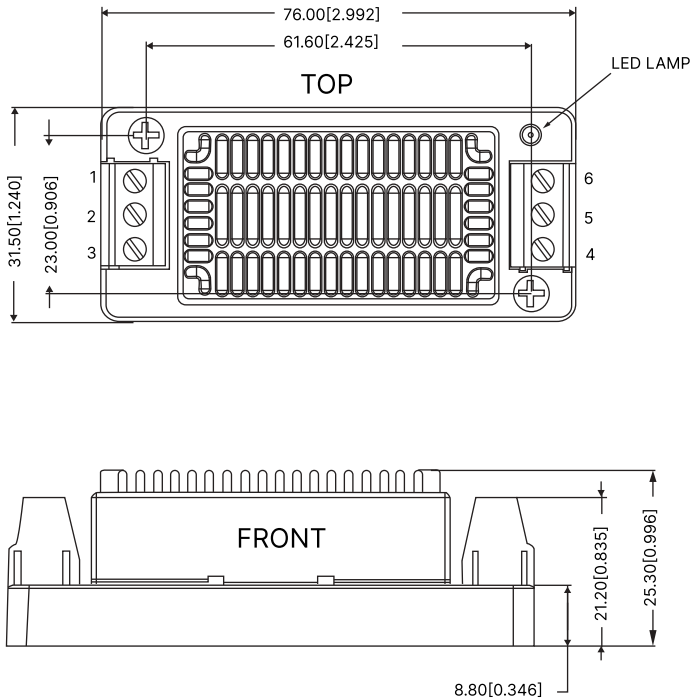


Table 3: Pin Function Table

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

Note:

Unit: mm[inch]

Wide range: 24-12 AWG

Tightening torque: Max 0.4 N-m

General tolerances: ± 1.00 [± 0.039]

DCMB_LD-40WDR (without heatsink)

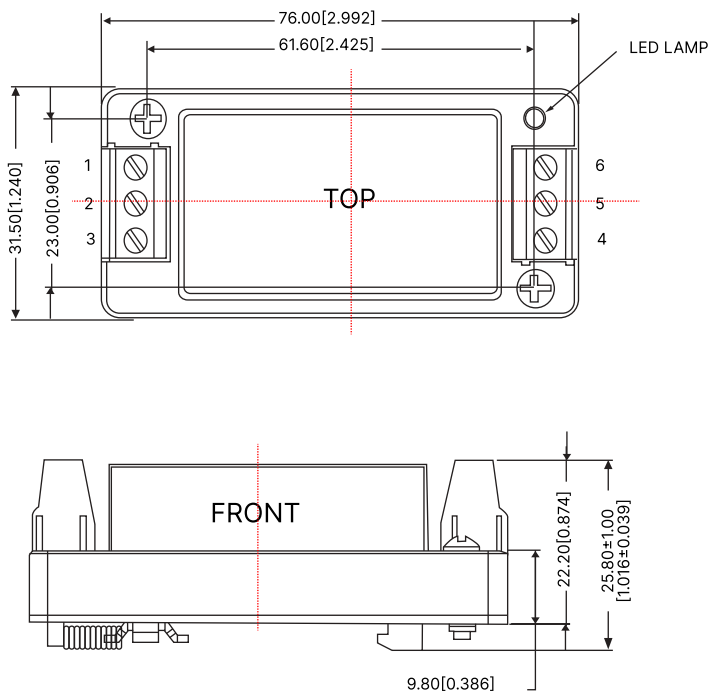


Table 3: Pin Function Table

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

Note:

Unit: mm[inch]

Mounting Rail: TS35

Wide range: 24-12 AWG

Tightening torque: Max 0.4 N-m

General tolerances: ± 1.00 [± 0.039]

DCMB_LD-40WHDR (with heatsink)

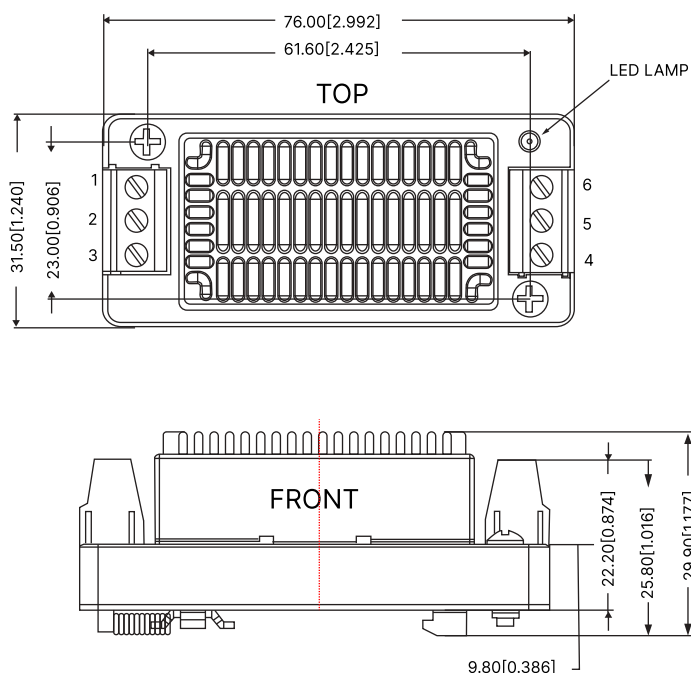


Table 3: Pin Function Table

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

Note:

Unit: mm[inch]

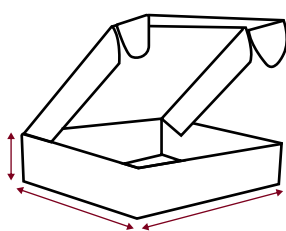
Mounting Rail: TS35

Wide range: 24-12 AWG

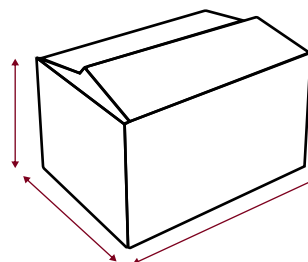
Tightening torque: Max 0.4 N-m

General tolerances: ± 1.00 [± 0.039]

PACKAGING METHOD



70 Pieces/Inner box



350 Pieces/Outer box

NOTES & INSTRUCTIONS

- 1.The input voltage shall not exceed the specified range value, otherwise permanent and unrecoverable damage maybe caused;
2. Unless otherwise specified,the parameters in this manual are measured at 25 °C,40%~75% humidity, input nominal voltage and output pure resistance mode under full load;
- 3.All index test methods are based on the company's enterprise standards.
- 4.The copyright and the final interpretation right of the product belong to RHENXV.