RHENXV
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DC-DC CONVERTERS

50 WATTS

DCMB24_LD-50W Series

CE Report RoHS

3 YEARS WARRANTY

FEATURES

- Wide input voltage range (2:1)
- High efficiency up to 91%
- Industry standard pin-out
- No-load power consumption as low as 0.048W
- Isolation voltage :1.5K VDC
- Operating temperature range: -40°C To +105°C
- Output short-circuit, over-voltage, over-current protection
- Metal shielded package

DESCRIPTION

DC-DC Module Power Supply, Wide Voltage Input, Power 50W, Isolated, Regulated, Single Output, DIP Packaging.

MODEL NUMBERING

DCMB24xxLD-50W

- Series
- Input Voltage
- Output Voltage
- Output Power
- Packaging Form

SELECTION GUIDE

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum Capacitive load (μF)
DCMB2403LD-50W	24VDC (18-36)	3.3	10000/500	87/90	27000
DCMB2405LD-50W		5	10000/500	88/90	18900
DCMB2412LD-50W		12	4167/208	89/91	3700
DCMB2415LD-50W		15	3333/167	89/91	2000
DCMB2424LD-50W		24	2083/104	89/91	1000

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	--	2289	2367	mA
Input Current (No load)	Nominal voltage input 24VDC	--	2	12	mA
Reflected Ripple Current	Nominal voltage input 24VDC	--	12	100	mA
Input impulse voltage (1 Sec. max.)		-0.7	--	50	mA
Starting voltage	Nominal input voltage	--	--	18	mA
Under voltage protect	Nominal voltage input 24VDC	11	13	--	VDC
Start Time	Nominal Input Voltage & Constant Resistance Load	--	10	120	ms
Remote control foot (Some models are applicable)	Module On	Ctrl hovering or connected to TTL high level (3.0-12VDC)			
	Module shutdown	Ctrl connected to GND or low level (0-1.2VDC)			
	Input current during shutdown	--	6	12	mA
Input filter	PI Filter				

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	%
Line Regulation Rate	Input voltage variation from low to high at full load		--	±0.2	±0.5	%
Load Regulation Rate	5%-100% load		--	±0.5	±1	%
Dynamic Response Recovery Time	25% load step change, nominal input voltage		--	250	500	μs
Dynamic Response Step Deviation	25% load step change, input voltage range	3.3V, 5V, output	--	±3	±8	%
		Others	--	±3	±5	%
Temperature Drift Coefficient	100% load		--	--	±0.03	%/°C
Ripple & Noise *	20MHz bandwidth, nominal input voltage, 5%-100% load		--	240	300	mVp-p
Trim			90	--	110	%Vo
Over Voltage Protection	Input voltage range		110	140	160	%Vo
Over Current Protection			110	140	200	%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	--	2200	--	pF
Working Temperature		-40	--	+105	°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		10-150Hz, 5G, 0.75mm. along X, Y & Z			
Switching Frequency *	PWM mode	--	300	--	
MTBF	MIL-HDBK-217F@25°C	1000	--	--	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	39.0g (Typ.)
		Screw Terminal (ST)	62.0g (Typ.)
		DIN Rail (DR)	82.0g (Typ.)
	With heatsink	Horizontal package	47.0g (Typ.)
		Screw Terminal (ST)	70.0g (Typ.)
		DIN Rail (DR)	90.0g (Typ.)
Cooling Method	Free air convection		

EMC CHARACTERISTICS

Parameter		Category	Content	
EMI	CE	CISPR32/EN55032	CLASS B (see Fig.2-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig.2-② for recommended circuit)	
EMS	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	100KHz ±2KV (see Fig.2-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV (see Fig.2-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	10 Vr.m.s	perf. Criteria A

CIRCUIT DESIGN AND APPLICATION

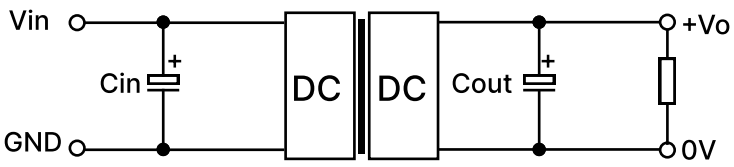
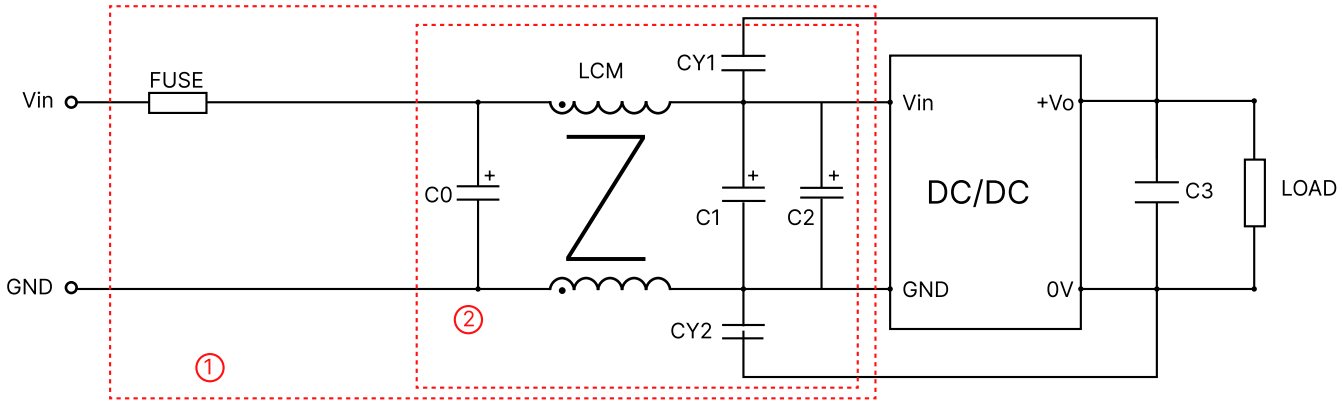


Figure 1: Application circuit

Vout (VDC)	Cin	Cout
3.3/5/12/15/24	100μF	47-470μF

Table 1: Recommended Capacitive Load Values

2. EMC compliance circuit

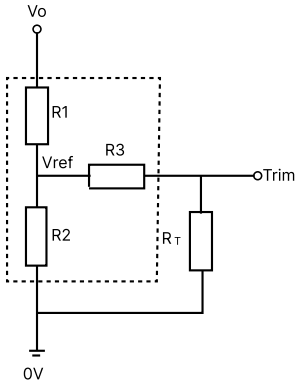


Notes: Part ① in the Fig. 2 is used for EMC test and part ② for EMI filtering; selected based on needs.

Fig. 2 Parameter description

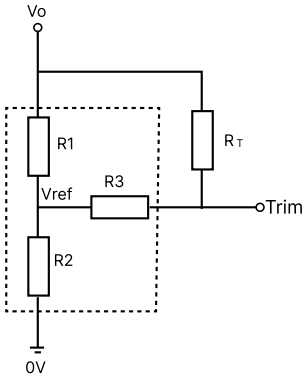
Model	Vin:24Vdc
FUSE	4A/250VAC
C0	680μF/50V
LCM	2.2mH
C1	330μF/50V
C2	4.7uF/50V
CY1, CY2	Y1 Safety capacitor 2.2nF/250VAC
C3	Refer to the Cout in Fig.2

TRIM FUNCTION FOR OUTPUT VOLTAGE ADJUSTMENT (OPEN IF UNUSED)



Trim up

Fig. 3



Trim Down

Fig. 4

The Calculation formula for trip resistance

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

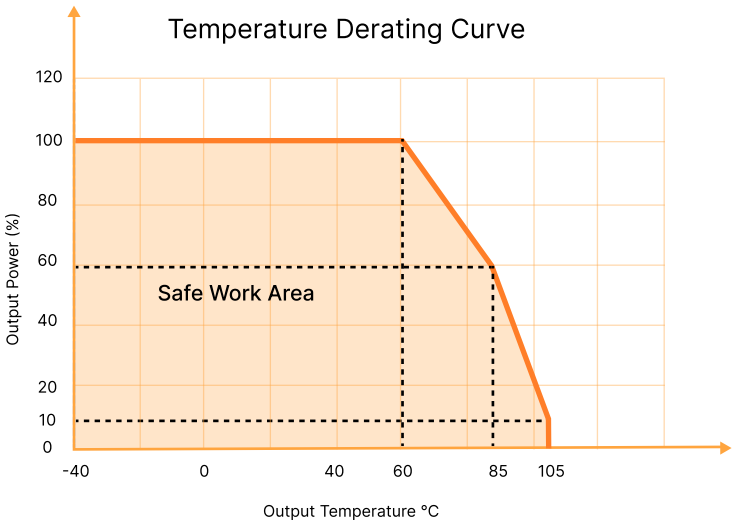
Trim down: $R_T \frac{aR_1}{R_1-a} - R_3$ $\quad a = \frac{Vo'-Vref}{Vref} R_2$

R_T = Trim resistance
a = is a self-defined parameter,
Vo' = desired output voltage

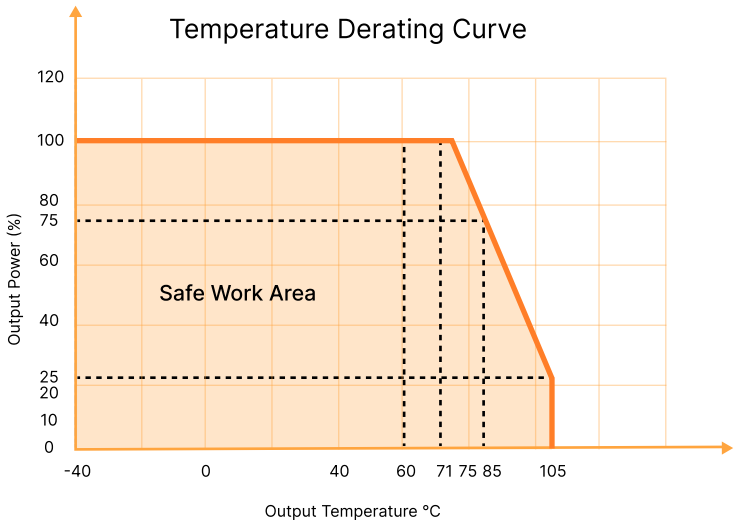
TRIM resistor connection (dashed line shows internal resistor network)

Vout(V)	Vout adj. value (V)	RT(KΩ)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	Up : 3.63	15.0	4.83	2.87	4.7	1.24
	Down : 2.97	18.7	4.83	2.87	4.7	1.24
5	Up : 5.5	13.3	2.97	2.87	4.7	2.5
	Down : 4.5	5.4	2.97	2.87	4.7	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

PRODUCT CHARACTERISTIC CURVE



DCMB_LD-50W (without heatsink)
Figure 5

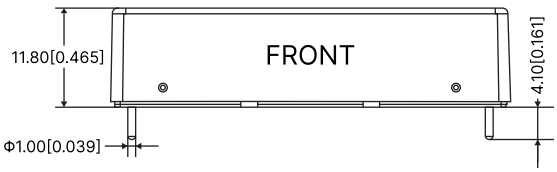


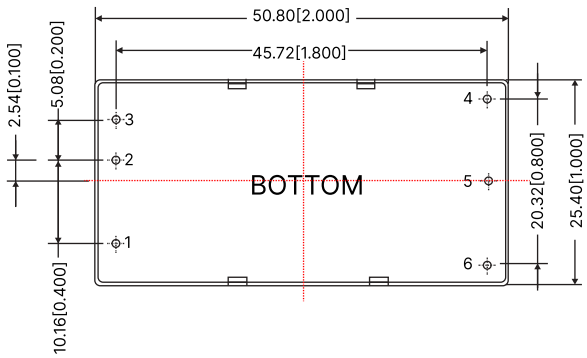
DCMB_LD-50WH (with heatsink)
Figure 6

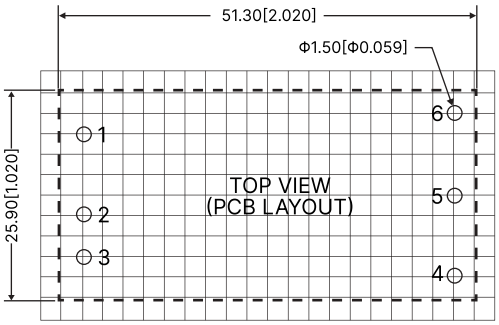
OVERALL DIMENSIONS AND PIN FUNCTIONS

DCMB24_LD-50W (without heatsink)

THIRD ANGLE PROJECTION







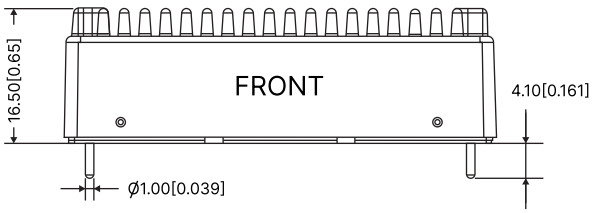
Note: Grid 2.54*2.54

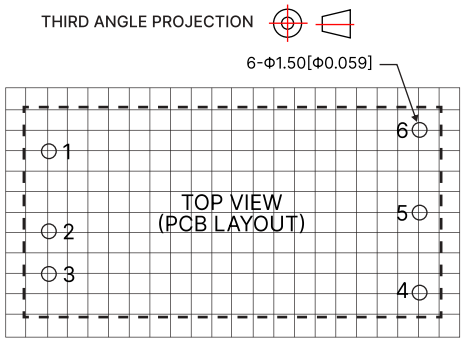
Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]

Table 3: Pin Function Table

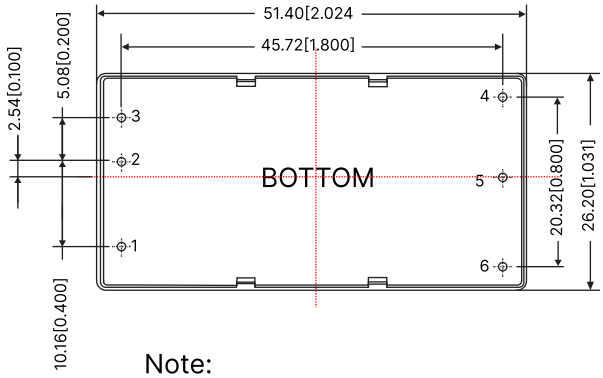
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	0V
6	Trim

DCMB24_LD-50WH (with heatsink)





Note: Grid 2.54*2.54

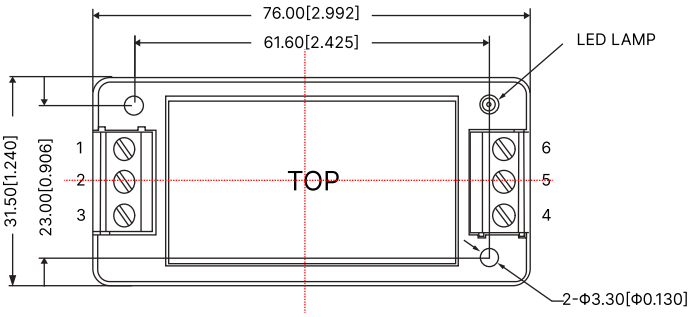


Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10 [±0.004]
General tolerances: ±0.50 [±0.020]

Table 4: Pin Function Table

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

DCMB24_LD-50WST (without heatsink)



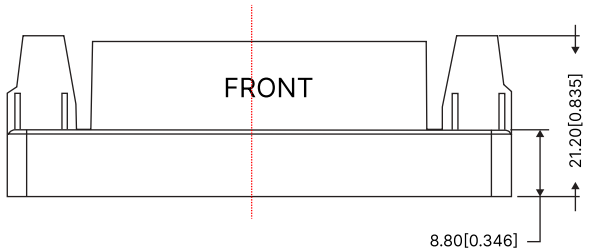


Table 5: Pin Function Table

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]

DCMB24_LD-50WHST (with heatsink)

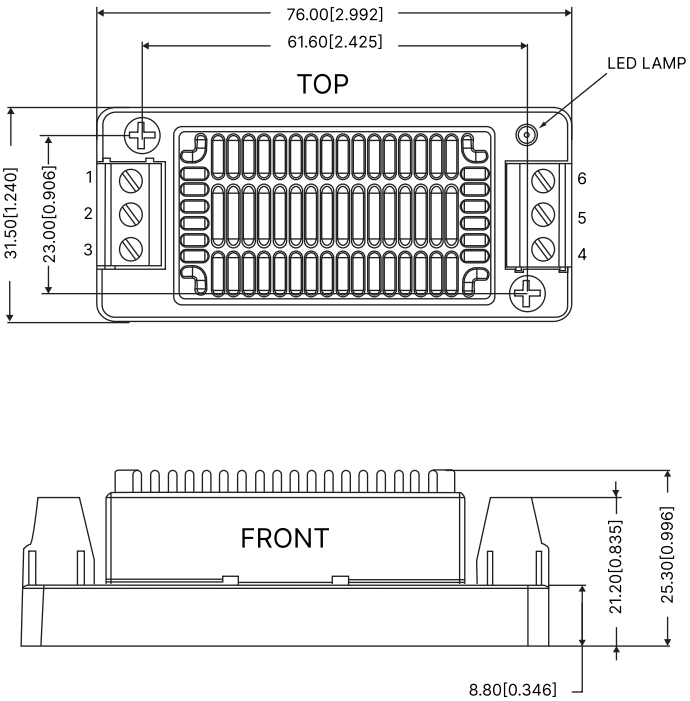


Table 6: Pin Function Table

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]

DCMB24_LD-50WDR (without heatsink)

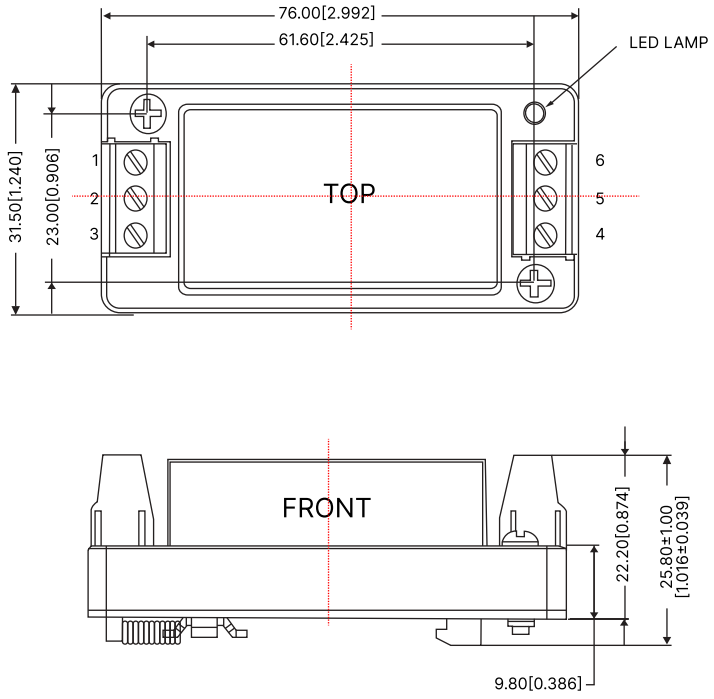
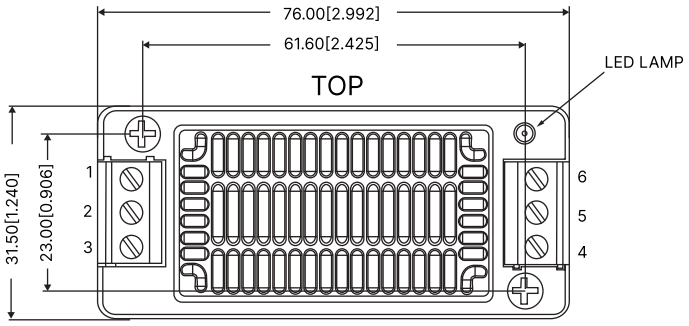


Table 7: Pin Function Table

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]

DCMB24_LD-50WHDR (with heatsink)



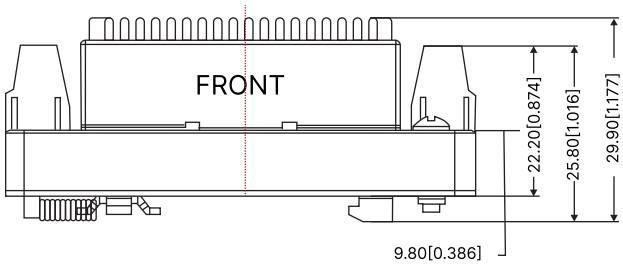
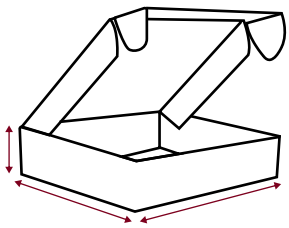


Table 8: Pin Function Table

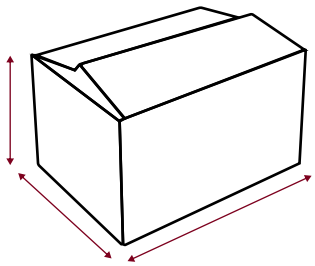
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	0V
6	Trim

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.

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