

DCMB_LD-15W Series



CE Report RoHS



FEATURES

- I/O isolation test voltage 1.5k VDC
- No-load power consumption as low as 0.12W
- Wide 2:1 input voltage range
- High efficiency up to 90%
- Input under-voltage protection, output short- circuit, over-voltage, over-current protection
- Metal shielding package
- Working temperature range:-40°C to +85°C

APPLICATIONS

- Industrial Control
- Electrical Power
- Instrumentation
- Communication

DESCRIPTION

DC-DC module power supply, Wide voltage input, Power 15W, Isolated, Regulated, Single output, DIP packaging.

MODEL NUMBERING

DCMBxxxxLD-15W



SELECTION GUIDE

Product Model	Input Voltage (Standard Value range)	Output Voltage (Vdc)	Output Current(mA) Max./Min.	Full Load Efficiency(%) Min./Typ	Capacitive Load(μF) Max.
DCMB2405LD-15W	24 (18-36)	5	3000/0	87/89	4700
DCMB2412LD-15W		12	1250/0	87/89	1000
DCMB2415LD-15W		15	1000/0	87/89	820
DCMB2424LD-15W		24	625/0	88/90	270

Use suffix "H" for heatsink

DC - DC CONVERTERS
15 WATTS

Product Model	Input Voltage (Standard Value range)	Output Voltage (Vdc)	Output Current(mA) Max./Min.	Full Load Efficiency(%) Min./Typ	Capacitive Load(μF) Max.
DCMB4803LD-15W	48 (36-75)	3.3	4000/0	81/83	4700
DCMB4805LD-15W		5	3000/0	86/88	4700
DCMB4812LD-15W		12	1250/0	86/88	1000
DCMB4815LD-15W		15	1000/0	87/89	820
DCMB4824LD-15W		24	625/0	87/89	270

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input current (Rated Load)	Nominal voltage input 24VDC	--	702	718	mA
	Nominal voltage input 48VDC	--	355	363	mA
Input current (No-load)	Nominal voltage input 24VDC	--	20	75	mA
	Nominal voltage input 48VDC	--	20	30	mA
Reflected ripple current	Nominal voltage input	--	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	12	15.5	--	VDC
	Nominal voltage input 48VDC	26	30	--	VDC
Start Time	Nominal voltage input	--	10	--	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	--	4	7	mA
Input filter	PI type				

Remarks: This product does not support hot plug

OUTPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Output voltage accuracy	0% -100% Load	--	±1	±3	%
Line regulation rate	Input voltage variation+/- 1%	--	±0.2	±0.5	%
Load regulation rate	Input voltage variation+/- 1%	--	±0.5	±1	%
Ripple & Noise	20MHz bandwidth	--	50	100	mVp p
Dynamic response step deviation	25% load step change	--	±5	±8	%
Dynamic response recovery time		--	300	500	μs
Temperature drift coefficient	100% load	--	--	±0.03	%/°C
Trim	Input voltage range	90	--	110	%Vo
Over Voltage Protection		110	--	160	%Vo
Over Current Protection		110	--	190	%Io
Short Circuit Protection		Continuous, self-recovery			

Note: The Testing Method For Ripple And Noise Is The Parallel Line Testing Method.

GENERAL CHARACTERISTIC

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input/output-Case 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	--	2050	--	pF
Working Temperature	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	°C
Storage Humidity	Non-condensing	5	--	95	%RH
Soldering Temperature Resistance Of Pins	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Vibration		10-55Hz, 2G, 30 Min. along X, Y and Z			

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
Switching Frequency *	PWM mode	--	270	--	KHz
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	With Heat Sink Horizontal package 51.40 × 26.20 × 16.50 mm
	Without Heat Sink Horizontal package 50.80 × 25.40 × 11.80 mm
Weight	With Heat Sink Horizontal package 34.0g (Typ.)
	Without Heat Sink Horizontal package 26.0g (Typ.)
Cooling Mode	Natural Air Cooling

EMC CHARACTERISTICS

Parameter	Category	Content
EMI	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)
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 ±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 3 Vr.m.s perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29 0%, 70% perf. Criteria B

CIRCUIT DESIGN AND APPLICATION

Typical application

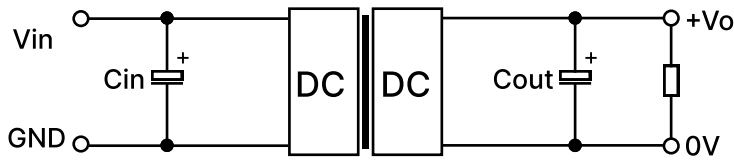


Fig. 2

Table 1: Recommended Capacitive Load Values

Output Voltage (VDC)	Cin(uF)	Cout(μF)
3.3/5	100	470
12/15	100	220
24	100	100

EMC compliance circuit

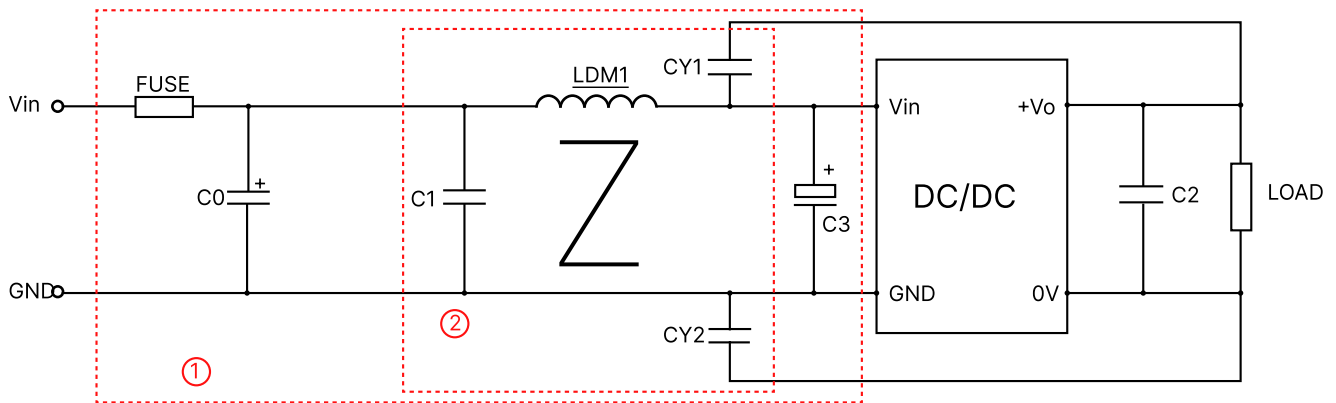
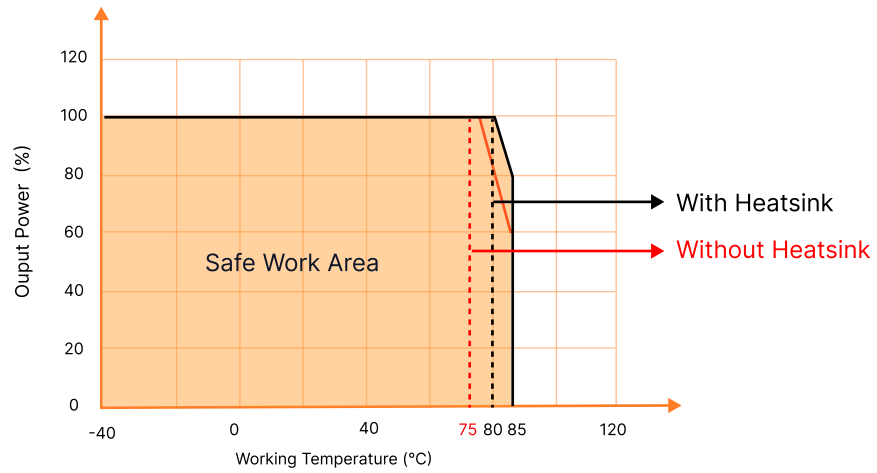


Fig. 3

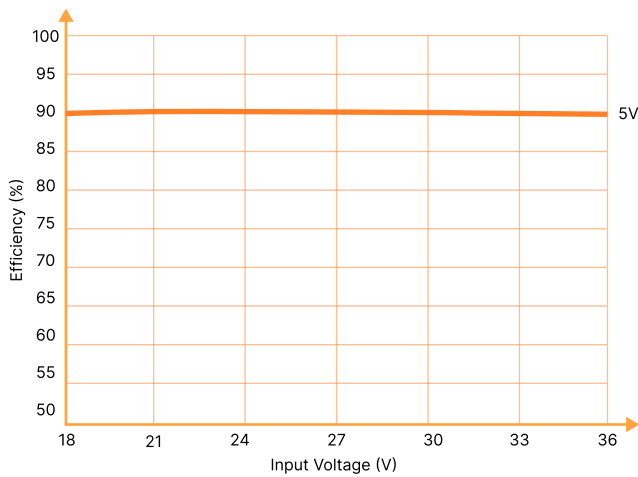
Notes: We use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Model	Vin:24VDC	Vin:48VDC
FUSE	Choose according to actual input current	
C0/C3	330μF/50V	330μF/100V
C1	1μF/50V	4.7μF/100V
C2	Refer to the Cout in Fig.2	
LDM1	4.7μH/2.2A	
CY1/CY2	1nF/2kV	

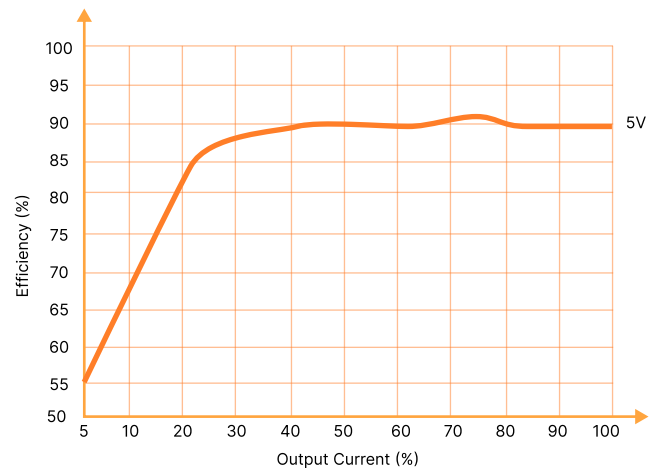
PRODUCT CHARACTERISTIC CURVE



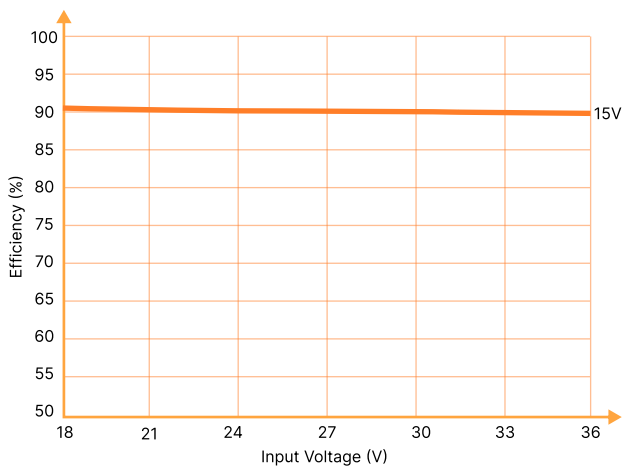
Temperature Derating Curve



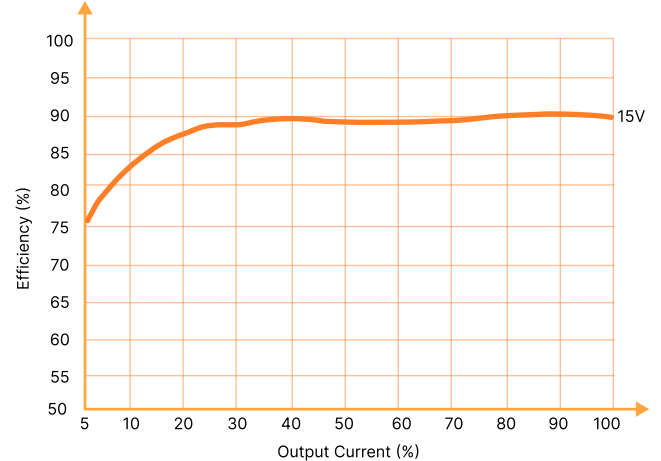
Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=24V)

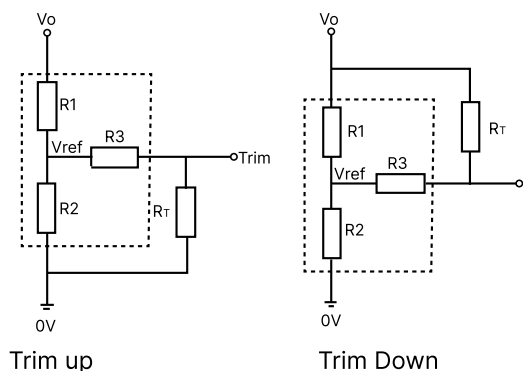


Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load (Vin=48V)

Trim Function for Output Voltage Adjustment (open if unused)



Trim resistor connections (dashed line shows internal resistor network)

Calculating Trim resistor values:

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

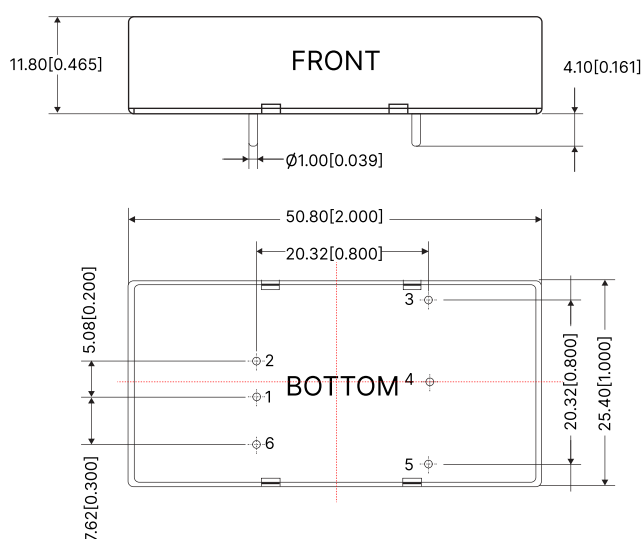
$$\text{Trim down: } R_T = \frac{aR_1}{R_1 - a} - R_3 \quad a = \frac{V_o' - V_{ref}}{V_{ref}} R_2$$

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

Vout(VDC)	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

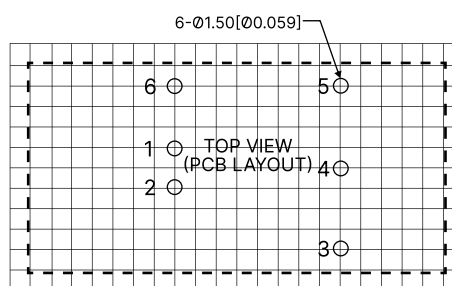
OVERALL DIMENSIONS AND PIN FUNCTIONS

DCMB_LD-15W (WITHOUT HEATSINK)



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

THIRD ANGLE PROJECTION

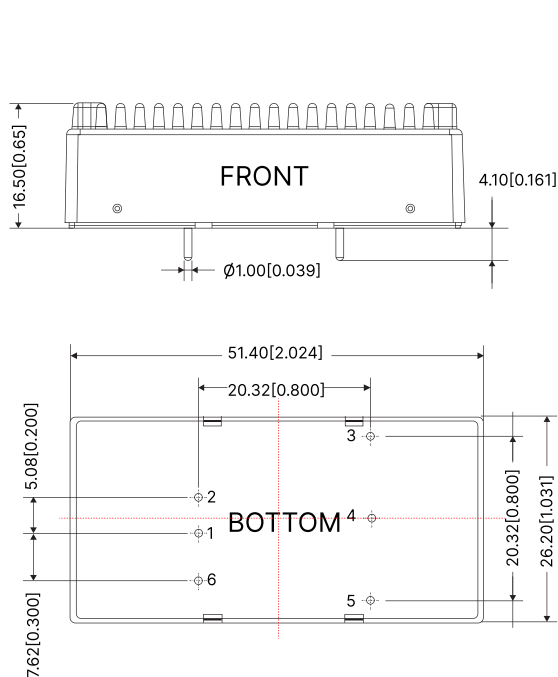


Note: Grid 2.54*2.54

Pin Function Table

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

DCMB_LD-15WH (WITH HEATSINK)



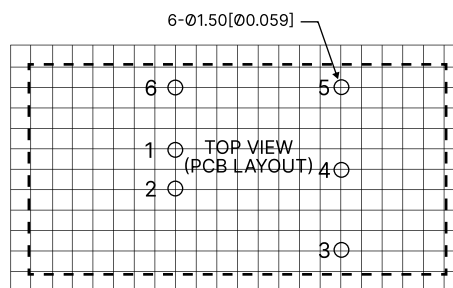
Note:

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General tolerances: ± 0.50 [± 0.020]

THIRD ANGLE PROJECTION

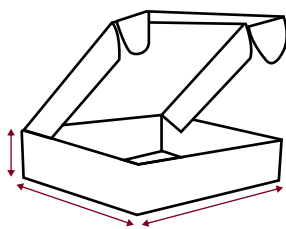


Note: Grid 2.54*2.54

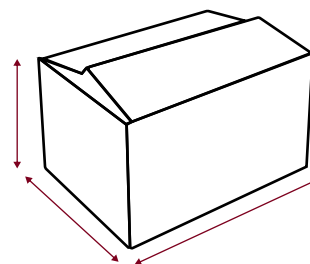
Pin Function Table

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

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.