

DCMB_YD-10W Series



CE Report RoHS



FEATURES

- Wide voltage range input (2:1)
- 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°C to +85°C
- Input reverse polarity protection available with chassis (ST) or Din-Rail mounting(DR) version
- 3 Years Warranty

DESCRIPTION

DC-DC module power supply, Wide voltage input, Power 10W, Isolated, Regulated, Single output, DIP packaging.

MODEL NUMBERING

DCMBxxxxYD-10W



SELECTION GUIDE

Product Model	Input Voltage Standard Value(range)	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μF)
DCMB0503YD-10W	5VDC (4.5-9)	3.3	2500/0	82/84	470
DCMB0505YD-10W		5	2000/0	83/85	470
DCMB0512YD-10W		12	834/0	81/83	470
DCMB0515YD-10W		15	667/0	82/84	330
DCMB0524YD-10W		24	417/0	81/83	100

Product Model	Input Voltage Standard Value(range)	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μ F)
DCMB1205YD-10W	12VDC (9-18)	5	2000/0	79/81	2200
DCMB2405YD-10W	24VDC (18-36)	5	2000/0	80/82	2200
DCMB2412YD-10W		12	833/0	85/87	470
DCMB2415YD-10W		15	667/0	85/87	330
DCMB2424YD-10W		24	416/0	86/88	100
DCMB4803YD-10W	48VDC (36-75)	3.3	2400/0	77/79	2200
DCMB4805YD-10W		5	2000/0	81/83	2200
DCMB4812YD-10W		12	833/0	85/87	470
DCMB4815YD-10W		15	667/0	85/87	330
DCMB4824YD-10W		24	416/0	86/88	100

NOTE:

1. Use "ST" suffix for chassis mounting and "DR" suffix for Din-Rail mounting;
2. The ST and DR Model's start-up and minimum input voltages are increased by 0.5VDC due to the input reverse polarity protection circuit;
3. Exceeding the maximum input voltage may cause permanent damage;
4. Efficiency is measured at nominal input voltage and rated output load; efficiencies for ST and DR Model's is decreased by 2% due to the input reverse polarity protection circuit.

INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input current (Rated Load)	Nominal voltage input 5VDC	--	1964	2564	mA
	Nominal voltage input 12VDC	--	1004	1029	mA
	Nominal voltage input 24VDC	--	502	515	mA
	Nominal voltage input 48VDC	--	208	258	mA
Input current (No-load)	Nominal voltage input 5VDC	--	10	150	mA
	Nominal voltage input 12VDC	--	5	12	mA
	Nominal voltage input 24VDC	--	5	12	mA
	Nominal voltage input 48VDC	--	4	8	mA
Reflected ripple current		30	40	50	mA
Input impulse voltage	1sec. max.	-0.7	--	16	VDC
		-0.7	--	25	VDC
		-0.7	--	50	VDC
		-0.7	--	100	VDC
Starting voltage	Nominal voltage input	--	--	4.5	VDC
		--	--	09	VDC
		--	--	18	VDC
		--	--	36	VDC
Under voltage protect	Nominal voltage input	3	3.5	--	VDC
		5.5	6.5	--	VDC
		12	15.5	--	VDC
		26	30	--	VDC
Start Time		--	10	--	ms
Remote control foot (Some models are applicable)	Module On	Ctrl pin open or pulled high TTL(3.5-12VDC)			
	Module shutdown	Ctrl pin pulled low to GND(0-1.2VDC)			
	Input current during shutdown	--	6	10	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	±1.5	%
Ripple & Noise	20MHz bandwidth	--	40	100	mVp-p
Dynamic response step deviation		--	±3	±8	%
Dynamic response recovery time		--	300	500	us
Temperature drift coefficient	100% load	--	--	±0.03	%/°C
Output over voltage protection	Full voltage range input	110	--	160	%Vo
Output over current protection	Full voltage range input	110	140	190	%Io
Short circuit protection		Sustainable, Self healing			

Note:

1. Load regulation for 0% - 100% for 12VDC/48VDC nominal input series parts to ±5%;
2. Under 0% - 5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for Ripple and Noise test

GENERAL CHARACTERISTIC

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Input output, test time 1 minute, Leakage current less than1 mA	1500	--	--	VDC
Insulation resistance	Input output, Insulation voltage 500VDC	1000	--	--	MΩ
Isolation capacitance	Input output, 100KHz/0.1V	--	1000	--	pF
Working temperature	SeeFig.1	-40	--	+85	°C
Storage temperature		-55	--	+125	°C
Storage humidity	Non condensing	5	--	95	%RH

Parameter	Conditions	Min.	Typ.	Max.	Units
Vibration		10-150Hz, 5G, 90 Min. along X, Y and Z			
Soldering temperature resistance of pins	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	°C
Switching frequency	PWM mode	--	350	--	kHz
Mean time between failures 【MTBF】	MIL HDBK-217F@25°C	1000	--	--	kHours

PHYSICAL CHARACTERISTICS

Parameter	Conditions		
Housing material	Aluminum alloy		
Dimensions	Horizontal package		25.40 × 25.40 × 11.70mm
	Screw Terminal (ST)		76.00 × 31.50 × 21.20mm
	DIN Rail (DR)		76.00 × 31.50 × 25.80mm
Weight	DCMB0503/05YD-10W	Horizontal package	15.0g(Typ.)
		Screw Terminal (ST)	38.5g(Typ.)
		DIN Rail (DR)	58.5g(Typ.)
	DCMB0512/15/24YD-10W	Horizontal package	12.5g(Typ.)
		Screw Terminal (ST)	36.0g(Typ.)
		DIN Rail (DR)	56.0g(Typ.)
Cooling mode	Natural air cooling		

EMC CHARACTERISTICS

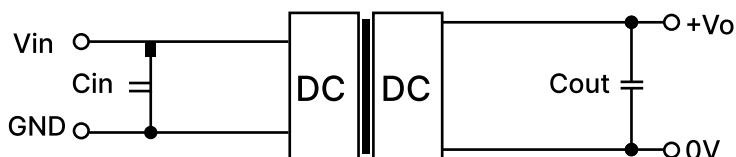
Parameter	Category		Content	
EMI	CE	5VDC nominal input	CISPR32/EN55032	CLASS B(seeFig.5-② for recommended circuit)
		12VDC nominal input	CISPR32/EN55032	CLASS A (without extra components.)/CLASS B (see Fig.4-② for recommended circuit)
		24VDC nominal input	CISPR32/EN55032	CLASS A (without extra components.)/CLASS B(see Fig.3-② for recommended circuit)
		48VDC nominal input	CISPR32/EN55032	CLASSB(seeFig.3-② for recommended circuit)

Parameter	Category	Content
EMI	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)
EMS	ESD	5VDC nominal input IEC/EN61000-4-2 Contact±6kV perf. Criteria B
		Other 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	Other IEC/EN61000-4-5 line to line ±2kV (see Fig.3-① for recommended circuit) perf. Criteria B
		5VDC nominal input IEC/EN61000-4-5 line to line ±2kV (see Fig.5-① for 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 V _{r.m.s} perf. Criteria A

CIRCUIT DESIGN AND APPLICATION

1. Typical application

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} 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.



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

2. EMC compliance circuit

24VDC/48VDC nominal input series

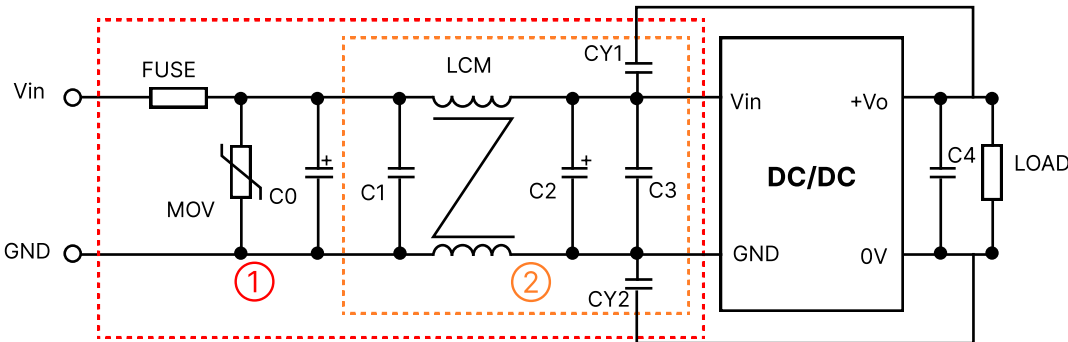


Fig. 3

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

Model	Vin: 24VDC	Vin: 48VDC
FUSE	Select fuse value according to actual input current	
MOV	S20K30	S14K60
C0	680μF/50V	680μF/100V
C1	1μF/50V	1μF/100V
C2	330μF/50V	330μF/100V
C3	4.7μF/50V	4.7μF/100V
C4	Refer to the Cout in Fig.2	
LCM	4.7mH	
CY1, CY2	1nF/2kV	

12VDC nominal input series

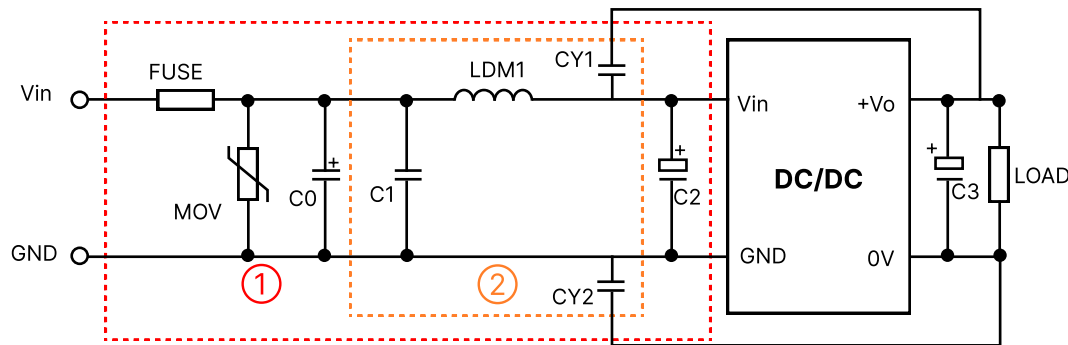


Fig. 4

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

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

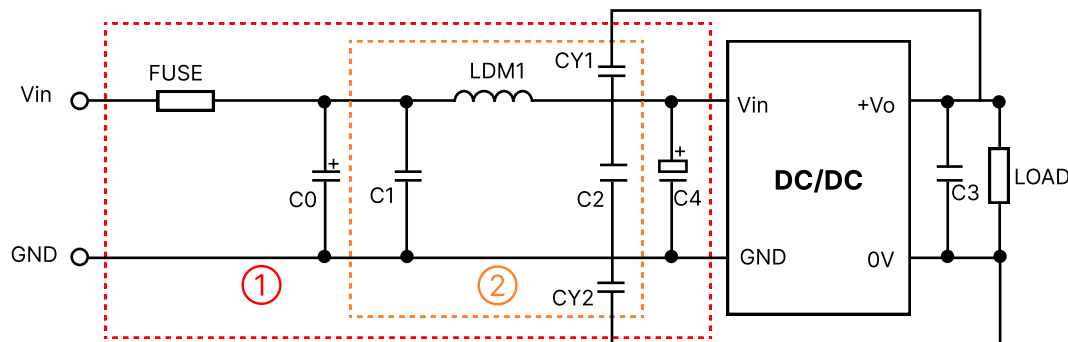
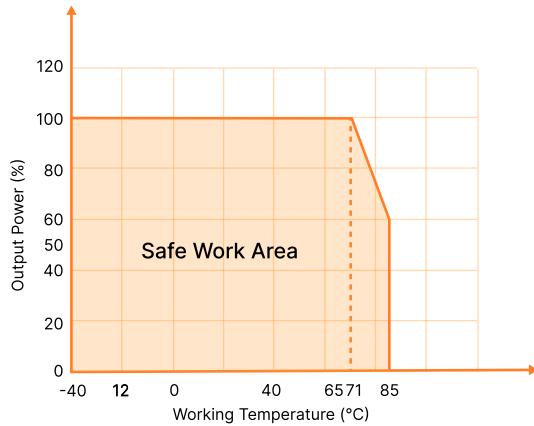


Fig. 5

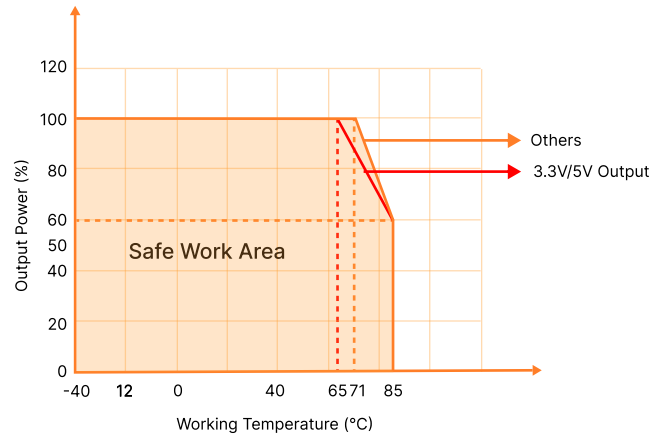
Notes: For EMC tests we use Part ① in Fig.5 for immunity and part ② for emissions test. Selecting based on needs.

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

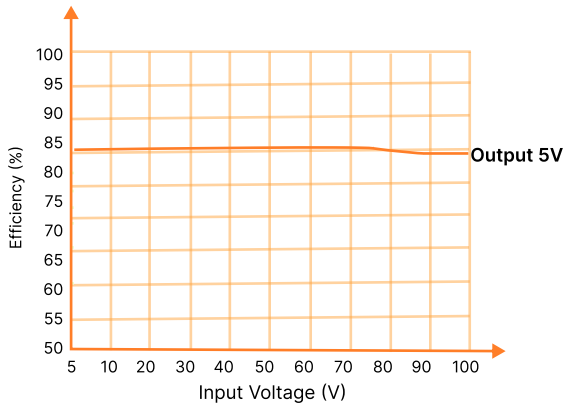
PRODUCT CHARACTERISTIC CURVE



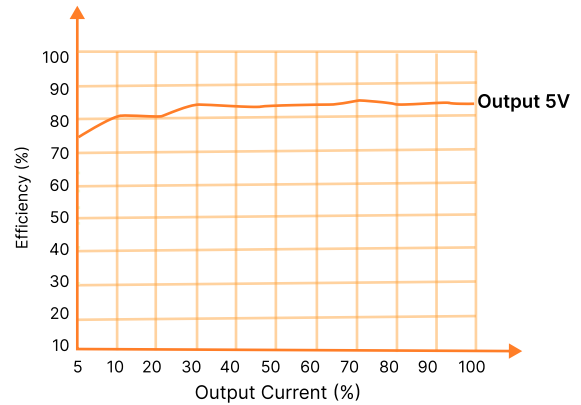
DCMB0503-YD-10W



Others



Efficiency Vs Input Voltage
(Full Load)



Efficiency Vs Output Load
(Vin=24V)

OVERALL DIMENSIONS AND PIN FUNCTIONS

DCMB_YD-10W

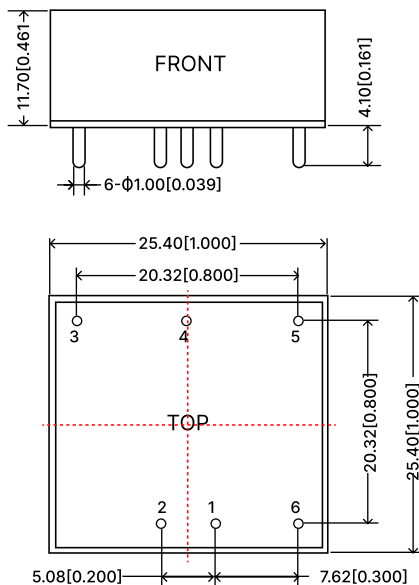


Table 3: Pin Function Table

Pin	Function
1	GND
2	Vin
3	+Vo
4	No Pin
5	0V
6	Ctrl

DCMB_YD-10WST

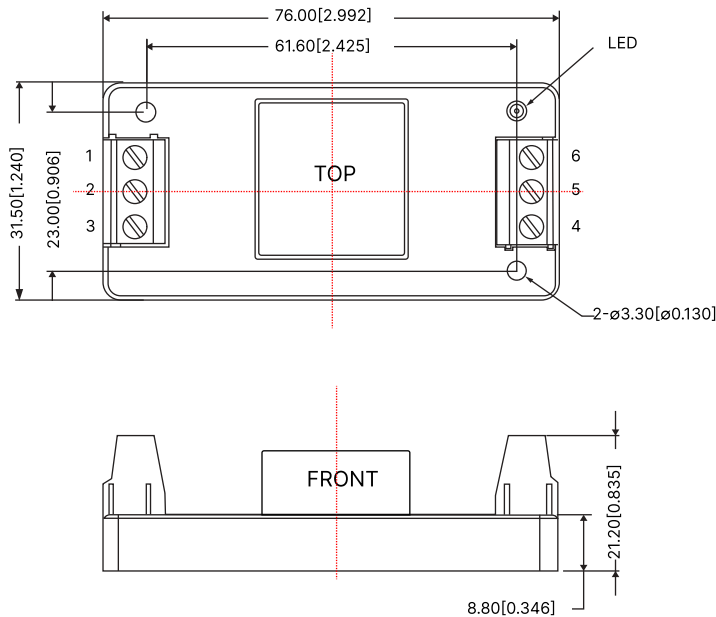


Table 4: Pin Function Table

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

Note: Unit: mm[inch]

Wire range: 24-12 AWG

Tightening torque: <ax 0.4 N.m

General tolerances: ±1.00 [±0.039]

DCMB_YD-10WDR

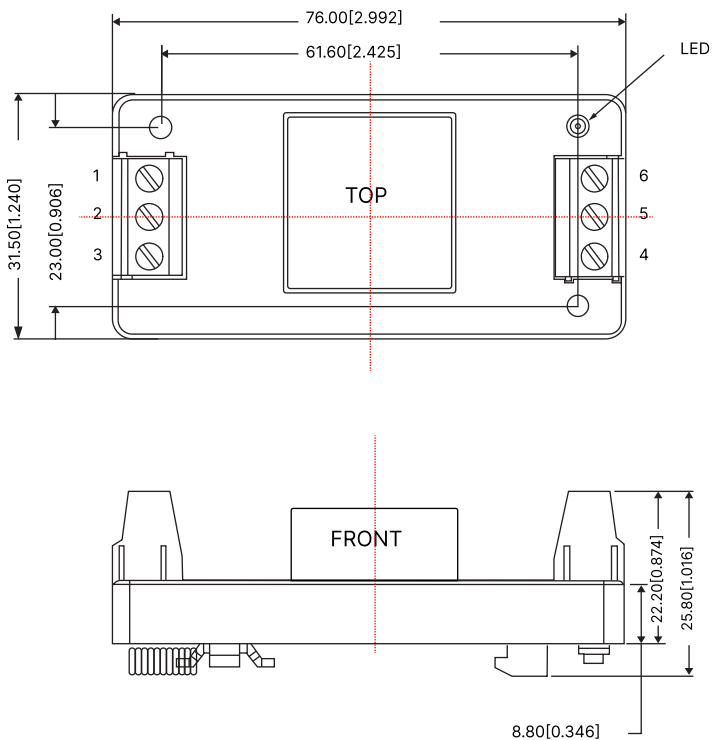


Table 5: Pin Function Table

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

Note: Unit: mm[inch]

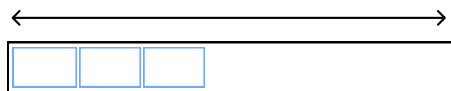
Mounting rail : TS35

Wire range: 24-12 AWG

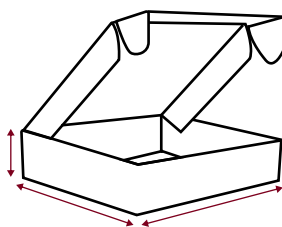
Tightening torque: Max 0.4 N.m

General tolerances: ±1.00 [±0.039]

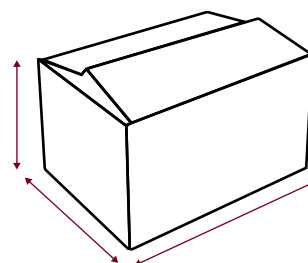
PACKAGING METHOD



50 Pieces/Tube



100 Pieces/Inner box



500 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.