

### DCWB\_ZP-6W Series



### FEATURES

- Wide voltage range input (4:1)
- Working temperature range: -40°C To +85°C
- Up to 88% efficiency
- Standby power consumption: 0.9W
- Output short circuit, overcurrent, over voltage protection
- 3 Years Warranty

### DESCRIPTION

DC-DC Module Power Supply, Wide Voltage Input, Power 6W, Isolated, Regulated, Single Output, DIP Packaging.

### MODEL NUMBERING

## DCWBxxxxZP-6W



### SELECTION GUIDE

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load ( $\mu$ F)
DCWB2403ZP-6W	24VDC (9-36)	3.3	1500/0	79/79	1800
DCWB2405ZP-6W		5	1200/0	81/83	1000
DCWB2409ZP-6W		9	667/0	81/83	1000
DCWB2412ZP-6W		12	500/0	85/87	470
DCWB2415ZP-6W		15	400/0	86/88	220
DCWB2424ZP-6W		24	250/0	86/88	100

Product Model	Input Voltage Standard Value(range)	Output Voltage (Vdc)	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load ( $\mu$ F)
DCWB4803ZP-6W	48VDC (18-75)	3.3	1500/0	79/79	1800
DCWB4805ZP-6W		5	1200/0	81/83	1000
DCWB4809ZP-6W		9	667/0	81/83	680
DCWB4812ZP-6W		12	500/0	85/87	470
DCWB4815ZP-6W		15	400/0	86/88	220
DCWB4824ZP-6W		24	250/0	86/88	100

## INPUT CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Input current (Rated Load)/ (No-Load)	24VDC Nominal voltage input	--	315/10	330/15	mA
	48VDC Nominal voltage input	--	160/6	165/9	mA
Reflected ripple current		30	40	50	mA
Input impulse voltage	24VDC Nominal voltage input	-0.7	--	50	VDC
	48VDC Nominal voltage input	-0.7	--	100	VDC
Starting Voltage	24VDC Nominal voltage input	--	--	9	VDC
	48VDC Nominal voltage input	--	--	18	VDC
Input Under voltage protection	24VDC Nominal voltage input	5.5	6.5	--	VDC
	48VDC Nominal voltage input	12	15.5	--	VDC
Start Time		--	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	--	06	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	%
Linear Regulation Rate	Input voltage variation+/- 1%	--	--	±1.5	%
Load Regulation Rate	10% to 100% load	--	±0.5	±1.5	%
Ripple & Noise	20MHz bandwidth	--	30	100	mVp-p
Dynamic Response Step Deviation		--	±3	±5	%
Dynamic Response Recovery Time		--	300	500	μs
Temperature Drift Coefficient	100% load	--	±0.03	--	%/°C
Output Overvoltage Protection	Full voltage range input	110	--	160	%Vo
Output Overcurrent Protection	Full voltage range input	110	140	190	%Io
Short Circuit Protection	Sustainable, Self-healing				

## GENERAL CHARACTERISTICS

Parameter	Conditions	Min.	Typ.	Max.	Units
Isolation Voltage	Input-output, Test time 1 minute, Leakage current less than 1 mA	1500	--	--	VDC
Insulation Resistance	Input-output, Insulation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF
Working Temperature	Temperature ≥ 71 °C for derating (See Figure 4)	-40	--	+85	°C
Storage Temperature		-55	--	+125	°C
Storage Humidity	Non condensing	--	--	95	%RH
Maximum Temperature Of The Casing During Operation	Ta=25 °C, Nominal input, Full output	--	--	300	°C
Soldering Temperature Resistance Of Pins	The distance from the welding spot to the shell is 1.5mm, 10 seconds	--	--	245	°C
Switching Frequency	Full load, Nominal input voltage	--	270	--	kHz
MTBF	MIL-HDBK-217F@25°C	2000	--	--	kHours

**PHYSICAL CHARACTERISTICS**

Parameter	Contents
Housing material	Aluminum alloy
Overall dimensions	32.00 × 20.00 × 11.00 mm
Weight	14g(Typ.)
Cooling mode	Natural air cooling

**EMC CHARACTERISTICS**

Parameter	Category	Content	
EMI	Conductive disturbance	CISPR32/EN55032 CLASS A (without extra components)/ CLASS B (see Fig.2-② for recommended circuit)	
	Radiation disturbance	CISPR32/EN55032 CLASS A (without extra components)/ CLASS B (see Fig.2-② for recommended circuit)	
EMS	Electrostatic Discharge	IEC/EN61000-4-2 Contact ±4kV	perf. Criteria B
	Radiated Immunity	IEC/EN61000-4-3 10V/m	perf. Criteria A
	EFT	±2kV (see Fig.2-① for recommended circuit)	perf. Criteria B
	Surge Immunity	±2kV (see Fig.2-① for recommended circuit)	perf. Criteria B
	Conducted Disturbance Immunity	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A
	Voltage dips, and short-term interruptions immunity	IEC/EN61000-4-29 0%, 70%	perf. Criteria B

**CIRCUIT DESIGN AND APPLICATION**

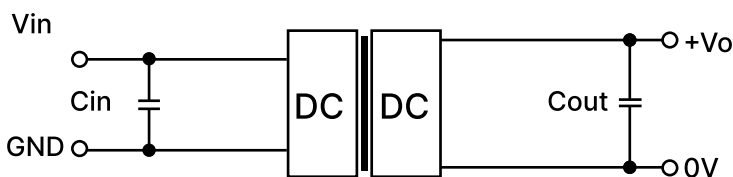


Figure 1: Application circuit

Table 1: Recommended Capacitive Load Values

Vin(VDC)	Cin(μF)	Vo(VDC)	Cout(μF)
Nominal voltage	100	Nominal voltage	10

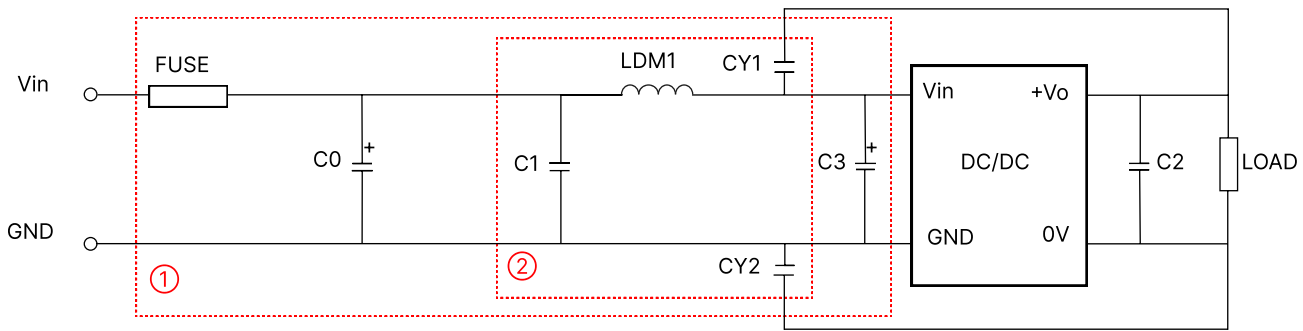


Figure 2: EMC Typical Recommended Circuits

Category	Component	Value	
EMI	Model	Vin: 24VDC	Vin: 48VDC
	Fuse	Choose according to actual input current	
	C0/C3	330 $\mu$ F/50V	330 $\mu$ F/100V
	C1	1 $\mu$ F/50V	1 $\mu$ F/100V
	C2	Refer to the Cout in Fig.2	
	LDM1	4.7 $\mu$ H	
	CY1/CY2	1nF/2kV	

Table 2: Recommended Circuit Parameter Values

1. Typical application: If further reduction of input and output ripple is required, a capacitor filter network can be connected at the input and output ends. The application circuit is shown in Figure 1. However, suitable filter capacitors should be selected. If the capacitance is too large, it may cause overcurrent or poor startup of the power supply. For each output, while ensuring safe and reliable operation, the recommended capacitance load values are shown in Table 1.
2. EMC requirements: For situations with high EMC requirements, a typical EMC recommended circuit is shown in Figure 2.
3. Input requirements: Ensure that the fluctuation range of the input voltage does not exceed the upper and lower limits of the input voltage specified in this data sheet, and the input power must be greater than the output power specified in this data sheet. For situations with a 24V input voltage, it is recommended to connect a TVS tube between the positive and negative input pins for protection (recommended parameters for TVS tubes: 30V, bidirectional, SOD-123 packaging).
4. Output load requirements: Try to avoid using it without load as much as possible; When the actual power of the load is less than 10% of the rated output power in this data sheet, or when it needs to be used in no-load situations, it is recommended to connect a load resistor externally at the output end. The load resistor can be calculated according to 5-10% of the rated power in this data sheet. The calculation formula for the load resistor value is  $R_L = V_{out}^2 / (P_{out} * 10\%)$ .
5. Overload protection: Under normal working conditions, the output circuit of this product has no protection function for overload situations. The simplest method is to connect a self recovery fuse in series at the input end, or add a circuit breaker outside the circuit; Or during design and selection, the actual power of the circuit should be around 60-80% of the rated power in this data sheet.

**PRODUCT CHARACTERISTIC CURVE**

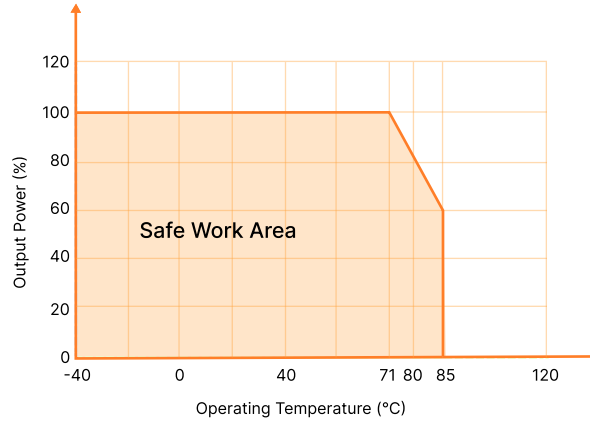


Figure 4: Temperature Derating Curve

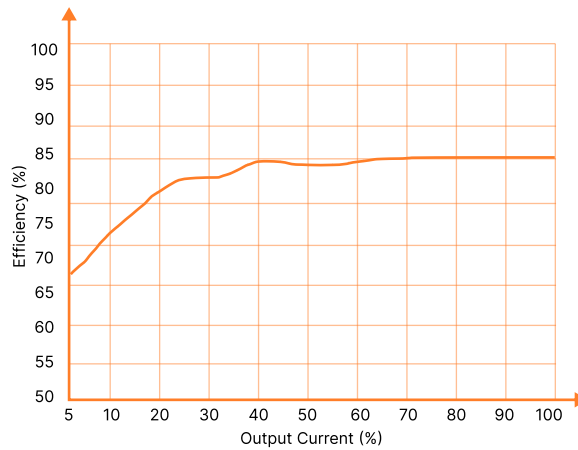


Figure 5: Efficiency Vs Output Load

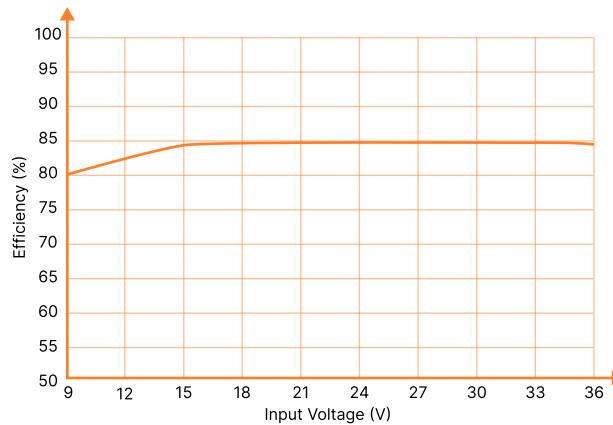
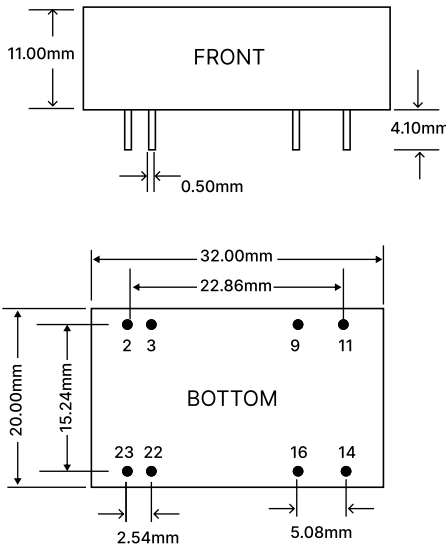
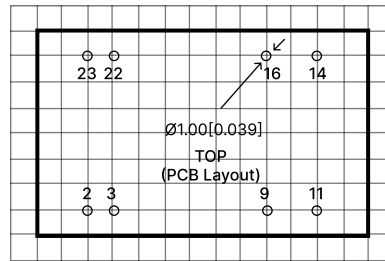


Figure 6: Efficiency Vs Input Voltage (100% Load)

OVERALL DIMENSIONS AND PIN FUNCTIONS



Note: The grid distance is 2.54mm\*2.54mm



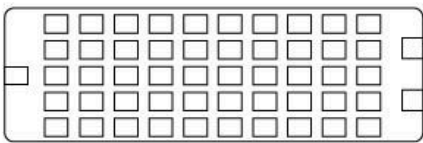
Note:  
Dimensions in mm  
Terminal diameter tolerance: +/-0.10  
Undeclared tolerance: +/-0.50

Table 3: Pin Function Table

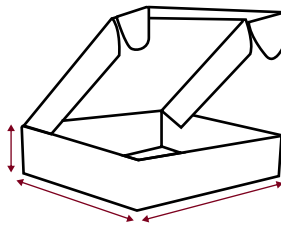
Pin	Function
2,3	GND
9	No Pin
11	NC
14	+V0
16	0V
22,23	Vin

Figure 7: Overall dimensions

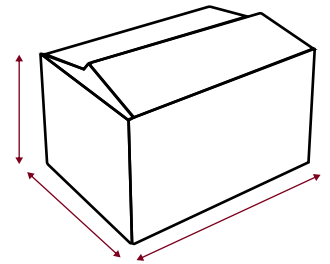
PACKAGING METHOD



50 Pieces/Tube



100 Pieces/Inner box



500 Pieces/Outer box

NOTES & INSTRUCTIONS

- 1.The input voltages shall not exceed the specified range value, otherwise permanent and unrecoverable damage may be 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.