DCWB_YD-30W Series

CE Report **RoHS**

FEATURES

- Wide input voltage range (4:1)
- High efficiency up to 87%
- No-load power consumption as low as 0.12W
- Isolation voltage :1.6K VDC
- Input under-voltage protection, output short circuit, over-current protection
- Operating temperature range: -40°C To +85°C
- 3 Years Warranty

DESCRIPTION

DC-DC module power supply, Wide voltage input, Power 6W, Isolated, Regulated, Single output, DIP packaging.

MODEL NUMBERING

DCWBxxxxYD-30W

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

SELECTION GUIDE

Product Model	Input Voltage Standard Value(range)	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum Capacative load (μF)
DCWB2403YD-30W	24VDC (9-36)	3.3	6000/0	84/86	10000
DCWB2405YD-30W		5	6000/0	86/88	10000
DCWB2409YD-30W		9	3333/0	86/88	4700
DCWB2412YD-30W		12	2500/0	88/90	1500
DCWB2415YD-30W		15	2000/0	88/90	1000
DCWB2424YD-30W		24	1250/0	88/90	750

Product Model	Input Voltage Standard Value(range)	Output Voltage	Output Current (mA) (Max./Min.)	Efficiency % (Min./Typ.)	Maximum capacitive load (μF)
DCWB4803YD-30W	24VDC (18-75)	3.3	6000/0	84/86	10000
DCWB4805YD-30W		5	6000/0	86/88	10000
DCWB4809YD-30W		9	3333/0	86/88	4700
DCWB4812YD-30W		12	2500/0	88/90	1500
DCWB4815YD-30W		15	2000/0	88/90	1000
DCWB4824YD-30W		24	1250/0	88/90	750

INPUT CHARACTERISTICS

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
Input Current (full load / no-load)		--	710/8	735/15	mA
Reflected Ripple Current		--	40	--	mA
Surge Voltage (1sec. max.)	Nominal input voltage	-0.7	--	100	VDC
Start-up Voltage		--	--	18	VDC
Input under-voltage protection		12	15.5	--	VDC
Start-up Time	Nominal input voltage & constant resistance load	--	10	--	ms
Input Filter	12VDC nominai input voltage	Capacitance filter			
Ctrl*	Module on	Ctrl pin open or pulled high (TTL 3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND(0-1.2VDC)			
	Input current when off	--	2	7	mA

Note: *The Ctrl pin voltage is referenced to input GND.

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	%
Linear Regulation	Input voltage variation from low to high at full load		--	±0.2	±0.5	%
Load Regulation	5%-100% load		--	±0.5	±1	%
Transient Recovery Time	25% load step change, nominal input voltage		--	250	500	μs
Transient Response Deviation	25% load step change, input voltage range	3.3V, 5V,output	--	±3	±8	%
		Others	--	±3	±5	%
Temperature Coefficient	Full load		--	--	±0.03	%/°C
Ripple & Noise *	20MHz bandwidth, nominal input voltage, 5%-100% load	5V/12V/15V output	--	60	120	mVp-p
		24V output	--	60	150	mVp-p
Trim	Input voltage range		90	--	110	%Vo
Over-voltage Protection			110	--	160	%Vo
Over-current Protection			110	170	260	%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, please refer to DC-DC Converter ApplicationNotes for specific information.

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

Parameter	Operating Conditions	Min.	Typ.	Max.	Units
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Humidity	Without condensation	5	--	95	%RH
Storage Temperature		-55	--	+125	°C
Pin Soldering Resistance Temperature	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	--	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	25.40 × 25.40 × 11.70 mm
Weight	18.4g
Cooling Method	Free air convection

EMC CHARACTERISTICS

Parameter		Category	Content	
EMI	CE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig.3-② for recommended circuit)	
EMC	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. CriteriaB
	RS	IEC/EN61000-4-3	10V/m	perf. CriteriaA
	EFT	IEC/EN61000-4-4	±2KV (see Fig.3-① for recommended circuit)	perf. CriteriaB
	Surge	IEC/EN61000-4-5	line to line ±2KV (see Fig.3-① for recommended circuit)	perf. CriteriaB
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. CriteriaA

CIRCUIT DESIGN AND APPLICATION

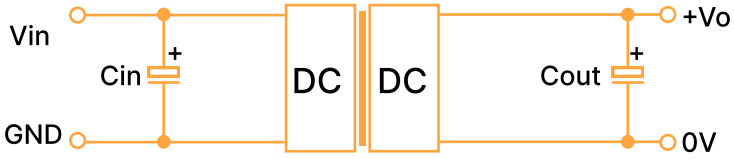


Figure 1: Application circuit

Table 1: Recommended Capacitive Load Values

Vout (VDC)	Cin (μF)	Cout (μF)
5, 12, 15	100	100
24		47

2. EMC compliance circuit

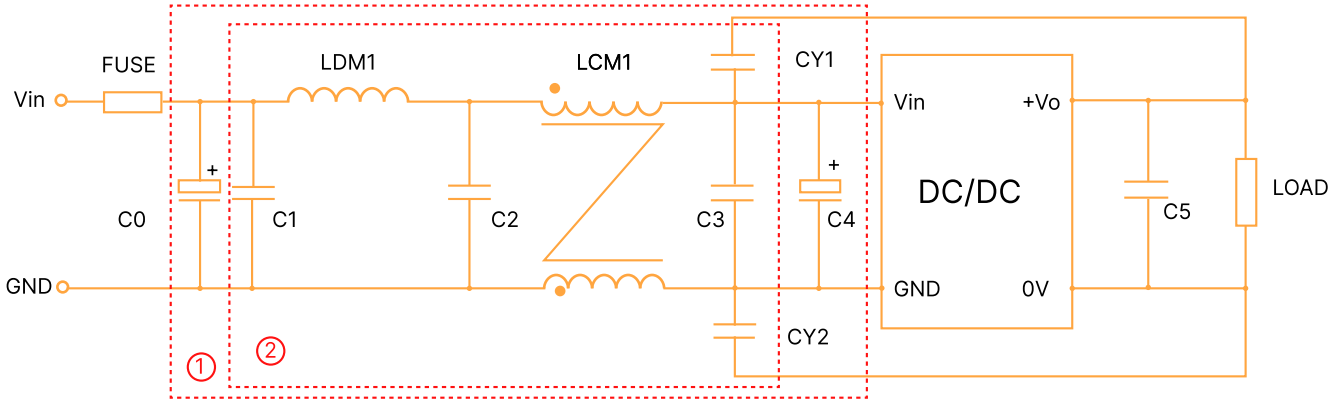


Figure 3

Notes: Part ① in the Fig. 3 is used for EMC test and part ② for EMI filtering; selected based on needs.

Fig. 3 Parameter description

Model	Vin:24V
FUSE	Choose accordingtoactual input current
C0, C4	470μF/100V
C1	10μF/100V
LDM1	22uH/3A
C2	22uF/100V
LCM1	10mH, recommended to use
C3	22uF/100V
C5	Refer to the Cout in Fig.2
CY1, CY2	1nF/2KV

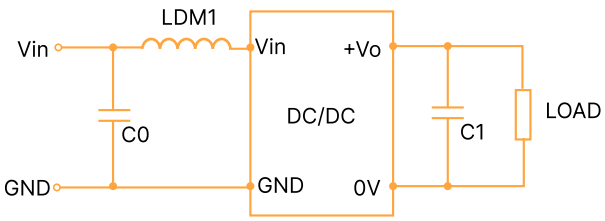
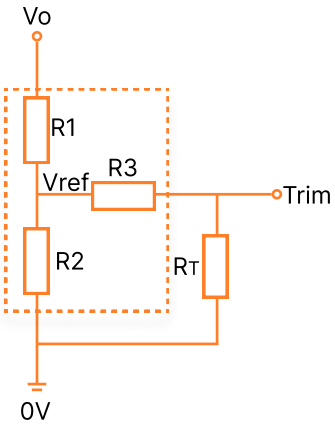


Figure 4

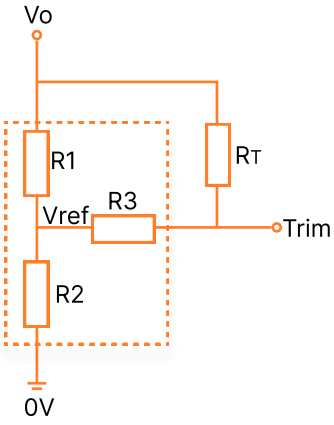
Parameter description:

Model	Vin:48V
C0	4.7μF/100V
LDM1	22uH/3A
C1	Refer to the Cout inFig.2

TRIM FUNCTION FOR OUTPUT VOLTAGE ADJUSTMENT (OPEN IF UNUSED)



Trim up



Trim Down

TRIM resistor connection (dashed line shows internal resistor network)

The Calculation formula for trip resistance

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

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

R_T is Trim resistance
a is a self-defined parameter, with no real meaning.

Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	4.772	2.87	12.4	1.25
5	2.883	2.87	10	2.5
09	7.500	2.87	15	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

PRODUCT CHARACTERISTIC CURVE

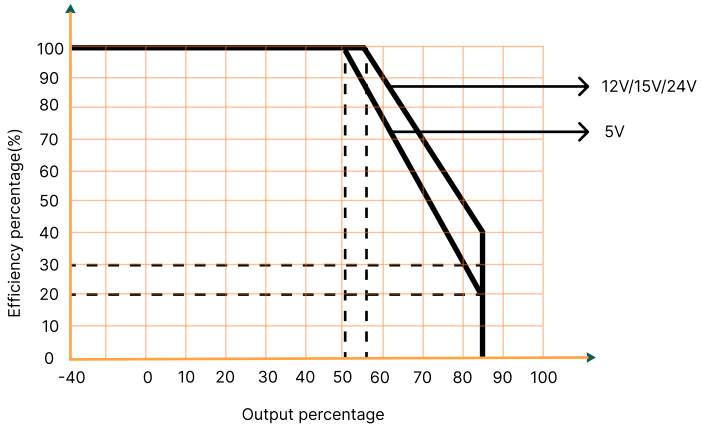


Figure 4: Temperature Derating Curve

OVERALL DIMENSIONS AND PIN FUNCTIONS

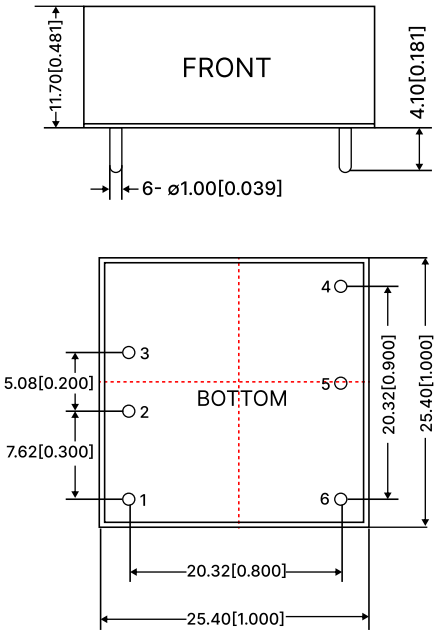
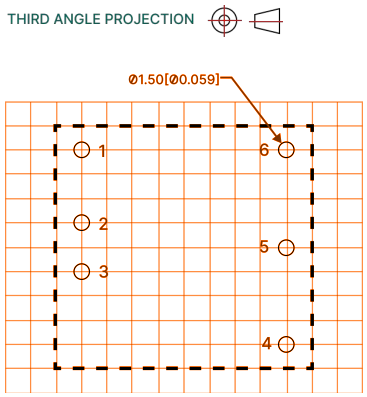


Figure 7: Overall dimensions



Note: Grid 2.54*2.54

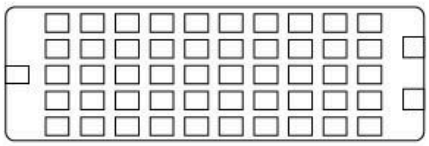
Unit: mm[inch]
Pin diameter tolerances: ±0.10
General tolerances: ±0.50

Table 3: Pin Function Table

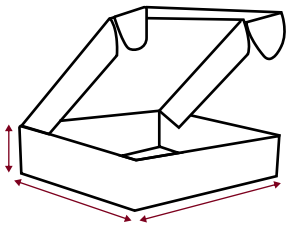
Pin	Function
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V

*NC cannot be connected to any external circuits

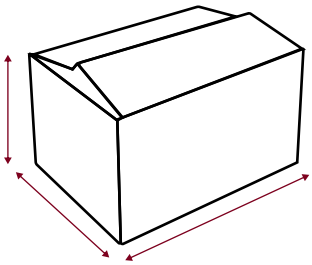
PACKAGING METHOD



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 HENXV.