

FEATURES

- 1.Package Type: 1"X 1"
- 2.Operating temperature range: -40°C - +105°C
- 3.Isolation voltage: 1500VDC
- 4.High efficiency up to 90%
- 5.The mechanism has input undervoltage protection, output short circuit protection and over current protection
- 6.4:1 Ultra-wide input voltage range
- 7.Fields of application: Power, industrial control, communications, Internet of Things, automotive, etc



3 years
Warranty

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Maximum	Voltage (VDC)	Current (mA)		
ZYB2403YMD-30WR3	24 (9-36)	40	3.3	6000/0	84	8000
ZYB2405YMD-30WR3			5	6000/0	88	6000
ZYB2412YMD-30WR3			12	2500/0	89	5000
ZYB2415YMD-30WR3			15	2000/0	89	3000
ZYB2424YMD-30WR3			24	1250/0	90	1000
ZYA4812YMD-30WR3	48 (18-75)	80	±12	±2500/0	88	5000
ZYA4815YMD-30WR3			±15	±2000/0	88	3000
ZYA4824YMD-30WR3			±24	±1250/0	89	1000
ZYB4803YMD-30WR3	48 (18-75)	80	3.3	6000/0	83	8000
ZYB4805YMD-30WR3			5	6000/0	87	6000
ZYB4812YMD-30WR3			12	2500/0	88	5000
ZYB4815YMD-30WR3			15	2000/0	88	3000
ZYB4824YMD-30WR3			24	1250/0	89	1000

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current(full load/no-load)	24VDCnominal input series	3.3VDC	--	1545/6	1580/50	mA
		5VDC	--	1454/6	1488/50	
		Other	--	1388/6	1458/16	
	48VDCnominal input series	--	710/8	735/15		
Reflected Ripple Current	nominal input	--	60	--		
Impulse Voltage	24VDCnominal input series	-0.7	--	50	VDC	
	48VDCnominal input series	-0.7	--	100		
Starting Voltage	24VDCnominal input series	--	--	9		
	48VDCnominal input series	--	--	18		
Input undervoltage protection	24VDCnominal input series	5.5	7.5	--		
	48VDCnominal input series	12.0	15.5	--		
Ctrl	turn off module	connected GND or (0-1.2V)				
	turn on module	No connected or (3.5-12V)				
	Input current when off	--	5	8	mA	
Input Filter	PI filter					

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5%-100% load	--	±1.0	±3.0	%
Linear Regulation	Vin=Min. to Max. @Full Load	--	±0.2	±0.5	
Load Regulation	5%-100% load	--	±0.5	±1.0	
Ripple & Noise	20MHz bandwidth,5%-100% load	--	100	200	mVp-p
Transient Recovery Time	25% Load Step Change,nominal input voltage	--	250	500	µs
Transient Response		--	±3	±8	%
Temperature Coefficient	Full Load	--	±0.01	±0.02	%/°C
Trim	input voltage range	--	±10.0	--	%
Over Voltage Protection		110	140	--	%
Over Current Protection		110	140	--	%
Short-Circuit Protection		Continuous, Self-Recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, test time 1 minute,	1500	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	See Fig 1, Fig 2	-40	--	+105	°C
Storage Temperature		-50	--	+125	
Storage Humidity	Non-condensing	--	--	95	%RH
Soldering Profile	1.5mm from case for 10 sec	--	--	300	°C
Switching Frequency	Full load, nominal input voltage	--	330	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K Hours

Mechanical Specifications

Case Material	Aluminum alloy
Package Dimensions	25.4mm * 25.40mm * 12.00 mm
Weight	21.00g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	EN55032, FCC part 15	CLASS B
	RE		
EMS	ESD	EN61000-4-2 Air ± 8kV , Contact ± 6kV	perf. Criteria B
	RS	EN61000-4-3 10V/m	perf. Criteria A
	EFT	EN61000-4-4 ±2kV	perf. Criteria B
	Surge	EN61000-4-5 ±1kV	perf. Criteria B
	CS	EN61000-4-6 3Vrms	perf. Criteria A

Typical Characteristic Curves

Temperature Derating (ZYB2403/05YMD-30WR3)

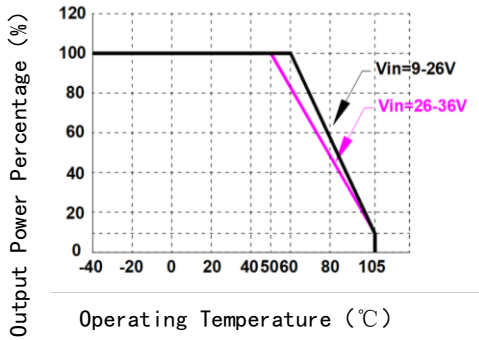


Fig 1-1

Temperature Derating (ZYB2412/24YMD-30WR3)

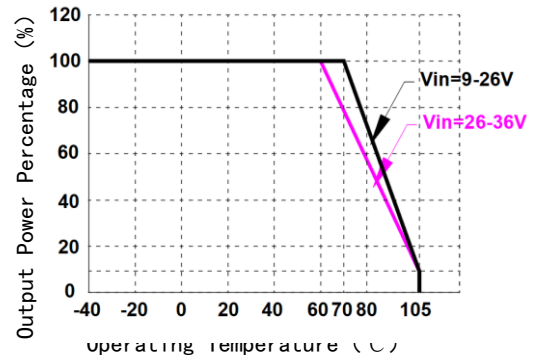


Fig 1-2

Temperature Derating (ZYB4803/05YMD-30WR3)

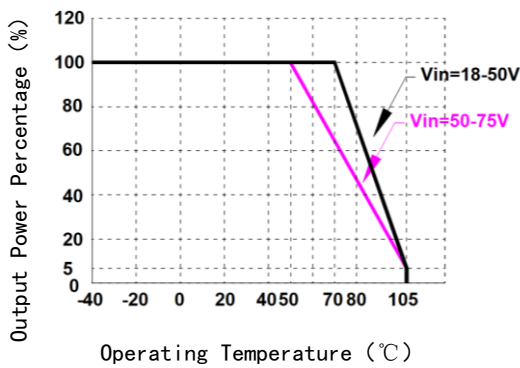


Fig 2-1

Temperature Derating (ZYB4812/15YMD-30WR3)

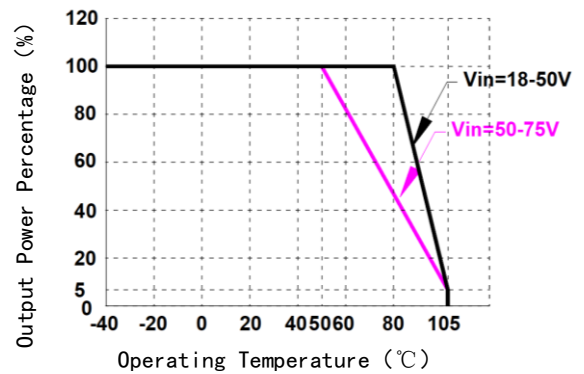
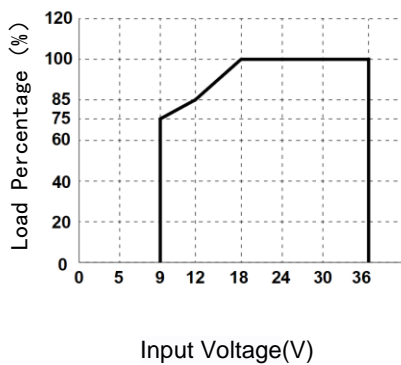
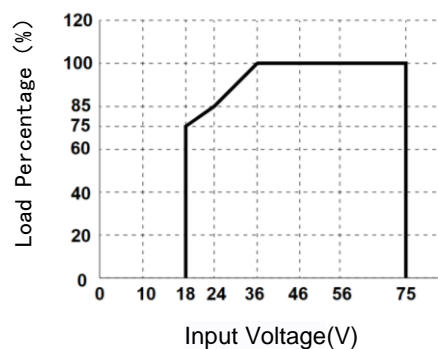


Fig 2-2

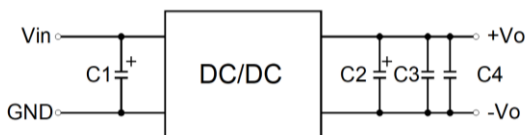
Load VS Vin (24V)



Load VS Vin (48V)



Typical Circuit Design And Application



Recommended component parameters				
Vin(VDC)	C1(uF)	C2(uF)	C3(uF)	C4(uF)
24	100	470	10	0.1
48			22	10

Fig 3

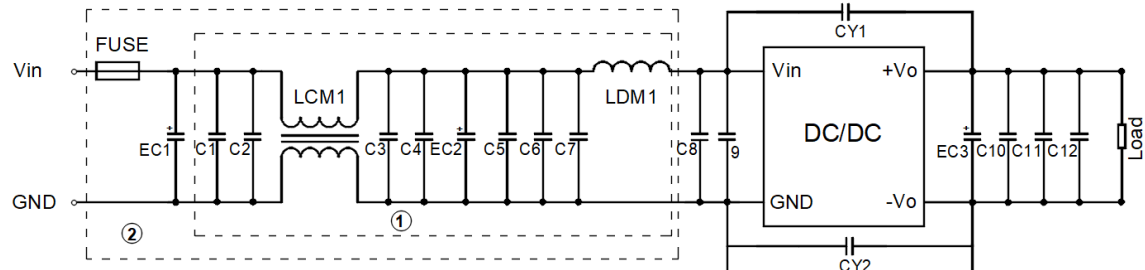
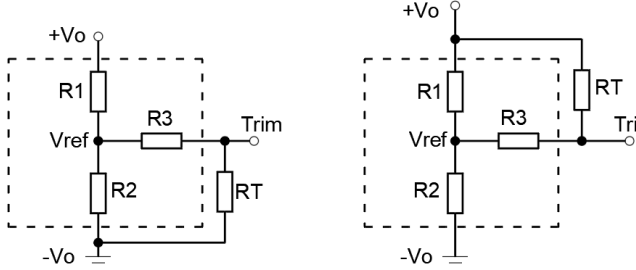


Fig 4

EMI recommended component parameters												
Vin (VDC)	FUSE	CEC1 (uF)	EC2 (uF)	C1,C2,C3,C4,C5	LCM 1	LDM1 (uH)	C8,C9 (uF)	CY2	CY1, CY3	EC3 (uF)	C10 (uF)	C11 C12
24V	Choose according to actual input	1000	220	4.7	0.32	2.2	-	222	2200	470	10	1uF
48V		680	100	4.7	10	6.8	4.7	102	2200	470	22	10uF



Trim up Trim down

Trim resistor connections (dashed line shows internal resistor network)

Trim				
Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	10	6.064	13.622	1.24
5	2.4	2.344	13.622	2.5
12	8.2	2.153	17.346	2.5
15	12	2.388	21.016	2.5
24	10	1.158	10.714	2.5

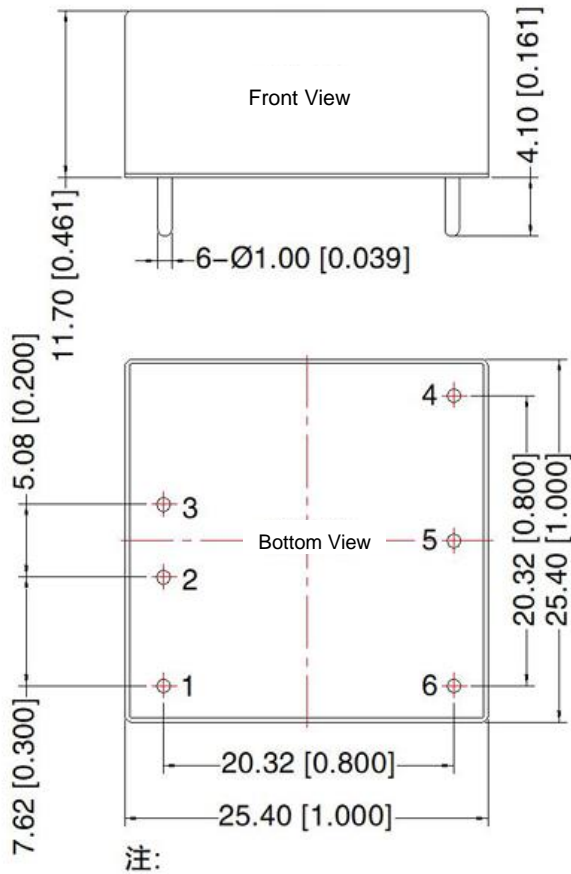
Up : $R_t = \frac{nR_2}{R_2 - n} - R_3$ $n = \frac{V_{ref}}{V_o - V_{ref}} * R_1$

Down : $R_t = \frac{nR_1}{R_1 - n} - R_3$ $n = \frac{V_o - V_{ref}}{V_{ref}} * R_2$

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.

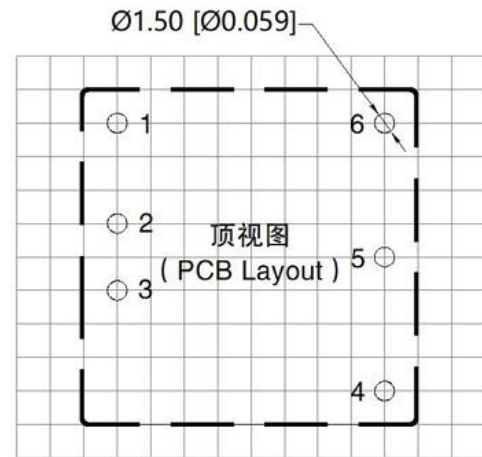
Dimensions and Recommended Layout

Dimensions



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

PCB Printing Layout & Pin Definition Table



Pin	Function(S)	Function(D)
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+V0
5	Trim	Trim
6	0V	-Vo

Note: The grid distance is 2.54*2.54mm

Note:

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at Ta=25°C, humidity <75%RH, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;

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Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.norpas-power.com

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