

Feature

1. Package Type: 1 * 1
2. Operating Temperature Range: -40°C - +85°C
3. Isolation Voltage: 1500VDC
4. Wide Input Voltage Range: 4: 1
5. High efficiency up to 90%
6. With the output overcurrent, output short circuit protection mechanism
7. Fields of application: electric power, industrial control, etc



3 years
Warranty

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Min./Typ.)	Capacitive Load Max. (μF)
	Nominal (Range)	Maximum	Voltage (VDC)	Current Max.(mA)		
ZYB2403YMD-20WR3	24 (9-36)	40	3.3	5000/0	86/88	10000
ZYB2405YMD-20WR3			5	4000/0	88/90	10000
ZYB2406YMD-20WR3			6	3333/0	87/89	10000
ZYB2412YMD-20WR3			12	1667/0	88/90	1600
ZYB2415YMD-20WR3			15	1333/0	89/91	1000
ZYB2424YMD-20WR3			24	833/0	89/91	500
ZYA2405YMD-20WR3			±5	±2000/0	85/87	2000
ZYA2412YMD-20WR3			±12	±833/0	88/90	800
ZYA2415YMD-20WR3			±15	±667/0	88/90	600
ZYA2424YMD-20WR3			±24	±417/0	87/89	300
ZYA4803YMD-20WR3	48 (18-75)	80	3.3	5000/0	86/88	10000
ZYA4805YMD-20WR3			5	4000/0	88/90	10000
ZYA4812YMD-20WR3			12	1667/0	89/91	1600
ZYA4815YMD-20WR3			15	1333/0	89/91	1000
ZYA4824YMD-20WR3			24	833/0	89/91	500
ZYA4805YMD-20WR3			±5	±2000/0	84/86	2000
ZYA4812YMD-20WR3			±12	±833/0	88/90	800
ZYA4815YMD-20WR3			±15	±667/0	88/90	600
ZYA4824YMD-20WR3			±24	±417/0	88/90	300

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load/no load)	24VDC Input	--	3.3V output	782/30	800/50	mA
			5V output	926/35	947/55	
			6V output	936/50	958/70	
			12V output	926/6	947/15	
			15V output	916/6	937/15	
			24V output	916/10	937/20	
	48VDC Input	--	3.3V output	391/15	400/30	
			5V output	463/20	474/30	
			12V output	458/3	469/15	
			15V output	458/3	469/15	
24V output			458/4	469/15		
Reflected Ripple Current		--	30	--		
Impulse Voltage	24VDC Input	-0.7	--	50	VDC	
	48VDC Input	-0.7	--	100		
Starting Voltage	24VDC Input	--	--	9		
	48VDC Input	--	--	18		
Undervoltage Protection	24VDC Input	5.5	6.5	--		
	48VDC Input	12	15.5	--		
Start time		--	10	--	ms	
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				
Hot Plug		Unavailable				

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	0% - 100% Load	--	±1	±3.0	%
Linear Regulation	Full load, Input voltage from low limit to high limit	--	±0.2	±0.5	
Load Regulation	5% - 100% Load	--	±0.5	±1	
Ripple & Noise	20MHZ Bandwidth, 5% - 100% Load	--	50	100	mVp-p

Transient Recovery Time	25% load step change		--	300	500	μs
Transient Response Deviation		3.3V、5V、6V output	--	±5	±8	%
		Other	--	±3	±5	
Temperature Coefficient	Full Load		--	--	±0.03	%/°C
Output voltage adjustment	input voltage range		90	--	110	%Io
Over Current Protection			110	--	160	
Over Voltage Protection			110	150	190	%Vo
Short-circuit Protection			Continuous, Self-Recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC	
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ	
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF	
Operating Temperature	(See Figure 1)	3.3V、5V、6V output	-40	--	+95	°C
		Other		--	+105	
Storage Temperature		-55	--	+125		
Storage Humidity	Non-condensing	5	--	95	%RH	
Pin welding can withstand the highest temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C	
Switching Frequency	PWM pattern	--	300	--	kHz	
MTBF	MIL-HDBK-217F@25°C	1000Kh				

Mechanical Specifications

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

EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS A(open board)/CLASS B (application circuit 3-②)
	RE	CISPR32/EN55032 CLASS A(open board)/CLASS B (application circuit 3-②)
EMS	ESD	IEC/EN61000-4-2 Contact±6KV,Air ±8KV perf. CriteriaB

RS	IEC/EN61000-4-3 10V/m	perf. CriteriaA
EFT	IEC/EN61000-4-4 ±2KV(application circuit3-①)	Perf.Criteria A
Surge	IEC/EN61000-4-5 line to line±2KV(application circuit3-①)	Perf.Criteria B
CS	IEC/EN61000-4-6 3 Vr.m.s	Perf.Criteria A

Typical Characteristic Curves

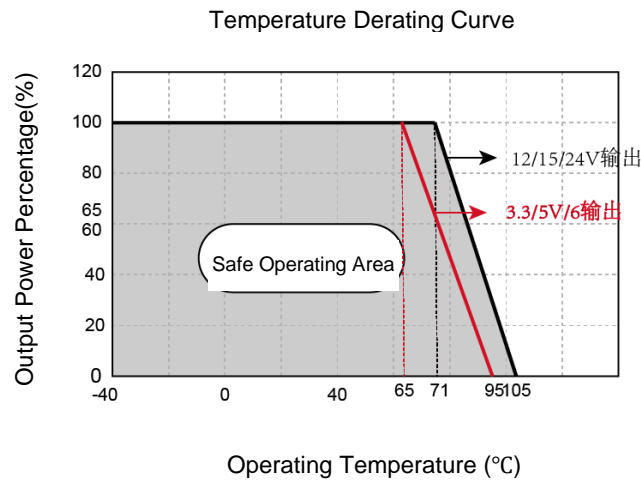
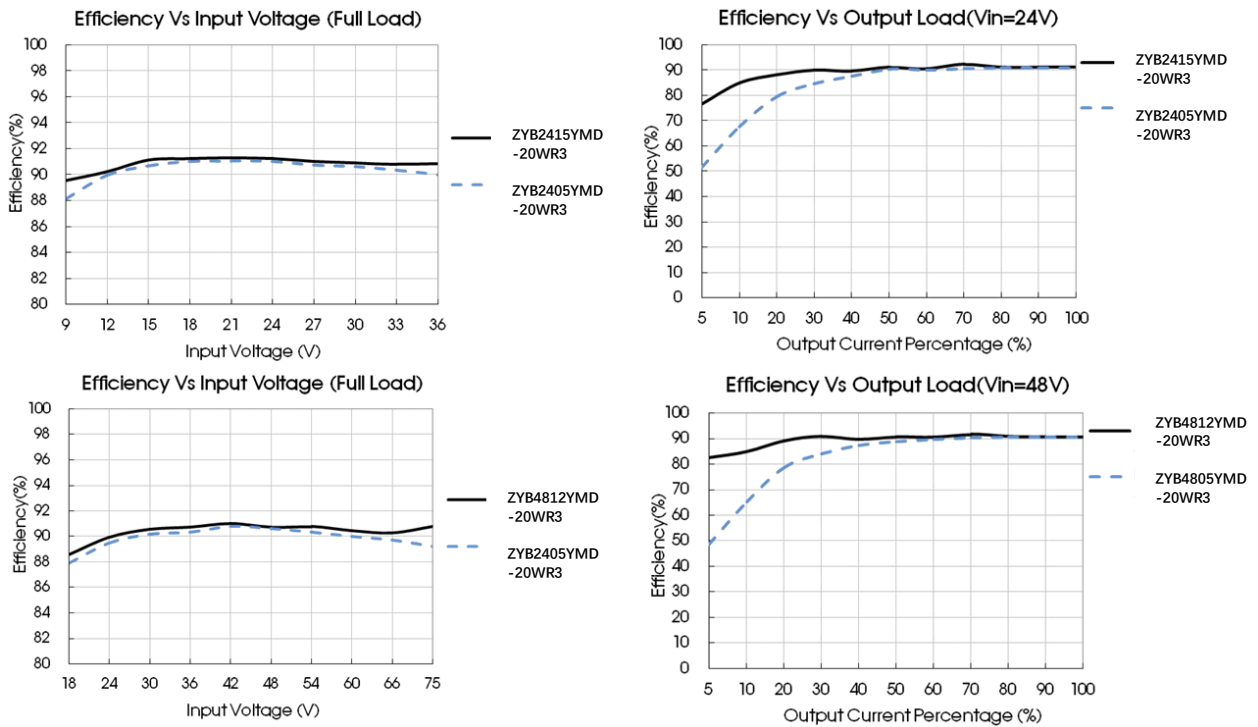
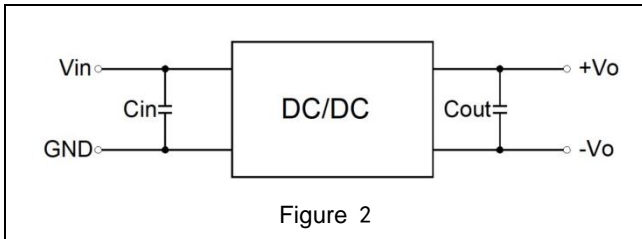


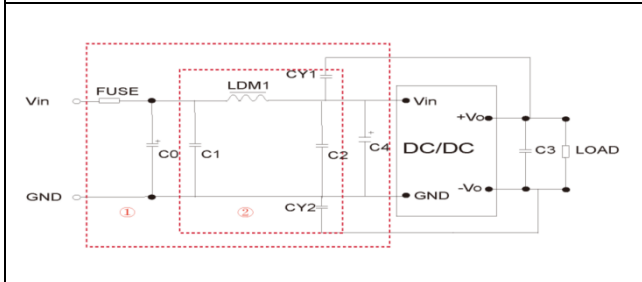
Figure 1



Circuit Design and Application

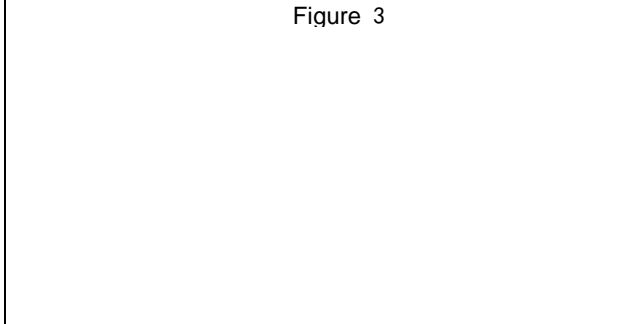


Recommended Capacitive Load Value Table		
Vin(VDC)	Cin	Cout
24	100uF	100uF
48	10uF-47uF	



EMI Recommended Parameter Table		
Model	Vin: 24V	Vin: 48V
FUSE	Select according to the actual input current of the customer	
C0、C4	330μF/50V	330μF/100V
C1、C2	4.7μF/50V	4.7μF/100V
C3	Refer to Figure 2 Cout parameter	
LCM1	2.2uH/4A	2.2uH/2A
CY1、CY2	1nF/2KV	

Note: Part 1 in Figure 3 is for EMC testing;
The second part is used for EMI filtering, which can be selected according to the demand.



Trim resistor calculation				
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

$$Up : Rt = \frac{nR2}{R2-n} - R3 \quad n = \frac{Vref}{Vo-Vref} * R1$$

$$Down : Rt = \frac{nR1}{R1-n} - R3 \quad n = \frac{Vo-Vref}{Vref} * R2$$

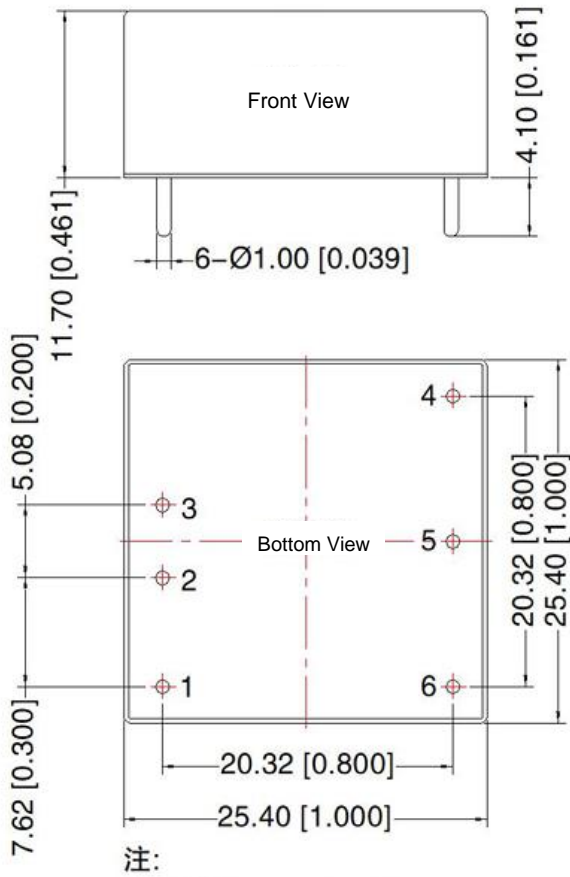
Note: Part 1 in Figure 3 is for EMC testing; The second part is used for EMI filtering, which can be selected according to the demand.

Note:

- 1.The input voltage cannot exceed the specified range value, otherwise permanent and irreparable damage may be caused ;
2. Unless otherwise specified,the parameters in this datasheet were measured at 25°C, humidity 40%~75%, input nominal voltage and output pure resistance mode under full load;
3. All index test methods are based on our company's enterprise standards.

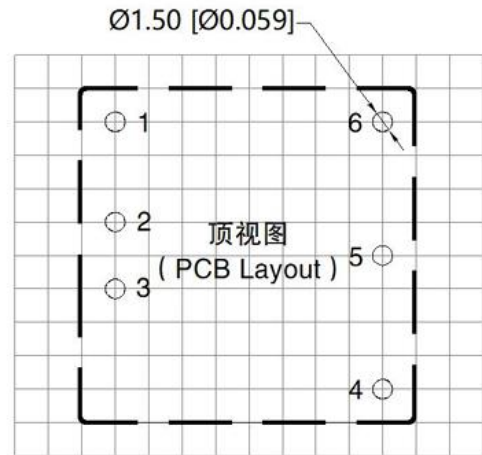
Dimensions and Recommended Layout

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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