FEATURES

1. Package Type：DIP-24
2. Operating Temperature Range：-40℃ - +85℃
3. Isolation Voltage：1500VDC
4. Wide Input Voltage Range： 4：1
5. High efficiency up to 88%
6. With the output overcurrent, output short circuit protection mechanism
7. Fields of application：electric power, industrial control,etc

RoHS CE 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)		
ZYB2403ZP-6WR3	24 (9-36)	40	3.3	1500/0	77	1800
ZYB2405ZP-6WR3			5	1200/0	82	1000
ZYB2409ZP-6WR3			9	667/0	83	1000
ZYB2412ZP-6WR3			12	500/0	85	470
ZYB2415ZP-6WR3			15	400/0	86	220
ZYB2424ZP-6WR3			24	250/0	86	100
ZYA2405ZP-6WR3			±5	±600/0	82	680
ZYA2409ZP-6WR3			±9	±333/0	84	220
ZYA2412ZP-6WR3			±12	±250/0	85	330
ZYA2415ZP-6WR3			±15	±200/0	88	220
ZYA2424ZP-6WR3			±24	±125/0	86	100
ZYB4803ZP-6WR3	48 (18-75)	80	3.3	1500/0	80	1800
ZYB4805ZP-6WR3			5	1200/0	84	1000
ZYB4809ZP-6WR3			9	667/0	85	680
ZYB4812ZP-6WR3			12	500/0	87	470
ZYB4815ZP-6WR3			15	400/0	88	220
ZYB4824ZP-6WR3			24	2500/0	87	100
ZYA4805ZP-6WR3			±5	±600/0	83	680
ZYA4812ZP-6WR3			±12	±250/0	87	330
ZYA4815ZP-6WR3			±15	±200/0	88	220

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no load)	24VDC Input	--	302/5	333/12	mA
	48VDC Input	--	156/4	160/8	
Reflected Ripple Current	24VDC Input	--	20	--	

	48VDC Input	--	20	--	
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	--	
Input Filter		PI filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5% - 100% Load		--	±1	±3.0	%
Linear Regulation	Full load, Input voltage from low limit to high limit	Vo1	--	±0.2	±0.5	
		V02				
Load Regulation	5% - 100% Load	Vo1	--	±0.5	±1	
		V02				
Ripple & Noise	20MHZ Bandwidth		--	--	85	mVp-p
Transient Recovery Time	25% load step change		--	300	500	μs
Transient Response Deviation		3.3V、5V、±5V output	--	±5	±8	%
		Other	--	±3	±5	
Temperature Coeffcient	Full Load		--	--	±0.03	%/℃
Over Current Protection	input voltage range		110	140	--	%Io
Over Voltage Protection			110	--	160	%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	Derating when operating temperature≥85℃ (See Figure 1)	-40	--	85	℃
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	℃
Switching Frequency	Full Load, Nominal Input Voltage	--	300	--	kHz
MTBF	MIL-HDBK-217F@25℃	>1000Kh			

Mechanical Specifications

Case Material	Aluminum alloy, black anodized coating
Package Dimensions	32.00 * 20.00 * 11.10 mm
Weight	14.3g(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±4KV	Perf.Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf.Criteria A
	EFT	IEC/EN61000-4-4 ±2KV(application circuit3-①)	Perf.Criteria B
	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

Temperature Derating Curve

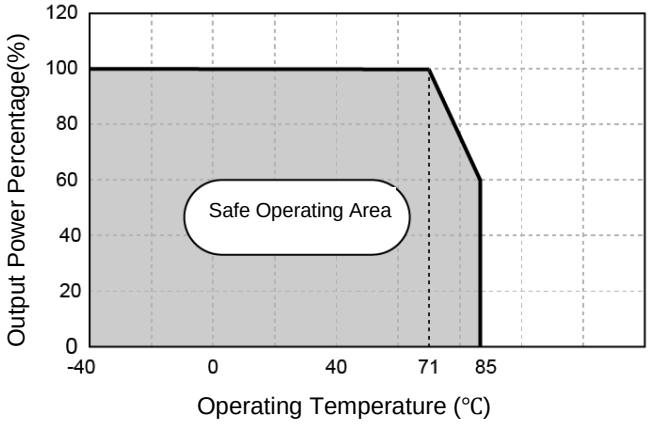
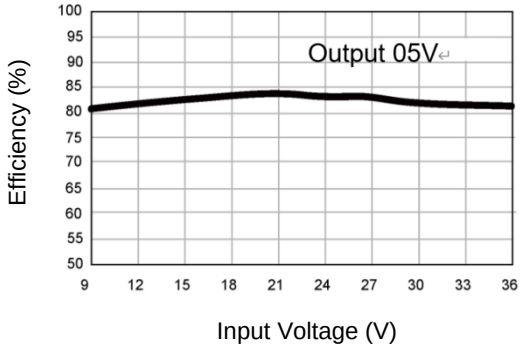
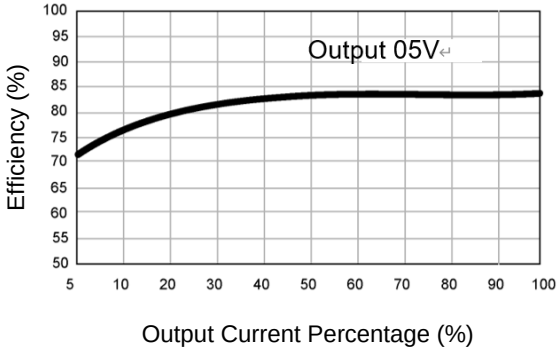


Figure 1

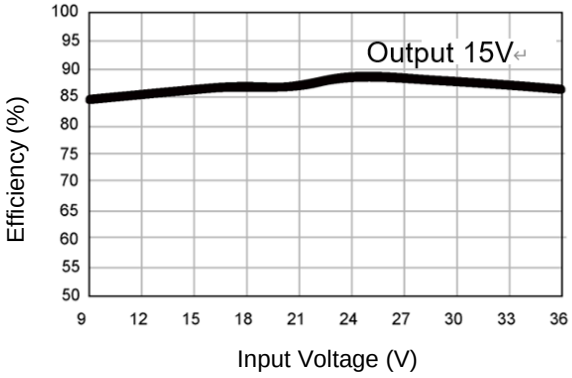
Efficiency VS Input Voltage (full load)



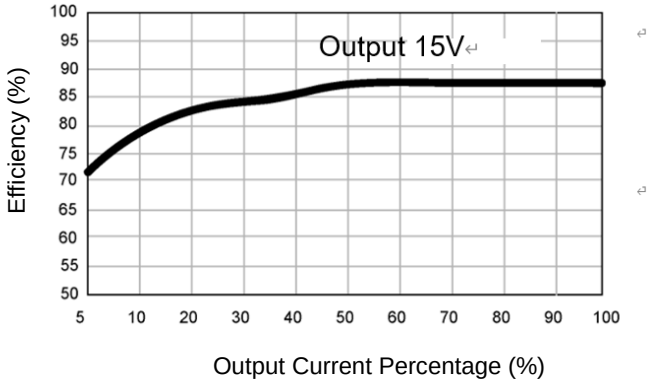
Efficiency VS Output Load（Vin=24V）



Efficiency VS Input Voltage (full load)



Efficiency VS Input Voltage (Vin=24V)



Circuit Design and Application

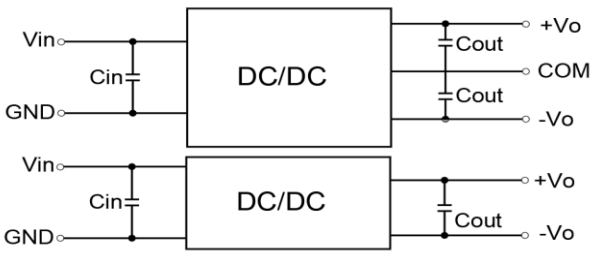
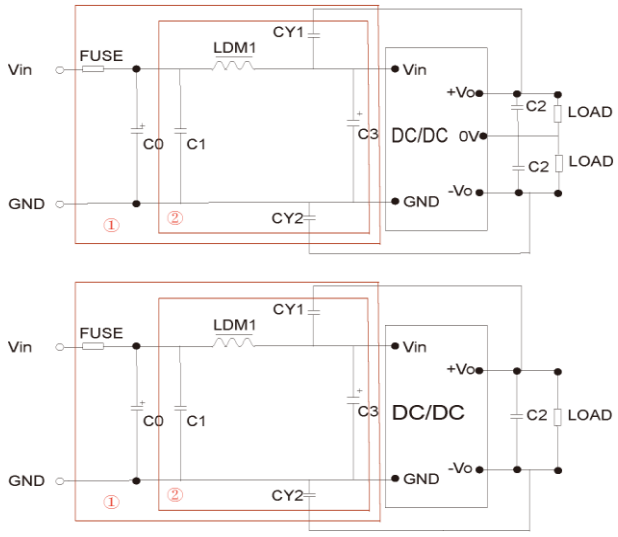


Figure 2

Recommended Capacitive Load Value Table		
Vin	24V	48V
Cin	100uF	10-47uF
Cout	10uF	10uF



EMI Recommended Parameter Table		
Model	Vin：24V	Vin：48V
FUSE	Select according to the actual input current of the customer	
C1	1uF/50V	1uF/100V
C2	Refer to Figure 2 Cout parameter	
LCM	4.7uH	
CY1、CY2	1nF/2KV	

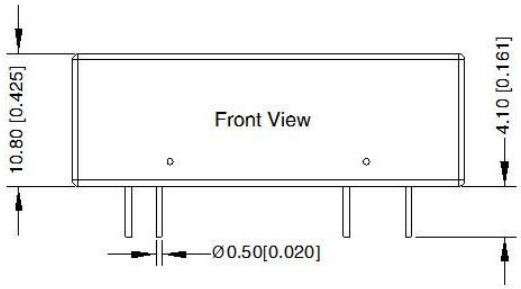
Note: Part 1 in Figure 3 is for EMC testing;
The second part is used for EMI filtering, which can be selected according to the demand.

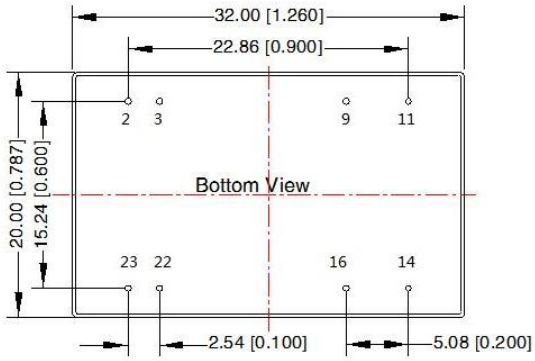
Application circuit

All DC/DC converters of this series are tested according to the recommended test circuit (Figure 2) before leaving the factory. If it is required to further reduce the input and output ripple, the input and output external capacitors Cin1, Cin2, Cs, Cout can be increased or a capacitor with a small series equivalent impedance value can be selected. Cs is used to reduce the ripple, and if the ripple is to meet the demand, there is no need to add Cs. However, the appropriate filter capacitor should be selected, if the capacitor is too large, it is likely to cause startup problems. For each output, under safe and reliable working conditions, the maximum capacitance of the filter capacitance cannot be greater than the maximum capacitive load of the product.

Dimensions and Recommended Layout

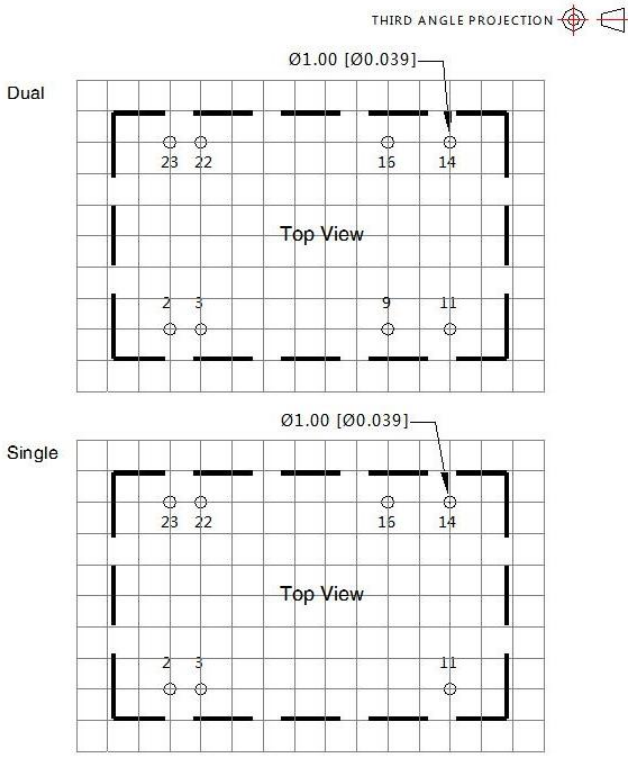
Dimensions





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

PCB Printing Layout & Pin Definition Table



Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
2,3	GND	GND
9	No Pin	0V
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

NC: Pin to be isolated from circuit

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℃, 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;