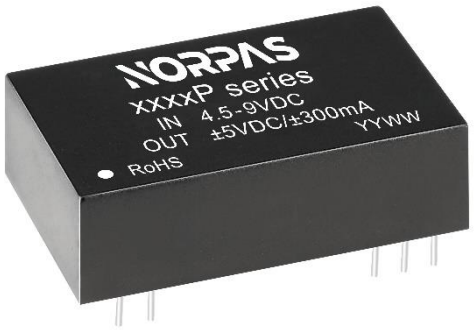
FEATURES

1. Package Type: DIP24
2. Universal Input: 4:1
3. Operating temperature range: -40℃ - +85℃
4. Isolation voltage: 3000VDC
5. High efficiency up to: 88% (Type)
6. Input undervoltage protection.
7. Output short-circuit protection, Overvoltage protection, Overcurrent protection mechanism.
8. Fields of application: Electricity, Industrial control, Communication, Internet of Things, Automotive



RoHS CE 3 years Warranty

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Typ.)	Capacitive Load(μF) Max.
	Nominal (Range)	Max.	Voltage (VDC)	Current (mA) Max./Min.		
ZYF2403P-6WR3	24（9-36）	40	3.3	1500/0	79	2200
ZYF2405P-6WR3			5	1200/0	82	2200
ZYF2409P-6WR3			9	667/0	85	1000
ZYF2412P-6WR3			12	500/0	86	680
ZYF2415P-6WR3			15	400/0	88	680
ZYF2424P-6WR3			24	250/0	87	680
ZYE2405P-6WR3			±5	±600/0	80	#680
ZYE2412P-6WR3			±12	±250/0	84	#330
ZYE2415P-6WR3			±15	±200/0	85	#220
ZYF4803P-6WR3	48（18-75）	80	3.3	1500/0	79	2200
ZYF4805P-6WR3			5	1200/0	83	2200
ZYF4812P-6WR3			12	500/0	87	680
ZYF4815P-6WR3			15	400/0	88	680
ZYF4824P-6WR3			24	250/0	87	680

#Each output

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no load)	24VDC Input	3.3V Output	--	261/10	268/16	mA
		Other Output	--	297/10	320/16	
	48VDC Input	3.3V Output	--	131/4	134/7	
		Other Output	--	146/4	154/7	
Reflected Ripple Current	24VDC Input		--	20	--	mA
	48VDC Input		--	20	--	
Input impulse voltage	24VDC Input		-0.7	--	50	VDC
	48VDC Input		-0.7	--	100	
Starting voltage	24VDC Input		--	--	9	VDC
	48VDC Input		--	--	18	
Input undervoltage protection	24VDC Input		5.5	6.5	--	VDC
	48VDC Input		12	15.5	--	
Start Time	Nominal input and constant resistance load		--	10	--	ms
Input Filter			PI Filter			
Hot Plug			Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output voltage accuracy	5% to 100% load		--	±3.0	±3.0	%
	% to 5% load	Single output	--	±1.0	±3.0	
		Dual output	--	±2.0	±5.0	
Output voltage balance	Dual output, balanced load		--	±0.5	±1.5	%
Linear Regulation	Input voltage from low limit to high limit, full load	Positive output	--	±0.2	±0.5	%
		Negative output	--	±0.5	±1	
Load Regulation	5%- 100% load	Positive output	--	±0.5	±1	%
		Negative output	--	±0.5	±1.5	
Ripple & Noise	20MHz bandwidth, 5% to 100% load		--	85	120	mVp-p
Transient Recovery Time	25% load step change		--	300	500	μs
Transient response deviation	25% load step change		--	±3	±5	%
Temperature Drift Coefficient	Full Load		--	--	±0.03	%/℃
Overcurrent protection	Input voltage range	24V output	110	220	--	%Io
		Other output	110	140	--	
Short-Circuit Protection	Input voltage range		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	3000	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	1000	--	pF
Operating Temperature	See temperature derating curve diagram	-40	--	85	C°
Storage Temperature		-55	--	125	C°
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℃	1000	--	--	K Hours

Mechanical Specification

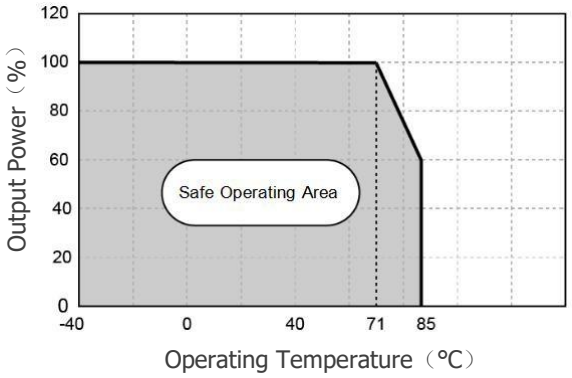
Case Material	Black flame retardant and heat-resistant plastic（UL 94V-0 rated）
Package Dimensions	31.80 × 20.00 × 12.60mm
Weight	12.70g(Typ.)
Cooling Method	Free air convection

EMC Specifications

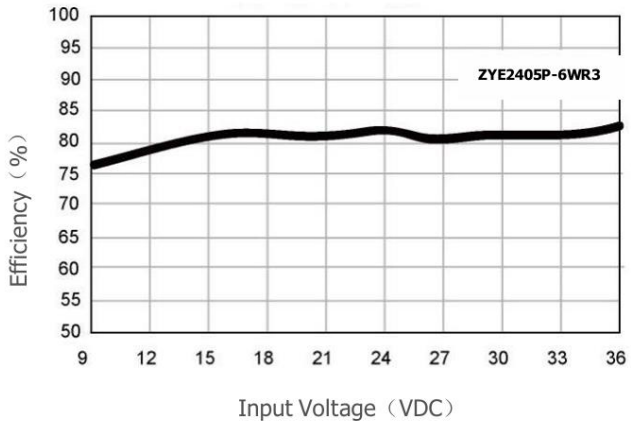
EMI	CE	CISPR32/EN55032 CLASS A			
	RE	CISPR32/EN55032 CLASS A			
EMS	ESD	IEC/EN61000-4-2	Contact±4KV	Perf.Criteria	B
	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria	A
	EFT	IEC/EN61000-4-4	±2KV (Recommended circuit diagram 3-①)	Perf.Criteria	B
	Surge	IEC/EN61000-4-5	line to line±2KV (Recommended circuit diagram 3-①)	Perf.Criteria	B
	CS	IEC/EN61000-4-6	3Vr.m.s	Perf.Criteria	A
	Voltage sag, drop, and short-term interruption immunity	IEC/EN61000-4-29	0-70%	Perf.Criteria	B

Typical Characteristic Curves

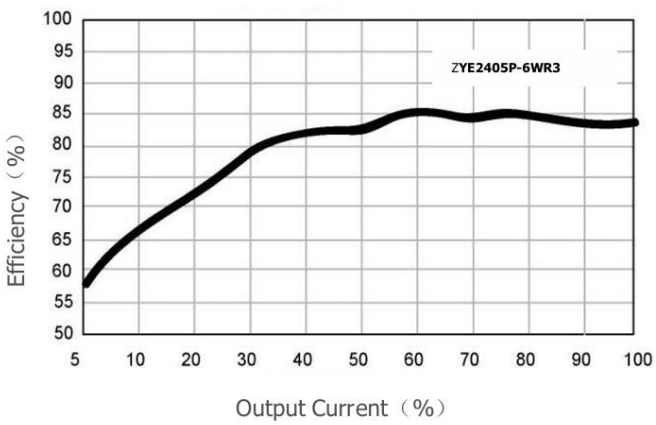
Temperature Derating Curve（Figure 1）



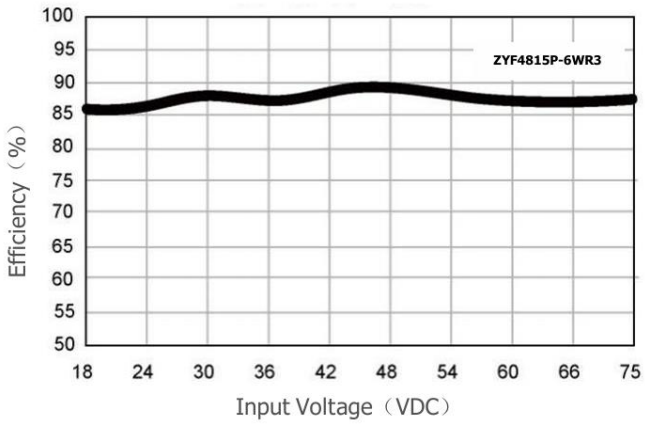
Efficiency VS Input Voltage (full load)



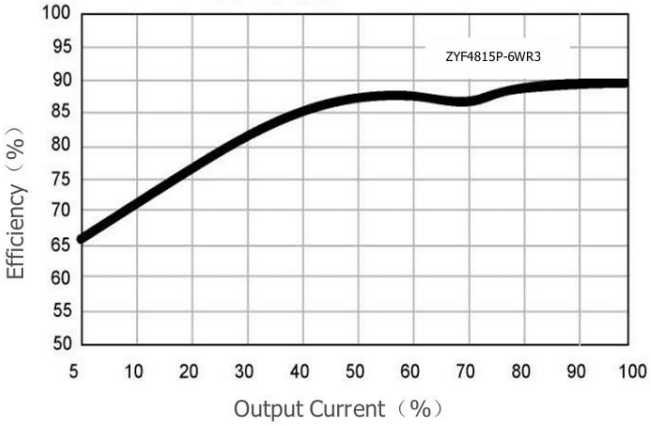
Efficiency VS Output Load（Vin=24V）



Efficiency VS Input Voltage (full load)

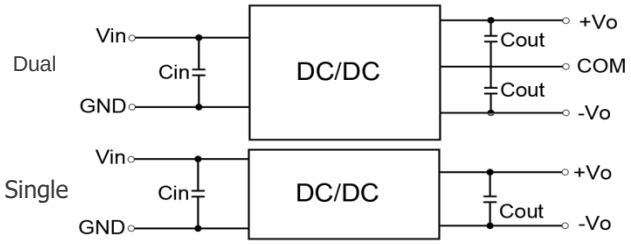


Efficiency VS Output Load（Vin=48V）



Typical Circuit Design and Application

Application circuit（Figure 2）

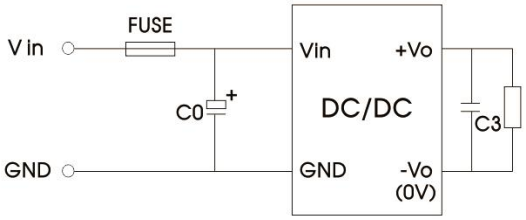


Recommended Capacitive Load Value Table

Vin	24V	48V
Cin	100uF	10-47uF
Cout	10uF	

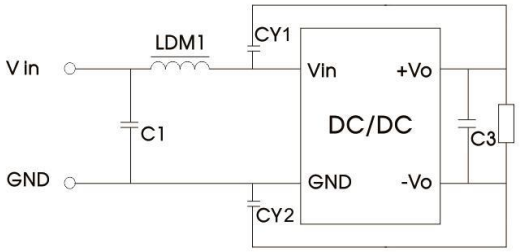
All DC/DC converters in this series are tested according to the recommended testing circuit (Figure 2) before leaving the factory. If further reduction of input and output ripple is required, the external capacitance C in and Cout of the input and output can be increased or a capacitor with a small series equivalent impedance value can be selected, but the capacitance value cannot exceed the maximum capacitive load of the product

EMC Solution - Recommended Circuit (Figure 3-1)

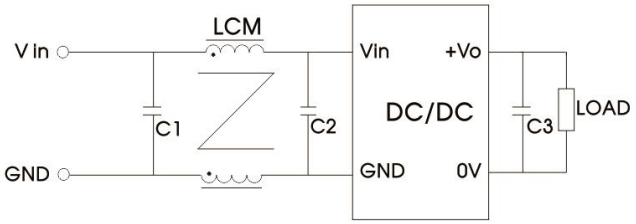


EMC Solution - Recommended Circuit (Figure 3-2)

Dual



Single

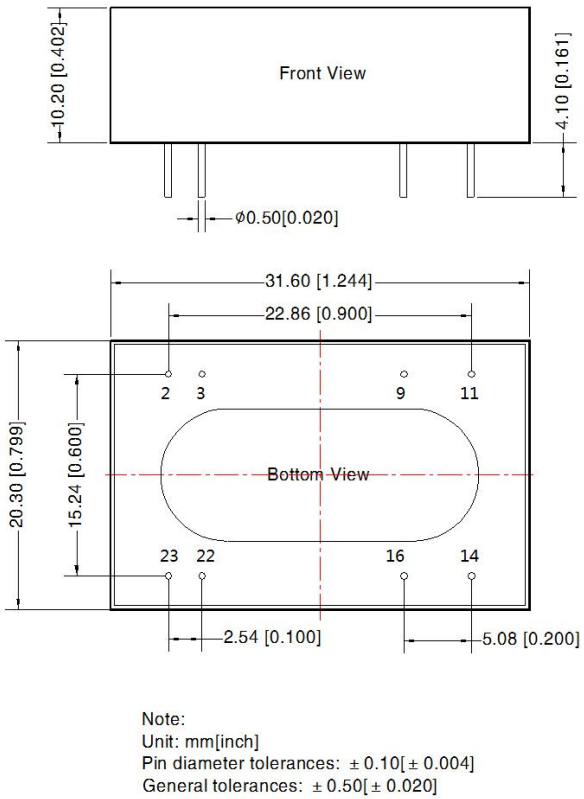


Note: Part 1 in Figure 3 is for EMC testing; The second part is used for EMI filtering, which can be selected according to the demand.

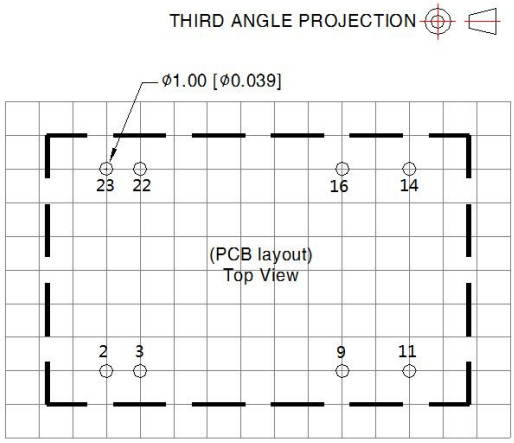
Dual		Single		
Model	Vin:24V	Model	Vin:24V	Vin:48V
FUSE	Select according to the actual input current of the customer	FUSE	Select according to the actual input current of the customer	
C0	1000μF/50V	C0	1000μF/50V	680μF/100V
C1	1μF/50V	C1 、C2	2.2μF/50V	2.2μF/100V
C3	Refer to the Cout parameters in Figure 2	C3	Refer to the Cout parameters in Figure 2	
LDM1	4.7μH	LCM1	2.2mH	
CY1 、CY2	1nF/3KV			

Dimensions and Recommended Layout

Dimensions	PCB Printing Layout



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



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

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;