



Z7X-(X)D10P &

Z7Y-(X)D10P Series 10W,ULTRA-WIDE INPUT ISOLATED& **REGULATED DUAL/SINGLE OUTPUT** DIP PACKAGING, DC-DC CONVERTER

PART NUMBER SYSTEM

Z7Y-2405-(X)D10P

Rated Power Package
No Ctrl Output Voltage
 Input Voltage Product Series

FEATURES 4:1 wide input voltage range

- Efficiency up to 88%
- 1.5KVDC isolation
- Short circuit protection
- Output over voltage protection
- Operating Temperature range:
- -40°C ~ +85°C
- Six-sided metal shield
- Industry standard pinout
- Low ripple & noise
- Meet CISPR22/EN55022 CLASS A
- Inverse polarity protection for A2S (chassis mounting) and A4S (DIN-Rail mounting)

APPLICATION

The Z7X-(X)D10P & Z7Y-(X)D10P series models provide 10 Watt output power, with 4:1 wide range of 9-36VDC, output over-voltage and short-circuit protection. And all f them can meet CISPR22/EN55022 CLASS A without external circuit. Typical applications for these converters are industrial, electric power, instrumentation, telecommunication.

SELECTION GUID										
	Input Voltage(VDC)		Output	Output Current (mA)		Input Current (mA)(Typ.)		Reflected	Max. Capacitive	Efficiency
Model	Nominal (Range)	Max. ^②	Voltage (VDC)	Max.	Min.	@Max. Load	@No Load	Current (mA,Typ.)	Load ^③ (µF)	(%,Typ.) @Max. Load
Z7X-2405-(X)D10P			±5	±1000	±50	502			680	83
Z7X-2412-(X)D10P			±12	±416	±21	484			220	86
Z7X-2415-(X)D10P			±15	±333	±16	473			100	88
Z7Y-2403-(X)D10P	24	10	3.3	2400	120	418	12	40	2200	79
Z7Y-2405-(X)D10P	(9-36)	40	5	2000	100	508			2200	82
Z7Y-2412-(X)D10P			12	833	42	484			470	86
Z7Y-2415-(X)D10P			15	667	33	479			330	87
Z7Y-2424-(X)D10P			24	416	21	479			100	87
Z7X-4805-(X)D10P			±5	±1000	±50	251			680	83
Z7X-4812-(X)D10P			±12	±416	±21	242			150	86
Z7X-4815-(X)D10P			±15	±333	±16	237			100	88
Z7Y-4803-(X)D10P	48	00	3.3	2400	120	209	6	20	2200	79
Z7Y-4805-(X)D10P	(18-75)	00	5	2000	100	254	0	30	2200	82
Z7Y-4812-(X)D10P		-	12	833	42	242			330	86
Z7Y-4815-(X)D10P			15	667	33	239			220	87
Z7Y-4824-(X)D10P			24	416	21	239			100	87

Note

①"X" means the model without Ctrl pin, series with suffix "A2S" are chassis mounting, with suffix "A4S" are DIN-Rail mounting, for example Z7Y-2405-XD10PA2S is chassis mounting without Ctrl pin, Z7Y-2405-D10PA4S is DIN-Rail mounting with Ctrl pin;

②Absolute maximum rating without damage on the converter, ③For dual-output-converters the given value is for one output (for both outputs the same value);

The efficiency of "A2S" and "A4S" is approx. 2% lower.

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INPUT SPECIFICATIONS	3				
Item	Test Conditions	Min.	Тур.	Max.	Unit
	24VDC input	-0.7		50	
Input Surge Voltage (Tsec. Inax.)	48VDC input	-0.7		100	VDC
Chart up Maltana	24VDC input			9	VDC
Stan-up voltage	48VDC input			18	
Input Filter		Pi Filter			
	Models ON	Ctrl open or connect high level (3.5-12VDC)			
Ctrl [*]	Models OFF	Ctrl connect GND or low level (0-1.2VDC)			
	Input current (Models OFF)		1	3	mA
Note: *The Ctrl pin voltage is reference	ed to GND.				

OUTPUT SPECIFICATIONS								
Item	Test Conditions	Min.	Тур.	Max.	Unit			
Output Voltage Accuracy			±1	±2				
Output Voltage Balance	Dual output, balanced Loads		±0.5	±1.5				
Line Regulation Full load, Input voltage from low to high			±0.2	±0.5	%			
Load Regulation	5% to 100% load		±0.5	±1				
Cross Regulation	Dual output, main output 50% load, secondary output from 10% to 100% load			±5	-			
Transient Recovery Time	25% load stop shange		300	500	μs			
Transient Response Deviation	25% load step change		±3	±5	%			
Temperature coefficient	100% load			±0.03	%/°C			
Ripple*			15	35	m)/n n			
Noise*			40	80	птур-р			
Output Over Voltage Protection		110	120	140	%Vo			
Output Short Circuit Protection	Short Circuit Protection Continuous, a		Continuous, auto	omatic recovery	1			
Note:* Ripple and noise tested with	"narallel cable" method. See detailed operation instructions at DC	-DC application no	ntes					

COMMON SPEC	CIFICATIONS				
Item	Test Conditions	Min.	Тур.	Max.	Unit
Isolation Voltage	Input-Output, tested for 1 minute, leakage current less than 1 mA	1500			VDC
Isolation Resistance	Input-Output, test at 500VDC	1000			MΩ
Isolation Capacitance	Input-Output,100KHz/0.1V		1000		pF
Switching Frequency	PWM mode		350		KHz
MTBF	MIL-HDBK-217F@25°C	1000			K hours
Case Material			Aluminum Alloy	/	
	PCB mounting	50.8x25.4x11.8			
Size	A2S chassis mounting	76.0x31.5x21.2			mm
	A4S DIN-Rail mounting	76.0x31.5x25.8			
	PCB mounting		22		
Weight	A2S chassis mounting	44			g
	A4S DIN-Rail mounting		64		

ENVIRONMENTAL SPECIFICATIONS								
Item	Test Conditions	Min.	Тур.	Max.	Unit			
Storage Humidity	Non condensing	5		95	%			
Operating Temperature	Power derating (above 71°C, see Figure 5)	-40		85				
Storage Temperature		-55		125	°C			
Max. Case Temperature	Operating Temperature curve range	105		U				
Lead Temperature	1.5mm from case for 10 seconds			300				
Cooling		Free air convection						
Vibration		10-55Hz,10G,30 Min. along X, Y and Z						



EMC	SPECIFICATIO	NS		
	CE	CISPR22/EN55022	CLASS A (Without External C	Circuit)/ CLASS B(External Circuit Refer to Figure1-② or Figure 3
	RE	CISPR22/EN55022	CLASS A (Without External C	Circuit)/ CLASS B(External Circuit Refer to Figure1-② or Figure 3
	ESD	IEC/EN61000-4-2	Contact ±4KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
EMS	EFT	IEC/EN61000-4-4	±2KV	perf. Criteria B (External Circuit Refer to Figure1-(1))
		IEC/EN61000-4-4	±4KV	perf. Criteria B (External Circuit Refer to Figure 3)
	Surge	IEC/EN61000-4-5	±2KV	perf. Criteria B (External Circuit Refer to Figure 1-①or Figure 3)
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A
EMS	Voltage dips, short and interruptions immunity	IEC/EN61000-4-29	0%-70%	perf. Criteria B

EMC RECOMMENDED CIRCUIT





Recommended external circuit parameters:

Model	Vin·24V	Vin·48V			
model	VIII.2 IV				
FUSE	Choose according to	actual input current			
MOV	S14K35	S14K60			
LDM1	56	56µH			
TVS	SMCJ48A	SMCJ90A			
C0	330µF/50V	330µF/100V			
C1	1µF/50V	1µF/100V			
LDM2	4.7µH				
CY1	1nF /2KV				
CY2	1nF /2KV				

Note: In Figure 1,part①is EMS recommended external circuit, part② is EMI recommended external circuit. Choose according to requirements.

EMC RECOMMENDED CIRCUIT PCB LAYOUT



(Figure 2)



EMC MODULE APPLICATION CIRCUIT



FT-A/BX1D isZimTec Electronics EFT suppresser. For specific model, please refer to the selection guide.

For nominal input voltage of 12V or 24V,C≥330µF/50V For nominal input voltage of 48V,C≥330µF/100V

(Figure 3)

EMC MODULE RECOMMENDED CIRCUIT PCB LAYOUT



(Figure 4)

EMI TEST WAVEFORM (RECOMMENDED CIRCUIT FINGURE 1-2)



Z7Y-2405-D10P CE (Class B, Positive line)



Z7X-4805-D10P CE (Class B, Positive line)



Z7Y-2405-D10P CE (Class B, Negative line)



Z7X-4805-D10P CE (Class B, Negative line)

PRODUCT TYPICAL PERFORMANCE CURVE







Z7X-(X)D10P & Z7Y-(X)D10P PCB Mounting Outline Dimensions, Recommended Footprint





Z7X-(X)D10PA2S & Z7Y-(X)D10PA2S

CHASSIS MOUNTING OUTLINE DIMENSIONS

Footprint Details							
Pin	1*	2	3	4	5	6	
Z7X-XD	Ctrl	GND	Vin	-Vo	0V	+Vo	
Z7Y-XD	Ctrl	GND	Vin	0V	NC	+Vo	

*Z7X/Y-(X)D10PA2S series have no connection



Z7X-(X)D10PA4S & Z7Y-(X)D10PA4S

DIN-RAIL MOUNTING OUTLINE DIMENSIONS

DIN-rail	modules	are	fittina	to	TS35	rails
Dintrai	mouules	are	nung	ιU	1000	rans

Footprint Details							
Pin	1*	2	3	4	5	6	
Z7X-XD	Ctrl	GND	Vin	-Vo	0V	+Vo	
Z7Y-XD	Ctrl	GND	Vin	0V	NC	+Vo	

*Z7X/Y-(X)D10PA4S series have no connection



PACKAGE DIAGRAM

PCB mounting Series



Special Package Series (A2S/A4S)



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate the source impedance.





DESIGN CONSIDERATIONS

1) Recommended circuit

All Z7X-(X)D10P & Z7Y-(X)D10P Series have been tested according to the following recommended test circuit before leaving the factory (see Figure 6). If you want to further decrease the input/output ripple. You can increase a capacitance-values properly or choose capacitors with low ESR, but the total capacitance of the filter capacitor must not exceed the Max. Capacitive Load.

Cin: 10μF~47μF Cout: 10μF



2) The modules can't be used in parallel or hot swap applications

Note:

- 1. Min. load shouldn't be less than 5%, otherwise ripple maybe increased dramatically, If the product operates under min. load, it may not be guaranteed to meet all specifications listed. Operation under minimum load will not damage the converter.
- Recommended Dual output models unbalanced load is ≤±5%, If the product operates >±5%, it may not be guaranteed to meet all specifications listed. Please contact our technical support for more details.
- 3. Max. Capacitive Load is tested at input voltage range and full load.
- 4. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- 5. In this datasheet, all test methods are based on our corporate standards.
- 6. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more details.
- 7. Please contact our technical support for any specific requirement.
- 8. Specifications of this product are subject to changes without prior notice.