Product Feature

1. Package Type: DIP24
2. Universal Input: 4:1
3. Operating temperature range: -40℃ - +85℃
4. Isolation voltage: 1500VDC
5. High efficiency up to: 88% (Type)
6. Input undervoltage protection.Output short-circuit protection, overvoltage protection, overcurrent protection mechanism.
7. Fields of application: Industry, Power, Instrumentation, Communication, Rail transit.

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 Vo1(VDC)	Current Io1(mA)	Voltage Vo2(VDC)	Current Io2(mA)		
ATB2403ZP-10WR3	24(9-36)	40	3.3	2400	/	/	87	1200
ATB2405ZP-10WR3	24(9-36)	40	5	2000	/	/	87	1000
ATB2412ZP-10WR3	24(9-36)	40	12	833	/	/	87	470
ATB2415ZP-10WR3	24(9-36)	40	15	667	/	/	87	330
ATB2424ZP-10WR3	24(9-36)	40	24	416	/	/	88	100
ATA2405ZP-10WR3	24(9-36)	40	5	1000	-5	-1000	83	#1000
ATA2412ZP-10WR3	24(9-36)	40	12	416	-12	-416	87	#470
ATA2415ZP-10WR3	24(9-36)	40	15	333	-15	-333	87	#330
ATB4803ZP-10WR3	48(18-75)	80	3.3	2400	/	/	87	1200
ATB4805ZP-10WR3	48(18-75)	80	5	2000	/	/	88	1000
ATB4812ZP-10WR3	48(18-75)	80	12	833	/	/	87	470
ATB4815ZP-10WR3	48(18-75)	80	15	667	/	/	87	330
ATB4824ZP-10WR3	48(18-75)	80	24	416	/	/	88	100
ATA4805ZP-10WR3	48(18-75)	80	5	1000	-5	-1000	83	#1000
ATA4812ZP-10WR3	48(18-75)	80	12	416	-12	-416	87	#470
ATA4815ZP-10WR3	48(18-75)	80	15	333	-15	-333	87	#330

#Each output

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no load)	24VDC Nominal input series, nominal input voltage	Single 3.3VDC Output	--	379/12	388/25	mA
		Single 5VDC Output	--	473/6	484/15	
		Other Output	--	502/5	515/12	
	48VDC Nominal input series, nominal input voltage	Single 3.3VDC Output	--	192/5	197/20	
		Single 5VDC Output	--	239/6	245/12	
		Other Output	--	251/4	258/8	
Reflected Ripple Current	24VDC Nominal input series, nominal input voltage		--	40	--	mA
	48VDC Nominal input series, nominal input voltage		--	30	--	
Input impulse voltage	24VDC Nominal input series, nominal input voltage		-0.7	--	50	VDC
	48VDC Nominal input series, nominal input voltage		-0.7	--	100	
Starting voltage	24VDC Nominal input series, nominal input voltage		--	--	9	VDC
	48VDC Nominal input series, nominal input voltage		--	--	18	
Input undervoltage protection	24VDC Nominal input series, nominal input voltage		5.5	6.5	--	VDC
	48VDC Nominal input series, nominal input voltage		12	15.5	--	
Input Filter			PI Filter			
Hot Plug			Unavailable			
Ctrl	Module enabled		Suspended or 3.5-12V open			
	Module shutdown		0-0.7V shutdown			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	0%- 100% load	Single 3.3/5VDC Output	--	±0.5	±2	%
		Other Output	--	±1	±3	
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	10%- 100% load	Positive output	--	±0.5	±1	%
		Negative output	--	±0.5	±1.5	
Ripple & Noise	20MHz bandwidth		--	40	80	mVp-p
Transient Recovery Time	25% load step change		--	300	500	ms
Transient response deviation	25% load step change	Single 3.3/5VDC Output	--	±5	±8	%
		Other Output	--	±3	±5	
Temperature Drift Coefficient	Full Load		--	--	±0.03	%/℃
Overcurrent protection	Input voltage range	Single 3.3/5VDC Output	110	160	230	%Io
		Other Output	110	140	190	
Short-Circuit Protection	Input voltage range		Continuous, Self-Recovery			

Note:

1.Auxiliary circuit output voltage(Vo2) maximum accuracy is ±5%; 2.Load regulation for 0%-100% load is ±5%.

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	--	2000	--	pF
Operating Temperature	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	--	312.5	--	kHz
MTBF	MIL-HDBK-217F@25℃	>1000K Hours			

Mechanical Specification

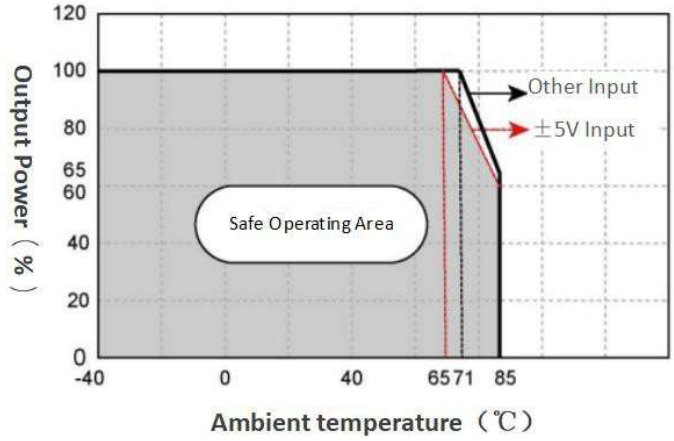
Case Material	Aluminum alloy
Package Dimensions	32.00 × 20.30 × 12.00mm
Weight	12.70g(Typ.)
Cooling Method	Free air convection

EMC Specifications

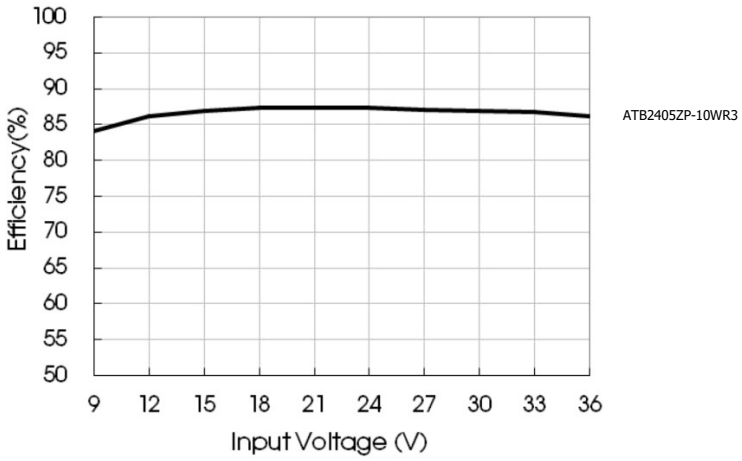
EMI	CE	CISPR32/EN55032 CLASS A(bare board)/CLASS B (Recommended circuit see Figure 3-2)			
	RE	CISPR32/EN55032 CLASS A(bare board)/CLASS B (Recommended circuit see Figure 3-2)			
EMS	ESD	IEC/EN61000-4-2	Contact±4KV	Perf.Criteria	B
	RS	IEC/EN61000-4-3	10V/m	Perf.Criteria	A
	EFT	IEC/EN61000-4-4	±2KV (Recommended circuit diagram 3-①)	Perf.Criteria	B
	Surge	IEC/EN61000-4-5	±2KV (Recommended circuit diagram 3-①)	Perf.Criteria	B
	CS	IEC/EN61000-4-6	10Vr.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

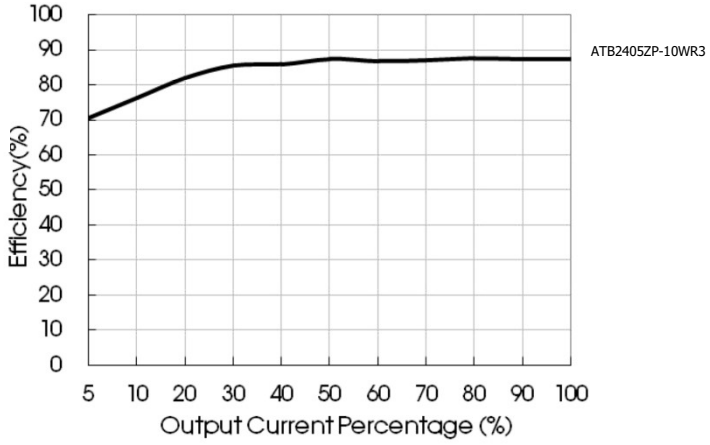
Temperature Derating Curve（Figure 1）



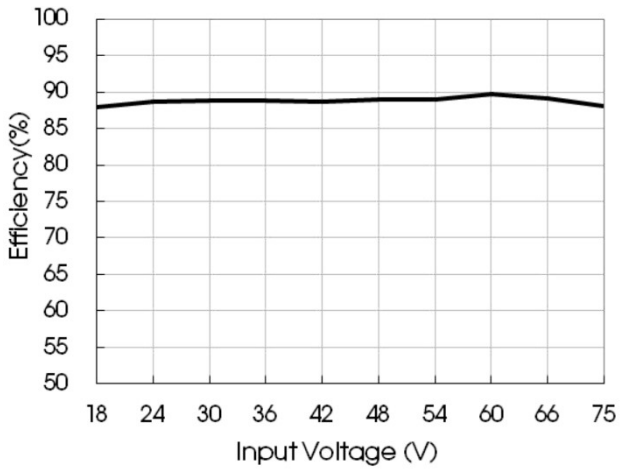
Efficiency VS Input Voltage Curve (Full load)



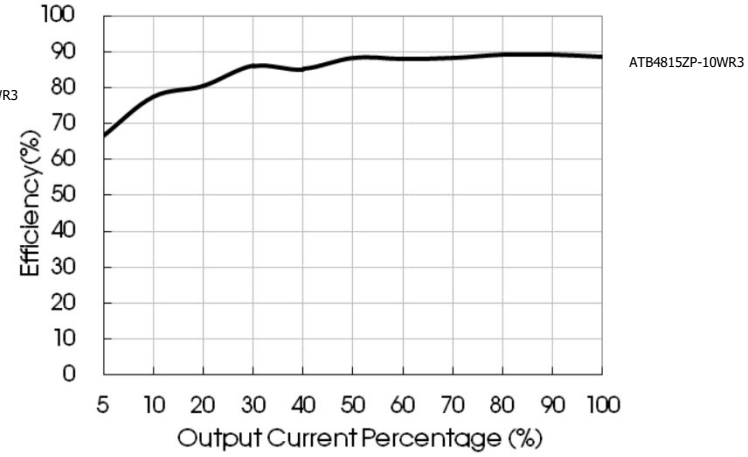
Efficiency VS Output Load（Vin=24V）



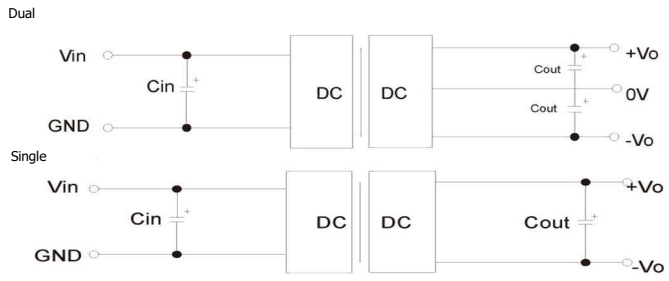
Efficiency VS Input Voltage Curve (Full load)



Efficiency VS Output Load（Vin=48V）



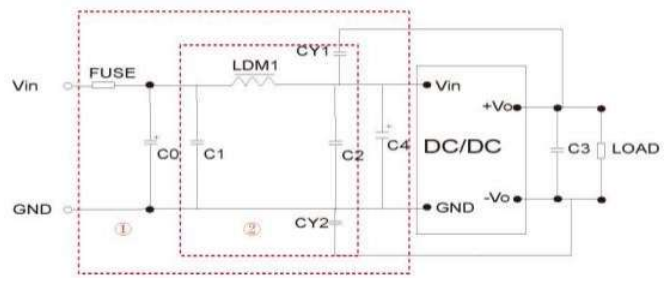
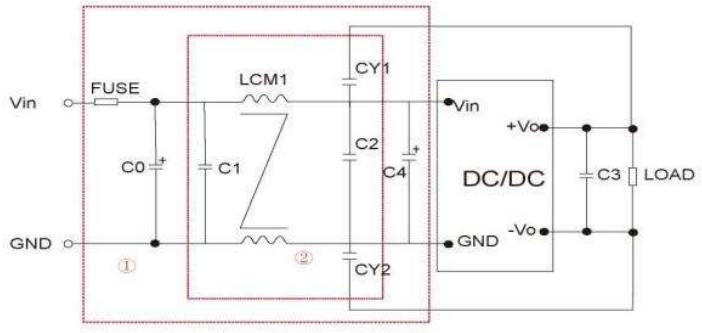
Typical Circuit Design and Application

Application circuit（Figure2）	Recommended Capacitive Load Value Table		
	Vin	24V	48V
	Cin	100uF	10-47uF
	Cout	10uF	

Application circuit description：

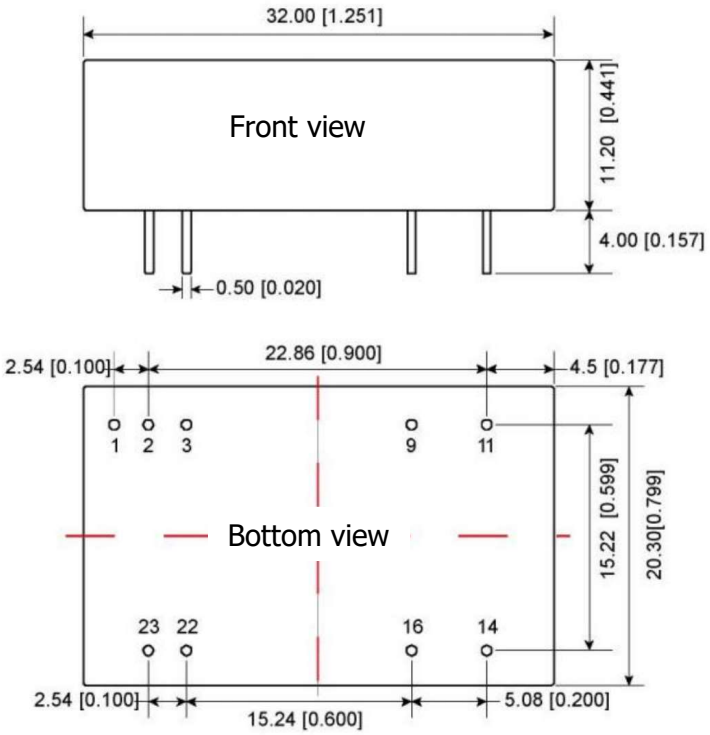
1. All DC/DC converters in this series are tested according to the recommended testing circuit (Figure 2) before leaving the factory.
2. If further reduction of input and output ripple is required, the input and output external capacitor Cin1 can be connected Increase or select capacitors with small series equivalent impedance values for Cin2, Cs, and Cout, Cs are used to reduce ripple, and if the ripple meets the demand, there is no need to add Cs. But suitable filtering capacitors should be selected, as excessive capacitance may cause startup problems. For each output, under safe and reliable working conditions, the maximum capacitance value of its filtering capacitor cannot exceed the maximum capacitive load of the product.

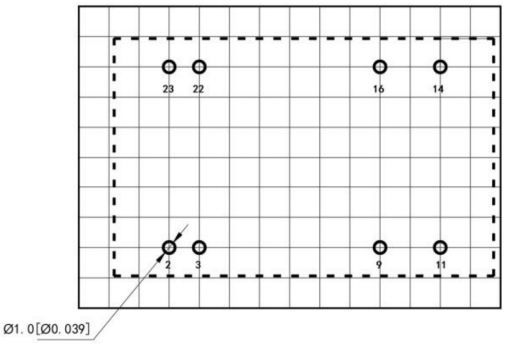
EMC Solutions - Recommended Circuits

3.3VDC、5VDC Output（Figure3）	EMI Recommended Parameter Table		
	Model	Vin：24V	Vin：48V
	FUSE	Select based on the actual input current of the customer	
	C0 、C4	330μF/50V	330μF/100V
	C1 、C2	10μF/50V	10μF/100V
	C3	Refer to the Cout in Fig.2	
Other Output（Figure4）	LCM1	1.4-1.7mH	
	LDM1	10uH	
	CY1 、CY2	1nF/2KV	
	Note: Part ① of Figure 3 ,4 is used for EMC testing; Part 2 is used for EMI filtering and can be selected according to requirements.		

Dimensions and Recommended Layout

Dimensions	PCB Printing Layout





Note: Grid 2.54*2.54mm

Pin-Out		
Pin	Single	Dual
1	Ctrl	Ctrl
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: Size unit: mm[inch]
Terminal diameter tolerance: ±0.10[±0.004]
Unmarked tolerance: ±0.50[±0.020]

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;
6. AMCHARD reserves the right to make changes to the product at any time without notice.