Product Feature

1. Package Type：2"X 1"
2. Input voltage range：4:1
3. Operating temperature range: -40℃ - +105℃
4. Isolation voltage：1500VDC
5. High efficiency up：90%（Typ.）
6. Equipped with output short-circuit protection, over current protection, and over voltage protection mechanisms.
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 (VDC)	Current (mA)		
ATB2403LD-30WR3	24 (9-36)	40	3.3	6000/0	85	10000
ATB2405LD-30WR3	24 (9-36)	40	5	6000/0	88	10000
ATB2409LD-30WR3	24 (9-36)	40	9	3333/0	88	4700
ATB2412LD-30WR3	24 (9-36)	40	12	2500/0	88	2700
ATB2415LD-30WR3	24 (9-36)	40	15	2000/0	90	1680
ATB2424LD-30WR3	24 (9-36)	40	24	1250/0	90	680
ATA2405LD-30WR3	24 (9-36)	40	±5	±3000/0	86	#2000
ATA2412LD-30WR3	24 (9-36)	40	±12	±1250/0	89	#1250
ATA2415LD-30WR3	24 (9-36)	40	±15	±1000/0	89	#680
ATA2424LD-30WR3	24 (9-36)	40	±24	±625/0	89	#470
ATB4803LD-30WR3	48 (18-75)	80	3.3	6000/0	86	10000
ATB4805LD-30WR3	48 (18-75)	80	5	6000/0	87	10000
ATB4812LD-30WR3	48 (18-75)	80	12	2500/0	88	2700
ATB4815LD-30WR3	48 (18-75)	80	15	2000/0	89	1680
ATB4824LD-30WR3	48 (18-75)	80	24	1250/0	87	680
ATA4805LD-30WR3	48 (18-75)	80	±5	±3000/0	86	#2000
ATA4812LD-30WR3	48 (18-75)	80	±12	±1250/0	90	#1250
ATA4815LD-30WR3	48 (18-75)	80	±15	±1000/0	90	#680

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	24VDCnominal input series	3.3VDC Output	--	970/60	993/100	mA
		5VDC Output	--	1454/60	1488/100	
		Other Output	--	1388/6	1488/16	
	48VDCnominal input series	3.3VDC Output	--	474/20	485/30	
		5VDC Output	--	710/20	726/35	
		Other Output	--	702/5	744/10	
Reflected Ripple Current	Rated input voltage		--	40	--	mA
Impulse Voltage	24VDC nominal input series		-0.7	--	50	VDC
	48VDC nominal input series		-0.7	--	100	
Starting Voltage	24VDC nominal input series		--	--	9	
	48VDC nominal input series		--	--	18	
Input undervoltage protection	24VDC nominal input series		5.5	6.5	--	
	48VDC nominal input series		12.0	15.5	--	
Start time	Nominal input and constant resistance load		--	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			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy	5%-100% load	--	±1.0	±3.0	%
Linear Regulation	Vin=Min. to Max. @Full Load	--	±0.2	±0.5	
Load Regulation	5%-100% load	--	±0.5	±1.0	
Ripple & Noise	20MHz bandwidth,5%-100% load	--	50	100	mVp-p
Transient Recovery Time	25% Load Step Change, nominal input voltage	--	300	500	μs
Transient Response Deviation		--	±5	±8	%
Temperature Coefficient	Full Load	--	±0.01	±0.02	%/℃
Trim	input voltage range	--	±10.0	--	%
Over Voltage Protection	input voltage range	110	--	160	%
Over Current Protection	input voltage range	110	--	190	%
Short-Circuit Protection	input voltage range	Continuous, Self-Recovery			

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation 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 Fig 1、Fig 2	-40	--	+105	℃
Storage Temperature		-55	--	+125	℃
Storage Humidity	Non-condensing	--	--	95	%RH
Soldering Profile	1.5mm from case for 10 sec	--	--	300	℃
Switching Frequency	PWM	--	330	--	kHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K Hours

Mechanical Specifications

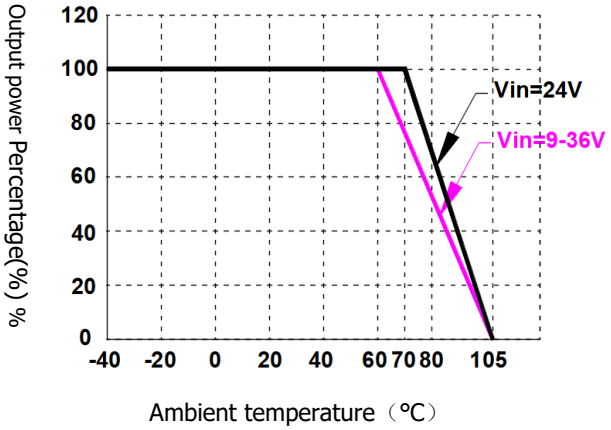
Case Material	Aluminum alloy
Package Dimensions	50.80 x 25.40 x 11.80mm
Weight	30.00g(Typ.)
Cooling Method	Free air convection

EMC Specifications

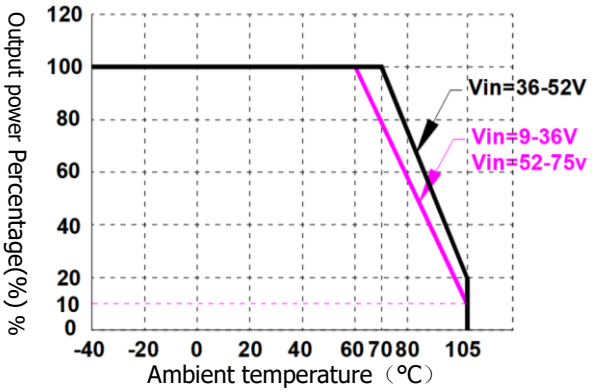
EMI	CE	EN55032/CISPR32		CLASS A		
	RE	EN55032, FCC part 15		CLASS A		
EMS	ESD	EN61000-4-2	Air ± 8kV, Contact ± 6kV	perf.	Criteria	B
	RS	EN61000-4-3	10V/m	perf.	Criteria	A
	EFT	EN61000-4-4	±2kV	perf.	Criteria	B
	Surge	EN61000-4-5	±1kV	perf.	Criteria	B
	CS	EN61000-4-6	10Vrms	perf.	Criteria	A

Typical Characteristic Curves

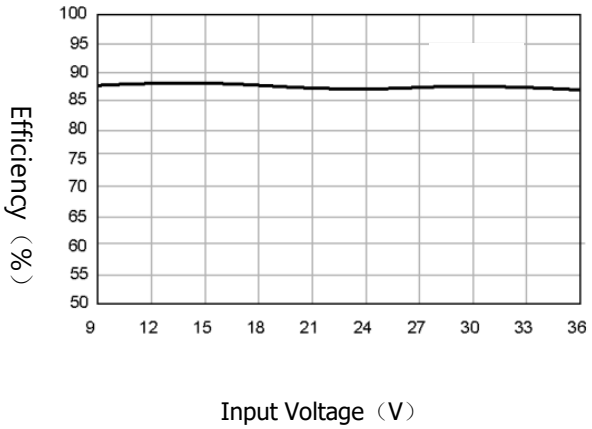
Temperature Derating Curve （24V）



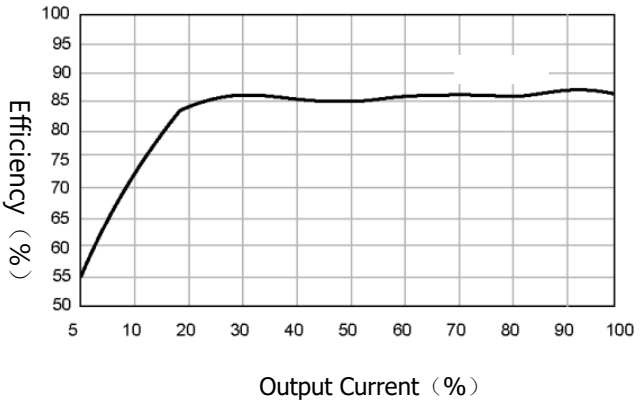
Temperature Derating Curve(48V)



Efficiency Vs Input Voltage (Full Load)

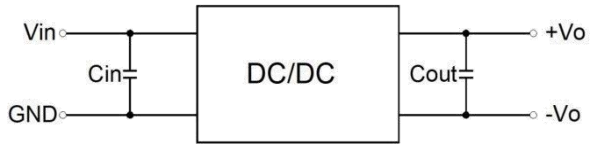


Efficiency Vs Output Load (Vin=24V)



Typical Circuit Design And Application

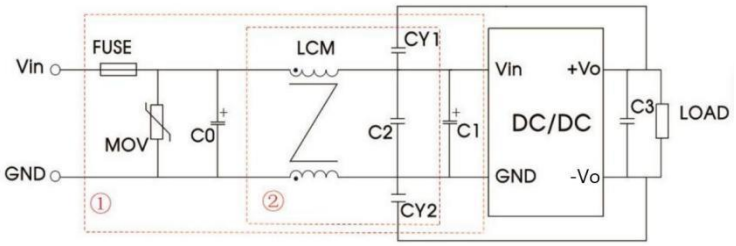
Figure3



Recommended component parameters

Vo(VDC)	Cin(uF)	Cout(uF)
3.3/5/12/15	100	220
24	100	100

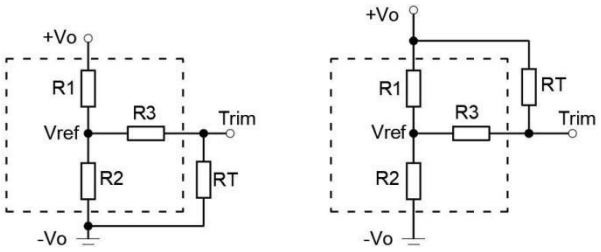
Figure 4



EMI Recommended component parameters

Vin(VDC)	24VDC	48VDC
FUSE	Choose according to actual input current	
MOV	20D470K	14D101K
C0、C1	680μF/50V	330μF/100V
C2	4.7μF/50V	2.2μF/100V
C3	Refer to the Cout in Fig.3	
LCM	1.0mH/4A	1.0mH/2A
CY1/CY2	1nF/2KV	

Figure 5



Trim up Trim down

Trim resistor connections
(dashed line shows internal resistor network)

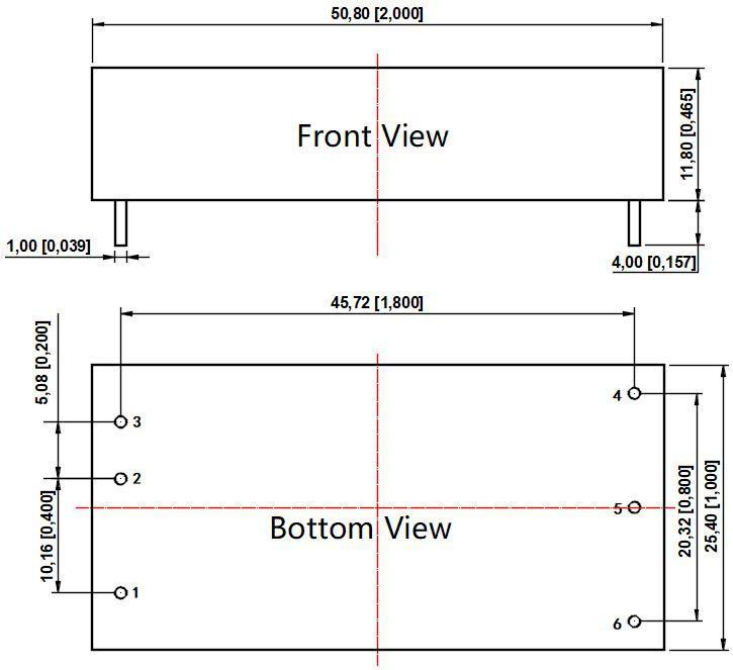
Trim Recommended component parameters

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

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 3. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the specified max. capacitive load value of the product.

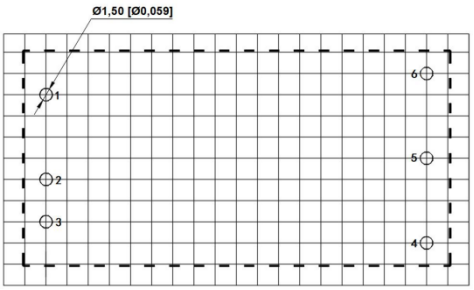
Dimensions and Recommended Layout

Dimensions



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

PCB Printing Layout



The grid distance is 2.54 x 2.54mm

Pin Definition Table

Pin	Function（Single）	Function（Dual）
1	Ctrl	Ctrl
2	GND	GND
3	Vin	Vin
4	+Vo	+Vo
5	-Vo	COM
6	Trim	-Vo

Note:

1. The input voltage should not exceed the specified range value, otherwise it may cause permanent and irreparable damage;
2. It is recommended to use at a load of over 5%. If the load is below 5%, the ripple index of the product may exceed the specifications, but it does not affect the reliability of the product;
3. Suggested dual output module load imbalance: ≤ ± 5%. If it exceeds ± 5%, it cannot be guaranteed that the product performance meets all performance indicators in this manual;
4. The maximum capacitive load is tested within the input voltage range and under full load conditions;
5. Unless otherwise specified, all indicators in this manual are measured at Ta=25 ℃, humidity<75% RH, nominal input voltage, and output rated load;
6. All indicator testing methods in this manual are based on our company's corporate standards;
7. Our company can provide product customization, and specific requirements can be directly contacted by our technical personnel;
8. Product specifications are subject to change without prior notice.