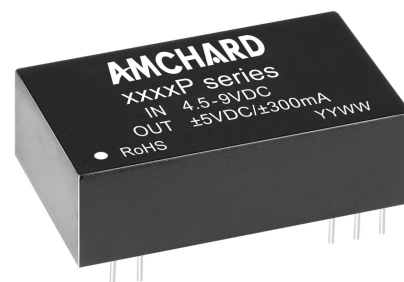


FEATURES

1. Wide input voltage range (2:1)
2. High efficiency up to 86%
3. I/O isolation test voltage 1.5k VDC
4. Output short-circuit protection (self-recovery)
5. Operating ambient temperature range: -40°C to +85°C
6. Meet CISPR32/EN55032 CLASS A, without extra components



3 years
Warranty

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency (%)Min./Typ.	Capacitive Load [®] (μF)Max.
	Nominal (Range)	Max. ^①	Voltage (VDC)	Current (mA) Max./Min.		
BTA0505P-3WR2	5 (4.5-9)	11	±5	±300/±15	74/76	2200
BTA0512P-3WR2			±12	±125/±6	76/78	1800
BTA0515P-3WR2			±15	±100/±5	76/78	1000
BTB0505P-3WR2			5	600/30	72/74	4700
BTB0512P-3WR2			12	250/12	75/77	2700
BTB0515P-3WR2			15	200/10	75/77	2200
BTA1205P-3WR2	12 (9-18)	20	±5	±300/±15	79/81	2200
BTA1209P-3WR2			±9	±166/±8	82/84	2000
BTA1212P-3WR2			±12	±125/±6	82/84	1800
BTA1215P-3WR2			±15	±100/±5	83/85	1000
BTB1203P-3WR2			3.3	909/46	72/74	4700
BTB1205P-3WR2			5	600/30	79/81	4700
BTB1212P-3WR2			12	250/12	81/83	2700
BTB1215P-3WR2			15	200/10	80/82	2200
BTB1224P-3WR2			24	125/6	81/83	1800
BTA2405P-3WR2	24 (18-36)	40	±5	±300/±15	80/82	2200
BTA2412P-3WR2			±12	±125/±6	82/84	1800
BTA2415P-3WR2			±15	±100/±5	82/84	1000
BTB2403P-3WR2			3.3	909/46	76/78	4700
BTB2405P-3WR2			5	600/30	79/81	4700
BTB2409P-3WR2			9	333/16	79/81	2700
BTB2412P-3WR2			12	250/12	84/86	2700
BTB2415P-3WR2			15	200/10	84/86	2200
BTB2424P-3WR2			24	125/6	83/85	1800
BTA4805P-3WR2	48 (36-75)	80	±5	±300/±15	80/82	2200
BTA4812P-3WR2			±12	±125/±6	82/84	1800
BTA4815P-3WR2			±15	±100/±5	83/85	1000
BTB4803P-3WR2			3.3	909/46	74/76	4700
BTB4805P-3WR2			5	600/30	80/82	4700
BTB4812P-3WR2			12	250/12	84/86	2700

BTB4815P-3WR2	48 (36-75)	80	15	200/10	84/86	2200
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Notes: ①Exceeding the maximum input voltage may cause permanent damage;
②The specified maximum capacitive load for positive and negative output is identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load /no-load)	5VDC input	—	789/40	834/45	mA
	12VDC input	—	316/30	348/35	
	24VDC input	—	152/15	165/20	
	48VDC input	—	77/5	85/10	
Reflected Ripple Current	5VDC input	—	20	—	
	12VDC input	—	30	—	
	24VDC input	—	30	—	
	48VDC input	—	30	—	
Surge Voltage (1sec. max.)	5VDC input	-0.7	—	12	VDC
	12VDC input	-0.7	—	25	
	24VDC input	-0.7	—	50	
	48VDC input	-0.7	—	100	
Start-up Voltage	5VDC input	—	—	4.5	
	12VDC input	—	—	9	
	24VDC input	—	—	18	
	48VDC input	—	—	36	
Input Filter		Pi filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	5%-100% load		—	±1	±3	%
No-load Output Voltage Accuracy	Input voltage range		—	±1.5	±5	
Balance Of Output Voltage	Dual output, balanced load		—	±0.5	±1	
Linear Regulation	Input voltage variation from low to high at full load		—	±0.2	±0.5	
Load Regulation	5%-100% load		—	±0.2	±0.5	
Transient Recovery Time	25% load step change		—	0.5	2	ms
Transient Response Deviation			—	±2	±5	%
Temperature Coefficient	Full load		—	±0.02	±0.03	%/°C
Ripple & Noise*	20MHz bandwidth, nominal input voltage	24VDC output	—	100	120	mVp-p
		Others	—	50	80	
Short-circuit Protection	Input voltage range		Continuous, self-recovery			
Note: *The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.						

Note: *The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	--	—	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	—	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	—	120	—	pF
Operating Temperature	Derating when operating temperature up to 85°C (see Fig. 1)	-40	--	85	°C
Storage Temperature		-55	—	125	
Case Temperature Rise	Ta=25°C	—	25	—	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	—	--	300	

Storage Humidity	Non-condensing	–	–	95	%RH
Switching Frequency(PFM mode)	100% load, nominal input voltage	–	200	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	–	--	k hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimensions	31.60 x 20.30 x 10.20 mm
Weight	14g(Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

EMI	CE	CISPR32/EN55032	CLASS A(Bare component)/CLASS B (see Fig.3-② for recommended circuit)
	RE	CISPR32/EN55032	CLASS A(Bare component)/CLASS B (see Fig.3-② for recommended circuit)
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 (see Fig.3-① for recommended circuit) perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2kV (see Fig.3-① for recommended circuit) perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s perf. Criteria A
	Voltage dips, short interruptions and voltage variations immunity	IEC/EN61000-4-29	0%, 70% perf. Criteria B

Typical Characteristic Curve

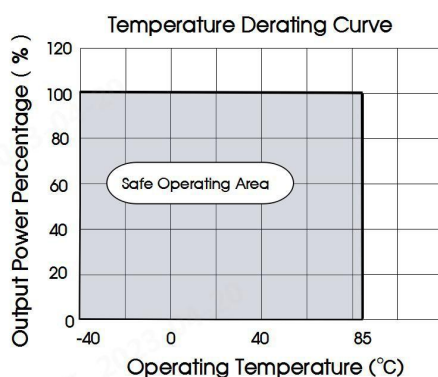
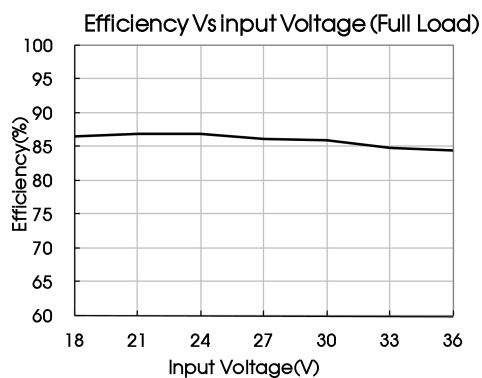
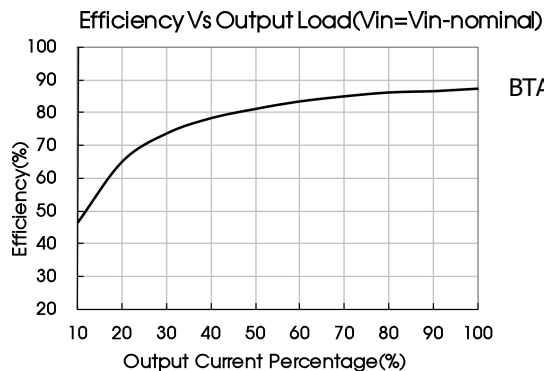


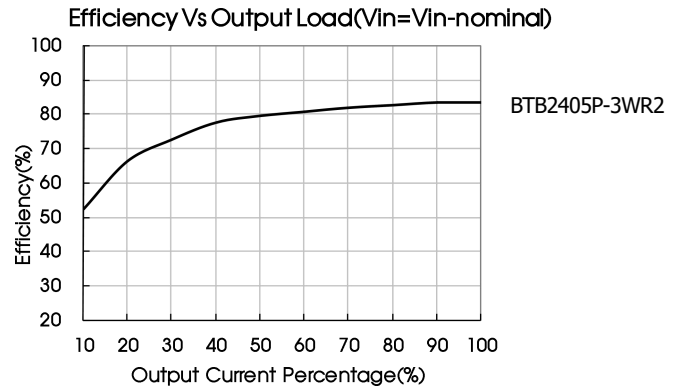
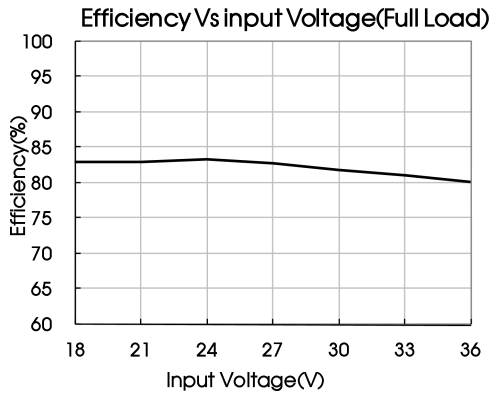
Fig. 1



BTA2415P-3WR2



BTA2415P-3WR2



Design Reference

1. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 5% rated load when it is used, or the output ripple may increase rapidly. Ensure that the product working load must be higher than 5% of the rated load.

2. Typical application

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} 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.

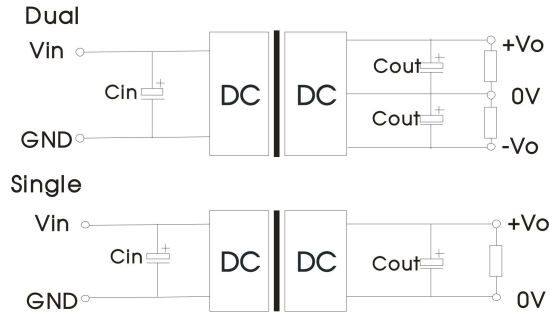


Fig. 2

V_{in}	C_{in}	$V_o(VDC)$	C_{out}
5VDC	10 μ F/16V	$\pm 5/5$	10 μ F/16V
		$\pm 12/\pm 15/12/15$	10 μ F/25V
12VDC	100 μ F/25V	$\pm 5/\pm 9/3.3/5$	10 μ F/16V
		$\pm 12/\pm 15/12/15$	10 μ F/25V
		24	10 μ F/50V
24VDC	10 μ F/50V~ 47 μ F/50V	$\pm 5/3.3/5/9$	10 μ F/16V
		$\pm 12/\pm 15/12/15$	10 μ F/25V
		24	10 μ F/50V
48VDC	10 μ F/100V~ 47 μ F/100V	$\pm 5/3.3/5$	10 μ F/16V
		$\pm 12/\pm 15/12/15$	10 μ F/25V

3. EMC compliance circuit

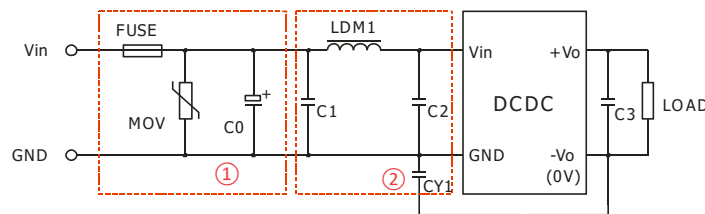


Fig. 3

Parameter description:

Model	V_{in} : 5VDC	V_{in} : 12VDC	V_{in} : 24VDC	V_{in} : 48VDC
FUSE	Choose according to actual input current			
MOV	—	S14K20	S20K30	S14K60
C0	1000 μ F/16V	1000 μ F/25V	330 μ F/50V	330 μ F/100V
C1	4.7 μ F/50V			4.7 μ F/100V
LDM1	12 μ H			
C2	4.7 μ F/50V			4.7 μ F /100V
C3	10 μ F			
CY1	1nF/2kV			

Note: ① For EMC tests we use Part ① in the Fig. 3 is used for immunity and part ② for emissions test. Selecting based on needs.

② If there is no recommended parameters, the model no require the external component.

4. Input current

When the electricity is provided by the unstable power supply, please make sure that the range of the output voltage fluctuation and the ripple voltage of the power supply do not exceed the indicators of the modules. Input current of power supply should afford the flash startup current of this kind of DC/DC module(see Fig. 4).

Generally: Vin=5V Iave =1297mA
Vin=12V Iave=649mA
Vin=24V Iave=307mA
Vin=48V Iave =158mA

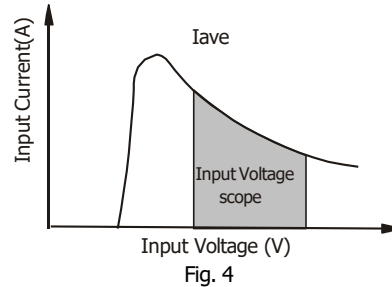
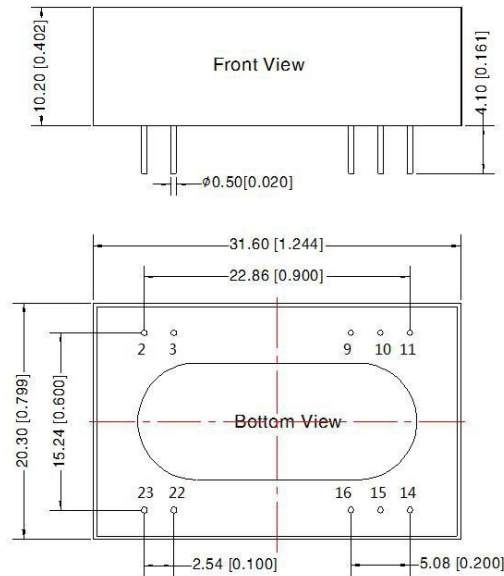
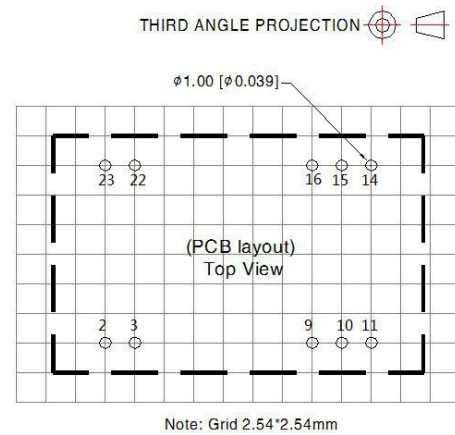


Fig. 4

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10 [\pm 0.004]$
General tolerances: $\pm 0.50 [\pm 0.020]$



Pin-Out		
Pin	Single	Dual
2,3	GND	GND
9	NC	0V
10,15	NC	NC
11	NC	-Vo
14	+Vo	+Vo
16	0V	0V
22,23	Vin	Vin

NC: Not available for electrical connection

Notes & Instructions

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°C, 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;

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