

FEATURES

1. Continuous short-circuit protection
2. No-load input current as low as 8mA
3. Operating ambient temperature range: -40°C to +105°C
4. High efficiency up to 86%
5. High power density
6. I/O isolation test voltage 1.5k VDC
7. Industry standard pin-out



**3 years
Warranty**

Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load*(μ F) Max.
	Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
A0503S-2WR3	5 (4.5-5.5)	\pm 3.3	\pm 303/ \pm 30	71/75	1200
A0505S-2WR3		\pm 5	\pm 200/ \pm 20	80/84	1200
A0509S-2WR3		\pm 9	\pm 111/ \pm 11	81/85	470
A0512S-2WR3		\pm 12	\pm 83/ \pm 8	81/85	220
A0515S-2WR3		\pm 15	\pm 67/ \pm 7	82/86	220
A0524S-2WR3		\pm 24	\pm 42/ \pm 4	82/86	100
B0503S-2WR3		3.3	400/40	74/78	2400
B0505S-2WR3		5	400/40	80/84	2400
B0507S-2WR3		7.2	278/28	80/84	1000
B0509S-2WR3		9	222/22	81/85	1000
B0512S-2WR3		12	167/17	81/85	560
B0515S-2WR3		15	133/13	82/86	560
B0524S-2WR3		24	83/8	82/86	220
A1203S-2WR3		12 (10.8-13.2)	\pm 3.3	\pm 303/ \pm 30	71/75
A1205S-2WR3	\pm 5		\pm 200/ \pm 20	76/80	1200
A1207S-2WR3	\pm 7.2		\pm 139/ \pm 13	76/80	470
A1209S-2WR3	\pm 9		\pm 111/ \pm 11	78/82	470
A1212S-2WR3	\pm 12		\pm 83/ \pm 8	79/83	220
A1215S-2WR3	\pm 15		\pm 67/ \pm 7	79/83	220
A1224S-2WR3	\pm 24		\pm 42/ \pm 4	79/83	100
B1203S-2WR3	3.3		400/40	75/79	2400
B1205S-2WR3	5		400/40	78/82	2400
B1209S-2WR3	9		222/22	78/82	1000
B1212S-2WR3	12		167/17	80/84	560
B1215S-2WR3	15		133/13	81/85	560
B1224S-2WR3	24		83/8	82/86	220

A1505S-2WR3	15 (13.5-16.5)	±5	±200/±20	76/80	1200
A1515S-2WR3		±15	±67/±7	78/82	220
B1505S-2WR3		5	400/40	76/80	2400
B1515S-2WR3		15	133/13	77/81	560
B1524S-2WR3		24	83/8	77/81	220
A2403S-2WR3	24 (21.6-26.4)	±3.3	±303/±30	70/76	1200
A2405S-2WR3		±5	±200/±20	74/80	1200
A2407S-2WR3		±7.2	±139/±13	74/80	470
A2409S-2WR3		±9	±111/±11	75/81	470
A2412S-2WR3		±12	±83/±8	77/83	220
A2415S-2WR3		±15	±67/±7	77/83	220
A2424S-2WR3		±24	±42/±4	77/83	100
B2403S-2WR3	24 (21.6-26.4)	3.3	400/40	70/76	2400
B2405S-2WR3		5	400/40	74/80	2400
B2409S-2WR3		9	222/22	75/81	1000
B2412S-2WR3		12	167/17	78/84	560
B2415S-2WR3		15	133/13	80/86	560
B2424S-2WR3		24	83/8	80/86	220

Note: * The 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	3.3VDC output	-	534/8	564/-	mA
		5VDC/7.2VDC output	-	477/8	500/-	
		9VDC/12VDC output	-	471/8	494/-	
		15VDC/24VDC output	-	466/8	488/-	
	12VDC input	3.3VDC output	-	223/8	235/-	
		5VDC/7.2VDC output	-	208/8	219/-	
		9VDC output	-	203/8	214/-	
		12VDC/15VDC/24VDC output	-	201/8	211/-	
	15VDC input	5VDC output	-	167/8	176/-	
		15VDC output	-	163/8	171/-	
		24VDC output	-	165/8	174/-	
	24VDC input	3.3VDC output	-	110/8	120/-	
		5VDC/7.2VDC output	-	104/8	112/-	
		9VDC output	-	103/8	111/-	
		12VDC/15VDC/24VDC output	-	101/8	108/-	
	Reflected Ripple Current*		-	15	-	
Surge Voltage (1sec. max.)	5VDC input	-0.7	-	9	VDC	
	12VDC input	-0.7	-	18		
	15VDC input	-0.7	-	21		
	24VDC input	-0.7	-	30		
Input Filter		Capacitance filter				
Hot Plug		Unavailable				

Note: * Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit	
Voltage Accuracy			See output regulation curve(Fig. 1)				
Linear Regulation	Input voltage change: ±1%	3.3VDC output	-	-	±1.5	-	
		Others	-	-	±1.2		
Load Regulation	5VDC input	3.3VDC output	-	10	20	%	
		5VDC/7.2VDC output	-	8	15		
		9VDC/12VDC/15VDC output	-	7	10		
		24VDC output	-	5	10		
	10%-100% load	12/15/24 VDC input	3.3VDC output	-	15		20
			5VDC output	-	7		15
			7.2VDC output	-	6		15
			9VDC output	-	5		15
			12VDC output	-	5		10
			15VDC output	-	4		10
Ripple & Noise*	20MHz bandwidth	5VDC input	-	75	200	mVp-p	
		12/15/24VDC input	-	75	180		
Temperature Coefficient	Full load		-	±0.02	-	%/°C	
Short-circuit Protection			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.

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		-	20	-	pF
Operating Temperature	Derating when operating temperature ≥ 85°C, (see Fig. 2)		-40	-	105	°C
Storage Temperature			-55	-	125	
Case Temperature Rise	Ta=25°C	5VDC input	-	25	-	
		12/15/24VDC input	-	15	-	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds		-	-	300	
Storage Humidity	Non-condensing		5	-	95	%RH
Vibration			10-150Hz, 5G, 0.75mm. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	5VDC input	-	220	-	kHz
		12/15/24VDC input	-	260	-	
MTBF	MIL-HDBK-217F @ 25°C		3500	-	-	k hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.65 x 7.05 x 10.16mm
Weight	2.4g(Typ.)
Cooling Method	Free air convection

EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B
	RE	CISPR32/EN55032 CLASS B
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf. Criteria B

Note: Refer to Fig. 4 for recommended circuit test

Typical Characteristic Curves

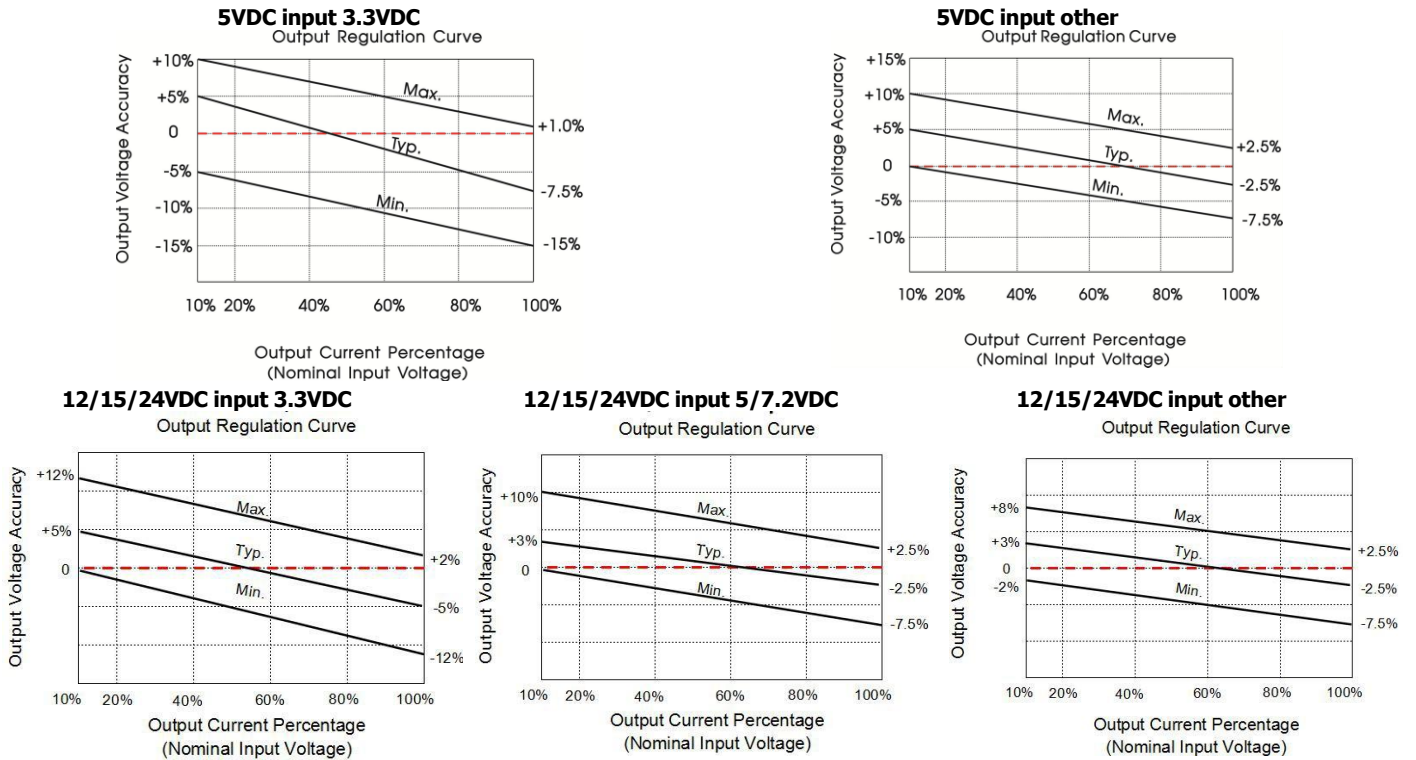


Fig. 1

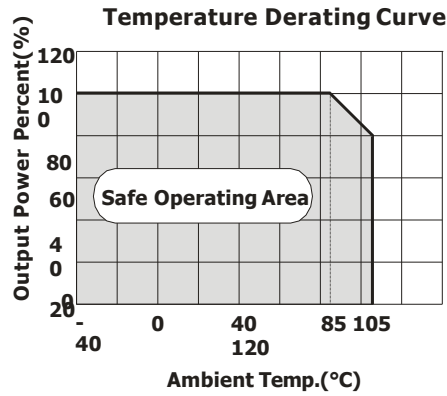
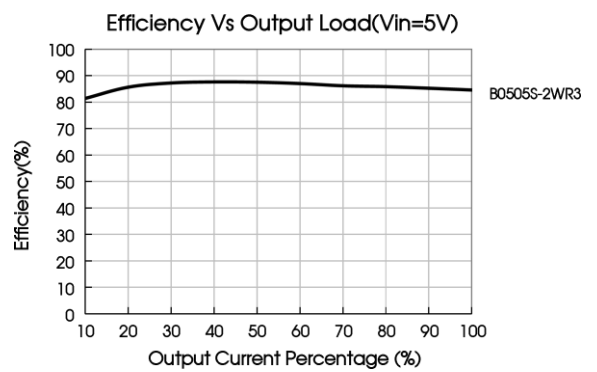
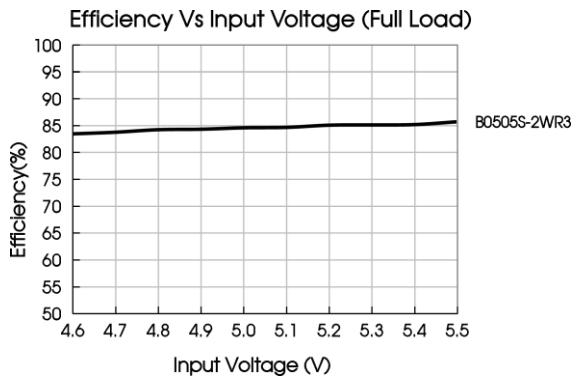


Fig. 2



Design Reference

1. Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig. 3. Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problem caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

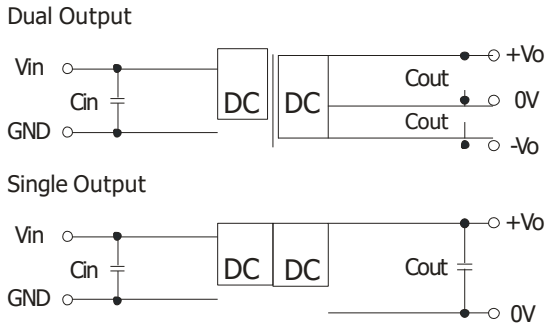


Fig. 3

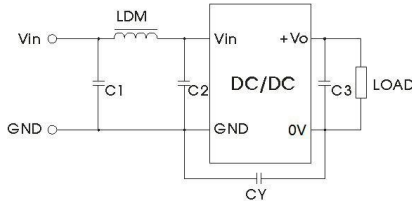
Table 1: Recommended input and output capacitor values

Vin	Cin	Single Vout	Cout	Dual Vout	Cout*
5VDC	10 μ F/16V	3.3VDC	10 μ F/16V	\pm 3.3VDC	4.7 μ F/16V
12VDC	2.2 μ F/25V	5VDC	10 μ F/16V	\pm 5VDC	4.7 μ F/16V
15VDC	2.2 μ F/25V	7.2VDC	10 μ F/16V	\pm 7.2VDC	2.2 μ F/25V
24VDC	1 μ F/50V	9VDC	2.2 μ F/25V	\pm 9VDC	2.2 μ F/25V
-	-	12VDC	2.2 μ F/25V	\pm 12VDC	1 μ F/25V
-	-	15VDC	1 μ F/25V	\pm 15VDC	1 μ F/25V
-	-	24VDC	1 μ F/50V	\pm 24VDC	0.47 μ F/50V

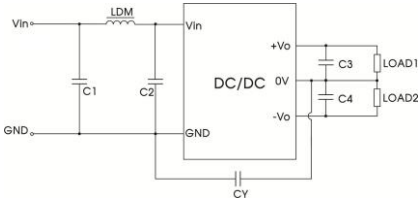
Note: *The capacitor value of the positive and the negative output is identical.

2. EMC compliance circuit

Single Output



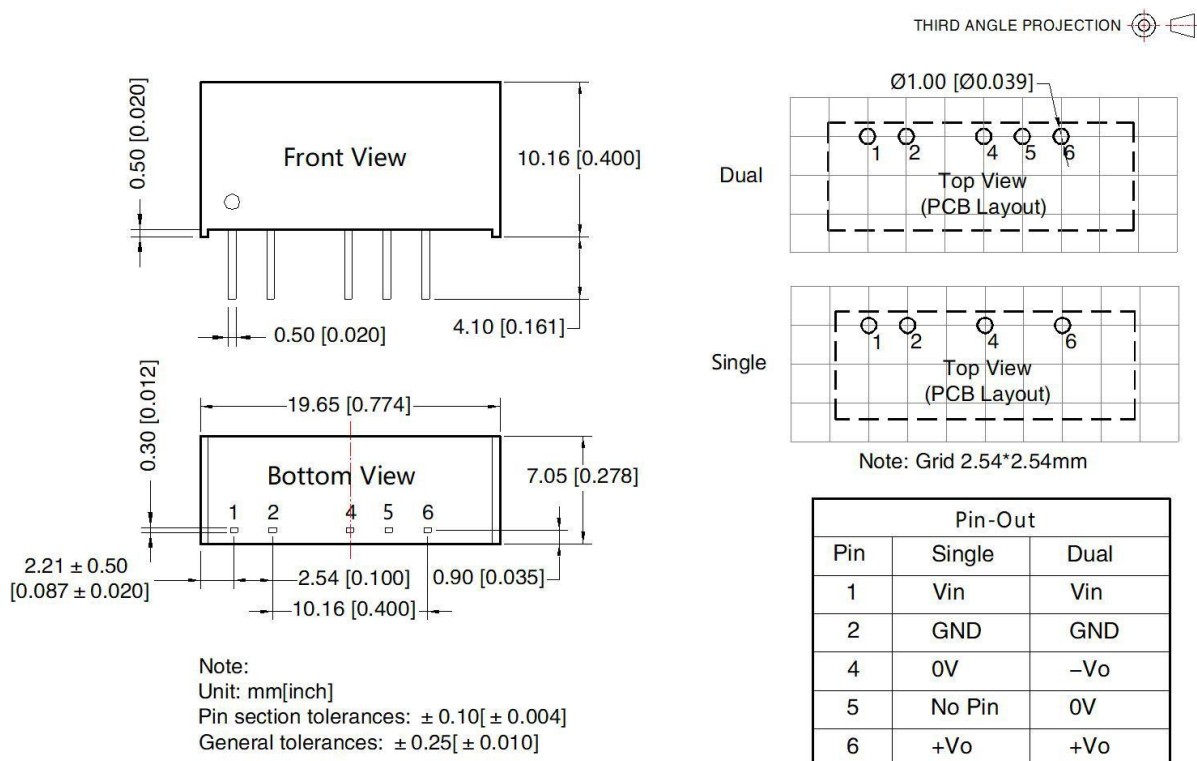
Dual Output



Input voltage		5 VDC	12/15/24 VDC
Emissions	C1/C2	4.7 μ F /16V	4.7 μ F /50V
	CY	270pF/2kV	
	C3	Refer to Cout in Fig. 3	
	LDM	6.8 μ H	

Input voltage		5 VDC	12/15/24 VDC
Emissions	C1/C2	4.7 μ F /16V	4.7 μ F /50V
	CY	270pF/2kV	
	C3/C4	Refer to Cout in Fig. 3	
	LDM	6.8 μ H	

Dimensions and Recommended Layout



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 $T_a=25^{\circ}\text{C}$, 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;