Features

1)Continuous short-circuit protection
2)No-load input current as low as 8mA
3)Operating ambient temperature range: -40℃ to +105℃
4)High efficiency up to 85%
5)I/O isolation test voltage: 1.5k VDC
6)Industry standard pin-out

RoHS CE 3 years Warranty

Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF) Max.
	Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
B0303D-1WR3	3.3 (2.97-3.63)	3.3	303/30	75/79	2400
B0305D-1WR3		5	200/20	78/82	2400
B0503D-1WR3	5 (4.5-5.5)	3.3	303/30	70/74	2400
B0505D-1WR3		5	200/20	78/82	2400
B0507D-1WR3		7.2	139/13	76/80	1000
B0509D-1WR3		9	111/12	79/83	1000
B0512D-1WR3		12	84/9	79/83	560
B0515D-1WR3		15	67/7	79/83	560
B0524D-1WR3		24	42/4	81/85	220
B1203D-1WR3	12 (10.8-13.2)	3.3	303/30	71/75	2400
B1205D-1WR3		5	200/20	76/80	2400
B1209D-1WR3		9	111/12	74/78	1200
B1212D-1WR3		12	83/9	76/80	560
B1215D-1WR3		15	67/7	77/81	560
B1224D-1WR3		24	42/5	77/81	220
B1505D-1WR3	15 (13.5-16.5)	5	200/20	76/80	2400
B1509D-1WR3		9	111/12	76/80	1200
B1515D-1WR3		15	67/7	77/81	560
B2403D-1WR3	24 (21.6-26.4)	3.3	303/30	69/75	2400
B2405D-1WR3		5	200/20	73/79	2400
B2409D-1WR3		9	111/12	74/80	1200
B2412D-1WR3		12	83/9	75/81	560
B2415D-1WR3		15	67/7	75/81	560
B2424D-1WR3		24	42/5	75/81	220

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC input	3.3VDC output	–	384/12	405/--	mA
		5VDC output	–	370/12	389/--	
	5VDC input	3.3VDC/5VDC output	–	270/8	286/--	
Input Current (full load / no-load)	5VDC input	7.2VDC/9VDC/12VDC output	–	241/8	254/--	mA
		15VDC/24VDC output	–	241/8	254/--	
	12V input	3.3VDC output	–	112/8	118/--	
		5VDC/9VDC/12VDC output	–	105/8	110/--	

		15VDC/24VDC output	**--**	**103/8**	**109/--**	
	15V input	5VDC/9VDC output	–	83/8	88/--	
		15VDC output	–	82/8	87/--	
	24V input	3.3VDC output	–	56/8	61/--	
		5VDC output	–	53/8	58/--	
		9VDC output	–	52/8	57/--	
		12VDC/15VDC/24VDC output	–	52/8	56/--	
Reflected Ripple Current*			–	15	–	
Surge Voltage(1sec. max.)	3.3VDC input		-0.7	–	5	VDC
	5VDC input		-0.7	–	9	
	12VDC input		-0.7	–	18	
	15VDC input		-0.7	–	21	
	24VDC input		-0.7	–	30	
Input Filter			Capacitance filter			
Hot Plug			Unavailable			
Note: * Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.						

Output Specifications

Item	Operating Conditions			Min.	Typ.	Max.	Unit
Voltage Accuracy				See output regulation curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output		–	–	±1.5	–
		Other output		–	–	±1.2	
Load Regulation	10%-100% load	3.3VDC intput	3.3VDC output	–	13	20	%
			5VDC output	–	11	15	
		5VDC intput	3.3VDC output	–	15	20	
			5VDC/7.2VDC output	–	10	15	
			9VDC output	–	8	10	
			12VDC output	–	7	10	
			15VDC output	–	6	10	
			24VDC output	–	5	10	
		Other intput	3.3VDC output	–	8	20	
			5VDC output	–	5	15	
			9V/12/15DC output	–	3	10	
			24VDC output	–	2	10	
Ripple & Noise*	20MHz bandwidth	B03_D-1WR3		–	50	100	mVp-p
		B05_D-1WR3	24VDC output	–	50	100	
			other output	–	30	75	
		Other intput	3.3VDC/5VDC/9VDC/12VDC/15VDC output	–	30	75	
			24VDC output	–	50	100	
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 Voltagse	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℃, (see Fig. 2)		-40	–	105	℃
Storage Temperature			-55	–	125	
Case Temperature Rise	Ta=25℃		–	25	–	
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	B03_D-1WR3	–	220	–	kHz
		B05_D-1WR3	–	300	–	
		Other intput	–	260	–	
MTBF	MIL-HDBK-217F @ 25℃		3500	–	–	k hours

Mechanical Specifications

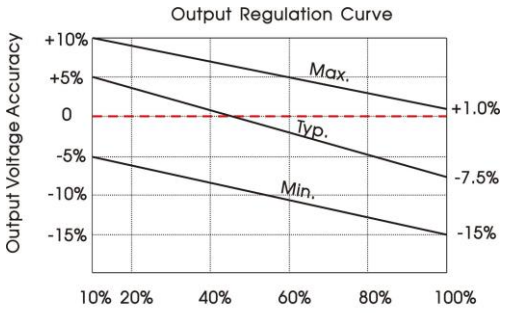
Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	12.70 x 10.16 x 8.50 mm
Weight	1.8g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

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 Figure 4 for recommended circuit test.		

Typical Performance Curves

B0303D-1WR3



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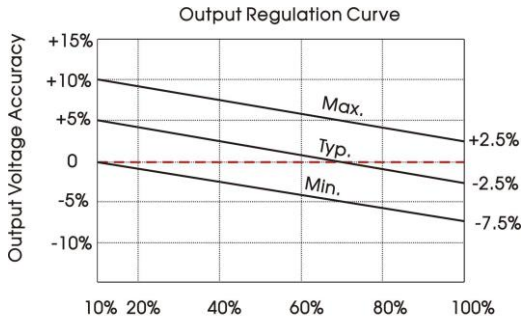
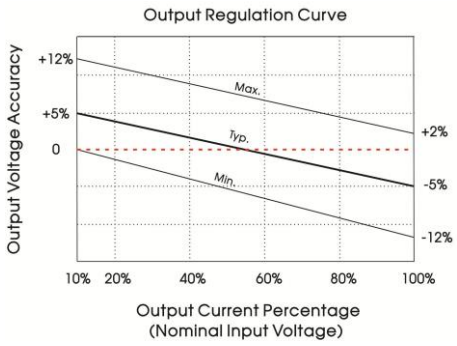


B_03D-1WR3（Except B0303D-1WR3）



Others

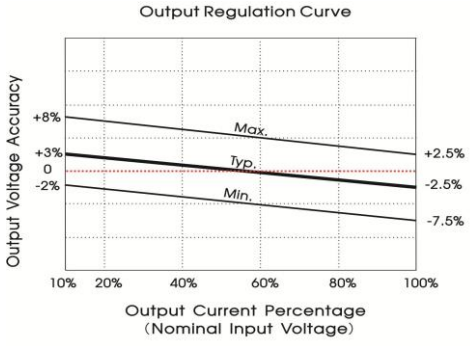


Fig. 1

Temperature Derating Curve

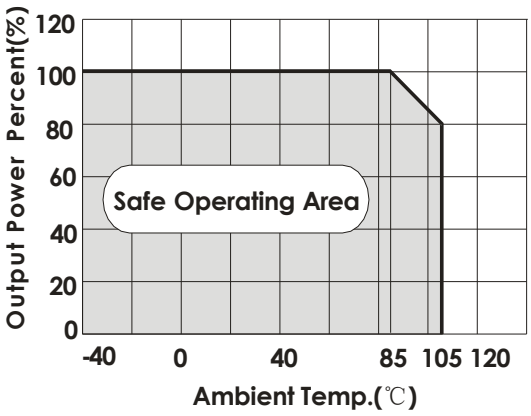
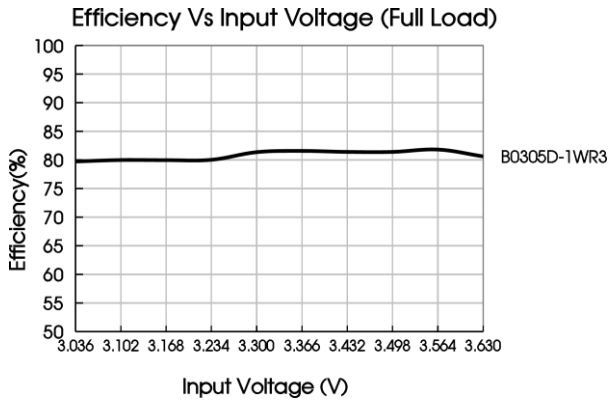
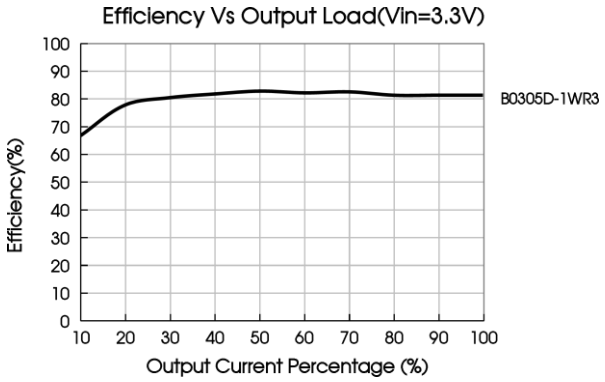
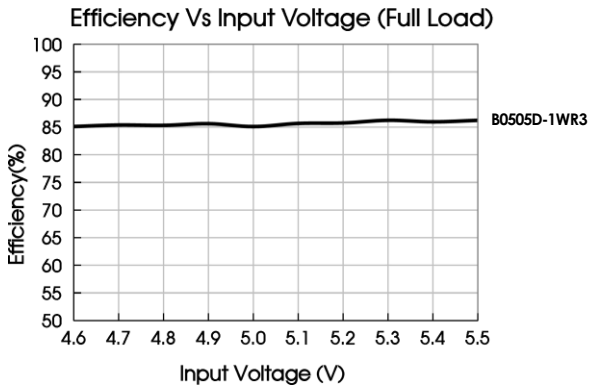
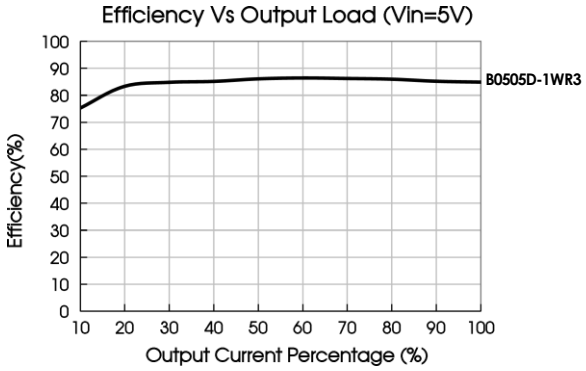


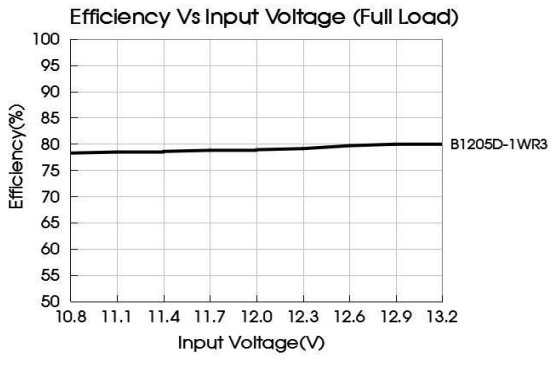
Fig. 2

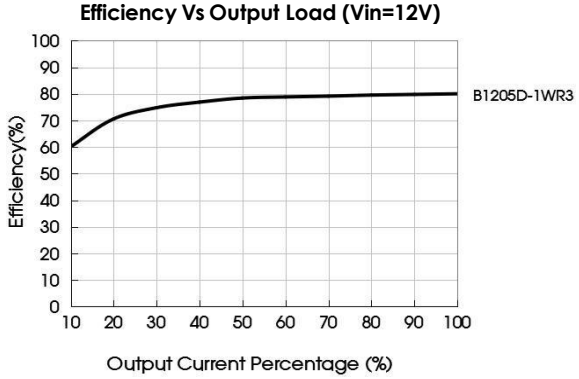


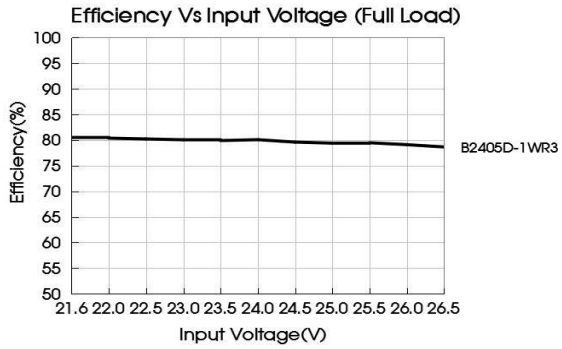


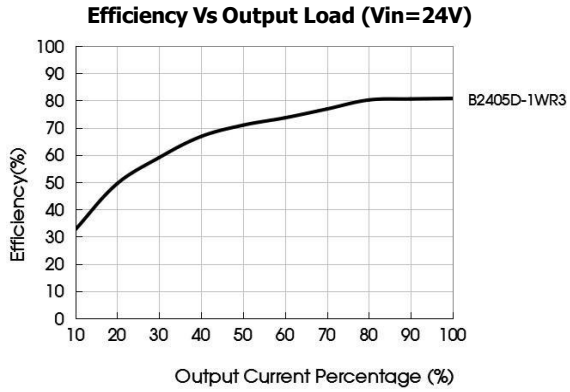












Design Reference

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 problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

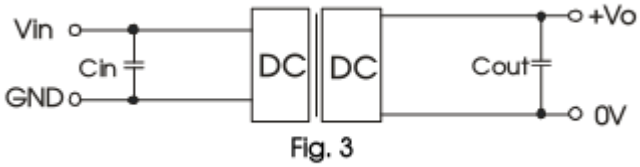


Fig. 3

Table 1: Recommended input and output capacitor values

Vin	Cin	Vo	Cout
3.3VDC	10μF/16V	3.3VDC	10μF/16V
–	–	5VDC	10μF/16V
5VDC	4.7μF/16V	3.3/5/7.2VDC	10μF/16V
–	–	9/12VDC	2.2μF/25V
–	–	15/24VDC	1μF/50V
12VDC	2.2μF/25V	3.3/5VDC	10μF/16V
15VDC	2.2μF/25V	9VDC	4.7μF/25V
24VDC	1μF/50V	12VDC	2.2μF/25V
–	–	15/24VDC	1μF/50V

2. EMC compliance circuit

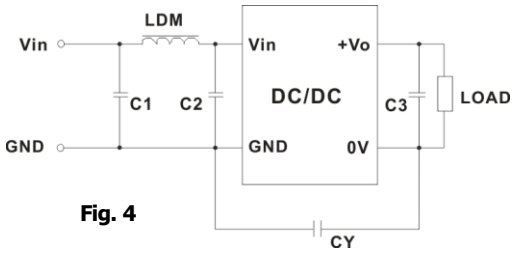


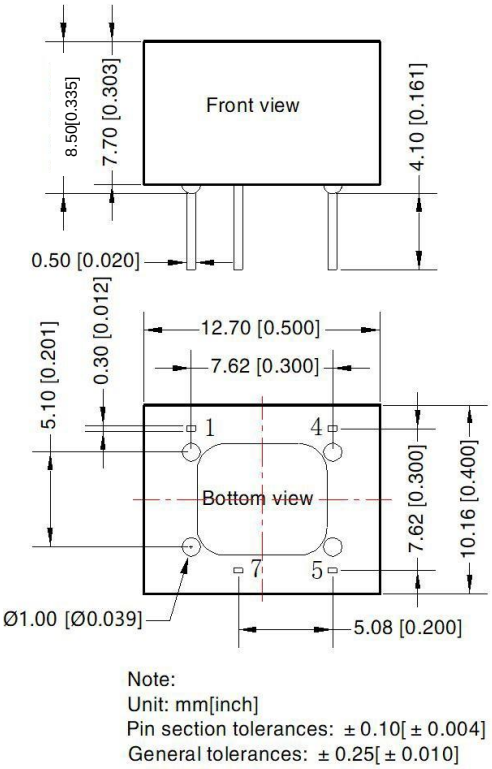
Fig. 4

Table 2: Recommended EMC filter values

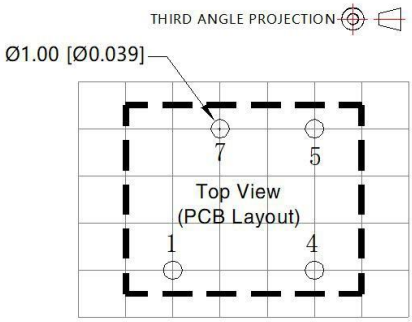
Input voltage		3.3VDC	5VDC		Other input
Output voltage		–	3.3/5/7.2/9VDC	12/15/24VDC	–
Emissions	C1/C2	4.7μF /16V	4.7μF /25V	4.7μF /25V	4.7μF /50V
	CY	270pF/2kVDC	100pF /2kVDC	1nF /2kVDC	270pF /2kVDC
	C3	Refer to the Cout in table 1			
	LDM	6.8μH			

Note: In the case of actual use, the requirements for emissions are high, it is subject to CY .

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.25[± 0.010]



Note: Grid 2.54*2.54mm

Pin–Out	
Pin	Mark
1	GND
4	Vin
5	+Vo
7	0V

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℃, 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;