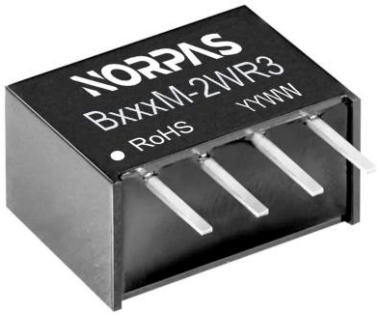
FEATURES

1. Continuous short-circuit protection
2. No-load input current as low as 8mA
3. Operating ambient temperature range: -40°C to +85°C
4. High efficiency up to 86%
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.		
B0505M-2WR3	5 (4.5-5.5)	5	400/40	77/81	2400
B0509M-2WR3		9	222/22	80/84	1000
B0512M-2WR3		12	167/17	77/81	560
B0515M-2WR3		15	133/13	77/81	560
B0524M-2WR3		24	83/8	80/84	220
B1203M-2WR3	12 (10.8-13.2)	3.3	400/40	75/79	2400
B1205M-2WR3		5	400/40	78/82	2400
B1212M-2WR3		12	167/17	80/84	560
B2405M-2WR3	24 (21.6-26.4)	5	400/40	74/80	2400
B2415M-2WR3		15	133/13	78/84	560
B2424M-2WR3		24	83/8	80/86	220

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	5VDC/12VDC/15VDC output	–	494/8	520/--	mA
		9VDC/24VDC output	–	477/8	500/--	
	12VDC input	3.3VDC output	–	140/8	147/--	
		5VDC output	–	204/8	214/--	
		12VDC output	–	199/8	209/--	
	24VDC input	5VDC output	–	105/8	113/--	
		15VDC output	–	100/8	107/--	
		24VDC output	–	97/8	104/--	
Reflected Ripple Current*			–	15	–	
Surge Voltage(1sec. max.)	5VDC input		-0.7	–	9	VDC
	12VDC input		-0.7	–	18	
	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 curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%		3.3VDC output	–	–	±1.5	–
			Other output	–	–	±1.2	
Load Regulation	10%-100% load	5VDC input	5VDC output	–	11	20	%
			9VDC/12VDC/15VDC output	–	8	15	
			24VDC output	–	6	15	
		12/24VDC input	3.3VDC output	–	10	20	
			5VDC output	–	7	15	
			12VDC output	–	7	10	
			15VDC output	–	4	10	
			24VDC output	–	3	10	
Ripple & Noise*	20MHz bandwidth	5VDC input		–	75	200	mVp-p
		12/24VDC input	Other output	–	75	180	
			24VDC output	–	200	300	
Temperature Coefficient	Full load			–	±0.02	–	%/°C
Short-circuit Protection				Continuous, self-recovery			
Notes: * 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≥71°C(see Fig. 2)		-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	
	Wave-soldering, max. 10 seconds		255	260	265	
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
		12/24VDC 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	11.60 x 7.55 x 10.16 mm
Weight	1.6g(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

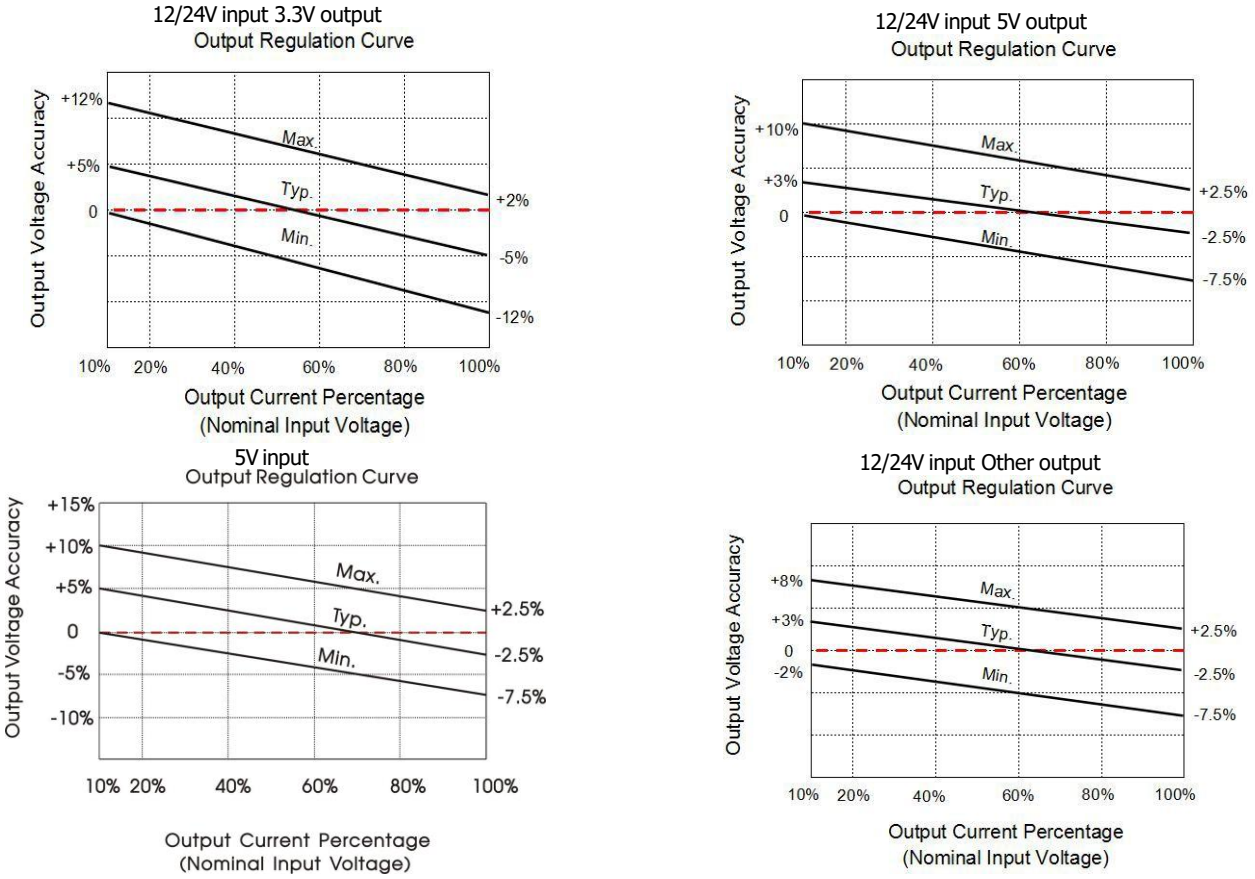


Fig. 1

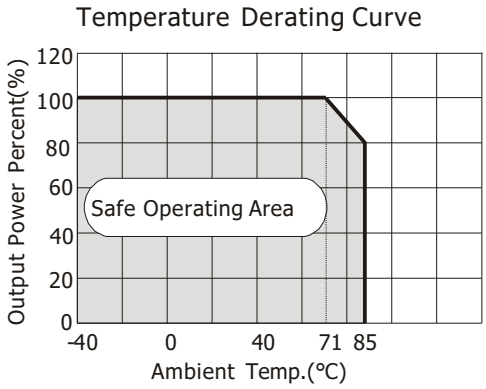
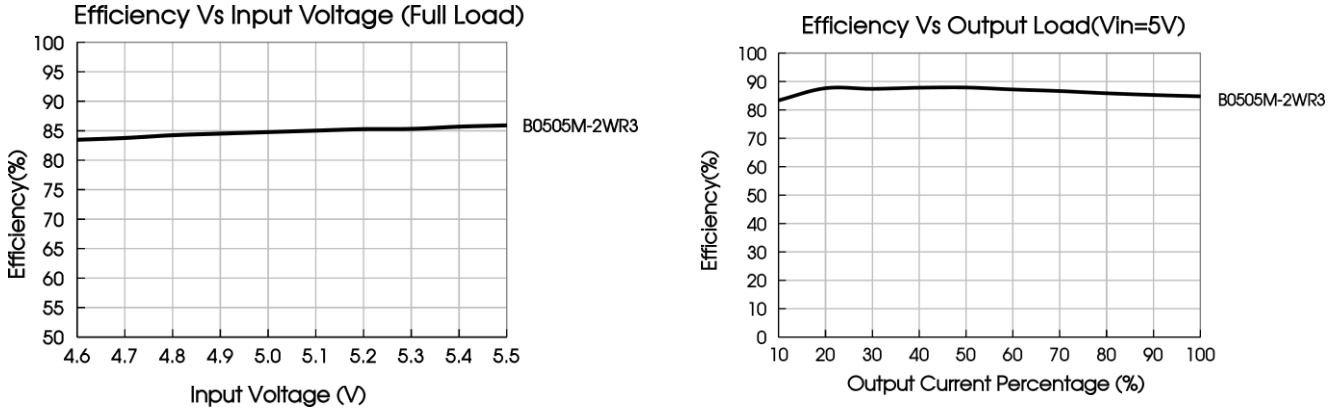
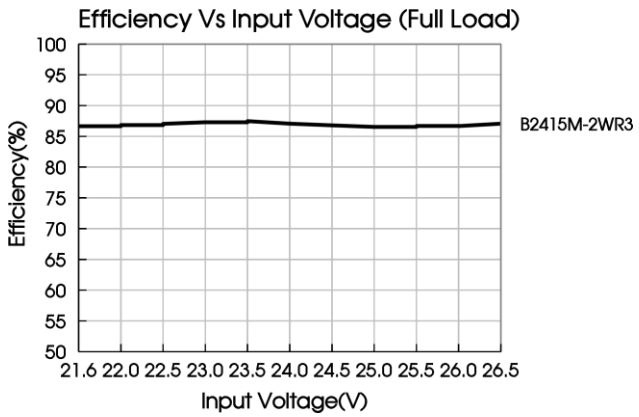
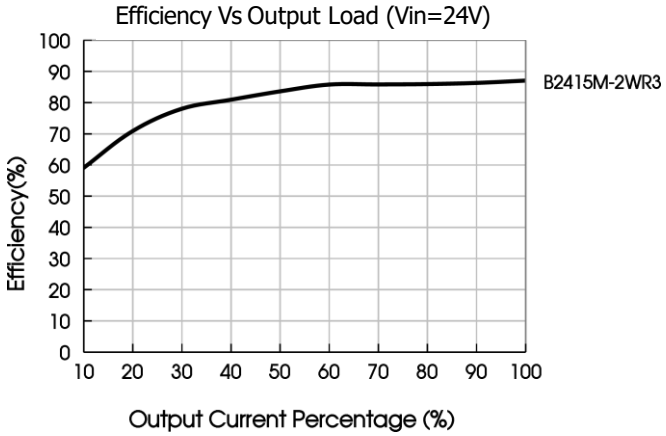


Fig. 2







Design Reference

1. Typical application circuit

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.

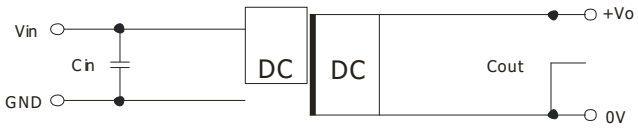


Fig. 3

Table 1: Recommended input and output capacitor values

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

2. EMC compliance circuit

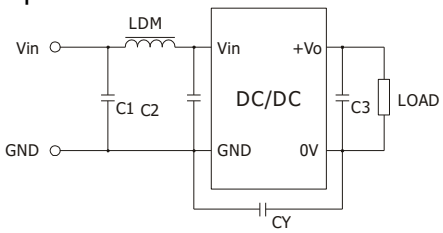
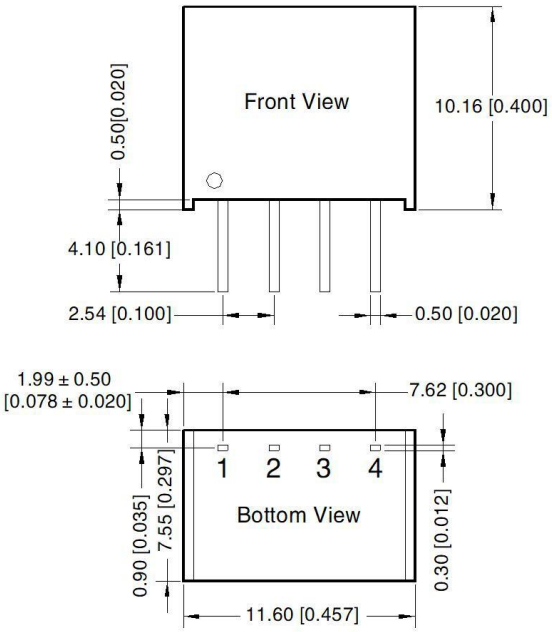
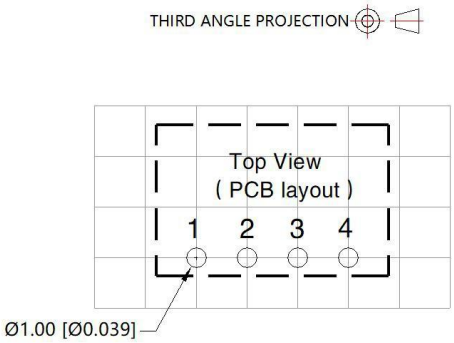


Fig. 4

Input Voltage		5V input	12/24 input
Emissions	C1/C2	4.7μF /16V	4.7μF /50V
	CY	270pF /2kV	
	C3	Refer to Cout in Fig. 3	
	LDM	6.8μH	

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm

Pin	Mark
1	GND
2	Vin
3	0V
4	+Vo

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

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;