

Features

1. Operating ambient temperature range: -40°C to +85°C
2. Compact SIP package
3. I/O isolation test voltage 3k VDC
4. High power density
5. No extra components required
6. Industry standard pin-out
7. Single output



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.		
F0505S-3WR2	5 (4.5-5.5)	5	600/60	80/84	220
F0509S-3WR2		9	333/33	80/84	
F1205S-3WR2	12 (10.8-13.2)	5	600/60	77/81	
F1212S-3WR2		12	250/25	84/88	
F1515S-3WR2	15 (13.5-16.5)	15	200/20	81/85	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	--	714/40	--/80	mA
	12VDC input	--	308/20	--/40	
	15VDC input	--	230/20	--/40	
Reflected Ripple Current*		--	15	--	
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	9	VDC
	12VDC input	-0.7	--	18	
	15VDC input	-0.7	--	21	
Input Filter		Capacitance filter			
Hot Plug		Unavailable			

Note: * Please refer to DC-DC Converter Application Note for detailed description of Reflected ripple current testing method.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Voltage Accuracy		See output regulation curve (Fig. 1)				
Linear Regulation	Input voltage change: ±1%	--	--	±1.2	--	
Load Regulation	10%-100% load	--	8	--	%	
Ripple & Noise*	20MHz bandwidth	5/9VDC output	--	150	300	mVp-p
		12VDC output	--	150	250	

		15VDC output	--	150	300	
Temperature Coefficient	Full load		--	--	±0.03	%/°C
Short-circuit Protection**			--	--	1	s

Notes: * The "parallel cable" method is used for Ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.
 ** At the end of the short circuit duration, the supply voltage must be disconnected from the modules.

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.	3000	--	--	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 up to 71°C (see Fig. 2)	-40	--	85	°C
Storage Temperature		-55	--	125	
Case Temperature Rise	Ta=25°C, nominal input, full load output	--	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	Full load, nominal input voltage	--	100	--	KHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	K hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-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 (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Contact ±6KV perf.CriteriaB	

Typical Characteristic Curves

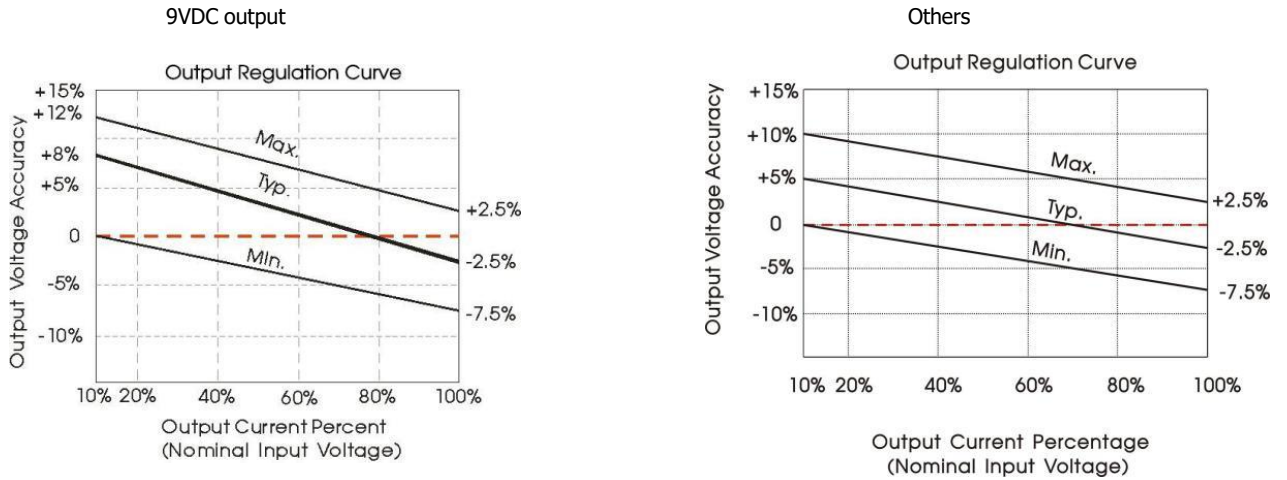


Fig. 1

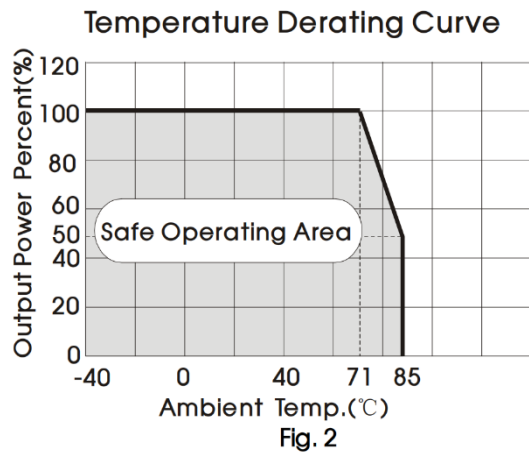
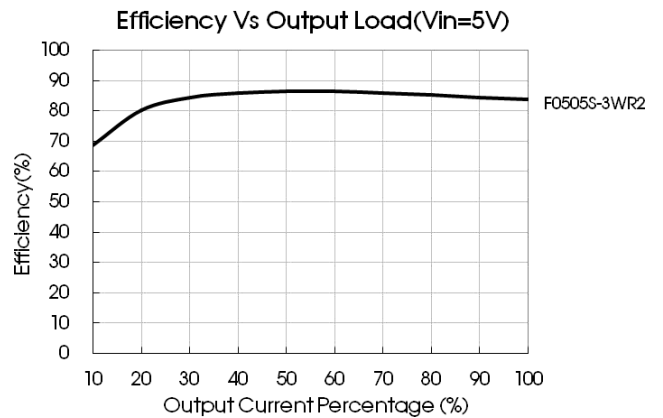
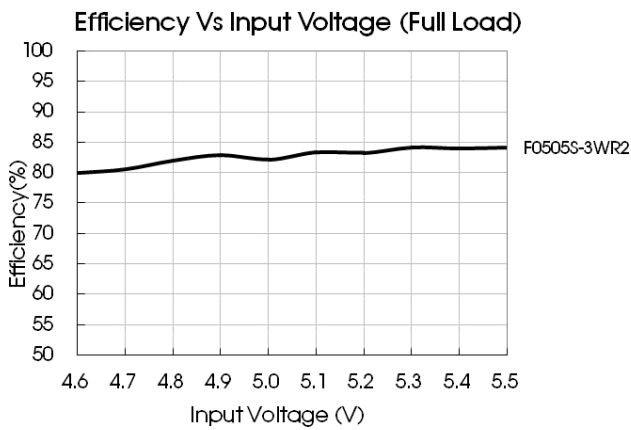


Fig. 2



Circuit Design and Application

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.

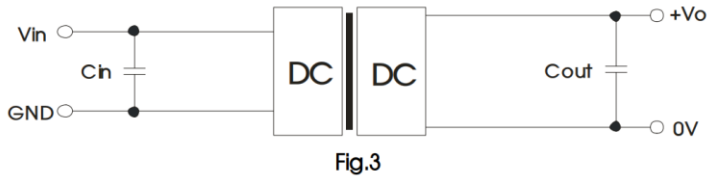


Table 1: Recommended input and output capacitor values

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	5	10
12/15	2.2	9	4.7
-	-	12/15	2.2

2. EMC(CLASS B)compliance circuit

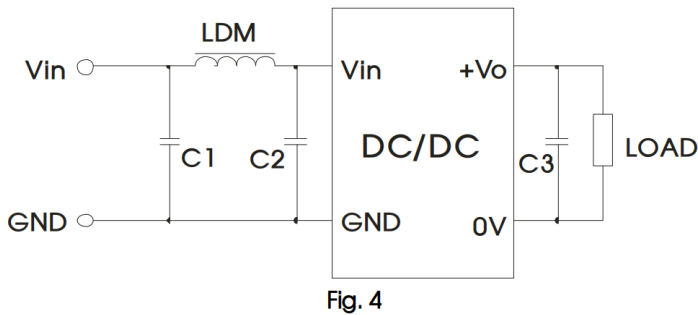


Table 2: Recommended EMC filter values

Input voltage (VDC)		5/12	15
Emissions	C1/ C2	4.7μF /50V	
	C3	Refer to the Cout in Fig.3	
	LDM	6.8μH	12μH

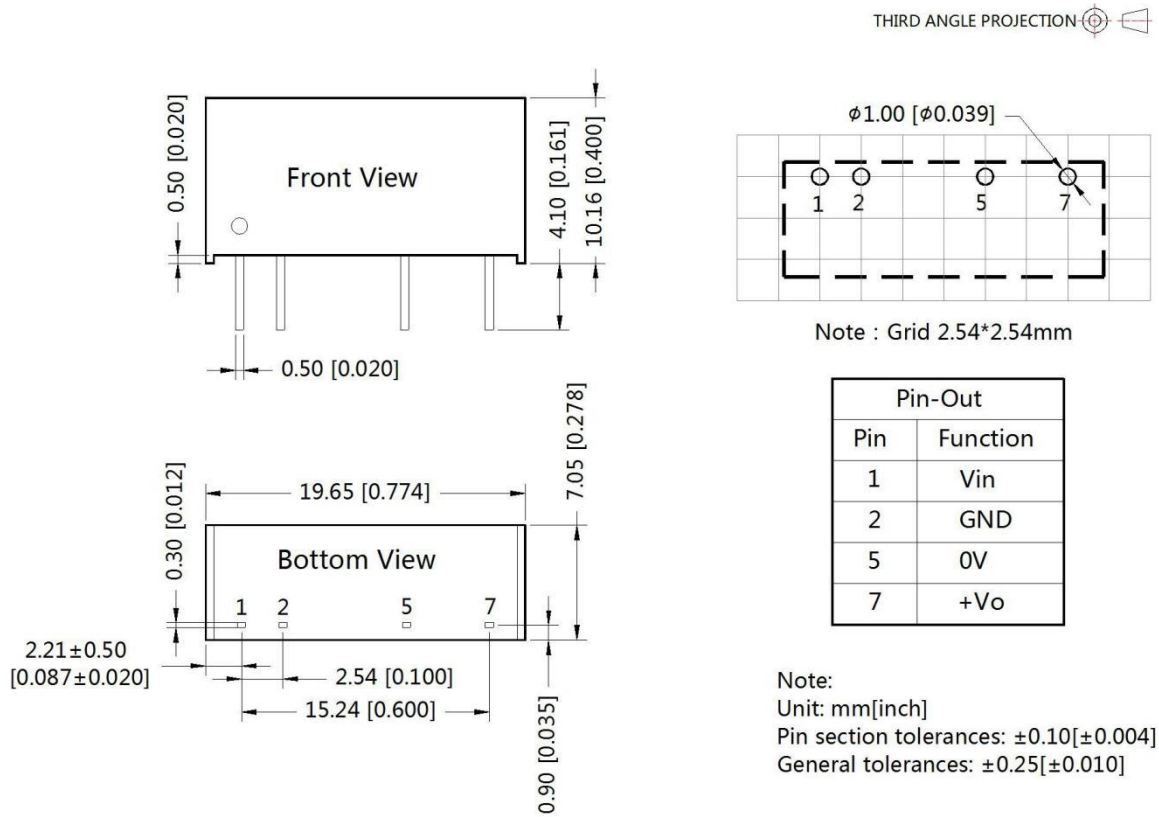
3. Minimum Output load requirement

For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output, ensuring that the sum of the power consumption is always maintained at 10% minimum.

Dimensions and Recommended Layout

Dimensions

PCB Printing Layout & Pin Definition Table



Note:

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;

NORPAS-POWER TECHNOLOGY CO., LTD.

www.norpas-power.com Mail: info@norpas-power.com

Specifications can be changed without notice! Make sure you are using the latest documentation, downloadable at www.norpas-power.com

REV:07/2024