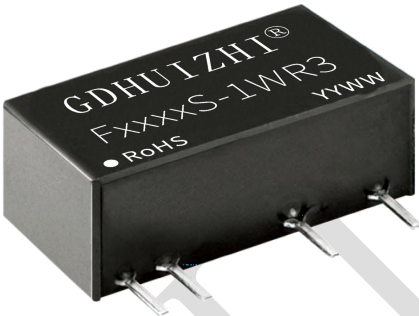


Typical Performance

- Fixed voltage input, isolated unregulated output, 1W power
- Isolation voltage 3000VDC
- Low no-load power consumption:0.025W(Typ.)
- High efficiency up to88%
- Working ambient temperature:-40℃~+85℃
- MTBF ≥ 3.5 million hours(3,500,000Hrs)
- Output short-circuit protection: Continuous short-circuit protection with auto-recover
- Compact SIP package, plastic enclosure
- Industry standard pin-out
- Low ripple/noise (20MHz bandwidth): 30mVp-p(Typ.)

1W isolated DC-DC converter Fixed input voltage, unregulated single output, DC-DC Converter



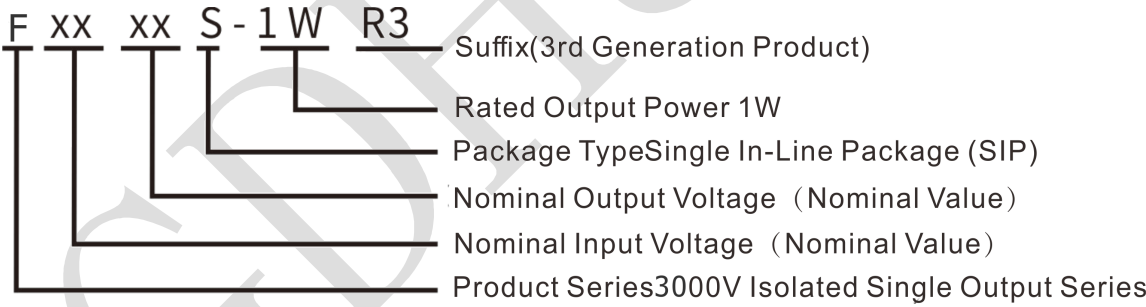
Thermal shutdown protection + non-latching short-circuit endurance

RoHS

F_S-1WR3 series----Developed by HuiZhi for customer applications:Compact, high-efficiency DC/DC converters with fixed input voltage and isolated unregulated single output, which specifically designed for applications requiring an isolated voltage from the input power source in board-level power systems.Typical use cases include:

- Input voltage stability: ±10% Vin.
- Required input-to-output isolation: 3000VDC dielectric strength
- Output Voltage Stability Tolerance
- Application:Digital logic circuits, Low-frequency analog circuitry, lectromechanical relay driving circuits,Data communication interface power.

Product Coding Rules



Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Ripple & Noise	Full Load Efficiency (%) Min./Typ.	Capacitive Load (μF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.	Full Load (mVp-p) Typ./Max.	Full Load% (Min./Typ.)	uF
	F0303S-1WR3	3.3 (2.97~3.63)	3.3	303/30	30/75	75/79	2400

	F0305S-1WR3	5 (4.5~5.5)	5	200/20	30/75	78/82	2400
	F0312S-1WR3		12	84/9	30/75	78/82	560
	F0503S-1WR3		3.3	303/30	30/75	70/74	2400
	F0505S-1WR3		5	200/20	30/75	78/82	2400
	F0509S-1WR3		9	111/12	30/75	79/83	1000
	F0512S-1WR3		12	84/9	30/75	79/83	560
	F0515S-1WR3		15	67/7	30/75	79/83	560
	F0524S-1WR3		24	42/4	50/100	81/85	220
	F0903S-1WR3	9 (8.1~9.9)	3.3	303/30	30/75	71/75	2400
	F0905S-1WR3		5	200/20	30/75	76/80	2400
	F0909S-1WR3		9	111/12	30/75	76/80	1000
	F0912S-1WR3		12	84/9	30/75	76/80	560
	F0915S-1WR3		15	67/7	30/75	77/81	560
	F0924S-1WR3		24	42/4	50/100	77/81	220
	F1203S-1WR3	12 (10.8~13.2)	3.3	303/30	30/75	71/75	2400
	F1209S-1WR3		9	111/12	30/75	76/80	1000
	F1212S-1WR3		12	84/9	30/75	76/80	560
	F1215S-1WR3		15	67/7	30/75	77/81	560
	F1224S-1WR3		24	42/4	50/100	77/81	220
	F1503S-1WR3	15 (13.5~16.5)	3.3	303/30	30/75	81/84	2400
	F1505S-1WR3		5	200/20	30/75	76/80	2400
	F1509S-1WR3		9	111/12	30/75	76/80	1000
	F1512S-1WR3		12	84/9	30/75	76/80	560
	F1515S-1WR3		15	67/7	30/75	77/81	560
	F1524S-1WR3	24 (21.6~26.4)	24	42/4	50/100	77/81	220
	F2403S-1WR3		3.3	303/30	30/80	69/75	2400
	F2405S-1WR3		5	200/20	30/75	73/79	2400
	F2409S-1WR3		9	111/12	30/75	74/80	1000
	F2412S-1WR3		12	84/9	30/75	75/81	560
	F2415S-1WR3		15	67/7	30/75	75/81	560
	F2424S-1WR3		24	42/4	50/100	75/81	220

Note: 1、Catalog shows core products only,Contact Sales for full portfolio.
2、Exceeding specified output capacitance (Cout max) will cause startup failure"

Test Conditions: Unless otherwise specified, all parameters are measured at nominal input voltage, rated resistive load, and 25°C ambient temperature.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full	3.3VDC Input	3.3VDC Output	--	384/10	405/--	mA

load / no-load)		其他 Output	--	370/18	389/--	
	5VDC Input	3.3VDC/5VDC Output	--	270/8	286/--	
		9VDC/12VDC Output	--	241/12	254/--	
		15VDC/24VDC Output	--	241/18	254/--	
	9VDC Input		--	137/8	144/--	
	12VDCInput	3.3VDC Output	--	112/8	118/--	
		5VDC/9VDC Output	--	105/8	110/--	
		12VDC/15VDC Output	--	103/8	109/--	
		24VDC Output	--	105/8	110/--	
	15VDC Input	5VDC/9VDC/12VDC Output	--	84/8	88/--	
		15VDC/24VDC Output	--	83/8	87/--	
	24VDC Input	3.3VDC Output	--	55/8	58/--	
		5VDC/9VDC/24VDC	--	53/8	57/--	
		12VDC Output	--	53/8	56/--	
		15VDC Output	--	53/8	58/--	
Reflected Ripple Current		--	15	--		
Surge Voltage(1sec. max.)	3.3VDC Input	-0.7	--	5	VDC	
	5VDC Input	-0.7	--	9		
	9VDC Input	-0.7	--	12		
	12VDC Input	-0.7	--	18		
	15VDC Input	-0.7	--	21		
	24VDC Input	-0.7	--	30		
Input Filter		Capacitance filter				
Hot Plug		Unavailable				

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Load	Load percentage		10	--	100	%
Voltage Accuracy	See output regulation curves		--	--	±15.0	%
Linear Regulation	Input voltage change: ±1%	3.3V output	--	--	±1.5	%
		Other output	--	--	±1.2	%
Load Regulation	10%-100% load	3.3VDC Output	--	18	--	%
		5VDC Output	--	12	--	%

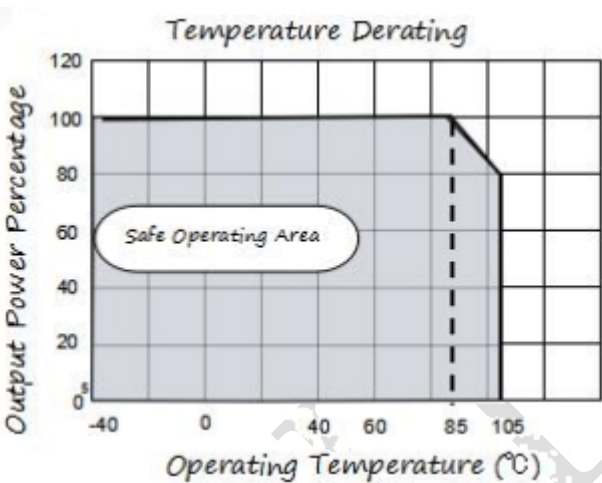
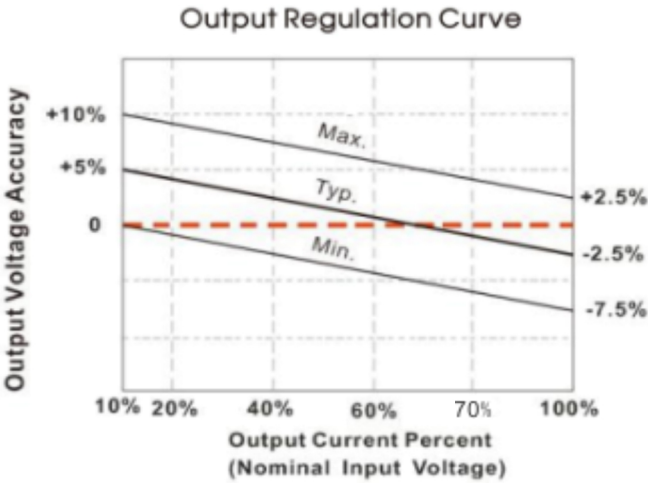
		9VDC Output	--	8	--	%
		12VDC Output	--	7	--	%
		15VDC Output	--	6	--	%
		24VDC Output	--	5	--	%
Ripple & Noise	Purely resistive load. 20MHz bandlimited	Other output	--	50	100	mVp-p
		24VDC output	--	30	75	
Temperature Coefficient	Full load	--	±0.02	--	% / °C	
Output Short-Circuit Protection	Continuous, self-recovery					

Note:Ripple & Noise: Twisted-pair method。

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	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	Reference Temperature Derating Curves	-40	--	+85	°C
Storage Temperature		-40	--	+125	
Housing temperature rise		--	25	--	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	°C
Switching Frequency	full load, nominal input voltage	--	100	--	KHz
Vibration	10-55Hz, 10G, 30 Min. along X, Y and Z				
Case Material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)				
Minimum Failure-Free Interval	MIL-HDFK-217F@25°C	3.5X10 ⁶	--	--	Hrs

Typical Characteristic Curves



Typical Application Reference Circuit (Recommended Parameters)

1. Typical application:

To further reduce the input/output ripple, a capacitive filter network can be connected at the input/output terminal, as shown in Figure 1. However, it is important to select an appropriate filter capacitor, as an excessively large capacitance may cause startup issues. For each output, the recommended capacitive load value under safe and reliable operating conditions is detailed in Table 1.



Fig 1

Table 1: Recommended input and output capacitor values

Vin (Vdc)	Cin (uF)	Vo (Vdc)	Cout (uF)
3.3/5	4.7	3.3/5	10
12	2.2	9	4.7
15	2.2	12	2.2
24	1	15	1
-	-	24	0.47

2.EMI Typical application circuit



Fig 2

Table 2: Recommended EMI filter values

Vin (Vdc)	3.3/5/12/15/24
Cin	4.7u F/50V
Cout	Refer to the Cout in table 1
Lin	4.7uH
Lout	4.7uH

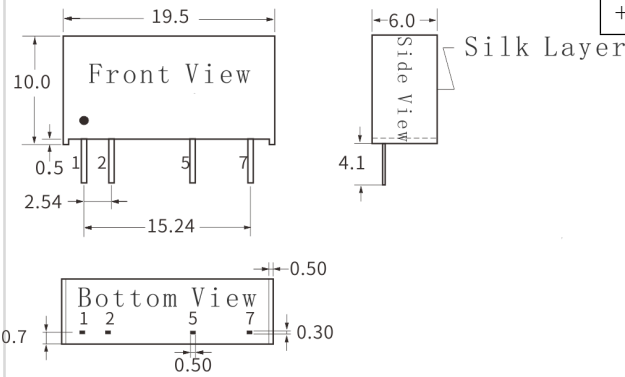
3.Output Load Requirements

To ensure reliable and efficient operation, the minimum load must not be less than 10% of the rated power. If the actual required power is lower, connect a parallel resistor at the output terminals meeting:

- (1)Resistor power dissipation $\geq$ 10% of rated power
- (2)Resistor power rating $\geq$ 5 $\times$ actual dissipation(to prevent overheating)

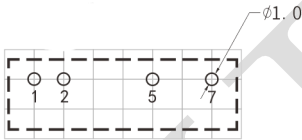
Dimensions and Recommended Layout

1.Dimensions (Unit: mm, Tolerance: ±0.25)



2.Pin Definitions

1	2	3	4	5	6	7
+Vin	-Vin	No Pin	No Pin	- Vout	No Pin	+Vout



Note: Grid 2.54*2.54mm

3.Recommended PCB Layout Guidelines

***Note:** If the pin definitions of the power module are inconsistent with the selection manual, the labels on the physical product shall prevail.

Package Description

Package Code	L x W x H	
S	19.50 x 6.0 x 10.0 mm	0.768 ×0.236 ×0.394inch

Test Application Reference

Ripple & Noise Test(Twisted Pair Method, 20MHz Bandwidth)

Test Method:

1.Measurement Setup:

Use 12#AWG twisted pair for connections.

Set oscilloscope bandwidth to 20MHz with a 100MHz probe.

Parallel connect at the probe tip:

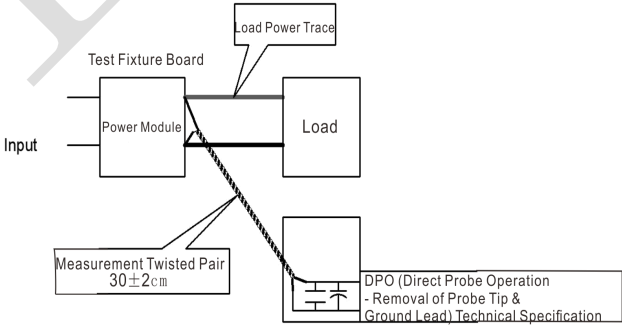
(1)0.1μF polypropylene capacitor (for high-frequency noise suppression)

(2)4.7μF low-ESR electrolytic capacitor (for mid-frequency stabilization)

Oscilloscope sampling mode: Sample mode (to avoid aliasing).

Test Schematic:

- 2.Connect the power input to the DC source.
- 3.Link the power output to an electronic load via a test fixture board.
- 4.Use a 30cm ±2cm dedicated sampling wire to directly measure output ripple at the power port.
- 5.Select insulated power wires with appropriate gauge based on output current:



Application Notes

1. Input Requirements: Ensure that the output voltage fluctuation range of the power supply does not exceed the input requirements of the DC/DC module itself, and the output power of the input power supply must be greater than the output power of the DC/DC module.
2. Recommended Circuit 1: For applications with general requirements for ripple and noise, a filter capacitor can be connected in parallel at both the input and output ends. The external circuit is shown in Figure (1) below, and the recommended values of the filter capacitors are detailed in Table (1). Output Load Requirements: Avoid no-load operation as much as possible. When the actual power consumption of the load is less than 10% of the module's rated output power or no-load occurs, it is recommended to connect an external dummy load at the output end. The dummy load (resistor) can be calculated according to 5~10% of the module's rated power, with the resistance value calculated as: $\text{Resistance} = U_{\text{out}} / (\text{Rated Power} \times 10\%)$.
3. Overload Protection: Under normal operating conditions, the output circuit of this product has no protection function against overload. Long-term overload will trigger over-temperature protection and shut down the output.
4. Continuous short-circuit protection with auto-recover
5. The capacitance value of the external capacitor at the output end should not be too large; otherwise, it may easily cause overcurrent or startup failure during module startup
6. If the product operates below the minimum required load, it cannot be guaranteed that all product performance indicators meet those specified in this manual.
7. The maximum capacitive load is tested under the conditions of input voltage range and full load.
8. Unless otherwise specified, all specifications in this manual are measured at $T_a=25^\circ\text{C}$, humidity $<75\%\text{RH}$, nominal input voltage, and rated output load.
9. All specification test methods in this manual are based on the company's internal standards.
10. We provide product customization services. For specific details, please contact our technical staff directly.
11. Product specifications are subject to change without prior notice.

联系方式

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