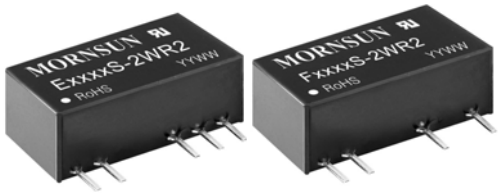
2W, Fixed input voltage, isolated & unregulated dual /single output



Continuous Short Circuit Protection

3 years Warranty

Patent Protection RoHS

FEATURES

- Continuous short-circuit protection
- Operating temperature range: -40℃ to +105℃
- High efficiency up to 86%
- High power density
- Miniature SIP package
- Isolation voltage: 3K VDC
- No external component required
- International standard pin-out

E_S-2WR2 & F_S-2WR2 series are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for

1. *Where the voltage of the input power supply is stable (voltage variation: ±10%Vin);*
2. *Where isolation between input and output is necessary (isolation voltage ≤3000VDC);*
3. *Where the output voltage regulation and the ripple & noise of the output voltage is not strictly required;*
4. *Typical application: digit circuit condition; normal low-frequency artificial circuit condition; relay drive circuit and data switching circuit condition, etc.*

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load* (μF)
		Nominal (Range)	Output Voltage (VDC)	Output Current (mA)(Max./Min.)		
--	E0503S-2WR2	5 (4.5-5. 5)	±3.3	±303/±30	68/72	100
UL/CE	E0505S-2WR2		±5	±200/±20	76/80	
	E0509S-2WR2		±9	±111/±11	80/84	
	E0512S-2WR2		±12	±83/±8	79/83	
	E0515S-2WR2		±15	±67/±7	78/82	
	E0524S-2WR2		±24	±42/±4	80/84	
--	F0503S-2WR2		3.3	400/40	75/79	220
UL/CE	F0505S-2WR2		5	400/40	78/82	
	F0509S-2WR2		9	222/22	78/82	
	F0512S-2WR2		12	167/17	78/82	
	F0515S-2WR2		15	133/13	79/83	
	F0524S-2WR2		24	83/8	80/84	
--	E1203S-2WR2	12 (10.8-13.2)	±3.3	±303/±30	71/75	100
UL/CE	E1205S-2WR2		±5	±200/±20	76/80	
	E1209S-2WR2		±9	±111/±11	80/84	
	E1212S-2WR2		±12	±83/±8	80/84	
	E1215S-2WR2		±15	±67/±7	80/84	
	F1205S-2WR2		5	400/40	78/82	220
	F1209S-2WR2		9	222/22	77/81	
	F1212S-2WR2		12	167/17	80/84	
	F1215S-2WR2		15	133/13	81/85	
	F1224S-2WR2		24	83/8	82/86	
--	E1515S-2WR2	15 (13.5-16.5)	±15	±67/±7	80/84	100
	F1505S-2WR2		5	400/40	76/80	220
	F1509S-2WR2		9	222/22	76/80	
	F1512S-2WR2		12	167/17	77/81	

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UL/CE	E2405S-2WR2	24 (21.6-26.4)	±5	±200/±20	76/80	100
	E2409S-2WR2		±9	±111/±11	80/84	
	E2412S-2WR2		±12	±83/±8	80/84	
	E2415S-2WR2		±15	±67/±7	80/84	
	F2405S-2WR2		5	400/40	76/80	220
	F2409S-2WR2		9	222/22	82/86	
	F2412S-2WR2		12	167/17	80/84	
	F2415S-2WR2		15	133/13	82/86	
--	F2418S-2WR2		18	111/11	82/86	
UL/CE	F2424S-2WR2		24	83/8	82/86	

Note: *The capacitive loads of positive and negative outputs are the same.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	506/35	--/60	mA
	12V input	--	208/20	--/50	
	15V input	--	159/15	--/35	
	24V input	--	104/10	--/30	
Reflected Ripple Current		--	15	--	mA
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
	15V input	-0.7	--	21	
	24V input	-0.7	--	30	
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1)			
Line Regulation	Input voltage change: ±1%	3.3VDC output	--	--	±1.5	--
		Other output	--	--	±1.2	
Load Regulation	10%-100% load	3.3VDC output	--	18	--	%
		5VDC output	--	12	--	
		9VDC output	--	9	--	
		12VDC output	--	8	--	
		15VDC/18VDC output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth		--	75	200	mVp-p
Temperature Coefficient	Full load		--	--	±0.03	%/℃
Short Circuit Protection**	E24xxS-2WR2/F24xxS-2WR2/E0524S-2WR2/F0524S-2WR2		--	--	1	s
	Others		Continuous, self-recovery			

Note: * Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation;
**Supply voltage must be discontinued at the end of short circuit duration forE24xxS-2WR2/F24xxS-2WR2 series, and E0524S-2WR2/F0524S-2WR2 models.

General Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA		3000	--	--	VDC
Isolation Resistance	Input-output, isolation voltage 500VDC		1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	E2415S-2WR2/F2424S-2WR2	--	50	--	pF
		Other models	--	20	--	

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Operating Temperature	Derating when operating temperature up to 85℃, (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25℃, nominal input, full load output	--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	Full load, nominal input voltage	--	100	--	KHz
MTBF	MIL-HDFK-217F@25℃	3500	--	--	K hours

Physical Specifications

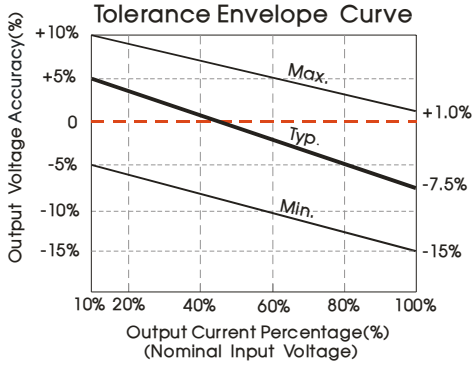
Casing Material	Plastic (UL94-V0)
Package Dimensions	19.65*7.05*10.16 mm
Weight	2.4g (Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE		CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
	RE		CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
EMS	ESD	E_S-2WR2	IEC/EN61000-4-2	Contact ±6KV perf. Criteria B
		F_S-2WR2	IEC/EN61000-4-2	Contact ±8KV perf. Criteria B

Product Characteristic Curve

3.3VDC output



Other output

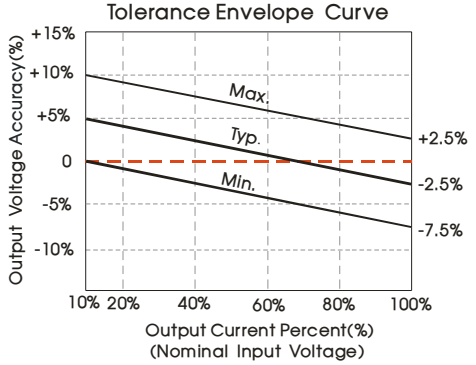


Fig. 1

Temperature Derating Curve

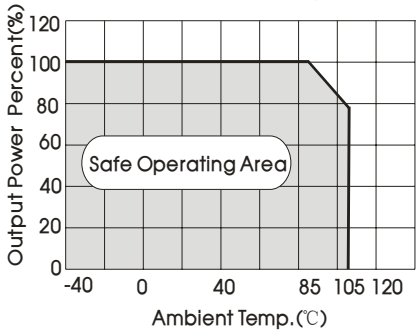
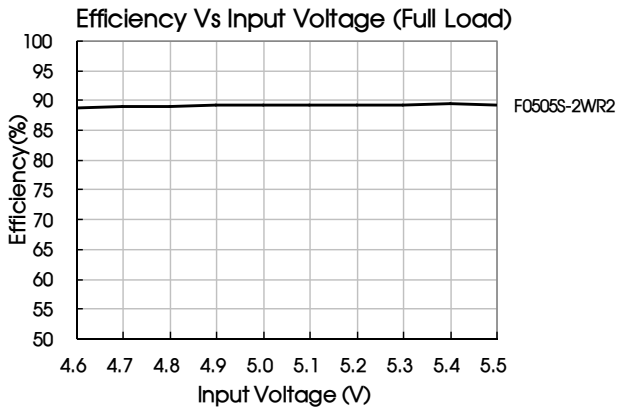
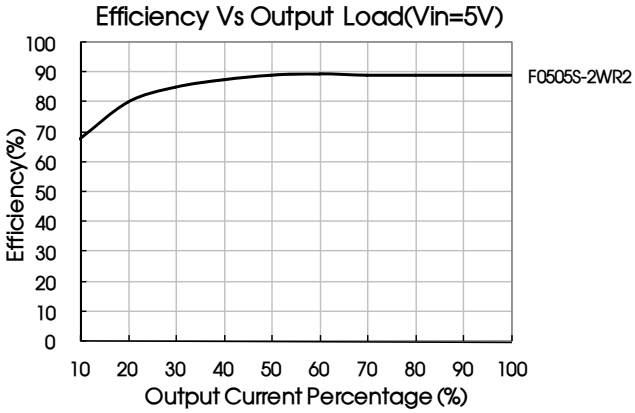
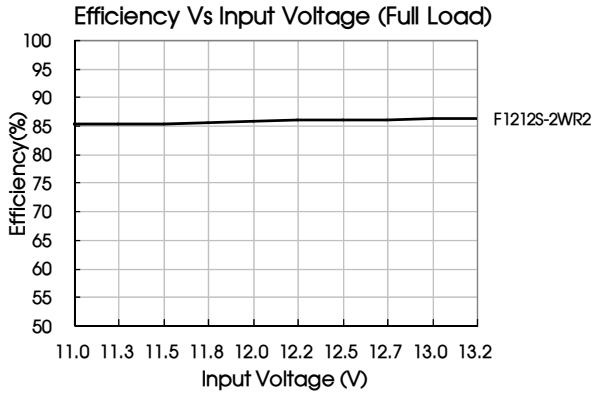


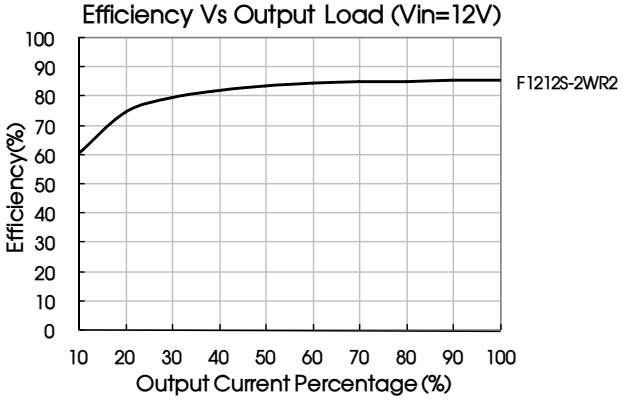
Fig. 2

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Design Reference

1. Typical application

If it is required to further reduce input and output ripple, a filter capacitor can be connected to the input and output terminals, see Fig.3. Moreover, choosing suitable filter capacitor is very important , start-up problems may be caused by too large capacitance. To ensured the modules running well, the recommended capacitive load values as shown in Table 1.

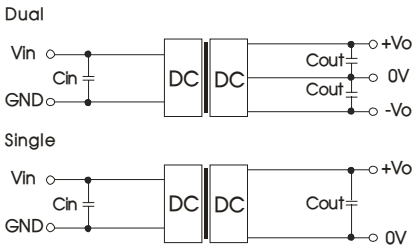


Fig.3

Recommended capacitive load value table (Table 1)

Vin (VDC)	Cin (μF)	Single Vout (VDC)	Cout (μF)	Dual Vout (VDC)	Cout# (μF)
5	4.7	3.3/5	10	±3.3/±5	4.7
12/15	2.2	9/12	2.2	±9/±12	1
24	1	15/18/24	1	±15/±24	0.47

Note: #The capacitive loads of positive and negative outputs are the same..

2. EMC typical recommended circuit (CLASS B)

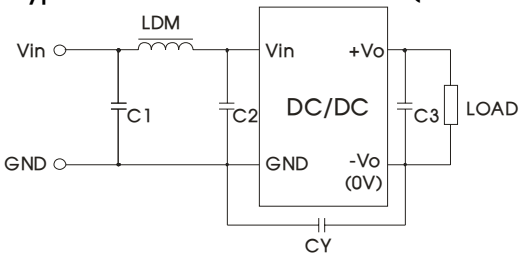


Fig. 4

Input voltage (VDC)		5/12/15	24
EMI	C1/C2	4.7μF/50V	
	CY	–	1nF/3KV
	C3	Refer to the Cout in Fig.3	
	LDM	6.8μH	

Note: 1. 24V input series, is subject to CY (CY : 1nF/3KV).
2. It is not needed to add the component in the peripheral circuit when parameter with the symbol of "--".

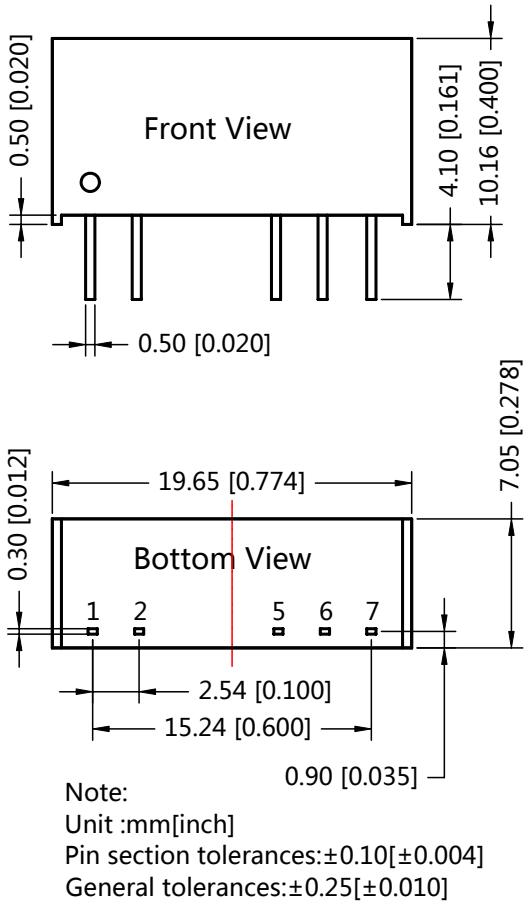
3. Output load requirements

To ensure the module work efficiently and reliably, during the operation, the min. output load should be no less than 10% of the full load. If the actual output power is low, please connect a resister to the output terminal in parallel, with a recommenced resistance which is 10% of the rated power, and derating is required during operation.

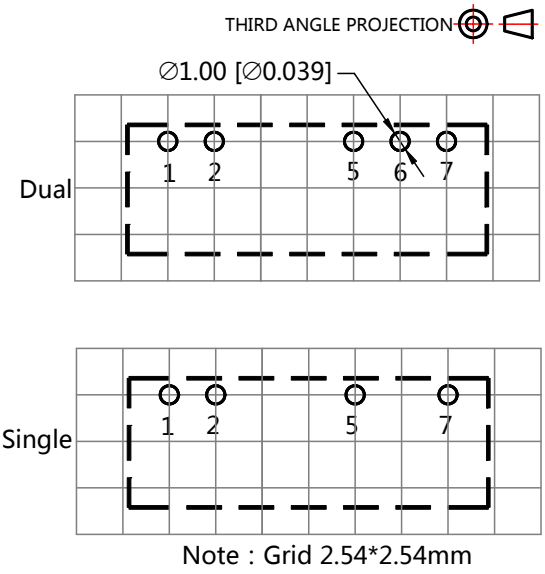
4. For more information please find the application notes on www.mornsun-power.com

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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	Single	Dual
1	Vin	Vin
2	GND	GND
5	0V	-Vo
6	No Pin	0V
7	+Vo	+Vo

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200001;
2. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
3. The maximum capacitive load offered were tested at nominal input voltage and full load;
4. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75% with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our Company's corporate standards;
6. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
7. We can provide product customization service;
8. Specifications are subject to change without prior notice.

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