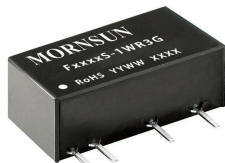


1W Isolated DC-DC converter
Fixed input voltage, unregulated dual/single output



FEATURES

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

F_S-1WR3G series are specially designed for applications where an isolated (two isolated)voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Capacitive Load(μF) Max.
		Nominal (Range)	Voltage (VDC)	Current (mA) Max./Min.		
—	F0303S-1WR3G	3.3 (2.97-3.63)	3.3	303/30	75/79	2400
	F0305S-1WR3G		5	200/20	78/82	2400
	F0309S-1WR3G		9	111/11	81/85	1000
	F0312S-1WR3G		12	83/8	78/82	560
	F0315S-1WR3G		15	67/7	78/82	560
	F0324S-1WR3G		24	42/4	80/84	220
	F0503S-1WR3G	5 (4.5-5.5)	3.3	303/30	70/74	2400
	F0505S-1WR3G		5	200/20	78/82	2400
	F05X7S-1WR3G		7	143/14	76/80	1000
	F0509S-1WR3G		9	111/12	79/83	1000
	F0512S-1WR3G		12	84/9	79/83	560
	F0515S-1WR3G		15	67/7	79/83	560
	F0524S-1WR3G		24	42/4	81/85	220

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	3.3VDC input	3.3VDC output	--	384/10	405/--	mA
		Other output	--	370/18	389/--	
	5VDC input	3.3VDC input	--	270/8	286/--	
		5VDC input	--	244/8	257/--	
		7VDC output	--	250/12	263/--	
		9VDC/12VDC input	--	241/12	254/--	
		15VDC/24VDC input	--	241/18	254/--	
Reflected Ripple Current*			--	15	--	
Surge Voltage(1sec. max.)	3.3VDC input		-0.7	--	5	VDC
	5VDC input		-0.7	--	9	
Input Filter			Capacitance filter			
Hot Plug			Unavailable			
Note: * Refer to DC-DC Converter Application Notes for detailed description of reflected ripple current test method.						

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	3.3VDC input	3.3VDC output	--	12	18	%
			Other output	--	8	15	
		5VDC input	3.3VDC output	--	15	20	
			5VDC output	--	10	15	
			7VDC output	--	10	15	
			9VDC output	--	8	10	
			12VDC output		7	10	
			15VDC output		6	10	
			24VDC output		5	10	
Ripple & Noise*	20MHz bandwidth	3.3VDC input	24VDC output	--	50	120	mVp-p
			15VDC output	--	50	100	
			Other output	--	30	75	
		5VDC input	24VDC output	--	50	100	
			Other output	--	30	75	
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.							

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	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	5VDC input	Derating when operating temperature ≥85℃, (see Fig. 2)		-40	--	105	℃
	3.3VDC input	Derating when operating temperature ≥100℃, (see Fig. 2)					
Storage Temperature				-55	--	125	
Case Temperature Rise	Ta=25℃	3.3VDC input		--	25	--	
		5VDC input	3.3VDC output		25	--	
			Other output	--	15	--	
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			--	--	95	%RH
Switching Frequency	Full load, nominal input voltage	3.3VDC input		--	220	--	kHz
		5VDC input		--	300	--	
MTBF	MIL-HDBK-217F@25℃			3500	--	--	k hours

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	19.65 x 6.00 x 10.16mm
Weight	2.1g(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 ±4kV perf. Criteria B

Note: Refer to Fig. 4 for recommended circuit test.

Typical Performance Curves

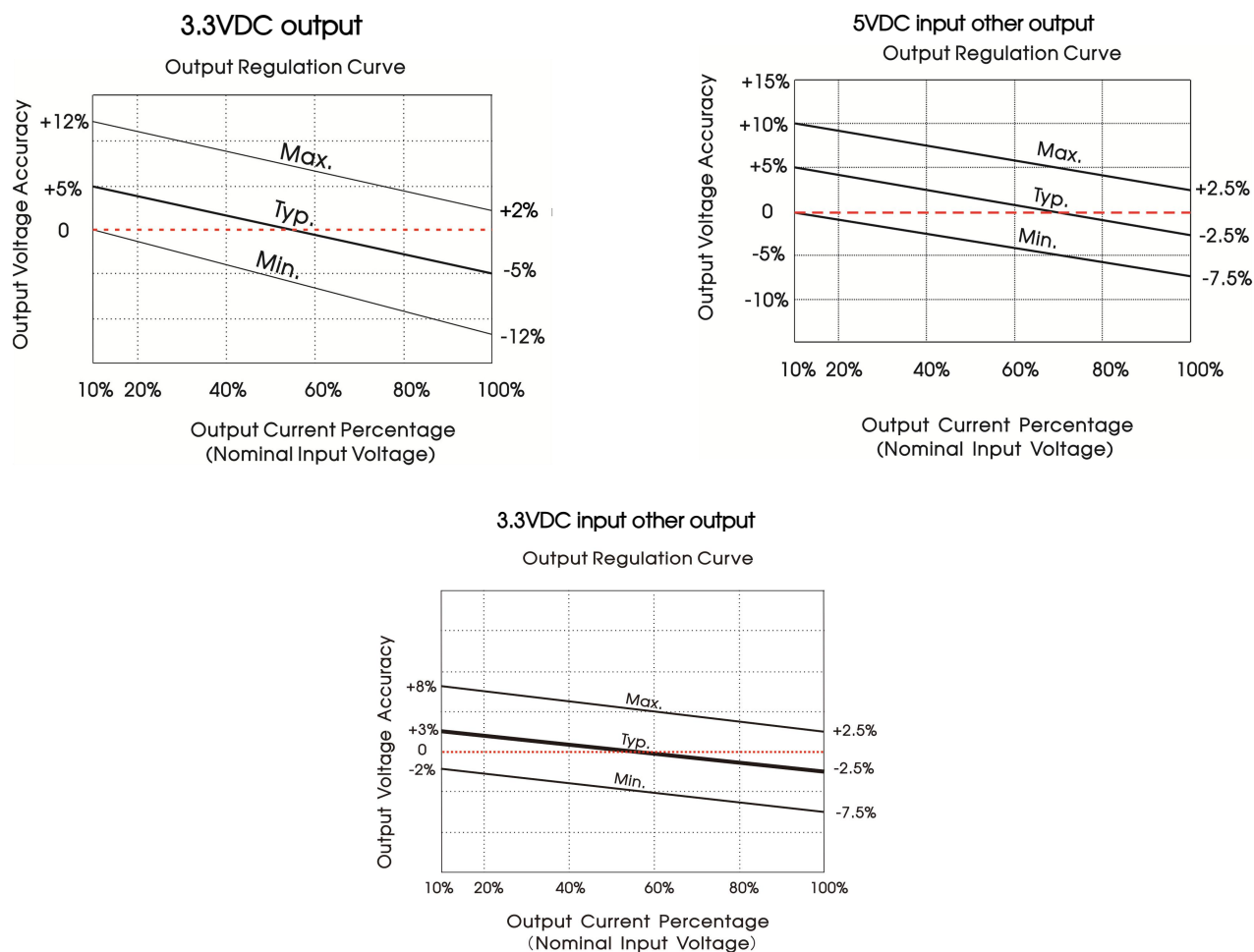


Fig. 1

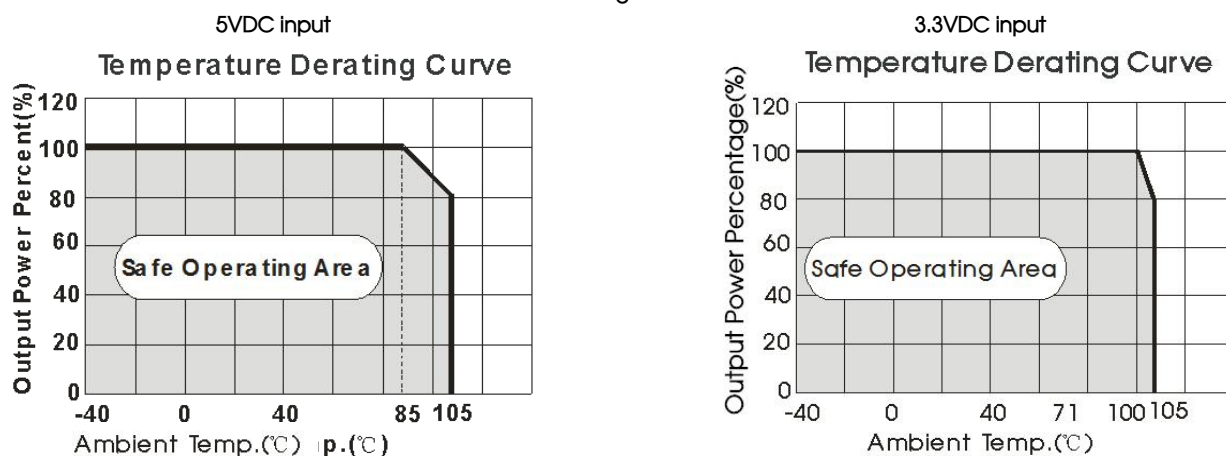
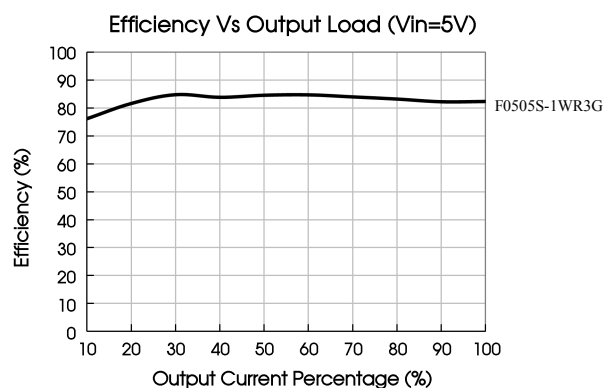
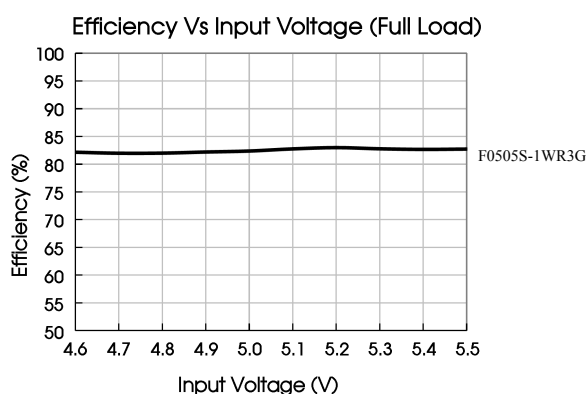
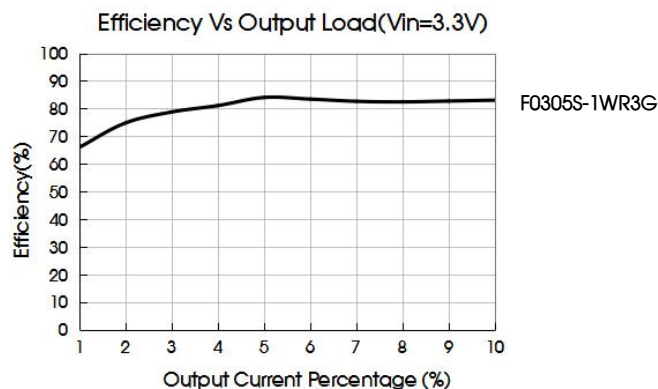
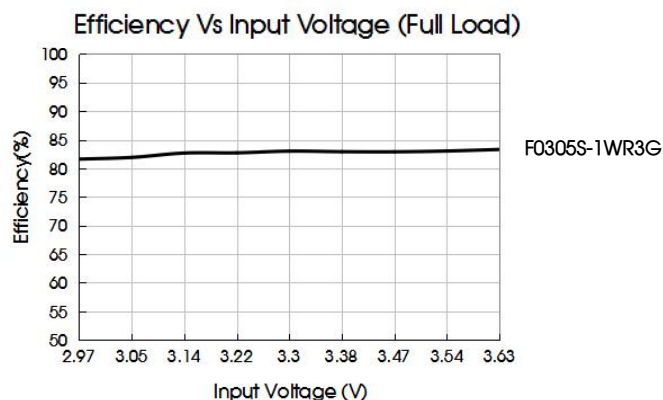


Fig. 2



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	3.3/5VDC	10μF/16V
5VDC	4.7μF/16V	7VDC	2.2μF/16V
--	--	9/12VDC	2.2μF/25V
--	--	15/24VDC	1μF/50V

2. EMC compliance circuit

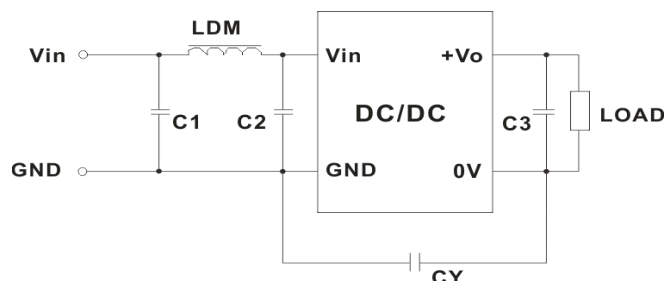


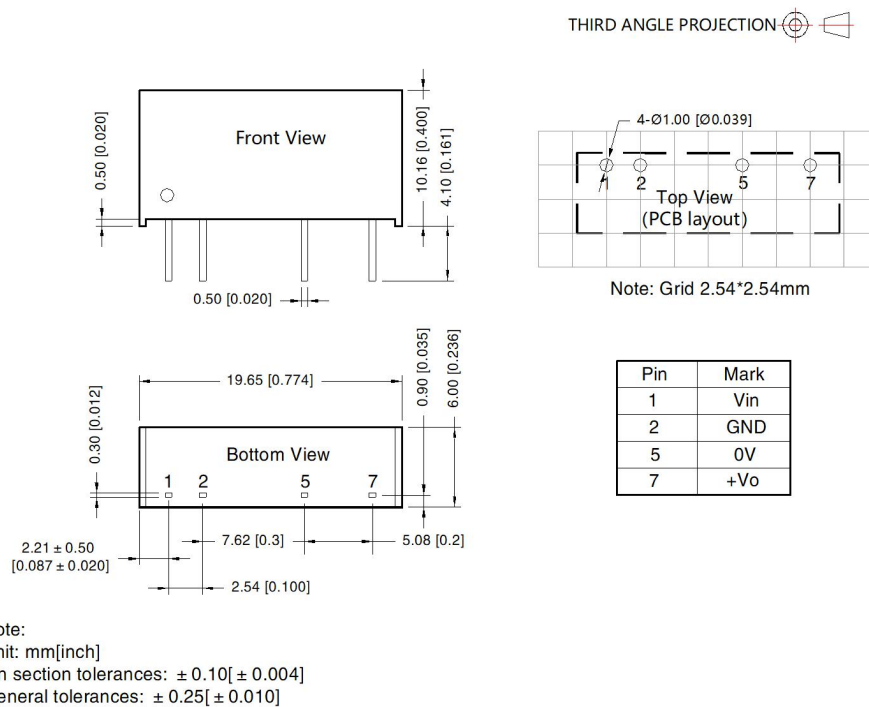
Fig. 4

Table 2: EMC recommended circuit value table

input Voltage		3.3VDC		5VDC	
Output Voltage		3.3/5VDC	9/12/15/24VDC	3.3/5/7/9 VDC	12/15/24 VDC
EMI	C1/C2	4.7uF/16V	4.7uF/16V	4.7μF /25V	4.7μF /25V
	CY	--	270pF /4kVDC	100pF /4kV	1nF /4kVDC
	C3	Refer to the Cout in table 1		Refer to the Cout in table 1	
	LDM	6.8μH		6.8μH	

3. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58200001;
- 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;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

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