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

Continuous Short Circuit Protection

Patent Protection RoHS

FEATURES

- Efficiency up to 86%
- Isolation voltage: 3KVDC
- Operating temperature range: -40℃ to +105℃
- Miniature SMD package
- Internal surface mounted design
- No external component required
- International standard pin-out

F_XT-2WR2 series is specially designed for applications where an isolated voltage is required in a distributed power supply system. It is suitable for:

1.Where the voltage of the input power supply is stable (voltage variation: ±10%Vin);

2.Where isolation is necessary between input and output (isolation voltage ≤3000VDC);

3.Where do not has high requirement of line regulation , load regulation and the ripple & noise of the output voltage;

Such as: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.

Selection Guide

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.)		
F0503XT-2WR2	5 (4.5-5.5)	3.3	400/40	68/72	220
F0505XT-2WR2		5	400/40	75/79	
F0509XT-2WR2		9	222/22	78/82	
F0512XT-2WR2		12	167/17	78/82	
F0515XT-2WR2		15	133/13	79/83	
F1205XT-2WR2	12 (10.8-13.2)	5	400/40	75/79	
F1212XT-2WR2		12	167/17	78/82	
F1215XT-2WR2		15	133/13	79/83	
F1224XT-2WR2		24	83/8	80/84	
F1515XT-2WR2	15 (13.5-16.5)	15	133/13	79/83	
F2405XT-2WR2	24 (21.6-26.4)	5	400/40	75/79	
F2412XT-2WR2		12	167/17	78/82	
F2415XT-2WR2		15	133/13	79/83	
F2424XT-2WR2		24	83/8	82/86	

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	506/30	--	mA
	12V input	--	212/25	--	
	15V input	--	169/18	--	
	24V input	--	105/15	--	
Surge Voltage (1sec. max.)	5V input	-0.7	--	9	VDC
	12V input	-0.7	--	18	
Surge Voltage (1sec. max.)	15V input	-0.7	--	21	VDC
	24V input	-0.7	--	30	
Reflected Ripple Current		--	15	--	mA
Input Filter		Capacitance Filter			

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 output	--	7	--	
		24VDC output	--	6	--	
Ripple & Noise*	20MHz bandwidth		--	100	--	mVp-p
Temperature Drift Coefficient	100% load		--	--	±0.03	%/℃
Output Short Circuit Protection**	5/12/15VDC input		Continuous, self-recovery			
	24VDC input		--	--	1	s

Notes:
* Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.
**For the products of 24V Intput voltage, supply voltage must be discontinued at the end of short circuit duration.

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, isolationvoltage 500VDC.		1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V.		--	20	--	pF
Operating Temperature	3.3V/5V output	Derating if the temperature ≥71°C, (see Fig. 2)	-40	--	105	℃
	Other output	Derating if the temperature ≥85°C, (see Fig. 2)				
Storage Temperature			-55	--	125	
Casing Temperature Rise	Ta=25℃		--	25	--	
Pin Welding Resistance Temperature	Welding spot is 1.5mm away from the casing, 10		--	--	300	
Reflow Soldering Temperature			Peak temp.≤245℃, maximum duration time≤60s at 217℃. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Storage Humidity	Non-condensing		--	--	95	%
Switching Frequency	100% load, nominal input voltage.		--	100	300	KHz
MTBF	MIL-HDFK-217F@25℃		3500	--	--	K hours

Physical Specifications

Casing Material	Black flame-retardant heat-proof epoxy resin (UL94-V0)
Package Dimensions	12.70*11.20*7.25mm
Weight	1.5g (Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	Conducted disturbance	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
	Radiated emission	CISPR22/EN55022	CLASS B (see Fig. 4 for recommended circuit)
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±6KV perf. Criteria B

Product Characteristic Curve

Tolerance Envelope Graph

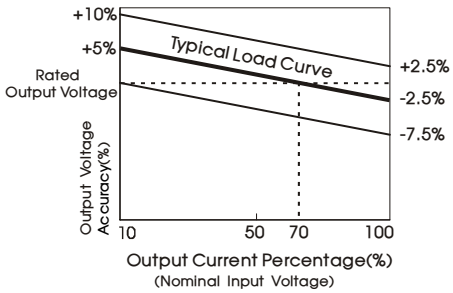


Fig. 1

Temperature Derating Graph

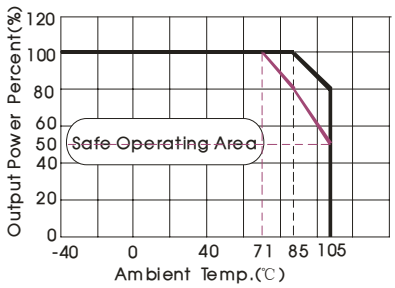
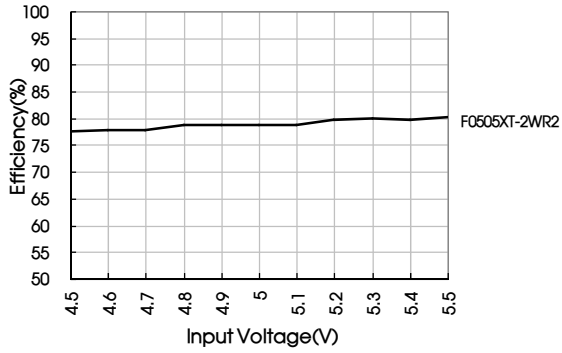
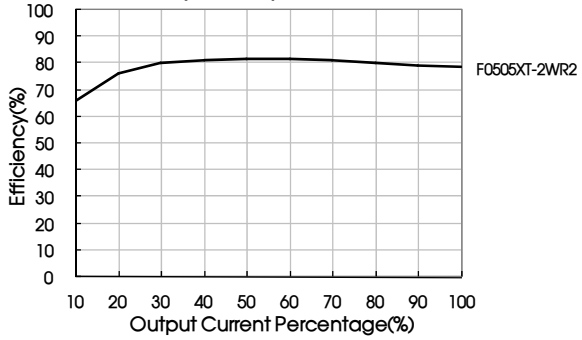


Fig. 2

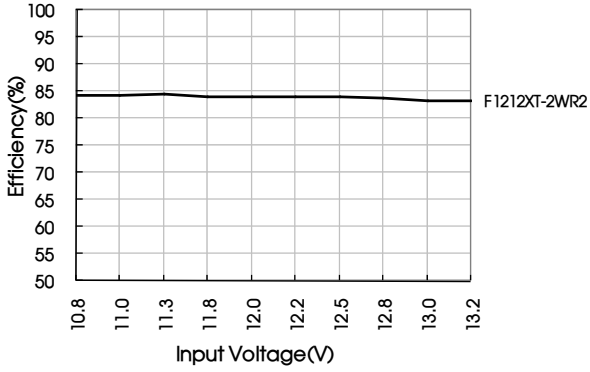
Efficiency Vs Input Voltage (Full Load)



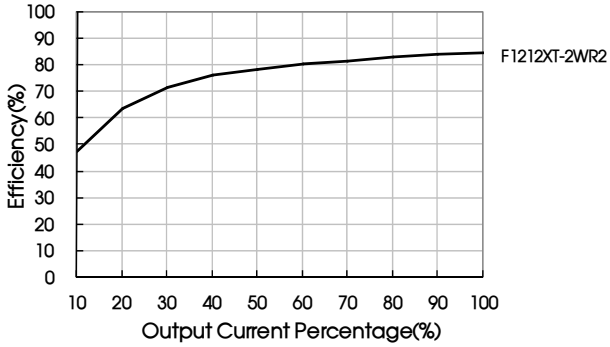
Efficiency Vs Output Load(Vin=5V)



Efficiency Vs Input Voltage (Full Load)



Efficiency Vs Output Load(Vin=12V)



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.

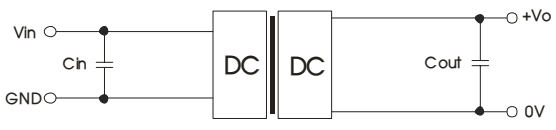


Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	3.3	10
12	2.2	5	10
15	2.2	9	4.7
24	1	12	2.2
--	--	15	1
--	--	24	0.47

It is not recommended to connect any external capacitor when output power is less than 0.5W.

2. EMC typical recommended circuit

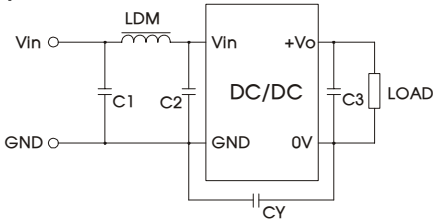


Fig. 4

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

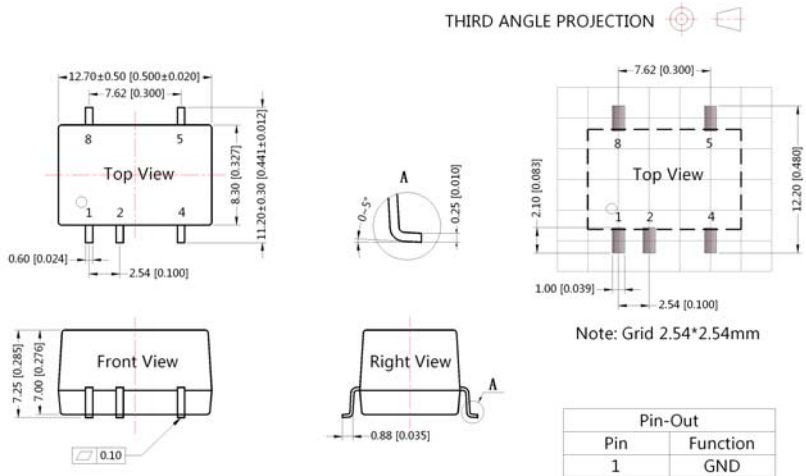
Note: 1. F2424XT-2WR2 is subject to CY (CY : 470pF/3KV).
2. It is not needed to add the component in the peripheral circuit when parameter with the symbol of "--".

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 DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Vin
4	0V
5	+Vo
8	NC

NC: No Connection

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

Notes:

1. Packing information please refer to "Product Packing Information ".Packing bag number: 58210024;
2. If the product is operated out of the min. load requirement, the product performance may not meet all parameter indexes in this datasheet;
3. The max. capacitive load offered is tested at nominal input voltage and full load;
4. Unless otherwise specified, parameter indexes in this datasheet is measured under the conditions of Ta=25°C, humidity<75% with nominal input voltage and rated output load;
5. All testing methods in this datasheet are based on our Company's corporate standards;
6. The parameter indexes above are for the modules listed in this datasheet, for non-standard module's parameter indexes, please contact our technicians for specific information;
7. We can provide custom design;
8. Specifications are subject to change without prior notice.

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