DC/DC Converter

CF0505XT-1WR3

MORNSUN®

1W, Fixed input voltage, isolated & unregulated single output

Patent Protection RoHS

FEATURES

- Continuous short-circuit protection
- Operating temperature range: -40℃ to +105℃
- Compact SMD package
- Isolation voltage: 3.5K VDC
- International standard pin-out
- Meet AEC-Q100 standards
- The production is controlled by IATF16949 system requirements

The CF0505XT-1WR3 is designed for application where isolated output is required from a distributed power system. It can be used in automobile motor control and drive system. Such as motor vehicle communication system controller, engine control system, the ignition system, the motor voltage monitoring, the electronic accelerator pedal, automobile tire pressure detection system, doors and tail lights controller, air conditioning control and battery management system (BMS), etc.

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.)		
CF0505XT-1WR3	5 (4.5-5.5)	5	200/20	78/82	2200

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	--	244/5	257/10	mA
Reflected Ripple Current*		--	15	--	mA
Surge Voltage (1sec. max.)		-0.7	--	9	VDC
Input Filter		Filter capacitor			
Hot Plug		Unavailable			

Note: * Reflected ripple current testing method please see DC-DC Converter Application Notes for specific operation.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Output Voltage Accuracy		See tolerance envelope curve(Fig. 1)			
Line Regulation	Input voltage change: ±1%	--	--	1.2	%/%
Load Regulation	10%-100% load	--	10	15	%
Ripple & Noise*	20MHz bandwidth	--	30	70	mVp-p
Temperature Coefficient	Full load	--	±0.02	--	%/℃
Short Circuit Protection		Continuous, self-recovery			

Note:*Ripple and noise are measured by "parallel cable" method, please see DC-DC Converter Application Notes for specific operation.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	3500	--	--	VDC
Insulation Resistance	Input-output, isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature up to 85℃, (see Fig. 2)	-40	--	105	℃
Storage Temperature		-55	--	125	
Casing Temperature Rise	Ta=25℃	--	15	--	
Storage Humidity	Non-condensing	--	--	95	%RH

Reflow Soldering Temperature*		Peak temp.≤245℃, maximum duration time≤60s at 217℃			
Switching Frequency	Full load, nominal input voltage	--	270	--	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours
Vibration		10-1000Hz, 1mm, 10G, alongX, Y and Z (4 cycles)			
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 2			
Note: * For actual application, please refer to IPC/JEDEC J-STD-020D.1.					

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic(UL94 V-0)
Dimensions	13.20*11.40*7.25 mm
Weight	1.4g(Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	CE	CISPR25/EN55025 CLASS 1 (see Fig. 4 for recommended circuit)
	RE	CISPR25/EN55025 CLASS 1 (see Fig. 4 for recommended circuit)
EMS	ESD	ISO10605 Air ±8kV , Contact ±4kV perf. Criteria B

Product Characteristic Curve

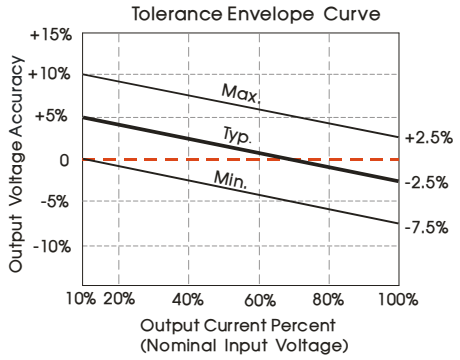


Fig. 1

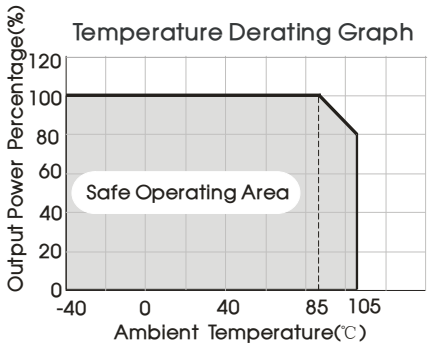
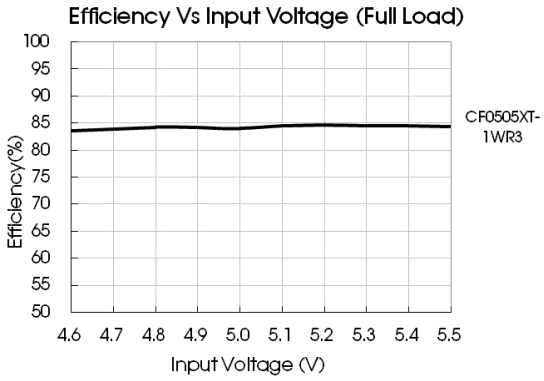
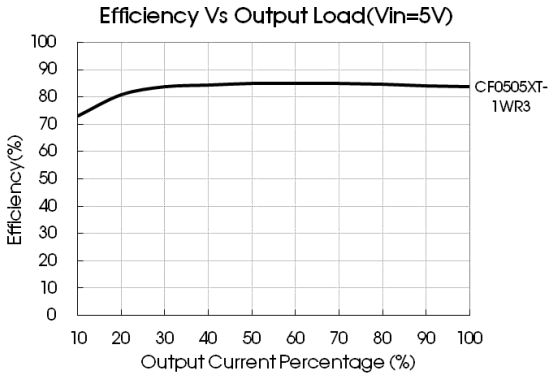


Fig. 2





Design Reference

1. Typical application circuit

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals, see Fig.3. Moreover, choosing a suitable filter capacitor is very important, start-up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in Table 1.

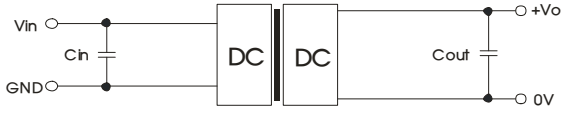


Fig.3

Recommended capacitive load value table (Table 1)

Vin(VDC)	Cin(μF)	Vo (VDC)	Cout(μF)
5	4.7	5	10

2. EMC solution-recommended circuit

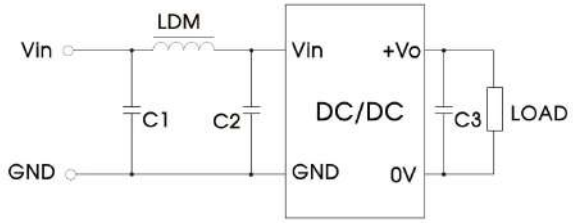


Fig. 4

EMC recommended circuit value table (Table 2)

EMI	Input voltage(VDC)	5
	C1/C2	4.7μF /25V
	C3	10μF
	LDM	6.8μH

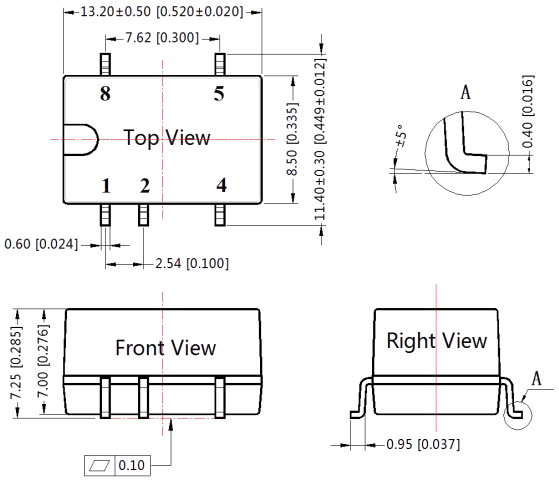
3. Output load requirements

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10% rated load when it is used. If the needed power is indeed small, please parallel a resistor on the output side (The sum of the efficient power and resistor consumption power is not less than 10%).

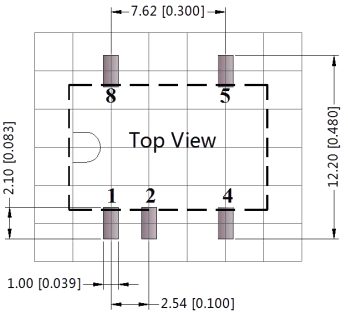
4. For more information please find DC-DC converter application notes on www.mornsun-power.com

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION



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

NC: Pin to be isolated from circuitry

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Tube Packing bag number: 58210024, Roll Packing bag number: 58200054;
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 input voltage range and full load;
4. 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;
5. About the AEC-Q100 specific test project, please contact our technicians directly for specific information;
6. All index testing methods in this datasheet are based on our Company's corporate standards;
7. We can provide product customization service, please contact our technicians directly for specific information;
8. Products are related to laws and regulations: see "Features" and "EMC";
9. 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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