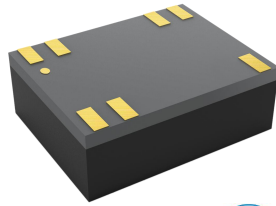


1W isolated DC-DC converter  
Fixed input voltage, unregulated single output



**UL** **CE** **CB** Patent Protection **RoHS**

## FEATURES

- Ultra-small, ultra-thin DFN package (9.00 x 7.00 x 3.10mm)
- Isolation capacitance as low as 8pF
- I/O isolation test voltage 3k VDC
- Operating ambient temperature range: -40°C to +125°C
- High efficiency up to 85%
- Continuous short-circuit protection
- IEC62368/UL62368/EN62368 approved
- AEC-Q100 approved

*B05xxMT-1WR4 series are specially designed for applications where an isolated voltage is required in a distributed power supply system and especially suitable in applications such as 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.		
UL/CE/CB	B0505MT-1WR4	5 (4.5-5.5)	5	200/20	81/85	2400

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5VDC input	--	235/7	247/15	mA
Reflected Ripple Current*		--	10	--	mA
Surge Voltage (1sec. max.)	5VDC input	-0.7	--	9	VDC
Input Filter		Capacitance filter			
Hot Plug		Unavailable			

Note: \* Please refer to DC-DC Converter Application Note for detailed description of reflected ripple current testing method.

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy		See output regulation curve (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	--	--	1.2	--
Load Regulation	10%-100% load	--	8	15	%
Ripple & Noise*	20MHz bandwidth	--	30	75	mVp-p
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.

## 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
		1500	--	--	VAC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	8	--	pF
Operating Temperature	Derating when operating temperature ≥ 105°C, (see Fig. 2)	-40	--	125	°C

Storage Temperature		-55	--	125	°C
Case Temperature Rise	Ta=25°C	--	10	--	
Storage Humidity	Non-condensing	--	--	95	%RH
Reflow Soldering Temperature*		Peak temp. ≤245°C, maximum duration time ≤60s over 217°C			
Vibration		10-150Hz, 0.75mm, 5G, 90Min. along X, Y and Z			
Switching Frequency	Full load, nominal input voltage	--	300	--	kHz
MTBF	MIL-HDBK-217F@25°C	7500	--	--	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 3			

Note: \* See also IPC/JEDEC J-STD-020D.1.

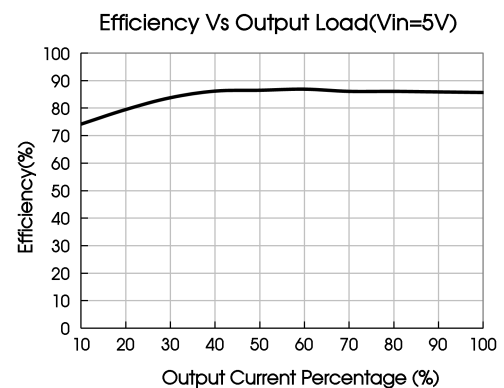
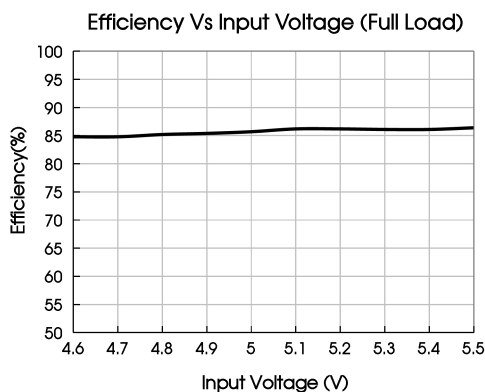
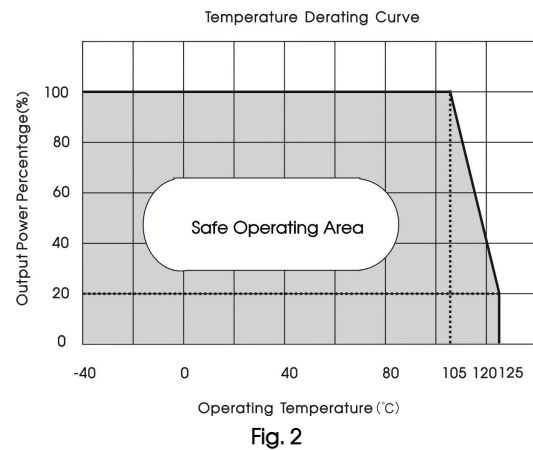
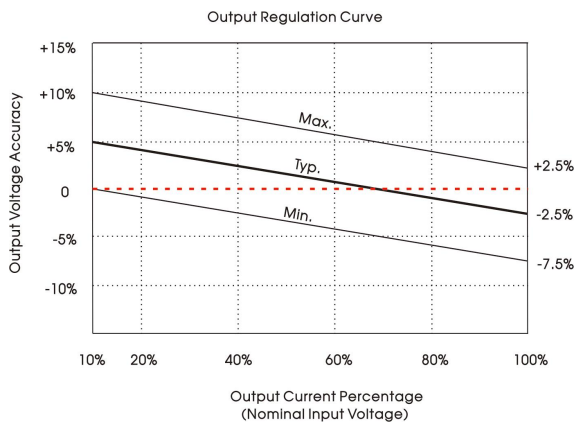
### Mechanical Specifications

Case Material	Black epoxy resin; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	9.00 x 7.00 x 3.10 mm
Weight	0.5(Typ.)
Cooling Method	Free air convection

### Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
	RE	CISPR32/EN55032	CLASS B (see Fig. 4 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2	Contact ±8kV perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m perf. Criteria A
	CS	IEC/EN61000-4-6	3Vr.m.s perf. Criteria A

### Typical Characteristic Curves



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. For recommended input and output capacitor values refer to Table 1.

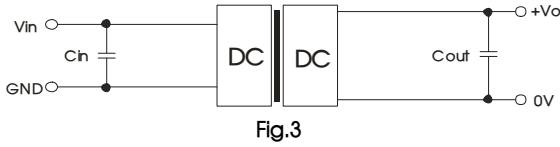


Fig.3

Table 1: Recommended input and output capacitor values

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

2. EMC (CLASS B) compliance circuit

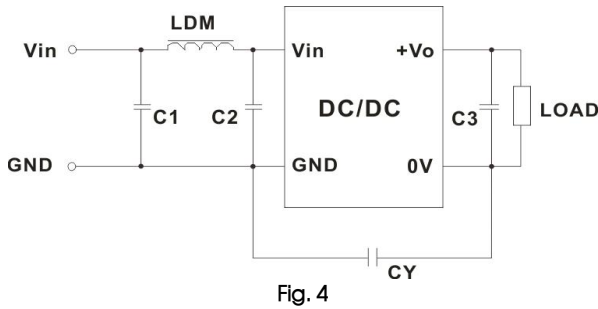


Fig. 4

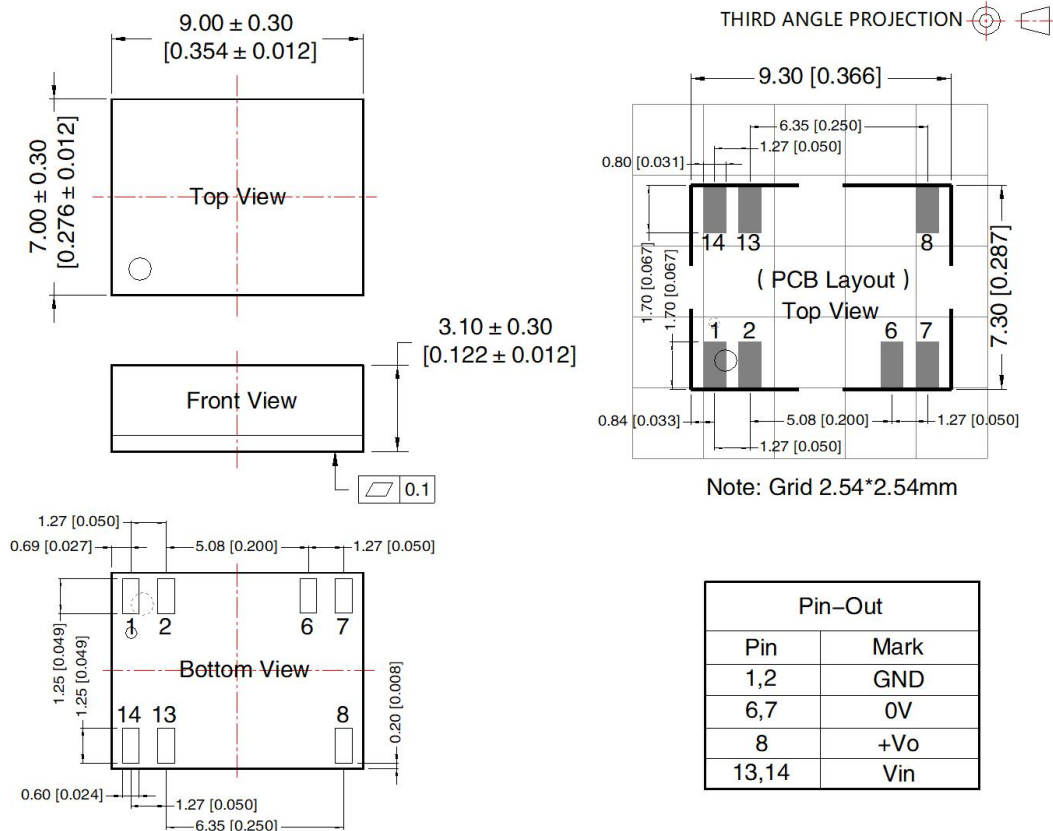
Table 2: Recommended EMC filter values

Input voltage 5VDC	Output voltage(VDC)		5
	Emissions	C1/C2	4.7μF /25V
		CY	47pF/4KVDC
		C3	Refer to the Cout in table 1
LDM		6.8μH	

3. For additional information, please refer to DC-DC converter application notes on

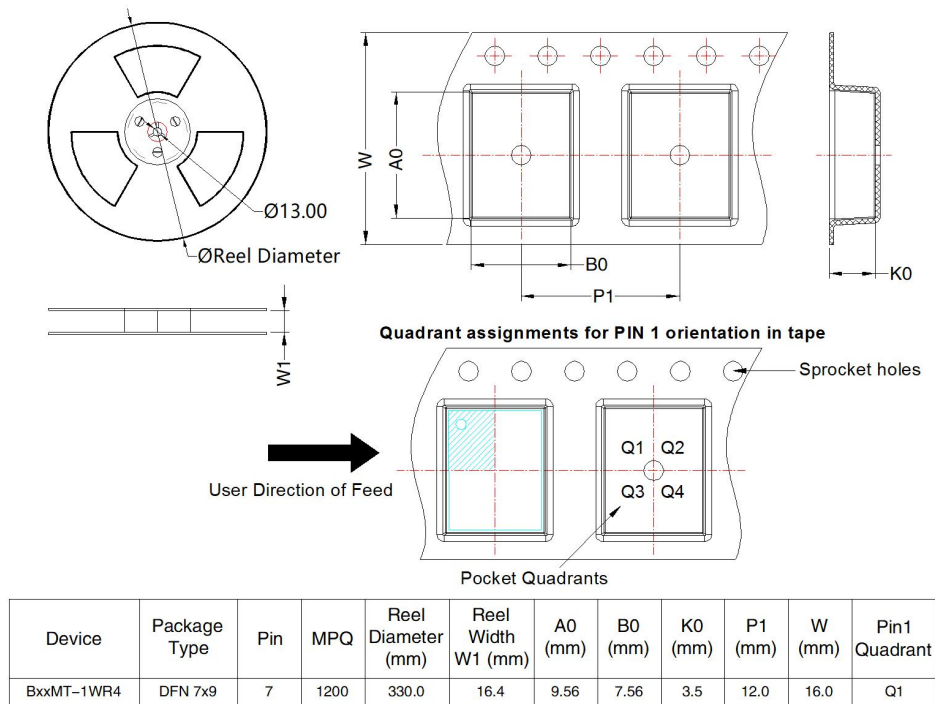
[www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout

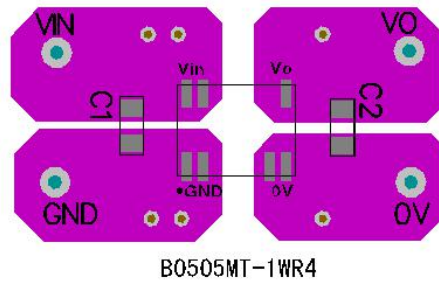


Note:  
Unit: mm[inch]  
Pin diameter tolerances: ± 0.10 [± 0.004]

Tape/Reel packaging



Temperature Rise Test PCB Layout



Notes:

- For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Tape/Reel packaging bag number: 58240017;
- Refer to *IPC 7093* for the welding process design of this product. For detailed operation guidance, please refer to *Hot Air Gun Welding Operation Instruction for DFN Package Product* or *Welding Operation Instruction for DFN Package Product*;
- 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  $T_a=25^{\circ}\text{C}$ , 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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