

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



CE Report EN 62368-1 UKCA Report BS EN 62368-1 RoHS Patent Protection

FEATURES

- Continuous short-circuit protection
- Operating ambient temperature range: -40°C to +105°C
- Compact SMD package
- I/O isolation test voltage: 3k VAC/4.2k VDC
- Industry standard pin-out

FB0505XT-1WR3 series are specially designed for applications where an 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.		
EN/BS EN	FB0505XT-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	--	
Surge Voltage(1sec. max.)	5VDC input	-0.7	--	9	VDC
Input Filter		Capacitance filter			
Hot Plug		Unavailable			

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%	--	--	±1.2	--
Load Regulation	10%-100% load	--	10	15	%
Ripple & Noise*	20MHz bandwidth	--	60	100	mVp-p
Temperature Coefficient	Full load	--	±0.02	--	%/°C
Short-Circuit Protection		Continuous, self-recovery			

Notes: * 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.	4000	--	--	VDC
	Input-output electric strength test for 1 minute with a leakage current of 5mA max.	3000	--	--	VAC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	20	--	pF
Operating Temperature	Derating when operating temperature ≥85°C, (see Fig. 2)	-40	--	105	°C

Storage Temperature		-55	--	125	°C
Case Temperature Rise	Ta=25°C	--	15	--	
Storage Humidity	Non-condensing	--	--	95	%RH
Reflow Soldering Temperature*		Peak temp. ≤245°C, maximum duration time ≤60s over 217°C.			
Vibration		10-1000Hz, 10G, 1mm. along X, Y and Z(4 cycles)			
Switching Frequency	Full load, nominal input voltage	--	270	--	kHz
MTBF	MIL-HDBK-217F@25°C	3500	--	--	k hours
Moisture Sensitivity Level (MSL)	IPC/JEDEC J-STD-020D.1	Level 1			

Note: *For actual application, please refer to IPC/JEDEC J-STD-020D.1.

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	15.24 x 11.40 x 7.25 mm
Weight	1.3g(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	Air ±8kV, Contact ±4kV perf. Criteria B

Typical Performance Curves

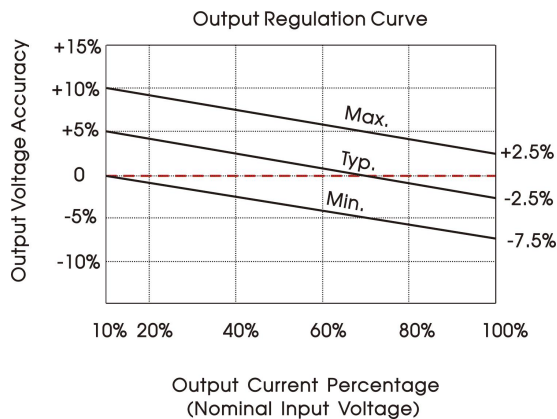


Fig. 1

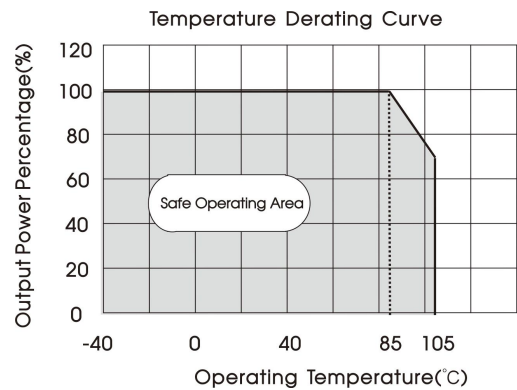


Fig. 2

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
5VDC	4.7μF/25V	5VDC	10μF/16V

2. EMC compliance circuit

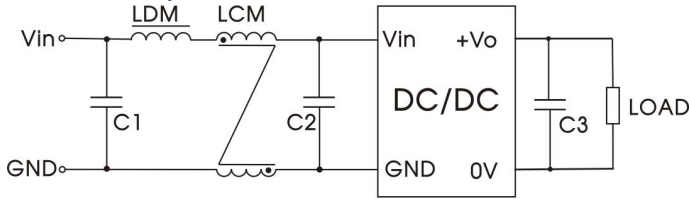


Fig. 4

Note: The use of this circuits will create output voltage drop, the input voltage needs to be increased according to the actual Application

Table 2: EMC recommended circuit value table

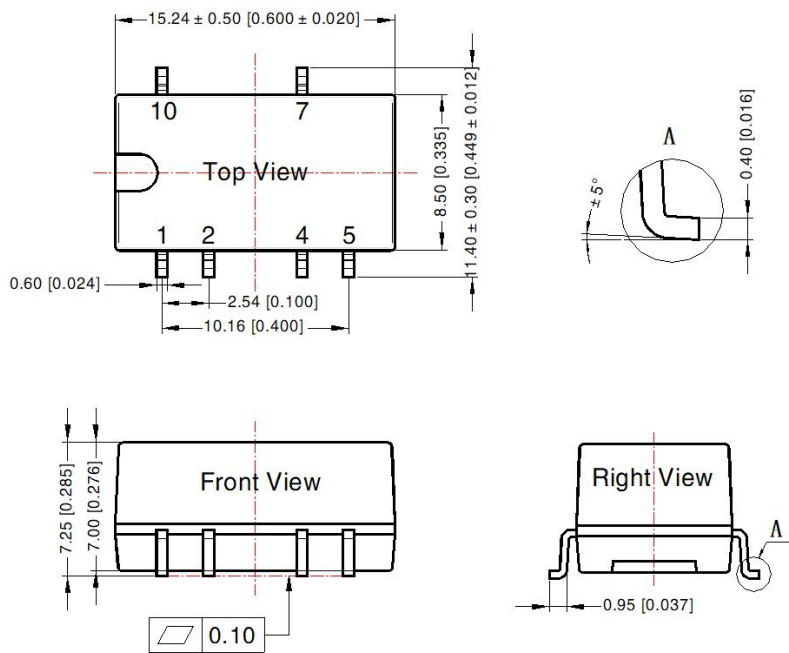
Emissions	Input voltage	5VDC
	C1/C2	4.7μF /25V
	C3	Refer to the Cout in table 1
	LDM	47μH
	LCM	2.2mH

3. Output load requirements

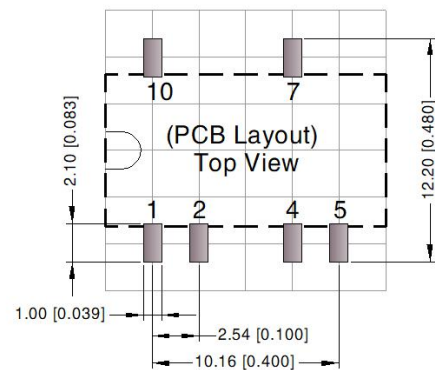
For a reliable and efficient operation of the converter, the minimum load should never be less than 10% of the rated output load. If the total required output power is below 10%, a parallel bleeding resistor is required on the output (The sum of the efficient power and resistor consumption power is not less than 10%).

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

Dimensions and Recommended Layout



THIRD ANGLE PROJECTION



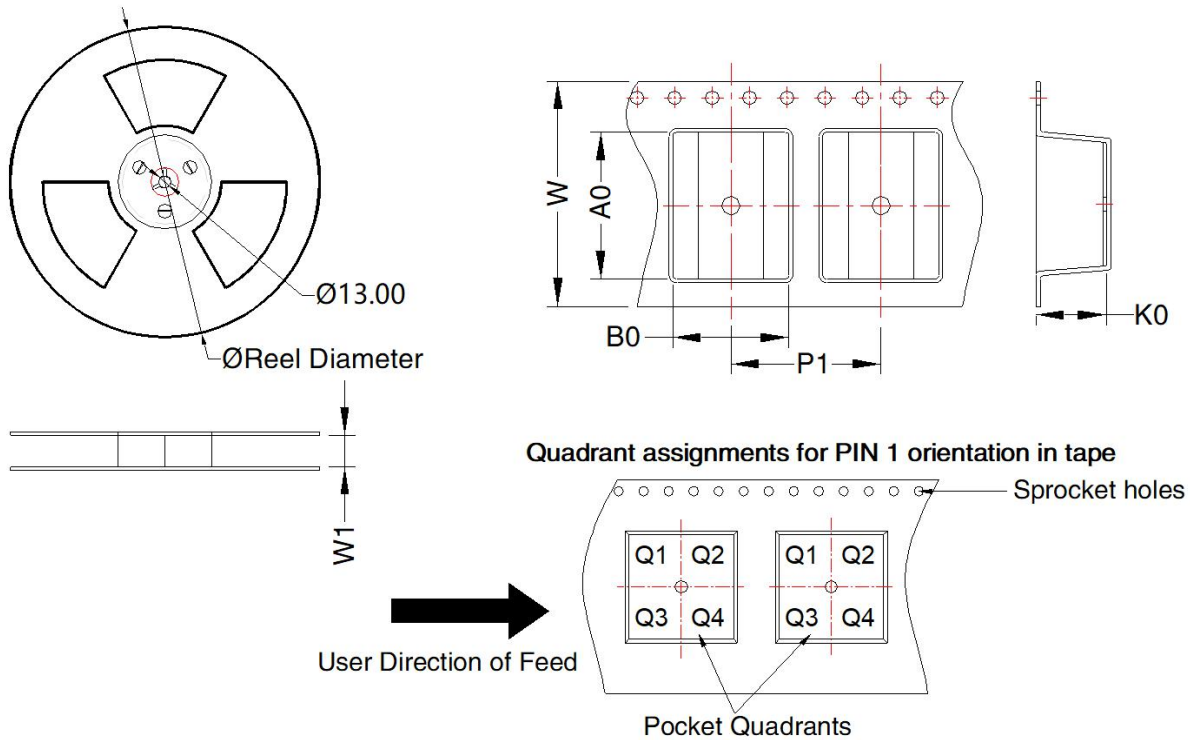
Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	GND
2	Vin
4	0V
5	NC
7	+Vo
10	NC

Note:
Unit: mm[inch]
Pin section tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.25[\pm 0.010]$

NC: Pin to be isolated from circuitry

Tape and Reel Info



Device	Package Type	Pin	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
FB0505XT-1WR3	SMD	6	500	330.0	24.5	15.64	12.4	7.45	16.0	24.0	Q1

Notes:

1. For additional information on Product Packaging please refer to www.mornsun-power.com. Tube Packaging bag number: 58210023, Roll Packaging bag number: 58210034;
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 $T_a=25^{\circ}\text{C}$, humidity<75%RH with nominal input voltage and rated output load;
5. All index testing methods in this datasheet are based on our company corporate standards;
6. We can provide product customization service, please contact our technicians directly for specific information;
7. Products are related to laws and regulations: see "Features" and "EMC";
8. 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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