

MORNSUN®

CB0505D-1W

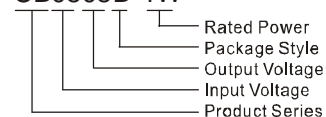
1W, SMALL FIXED INPUT, 1000VDC ISOLATED & UNREGULATED SINGLE OUTPUT DC-DC CONVERTER



RoHS

PART NUMBER SYSTEM

CB0505D-1W



Rated Power
Package Style
Output Voltage
Input Voltage
Product Series

FEATURES

- Miniature DIP Package
- 1KVDC Isolation
- Operating Temperature Range: -40°C ~ +85°C
- Low Temperature rise
- No External Component Required
- PCB Mounting
- Industry Standard Pinout
- Applies to Automotive electronics

APPLICATIONS

The CB0505D-1W is designed for application where isolated output is required from a distributed power system.

These products apply to where:

- 1) Input voltage variation $\leq \pm 10\%$;
- 2) 1KVDC input and output isolation;
- 3) Regulated and low ripple noise is not required.

Such as: digital circuits, low frequency analog circuits, and IGBT power device driving circuits.

SELECTION GUIDE

Model Number	Input Voltage(VDC)	Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		Max. Capacitive Load(μ F)	Efficiency (% , typ.) @Max. Load
	Nominal(Range)		Max.	Min.	@Max. Load	@No Load		
CB0505D-1W	5(4.5-5.5)	5	200	20	286	25	220	70

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage (1sec.max.)		-0.7	--	9	VDC
Input Filter		Capacitance Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Power		0.1	--	1	W
Output Voltage Accuracy		See tolerance envelope curve			
Line Regulation	For V_{in} change of $\pm 1\%$	--	--	± 1.2	%
Load Regulation	10% to 100% load	--	12.8	15	
Temperature Drift	Full load	--	--	± 0.03	%/°C
Ripple*	20MHz bandwidth	--	60	100	mVp-p
Noise*		--	75	150	
Short Circuit Protection **		--	--	1	s

Note: *Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

**Supply voltage must be discontinued at the end of short circuit duration.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	1000	--	--	VDC
Isolation Resistance	Test at 500VDC	1000	--	--	M Ω
Isolation Capacitance	Input/Output, 100KHz/1V	--	30	--	pF
Switching Frequency	100% load, Input voltage range	--	125	--	KHz
MTBF	MIL-HDBK-217F @ 25°C	3500	--	--	K hours
Case Material		Plastic (UL94-V0)			
Weight		--	1.8	--	g

ENVIRONMENTAL SPECIFICATIONS

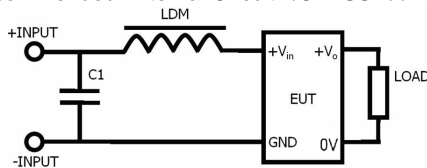
Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 85°C)	-40	--	85	°C
Storage Temperature		-55	--	125	
Temp. rise at full load	Ta=25°C	--	30	--	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR25/EN55025 CLASS 1 (External Circuit Refer to Figure1)
ESD	ESD	ISO10605 Contact ±8KV perf. Criteria B

EMC RECOMMENDED CIRCUIT

EMI Recommended External Circuit (CLASS A):



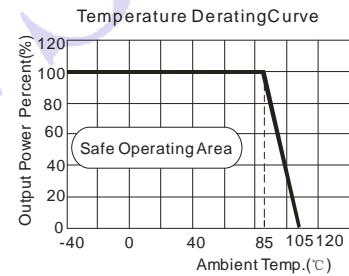
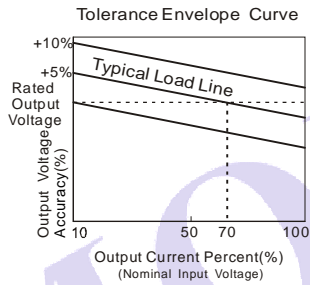
(Figure1)

Recommended external circuit parameters:

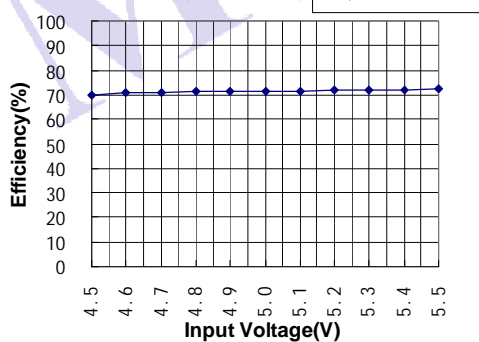
C1: 4.7μF/50V

LDM: 6.8μH

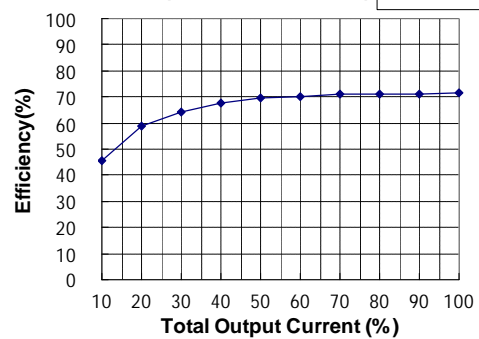
PRODUCT TYPICAL CURVE



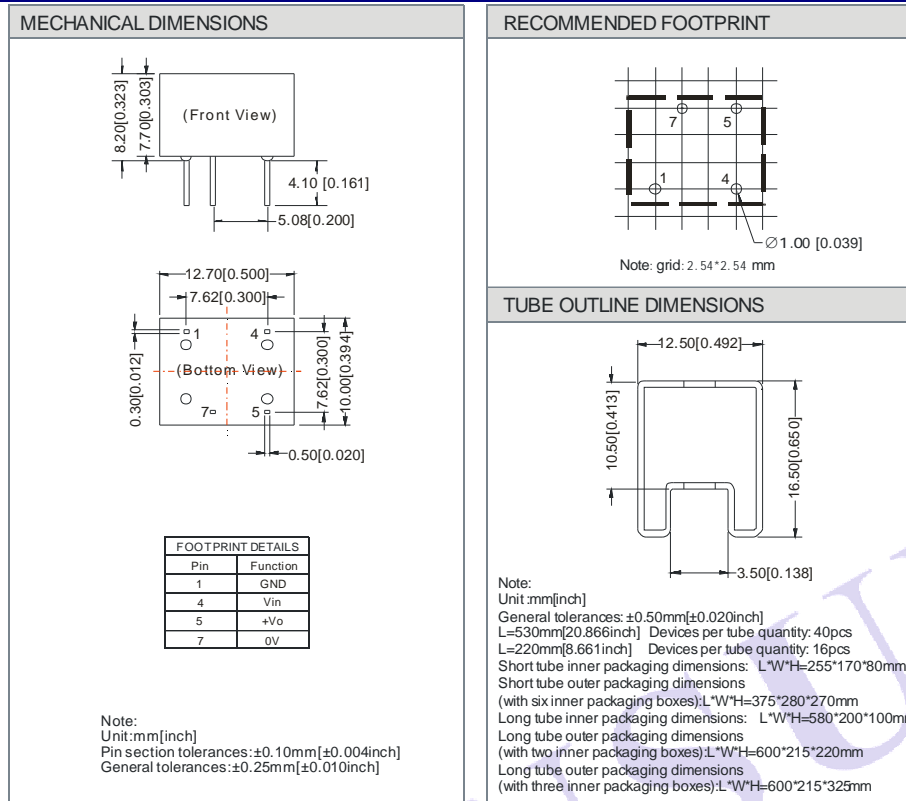
Efficiency VS Input Voltage curve (Full Load)



Efficiency VS Output Load curve (Vin=Vin-nominal)



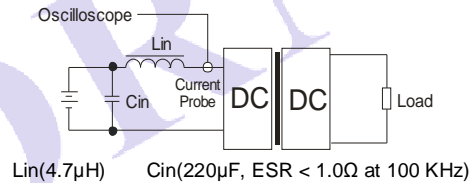
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING



TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor L_{in} and Capacitor C_{in} to simulate source impedance.



DESIGN CONSIDERATIONS

1) Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is not less than 10% of the full load. If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load.

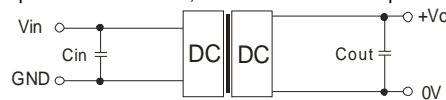
2) Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to add a circuit breaker to the circuit.

3) Recommended Circuit

If you want to further decrease the input/output ripple, a capacitor filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 2).

It should also be noted that the capacitance of filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the recommended capacitance of its filter capacitor sees (Table 1).



(Figure 2)

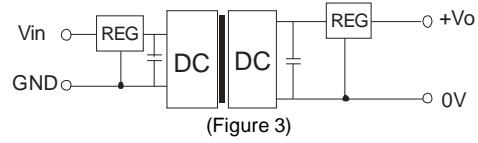
EXTERNAL CAPACITOR TABLE (Table 1)

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

It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output.

4) Output Voltage Regulation and Over-voltage Protection Circuit

The simplest device for output voltage regulation, over-voltage and over-current protection is a linear regulator and a capacitor filtering network with overheat protection that is connected to the input or output end in series (Figure 3), the recommended capacitance of its filter capacitor sees (Table 1), linear regulator based on the actual voltage and current required.



5) Cannot use in parallel and hot swap

Note:

1. Operation under minimum load will not damage the converter; However, they may not meet all specification listed.
2. Max. Capacitive Load tested at input voltage range and full load.
3. All data in the datasheet are measured according to nominal input voltage, rated output load, $T_A=25^{\circ}\text{C}$, humidity<75%, unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on our corporate standards.
5. The performance in the datasheet is just fit for the part number in the selection guide, and may be different from the customer-designed product, you can get more details from MORNSUN FAE.
6. Contact us for your specific requirement.
7. Specifications subject to change without prior notice.

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