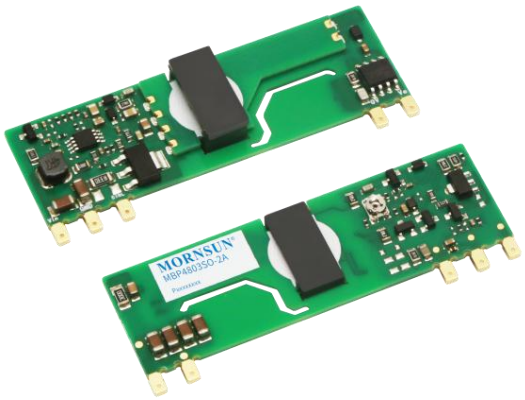
DC/DC Converter
MBP4803SO-2A

MORNSUN®

Wide input voltage and isolated single output
SIP package, DC-DC converter



RoHS Patent Protection

FEATURES

- Super capacitor or battery special charging power supply
- Output constant current, constant voltage double loop control
- Output constant current accuracy up to ±10%
- The static operating current on the input side is as low as 10uA
- No-load input current as low as 10mA
- Efficiency up to 85%
- Creepage distance > 16mm, electrical clearance > 8mm
- Isolation up to 6000VDC
- input under-voltage protection, short-circuit protection
- Operating ambient temperature range -40℃ to +70℃

MBP4803SO-2A is a one-way charging power module, the input voltage is 42~58VDC, the output voltage is 2.5~4.2VDC, the charging current is constant current 2A, the electrical gap/creepage distance is up to 8/16mm, and the isolation voltage is up to 6000VDC. It can be applied to the active voltage balancing between ultracapacitors and ultracapacitors and between ultracapacitors and batteries.

Selection Guide

Part No.	Input Voltage (VDC)		Output Voltage (VDC)	Output Current③ (A,Typ.)	Efficiency(%,Typ.) @full load
	+Vin Voltage	Max.②	+Vo Voltage		
MBP4803SO-2A	48 (42-58)	58	3.8 (2.5-4.2)	2	85/81

Note:
① Input voltage can not exceed this value, otherwise it may cause permanent irreparable damage;
② When the output voltage is < 3.8V, the product works in constant current mode, the constant current value 2A±10% (1.8-2.2A) (when the output voltage is 3.4V, the constant current accuracy is ≤±5%), the output voltage rises linearly;When the output voltage is ≥3.8V, the product begins to enter the constant voltage mode, the constant voltage value is 4.2V±10% (3.8-4.6V), and the output current gradually decreases with the increase of the load.
③ The above efficiency values are measured at the input nominal voltage and the output nominal voltage.

Input Specifications

Item		Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no load)		Nominal input voltage	--	186/8	--	mA
Starting Voltage		Output power range	--	--	42	VDC
Input under-voltage protection			31	33	--	
Ctrl①	Module open	Full input voltage range, full output voltage range	Ctrl pin open or pulled high TTL (4.5-12VDC)			
	Module shutdown		Ctrl pin pulled low to GND (0-1.2VDC)			
	Static working current②		--	10	30	uA

Note:
①The voltage of the Ctrl control pin is relative to the input pin GND
② The above static working current is measured when Ctrl is suspended, GND is connected, or 0 VDC is connected.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Output Voltage	Input voltage range	--	--	5.5	VDC
Output Constant Current Accuracy①	Input voltage range, Works in constant current mode	1.8	2	2.2	A
Output Over-Voltage Protection	Input voltage range	3.8	4.2	4.6	VDC
Short-Circuit Protection*	Input voltage range	Constant current mode, continuous, self-recovery			

Note:
① The above constant current accuracy range values are measured when the product enters the constant current mode, that is, the output voltage range (2.5-3.8V).
② The above output overvoltage protection value is the value of the voltage range when the product enters the constant voltage mode.
③ The above test is based on the test circuit diagram 2, 20M bandwidth limit measurement. For details, see the DC-DC Product Application Guide.

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.	6000	--	--	VDC
Insulation Resistance	Input-output Resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	24	--	pF
Operating Ambient Temperature	See Fig. 1	-40	--	+70	℃
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	℃
Vibration		10-55Hz, 10G, 30 Min. along X, Y and Z			
Switching Frequency	PWM mode	--	200	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Hot Plug		nonsupport			

Note:
① Hot swap may damage the module.

Mechanical Specifications

Dimension	58.00x 18.00 x 7.60 mm
Weight	7.00g (Typ.)
Cooling method	Free air convection

EMC

EMI	CE	CISPR32/EN55032 CLASS B (see Fig.4 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig.4 for recommended circuit)	
EMS	ESD	IEC/EN61000-4-2 Contact ±4kV	perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m (see Fig.4 for recommended circuit)	perf. Criteria B
	EFT	IEC/EN61000-4-4 100KHz, ±2kV (see Fig.4 for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line ±1kV (see Fig.4for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s (see Fig.4 for recommended circuit)	perf. Criteria B

Typical Performance Curves

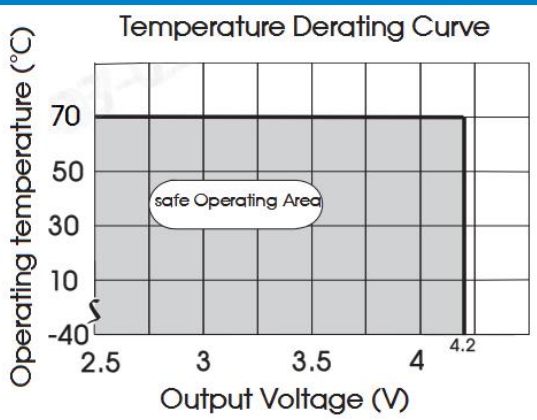


Fig. 1

Design Reference

1. Model Testing Circuit

All DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

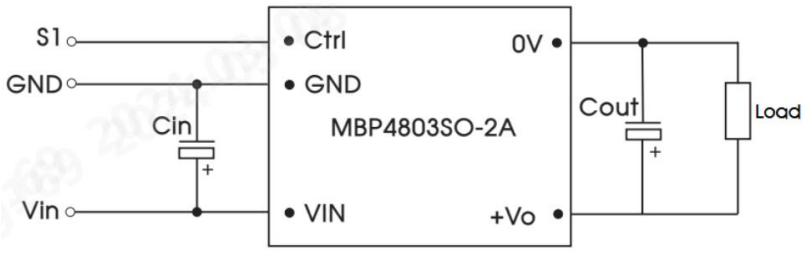


Fig. 2

Parameter description:

Cin	100uF/100V
Cout	2200uF/35V

2. Model Control recommended circuit

When control is enabled, the voltage of the enable signal S1 is relative to the input pin GND.

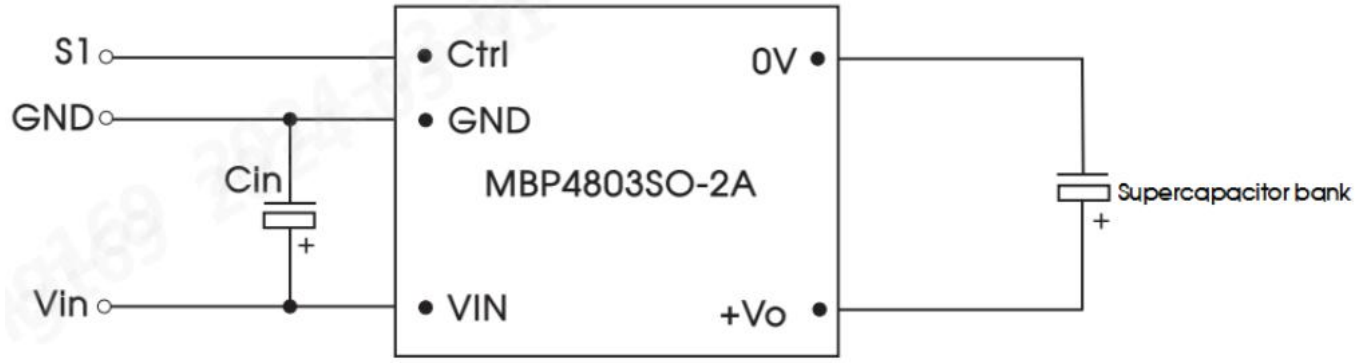


Fig. 3

3. EMC compliance circuit

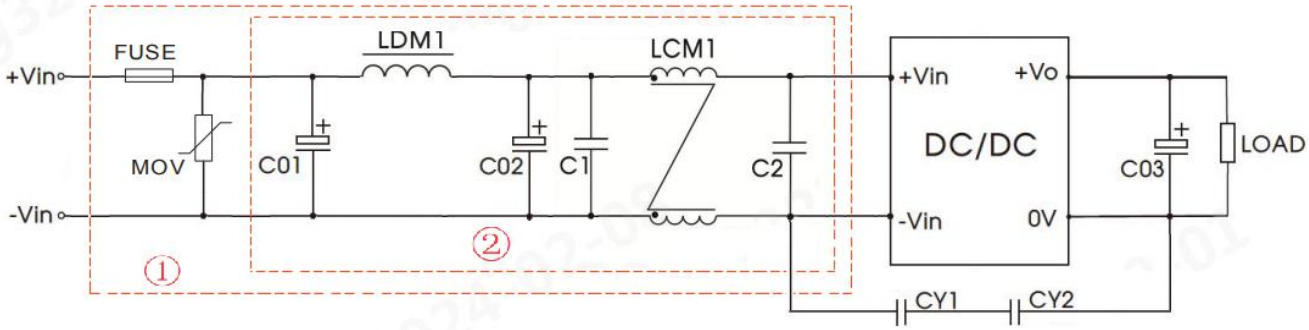


Fig. 4 Notes: We use Part ① in Fig. 4 for Immunity tests and Part ② for Emissions test. Selecting based on needs.

Parameter description:

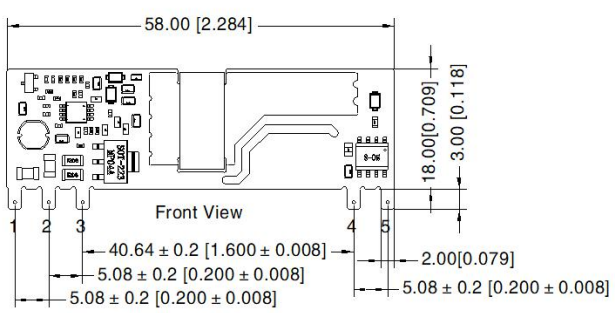
FUSE	Select according to the actual input current of the customer
MOV	14D101K
C01、C02	330uF 200V aluminum electrolytic capacitor
C03	100uF 100V aluminum electrolytic capacitor
CY1、CY2	2.2uF/400VDC
LDM1	6.8uH Differential mode inductance
C1、C2	4.7uF/100V
LCM1	4.7mH (We recommend using our common mode inductor FL2D-30-472 differential mode inductor)

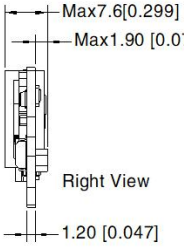
4. The product does not support hot swap

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

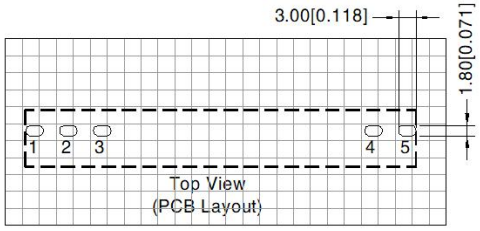
Dimensions and Recommended Layout

THIRD ANGLE PROJECTION





Pin-Out	
Pin	Mark
1	Vin
2	GND
3	CTRL
4	0V
5	Vo



Note: Grid 2.54*2.54mm

Note:
Unit: mm[inch]
Pin size tolerances: ± 0.10[± 0.004]
General tolerances: ± 0.50[± 0.020]
The layout of the device is for reference only, please refer to the actual product

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number 58210349;
2. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on our company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" ;
6. 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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