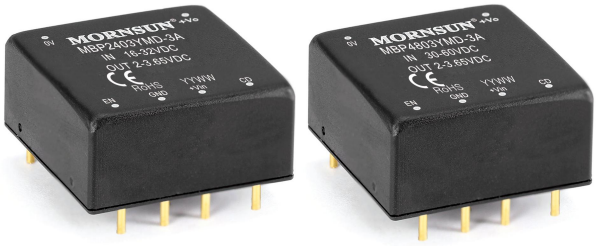
DC/DC Converter
MBP24/4803YMD-3A

MORNSUN®

Ultra-wide input voltage and isolated single output, DIP package, Super-Capacitor group two-way balanced, DC-DC converter



CE Patent Protection RoHS

3 years Warranty

FEATURES

- Two-way charging power supply
- Wide 2:1 input voltage range
- Efficiency up to 79%
- I/O isolation test voltage 1.0kVDC
- Input under-voltage protection
- Operating ambient temperature range -40℃ to +85℃
- Super-Capacitor or battery power supply
- EN62368 approved

MBP24/4803YMD-3A, a two-way switching power supply with isolation voltage 1000VDC, which can be used in occasion of voltage balance between super capacitor, super capacitor group and system bus or battery.

Selection Guide

Certification	Part No.	Working Status	Input Voltage Vin (VDC)		Output Voltage Vo (VDC)		Full Load Efficiency③(%) Typ.
			Nominal (Range)	Max.①	Nominal (Range)	Max.②	
CE	MBP2403YMD-3A	Forward	24 (16-32)	40	2.5 (2.0-3.65)	5.5	79
		Reverse	24 (16-32)	40	3.5 (2.0-3.65)	5.5	
	MBP4803YMD-3A	Forward	48 (30-60)	65	2.5 (2.0-3.65)	5.5	79
		Reverse	48 (30-60)	65	3.5 (2.0-3.65)	5.5	

Note:
①Exceeding the maximum input voltage may cause permanent damage ;
②Exceeding the maximum output voltage may cause permanent damage ;
③Efficiency is measured at nominal input voltage and rated output load .

Control Specifications

Working Status	Working Status Describe	EN Pin	CD Pin
Static Working	No charge /discharge on module	Open	Open or connect to input GND
Forward	Input end (Vin) charge output end (Vo)	Connect to input GND	Open
Reverse	Output end (Vo) discharge input end (Vin)	Connect to input GND	Connect to input GND

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (Iin)	Forward	Vin=24VDC, Vo=2.5VDC	--	400	--	mA
		Vin=48VDC, Vo=2.5VDC	--	200	--	
	Reverse	Vin=24VDC, Vo=3.5VDC	--	-320	--	
		Vin=48VDC, Vo=3.5VDC	--	-160	--	
Start-up Voltage	Forward	24VDC nominal input series	--	--	16	VDC
		48VDC nominal input series	--	--	30	
Under-voltage Protection	24VDC nominal input series		10	13	--	
	48VDC nominal input series		18	22	--	

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Current (Io)	Forward	Vin=24VDC, Vo=2.5VDC	--	3000	--	mA
		Vin=48VDC, Vo=2.5VDC	--	3000	--	

Output Current (Io)	Reverse	Vin=24VDC, Vo=3.5VDC	--	-2700	--	mA
		Vin=48VDC, Vo=3.5VDC	--	-2700	--	
Start-up Voltage	Reverse		--	--	2	VDC

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.	1000	--	--	VDC
	Input and output to out-case Electric Strength test for 1 minute with a leakage current of 1mA max.	1000	--	--	
Insulation Resistance	Input-output Resistance at 500VDC	1000	--	--	MΩ
Static Working Current①	Under static working	--	20	40	uA
Operating Temperature	See Fig. 1	-40	--	+85	℃
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		2G, 10-55Hz, 30min., along X, Y and Z			
Switching Frequency	PWM mode	--	300	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Hot Plug		Unavailable			

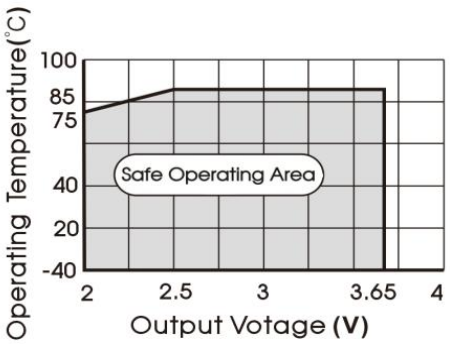
Note :①Static working current including input and output under static working .

Mechanical Specifications

Case Material	Aluminum alloy
Dimension	25.40 x 25.40 x 11.70 mm
Weight	13.5g (Typ.)
Cooling method	100LFM

Typical Performance Curves

Forward Working Temperature Derating Curve



Reverse Working Temperature Derating Curve

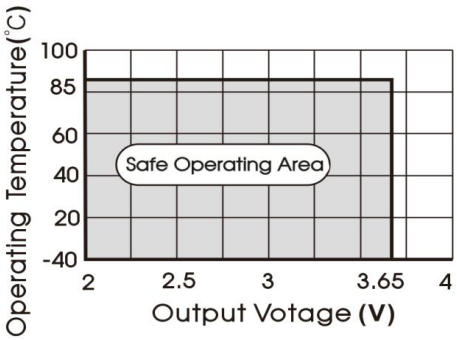


Fig. 1

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.

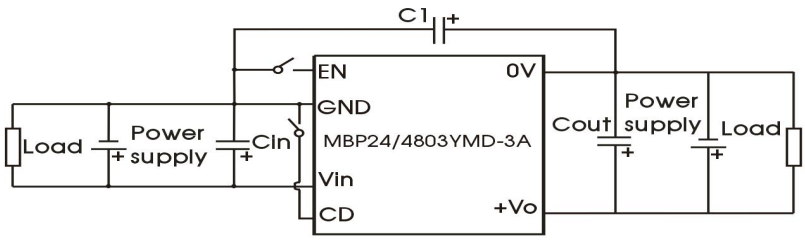


Fig. 2

2. Model Control recommended circuit

When the working direction is trigger Ctrl signal, we suggest that the current through R1 and R2 is 5 mA.

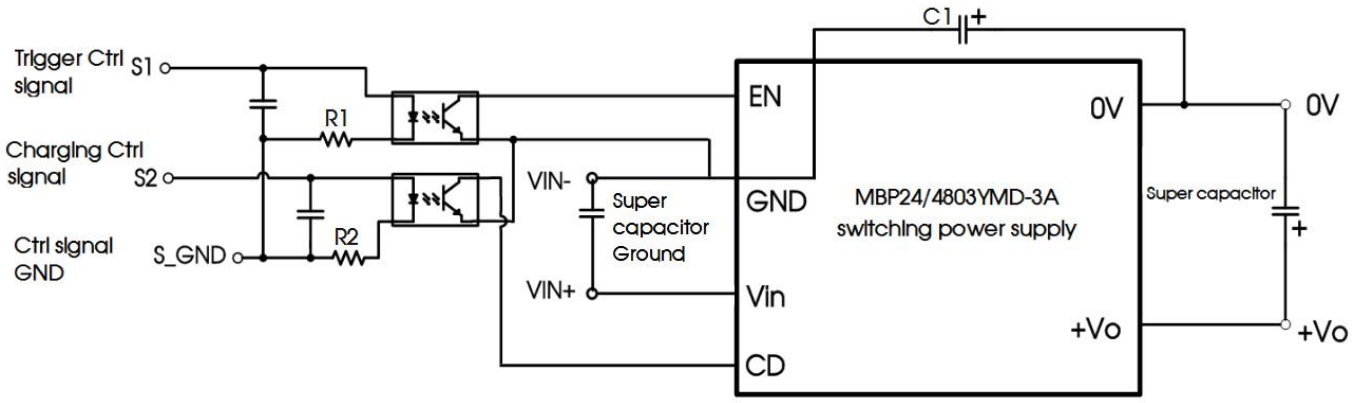
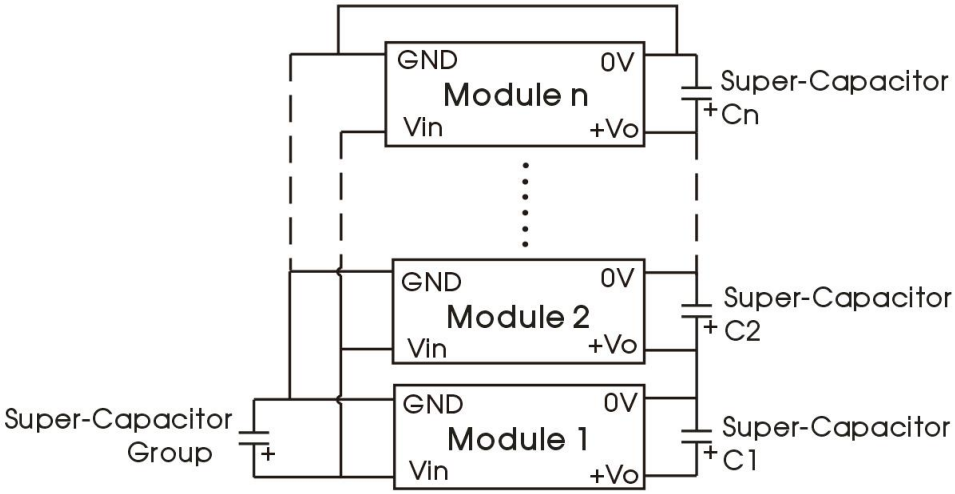


Fig. 3

3. System application recommended circuit

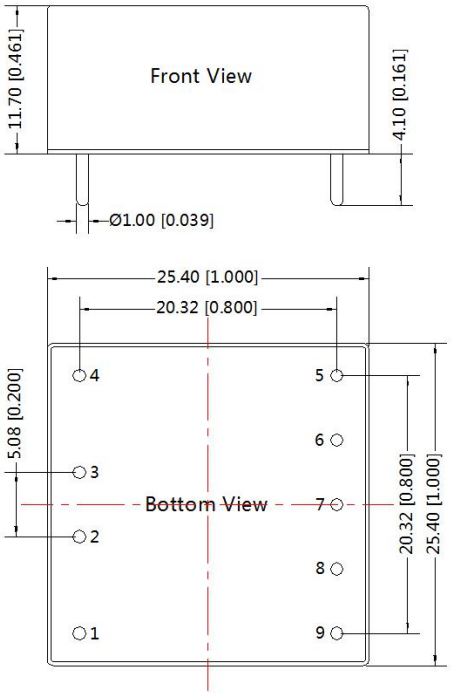
For MBP2403YMD-3A, we suggest that the super-Capacitor group is less than 8 when connect to the input;
For MBP4803YMD-3A, we suggest that the super-Capacitor group is less than 16 when connect to the input;
The 0V, output ground of the last super capacitor Cn, must be shorted to the input ground GND.



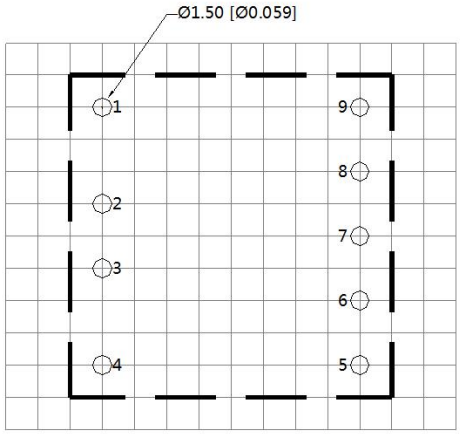
4. The products do not support output without load and hot plug.

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

Dimensions and Recommended Layout



Note:
Unit: mm[inch]
Pin diameter tolerances: ±0.10[±0.004]
General tolerances: ±0.50[±0.020]



Note:Grid 2.54*2.54mm

Pin-Out			
PIN	FUNCTION	PIN	FUNCTION
1	EN	5	+Vo
2	GND	6	No Pin
3	+Vin	7	No Pin
4	CD	8	No Pin
		9	0V

Note:
1. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58210003;
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.

Mornsun Guangzhou Science & Technology Co., Ltd.
Address: No. 5, Kehui St. 1, Kehui Development Center, Science Ave., Guangzhou Science City, Huangpu District, Guangzhou, P. R. China
Tel: 86-20-38601850 Fax: 86-20-38601272 E-mail: info@mornsun.cn www.mornsun-power.com