MOSFET SiC Driver Dedicated Power Supply
QA051C

MORNSUN®

MOSFET SiC Driver Dedicated Power Supply

Patent Protection RoHS

Continuous Short Circuit Protection

FEATURES

- Efficiency up to 79%
- SIP package
- Isolation voltage : 3.0kVAC/5.2kVDC
- Ultra low-volume isolation capacitance
- Operating temperature range: -40℃ to +105℃
- Continuous short circuit protection
- International standard pin-out

QA051C is DC-DC module power supplie designed for IGBT driver requiring two set of isolation power supply. The mode of mutual connection after two independent outputs is adopted internally for better energy provision of SiC turn-on and turn-off. Output short circuit protection and self-recovery capabilities are also provided. General application includes:

1.Universal converter

2.AC servo drive system

3.Electric welding machine

4.Uninterruptible power supply (UPS)

Selection Guide

Part No.	Input Voltage (VDC)	Output		Efficiency (%,Min./Typ.) @ Full Load	Max. Capacitive Load*(μF)
	Nominal (Range)	Output Voltage (VDC)+Vo/-Vo	Output Current (mA)+Io/-Io		
QA051C	5 (4.5-5.5)	+20/-5	+80/-40	75/79	100

Note:*The capacitive loads of positive and negative outputs are identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	5V input	--	456/53	--	mA
Surge Voltage (1sec. max.)		-0.7	--	9	VDC
Input Filter		Capacitor filter			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Output Voltage Accuracy			See tolerance envelope graph (Fig. 1, Fig. 2)			
Line Regulation	Input voltage change: ±10%		--	±1.4	±2	--
Load Regulation	10%-100% load	20VDC output	--	8	12	%
		-5VDC output	--	10	14	
Ripple & Noise*	20MHz bandwidth	Ripple	--	40	--	mVp-p
		Noise	--	75	--	
Temperature Drift Coefficient	100% load		--	±0.03	--	%/℃
Output Short Circuit Protection			Continuous, self-recovery			

Note:*Ripple and noise tested with "parallel cable" method, please see *DC-DC Converter Application Notes* for specific operation methods.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Input-output, with the test time of 1 minute and the leak current lower than 1mA	3000	--	--	VAC
		5200	--	--	VDC
Insulation Resistance	Input-output, Isolation voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	3.5	--	pF
Operating Temperature	Power derating ⩾85℃, (see Fig. 3)	-40	--	105	℃
Storage Temperature		-55	--	125	

Lead Temperature	Welding spot is 1.5mm away from the casing, 10 seconds	--	--	300	
Casing Temperature Rise	Ta=25℃	--	30	--	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	100	--	kHz
MTBF	MIL-HDFK-217F@25℃	3500	--	--	k hours

Physical Specifications

Casing Material	Black flame-retardant and heat-resistant plastic(UL94 V-0)
Package Dimensions	19.50*9.80*12.50mm
Weight	4.2g (Typ.)
Cooling Method	Free air convection

EMC Specifications

EMI	Conducted disturbance	CISPR32/EN55032	CLASS B (see Fig. 5 for recommended circuit)	
EMS	Electrostatic discharge	IEC/EN61000-4-2	Contact ±6kV	perf. Criteria B

Product Characteristic Curve

+Vo Tolerance Envelope Graph

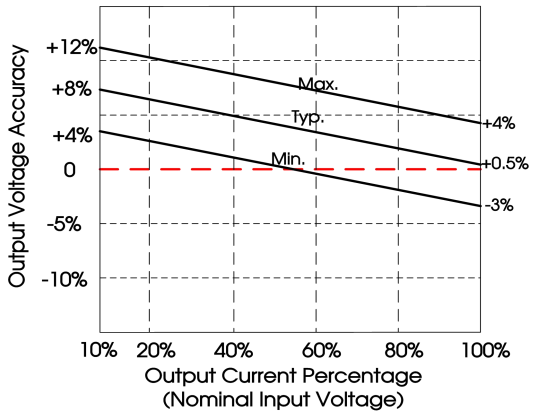


Fig. 1

-Vo Tolerance Envelope Graph

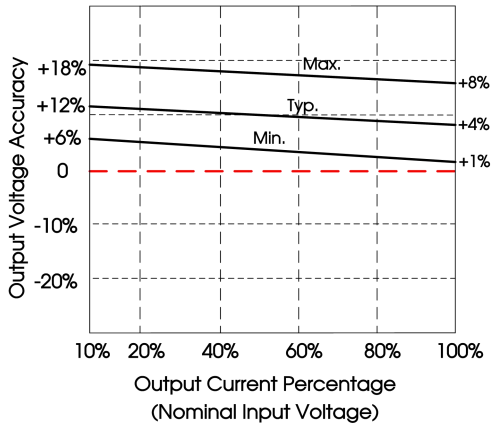


Fig. 2

Temperature Derating Curve

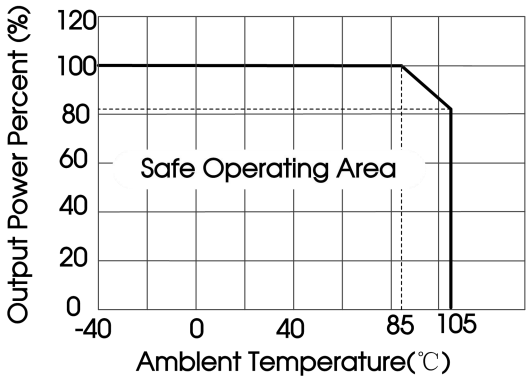


Fig. 3

Design Reference

1. Overload Protection

In normal operating conditions, the circuit of these products have no overload protection. Protect with a breaker is a simple way to make overload protection.

2. Test configurations

Note: C1,C2,C3: 100uF/35V (Low impedance)

3. Typical application

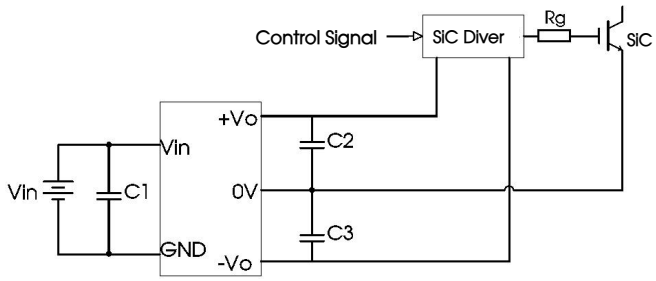


Fig. 4

C1/C2/C3
100uF/35V (Low internal resistance capacitance)

4. EMC typical recommended circuit

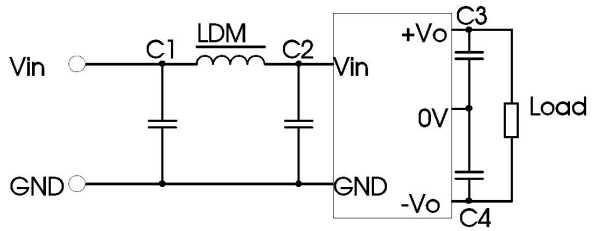


Fig. 5

Input voltage (VDC)		15
EMI	C1/C2	4.7μF /50V
	C3/C4	100μF /35V (Low internal resistance capacitance)
	LDM	6.8μH

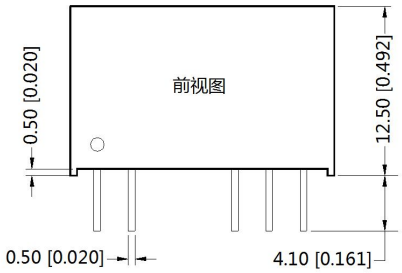
5. The product does not support output in parallel with power per liter or hot-swappable use

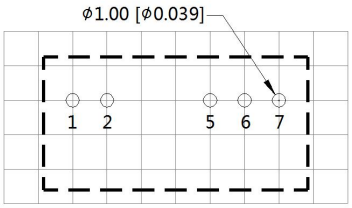
6.The input and the output of the product are recommended to be connected to ceramic capacitor or electrolytic capacitor. Using tantalum capacitor may cause risk of failure

7.For more information please find the application notes on www.mornsun-power.com

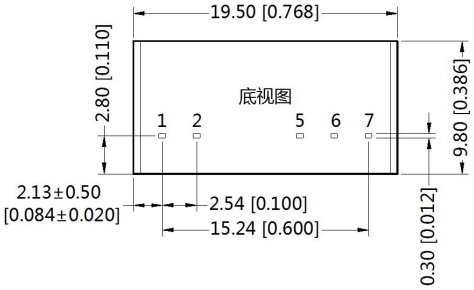
Dimensions and Recommended Layout

第三角投影





注：栅格距离为2.54*2.54mm



引 脚 方 式	
引脚	功能
1	Vin
2	GND
5	-Vo
6	0V
7	+Vo

注：
尺寸单位:mm[inch]
端子截面公差:±0.10[±0.004]
未标注公差:±0.25[±0.010]

Notes:

1. Packing information please refer to Product Packing Information which can be downloaded from www.mornsun-power.com. Packing bag number: 58200013;
2. The lead connecting the power supply module and SiC driver should be as short as possible during use;
3. The output filtering capacitor should be as close as possible to the power supply module and SiC driver;
4. The peak of the SiC driver gate drive current is high, so low internal resistance electrolytic capacitor is recommended to be used for the power supply module output filter capacitor;
5. The average output power of the driver must be lower than that of the power supply module;
6. Consider fixing with glue near the module if being used in vibration occasion;
7. The max. capacitive load should be tested within the input voltage range and under full load conditions;
8. Unless otherwise specified, data in this datasheet should be tested under the conditions of Ta=25°C, humidity<75% when inputting nominal voltage and outputting rated load;
9. All index testing methods in this datasheet are based on our Company's corporate standards;
10. The performance indexes of the product models listed in this manual are as above, please directly contact our technicians for specific information;
11. We can provide product customization service;
12. Products are related to laws and regulations: see "Features" and "EMC".
13. 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, Luogang District, Guangzhou, P. R. China
Tel: 86-20-38601850-8801 Fax: 86-20-38601272 E-mail: info@mornsun.cn