DC/DC Converter for SiC Driver

QA01C-18

MORNSUN®

DC-DC module power supply specialized for SIC driver

Continuous Short Circuit Protection

Patent Protection RoHS

FEATURES

- Efficiency up to 79%
- SIP package
- I/O isolation test voltage 3.5kVAC/6kVDC
- Ultra low-volume isolation capacitance
- Operating ambient temperature range -40℃ to +105℃
- Continuous short circuit protection
- Industry standard pin-out

QA01C-18 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

Certification	Part No.	Input Voltage (VDC)	Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load*(μF) Max.
		Nominal (Range)	Voltage(VDC) +Vo/-Vo	Current(mA) +Io/-Io		
--	QA01C-18	15 (13.5-16.5)	+18/-3	+100/-100	76/79	220

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)		--	177/16	185/30	mA
Surge Voltage (1sec. max.)		-0.7	--	21	VDC
Input Filter		Capacitor filter			
Hot Plug		Unavailable			

Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy			See tolerance envelope graph (Fig. 1, Fig. 2)			
Line Regulation	Input voltage change: ±10%		--	±1.1	±1.3	%/%
Load Regulation	10%-100% load	18VDC output	--	6	10	%
		-3VDC output	--	12	20	
Ripple & Noise*	20MHz bandwidth	Ripple	--	60	--	mVp-p
		Noise	--	75	--	
Temperature Drift Coefficient	100% load		--	±0.03	--	%/℃
Short-circuit Protection			Continuous, self-recovery			

Note: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.	3500	--	--	VAC
		6000	--	--	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ

Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	5	--	pF
Operating Temperature	Derating when operating temperature up to 85℃ (See Fig. 3)	-40	--	105	℃
Storage Temperature		-55	--	125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	
Case Temperature Rise	Ta=25℃	--	30	40	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	95	--	KHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	K hours

Mechanical Specifications

Case Material	Black Epoxy resin; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	19.50 x 9.80 x 12.50mm
Weight	4.2g (Typ.)
Cooling Method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit)
	RE	CISPR32/EN55032 CLASS B (see Fig. 5 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B

Typical Characteristic Curves

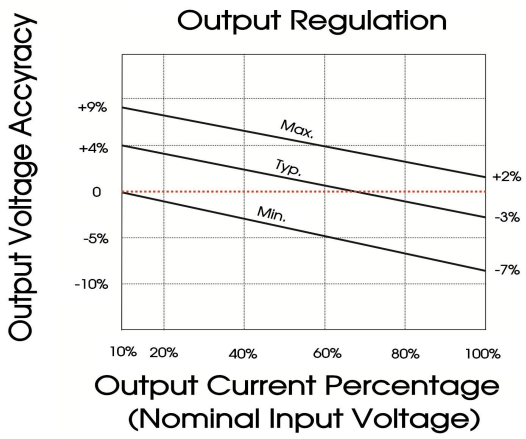


Fig. 1

18V output

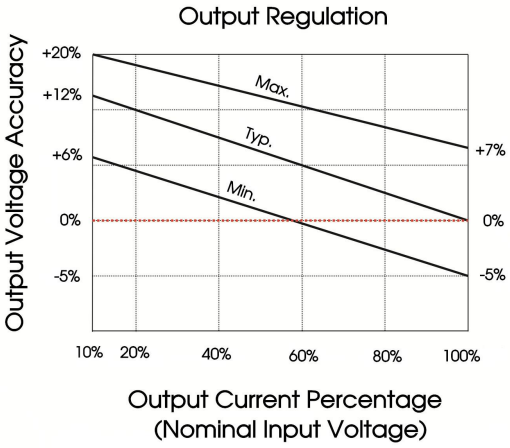


Fig. 2

-3V output

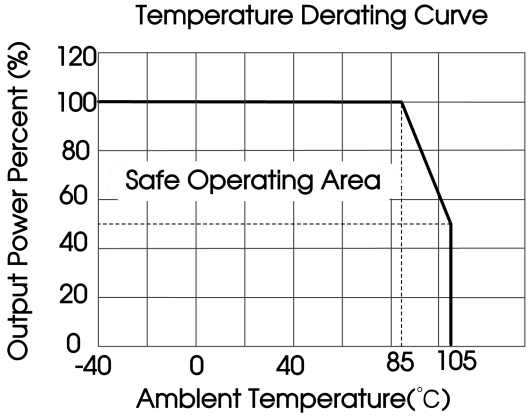


Fig. 3

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

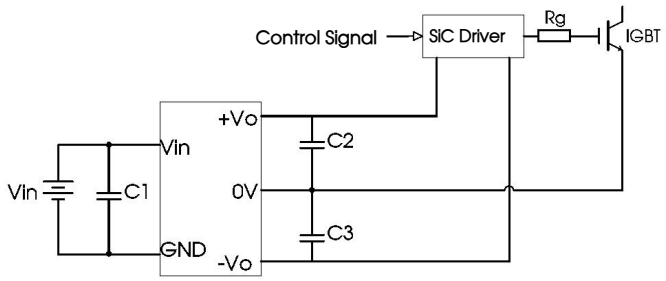


Fig. 4

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

4. EMC compliance circuit (CLASS B)

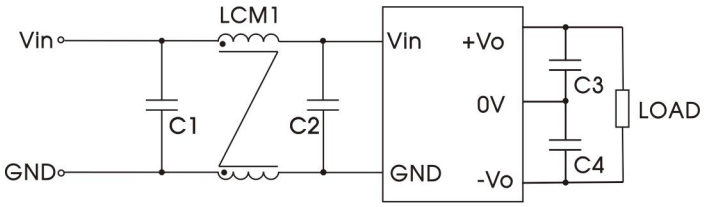


Fig. 5

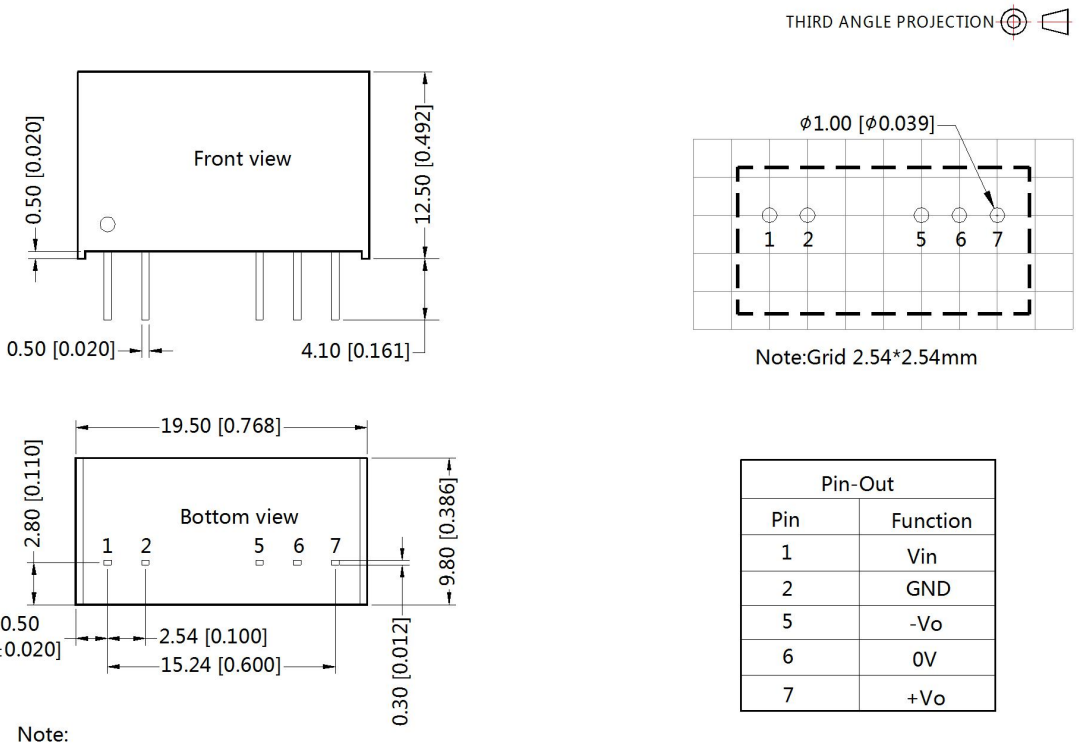
Input voltage (VDC)		15
EMI	C1/C2	4.7μF /50V
	C3/C4	100μF /35V (Low internal resistance capacitance)
	LCM1	4.7mH

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

Dimensions and Recommended Layout



Pin-Out	
Pin	Function
1	Vin
2	GND
5	-Vo
6	0V
7	+Vo

Note:
Unit :mm[inch]
Pin section tolerances:±0.10[±0.004]
General tolerances:±0.25[±0.010]

Notes:

1. Packing information please refer to Product Packaging Information which can be downloaded from www.mornsun-power.com. Packaging 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%RH 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

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