MOSFET SiC Driver Dedicated Power Supply

QA151M

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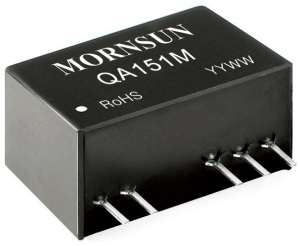


Continuous Short Circuit Protection

FEATURES

- High efficiency up to 80%
- SIP package
- I/O isolation test voltage: 3.5k VAC
- Ultra low isolation capacitor
- Operating ambient temperature range: -40℃ to +105℃
- Continuous short-circuit protection
- Industry standard pin-out

Patent Protection RoHS

QA151M is DC-DC module power supply designed for MOSFET SiC driver requiring two set of isolation power supply. The mode uses two common ground output modes to better provide energy for 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 systems
3.Electric welding machines
4.Un-interruptible power supplies (UPS)

Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency(%) Min./Typ.	Max. Capacitive Load*(μF)
	Nominal (Range)	Voltage (VDC) +Vo/-Vo	Current (mA) +Io/-Io		
QA151M	15 (13.5-16.5)	+15/-5	+100/-100	76/80	220

Note:*The specified maximum capacitive load value for positive and negative output is identical.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	15V input	--	162/15	--	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
Output Voltage	Vin=15VDC, Pin6 & Pin7 +Io=+100mA	+Vo	14.4	15	15.9	VDC
	Vin=15VDC, Pin5 & Pin6 -Io=-100mA	-Vo	-4.75	-5	-5.75	
Voltage Accuracy	Vin=15VDC, Pin6 & Pin7 +Io=+100mA	+Vo	-4% to +6%			
	Vin=15VDC, Pin5 & Pin6 -Io=-100mA	-Vo	-5% to +15%			
	10%-100% load		See output regulation curve(Fig. 1)			
Linear Regulation	Input voltage change: ±1%		--	±1.1	--	--
Load Regulation	10%-100% load	+Vo	--	7	--	%
		-Vo	--	9	--	
Ripple & Noise*	20MHz bandwidth	+Vo	--	120	--	mVp-p
		-Vo	--	80	--	
Temperature Coefficient	100% load		--	±0.02	--	%/℃
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
Insulation Resistance	Input-output resistance at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V	--	3.5	--	pF
Operating Temperature	Derating when operating temperature up to 85℃ (see Fig. 2)	-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	--	
Storage Humidity	Non-condensing	--	--	95	%RH
Switching Frequency	100% load, nominal input voltage	--	83	--	kHz
MTBF	MIL-HDBK-217F@25℃	3500	--	--	k hours

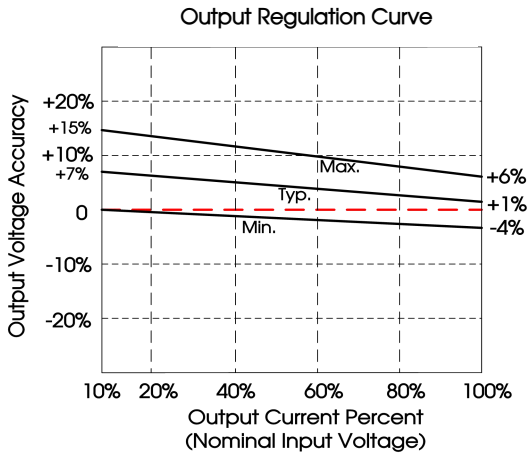
Mechanical Specifications

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

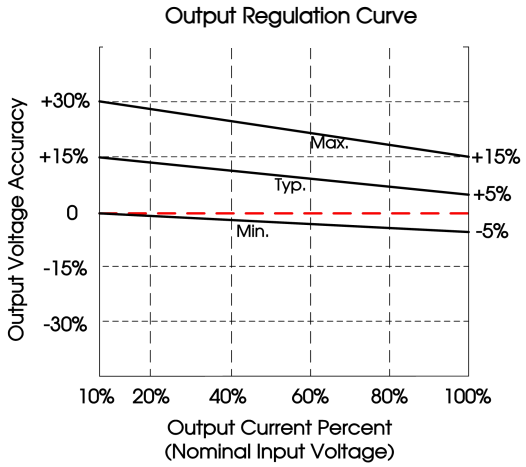
Electromagnetic Compatibility (EMC)

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



+Vo output regulation curve



-Vo output regulation curve

Fig. 1

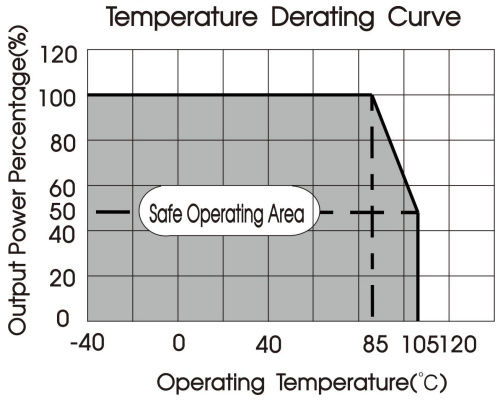


Fig. 2

Design Reference

1. Test configurations

Fig. 3

Note: C1,C2,C3: 100uF/35V (Low internal resistance capacitor)

2. Typical application

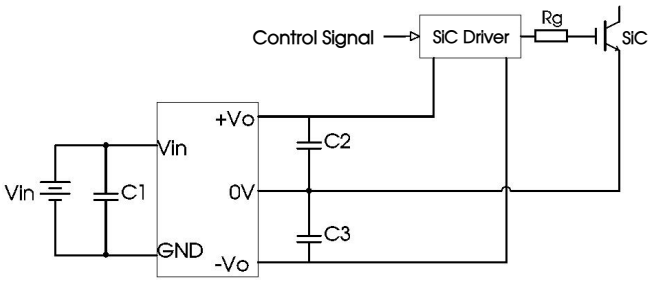


Fig. 4

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

3. EMC compliance circuit

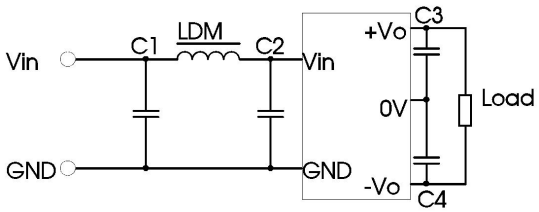


Fig. 5

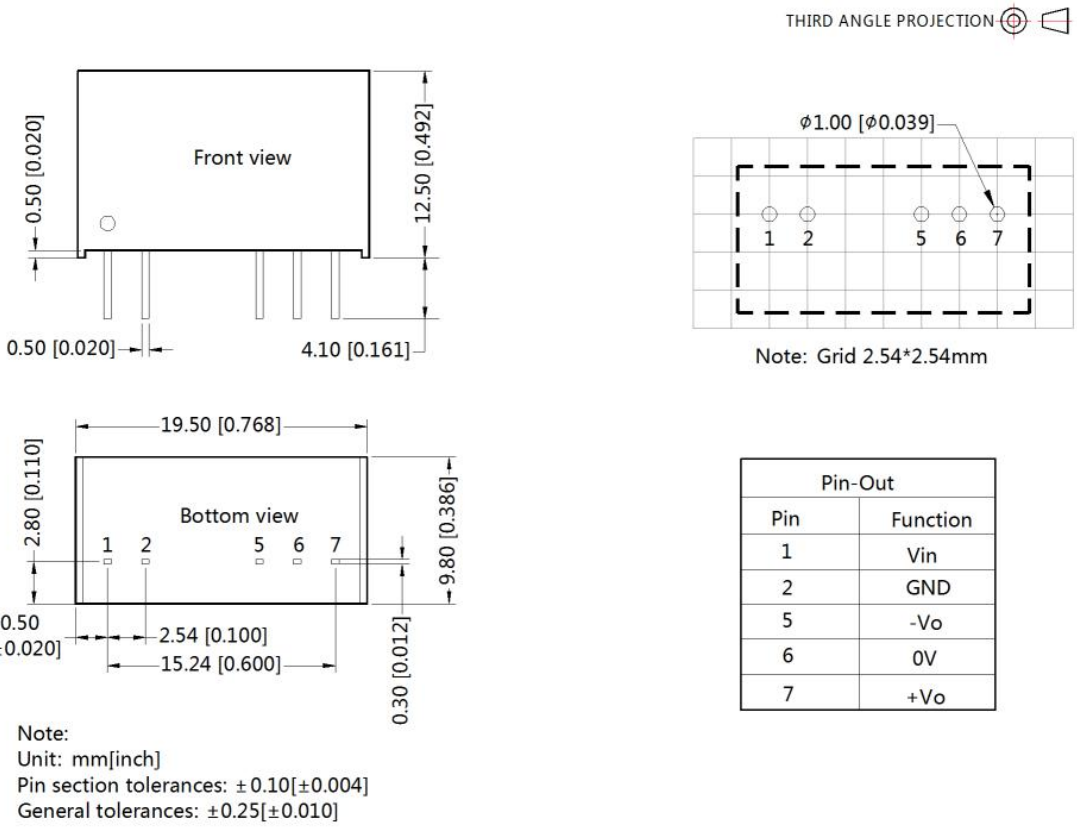
Input voltage (VDC)		15
EMI	C1/C2	4.7μF /50V
	C3/C4	100μF /35V (Low internal resistance capacitor)
	LDM	6.8μH

4. Electrolytic capacitors with low ESR (equivalent series resistance) are recommended for external capacitors at the input or output of the product.

5. The products do not support parallel connection of their output and hot plug.

6. 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. For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200013;
2. The connection between the power supply module and SiC driver should be kept as short as possible;
3. The output filter capacitors should be as close as possible to the power supply module and SiC driver;
4. Low ESR electrolytic capacitors are recommended for output filtering (MOSFET SiC gate drives have high peak current);
5. The average driver output power must be lower than the one of the power supply module;
6. For using parts in high vibration environments, consider gluing technics for securing the module;
7. The maximum capacitive load offered were tested at nominal input voltage and full load;
8. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
9. All index testing methods in this datasheet are based on company corporate standards;
10. The performance parameters of the product models listed in this manual are as above, but some parameters of non-standard model products may exceed the requirements mentioned above. Please contact our technicians directly for specific information;
11. We can provide product customization service, please contact our technicians directly for specific information;
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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