

MOSFET SiC Driver Dedicated Power Supply



FEATURES

- High efficiency up to 78%
- SIP package
- I/O isolation test voltage 3.5k VAC
- Ultra low isolation capacitance
- Operating ambient temperature range: -40°C to +105°C
- Continuous short-circuit protection
- Industry standard pin-out

Patent Protection RoHS

QA15115R2 is DC-DC module power supply designed for MOSFET SiC driver requiring two sets of isolation power supply. The mode of two common ground 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		Full Load Efficiency(%) Min./Typ.	Capacitive Load*(μF) Max.
	Nominal (Range)	Voltage (VDC) +Vo/-Vo	Current (mA) +Io/-Io		
QA15115R2	15 (13.5-16.5)	+15/-2.5	+100/-100	77/78	220

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

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	15V input	--	193/17	--	mA
Surge Voltage (1sec. max.)		-0.7	--	21	VDC
Input Filter		Capacitance filter			

Output Specifications

Item		Operating Conditions		Min.	Typ.	Max.	Unit
Voltage	+Vo	Vin=15VDC, Pin6 & Pin7 +Io=+100mA		14.25	15	15.75	VDC
	-Vo	Vin=15VDC, Pin5 & Pin6 -Io=-100mA		-2.35	-2.5	-2.8	
Voltage Accuracy	+Vo	Vin=15VDC, Pin6 & Pin7 +Io=+100mA		-5% to +5%			
	-Vo	Vin=15VDC, Pin5 & Pin6 -Io=-100mA		-6% to +12%			
Linear Regulation		Input voltage change: ±10%		--	±1.1	±1.3	%
Load Regulation		10%-100% load	+15VDC output	--	5	10	%
			-2.5VDC output	--	8	16	
Ripple & Noise*		20MHz bandwidth	Ripple	--	60	--	mVp-p
			Noise	--	75	--	
Temperature Coefficient		100% load		--	--	±0.03	%/°C
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	3500	--	--	VAC

	leakage current of 1mA max.				
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. 1)	-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	--	85	--	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

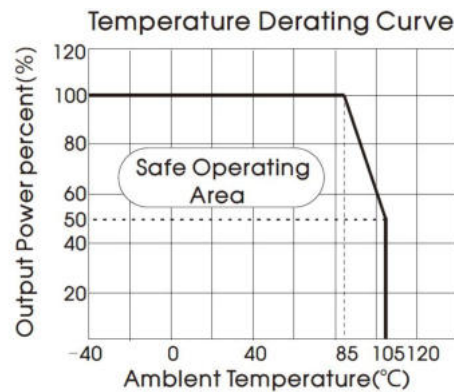


Fig. 1

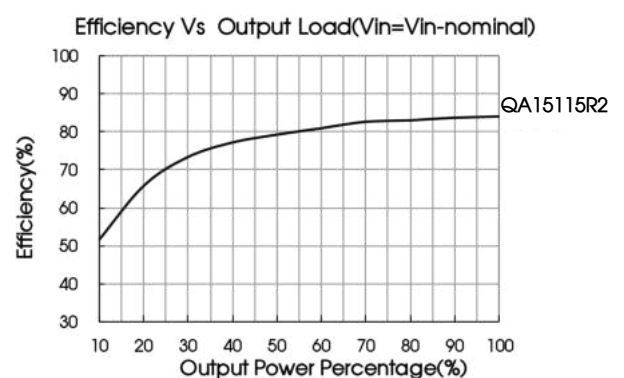
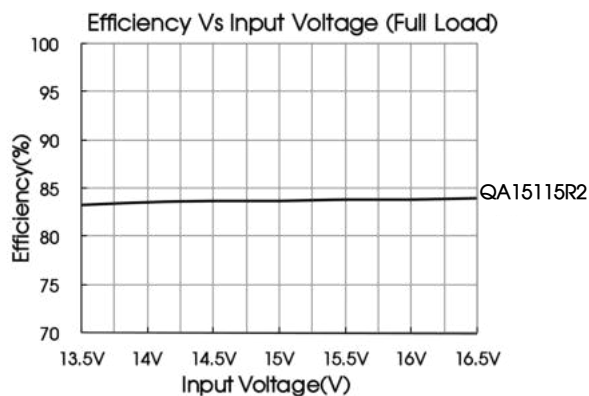


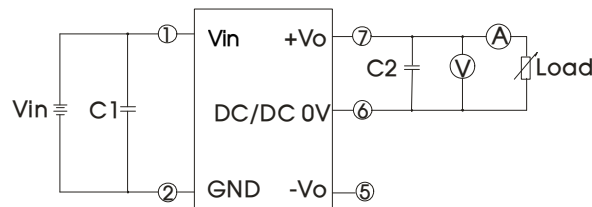
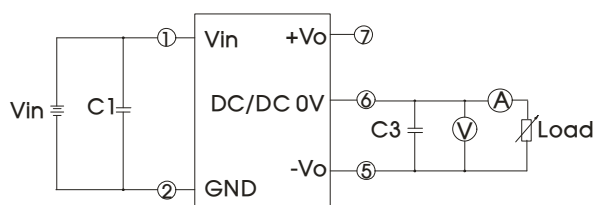
Fig. 2

Design Reference

1. Overload Protection

there is no over-load protection under normal operating conditions, we suggest to add an circuit breaker outside in the circuit.

2. Test configurations



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

Fig. 3

3. Typical application

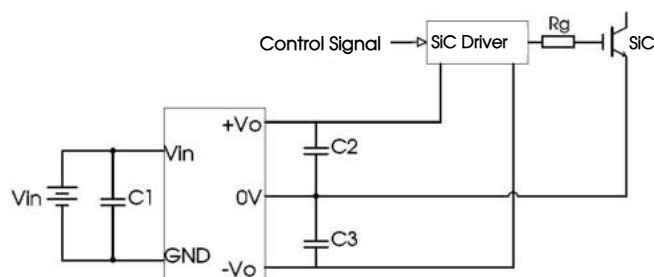


Fig. 4

C1/C2/C3
100uF/35V (Low internal resistance capacitance) (Recommended brand : KEMET)

4. EMC (CLASS B) compliance circuit

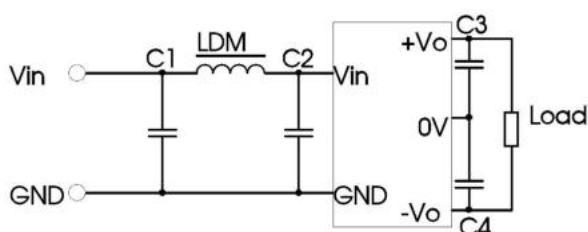


Fig. 5

Input voltage (VDC)		15
Emission	C1/C2	4.7μF /50V (Recommended brand : TDK)
	C3/C4	100μF /35V (Low internal resistance capacitance) (Recommended brand : KEMET)
	LDM	22μH (Recommended brand : TDK)

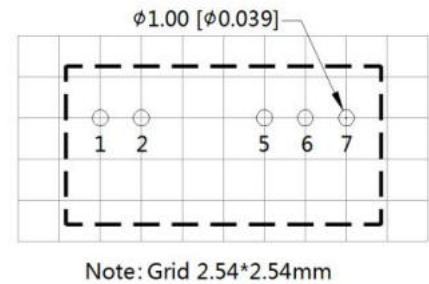
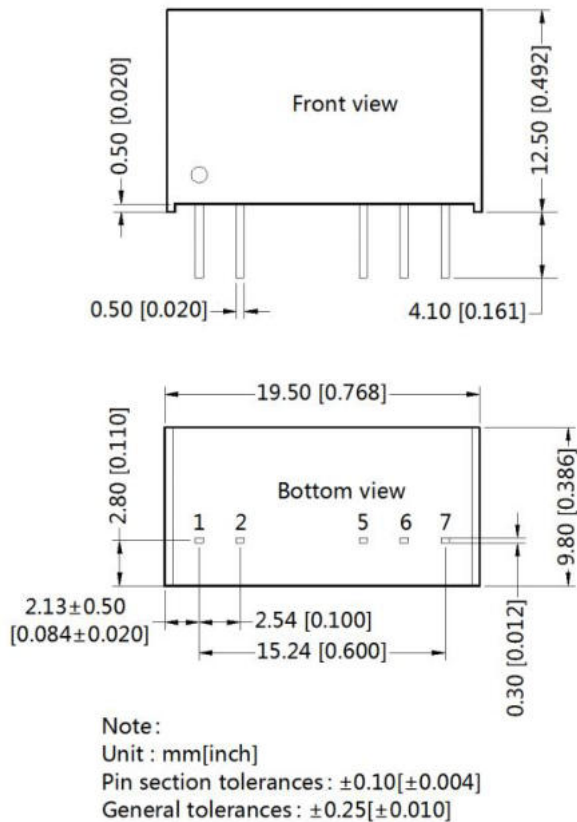
5. Electrolytic capacitors are recommended for external capacitors at the input or output of the product. Tantalum capacitors are not, otherwise there is a risk of failure.

6. The products do not support parallel connection of their output or hot-swappable use

7. 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	Function
1	V _{in}
2	GND
5	-V _o
6	0V
7	+V _o

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58200013;
- The lead connecting the power supply module and SiC driver should be as short as possible during use;
- The output filtering capacitor should be as close as possible to the power supply module and SiC driver;
- The peak of the MOSFET SiC driver dedicated power supply gate drive current is high, so low internal resistance electrolytic capacitor is recommended to be used for the power supply module output filter capacitor;
- The average output power of the driver must be lower than that of the power supply module;
- Consider fixing with glue near the module if being used in vibration occasion;
- The max. capacitive load should be tested within the input voltage range and under full load conditions;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of T_a=25°C, humidity<75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- The above are the performance indicators of the product models listed in this datasheet. Some indicators of non-standard models will exceed the above requirements. For details, please contact our technical staff;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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