Descriptions

SIC MOSFET driver dedicated power supply



RoHS

UL62368-1 EN62368-1 BS EN62368-1

Features

- High efficiency up to 80%
- SIP package
- I/O isolation test voltage: 3.5kVAC/6kVDC
- Ultra-low isolation capacitance
- Operating ambient temperature range: -40℃ to +105℃
- Continuous short-circuit protection
- Industry standard pin-out

Applications

- Variable Frequency Drive
- AC servo drive system
- Electric welding machine
- Uninterruptible power supply (UPS)

Selection Guide

Certification	Part No.	Input Voltage (VDC)	Output		Efficiency at Full Load (%) Min./Typ	Capacitive Load① (μF) Max.
		Nominal (Range)	Voltage (VDC)+Vo/-Vo	Current (mA)+Io/-Io		
UL/EN/BS EN	DQP2-12S2004V0	12 (10.8-13.2)	+20/-4	+100/-100	75/80	220
	DQP2-24S2004V0	24 (21.6-26.4)	+20/-4	+100/-100	75/80	220

Note:
①The specified maximum capacitive load for positive and negative output is identical;
②Product images are for reference only; the actual product shall prevail.

Specifications

Product Specifications	Item	Operating Conditions				Min.	Typ.	Max.	Unit
Input Specifications	Input Current (full load / no-load)	12V nominal voltage input				--	125/13	--	mA
		24V nominal voltage input				--	240/20	--	
	Surge Voltage (1sec. max.)	12V nominal voltage input				-0.7	--	18	VDC
		24V nominal voltage input				-0.7	--	30	
	Input Filter					Capacitance filter			
	Hot Plug					Unavailable			
Output Specifications	Voltage Accuracy	Nominal voltage input	DQP2-12S2004V0	Light Load	+Vo	0	+5	+10	%
					-Vo	0	+7.5	+15	
				Full Load	+Vo	-2	0	+2	
					-Vo	-7.5	-2.5	+2.5	
			DQP2-24S2004V0	Light Load	+Vo	+0.5	+5.5	+10.5	
					-Vo	+5.5	+13	+20.5	
				Full Load	+Vo	-2.5	0	+2.5	
					-Vo	-7.5	0	+7.5	
	Linear Regulation	Input voltage change: ±10%		DQP2-12S2004V0		--	±1.5	±2	
				DQP2-24S2004V0		--	±1.1	±1.3	
	Load Regulation	10% to100% load	+Vo	DQP2-12S2004V0		--	±1.5	±2	
				DQP2-24S2004V0		--	±1.1	±1.3	
			-Vo	DQP2-12S2004V0		--	--	8	
				DQP2-24S2004V0		--	5	8	
	Ripple & Noise①	20MHz bandwidth	Ripple	DQP2-12S2004V0		--	10	13	mVp-p
				DQP2-24S2004V0		--	--	13	
			Noise	DQP2-12S2004V0		--	100	--	
				DQP2-24S2004V0		--	75	--	
	Temperature Coefficient	100% load	DQP2-24S2004V0			--	--	±0.03	%/℃
	Output Short Circuit Protection					Continuous, self-recovery			
General Specifications	Isolation Voltage	Input-output	Electric Strength test for 1 minute with a leakage current of 1mA max.			3500	--	--	VAC
	Isolation Resistance	Input-output	Testing voltage: 500VDC			1000	--	--	MΩ
	Isolation Capacitance	Input-output	100kHz/0.1V			--	3.5	--	pF
	Operating Temperature		Derating when operating temperature up to 85℃,(Fig.1)			-40	--	105	℃
	Storage Temperature	DQP2-24S2004V0				-55	--	125	
		DQP2-12S2004V0				-50	--	105	
	Pin Soldering Resistance Temperature②	Soldering spot is 1.5mm away from the case, 10 seconds max.				--	--	+300	
		Wave soldering, maximum 10 seconds				255	260	265	
	Case Temperature Rise	Ta=25℃				--	30	--	
	Storage Humidity	Non-condensing				--	--	95	%RH

	Switching Frequency	100% load, nominal input voltage	--	100	--	kHz
	MTBF	MIL-HDBK-217F@25℃	3500	--	--	k hours
Mechanical Specifications	Case Material	Black plastic; flame-retardant and heat-resistant（UL94 V-0）				
	Package Dimensions	19.50 × 9.80 × 12.50mm				
	Weight	4.2g (Typ.)				
	Cooling Method	Free air convection				

Note:
①Ripple and noise tested with "parallel cable" method;
②The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and soldering iron tip selection.

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig. 12 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig. 12 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2 Contact ±6kV	perf. Criteria B

Characteristic Curve

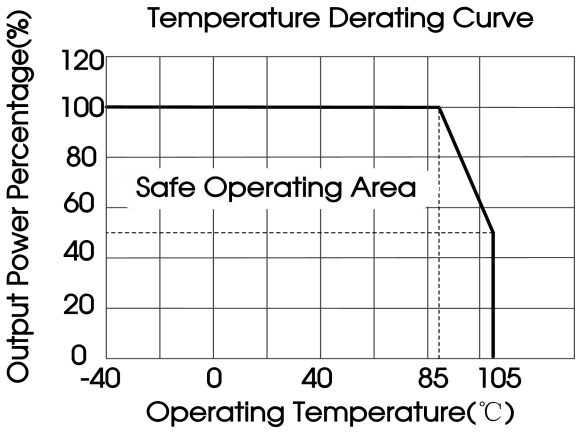


Fig. 1

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

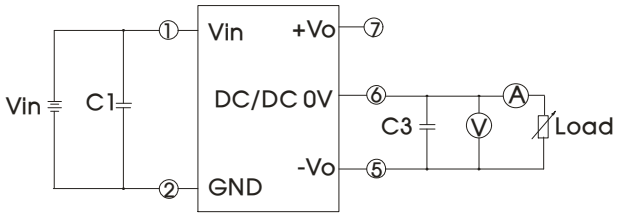


Fig. 2

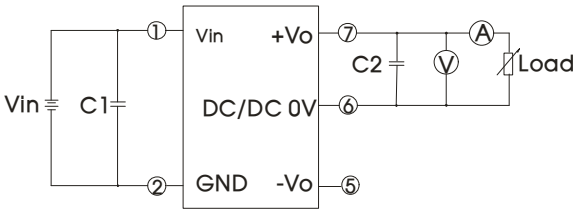
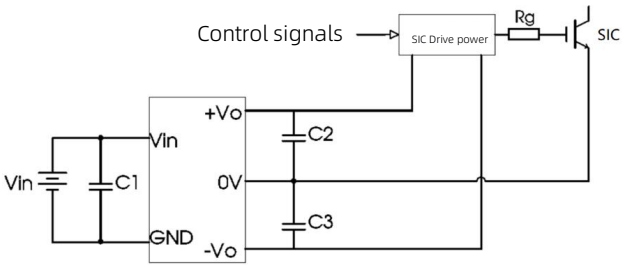


Fig. 3

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

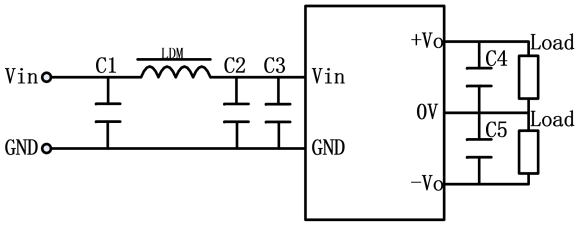
3. EMC typical recommended circuit (CLASS B)



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

Fig. 4 Typical application circuits

4. EMC Solution - Recommended Circuits



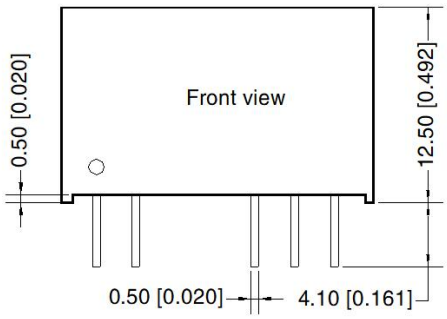
Model		DQP2-12S2004V0	DQP2-24S2004V0
EMI	C1/C2	4.7μF /50V	
	C4/C5	100μF /35V (Low internal resistance capacitance)	
	LDM	6.8μH	

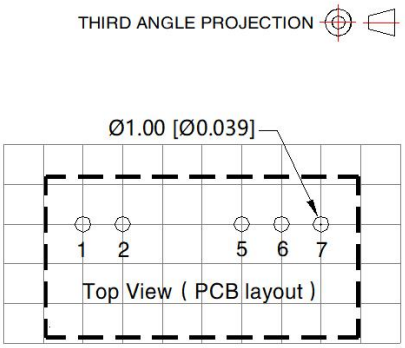
Fig. 5

5. It is recommended to use ceramic capacitors or electrolytic capacitors for external capacitors at the input or output terminals of the product, and tantalum capacitors are not recommended, otherwise there may be a certain risk of failure.

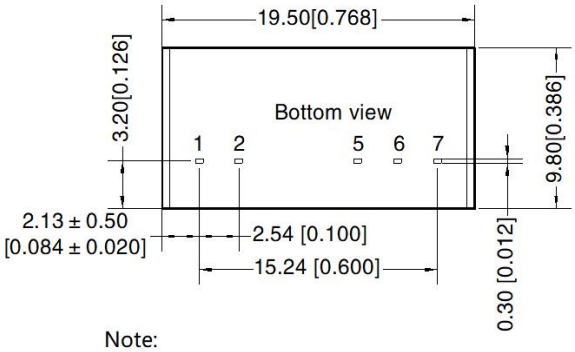
6. The product does not support output parallel power boost or hot swappable use.

Dimensions and Recommended Layout





Note: Grid 2.54*2.54mm



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

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

Note:
1. When in use, the leads connecting the power module to the SiC driver are as short as possible;
2. The output filter capacitors are as close as possible to the power module and SiC driver;
3. The peak value of the gate driving current of the SiC driver is high, so it is recommended to use a low internal resistance electrolytic capacitor for the output filter capacitor of the power module;
4. The average output power of the driver must be less than the output power of the power module;
5. If used for vibration, consider fixing it with glue next to the module3;
6. The maximum capacitive load is tested in the input voltage range and under full load conditions;
7. Unless otherwise specified, all indicators in this manual are measured at Ta=25°C, humidity <75%RH, nominal input voltage and output rated load;
8. The test methods of all indicators in this manual are based on the company's corporate standards;
9. The above are the performance indicators of the product models listed in this manual, some indicators of non-standard model products will exceed the above requirements, and the specific situation can be directly contacted by our technical personnel;
10. Products related to laws and regulations: see "Product Features", "EMC Features";
11. After the scrapping of our products, they need to be classified and stored in accordance with ISO14001 and relevant environmental laws and regulations, and handed over to qualified units for disposal;
12. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.