GAPTEC®
GREEN TECHNOLOGY

2.4S7SIC_152004D6UP

2.4W - Dual Output - Wide Input - Isolated & Unregulated
DC-DC module power supply specialized for SiC driver

DC-DC Converter 2.4 Watt

- Efficiency up to 83%
- Temperature range: -40°C~+105°C
- Dual Output Voltage
- Up to 6000VDC isolation
- Short circuit protection (SCP)
- Industry standard pinout
- Output over-voltage protection
- RoHS Compliance
- UL60950, EN60950 and IEC60950 approved

The 2.4S7SIC_152004D6UP is a DC-DC module power supply designed for SiC drivers, requiring two sets 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:

- Universal converter
- AC servo drive system
- Electric welding machine
- Uninterruptible power supply (UPS)

c UL us
UL-60950-1 (E347551)

Common specifications

Short circuit protection:	Continuous, automatic recovery
Temperature rise at full load:	30°C TYP (Ta=25°C)
Cooling:	Free air convection
Operation temperature range*:	-40°C – +105°C
Storage temperature range:	-55°C – +125°C
Lead temperature	300°C MAX, 1.5mm from case for 10 sec
Storage humidity range:	< 95%
Case material:	Black flame-retardant and heat-resistant plastic [UL94-V0]
MTBF:	>3,500 K hours
Weight:	4.2g

* Power derating ≥85°C, (see Typical characteristics, temperature derating curve); the product's max certification operating temperature: 85°C.

Input specifications

Item	Test condition	Min	Typ	Max	Units
Surge voltage		-0.7		21	VDC
Hot plug	Unavailable				
Input filter	Capacitor				

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-Output, tested for 1 minute and leakage current less than 1mA	6000			VDC
Isolation resistance	Input-Output, test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		3.5		pF

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage accuracy	See tolerance envelope graph (Fig. 1, Fig. 2)				
Line regulation	Input voltage change: ±10%		±1.1	±1.3	%
Load regulation	10% to 100% load • 20VDC output • -4VDC output		 5 10	 8 15	 % %
Temperature drift coefficient	100% load			±0.03	%/°C
Ripple & Noise*	20MHz Bandwidth • Ripple • Noise		 60 75		 mVp-p mVp-p
Switching frequency	Full load, nominal input		300		KHz

*Test ripple and noise by "parallel cable" method. See detailed operation instructions at DC-DC application notes.

EMC specifications

EMI	CE	CISPR22/EN55022 (see EMC recommended circuit)	CLASS B
EMI	RE	CISPR22/EN55022 (see EMC recommended circuit)	CLASS B
EMS	ESD	IEC/EN61000-4-2	Contact ±6KV perf. Criteria B

Example:
2.4S7SIC_152004D6UP
2.4 = 2.4 Watt; S7 = SIP7; SiC = SiC ; 15 = 15Vin;
20 = +20Vout; 04 = -4Vout; D = Dual Output; 6 = 6kVDC isolation;
U = Unregulated; P = Short Circuit Protection (SCP)

Part Number	Input Voltage [V]	Input current full load/ no load [mA, typ]	Output Voltage [VDC, +Vo/-Vo]	Output current [mA, +Vo/-Vo]	Max. capacitive load [µF]	Efficiency [%, typ]
2.4S7SIC_152004D6UP	15 (13.5-16.5)	193/16	+20/-4	+100/-100	220	79/83

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Specifications subject to change without notice.

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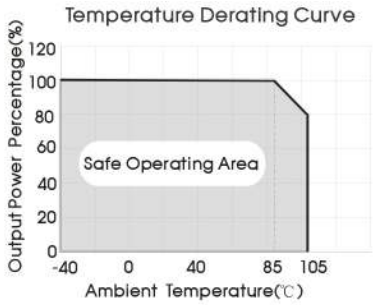
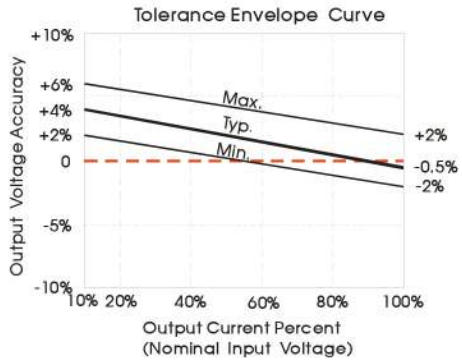
DC-DC module power supply specialized for SiC driver

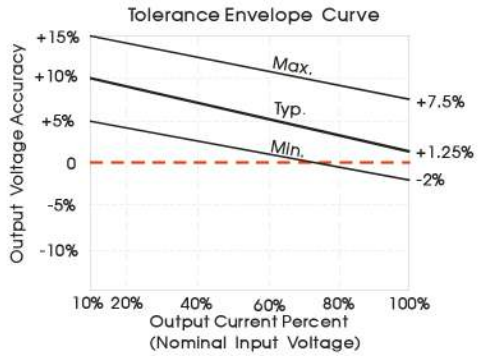
Typical characteristics



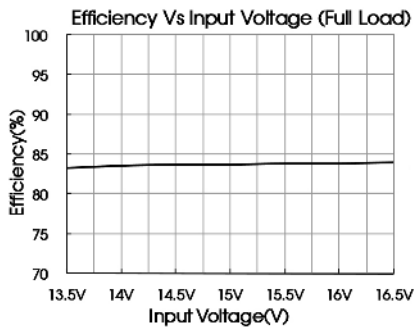
Positive Output Voltage Tolerance Envelope Graph

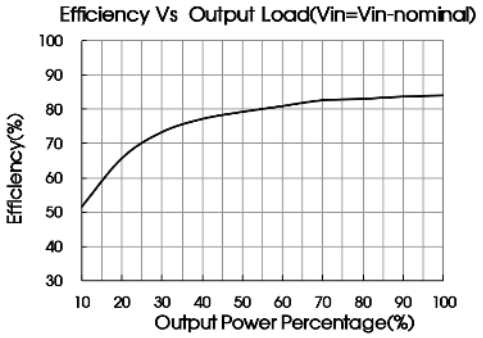


Negative Output Voltage Tolerance Envelope Graph



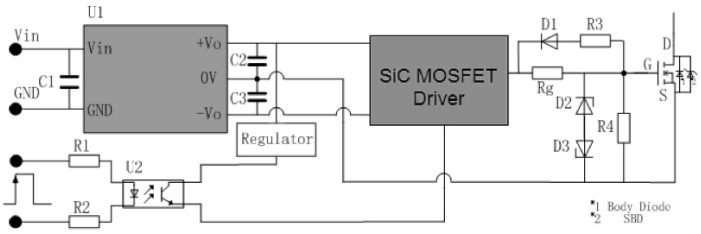
Efficiency





Application

SiC MOSFET driver can receive asymmetric positive driving voltage of 20V and turn off voltage bias -4V from 5S7SIC In order to prevent the damage to the grid electrode, adding D2(zener diode) & D3(zener diode) is necessary to absorb the peak voltage. In addition, we recommend opto-coupler isolation to achieve the signal isolation between control circuit and main power circuit, but the opto-coupler must has high CMRR(30KV/us) /high isolation voltage/ultra-short delay time to meet the characteristic high frequency of SiC MOSFET.



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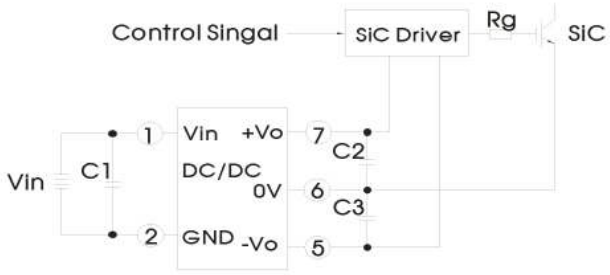
Test configurations

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

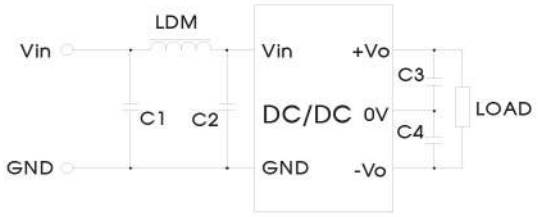
Overload protection:
In normal operating conditions, the circuit of these products have no overload protection.
Protect with a breaker is a simple way to make overload protection.

Typical application



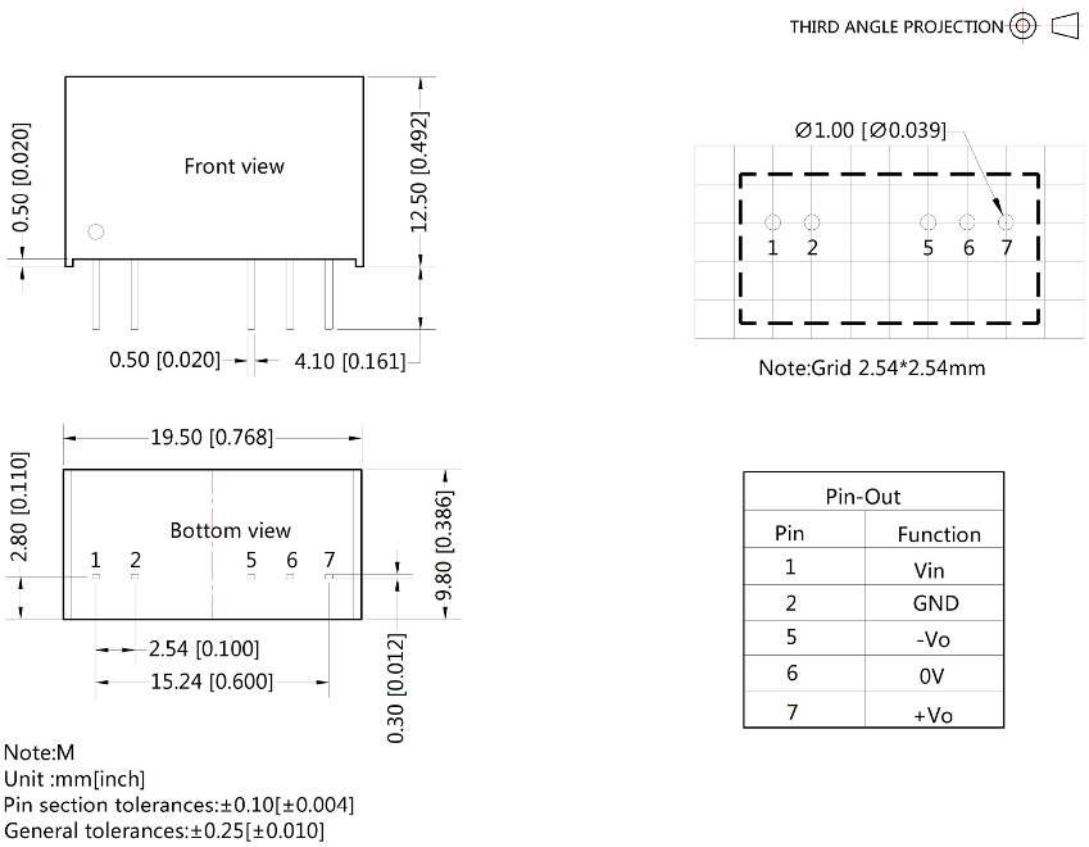
C1/C2/C3
100uF/35V (Low internal resistance capacitance)

EMC typical recommended circuit (Class B)



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

Mechanical dimensions



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

Note:

1. The lead connecting the power supply module and SIC driver should be as short as possible during use;
2. The output filtering capacitor should be as close as possible to the power supply module and SIC driver;
3. 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;
4. The average output power of the driver must be lower than that of the power supply module;
5. Consider fixing with glue near the module if being used in vibration occasion;
6. The max. capacitive load should be tested within the input voltage range and under full load conditions;
7. Unless otherwise noted, all specifications are measured at Ta= 25°C, humidity <75%, nominal input voltage and rated output load.
8. In this datasheet, all test methods are based on our corporate standards.
9. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
10. Please contact our technical support for any specific requirement.
11. Specifications of this product are subject to changes without prior notice.