GAPTEC®
GREEN TECHNOLOGY

2.4S7SIC_122004D6UP Series

2.4W - Dual Output - Wide Input - Isolated & Unregulated
SIC dedicated DC-DC converter

DC-DC Converter 2.4 Watt

- Efficiency up to 80%
- Temperature range: -40°C~+105°C
- Dual Output Voltage
- Isolation voltage: 3.5kVAC/6kVDC
- Short circuit protection (SCP)
- RoHS Compliance
- Ultra low isolation capacitance
- IGBT dedicated regulated DC-DC converter

The 2.4S7SIC_122004D6UP is a DC-DC module power supplie designed for IGBT drivers 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:

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

Common specifications

Short circuit protection:	Continuous, automatic recovery
Temperature rise at full load:	30°C TYP (Ta=25°C) Derating at ≥85°C (see graph)
Cooling:	Free air convection
Operation temperature range:	-40°C – +105°C
Storage temperature range:	-50°C – +105°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:	>3,500,000 hours
Weight:	4.3g
Dimensions:	19.50*9.80*12.50mm

EMC specifications

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

Input specifications

Item	Test condition	Min	Typ	Max	Units
Input surge voltage		--0.7		18	VDC
Hot plug	Unavailable				
Input filter	Capacitor				

Example:
2.4S7SIC_122004D6UP
2.4= 2.4Watt; S7= SIP7; SIC= SiC Series; 12= 12Vin; 20= +20Vout; 04= -4Vout; D= Dual Output; 6= 6kVDC; U= Unregulated; P= Short Circuit Protection (SCP)

Output specifications

Item	Test condition	Min	Typ	Max	Units
Output voltage	+Vo: Vin= 12VDC, Pin6 & Pin7 +Io=+100mA	19.6	20	20.4	VDC
	-Vo: Vin= 12VDC, Pin5 & Pin6 -Io=-100mA	-3.7	-3.9	-4.1	VDC
Output voltage accuracy	+Vo: Vin=12VDC, Pin6 & Pin7 +Io=+100mA	-2		+2	%
	-Vo: Vin=12VDC, Pin5 & Pin6 -Io=-100mA	-7.5		+2.5	%
Line regulation	Input voltage change: ±10%		±1.5	±2	%
Load regulation	10% to 100% load • 20VDC output • -4VDC output			8 13	% %
Ripple & Noise*	20MHz Bandwidth • Ripple • Noise		60 100		mVp-p mVp-p
Temperature drift coefficient	100% load			±0.03	%/°C
Switching frequency	Full load, nominal input		100		KHz

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

Isolation specifications

Item	Test condition	Min	Typ	Max	Units
Isolation voltage	Input-Output, tested for 1 minute and leakage current less than 1mA	3500 6000			VAC
Isolation resistance	Input-Output, test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/0.1V		3.5		pF

Part Number	Input Voltage (Range) [V]	Input current, no load [mA, typ]	Output Voltage [VDC, +Vo/-Vo]	Output current [mA, +Vo/-Vo]	Max. capacitive load [µF]	Efficiency [%, typ]
2.4S7SIC_122004D6UP	12 (10.8-13.2)	20	+20/-4	+100/-100	220	80

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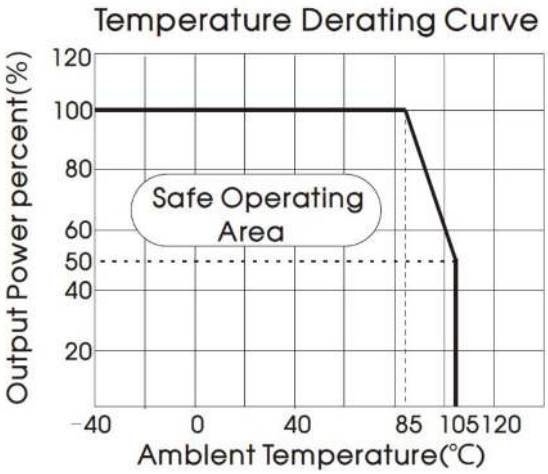
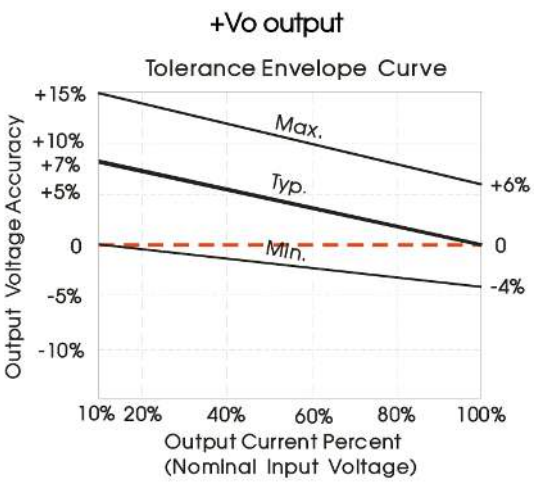
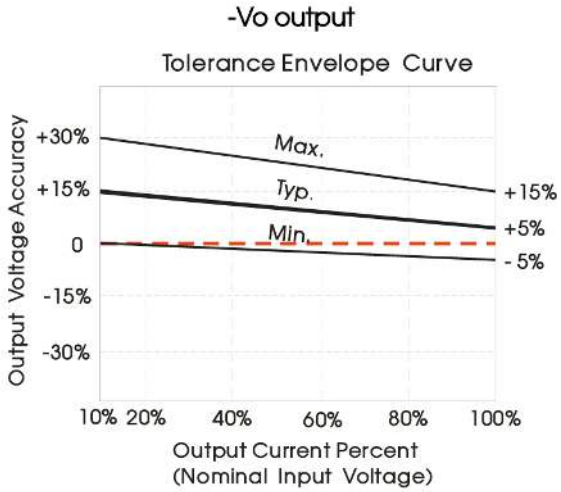
Temperature Derating Curve



Efficiency

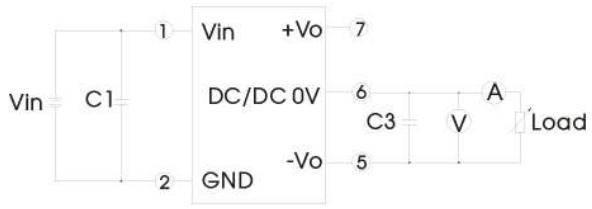




Overload protection

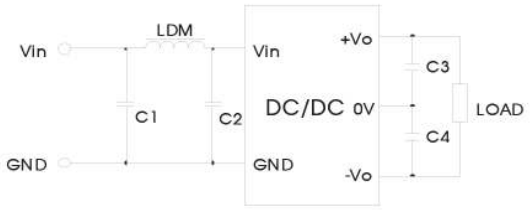
In normal operating conditions, the circuit of these products have no overload protection.
Protect with a breaker is a simple way to make overload protection.

Test configurations



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

EMC solution-recommended circuit

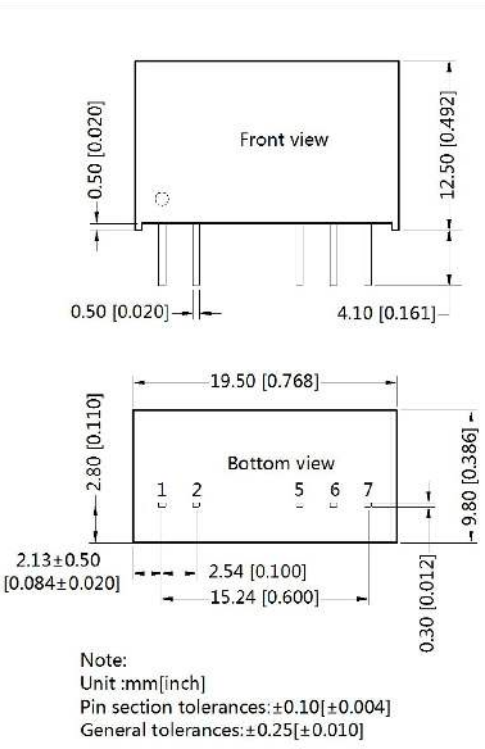


EMI	C1/C2	4.7μF /50V
	C3/C4	100μF /35V (Low internal resistance capacitance)
	LDM	6.8μH

The product does not support output in parallel with power per liter or hot-swappable use.

It is not allowed to connect modules output in parallel to enlarge the power.

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 IGBT 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 MOSFET 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.