

Non-isolated & regulated 6A single output
POL power converter



FEATURES

- High efficiency up to 94%
- Operating ambient temperature range: -40°C ~ +85°C
- Input under-voltage protection, output short-circuit, over-current protection
- High-speed transient response
- Compact SMD package
- EN62368 approved

SK12T-6A series is a 6A non-isolated switching regulator. The output voltage is accurately adjustable from 0.75V to 5.0V, and the product is featured with high efficiency, fast transient response, input under-voltage, output short circuit, over-current protection. They meet CLASS B of CISPR32/EN55032 EMI standards by adding the recommended external components and they are widely used in applications such as communications, computer network industry, power distributed architecture, workstations, servers, LANs/WANs and provide high current with fast transient response for high-speed chips such as FPGA, DSP, and ASIC.

Selection Guide

Certification	Part No. ①	Input Voltage (VDC)		Output		Efficiency(%) Min./Typ.	Capacitive Load(μF) Max.	
		Nominal (Range)	Max. ②	Voltage(VDC) ③ (Range)	Current (A) Max./Min.		1mΩ ≤ ESR < 10 mΩ	ESR ≥ 10 mΩ
CE	SK12T-6A-P	12	15	0.75~5.0	6/0	90/94	1000	3000
	SK12T-6A-N	(8.3~14)						

Notes: ① "P" indicates that the Ctrl pin is positive logic control, "N" indicates that the Ctrl pin is negative logic control;

② Exceeding the maximum input voltage may cause permanent damage;

③ The default output voltage is 0.75VDC, which can be adjusted to 1.2VDC, 1.8VDC, 2.5VDC, 3.3VDC, 5VDC. See Trim instructions for specific output voltage adjustment;

④ Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

Input Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	Nominal input voltage		--	2660/20	--	mA
Start-up Voltage			--	--	8	VDC
Under-voltage Protection			6	--	--	
Reverse Polarity Input			Avoid / Not protected			
Hot Plug			Unavailable			
Input Filter			Capacitance filter			
Ctrl*	Module on	SK12T-6A-P (Positive logic)	Ctrl pin open or pulled high (Vin-2.5VDC ~ Vin)			
		SK12T-6A-N (Negative logic)	Ctrl pin pulled low to GND (0 ~ 0.5VDC)			
	Module off	SK12T-6A-P (Positive logic)	Ctrl pin pulled low to GND (0 ~ 0.5VDC)			
		SK12T-6A-N (Negative logic)	Ctrl pin open or pulled high (Vin-2.5VDC ~ Vin)			
	Input current when off		--	1	--	mA

Notes: * 1. The Ctrl pin voltage is referenced to GND.

2. Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	Full load, nominal input voltage	--	±1.0	±2.0	%
Linear Regulation	Full load, input voltage range	--	±0.3	--	
Load Regulation	Nominal input, 0% -100% load	--	±0.4	--	

DC/DC Converter

SK12T-6A Series

Ripple & Noise*	20MHz bandwidth, nominal input, 100% load	--	35	75	mVp-p
Trim		0.75	--	5.0	VDC
Temperature Coefficient	100% load	--	±0.02	--	%/°C
Transient Response Deviation	Nominal input, 50%-100%-50% load step change, di/dt=2.5A/us, with external 2 x 150 µF polymer capacitors	--	±70	--	mV
Transient Recovery Time		--	20	--	us
Over-current Protection	Nominal input	140	160	--	%Io
Short-circuit Protection	Nominal input	Continuous, self-recovery			

Notes: * 1. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.
2. Unless otherwise specified, parameters in this table were measured under the 5VDC output voltage.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Reflow Soldering Temperature		Peak temp. Tc ≤245°C, maximum duration time ≤60s over 217°C. For actual application, please refer to IPC/JEDEC J-STD-020D.1.			
Switching Frequency	Full load, nominal input voltage	--	350	--	KHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	K hours

Mechanical Specifications

Dimensions	20.30 x 11.40 x 6.60 mm
Weight	3.9g (Typ.)
Cooling Method	Nature convection or forced convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032 Class B (see Fig.3 for recommended circuit)
	RE	CISPR32/EN55032 Class B (see Fig.3 for recommended circuit)
Immunity	ESD	IEC/EN61000-4-2 Contact ±6KV perf. Criteria B

Typical Characteristic Curves

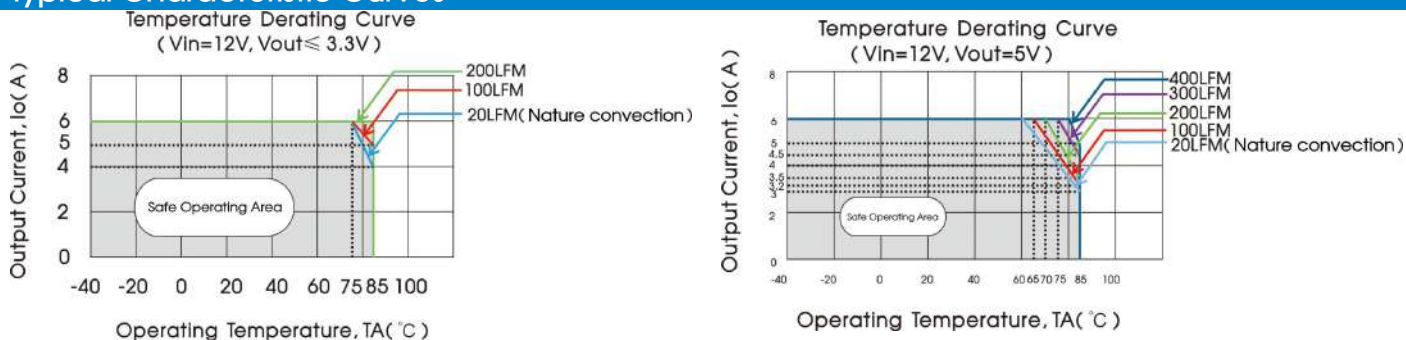
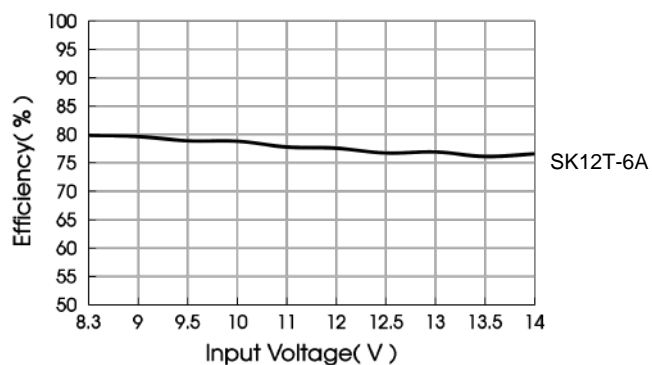


Fig. 1

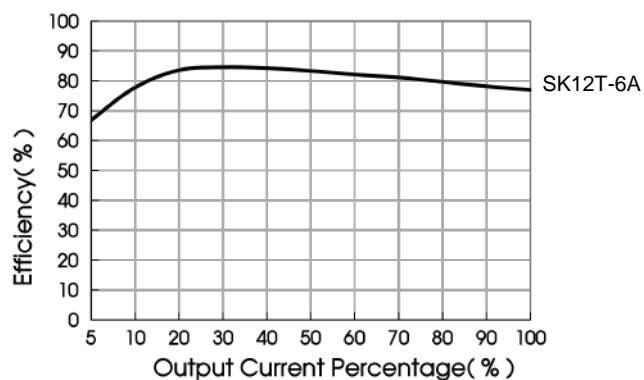
DC/DC Converter

SK12T-6A Series

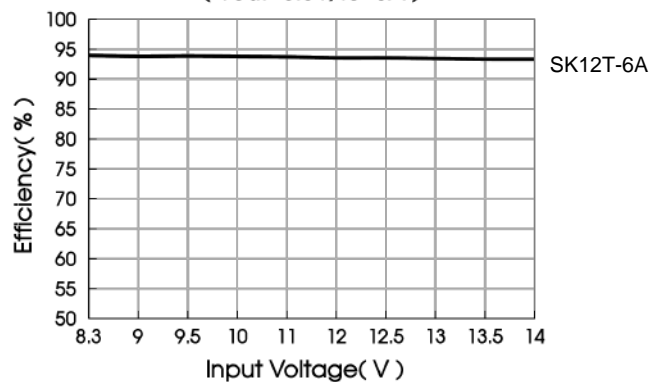
Efficiency Vs Input Voltage
($V_{out}=0.75V$, $I_o=6A$)



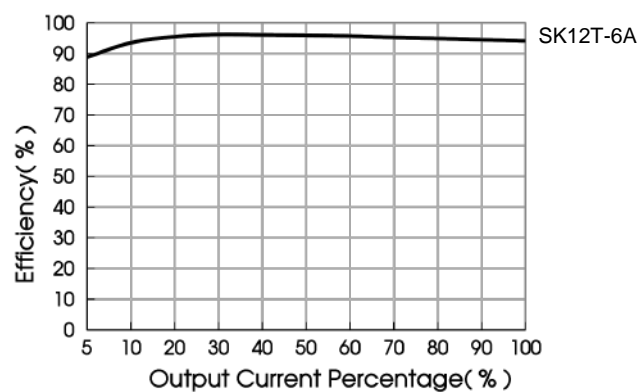
Efficiency Vs Output Load
($V_{in}=12V$, $V_{out}=0.75V$)



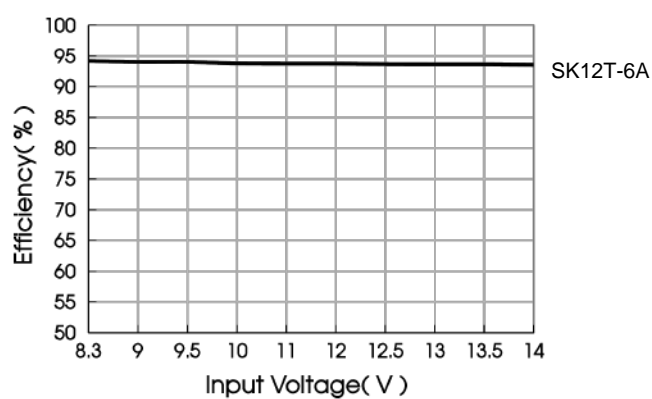
Efficiency Vs Input Voltage
($V_{out}=3.3V$, $I_o=6A$)



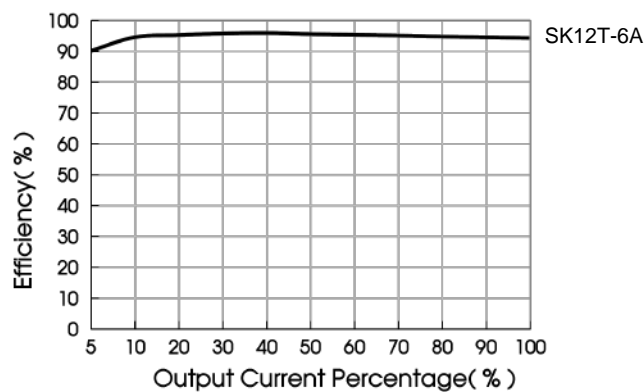
Efficiency Vs Output Load
($V_{in}=12V$, $V_{out}=3.3V$)



Efficiency Vs Input Voltage
($V_{out}=5V$, $I_o=6A$)



Efficiency Vs Output Load
($V_{in}=12V$, $V_{out}=5V$)



DC/DC Converter

SK12T-6A Series

Design Reference

1. Typical application

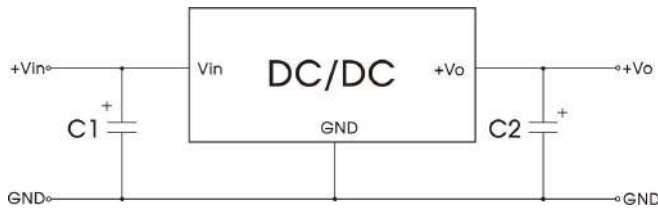


Fig. 2

Notes:

1. 100 μ F polymer capacitors (C1) is required and should be connected close to the pin terminal, to ensure the stability of the converter;
2. To reduce the output ripple further, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
3. Refer to Table 1 for C1 and C2 capacitor values;
4. Converter cannot be used for hot swap and with output in parallel.

2. EMC compliance circuit

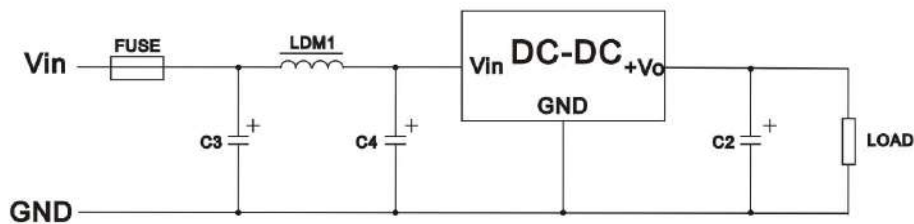


Fig. 3

Table 2

FUSE	C3/C4	LDM1	C2
Selected based on the actual input current in application	100 μ F /35V	6.8 μ H	Refer to the Cout in Table 1

3. Trim function for output voltage adjustment (open if unused)

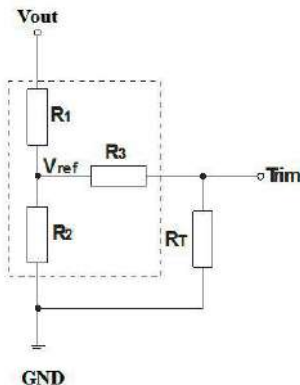


Fig. 4 TRIM resistor connection (dashed line shows internal resistor network)

Table 3

Vo(VDC)	R _T (k Ω)
0.7525	Open
1.2	15.089
1.8	5.873
2.5	3.120
3.3	1.826
5	0.695

Calculating Trim resistor (R_T) values:

$$R_T(\Omega) = \frac{7200}{V_o - 0.7525} - 1000$$

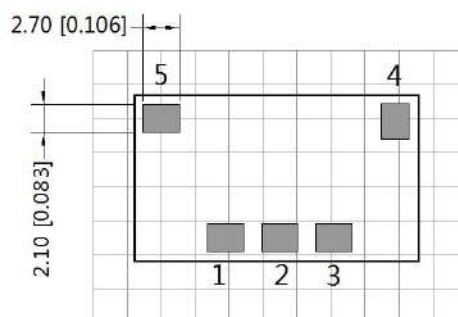
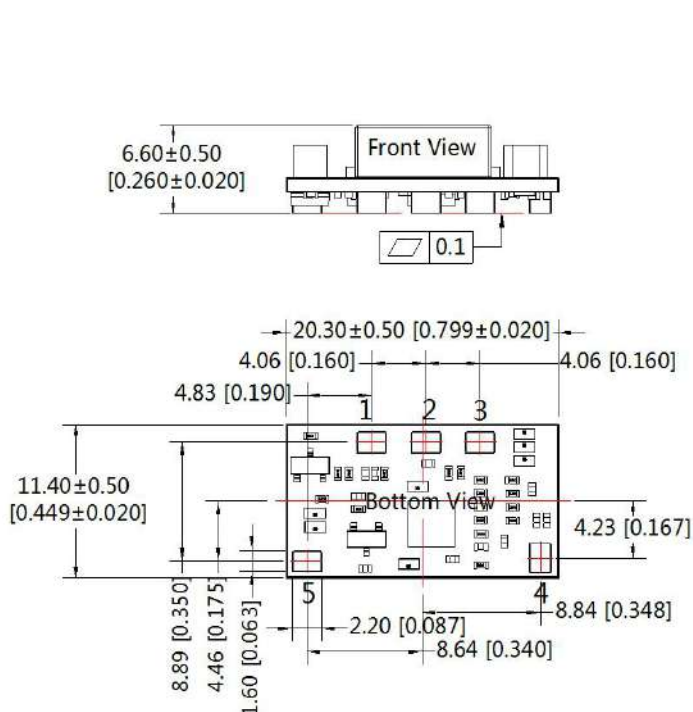
- Notes: 1. R_T : Resistance of Trim; Vo: The trim up voltage;
2. If R_T = ∞ or Trim pin open, Vo = 0.7525 VDC.

DC/DC Converter

SK12T-6A Series

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note : Grid: 2.54*2.54mm

Pin-Out	
Pin	Function
1	GND
2	Trim
3	+Vo
4	Ctrl
5	Vin

Note :
Unit: mm[inch]
General tolerances: ± 0.25 [± 0.010]
The layout of the device is for reference only ,
please refer to the actual product

Notes:

1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity<75%RH with nominal input voltage, 5VDC output voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. We can provide product customization service, please contact our technicians directly for specific information;
5. Products are related to laws and regulations: see "Features" and "EMC";
6. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.