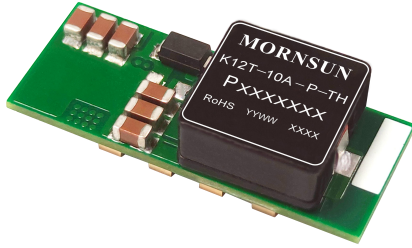


Non-isolated & regulated 10A single output  
POL power converter



RoHS



## FEATURES

- Operating ambient temperature range: -40°C to +85°C
- Output short-circuit protection
- High-speed transient response
- SMD package

K12T-10A-P-TH high-efficiency POL switching regulator, it features load capacity of 10A, the output voltage is precisely adjustable from 0.7525V to 5.0V, high conversion efficiency, fast transient response, with output short circuit protection functions, it is widely used in communication, computer network industry, and power distributed architecture, workstations, servers, LANs/WANs, providing high current with fast transient response for high-speed chips of FPGA, DSP and ASIC.

## Selection Guide

Certification	Part No. <sup>①</sup>	Input Voltage (VDC)		Output		Full Load Efficiency(%) Min./Typ.	Capacitive Load(μF) Max.
		Nominal (Range)	Max. <sup>②</sup>	Voltage(VDC) <sup>③</sup> (Range)	Current (A) Min./Max.		
--	K12T-10A-P-TH	12 (8.3-14)	15	0.7525-5.0	0/10	85/88	2000

Notes: ① "P" indicates that the Ctrl pin is positive logic control;  
② Exceeding the maximum input voltage may cause permanent damage;  
③ The default output voltage is 0.7525VDC, 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 1.8VDC output voltage.

## Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load/no-load)	Nominal input voltage	--	1704/50	--	mA
Start-up Voltage		--	--	8.3	VDC
Reverse Polarity Input		Avoid			
Hot Plug		Unavailable			
Input Filter		Capacitance filter			
Ctrl*	Module on	Ctrl pin open or pulled high(Vin-2.5V ~ Vin )			
	Module off	Ctrl pin pulled low to GND (0 ~ 0.5VDC)			
	Input current when off	--	--	4	mA

Notes: \* 1. The Ctrl pin voltage is referenced to GND;  
2. Unless otherwise specified, parameters in this table were measured under the 1.8VDC output voltage.

## Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	Full load, nominal input voltage	--	±1.0	±3.0	%
Linear Regulation	Full load, input voltage range	--	±0.4	--	
Load Regulation	Nominal input, 10% -100% load	--	±0.7	--	
Ripple & Noise	20MHz bandwidth, nominal input, 100% load	--	65	100	mVp-p
Trim		0.7525	--	5.0	VDC
Sense		--	--	0.5	%

Transient Response Deviation	Nominal input, 50%-100%-50% load step change	Vo=0.6VDC Co=2*47μF//4*330μF	--	±50	--	mV
		Vo=1.2VDC Co=47μF//3*330μF	--	±75	--	
		Vo=1.8VDC Co=47μF//330μF	--	±90	--	
		Vo=2.5VDC Co=3*47μF	--	±100	--	
		Vo=3.3VDC Co=3*47μF	--	±180	--	
		Vo=5VDC Co=2*47μF	--	±200	--	
Short-circuit Protection	Nominal input		Continuous, self-recovery			
Temperature Coefficient	100% load		--	±0.2	--	%/°C
Notes: Unless otherwise specified, all indicators in the table are Vo=1.8VDC.						

## 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 input	--	680	--	kHz
MTBF	MIL-HDBK-217F@25°C	1000	--	--	k hours
MSL	IPC/JEDEC J-STD-020D.1	MSL3			

## Mechanical Specifications

Dimensions	33.00 x 13.50 x 8.30mm
Weight	8.6g (Typ.)
Cooling Method	Nature convection or forced convection

## Typical Characteristic Curves

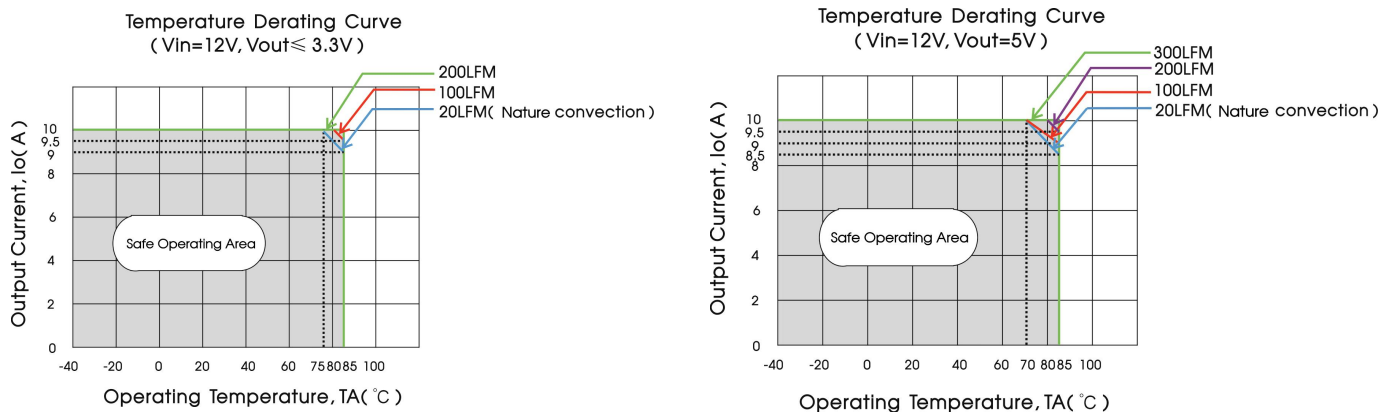
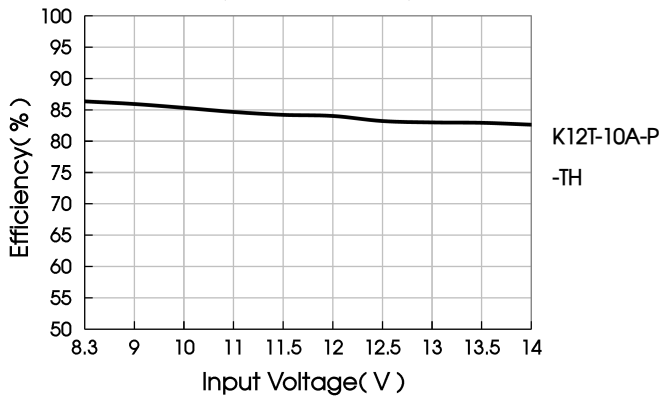
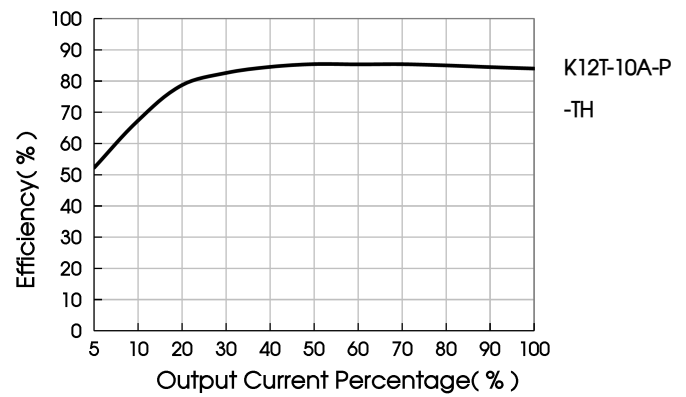


Fig.1

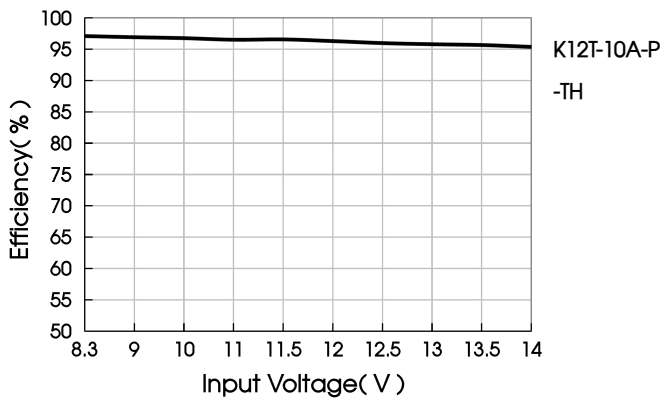
Efficiency Vs input Voltage  
( $V_{out}=1V$ ,  $I_o=10A$ )



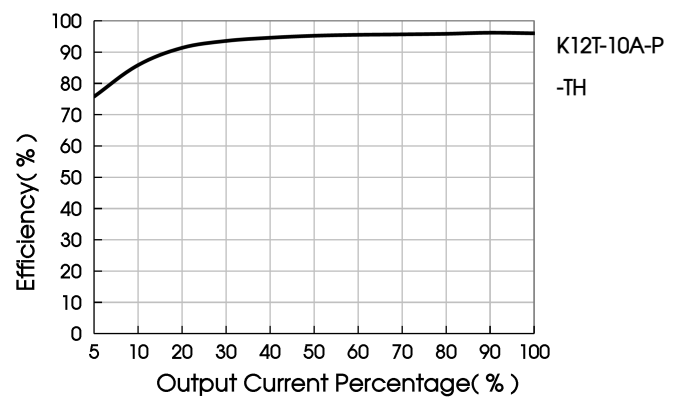
Efficiency Vs Output Load  
( $V_{in}=12V$ ,  $V_{out}=1V$ )



Efficiency Vs Input Voltage  
( $V_{out}=5V$ ,  $I_o=10A$ )

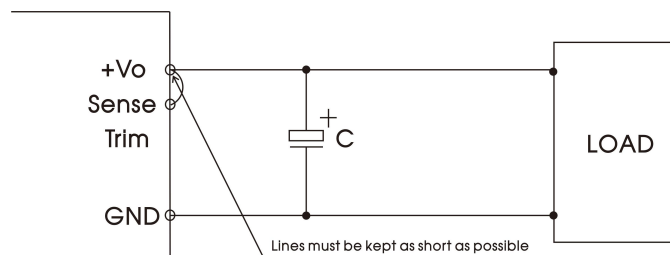


Efficiency Vs Output Load  
( $V_{in}=12V$ ,  $V_{out}=5V$ )



## Remote Sense Application

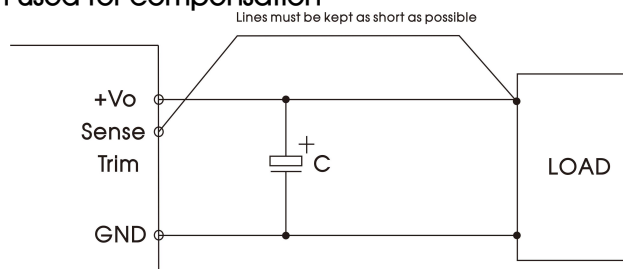
### 1. Remote sense connection if not used



Notes:

1. If the sense function is not used for remote regulation the user must connect the Sense to +Vo at the DC-DC converter pins and will compensate for voltage drop across pins only;
2. The connections between sense and +Vo must be kept as short as possible, otherwise they may be picking up noise, interference and/or causing unstable operation of the power module.

### 2. Remote sense connection used for compensation



### Notes:

1. PCB-tracks or cables/wires for Remote Sense must be kept as short as possible;
2. Using remote sense with long wires may cause unstable operation. Note that large wire impedance may cause oscillation of the output voltage and/or increased ripple. Consult technical support or factory for further advice of sense operation;
3. We recommend using adequate cross section for PCB-track layout and/or cables to connect the power supply module to make sure the power supply's output voltage remains within the specified range.

## Design Reference

### 1. Typical application

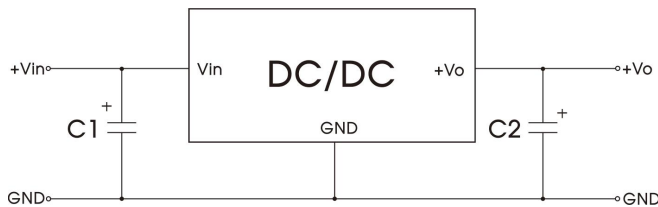


Fig. 2

Table 1

Part No.		C1	C2
K12T-10A-P-TH	Vo=0.6V	100μF/35V	2*47μF//4*330μF
	Vo=1.2V		47μF//3*330μF
	Vo=1.8V		47μF//330μF
	Vo=2.5V		3*47μF
	Vo=3.3V		3*47μF
	Vo=5V		2*47μF

### Notes:

1. 100 μF or 220 μF capacitor (C1) and 22 μF or 47 μF capacitor (C2) are 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 polymer 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. Trim function for output voltage adjustment (open if unused)

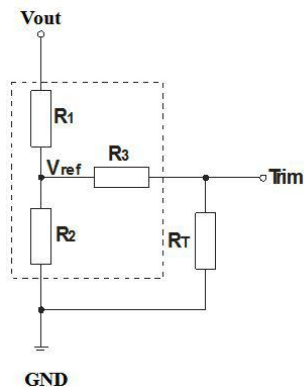


Fig. 4 Trim resistor connection (dashed line shows internal resistor network)

Table 3

Vo (VDC)	Rt (kΩ)
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 (Rt) values:

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


Notes: 1. Rt: Resistance of Trim; Vo: The trim up voltage;

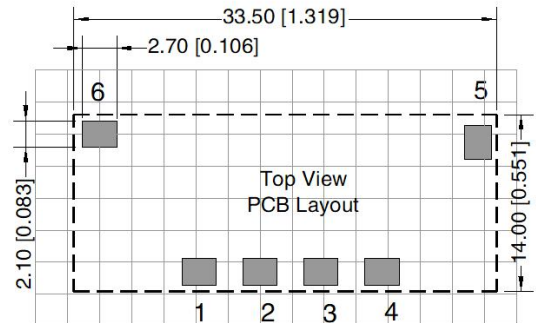
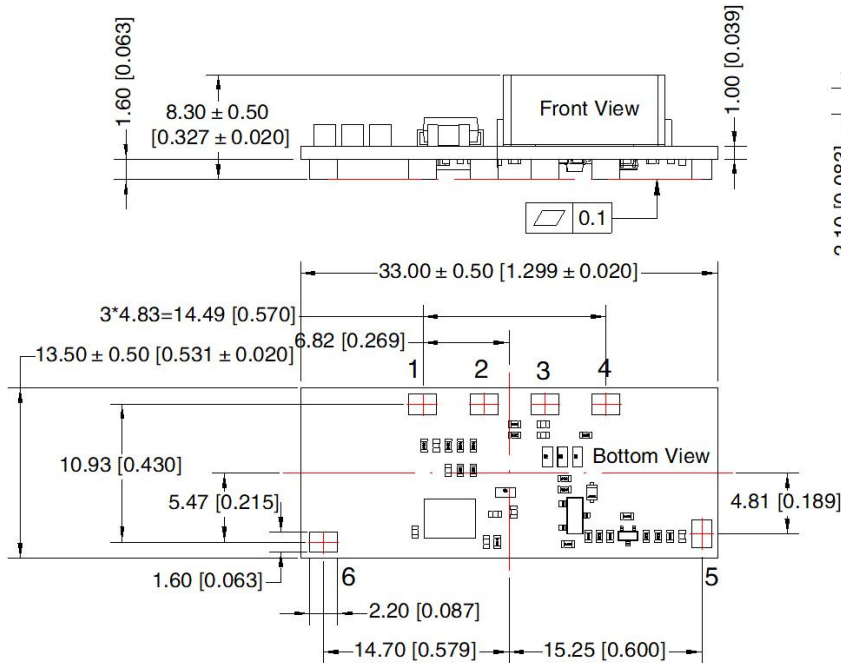
2. If Rt = ∞ or Trim pin open, Vo = 0.7525 VDC.

3. For additional information please refer to DC-DC converter application notes on

[www.mornsun-power.com](http://www.mornsun-power.com)

Dimensions and Recommended Layout

THIRD ANGLE PROJECTION 



Note: Grid 2.54\*2.54mm

Pin-Out	
Pin	Mark
1	GND
2	+Vo
3	Trim
4	Sense
5	Ctrl
6	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. For additional information on Product Packaging please refer to [www.mornsun-power.com](http://www.mornsun-power.com). Packaging bag number: 58210267;
2. The maximum capacitive load offered were tested at input voltage range and full load;
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage, 1.8VDC output voltage and rated output load;
4. All index testing methods in this datasheet are based on company corporate standards;
5. We can provide product customization service, please contact our technicians directly for specific information;
6. Products are related to laws and regulations: see "Features" and "EMC";
7. 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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