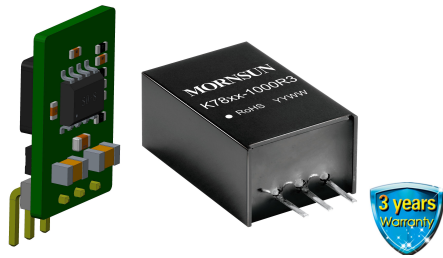


DC/DC Converter

K78(L)04-1000R3

MORNSUN®

Wide input voltage non-isolated and regulated single output



Patent Protection RoHS

FEATURES

- High efficiency up to 85%
- No-load input current as low as 0.1mA
- Operating ambient temperature range: -40°C to +85°C
- Support the negative output
- Short-circuit protection
- Pin-out compatible with LM78XX linear regulators

K78(L)04-1000R3 series are high efficiency switching regulators and ideal substitutes of LM78XX series three-terminal linear regulators. The product is featured with high efficiency, low loss and no heat sink requirement. They are widely used in industrial control, electric power, and instrumentation applications.

Selection Guide

Part No.	Input Voltage (VDC)	Output		Full Load Efficiency (%) Min./Typ.	Max. Capacitive Load(μF)
	Nominal (Range)	Voltage (VDC)	Current(mA) Max.		
K78(L)04-1000R3	24(8-36)	+4	1000	83/85	680
	12(8-27)	-4	-500	80/82	330

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Power Consumption	Positive output	--	0.1	1	mA
Reverse Polarity Input		Avoid / Not protected			
Input Filter		Capacitance Filter			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	100% load, input voltage range	--	±2	±3	%
Linear Regulation		--	±0.2	±0.4	
Load Regulation		--	±0.4	±0.6	
Ripple & Noise*	20MHz bandwidth, 20%-100% load, Nominal input	--	20	75	mVp-p
Temperature Coefficient	-40°C to +85°C	--	--	±0.03	%/°C
Transient Response Deviation	Nominal input, 25%-50%-25%, 50%-75%-50% load change	--	--	±5	%
Transient Recovery Time		--	0.1	1	ms
Short-circuit Protection	Nominal input	Continuous, self-recovery			

Note: *With the load less than 20%, the maximum ripple and noise will be 100mVp-p. The "parallel cable" method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information;
**parameters in this table were measured under positive output.

General Specifications

Item	Operating Condition	Min.	Typ.	Max.	Unit
Operating Temperature	See Fig. 1	-40	--	+85	°C
Storage Temperature		-55	--	+125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	+300	
Storage Humidity	Non-condensing	5	--	95	%RH
Switching Frequency	100% load, input voltage range	--	680	--	KHz
MTBF	MIL-HDBK-217F@25°C	2000	--	--	K hours

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Page 1 of 4

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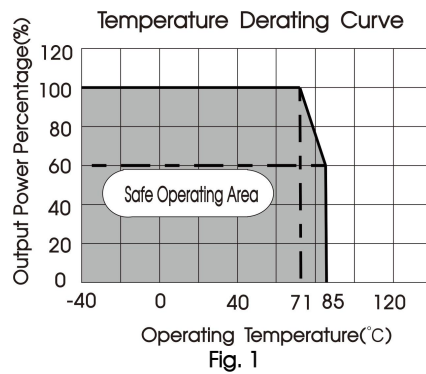
Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94-V0)	
Dimensions	K7804-1000R3	17.50 x 11.50 x 9.00 mm
	K78L04-1000R3	17.50 x 11.50 x 7.50 mm
Weight	K7804-1000R3	3.8g (Typ.)
	K78L04-1000R3	2.1g (Typ.)
Cooling Method	Free air convection	

Electromagnetic compatibility (EMC)

Immunity	ESD	IEC/EN 61000-4-2	Contact ±4KV	perf. Criteria B
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Typical Characteristic Curve



Design Reference

1. Typical application circuit

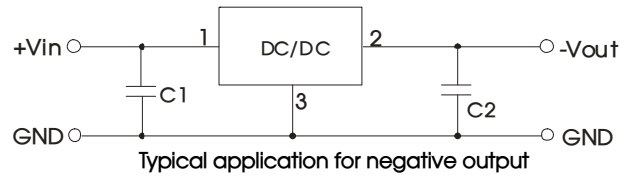
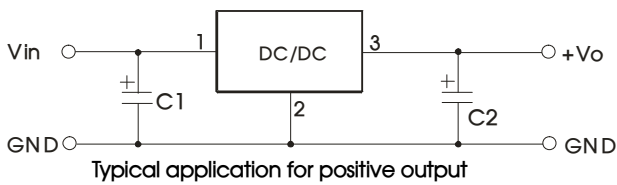


Fig. 2 Typical application circuit

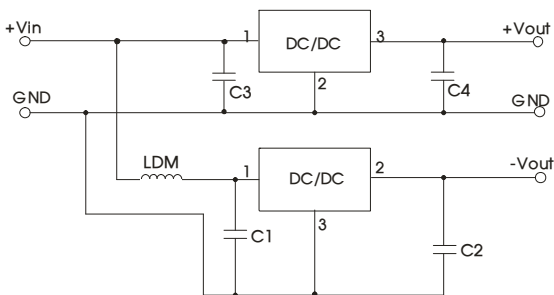


Fig. 3 Typical application circuit for dual output positive and negative

Part No	C1/C3 (ceramic capacitor)	C2/C4 (ceramic capacitor)
K78(L)04-1000R3	10μF/50V	22μF/10V

Tab. 1

Notes:

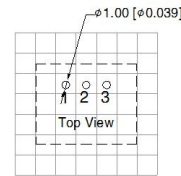
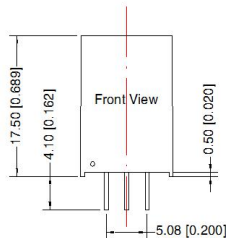
- ①The required C1 and C2 (C3 and C4) capacitors must be connected as close as possible to the terminals of the module.
- ②Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values.
- ③For certain applications, increased C2/C4 values and/or tantalum or low ESR electrolytic capacitors may also be used instead.
- ④When using configurations as shown in figure 3, we recommended to add an inductor (LDM) with a value of up to 10μH which helps reducing mutual interference.
- ⑤Converter cannot be used for hot swap and with output in parallel.

2. For additional information please refer to DC-DC converter application notes on www.mornsun-power.com

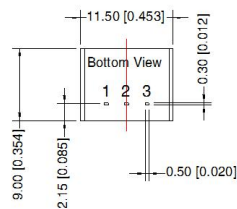
Dimensions and Recommended Layout

K7804-1000R3 (Potting SIP) Dimensions

THIRD ANGLE PROJECTION 



Note: Grid 2.54*2.54mm

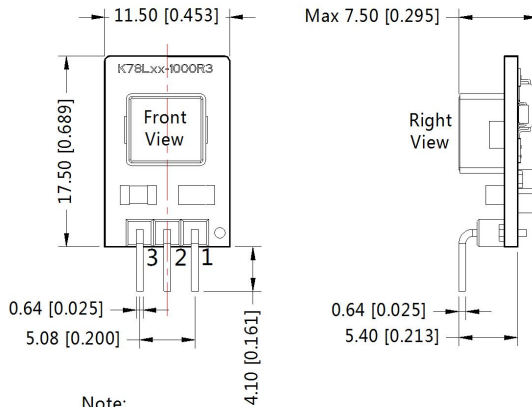


Pin-Out		
Pin	Positive output	Negative output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND

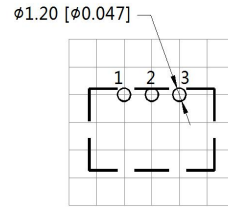
Note:
Unit: mm[inch]
Pin diameter tolerances: $\pm 0.10[\pm 0.004]$
General tolerances: $\pm 0.25[\pm 0.010]$

K78L04-1000R3(Open Frame SIP)Dimensions

THIRD ANGLE PROJECTION 



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



Note : Grid 2.54*2.54mm

Pin-Out		
Pin	Positive Output	Negative Output
1	V _{in}	V _{in}
2	GND	-V _o
3	+V _o	GND

Notes:

- For additional information on Product Packaging please refer to www.mornsun-power.com. Packaging bag number: 58010116(K78L04-1000R3), 58210021(K7804-1000R3);
- The max. capacitive load should be tested within the input voltage range and under full load conditions;
- Unless otherwise specified, data in this datasheet should be tested under the conditions of T_a=25°C, humidity<75%RH when inputting nominal voltage and outputting rated load;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see "Features" and "EMC";
- 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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