

# Features

- 1 ) No need for external heat sinks
- 2 ) Wide operating temperature range : -40°C to +85°C
- 3 ) Up to 96% efficiency
- 4 ) No load current as low as 0.2MA
- 5 ) The pins are compatible with the LM78xx series and can be packaged with straight or curved pins



## Power Solutions

### DC-DC Converters

# K78xxM-1000R3

## Series



3rd generation chip solution



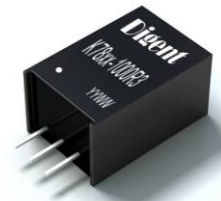
3-year quality assurance



3rd generation manufacturing process

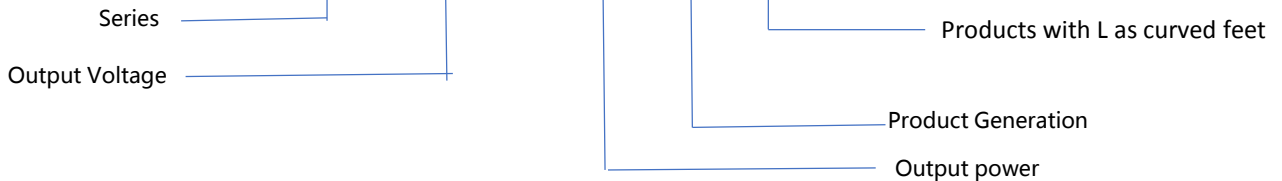
## Description

Wide voltage input, output 1000mA, non isolated/stabilized/single output/SIP3 packaging



## Model Numbering

# K78xx-1000R3(L)



## Selection Guide

Product model	Input Voltage Standard value(range)	Output Voltage	Output Current (mA) ( Max./Min. )	Efficiency % ( Min./Typ. )	Maximum capacitive load ( $\mu$ F)
K7803-1000R3(L)	24 ( 4.75-36 )	3.3	1000	90/81	680
K7805-1000R3(L)	24 ( 6.5-36 )	5		93/86	680
K7809-1000R3(L)	24 ( 12-36 )	9		95/90	680
K7812-1000R3(L)	24 ( 15-36 )	12		96/93	680
K7815-1000R3(L)	24 ( 19-36 )	15		96/94	330

## Input Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Input current (Rated Load)	Positive output	--	0.1	1	mA
Input filter	Capacitive filtering				
Remarks : <b>This product does not support hot plug</b>					

## Output Characteristic

Parameter	Conditions	Min.	Typ.	Max.	Units
Output voltage accuracy		See Figure 1 (envelope curve)			
Linear regulation rate	Input voltage variation +/- 1%	--	+/-2	+/-4	--
Load regulation rate	10% to 100% load	--	+/-0.3	+/-0.6	%
Ripple & Noise	20MHz bandwidth	--	20	80	mVp-p
Temperature drift coefficient	100% load	--	+/-0.03	--	%/°C
Short circuit protection	Sustainable, Self-healing				

## General Characteristics

Parameter	Conditions	Min.	Typ.	Max.	Units
Working temperature	Temperature $\geq 85$ °C for derating (See Figure 2)	-40	--	+85	°C
Storage temperature		-55	--	+125	°C
Storage humidity	Non condensing	--	--	95	%RH
Housing temperature rise during operation	Ta=25 °C, Nominal input, Full output	--	15	25	°C
Soldering temperature resistance of pins	The distance from the welding spot to the shell is 1.5mm, 10 seconds	--	--	260	°C
Switching frequency	Full load, Nominal input voltage	550	--	850	kHz
Mean time between failures	MIL-HDBK-217F@25°C	2000	--	--	K Hours

## Physical Characteristics

Parameter	Content
Housing material	Black flame retardant and heat-resistant plastic (UL94V-0)
Overall dimensions	11.50 x 9.00 x 17.50 mm
Weight	3.8g(Typ.)
Cooling mode	Natural air cooling

## EMC Characteristics

Parameter	Category	Content
EMI	Conductive disturbance	CISPR32/EN55032 CLASS B ( The recommended circuit is shown in Figure 2 )
	Radiation disturbance	CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 2 )
EMS	Electrostatic discharge	IEC/EN61000-4-2 Contact $\pm 6\text{KV}$ perf. Criteria B

## Circuit Design and Application

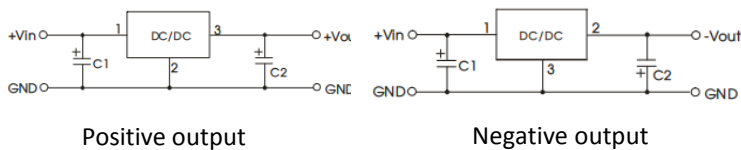


Figure 1: Application circuit

Table 1:  
Recommended Capacitive Load Values

Product model	C1/C3	C2/C4
K7803-500	10 $\mu\text{F}/50\text{V}$	22 $\mu\text{F}/10\text{V}$
K7805-500		22 $\mu\text{F}/10\text{V}$
K7809-500		22 $\mu\text{F}/16\text{V}$
K7812-500		22 $\mu\text{F}/25\text{V}$
K7815-500		22 $\mu\text{F}/25\text{V}$

Table 2:  
Recommended Circuit Parameter Values

project	element	value
EMI	FUSE	Based on actual selection
	MOV	20D470K
	LDM1	82 $\mu\text{H}$
	C0	680pF/50V
	C1、C2	Reference Table 1
	C5	4.7 $\mu\text{F}/50\text{V}$
	LDM2	12 $\mu\text{H}$

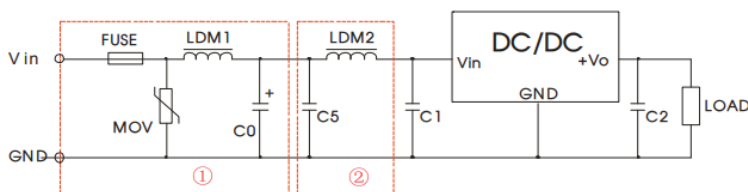


Figure 2: EMC Typical Recommended Circuits

- 1) Typical application: If it is required to further reduce the input and output ripple, a capacitor filter network can be connected at the input and output terminals. The application circuit is shown in Figure 1. However, proper filter capacitor shall be selected. If the capacitance is too large, it may cause startup problems. For each output, under the condition of ensuring safe and reliable operation, the recommended capacitive load values are shown in Table 1.
- 2) Typical EMC recommended circuits are shown in Figure 2.

**Product Characteristic Curve**

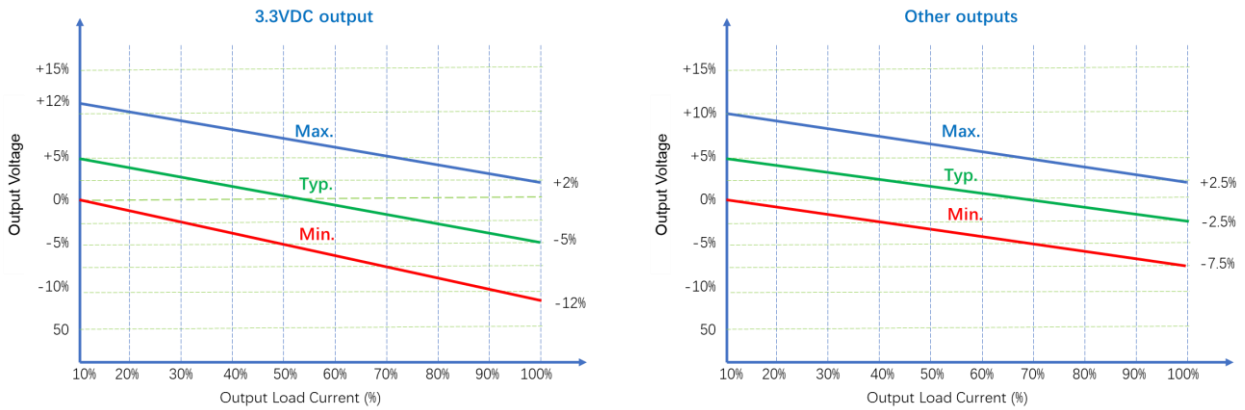


Figure 3: Voltage tolerance envelope

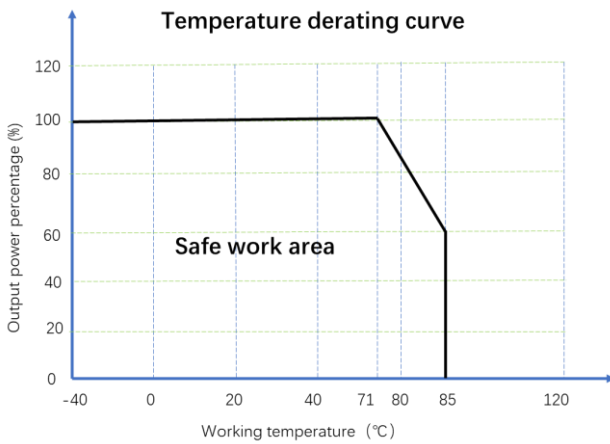


Figure 4: Temperature Derating Curve

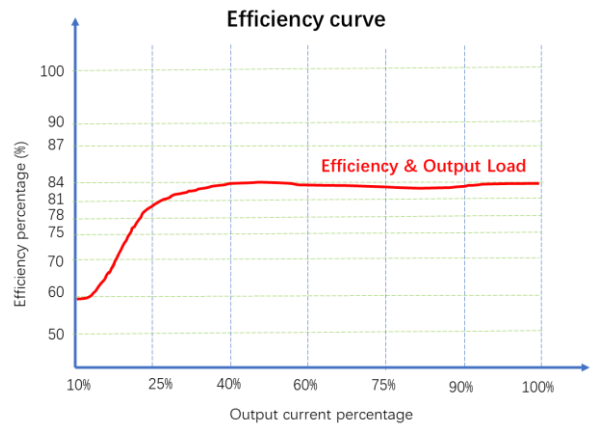


Figure 5: Efficiency VS Output Load (Nominal Voltage Input)

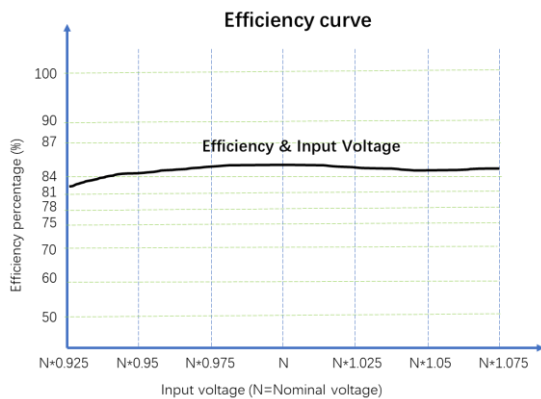


Figure 6: Efficiency VS Input Voltage (100% Load)

## Overall Dimensions and Pin Functions

Note:  
 Dimensions in mm [inch]  
 Terminal diameter tolerance:  $\pm 0.10$  [ $\pm 0.004$ ]  
 Undeclared tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]

Table 3: Pin Function Table

引脚	功能
1	Vin
2	GND
3	+Vo

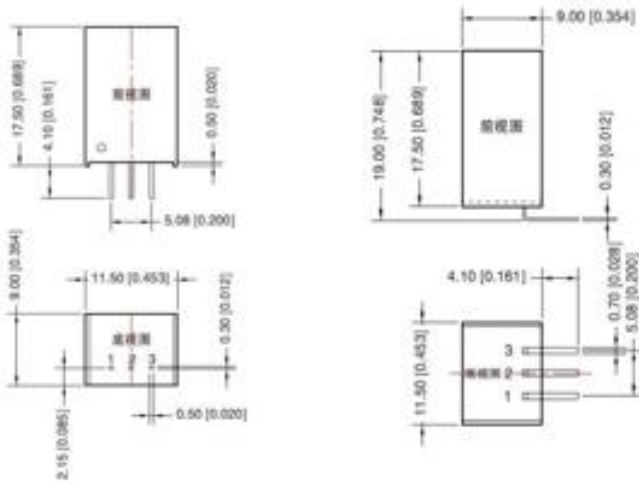
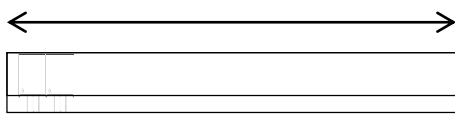
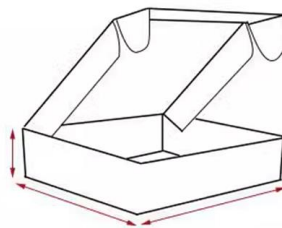


Figure 7: Overall dimensions

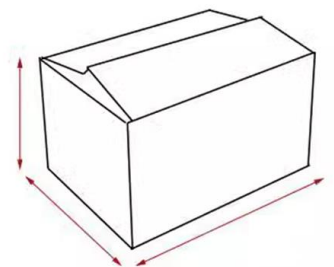
## Packaging Method



30 Pieces/Tube



1500 Pieces/Inner box



7500 Pieces/Outer box

## Notes & Instructions

- 1) The input voltage shall not exceed the specified range value, otherwise permanent and unrecoverable damage may be caused;
- 2) Unless otherwise specified, the parameters in this manual are measured at 25 °C, 40%~75% humidity, input nominal voltage and output pure resistance mode under full load;
- 3) All index test methods are based on the company's enterprise standards.
- 4) The copyright and the final interpretation right of the product belong to DIGENT.