Product Features

Wide voltage input, output 500mA, non isolated/stabilized/single output

- ✧ Short circuit protection
- ✧ Operating temperature range: -40℃~+85℃
- ✧ Efficiency up to 95%
- ✧ No load current as low as 0.2mA
- ✧ Application fields: electric power, industrial control, communication, Internet of things, automobile, rail transit, etc.

Selection Table

产品型号 Product model	输入电压 标准值 Input Voltage Standard value(range)	输出电压 Output Voltage	输出电流 Output Current (mA) (Max./Min.)	效率 Efficiency % (最小 Vin./最大Vin.)	最大容性负载 Maximum capacitive load (μF)
K78L03-500R3	24 (4.75-36)	3.3	500	86/80	680
K78L05-500R3	24 (6.5-36)	5		90/83	680
K78L09-500R3	24 (12-36)	9		93/88	680
K78L12-500R3	24 (15-36)	12		95/89	680
K78L15-500R3	24 (19-36)	15		95/90	680

Input Characteristics

项目 Parameter	工作条件 Conditions	Min.	Typ.	Max.	Units
输入电流 (空载) Input current (Rated Load)	正输出 Positive output	- -	- -	1.5	mA
反接输入 Reverse input	禁止 Prohibition				
输入滤波器 Input filter	电容滤波 Capacitive filtering				
备注：本产品不支持热插拔 Remarks : This product does not support hot plug					

Output Characteristics

项目 Parameter	工作条件 Conditions		Min.	Typ.	Max.	Units
输出电压精度 Output Voltage Precision	10%-100%负载，输入电压范围 10%-100% load, input voltage range	3.3V output\3.3V 输出	--	+/-2	+/-4	%
		Other Output\其他输出	--	+/-2	+/-3	%
线性调节率 Linear regulation rate	输入电压变化±1% Input voltage variation± 1%		--	±0.2	±0.4	--
负载调节率 Load regulation rate	10%-100%负载 10% to 100% load		--	±0.3	±0.6	%
纹波与噪声 Ripple & Noise	20 mhz带宽 20MHz bandwidth		--	20	75	mVp-p
温度漂移系数 Temperature drift coefficient	工作温度-40℃ to +85℃ Operating temperature -40℃ to +85℃		--	--	±0.03	%/℃
瞬态响应偏差 Transient response deviation	标称输入电压，25%负载阶跃变化 Nominal input voltage, 25% load step change		--	50	250	mV
瞬态恢复时间 Transient RecoveryTime	标称输入电压，25%负载阶跃变化 Nominal input voltage, 25% load step change		--	0.2	1	ms
短路保护 Short circuit protection	Sustainable, Self-healing/可持续，自恢复					

General Characteristics

项目 Parameter	工作条件 Conditions	Min.	Typ.	Max.	Units
工作温度 Working temperature	降额温度≥71℃（见图4） Temperature ≥ 71 ℃ for derating (See Figure 4)	-40	--	+85	℃
存储温度 Storage temperature		-55	--	+125	℃
存储湿度 Storage humidity	Non condensing/无凝结	5	--	95	%RH
引脚耐焊接温度 Soldering temperature resistance of pins	焊点距离外壳 1.5mm,10s The distance from the welding spot to the shell is 1.5mm, 10 seconds	--	--	260	℃
开关频率 Switching frequency	标称输入电压，满载 Full load, Nominal input voltage	550	--	850	kHz
平均无故障时间 Mean time between failures	MIL-HDBK-217F@25℃	2000	--	--	K Hours

Physical Characteristics

项目 Parameter	工作条件 Content
外壳材料 Housing material	None (bare board)/无（裸板）
封装尺寸 Overall dimensions	10.30x 7.50 x 7.90 mm
重量 Weight	1.0g(Typ.)
冷却方式 Cooling mode	自然空冷 Natural air cooling

EMC Characteristics

Parameter	Category	Content
EMI	传导骚扰 Conductive disturbance	CISPR32/EN55032 CLASS B（推荐电路如图2所示） CISPR32/EN55032 CLASS B（The recommended circuit is shown in Figure 2）
	辐射骚扰 Radiation disturbance	CISPR32/EN55032 CLASS B（推荐电路如图2所示） CISPR32/EN55032 CLASS B (The recommended circuit is shown in Figure 2）
EMS	静电放电 Electrostatic discharge	IEC/EN61000-4-2 Contact ±4kV

Product Characteristic Curve

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.

1)典型应用：如需进一步减小输入输出纹波，可在输入输出端连接电容滤波网络。应用电路如图1所示。但应选择合适的滤波电容。如果电容太大，可能会导致启动问题。对于每个输出，在保证安全可靠运行的情况下，电容性负载的推荐值如表1所示。
2)典型的EMC推荐电路如图2所示。

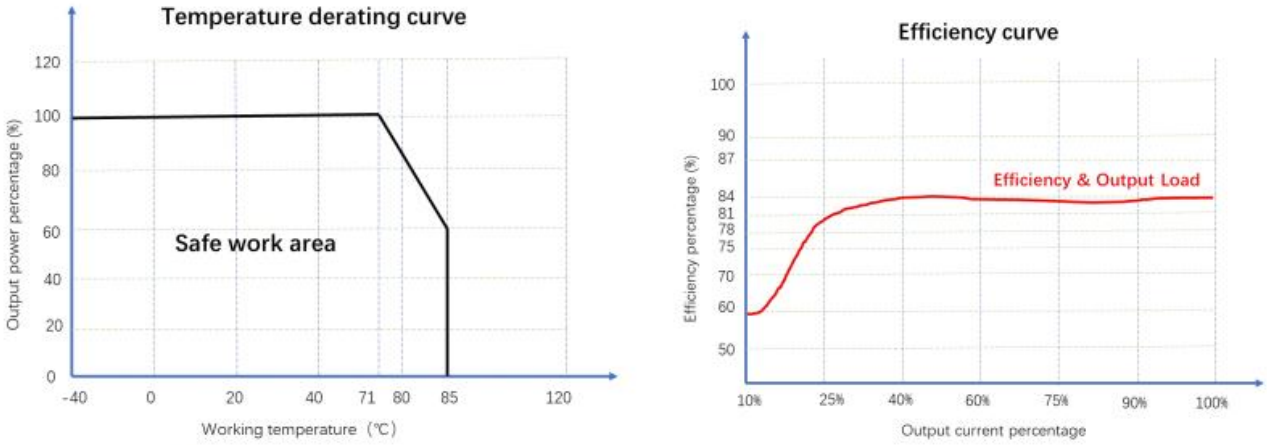

Figure 4: Temperature Derating Curve

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

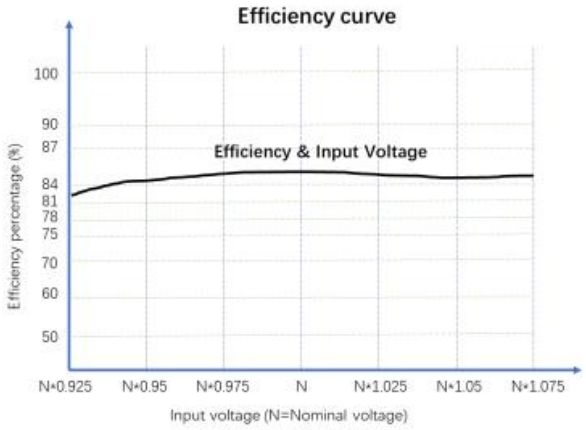

Figure 6: Efficiency VS Input Voltage
(100% Load)

Typical Application Circuit

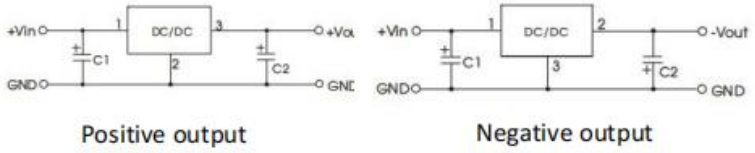

Figure 1: Application circuit
图1：应用电路

Table 1:
Recommended Capacitive Load Values
推荐电容负载值

Product model	C1/C3	C2/C4
K78L03-500	10μF/50V	22μF/10V
K78L05-500		22μF/10V
K78L09-500		22μF/16V
K78L12-500		22μF/25V
K78L15-500		22μF/25V

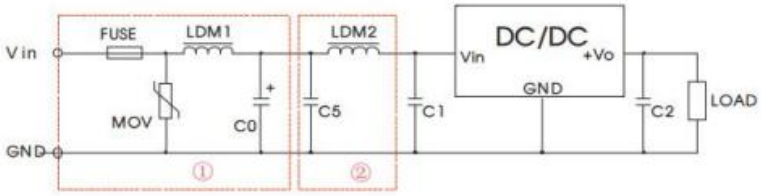

Figure 2: EMC Typical Recommended Circuits
图2:EMC典型推荐电路

Table 2:
Recommended Circuit Parameter Values
推荐电路参数值

project	element	value
EMI	FUSE	Based on actual selection
	MOV	20D470K
	LDM1	82μH
	C0	680pF/50V
	C1、C2	Reference Table 1
	C5	4.7μF /50V
	LDM2	12μH

Appearance Dimensions and Pin Functions

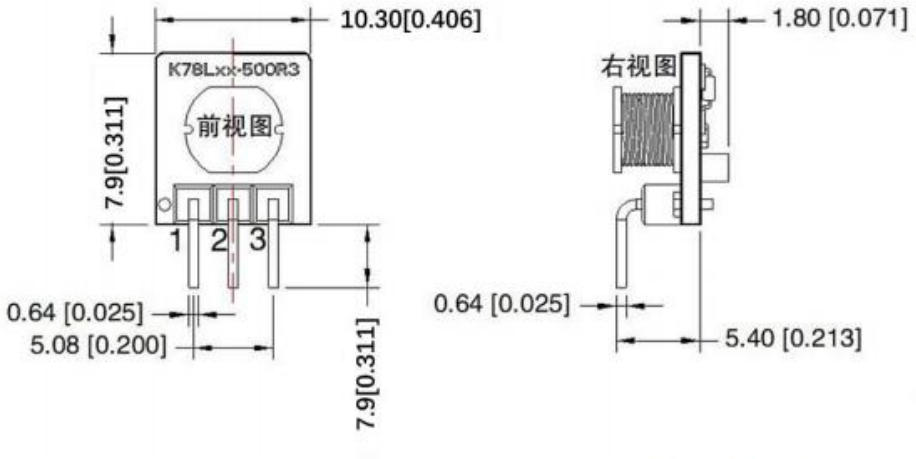

Figure 7: Overall dimensions
图7：外形尺寸

Table 3: Pin Function Tabl
表3：引脚函数表

Pin	Function
1	+Vo
2	GND
3	Vin

注：尺寸单位：mm[英寸] 端子直径公差：
±0.10[±0.[004]
未标注公差：±0.50[±0.020]

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

Note:The drawing dimensions are for reference only; the actual dimensions shall prevail.

Note:

1. The maximum capacitive load is tested under the input voltage range and full load conditions;
2. Unless otherwise specified, all indicators in this manual are measured at Ta=25℃, humidity <75RH, nominal input voltage and positive output rated load;
3. Our company can provide product customization, and you can directly contact our technical staff for specific needs;
4. All index testing methods are based on the company's corporate standards;
5. The copyright and the final interpretation right of the product belong to Shenzhen Hi-link Electronics Co., Ltd..

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