

Product Specification

Number: L-KLS10-CD228K-2200uF6.3V-8*20

Name: Aluminum Electrolytic Capacitors

Specification: _____

Customer: D02

Date: 2020-02-25

Customer Signature:



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Compile	Check	Review	Approval
Jenny	Jack.C		

文件内容修改历史记录
RECORD OF REVISION

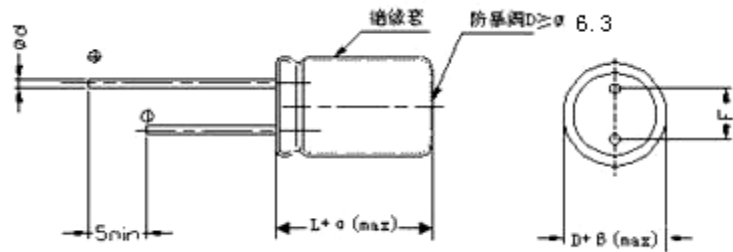
生效版本 REV. NO.	变更原因 REASON	修改内容 CONTENTS	承认时间 DATE OF APPROVAL	拟制 CHECKED	备注 REMARKS
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规格表 Table

额定电压 Rated Voltage (VDC)	标称容量 Capacitance (μF)	尺寸 Dimension (D×L, mm)	损耗角 正切值 tg δ	漏电流 Leakage Current (μA)	ESR +20℃ 100KHz (Ω)	纹波电流 Ripple Current at 105℃ 100KHz (mA)	KLS Part Number
10	1500	8*20	0.19	150.0	0.041	1430	CD228K-1500uF6.3V-8x20
6.3	2200	8*20	0.24	138.6	0.041	1430	CD228K-2200uF6.3V-8x20

一、范围 Scope
GK TYPE (Radial)

二、外形图及尺寸表 Case size table



单位: (mm)

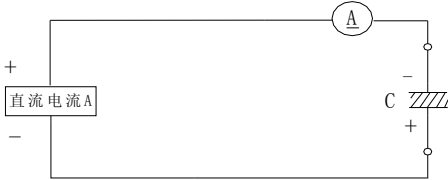
ØD	8
L	20
F±0.5	3.5
d±0.05	0.6
α	-1.0~+1.0
β	0.5

三、技术性能 Specifications

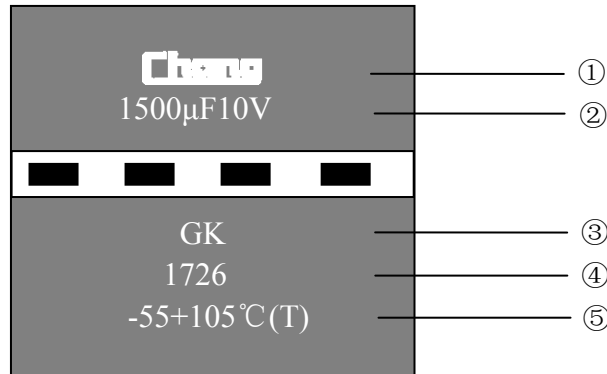
项目 Item	特性 Performance Characteristics								
使用温度范围 Operating temperature range	-55 ~ +105℃								
额定电压范围 Rated working voltage	6.3 ~100V								
标称电容量范围 Nominal capacitance range	4.7 ~ 6800 μ F								
标称电容量允许偏差 Capacitance tolerance	± 20% (120Hz, +20℃)								
漏电流 Leakage current	I≤0.01CV (μA)或 3(μA) 2 分钟(at 20℃, after 2minute)取较大者(Whichever is greater)								
损耗角正切值 Dissipation Factor (tg δ) (+20℃, 120Hz)	U _R (V)	6.3	10	16	25	35	50	63	100
	tg δ	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.10
容量大于 1000μF 者, 每增加 1000μF, 其损耗角正切值增加 0.02 For capacitance value >1000μF, add 0.02 per another 1000μF									
温度特性 Temperature characteristics (Impedance ratio at 120Hz)	U _R (V)	6.3	10	16	25	35	50	63	100
	Z-25℃ / Z+20℃	4	3	2	2	2	2	2	2
	Z-40℃ / Z+20℃	8	6	4	3	3	3	3	3
浪涌电压 Surge voltage	W.V	6.3	10	16	25	35	50	63	100
	S.V.	8	13	20	32	44	63	79	125

四、试验方法及要求 Tests

No	项目 Item	试验条件 Test Conditions	性能要求 Requirements									
1	浪涌电压 Surge Voltage	温度 15~35℃, 充电 30 秒, 放电 5 分 30 秒, 共循环 1000 次。 At 15~35℃, 1000 cycles of 30s on and 330s off.	无可见损伤 No visible damage									
			Δ C/C	± 15%初始测量值以内 ± 15%Initial measured value								
			tg δ	≤初始规定值 Initial specified value								
			I	≤初始规定值 Initial specified value								
2	耐久性 Load Life	+105℃施加额定电压 Ø6.3 2000 小时, Ø8 3000 小时, Ø10 4000 小时, Ø≥12.5 5000 小时, 恢复 16 小时后: After applying rated voltage Ø6.3 2000 hours, Ø8 3000 hours, Ø10 4000 hours, Ø≥12.5 5000 hours at 105℃and then resumed 16 hours.	Δ C/C	± 20%初始测量值以内 ± 20% of Initial measured value								
			tg δ	≤200%初始规定值 2times Initial specified value								
			I	≤初始规定值 Initial specified value								
3	高温贮存 Shelf Life	+105℃, 1000 小时, 恢复 16 小时后: After storage for 1000 hours at +105℃ then resumed 16 hours	Δ C/C	± 20%初始测量值以内 ± 20% of Initial measured value								
			tg δ	≤200%初始规定值 2times Initial specified value								
			I	≤200%初始规定值 2times Initial specified value								
4	抗拉强度 Tension Strength	IEC 60384 – 4 试验 Ua: 10 秒 <table><tr><td>d (mm)</td><td>0.5</td><td>0.6</td><td>0.8</td></tr><tr><td>load(N)</td><td>5</td><td>10</td><td>10</td></tr></table> IEC 60384 – 4 Test Ua: 10S	d (mm)	0.5	0.6	0.8	load(N)	5	10	10	电容及端子没有损伤 Performance of capacitor shall not have changed and leads shall be undamaged	
d (mm)	0.5	0.6	0.8									
load(N)	5	10	10									
5	折弯强度 Bending strength	将电容器垂直固定在夹具上, 以电容由垂直向水平方向作 90°旋转, 再旋转至垂直方向, 共 2 次 With the capacitor in a vertical position apply the load specified axially to each lead. The capacitor 90° in the opposite direction and back the original position. repeat two times. Total 2 <table><tr><td>d (mm)</td><td>0.5</td><td>0.6</td><td>0.8</td></tr><tr><td>load(N)</td><td>2.5</td><td>5</td><td>5</td></tr></table>	d (mm)	0.5	0.6	0.8	load(N)	2.5	5	5	电容及端子没有损伤 Performance of capacitor shall not have changed and leads shall be undamaged	
d (mm)	0.5	0.6	0.8									
load(N)	2.5	5	5									
6	可焊性 Solderability	IEC 60384 – 4 试验 Ta: 焊料槽温度为 245±5℃, 浸渍深度占整个引出线的 95%, 浸渍持续时间为 2±0.5 秒。 IEC 60384–4 Test Ta:Tank temperature : 245±5℃; Impregnating depth: ≥95% of the total lead wire; Impregnating time:2±0.5s.	引出端的良好镀层, 焊料自由流动, 引出端湿润。 焊料覆盖率≥95% The lead wire is coated by tin and wet; Impregnating coverage rate≥95%									
7	耐焊接热 Resistance to soldering heat	IEC 60384-4 试验 Tb 方法 1A:焊料槽温度为 260±5℃ 时间为 10 秒; 或者焊料槽温度为 380±10℃, 浸渍持续时间为 3 秒, 浸渍深度距离电容本体: 1.5~2.0mm。 IEC 60384-4 Test Ta:Tank temperature:260 ± 5℃ for10seconds; Tank temperature:380±10℃ for3seconds The distance from the surface of the dipping liquid to the capacitor:1.5~2.0mm.	无可见损伤, 标志清晰, 无电解液泄漏. No visible damage; marking legible, There shall be no leakage of electrolyte.									
			Δ C/C	≤ ± 10%初始测试值 ≤ ± 10% of Initial measured value								
			tg δ	≤初始规定值 Initial specified value								
			I	≤初始规定值 Initial specified value								

8	稳态湿热 Stable Humidity	IEC 60384-4 试验 Ca: +40℃, 湿度 90~95%, 不施加电压 21 天, IEC 60384 -4 Test Ca:21 days at 40℃ ,RH 90 to 95 %,no voltage applied.	无可见损伤和电解液漏出, 且标志清晰 No visible damage; no leakage of electrolyte; marking legible.	
			$\Delta C/C$	$\leq \pm 20\%$ 初始测试值 $\leq \pm 20\%$ Initial measured value.
			tg δ	$\leq 120\%$ 初始规定值 1.2 Initial specified value
			I	$\leq 120\%$ 初始规定值 1.2 Initial specified value
9	耐振性 Resistance to vibration	IEC 60384-4 试验 Fc: 频率范围 10~55Hz, 频率变化 10Hz~55Hz~10Hz 约为一分钟内, 振幅为 1.5mm, 持续时间为 3×2 小时。 IEC 60384-4 Test Fc : Frequency:10~55Hz,Sweep rate: 10Hz~55Hz~10Hz in about 1 minute;Amplitude:1.5mm;3 direction,2hours per direction.	无可见损伤和电解液漏出, 且标志清晰。 No visible damage ; no leakage of electrolyte; marking legible.	
10	防爆阀测试 Safety vent ($\Phi \cong 6.3\text{mm}$)	直流反向电压法 DC Inverse voltage		(1) 不允许出现爆炸和着火 (Not appear detonate and be on fire) (2) 防爆装置要打开, 不允许从封口卷边处释放气体 (Vent should be opened, the gas not be allowed be set free from rubber) (3) 不允许出现电容器外壳和芯子飞溅的危险状态 (the case and the pistil of the capacitor can't be splashed) 在试验中如果试验时间经历 30 分钟后不释放气体, 则可认为合格 (It's is not eligible if the vent can't be open when the test be lasted out for 30 minutes.)
				
		(A) 直流电流表 C: 试验电容器		
		标称外形直径 Diameter /mm	直流电流 DC Current /A	
		22.4 以下 less	1	

五、标志 Marking



序号 No.	项目 Item
1	商标 Brand
2	产品规格 Products specification
3	产品型号 Products type
4	生产周期 D.C(17: 年, 26: 周)
5	温度范围 Temperature Range (PET Sleeve)

六、铝电解电容器的使用注意事项 Guidelines For Using Aluminum Electrolytic Capacitor

为使您获得电解电容器的最佳性能和延长电解电容器的使用寿命，在使用电解电容器前，请务必阅读本注意事项。

Upon using Aluminum Electrolytic Capacitors, please proper handing and observing to following important points will insure optimum capacitor performance and long life.

1. 直流电解电容器是有极性的 DC electrolytic capacitors are polarized.

确定极性，极性标志在电容器的基体上。以免因极性反可能引起电路短路或电容器损坏，当极性不固定或不确定的，使用双极性电容器。注意直流电解电容器不能使用于交流。

Make sure of the polarity. The polarity is marked on the body of the capacitor .Application of the reversed voltage cause a short circuit or damage to the capacitor. Use bipolar capacitors when the polarity is not determined or unknown. Note that DC electrolytic capacitors can not be used for AC application.

2. 使用电压不要大于额定电压 Do not apply voltage greater than rated voltage.

使用电压大于额定电压，漏电流会增大，可能损坏电容器。建议工作电压为额定电压的百分之七十~八十，电容器在建议的工作电压下使用可延长电容器的寿命。

If a voltage exceeding the rated voltage is applied, the leakage current will increase, which damage the capacitor. Recommended working voltage is 70 to 80 percent of tatted voltage. Using capacitors at recommended working voltage prolongs capacitor life.

3. 不要使过量的纹波电流通过电容器 Do not allow excessive ripple current through the capacitor.

流过电容器的纹波电流超过许可值，将会引起电容器发热，电容量减少，损害电容器。通过电容器的纹波电流不要大于允许值。

The flow of ripple current over permissibile ripple current will cause heat of the capacitor, which may decrease the capacitance and damage the capacitor. Ripple current on the capacitor must be at or bellow allowable level.

4. 快速的充放电电路中，使用专门设计的电容器 Use specially designed capacitors for the circuits where charge and discharge are frequency repeated.

在经受快速的周期性充放电电路中，电容器可能受损害，它的寿命因容量下降、温升等原因而缩短，在这种电路中，一定要使用专门设计的电容器。

In the circuit subjected to rapid charge cycles, capacitors may be damaged; its life may be shortened by capacitance decrease, heat rise, etc. Be sure and use special capacitors in these applications.

5. 工作温度范围 Operating temperature range.

电容器的特性随工作温度而变化，在温度较高的情况下，容量、漏电流增大，损耗减少；在低温情况下，容量和漏电流下降，损耗增大。电容器在较低的温度下使用会确保延长寿命。

The characteristics of capacitors change with the operating temperature. The capacitance and leakage current increase and $\text{tg}\delta$ decrease at higher temperatures. The capacitance and leakage current decrease and $\text{tg}\delta$ at increase lower temperature. Usage at lower temperature will ensure longer life.

6. 核对工作频率 Check operating frequency.

电解电容器的容量通常是在 100Hz 或 120Hz 下测得的。然而要记住容量随频率的升高而下降， $\text{tg}\delta$ 随频率的升高而增大，并使周围温度升高。

The capacitance of electrolytic capacitors is usually measured at 100Hz or 120Hz. However, remember that capacitance decrease and $\text{tg}\delta$ increase as the applied frequency becomes higher whereas the ambient temperature becomes higher.

7. 为保持良好的焊接性，请将产品保管期限控制在一年以内。

To keep good solderability, Please send the product storage period in one year of less than control.

8. 电容器外壳与阴极端是不绝缘的 The capacitor case is not insulated from the cathode terminal.

电容器外壳与阴极端是通过电解液连接的，如果电容器的外壳必须与线路绝缘，则电容器的安装位置处，一定要采取绝缘措施。

The capacitor's case and cathode terminal connect through the electrolyte. If the case is to be completely insulated, that insulation must be at the capacitor's mounting point.

9. 电容器的端子或引线上不要施加过大的力 Do not apply excessive force to the terminals and leads.

过大的力施加到端子和引线上，可能引起引线的断裂或端子分裂，转而会引起内部连接的破坏。

The excessive strong force applied to the terminals and lead wires may cause leads to break or terminals to separate and, in turn, cause the internal contact to fail.

有害物质管理目录表

区分	物质名称(中文名)	物质名称 (英文名)	有害物质包含与否	
			有	无
Level A-I	铅以及它的化合物	Lead and its compounds		ND
	镉以及它的化合物	Cadmium and its compounds		ND
	水银以及它的化合物	Mercury and its compounds		ND
	六价铬以及它的化合物	Hexavalent chromium and its compounds		ND
	多溴化的联苯	Polybrominated biphenyls		ND
	聚溴二苯醚	Polybrominated diphenylethers		ND
Level A-II	多氯化联苯(PCB)	Polychlorinated biphenyls (PCB)		无
	多氯化萘 (PCN)	Polychlorinated naphthalenes (PCN)		无
	聚氯三联苯(PCT)	Polychlorinated terphenyls (PCT)		无
	氯化涂石蜡(SCCP)	Short-chain Chlorinated paraffins (SCCP)		无
	石棉以及它的化合物	Asbestos and its compounds		无
	臭气层破坏物质	Ozone Depleting Substances		无
	偶氮化合物	Azo compounds		无
	镍以及它的化合物	Nickel and its compounds		无
	有机锡类化合物	Specific Organic tin compounds		无
	砷以及它的化合物	Arsenic and its compounds		无
	甲醛	Formaldehydes		无
	氯化乙烯树脂	Poly vinyl chloride(PVC)		无
Level B	邻苯二甲酸盐	Phthalates		ND
	铍以及它的化合物	Beryllium and its compounds		无
	锑以及它的化合物	Antimony and its compounds		无
	硒以及它的化合物	Selenium and its compounds		无
	钯以及它的化合物	Palladium and its compounds		无
	铋以及它的化合物	Bismuth and its compounds		无
	其它氯类难燃剂	Other chlorinated flame retardants		无
	其它溴类难燃剂	Other brominated flame retardants		无

Note.

- 原则上按照公司的管理规定，但由管理总部提出按根据 Buyer 等交易商的要求制定的另行有害物质管理目录来执行的要求时，应优先按照管理总部的管理目录来记载。
- 确认合作企业现在是否在使用这类物质，应纪录使用与否。