



設計驗證
工程課
2024-04-26
發行
鈺緯科技開發股份有限公司

承　　認　　書

Specification Approval

CUSTOMER : 鈺緯科技開發股份有限公司

BRAND: Kaimei Electronic Corp.

PART NO : KTC227M050ZTH6H169

CUSTOMER PART NO: 3CE22150M3G *(C0110)*

APPROVED BY: Frankie Wang　　DATE: 2023/12/8

AVNET ASIA PTE. LTD.	CUSTOMER APPROVAL STAM
Avnet Asia Pte., Ltd. Taiwan Br. (Singapore) 新加坡商安富利股份有限公司台灣分公司 台北市南港區園區街 3 號 5 樓 Tel : (02)2655-8688 Fax: (02)2655-8666	設計驗證 工程課 2024-04-26 發行 鈺緯科技開發股份有限公司

新加坡商安富利股份有限公司台灣分公司

台北市南港區園區街 3 號 5 樓

電話:(02)2655-8688　傳真:(02)3655-8666

Table of specification and characteristics 规格和特性表

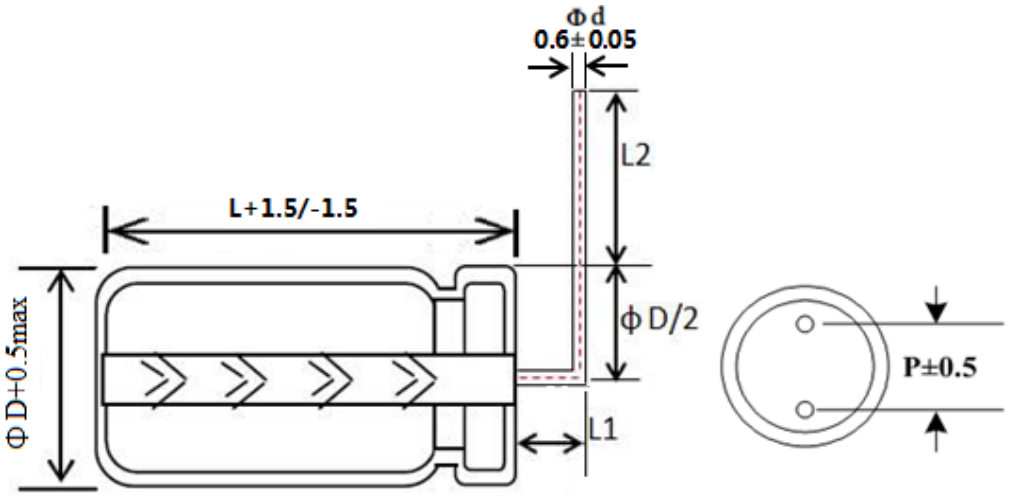
NO.	料 号 Part NO.	静电容量 CAP(μF) 120Hz 20℃	容量公差 CAP Tol. (%)	工作电压 WV	损失角 DF(%) (MAX) 120Hz 20℃	阻抗值 Z(mΩ) (MAX) 100kHz 25℃	漏电流 LC(μA) (MAX) 20℃	纹波电流 RC(mArms) (MAX) 100kHz 105℃	纹波寿命 Ripple Life (Hrs) 105℃	尺寸 Dimensions (mm) φD	L	P
1	KTC227M050ZTH6H169	220	±20	50	10	42	110	1650	10000	10	16	5.0

Ⅰ. Scope 范围

This standard defines characteristics and dimensions for aluminum electrolytic capacitors named TC Series is long life and low impedance product.

此标准描述了铝电解电容器长寿命低阻抗TC系列的特性和尺寸。

Ⅱ. Construction & Dimensions 尺寸图



負極向上，CP 線 90 度上彎 The negative pin is upward, and the CP wire is bent upward by 90 degrees.		
加工號 processing code	L1 mm	L2 mm
ZT	3.0max(含Φd)	5.0±0.5

Ⅲ. Characteristics 特性

Standard test condition 标准试验条件

Unless otherwise specified all tests shall be performed at, or referred to, an ambient temperature of 20℃ and a relative humidity not greater than 60%.

所有的试验应在环境温度20℃和相对湿度小于等于60%的条件下进行，除非另有规定。

Operating Temperature Range 工作温度范围

6.3~100VDC －40~+105℃

1. Electrical characteristics 电气特性

(1). Rated Voltage and Surge Voltage 额定电压和浪涌电压

WV: Working Voltage 工作电压(VDC)

SV: Surge Voltage 浪涌电压 (V)

WV	6.3	10	16	25	35	50	63	100
SV	8	13	20	32	44	63	79	125

(2). Leakage Current 漏电流

The maximum leakage current is specified in the following formula after DC working voltage applied for 2 minutes.

印加直流工作电压2分钟后的最大漏电流值如下列公式所示：

I=0.01CV or 3 (μA),Whichever is greater.

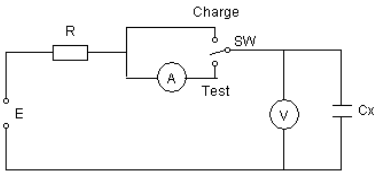
I=0.01CV or 3 (μA),中任意一个较大值。

where I: Leakage Current (漏电流) (μA)

C: Nominal Capacitance (标称容量) (μF)

V: Rated Voltage (额定电压) (V)

Measurement circuit 测试电路



(3). Dissipation Factor 损失角

Dissipation Factor at 120Hz/ 20℃ shall not exceed the values given in the table below.

在120 Hz / 20℃条件下的DF值不应超过下表中给出的值。

WV	6.3	10	16	25	35	50	63	80	100
DF(%)	22	19	16	14	12	10	9	8	8

Note:Above DF specifications shall be 2% added for every 1000μF capacitor exceeding 1000uμF.

注：当静电容量超过1000μF时，每增加1000μF，则以上损失角规格值应增加2%。

(4). Low Temperature Characteristics 低温特性

The ratio of impedance at -25℃/+20℃ and -40℃/+20℃ of the capacitor shall be less than the following value at 120Hz.

电容器在120Hz的条件下,分别在-25℃/+20℃和-40℃/+20℃的阻抗比，应小于以下的规格值：

WV额定电压 / Z阻抗(120Hz)	6.3	10	16	25	35~100
Z(-25℃) / Z(+20℃)	4	3	2	2	2
Z(-40℃) / Z(+20℃)	8	6	4	3	3

(5). Multiplier for Ripple Current 纹波电流频率修正系数

Frequency coefficient 频率系数

Frequency 频率(Hz)	120	1k	10k	100k
8.2~33μF	0.42	0.70	0.90	1.00
47~270μF	0.50	0.73	0.92	1.00
330~680μF	0.55	0.77	0.94	1.00
820~1800μF	0.60	0.80	0.96	1.00
≧2200μF	0.70	0.85	0.98	1.00

Temperature coefficient 温度系数

Ambient Temperature (℃) 环境温度 (℃)	≦50	70	85	105
Coefficient系数	1.90	1.75	1.40	1.00

2. Mechanical Characteristics 机械特性

Lead Pull Test 导针拉力测试

Capacitors shall be with stand the pull test shown in the following table.

电容器的导针应能承受下表所示的拉力测试

Lead diameter 线径(mm)	Load 负荷(Kg)	Test time 测试时间(sec)
d≦0.5	0.5	30±1
0.5<d≦0.8	1.0	30±1
0.8<d≦1.2	2.5	30±1

3. Endurance characteristics 耐久特性

(1). Ripple Life 纹波寿命

After applying rated voltage with rated ripple current for specified time (refer to the below table for specified time) at 105±2℃, when the capacitors are restored to 20℃,the capacitors shall meet the following requirements.

在105±2℃环境中，不超过额定电压的范围下叠加额定纹波电流达规定时间后（规定时间参考下表），待温度恢复至20℃后测试，电容器应满足以下要求。

φD	φ10
6.3~100(V)	10000hrs

Capacitance Change 容量变化	Within ±25% of initial value(6.3、10V：±30%) 在初始值的±25%以内(6.3、10V：±30%)
Dissipation Factor 损失角	Not more than 200% of specified value 不超过规格值的200%
Leakage Current 漏电流	Not more than the specified value 不超过规格值

(2). Shelf life 高温无负荷寿命

The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1000+12/-0 hours at 105±2℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.

在105℃±2℃环境中，无负荷放置1000+12/-0小时后待温度恢复到20℃，
特性测量前需先进行試验前处理（处理方法参照JIS C 5101-4 4.1项），
测量时应满足以下要求。

Capacitance Change 容量变化	Within ±25% of initial value(6.3、10V：±30%) 在初始值的±25%以内(6.3、10V：±30%)
Dissipation Factor 损失角	Not more than 200% of specified value 不超过规格值的200%
Leakage Current 漏电流	Not more than the specified value 不超过规格值

(3). Solderability test 焊锡性试验

The following specifications shall be satisfied when the lead wires are tested in solder bath at 245±5℃ for 2.5±0.5 seconds, more than 95% of the terminal surface shall be covered with new solder.

当导针在245±5℃的焊锡槽中试验2.5±0.5秒后，95%以上的端子表面应当要被新焊料覆盖。

(4). Solder Heat Resistance Test 焊锡耐热试验

The following specifications shall be satisfied when the lead wires are tested in solder bath at 275+2/-0℃ for 20±0.5 seconds.

当导针在275+2/-0℃的焊锡槽中试验20±0.5秒后，应当满足以下要求：

Capacitance Change 容量变化	≦±5% of the initial value ≦初始值的±5%
Dissipation factor 损失角	≦Initial specified value 低于初始规格值
Leakage Current 漏电流	≦Initial specified value 低于初始规格值

Ⅳ. Mounting 安装

The paper separators and the electrolytic-conductive electrolytes in a non-solid aluminum electrolytic capacitor is flammable.

非固态电容器内中的电解纸和电解液都是易燃品。

Leaking electrolyte on a PC board can gradually erode the copper traces, possibly causing smoke or burning by short-circuiting the copper traces.

PC板上漏液会逐渐侵蚀铜丝,很可能由于铜丝短路导致冒烟或燃烧。

Verify the following points when designing a PC board.

在设计PC板时需验证以下要点：

(1) Provide the appropriate hole spacing on the PC board to match the terminal spacing of the capacitor.在PC板上保留适当的孔距以匹配电容器的端子间距。

(2) Make the following open space over the vent so that the vent can operate correctly.

在防爆阀的上方保留适当空间，以便防爆阀可以正常工作。

Case diameter 铝壳直径	Clearance 间隔
φ6.3 ~ φ13 mm	≧2 mm
φ16 ~ φ35 mm	≧3 mm
≧φ40 mm	≧5 mm

(3) Do not place any wires or copper traces over the vent of the capacitor.

请不要在电容器的防爆阀上方放置任何电线或铜丝。

(4) Installing a capacitor with the vent facing the PC board needs an appropriate ventilation hole in PC board. 在安装电容器时，如果防爆阀正对PC板，则PC板上需要开一个适当的通风孔。

(5) Do not pass any copper traces beneath the seal side of a capacitor.

The trace must pass 1 or 2 mm to the side of the capacitor.

请不要在电容器的封口部下面进行电路配线。如果在电容器附近配线,请确保线路与电容器间隔1~2㎜。

(6) Avoid placing any heat-generating objects adjacent to a capacitor or even on the reverse side of the PC board.

请不要在电容器周围或PC板的背面放置任何发热部件。

(7) Do not pass any via holes or underneath a capacitor.
请不要从电容器通孔或电容器底部穿过。

(8) In designing double-sided PC boards, do not locate any copper trace under the seal side of capacitor.设计双面PC板时，请不要在电容器的封口面放置任何铜丝。

(9) The liquid aluminum electrolytic capacitor can't be reflow soldering, please contact us if you need to do that. 液态铝电解电容器不能进行回流焊，如需进行回流焊请与我司联系。

(10) For the capacitor that diameter > 13 Φ and the Pen-cap that diameter≦ 13 Φ , it is recommended to be fixed on the PCB with fixed adhesive when installed, so as to enhance their vibration resistance.
直径>13Φ的电容和直径≦13Φ的笔形电容，为增强其抗振动能力，建议安装时用固定胶辅助其固定于PCB上。

Ⅴ. Storage Condition 储存条件

(1) Aluminum Electrolytic Capacitors should not be stored in high temperatures or where there is a high level of humidity. The suitable storage condition is 5~35℃ and less than 75% in relative humidity.
铝电解电容器不应当储存在高温或高湿的条件下.合适的储存条件为5~35℃,相对湿度低于75%。

(2) Aluminum Electrolytic Capacitors should not be stored in damp conditions such as water, saltwater spray or oil spray.
铝电解电容器不应当储存在潮湿的条件下，如水、盐水喷雾或油雾。

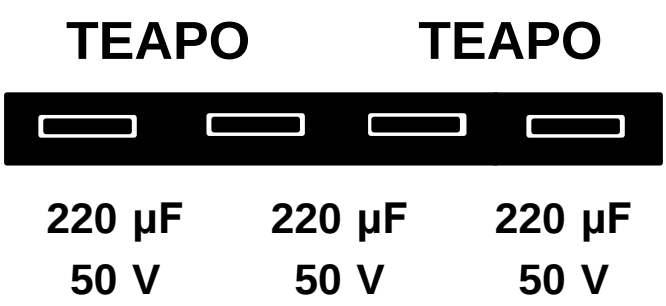
(3) Do not store Aluminum Electrolytic Capacitors in an environment full of hazardous gas (hydrogen sulfide , sulfurous acid gas, nitrous acid, chlorine gas, ammonium, etc…).
请不要将铝电解电容器存储在一个充满有害气体的环境下(硫化氢、二氧化硫、亚硝酸、氯气、铵气等…)。

(4) Aluminum Electrolytic Capacitors should not be stored under exposure to ozone, ultraviolet rays or radiation.
铝电解电容器储存不应暴露在臭氧、紫外线辐射和射线中。

(5) If a capacitor has been stored for more than one year under normal temperature (shorter if high temperature) and it shows increased leakage current, then a treatment by voltage application is recommended. The capacitor which hasn't been treated mustn't be used directly.
如果电容器在常温下储存超过一年(高温条件下不超过一年),出现漏电流上升现象,
那么建议对电容器进行加压处理.未被处理过的电容器不能直接使用。

Ⅵ. Marking 标识

Marking on capacitor include 电容器上的标识包含：

正面	背面
	TC 105℃ 10 / 22 A3 TD TC 105℃ 10 / 22 A3 TD

- ☑ TEAPO trademark 商标
- ☑ Nominal capacitance 标称容量
- ☑ Working voltage 工作电压
- ☑ Polarity 极性
- ☑ Sleeve material & vendor 胶管材质&厂商
- ☑ Series No. 系列编号
- ☑ Max operating temperature 最高工作温度
- ☑ Date code周期(Month月/Year年)
- ☑ EC vendor 厂商

Remark: Date code numbering system. Date code is indicated manufactured date

备注:周期编号系统,周期是表示生产日期.

Manufactured month 生产月份

Month	1	2	3	4	5	6	7	8	9	10	11	12
Code	01	02	03	04	05	06	07	08	09	10	11	12

Manufactured year 生产年份

Code	22	23	24	25	26	27	28	29	30
Year	2022	2023	2024	2025	2026	2027	2028	2029	2030

Manufactured Place 生产场所

Code	A3
Place	Made in Dong Guan 东莞制造

Sleeve Material 胶管材质

Code	T	V
Material	PET	PVC

Sleeve Suppiler(Made in Dongguan) 胶管厂商（东莞制造）

Code	C	D	E
Supplier	Chi Yuan 启源	Yun Lin 云林	CYG 长园长通

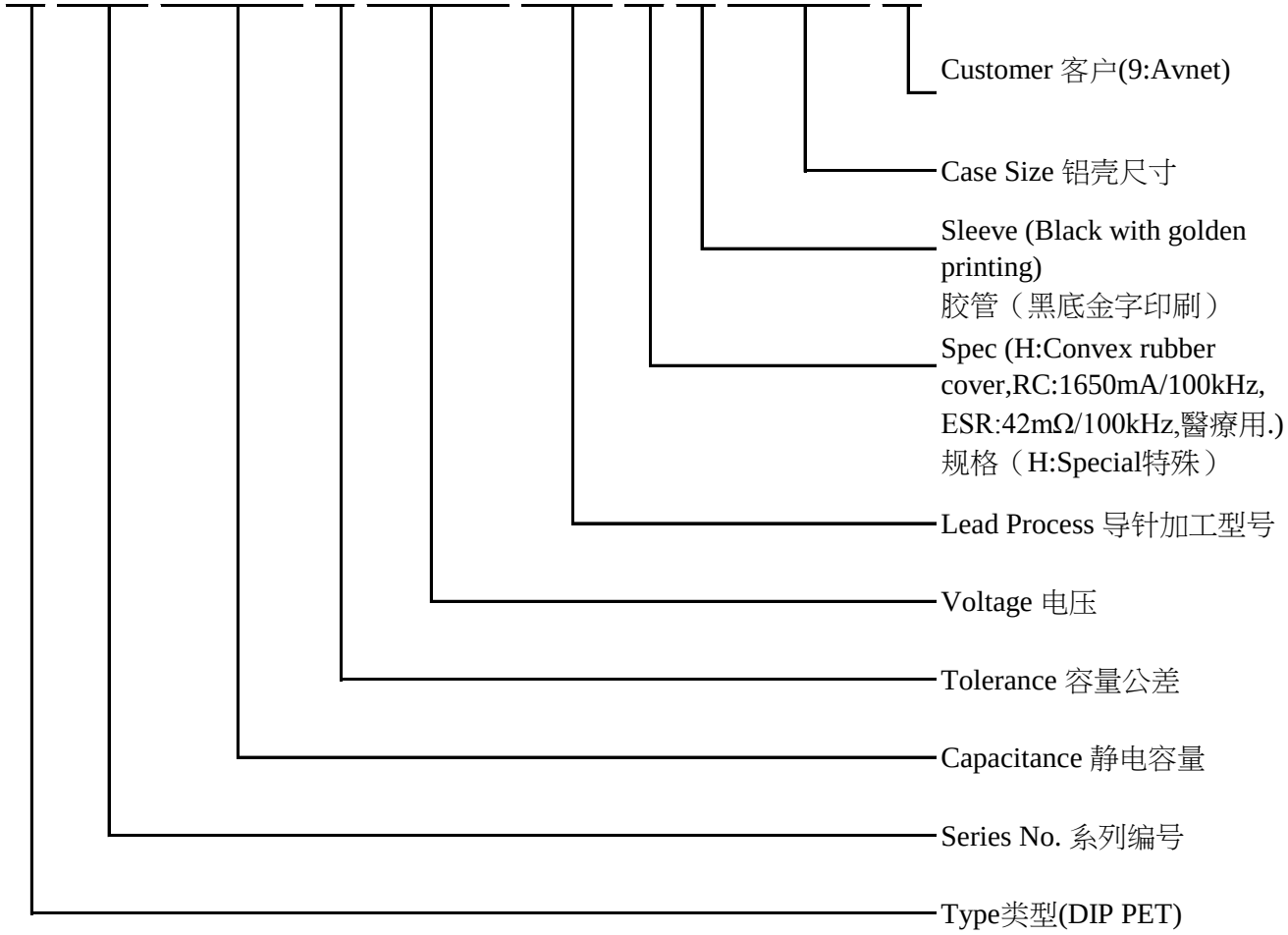
*The above code descriptions are just examples, they haven't completely shown all sleeve suppliers.

*以上代码描表述仅为举例,并没有完全显示出所有胶管供货商。

Ⅶ. Catalog numbering

TEAPO TYPE 类型(Part Number 料号)：

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
K	T	C	2	2	7	M	0	5	0	Z	T	H	6	H	1	6	9



Ⅷ.PACKAGING SPECIFICATION 包装规范

Radial Lead Type Aluminium Electrolytic Capacitors 引线型铝电解电容器

For Bulk: Standard Cutting & Forming 针对散装：标准切脚&成型

Classification 分类	Standard Bulk 标准品散装				Cutting & Forming 切脚&成型			
Case size 尺寸 D*L(mm)	Vinyl bag Qty 袋装数量(pcs)	inner box 内箱数量 (pcs)	outer carton 外箱数量 (pcs)	gross weight 总重(kg)	Vinyl bag Qty 袋装数量(pcs)	inner box 内箱数量 (pcs)	outer carton 外箱数量 (pcs)	gross weight 总重(kg)
4×5	2,000	24,000	48,000	13	2,000	40,000	80,000	13
4×7	2,000	20,000	40,000	12	2,000	32,000	64,000	15
5×5	2,000	20,000	40,000	11	2,000	32,000	64,000	14
5×7	2,000	16,000	32,000	14	2,000	32,000	64,000	17
5×9~5x11	1,000	12,000	24,000	11	1,000	20,000	40,000	17
5×15	1,000	10,000	20,000	13	1,000	14,000	28,000	14
6.3×5	2,000	16,000	32,000	13	2,000	20,000	40,000	17
6.3×7	2,000	12,000	24,000	11	2,000	20,000	40,000	18
6.3×9~6.3×14	1,000	10,000	20,000	14	1,000	14,000	28,000	19
6.3×15~6.3×17	1,000	10,000	20,000	14	1,000	10,000	20,000	15
8×5~8×7	500	10,000	20,000	14	500	8,000	16,000	12
8×9~8×12	500	7,500	15,000	16	500	8,000	16,000	15
8×14~8×15	500	5,000	10,000	13	500	6,000	12,000	15
8×16	500	5,000	10,000	14	200	4,000	8,000	11
8×20~8×25	200	4,000	8,000	14	200	4,000	8,000	13
10×9~10×13	200	4,000	8,000	14	200	4,000	8,000	13
10×14~10×15	200	3,600	7,200	15	200	4,000	8,000	15
10×16~10×18	200	3,600	7,200	15	200	3,200	6,400	14
10×20~10×21	200	3,000	6,000	16	200	2,800	5,600	13
10×22~10×25	200	2,400	4,800	16	200	2,400	4,800	15
10×26	200	2,400	4,800	17	200	1,600	3,200	13
10×27~10×35	200	1,800	3,600	16	200	1,600	3,200	14
12.5×13~12.5×16	100	2,400	4,800	15	200	1,600	3,200	11
12.5×20~12.5×22	100	1,800	3,600	15	200	1,200	2,400	10
12.5×23~12.5×26	100	1,200	2,400	13	200	1,200	2,400	12
12.5×30	100	1,200	2,400	15	100	1,000	2,000	11
13×13~13×16	100	2,400	4,800	15	200	1,600	3,200	11
13×18~13×21	100	1,800	3,600	16	200	1,200	2,400	11
13×24~13×26	100	1,200	2,400	12	200	1,200	2,400	11
13×30	100	1,200	2,400	13	100	1,000	2,000	13
13×35~13×36	100	1,000	2,000	14	100	600	1,200	9
13×38~13×40	100	800	1,600	13	100	600	1,200	12
16×15~16×20	-	-	-	-	200	1,000	2,000	14
18×15~18×20	-	-	-	-	200	1,000	2,000	17

Note: Inner box size L×B×H(mm) 290*170*265, Outer carton size L×B×H (mm) 360*305*280

注：内箱尺寸L×B×H(mm)290*170*265，外箱尺寸L×B×H(mm) 360*305*280

For lattice bar type packing of standard cutting&Forming 针对排装: 標準品 切脚&成型

Classification 分类	For lattice bar type packing of standard 排装/標準品				Classification 分类	For lattice bar type packing of cutting&Forming 排装/ 切脚&成型			
Case size D*L(mm)	inner box 内盒 (mm)	quantity 数量(pcs)	outer carton 外箱(mm) 360*305*280	gross weight 总重(kg)	Case size D*L(mm)	inner box 内盒 (mm)	quantity 数量(pcs)	outer carton 外箱(mm) 360*305*280	gross weight 总重(kg)
8φ×50~60L	340*288*130	1000	2000	10	8φ×30~45L	340*288*65	1000	4000	13
10φ×30~45L	340*288*85	700	2100	16	8φ×46~50L	340*288*85	1000	3000	14
10φ×46~60L	340*288*130	700	1400	13	10φ×30~45L	340*288*65	700	2800	15
12.5φ×30~40L	340*288*85	460	1380	12	10φ×46~60L	340*288*85	700	2100	16
12.5φ×41~50L	340*288*130	460	920	10	12.5φ×40~45L	340*288*65	460	1840	13
12.5φ×55~60L	340*288*130	460	920	13	12.5φ×46~55L	340*288*85	460	1380	12
13φ×16~20L	340*288*65	450	1800	9	16φ×21~30L	340*288*65	300	1200	13
13φ×35L	340*288*85	450	1350	10	16φ×31~45L	340*288*65	300	1200	16
16φ×15~20L	340*288*65	300	1200	9	18φ×21~30L	340*288*65	250	1000	13
16φ×21~26L	340*288*85	300	900	8	18φ×31~45L	340*288*65	250	1000	19
16φ×27~32L	340*288*85	300	900	9	18φ×50L	340*288*85	250	750	16
16φ×33~40L	340*288*85	300	900	14	22φ×25~30L	340*288*65	160	640	11
16φ×45L	340*288*130	300	600	12	22φ×31~45L	340*288*65	160	640	16
18φ×15~20L	340*288*65	250	1000	9	22φ×50L	340*288*85	160	480	13
18φ×21~42L	340*288*85	250	750	14	-	-	-	-	-
18φ×43~50L	340*288*130	250	500	11	-	-	-	-	-
22φ×25~40L	340*288*85	160	480	13	-	-	-	-	-
22φ×41~50L	340*288*130	160	320	12	-	-	-	-	-

For Taping Ammo & Reel 针对编带折迭式&圆盘式：

Classification 分类	Ammo Tape 折迭式编带				Reel Tape 圆盘式编带		
Case size D*L(mm)	inner box 内盒 (mm)	quantity 数量(pcs)	outer carton 外箱(mm) 360*305*280	gross weight 总重(kg)	inner carton 内箱(mm) 350*350*110	outer carton 外箱(mm) 370*370*600	gross weight 总重(kg)
4φ×5~7L	340*288*50	3000	15000	5	3,000	15,000	6
5φ×5~15L	340*288*50	2600	13000	8	2,400	12,000	8
6.3φ×5~17	340*288*50	2000	10000	8	2,000	10,000	9
8φ×5~17L	340*288*50	1200	6000	10	1,600	8,000	12
8φ×18~30L	340*288*65	1200	4800	13	1,000	5,000	12
10φ×9~17L	340*288*50	800	4000	10	-	-	-
10φ×18~32L	340*288*65	800	3200	11	-	-	-
10φ×35L	340*288*85	800	2400	14	-	-	-
12.5φ×12.5~31 13φ×13~31L	340*288*65	500	2000	14	-	-	-
12.5φ×35~41L 13φ×35~41L	340*288*85	500	1500	12	-	-	-
16φ×15~32L	340*288*65	300	1200	14	-	-	-
16φ×35~40L	340*288*85	300	900	13	-	-	-
18φ×16~32L	340*288*65	250	1000	16	-	-	-
18φ×35~35.5L	340*288*85	250	750	14	-	-	-

Note：For 10φ Reel Tape：备注：对于10φ圆盘式编带

size 尺寸	inner carton 内箱(pcs)	outer carton 外箱(pcs)
10φ×10~16L	1,200	6,000
10φ×17~20L	1,000	5,000

Ⅸ. Others

(1) All the Jamicon capacitors, which are authenticated by the SGS, and the test report shows that the inspection results of Hexavalent Chromium VI(Cr(VI)), Cadmium (Cd), Mercury (Hg), Lead (Pb), Polybrominated Biphenyls (PBBs),Polybrominated Diphenyl Ether (PBDEs),Bis(2-ethylhexyl) phthalate(DEHP)，Dibutyl phthalate (DBP)，Butyl benzyl phthalate (BBP)，Diisobutyl phthalate (DIBP)，chlorine(Cl) and bromine(Br) are comply with ROHS and halogen-free requirements．

凱美所有电容器经SGS认证测试报告中所检测的六价铬(Cr^{+6})，镉(Cd)，汞（Hg），铅(Pb)，多溴联苯(PBBs)，多溴联苯醚(PBDEs)，邻苯二甲酸二(2-乙基已基)酯(DEHP)，邻苯二甲酸二丁酯(DBP)，邻苯二甲酸甲苯基丁酯(BBP)，邻苯二甲酸二异丁酯(DIBP)，氯(Cl)，溴(Br）均符合RoHS及無鹵要求。

(2)Satisfied characteristic JIS C 5101. 符合JIS C 5101特性.

(3)Aluminum Electrolytic Capacitors may b e damaged by corrosion which is caused by any halogenated hydrocarbon solvents.

铝电解电容器可能会被卤化烃类溶剂导致的腐蚀而损坏。

Please let us know in advance the solvent name and conditions for your PCB cleaning

请让我们事先了解贵司印刷线路板使用的清洗剂的名称和清洗条件.