承　认　书

APPROVAL SHEET

客　户： CUSTOMER	**ROPLA**	承认书编号： APP. NO.	**D230072810**
系　列： SERIES	**TT**	使用温度范围： OPERATION TEMP. RANGE	**-40~+105℃**

凯美品牌料号 JAMICON PART No.：	客户产品料号 CUSTOMER PART No.：
JTT828M016S1A5N36S **Note：“Qualified AEC-Q200”**	

客戶承認印 CUSTOMER'S APPROVAL STAMP	凯美电机股份有限公司(总部) KAIMEI ELECTRONIC CORP.(Headquarters) 凱美電機股份有限公司 28.JUL.2023 技術部	
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Revision Change History
變更記錄

Version 版本	Change date 日期	Originator 責任人	Change Description 變更描述	Checked 審核
0.1	2023/7/28	許洪梅	For the first time to issue 首次發行	高維琴

Table of specification and characteristics 规格和特性表

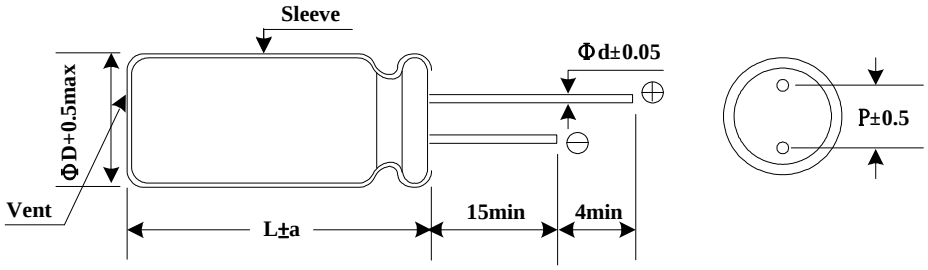
NO.	料 号 Part NO.	静电容量 CAP(μF) 120Hz 20℃	容量公差 CAP Tol. (%)	工作电压 WV	损失角 DF(%) (MAX) 120Hz 20℃	阻抗值 Z(mΩ) (MAX) 100kHz 20℃	漏电流 LC(μA) (MAX) 20℃	纹波电流 RC(mArms) (MAX) 100kHz 105℃	纹波寿命 Ripple Life (Hrs) 105℃	尺 寸 Dimensions (mm)		
										φD	L	P
1	JTT828M016S1A5N36S	8200	±20	16	30	14	1312	4220	10000	18	36	7.5

Ⅰ. Scope 范围

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

此标准描述了铝电解电容器长寿命、低阻抗品TT系列的特性和尺寸。

Ⅱ. Construction & Dimensions 尺寸图（S1)



*Safety vent only for :Dimension≧6.3×11

Diameter直径(φD)	5	6.3	8	10	12.5~13	16	18
Lead space引线间距(P)	2.0	2.5	3.5	5.0	5.0	7.5	7.5
Lead diameter引线直径(φd)	0.5	0.5	0.6	0.6	0.6	0.8	0.8
a	1.5	1.5	1.5	1.5	2.0	2.0	2.0

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). Working Voltage and Surge Voltage 工作电压和浪涌电压

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：

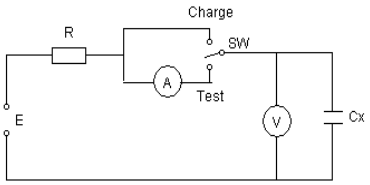
I=0.01CV or 3 (μA),whichever is greater任意一个较大值.

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	100
DF(%)	22	19	16	14	12	10	9	8

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

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
10~180μF	0.40	0.75	0.90	1.00
220~560μF	0.50	0.85	0.94	1.00
680~1800μF	0.60	0.87	0.95	1.00
2200~3900μF	0.75	0.90	0.95	1.00
≧4700μF Higher	0.85	0.95	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	φ5~6.3	φ8~10	φ12.5~18
6.3~10(V)	4000hrs	6000hrs	8000hrs
16~100(V)	5000hrs	7000hrs	10000hrs

Capacitance Change 容量变化	Within ±25% of initial value 在初始值的±25%以内
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 在初始值的±25%以内
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.

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.
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)In principle, aluminum electrolytic capacitors should be used within one years after production. If a capacitor has been stored for more than one year under normal temperature (not more than one year at >35℃) 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. If the capacitor is stored at room temperature for more than two years, it shall be scrapped.
保管期限，原则上为制造后一年。
如果电容器在常温下储存超过一年(>35℃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。
如果电容器常温下储存超過兩年则请报废处理。

Ⅵ. Marking 标识

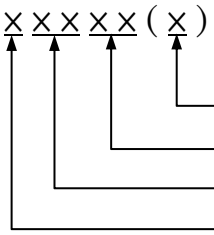
Marking on capacitor include 电容器上的标识包含：

JAMICON trademark 商标

Polarity of the terminals 负极标示线

Capacitance and Rate voltage 标称容量和工作电压

Series and Maximan operating temperature, PET Sleeve.
系列和最高工作温度及PET胶管



Capacitors tolerance zone 容量公差范围
Sleeve Suppiler 胶管供货商
Weeks of production 生产周期
Year of production 生产年份

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 year 生产年份

Year	2021	2022	2023	2024	2025	2026	2027	20208	2029	2030
Code	1	2	3	4	5	6	7	8	9	0

Manufactured month 生产月份

Month	1	2	3	4	5	6	7	8	9	10	11	12
Code	04	08	12	16	20	24	28	32	36	40	44	48

Sleeve Suppiler 胶管供货商

Supplier	Yun Lin云林	Shun Peng顺鹏
Code	C0	C2

※ The above code descriptions are just examples, they haven't completely shown all sleeve suppliers.
以上代码表描述仅为举例,并没有完全显示出所有胶管供货商

Ⅶ. Catalog numbering

JAMICON 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
J	T	T	8	2	8	M	0	1	6	S	1	A	5	N	3	6	S

- 18: Special code 特殊代码 (S: Auto Grade車載專用)
- 16–17: Size 尺寸
- 14: Sleeve (Black with white printing) 胶管（黑底白字印刷）
- 13: Spec (A:Standard) 规格（A:標準品）
- 12: Lead Process 导针加工型号
- 9–10: Voltage 电压
- 7: Cap. Tolerance 容量公差
- 5–6: Capacitance 静电容量
- 3: Series No. 系列编号
- 1: Type类型(DIP PET)

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	20
4×7	2,000	20,000	40,000	11	2,000	32,000	64,000	17
5×5	2,000	20,000	40,000	12	2,000	32,000	64,000	18
5×7	2,000	16,000	32,000	13	2,000	32,000	64,000	23
5×11	1,000	12,000	24,000	13	1,000	20,000	40,000	22
6.3×5	2,000	16,000	32,000	11	2,000	20,000	40,000	16
6.3×7	2,000	12,000	24,000	10	2,000	20,000	40,000	15
6.3×11,6.3×12	1,000	10,000	20,000	14	1,000	14,000	28,000	17
6.3×15	1,000	10,000	20,000	14	1,000	10,000	20,000	17
8×7	500	10,000	20,000	14	500	13,000	26,000	16
8×9,8×11	500	7,500	15,000	17	500	8,000	16,000	18
8×14,8×15	500	5,000	10,000	12	500	6,000	12,000	14
8×16	500	5,000	10,000	16	200	4,000	8,000	13
8×20	200	4,000	8,000	14	200	4,000	8,000	14
8×30,8×35	200	1,800	3,600	14	200	1,600	3,200	14
10×12.5	200	4,000	8,000	15	200	4,000	8,000	15
10×15	200	3,600	7,200	16	200	4,000	8,000	18
10×16,10×17	200	3,600	7,200	17	200	3,200	6,400	15
10×20	200	3,000	6,000	19	200	2,800	5,600	17
10×25	200	2,400	4,800	17	200	2,400	4,800	16
10×30,10×35	200	1,800	3,600	17	200	1,600	3,200	13
13×13,13×15	100	2,400	4,800	15	200	1,600	3,200	13
13×18,13×20	100	1,800	3,600	15	200	1,200	2,400	10
13×25	100	1,200	2,400	14	200	1,200	2,400	14
13×30	100	1,200	2,400	16	100	1,000	2,000	14
13×34,13×36	100	1,000	2,000	14	100	600	1,200	12
13×38,13×40	100	800	1,600	15	100	600	1,200	13
16×15,16×20	100	1,000	2,000	22	200	1,000	2,000	22
16×25	100	1,000	2,000	24	-	-	-	-
16×30,16×32	100	800	1,600	20	-	-	-	-
16×36,16×40	100	600	1,200	22	-	-	-	-
18×15,18×20	100	800	1,600	21	200	1,000	2,000	28
18×22,18×25	100	800	1,600	23	-	-	-	-
18×30	100	600	1,200	25	-	-	-	-
18×32,18×36 18×40	100	500	1,000	25	-	-	-	-
18×45,18×50	100	300	600	21	-	-	-	-
22×32	-	-	-	-	-	-	-	-
22×30	-	-	-	-	-	-	-	-
22×35、22×40	100	300	600	21	-	-	-	-

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	1200	2400	19	8φ×30~50L	340*288*85	1200	3600	23
10φ×30~45L	340*288*85	700	2100	17	10φ×30~60L	340*288*85	700	2100	19
10φ×46~60L	340*288*130	700	1400	14	12.5φ×40~55L	340*288*85	460	1380	8
12.5φ×30~40L	340*288*85	460	1380	8	16φ×20~30L	340*288*65	300	1200	11
12.5φ×41~50L	340*288*130	460	920	9	16φ×31~45L	340*288*65	300	1200	18
12.5φ×55~60L	340*288*130	460	920	13	18φ×15~30L	340*288*65	250	1000	12
13φ×16~20L	340*288*65	450	1800	9	18φ×31~50L	340*288*65	250	1000	22
13φ×35L	340*288*85	450	1350	9	22φ×25~30L	340*288*65	160	640	15
16φ×15~20L	340*288*65	300	1200	11	22φ×31~50L	340*288*65	160	640	21
16φ×21~26L	340*288*85	300	900	14	-	-	-	-	-
16φ×27~32L	340*288*85	300	900	14	-	-	-	-	-
16φ×33~40L	340*288*85	300	900	15	-	-	-	-	-
18φ×15~20L	340*288*65	250	1000	9	-	-	-	-	-
18φ×21~42L	340*288*85	250	750	13	-	-	-	-	-
18φ×43~50L	340*288*130	250	500	12	-	-	-	-	-
22φ×25~40L	340*288*85	160	480	9	-	-	-	-	-
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	340*288*50	3000	15000	5	3,000	15,000	8
5φ	340*288*50	2600	13000	11	2,400	12,000	8
6.3φ	340*288*50	2000	10000	7	2,000	10,000	6
8φ×5~16L	340*288*50	1200	6000	9	1,600	8,000	12
8φ×20~30L	340*288*65	1200	4800	13	1,000	5,000	12
10φ×9~17L	340*288*50	800	4000	10	-	-	-
10φ×18~30L	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×40L 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 .
凯美所有电容器经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-乙基己基)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.