

产品承认书  
APPROVAL SHEET

客户料号:

Part Number

客 户:

CUSTOMERS

品 名:

DESCRIPTION

铝电解电容

规 格:

SERIES

GF 1500UF16V 8X20

供应商料号

Supplier PN:

1500uF16V8x20GF

日 期:

DATE

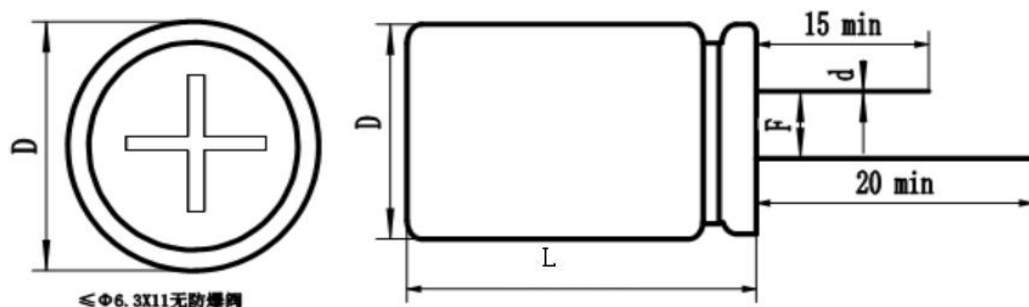
2025/7/8

| 发行单位<br>ISSUE DEPARTMENT                                                            |                   |
|-------------------------------------------------------------------------------------|-------------------|
|  |                   |
| 制作<br>PREPARED BY                                                                   | 侯业刚<br>HOU YEGANG |
| 批准<br>APPROVED                                                                      | 胡俊波<br>HU JUNBO   |

| 客户承认栏<br>APPROVED COLUMN     |  |
|------------------------------|--|
| 合格 <input type="checkbox"/>  |  |
| 不合格 <input type="checkbox"/> |  |
| 审核<br>CHECKED                |  |
| 批准<br>APPROVED               |  |

贵司确认后，敬请回签一份（After your confirmation, please sign back）

### 1. 外形尺寸图 (Dimensions) : 单位: mm



|          |      |            |
|----------|------|------------|
| $\Phi D$ | 8.0  | $\pm 0.5$  |
| $L$      | 20.0 | $\pm 1.5$  |
| $F$      | 3.5  | $\pm 0.5$  |
| $\Phi d$ | 0.6  | $\pm 0.05$ |
|          |      |            |
|          |      |            |

### 2. 部品规格特性表 (电容测试条件: $25 \pm 5^\circ\text{C}$ 湿度 $65\% \pm 5\%$ , 容量\损失测试频率 120HZ)

| 客户料号        | 系列     | 标准容量     | 额定电压   | 尺寸         | 容差              | 损失角        | 漏电流         | 阻抗         | 寿命         | 纹波电流                   | 浪涌电压             | 套管      | 加工形式 | 工作温度                          |
|-------------|--------|----------|--------|------------|-----------------|------------|-------------|------------|------------|------------------------|------------------|---------|------|-------------------------------|
| Part Number | Series | CAP (uF) | WV (V) | SIZE       | Tolerance/120HZ | D. F/120HZ | LC (uA) 60s | 100KHz (Ω) | life (Hrs) | R. C. mA100K<br>HZ105℃ | surge<br>voltage | Sleeve  | B    | working<br>temperature<br>(℃) |
|             | GF     | 1500.0   | 16.0   | 8.0 X 20.0 | - 20 % ~ 20 %   | 10.0       | 240.0       | 0.05       | 2000       | 1300.0                 | 20.0             | 绿底白字PET | 长脚   | -40~+105                      |
| 备注          |        |          |        |            |                 |            |             |            |            |                        |                  |         |      |                               |

#### 纹波电流系数 (Multiplier for ripple current) :

| Freq                          | 120Hz | 1KHz | 10KHz | 50~100KHz |
|-------------------------------|-------|------|-------|-----------|
| CAP $\leq 180$                | 0.40  | 0.75 | 0.9   | 1.00      |
| $220 < \text{CAP} \leq 560$   | 0.50  | 0.85 | 0.94  | 1.00      |
| $680 < \text{CAP} \leq 1800$  | 0.60  | 0.87 | 0.95  | 1.00      |
| $2200 < \text{CAP} \leq 3900$ | 0.75  | 0.9  | 0.95  | 1.00      |
| CAP $> 4700$                  | 0.85  | 0.95 | 0.98  | 1.00      |

#### 纹波温度系数 Multiplier for ripple current vs temperature

| Temperatrue (℃) | $\leq 45$ | 60   | 70   | 85  | 95   | 105  |
|-----------------|-----------|------|------|-----|------|------|
| Multiplier      | 2.30      | 2.10 | 2.00 | 1.7 | 1.40 | 1.00 |

3. 胶管标识示意图 (Marking):

3.....

Econd

16V1500uF

Econd

.....1

.....2

GF

105℃ (M)

RoHS

2502

PET

.....4

.....5

.....6

.....7

.....8

NO. 代表内容 Item

1. 公司商标 (Logo)

2. 电容器规格 (额定电压和容量) Capacitance and Rated Vlotage

3. 负极表示带 Polarity bar

4. 产品系列 (Series)

5. 工作最高温度与容量范围 (Operating Temperature Range and Capacitance Tolerance )

6. 环保标识 (RoHS)

7. 生产周期:如“ 2502 ”其中 25 代表 2025年; 02 代表 02 月份生产.

8. 胶管材质

## 5.1 试验项目 Test item

| NO                        | 项 目<br>Items                                   | 条 件<br>Conditions                                                                                                                                                                                                                                                                                                                                              | 规 格<br>Specifications                                                                                                                                                        |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
|---------------------------|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|-----------------------------------|------|-----|------|----------------------------------|------|-----|------|---------------------------|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                         | 最大允许纹波电流<br>Maximum permissible ripple current | Temperature:105±2℃<br>Voltage :DC.Voltage+peak ripple voltage≤<br>Rated voltage.<br>Ripple frequency:100KHz                                                                                                                                                                                                                                                    | Refer to table                                                                                                                                                               |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
| 2                         | 浪涌<br>Surge                                    | Temperature:105±2℃<br>Applied voltage: see specification<br>"ON" position : 30 seconds<br>"OFF" position :5 minutes 30 seconds.<br>Duration : 1000 cycles                                                                                                                                                                                                      | 1.No electrical or mechanical damage.<br>2.Capacitance change within ±15%.<br>3.D.F.smaller than specification volue.<br>4.Leakage current smaller than specification value. |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
| 3                         | 温度循环<br>Temperature Cycle                      | <table><tr><td rowspan="5">One Cycle</td><td>Temperature(℃)</td><td>Time (minutes)</td></tr><tr><td>Rated high category temperature±3</td><td>30±3</td></tr><tr><td>25℃</td><td>3MAX</td></tr><tr><td>Rated low category temperature±3</td><td>30±3</td></tr><tr><td>25℃</td><td>3MAX</td></tr><tr><td colspan="3">Total number of cycles: 5</td></tr></table> | One Cycle                                                                                                                                                                    | Temperature(℃) | Time (minutes) | Rated high category temperature±3 | 30±3 | 25℃ | 3MAX | Rated low category temperature±3 | 30±3 | 25℃ | 3MAX | Total number of cycles: 5 |  |  | 1.No appearance defect.<br>2.Capacitance change within ±5%<br>3.D.F.smaller than specification value.<br>4.Leakage current smaller than specification value. |
| One Cycle                 | Temperature(℃)                                 | Time (minutes)                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                              |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
|                           | Rated high category temperature±3              | 30±3                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                              |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
|                           | 25℃                                            | 3MAX                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                              |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
|                           | Rated low category temperature±3               | 30±3                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                              |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
|                           | 25℃                                            | 3MAX                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                              |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
| Total number of cycles: 5 |                                                |                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                              |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
| 4                         | 耐焊接热<br>Resistance to Soldering Heat           | Warm up time :120±2 seconds to reach 120±2℃<br>Solder bath temperature: 260±5℃.<br>Solder bath composition: Sn-96.5%.<br>Ag-3.0%<br>Cu-0.5%<br>Immersion depth: 1.5 to 2.0mm<br>Immersion duration: 10±1 seconds                                                                                                                                               | 1.No appearance defect.<br>2.Capacitance change within ±5%<br>3.D.F.smaller than specification value.<br>4.Leakage current smaller than specification                        |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |
| 5                         | 可焊性<br>Solder Ability                          | Solder bath temperature: 235±5℃.<br>Solder bath composition: Sn-96.5%.<br>Ag-3.0%<br>Cu-0.5%<br>Immersion depth: 1.5 to 2.0mm<br>Immersion duration: 10±1 seconds                                                                                                                                                                                              | A minimum of 95% the immersed surface is to be coated with the new solder                                                                                                    |                |                |                                   |      |     |      |                                  |      |     |      |                           |  |  |                                                                                                                                                              |

## 5. 2试验项目 Test item

| NO               | 项 目<br>Items                                                                 |                              | 条 件<br>Conditions                                                                                                                                                                      |                     |                | 规 格<br>Specifications                                          |                                                                                                                                                                              |    |    |    |    |    |     |
|------------------|------------------------------------------------------------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|----|----|----|-----|
| 6                | 低温特性（最大阻抗比）<br>Low Temperature Charcteristics (Max.Impedance Ratio)          |                              | working Voltage (v)                                                                                                                                                                    |                     |                | 6.3                                                            | 10                                                                                                                                                                           | 16 | 25 | 35 | 50 | 63 | 100 |
|                  |                                                                              |                              | Impedance Z-40℃/+20℃                                                                                                                                                                   |                     |                | 8                                                              | 6                                                                                                                                                                            | 4  | 3  | 3  | 3  | 3  | 3   |
|                  |                                                                              |                              |                                                                                                                                                                                        |                     |                |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
| 7                | 高湿度储存<br>High Humidity storage                                               |                              | Temperature:40±2℃<br>Relative humidity :90 to 95%<br>Duration : 240±8 hours                                                                                                            |                     |                |                                                                | 1.No electrical or mechanical damage.<br>2.Capacitance change within ±15%.<br>3.D.F.smaller than specification volue.<br>4.Leakage current smaller than specification volue. |    |    |    |    |    |     |
| 8                | 防爆<br>Vent                                                                   |                              | Conduct under normal lighting for lab work                                                                                                                                             |                     |                |                                                                | There shall be no explosion,flash,flame,spark or fire from the capacitor during or after the test,nor shall there be expulsion of any metal from the casing                  |    |    |    |    |    |     |
|                  |                                                                              |                              | Capacitor diameter                                                                                                                                                                     | Applied current(A)  | Minutes        |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
|                  |                                                                              |                              | Less than 22.4mm                                                                                                                                                                       | 1                   | within 30      |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
| More than 22.5mm | 10                                                                           |                              |                                                                                                                                                                                        |                     |                |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
| 9                | 端子强度：拉伸度/弯曲强度<br>Terminal strength : Tensile testintensity/winding intensity | 拉伸度<br>Tensile testintensity | Diameter of terminnal                                                                                                                                                                  | Tensile Strength(n) | continued time | 1.No electrical or mechanical damage<br>2.No appearance damage |                                                                                                                                                                              |    |    |    |    |    |     |
|                  |                                                                              |                              | 0.5≧d≤0.8                                                                                                                                                                              | 10                  | 10±1sec        |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
|                  |                                                                              |                              | 0.8<d≤1.25                                                                                                                                                                             | 20                  |                |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
|                  |                                                                              | 弯曲强度<br>winding intensity    | 2bends（Bend 180 degrees for a round）                                                                                                                                                   |                     |                |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
|                  |                                                                              |                              | Diameter of terminnal                                                                                                                                                                  | winding Strength(n) | Awl quality    |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
| 0.5≧d≤0.8        | 5                                                                            |                              | 0.51kg                                                                                                                                                                                 |                     |                |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
| 0.8<d≤1.25       | 10                                                                           | 1.02kg                       |                                                                                                                                                                                        |                     |                |                                                                |                                                                                                                                                                              |    |    |    |    |    |     |
| 10               | 振动<br>Vibration                                                              |                              | Frequency range : 10 Hz to 55 Hz<br>Amplitude :1.5 mm<br>Cycle definition:10Hz to 55 Hz and back to 10Hz<br>Cycle duration :1 minute.<br>Duration :2 hours per direction (3directions) |                     |                |                                                                | 1.No electrical or mechanical damage<br>2.No appearance damage                                                                                                               |    |    |    |    |    |     |
| 11               | 高温负荷<br>Endurance                                                            |                              | Capacitors are placed in an oven and applied voltage for 2000 hours at 105℃.After being restored to 25℃, capacitors shall meet the specifications.                                     |                     |                |                                                                | 1.Capacitance change within ±20% of the initial value.<br>2.D.F.change within ±200% of the specified value.<br>3.Leakage current smaller than specification value.           |    |    |    |    |    |     |
| 12               | 高温储存<br>Shelf Life                                                           |                              | Capacitors are placed in an oven for 1000 hours at 105℃without applying rated working voltage.After being restored to 25℃,capacitors shall meet the snecifications                     |                     |                |                                                                | 1.Capacitance change within ±20% of the initial value.<br>2.D.F.change within ±200% of the specified value.<br>3.Leakage current within ±200% of the specification value.    |    |    |    |    |    |     |

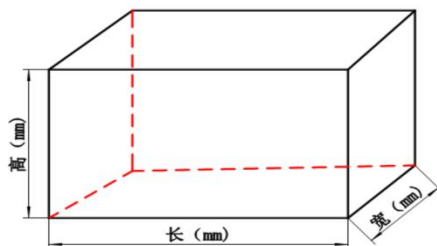
### 6. 包装方式 (Packing)

#### 6.1 散料包装: 散料包装包含长脚和短脚包装, 具体如下:

| 电容尺寸<br>DXL (mm) | 长脚                     |          | 短脚                     |          |
|------------------|------------------------|----------|------------------------|----------|
|                  | 包装袋尺寸 (长x宽): 220*200mm |          | 包装袋尺寸 (长x宽): 200*180mm |          |
|                  | 每袋数量 (pcs)             | 每箱数量 (K) | 每袋数量 (pcs)             | 每箱数量 (K) |
| 3X5-4X7          | 2000                   | 96       | 2000                   | 96       |
| 5X7              | 1000                   | 40       | 1000                   | 40       |
| 5X9-11           | 1000                   | 40       | 1000                   | 32       |
| 6. 3X7           | 1000                   | 40       | 1000                   | 40       |
| 6. 3X9-15        | 1000                   | 32       | 1000                   | 24       |
| 8X7-9            | 1000                   | 40       | 1000                   | 24       |
| 8X10-13          | 500                    | 20       | 500                    | 16       |
| 8X13.5-15        | 500                    | 16       | 500                    | 16       |
| 8X15.5-16.5      | 500                    | 16       | 500                    | 12       |
| 8X20-10X13       | 500                    | 12       | 500                    | 12       |
| 10X14-17         | 400                    | 9.6      | 400                    | 9.6      |
| 10X20-26         | 300                    | 7.2      | 300                    | 7.2      |
| 13X14-22         | 200                    | 4.8      | 200                    | 4.8      |
| 13X24-26         | 100                    | 3.2      | 100                    | 4        |
| 13X30-31         | 100                    | 2        | 100                    | 3.2      |
| 16X18-22         | 100                    | 2.4      | 100                    | 3.2      |
| 16X25-28         | 100                    | 3.2      | 100                    | 3.2      |
| 16X30-18X26      | 100                    | 2.4      | 100                    | 2.4      |
| 18X28-36         | 50                     | 1.6      | 50                     | 1.6      |
| 18X40            | 50                     | 1.2      | 50                     | 1.2      |
| 22X24-38         | 25                     | 0.8      | 25                     | 0.8      |



散料尺寸示意图 (上)

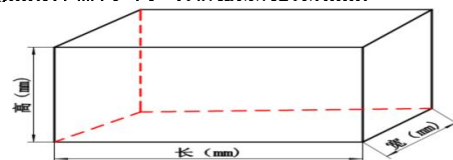


散料尺寸示意图 (下)

散料包装外箱尺寸 (长X宽X高):  
420X327X270mm

#### 6.2 编带包装: 编带为统一包装方式: 每箱固定装10盒, 内盒尺寸345X235X55 (mm); 外盒尺寸: 490X355X295 (mm)

| 电容拍别 | 每盒数量 (pcs) | 每箱盒数 | 每箱数量 (K) | 备注   |
|------|------------|------|----------|------|
| 4    | 2500       | 10   | 25       |      |
| 5    | 2000       | 10   | 20       |      |
| 6. 3 | 1500       | 10   | 15       |      |
| 8    | 1000       | 10   | 10       |      |
| 10   | 600        | 10   | 6        | 每行空一 |
| 13   | 400        | 10   | 4        | 编一隔一 |



内盒尺寸 (长X宽X高): 345X235X55 外  
盒尺寸 (长X宽X高): 490X355X295

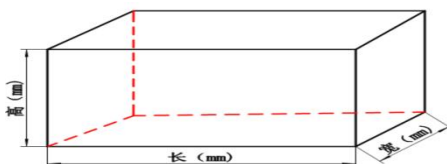
#### 6.3 排盒包装:

##### 1. 排盒包装标准:

| 拍别 (mm) | 内盒选择              | 内盒品种 | 每排数量 | 每排排数 | 每盒数量 | 每箱盒数 | 每箱数量 | 内盒隔板数 |
|---------|-------------------|------|------|------|------|------|------|-------|
| 13Φ     | 内盒选择寸<br>依据产品尺寸而定 | 高盒   | 22   | 14   | 308  | 6    | 1848 | 单条/2排 |
|         |                   | 中盒   |      |      |      | 8    | 2464 | 单条/2排 |
|         |                   | 低盒   |      |      |      | 12   | 3696 | 单条/2排 |
| 16Φ     | 内盒选择寸<br>依据产品尺寸而定 | 高盒   | 18   | 12   | 216  | 6    | 1296 | 单条/2排 |
|         |                   | 中盒   |      |      |      | 8    | 1728 | 单条/2排 |
|         |                   | 低盒   |      |      |      | 12   | 2592 | 单条/2排 |
| 18Φ     | 内盒选择寸<br>依据产品尺寸而定 | 高盒   | 16   | 10   | 160  | 6    | 960  | 单条/2排 |
|         |                   | 中盒   |      |      |      | 8    | 1280 | 单条/2排 |
|         |                   | 低盒   |      |      |      | 12   | 1920 | 单条/2排 |
| 22Φ     | 内盒选择寸<br>依据产品尺寸而定 | 高盒   | 13   | 9    | 117  | 6    | 702  | 双条/3排 |
|         |                   | 中盒   |      |      |      | 8    | 936  | 双条/3排 |
|         |                   | 低盒   |      |      |      | 12   | 1404 | 双条/3排 |

##### 2. 内盒、隔条、外箱 {长X宽X高 (mm)}

| 内盒型号 | 内盒尺寸 (mm)  | 隔条尺寸 (mm) | 每大箱装盒数 (盒) | 外箱尺寸 (mm)   |
|------|------------|-----------|------------|-------------|
| 高盒   | 305*200*65 | 300*62    | 6          | 420*310*215 |
| 中盒   | 305*200*45 | 300*42    | 8          |             |
| 低盒   | 305*200*30 | 300*30    | 12         |             |



### 7. 铝电解电容器仓储条件:

- ① 仓储温度:  $\leq 35^{\circ}\text{C}$       ② 仓储湿度:  $\leq 75\text{RH}\%$       ③ 电容存储有效期: 一年 (超过一年需要重新充电)