

# 东莞市华松电子科技有限公司

## 规格承认书

规格书号：HS/GD20170610001

客 户 (CUSTOMER) : 香港刚达制品有限公司

品 名 (DISCRIPTION) : 校正电容(MBOX)

规 格 (SPECIFICATION) : 系列承认

料 号 (Part Number):

客户承认栏 (CUSTOMER APPROVAL) :

| 制 表 | 批 准 | 确 认 |
|-----|-----|-----|
| 杨敏娟 | 唐泽民 | 周海明 |

TEL : 0769-86255255

FAX : 0769-86255256

Email:hs@hscap.com

**东莞市华松电子科技有限公司**  
**DONG GUAN HUA SONG TECHNOLOGYCO., LTD**

**CONTENTS**

| <b>Material</b> | <b>Type</b>  | <b>Inductived</b> | <b>Appearance</b> | <b>Cap. (uF)</b> | <b>Voltage</b> |
|-----------------|--------------|-------------------|-------------------|------------------|----------------|
| PEI<br>PET      | CL11         | Yes               | Epoxy dipped      | 0.001-0.47       | 100-1200 VDC   |
| PEI<br>PET      | PSR          | Yes               | Epoxy dipped      | 0.0001- 0.01     | 63-100 VDC     |
| MPET            | CL21         | No                | Epoxy dipped      | 0.001-10.0       | 100-630 VDC    |
|                 | CL21-B       | No                | Plastic case      | 0.0047-10.0      | 100-630 VDC    |
|                 | CL21X        | No                | Epoxy dipped      | 0.0022-1.0       | 100 VDC        |
|                 | CL71<br>MBOX | No                | Mini box          | 0.001-1.0        | 63V/100 VDC    |
|                 | CL20T        | No                | PE Film tape      | 0.01-20.0        | 100-630 VDC    |
|                 | CL20A        | No                | PE Film tape      | 0.01-20.0        | 100-630 VDC    |
| PP              | CBB13        | No                | Epoxy dipped      | 0.001-0.47       | 100-630 VDC    |
| MPP             | CBB21        | No                | Epoxy dipped      | 0.0047-3.3       | 100-630 VDC    |
|                 | CBB21-B      | No                | Plastic case      | 0.0047-3.3       | 100-630 VDC    |
|                 | CBB20T       | No                | PE Film tape      | 0.010-10.0       | 100-630 VDC    |
|                 | CBB20A       | No                | PE Film tape      | 0.010-10.0       | 100-630 VDC    |
|                 | CBB81        | No                | Epoxy dipped      | 0.0010-0.1       | 1000-2000 VDC  |
|                 | CBB81-B      | No                | Plastic case      | 0.0010-0.1       | 1000-2000 VDC  |
|                 | X1           | No                | Plastic case      | 0.0022-4.7       | 300 VAC        |
|                 | X2           | No                | Plastic case      | 0.0022-4.7       | 275 VAC        |

**NOTE**

PEI/PET: Polyester film capacitor

MPET: Metalized polyester film capacitor

PP : Polypropylene Film-Foil Capacitor(Non-indctive)

MPP: Metalized polypropylene film capacitor

**东莞市华松电子科技有限公司**  
**DONG GUAN HUA SONG TECHNOLOGYCO.,LTD**

**Item No. information**

**TYPE: CL71**

**Example: CL71 1J 104 J 05 U**

- 1 “CL71” Stand for type CL21;
- 2 “1J” Stand for rated voltage;
- 3 “104” Stand for nominal capacitance;
- 4 “J” Stand for capacitance tolerance;
- 5 “05” Stand for Lead space;
- 6 “U” Stand for Lead configuration;

**1 Type**

|      |        |        |        |        |        |     |       |      |        |        |       |       |       |       |        |        |       |
|------|--------|--------|--------|--------|--------|-----|-------|------|--------|--------|-------|-------|-------|-------|--------|--------|-------|
| TYPE | X1     | X2     | X2Y2   | RC     | CL11   | PSR | CBB13 | GH11 | CBB20A | CBB20T | CL20A | CL20T | CL21  | CBB21 | CL71   | CL21X  | CL21B |
| TYPE | CBB21B | CBB93A | CBB93T | CBB94A | CBB94T | Y1  | Y2    | CA42 | MLC    | CC     | CBB60 | CBB61 | CBB65 | CBB81 | CBB81B | Others |       |

**2 RATED VOLTAGE :**

Expressed in 1digit-1-letter code for VDC and 2-digit code for VAC

|             |       |       |       |      |      |      |       |       |      |      |       |       |       |       |       |       |       |
|-------------|-------|-------|-------|------|------|------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|
| <b>VDC</b>  | 4.0V  | 6.3V  | 10V   | 12V  | 15V  | 16V  | 20V   | 25V   | 35V  | 50V  | 60V   | 63V   | 80V   | 100V  | 120V  | 150V  | 160V  |
| <b>CODE</b> | 0G    | 0J    | 1A    | 1M   | 1N   | 1C   | 1D    | 1E    | 1V   | 1H   | 1S    | 1J    | 1K    | 2A    | 2M    | 2N    | 2C    |
| <b>VDC</b>  | 200V  | 250V  | 300V  | 350V | 400V | 450V | 500V  | 600V  | 630V | 800V | 1000V | 1200V | 1250V | 1500V | 1600V | 1800V | 2000V |
| <b>CODE</b> | 2D    | 2E    | 2F    | 2V   | 2G   | 2W   | 2H    | 2S    | 2J   | 2K   | 3A    | 3M    | 3B    | 3N    | 3C    | 3Q    | 3D    |
| <b>VDC</b>  | 2500V | 3000V | 3500V | 4000 | 5000 | 6000 | 10000 | 15000 |      |      |       |       |       |       |       |       |       |
| <b>CODE</b> | 3E    | 3F    | 3V    | 3G   | 3H   | 3S   | 4A    | 4N    |      |      |       |       |       |       |       |       |       |

|             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>VAC</b>  | 125 | 180 | 200 | 220 | 230 | 250 | 275 | 280 | 300 | 320 | 350 | 370 | 400 | 440 | 450 | 500 | 600 |
| <b>CODE</b> | 12  | 18  | 20  | 22  | 23  | 25  | 27  | 28  | 30  | 32  | 35  | 37  | 40  | 44  | 45  | 50  | 60  |
| <b>VAC</b>  | 700 | 800 |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>CODE</b> | 70  | 80  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

**3 CAPACITANCE ( EIA Code) :**

The first 2 digits indicate significant figures, and the third digit specifies the number of zero to follow. This gives the capacitance in picofarads.

- 101 = 100pF =0.1nF = 0.0001uF
- 102 = 1,000pF =1.0nF = 0.001uF
- 103 = 10,000pF =10nF = 0.01uF
- 104 = 100,000pF =100nF = 0.1uF
- 105 = 1,000,000pF =1,000nF = 1.0uF
- 106 = 10,000,000pF =10,000nF = 10uF

**4 TOLERANCE ( EIA Code) :**

|                  |      |      |      |      |       |       |          |          |
|------------------|------|------|------|------|-------|-------|----------|----------|
| <b>TOLERANCE</b> | ± 1% | ± 2% | ± 3% | ± 5% | ± 10% | ± 20% | +80%-20% | +100%-0% |
| <b>CODE</b>      | F    | G    | H    | J    | K     | M     | Z        | P        |

**5 LEAD SPACE :**

Expressed in 2-digit or 1-digit-1-letter code

Unit : mm

|                   |      |      |      |      |      |      |      |      |      |      |      |      |      |      |                 |     |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|-----|
| <b>LEAD SPACE</b> | 2.0  | 2.54 | 3.0  | 3.5  | 4.0  | 4.5  | 5.0  | 5.5  | 6.0  | 6.5  | 7.0  | 7.5  | 8.0  | 8.5  | 9.0             | 9.5 |
| <b>CODE</b>       | 02   | 2P   | 03   | 3P   | 04   | 4P   | 05   | 5P   | 06   | 6P   | 07   | 7P   | 08   | 8P   | 09              | 9P  |
| <b>LEAD SPACE</b> | 10.0 | 12.5 | 15.0 | 16.0 | 17.5 | 20.0 | 22.5 | 25.0 | 27.5 | 30.0 | 32.5 | 35.0 | 37.5 | 41.0 | Capacitor-Axial |     |
| <b>CODE</b>       | 10   | 12   | 15   | 16   | 17   | 20   | 22   | 25   | 27   | 30   | 32   | 35   | 37   | 41   | 00              |     |

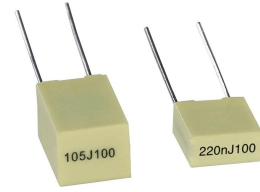
**6 LEAD CONFIGURATION :**

|                  |   |   |  |   |  |                                |   |   |                  |   |   |                        |   |   |   |   |
|------------------|---|---|--|---|--|--------------------------------|---|---|------------------|---|---|------------------------|---|---|---|---|
| <b>CODE</b>      | L |   |  |   |  |                                | M | B | C                | D | E | F                      | G | H | A | V |
| <b>LEAD TYPE</b> |   |   |  |   |  |                                |   |   |                  |   |   |                        |   |   |   |   |
| <b>CODE</b>      | V | T |  | U |  | W(standed PVC insulation wire) |   |   | O(Isolated wire) |   |   | Q(Soldering terminals) |   |   |   |   |
| <b>LEAD TYPE</b> |   |   |  |   |  |                                |   |   |                  |   |   |                        |   |   |   |   |

# 东莞市华松电子科技有限公司 DONG GUAN HUA SONG TECHNOLOGY CO., LTD

## Minibox metallized polyester film capacitor

CL71 are non-inductively wound with polyester film as dielectric and electrode, with cooper-clad steel leads and encapsulated in plastic cases, and sealed with epoxy resin. They are suitable for decoupling, by-passing, filtering, treatment of analog signals, rejection of line perturbations, etc.



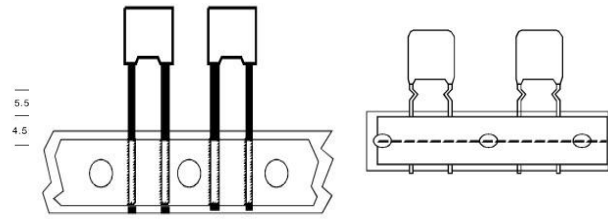
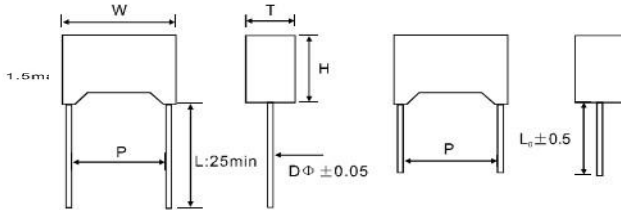
### Features:

- ◆ Non-inductive construction
- ◆ Self-healing properties
- ◆ Space-saving miniature size
- ◆ Available on tape for automatic insertion

### Specifications:

1. Operating temperature: -40°C -- +85°C
2. Capacitance range: 0.001uF – 1.0uF
3. Capacitance tolerance: ±5%(J), ±10%(K)
4. Rated voltage: 100/ 250/ 400VDC
5. Dissipation factor: 1.0% max. at 1KHz, 25°C
6. Insulation resistance: 15,000 MOhm min. for  $\leq 0.33\mu\text{F}$   
5,000 MOhm\* $\mu\text{F}/\text{C}$  min. for  $\text{C} > 0.33\mu\text{F}$
7. Dielectric strength: 150% of rated voltage for 5 sec.

### Dimensions: (Unit: mm)



| CAP    | Case type |        |        |        |
|--------|-----------|--------|--------|--------|
|        | 63VDC     | 100VDC | 250VDC | 400VDC |
| 0.001  | 01        | 01     | 01     | 01     |
| 0.0012 | 01        | 01     | 01     | 01     |
| 0.0018 | 01        | 01     | 01     | 01     |
| 0.0022 | 01        | 01     | 01     | 01     |
| 0.0027 | 01        | 01     | 01     | 01     |
| 0.0033 | 01        | 01     | 01     | 01     |
| 0.0047 | 01        | 01     | 01     | 01     |
| 0.0056 | 01        | 01     | 01     | 01     |
| 0.0068 | 01        | 01     | 01     | 01     |
| 0.01   | 01        | 01     | 01     | 01     |
| 0.012  | 01        | 01     | 01     | 02     |
| 0.015  | 01        | 01     | 01     | 02     |
| 0.018  | 01        | 01     | 01     | 02     |
| 0.022  | 01        | 01     | 01     | 02     |
| 0.027  | 01        | 01     | 01     | 07     |
| 0.033  | 01        | 01     | 02     | 07     |
| 0.039  | 01        | 01     | 02     | 06     |
| 0.047  | 01        | 01     | 02     | 06     |
| 0.056  | 01        | 01     | 07     | 05     |
| 0.068  | 01        | 01     | 07     | 05     |
| 0.082  | 01        | 01     | 07     | 05     |
| 0.1    | 01        | 01     | 07     | 05     |

| CAP  | Case type |        |        |        |
|------|-----------|--------|--------|--------|
|      | 63VDC     | 100VDC | 250VDC | 400VDC |
| 0.12 | 01        | 01     | 06     | /      |
| 0.15 | 01        | 01     | /      | /      |
| 0.22 | 02        | 02     | /      | /      |
| 0.33 | 02        | 07     | /      | /      |
| 0.47 | 02        | 05     | /      | /      |
| 0.68 | 06        | /      | /      | /      |
| 1.0  | 05        | /      | /      | /      |

| Case type | W    | H    | T    | P    | D     |
|-----------|------|------|------|------|-------|
|           | ±0.5 | ±0.5 | ±0.5 | ±0.5 | ±0.05 |
| 01        | 7.5  | 6.5  | 2.5  | 5.0  | 0.5   |
| 02        | 7.5  | 8.0  | 3.5  | 5.0  | 0.5   |
| 05        | 7.5  | 12.0 | 6.0  | 5.0  | 0.5   |
| 06        | 7.5  | 10.0 | 6.0  | 5.0  | 0.5   |
| 07        | 7.5  | 8.0  | 5.0  | 5.0  | 0.5   |

- ◆ For inquiry of items out of above range or with special dimensions, kindly contact us for availability.
- ◆ Specifications are subject to change without notice. Please refer to approval sheets for final and mutually agreed specifications.

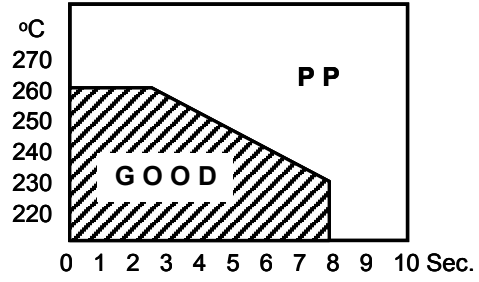
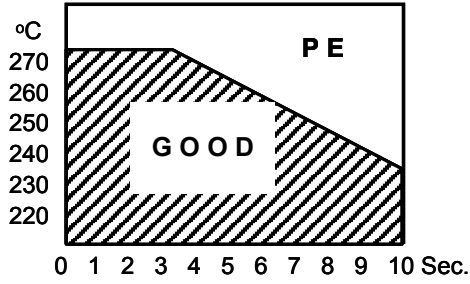


**东莞市华松电子科技有限公司**  
**DONG GUAN HUA SONG TECHNOLOGY CO., LTD**

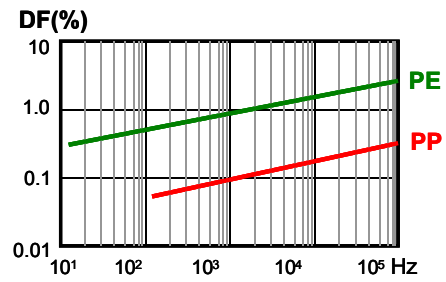
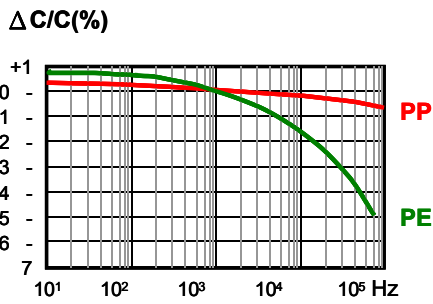
| Characteristics |                           |   | TYPE:CL71  |
|-----------------|---------------------------|---|--|
| No.             | Test items                | Test method   | Characteristics  |
| 1               | Climatic Category         | /   | 40/85/21   |
| 2               | Rated voltage             | /   | 50V — 630VDC   |
| 3               | Withstand Voltage(TV)     | 160% of rated voltage for 5sec.   | Shall be no abnormality.   |
| 4               | Capacitance(CAP)          | Measuring Frequency:1KHz±10%.<br>Measuring Voltage :1Vrms.max.  | 0.001uF — 1uF  |
| 5               | Tolerance (%)             | /   | J(±5%); K (±10%)   |
| 6               | Dissipation Factor(DF)    | Measuring Frequency:1KHz±10%.<br>Measuring Voltage :1Vrms.max.  | 0.01 (1%)max. at 1 KHz.  |
| 7               | Insulation resistance(IR) | Apply 100V±15%for 60±5sec.at+20 ±2℃ .   | ≥30000MΩ(C≤0.33uF)<br>≥10000MΩ·uF/C (C>0.33uF)   |
| 8               | Terminal Strength         | Tensile<br>Apply 1.0 kg for 10 ± 1sec.<br>to the terminal in the axial direction,<br>and acting in a direction away from the body.  | Shall be no abnormality.   |
| 9               |                           | Bending<br>Apply 0.5 kg for 2 cycles.<br>Each cycle includes:<br>90°once, return to its initial position for 2-3 sec.<br>and then to the opposite direction once.   | Shall be no abnormality.   |
| 10              | Solderability             | Soldering temperature:235 ±3℃ ;<br>Immersion duration: 2.0 ±0.5sec  | Good Tinning.  |
| 11              | Soldering Heat Resistance | Soldering Temperature : +260 ± 5℃ .<br>Immersion Duration : 10 ±1sec.   | CAP(ΔC/C) Within ±2% of the value before test.<br>DF 0.003(0.3%) max.at 1KHz   |
| 12              | Rapid Temperature Change  | Test Temperature Cycle : Total 5 cycles.<br>High Temperature : +85±5 ℃<br>Low Temperature : -40 ±5℃<br>30 min ± 10% for each temperature.   | Shall be no abnormality.<br>CAP(ΔC/C) Within ±5% of the value before test.<br>DF 0.003(0.3%) max.at 1KHz   |
| 13              | Damp Heat Loading         | Test temperature :+40 ± 2℃<br>Test humidity : 90% to 95% R.H.<br>Test voltage : rated voltage.<br>Test duration : 500 +24/-0 hrs.   | Shall be no remarkable change.<br>The marking shall be legible.<br>CAP(ΔC/C) Within ±5% of the value before test.<br>DF 0.005 (0.5%) max.at 1KHz                                 |
| 14              | Climatic Sequence         | Dry heat<br>Temperature: 85℃,Duration: 16 hrs.  | Shall be no abnormality.<br>Shall be no remarkable change.<br>CAP(ΔC/C) Within ±5% of the value before test.<br>DF 0.005(0.5%) max.at 1KHz<br>IR≥50% of the limit value of No. 7 |
|                 |                           | Humid Cool<br>—40℃,Duration: 2 hrs.   |  |
|                 |                           | Air pressure<br>Temperature: 15℃—35℃,Pressure: 8.5KPa;<br>Duration: 1 hr; After experiment, applied vottage 1 min.  |  |
|                 |                           | Temperature Cycle<br>Test Temperature Cycle:Total 5 cycles.<br>Each cycle includes :<br>1. +20 ±2℃ for 3min.<br>2. -40 ±3 ℃ for 30 min.<br>3. +20 ±2℃ for 3min.<br>4. +100 +3/-0 ℃ for 30 min.<br>5. +20 ±2℃ for 3 min. |  |
| 15              | Durability                | 85℃,Applied 1.25 multiple rate voltage,<br>Duration: 1000 hours (41.6 days)   | No visible damage and clear mark;<br>CAP(ΔC/C) Within ±5% of the value before test.<br>DF 0.003 (0.3%) max.at 1KHz<br>IR≥50% of the limit value of No. 7                         |
| 16              | Charge & Discharge        | Experiment period :10000 times;<br>Charge duration: 0.5s;<br>Discharge duration: 0.5s;  | CAP(ΔC/C) Within ±5% of the value before test.<br>DF 0.003 (0.3%) max.at 1KHz<br>IR≥50% of the limit value of No. 7  |

## CHARACTERISTICS REFERENCE

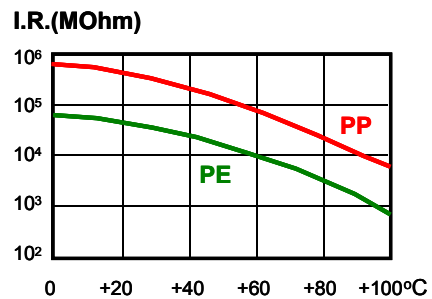
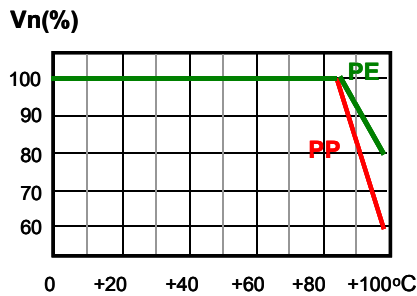
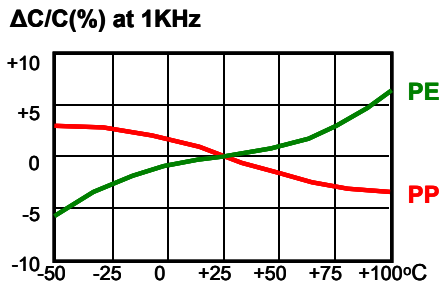
### Soldering Temperature VS Time



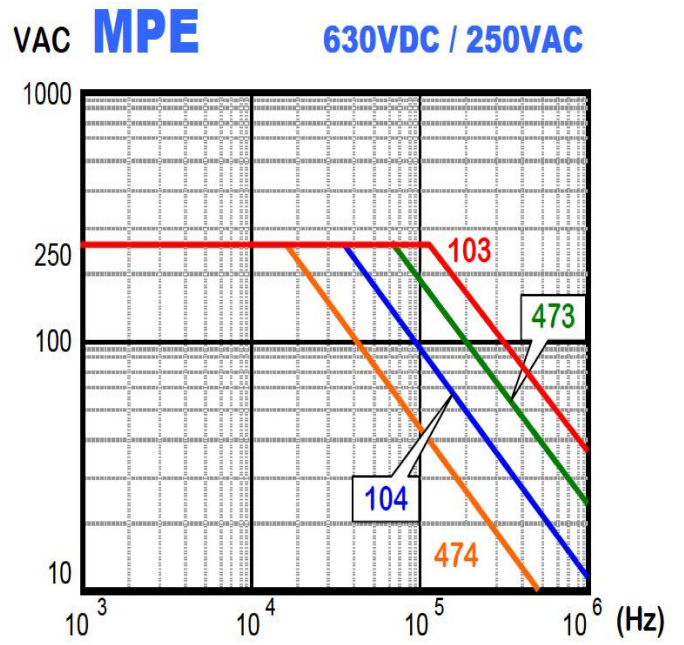
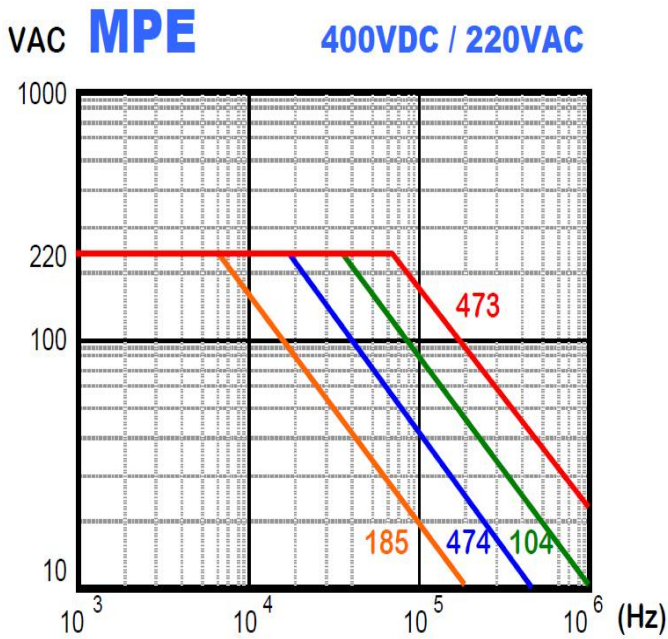
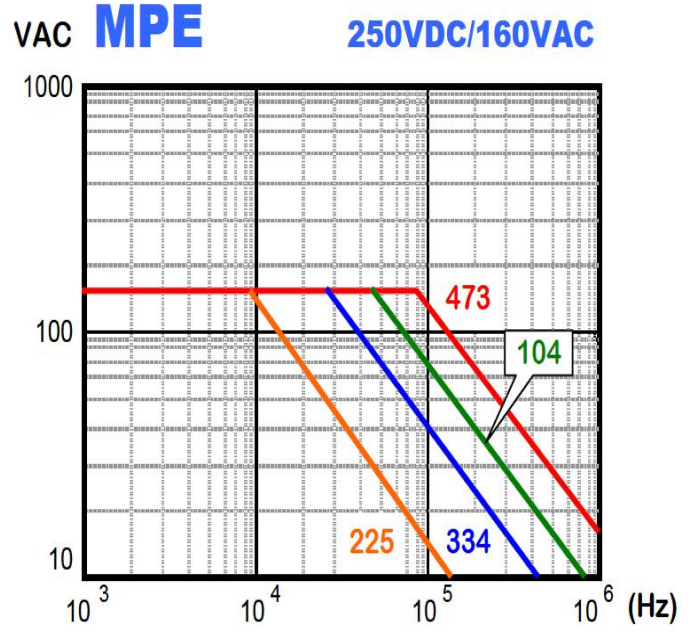
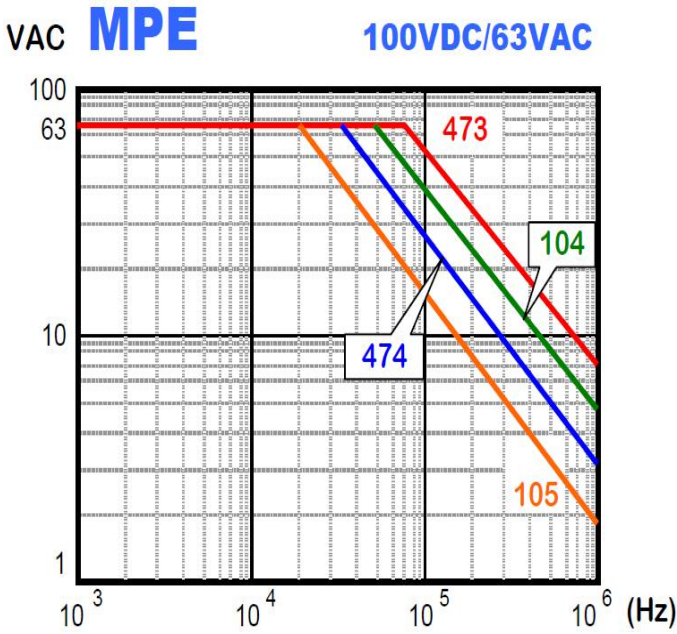
### Frequency Characteristics



### Temperature Characteristics



**CL71 Permissible AC Voltage VS Frequency Curve**

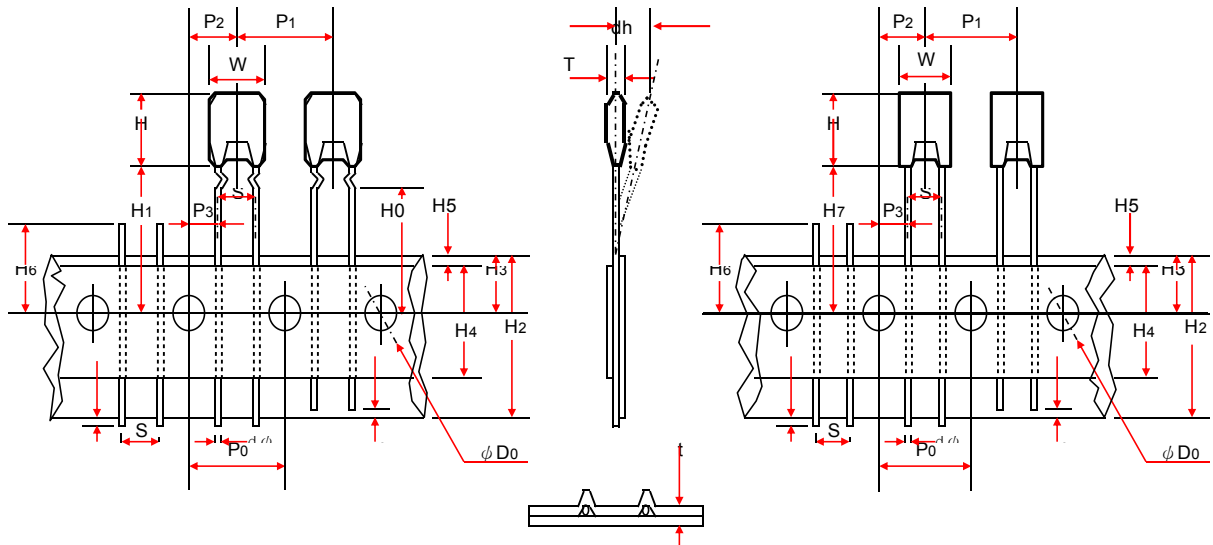




**Taping Dimensions and Packing**

Forming Lead Taping / 弯脚型编带:

Straight Lead Taping / 直脚型编带:



Dimensions & Allowances / 各部尺寸及公差:

Unit : mm

| Symbol    | dh   | H0   | H1             | H2            | H3   | H4   | H5   | H6   | H7   |      |
|-----------|------|------|----------------|---------------|------|------|------|------|------|------|
| Dimension | 0    | 16.0 | 20.0           | 18.0          | 9.0  | 12.5 | 3.0  | 11.0 | 16.5 | 19.5 |
| Allowance | ±0.5 | ±0.5 | +0.75<br>- 0.5 | +1.0<br>- 0.5 | ±1.5 | min. | max. | max. | ±0.3 | ±0.5 |

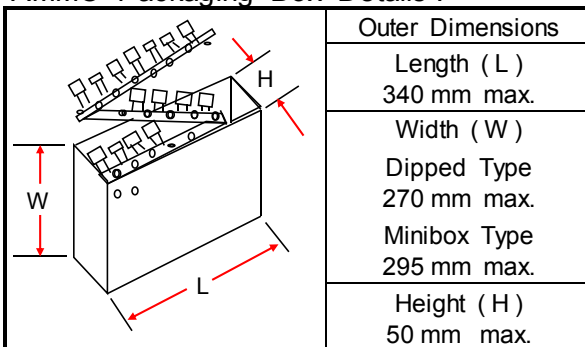
  

| Symbol    | P0   | P1   | P2   | P3   | ℓ0   | ℓ1   | S    | t    | dψ         | ψD0  |
|-----------|------|------|------|------|------|------|------|------|------------|------|
| Dimension | 12.7 | 12.7 | 6.35 | 3.85 | 7.0  | 2.0  | 5.0  | 0.7  | 0.5 or 0.6 | 4.0  |
| Allowance | ±0.3 | ±1.0 | ±1.3 | ±0.7 | max. | max. | ±1.0 | ±0.2 | ±0.05      | ±0.3 |

- Remarks :
1. Allowance of accumulated pitch : less than 1 mm at the sum of 20 pitches.
  2. Continuous empty components : less than 3 pcs.
  3. Total empty components in one AMMO box : less than 1 %.

※ Unless otherwise Specified.

AMMO Packaging Box Details :



AMMO PACKAGING Quantity : ( 每盒标准包装数 )

| Type  | 规格          | Pcs / Box |
|---|-------------|-----------|
| Dipped Capacitors<br>Forming Lead Taping<br>涤纶电容器<br>弯脚型编带            | 102-103     | 2000      |
|   | 223-683     | 1500      |
|   | 104         | 1000      |
| Type  | Case Type   | Pcs / Box |
| Minibox Capacitors (EMPE)<br>Straight Lead Taping<br>小型盒装电容器<br>直脚型编带 | BF01        | 2,500     |
|   | BF02        | 2,000     |
|   | BF07        | 1,500     |
|   | BF05 / BF06 | 1,000     |
|   | BF04        | 750       |