

承 認 書

SPECIFICATION FOR APPROVAL

客户名称: 深圳市立创电子商务有限公司
Customer:

产品型号: M/C 332J/400V P=5mm
Product Type:

产品编码: C2913427
Product Code:

客户料号: ESK400D33JAC200
Customer Code:

日期: 2021年11月20日

Approval signature:

AUTHORIZED BY

CHECK BY

VALIDATED BY

承认后请寄回一份 (Please return one copy after approved)

东莞市弘源电子有限公司

Dongguan Hongfarad Electronic Co., Ltd

地址: 东莞市塘厦镇林村新鸿路9号

No. 9, Xinhong Road, tangxialin village, Dongguan City, Guangdong Province

TEL:0769-87333312

FAX:0769-87333314

| | | | |
|--------|---|--------|----|
| 确 认 |  | 制 作 | 刘玲 |
|--------|---|--------|----|

ESK 系列承认书

| NO | 客户料号 | 规格 | 料号 |
|----|------|--------------------------------|-----------------|
| 1 | | 332J/400V 7.2*2.5*6.5 P=5mm 编带 | ESK400D33JAC200 |
| 2 | | 以下空白 | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| 6 | | | |
| 7 | | | |
| 8 | | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
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| 25 | | | |

产品编码说明 Part number system

17 位产品代码如下:

The 17 digits part number is formed as follow:

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| E | S | K | 1 | 0 | 0 | D | 2 | 2 | J | A | C | 2 | 0 | 0 |

1. 1~3 TYPE OF CAPACITOR:

电容器系列

| | | | | | | | | | | | | | | |
|------|-----|--|--|--|--|--|--|--|--|--|--|--|--|--|
| TYPE | -OK | | | | | | | | | | | | | |
| CODE | -OK | | | | | | | | | | | | | |

2. 4~6 RATED VOLTAGE:

额定电压

063: 63VDC/JIS 1J. 400: 400VDC/JIS 2G. 1K6: 1,600VDC/JIS 3C.
 100: 100VDC/JIS 2A. 630: 630VDC/JIS 2J. 1N0: 10,000VDC/JIS 4A.
 250: 250VDC/JIS2E. 1K0: 1,000VDC/JIS 3A. 2A7: 275VAC.

3. 7~9 Symbols of capacitance in Mfd:

电容器容量代码

A: Indicates tens. EX: 12Mfd=A12, 10Mfd=A10.(Mfd: Micro-Farad)

W(Word): Indicates unit. EX: 1.5Mfd=W15

P(Point): Digits following the decimal point. EX: 0.22Mfd=P22

S(Single Zero): Digits following the decimal point followed by one zero. EX: 0.015Mfd=S15

D(Double Zeroes): Digits following the decimal point followed by two zeroes. EX: 0.0047Mfd=D47

T(Triple Zeroes): Digits following the decimal point followed by three zeroes. EX: 0.00068Mfd=T68

4. 10 Symbols of capacitance Tolerance:

容量公差代码

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

5. 11 Lead Style Code:

引脚方式

| | | | | | | | | | | |
|-----------|---------|--|---------|--|----------|--|---------|--|---------|--|
| CODE | 0(不加工) | | 1(内弯) | | 2(外弯) | | 3(内外弯) | | 4(切脚) | |
| LEAD TYPE | | | | | | | | | | |
| CODE | 5(内弯切脚) | | 6(内弯切脚) | | 7(内外弯切脚) | | A(直角编带) | | B(弯脚编带) | |
| LEAD TYPE | | | | | | | | | | |

6. 12 引线脚距 Pitch **A=3.5 B=4.0 C=5.0 D=7.5 F=10 I=15 M=20 N=22.5 R=27.5 S=31.5**

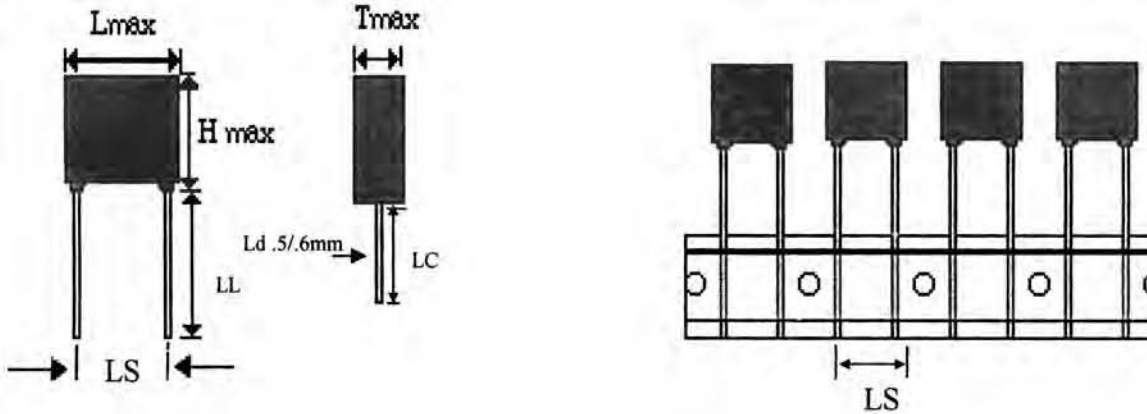
7. 13~14 引线脚长 Lead Length **05=5mm 20=20mm**

8. 15 特征码 Feature Codes ROHS:**0** Halogen Free:**A** capacitive divider : **B**

"

CUSTOMER : 立创
 CUSTOMER PART : 332J/400V
 FARAD TYPE : ESK400D33JAC200

Spec Ref :



| Item | Description | AQL % | Test Detail or instruments |
|-----------------------|---|-------|--|
| Capacitance (uF) | See listed below | 0.4 | Test signal: 1 Vrms max. 1.0±0.02 KHz, 0.5% accuracy reading |
| Diss. Factor (%) | 1.0 max. | 0.4 | by GR-1689 Digibridge or CH 1063 LCR meter at 25 °C |
| Rated voltage (VDC) | See listed below | 0.4 | Test Voltage: 160 % of rated voltage for 2 sec. |
| Insulation Resistance | C < .33uF, R ≥ 15GΩ. C ≥ .33uF, RC ≥ 5GΩ x uF. | 0.4 | Reading taken after 1 min. charged rated voltage or 500VDC, whichever is lower, by 705-I/R METER |
| Operating Temperature | -40°C to +105°C | | Derate DC voltage 1.5%/°C above 85°C to 105°C |
| Lead bend & Pull test | | | Follow IEC 60384-1 4.13 |
| Solderability | | | Follow IEC 60384-1 4.15 |

| Cap. uF | Tol. ±% | Vr VDC | T.V. VDC | L mm | T mm | H mm | LS mm | Ld ±0.05 mm | LL mm | LC mm | Remark |
|---------|---------|--------|----------|------|------|------|---------|-------------|-------|-------|-----------------|
| 0.0033 | 5 | 400 | 640 | 7.2 | 2.5 | 6.5 | 5 ± 0.5 | 0.5 | | | ESK400D33JAC200 |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| APPROVED BY | CHECKED BY | ORIGINATED BY |
|--------------------------|------------|---------------|
| 工程部 2021.11.20 张成伟 | 刘玲3.30 | 刘玲3.30 |

SPECIFICATION FOR ESK TYPE CAPACITOR

1. General

1.1 Applicable range of the specification

This specification applies to the fixed metallized polyester film dielectric capacitors used for general purpose circuit application.

1.2 Environmental conditions for test

Unless otherwise prescribed in other related specification, the test of this capacitor shall be performed under the temperature range from 15°C to 35°C and the R.H. ranges from 45% to 85%. However, if there is any doubt about the judgment of the measurement, the test shall be performed at $20 \pm 2^\circ\text{C}$ and $65\% \pm 5\% \text{ RH}$.

1.3 Reference specification

1.3.1 IEC 60384-1, 60384-2

2. Structure and Dimensions

2.1 Configuration and dimensions

The configuration of the capacitor and its dimensions shall be in compliance with the drawings and tables shown on page 1 and the attached sheet(s) therewith.

2.2 Structure

This flat radial lead type capacitor is comprised metallized polyester film and is encased and filled with epoxy.

2.3 Wire lead

The wire leads used is tinned copper clad steel wire or tinned copper wire upon customer requirement.

SPECIFICATION FOR ESK TYPE CAPACITOR

3. Mechanical performance

3.1 Tensile strength of the terminal

When 1 kg load is gradually and continuously applied to the either lead of the capacitor, along the wire lead direction, with the capacitor body being fixed, the wire lead shall be free from being damaged.

3.2 Bending strength of the terminal

The capacitor to be tested shall be kept such that its wire leads point to the perpendicular direction, and a 0.5 kg load is applied on the tip of the wire lead. The capacitor body shall be bended to 90° with respecting to its wire leads in 1- 2 seconds, and thereafter the capacitor body shall be returned to its original position in the same time period. Then the capacitor body shall be bended 90° to opposite direction and thereafter it is returned to its original position in the same period. This operation constitutes one bending. The wire leads shall withstand shall withstand 2 bending without being damaged.

3.3 Soldering heat resistance

The wire lead to be tested shall be immersed in the flux which shall consist of 25% by weight of colophony in 75% by weight of 2-propanol (isopropanol) or of ethyl alcohol. Then the wire lead shall be immersed in the solder pot, which shall be kept at $260\text{ }^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 5.0 ± 1.0 sec. Then leave the wire lead in normal condition for not less than 4 hours. The following requirement shall be met.

| | |
|-------------|-------------------------------------|
| Appearance | No distinguished change is observed |
| Cap. change | Within $\pm 3\%$ |
| D.F. change | Less than 150% of before test |

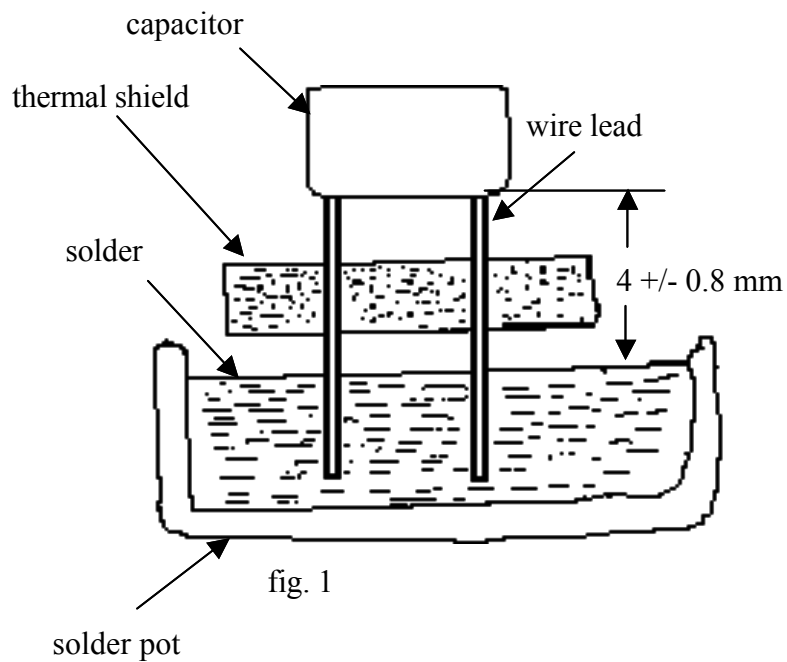
SPECIFICATION FOR ESK TYPE CAPACITOR

3.4 Solderability test

Test shall be performed with referring to IEC Publication 68-2-20 method 1 (as fig. 1). The surface of the leads immersed in the solder shall be covered with new solder for more than 95%.

3.4.1 test conditions:

- a. bath temperature: 235 ± 5
- b. immersion time: 2.0 ± 0.5 sec.
- c. depth of immersion : as shown in fig. 1



SPECIFICATION FOR ESK TYPE CAPACITOR

4. Electric performance

4.1 Capacitance

The capacitance of the capacitor shall be within the specified tolerance of the rated nominal value when it is measured to 0.5% accuracy with a signal of 1 Vrms max. at 1000 ± 200 Hz.

4.2 Dissipation Factor (DF)

The DF value of the capacitor shall be less than that specified in the table below when it is measured at the frequency specified in the same table.

| cap \ DF \ freq. | 1000 Hz |
|---|---------|
| $C \leq 0.1\mu\text{F}$ | 1.0% |
| $0.1 \mu\text{F} < C \leq 1.5\mu\text{F}$ | 1.0% |
| $1.5\mu\text{F} < C$ | 1.0% |

4.3 Voltage withstanding

Applying 160% of the rated voltage between the 2 terminals of the capacitor for 2 seconds, the capacitor shall be no permanent short circuit failure. The capacitor shall be charged and discharge through a resistor which limits the charge/discharge current to 0.1 A max.

4.4 Insulation resistance (IR)

The insulation resistance of the capacitor measured between the 2 terminals of the capacitor shall be no less than $15,000 \text{ M}\Omega$ for the capacitance less than 0.33 μf , and RC value shall be higher than $5,000 \text{ M}\Omega\text{-}\mu\text{F}$ for $C \geq 0.33 \mu\text{f}$. The capacitor shall be charged with rated voltage or 500 VDC, whichever is lower, for 1 minute, and thereafter the measurement readings shall be read in 1 minute.

SPECIFICATION FOR ESK TYPE CAPACITOR

5. Marking

Unless being otherwise specified, the capacitor shall be marked legibly showing the following items.

5.1 Rated nominal capacitance in uf (micro farad) or otherwise specified.

5.2 Capacitance tolerance symbol ; J ($\pm 5\%$), K ($\pm 10\%$), ...

6. Packing

6.1 The capacitors shall be packed together with desiccant in a polyethylene bag to prevent the capacitors from being moistened or damaged during transportation or in storage. The units can also be taped either in reel or Ammo packed for auto-insertion purpose.

7. Guaranteed period in store

7.1 The guaranteed period of the capacitor is 12 months from the shipping date provided the capacitor is packed in the original bag.

7.2 When the capacitor is unpacked, it shall be used within one month. Throughout that period the capacitor shall be packed in a polyethylene bag for preventing moisture absorption.

SPECIFICATION FOR ESK TYPE CAPACITOR

8. Environmental Test

8.1 Load life test

Capacitors shall be placed in an environmental test chamber, which the temperature shall be kept at $85 \pm 3^{\circ}\text{C}$, with 125 % rated voltage applied onto the 2 leads of the capacitor for testing 1000 ± 16 hrs. After the test completed, the capacitors shall be conditioned at room temperature for at least 4 hrs. and meet the following criteria.

- a. Capacitance change shall be less than $\pm 5\%$.
- b. Dissipation Factor shall be less than 120% of max. DF value.
- c. Insulation Resistance shall be higher than 50% of the min. IR value specified.
- d. Dielectric strength shall withstand 120% of rated voltage for 5 seconds
- e. without permanent short-circuited.

8.2 Humidity test

Capacitors are subjected to an environmental test chamber, which is kept at $40 \pm 2^{\circ}\text{C}$ with R.H. 90 - 95%, for test 240 hours. After the test, the capacitors shall be conditioned at room temperature for at least 2 hours and meet the following criteria.

- a. Capacitance change shall be less than $\pm 5\%$.
- b. Dissipation Factor shall be less than 120% of max. DF value.
- c. Insulation Resistance shall be higher than 50% of the min. IR value specified.
- d. Dielectric strength shall withstand 120% of rated voltage for 5 seconds
- e. without permanent short-circuited.

8.3 Temperature Coefficient

Capacitors are measured capacitance at the temperature cycle (20 minutes at each step), as follows: $+20^{\circ}\text{C} \rightarrow -40^{\circ}\text{C} \rightarrow +20^{\circ}\text{C} \rightarrow +85^{\circ}\text{C} \rightarrow +20^{\circ}\text{C}$, the temperature coefficient of capacitance shall be 400 ± 200 ppm/ $^{\circ}\text{C}$

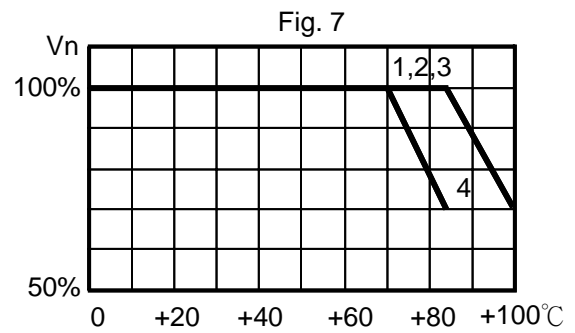
TEMPERATURE AND FREQUENCY CHARACTERISTICS

Curve 1 : Polyester dielectric.

Curve 2 : Polypropylene dielectric.

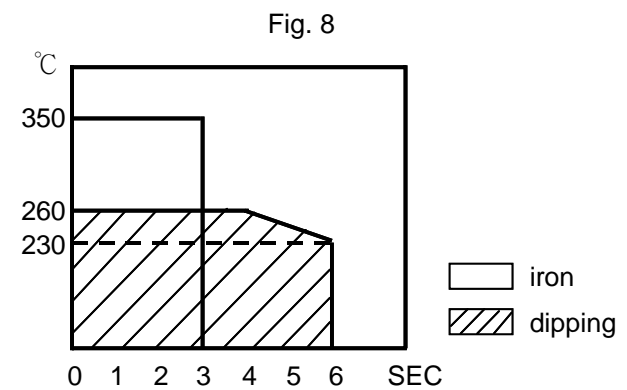
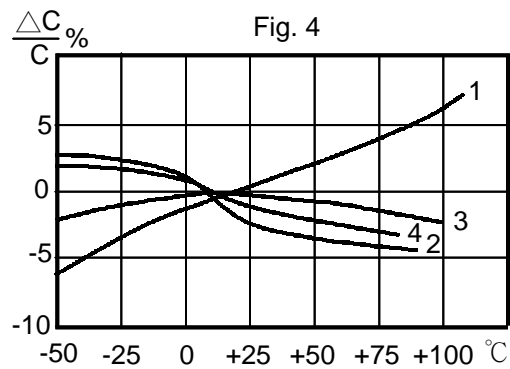
Curve 3 : Polycarbonate dielectric.

Curve 4 : Polystyrene dielectric.

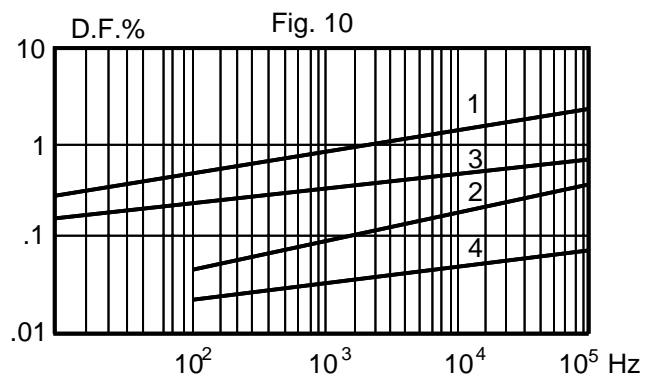
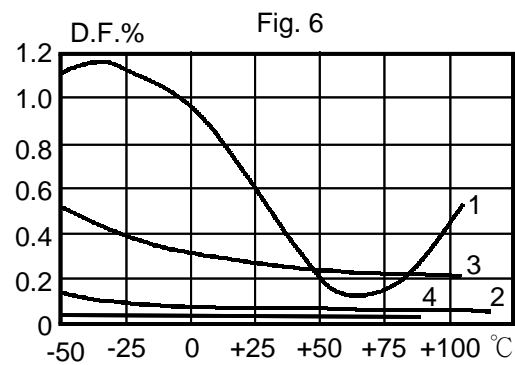
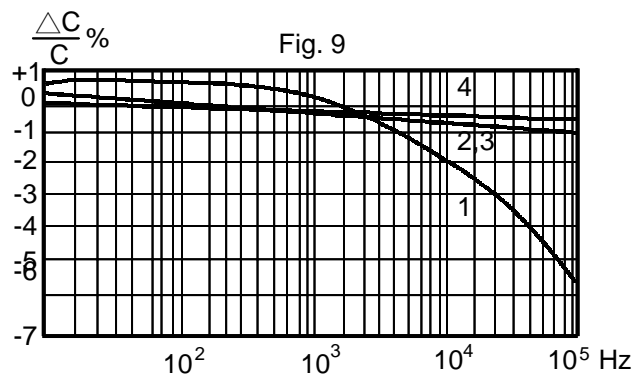
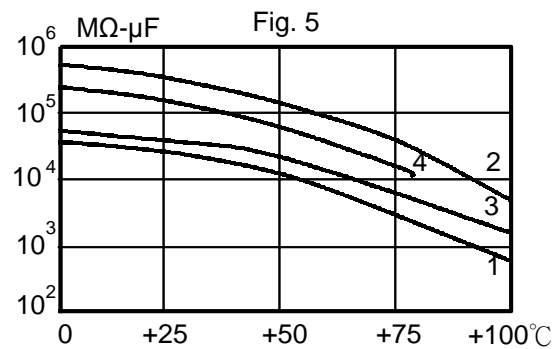


SOLDERING TEMPERATURE VS TIME

TEMPERATURE CHARACTERISTICS



FREQUENCY CHARACTERISTICS



AC RATED VOLTAGE-FREQUENCY DERATING CHARACTERISTICS

***Fig. 11 to 13 : Polyester dielectric.**

***Fig. 14 to 16 : Polypropylene dielectric.**

