

# PRODUCT SPECIFICATION

**PRODUCT: CERAMIC DISC CAPACITOR SAFETY  
RECOGNIZED For PITCH: 5mm**

**TYPE: AC SERIES**

**CUSTOMER:**

**DOC. NO.: POE-D12-00-E-26**

**Ver.: 26**

**APPROVED BY CUSTOMER**

**VENDOR:**

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### Record of change

| Date       | Version | Description                                                                                                                                                                                                                        | page         |
|------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 2008.6.3   | 1       | 1. D24-00-E-01( before) → POE-D12-00-E-01(1 <sup>st</sup> edition)                                                                                                                                                                 |              |
| 2008.8.22  | 2       | 1. Complete lead code                                                                                                                                                                                                              | 19           |
|            |         | 2. Add last SAP code “H” for halogen and Pb free , epoxy resin..                                                                                                                                                                   | 3            |
| 2008.12.12 | 3       | 1. Complete the 13 <sup>th</sup> to 17 <sup>th</sup> codes of SAP P/N.                                                                                                                                                             | 4            |
|            |         | 2. Page layout adjustment.                                                                                                                                                                                                         |              |
| 2009.7.16  | 4       | 1. Change PSA & POE logo to Walsin & POE logo.                                                                                                                                                                                     | 9            |
|            |         | 2. Complete Marking statement.                                                                                                                                                                                                     | 11           |
|            |         | 3. Revised standard NO. of SEV, SEMKO, FIMKO, NEMKO, DEMKO and KEMA.                                                                                                                                                               |              |
|            |         | 4. Revised recognized NO. of FIMKO, NEMKO, DEMKO ,KEMA and CQC.                                                                                                                                                                    | 6            |
|            |         | 5. Downsize :                                                                                                                                                                                                                      |              |
| 2009.9.14  | 5       | 1. Protrusion length: “1.0max” revised to “2.0max (Or the end of lead wire may be inside the tape.)”                                                                                                                               | 8            |
| 2009.12.24 | 6       | 1. Delete the P/N of diameter above 10 mm.                                                                                                                                                                                         | 6            |
|            |         | 2. Marking                                                                                                                                                                                                                         | 9            |
|            |         | 3. Correct recognized No                                                                                                                                                                                                           | 10           |
|            |         | 4. Revised the Figure of impulse voltage test(Item 7.3.14) according to the standard IEC 60384-14 ed.3                                                                                                                             | 14           |
| 2011/1/13  | 7       | 1. Review SAP P/N about diameter code:                                                                                                                                                                                             | 6            |
|            |         | 2. Delete “AT” taping type.                                                                                                                                                                                                        | 4,5,8        |
|            |         | 3. Add test item “Temperature Cycle ” .                                                                                                                                                                                            | 15           |
|            |         | 4. Add item 10 “Drawing of internal structure and material list”                                                                                                                                                                   | 20           |
| 2011/5/13  | 8       | 1. Add “1AC” type;                                                                                                                                                                                                                 | 4            |
|            |         | 2. Define the marking of the type “0AC” and “1AC” ;                                                                                                                                                                                | 9            |
|            |         | 3. Delete “old P/N”                                                                                                                                                                                                                | 6~8          |
|            |         | 4. Review the “Standard No. & Subclass & W.V. & Recognized No” .                                                                                                                                                                   | 10           |
| 2012/2/7   | 9       | 1. Review the “Standard No. & Subclass & W.V. & Recognized No” .                                                                                                                                                                   | 9            |
|            |         | 2. Review the “Operating Temperature Range” from “-25 to +125℃” to “-40 to +125℃”                                                                                                                                                  | 10           |
|            |         | 3. Review the temperature of Step 1 from “-25±0/-3” to “-40±0/-3”                                                                                                                                                                  | 14           |
| 2012/4/6   | 10      | 1. In order to improve the traceability of the product, change the date code on capacitor body, new date code can trace back to production “Lot No.”                                                                               | 8            |
| 2013/5/6   | 11      | 1. Review the Lead diameter $\varphi$ from 0.60 +0.1/-0.05mm to 0.55+/-0.05mm                                                                                                                                                      | 5,6,7        |
|            |         | 2. In order the customer to know the round time of manufacture, review the date code on capacitor body, new date code can know the month of manufacture.                                                                           | 8            |
|            |         | 3. Delete “No marked with “_” stand for Pb free” . Add “epoxy resin”                                                                                                                                                               | 8            |
|            |         | 4. Review the Solderability time from 2±0.5s to 5±0.5s                                                                                                                                                                             | 11           |
| 2013/10/16 | 12      | 1. Review the “Manufactured Date” to “Products ID” on the marking page                                                                                                                                                             | 8            |
|            |         | 2. Delete “The marking can be printed on either one side or two side of coating body. “and add “for SAP part number 10-11 digits ≤ ‘07’ products” to two sides and “for SAP part number 11-12 digits ≥ ‘08’ products” to one side. | 8            |
| 2014/11/5  | 13      | 1. Review the terminal position of the lead wire.                                                                                                                                                                                  | 7            |
|            |         | 2. Review the product of ID, add the code “D” for the products of Dongguan Walsin Technology Electronics Co., Ltd.                                                                                                                 | 8            |
| 2016/1/27  | 14      | 1. Review the Available lead code of Lead Configuration                                                                                                                                                                            | 5            |
|            |         | 2. Revised standard NO. of VDE, SEV, SEMKO, FIMKO, NEMKO and DEMKO.                                                                                                                                                                | 9            |
| 2016/5/3   | 15      | 1. Delete 6 pF~10 pF for P/N CH*AC***D06* *, 12 pF~15 pF for P/N CH*AC120J06* *, 18 pF~24 pF for P/N CH*AC***J07** , 27 pF~33 pF for P/N CH*AC***J08* *, and 36 pF~39 pF for P/N CH*AC***J09**.                                    | 6            |
| 2016/11/3  | 16      | 1. Delete “CH” series.                                                                                                                                                                                                             | 4,6,10~14,19 |
| 2017/6/26  | 17      | 1. Revise CQC Standard No.                                                                                                                                                                                                         | 9            |
| 2018/8/11  | 18      | 1. Revised standard NO. of VDE, SEV, SEMKO, FIMKO, NEMKO and DEMKO.                                                                                                                                                                | 9            |
| 2019/4/25  | 19      | 1. “Protrusion length” : “2.0max (Or the end of lead wire may be inside the tape.)” revised to “+0.5to-1.0 (Or the end of lead wire may be inside the tape.)”                                                                      | 7            |
|            |         | 2. Add “Soldering Recommendation”                                                                                                                                                                                                  | 19           |
| 2019/12/11 | 20      | 1. Review the Available lead code of Lead Configuration                                                                                                                                                                            | 5            |
|            |         | 2. Add “8.3 Label samples ”                                                                                                                                                                                                        | 14           |
| 2021/9/9   | 21      | 1. Delete Walsin & POE logo.                                                                                                                                                                                                       | 1            |

|                                                                                  |                                                                                  |                 |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------|
|  |  | POE-D12-00-E-26 |
| <b>CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,<br/>AC SERIES (pitch5mm)</b>        | Ver: 26                                                                          | Page: 3 / 20    |

### Record of change (continue)

| Date      | Version | Description                                                                                                          | page |
|-----------|---------|----------------------------------------------------------------------------------------------------------------------|------|
| 2022/4/20 | 22      | 1. Add Applied voltage in 9.1 Caution (Rating):                                                                      | 16   |
|           |         | 2. Add 9.3.4 List of substances that affect the insulation strength of coating                                       | 18   |
| 2023/5/26 | 23      | 1. Revised recognized No. of SEMKO and FIMKO.                                                                        | 9    |
| 2023/9/25 | 24      | 1. Review the bulk packing quantity of the code of 14 <sup>th</sup> to 15 <sup>th</sup> $\geq 12$                    | 14   |
| 2024/7/10 | 25      | 1. Revised recognized No. of SEV, SEMKO and FIMKO.                                                                   | 9    |
| 2025/2/22 | 26      | 1. Add the ENEC symbol and remove the safety symbols of the SEV, SEMKO, FIMKO, NEMKO, DEMKO for the 0AC Type marking | 8    |
|           |         | 2. Add the cUL symbol and remove the safety symbols of the SEMKO, FIMKO to the normal labels.                        | 14   |

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|     |                                                    |       |

**CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,  
AC SERIES (pitch5mm)**

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**1. Part number for SAP system**

(Ex.) YV 0AC 472 M 10 0 L 20 C 5 H  
(1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11)

**(1)Temperature characteristic (identified code)**

| CODE | Temperature characteristic | Cap. Change                    |
|------|----------------------------|--------------------------------|
| SL   | SL                         | -1000~+350ppm/°C (+20°C~+85°C) |
| YP   | Y5P                        | ±10%                           |
| YU   | Y5U                        | -55% to +20%                   |
| YV   | Y5V                        | -80% ~ +30%                    |

**(2)TYPE (identified by 3-figure code) : 0AC = X1:400Vac/Y2:250Vac**
**(3)Capacitance (identified by 3-figure code) : EX.221=220pF**
**(4)Capacitance tolerance (identified by code) : J:±5%,K:±10%,M:±20%**
**(5)Nominal body diameter dimension (identified by 2-figure code) : 06--Dmax7.0mm, 07--Dmax8.0mm...**
**(6)Internal code: 0--Normal, other code--Special control**
**(7)Lead Style : Refer to “2. Mechanical”.**
**(8)Packing mode and lead length (identified by 2-figure code)**

| Taping Code | Description                          |
|-------------|--------------------------------------|
| AN          | Ammo box and product pitch : 12.7mm  |
| AM          | Ammo box and product pitch : 25.4 mm |

| Bulk Code | Description          |
|-----------|----------------------|
| 03        | Lead length : 3.0mm  |
| 3E        | Lead length : 3.5mm  |
| 04        | Lead length : 4.0mm  |
| 4E        | Lead length : 4.5mm  |
| 20        | Lead length : 20.0mm |

**(9) Tolerance of lead length**

| Code | Description                          |
|------|--------------------------------------|
| A    | ±0.5 mm<br>(only for kink lead type) |
| B    | ±1.0 mm                              |
| C    | Min.                                 |
| D    | Taping special purpose               |

**(10)Lead space**

| Code | Description                                       |
|------|---------------------------------------------------|
| 5    | 5.0 ± 0.8(For Bulk)<br>5.0+0.8/-0.2mm(For Taping) |
| E    | 5.0 ± 0.5mm                                       |

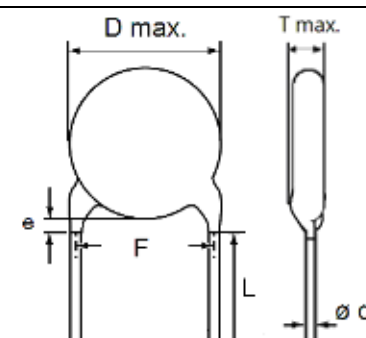
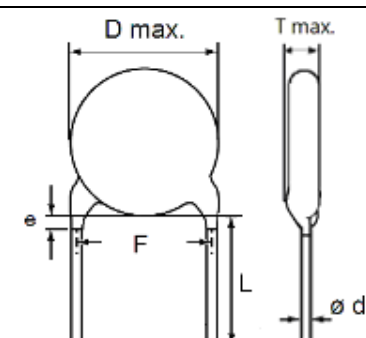
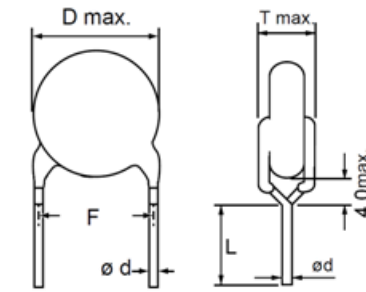
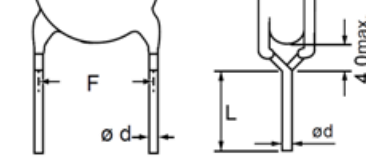
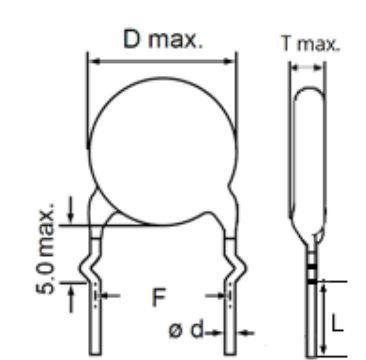
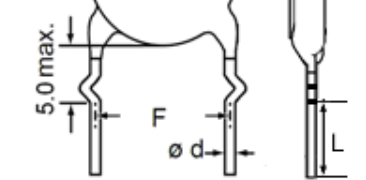
**(11)Epoxy resin code**

| Code | Description                        |
|------|------------------------------------|
| B    | Halogen and Pb free , epoxy resin. |
| H    |                                    |

## 2. Mechanical

Encapsulation : Epoxy resin, flammability UL94 V-0

**Available lead code(unit: mm)**

| Lead type                                      | SAP P/N<br>(13-17)digits | Lead space<br>(F) | Lead Length<br>(L)             | Packing   | Lead Configuration                                                                    |
|------------------------------------------------|--------------------------|-------------------|--------------------------------|-----------|---------------------------------------------------------------------------------------|
| Lead style : L<br>Type L<br>Straight long lead | L03B5                    | 5.0 ± 0.8         | 3.0 ± 1.0                      | Bulk      |    |
|                                                | L3EB5                    |                   | 3.5 ± 1.0                      |           |                                                                                       |
|                                                | L4EB5                    |                   | 4.5 ± 1.0                      |           |                                                                                       |
|                                                | L20C5                    |                   | 20 min.                        |           |                                                                                       |
| Lead style : B<br>Type B<br>Straight long lead | BAND5                    | 5.0+0.8/-0.2      | Refer to “4.<br>Taping format” | Tap. Ammo |   |
|                                                | BAMD5                    |                   |                                |           |                                                                                       |
| Lead style : D<br>Type D<br>Vertical kink lead | D03A5                    | 5.0 ± 0.8         | 3.0 ± 0.5                      | Bulk      |  |
|                                                | D3EA5                    |                   | 3.5 ± 0.5                      |           |                                                                                       |
|                                                | D04A5                    |                   | 4.0 ± 0.5                      |           |                                                                                       |
|                                                | DAND5                    | 5.0+0.8/-0.2      | Refer to “4.<br>Taping format” | Tap. Ammo |  |
|                                                | DAMD5                    |                   |                                |           |                                                                                       |
| Lead style : X<br>Type X<br>Outside kink lead  | X03A5                    | 5.0 ± 0.8         | 3.0 ± 0.5                      | Bulk      |  |
|                                                | X3EA5                    |                   | 3.5 ± 0.5                      |           |                                                                                       |
|                                                | X04A5                    |                   | 4.0 ± 0.5                      |           |                                                                                       |
|                                                | XAND5                    | 5.0+0.8/-0.2      | Refer to “4.<br>Taping format” | Tap. Ammo |  |
|                                                | XAMD5                    |                   |                                |           |                                                                                       |

\* Lead diameter Φd: 0.55 +/-0.05mm

 \* **e** (Coating **extension** on leads): 3.0mmMax for straight lead lead style; Not exceed the kink for kink lead.

|                                                                                  |                                                                                   |                 |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|
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| <b>CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,<br/>AC SERIES (pitch5mm)</b>        | Ver: 26                                                                           | Page: 6 / 20    |

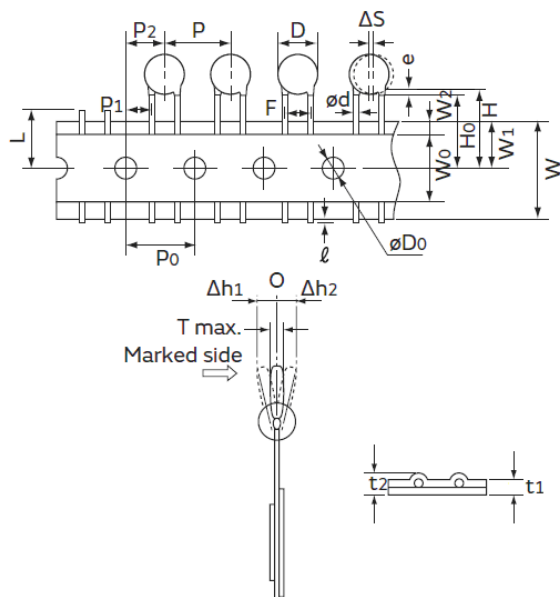
### 3. Part numbering/T.C/Capacitance/ Tolerance/Diameter :

| SAP P/N       | T.C.    | Capacitance                                      | Tolerance | Dimensions (unit : mm) |            |              |                        |           |     |
|---------------|---------|--------------------------------------------------|-----------|------------------------|------------|--------------|------------------------|-----------|-----|
|               |         |                                                  |           | D<br>(max)             | T<br>(max) | F            |                        | φd        |     |
|               |         |                                                  |           |                        |            | Bulk<br>type | Taping<br>type         |           |     |
| SL*AC***J060* | SL      | 10,12,15,18,20,22,24,27,30,33,36,39,47,50,51(pF) | ±5%       | 7.0                    | 5.0        | 5.0±0.8      | 5.0+0.8/-0.2<br>(AND5) | 0.55±0.05 |     |
| SL*AC***J070* |         | 56,62, 68,75(pF)                                 | ±5%       | 8.0                    |            |              |                        |           |     |
| SL*AC820J080* |         | 82pF                                             | ±5%       | 9.0                    |            |              |                        |           |     |
| SL*AC101J090* |         | 100pF                                            | ±5%       | 10.0                   |            |              |                        |           |     |
| YP*AC101K060* | Y5P     | 100 pF                                           | ±10%      | 7.0                    |            |              |                        |           |     |
| YP*AC151K060* |         | 150 pF                                           | ±10%      | 7.0                    |            |              |                        |           |     |
| YP*AC221K060* |         | 220 pF                                           | ±10%      | 7.0                    |            |              |                        |           |     |
| YP*AC331K060* |         | 330 pF                                           | ±10%      | 7.0                    |            |              |                        |           |     |
| YP*AC471K060* |         | 470 pF                                           | ±10%      | 7.0                    |            |              |                        |           |     |
| YP*AC561K070* |         | 560 pF                                           | ±10%      | 8.0                    |            |              |                        |           |     |
| YP*AC681K070* |         | 680 pF                                           | ±10%      | 8.0                    |            |              |                        |           |     |
| YP*AC821K080* |         | 820 pF                                           | ±10%      | 9.0                    |            |              |                        |           |     |
| YP*AC102K080* |         | 1000 pF                                          | ±10%      | 9.0                    |            |              |                        |           |     |
| YU*AC102M060* |         | Y5U                                              | 1000 pF   | ±20%                   |            |              |                        |           | 7.0 |
| YU*AC152M080* |         |                                                  | 1500pF    | ±20%                   |            |              |                        |           | 9.0 |
| YU*AC222M080* |         |                                                  | 2200 pF   | ±20%                   |            |              |                        |           | 9.0 |
| YU*AC332M100* | 3300 pF |                                                  | ±20%      | 11.0                   |            |              |                        |           |     |
| YU*AC392M120* | 3900 pF |                                                  | ±20%      | 13.0                   |            |              |                        |           |     |
| YU*AC472M120* | 4700 pF |                                                  | ±20%      | 13.0                   |            |              |                        |           |     |
| YV*AC102M060* | Y5V     | 1000 pF                                          | ±20%      | 7.0                    |            |              |                        |           |     |
| YV*AC152M060* |         | 1500 pF                                          | ±20%      | 7.0                    |            |              |                        |           |     |
| YV*AC222M060* |         | 2200 pF                                          | ±20%      | 7.0                    |            |              |                        |           |     |
| YV*AC332M080* |         | 3300 pF                                          | ±20%      | 9.0                    |            |              |                        |           |     |
| YV*AC392M100* |         | 3900 pF                                          | ±20%      | 11.0                   |            |              |                        |           |     |
| YV*AC472M100* |         | 4700 pF                                          | ±20%      | 11.0                   |            |              |                        |           |     |
| YV*AC682M120* |         | 6800 pF                                          | ±20%      | 13.0                   |            |              |                        |           |     |
| YV*AC103M140* |         | 10000 pF                                         | ±20%      | 15.0                   |            |              |                        |           |     |

#### 4. Taping Format:

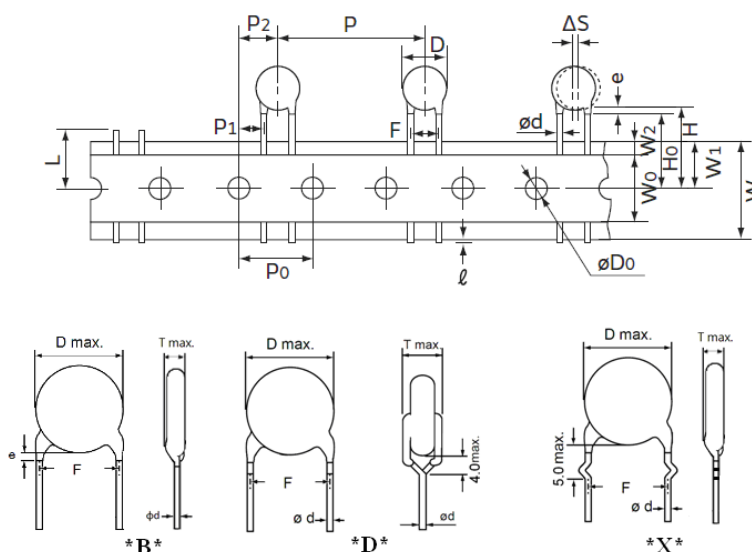
##### • 12.7mm pitch/lead spacing 5mm taping

Lead Code: \*BAND5 & \*DAND5 & \*XAND5



##### • 25.4mm pitch/lead spacing 5mm taping

Lead Code: \*BAMD5 & \*DAMD5 & \*XAMD5



| POE Part Number                                                          |           | *BAND5 / *DAND5 / *XAND5                                                  | *BAMD5 / *DAMD5 / *XAMD5              |
|--------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------|---------------------------------------|
| Item                                                                     | Symbol    | Dimensions (mm)                                                           |                                       |
| Pitch of component                                                       | P         | 12.7±1.0                                                                  | 25.4±2.0                              |
| Pitch of sprocket                                                        | P0        | 12.7±0.3                                                                  | 12.7±0.3                              |
| Lead spacing                                                             | F         | 5.0+0.8/-0.2                                                              |                                       |
| Length from hole center to component center                              | P2        | 6.35±1.5                                                                  | 12.7 ± 1.5                            |
| Length from hole center to lead                                          | P1        | 3.75±1.0                                                                  | 10.2±1.0                              |
| Body diameter                                                            | D         | See the “3. Part numbering/T.C/Capacitance/ Tolerance/Diameter”           |                                       |
| Deviation along tape, left or right                                      | Δ S       | 0±2.0                                                                     |                                       |
| Carrier tape width                                                       | W         | 18.0 +1/-0.5                                                              |                                       |
| Position of sprocket hole                                                | W1        | 9.0±0.5                                                                   |                                       |
| Lead distance between the kink and center of sprocket hole               | H0        | 18.0+2.0/-0<br>(For: *DAND5 / *XAND5)                                     | 18.0+2.0/-0<br>(For: *DAMD5 / *XAMD5) |
| Lead distance between the bottom of body and the center of sprocket hole | H         | 20.0+1.5/-1.0<br>(For: *BAND5)                                            | 20.0+1.5/-1.0<br>(For: *BAMD5)        |
| Length from the terminal of the lead wire to the edge of carrier tape    | ℓ         | +0.5 to -1.0 (Or the end of lead wire may be inside the hole-down tape.)  |                                       |
| Diameter of sprocket hole                                                | D0        | 4.0±0.2                                                                   |                                       |
| Lead diameter                                                            | φd        | 0.55±0.05                                                                 |                                       |
| Total tape thickness                                                     | t1        | 0.6±0.3                                                                   |                                       |
| Total thickness, tape and lead wire                                      | t2        | 1.5 max.                                                                  |                                       |
| Deviation across tape                                                    | Δ h1/Δ h2 | 2.0 max.                                                                  |                                       |
| Portion to cut in case of defect                                         | L         | 11.0 max.                                                                 |                                       |
| Hole-down tape width                                                     | W0        | 8.0 min                                                                   |                                       |
| Hole-down tape distortion                                                | W2        | 3.0 max.                                                                  |                                       |
| Coating extension on leads                                               | e         | 3.0 max for straight lead style; Not exceed the kink leads for kink lead. |                                       |
| Body thickness                                                           | T         | See the “3. Part numbering/T.C/Capacitance/ Tolerance/Diameter”           |                                       |



|                                                                                  |                                                                                   |                 |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|
|  |  | POE-D12-00-E-26 |
| <b>CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,<br/>AC SERIES (pitch5mm)</b>        | Ver: 26                                                                           | Page: 9 / 20    |

## 6. Scope

THIS SPECIFICATION APPLIES TO CERAMIC INSULATED CAPACITORS DISK TYPE USED IN ELECTRONIC EQUIPMENT.

1. VDE/SEV/SEMKO/FIMKO/NEMKO/DEMKO/UL/CSA recognized capacitor for Antenna coupling and AC line-by-pass.X1, Y2 Capacitor based on IEC 60384-14  
“UL, CSA recognized for across-the-line, line-by-pass” and antenna-isolation
2. Approval Standard and Recognized No.

| Safety Standard | Standard No.                                                                 | Subclass                | w.v.                | Recognized No. |
|-----------------|------------------------------------------------------------------------------|-------------------------|---------------------|----------------|
| UL              | ANSI/UL 60384-14:2013                                                        | X1                      | 400VAC              | E146544        |
|                 |                                                                              | Y2                      | 250VAC              |                |
| CSA             | CAN/CSA E60384-14:2009                                                       | X1                      | 400VAC              | 2347969        |
|                 |                                                                              | Y2                      | 250VAC              |                |
| VDE<br>(ENEC)   | EN 60384-14:2013/A1:2016<br>IEC 6.384-14:2013<br>IEC 6.384-14:2013/AMD1:2016 | X1                      | 400VAC              | 40001829       |
|                 |                                                                              | Y2                      | 250VAC              |                |
| SEV             | EN 60384-14:2013 + A1:16                                                     | X1                      | 400VAC              | 24.0417        |
|                 |                                                                              | Y2                      | 250VAC              |                |
| SEMKO           | EN 60384-14:2013+A1                                                          | X1                      | 400VAC              | SE-S-1811994R3 |
|                 |                                                                              | Y2                      | 250VAC              |                |
| FIMKO           | EN 60384-14:2013 + A1:16                                                     | X1                      | 400VAC              | FI/41696-A2    |
|                 |                                                                              | Y2                      | 250VAC              |                |
| NEMKO           | EN 60384-14:2013;A1                                                          | X1                      | 400VAC              | P18222947      |
|                 |                                                                              | Y2                      | 250VAC              |                |
| DEMKO           | EN 60384-14:2013/A1:2016<br>EN 60384-14:2013                                 | X1                      | 400VAC              | D-07617        |
|                 |                                                                              | Y2                      | 250VAC              |                |
| CQC             | GB/T6346.14-2015                                                             | X1:400VAC<br>/Y1:250VAC |                     | CQC08001026519 |
| KTL             | K60384-14 2006                                                               | X1                      | 400VAC or<br>440VAC | SU03065-14001  |
|                 |                                                                              | Y2                      | 250VAC              | SU03065-14002  |

## 7. Specification and test method:

### 7.1 Operating Temperature Range :

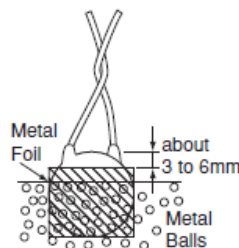
-40 to +125℃

### 7.2 Test condition:

Test and measurement shall be made at the standard condition. (temperature 15~35℃, relative humidity 45~75% and atmospheric pressure 860~1060hpa). Unless otherwise specified herein.

If doubt occurred on the value of measurement, and measurement was requested by customer capacitors shall be measured at the reference condition. (temperature 20±2℃ or 25 ± 2℃, relative humidity 60~70% and atmospheric pressure 860~1060hpa.)

### 7.3 Performance:

| Item |                                 |                    | Specification                                                 | Testing Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|------|---------------------------------|--------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|---|---|----------|-------|-------|-------|-------|-------|
| 1    | Appearance and Dimension        |                    | No visible defect, and dimensions are within specified range. | The capacitor should be visually inspected for evidence of defect. Dimensions should be measured with slide calipers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| 2    | Marking                         |                    | To be easily legible.                                         | The capacitor should be visually inspected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| 3    | Dielectric Strength             | Between lead wires | No failure.                                                   | The capacitors shall not be damage when AC2000V are applied between the lead wires for 60 sec.(Charge/Discharge current ≤ 50mA.)<br><br>Pre-treatment:<br>Capacitor shall be stored at 125±2℃ for 1hour.then placed at ※ <sup>1</sup> room condition for 24±2hours before initial measurements.                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|      |                                 | Body Insulation    | No failure.                                                   | First, the terminals of the capacitor should be connected together. Then, a metal foil should be closely wrapped around the body of the capacitor to the distance of about 3 to 6mm from each terminal. Then, the capacitor should be inserted into a container filled with metal balls of about 1mm diameter.Finally, AC2000V (r.m.s.)<50/60Hz> is applied for 60 s between the capacitor lead wires and metal balls. (Charge/Discharge current ≤ 50mA.)<br><br>Pre-treatment:<br>Capacitor shall be stored at 125±2℃ for 1hour.then placed at ※ <sup>1</sup> room condition for 24±2hours before initial measurements.<br> |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| 4    | Insulation Resistance(I.R.)     |                    | 10000MΩ min.                                                  | The insulation resistance shall be measured with 500±50VDC with 60±5sec. of charging.<br><br>Pre-treatment:<br>Capacitor shall be stored at 125±2℃ for 1hour.then placed at ※ <sup>1</sup> room condition for 24±2hours before initial measurements.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| 5    | Capacitance                     |                    | Within specified tolerance                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| 6    | Dissipation Factor(D.F.) or Q   |                    | Char.                                                         | Specification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|      |                                 |                    | Y5P                                                           | D.F≤2.5%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|      |                                 |                    | Y5U                                                           | D.F≤5.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|      |                                 |                    | Y5V                                                           | D.F≤5.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|      |                                 | SL                 | Q: 30pF&above: ≥ 1000<br>Below 30PF: ≥ 400+20×C               | Y5P&Y5U&Y5V: The capacitance shall be measured at 20±2℃ with 1kHz±20% and1.0Vrms<br>SL: The capacitance shall be measured at 25℃ with 1MHz±20% and1.0Vrms<br><br>Pre-treatment:<br>Capacitor shall be stored at 125±2℃ for 1hour.then placed at ※ <sup>1</sup> room condition for 24±2hours before initial measurements.                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| 7    | Temperature Characteristic      |                    | Char.                                                         | Capacitance Change                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The capacitance measurement shall be made at each step specified in table<br><table><tr><td>Step</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Temp.(℃)</td><td>+20±2</td><td>-25±2</td><td>+20±2</td><td>+85±2</td><td>+20±2</td></tr></table><br>Pr-treatment :<br>Capacitor shall be stored at 125±2℃ for 1 hour. Then placed at room condition for 1(※)24±2 hours before measurement | Step  | 1     | 2     | 3     | 4 | 5 | Temp.(℃) | +20±2 | -25±2 | +20±2 | +85±2 | +20±2 |
|      |                                 |                    | Step                                                          | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                               | 2     | 3     | 4     | 5     |   |   |          |       |       |       |       |       |
|      |                                 |                    | Temp.(℃)                                                      | +20±2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                               | -25±2 | +20±2 | +85±2 | +20±2 |   |   |          |       |       |       |       |       |
|      |                                 |                    | Y5P                                                           | Within ± 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
|      |                                 |                    | Y5U                                                           | Within ± $\frac{2}{5}$ %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| Y5V  | Within -80 ~ +30%               |                    |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |
| SL   | -1000~+350 ppm/℃<br>(+20℃~+85℃) |                    |                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                               |       |       |       |       |   |   |          |       |       |       |       |       |

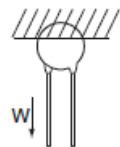
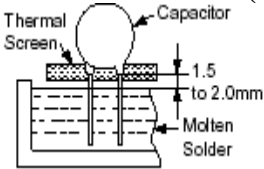
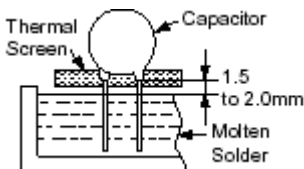
※ "room condition" temperature : 15~35℃, humidity : 45~75%,atmospheric pressure : 86~106kPa

※ "C" expresses nominal capacitance value (pF).

**CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,  
 AC SERIES (pitch5mm)**

Ver: 26

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| Item |                                |                     | Specification                                                                                                       | Testing Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------|--------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8    | Robustness of Termination      | Tensile             | Lead wire shall not cut off capacitor shall not be broken.                                                          | As shown in the figure at right, fix the body of the capacitor and apply a tensile weight gradually to each lead wire in the radial direction of the capacitor up to 10N and keep it for 10±1 sec.                                                                                                                                                                                                                                                                                                  |
|      |                                | Bending             | Lead wire shall not cut off capacitor shall not be broken.                                                          | With the termination in its normal position the specimen is held by its body in such a manner that the axis of the termination is vertical : a mass applying a force of 5N is then suspended from the end of the termination. The body of the specimen is then inclined within a period of 2 to 3 sec., through an angle of approximately 90° in the vertical plane and then resumed to its initial position over the same period of time; this operation constitutes one bend. One bend immediately followed by a second bend in the opposite direction.                              |
| 9    | Solderability of leads         |                     | Lead wire should be soldered with uniform coating on the axial direction over 3/4 of the circumferential direction. | The lead wire of capacitor should be dipped into molten solder for 5 ± 0.5 sec.<br>The depth of immersion is up to about 1.5 to 2.0 mm from the root of lead wires.<br>Temp. of solder : Lead free solder ( Sn-3Ag -0.5Cu )<br>245 ± 5 °C                                                                                                                                                                                                                                                                                                                                              |
| 10   | Soldering Effect (Non-Preheat) | Appearance          | No marked defect                                                                                                    | As shown in figure, the lead wires should be immersed in solder of 350 ± 10 °C or 260 ± 5 °C up to 1.5 to 2.0mm from the root of Terminal for 3.5 ± 0.5 sec ( 10 ± 1 sec for 260± 5 °C )<br><br>Pre-treatment:<br>Capacitor shall be stored at 125±2°C for 1hour.then placed at ※ <sup>1</sup> room condition for 24±2hours before initial measurements.<br>Post-treatment:<br>Capacitor shall be stored for 1 to 2hours at ※ <sup>1</sup> room condition.                                         |
|      |                                | I.R.                | 1000MΩ min.                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      |                                | Dielectric Strength | Per Item 3.                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      |                                | Capacitance Change  | Y5P,Y5U,Y5V :<br>Within ±10%<br>SL :<br>Within±2.5% or<br>±0.25pF,Whichever is large.                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      | Soldering Effect (On-Preheat)  | Appearance          | No marked defect.                                                                                                   | First the capacitor should be stored at 120 + 0 / -5 °C for 60 + 0 / -5sec.<br>Then, as in figure , the lead wires should be immersed solder of 260 + / -5 °C up to 1.5 to 2.0 mm from the root of terminal for 7.5 +0 / -1 sec.<br><br>Pre-treatment:<br>Capacitor shall be stored at 125±2°C for 1hour.then placed at ※ <sup>1</sup> room condition for 24±2hours before initial measurements.<br>Post-treatment:<br>Capacitor shall be stored for 1 to 2hours at ※ <sup>1</sup> room condition. |
|      |                                | I.R.                | 1000MΩ min.                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      |                                | Dielectric Strength | Per Item 3                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|      |                                | Capacitance Change  | Y5P,Y5U,Y5V :<br>Within ±10%<br>SL :<br>Within±2.5% or<br>±0.25pF,Whichever is large.                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

※ "room condition" temperature : 15~35°C, humidity : 45~75%,atmospheric pressure : 86~106kPa

※ "C" expresses nominal capacitance value (pF).

**CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,  
 AC SERIES (pitch5mm)**

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| Item |                                  | Specification       | Testing Method                                                                                                                                        |
|------|----------------------------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9    | Humidity<br>(Under Steady State) | Appearance          | No marked defect.                                                                                                                                     |
|      |                                  | Capacitance Change  | Y5P : Within $\pm 10\%$<br>Y5U : Within $\pm 20\%$<br>Y5V : Within $\pm 30\%$<br>SL : Within $\pm 2.5\%$ or $\pm 0.25\text{pF}$ , Whichever is large. |
|      |                                  | D.F.                | Y5P, Y5U : 5.0% max.<br>Y5V : 7.5% max.                                                                                                               |
| 10   | Humidity Loading                 | Q                   | SL :<br>$Q \geq 200$ ( $C \geq 30\text{pF}$ )<br>$Q \geq 100 + 10 \times C/3$ ( $C < 30\text{pF}$ )                                                   |
|      |                                  | I.R.                | Y5P, Y5U, Y5V : $3000\text{M}\Omega$ min.<br>SL : $1000\text{M}\Omega$ min.                                                                           |
|      |                                  |                     |                                                                                                                                                       |
| 11   | Life                             | Appearance          | No marked defect.                                                                                                                                     |
|      |                                  | Capacitance Change  | Y5P, Y5U, Y5V : Within $\pm 20\%$<br>SL : Within $\pm 3\%$ or $\pm 0.3\text{pF}$ , Whichever is large.                                                |
|      |                                  | I.R.                | $3000\text{M}\Omega$ min.<br>SL : $1000\text{M}\Omega$ min.                                                                                           |
|      |                                  | Dielectric Strength | Per Item 3.                                                                                                                                           |

Set the capacitor for  $500 \pm 12$  hours at  $40 \pm 2^\circ\text{C}$ , in 90 to 95% humidity.

Pre-treatment:

Capacitor shall be stored at  $125 \pm 2^\circ\text{C}$  for 1hour, then placed at  $\ast^1$ room condition for  $24 \pm 2$  hours before initial measurements.

Post-treatment:

Capacitor shall be stored for 1 to 2 hours at  $\ast^1$ room condition.

Apply the rated voltage for  $500 \pm 12$  hours at  $40 \pm 2^\circ\text{C}$ , in 90 to 95% humidity.

Pre-treatment:

Capacitor shall be stored at  $125 \pm 2^\circ\text{C}$  for 1hour, then placed at  $\ast^1$ room condition for  $24 \pm 2$  hours before initial measurements.

Post-treatment:

Capacitor shall be stored for 1 to 2 hours at  $\ast^1$ room condition.

Impulse Voltage:

Each individual capacitor shall be subjected to a 5kv impulses for three times. After the capacitors are applied to life test.

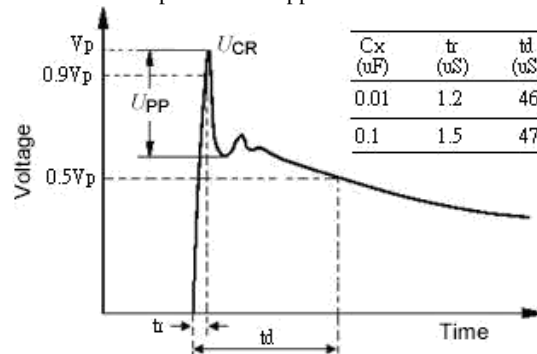


Fig.

The specimen capacitors are placed in a circulating air oven for a period of 1000 hrs. The air in the oven is maintained at a temperature of  $125 \pm 2^\circ\text{C}$ . Throughout the test. The capacitors are subjected to an AC425Vrms. (for 2AC type) or AC510Vrms. (for 3AC type) alternating voltage of mains frequency.

Pre-treatment:

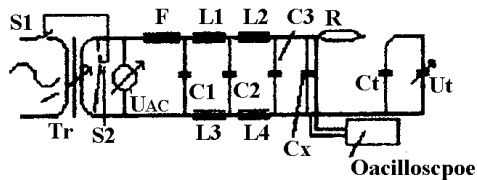
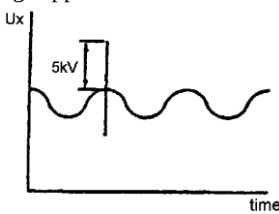
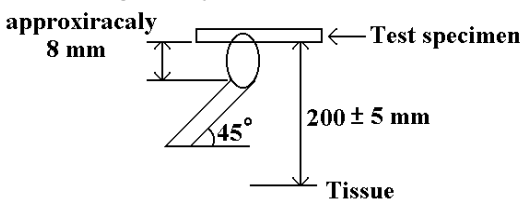
Capacitor shall be stored at  $125 \pm 2^\circ\text{C}$  for 1hour, then placed at  $\ast^1$ room condition for  $24 \pm 2$  hours before initial measurements.

Post-treatment:

Capacitor shall be stored for 1 to 2 hours at  $\ast^1$ room condition.

※ "room condition" temperature :  $15 \sim 35^\circ\text{C}$ , humidity : 45~75%, atmospheric pressure : 86~106kPa

※ "C" expresses nominal capacitance value (pF).

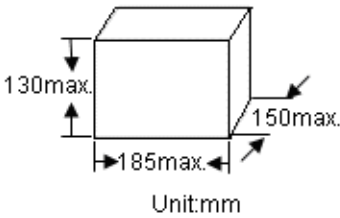
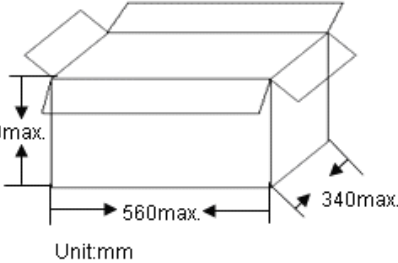
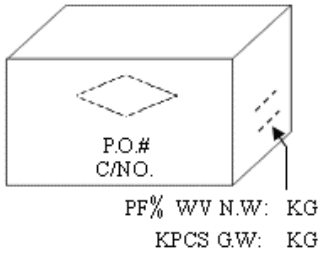
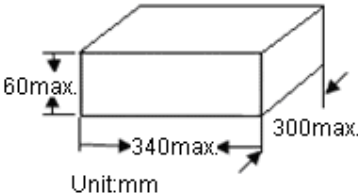
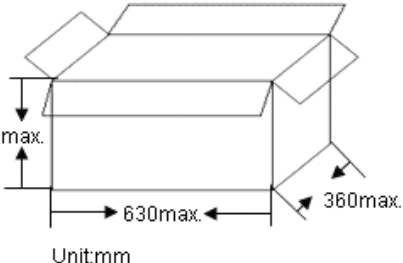
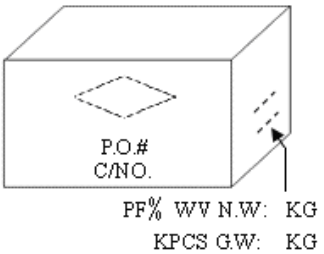
| Item                |                      | Specification                                                                              |                  | Testing Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
|---------------------|----------------------|--------------------------------------------------------------------------------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------|-----------|---|----------|----|---|------------|---|---|----------|----|---|------------|---|
| 12                  | Active Flammability  | The cheesecloth shall not be on fire.                                                      |                  | <p>The specimens shall be individually wrapped in at least one but more then two complete layers of cheesecloth. The specimens shall be subjected to 20 discharges. The interval between successive discharges shall be 5sec. The Uac shall be maintained for 2 min. after the last discharge.</p> <p>Fig.</p> <div><p>Oacilloscpeoe</p><p>C1,2 : 1Mf±10%    C3 : 0.03Mf±5% 10KV<br/>L1-4 : 1.5Mh±20% 16A Rod core choke<br/>R : 100Ω±2%    Ct : 3Mf±5% 10KV<br/>Uac : Ur±5%    Ur : Rated working voltage<br/>Cx : Capacitor    F : Fuse, Rated 10A<br/>Ut : Voltage applied to Ct</p><div><p>time</p></div></div> |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
|                     |                      |                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| 13                  | Passive Flammability | The burning time shall not be exceeded the time 30 sec. The tissue paper shall not ignite. |                  | <p>The capacitor under test shall be held in the flame in the position, which best promotes burning. Each specimen shall only be exposed once to the flame.</p> <p>Time of exposure to flame : 30 sec<br/>Length of flame : 12±1 mm<br/>Gas burner : Length 35 mm min.<br/>Inside Dia. : 0.5±0.1 mm<br/>Outside Dia. : 0.9 mm max.<br/>Gas : Butane gas Purity 95% min.</p> <div><p>approxiracaly 8 mm</p><p>Test specimen</p><p>200 ± 5 mm</p><p>Tissue</p></div>                                                                                                                                                                                                                                   |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
|                     |                      |                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| 15                  | Temperature Cycle    | Appearance                                                                                 | No marked defect | <p>The capacitor should be subjected to 5 temperature cycles,</p> <p>&lt;Temperature Cycle time: 5 cycles&gt;</p> <table><thead><tr><th>Step</th><th>Temperature(°C)</th><th>Time(min)</th></tr></thead><tbody><tr><td>1</td><td>-40+0/-3</td><td>30</td></tr><tr><td>2</td><td>Room temp.</td><td>3</td></tr><tr><td>3</td><td>125+3/-0</td><td>30</td></tr><tr><td>4</td><td>Room temp.</td><td>3</td></tr></tbody></table> <p>Pre-treatment:<br/>Capacitor shall be stored at 125±2°C for 1hour.then placed at<sup>*</sup>room condition for 24±2hours.</p> <p>Post-treatment:<br/>Capacitor shall be stored for 1 to 2hours at<sup>**1</sup>room condition.</p>                                                                                                                      | Step      | Temperature(°C) | Time(min) | 1 | -40+0/-3 | 30 | 2 | Room temp. | 3 | 3 | 125+3/-0 | 30 | 4 | Room temp. | 3 |
|                     |                      | Step                                                                                       | Temperature(°C)  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Time(min) |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
|                     |                      | 1                                                                                          | -40+0/-3         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30        |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
|                     |                      | 2                                                                                          | Room temp.       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3         |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
|                     |                      | 3                                                                                          | 125+3/-0         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30        |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| 4                   | Room temp.           | 3                                                                                          |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| Char.               | Cap. Change          | DF / Q                                                                                     |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| SL                  | ≤±5%                 | Q≥275+5/2C(C<30pF)<br>Q≥350 (C≥30pF)                                                       |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| Y5P                 | ≤±10%                | DF≤5. 0%                                                                                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| Y5U<br>Y5V          | ≤±20%                | DF≤7. 5%                                                                                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| I.R.                | 3000MΩ min.          |                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |
| Dielectric strength | Per Item 3           |                                                                                            |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                 |           |   |          |    |   |            |   |   |          |    |   |            |   |

※ "room condition" temperature : 15~35°C, humidity : 45~75%,atmospheric pressure : 86~106kPa

※ "C" expresses nominal capacitance value (pF).

8.Packaging Baggage :

8.1 Packing size:

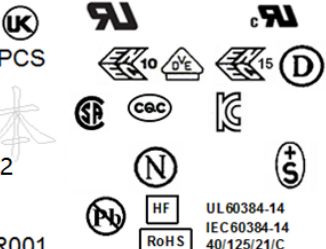
| Type           | Box                                                                                | Carton                                                                                                                                                                   |
|----------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bulk           |   |     |
| Ammo<br>taping |  |   |

8.2 Packing quantity:

| Packing type | The code of 14th to15th in SAP P/N | MPQ(Kpcs/Box) |
|--------------|------------------------------------|---------------|
| Taping       | AN                                 | 1             |
|              | AM (The size code ≤ 11)            | 1             |
|              | AM (The size code ≥ 12)            | 0.5           |

| Packing type | Lead length              | Size code of 10th to 11th in SAP P/N | MPQ (Kpcs/Bag) | Kpcs/Box |
|--------------|--------------------------|--------------------------------------|----------------|----------|
| Bulk         | Long lead<br>(L ≥ 20mm)  | 06~12                                | 0.5            | 1.5      |
|              |                          | 13-14                                | 0.5            | 1        |
|              | Short lead<br>(L < 20mm) | 06~12                                | 0.5            | 2        |
|              |                          | 13-14                                | 0.5            | 1.5      |

8.3 Label samples:

|                                                                                                                                                                                                                    |                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| CUST P/N:<br>NEW POE P/N: YV0AC222M060BAND5B QTY:1000 PCS<br>POE P/N: YV0AC222M060BAND5B<br>CAP:2200pF<br>VOLT:X1:400VAC, Y2:250VAC<br>LOT NO. : 741PA02690<br>PAN OVERSEAS(GUANGZHOU) ELECTRONIC CO.,LTD.<br>R001 |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|

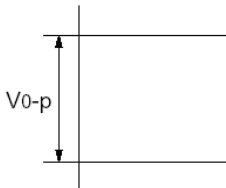
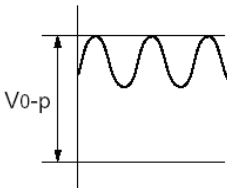
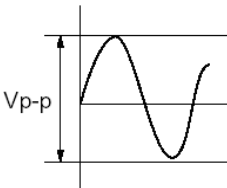
## 9. Notices:

### 9.1 Caution(Rating):

#### (1). Operating Voltage

Be sure to maintain the  $V_{p-p}$  value of the applied voltage or the  $V_{0-p}$  which contains DC bias within the rated voltage range.

When the voltage is started to apply to the circuit or it is stopped applying, the irregular voltage may be generated for a transit period because of resonance or switching. Be sure to use a capacitor within rated voltage containing this irregular voltage.

| Voltage                | DC Voltage                                                                        | DC+AC Voltage                                                                      | AC Voltage                                                                          |
|------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Positional measurement |  |  |  |

#### (2). Operating Temperature and Self-generated Heat

Keep the surface temperature of a capacitor below the upper limit of its rated operating temperature range. Be sure to take into account the heat generated by the capacitor itself.

#### (3). Test condition for withstanding Voltage

##### I. Test Equipment

Test equipment for AC withstanding voltage shall be used with the performance of the wave similar to 50/60 Hz sine waves.

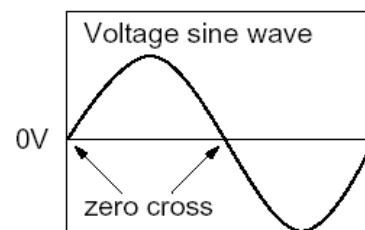
If the distorted sine wave or over load exceeding the specified voltage value is applied, the defective may be caused.

##### II. Voltage Applied Method

When the withstanding voltage is applied, capacitor's lead or terminal shall be firmly connected to the output of the withstanding voltage test equipment, and then the voltage shall be raised from near zero to the test voltage.

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, test voltage should be applied with the \*zero cross. At the end of the test time, the test voltage shall be reduced to near zero, and then capacitor's lead or terminal shall be taken off the output of the withstanding voltage test equipment.

If the test voltage without the raise from near zero voltage would be applied directly to capacitor, the surge voltage may arise, and therefore, the defective may be caused.



ZERO CROSS is the point where voltage sine wave pass 0V.- See the right figure.

### III. Applied voltage

The voltages of Table shall be applied between the respective measuring points of 1 min for qualification approval and periodic testing and for a period of not less than 1 s for lot-by-lot quality conformance testing, a voltage proof test such as Test C shall be carried out only for qualification approval tests and periodic tests;

**Attention is drawn to the fact that repetition of the voltage proof test by the user may damage the capacitor. If repetition of the voltage proof test is made by the user, the applied voltage should not be greater than 66 % of the test voltage specified in Table .**

**Table –Voltage proof**

| Class | Range of rated voltages                    | Test A                                                 | Test B or Test C                                         |
|-------|--------------------------------------------|--------------------------------------------------------|----------------------------------------------------------|
| X1    | $\leq 1\,000\text{ V}$                     | 4,3 UR (d.c.) c                                        | 2 UR + 1 500 V (a.c.) with a minimum of 2 000 V (a.c.) a |
| Y2    | $\geq 150\text{ V}$<br>$\leq 500\text{ V}$ | UR + 1 200 V (a.c.) with a minimum of 1 500 V (a.c.) b | 2 UR + 1 500 V (a.c.) with a minimum of 2 000 V (a.c.) b |

a For Delta and T-connected capacitor units according to Figures 5b and 5c, the test voltage for terminals to case shall be the appropriate test voltage for the Y-capacitors.

b For lot-by-lot tests of Class Y2 capacitors, the a.c. test voltage may be replaced by a d.c. voltage of 1,5 times the prescribed a.c. voltage.

c The UR in this d.c. test is the rated a.c.voltage value.

Note:

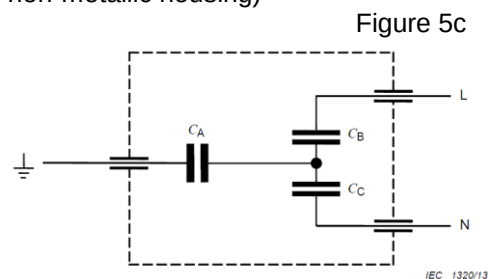
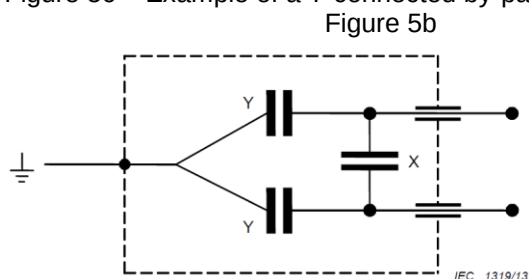
Test A – Between terminations

Test B – Internal insulation

Test C – External insulation (applicable only to insulated capacitors in nonmetallic case or in insulated metal case)

Figure 5b – Delta by-pass capacitor (in metallic housing)

Figure 5c – Example of a T-connected by-pass capacitor (in non-metallic housing)



**\*For capacitors with non-metallic housings, the earth connection is brought out as a separate termination as is shown in Figure 5c.**

#### (4). Fail-Safe

When capacitor would be broken, failure may result in a short circuit. Be sure to provide an appropriate fail-safe function like a fuse on your product if failure would follow an electric shock, fire or fume.

**Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used.**

|                                                                                  |                                                                                   |                 |
|----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|
|  |  | POE-D12-00-E-26 |
| <b>CERAMIC DISC CAPACITOR SAFETY RECOGNIZED,<br/>AC SERIES (pitch5mm)</b>        | Ver: 26                                                                           | Page: 17 / 20   |

## 9.2 Caution (Storage and operating condition):

### Operating and storage environment

The insulating coating of capacitors does not form a perfect seal; therefore, do not use or store capacitors in a corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. And avoid exposure to moisture. Before cleaning, bonding, or molding this product, verify that these processes do not affect product quality by testing the performance of a cleaned, bonded or molded product in the intended equipment. Store the capacitors where the temperature and relative humidity do not exceed -10 to 40 degrees centigrade and 15 to 85 % for 6 months maximum and use within the period after receiving the capacitors.

**"Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used."**

## 9.3 Caution (Soldering and Mounting):

### 9.3.1 Vibration and impact:

Do not expose a capacitor or its leads to excessive shock or vibration during use.

### 9.3.2 Soldering;

When soldering this product to a PCB/PWB, do not exceed the solder heat resistance specification of the capacitor. Subjecting this product to excessive heating could melt the internal junction solder and may result in thermal shocks that can crack the ceramic element.

When soldering capacitor with a soldering iron, it should be performed in following conditions.

Temperature of iron-tip: 400 degrees C. max.

Soldering iron wattage: 50W max.

Soldering time: 3.5 sec. max.

### 9.3.3 Cleaning (ultrasonic cleaning):

To perform ultrasonic cleaning, observe the following conditions.

Rinse bath capacity: Output of 20 watts per liter or less.

Rinsing time: 5 min maximum.

Do not vibrate the PCB/PWB directly.

Excessive ultrasonic cleaning may lead to fatigue destruction of the lead wires.

**"Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used."**

### 9.3.4 List of substances that affect the insulation strength of coating :

#### Epoxy resin solvent

| Category                 | Model           |                   |               |
|--------------------------|-----------------|-------------------|---------------|
| Ketone                   | Acetone         | Butanone          | Cyclohexanone |
| Esters                   | Ethyl acetate   | Dibutyl phthalate |               |
| Chlorinated hydrocarbons | Dichloromethane |                   |               |

#### Epoxy resin thinner

| Category                          |                       | Model                                            |                 |
|-----------------------------------|-----------------------|--------------------------------------------------|-----------------|
| Reactive diluentactivated thinner | Simple function group | HK-66 (Alkyl glycidyl ether)                     |                 |
|                                   |                       | 501 (Butyl glycidyl ether)                       |                 |
|                                   |                       | 690 (Phenyl Glycidyl Ether )                     |                 |
|                                   |                       | AGE (C12-14Aliphatic Polyalcohol Glycidyl Ether) |                 |
|                                   |                       | 692 (Benzyl Glycidyl Ether)                      |                 |
|                                   | Two functional groups | D-678 ( Neopentyl glycol diglycidyl ether )      |                 |
|                                   |                       | 622 (1,4-Butanediol diglycidyl ether)            |                 |
|                                   |                       | 669 (Ethylene glycol diglycidyl ether)           |                 |
|                                   |                       | X-632 (Polypropylene glycol diglycidyl ether)    |                 |
|                                   |                       | X-652 (1,6-Hexadiol diglycidyl ether)            |                 |
|                                   |                       | D-691Epoxypropane o-methylphenyl ether           |                 |
| Non-activated thinner             |                       | Anhydrous ethanol                                | Toluene         |
|                                   |                       | Ethyl acetate                                    | Dimethylbenzene |
|                                   |                       | Dimethyl formamide                               | Butyl acetate   |
|                                   |                       | Acetone                                          | Styrene         |
|                                   |                       | Polyol                                           | Benzyl alcohol  |

**Note: The above substances should not contact the coating of the product body, otherwise it will affect the insulation strength of the product**

### 9.4 Caution (Handling):

Vibration and impact

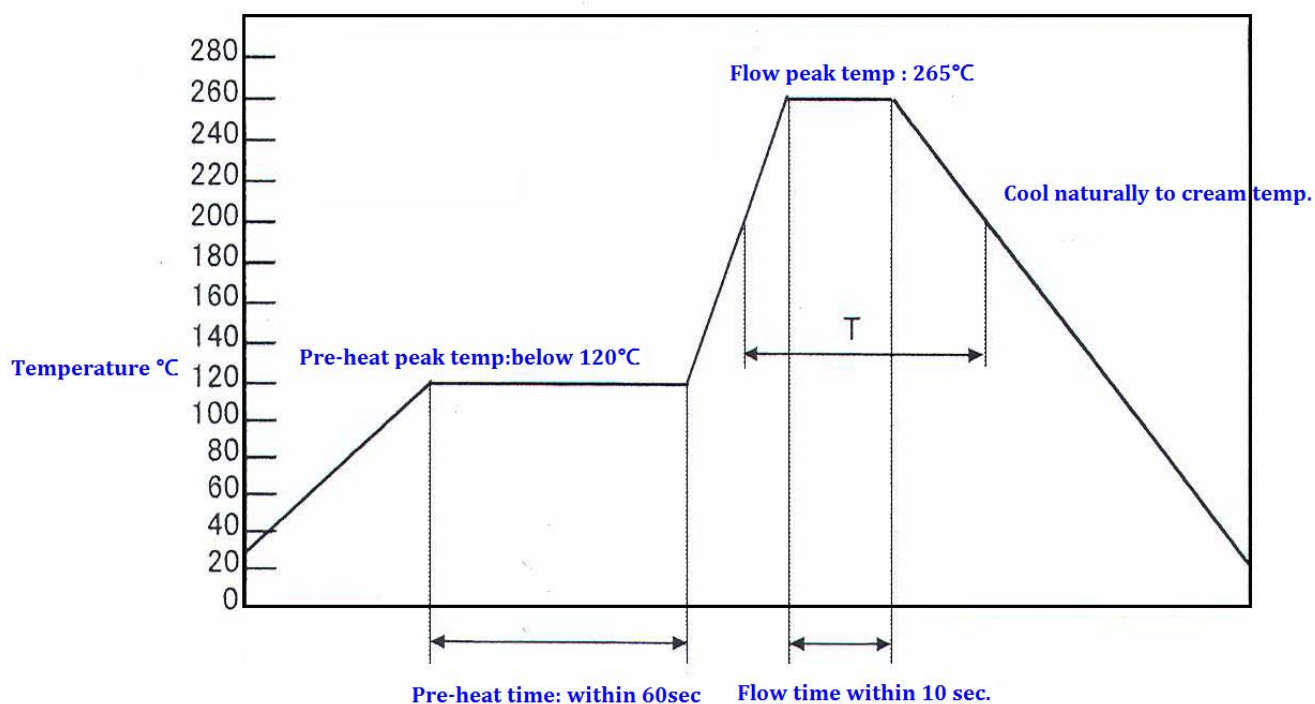
Do not expose a capacitor or its leads to excessive shock or vibration during use.

**"Failure to follow the above cautions may result, worst case, in a short circuit and cause fuming or partial dispersion when the product is used."**

## 10. Soldering Recommendation:

### 10.1 Wave Soldering Profile:

- Temperature conditions of the flow is recommended as shown in the chart
- Must implement the pre-heat
- Maximum peak flow temperature is recommended 265°C
- Time “T” implement in the chart recommended within 20 sec. if temperature exceed 200°C
- Take care with the flow solder not to touch the capacitor body directly at mounting

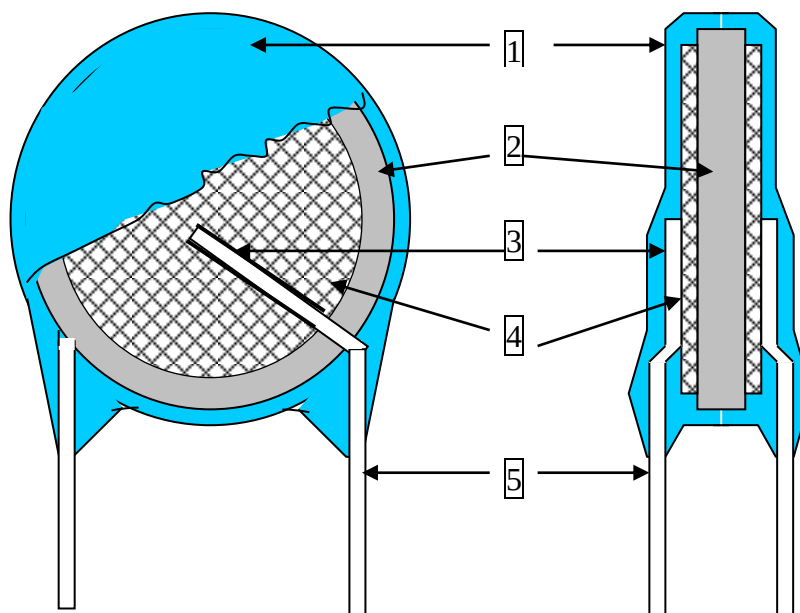


**Chart to show flow recommended temp**

### 10.2 Recommended Reworking Conditions with Soldering Iron :

- Temperature of iron-tip: 400 degrees C. max.
- Soldering iron wattage: 50W max.
- Soldering time: 3.5 sec. max.
- Distance from coating body: 2 mm (min.)

### 10.3 Reflow-Soldering : Lead Ceramic Cap. should not be soldered by reflow-soldering.

**11. Drawing of internal structure and material list :**

**Remarks :**

| No. | Part name          | Material                         | Model/Type                              | Component                                                                                                                                                                                                                                           |
|-----|--------------------|----------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Insulation Coating | Epoxy polymer                    | EF-150<br>PCE-300<br>ECP-357            | Epoxy resin、 Pigment<br>(Blue / UL 94 V-0 )                                                                                                                                                                                                         |
| 2   | Dielectric Element | Ceramic                          | SL/Y5P/Y5U/Y5V                          | SL: $\text{SrCO}_3/\text{TiO}_2/\text{Bi}_2\text{O}_3/\text{CaCO}_3$<br>Y5P: $\text{BaTiO}_3/\text{Bi}_2\text{O}_3/\text{SnO}_2/\text{CeO}_2$<br>Y5U: $\text{BaTiO}_3/\text{ZrO}_2/\text{CaCO}_3$<br>Y5V: $\text{BaTiO}_3/\text{WO}_3/\text{CeO}_2$ |
| 3   | Solder             | Tin-silver                       | $\text{Sn}96.5\text{-Ag}3\text{-Cu}0.5$ | $\text{Sn}96.5\text{-Ag}3\text{-Cu}0.5$                                                                                                                                                                                                             |
| 4   | Electrodes         | Ag                               | SP-160PL<br>SP-260PL                    | Silver 、 Glass frit                                                                                                                                                                                                                                 |
| 5   | Leads wire         | Tinned copper clad<br>steel wire | $0.55 \pm 0.05 \text{ mm}$              | Substrate metal: Fe & Cu<br>Surface plating: Sn 100%(3~7 $\mu\text{m}$ )                                                                                                                                                                            |