

Reference Specification

DEF Series/6.3kVp-p
Lead Type Disc Ceramic Capacitors for LCD Backlight Inverter Circuit only

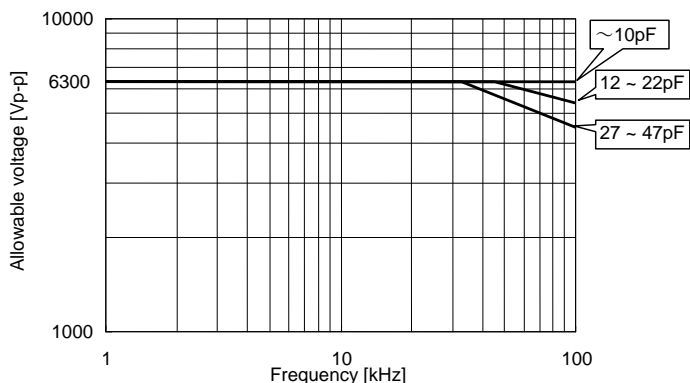
Product specifications in this catalog are as of Dec. 2017, and are subject to change or obsolescence without notice.

Please consult the approval sheet before ordering. Please read rating and Cautions first.

⚠ CAUTION

1. OPERATING VOLTAGE

The frequency of the applied sine wave voltage should be less than 100kHz. The applied voltage should be less than the value shown in following figure. In case of non-sine wave which include a harmonic frequency, please contact our sales representatives or product engineers.



The temperature of the surface of capacitor: below the upper limit of its rated operating temperature range (including self-heating.)

The capacitors can be applied maximum 6.3kVp-p at 100kHz when lamps turn on.

| 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. When the capacitor is used in a high-frequency current, pulse current or similar current, it may self-generate heat due to dielectric loss. Excessive heat may lead to deterioration of the capacitor's characteristics and reliability. (Never attempt to perform measurement with the cooling fan running. Otherwise, accurate measurement cannot be ensured.)

3. 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.

4. VIBRATION AND IMPACT

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

5. 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 chip : 400 °C max.
- Soldering iron wattage : 50 W max.
- Soldering time : 3.5 s max.

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6. BONDING, RESIN MOLDING AND COATING

In case of bonding, molding or coating this product, verify that these processes do not affect the quality of capacitor by testing the performance of the bonded, molded or coated product in the intended equipment.

In case of the amount of applications, dryness / hardening conditions of adhesives and molding resins containing organic solvents (ethyl acetate, methyl ethyl ketone, toluene, etc.) are unsuitable, the outer coating resin of a capacitor is damaged by the organic solvents and it may result, worst case, in a short circuit.

The variation in thickness of adhesive, molding resin or coating may cause a outer coating resin cracking and/or ceramic element cracking of a capacitor in a temperature cycling.

7. TREATMENT AFTER BONDING, RESIN MOLDING AND COATING

When the outer coating is hot (over 100 °C) after soldering, it becomes soft and fragile.

So please be careful not to give it mechanical stress.

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.

8. 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 °C and 15 to 85%. Use capacitors within 6 months after delivered.

Check the solderability after 6 months or more.

9. LIMITATION OF APPLICATIONS

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects which might directly cause damage to the third party's life, body or property.

1. Aircraft equipment
2. Aerospace equipment
3. Undersea equipment
4. Power plant control equipment
5. Medical equipment
6. Transportation equipment (vehicles, trains, ships, etc.)
7. Traffic signal equipment
8. Disaster prevention / crime prevention equipment
9. Data-processing equipment exerting influence on public
10. Application of similar complexity and/or reliability requirements to the applications listed in the above.

NOTICE

1. 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.

2. CAPACITANCE CHANGE OF CAPACITORS

Capacitance might change a little depending on a surrounding temperature or an applied voltage.

Please contact us if you use for the strict time constant circuit.

Reference only

NOTE

1. Please make sure that your product has been evaluated in view of your specifications with our product being mounted to your product.
2. You are requested not to use our product deviating from this specification.

Reference only

1. Application

This specification is applied to Lead Type Disc Ceramic Capacitors DEF series used for LCD Backlight Inverter Circuit only.

Please contact us when using this product for any other applications than described in the above.

Do not use these products in any automotive power train or safety equipment including battery chargers for electric vehicles and plug-in hybrids.

2. Rating

2-1. Operating temperature range

-25 ~ +105°C

2-2. Part number configuration

ex.) DEF 2C LH 100 J A3 B

Series Temperature Rated Capacitance Capacitance Lead Packing Individual
characteristic voltage tolerance code style code specification

- Temperature characteristic

| Code | Temperature characteristic |
|------|----------------------------|
| 2C | CH |
| 1X | SL |

Please confirm detailed specification on [Specification and test methods].

- Rated voltage

| Code | Rated voltage |
|------|---------------|
| LH | 6.3kVp-p |

Please confirm detailed specification on [OPERATING VOLTAGE].

- Capacitance

The first two digits denote significant figures ; the last digit denotes the multiplier of 10 in pF.
ex.) In case of 100.

$$10 \times 10^0 = 10\text{pF}$$

- Capacitance tolerance

Please refer to [Part number list].

- Lead code

| Code | Lead style |
|------|----------------------------|
| A* | Vertical crimp long type |
| J* | Vertical crimp short type |
| N* | Vertical crimp taping type |

* Please refer to [Part number list].

Solder coated copper wire is applied for termination.

- Packing style code

| Code | Packing type |
|------|-----------------------|
| B | Bulk type |
| A | Ammo pack taping type |

- Individual specification

In case part number cannot be identified without 'individual specification', it is added at the end of part number.

Reference only

3. Marking

Temperature characteristic : Upper horizontal line for char. CH(Omitted for char. SL)

Nominal capacitance : Actual value

Capacitance tolerance : Code

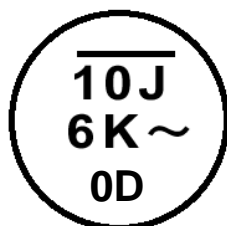
Rated voltage : Letter code(Marked with 6K~)

Manufacturing year : Letter code(The last digit of A.D. year.)

Manufacturing month : Code

| | |
|---------------|---------------|
| Feb./Mar. → 2 | Aug./Sep. → 8 |
| Apr./May → 4 | Oct./Nov. → O |
| Jun./Jul. → 6 | Dec./Jan. → D |

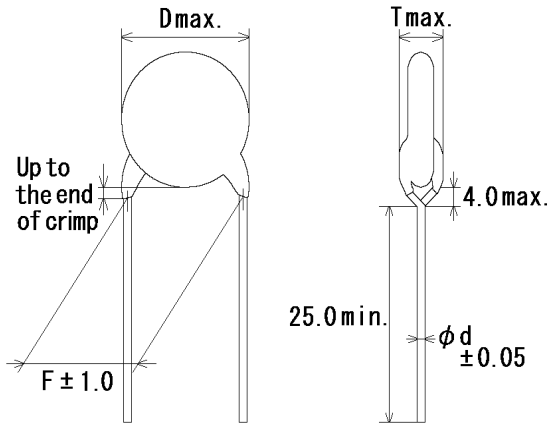
(Example)



Reference only

4. Part number list

-Vertical crimp long type
(Lead code:A*)



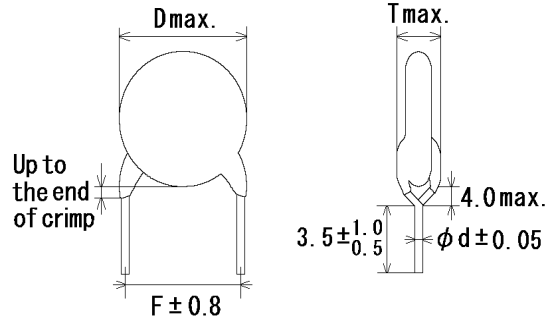
Note) The mark '*' of lead code differ from lead spacing(F) and lead diameter(d).
Please see the following list about details.

Unit : mm

| T.C. | Cap. (pF) | Cap. tol. | Customer Part Number | Murata Part Number | Dimension (mm) | | | | Lead code | Pack qty. (pcs) |
|------|--------------|--------------|----------------------|--------------------|----------------|-----|-----|-----|--------------|-----------------------|
| | | | | | D | T | F | d | | |
| CH | 2 | ±0.25pF | | DEF2CLH020CA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 3 | ±0.25pF | | DEF2CLH030CA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 4 | ±0.25pF | | DEF2CLH040CA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 5 | ±0.5pF | | DEF2CLH050DA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 6 | ±0.5pF | | DEF2CLH060DA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 7 | ±0.5pF | | DEF2CLH070DA3B | 8.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 8 | ±0.5pF | | DEF2CLH080DA3B | 8.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 9 | ±0.5pF | | DEF2CLH090DA3B | 8.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| CH | 10 | ±5% | | DEF2CLH100JA3B | 8.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 10 | ±5% | | DEF1XLH100JA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 12 | ±5% | | DEF1XLH120JA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 15 | ±5% | | DEF1XLH150JA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 18 | ±5% | | DEF1XLH180JA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 22 | ±5% | | DEF1XLH220JA3B | 7.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 27 | ±5% | | DEF1XLH270JA3B | 8.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 33 | ±5% | | DEF1XLH330JA3B | 9.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 39 | ±5% | | DEF1XLH390JA3B | 9.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |
| SL | 47 | ±5% | | DEF1XLH470JA3B | 9.0 | 6.0 | 7.5 | 0.6 | A3 | 250 |

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Vertical crimp short type
(Lead code: J*)



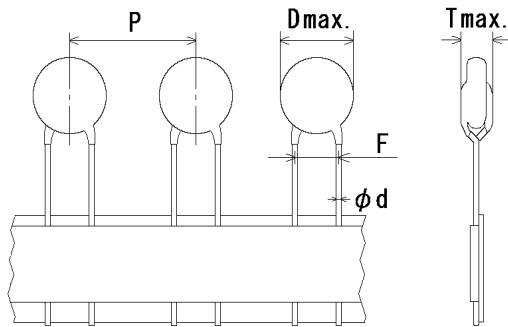
Note) The mark '*' of lead code differ from lead spacing(F) and lead diameter(d).
Please see the following list about details.

Unit : mm

| T.C. | Cap. (pF) | Cap. tol. | Customer Part Number | Murata Part Number | Dimension (mm) | | | | Lead code | Pack qty. (pcs) |
|------|--------------|--------------|----------------------|--------------------|----------------|-----|-----|-----|--------------|-----------------------|
| | | | | | D | T | F | d | | |
| CH | 2 | ±0.25pF | | DEF2CLH020CJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 3 | ±0.25pF | | DEF2CLH030CJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 4 | ±0.25pF | | DEF2CLH040CJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 5 | ±0.5pF | | DEF2CLH050DJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 6 | ±0.5pF | | DEF2CLH060DJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 7 | ±0.5pF | | DEF2CLH070DJ3B | 8.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 8 | ±0.5pF | | DEF2CLH080DJ3B | 8.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 9 | ±0.5pF | | DEF2CLH090DJ3B | 8.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| CH | 10 | ±5% | | DEF2CLH100JJ3B | 8.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 10 | ±5% | | DEF1XLH100JJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 12 | ±5% | | DEF1XLH120JJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 15 | ±5% | | DEF1XLH150JJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 18 | ±5% | | DEF1XLH180JJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 22 | ±5% | | DEF1XLH220JJ3B | 7.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 27 | ±5% | | DEF1XLH270JJ3B | 8.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 33 | ±5% | | DEF1XLH330JJ3B | 9.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 39 | ±5% | | DEF1XLH390JJ3B | 9.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |
| SL | 47 | ±5% | | DEF1XLH470JJ3B | 9.0 | 6.0 | 7.5 | 0.6 | J3 | 500 |

Reference only

·Vartical crimp tapping type
(Lead code:N*)

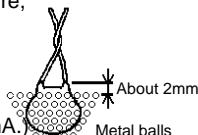
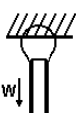


Note) The mark '*' of lead code differ from lead spacing(F), lead diameter(d) and pitch of component(P). Please see the following list or taping specification about details.

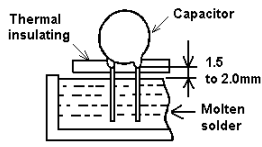
Unit : mm

| T.C. | Cap. (pF) | Cap. tol. | Customer Part Number | Murata Part Number | Dimension (mm) | | | | | Lead code | Pack qty. (pcs) |
|------|-----------|-----------|----------------------|--------------------|----------------|-----|-----|-----|------|-----------|-----------------|
| | | | | | D | T | F | d | P | | |
| CH | 2 | ±0.25pF | | DEF2CLH020CN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 3 | ±0.25pF | | DEF2CLH030CN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 4 | ±0.25pF | | DEF2CLH040CN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 5 | ±0.5pF | | DEF2CLH050DN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 6 | ±0.5pF | | DEF2CLH060DN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 7 | ±0.5pF | | DEF2CLH070DN3A | 8.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 8 | ±0.5pF | | DEF2CLH080DN3A | 8.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 9 | ±0.5pF | | DEF2CLH090DN3A | 8.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| CH | 10 | ±5% | | DEF2CLH100JN3A | 8.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 10 | ±5% | | DEF1XLH100JN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 12 | ±5% | | DEF1XLH120JN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 15 | ±5% | | DEF1XLH150JN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 18 | ±5% | | DEF1XLH180JN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 22 | ±5% | | DEF1XLH220JN3A | 7.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 27 | ±5% | | DEF1XLH270JN3A | 8.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 33 | ±5% | | DEF1XLH330JN3A | 9.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 39 | ±5% | | DEF1XLH390JN3A | 9.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |
| SL | 47 | ±5% | | DEF1XLH470JN3A | 9.0 | 6.0 | 7.5 | 0.6 | 15.0 | N3 | 900 |

Reference only

| 5. Specification and test methods | | | | | | | | | | | | | |
|--|------------------------------|--|---|------|------|---|---|---|-----------|------|-------|------|------|
| No. | Item | Specification | Test method | | | | | | | | | | |
| 1 | Appearance and dimensions | No marked defect on appearance form and dimensions. Please refer to [Part number list]. | The capacitor should be inspected by naked eyes for visible evidence of defect. Dimensions should be measured with slide calipers. | | | | | | | | | | |
| 2 | Marking | To be easily legible. | The capacitor should be inspected by naked eyes. | | | | | | | | | | |
| 3 | Dielectric strength | Between lead wires No failure. | The capacitor should not be damaged when DC12.6kV applied between the lead wires for 1 to 5 s. (Charge/Discharge current≤50mA.) | | | | | | | | | | |
| | | Body insulation No failure. | The capacitor is placed in the container with metal balls of diameter 1mm so that each lead wire, shortcircuited, is kept about 2mm off the balls as shown in the figure, and DC voltage of 1.3kV is applied for 1 to 5 s between capacitor lead wires and small metals. (Charge/Discharge current≤50mA.)  | | | | | | | | | | |
| 4 | Insulation Resistance (I.R.) | Between lead wires 10 000MΩ min. | The insulation resistance should be measured with DC500±50V within 60±5 s of charging. | | | | | | | | | | |
| 5 | Capacitance | Within specified tolerance. | The capacitance should be measured at 20°C with 1±0.2MHz and AC5V(r.m.s.) max.. | | | | | | | | | | |
| 6 | Q | 400+20C* ² min. (30pF under) 1000 min. (30pF min.) | The Q should be measured at 20°C with 1±0.2MHz and AC5V(r.m.s.) max.. | | | | | | | | | | |
| 7 | Temperature characteristic | Char. CH : 0±60ppm/°C Char. SL : +350 to - 1 000ppm/°C (Temp. range: +20 to 85°C) | The capacitance measurement should be made at each step specified in Table. | | | | | | | | | | |
| | | <table border="1" style="margin: auto;"> <thead> <tr> <th style="width: 15%;">Step</th> <th style="width: 10%;">1</th> <th style="width: 10%;">2</th> <th style="width: 10%;">3</th> <th style="width: 10%;">4</th> <th style="width: 10%;">5</th> </tr> </thead> <tbody> <tr> <td>Temp.(°C)</td> <td>20±2</td> <td>-25±3</td> <td>20±2</td> <td>85±2</td> <td>20±2</td> </tr> </tbody> </table> | Step | 1 | 2 | 3 | 4 | 5 | Temp.(°C) | 20±2 | -25±3 | 20±2 | 85±2 |
| Step | 1 | 2 | 3 | 4 | 5 | | | | | | | | |
| Temp.(°C) | 20±2 | -25±3 | 20±2 | 85±2 | 20±2 | | | | | | | | |
| 8 | Strength of lead | Pull Lead wire should not cut off. Capacitor should 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 s.  | | | | | | | | | | |
| | | Bending | Each lead wire should be subjected to 5N of weight and bent 90° at the point of egress, in one direction, then returned to its original position and bent 90° in the opposite direction at the rate of one bend in 2 to 3 s. | | | | | | | | | | |
| 9 | Vibration resistance | Appearance No marked defect. | The capacitor should be firmly soldered to the supporting lead wire and vibrated at a frequency range of 10 to 55Hz, 1.5mm in total amplitude, with about a 1min rate of vibration change from 10Hz to 55Hz and back to 10Hz. Apply for a total of 6 h; 2 h each in 3 mutually perpendicular directions. | | | | | | | | | | |
| | | Capacitance Within specified tolerance. | | | | | | | | | | | |
| | | Q 400+20C* ² min. (30pF under) 1 000 min. (30pF min.) | | | | | | | | | | | |
| 10 | Solderability of leads | Lead wire should be soldered with uniformly coated on the axial direction over 3/4 of the circumferential direction. | The lead wire of a capacitor should be dipped into a ethanol solution of 25wt% rosin and then into molten solder for 2±0.5 s. In both cases the depth of dipping is up to about 1.5 to 2.0mm from the root of lead wires. Temp. of solder : 245±5°C Lead Free Solder (Sn-3Ag-0.5Cu) 235±5°C H63 Eutectic Solder | | | | | | | | | | |
| <p>*1 "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa *2 "C" expresses nominal capacitance value (pF)</p> | | | | | | | | | | | | | |

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| No. | Item | Specification | Test method | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------|---------------------------------|--------------------|--|-----------------|-----------------|------|-----|-------|--------|-------|------------|-------|---|--------|--------|---|------------|-------|------|-----------------|------|-----------------|---|----------|--------|-------------|---|-----|--------|------------|
| 11 | Soldering effect (Non-preheat) | Appearance | The lead wire should be immersed into the melted solder of 350±10°C up to about 1.5 to 2.0mm from the main body for 3.5±0.5 s. Post-treatment : Capacitor should be stored for 1 to 2 h at *1room condition. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Capacitance change | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Soldering effect (On-preheat) | Appearance | First the capacitor should be stored at 120+0/-5°C for 60+0/-5 s. Then, as in figure, the lead wires should be immersed solder of 260+0/-5°C up to 1.5 to 2.0mm from the root of terminal for 7.5+0/-1 s. <div style="text-align: center;">  </div> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Capacitance change | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | Humidity (Under steady state) | Appearance | Set the capacitor for 500 +24/-0 h at 40±2°C in 90 to 95% relative humidity. Post-treatment : Capacitor should be stored for 1 to 2 h at *1room condition. | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Capacitance change | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 14 | Life | Q | Apply 6.3kVp-p at the frequency in Table for 1000 +48/-0 h at 105±2°C, and relative humidity of 50% max.. (Charge/Discharge current≤50mA.) <Frequency> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Capacitance(pF)</th> <th>Frequency(kHz)</th> </tr> </thead> <tbody> <tr> <td>~ 10</td> <td>100</td> </tr> <tr> <td>12~22</td> <td>45</td> </tr> <tr> <td>27~47</td> <td>33</td> </tr> </tbody> </table> | Capacitance(pF) | Frequency(kHz) | ~ 10 | 100 | 12~22 | 45 | 27~47 | 33 | | | | | | | | | | | | | | | | | | | |
| | | Capacitance(pF) | | Frequency(kHz) | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ~ 10 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12~22 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27~47 | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I.R. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 | Temperature and Immersion cycle | Appearance | The capacitor should be subjected to 5 temperature cycles, then consecutively to 2 immersion cycles. <Temperature cycle> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature(°C)</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25±3</td> <td>30 min</td> </tr> <tr> <td>2</td> <td>Room Temp.</td> <td>3 min</td> </tr> <tr> <td>3</td> <td>+105±3</td> <td>30 min</td> </tr> <tr> <td>4</td> <td>Room Temp.</td> <td>3 min</td> </tr> </tbody> </table> Cycle time : 5 cycle <Immersion cycle> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Step</th> <th>Temperature(°C)</th> <th>Time</th> <th>Immersion water</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>+65+5/-0</td> <td>15 min</td> <td>Clean water</td> </tr> <tr> <td>2</td> <td>0±3</td> <td>15 min</td> <td>Salt water</td> </tr> </tbody> </table> Cycle time : 2 cycle Post-treatment : Capacitor should be stored for 4 to 24 h at *1room condition. | Step | Temperature(°C) | Time | 1 | -25±3 | 30 min | 2 | Room Temp. | 3 min | 3 | +105±3 | 30 min | 4 | Room Temp. | 3 min | Step | Temperature(°C) | Time | Immersion water | 1 | +65+5/-0 | 15 min | Clean water | 2 | 0±3 | 15 min | Salt water |
| | | Step | | Temperature(°C) | Time | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | -25±3 | 30 min | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | Room Temp. | 3 min | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | +105±3 | 30 min | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | Room Temp. | 3 min | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Step | Temperature(°C) | Time | Immersion water | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | +65+5/-0 | 15 min | Clean water | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 0±3 | 15 min | Salt water | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Capacitance change | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

*1 "room condition" Temperature: 15 to 35°C, Relative humidity: 45 to 75%, Atmospheric pressure: 86 to 106kPa

*2 "C" expresses nominal capacitance value (pF)

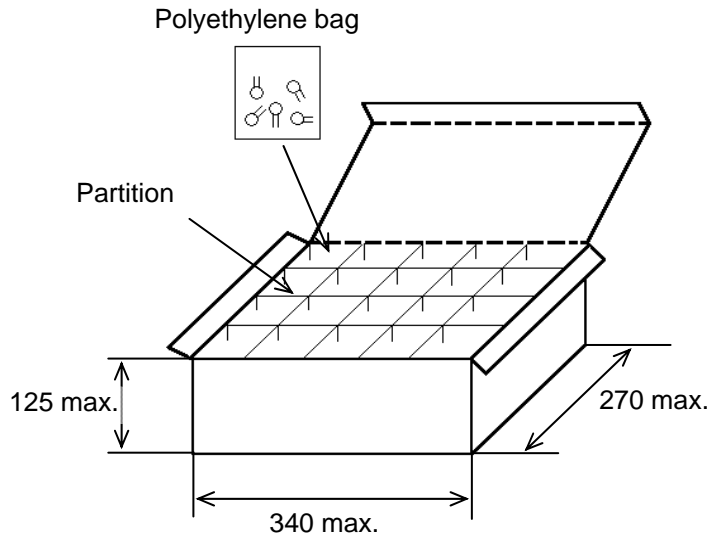
Reference only

6.Packing specification

- Bulk type (Packing style code : B)

The number of packing = $\frac{\text{Packing quantity}}{\text{Packing quantity}} \times n$

The size of packing case and packing way



- *1 : Please refer to [Part number list].
- *2 : Standard n = 20 (bag)

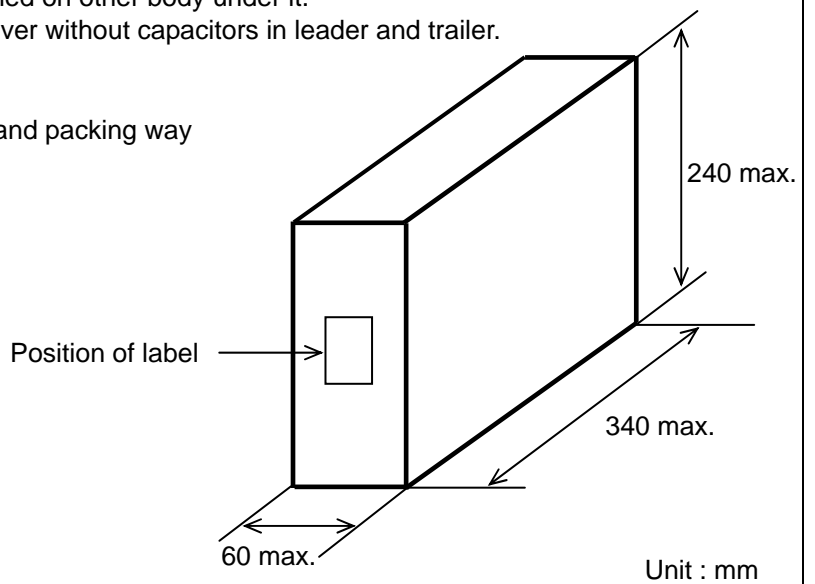
Note)
The outer package and the number of outer packing be changed by the order getting amount.

Unit : mm

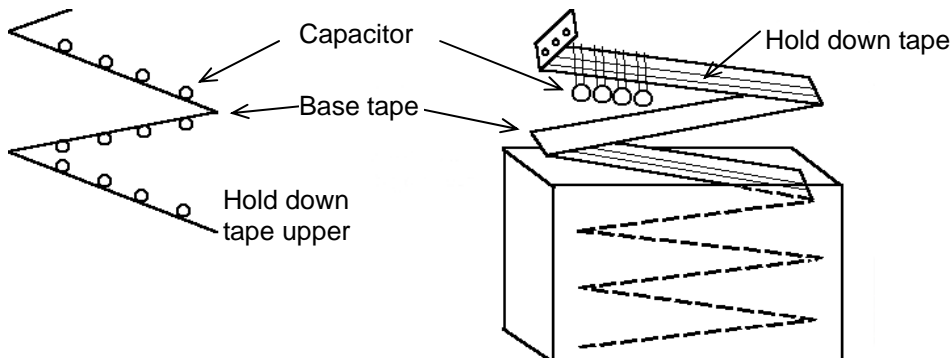
- Ammo pack taping type (Packing style code : A)

- The tape with capacitors is packed zigzag into a case.
- When body of the capacitor is piled on other body under it.
- There should be 3 pitches and over without capacitors in leader and trailer.

The size of packing case and packing way



Unit : mm



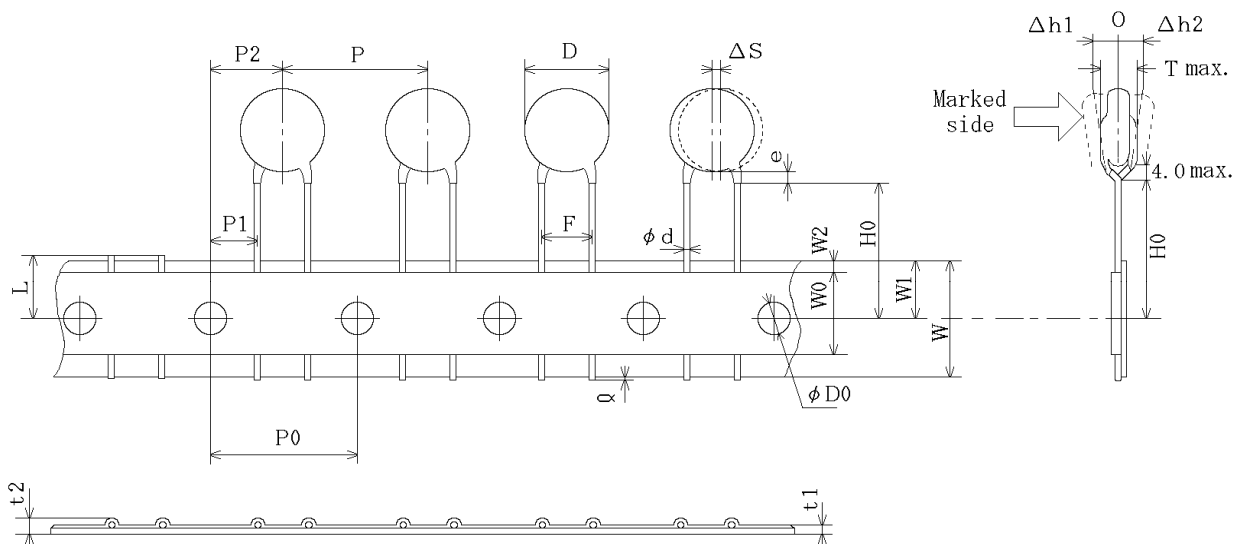
Reference only

7. Taping specification

7-1. Dimension of capacitors on tape

Vertical crimp taping type < Lead code : N3 >

Pitch of component 15.0mm / Lead spacing 7.5mm



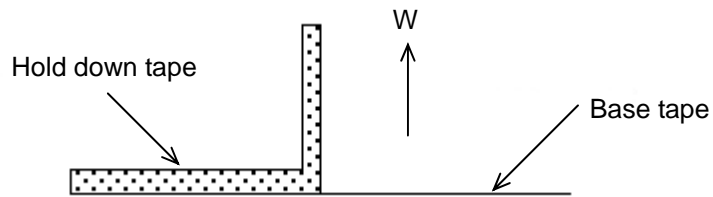
Unit : mm

| Item | Code | Dimensions | Remarks |
|---|------|---------------------------------------|--|
| Pitch of component | P | 15.0±2.0 | |
| Pitch of sprocket hole | P0 | 15.0±0.3 | |
| Lead spacing | F | 7.5±1.0 | |
| Length from hole center to component center | P2 | 7.5±1.5 | Deviation of progress direction |
| Length from hole center to lead | P1 | 3.75±1.0 | |
| Body diameter | D | Please refer to [Part number list]. | |
| Deviation along tape, left or right | ΔS | 0±2.0 | They include deviation by lead bend . |
| Carrier tape width | W | 18.0±0.5 | |
| Position of sprocket hole | W1 | 9.0±0.5 | Deviation of tape width direction |
| Lead distance between reference and bottom planes | H0 | 18.0 ⁰ ± ₀ 2.0 | |
| Protrusion length | Q | +0.5~-1.0 | |
| Diameter of sprocket hole | φD0 | 4.0±0.1 | |
| Lead diameter | φd | 0.60±0.05 | |
| Total tape thickness | t1 | 0.6±0.3 | They include hold down tape thickness. |
| Total thickness, tape and lead wire | t2 | 1.5 max. | |
| Deviation across tape, front | Δh1 | 2.0 max. | |
| Deviation across tape, rear | Δh2 | | |
| Portion to cut in case of defect | L | 11.0 ⁰ ± _{1.0} | |
| Hold down tape width | W0 | 11.5 min. | |
| Hold down tape position | W2 | 1.5±1.5 | |
| Coating extension on lead | e | Up to the end of crimp | |
| Body thickness | T | Please refer to [Part number list]. | |

Reference only

7-2. Splicing way of tape

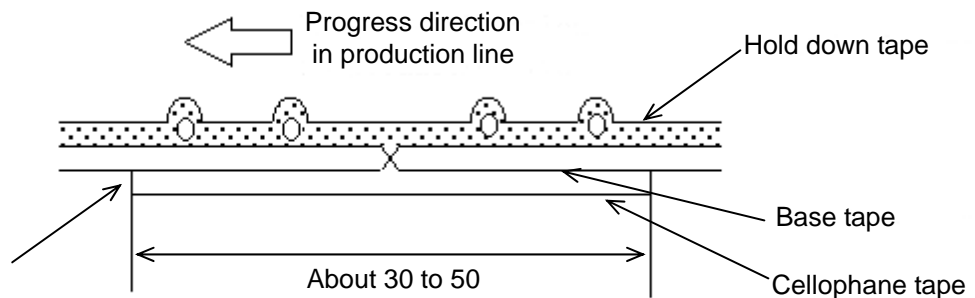
- 1) Adhesive force of tape is over 3N at test condition as below.



2) Splicing of tape

- a) When base tape is spliced

- Base tape should be spliced by cellophane tape.
(Total tape thickness should be less than 1.05mm.)

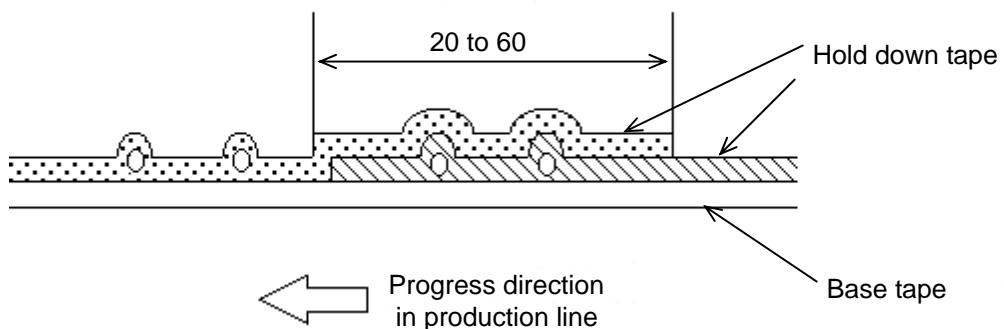


No lifting for the direction of progressing

Unit : mm

- b) When hold down tape is spliced

- Hold down tape should be spliced with overlapping.
(Total tape thickness should be less than 1.05mm.)



Unit : mm

- c) When both tape are spliced

- Base tape and hold down tape should be spliced with splicing tape.

3) Missing components

- There should be no consecutive missing of more than three components.
- The number of missing components should be not more than 0.5% of total components that should be present in a Ammo pack.

EU RoHS
RoHS指令への対応

This products of the following crresponds to EU RoHS
当製品は以下の欧州RoHSに対応しています。

(1) RoHS

EU RoHs 2011/65/EC compliance
2011/65/EC(改正RoHS指令)に対応

maximum concentration values tolerated by weight in homogeneous materials

- ・1000 ppm maximum Lead
- ・1000 ppm maximum Mercury
- ・100 ppm maximum Cadmium
- ・1000 ppm maximum Hexavalent chromium
- ・1000 ppm maximum Polybrominated biphenyls (PBB)
- ・1000 ppm maximum Polybrominated diphenyl ethers (PBDE)

鉛:1000ppm以下

水銀:1000ppm以下

カドミウム:100ppm以下

六価クロム:1000ppm以下

ポリ臭化ビフェニル(PBB):1000ppm以下

ポリ臭化ジフェニルエーテル(PBDE):1000ppm以下