## ■ ORDERING INFORMATION

Please note the order quantity must be in multiples of the minimum quantity.

### CONDUCTIVE POLYMER ALUMINUM SOLID ELECTROLYTIC CAPACITORS

| Size of product | | | Bulk | | | | Taping minimum quantity |
|---|---|---|---|---|---|---|---|
| | | | Quantity vinyl bag | | Minimum quantity | | |
| | | | Long lead | Lead forming | Long lead | Lead forming | |
| Chip Type | φ5 | 6L | — | | | | 1,000 |
| | φ6.3 | 5.5L 6L | — | | | | 1,000 |
| | | 8L | — | | | | 900 |
| | | 10L | — | | | | 600 |
| | φ8 | 7L | — | | | | 1,000 |
| | | 8L | — | | | | 900 |
| | | 10L 10.5L | — | | | | 500 |
| | | 12L | — | | | | 400 |
| | φ10 | 8L 10L 10.5L | — | | | | 500 |
| | | 12.7L 13.2L | — | | | | 400 |
| Radial Lead Type | φ6.3 | 6L | 200 | | 4,000 | 4,000 | 2,000 |
| | | 9L 10.5L | | | 3,000 | 3,000 | |
| | φ8 | 7L 8L 9L | 200 | | 2,000 | 3,000 | 1,000 |
| | | 12L | | | | 2,000 | |
| | φ10 | 8L 10L 13L | 200 | | 1,000 | 2,000 | 500 |

### CONDUCTIVE POLYMER ALUMINUM SOLID ELECTROLYTIC CAPACITORS(FPCAP)

| Size of product | | | Bulk | | | | Taping minimum quantity |
|---|---|---|---|---|---|---|---|
| | | | Quantity vinyl bag | | Minimum quantity | | |
| | | | Long lead | Lead forming | Long lead | Lead forming | |
| Chip Type | φ4 | 5.2L | — | | | | 2,000 |
| | φ5 | 5.7L | — | | | | 1,000 |
| | φ6.3 | 4.2L | — | | | | 1,000 |
| | | 5.7L | — | | | | 1,000 |
| | | 7.7L | — | | | | 900 |
| | φ8 | 6.7L | — | | | | 1,000 |
| | | 7.7L | — | | | | 900 |
| | | 8.7L | — | | | | 500 |
| | | 11.7L | — | | | | 500 |
| | φ10 | 7.7L | — | | | | 500 |
| | | 12.4L | — | | | | 400 |
| Radial Lead Type | φ4 | 5L | 200 | | 8,000 | | — |
| | φ5 | 8L 10L | 200 | | 3,200 | 4,000 | 2,000 |
| | φ6.3 | 5L 6L 7L | 200 | | 4,000 | | 2,000 |
| | | 8L 10L | 200 | | 3,200 | 4,000 | |
| | φ8 | 6L 8L 9L | 200 | | 3,200 | 4,000 | 1,000 |
| | | 11.5L | 100 | 200 | 2,000 | 2,400 | |
| | | 16L | 100 | | 1,600 | 2,000 | |
| | | 20L | | | 1,200 | 1,600 | |
| | φ10 | 12.5L | 100 | | 1,600 | 2,000 | 500 |
| | | 16L | | | 1,200 | 1,600 | |
| | | 20L | | | 800 | 1,200 | |

### CONDUCTIVE POLYMER HYBRID ALUMINUM ELECTROLYTIC CAPACITORS

| Size of product | | | Taping minimum quantity |
|---|---|---|---|
| Chip Type | φ6.3 | 5.8L | 1,000 |
| | | 7.7L | 900 |
| | φ8 | 10L | 500 |
| | φ10 | 10L | 500 |
| | φ10 | 12.5L | 400 |

### ALUMINUM ELECTROLYTIC CAPACITORS

| Size of product | | | Bulk | | | | Taping minimum quantity |
|---|---|---|---|---|---|---|---|
| | | | Quantity vinyl bag | | Minimum quantity | | |
| | | | Long lead | Lead forming | Long lead | Lead forming | |
| Chip Type | φ4 | | — | | | | 2,000 (1,500 : 7L product) |
| | φ5 | | — | | | | 1,000 |
| | φ6.3 | | — | | | | 1,000 (900 : 7.7L product, 800 : 8.7L, 600 : 10L product) |
| | φ8 | 5.4 L 6.2 L | — | | | | 1,000 |
| | | 10 L | — | | | | 500 |
| | φ10 | 7.7L 10 L | — | | | | 500 |
| | | 13.5 L | — | | | | 400 |
| | φ12.5 | 13.5 L | — | | | | 200 |
| | | 16 L | — | | | | 150 |
| | | 21 L | — | | | | 125 |
| | φ16 | 16.5 L | — | | | | 125 |
| | | 21.5 L | — | | | | 75 |
| | φ18 | 16.5 L | — | | | | 125 |
| | | 21.5 L | — | | | | 75 |

## ALUMINUM ELECTROLYTIC CAPACITORS

| Size of product | | | Bulk | | | | Taping minimum quantity |
|---|---|---|---|---|---|---|---|
| | | | Quantity vinyl bag | | Minimum quantity | | |
| | | | Long lead | Lead forming | Long lead | Lead forming | |
| Radial Lead Type | φ5 | 11L | 200 | 200 | 6,000 | 8,000 | 2,000 |
| | φ6.3 | 11L | 200 | 200 | 4,000 | 7,000 | 2,000 |
| | | 15L | | | 4,000 | 6,000 | |
| | φ8 | 11.5L | 200 | 200 | 3,000 | 4,000 | 1,000 |
| | | 15L | | | 2,000 | 3,600 | |
| | | 20L | | | 2,000 | 2,200 | |
| | φ10 | 12.5L | 200 | 200 | 2,000 | 2,800 | 500 |
| | | 15L 16L | | | 1,800 | 2,000 | |
| | | 20L | | | 1,400 | 1,600 | |
| | | 25L | | | 1,200 | 1,600 | |
| | | 30.5L | | | 1,000 | 1,200 | — |
| | | 40L | 100 | — | 500 | — | |
| | | 50L | | | 300 | — | |
| | φ12.5 | 12.5L | 100 | 100 | 1,500 | 1,800 | 500 |
| | | 15L | | | 1,200 | 1,400 | |
| | | 20L | | | 1,000 | 1,000 (1330)* | |
| | | 25L | | | 800 | 900 (1000)* | |
| | | 30.5L | | | 600 | 800 (650)* | — |
| | | 35.5L | | | 500 | 700 (650)* | |
| | | 40L | | | 400 | 600 (650)* | |
| | | 50L | 50 | — | 400 | — | |
| | φ16 | 15L | 50 | 50 | 700 | 900 (1050)* | 250 |
| | | 20L | | | 600 | 700 (840)* | |
| | | 25L | | | 400 | 400 (630)* | |
| | | 30.5L | | | 300 | 400 (630)* | — |
| | | 35.5L | | | 300 | 300 (400)* | |
| | | 40L | | — | 300 | 400 | |
| | φ18 | 15L | 50 | 50 | 400 | 500 (750)* | 250 |
| | | 20L | | | 400 | 400 (600)* | |
| | | 25L | | | 300 | 400 (450)* | |
| | | 30.5L | | — | 300 | 450 | — |
| | | 35.5L | | | 250 | 300 | |
| | | 40L 46L | | | 200 | 300 | |
| | φ20 | 15L | 50 | — | 300 | 400 | — |
| | | 20L | | | 250 | 400 | |
| | | 25L | | | 250 | 300 | |
| | | 31L | | | 200 | 300 | |
| | | 35L | | | 200 | 200 | |
| | | 40L | | | 150 | 200 | |
| | φ22 | 20L | — | | 250 | 250 (400)* | — |
| | | Other Length | | | 250 | 250 | |
| | φ25 | 30L | — | | 160 | 250 | — |
| | | 40L | | | 180 | 250 | |
| | | 50L | | | 140 | 250 | |
| 692 Type | φ20 to φ35 | | 50 | | | | — |

( )* : Export packaging The minimum packing unit of lead cut product code SZ, may differ from the above. Please confirm before you order.

## Eco-Products “GeoCap”

Nichicon promotes environmentally conscious practices.

Nichicon offers “GeoCap”,which has completely lead free terminals and contains no polyvinyl chloride in the sleeve.

### ■ Conductive Polymer Aluminum Solid Electrolytic Capacitors

| Type・Classification | Type・Series | Lead-Free Compliance | Anti Polyvinyl Chloride Compliance | Page |
|---|---|---|---|---|
| Surface Mount type | PCF, PCJ, PCK*, PCG, PCS*, PCL, PCV, PCX*, PCR, PCM, PCH, PCZ | Complied | Complied | 40 ~ |
| Radial Lead type | PLF, PLE, PLG, PLS, PLV, PLX | | | WEB |

### ■ Conductive Polymer Aluminum Solid Electrolytic Capacitors(FPCAP)

| Type・Classification | Type・Series | Lead-Free Compliance | Anti Polyvinyl Chloride Compliance | Page |
|---|---|---|---|---|
| Surface Mount type | RPS, RPA, RHS, RHA, RSS, RSA, RSB, RFS, RFA, RSL* | Complied | Complied | 60 ~ |
| Radial Lead type | RNS*, RR7*, RR5*, RL8, RE5*, RS8, RF8*, RNU, RNE, RNL, RS6, RHT | | | 68 ~ |

### ■ Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

| Type・Classification | Type・Series | Lead-Free Compliance | Anti Polyvinyl Chloride Compliance | Page |
|---|---|---|---|---|
| Surface Mount type | GYA, GYB, GYC, GYD, GYE, GYF | Complied | Complied | 86 ~ |

### ■ Aluminum Electrolytic Capacitors

| Type・Classification | | Type・Series | Lead-Free Compliance | Anti Polyvinyl Chloride Compliance | Page |
|---|---|---|---|---|---|
| Surface Mount type | | UZG, UZT, UCW, UCD, UCL, UCM, UCV, UUD, UWD, UCJ, UCZ, UYA, UCH, UCX, UUJ, UUE, UBC, UBH | Complied | Complied | 99 ~ |
| | | UZR, UZS, UWX, UWR, UWJ, UWP, UWT, UWZ, UWF, UWG, UUP, UUT, UUA, UUL, UCB, UUB, UWH, ULT, ULH, UUR, UUX, ULR, ULV, UUQ, UCQ, UUG, UUN | | | WEB |
| Radial Lead type | Standard type | UVK*, UVR, UVC*, UVY, UVZ*, URS*, URZ, UVP*, UEP | | | 142 ~ |
| | High Reliability type | UPM*, UPW, UPA*, UHV, UHD*, UHE*, UHW, UPJ*, UPS, UPV*, UPT, UPZ, UPH, UCP, ULD, UCA*, UCS, UCY, UBT, UBW, UBY, UXY, UBX | | | 160 ~ |
| | For special Circuits | UKL*, UAQ*, UAS | | | 219 ~ |
| | For Audio Equipment | UKA, UKZ, UFG*, UKT*, UKW*, UFW*, UES*, UDB* | | | 221 ~ |
| Snap-in Terminal type | Standard type | LLS, LLG | | | 226 ~ |
| | High Reliability type | LGU, LGN, LGG, LGL, LGM, LGJ, LGJ (15), LGY, LGR, LGZ, LGX, LGC, LGW, LHT | | | 234 ~ |
| | For special circuits | LAK*, LAQ*, LAS*, LAR*, LQS | | | 266 ~ |
| Screw Terminnal type | | LNR, LNX, LNK*, LNC, LQR*, LNY, LNT, LNU | | Available upon request | 268 ~ |
| For Audio Equipment | | LKG, LKS, LKX | | Complied | WEB |

Please refer to our website for the details of the series described as “WEB” or ＊mark

## Corresponding to RoHS Directive

| | | Conductive Polymer Aluminum Solid Electrolytic Capacitors | | | | Conductive Polymer Aluminum Solid Electrolytic Capacitors(FPCAP) | | Conductive Polymer Hybrid Aluminum Electrolytic Capacitors |
|---|---|---|---|---|---|---|---|---|
| | | SMD type (PCV, PCX, PCR, PCM, PCH, PCZ) | Lead wire terminal type (PLV, PLX) | SMD type (PCF, PCJ, PCK, PCG, PCS, PCL) | Lead wire terminal type (except PLV, PLX) | SMD type | Lead wire terminal type | SMD type |
| Corresponding to RoHS Directive | | Compliant to the RoHS directive (2011/65/EU,(EU)2015/863). | | | | | | |
| Material | The portion of the components | | | | | | | |
| Lead (Pb) | Plating on terminals | Sn plating | | Ag plating | | Sn plating | Sn plating | Sn plating |
| | Insulating Sleeves | Does not contain | | | | Does not contain | | Does not contain |
| | Construction of terminals | Fe/Cu/Sn | | Fe/Cu/Ag or Cu/Ag | | Cu/Sn | Cu/Sn or Fe/Cu/Sn | Fe/Cu/Sn |
| | Resistance to soldering heat | Please refer to page 19 for the recommendation reflow condition. | Correspondence to 265°C flow soldering condition | Please refer to page 19 for the recommendation reflow condition. | Correspondence to 265°C flow soldering condition | Please refer to page 25 for the recommendation reflow condition(FPCAP). | Correspondence to 260°C flow soldering condition | Please refer to page 19 for the recommendation reflow condition. |
| | Solderability Tensile strength | No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder. | | | | No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder. | | No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder. |
| Chromium (VI) | Plating material | Does not contain | | | | Does not contain | | Does not contain |
| Mercury<br>Cadmium<br>PBB, PBDE<br>DIBP, DBP, BBP, DEHP | | Does not contain | | | | Does not contain | | Does not contain |
| Identification for RoHS compliance parts | | Add "Pb free" marking on outer carton label | | | | Add "Pb free" marking on outer carton label | | Add "Pb free" marking on inner and outer carton label |
| MSL (IPC/JEDEC J-STD-020D) | | Not Applicable | | | | Not Applicable | | Not Applicable |

| | | Aluminum Electrolytic Capacitors | | | |
|---|---|---|---|---|---|
| | | SMD type | Lead wire terminal type | Snap-in terminal type | Screw terminal type |
| Corresponding to RoHS Directive | | Compliant to the RoHS directive (2011/65/EU, (EU)2015/863). | | | |
| Material | The portion of the components | | | | |
| Lead (Pb) | Plating on terminals | (< or=Dia.10mm) Change plating from Sn-Pb toSn-Bi<br>(> or=Dia.12.5mm) Change plating from Sn-Pb to Sn | Change plating from Sn-Pb to Sn | | Al |
| | Insulating Sleeves | No used | Replaced with PET | | — |
| | Construction of terminals | Fe/Cu/Sn-1.5Bi (<or=Dia 10mm)<br>Fe/Cu/Sn (>or=Dia 12.5mm) | Fe/Cu/Sn | | Al |
| | | | Cu/Sn (UKZ, UFG, UES, UDB) | Cu-Zn/Au (LKG type-Ⅲ) | |
| | | Plating thickness 12μm Plating type matte No heat treatment after plating | | Plating thickness 10μm Plating type matte No heat treatment after plating | — |
| | Resistance to soldering heat | Please refer to page 19 for the recommendation reflow condition. | Correspondence to 260°C flow soldering condition | | Not Applicable |
| | Solderability Tensile strength | No significant solderability difference between Sn-Ag-Cu and Sn-Pb solder. | | | — |
| Chromium (VI) | Plating material | Does not contain | | | Available (Chromium(VI) contained in the plating of fixtures) |
| Mercury<br>Cadmium<br>PBB, PBDE<br>DIBP, DBP, BBP, DEHP | | Does not contain | | | |
| Identification for RoHS compliance parts | | Part numbers are changed Add "Pb-free" marking on inner and outer carton label. | Part numbers are changed Add "Pb-free" and "PVCless" marking on inner and outer carton label. | | Part numbers are changed Add "RoHS" marking on outer carton label. |
| MSL (IPC/JEDEC J-STD-020D) | | Not Applicable | | | |

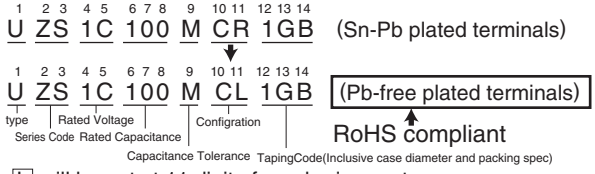
# Part Numbering for Pb-free Aluminum Electrolytic Capacitors

## SMD type

Part Numbers for Pb-free SMD type capacitors represent as follows:

(1) When certain part numbers are changed because of replacement with Pb-free plated terminals, their 11 digit shows the distinction.

(Example)




L will be put at 11 digit of numbering system

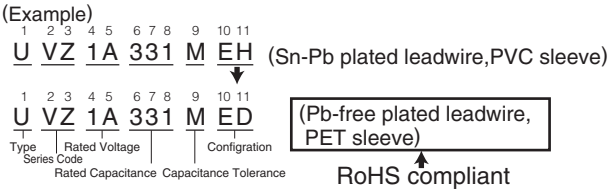
Exception : ※**10th digit** of the part number also need to be changed for the following type・series and case size.
8X6.2 case size of UWF, UUX and UUR : **BR** to **CL**
※UUE, UBC (Vibration Resistance) is only Pb-free and 11th digit the part number change to "S".
※UCD is only Pb-free. In case of φ12.5 or more: 11th digit the part number change to "J".

## Lead wire terminal type

Part Numbers for Pb-free type capacitors represent as follows:

(1) When certain part numbers are changed because of replacement with Pb-free plated leadwire and PVC less , sleeves the **11th digit** of the part number represents the distinction.

(Example)

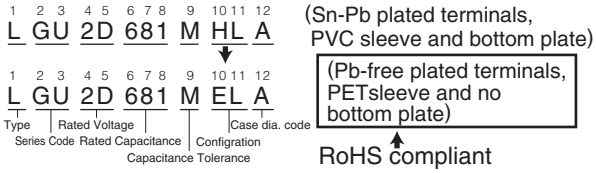



D will be put at 11 digit of numbering system

*Configuration code is subject to change by series of case diameter.

## Snap-in terminal type

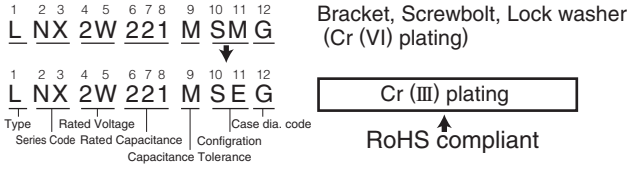
(Example)




E will be put at 10 digit of numbering system

## Screw terminal type

(Example)




E will be put at 11 digit of numbering system

# Information about "China RoHS 2"

CONDUCTIVE POLYMER ALUMINUM SOLID ELECTROLYTIC CAPACITORS,CONDUCTIVE POLYMER HYBRID ALUMINUM ELECTROLYTIC CAPACITORS ALUMINUM ELECTROLYTIC CAPACITORS

| Type | Hazardous Substances | | | | | |
|---|---|---|---|---|---|---|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr Ⅵ) | Polybrominated biphenyls (PBB) | Polybrominated diphenyl ethers (PBDE) |
| P, R, G, U, L | ○ | ○ | ○ | ○ | ○ | ○ |

This table is prepared in accordance with the provision of SJ/T 11364.
○ : the amount of the hazardous substance indicated inside the homogeneous materials used for this part is below the limit requirement of GB/T 26572
× : the amount of the hazardous substance indicated inside at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572

# ALUMINIUM ELECTROLYTIC CAPACITORS

## Standardization

Some of the series listed below have been removed from the catalog.
On designing, please select from the new series for your applications.

| Type | Contents | Obsoleted Type • Series | New Type • Series | Page |
|---|---|---|---|---|
| Chip Type | • 3.0mmL, Ultra-Smaller-Sized | UZD → | UZR | WEB |
| | • 3.95mmL max. Bi-Polarized | UZE → | UWP | WEB |
| | • 4.5mmL, Bi-Polarized | UZP → | UWP | WEB |
| | • Long Life Assurance | UUV → | UUL | WEB |
| | • Low Impedance(Low ESR) | UUU → | PCF(Polymer) | 40 |
| | • For Audio Equipment | UUK → | UUQ | WEB |
| | • High Reliability, Higher Capacitance Range | UUH → | UUE | 137 |
| | • High C/V | UWS → | UUR | WEB |
| Miniature Type | • 5mmL, Long Life Assurance | UMQ → | UMV | — |
| | • 7mmL, Long Life Assurance | USQ • USV → | UUL(Chip) | WEB |
| | • Standard type | UVX → | UVR | 142 |
| | • Compact & Standard For General Purposes | UVS → | URS | WEB |
| | • Low profile Sized, Wide Temperature Range | URT → | URZ | 154 |
| | • 12.5mmL height | URU → | URZ | 154 |
| | • 12.5mmL, Low profile Sized, Wide Temperature Range | URY → | ※1 | — |
| | • Bi-Polarized, Wide Temperature Range | UET → | UEP | 157 |
| | • Miniature Sized, High Ripple Current, High Reliability(105°C 5000h) | UPB → | ※1 | — |
| | • Low Impedance, For Switching Power Supplies | UPD → | UPM | WEB |
| | • Miniature Sized,Low Impedance, For Switching Power Supplies | UPE → | UPW | 160 |
| | • Low Impedance, High Reliability | UPF → | UPJ | WEB |
| | • Standard, For Switching Power Supplies | UPR → | UPS | 178 |
| | • Low Impedance, High Reliability | UPY → | UPW | 160 |
| | • Extremely Low Impedance, High Reliability | UPL → | UPM | WEB |
| | • Miniature Sized, Low Impedance, High Reliability | UTT → | ※1 | — |
| | • Miniature Sized, Low Impedance, High Reliability | UPQ → | UPV | WEB |
| | • Miniature Sized, For Switching Power Supplies | UTS • UTT → | UCW(Chip) | 103 |
| | • High Temperature Range, For +125°C use | UBD → | UBT | 205 |
| | • Timer Circuit Use | UTM → | ※1 | — |
| | • Memory Back-Up Use | UJB → | ※1 | — |
| | • High Grade Type, For Audio Equipment | UFA • UFS → | UFG | WEB |
| | • For General Audio Equipment | UFM • UFX → | UFW | WEB |
| | • For Speaker Network | UGB → | ※1 | — |
| | • 5mmL, For Audio Equipment | UMC • UMW → | UUQ(Chip) | WEB |
| | • 7mmL, For Audio Equipment | USK • USW → | UUQ(Chip) | WEB |
| Large Can Type | • Snap-in Terminal Type, Standard | LLQ • LLU → | LLS | 226 |
| | • Snap-in Terminal Type, Miniature Sized | LLN → | LLG | 231 |
| | • Horizontal Mounting Type | LDM → | ※2 | — |
| | • Snap-in Terminal Type, Wide Temperature Range | LGQ → | LGU | 234 |
| | • Snap-in Terminal Type, Low-Profile Sized, Wide Temperature Range | LGE → | LGJ,LGJ (15) | 249,251 |
| | • Snap-in Terminal Type, Long Life, Wide Temperature Range | LGY(160 to 450V) → | LGR,LGZ | 256,258 |
| | • Wide Temperature Range, Horizontal Mounting Type | LDQ → | ※2 | — |
| | • Wide Temperature Range, High CV | LGK-HH → | ※3 | — |
| | • Screw Terminal Type, Standard | LNR (350 to 450V) → | LNX | 272 |
| | • Screw Terminal Type, 85°C High Voltage, For General Inverter | LNW → | LNY | 277 |
| | • Lug/Snap-in Terminal Type, For Audio Equipment | LGS → | LKG | WEB |

Please refer to our website for the details of the series described as "WEB".

※1 Please contact us for details.
※2 Please contact us if you need horizontal mounting type. (Refer to the Guidelines for Aluminum Electrolytic Capacitors) Please have schematic of dimensions for lead bend.
※3 Please contact us if you need multi-terminal-shape. (Refer to the Guidelines for Aluminum Electrolytic Capacitors) Please have schematic of dimensions for lead bend.

## Matrix for major series

Conductive Polymer Aluminum Solid Electrolytic Capacitors※ (Type:P)

| Configuration \ Feature | Standard | Low ESR | High Capacitance | Long Life / High Reliability | High Voltage / LongLife | High Voltage / High Reliability | High Capacitance Long Life |
|---|---|---|---|---|---|---|---|
| Chip type | **PCF** | **PCJ, PCK** | **PCG** | **PCS, PCL** | **PCV** | **PCX** | **PCR,PCM,PCH,PCZ** |
| Radial Lead type | **PLF** | **PLE** | **PLG** | **PLS** | **PLV** | **PLX** | — |

※ Please contact us about the FPCAP.

Miniature Aluminium Electrolytic Capacitors (Type:U)

| Configuration \ Feature | Standard (High C / V) | Bi-polarized | Low leakage current | Wide temperature range | For Audio equipment | Low impedance | Long life |
|---|---|---|---|---|---|---|---|
| Standard type | **UVR • UVK** | **UVP** | **UKL** | **UVZ • UVY** | **UFW** | **UPA • UPW** | **ULD** |
| Low Profile | **URS** | — | — | **URZ** | — | — | — |
| Chip type | **UZS, UWX, UUR, UUG** | **UWP, UUN** | — | **UZT, UWT** | **UUQ, UCQ** | **UUD, UCD** | **UUL, UUJ** |

Large Can Aluminum Electrolytic Capacitors (Type:L)

| Configuration \ Feature | 85°C Product | | 105°C Product | | | 125°C Product |
|---|---|---|---|---|---|---|
| | Standard type | Miniature type | Standard type | Miniature type | Long Life | Standard type |
| Standard type | **LLS** | **LLG** | **LGU • LGN** | **LGG • LGL • LGM** | **LGY•LGX•LGC•LGR•LGZ** | **LHT** |
| Low Profile | — | — | **LGJ** | **LGJ (15)** | — | — |
| Permissible abnormal voltage type | — | — | **LAK** | **LAQ • LAS** | — | — |

# Application Guidelines for Aluminum Electrolytic Capacitors

## 1. Circuit Design

( 1 ) Make sure the application and mounting conditions are within the conditions specified in the catalog or alternate product specification (Referred to as specification hereafter) The capacitor may be damaged, catch fire, or vent if it is used beyond the specified conditions in the catalog or alternate product specification.

( 2 ) Operating temperature and applied ripple current shall be within specification.

① The capacitor shall not be used in an ambient temperature which exceeds the operating temperature specified.

② Do not apply ripple current which exceeds the allowable ripple current.

( 3 ) Appropriate capacitors which comply with the life requirement of the products should be selected when designing the circuit.

( 4 ) Aluminum electrolytic capacitors are polarized. Make sure no reverse voltage or AC voltage is applied to the capacitors. Please use bi-polar capacitors in a circuit that can possibly see reversed polarity.
Note: Even bi-polar capacitors cannot be used for AC voltage application.

( 5 ) For a circuit that repeats rapid charging/discharging, a capacitor that is capable of enduring such conditions must be used. Welding machines and photo flash are a few examples of products that contain such a circuit. In addition, rapid charging/discharging may be repeated in control circuits for servomotors, in which the circuit voltage fluctuates substantially.
Selecting capacitors for circuits that have repeated rapid charging/discharging, please consult Nichicon.
If excess a rush current due to drastic charge/dis-charge was applied to conductive polymer aluminum solid electrolytic capacitors, and conductive polymer hybrid aluminum electrolytic capacitors, it may cause a short circuit or an increase in leakage current. Therefore, please do not apply a rush current that is larger than 10A.

( 6 ) Make sure no voltage (higher than the rated voltage) is applied to the capacitor.

① The peak voltage, which is the DC voltage overlapped by ripple current, does not exceed the rated voltage.

② Where more than 2 aluminum electrolytic capacitors are used in series, make sure the applied voltage will be lower than rated voltage and voltage will be applied to each capacitor equally using a balancing resistor in parallel with the capacitors.
Please do not use conductive polymer alminum solid electrolytic capacitors, and conductive polymer hybrid aluminum electrolytic capacitors for the application listed below, since the solid organic polymer aluminum electrolytic capacitor cannot reach it's maximum performance.
1) Coupling circuits
2) R-C timing circuit
3) High impedance voltage retention circuit
4) Circuits, which extremely low voltage in compared to the rated voltage is only applie
5) Circuits, which are greatly affected by leakage currents for special use such as multiple parts used in a series, please contact us for recommendations

( 7 ) Aluminum electrolytic capacitors must be electrically isolated as follows:
(The aluminum case and the cathode foil are connected by the unstable resistance of a naturally formed oxide layer inside the aluminum case and the electrolyte.)

① (a) Case and negative terminal (except axisl leaded part such as JIS configuration 02 type)
(b) Case and positive terminal
(c) Case and circuit pattern

② Auxiliary terminal of can type such as JIS style symbol 693, 694 or 695 and negative and positive terminal, including the circuit pattern.

③ Case and both terminals of a bi-polarized capacitor.

( 8 ) Outer sleeve of the capacitor is not guaranteed as an electrical insulator. Do not use a standard sleeve on a capacitor in applications that require the electrical insulation. When the application requires special insulation, please contact our sales office for details.

( 9 ) Capacitors may fail if they are used under the following conditions:

① Environmental (climatic) conditions
(a) Being exposed to water, high temperature & high humidity atmosphere, or condensation of moisture.
(b) Being exposed to oil or an atmosphere that is filled with particles of oil.
(c) Being exposed to salty water or an atmosphere that is filled with particles of salt.
(d) In an atmosphere filled with toxic gasses (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, ammonia, etc.)
(e) Being exposed to direct sunlight, ozone, ultraviolet ray, or radiation
(f) Being exposed to acidic or alkaline solutions

② Under severe conditions where vibration and/or mechanical shock exceed the applicable ranges of the specifications.

(10) When designing a P.C. board, please pay attention to the following:

① Have the hole spacing on the P.C. board match the lead spacing of the capacitor.

② There should not be any circuit pattern or circuit wire above the capacitor pressure relief vent.

③ Unless otherwise specified, following clearance should be made above the pressure relief vent.

| Case Diameter | Clearance Required |
|---|---|
| φ 6.3 to 16mm | 2mm or more |
| φ 18 to 35mm | 3mm or more |
| φ 40mm or more | 5mm or more |

④ In case the vent side is placed toward P.C. board (such as end seal vented parts), make a corresponding hole on the P.C. board to release the gas when vent is operated. The hole should be made to match the capacitor vent position.

⑤ Screw terminal capacitors must be installed with their end seal side facing up. When you install a screw terminal capacitor in a horizontal position, the positive terminal must be in the upright position.

(11) The main chemical solution of the electrolyte and the separator paper used in the capacitors are combustible. The electrolyte is conductive. When it comes in contact with the P.C. board, there is a possibility of pattern corrosion or short circuit between the circuit pattern which could result in smoking or catching fire.
Do not locate any circuit pattern beneath the capacitor end seal.

(12) Do not design a circuit board so that heat generating components are placed near an aluminum electrolytic capacitor or reverse side of P.C. board (under the capacitor).

(13) Please refer to the pad size layout recommendations in our catalog when designing in surface mount capacitors.

(14) Electrical characteristics may vary depending on changes in temperature and frequency. Please consider this variation when you design circuits.

(15) When you mount capacitors on the double-sided P.C. boards, do not place capacitors on circuit patterns or over on unused holes.

(16) The torque for terminal screw or brackets screws shall be within the specified value on Nichicon's drawings.

(17) When you install more than 2 capacitors in parallel, consider the balance of current flowing though the capacitors. Especially, when a solid conductive polymer aluminum electrolytic capacitors, Conductive polymer hybrid aluminum electrolytic capacitors and a standard aluminum electrolytic capacitors are connected in parallel, special consideration must be given.

(18) If more than 2 aluminum electrolytic capacitors are used in series, make sure the applied voltage will be lower than the rated voltage and that voltage will be applied to each capacitor equally using a balancing resistor in parallel with each capacitor. If one side is shorted, the other side may be applied an overvoltage.

(19) When capacitors are connected in series or parallel, an imbalance current may cause to a short circuit on one side and an overvoltage on the other side.

## 2. Mounting

( 1 ) Once a capacitor has been assembled in the set and power applied, Even if a capacitor is discharged, an electric potential(restriking voltage) may exist between the terminals.

( 2 ) Electric potential between positive and negative terminal may exist as a result of returned electromotive force, so please discharge the capacitor using a 1kΩ resistor.

( 3 ) Leakage current of the parts that have been stored for more than 2 years may increase. If leakage current has increased, please perform a voltage treatment using 1kΩ resistor.

( 4 ) Please confirm ratings before installing capacitors on the P.C. board.

( 5 ) Please confirm polarity before installing capacitors on the P.C. board.

( 6 ) Do not drop capacitors on the floor, nor use a capacitor that was dropped.

( 7 ) Do not damage the capacitor while installing.

( 8 ) Please confirm that the lead spacing of the capacitor matches the hole spacing of the P.C. board prior to installation.

( 9 ) Snap-in can type capacitor such as JIS style symbol 692, 693, 694 and 695 type should be installed tightly to the P.C. board (allow no gap between the P.C. board an bottom of the capacitor).

(10) Please pay attention that the clinch force is not applied on the main body of the capacitor when capacitors are placed and fixed by an automatic insertion machine.

(11) Please pay attention to that the mechanical shock to the capacitor by suction nozzle of the automatic insertion machine or automatic mounter, or by product checker,or by centering mechanism.

(12) Hand soldering.

① Soldering condition shall be confirmed to be within the specification.

② If it is necessary that the leads must be formed due to a mismatch of the lead space to hole space on the board, bend the lead prior to soldering without applying too much stress to the capacitor.

③ If you need to remove parts which were soldered, please melt the solder enough so that stress is not applied to lead.

④ Please pay attention so that solder iron does not touch any portion of capacitor body.

(13) Flow soldering (Wave solder)

① Aluminum capacitor body must not be submerged into the solder bath. Aluminum capacitors must be mounted on the "top side" of the P.C. board and only allow the bottom side of the P.C. board to come in contact with the solder.

② Soldering condition must be confirmed to be within Nichicon specification.
Solder temperature: 260±5ºC Immersing lead time:10±1 second, Thickness of P.C. board : 1.6mm.

③ Please avoid having flux adhere to any portion except the terminal.

④ Please avoid contact between other components and the aluminum capacitor.

(14) Reflow soldering (SMD only)

① Soldering condition must be confirmed to be within Nichicon specification.

② When an infrared heater is used, please pay attention to the extent of heating since the absorption rate of infrared, will vary due to difference in the color of the capacitor body, material of the sleeve and capacitor size.

(15) Soldeing flux

There are non-halogen types of flux that do not contain ionic halides, but contain many non-ionic halides. When these non-ionic halides infiltrate the capacitor, they cause a chemical reaction that is just as harmful as the use of cleaning agents. Use soldering flux that dose not contain non-ionic halides.

(16) Shrinkage,bulging and/or cracking could be seen on the outer sleeve of the capacitor when capacitors are kept in for more than 2 minutes at 150°C ambient temperature during soldering at reflow process or resin curing process. Applying high temperature gas or heat ray to capacitor can cause the same phenomenon.

(17) Do not tilt lay down or twist the capacitor body after the capacitor are soldered to the P.C. board.

(18) Do not carry the P.C. board by grasping the soldered capacitor.

(19) Please do not allow anything to touch the capacitor after soldering. If P.C. board are stored in a stack, please make sure P.C. board or the other components do not touch the capacitor.
The capacitors shall not be effected by any radiated heat from the soldered P.C. board or other components after soldering.

(20) Recommended Cleaning Condition
Applicable : Any type, any ratings.

Cleaning Agents

Based Alcohol solvent cleaning agent

Isopropyl Alcohol

Based water solvent cleaning agent

・Higher alcohol solvent type

Pine Alpha ST-100S

NEWPOLE B-12

・Surfactant type

Clean Through 750HS, 750HN, 750K, 750J

Cleaning Conditions :

Total cleaning time shall be no greater than 5 minutes by immersion, ultrasonic or other method.
(Temperature of the cleaning agent shall be 60°C maximum.)
After the board cleaning has been completed, the capacitors should be dried using hot air for a minimum of 10 minutes.
If the cleaning solution is infiltrated between the case and the sleeve, the sleeve might soften and swell when hot air temperature is too high. Therefore, hot air temperature should not exceed softening temperature(80°C) of the sleeve.
Insufficient dries after water rinse may cause appearance problems, such as sleeve shrinking, bottom-plate bulging.
In addition, a monitoring of the contamination of cleaning agents (electric conductivity, pH, specific gravity, water content, etc.) must be implemented.
After the cleaning, do not keep the capacitors in an atmosphere containing the cleaning agent or in an air tight container.
In addition regarding jet washing, please use caution since the sleeve may expand cause of the angle and / or the strength of the water jet. Depending on the cleaning method, the marking on a capacitor may be erased or blurred.

Consult Nichicon before using a cleaning method or a cleaning agent other than those recommended.
The use of hydro-chlorofluorocarbon (HCFC) is expected to be banned in the future and Nichicon does not recommend the use of HCFC as a cleaning agent considering its impact on the environment. When it is absolutely necessary to use HCFC, cleaning is possible under the following conditions:

| Cleaning Agent | | AK-225AES | | | |
|---|---|---|---|---|---|
| Applicable Series | Aluminum Electrolytic Capacitors | Conductive Polymer Aluminum Solid Electrolytic Capacitors※ | | Chip (SMD) Type | PCF, PCJ, PCK, PCG, PCS, PCL, PCV, PCX, PCR, PCM, PCH, PCZ |
| | | | | Miniature Type | PLF, PLE, PLG, PLS, PLV, PLX |
| | | Conductive Polymer Hybrid Aluminum Electrolytic Capacitors | | Chip (SMD) Type | GYA, GYB, GYC, GYD, GYE, GYF |
| | | Miniature Type | Chip (SMD) Type | | UZR, UZG, UZS, UZT, UWX, UWR, UWJ, UWP, UWT, UWZ, UWF, UWG, UUP, UUT, UUA, UUL, UCB, UCW, UCD, UCL, UCM, UCV, UUD, UWD, UUB(50V or less), UWH, UCJ, UCZ, UYA, UCH, UCX, UUR, UUX (100V or less ), UUQ, UCQ, UUN, UUE, UBC, UBH UUG (100V or less), UUJ (100V or less) |
| | | | Standard Products | | UVK (100V or less ) UVR (100V or less ) UVY (100V or less ) UVZ (100V or less ) URS (100V or less ) URZ (100V or less ) UVP, UEP |
| | | | High-Reliability Type | | UPM (100V or less ) UPW (100V or less ) UPA, UHV, UHD, UHE, UHW UPJ (100V or less ) UPS (100V or less ) UPV, UBT (100V or less) UBW, UBY, UXY, UBX (100V or less) |
| | | | For Special Circuit | | UKL UVX 02 type (100V or less ) |
| | | | For Audio Use | | UKA, UKZ, UFG, UKT, UKW, UFW, UES, UDB |
| | | Large Can Type | Standard Products | | LLS (100V or less ) |
| | | | High-Reliability Type | | LGU (100V or less ) LGY |
| Cleaning Conditions | | Within 5 minutes, total cleaning time by immersion, vapor spray, or ultrasonic and such. For SMD and ultra-miniature type, within 2 minutes total cleaning time. (Temp. of agent: 40°C or below) | | | |

※ Please contact us about the FPCAP.

(21) Fixing Material and Coating Material

1) Do not use any fixing or coating materials, which contain halide substance.
2) Remove flux and any contamination, which remains in the gap between the end seal and PC board.
3) Please dry the cleaning agent on the PC board before using fixing or coating materials.
4) Please do not apply any material all around the end seal when using fixing or coating materials.

There are variations of cleaning agents, fixing and coating materials, so please contact those manufacture or our sales office to make sure that the material would not cause any problems.

(22) Others

When halogen contained in a fumigation agent enters the capacitors, it may chemically react with the electrolytic solution, electrode foil, etc. inside. (Some gases mainly permeate the sealing parts of the capacitors and they enter the capacitors.)
When this chemical reaction progresses further, the capacitors may cause a leakage current failure, opening failure, pressure valve operation, etc. due to the corrosion of the aluminum materials inside.
The capacitors may be fumigated by halogen compounds, such as methyl bromide, when they are exported or being used to protect them against pests.
When fumigating capacitors and devices embedded with capacitors and when using packing materials, such as a pallet, that have been fumigated, be very careful so that the capacitors are not exposed to the halogen atmosphere.

## 3. In the equipment

( 1 ) Do not directly touch terminal by hand.

( 2 ) Do not short between terminals with conductor, nor spill conductible liquid such as alkaline or acidic solution on or near the capacitor.

( 3 ) Please make sure that the ambient conditions where the set is installed not have any of the following conditions:

① Being exposed to water, high temperature & high humidity atmosphere, or condensation of moisture.

② Being exposed to oil or an atmosphere that is filled with particles of oil.

③ Being exposed to salty water or an atmosphere that is filled with particles of salt.

④ In an atmosphere filled with toxic gasses (such as hydrogen sulfide, sulfurous acid, nitrous acid, chlorine, bromine, methyl bromide, ammonia, etc.).

⑤ Being exposed to acidic or alkaline solutions.

⑥ Since shrinkage, bulging and/or crack could be seen on outer sleeve of capacitor when capacitors are used in atmosphere where condensation of moisture occures, please confirm their adaptation before the use.
The condensation of moisture could occure when temperature cycling test /Rapid change of temperature test is performed, in this case, aforementioned sleeve problem could be seen.

## 4. Maintenance Inspection

( 1 ) Please periodically inspect the aluminum capacitors that are installed in industrial equipment. The following items should be checked:

① Appearance : Remarkable abnormality such as vent operation, leaking electrolyte etc.

② Electrical characteristic: Capacitance, dielectric loss tangent, leakage current, and items specified in the specification.

## 5. In an Emergency

( 1 ) If you see smoke due to operation of safety vent, turn off the main switch or pull out the plug from the outlet.

( 2 ) Do not bring your face near the capacitor when the pressure relief vent operates. The gasses emitted from that are over 100°C.
If the gas gets into your eyes, please flush your eyes immediately in pure water.
If you breathe the gas, immediately wash out your mouth and throat with water.
Do not ingest electrolyte. If your skin is exposed to electrolyte, please wash it away using soap and water.

## 6. Storage

( 1 ) It is recommended to keep capacitors between the ambient temperatures of 5°C to 35°C and a relative humidity of 75% or below.

( 2 ) Please make sure the ambient storage conditions will be free from the conditions that are listed in clause 1. "Circuit Design" at (9).

In order to maintain the satisfactory soldering condition for conductive polymer aluminum solid electrolytic capacitors, the following items must be strictly adhered to.
1) Parts should be stored sealed in a bag until they are actually used.
2) Once the sealed bag is cut open, all the parts should be used at one time. If not, then the remaining parts should be places in a bag and sealed with tape.
3) The storage period of products that can maintain good solderability should be within one year (in unopened package).

## 7. Disposal

( 1 ) Take either of the following methods in disposing of capacitors.

① Make a hole in the capacitor body or crush capacitors and incinerate them.

② If incineration is not applicable, hand them over to a waste disposal agent and have them buried in a landfill.

( 2 ) When removing a capacitor from the circuit board or when disposing of capacitor please ensure that the capacitor is properly discharged.

## 8. AEC-Q200 Compatibility

The Automotive Electronics Council (AEC) is an organization created by U.S. automakers and electronic component manufacturers for the standardization of reliability and certification criteria for automotive electronic components. AEC-Q200 is a certification reliability test standard for passive components widely adopted as the standard for electronic components for automotive use in Europe and the United States.
Nichicon provides products that conform to AEC-Q200 requirements. Please contact us for details.

The above mentioned material according to JEITA RCR - 2367D (issued in March, 2019), titled "Safety Application Guide for fixed aluminium electrolytic capacitors for use in electronic equipment".
Please refer to the book for details.

## Type numbering system ※1

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | Series name | | Rated voltage | | Rated capacitance | | | Capacitance tolerance | Configuration | | Size code | | |

| Conductive polymer type (CA32,04) | P |
|---|---|
| FPCAP (CA32,04) | R |
| Hybrid type | G |
| Aluminum electrolytic capacitors Chip type Radial lead type (CE32,04) | U |
| Aluminum electrolytic capacitors Axial lead type (CE02) | T |
| Aluminum electrolytic capacitors Can type (CE621,622,692, 694,695,331) | L |

| Rated voltage (V) | Code |
|---|---|
| 2.5 | 0E |
| 4 | 0G |
| 5.5 | 0L |
| 6.3 | 0J |
| 10 | 1A |
| 16 | 1C |
| 20 | 1D |
| 25 | 1E |
| 35 | 1V |
| 50 | 1H |
| 63 | 1J |
| 80 | 1K |
| 100 | 2A |
| 110 | 2Q |

| Rated voltage (V) | Code |
|---|---|
| 125 | 2B |
| 160 | 2C |
| 180 | 2Z |
| 200 | 2D |
| 220 | 2P |
| 250 | 2E |
| 315 | 2F |
| 350 | 2V |
| 400 | 2G |
| 420 | W6 |
| 450 | 2W |
| 500 | 2H |
| 550 | 2L |
| 600 | 2X |
| 630 | 2J |

| Capacitance (μF) | Code |
|---|---|
| 0.1 | 0R1 |
| 0.47 | R47 |
| 1 | 010 |
| 2.2 | 2R2 |
| 22 | 220 |
| 220 | 221 |
| 2200 | 222 |
| 22000 | 223 |

※ Standard capacitance tolerance is ±20%(M), please contact us for any other tolerance requirements.

| Cap. tol. (%) | Code |
|---|---|
| ±10 | K |
| ±20 | M |
| −10 to +30 | Q |
| −10 to +50 | T |
| Special | A |

Miniature Type
- Taped, lead cut / formed — Please refer to the Guidelines for Aluminum Electrolytic Capacitors.

Large Can Type
- Specification code

※1 Please contact us about the FPCAP part number.

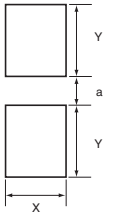
Product type and series names are listed on the top left of the individual specification pages.

## Surface Mount Type

### Recommended Land Size

(mm)

● Chip type aluminum electrolytic capacitors
Standard type



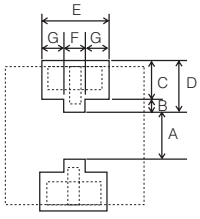

| Size | X | Y | a |
|---|---|---|---|
| φ4 | 1.6 | 2.6 | 1.0 |
| φ5 | 1.6 | 3.0 | 1.4 |
| φ6.3 | 1.6 | 3.5 | 1.9 |
| φ8×5.4L, φ8×6.2L | 2.5 | 4.0 | 2.1 |
| φ8 × 10L | 2.5 | 3.5 | 3.0 |
| φ10 | 2.5 | 4.0 | 4.0 |
| φ12.5 | 2.0 | 7.3 | 3.0 |
| φ16 | 2.0 | 7.9 | 5.3 |
| φ18 | 2.0 | 8.9 | 5.3 |

● Chip type aluminum electrolytic capacitors
Vibration Resistance Type (UCZ, UCH, UCX, UUE, UBC, UBH)

① φ6.3 to 10

| Size | X | Y | a |
|---|---|---|---|
| φ6.3× 7.7L | 3.0 | 4.0 | 1.6 |
| φ6.3×10 L | 3.0 | 4.0 | 1.6 |
| φ8 ×10 L | 4.3 | 5.3 | 2.0 |
| φ10 ×10 L | 4.3 | 5.6 | 3.3 |

② φ12.5 to 18




| Size | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| φ12.5 | 3.0 | 2.3 | 5.0 | 7.3 | 7.0 | 2.0 | 2.5 |
| φ16 | 5.3 | 2.9 | 5.0 | 7.9 | 7.0 | 2.0 | 2.5 |
| φ18 | 5.3 | 3.1 | 5.8 | 8.9 | 11.0 | 2.0 | 4.5 |

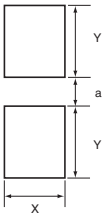
● Conductive polymer aluminum solid electrolytic capacitors

| Size | X | Y | a |
|---|---|---|---|
| φ5 | 1.6 | 3.0 | 1.4 |
| φ6.3 | 1.6 | 3.5 | 2.1 |
| φ8 | 2.0 | 3.5 | 3.0 |
| φ10 | 2.0 | 4.0 | 4.0 |

● Conductive polymer aluminum solid electrolytic capacitors
Vibration Resistance Type (PCX, PCR, PCM, PCH ,PCZ)

| Size | X | Y | a |
|---|---|---|---|
| φ6.3 × 8L | 3.0 | 4.0 | 1.6 |
| φ8 × 10.5L | 4.3 | 5.3 | 2.0 |
| φ10 × 10.5L | 4.3 | 5.6 | 3.3 |
| φ10 × 13.2L | 4.3 | 5.6 | 3.3 |

● Conductive polymer aluminum solid electrolytic capacitors
(RPS,RPA,RHS,RHA,RSS,RSA,RSB,RFS,RFA,RSL)




| Size | | X | Y | a |
|---|---|---|---|---|
| FPCAP | φ4 | 1.6 | 2.6 | 1.0 |
| | φ5 | 1.6 | 3.0 | 1.4 |
| | φ6.3 | 1.6 | 3.5 | 2.1 |
| | φ8 | 1.9 | 4.2 | 2.8 |
| | φ10 | 1.9 | 4.4 | 4.3 |

● Conductive polymer hybrid aluminum electrolytic capacitors
(GYA,GYB,GYC,GYD,GYE,GYF)

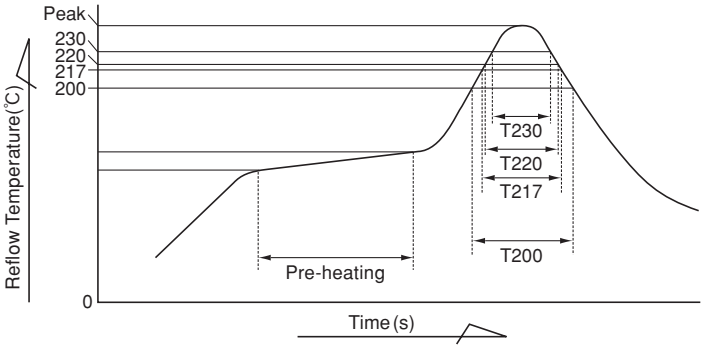
| Size | X | Y | a |
|---|---|---|---|
| φ6.3 | 1.6 | 3.5 | 1.9 |
| φ8 | 2.5 | 3.5 | 3.0 |
| φ10 | 2.5 | 4.0 | 4.0 |

● Conductive polymer hybrid aluminum electrolytic capacitors
Vibration Resistance Type

| Size | X | Y | a |
|---|---|---|---|
| φ6.3× 7.7L | 3.0 | 4.0 | 1.6 |
| φ8 ×10 L | 4.3 | 5.3 | 2.0 |
| φ10 | 4.3 | 5.6 | 3.3 |

〈Chip Type〉

## ■ Recommended conditions of Soldering by Reflow




T200 : Duration for over +200℃ at capacitor surface.
T217 : Duration for over +217℃ at capacitor surface.
T220 : Duration for over +220℃ at capacitor surface.
T230 : Duration for over +230℃ at capacitor surface.

The temperature measuring point is at the case top.

Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

| No. | Type・Series | Size | Pre-heating | Peak temperature | Duration over 230℃ | Duration over 220℃ | Duration over 217℃ | Duration over 200℃ | Reflow cycle |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Chip Type Conductive Polymer Aluminum Solid Electrolytic Capacitors (PCF, PCJ, PCK, PCG, PCS, PCL, PCV, PCX, PCR, PCM, PCH, PCZ) | — | +150°C to 200°C from 60 to 180s | 260°C Max. | within 60s | — | within 70s | — | 1cycle only (within 2 cycles※5 for series※4) |
| | | — | | 250°C Max. | within 60s | — | within 70s | — | within 2 cycles※5 |
| 2 | Conductive Polymer Hybrid Aluminum Electrolytic Capacitors (GYA, GYB, GYC, GYD, GYE, GYF) | — | +150°C to 180°C within 120s | 260°C Max. | within 40s | — | within 50s | — | 1cycle only |
| | | — | | 250°C Max. | within 30s | — | within 40s | — | within 2 cycles※5 |
| 3 | Chip Type Aluminum Electrolytic Capacitors (UZS, UZT, UWX※1, UWR, UWP※1, UWT※1, UWF, UWG, UUP, UUT, UUA, UUL, UCB, UCW, UCD※2, UCL, UCM※2, UCV, UUD, UUB※3, UCJ, UCZ※2, UCH, UCX※2, UUR, UUX※3, UUQ, UCQ, UUE※2, UBC※2, UBH) | ～ φ10 | | 250°C Max. | within 30s | — | within 40s | — | within 2 cycles※5 |
| 4 | Chip Type Aluminum Electrolytic Capacitors (UWX, UWP, UWT) | φ8×5.4L | | 245°C Max. | — | within 30s | within 30s | — | within 2 cycles※5 |
| 5 | Chip Type Aluminum Electrolytic Capacitors (UZR, UZG) | 3.9L | | 240°C Max. | — | within 30s | within 30s | — | within 2 cycles※5 (φ6.3:1 cycle only) |
| 6 | Chip Type Aluminum Electrolytic Capacitors (UUX(160-400V), UUB(160-400V), ULT, ULH, ULR, ULV) | ～ φ10 | | 240°C Max. | — | within 30s | within 30s | — | within 2 cycles※5 |
| 7 | Chip Type Aluminum Electrolytic Capacitors (UCD, UCM, UCZ, UYA, UCX, UUG, UUJ, UUN, UUE, UBC) | φ12.5 ～ | | 240°C Max. | — | — | within 30s | within 60s | within 2 cycles※5 |
| 8 | Chip Type Aluminum Electrolytic Capacitors※6 (UWJ, UWZ, UWD, UWH) | — | | 260°C Max. | within 60s | — | within 70s | — | within 2 cycles※5 (φ8×6.2L and φ10×10L: 1 cycle only) |

s=seconds

※1: For φ8×5.4L, please refer to the No.4.
※2: For φ12.5 or greater, please refer to the No.7.
※3: For 160～400V, please refer to the No.6.
※4: Including PCR, PCM, PCH and PCZ.
※5: Please make sure the parts have enough cooling down time between the first and second soldering process.
※6: For High Temp. Reflow.

### ESR. Impedance Measuring Point

**Radial lead type**
ESR should be measured at both of the terminal ends closest to the capacitor body.

**Chip type**
ESR should be measured at both of the terminal ends closest where the terminals protrude through the plastic platform.

## ■ Taping Specifications for Chip Type Capacitors

※ Please refer to FPCAP Taping Specifications for Chip Type about the FPCAP product spec.

● Carrier tape (mm)

Fig.1 For φ10 or less

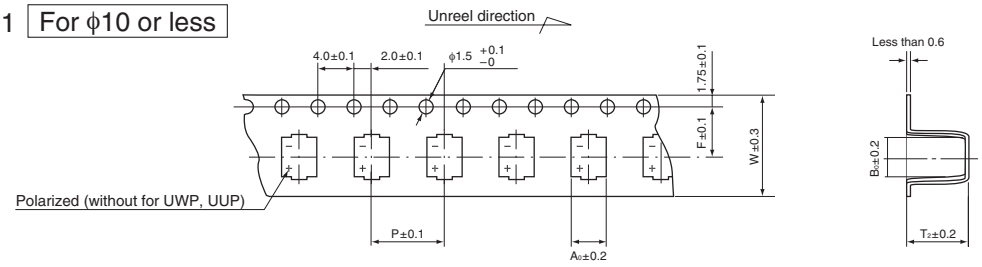
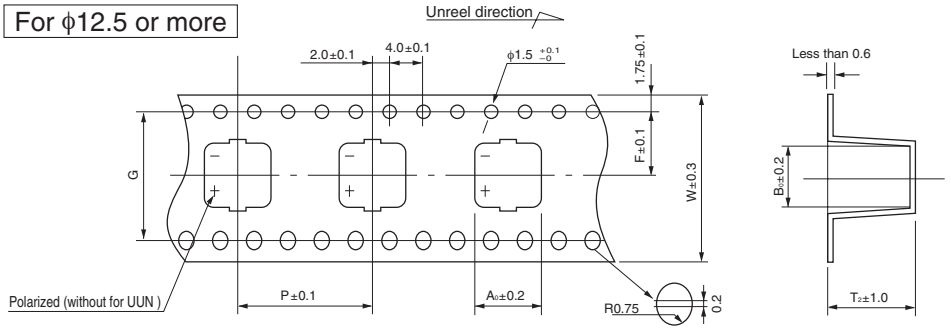
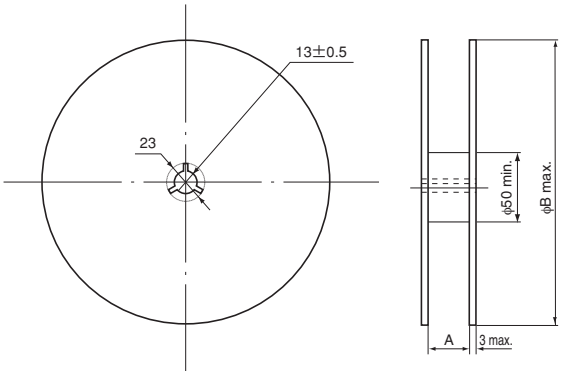



Fig.2 For φ12.5 or more




| Size | Item | | | | | | | fig. | Type · Series |
|---|---|---|---|---|---|---|---|---|---|
| | W | P | F | A0 | B0 | T2 | G | | |
| φ5 × 6 L | 12.0 | 12.0 | 5.5 | 5.7 | 5.7 | 6.3 | | | |
| φ6.3 × 5.5 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 5.7 | | | |
| φ6.3 × 6 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 6.3 | | | |
| φ6.3 × 8 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 8.2 | | | |
| φ8 × 7 L | 24.0 | 12.0 | 11.5 | 8.7 | 8.7 | 7.3 | | | |
| φ8 × 8 L | 24.0 | 12.0 | 11.5 | 8.7 | 8.7 | 8.3 | | | |
| φ8 × 10 L | 24.0 | 16.0 | 11.5 | 8.7 | 8.7 | 11.0 | — | 1 | PCF, PCJ, PCK, PCG, PCS, PCL, PCV, PCX, PCR, PCM, PCH, PCZ (Conductive Polymer Aluminum Solid Electrolytic Capacitors) |
| φ8 × 10.5 L | 24.0 | 16.0 | 11.5 | 8.7 | 8.7 | 11.0 | | | |
| φ8 × 12 L | 24.0 | 16.0 | 11.5 | 8.7 | 8.7 | 12.3 | | | |
| φ10 × 8 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 8.3 | | | |
| φ10 × 10 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 11.0 | | | |
| φ10 × 10.5 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 11.0 | | | |
| φ10 × 12.7 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 12.8 | | | |
| φ10 × 13.2 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 13.5 | | | |
| φ6.3 × 5.8 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 6.3 | | | |
| φ6.3 × 7.7 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 8.0 | | | |
| φ8 × 10 L | 24.0 | 16.0 | 11.5 | 8.7 | 8.7 | 11.0 | — | 1 | GYA, GYB, GYC, GYD, GYE, GYF (Conductive Polymer Hybrid Aluminum Electrolytic Capacitors) |
| φ10 × 10 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 11.0 | | | |
| φ10 × 12.5 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 14.1 | | | |
| φ4 × 3.9 L | 12.0 | 8.0 | 5.5 | 4.7 | 4.7 | 4.3 | | | |
| φ5 × 3.9 L | 12.0 | 12.0 | 5.5 | 5.7 | 5.7 | 4.3 | — | 1 | UZR, UZG |
| φ6.3 × 3.9 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 4.4 | | | |
| φ4 × 4.5 L | 12.0 | 8.0 | 5.5 | 4.7 | 4.7 | 4.9 | | | |
| φ5 × 4.5 L | 12.0 | 12.0 | 5.5 | 5.7 | 5.7 | 4.9 | — | 1 | UZS, UZT, UCQ |
| φ6.3 × 4.5 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 5.0 | | | |
| φ4 × 5.4 L | 12.0 | 8.0 | 5.5 | 4.7 | 4.7 | 5.8 | | | |
| φ5 × 5.4 L | 12.0 | 12.0 | 5.5 | 5.7 | 5.7 | 5.8 | — | 1 | UWX, UWR, UWJ, UWP, UWT, UWZ, UWF, UWG, UUQ |
| φ6.3 × 5.4 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 5.8 | | | |
| φ8 × 5.4 L | 16.0 | 12.0 | 7.5 | 8.7 | 8.7 | 5.8 | | | |
| φ4 × 5.8 L | 12.0 | 8.0 | 5.5 | 4.7 | 4.7 | 6.3 | | | |
| φ5 × 5.8 L | 12.0 | 12.0 | 5.5 | 5.7 | 5.7 | 6.3 | — | 1 | UWT, UWZ, UUT, UUP, UCD, UCL, UCM, UUD, UWD, UCZ, UUR, UUA, UUL, UCQ |
| φ6.3 × 5.8 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 6.3 | | | |
| φ4 × 7 L | 12.0 | 8.0 | 5.5 | 4.7 | 4.7 | 7.5 | | | |
| φ5 × 7 L | 16.0 | 12.0 | 7.5 | 5.7 | 5.7 | 7.5 | | | |
| φ6.3 × 7 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 7.5 | | | |
| φ6.3 × 7.7 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 8.0 | | | |
| φ6.3 × 8.7 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 9.1 | | | |
| φ6.3 × 10 L | 16.0 | 12.0 | 7.5 | 7.0 | 7.0 | 11.4 | — | 1 | UWT, UWZ, UWF, UWG, UUA, UUL, UCB, UCW, UCD, UCL, UCM, UCV, UUD, UWD, UUB, UWH, ULT, ULH, UCJ, UCZ, UYA, UCH, UCX, UUR, UUX, ULR, ULV, UUQ, UCQ,UUE, UBC, UBH |
| φ8 × 6.2 L | 16.0 | 12.0 | 7.5 | 8.7 | 8.7 | 6.8 | | | |
| φ8 × 10 L | 24.0 | 16.0 | 11.5 | 8.7 | 8.7 | 11.0 | | | |
| φ10 × 7.7 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 8.4 | | | |
| φ10 × 10 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 11.0 | | | |
| φ10 × 13.5 L | 24.0 | 16.0 | 11.5 | 10.7 | 10.7 | 14.1 | | | |
| φ12.5 × 13.5 L | 32.0 | 24.0 | 14.2 | 14.0 | 14.0 | 14.0 | 28.4 | | |
| φ12.5 × 16 L | 32.0 | 24.0 | 14.2 | 14.0 | 14.0 | 16.3 | 28.4 | | |
| φ12.5 × 21 L | 32.0 | 24.0 | 14.2 | 14.0 | 14.0 | 21.3 | 28.4 | | |
| φ16 × 16.5 L | 44.0 | 28.0 | 20.2 | 17.5 | 17.5 | 16.8 | 40.4 | 2 | UCD, UCM, UCZ, UCX, UUG, UUJ, UUN, UUE, UBC |
| φ16 × 21.5 L | 44.0 | 28.0 | 20.2 | 17.5 | 17.5 | 21.8 | 40.4 | | |
| φ18 × 16.5 L | 44.0 | 32.0 | 20.2 | 19.5 | 19.5 | 16.8 | 40.4 | | |
| φ18 × 21.5 L | 44.0 | 32.0 | 20.2 | 19.5 | 19.5 | 21.8 | 40.4 | | |

● Reel ※Please refer to FPCAP Taping Specifications for Chip Type about the FPCAP product spec. (mm)




### Package quantity

| φD, φD × L | Q'ty / reel |
|---|---|
| 4 | 2,000pcs. |
| 4 × 7 | 1,500pcs. |
| 5, 6.3 | 1,000pcs. |
| 6.3 × 7.7, 6.3 × 8, 8 × 8 | 900pcs. |
| 6.3 × 8.7 | 800pcs. |
| 6.3 × 10 | 600pcs. |
| 8 × 5.4, 8 × 6.2, 8 × 7 | 1,000pcs. |
| 8 × 10 , 8 × 10.5, 10 × 7.7, 10 × 8 ,10 × 10 ,10 × 10.5 | 500pcs. |
| 8 × 12, 10 × 12.5, 10 × 12.7, 10 × 13.2, 10 × 13.5 | 400pcs. |
| 12.5 × 13.5 | 200pcs. |
| 12.5 × 16 | 150pcs. |
| 12.5 × 21, 16 × 16.5, 18 × 16.5 | 125pcs. |
| 16 × 21.5, 18 × 21.5 | 75pcs. |

### Conductive Polymer Aluminum Solid Electrolytic Capacitors

| φD | 5 | 6.3 | 8 | 10 |
|---|---|---|---|---|
| A | 14 | 18 | 26 | |
| B | 382 | | | |

### Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

| φD | 6.3 | 8 | 10 |
|---|---|---|---|
| A | 18 | 26 | |
| B | 382 | | |

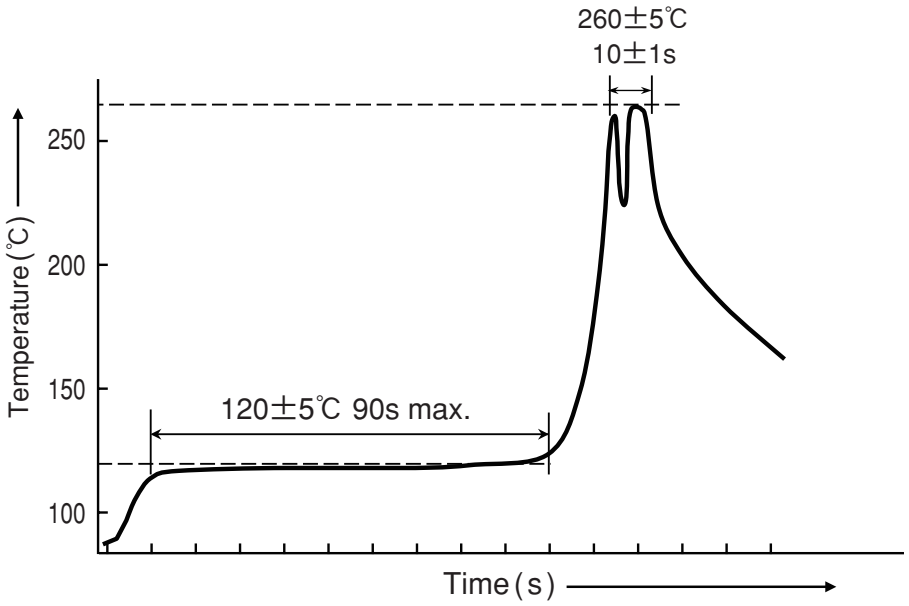
### Aluminum Electrolytic Capacitors

| φD | 4 | 5×3, 5×3.9, 5×4.5, 5×5.4, 5×5.8 | 5×7 | 6.3 | 8×5.4, 8×6.2 | 8×7, 8 ×10, 10 ×7.7, 10 ×8, 10 ×10, 10 ×13.5 | 12.5 | 16, 18 |
|---|---|---|---|---|---|---|---|---|
| A | 14 | 14 | 18 | 18 | 18 | 26 | 34 | 46 |
| B | 382 | 382 | 382 | 382 | 382 | 382 | 332 | 332 |

Optional tray packaging for chip type (φ12.5 to φ18) available upon request, please ask for details.

# Lead type aluminum electrolytic capacitors

## Recommended conditions for flow soldering




Recommended flow soldering conditions
Preheat : 120±5℃ 90s max.
Flow : 260±5℃ 10±1s

Temperature measurement position
A lead on the back of the board
(See the figure on the right)

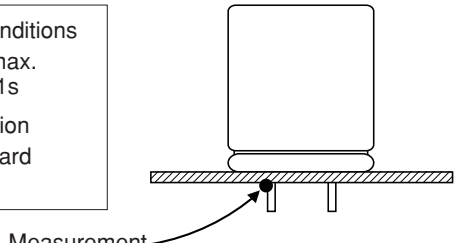



Figure :
Temperature measurement point

## Recommended conditions for soldering irons

Temperature at the tip of the soldering iron. :
350±10℃ 3+1/−0s

※ Conductive polymer aluminum solid electrolytic capacitors are not covered so please inquire separately.

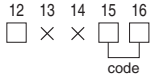
## ※Trimmed (Cut) or Formed Leads ※Please refer to FPCAP Lead Forming about the FPCAP product spec.

● Radial lead type
In order to identify correct part number for the processed lead product, cut/formed lead code must be added to bulk part number.

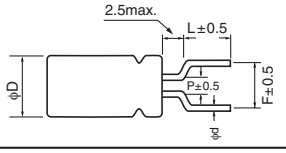
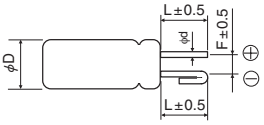
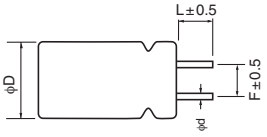
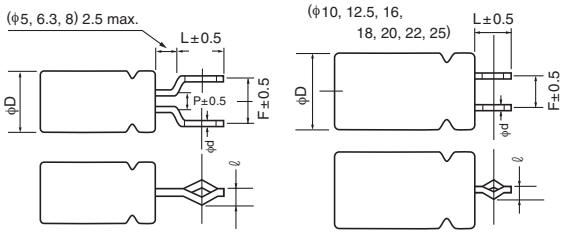
● If the bulk part number is up to 11th digit, processed lead coding shall be as follows:


● In case 12th digit is numeral, it shall be:


● In case 12th digit is alphabet, it shall be:



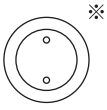
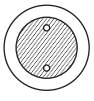

(mm)

| Configurations | Cut / Formed lead code | Dimensions (mm) | | | | Lead configurations |
|---|---|---|---|---|---|---|
| | Code | φD | F | L | ℓ | |
| Forming and cutting | FA | 5 | 5 | 5.0 | — |  |
| | | 6.3 | | | — | |
| | | 8 | | | — | |
| | FV | 5 | 5 | 3.5 | — | |
| | | 6.3 | | | — | |
| | | 8 | | | — | |
| Forming and cutting | SZ | 10 | 5 | 3.2 | — |  ※Please contact your local Nichicon sales office for the following sizes. —10mm Diameter parts with 25mm length or larger —12.5 to18mm Diameter parts with 12.5mm length or less, and 46mm or larger ※This operation is available on product made in Japan. |
| | | 12.5 | | | — | |
| | | 16 | 7.5 | | — | |
| | | 18 | | | — | |
| Cutting | CA | 5 | 2.0 | 5.0 | — |  |
| | | 6.3 | 2.5 | | — | |
| | | 8 | 3.5 | | — | |
| | | 10 | 5 | | — | |
| | | 12.5 | | | — | |
| | | 16 | 7.5 | | — | |
| | | 18 | | | — | |
| | | 20 | 10 | | — | |
| | | 22 | | | — | |
| | | 25 | 12.5 | | — | |
| | CP | Same as above. | | 4.5 | — | |
| | CC | Same as above. | | 4.0 | — | |
| | CV | Same as above. | | 3.5 | — | |
| | CT | Same as above. | | 3.2 | — | |
| | CM | Same as above. | | 3.0 | — | |
| Snap-in | AA | 5 | 5 | 4.5 | 1.1 |  |
| | | 6.3 | | | | |
| | | 8 | | | 1.3 | |
| | | 10 | 5 | 4.5 | 1.3 | |
| | | 12.5 | | | | |
| | | 16 | 7.5 | | | |
| | | 18 | | | | |
| | | 20 | 10 | 5.0 | 1.8 | |
| | | 22 | | | | |
| | | 25 | 12.5 | | | |

● Conductive polymer aluminum solid electrolytic capacitors : Cutting configurations only

*Lead diameter (φd) and lead pitch (P) are subject to capacitor specifications.

## End seal Configuration ※Please contact us about the FPCAP.

| Configuration | ※1 | | | | |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| φ(mm) | — | 5・6.3 | 8・10 | 12.5・16・18 | 20・22・25 |

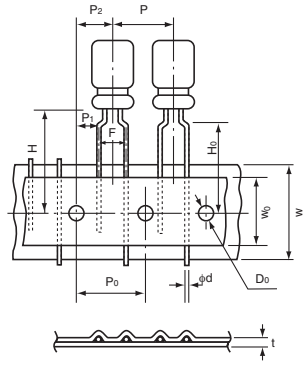
Exception : The followings refer to ※1.
- φ6.3 × 6mmL, φ6.3 × 9mmL, φ8 × 7mmL, φ8 × 9mmL, φ10 × 8mmL, φ10 × 10mmL size of PLF, PLE, PLG, PLS, PLV, PLX.
- UPV.
- UCS and UPZ with 9 in the 12th digit of the part number.

## ※Taped Leads for Automatic Insertion Systems

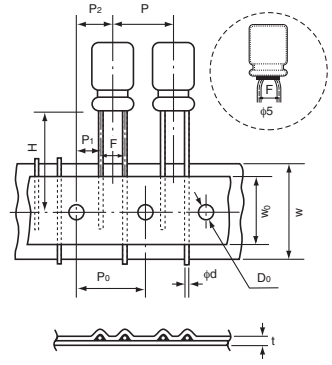
※Please refer to FPCAP Taped Leads for Automatic Insertion Systems about the FPCAP product spec.

- Radial lead type (Applicable standard JIS C0806-2)
  In order to identify correct part number for the taped product, taping code must be added.
- If the bulk part number is up to 11th digit, taping code shall be as follows: 12 13 14 — 1 □ □ code
- In case 12th digit is numeral, it shall be 12 13 14 — □ □ □ code
- In case 12th digit is alphabet, it shall be 12 13 14 15 16 — × × □ □ code

(Formed lead type)




(Straight lead type)




- Special taping specifications on H. F. and K. dimensions other than the above figures are available upon request.
- Conductive polymer aluminum solid electrolytic capacitors : Straight lead type only
- Only the above mentioned dimensions are specified.

(mm)

| Specifications | | | | Capacitor diameter (φ) | Taping code | |
|---|---|---|---|---|---|---|
| Packaging | Lead style | F | P0 | | Code | Applicable size |
| Ammo-pack | Formed lead | See Table 1 | 12.7 | 5 to 8 | TA | φ5×11 to φ8×20 |
| | Straight lead | See Table 2 | 12.7 | 5 to 10 | TP | φ6.3×6※ |
| | | | | | TD | φ5×11, φ6.3×9 or more, φ8×7 or more, φ10×8 to 25 |
| | | See Table 2 | 15.0 | 12.5 | TO | φ12.5×12.5 to 25 |
| | | See Table 2 | 15.0 | 16, 18 | TN | φ16×15 to 25, φ18×15 to 25 |

Notes: ※ Conductive polymer aluminum solid electrolytic capacitors

### Table 1

(mm)

| Item \ Case Size / Taping Code | | Tolerance | Formed Lead Type Case dia (φ) × Length (L) | |
|---|---|---|---|---|
| | | | φ5 × 11<br>φ6.3 × 11<br>φ6.3 × 15 | φ8 × 11.5<br>φ8 × 15<br>φ8 × 20 |
| | | | TA | TA |
| φd | Lead-wire diameter | ±0.05 | 0.5 | 0.6 |
| P | Pitch of component | ±1.0 | 12.7 | 12.7 |
| P0 | Feed hole pitch | ±0.2 | 12.7 | 12.7 |
| P1 | Hole center to lead | ±0.5 | 3.85 | 3.85 |
| P2 | Feed hole center to component center | ±1.0 | 6.35 | 6.35 |
| F | Lead-to-lead distance | +0.8 −0.2 | 5.0 | 5.0 |
| H | Height of component from tape center | ±0.75 | 18.5 | 20.0 |
| H0 | Lead-wire clinch height | ±0.5 | 16.0 | 16.0 |
| W | Tape Width | ±0.5 | 18.0 | 18.0 |
| W0 | Hold down tape width | min. | 7.0 | 7.0 |
| φD0 | Feed hole diameter | ±0.2 | 4.0 | 4.0 |
| t | Total tape thickness | ±0.2 | 0.6 | 0.6 |

### Table 2

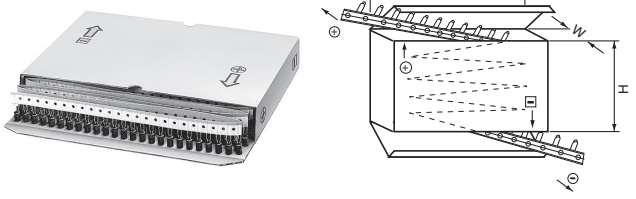
(mm)

| Item \ Case Size / Taping Code | | Tolerance | Straight Lead Type Case dia (φ) × Length (L) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | φ5 | φ6.3 | φ8 × 7 | φ8 | φ10 | φ12.5 | φ16<br>φ18 |
| | | | TD | TP, TD | TD | TD | TD | TO | TN |
| φd | Lead-wire diameter | ±0.05 | 0.5, 0.6 | 0.45<br>0.5, 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 |
| P | Pitch of component | ±1.0 | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 15.0 | 30.0 |
| P0 | Feed hole pitch | ±0.2 | 12.7 | 12.7 | 12.7 | 12.7 | 12.7 | 15.0 | 15.0 |
| P1 | Hole center to lead | ±0.5 | 5.1<br>(※1 5.35) | 5.1 | 4.6 | 4.6 | 3.85 | 5.0 | 3.75 |
| P2 | Feed hole center to component center | ±1.0 | 6.35 | 6.35 | 6.35 | 6.35 | 6.35 | 7.5 | 7.5 |
| F | Lead-to-lead distance | +0.8 −0.2 | 2.5※1 | 2.5 | 3.5 | 3.5 | 5.0 | 5.0 | 7.5※2 |
| H | Height of component from tape center | ±0.75 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 | 18.5 |
| W | Tape Width | ±0.5 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| W0 | Hold down tape width | min. | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 12.5 | 12.5 |
| φD0 | Feed hole diameter | ±0.2 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 |
| t | Total tape thickness | ±0.2 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |

Notes: ※ 1 F = 2.0mm is also available, provided Taping code to be TC.
※ 2 Tolerance on F for φ16 and φ18 units shall be ±0.8mm.

## Packaging

- Ammo-pack (Flat box type)



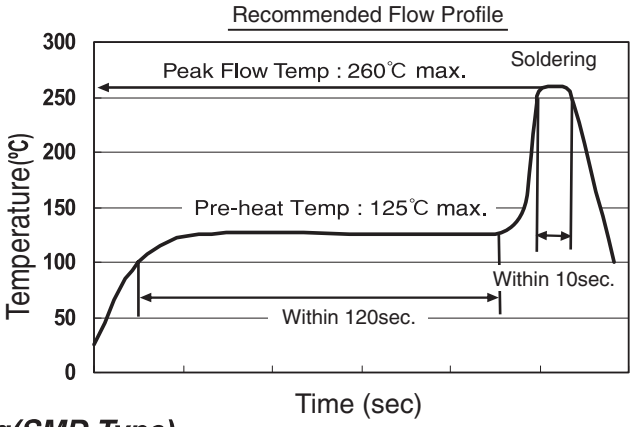

(mm)

| L (mm) | H (mm) | W (mm) | Case Size (φD × L) | Q'ty / Box |
|---|---|---|---|---|
| 340 | 250 | 50 | 8 × 7, 8 × 8 | 1,000 |
| 340 | 300 | 50 | 6.3 × 6 | 2,000 |
| 340 | 260 | 54 | 5 × 11 | 2,000 |
| | | | 8 × 9, 8 × 10, 8 × 11.5, 8 × 12, 8 × 15 | 1,000 |
| 340 | 200 | 54 | 10×8, 10×9, 10×10, 10×12.5, 10×13, 10×15, 10×16 | 500 |
| 340 | 300 | 54 | 6.3×9, 6.3×10.5, 6.3×11, 6.3×15 | 2,000 |
| 340 | 260 | 62 | 8 × 20 | 1,000 |
| 340 | 200 | 62 | 10 × 20 | 500 |
| 340 | 200 | 65 | 10 × 25 | 500 |
| 330 | 290 | 65 | 12.5 × 12.5, 12.5 × 15, 12.5 × 20 | 500 |
| | | | 12.5 × 25 | |
| | | | 18 × 15, 18 × 20, 18 × 25 | 250 |
| 320 | 230 | 65 | 16 × 15, 16 × 20, 16 × 25 | 250 |

## *FPCAP* Lead free and RoHS directive compliant soldering requirements

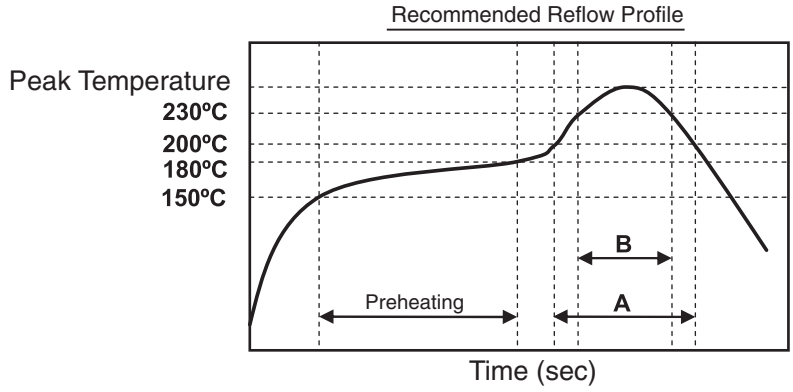
### *Flow Soldering(Radial Lead Type)*

***RNS, RR7, RR5, RL8, RE5, RS8, RF8, RNU, RNE, RNL, RS6, RHT***




### *Reflow Soldering(SMD Type)*

***RPS, RPA, RHS, RHA, RSS, RSA, RSB, RFS, RFA, RSL***




| Item | Recommended Condition 1 | Recommended Condition 2 |
|---|---|---|
| Peak Temperature | 260℃ max. | 250℃ max. |
| Preheating | 150℃ to 180℃ within 90 seconds | 150℃ to 180℃ within 90 seconds |
| A | 200℃ and higher within 60 seconds | 200℃ and higher within 60 seconds |
| B | 230℃ and higher within 40 seconds | 230℃ and higher within 40 seconds |
| The Number of Reflow | Only 1 time | Twice or less |

# FPCAP Lead forming (Radial lead type)

## RNS, RR7, RR5, RL8, RE5, RS8, RF8, RNU, RNE, RNL, RS6, RHT

## Components are packaged as per following packing unit.

### ● Packing Quantity (Bulk)

| Case Size φD × L (mm) | Long Lead | | Cut Lead | |
|---|---|---|---|---|
| | Quantity vinyl bag (PCS) | Minimum quantity (PCS / Carton Box) | Quantity vinyl bag (PCS) | Minimum quantity (PCS / Carton Box) |
| φ4×5 | 200 | 8,000 | 200 | 8,000 |
| φ5×8, φ5×10 | 200 | 3,200 | 200 | 4,000 |
| φ6.3×5, φ6.3×6, φ6.3×7 | 200 | 4,000 | 200 | 4,000 |
| φ6.3×8, φ6.3×10 | 200 | 3,200 | 200 | 4,000 |
| φ8×6, φ8×8, φ8×9 | 200 | 3,200 | 200 | 4,000 |
| φ8×11.5 | 100 | 2,000 | 200 | 2,400 |
| φ8×16 | 100 | 1,600 | 100 | 2,000 |
| φ8×20 | 100 | 1,200 | 100 | 1,600 |
| φ10×12.5 | 100 | 1,600 | 100 | 2,000 |
| φ10×16 | 100 | 1,200 | 100 | 1,600 |
| φ10×20 | 100 | 800 | 100 | 1,200 |

Please note the order quantity must be in multiples of the minimum quantity.

### ● Bulk Long Lead Part Number

**Nichicon P/N : R□□□□□□□ M□□□ ___**

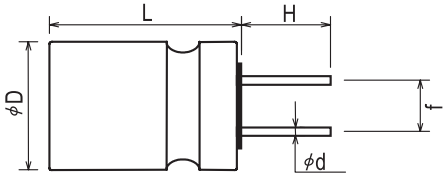
**FPCAP P/N : FP- □□□RE□□□M- □□ R**

### ● Cut Lead (Bulk) Dimensions

**Lead Forming (Symbol:CG)**

**Nichicon P/N : R□□□□□□□ M□□□ CG**

**FPCAP P/N : FP- □□□RE□□□M- □□ CG**




[Unit : mm]

| Item \ φD×L | φ4×5 | φ5×8, φ5×10 | φ6.3×5, φ6.3×6, φ6.3×7, φ6.3×8, φ6.3×10 | φ8×6, φ8×8, φ8×9, φ8×11.5, φ8×16, φ8×20 | φ10×12.5, φ10×16, φ10×20 |
|---|---|---|---|---|---|
| Lead Forming Symbol | CG | CG | CG | CG | CG |
| Lead Wire Diameter φd | 0.45±0.05 | 0.5, 0.6±0.05 | 0.45, 0.5, 0.6±0.05 | 0.6±0.05 | 0.6±0.05 |
| Lead Wire Length H | 3.1±0.3 | 3.1±0.3 | 3.1±0.3 | 3.1±0.3 | 3.1±0.3 |
| Lead Wire Interval f | 1.5±0.5 | 2.0±0.5 | 2.5±0.5 | 3.5±0.5 | 5.0±0.5 |

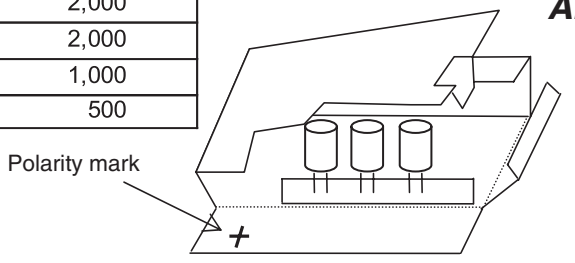
Note : Please inquire for FPCAP by Packing Unit as above.

# FPCAP Taped Leads for Automatic Insertion Systems (Radial lead type)

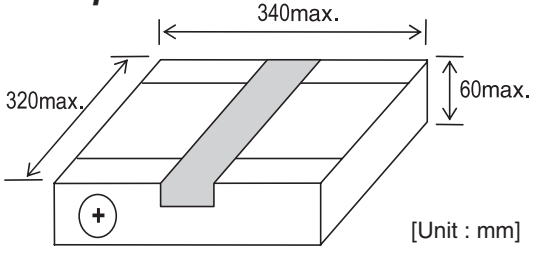
## RNS, RR7, RR5, RL8, RE5, RS8, RF8, RNU, RNE, RNL, RS6, RHT

### ● Packing Quantity(Ammo Pack)

| Size (dia) | Minimum quantity (pcs / Ammo Pack) |
|---|---|
| φ5 | 2,000 |
| φ6.3 | 2,000 |
| φ8 | 1,000 |
| φ10 | 500 |




**Ammo pack**




[Unit : mm]

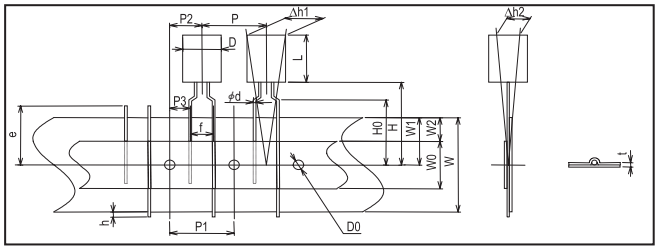
The lid of feeding side of the taping box shall be torn off at the perforation line.

## ● Taping Dimensions

**Lead Forming ( Symbol:Ex. PX )** **Nichicon P/N Symbol : R□□□□□□□ M□□□PX**
**FPCAP P/N Symbol : FP-□□□RE□□□M-□□ P**

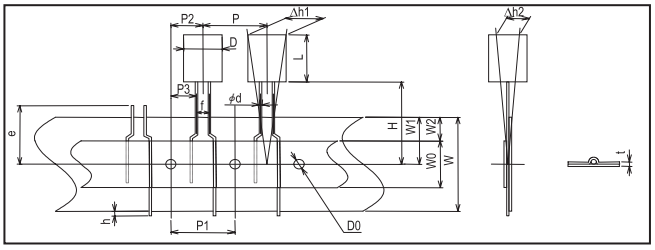
### ■ 2.5mm pitch taping
**Taping Dimensions for φ5**

**Nichicon P/N Symbol : JT (φ5×8) , JX (φ5×10)**
**FPCAP P/N Symbol : JT (φ5×8) , J (φ5×10)**



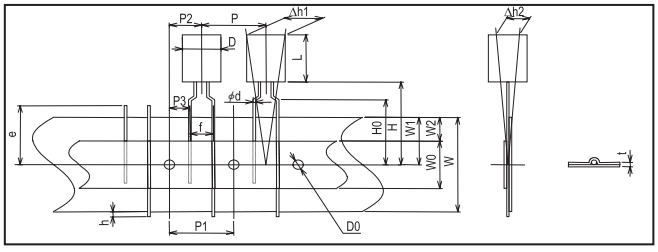

### ■ 2.5mm pitch taping
**Taping Dimensions for φ6.3**

**Nichicon P/N Symbol : JT (φ6.3×5 to 8) , JX (φ6.3×10)**
**FPCAP P/N Symbol : JT (φ6.3×5 to 8) , J (φ6.3×10)**



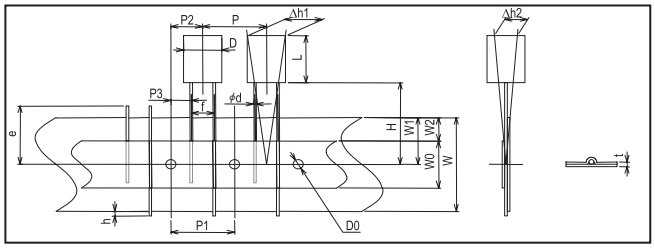

### ■ 5.0mm pitch taping
**Taping Dimensions for φ5, φ6.3, φ8**

**Nichicon P/N Symbol : PX**
**FPCAP P/N Symbol : P**




### ■ 2.0mm(φ5) or 3.5mm(φ8) or 5.0mm(φ10) pitch taping
**Taping Dimensions for φ5, φ8, φ10**

**Nichicon P/N Symbol : TX (φ5), KX (φ8), PH (φ10)**
**FPCAP P/N Symbol : T (φ5), K (φ8), PH (φ10)**




## ● Specification Table

[Unit : mm]

| Item \ φDxL | φ6.3×6, φ6.3×7 | φ5×8, φ6.3×8 | φ6.3×5 φ5×8 | φ5×10, φ6.3×10 | φ6.3×6, φ6.3×7 | φ5×8, φ6.3×8 | φ5×10, φ6.3×5, φ6.3×10 | φ8×6, φ8×8, φ8×9, φ8×11.5, φ8×16, φ8×20 | φ5×8 | φ8×6, φ8×8, φ8×9, φ8×11.5, φ8×16, φ8×20 | φ10×12.5, φ10×16, φ10×20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead Forming Symbol (Nichicon P/N) | JT | | | JX | PX | | | PX | TX | KX | PH |
| Lead Forming Symbol (FPCAP P/N) | JT | | | J | P | | | P | T | K | PH |
| Lead Wire Diameter φd | 0.45 | 0.6 | 0.5 | 0.5 | 0.45 | 0.6 | 0.5 | 0.6 | 0.6 | 0.6 | 0.6 |
| Tolerance | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 | ±0.05 |
| Lead Wire Interval f | 2.5 +0.8/-0.2 (φ6.3: 2.5±0.5) | | | | 5.0 +0.8/-0.2 | | | 5.0 +0.8/-0.2 | 2.0 +0.8/-0.2 | 3.5 +0.8/-0.2 | 5.0 +0.8/-0.2 |
| Pitch Between Components P | 12.7±1.0 | | | | 12.7±1.0 | | | 12.7±1.0 | 12.7±1.0 | 12.7±1.0 | 12.7±1.0 |
| Feed Holes Position Gap P1 | 12.7±0.3 | | | | 12.7±0.3 | | | 12.7±0.3 | 12.7±0.3 | 12.7±0.3 | 12.7±0.3 |
| Feed Holes Position Gap P2 | 6.35±1.0 | | | | 6.35±1.0 | | | 6.35±1.0 | 6.35±0.5 | 6.35±0.5 | 6.35±0.5 |
| Lead Wire Clinch Height H0 | — | | | | 16.0±0.5 | | | 16.0±0.5 | — | — | — |
| Components Height H | 18.5±0.5 | | | | 17.5±0.5 | | | 20.0±0.75 | 18.5±0.5 | 20.0±0.5 | 18.5±0.5 |
| Base Tape W | 18.0 +1.0/-0.5 | | | | 18.0 +1.0/-0.5 | | | 18.0 +1.0/-0.5 | 18.0 +1.0/-0.5 | 18.0 +1.0/-0.5 | 18.0 +1.0/-0.5 |
| Feed Holes Position Gap W1 | 9.0±0.5 | | | | 9.0±0.5 | | | 9.0±0.5 | 9.0±0.5 | 9.0±0.5 | 9.0±0.5 |
| Feed Holes Diameter D0 | 4.0±0.2 | | | | 4.0±0.2 | | | 4.0±0.2 | 4.0±0.2 | 4.0±0.2 | 4.0±0.2 |
| Components Alignment Δh | 2.0 max. | | | | 2.0 max. | | | 2.0 max. | 2.0 max. | 2.0 max. | 2.0 max. |
| Tape Thickness t | 0.6±0.2 | | | | 0.6±0.2 | | | 0.6±0.2 | 0.6±0.2 | 0.6±0.2 | 0.6±0.2 |

# FPCAP Packing Unit Quantity for Reel (SMD Type)

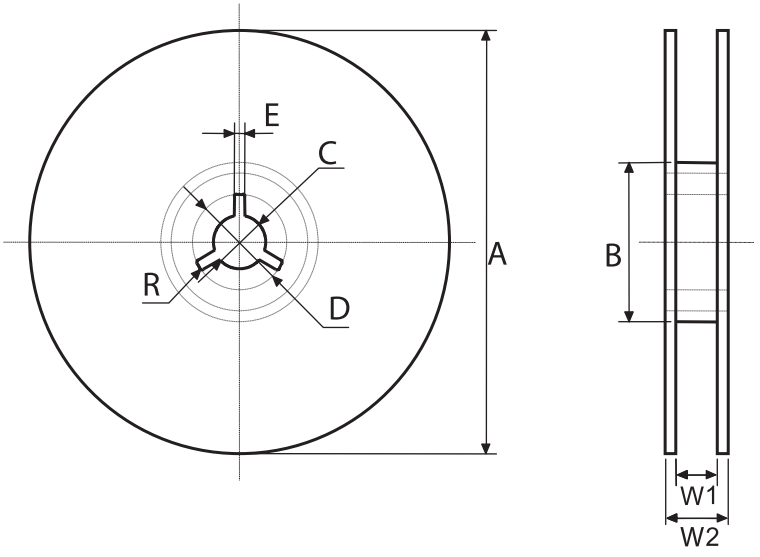
## RPS, RPA, RHS, RHA, RSS, RSA, RSB, RFS, RFA, RSL

**Components are packaged as per following packing unit.**

● Packing Quantity (Reel)

| Case Size φD×L (mm) | Packing Unit (pcs) |
|---|---|
| φ4×5.2 | 2,000 |
| φ5×5.7 | 1,000 |
| φ6.3×4.2 | 1,000 |
| φ6.3×5.7 | 1,000 |
| φ6.3×7.7 | 900 |
| φ8×6.7 | 1,000 |
| φ8×7.7 | 900 |
| φ8×8.7 | 500 |
| φ8×11.7 | 500 |
| φ10×7.7 | 500 |
| φ10×12.4 | 400 |

Note : Please inquire for FPCAP by Packing Unit as above.




[Unit : mm]

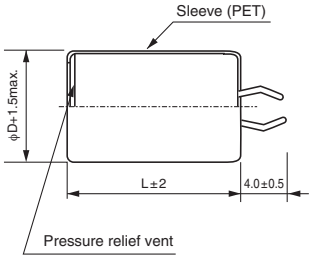
| Size (dia) | A ±2.0 | B ±1.0 | C ±0.5 | D ±1.0 | E ±0.5 | W1 ±1.0 | W2 ±1.0 | R |
|---|---|---|---|---|---|---|---|---|
| φ4, φ5 | 380 | 80 | 13.0 | 21 | 2.0 | 13.4 | 17.4 | 1.0 |
| φ6.3 | 380 | 80 | 13.0 | 21 | 2.0 | 17.4 | 21.4 | 1.0 |
| φ8, φ10 | 380 | 80 | 13.0 | 21 | 2.0 | 25.4 | 29.4 | 1.0 |

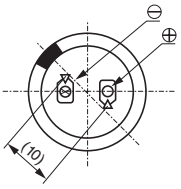
## Snap-in Terminal Style

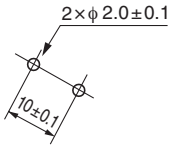
- Available terminal styles below.
- Not all terminal styles are available for all case sizes.
- Please contact us for the ordering part number.
- Custom terminal styles available, Contact Nichicon for more information.

### EL-Terminal (2-pins type, Snap-in type)
(terminal length 4.0mm)

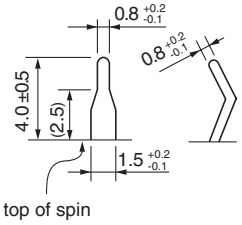
Applicable size : φ 20 to φ 35, Less than 50mmL
Pb-free terminal



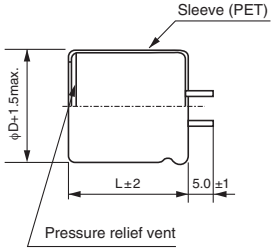

PC board hole dimensions

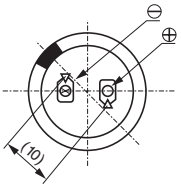


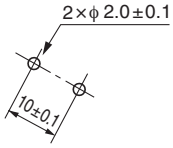

terminal dimensions

### EK-Terminal (2-pins type, Straight type)

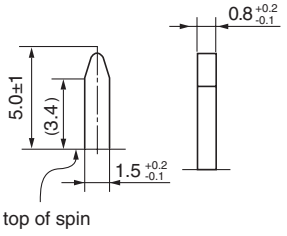
Applicable size : φ 20 to φ 35, Less than 50mmL
Pb-free terminal



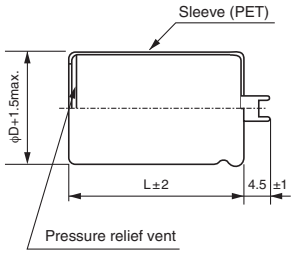

PC board hole dimensions

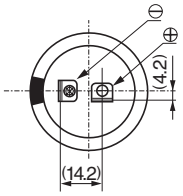


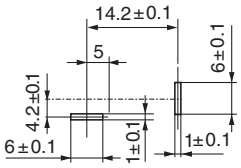

terminal dimensions

### EU-Terminal (Vibration-resistant type)

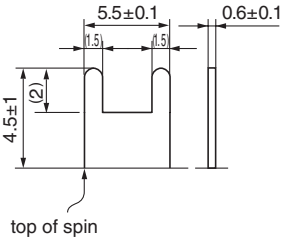
Applicable size : φ 30 to φ 40
Pb-free terminal



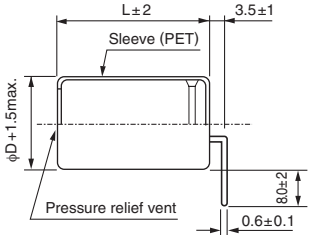

PC board hole dimensions



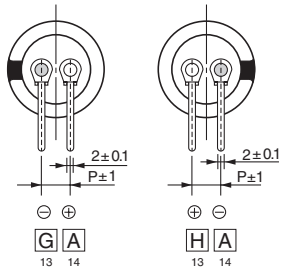

terminal dimensions

### ER-Terminal (Horizontal mounting type)

Applicable size : φ 20 to φ 25
Pb-free terminal




Formed leads code



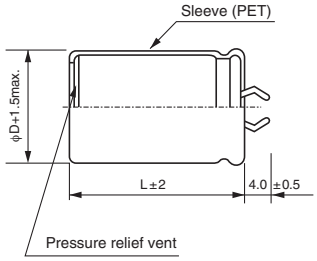

| |
|---|
| φ20 : P=7.5 |
| φ22, φ25 : P=8.5 |

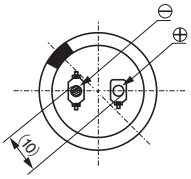
※ Negative terminal : Mesh marking

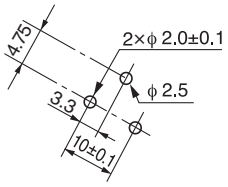
## Snap-in Terminal Shape

### ET-Terminal (3-pins type, Snap-in type)

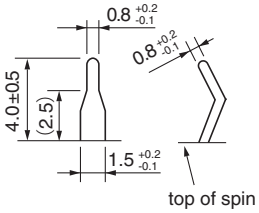
Applicable size : φ 22 to φ 35
Pb-free terminal



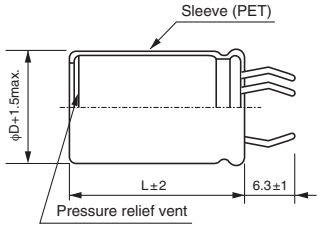

PC board hole dimensions

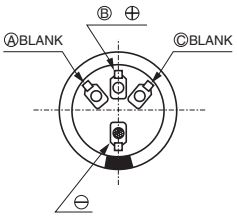


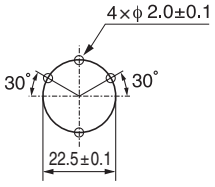

terminal dimensions

### EF-Terminal (4-pins type, Snap-in type)

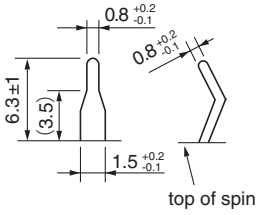
Applicable size : φ 35 , φ 40
Pb-free terminal
(terminal length 6.3mm)



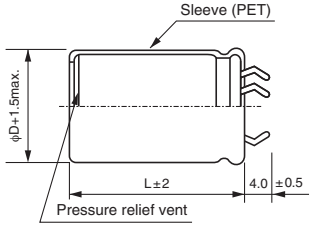

PC board hole dimensions

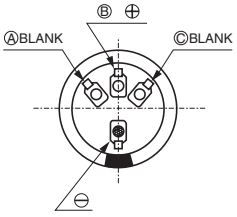


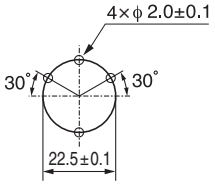

terminal dimensions

### EG-Terminal (4-pins type, Snap-in type)

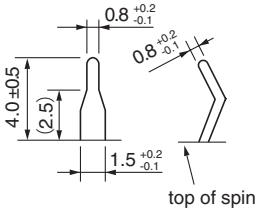
Applicable size : φ 35 , φ 40
Pb-free terminal
(terminal length 4.0mm)



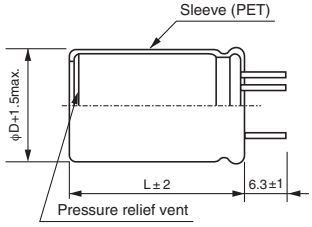

PC board hole dimensions

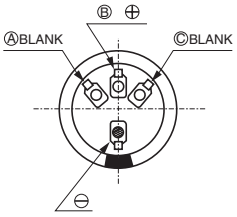


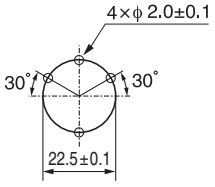

terminal dimensions

### EH-Terminal (4-pins type, Straight type)

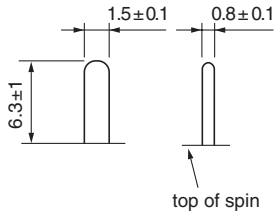
Applicable size : φ 35 , φ 40
Pb-free terminal



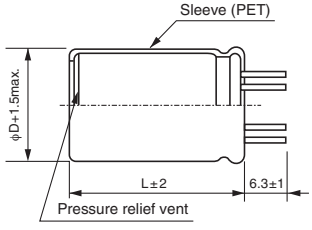

PC board hole dimensions

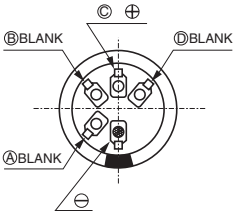


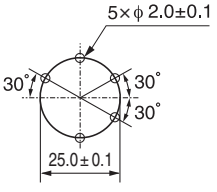

terminal dimensions

### EJ-Terminal (5-pins type, Straight type)

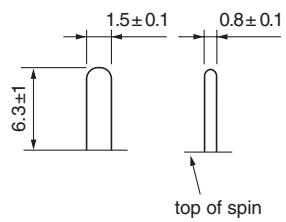
Applicable size : φ 40
Pb-free terminal




PC board hole dimensions




terminal dimensions

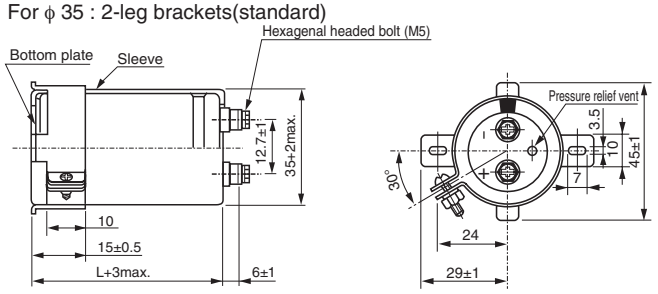
※ Negative terminal : Mesh marking

## Dimension of bracket / bushing for screw terminal type

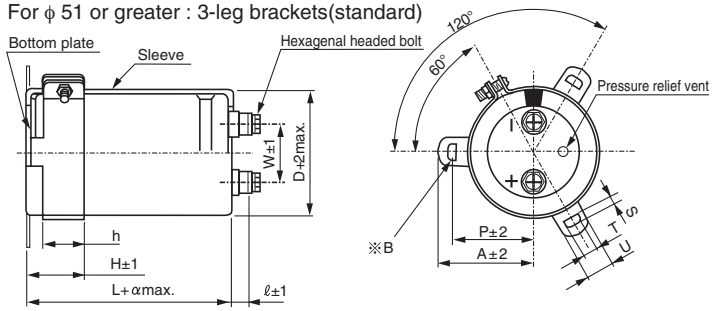
- Screw terminal type can be supplied with the following bracket and bushing.
- Here is standard position and angle of the bracket / bushing. Please contact us if you have specific requirement.
- There is a restriction for capacitors size.

### ■Method to mount with metal bracket

For φ 35 : 2-leg brackets(standard)




For φ 51 or greater : 3-leg brackets(standard)

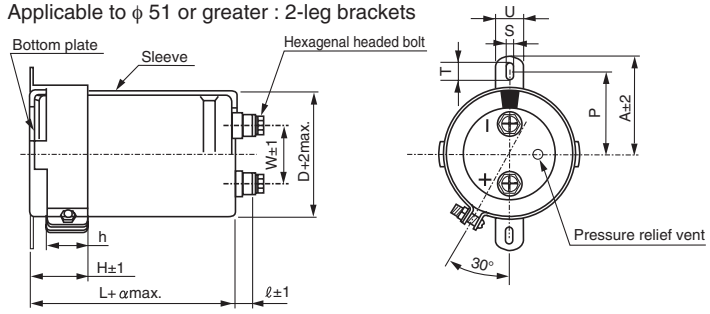



(mm)

| Symbol \ φD | 51 | 63.5 | 76.2 | 90 | 100 |
|---|---|---|---|---|---|
| P | 32.5 | 38.1 | 44.5 | 50.8 | 56.3 |
| A | 38.5 | 43 | 49.2 | 58.5 | 62 |
| T | 7.5 | 8 | 7 | 8 | 8 |
| S | 5 | 5 | 5 | 5 | 5 |
| U | 12 | 14 | 14 | 18 | 16 |
| H | 20 | 25 | 30 | 35 | 36 |
| h | 15 | 20 | 24 | 25 | 30 |
| W | 22 | 28.6 | 31.8 | 31.8 | 41.5 |
| ℓ | 6 | 6 | 6 | 6 | 10 |
| α | 3 | 3 | 3 | 3 | 4 |

※ Please consult us separately for the dimensional shape of the mounting hole(B) for φ90.

Applicable to φ 51 or greater : 2-leg brackets

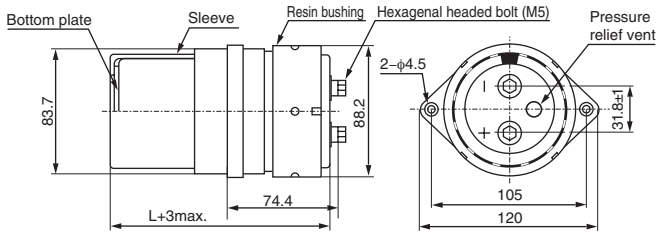



(mm)

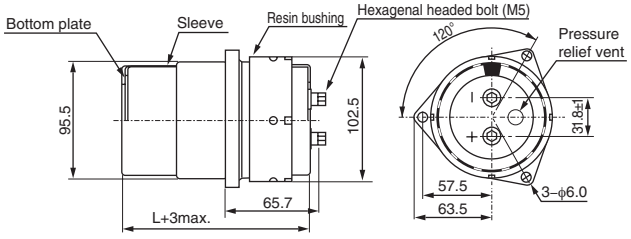
| Symbol \ φD | 51 | 63.5 | 76.2 | 90 |
|---|---|---|---|---|
| P | 33.2 | 40.5 | 46.5 | 53 |
| A | 40 | 46.5 | 53 | 59 |
| T | 6 | 7 | 6 | 6 |
| S | 4.5 | 4.5 | 4.5 | 4.5 |
| U | 14 | 14 | 14 | 14 |
| H | 25 | 35 | 35 | 35 |
| h | 15 | 20 | 20 | 20 |
| W | 22 | 28.6 | 31.8 | 31.8 |
| ℓ | 6 | 6 | 6 | 6 |
| α | 3 | 3 | 3 | 3 |

### ■Method to mount with resin bushing.

Applicable to φ 76.2 and L ≧ 150

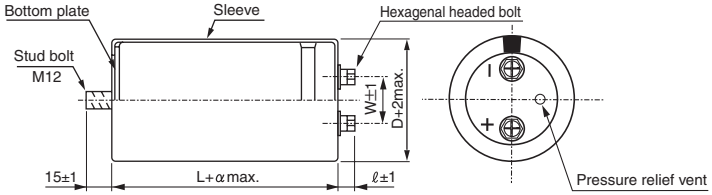



Applicable to φ 90 and L ≧ 150




### ■Method to mount with stud bolt.

Applicable to φ 51 to φ 90



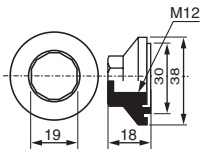

Stud bolt

(mm)

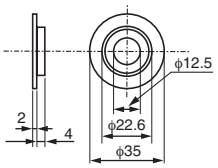
| Symbol \ φD | 51 | 63.5 | 76.2 | 90 |
|---|---|---|---|---|
| W | 22 | 28.6 | 31.8 | 31.8 |
| ℓ | 6 | 6 | 6 | 6 |
| α | 3 | 3 | 3 | 3 |

A nut for stud bolt. (option)

Plastic nut




Plastic washer




※ Bracket hole : φ30.5mm(min.)

# PRODUCTION LOCATION BY SERIES OUTSIDE OF JAPAN

nichicon

## Conductive Polymer Aluminum Solid Electrolytic Capacitors

| Type | Classification | Type • Series | NICHICON ELECTRONICS (SUQIAN) CO., LTD. |
|---|---|---|---|
| Conductive Polymer Aluminum Solid Electrolytic Capacitors (FPCAP) | Surface Mount Type | RPS, RPA, RHS, RHA, RSS, RSA, RSB, RFS, RFA, RSL | ○ |
| | Radial Lead Type | RNS, RR7, RR5, RL8, RE5, RS8, RF8, RNU, RNE, RNL, RS6, RHT | ○ |

## Aluminum Electrolytic Capacitors

| Type | Classification | Type • Series | NICHICON (MALAYSIA) SDN. BHD. | NICHICON ELECTRONICS (WUXI) CO., LTD. |
|---|---|---|---|---|
| Chip Aluminum Electrolytic Capacitors | Chip Type | UWX,UWJ,UWT,UWZ, UWF,UWG,UUT,UUA, UUL,UCD,UUD,UWD, UUB,UWH,UUR,UUX, UCJ | ○ | ○ |
| | | UCL, UCZ, UCM, UCB, UCW | ○ | — |
| Miniature Aluminum Electrolytic Capacitors | Standard Type | UVK, UVR, UVY, UVZ, URS, URZ, UVP | ○ | ○ |
| | | UEP | ○ | — |
| | High Reliability Type | UPM,UPW,UHV,UHD, UHE,UHW,UPJ,UPS, UBT,UPT,UCY,UPZ, UCA,UCS,UPA | ○ | ○ |
| | | UPV, ULD | ○ | — |
| | Special Equipment | UKL | ○ | ○ |
| | | UAQ, UAS | — | ○ |
| | For Audio Equipment | UFW, UES, UFG, UKA, UKT, UKW | ○ | — |
| Large Can Aluminum Electrolytic Capacitors | Standard Type | LLS, LLG | ○ | ○ |
| | High Reliability Type | LGU, LGN, LGG, LGM, LGJ, LGY, LGZ, LGX, LAR, LGR, LGL, LGW, LAK, LAQ, LAS, LQS | ○ (Excluding LAK, LAQ, LAS) | ○ |
| | For Audio Equipment | LKG, LKS, LKX | ○ | LKG : ○<br>LKS, LKX : — |
| Screw Terminal Electrolytic Capacitors | | | — | applicable Size D=φ35 to 100<br>L= 80 to 200L<br>Please contact us for details. |

※However, please contact us because there may be a series, size that cannot be produced at a given factory.

## Conductive Polymer Aluminum Solid Electrolytic Capacitors

| Classification | Type · Series | Configuration | Applications | Category Temperature Range (°C) | Features: Standard type | Low ESR | High Capacitance | Long Life | Anti-cleaning solvent | High Voltage | High Reliability | AEC-Q200 | Rated Voltage Range (V.D.C) | Rated Capacitance Range (μF) | Tolerance on Rated Capacitance (%) | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chip type | PCF | 32 | Standard | −55 to +105 | ● | | | | ● | | | ● | 2.5 to 25 | 6.8 to 1500 | ±20 | 40 |
| | PCJ | 32 | Low ESR, Higher Capacitance | −55 to +105 | | ● | ● | | ● | | | ● | 2.5 to 16 | 33 to 2700 | ±20 | 43 |
| | PCK | 32 | Ultra-low ESR | −55 to +105 | | ● | | | ● | | | ● | 2.5 to 6.3 | 220 to 2200 | ±20 | WEB |
| | PCG | 32 | Higher Capacitance | −55 to +105 | | | ● | | ● | | | ● | 2.5 to 16 | 47 to 4700 | ±20 | 45 |
| | PCS | 32 | Long Life Assurance | −55 to +105 | | | | ● | ● | | ● | ● | 4 to 16 | 22 to 560 | ±20 | WEB |
| | PCL | 32 | Higher Capacitance / Long Life Assurance | −55 to +105 | | ● | ● | ● | ● | | ● | ● | 2.5 to 25 | 12 to 3300 | ±20 | 47 |
| | PCV | 32 | High Voltage / Long Life Assurance | −55 to +105 | | | | ● | ● | ● | | ● | 16 to 125 | 5.6 to 680 | ±20 | 49 |
| | PCX | 32 | High Voltage / High Reliability | −55 to +125 | | | | ● | ● | ● | ● | ● | 16 to 50 | 5.6 to 390 | ±20 | WEB |
| | PCR | 32 | Higher Capacitance / Long Life Assurance | −55 to +125 | | | ● | ● | ● | ● | ● | ● | 16 to 80 | 22 to 1000 | ±20 | 52 |
| | PCM | 32 | Higher Capacitance / High Temperature Range | −55 to +125 | | ● | ● | ● | ● | ● | ● | ● | 16 to 80 | 12 to 1000 | ±20 | 54 |
| | PCH | 32 | Higher Capacitance / High Temperature Range | −55 to +135 | | ● | ● | ● | ● | ● | ● | ● | 16 to 80 | 12 to 1000 | ±20 | 56 |
| | PCZ | 32 | Higher Capacitance / High Temperature Range | −55 to +150 | | ● | ● | ● | ● | ● | ● | ● | 16 to 63 | 12 to 1000 | ±20 | 58 |
| Radial Lead type | PLF | 04 | Standard | −55 to +105 | ● | | | | ● | | | ● | 2.5 to 25 | 6.8 to 1500 | ±20 | WEB |
| | PLE※2 | 04 | Ultra-low ESR | −55 to +105 | | ● | | | ● | | | | 2.5 to 6.3 | 470 to 1500 | ±20 | WEB |
| | PLG | 04 | Higher Capacitance | −55 to +105 | | | ● | | ● | | | | 2.5 to 16 | 330 to 3900 | ±20 | WEB |
| | PLS | 04 | Long Life Assurance | −55 to +105 | | | | ● | ● | | ● | | 2.5 to 16 | 100 to 1500 | ±20 | WEB |
| | PLV※2 | 04 | High Voltage / Long Life Assurance | −55 to +105 | | | | ● | ● | ● | | ● | 16 to 100 | 6.8 to 470 | ±20 | WEB |
| | PLX | 04 | High Voltage / High Reliability | −55 to +125 | | | | ● | ● | ● | ● | ● | 16 to 50 | 22 to 390 | ±20 | WEB |

## FPCAP Product List

| Classification | Type · Series | Note | Rated Voltage Range (V.D.C) | Capacitance Range (μF) | Endurance | Page |
|---|---|---|---|---|---|---|
| SMD Type | RPS / RPA | Standard (φ6.3, φ8, φ10) | 2.5 to 63 | 8.2 to 1500 | 105°C 2000 / 5000Hrs | 60 |
| | Expanded RHS / RHA | High Capacitance (φ8) | 2.5 to 35 | 56 to 1500 | 105°C 2000 / 5000Hrs | 62 |
| | RSS/RSA/RSB | High Capacitance (φ6.3) | 2.5 to 35 | 10 to 820 | 105°C 2000Hrs | 64 |
| | RFS / RFA | High Capacitance (φ4, φ5) | 2.5 to 25 | 10 to 330 | 105°C 2000Hrs | 66 |
| | RSL | Low Profile (φ6.3) | 2.5 to 25 | 15 to 330 | 105°C 2000Hrs | WEB |
| Radial Lead Type | RNS | Standard | 4.0 to 25 | 10 to 1200 | 105°C 2000Hrs | WEB |
| | RR7 | Low ESR | 2.5 to 16 | 68 to 1500 | 105°C 2000 / 5000Hrs | WEB |
| | RR5 | Ultra-Low ESR | 2.5 to 6.3 | 390 to 1500 | 105°C 2000Hrs | WEB |
| | RL8 | Low ESR and Low Profile (φ8) | 2.5 to 35 | 100 to 1500 | 105°C 2000 / 5000Hrs | 68 |
| | RE5 | Ultra-Low ESR and Low Profile (φ8) | 2.5 to 4.0 | 560 to 820 | 105°C 2000Hrs | WEB |
| | Expanded RS8 | Low ESR / ESL and Low Profile (φ6.3) | 2.5 to 25 | 56 to 1200 | 105°C 2000 / 5000Hrs | 71 |
| | RF8 | Low ESR / ESL and Low Profile (φ5) | 2.5 to 6.3 | 100 to 560 | 105°C 2000Hrs | WEB |
| | RNU | High Capacitance | 2.5 to 63 | 10 to 2700 | 105°C 2000 / 5000Hrs | 73 |
| | Expanded RNE | High Capacitance | 2.5 to 25 | 100 to 1500 | 105°C 2000 / 5000Hrs | 76 |
| | RNL | Large Sized High Capacitance | 16 to 25 | 270 to 2400 | 105°C 2000 / 5000Hrs | 78 |
| | RS6 | Miniature Sized High Capacitance | 2.5 to 25 | 33 to 560 | 105°C 2000 / 5000Hrs | 80 |
| | RHT | High Temperature (125°C) | 6.3 to 35 | 100 to 1000 | 125°C 1000Hrs | 82 |

## Conductive Polymer Hybrid Aluminum Electrolytic Capacitors

| Classification | Type · Series | Configuration | Applications | Category Temperature Range (°C) | Features: Standard type | Low ESR | High Capacitance | Long Life | Anti-cleaning solvent | High Voltage | High Reliability | AEC-Q200 | Rated Voltage Range (V.D.C) | Rated Capacitance Range (μF) | Tolerance on Rated Capacitance (%) | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chip type | Expanded GYA | 32 | Chip type, 125°C High Reliability | −55 to +125 | | ● | | ● | ● | | ● | ● | 16 to 80 | 10 to 470 | ±20 | 86 |
| | Expanded GYB | 32 | Chip type, 105°C High Reliability | −55 to +105 | | ● | | ● | ● | | ● | ● | 16 to 63 | 10 to 470 | ±20 | 88 |
| | Expanded GYC | 32 | Chip type, 135°C High Reliability | −55 to +135 | | ● | | ● | ● | | ● | ● | 16 to 63 | 10 to 470 | ±20 | 90 |
| | GYD | 32 | Chip type, 150°C High Reliability | −55 to +150 | | ● | | ● | ● | | ● | ● | 25 to 35 | 100 to 270 | ±20 | 92 |
| | GYE | 32 | Chip type, 125°C High Reliability | −55 to +125 | | ● | ● | ● | ● | | ● | ● | 25 to 35 | 56 to 470 | ±20 | 94 |
| | NEW GYF | 32 | Chip type, 125°C High Reliability | −55 to +125 | | ● | ● | ● | ● | | ● | ● | 25 to 35 | 68 to 560 | ±20 | 96 |

※2 Products which are scheduled to be discontinued, Not recommended for new designs.

AEC-Q200 : AEC-Q200 compliant. Please contact us for details.

Please refer to our website for the details of the series described as “WEB”.

## Chip Aluminum Electrolytic Capacitors

| Classification | Type・Series | Configuration | Applications | Category Temperature Range (°C) | Features: Standard type | Features: Smaller-sized & low profile | Features: Low impedance | Features: Long life | Features: Anti-cleaning solvent | Features: AEC-Q200 | Rated Voltage Range (V.D.C) | Rated Capacitance Range (μF) | Tolerance on Rated Capacitance (%) | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface Mount type | UZR※2 | 32 | 3.95mmL max. Standard | −40 to +85 | | ● | | | ● | ● | 4 to 50 | 1 to 220 | ±20 | WEB |
| | UZG | 32 | 3.95mmL max. Wide Temperature Range | −40 to +105 | | ● | | | ● | ● | 6.3 to 50 | 1 to 100 | ±20 | 99 |
| | UZS※2 | 32 | 4.5mmL Standard | −40 to +85 | | ● | | | ● | ● | 4 to 50 | 1 to 220 | ±20 | WEB |
| | UZT | 32 | 4.5mmL, Wide Temperature Range | −40 to +105 | | ● | | | ● | ● | 6.3 to 50 | 1 to 100 | ±20 | 101 |
| | UWX※2 | 32 | 5.5mmL, Standard | −40 to +85 | ● | | | | ● | ● | 4 to 50 | 1 to 330 | ±20 | WEB |
| | UWJ※2 | 32 | 5.5mmL, High Temperature Reflow | −40 to +85 | | | | | ● | ● | 6.3 to 50 | 1 to 150 | ±20 | WEB |
| | UWP | 32 | 5.5mmL, Bi-Polarized | −40 to +85 | | ● | | | ● | ● | 6.3 to 50 | 0.1 to 100 | ±20 | WEB |
| | UWT | 32 | Wide Temperature Range | −55 to +105 | | ● | | | ● | ● | 4 to 50 | 1 to 1500 | ±20 | WEB |
| | UWZ | 32 | Wide Temperature Range High Temperature Reflow | −55 to +105 | | | | | ● | ● | 6.3 to 50 | 1 to 1500 | ±20 | WEB |
| | UWF※2 | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 6.3 to 35 | 1 to 220 | ±20 | WEB |
| | UWG | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 6.3 to 50 | 1 to 1500 | ±20 | WEB |
| | UUP | 32 | 6mmL, Bi-Polarized | −55 to +105 | ● | | | | ● | ● | 6.3 to 50 | 0.1 to 47 | ±20 | WEB |
| | UUT※2 | 32 | 6mmL, Wide Temperature Range | −55 to +105 | ● | | | | ● | ● | 4 to 50 | 1 to 100 | ±20 | WEB |
| | UUA | 32 | Long Life Assurance | −55 to +105 | | | | ● | ● | ● | 6.3 to 50 | 1 to 1000 | ±20 | WEB |
| | UUL | 32 | Long Life Assurance (105°C 5,000h) | −40 to +105 | | | | ● | ● | ● | 6.3 to 50 | 1 to 1000 | ±20 | WEB |
| | UCB | 32 | Long Life Assurance (105°C 7,000h) | −25 to +105 | | | | ● | ● | ● | 6.3 to 50 | 1 to 1000 | ±20 | WEB |
| | UCW | 32 | Long Life Low Impedance (105°C 7,000h) | −25 to +105 | | | ● | ● | ● | ● | 6.3 to 50 | 10 to 470 | ±20 | 103 |
| | UCD | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 6.3 to 100 | 1 to 3300 | ±20 | 105 |
| | UCL | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 6.3 to 50 | 10 to 2200 | ±20 | 109 |
| | UCM | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 6.3 to 100 | 10 to 5100 | ±20 | 112 |
| | UCV | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 16 to 35 | 220 to 1500 | ±20 | 115 |
| | UUD | 32 | Low Impedance | −55 to +105 | | | ● | | ● | ● | 6.3 to 50 | 1 to 1500 | ±20 | WEB |
| | UWD | 32 | Low Impedance High Temperature Reflow | −55 to +105 | | | ● | | ● | ● | 6.3 to 50 | 1 to 1500 | ±20 | 120 |
| | UUB | 32 | High Reliability, For +125°C Use | −40 to +125 | | | | ● | ▲ | ● | 10 to 400 | 1 to 330 | ±20 | WEB |
| | UWH | 32 | High Reliability (For +125°C Use) High Temperature Reflow | −40 to +125 | | | | ● | ● | ● | 10 to 50 | 10 to 330 | ±20 | WEB |
| | ULT | 32 | High Voltage, High Temperature Range(For +125°C Use) | −40 to +125 | | ● | | ● | | ● | 160 to 500 | 1.8 to 33 | ±20 | WEB |
| | ULH | 32 | High Voltage, High Reliability (For +125°C 4000h) | −40 to +125 | | | | ● | | ● | 160 to 450 | 2.2 to 27 | ±20 | WEB |
| | UCJ | 32 | High Reliability Low Temperature ESR specification | −40 to +125 | | | | ● | ● | ● | 10 to 50 | 10 to 470 | ±20 | 123 |
| | UCZ | 32 | High Reliability Low Temperature ESR specification | −40 to +125 | | | | ● | ● | ● | 10 to 100 | 10 to 3300 | ±20 | 125 |
| | NEW UYA | 32 | Long Life Assurance | −40 to +125 | | | | ● | ● | ● | 63 to 100 | 90 to 880 | ±20 | 128 |
| | UCH | 32 | High Reliability Low Temperature ESR specification | −40 to +125 | | | | ● | ● | ● | 25 to 63 | 33 to 560 | ±20 | 130 |
| | UCX | 32 | High Reliability Low Temperature ESR specification | −40 to +135 | | | | ● | ● | ● | 10 to 50 | 47 to 3300 | ±20 | 132 |
| | UUR※2 | 32 | High C / V | −40 to +85 | | ● | | | ● | ● | 4 to 100 | 3.3 to 1500 | ±20 | WEB |
| | UUX | 32 | Wide Temperature Range | −55 (−40) to +105 | | | | | ▲ | ● | 6.3 to 400 | 1 to 1000 | ±20 | WEB |
| | ULR | 32 | High Voltage | −40 to +105 | | ● | | | | ● | 160 to 500 | 2.7 to 39 | ±20 | WEB |
| | ULV | 32 | High Voltage, Long Life | −40 to +105 | | | | ● | | ● | 160 to 500 | 1.8 to 33 | ±20 | WEB |
| | UUQ | 32 | Wide Temperature Range | −40 to +105 | | | | | ● | ● | 6.3 to 50 | 1 to 1000 | ±20 | WEB |
| | UCQ | 32 | Wide Temperature Range | −55 to +105 | | | | | ● | ● | 10 to 35 | 4.7 to 680 | ±20 | WEB |
| | UUG | 32 | Higher Capacitance Range | −40 to +85 | ● | | | | ▲ | ● | 6.3 to 450 | 4.7 to 10000 | ±20 | WEB |
| | UUJ※1 | 32 | Higher Capacitance Range | −55 (−40) to +105 | ● | | | ● | ▲ | ● | 6.3 to 450 | 3.3 to 6800 | ±20 | 134 |
| | UUN | 32 | Bi-Polarized, Higher Capacitance Range | −55 to +105 | | | | | ● | | 6.3 to 100 | 22 to 3300 | ±20 | WEB |
| | UUE | 32 | Vibration Resistance (125°C) | −55 (−40) to +125 | | | | ● | ● | ● | 10 to 50 | 33 to 4700 | ±20 | 137 |
| | UBC※1 | 32 | Vibration Resistance (150°C) | −55 (−40) to +150 | | | | ● | ● | ● | 10 to 50 | 33 to 3300 | ±20 | 139 |
| | UBH | 32 | High Temperature Range Vibration Resistance Low Temperature ESR specification | −40 to +150 | | | | ● | ● | ● | 25 to 35 | 100 to 270 | ±20 | 141 |

※1 May have values that are products which are scheduled to be discontinued.
They are not recommended for new designs. Please refer to the series data pages for details.

※2 Products which are scheduled to be discontinued, Not recommended for new designs.

Above description is a feature against AK-225AES.
▲ : Applicable up to 100V ratings or less.

AEC-Q200 : AEC-Q200 compliant. Please contact us for details.

Please refer to our website for the details of the series described as “WEB”.

## Miniature Aluminum Electrolytic Capacitors

| Classification | Type・Series | Configuration | Applications | Category Temperature Range (°C) | Features | | | | | | Rated Voltage Range (V.D.C) | Rated Capacitance Range (μF) | Tolerance on Rated Capacitance (%) | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Standard type | Smaller-sized & low profile | Low impedance | Long life | Anti-cleaning solvent | AEC-Q200 | | | | |
| Standard type | **UVK** ※1 | 04 | Miniature Sized, Standard | –40 (–25) to +85 | | ● | | | ▲ | | 6.3 to 450 | 0.47 to 33000 | ±20 | WEB |
| | **UVR** ※1 | 04 | Standard | –40 (–25) to +85 | ● | | | | ▲ | | 6.3 to 450 | 0.47 to 33000 | ±20 | 142 |
| | **UVC** | 04 | High Voltage, Ultra-Miniature Sized, For Adapters | –40 to 105 | | ● | | | | | 400 | 4.7 to 18 | ±20 | WEB |
| | **UVY** ※1 | 04 | Miniature Sized, Wide Temperature Range | –55 (–40, –25) to +105 | | ● | | | ▲ | | 6.3 to 450 | 0.47 to 33000 | ±20 | 149 |
| | **UVZ** ※1 | 04 | Wide Temperature Range | –55 (–40, –25) to +105 | ● | | | | ▲ | | 6.3 to 450 | 0.47 to 33000 | ±20 | WEB |
| | **URS** ※1 | 04 | Compact & Standard For General Purposes | –40 to +85 | | ● | | | ▲ | | 6.3 to 400 | 10 to 10000 | ±20 | WEB |
| | **URZ** ※1 | 04 | Low-Profile Sized, Wide Temperature Range | –55 (–40) to +105 | | ● | | | ▲ | | 6.3 to 400 | 10 to 10000 | ±20 | 154 |
| | **UVP** ※1 | 04 | Bi-Polarized | –40 to +85 | ● | | | | ● | | 6.3 to 100 | 1 to 6800 | ±20 | WEB |
| | **UEP** ※1 | 04 | Bi-Polarized, Wide Temperature Range | –55 to +105 | ● | | | | ● | | 6.3 to 100 | 1 to 6800 | ±20 | 157 |
| High Reliability type | **UPM** ※1 | 04 | Low Impedance, High Reliability | –55 (–40, –25) to +105 | | | ● | ● | ▲ | ● | 6.3 to 450 | 1 to 15000 | ±20 | WEB |
| | **UPW** ※1 | 04 | Miniature Sized, Low Impedance, High Reliability | –55 (–40, –25) to +105 | | ● | ● | ● | ▲ | ● | 6.3 to 450 | 0.47 to 15000 | ±20 | 160 |
| | **UPA** | 04 | Miniature Sized, Low Impedance, High Reliability | –55 to +105 | | ● | ● | ● | ● | | 6.3 to 35 | 180 to 10000 | ±20 | WEB |
| | **UHV** ※1 | 04 | Extremely Low Impedance, High Reliability | –40 to +105 | | ● | ● | ● | ● | | 6.3 to 35 | 47 to 8200 | ±20 | 168 |
| | **UHD** ※1 | 04 | Extremely Low Impedance, High Reliability | –40 to +105 | | ● | ● | | ● | | 6.3 to 50 | 22 to 6800 | ±20 | WEB |
| | **UHE** ※1 | 04 | Extremely Low Impedance, High Reliability | –40 to +105 | | ● | ● | ● | ● | | 6.3 to 100 | 2.2 to 18000 | ±20 | WEB |
| | **UHW** ※1 | 04 | Extremely Low Impedance, High Reliability | –40 to +105 | | ● | ● | ● | ● | | 6.3 to 100 | 8.2 to 15000 | ±20 | 172 |
| | **UPJ** ※1 | 04 | Low Impedance, For Switching Power Supplies | –55 (–40, –25) to +105 | ● | | ● | ● | ▲ | | 6.3 to 450 | 1 to 15000 | ±20 | WEB |
| | **UPS** ※1 | 04 | Miniature Sized, Low Impedance, For Switching Power Supplies | –55 (–40, –25) to +105 | | ● | ● | | ▲ | | 6.3 to 450 | 0.47 to 15000 | ±20 | 178 |
| | **UPV** ※1 | 04 | Miniature Sized, Low Impedance, High Reliability | –55 to +105 | | | ● | ● | ● | | 6.3 to 50 | 1.5 to 390 | ±20 | WEB |
| | **UPT** ※1 | 04 | Miniature Sized, High Ripple Current, Long Life | –40 to +105 | | ● | | ● | | | 200 to 450 | 15 to 820 | ±20 | 184 |
| | **UPZ** | 04 | High voltage, MiniatureSized | –40 to +105 | | ● | | | | | 200 to 450 | 18 to 470 | ±20 | 188 |
| | **UPH** | 04 | High voltage, MiniatureSized | –40 to +105 | | ● | | | | | 400 to 450 | 27 to 220 | ±20 | WEB |
| | **UCP** | 04 | High voltage, MiniatureSized, Long Life Assurance | –40 to +105 | | ● | | ● | | | 400 to 450 | 27 to 220 | ±20 | 191 |
| | **ULD** ※1 | 04 | Miniature Sized, Long Life Assurance | –40 to +105 | | | | ● | | | 10 to 450 | 1 to 330 | ±20 | 193 |
| | **UCA** ※2 | 04 | Miniature Sized, High Ripple Current, Long Life | –25 to +105 | | ● | | ● | | | 160 to 450 | 6.8 to 220 | ±20 | WEB |
| | **UCS** | 04 | Miniature Sized, High Ripple Current, High Reliability | –40 to +105 | | ● | | ● | | | 160 to 450 | 6.8 to 330 | ±20 | 196 |
| | **UCY** | 04 | Miniature Sized, High Ripple Current, High Reliability | –40 to +105 | | ● | | ● | | ● | 160 to 500 | 6.8 to 680 | ±20 | 199 |
| | **UBT** | 04 | High Temperature Range (125°C) | –40 (–25) to +125 | | | | ● | ▲ | ● | 10 to 450 | 4.7 to 4700 | ±20 | 205 |
| | **UBW** | 04 | High Temperature Range (135°C) | –55 to +135 | | | | ● | ● | ● | 10 to 100 | 4.7 to 4700 | ±20 | 208 |
| | **UBY** | 04 | High Temperature Range, For Automobile equipment (125/135°C) | –40 to +135 | ● | | | ● | ● | ● | 25 to 100 | 160 to 12000 | ±20 | 211 |
| | **UXY** | 04 | Vibration Resistance (125/135°C) | –40 to +135 | ● | | ● | | ● | ● | 25 to 35 | 5000 to 11000 | ±20 | 214 |
| | **UBX** ※1 | 04 | High Temperature Range, For Automobile equipment (150°C) | –55 (–40, –25) to +150 | | | | ● | ▲ | ● | 10 to 400 | 2.2 to 4700 | ±20 | 216 |

※1 May have values that are products which are scheduled to be discontinued.
They are not recommended for new designs. Please refer to the series data pages for details.

※2 Products which are scheduled to be discontinued, Not recommended for new designs.

Above description is a feature against AK-225AES.
▲ : Applicable up to 100V ratings or less.

AEC-Q200 : AEC-Q200 compliant. Please contact us for details.

Please refer to our website for the details of the series described as “WEB”.

## Miniature Aluminum Electrolytic Capacitors

| Classification | Type・Series | Configuration | Applications | Category Temperature Range (°C) | Features: Standard type | Features: Smaller-sized & low profile | Features: Low impedance | Features: Long life | Features: Anti-cleaningsolvent | Features: AEC-Q200 | Rated Voltage Range (V.D.C) | Rated Capacitance Range (μF) | Tolerance on Rated Capacitance (%) | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Special equipment | **UKL** ※1 | 04 | Low Leakage Current | −40 to +85 | ● | | | | ● | | 6.3 to 100 | 1.5 to 10000 | ±20, ±10 | WEB |
| | **UAQ** ※1 | 04 | For Permissible Abnormal Voltage | −40 to +105 | | | | | | | 200・400 | 10 to 220 | ±20 | WEB |
| | **UAS** | 04 | Miniature sized,For Permissible Abnormal Voltage | −40 to +105 | | ● | | | | | 200・400 | 22 to 330 | ±20 | 219 |
| For audio equipment | **UKA** ※1 | 04 | 105°C For High Grade Equipment | −55 to +105 | | | | | ● | ● | 6.3 to 50 | 22 to 22000 | ±20 | 221 |
| | **UKZ** | 04 | Premium Grade Type, For Audio Equipment | −40 to +85 | | | | | ● | | 25 to 100 | 10 to 1000 | ±20 | 224 |
| | **UFG** ※1 | 04 | High Grade Type, For Audio Equipment | −40 to +85 | ● | | | | ● | | 6.3 to 100 | 1 to 10000 | ±20 | WEB |
| | **UKT** ※1 | 04 | 105°C Standard, For Audio Equipment | −55 to +105 | ● | | | | ● | ● | 6.3 to 50 | 2.2 to 33000 | ±20 | WEB |
| | **UKW** ※1 | 04 | Standard, For Audio Equipment | −40 to +85 | ● | | | | ● | | 6.3 to 100 | 2.2 to 33000 | ±20 | WEB |
| | **UFW** ※1 | 04 | Standard, For Audio Equipment | −40 to +85 | | ● | | | ● | | 6.3 to 100 | 2.2 to 33000 | ±20 | WEB |
| | **UUQ** | 32 | 105°C Chip Type, For Audio Equipment | −40 to +105 | | | | | ● | ● | 6.3 to 50 | 1 to 1000 | ±20 | WEB |
| | **UCQ** | 32 | 105°C Chip Type, For Audio Equipment | −55 to +105 | | | | | ● | ● | 10 to 35 | 4.7 to 680 | ±20 | WEB |
| | **UES** ※1 | 04 | Bi-Polarized, For Audio Equipment | −40 to +85 | ● | | | | ● | | 6.3 to 50 | 1 to 1000 | ±20 | WEB |
| | **UDB** | 04 | Bi-Polarized, For Speaker Network | −40 to +85 | ● | | | | ● | | 50 | 1 to 47 | ±20 | WEB |

AEC-Q200 : AEC-Q200 compliant. Please contact us for details.

## Large Can Aluminum Electrolytic Capacitors

| Classification | Type・Series | Configuration | Applications | Category Temperature Range (°C) | Features: Standard type | Features: Smaller-sized & low profile | Features: High ripple | Features: High reliability | Features: Long life | Features: Anti-cleaningsolvent | Rated Voltage Range (V.D.C) | Rated Capacitance Range (μF) | Tolerance on Rated Capacitance (%) | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Standard type | **LLS** | 692 | 85°C Standard | −40 (−25) to +85 | ● | | | | | ▲ | 16 to 450 | 56 to 56000 | ±20 | 226 |
| | **LLG** | 692 | 85°C Smaller-Sized | −40 (−25) to +85 | | ● | | | | | 160 to 450 | 120 to 3900 | ±20 | 231 |
| | **LGU** | 692 | 105°C Standard | −40 (−25) to +105 | ● | | | | | ▲ | 16 to 450 | 47 to 47000 | ±20 | 234 |
| | **LGN** | 692 | 105°C Smaller-sized | −40 (−25) to +105 | | ● | | | | | 160 to 600 | 56 to 3300 | ±20 | 239 |
| | **LGG** | 692 | 105°C Ultra Smaller-Sized | −40 (−25) to +105 | | ● | | | | | 160 to 450 | 100 to 3300 | ±20 | 243 |
| | **LGL** | 692 | 105°C Ultra Smaller-Sized | −25 to +105 | | ● | | | | | 400・450 | 120 to 1000 | ±20 | 246 |
| | **LGM** | 692 | 105°C Ultra Smaller-Sized | −25 to +105 | | ● | | | | | 450 | 180 to 820 | ±20 | 248 |
| | **LGJ** | 692 | 105°C Low-Profile Sized | −40 (−25) to +105 | | ● | | | | | 200 to 450 | 47 to 680 | ±20 | 249 |
| | **LGJ(15)** | 692 | 105°C Low-Profile Sized (15mmL) | −40 (−25) to +105 | | ● | | | | | 160 to 400 | 39 to 390 | ±20 | 251 |
| | **LGY** | 692 | 105°C Long Life Assurance | −40 to +105 | | | | | ● | ● | 16 to 100 | 560 to 47000 | ±20 | 253 |
| | **LGR** | 692 | 105°C Long Life, Assurance | −40 (−25) to +105 | | | | | ● | | 200 to 450 | 39 to 1500 | ±20 | 256 |
| | **LGZ** | 692 | 105°C Long Life, Assurance | −25 to +105 | | | | | ● | | 450 | 82 to 330 | ±20 | 258 |
| | **LGX** | 692 | 105°C Long Life, Smaller-Sized | −25 to +105 | | ● | | | ● | | 200 to 500 | 56 to 2200 | ±20 | 259 |
| | NEW **LGC** | 692 | 105°C Long Life Assurance, Ultra-Smaller-Sized | −40 to +105 | | ● | | ● | ● | | 500 | 68 to 680 | ±20 | 262 |
| | **LGW** | 692 | 105°C High Ripple Current | −40 (−25) to +105 | | | ● | | | | 200 to 450 | 82 to 2200 | ±20 | 263 |
| | NEW **LHT** | 692 | 125°C High Reliability | −40 to +125 | | | ● | | | | 450 | 220 to 680 | ±20 | 265 |
| | **LAK** | 692 | 105°C Permissible Abnormal Voltage | −25 to +105 | | | | ● | | | 200・400・420 | 33 to 1200 | ±20 | WEB |
| | **LAQ** | 692 | 105°C Permissible Abnormal Voltage, Smaller-sized | −25 to +105 | | ● | | ● | | | 200・220・400 | 33 to 1500 | ±20 | WEB |
| | **LAS** | 692 | 105°C Permissible Abnormal Voltage, Smaller-sized | −25 to +105 | | ● | | ● | | | 400・420・450 | 56 to 390 | ±20 | WEB |
| | **LAR** | 692 | 105°C Permissible Overvoltage | −40 (−25) to +105 | | ● | | ● | | | 200 to 450 | 82 to 2200 | ±20 | WEB |
| | **LQS** | 692 | 105°C Permissible for Rapid Charge and Discharge Application | −25 to +105 | | ● | | ● | | | 350 to 450 | 82 to 820 | ±20 | 266 |
| Screw Terminal Type | **LNR** | 331 | 85°C Standard | −40 (−25) to +85 | ● | | ● | | | | 10 to 250 | 1000 to 680000 | ±20 | 268 |
| | **LNX** ※1 | 331 | 85°C Long Life Assurance | −25 to +85 | | | ● | ● | ● | | 350 to 630 | 1000 to 27000 | ±20 | 272 |
| | **LNK** | 331 | 85°C Smaller-Sized | −25 to +85 | | ● | | | | | 350 to 500 | 1000 to 18000 | ±20 | WEB |
| | **LNC** | 331 | 85°C Smaller-Sized High Ripple Current | −40 to +85 | | ● | ● | ● | | | 350 to 500 | 1000 to 22000 | ±20 | 275 |
| | **LQR** | 331 | 85°C Permissible for Rapid Charge and Discharge Application | −25 to +85 | | ● | ● | ● | | | 350 to 450 | 680 to 15000 | ±20 | WEB |
| | **LNY** | 331 | 85°C High Voltage, For General Inverter | −40 to +85 | ● | | | | | | 350 to 450 | 820 to 22000 | ±20 | 277 |
| | **LNT** | 331 | 105°C Standard | −40 (−25) to +105 | ● | | ● | ● | | | 10 to 500 | 220 to 680000 | ±20 | 279 |
| | **LNU** | 331 | 105°C High voltage, Smaller-Sized | −40 to +105 | | ● | ● | | | | 400 to 525 | 680 to 18000 | ±20 | 284 |
| For audio equipment | **LKG** | 621 692 | Lug / Snap-in Terminal Type, For Audio Equipment | −40 to +85 | ● | | | | | | 16 to 100 | 680 to 33000 | ±20 | WEB |
| | **LKS** | 692 | Snap-in Terminal Type, For Audio Equipment, Smaller-Sized | −40 to +85 | | ● | | | | | 25 to 100 | 680 to 33000 | ±20 | WEB |
| | **LKX** | 692 | Snap-in Terminal Type, For Audio Equipment of Switching Power Supplies | −40 (−25) to +105 | ● | | | | | | 200 to 450 | 56 to 2200 | ±20 | WEB |

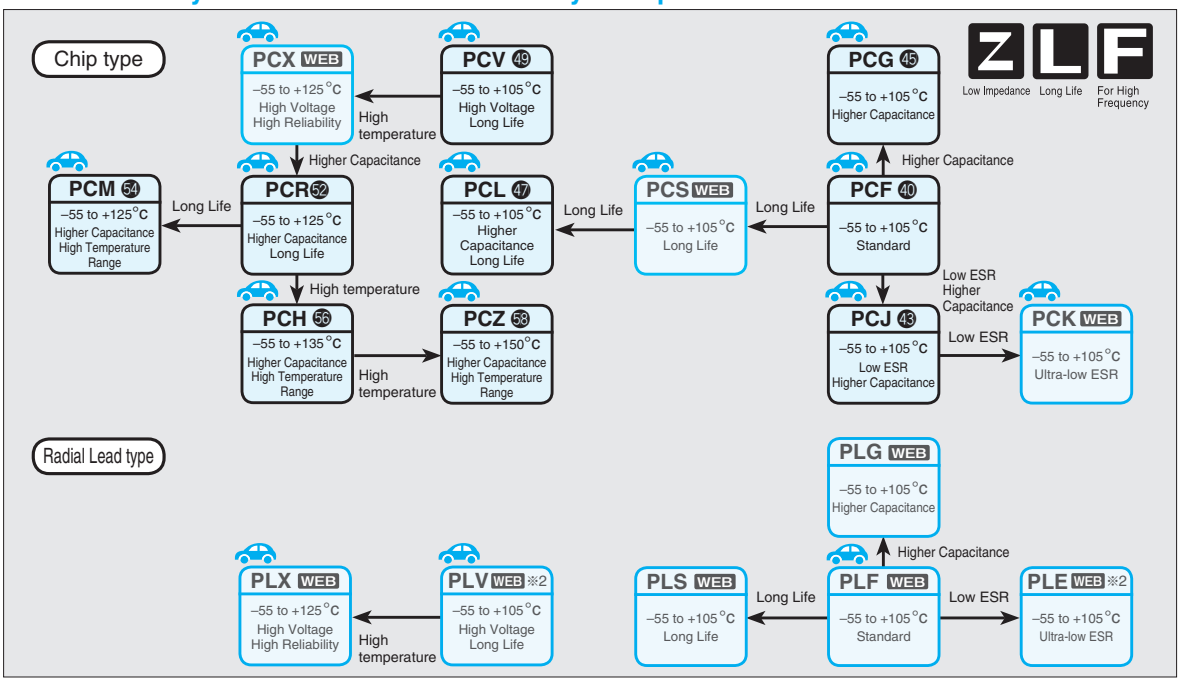
※1 May have values that are products which are scheduled to be discontinued.
They are not recommended for new designs. Please refer to the series data pages for details.

Above description is a feature against AK-225AES.
▲ : Applicable up to 100V ratings or less.Please refer to the Guidelines for Aluminum Electrolytic Capacitors for details of cleaning.

Please refer to our website for the details of the series described as “WEB”.

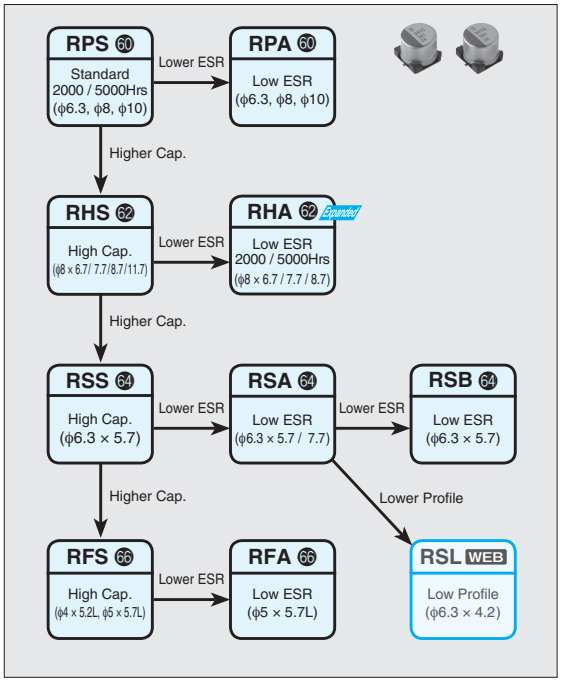
## Conductive Polymer Aluminum Solid Electrolytic Capacitors

○ Page number




## System Diagram for FPCAP

### SMD type

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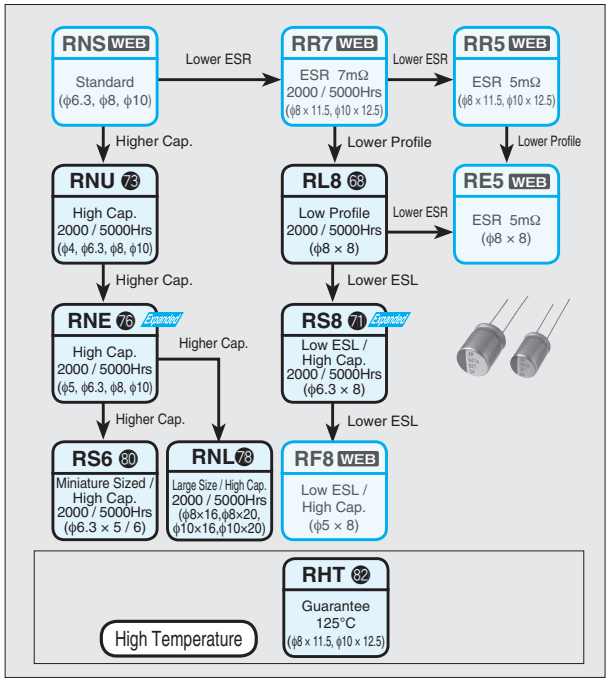
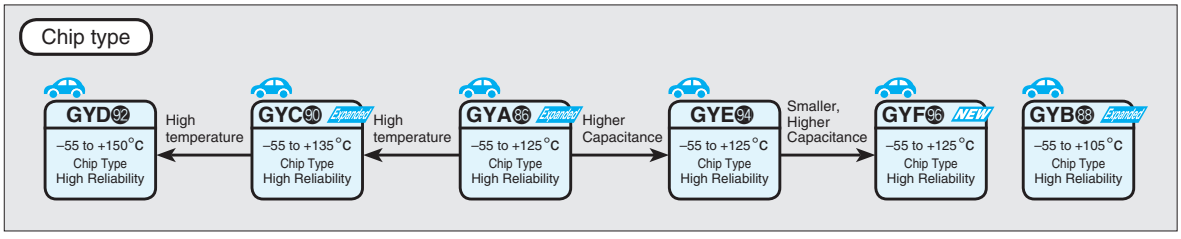



## Conductive Polymer Hybrid Aluminum Electrolytic Capacitors



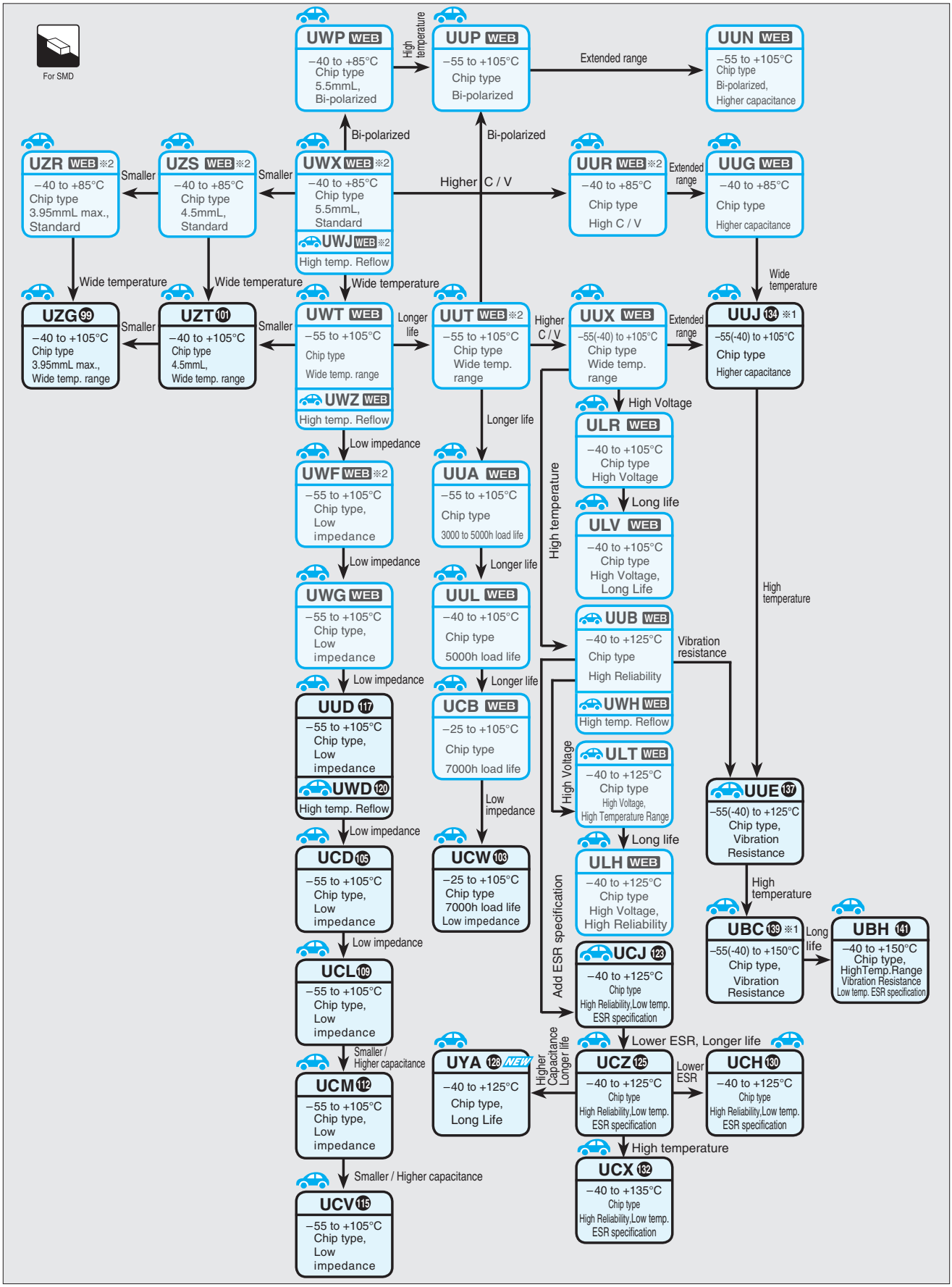

※2 Products which are scheduled to be discontinued, Not recommended for new designs.

AEC-Q200 compliant. Please contact us for details.

Please refer to our website for the details of the series described as "WEB".

## Chip Aluminum Electrolytic Capacitors

○ Page number




※1 May have values that are products which are scheduled to be discontinued.
They are not recommended for new designs. Please refer to the series data pages for details.

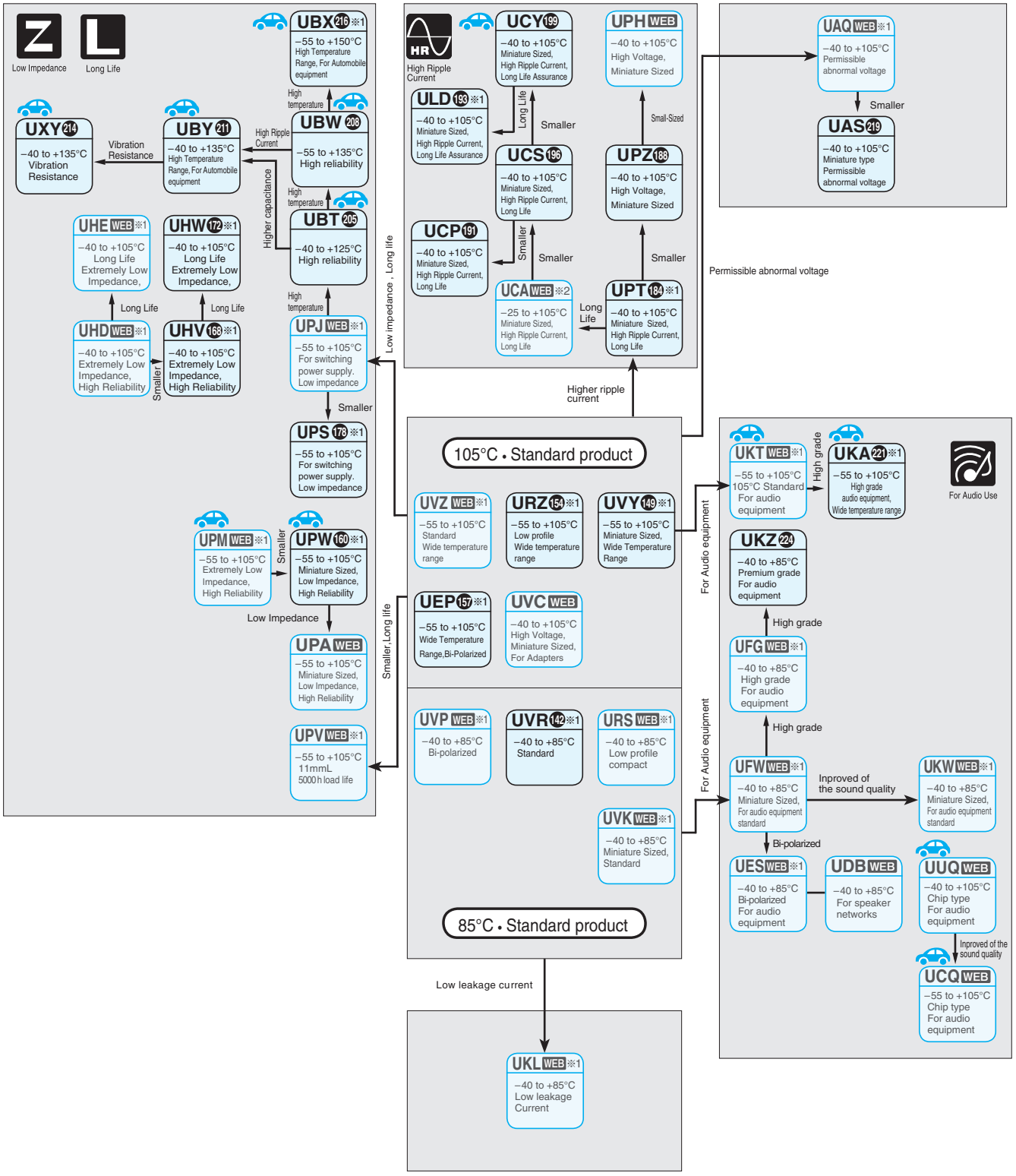
※2 Products which are scheduled to be discontinued, Not recommended for new designs.

AEC-Q200 compliant. Please contact us for details.

Please refer to our website for the details of the series described as “WEB”.

## Miniature Aluminum Electrolytic Capacitors

○ Page number




※1 May have values that are products which are scheduled to be discontinued.
They are not recommended for new designs. Please refer to the series data pages for details.

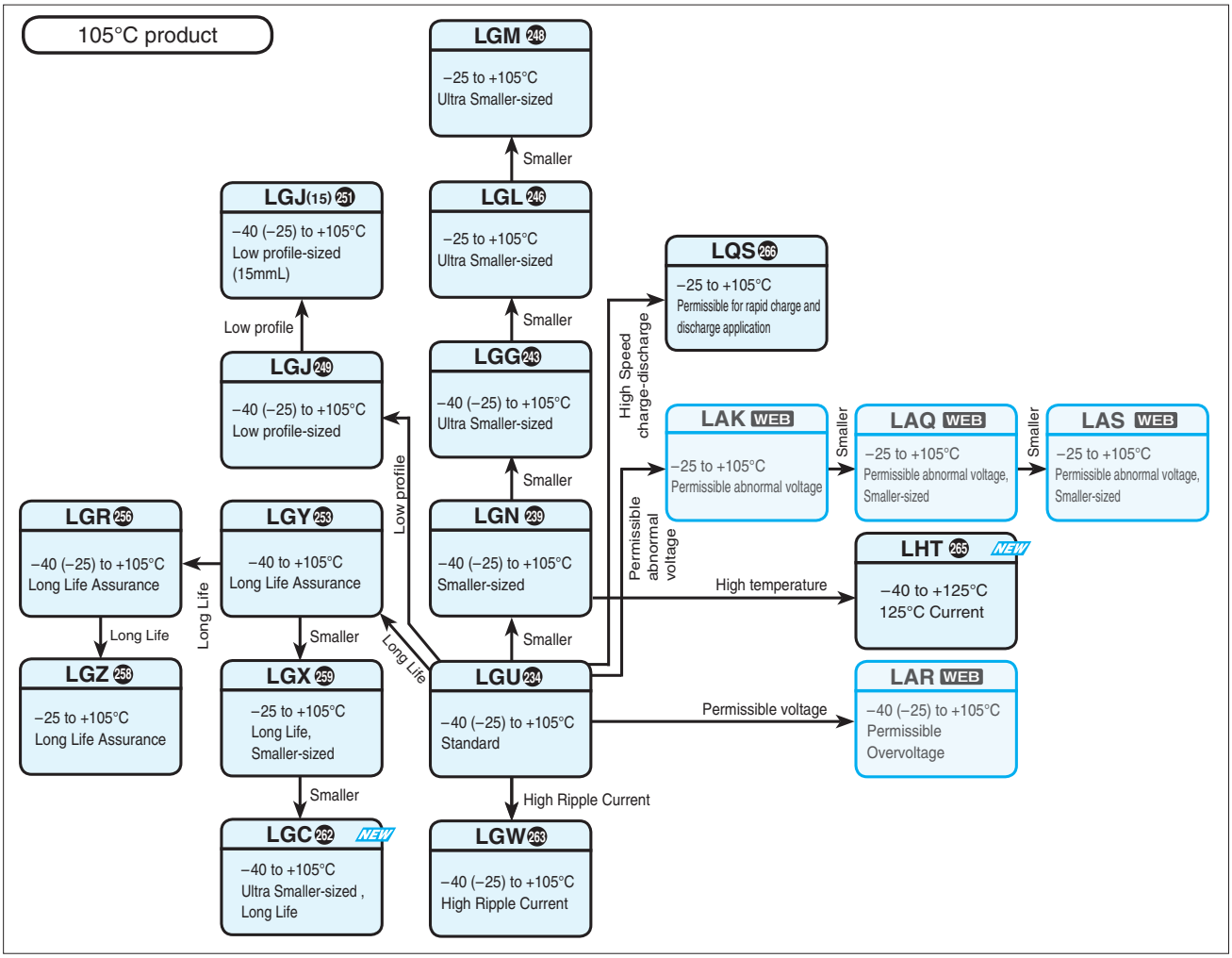
※2 Products which are scheduled to be discontinued, Not recommended for new designs.

AEC-Q200 compliant. Please contact us for details.

Please refer to our website for the details of the series described as “WEB”.

## Large Can Aluminum Electrolytic Capacitors

○ Page number




※1 May have values that are products which are scheduled to be discontinued.
They are not recommended for new designs. Please refer to the series data pages for details.

Please refer to our website for the details of the series described as “WEB”.