

Please read this notice before using the TAIYO YUDEN products.

REMINDERS

- Product information in this catalog is as of October 2017. All of the contents specified herein are subject to change without notice due to technical improvements, etc. Therefore, please check for the latest information carefully before practical application or use of our products.

Please note that TAIYO YUDEN shall not be in any way responsible for any damages and defects in products or equipment incorporating our products, which are caused under the conditions other than those specified in this catalog or individual product specification sheets.

- Please contact TAIYO YUDEN for further details of product specifications as the individual product specification sheets are available.
- Please conduct validation and verification of our products in actual condition of mounting and operating environment before using our products.
- The products listed in this catalog are intended for use in general electronic equipment (e.g., AV equipment, OA equipment, home electric appliances, office equipment, information and communication equipment including, without limitation, mobile phone, and PC) and medical equipment classified as Class I or II by IMDRF. Please be sure to contact TAIYO YUDEN for further information before using the products for any equipment which may directly cause loss of human life or bodily injury (e.g., transportation equipment including, without limitation, automotive powertrain control system, train control system, and ship control system, traffic signal equipment, disaster prevention equipment, medical equipment classified as Class III by IMDRF, highly public information network equipment including, without limitation, telephone exchange, and base station).

Please do not incorporate our products into any equipment requiring high levels of safety and/or reliability (e.g., aerospace equipment, aviation equipment*, medical equipment classified as Class IV by IMDRF, nuclear control equipment, undersea equipment, military equipment).

*Note: There is a possibility that our products can be used only for aviation equipment that does not directly affect the safe operation of aircraft (e.g., in-flight entertainment, cabin light, electric seat, cooking equipment) if such use meets requirements specified separately by TAIYO YUDEN. Please be sure to contact TAIYO YUDEN for further information before using our products for such aviation equipment.

When our products are used even for high safety and/or reliability-required devices or circuits of general electronic equipment, it is strongly recommended to perform a thorough safety evaluation prior to use of our products and to install a protection circuit as necessary.

Please note that unless you obtain prior written consent of TAIYO YUDEN, TAIYO YUDEN shall not be in any way responsible for any damages incurred by you or third parties arising from use of the products listed in this catalog for any equipment requiring inquiry to TAIYO YUDEN or prohibited for use by TAIYO YUDEN as described above.

- Information contained in this catalog is intended to convey examples of typical performances and/or applications of our products and is not intended to make any warranty with respect to the intellectual property rights or any other related rights of TAIYO YUDEN or any third parties nor grant any license under such rights.
- Please note that the scope of warranty for our products is limited to the delivered our products themselves and TAIYO YUDEN shall not be in any way responsible for any damages resulting from a fault or defect in our products. Notwithstanding the foregoing, if there is a written agreement (e.g., supply and purchase agreement, quality assurance agreement) signed by TAIYO YUDEN and your company, TAIYO YUDEN will warrant our products in accordance with such agreement.
- The contents of this catalog are applicable to our products which are purchased from our sales offices or authorized distributors (hereinafter "TAIYO YUDEN's official sales channel"). Please note that the contents of this catalog are not applicable to our products purchased from any seller other than TAIYO YUDEN's official sales channel.
- Caution for Export
Some of our products listed in this catalog may require specific procedures for export according to "U.S. Export Administration Regulations", "Foreign Exchange and Foreign Trade Control Law" of Japan, and other applicable regulations. Should you have any questions on this matter, please contact our sales staff.

CYLINDER TYPE POLYACENE CAPACITORS



■ PARTS NUMBER

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | A | S | 0 | 8 | 1 | 5 | L | S | 2 | R | 5 | 1 | 0 | 5 |
| ① | | | ② | | ③ | | ④ | | ⑤ | | | ⑥ | | |

① Series name

| Code | Series name |
|------|---------------------|
| PAS | Polyacene capacitor |

② Dimensions (φD)

| Code | Dimensions (φD) [mm] |
|------|----------------------|
| 08 | 8 |
| 10 | 10 |
| 12 | 12.5 |

③ Dimensions (L)

| Code | Dimensions (L) [mm] |
|------|---------------------|
| 15 | 15 |
| 16 | 16 |
| 20 | 20 |
| 30 | 30 |
| 35 | 35 |

④ Characteristics spec

| Code | Characteristics spec |
|------|-----------------------|
| LS | Low ESR type |
| LN | High Reliability type |
| LA | High Voltage type |

⑤ Maximum usable voltage

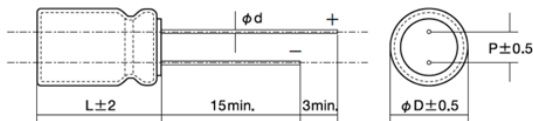
| Code | Maximum usable voltage [V] |
|------|----------------------------|
| 2R5 | 2.5 |
| 2R7 | 2.7 |
| 3R0 | 3.0 |

※R=Decimal point

⑥ Nominal capacitance

| Code (example) | Nominal capacitance [F] |
|----------------|------------------------------|
| 105 | $10 \times 10^5 \mu F = 1F$ |
| ∫ | ∫ |
| 206 | $20 \times 10^6 \mu F = 20F$ |

■ EXTERNAL DIMENSIONS



| Characteristics spec | Part number | φD | L | φd | P |
|-----------------------------------|-----------------|------|----|-----|-----|
| Low ESR type (LS series) | PAS0815LS2R5105 | 8 | 15 | 0.6 | 3.5 |
| | PAS1016LS2R5205 | 10 | 16 | 0.6 | 5.0 |
| High Reliability type (LN Series) | PAS0815LN2R7205 | 8 | 15 | 0.6 | 3.5 |
| | PAS1030LN2R7705 | 10 | 30 | 0.6 | 5.0 |
| | PAS1030LN2R7905 | 10 | 30 | 0.6 | 5.0 |
| | PAS1220LN2R7905 | 12.5 | 20 | 0.6 | 5.0 |
| High Voltage Type (LA Series) | PAS1230LN2R7166 | 12.5 | 30 | 0.6 | 5.0 |
| | PAS1020LA3R0405 | 10 | 20 | 0.6 | 5.0 |
| | PAS1220LA3R0905 | 12.5 | 20 | 0.6 | 5.0 |
| | PAS1235LA3R0206 | 12.5 | 35 | 0.6 | 5.0 |

Unit: mm

■ PARTS NUMBER

| Characteristics spec | Part number | Maximum usable voltage [V] | Nominal capacitance [F] | ESR@1KHz [mΩ] |
|-----------------------------------|-----------------|----------------------------|-------------------------|---------------|
| Low ESR type (LS series) | PAS0815LS2R5105 | 2.5 | 1 | 70 |
| | PAS1016LS2R5205 | | 2 | 50 |
| High Reliability type (LN Series) | PAS0815LN2R7205 | 2.7 | 2 | 180 |
| | PAS1030LN2R7705 | | 7 | 80 |
| | PAS1030LN2R7905 | | 9 | 80 |
| | PAS1220LN2R7905 | | 9 | 60 |
| | PAS1230LN2R7166 | | 16 | 50 |
| High Voltage Type (LA Series) | PAS1020LA3R0405 | 3.0 | 4 | 300 |
| | PAS1220LA3R0905 | | 9 | 200 |
| | PAS1235LA3R0206 | | 20 | 100 |

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[LS series]

| Part number | Operating temp. range [°C] | Maximum usable voltage [V] | Initial capacitance [F] | Initial ESR@1KHz [mΩ] | Temperature characteristics |
|-----------------|----------------------------|----------------------------|-------------------------|-----------------------|--|
| PAS0815LS2R5105 | -25 ~ +70 | 2.5 | 1.0±20% | Under 70 | Lowest temperature (-25°C) Capacitance: Over 70% of initial spec. Internal resistance: Within 4 times of initial spec. Highest temperature (70°C) Capacitance: Within initial spec. Internal resistance: Within initial spec. |
| PAS1016LS2R5205 | | | 2.0±20% | Under 50 | |

[LN series]

| Part number | Operating temp. range [°C] | Maximum usable voltage [V] | Initial capacitance [F] | Initial ESR@1KHz [mΩ] | Temperature characteristics |
|-----------------|-----------------------------|----------------------------|-------------------------|-----------------------|--|
| PAS0815LN2R7205 | -40 ~ +70 Over +70 ~ +85 | 2.7 2.3 | 2.0±20% | Under 180 | Lowest temperature (-40°C) Capacitance: Over 85% of initial spec. Internal resistance: Within 6 times of initial spec. High temperature (70°C) Capacitance: Within initial spec. Internal resistance: Within initial spec. Highest temperature (85°C) Capacitance: Over 90% of initial spec. Internal resistance: Within initial spec. |
| PAS1030LN2R7705 | | | 7.0±20% | Under 80 | |
| PAS1030LN2R7905 | | | 9.0±20% | Under 80 | |
| PAS1220LN2R7905 | | | 9.0±20% | Under 60 | |
| PAS1230LN2R7166 | | | 16±20% | Under 50 | |

[LA series]

| Part number | Operating temp. range [°C] | Maximum usable voltage [V] | Initial capacitance [F] | Initial ESR@1KHz [mΩ] | Temperature characteristics |
|-----------------|---|----------------------------|-------------------------|-----------------------|---|
| PAS1020LA3R0405 | -25 ~ +60 Over +60 ~ +70 Over +70 ~ +85 | 3.0 2.7 2.3 | 4.0±20% | Under 300 | Lowest temperature (-25°C) Capacitance: Over 70% of initial spec. Internal resistance: Within 4 times of initial spec. High temperature (60°C/70°C) Capacitance: Within initial spec. Internal resistance: Within initial spec. Highest temperature (85°C) Capacitance: Over 90% of initial spec. Internal resistance: Within initial spec. |
| PAS1220LA3R0905 | | | 9.0±20% | Under 200 | |
| PAS1235LA3R0206 | | | 20±20% | Under 100 | |

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| Items | Specified value | | | Test methods and remark |
|---|---|-----------------|-----------------------|---|
| | LS series | LN series | LA series | |
| 1. Operating temperature range | -25~+70°C | -40~+70 / +85°C | -25~+60 / +70 / +85°C | |
| 2. Maximum usable voltage | 2.5V | 2.7V / 2.3V | 3.0V / 2.7V / 2.3V | |
| 3. Soldering | Capacitance: Within initial spec. Internal resistance: Within initial spec. Appearance: No noticeable abnormality | | | Material: Sn-3Ag-0.5Cu Solder temperature: 260±5°C Dipping time: 10±1 sec. Dipping depth: 1.5~2mm from cell body |
| 4. Floating charge characteristics | Capacitance: Over 70% of initial spec. Internal resistance: Within 4 times of initial spec. Appearance: No noticeable abnormality | | | Apply a max. usable voltage to capacitor for 1000 hours at max. operating temperature and measure the floating charge characteristics after returning to normal temperature and humidity. |
| 5. Charge/Discharge cycle characteristics | | | | Measure the charge/discharge cycle characteristics after 10000 charge/discharge cycle at 25±5°C with under mentioned charge/discharge cycle test condition for each parts. |
| 6. Thermal durability | Capacitance: Within initial spec. Internal resistance: Within initial spec. Appearance: No noticeable abnormality | | | Leave the capacitor in environment of the max. usable temperature ±2°C and -25±2°C consecutively for 96 hours each, and return to normal temperature and humidity. |
| 7. Humidity durability | Capacitance: Within initial spec. Internal resistance: Within 4 times of initial spec. Appearance: No noticeable abnormality | | | Temperature: 40±2°C, humidity: 90~95%RH leave the capacitor for 500 hours, and return to normal temperature and humidity. |
| 8. Shock resistance | No exterior abnormality observed: initial spec. values retained | | | According to JIS C 60068-2-27 Half-sine wave A=294 |
| 9. Vibration resistance | | | | Apply a sine wave vibration of 1.5mm amplitude and frequency 10~55Hz, for 2 hours per each direction (X,Y and Z), total 6 hours. |

Charge/Discharge cycle test condition

| Part number | Charging voltage [V] | Charging time [sec] | Max. Charging current [A] | Discharge current [A] | Terminal voltage [V] | | |
|-----------------|----------------------|---------------------|---------------------------|-----------------------|----------------------|---|-----|
| PAS0815LS2R5105 | 2.5 | 10 | 1 | 1 | 1.5 | | |
| PAS1016LS2R5205 | | | 0.2 | 0.2 | | | |
| PAS0815LN2R7205 | 2.7 | 30 | 0.9 | 0.9 | | | |
| PAS1030LN2R7705 | | | 1 | 1 | | | |
| PAS1220LN2R7905 | | | 1 | 1 | | | |
| PAS1230LN2R7166 | | | 1 | 1 | | | |
| PAS1020LA3R0405 | | | 3.0 | | | 2 | 0.5 |
| PAS1220LA3R0905 | | | | | | 3 | 1 |
| PAS1235LA3R0206 | 5 | 1 | | | | | |

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CYLINDER TYPE POLYACENE CAPACITORS

■ PRECAUTIONS

1. Use within the usable voltage range

Applying voltage exceeding the maximum working voltage may cause leakage or damage.

2. Use within the operating temperature range

3. Lifetime of POLYACENE capacitor is finite

The life of the product is affected by operating temperature and operating voltage. In addition, the internal resistance rises gradually with usage and the capacity drops.

4. There are temperature dependence and voltage dependence in the electrical characteristics

The electrical characteristics of the product vary depending on operating temperature and voltage. Please check the temperature characteristics before using the product.

5. Polyacene capacitor has polarity

Check the polarity before use. It will be damage if it is reversely charged. Avoid using products with reverse voltage applied.

6. Be aware of the ripple current and use in circuits that repeat sudden charge and discharge

POLYACENE capacitor may be used in a circuit that repeats sudden charge / discharge or application of high ripple current may cause the life to be shortened due to heat generation. Please inquire when using it for such a circuit.

7. Mind the voltage drop during discharge (backup)

If the discharge current is large, a voltage drop occurs at the start of discharge. Be careful about discharge current.

8. Series connection

When POLYACENE capacitors are connected in series, the balance of the applied voltage may be lost, and some capacitors may be overcharged or may lead to shortening lifetime and breakdown. Take a margin against the maximum usable voltage or add a balancing resistor.

9. POLYACENE capacitor has the pressure release vent

In case of inside pressure of capacitor excessively rising, the pressure release vent will be opened in order to release inner gas. Following clearance (Diameter < $\phi 18$: over 2mm, Diameter $\geq \phi 18$: over 3mm) should be made above the pressure release vent.

Don't set up wiring or a pattern in the upper part of the pressure release vent, so that the high temperature gas is gushed when the pressure release vent open.

The product which open the pressure release vent cannot use.

10. Insulation of the aluminum case and sleeve of lithium ion capacitor is not guaranteed

There is a possibility of short-circuiting when the circuit pattern is arranged under the POLYACENE capacitor or when it comes in contact with other parts.

11. Environmental of usage

In case POLYACENE capacitor is used in high humidity, alkaline or acid air, it may cause deteriorating of its performance and short circuit by corrosion of outer can or lead terminal. In addition, used in sudden temperature change or high humidity, it may cause deteriorating of its performance and electrolyte leak by dew condensation.

12. Don't apply shock and vibration or pressure

POLYACENE capacitors are weak parts for mechanical shock. Be careful not to drop the product or apply strong force to the main body and lead terminal. Also, if you apply excessive vibration or shock after mounting, stress such as grasping, tilting, pushing, twisting, etc., the soldered part may come off or the lead terminal part may be damaged.

13. Be careful not to apply excessive heat when mounting

If excessive heat stress is added to the product, electric characteristics deterioration and electrolyte leakage may occur.

Soldering conditions should be within the range specified in the delivery specifications.

14. Please consult about substrate cleaning after soldering

There are cases where the product may be adversely affected depending on the type of solvent and washing conditions, so please consult in advance.

15. Storage

Keep following cautions for storage of POLYACENE capacitor.

- Don't store in the high temperature and the high humidity condition and a place where receiving direct sunlight. Storing POLYACENE capacitor in the room condition of 10 °C – 35 °C and less than 65% relative humidity is recommended. Sudden temperature change or high humidity may cause deteriorating of its characteristics and solderability.

- Don't store POLYACENE capacitor near water, salt water or oil, and in the dew condensation, gasified oil or salinity filled place.

- Don't store POLYACENE capacitor in the hazardous gas (hydrogen sulfide, sulfurous, chlorine, ammonia, bromine, methyl bromine, ozone and etc.) .

- Don't fumigate by halogen fumigant.

- Don't store POLYACENE capacitor near acid or alkaline solvent.

- Don't store POLYACENE capacitor in a place where exposed to ultraviolet or radioactive rays.

- Don't store POLYACENE capacitor in a place where vibration and shock might occur.

16. Disposal

Dispose POLYACENE capacitor properly with a decree or the regulation a local public organization designates.

17. Usage

POLYACENE capacitor is developed on the assumption that this product will be used in the memory-backup & RTC for usage of information & communication equipment, home electronics, audio & visual equipment, office equipment, etc. Consult us about using high reliability and safety required products such as medical equipment, transportation equipment, industrial equipment, flight / space equipment and emergency equipment, etc.

18. Other Notice

- Don't heat or throw POLYACENE capacitor into fire.
- Don't short-circuit.
- Don't solder directly to a cell body.
- Don't open a body.
- Don't deform.
- Don't apply pressure.

※All of the contents specified herein are subject to change without notice due to technical improvements, etc.

※Please see JEITA RCR-2370C for details.

JEITA RCR-2370C

「Safety application guide of electric double layer capacitor (EDLC) (Directions guideline of electric double layer capacitor)」
[Corporation Electronic Industries Association of Japan. Enactment in March 1995 and revision in July 2008]
