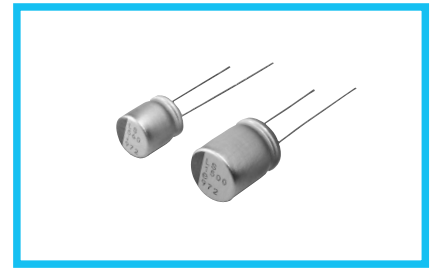


**LS** series

Radial Lead Type, Long Life Assurance



- Ultra-low ESR, High ripple current.
- Load life of 5000 hours at 105°C.
- Radial lead type :  
Lead free flow soldering condition correspondence.
- Compliant to the RoHS directive (2011/65/EU).



## Specifications

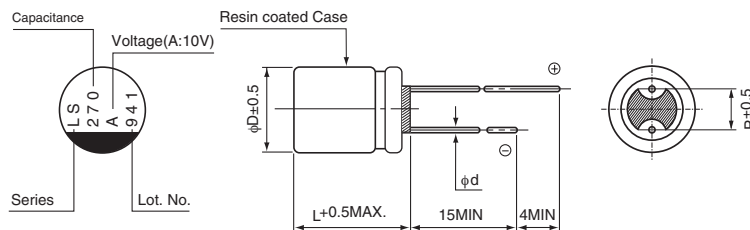
| Item                                              | Performance Characteristics                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------------|-------|-----------------------------------------------|-----------|-----------------------------------------------|-----------------------|---------------------------------------------------|
| Category Temperature Range                        | -55 to +105°C                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Rated Voltage Range                               | 2.5 to 16V                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Rated Capacitance Range                           | 100 to 1500μF                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Capacitance Tolerance                             | ±20% at 120Hz, 20°C                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Tangent of loss angle (tan δ)                     | Less than or equal to the specified value at 120Hz, 20°C                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| ESR (※ 1)                                         | Less than or equal to the specified value at 100kHz, 20°C                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Leakage Current (※ 2)                             | Less than or equal to the specified value. After 2 minutes' application of rated voltage at 20°C                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Temperature Characteristics (Max.Impedance Ratio) | Z+105°C / Z+20°C ≤ 1.25 (100kHz)<br>Z-55°C / Z+20°C ≤ 1.25                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Endurance                                         | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 5000 hours at 105°C.                                                                                                                                                                                                   | <table><tr><td>Capacitance change</td><td>Within ± 20% of the initial capacitance value (※ 3)</td></tr><tr><td>tan δ</td><td>150% or less than the initial specified value</td></tr><tr><td>ESR (※ 1)</td><td>150% or less than the initial specified value</td></tr><tr><td>Leakage current (※ 2)</td><td>Less than or equal to the initial specified value</td></tr></table> | Capacitance change | Within ± 20% of the initial capacitance value (※ 3) | tan δ | 150% or less than the initial specified value | ESR (※ 1) | 150% or less than the initial specified value | Leakage current (※ 2) | Less than or equal to the initial specified value |
| Capacitance change                                | Within ± 20% of the initial capacitance value (※ 3)                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| tan δ                                             | 150% or less than the initial specified value                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| ESR (※ 1)                                         | 150% or less than the initial specified value                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Leakage current (※ 2)                             | Less than or equal to the initial specified value                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Damp Heat (Steady State)                          | The specifications listed at right shall be met when the capacitors are restored to 20°C after the rated voltage is applied for 1000 hours at 60°C, 90% RH.                                                                                                                                                                                            | <table><tr><td>Capacitance change</td><td>Within ± 20% of the initial capacitance value (※ 3)</td></tr><tr><td>tan δ</td><td>150% or less than the initial specified value</td></tr><tr><td>ESR (※ 1)</td><td>150% or less than the initial specified value</td></tr><tr><td>Leakage current (※ 2)</td><td>Less than or equal to the initial specified value</td></tr></table> | Capacitance change | Within ± 20% of the initial capacitance value (※ 3) | tan δ | 150% or less than the initial specified value | ESR (※ 1) | 150% or less than the initial specified value | Leakage current (※ 2) | Less than or equal to the initial specified value |
| Capacitance change                                | Within ± 20% of the initial capacitance value (※ 3)                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| tan δ                                             | 150% or less than the initial specified value                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| ESR (※ 1)                                         | 150% or less than the initial specified value                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Leakage current (※ 2)                             | Less than or equal to the initial specified value                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Resistance to Soldering Heat                      | After soldering the capacitor under the soldering conditions prescribed here as preheat at 150 to 200°C for 60 to 180 seconds and peak temperature at 265°C for 10 seconds or less, the capacitor shall meet the specifications listed at right, provided that its temperature profile is measured at both of terminal ends facing the soldering side. | <table><tr><td>Capacitance change</td><td>Within ± 10% of the initial capacitance value (※ 3)</td></tr><tr><td>tan δ</td><td>130% or less than the initial specified value</td></tr><tr><td>ESR (※ 1)</td><td>130% or less than the initial specified value</td></tr><tr><td>Leakage current (※ 2)</td><td>Less than or equal to the initial specified value</td></tr></table> | Capacitance change | Within ± 10% of the initial capacitance value (※ 3) | tan δ | 130% or less than the initial specified value | ESR (※ 1) | 130% or less than the initial specified value | Leakage current (※ 2) | Less than or equal to the initial specified value |
| Capacitance change                                | Within ± 10% of the initial capacitance value (※ 3)                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| tan δ                                             | 130% or less than the initial specified value                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| ESR (※ 1)                                         | 130% or less than the initial specified value                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Leakage current (※ 2)                             | Less than or equal to the initial specified value                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |
| Marking                                           | Navy blue print on the case top                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                |                    |                                                     |       |                                               |           |                                               |                       |                                                   |

※ 1 ESR should be measured at both of the terminal ends closest to the capacitor body.

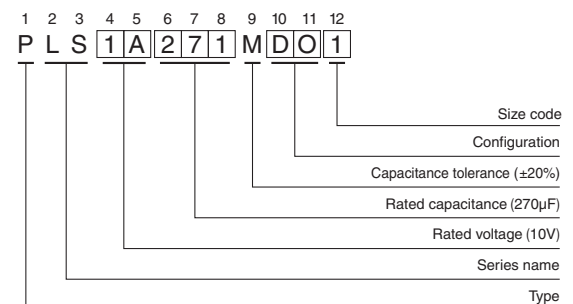
※ 2 Conditioning : If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105°C.

※ 3 Initial value : The value before test of examination of resistance to soldering.

## Dimensions



## Type numbering system (Example : 10V 270μF)



(mm)

| Size | φ6.3 × 9L | φ6.3 × 10.5L | φ8 × 7L | φ8 × 9L | φ8 × 12L | φ10 × 13L |
|------|-----------|--------------|---------|---------|----------|-----------|
| φD   | 6.3       | 6.3          | 8.0     | 8.0     | 8.0      | 10.0      |
| L    | 8.5       | 10.0         | 6.5     | 8.5     | 11.5     | 12.5      |
| P    | 2.5       | 2.5          | 3.5     | 3.5     | 3.5      | 5.0       |
| φd   | 0.6       | 0.5          | 0.6     | 0.6     | 0.6      | 0.6       |

### Voltage

| V    | 2.5 | 4 | 6.3 | 10 | 16 |
|------|-----|---|-----|----|----|
| Code | e   | g | j   | A  | C  |

Please refer to page 20 about the end seal configuration.

● Dimension table in next page.



# Standard Ratings

| Rated Voltage (V)<br>code | Surge Voltage (V) | Rated Capacitance (μF) | Case Size<br>φD × L (mm) | tan δ | Leakage Current (μA) | ESR (mΩ)<br>(at 100kHz 20°C) | Rated Ripple (mArms) | Part Number  |
|---------------------------|-------------------|------------------------|--------------------------|-------|----------------------|------------------------------|----------------------|--------------|
| 2.5<br>(0E)               | 2.8               | 330                    | ○ 6.3 × 9                | 0.08  | 500                  | 8                            | 4800                 | PLS0E331MCO8 |
|                           |                   | 680                    | △ 8 × 7                  | 0.08  | 340                  | 15                           | 3900                 | PLS0E681MCL2 |
|                           |                   | 820                    | ○ 6.3 × 9                | 0.08  | 500                  | 8                            | 4800                 | PLS0E821MCO8 |
|                           |                   | 820                    | ▲ 8 × 9                  | 0.08  | 410                  | 7                            | 5200                 | PLS0E821MCO6 |
|                           |                   | 820                    | 8 × 12                   | 0.08  | 410                  | 7                            | 5800                 | PLS0E821MDO1 |
|                           |                   | 1500                   | 10 × 13                  | 0.08  | 750                  | 8                            | 5500                 | PLS0E152MDO1 |
| 4<br>(0G)                 | 4.6               | 270                    | ○ 6.3 × 9                | 0.08  | 500                  | 8                            | 4800                 | PLS0G271MCO8 |
|                           |                   | 560                    | △ 8 × 7                  | 0.08  | 448                  | 15                           | 3900                 | PLS0G561MCL2 |
|                           |                   | 560                    | ▲ 8 × 9                  | 0.08  | 448                  | 7                            | 5200                 | PLS0G561MCO6 |
|                           |                   | 680                    | 8 × 12                   | 0.08  | 544                  | 7                            | 5800                 | PLS0G681MDO1 |
|                           |                   | 1200                   | 10 × 13                  | 0.08  | 960                  | 8                            | 5500                 | PLS0G122MDO1 |
| 6.3<br>(0J)               | 7.2               | 330                    | ■ 6.3 × 10.5             | 0.08  | 416                  | 20                           | 3000                 | PLS0J331MDL4 |
|                           |                   | 390                    | △ 8 × 7                  | 0.08  | 491                  | 15                           | 3900                 | PLS0J391MCL2 |
|                           |                   | 470                    | 8 × 12                   | 0.08  | 592                  | 7                            | 5500                 | PLS0J471MDO1 |
|                           |                   | 560                    | ○ 6.3 × 9                | 0.08  | 706                  | 9                            | 4300                 | PLS0J561MCO8 |
|                           |                   | 560                    | ▲ 8 × 9                  | 0.08  | 706                  | 8                            | 5000                 | PLS0J561MCO6 |
|                           |                   | 820                    | 10 × 13                  | 0.08  | 1033                 | 8                            | 5500                 | PLS0J821MDO1 |
| 10<br>(1A)                | 11.5              | 150                    | ■ 6.3 × 10.5             | 0.08  | 300                  | 20                           | 3000                 | PLS1A151MDL4 |
|                           |                   | 270                    | 8 × 12                   | 0.08  | 540                  | 8                            | 4900                 | PLS1A271MDO1 |
|                           |                   | 470                    | 10 × 13                  | 0.08  | 940                  | 8                            | 5500                 | PLS1A471MDO1 |
| 16<br>(1C)                | 18.4              | 100                    | ■ 6.3 × 10.5             | 0.08  | 320                  | 24                           | 2800                 | PLS1C101MDL4 |
|                           |                   | 270                    | 8 × 12                   | 0.08  | 864                  | 9                            | 4500                 | PLS1C271MDO1 |
|                           |                   | 330                    | 10 × 13                  | 0.08  | 1056                 | 9                            | 4700                 | PLS1C331MDO1 |
|                           |                   | 470                    | 10 × 13                  | 0.08  | 1504                 | 9                            | 4700                 | PLS1C471MDO1 |

Rated ripple current (mArms) at 105°C 100kHz

No marked, [1] will be put at 12th digit of type numbering system.  
 △: In this case, [2] will be put at 12th digit of type numbering system.  
 ■: In this case, [4] will be put at 12th digit of type numbering system.  
 ▲: In this case, [6] will be put at 12th digit of type numbering system.  
 ○: In this case, [8] will be put at 12th digit of type numbering system.

- Please refer to page 20, 21, 22 about the formed or taped product spec.
- Please refer to page 3 for the minimum order quantity.

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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