

## PB

## Radial Lead Type, Ultra-low ESR Series

- Ultra-Low ESR, High ripple current.
- Load life of 2000 hours at 105°C.
- Radial lead type: lead free flow soldering condition correspondence.
- RoHS Compliance (2011/65/EU)



## ■ SPECIFICATIONS

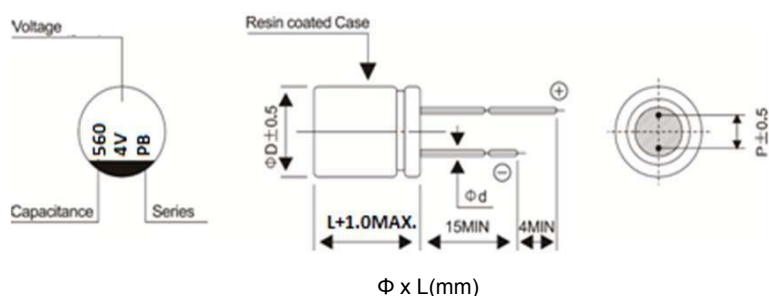
| Items                                              | Performance Characteristics                                                                                                                                                                                                                                                                                                                            |                     |                                                   |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------|
| Category Temperature Range                         | -55 ~ +105°C                                                                                                                                                                                                                                                                                                                                           |                     |                                                   |
| Rated Voltage Range                                | 2.5 ~ 16V                                                                                                                                                                                                                                                                                                                                              |                     |                                                   |
| Rated Capacitance Range                            | 270 ~ 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 2000 hours at 105 °C                                                                                                                                                                                                  | 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     |
| 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.                                                                                                                                                                                          | 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     |
| 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. | 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 ±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                                            | Red print on the case top                                                                                                                                                                                                                                                                                                                              |                     |                                                   |

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

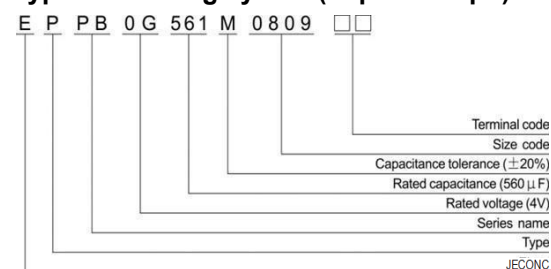
※2 Conditioning: If any doubt arises, measure the leakage current after the voltage treatment of applying DC rated voltage continuously to the capacitor for 120 minutes at 105 °C

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

## ■ Dimensions



## Type numbering system (Exp: 4V 560μF)



| Size | 6.3x8 | 6.3x11 | 8x8 | 8x11 | 10x12 | 10x16 |
|------|-------|--------|-----|------|-------|-------|
| ΦD   | 6.3   | 6.3    | 8.0 | 8    | 10.0  | 10    |
| L    | 8     | 11     | 8   | 11   | 12    | 16    |
| P    | 2.5   | 2.5    | 3.5 | 3.5  | 5.0   | 5     |
| Φd   | 0.6   | 0.6    | 0.6 | 0.6  | 0.6   | 0.6   |

| Voltage |     |    |     |    |
|---------|-----|----|-----|----|
| V       | 2.5 | 4  | 6.3 | 16 |
| Code    | 0E  | 0G | 0J  | 1C |

**PB Series****■ STANDARD RATINGS**

| Rated voltage<br>(V)(code) | Surge Voltage<br>(V) | Rated Capacitance<br>(μF) | Case Size<br>ΦD x L(mm) | tan δ | Leakage Current<br>(μA) | ESR(mΩ)<br>(at 100kHz 20℃) | Rated Ripple<br>(mArms) | Part Number    |
|----------------------------|----------------------|---------------------------|-------------------------|-------|-------------------------|----------------------------|-------------------------|----------------|
| 2.5<br>(0E)                | 2.8                  | 560                       | 6.3x8                   | 0.08  | 280                     | 7                          | 5900                    | EPPB0E561M6308 |
|                            |                      | 820                       | 6.3x8                   | 0.08  | 410                     | 7                          | 5900                    | EPPB0E821M6308 |
|                            |                      | 820                       | 8x8                     | 0.08  | 410                     | 7                          | 5900                    | EPPB0E821M0808 |
|                            |                      | 1000                      | 6.3x8                   | 0.08  | 500                     | 7                          | 5900                    | EPPB0E102M6308 |
|                            |                      | 1500                      | 8X8                     | 0.08  | 750                     | 7                          | 6100                    | EPPB0E152M0808 |
| 4<br>(0G)                  | 4.6                  | 560                       | 6.3x8                   | 0.08  | 224                     | 9                          | 5900                    | EPPB0G561M6308 |
|                            |                      | 680                       | 6.3x8                   | 0.08  | 272                     | 9                          | 5900                    | EPPB0G681M6308 |
|                            |                      | 820                       | 6.3x11                  | 0.08  | 328                     | 7                          | 6150                    | EPPB0G821M6311 |
|                            |                      | 1200                      | 6.3x11                  | 0.08  | 480                     | 7                          | 6150                    | EPPB0G122M6311 |
| 6.3<br>(0J)                | 7.2                  | 100                       | 5x6                     | 0.08  | 126                     |                            |                         | EPPB0J101M0506 |
|                            |                      | 220                       | 6.3x5.5                 | 0.08  | 278                     | 17                         | 3160                    | EPPB0J221M6355 |
|                            |                      | 220                       | 6.3x7                   | 0.08  | 278                     | 10                         | 3600                    | EPPB0J221M6307 |
|                            |                      | 270                       | 5x7                     | 0.08  | 340                     | 10                         | 3200                    | EPPB0J271M0507 |
|                            |                      | 270                       | 5x8                     | 0.08  | 340                     | 10                         | 3200                    | EPPB0J271M0508 |
|                            |                      | 270                       | 5x9                     | 0.08  | 340                     | 10                         | 3200                    | EPPB0J271M0509 |
|                            |                      | 270                       | 6.3x7                   | 0.08  | 340                     | 10                         | 4100                    | EPPB0J271M6307 |
|                            |                      | 330                       | 5x8                     | 0.08  | 416                     | 10                         | 3200                    | EPPB0J331M0508 |
|                            |                      | 330                       | 6.3x5.2                 | 0.08  | 416                     | 9                          | 4800                    | EPPB0J331M6352 |
|                            |                      | 330                       | 6.3x5.5                 | 0.08  | 416                     | 9                          | 4800                    | EPPB0J331M6355 |
|                            |                      | 330                       | 6.3x5.7                 | 0.08  | 416                     | 9                          | 4800                    | EPPB0J331M6357 |
|                            |                      | 330                       | 6.3x6                   | 0.08  | 416                     | 9                          | 4800                    | EPPB0J331M6306 |
|                            |                      | 330                       | 6.3x8                   | 0.08  | 416                     | 9                          | 5000                    | EPPB0J331M6308 |
|                            |                      | 390                       | 5x8                     | 0.08  | 492                     | 12                         | 3100                    | EPPB0J391M0508 |
|                            |                      | 390                       | 5x9                     | 0.08  | 492                     | 12                         | 3100                    | EPPB0J391M0509 |
|                            |                      | 390                       | 6.3x8                   | 0.08  | 492                     | 12                         | 3300                    | EPPB0J391M6308 |
|                            |                      | 470                       | 5x9                     | 0.08  | 492                     | 12                         | 3600                    | EPPB0J471M0509 |
|                            |                      | 470                       | 6.3x8                   | 0.08  | 492                     | 9                          | 5900                    | EPPB0J471M6308 |
|                            |                      | 470                       | 8x8                     | 0.08  | 492                     | 9                          | 5900                    | EPPB0J471M0808 |
|                            |                      | 560                       | 5x9                     | 0.08  | 706                     | 12                         | 3600                    | EPPB0J561M0509 |
|                            |                      | 560                       | 6.3x8                   | 0.08  | 706                     | 9                          | 5900                    | EPPB0J561M6308 |
|                            |                      | 560                       | 8x8                     | 0.08  | 706                     | 8                          | 5900                    | EPPB0J561M0808 |
|                            |                      | 680                       | 5x12                    | 0.08  | 856                     | 15                         | 5500                    | EPPB0J681M0512 |
|                            |                      | 680                       | 6.3x8                   | 0.08  | 1034                    | 9                          | 5900                    | EPPB0J681M6308 |
|                            |                      | 820                       | 5x11                    | 0.08  | 1034                    | 8                          | 5500                    | EPPB0J821M5511 |
|                            |                      | 820                       | 5x12                    | 0.08  | 1034                    | 8                          | 5500                    | EPPB0J821M0512 |
|                            |                      | 820                       | 6.3x8                   | 0.08  | 1034                    | 9                          | 5900                    | EPPB0J821M6308 |
|                            |                      | 820                       | 6.3x9                   | 0.08  | 1034                    | 9                          | 5900                    | EPPB0J821M6309 |
|                            |                      | 820                       | 6.3x11                  | 0.08  | 1034                    | 7                          | 6150                    | EPPB0J821M6311 |
|                            |                      | 820                       | 8x8                     | 0.08  | 1034                    | 9                          | 5900                    | EPPB0J821M0808 |
|                            |                      | 820                       | 8x11                    | 0.08  | 1034                    | 9                          | 6150                    | EPPB0J821M0811 |
|                            |                      | 1000                      | 6.3x11                  | 0.08  | 1260                    | 12                         | 6150                    | EPPB0J102M6311 |
|                            |                      | 1000                      | 8x8                     | 0.08  | 1260                    | 10                         | 6000                    | EPPB0J102M0808 |
|                            |                      | 1000                      | 8x11                    | 0.08  | 1260                    | 9                          | 6150                    | EPPB0J102M0811 |
|                            |                      | 1200                      | 6.3x12                  | 0.08  | 1512                    | 9                          | 6100                    | EPPB0J122M6312 |
|                            |                      | 1200                      | 8x12                    | 0.08  | 1512                    | 9                          | 6150                    | EPPB0J122M0812 |
|                            |                      | 1500                      | 8x12                    | 0.08  | 1890                    | 9                          | 6150                    | EPPB0J152M0812 |
|                            |                      | 1500                      | 10x12                   | 0.08  | 1890                    | 9                          | 6200                    | EPPB0J152M1012 |
|                            |                      | 2200                      | 10x12                   | 0.08  | 2772                    | 9                          | 6200                    | EPPB0J222M1012 |
| 7.5<br>(0T)                | 8.6                  | 500                       | 5x9                     | 0.08  | 375                     | 11                         | 3800                    | EPPB0J501M0509 |
|                            |                      | 500                       | 6.3x9                   | 0.08  | 375                     | 9                          | 5900                    | EPPB0J501M6309 |
|                            |                      | 560                       | 5x9                     | 0.08  | 420                     | 11                         | 4000                    | EPPB0J561M0509 |
|                            |                      | 560                       | 6.3x9                   | 0.08  | 420                     | 9                          | 5900                    | EPPB0J561M6309 |
|                            |                      | 680                       | 6.3x9                   | 0.08  | 510                     | 9                          | 5900                    | EPPB0J681M6309 |
|                            |                      | 820                       | 6.3x9                   | 0.08  | 615                     | 9                          | 5900                    | EPPB0J821M6309 |
| 10<br>(1A)                 | 11.5                 | 220                       | 5x8                     | 0.08  | 440                     | 16                         | 3500                    | EPPB1A221M0508 |
|                            |                      | 270                       | 6.3x8                   | 0.08  | 540                     | 10                         | 4100                    | EPPB1A271M6308 |
|                            |                      | 330                       | 6.3x8                   | 0.08  | 660                     | 12                         | 4500                    | EPPB1A331M6308 |
|                            |                      | 330                       | 8x8                     | 0.08  | 660                     | 12                         | 4620                    | EPPB1A331M0808 |
|                            |                      | 470                       | 5x11                    | 0.08  | 940                     | 16                         | 3000                    | EPPB1A471M0511 |

|         |      |      |          |      |      |    |      |                |
|---------|------|------|----------|------|------|----|------|----------------|
|         |      | 470  | 6.3X8    | 0.08 | 940  | 9  | 5400 | EPPB1A471M6308 |
|         |      | 470  | 8X8      | 0.08 | 940  | 10 | 5600 | EPPB1A471M0808 |
|         |      | 560  | 6.3x9    | 0.08 | 1120 | 9  | 5400 | EPPB1A561M6309 |
|         |      | 560  | 8X8      | 0.08 | 1120 | 9  | 5600 | EPPB1A561M0808 |
|         |      | 680  | 6X12     | 0.08 | 1360 | 13 | 3650 | EPPB1A681M0612 |
|         |      | 680  | 6.3x12   | 0.08 | 1360 | 13 | 3650 | EPPB1A471M0511 |
|         |      | 680  | 8X8      | 0.08 | 1360 | 9  | 5600 | EPPB1A681M0808 |
|         |      | 680  | 8X11     | 0.08 | 1360 | 9  | 6100 | EPPB1A681M0811 |
|         |      | 820  | 8X11     | 0.08 | 1360 | 9  | 6100 | EPPB1A821M0811 |
|         |      | 1000 | 8X11     | 0.08 | 2000 | 9  | 6200 | EPPB1A102M0811 |
|         |      | 1500 | 8X12     | 0.08 | 3000 | 10 | 5700 | EPPB1A152M0812 |
|         |      | 1500 | 10X12    | 0.08 | 3000 | 9  | 6100 | EPPB1A152M1012 |
|         |      | 2200 | 10X12    | 0.08 | 4400 | 9  | 6500 | EPPB1A222M1012 |
| 12( 1R) | 13.8 | 330  | 5X9      | 0.08 | 396  | 14 | 3800 | EPPB1R331M0509 |
|         |      | 330  | 5.5X9    | 0.08 | 396  | 14 | 3800 | EPPB1R331M5509 |
|         |      | 330  | 6.3X8    | 0.08 | 396  | 12 | 2690 | EPPB1C331M6308 |
| 16( 1C) | 18.4 | 100  | 5x8      | 0.08 | 160  | 24 | 2500 | EPPB1C101M0508 |
|         |      | 100  | 6.3x6    | 0.08 | 160  | 24 | 2560 | EPPB1C101M6306 |
|         |      | 100  | 6.3X7    | 0.08 | 160  | 16 | 3250 | EPPB1C101M6307 |
|         |      | 220  | 5X9      | 0.08 | 352  | 20 | 3300 | EPPB1C221M0509 |
|         |      | 220  | 6.3X8    | 0.08 | 352  | 12 | 3550 | EPPB1C221M6308 |
|         |      | 270  | 5.5x10   | 0.08 | 432  | 10 | 4100 | EPPB1C271M5510 |
|         |      | 270  | 6.3X8    | 0.08 | 432  | 10 | 4100 | EPPB1C271M6308 |
|         |      | 270  | 8X8      | 0.08 | 432  | 10 | 5000 | EPPB1C271M0808 |
|         |      | 270  | 8X11     | 0.08 | 432  | 10 | 5000 | EPPB1C271M0811 |
|         |      | 330  | 5.5X11   | 0.08 | 528  | 14 | 4000 | EPPB1C331M5511 |
|         |      | 330  | 6.3X7    | 0.08 | 528  | 12 | 4500 | EPPB1C331M6307 |
|         |      | 330  | 6.3X8    | 0.08 | 528  | 12 | 4500 | EPPB1C331M6308 |
|         |      | 330  | 6.3X9    | 0.08 | 528  | 12 | 4500 | EPPB1C331M6309 |
|         |      | 330  | 6.3X11   | 0.08 | 528  | 12 | 4300 | EPPB1C331M6311 |
|         |      | 330  | 8X8      | 0.08 | 528  | 10 | 5000 | EPPB1C331M0808 |
|         |      | 330  | 10X12    | 0.08 | 528  | 9  | 6100 | EPPB1C331M1012 |
|         |      | 390  | 8X8      | 0.08 | 624  | 10 | 5000 | EPPB1C391M0808 |
|         |      | 470  | 6.3X10.5 | 0.08 | 752  | 10 | 5200 | EPPB1C471M6310 |
|         |      | 470  | 6.3X11   | 0.08 | 752  | 12 | 4100 | EPPB1C471M6310 |
|         |      | 470  | 6.3X12   | 0.08 | 752  | 10 | 5200 | EPPB1C471M6312 |
|         |      | 470  | 8X8      | 0.08 | 752  | 13 | 5000 | EPPB1C471M0808 |
|         |      | 470  | 8X11     | 0.08 | 752  | 10 | 5400 | EPPB1C471M0811 |
|         |      | 470  | 10X10    | 0.08 | 752  | 9  | 5800 | EPPB1C471M1010 |
|         |      | 470  | 10X12    | 0.08 | 752  | 9  | 5800 | EPPB1C471M1012 |
|         |      | 560  | 6.3x12   | 0.08 | 896  | 12 | 5200 | EPPB1C561M6312 |
|         |      | 560  | 6.3x11   | 0.8  | 896  | 12 | 5200 | EPPB1C561M6311 |
|         |      | 560  | 8X9      | 0.08 | 896  | 12 | 5200 | EPPB1C561M0809 |
|         |      | 560  | 8X11     | 0.08 | 896  | 10 | 5400 | EPPB1C561M0811 |
|         |      | 680  | 6.3x11   | 0.08 | 1088 | 10 | 4600 | EPPB1C681M6311 |
|         |      | 680  | 6.3X14   | 0.08 | 1088 | 10 | 4600 | EPPB1C681M6314 |
|         |      | 680  | 8X11     | 0.08 | 1088 | 10 | 5400 | EPPB1C681M0811 |
|         |      | 820  | 8X10.5   | 0.08 | 1312 | 10 | 5700 | EPPB1C821M0810 |
|         |      | 820  | 8X12     | 0.08 | 1312 | 10 | 5700 | EPPB1C821M0812 |
|         |      | 820  | 10X12    | 0.08 | 1312 | 10 | 5800 | EPPB1C821M1012 |
|         |      | 1000 | 8X12     | 0.08 | 1600 | 10 | 6000 | EPPB1C102M0812 |
|         |      | 1000 | 10X12    | 0.08 | 1600 | 9  | 6500 | EPPB1C102M1012 |
|         |      | 1200 | 8x12     | 0.08 | 1920 | 9  | 6500 | EPPB1C121M0812 |
|         |      | 1200 | 10X12    | 0.08 | 1920 | 9  | 6500 | EPPB1C121M1012 |
|         |      | 1500 | 8x16     | 0.08 | 2400 | 9  | 6500 | EPPB1C152M0816 |
|         |      | 1500 | 10X12    | 0.08 | 2400 | 9  | 6500 | EPPB1C152M1012 |
|         |      | 1500 | 10X13    | 0.08 | 2400 | 9  | 6500 | EPPB1C152M1013 |
|         |      | 1500 | 10X16    | 0.08 | 2400 | 9  | 6500 | EPPB1C152M1016 |
|         |      | 2200 | 10X16    | 0.08 | 3520 | 10 | 5800 | EPPB1C222M1016 |
| 18V(1Z) |      | 1000 | 10X12    | 0.08 | 1800 | 9  | 6500 | EPPB1Z102M1012 |