

## Part Numbering System



① Category code

| Type                   | Code |   |
|------------------------|------|---|
|                        | 2    | 3 |
| Electrolytic Capacitor | E    |   |
| Conductive Polymer     | S    |   |

② Series code

| Series name | Code |   |
|-------------|------|---|
|             | 2    | 3 |
| WH          | W    | H |
| CD11GE      | G    | E |
| CD11GES     | G    | X |
| CD11GAS     | G    | W |
| CD11GHS     | G    | S |
| NR          | N    | R |
| PZ          | P    | Z |

③ Voltage code

| WV (V <sub>dc</sub> ) | Code |   |
|-----------------------|------|---|
|                       | 4    | 5 |
| 2.5                   | 0    | E |
| 3                     | 0    | D |
| 4                     | 0    | G |
| 6.3                   | 0    | J |
| 6.8                   | 0    | C |
| 7                     | 0    | Q |
| 7.5                   | 0    | A |
| 10                    | 1    | A |
| 12                    | 1    | T |
| 16                    | 1    | C |
| 25                    | 1    | E |
| 35                    | 1    | V |
| 40                    | 1    | G |
| 50                    | 1    | H |
| 63                    | 1    | J |
| 80                    | 1    | B |
| 100                   | 1    | K |
| 120                   | 2    | B |
| 160                   | 2    | C |
| 180                   | 2    | L |
| 200                   | 2    | D |
| 220                   | 2    | N |
| 250                   | 2    | E |
| 315                   | 2    | F |
| 350                   | 2    | V |
| 380                   | 2    | P |
| 400                   | 2    | G |
| 420                   | 2    | T |
| 450                   | 2    | W |
| 500                   | 2    | H |
| 550                   | 2    | J |
| 600                   | 2    | K |

④ Capacitance tolerance code

| Tol. (%) | Code |  |
|----------|------|--|
|          | 6    |  |
| -10~+10  | K    |  |
| -20~+20  | M    |  |
| -10~+30  | Q    |  |
| -10~+20  | V    |  |
| 0~+20    | A    |  |
| -5~+20   | C    |  |
| -10~-20  | B    |  |
| -5~+5    | D    |  |
| 0~+10    | E    |  |
| -5~-20   | F    |  |
| -15~+5   | N    |  |

⑤ Capacitance code

| Cap (μF) | Code |   |   |
|----------|------|---|---|
|          | 7    | 8 | 9 |
| 0.10     | R    | 1 | 0 |
| 0.22     | R    | 2 | 2 |
| 0.33     | R    | 3 | 3 |
| 0.47     | R    | 4 | 7 |
| 0.68     | R    | 6 | 8 |
| 1        | 0    | 1 | 0 |
| 2.2      | 2    | R | 2 |
| 3.3      | 3    | R | 3 |
| 4.7      | 4    | R | 7 |
| 6.8      | 6    | R | 8 |
| 10       | 1    | 0 | 0 |
| 22       | 2    | 2 | 0 |
| 33       | 3    | 3 | 0 |
| 47       | 4    | 7 | 0 |
| 68       | 6    | 8 | 0 |
| 100      | 1    | 0 | 1 |
| 220      | 2    | 2 | 1 |
| 330      | 3    | 3 | 1 |
| 470      | 4    | 7 | 1 |
| 680      | 6    | 8 | 1 |
| 1000     | 1    | 0 | 2 |
| 2200     | 2    | 2 | 2 |
| 3300     | 3    | 3 | 2 |
| 4700     | 4    | 7 | 2 |
| 6800     | 6    | 8 | 2 |
| 10000    | 1    | 0 | 3 |
| 22000    | 2    | 2 | 3 |
| 33000    | 3    | 3 | 3 |
| 68000    | 6    | 8 | 3 |

⑥ Size code

| ΦD (mm) | Code |
|---------|------|
| 4       | C    |
| 5       | D    |
| 6.3     | E    |
| 8       | F    |
| 10      | G    |
| 11      | H    |
| 12      | J    |
| 12.5    | W    |
| 13      | K    |
| 14      | X    |
| 16      | L    |
| 18      | M    |
| 19      | Z    |
| 20      | N    |
| 22      | O    |
| 25      | P    |
| 30      | Q    |
| 35      | R    |
| 40      | Y    |
| 51.6    | S    |
| 64.3    | T    |
| 76.9    | U    |
| 91      | V    |
| 100     | A    |

| L (mm) | Code |    |
|--------|------|----|
|        | 11   | 12 |
| 5      | 0    | 5  |
| 7      | 0    | 7  |
| 11     | 1    | 1  |
| 12     | 1    | 2  |
| 16     | 1    | 6  |
| 20     | 2    | 0  |
| 25     | 2    | 5  |
| 30     | 3    | 0  |
| 35     | 3    | 5  |
| 40     | 4    | 0  |
| 46     | 4    | 6  |
| 50     | 5    | 0  |
| 60     | 6    | 0  |
| 80     | 8    | 0  |
| 100    | A    | 0  |
| 115    | B    | 5  |
| 120    | C    | 0  |
| 130    | D    | 0  |
| 140    | E    | 0  |
| 160    | G    | 0  |
| 200    | K    | 0  |
| 220    | M    | 0  |
| 236    | N    | 6  |
| 250    | P    | 0  |

⑦ Terminal code

| Specification                         | Code |    |    |
|---------------------------------------|------|----|----|
|                                       | 13   | 14 | 15 |
| Bulk packing                          | O    | -  | -  |
| Taping (SMD Type)                     | D    | 0  | 0  |
| Φ4~8 Taping F=5.0mm                   | P    | 5  | 0  |
| Φ10~12.5 Taping F=5.0mm               | B    | 5  | 0  |
| Lead Cut L=3.5mm                      | C    | 3  | 5  |
| Lead Cut L=11.0mm                     | C    | B  | 0  |
| Lead Forming & Cut L=4.5mm            | F    | -  | -  |
| Kink & Cut L=4.5mm                    | J    | -  | -  |
| Snap-in type Terminal 4.0mm in length | K    | -  | -  |
| Three Terminals                       | T    | -  | -  |
| Ring clip mounting standard design    | A    | 0  | 0  |
| Ring clip mounting special design     | S    | -  | -  |

⑧ Sleeve/Marking code

| Sleeve/Marking | Code |  |
|----------------|------|--|
|                | 16   |  |
| PVC            | C    |  |
| PET            | T    |  |
| Dark blue      | B    |  |
| Bright red     | R    |  |
| Sky-blue       | S    |  |
| Light blue     | T    |  |
| Pink           | Z    |  |
| Black          | H    |  |
| Purple-blue    | V    |  |
| Red            | O    |  |

Lead Forming  
Taping Specifications

Fig.1 code: X



Fig.2 code: B



Fig.3 code: B

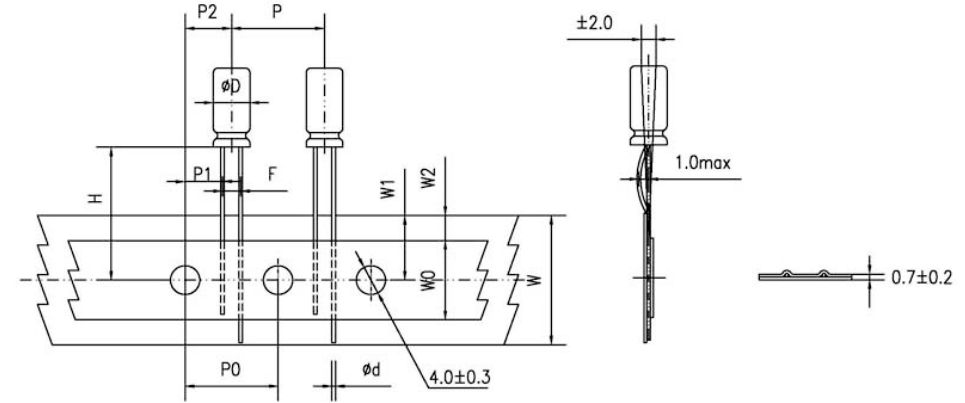


Fig.4 code: P



## Lead Forming

Specification Fig.1 & Fig.2 & Fig.3

| Items   | Symbol | Case size  |     |            |      |      |      |       |                |                  |                                   | Tolerance |              |  |
|---|--------|------------|-----|------------|------|------|------|-------|----------------|------------------|-----------------------------------|-----------|--------------|--|
|   |        | 4*5<br>4*7 |     | 5*5<br>5*7 |      | 5*11 |      | 6.3*5 | 6.3*7<br>6.3*9 | 6.3*11<br>6.3*12 | 8*5/7<br>8*9/11<br>8*11.5<br>8*12 |           | 8*16<br>8*20 | 10*9/12<br>10*12.5<br>10*13/16<br>10*20/25 |
| Pin Code                                      |        | X          | B   | X          | B    | X    | B    | B     | B              | B                | B                                 | B         | B            |  |
| Lead wire diameter                            | Φd     | 0.45       |     | 0.45       |      | 0.5  |      | 0.45  | 0.5            | 0.5              | 0.45/0.5                          | 0.6       | 0.6          | ±0.05                                      |
| Pitch of body                                 | P      | 12.7       |     | 12.7       |      | 12.7 |      | 12.7  | 12.7           | 12.7             | 12.7                              | 12.7      | 12.7         | ±1.0                                       |
| Feed hole pitch                               | P0     | 12.7       |     | 12.7       |      | 12.7 |      | 12.7  | 12.7           | 12.7             | 12.7                              | 12.7      | 12.7         | ±0.2                                       |
| Distance from hole center to lead             | P1     | 5.1        | 5.6 | 5.1        | 5.35 | 5.1  | 5.35 | 5.1   | 5.1            | 5.1              | 4.6                               | 4.6       | 3.85         | ±0.7                                       |
| Distance from feed hole center to body center | P2     | 6.35       |     | 6.35       |      | 6.35 |      | 6.35  | 6.35           | 6.35             | 6.35                              | 6.35      | 6.35         | ±1.0                                       |
| Lead-to-lead distance                         | F      | 2.5        | 1.5 | 2.5        | 2.0  | 2.5  | 2.0  | 2.5   | 2.5            | 2.5              | 3.5                               | 3.5       | 5.0          | ±0.5                                       |
| Height of body from tape center               | H      | 18.5       |     | 18.5       |      | 18.5 |      | 18.5  | 18.5           | 18.5             | 18.5                              | 18.5      | 18.5         | ±0.75                                      |
| Base tape width                               | W      | 18.0       |     | 18.0       |      | 18.0 |      | 18.0  | 18.0           | 18.0             | 18.0                              | 18.0      | 18.0         | ±0.5                                       |
| Adhesive tape width                           | W0     | 6.0        |     | 6.0        |      | 6.0  |      | 6.0   | 6.0            | 8.0              | 8.0                               | 8.0       | 11.0         | min  |
| Hole position                                 | W1     | 9.0        |     | 9.0        |      | 9.0  |      | 9.0   | 9.0            | 9.0              | 9.0                               | 9.0       | 9.0          | +0.75<br>-0.5                              |
| Hole down tape position                       | W2     | 3.0        |     | 3.0        |      | 3.0  |      | 3.0   | 3.0            | 3.0              | 3.0                               | 3.0       | 3.0          | max  |

Specification Fig.4

| Items   | Symbol | Case size  |      |      |      |       |                |                  |                              |              | Tolerance     |
|---|--------|------------|------|------|------|-------|----------------|------------------|------------------------------|--------------|---------------|
|   |        | 4*5<br>4*7 | 5*5  | 5*7  | 5*11 | 6.3*5 | 6.3*7<br>6.3*9 | 6.3*11<br>6.3*12 | 8*5/7<br>8*9/11<br>8*11.5/12 | 8*16<br>8*20 |               |
| Pin Code                                      |        | P          | P    | P    | P    | P     | P              | P                | P                            | P            |               |
| Lead wire diameter                            | Φd     | 0.45       | 0.45 | 0.45 | 0.5  | 0.45  | 0.5            | 0.5              | 0.45/0.5                     | 0.6          | ±0.05         |
| Pitch of body                                 | P      | 12.7       | 12.7 | 12.7 | 12.7 | 12.7  | 12.7           | 12.7             | 12.7                         | 12.7         | ±1.0          |
| Feed hole pitch                               | P0     | 12.7       | 12.7 | 12.7 | 12.7 | 12.7  | 12.7           | 12.7             | 12.7                         | 12.7         | ±0.2          |
| Distance from hole center to lead             | P1     | 3.85       | 3.85 | 3.85 | 3.85 | 3.85  | 3.85           | 3.85             | 3.85                         | 3.85         | ±0.7          |
| Distance from feed hole center to body center | P2     | 6.35       | 6.35 | 6.35 | 6.35 | 6.35  | 6.35           | 6.35             | 6.35                         | 6.35         | ±1.0          |
| Lead-to-lead distance                         | F      | 1.5        | 2.0  | 2.0  | 2.0  | 2.5   | 2.5            | 2.5              | 3.5                          | 3.5          | ±0.5          |
| Lead to lead distance                         | F1     | 5.0        | 5.0  | 5.0  | 5.0  | 5.0   | 5.0            | 5.0              | 5.0                          | 5.0          | +0.8<br>-0.2  |
| Height of body from tape center               | H      | 18.5       | 18.5 | 18.5 | 18.5 | 18.5  | 18.5           | 18.5             | 18.5                         | 18.5         | ±0.75         |
| Lead wire clinch height                       | H0     | 16.0       | 16.0 | 16.0 | 16.0 | 16.0  | 16.0           | 16.0             | 16.0                         | 16.0         | ±0.5          |
| Base tape width                               | W      | 18.0       | 18.0 | 18.0 | 18.0 | 18.0  | 18.0           | 18.0             | 18.0                         | 18.0         | ±0.5          |
| Adhesive tape width                           | W0     | 6.0        | 6.0  | 6.0  | 6.0  | 6.0   | 6.0            | 8.0              | 8.0                          | 8.0          | min           |
| Hole position                                 | W1     | 9.0        | 9.0  | 9.0  | 9.0  | 9.0   | 9.0            | 9.0              | 9.0                          | 9.0          | +0.75<br>-0.5 |
| Hole down tape position                       | W2     | 3.0        | 3.0  | 3.0  | 3.0  | 3.0   | 3.0            | 3.0              | 3.0                          | 3.0          | max           |

### Lead Forming

#### Lead Forming & Cut

Code:C  
RANGE:  $\Phi 4\sim\Phi 18$



Code:F  
RANGE:  $\Phi 4\sim\Phi 8$



| $\Phi D$ | F   | L        | $\Phi D$ | F   | L                  |
|----------|-----|----------|----------|-----|--------------------|
| 4        | 1.5 | 3.0~12.0 | 4        | 5.0 | 3.5, 4.5, 5.0, 7.0 |
| 5        | 2.0 | 3.0~12.0 | 5        | 5.0 | 3.5, 4.5, 5.0, 7.0 |
| 6.3      | 2.5 | 3.0~12.0 | 6.3      | 5.0 | 3.5, 4.5, 5.0, 7.0 |
| 8        | 3.5 | 3.0~12.0 | 8        | 5.0 | 3.5, 4.5, 5.0, 7.0 |
| 10       | 5.0 | 3.0~12.0 | -        | -   | -                  |
| 12.5     | 5.0 | 3.0~12.0 | -        | -   | -                  |
| 16       | 7.5 | 3.0~12.0 | -        | -   | -                  |
| 18       | 7.5 | 3.0~12.0 | -        | -   | -                  |

Code:J  
RANGE:  $\Phi 10\sim\Phi 18$



| $\Phi D$ | F   | L             |
|----------|-----|---------------|
| 10       | 5.0 | 4.0, 4.5, 5.0 |
| 12.5     | 5.0 | 4.0, 4.5, 5.0 |
| 16       | 7.5 | 4.0, 4.5, 5.0 |
| 18       | 7.5 | 4.0, 4.5, 5.0 |

### Solering Recommendation

■ Flow Soldering(Radial Lead Type)



■ Reflow Soldering

- (For Polymer SMD Type)

#### Recommended Reflow Profile



| Item        | Preheating                      | T1(°C) | T2(°C) | T3(°C) | t1(sec.) | t2(sec.) | t3(sec.) | Reflow cycle |
|-------------|---------------------------------|--------|--------|--------|----------|----------|----------|--------------|
| Condition 1 | 150°C to 180°C<br>Within 90sec. | ≤260   | 230    | 200    | ≤10      | ≤40      | ≤60      | 1            |
| Condition 2 |                                 | ≤250   | 230    | 200    | ≤10      | ≤40      | ≤60      | 2            |

● (For Liquid SMD Type)

Case size:  $\Phi 6.3$ – $\Phi 10$ mm:

- Temperature at surface of capacitor shall not exceed  $T^{\circ}\text{C}$ .
- The duration for over  $200^{\circ}\text{C}$  temperature and  $T_1^{\circ}\text{C}$  at surface of capacitor shall not exceed  $t$  and  $t_1$  seconds, respectively.
- Preheat shall be done at  $100^{\circ}\text{C}$  to  $200^{\circ}\text{C}$  and for Maximum 180 seconds.

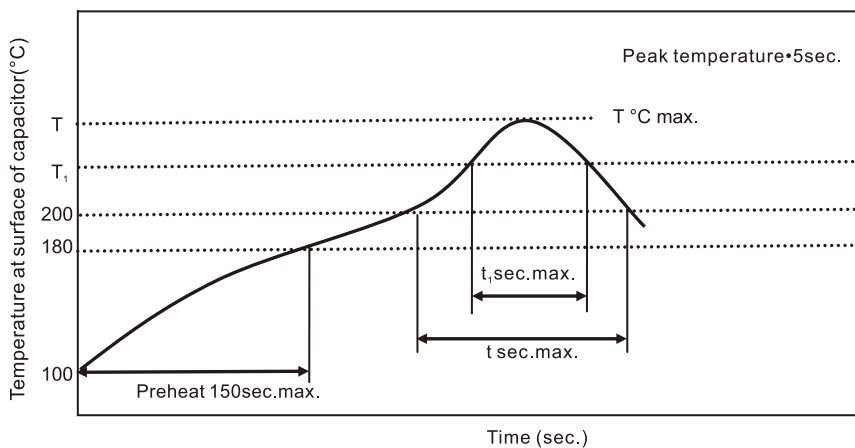


| Case size (mm) | $T(^{\circ}\text{C})$ ① | $T_1(^{\circ}\text{C})$ | $t(\text{sec.})$ ② | $t_1(\text{sec.})$ ③ | Reflow cycle |
|----------------|-------------------------|-------------------------|--------------------|----------------------|--------------|
| $\Phi 6.3$     | 250                     | 230                     | 90                 | 40                   | 1            |
| $\Phi 8$       | 240                     | 230                     | 90                 | 30                   | 1            |
| $\Phi 10$      | 235                     | 230                     | 60                 | 30                   | 1            |

- ① Peak temperature
- ② The duration over  $200^{\circ}\text{C}$  (max.)
- ③ The duration over  $T_1^{\circ}\text{C}$
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

Case size:  $\Phi 12.5$ – $\Phi 18$ mm:

- Temperature at surface of capacitor shall not exceed  $T^{\circ}\text{C}$ .
- The duration for over  $200^{\circ}\text{C}$  temperature and  $T_1^{\circ}\text{C}$  at surface of capacitor shall not exceed  $t$  and  $t_1$  seconds, respectively.
- Preheat shall be done at  $100^{\circ}\text{C}$  to  $180^{\circ}\text{C}$  and for Maximum 150 seconds.

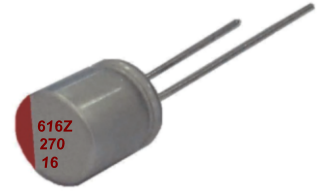


| Case size (mm)          | $T(^{\circ}\text{C})$ ① | $T_1(^{\circ}\text{C})$ | $t(\text{sec.})$ ② | $t_1(\text{sec.})$ ③ | Reflow cycle |
|-------------------------|-------------------------|-------------------------|--------------------|----------------------|--------------|
| $\Phi 12.5$ – $\Phi 18$ | 240                     | 230                     | 60                 | 30                   | 1            |

- ① Peak temperature
- ② The duration over  $200^{\circ}\text{C}$  (max.)
- ③ The duration over  $T_1^{\circ}\text{C}$
- Please contact us if capacitors are subject to the conditions other than the allowable range of reflow.

# PZ series

- Endurance: +105°C 2,000 hours
- Low ESR
- Recommended Applications: System Board, Display Card, Small Charger and intelligent TV
- RoHS Compliant and lead-free

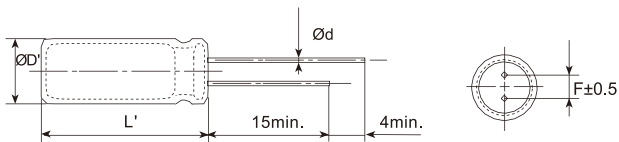


## SPECIFICATIONS

| Items  | Characteristics  |                                      |
|--|--|--------------------------------------|
| Category Temperature Range                             | -55~+105°C   |                                      |
| Rated Working Voltage Range                            | 6.3~100 V <sub>dc</sub>  |                                      |
| Nominal Capacitance Range                              | 4.7~5600μF   |                                      |
| Capacitance Tolerance                                  | ±20%(M) (at 20°C, 120Hz)   |                                      |
| DC Leakage Current                                     | I≤0.2CV or 500μA, whichever is greater.<br>Where, I:Max.leakage current (μA),C:Nominal capacitance (μF),V: Rated voltage (V) (at 20°C after 2 minutes)   |                                      |
| Dissipation Factor (tanδ)                              | Rated Voltage(V <sub>dc</sub> )  | 6.3 6.8 7.5 10 16 25 35 50 63 100    |
|  | tanδ (max.)  | 0.08 0.12 0.15 (at 20°C, 120Hz)      |
| ESR(100k~300kHz,20°C)                                  | Value in characteristics table   |                                      |
| Temperature Characteristic (Impedance Ratio at 100kHz) | Z(+105°C)/Z(+20°C)≤1.25<br>Z(-55°C)/Z(+20°C)≤1.25  |                                      |
| Endurance  | After applying rated voltage for 2,000 hours at 105°C, the capacitors shall meet the following requirements.   |                                      |
|  | Appearance   | No significant damage                |
|  | Capacitance Change   | ≤±20% of the initial value           |
|  | D.F. (tanδ)  | ≤150% of the initial specified value |
|  | ESR  | ≤150% of the initial specified value |
| Humidity Test  | After subjecting to 90%~95% RH for 2,000 hours at 60°C without voltage applied, the capacitors shall meet the specified values for the Endurance characteristics listed above.   |                                      |
|  | After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements. |                                      |
|  | Appearance   | No significant damage                |
|  | Capacitance Change   | ≤±20% of the initial value           |
|  | D.F. (tanδ)  | ≤150% of the initial specified value |
| Surge Test   | After subjecting to 1,000 cycles each consisting of charge with the surge voltage specified at normal temperature for 30 seconds through a protective resistor and discharge for 5 minutes 30 seconds, the capacitors shall meet the following requirements. |                                      |
|  | Appearance   | No significant damage                |
|  | Capacitance Change   | ≤±20% of the initial value           |
|  | D.F. (tanδ)  | ≤150% of the initial specified value |
|  | ESR  | ≤150% of the initial specified value |
| Leakage Current  | ≤The initial specified value   |                                      |

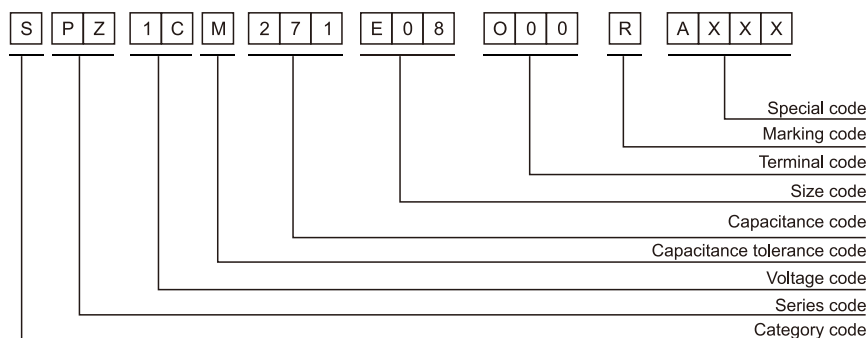
Conductive Polymer Radial Type

## DIMENSIONS[mm]



|     |            |     |     |     |          |     |          |
|-----|------------|-----|-----|-----|----------|-----|----------|
| ØD  | 5          | 5.5 | 6.3 | 6.8 | 8        | 10  | 13       |
| Ød  | 0.5        | 0.5 | 0.5 | 0.5 | 0.6      | 0.6 | 0.6      |
| F   | 2.0        | 2.5 | 2.5 | 2.5 | 3.5      | 5.0 | 5.0      |
| ØD' | ØD+0.5max. |     |     |     |          |     |          |
| L'  | L+1.0max.  |     |     |     | L-0.5~+1 |     | L-0.5~+2 |

## PART NUMBERING SYSTEM





**PZ series**

■ STANDARD RATINGS

| VDC (SV)     | Cap (μF)     | Size ΦDxL(mm) | ESR (mΩ,20°C,100kHz)(max.) | Rated ripple current (mA rms/105°C,100kHz) | Leakage Current (μA)(max.) |
|--------------|--------------|---------------|----------------------------|--|----------------------------|
| 6.3<br>(7.2) | 47           | 6.3*5         | 40                         | 1100                                       | 500                        |
|              | 82           | 6.3*5         | 40                         | 1100                                       | 500                        |
|              | 100          | 4*7           | 30                         | 1500                                       | 500                        |
|              |              | 5*7           | 30                         | 1800                                       | 500                        |
|              | 150          | 6.3*6         | 40                         | 1900                                       | 500                        |
|              |              | 4*7           | 30                         | 2100                                       | 500                        |
|              | 180          | 5*7           | 30                         | 2600                                       | 500                        |
|              |              | 5*7           | 20                         | 3500                                       | 500                        |
|              | 220          | 6.3*7         | 20                         | 3550                                       | 500                        |
|              |              | 6.3*8         | 15                         | 3600                                       | 500                        |
|              | 270          | 5*7           | 20                         | 3800                                       | 500                        |
|              |              | 5*6           | 20                         | 3200                                       | 500                        |
|              | 330          | 5*8           | 20                         | 4000                                       | 500                        |
|              |              | 6.3*5         | 25                         | 3160                                       | 500                        |
|              | 390          | 6.3*8         | 15                         | 4000                                       | 500                        |
|              |              | 5*9           | 20                         | 4100                                       | 500                        |
|              | 470          | 5*10          | 20                         | 4300                                       | 592                        |
|              |              | 5.5*9         | 20                         | 4100                                       | 592                        |
|              | 500          | 6.3*7         | 20                         | 3900                                       | 592                        |
|              |              | 6.3*8         | 15                         | 4400                                       | 592                        |
|              | 560          | 5*9           | 20                         | 4100                                       | 630                        |
|              |              | 6.3*7         | 20                         | 4200                                       | 706                        |
|              | 680          | 6.3*8         | 20                         | 4800                                       | 706                        |
|              |              | 5.5*9         | 20                         | 4300                                       | 706                        |
|              | 820          | 6.3*9         | 20                         | 5080                                       | 857                        |
|              |              | 5.5*9         | 20                         | 4800                                       | 857                        |
|              | 1000         | 8*9           | 20                         | 4600                                       | 857                        |
|              |              | 5.5*10        | 20                         | 4800                                       | 1033                       |
|              | 1200         | 6.3*9         | 20                         | 5080                                       | 1033                       |
|              |              | 8*9           | 15                         | 4700                                       | 1033                       |
| 1500         | 6.3*10       | 10            | 5150                       | 1260                                       |                            |
|              | 8*9          | 12            | 4800                       | 1260                                       |                            |
| 1800         | 8*11         | 10            | 5200                       | 1260                                       |                            |
|              | 6.3*11       | 10            | 5200                       | 1512                                       |                            |
| 2200         | 8*11         | 10            | 5300                       | 1512                                       |                            |
|              | 8*11         | 10            | 5400                       | 1890                                       |                            |
| 3300         | 10*12        | 10            | 5500                       | 1890                                       |                            |
|              | 10*10        | 10            | 5560                       | 2268                                       |                            |
| 4700         | 8*14         | 10            | 5700                       | 2772                                       |                            |
|              | 10*12        | 10            | 5800                       | 2772                                       |                            |
| 5600         | 10*14        | 10            | 5900                       | 4158                                       |                            |
|              | 10*17        | 10            | 6100                       | 5000                                       |                            |
| 6300         | 10*18        | 10            | 6300                       | 5000                                       |                            |
|              | 6.8<br>(7.8) | 220           | 5*7                        | 20   | 3300                       |
| 270          |              | 5*7           | 20                         | 3600                                       | 500                        |
|              |              | 6.3*8         | 20                         | 3900                                       | 500                        |
| 330          |              | 5*8           | 20                         | 3800                                       | 500                        |
|              |              | 6.3*5         | 25                         | 3100                                       | 500                        |
| 390          |              | 6.3*7         | 20                         | 3400                                       | 500                        |
|              |              | 5*9           | 20                         | 3900                                       | 530                        |
| 470          |              | 5*9           | 20                         | 4100                                       | 639                        |
|              |              | 6.3*7         | 20                         | 3700                                       | 639                        |
| 560          |              | 6.3*8         | 20                         | 4500                                       | 762                        |
|              |              | 6.3*9         | 20                         | 4800                                       | 925                        |
| 820          |              | 6.3*9         | 20                         | 4900                                       | 1115                       |
|              | 6.3*11       | 12            | 5100                       | 1360                                       |                            |
| 1000         | 8*11         | 10            | 5150                       | 1360                                       |                            |
|              | 7<br>(8)     | 150           | 5*6                        | 30   | 1500                       |
| 220          |              | 5*7           | 20                         | 3200                                       | 500                        |
| 270          |              | 5*8           | 20                         | 3400                                       | 500                        |
| 330          |              | 5*9           | 20                         | 3600                                       | 500                        |
| 470          |              | 6.3*8         | 20                         | 3800                                       | 658                        |
|              |              | 5.5*9         | 20                         | 3600                                       | 658                        |
| 560          | 6.3*8        | 20            | 4000                       | 784  |                            |
|              | 6.3*9        | 12            | 4200                       | 952  |                            |
| 820          | 6.3*10       | 12            | 4500                       | 1148                                       |                            |
|              | 8*9          | 12            | 4600                       | 1148                                       |                            |
| 7.5<br>(8.6) | 220          | 5*7           | 20                         | 3100                                       | 500                        |
|              | 270          | 5*8           | 20                         | 3300                                       | 500                        |
|              | 330          | 5*9           | 20                         | 3500                                       | 500                        |
|              | 390          | 5*9           | 20                         | 3500                                       | 585                        |
|              |              | 6.3*7         | 25                         | 3200                                       | 705                        |
|              | 470          | 5.5*9         | 20                         | 3550                                       | 705                        |
|              |              | 5*9           | 20                         | 3550                                       | 705                        |
|              | 500          | 5.5*8         | 25                         | 3100                                       | 705                        |
|              |              | 5.5*9         | 20                         | 3600                                       | 750                        |
|              | 560          | 6.3*8         | 20                         | 3900                                       | 840                        |
|              |              | 6.3*9         | 12                         | 4100                                       | 1020                       |
|              | 680          | 6.8*8         | 20                         | 4000                                       | 1020                       |
|              |              | 6.3*10        | 12                         | 4400                                       | 1230                       |
|              | 820          | 8*9           | 12                         | 4550                                       | 1230                       |
|              |              | 8*11          | 12                         | 4700                                       | 1500                       |
|              | 1000         | 6.3*11        | 12                         | 4500                                       | 1500                       |
|              |              | 8*11          | 12                         | 4800                                       | 1800                       |
|              | 1200         | 6.8*11        | 12                         | 4600                                       | 1800                       |



# PZ series

■ STANDARD RATINGS

| VDC (SV)  | Cap (μF)  | Size ΦDxL(mm) | ESR (mΩ,20°C,100kHz)(max.) | Rated ripple current (mArms/105°C,100kHz) | Leakage Current (μA)(max.) |
|-----------|-----------|---------------|----------------------------|---|----------------------------|
| 7.5 (8.6) | 1500      | 8*11          | 12                         | 4900                                      | 2250                       |
|           | 1800      | 7*13          | 12                         | 4800                                      | 2250                       |
|           | 2200      | 8*14          | 12                         | 5100                                      | 2700                       |
|           | 2200      | 10*12         | 12                         | 5700                                      | 3300                       |
| 10 (11.5) | 47        | 5*7           | 35                         | 2200                                      | 500                        |
|           | 56        | 5*7           | 35                         | 2250                                      | 500                        |
|           | 68        | 5*7           | 35                         | 2300                                      | 500                        |
|           | 82        | 5*7           | 35                         | 2350                                      | 500                        |
|           |           | 5*7           | 35                         | 2400                                      | 500                        |
|           | 100       | 6.3*5         | 30                         | 2300                                      | 500                        |
|           |           | 5*5           | 30                         | 2000                                      | 500                        |
|           | 120       | 5*7           | 20                         | 2450                                      | 500                        |
|           | 150       | 5*7           | 20                         | 2500                                      | 500                        |
|           | 180       | 6.3*7         | 20                         | 2800                                      | 500                        |
|           |           | 5*8           | 20                         | 2700                                      | 500                        |
|           |           | 5*9           | 20                         | 2820                                      | 500                        |
|           | 220       | 6.3*5         | 25                         | 2800                                      | 500                        |
|           |           | 6.3*8         | 15                         | 3160                                      | 500                        |
|           | 270       | 6.3*8         | 20                         | 3100                                      | 540                        |
|           |           | 6.3*8         | 20                         | 3300                                      | 660                        |
|           | 330       | 8*9           | 15                         | 3400                                      | 660                        |
|           |           | 6.3*10        | 12                         | 3500                                      | 660                        |
|           | 390       | 6.3*8         | 20                         | 3400                                      | 780                        |
|           |           | 5.5*9         | 20                         | 3400                                      | 940                        |
|           | 470       | 6.3*8         | 20                         | 3500                                      | 940                        |
|           |           | 8*9           | 15                         | 3550                                      | 940                        |
|           |           | 8*11          | 12                         | 5650                                      | 940                        |
|           | 560       | 6.3*10        | 13                         | 3600                                      | 1120                       |
|           |           | 8*9           | 15                         | 3600                                      | 1120                       |
|           |           | 6.3*11        | 15                         | 3800                                      | 1360                       |
|           | 680       | 8*11          | 12                         | 3900                                      | 1360                       |
|           |           | 8*8           | 20                         | 3300                                      | 1360                       |
|           | 820       | 8*11          | 12                         | 4000                                      | 1640                       |
|           | 1000      | 8*11          | 12                         | 4200                                      | 2000                       |
|           |           | 10*12         | 10                         | 5300                                      | 2000                       |
|           | 1200      | 8*12          | 10                         | 4500                                      | 2400                       |
|           | 10*12     | 10            | 5450                       | 2400                                      |                            |
| 1500      | 10*12     | 10            | 5500                       | 3000                                      |                            |
|           | 8*14      | 10            | 4800                       | 3000                                      |                            |
| 1800      | 10*13     | 10            | 5800                       | 3600                                      |                            |
| 2200      | 10*15     | 10            | 6100                       | 4400                                      |                            |
| 3300      | 10*18     | 10            | 6200                       | 5000                                      |                            |
| 220       | 4*10      | 15            | 2100                       | 528                                       |                            |
| 12 (13.8) | 330       | 5.5*9         | 20                         | 3100                                      | 792                        |
|           |           | 6.3*8         | 20                         | 3100                                      | 792                        |
|           | 470       | 5*10          | 20                         | 3100                                      | 792                        |
|           |           | 5.5*9         | 20                         | 3200                                      | 1128                       |
|           | 560       | 6.3*9         | 20                         | 3450                                      | 1128                       |
|           |           | 6.3*10        | 15                         | 3400                                      | 1344                       |
|           | 680       | 6.3*11        | 15                         | 3600                                      | 1632                       |
|           |           | 8*10          | 15                         | 3700                                      | 1632                       |
|           | 820       | 8*11          | 12                         | 3800                                      | 1968                       |
|           |           | 6.8*11        | 13                         | 3200                                      | 1968                       |
|           | 1000      | 8*12          | 12                         | 4000                                      | 2400                       |
|           | 1200      | 8*14          | 12                         | 4400                                      | 2880                       |
|           | 1500      | 8*16          | 12                         | 4800                                      | 3600                       |
|           | 16 (18.4) | 22            | 5*9                        | 80  | 1600                       |
| 47        |           | 5*7           | 20                         | 2050                                      | 500                        |
| 56        |           | 5*7           | 20                         | 2100                                      | 500                        |
| 68        |           | 5*7           | 20                         | 2150                                      | 500                        |
| 82        |           | 5*8           | 20                         | 2200                                      | 500                        |
|           |           | 5*7           | 20                         | 2250                                      | 500                        |
| 100       |           | 6.3*5         | 25                         | 2100                                      | 500                        |
|           |           | 6.3*8         | 20                         | 2800                                      | 500                        |
| 120       |           | 5*8           | 20                         | 2350                                      | 500                        |
| 150       |           | 5*8           | 20                         | 2400                                      | 500                        |
| 180       |           | 5*8           | 20                         | 2450                                      | 576                        |
|           |           | 6.3*7         | 16                         | 2500                                      | 576                        |
|           |           | 5*10          | 20                         | 2600                                      | 704                        |
| 220       |           | 6.3*8         | 20                         | 2700                                      | 704                        |
|           |           | 6.3*10        | 15                         | 2900                                      | 704                        |
|           |           | 5.5*9         | 20                         | 2750                                      | 864                        |
| 270       |           | 6.3*8         | 20                         | 2800                                      | 864                        |
|           |           | 8*9           | 20                         | 2900                                      | 864                        |
|           |           | 5.5*9         | 20                         | 2900                                      | 1056                       |
| 330       |           | 6.3*9         | 20                         | 2900                                      | 1056                       |
|           |           | 6.3*10        | 15                         | 3100                                      | 1056                       |
|           |           | 5.5*10        | 20                         | 3000                                      | 1504                       |
| 470       |           | 6.3*11        | 15                         | 3100                                      | 1504                       |
|           |           | 8*11          | 11                         | 4600                                      | 1504                       |
|           |           | 8*9           | 13                         | 4100                                      | 1504                       |
|           |           | 8*11          | 11                         | 3200                                      | 1792                       |
| 560       |           | 8*13          | 11                         | 3300                                      | 1792                       |
|           |           | 10*12         | 11                         | 3500                                      | 1792                       |
|           |           | 8*11          | 11                         | 3400                                      | 2176                       |
| 680       |           | 10*12         | 11                         | 3600                                      | 2176                       |
|           |           | 6.8*11        | 11                         | 3200                                      | 2176                       |
| 820       |           | 8*13          | 11                         | 3500                                      | 2624                       |
|           |           | 10*12         | 11                         | 3800                                      | 2624                       |
| 1000      |           | 10*12         | 11                         | 4000                                      | 3200                       |
|           |           | 8*14          | 11                         | 3600                                      | 3200                       |

Conductive Polymer Radial Type

# PZ series

■ STANDARD RATINGS

| VDC (SV)     | Cap (μF) | Size ΦDxL(mm) | ESR (mΩ,20°C,100kHz)(max.) | Rated ripple current (mArms/105°C,100kHz) | Leakage Current (μA)(max.) |      |
|--------------|----------|---------------|----------------------------|---|----------------------------|------|
| 16<br>(18.4) | 1200     | 10*15         | 11                         | 4300                                      | 3840                       |      |
|              |          | 10*12         | 11                         | 4200                                      | 3840                       |      |
|              | 1500     | 10*12         | 11                         | 4800                                      | 4800                       |      |
|              |          | 10*18         | 11                         | 5500                                      | 4800                       |      |
|              | 1800     | 10*14         | 11                         | 5400                                      | 5000                       |      |
|              |          | 10*17         | 11                         | 5800                                      | 5000                       |      |
|              | 2200     | 10*15         | 11                         | 5500                                      | 5000                       |      |
|              | 3300     | 13*18         | 11                         | 6100                                      | 5000                       |      |
| 20<br>(23)   | 33       | 5*8           | 40                         | 1900                                      | 500                        |      |
|              | 39       | 5*8           | 40                         | 1950                                      | 500                        |      |
|              | 47       | 5*8           | 40                         | 2200                                      | 500                        |      |
|              | 56       | 5*9           | 40                         | 2100                                      | 500                        |      |
|              | 68       | 6.3*8         | 30                         | 2100                                      | 500                        |      |
|              | 82       | 6.3*8         | 30                         | 2150                                      | 500                        |      |
|              | 100      | 6.3*8         | 30                         | 2200                                      | 500                        |      |
|              | 120      | 6.3*8         | 30                         | 2300                                      | 500                        |      |
|              | 150      | 6.3*10        | 20                         | 2350                                      | 600                        |      |
|              | 180      | 8*9           | 30                         | 2450                                      | 720                        |      |
|              | 220      | 8*11          | 20                         | 2550                                      | 880                        |      |
|              | 270      | 8*11          | 20                         | 2700                                      | 1080                       |      |
|              |          | 330           | 8*11                       | 20  | 2800                       | 1320 |
|              |          |               | 6.3*11                     | 20  | 2100                       | 1320 |
|              |          |               | 10*12                      | 20  | 2900                       | 1880 |
|              | 470      | 8*16          | 20                         | 3000                                      | 1880                       |      |
|              |          |               | 8*11                       | 20  | 2400                       | 1880 |
|              |          |               | 10*12                      | 20  | 3100                       | 2240 |
|              | 560      | 8*16          | 20                         | 3200                                      | 2240                       |      |
|              |          |               | 10*15                      | 20  | 3300                       | 2720 |
| 680          | 8*14     | 20            | 2700                       | 2720                                      |                            |      |
| 820          | 10*18    | 20            | 3400                       | 3280                                      |                            |      |
| 1000         | 10*18    | 20            | 3900                       | 4000                                      |                            |      |
| 25<br>(29)   | 6.8      | 6.3*6         | 100                        | 1100                                      | 500                        |      |
|              | 10       | 5*8           | 70                         | 1800                                      | 500                        |      |
|              | 22       | 5*9           | 60                         | 1810                                      | 500                        |      |
|              | 33       | 5*9           | 50                         | 1850                                      | 500                        |      |
|              | 39       | 5*8           | 40                         | 1900                                      | 500                        |      |
|              | 47       | 5*9           | 40                         | 1950                                      | 500                        |      |
|              | 56       | 5*9           | 40                         | 2050                                      | 500                        |      |
|              | 68       | 6.3*7         | 30                         | 2100                                      | 500                        |      |
|              | 82       | 6.3*7         | 30                         | 2150                                      | 500                        |      |
|              |          |               | 6.3*8                      | 30  | 2200                       | 500  |
|              | 100      | 6.3*10        | 20                         | 2300                                      | 500                        |      |
|              |          |               | 8*11                       | 20  | 2450                       | 500  |
|              | 120      | 6.3*8         | 30                         | 2300                                      | 600                        |      |
|              | 150      | 6.3*10        | 20                         | 2350                                      | 750                        |      |
|              |          |               | 6.3*10                     | 20  | 2350                       | 900  |
|              | 180      | 8*9           | 30                         | 2450                                      | 900                        |      |
|              |          |               | 8*11                       | 20  | 2550                       | 1100 |
|              | 220      | 10*12         | 20                         | 2900                                      | 1100                       |      |
|              |          |               | 5.5*10                     | 20  | 1900                       | 1100 |
|              | 270      | 8*11          | 20                         | 2700                                      | 1350                       |      |
|              |          |               | 8*11                       | 20  | 2800                       | 1650 |
|              | 330      | 10*12         | 20                         | 3100                                      | 1650                       |      |
|              |          |               | 10*10                      | 25  | 2800                       | 1650 |
|              |          |               | 10*12                      | 20  | 2800                       | 2350 |
|              | 470      | 8*16          | 20                         | 2700                                      | 2350                       |      |
|              |          |               | 8*11                       | 20  | 2300                       | 2350 |
|              |          | 10*10         | 25                         | 2300                                      | 2350                       |      |
| 560          | 10*12    | 20            | 3000                       | 2800                                      |                            |      |
|              |          | 8*11          | 20                         | 2400                                      | 2800                       |      |
|              |          | 10*15         | 20                         | 3200                                      | 3400                       |      |
| 680          | 10*12    | 20            | 2800                       | 3400                                      |                            |      |
|              |          | 8*14          | 20                         | 2500                                      | 3400                       |      |
|              |          | 10*18         | 20                         | 3300                                      | 4100                       |      |
| 820          | 10*12    | 20            | 2600                       | 4100                                      |                            |      |
|              |          | 8*16          | 20                         | 2600                                      | 4100                       |      |
| 1000         | 10*18    | 20            | 3800                       | 5000                                      |                            |      |
| 1500         | 13*16    | 20            | 4000                       | 5000                                      |                            |      |
| 35<br>(41)   | 4.7      | 5*8           | 60                         | 1700                                      | 500                        |      |
|              | 10       | 5*8           | 60                         | 1800                                      | 500                        |      |
|              | 15       | 5*8           | 60                         | 1850                                      | 500                        |      |
|              | 22       | 5*9           | 100                        | 1950                                      | 500                        |      |
|              | 33       | 5*9           | 50                         | 2000                                      | 500                        |      |
|              | 39       | 5*9           | 50                         | 2050                                      | 500                        |      |
|              | 47       | 6.3*7         | 50                         | 2100                                      | 500                        |      |
|              | 56       | 6.3*7         | 50                         | 2150                                      | 500                        |      |
|              | 68       | 6.3*7         | 50                         | 2200                                      | 500                        |      |
|              | 82       | 6.3*7         | 50                         | 2250                                      | 574                        |      |
|              |          |               | 6.3*8                      | 50  | 2350                       | 700  |
|              | 100      | 6.3*10        | 40                         | 2400                                      | 700                        |      |
|              |          |               | 8*11                       | 40  | 2600                       | 700  |
|              | 120      | 6.3*10        | 40                         | 2500                                      | 840                        |      |
|              | 150      | 6.3*10        | 40                         | 2550                                      | 1050                       |      |
|              | 180      | 6.3*11        | 40                         | 2600                                      | 1260                       |      |
|              |          |               | 8*11                       | 40  | 2800                       | 1540 |
|              | 220      | 10*12         | 30                         | 2900                                      | 1540                       |      |
|              |          |               | 6.3*11                     | 30  | 2700                       | 1540 |
|              | 270      | 10*12         | 30                         | 3000                                      | 1890                       |      |
|              | 330      | 10*12         | 30                         | 3100                                      | 2310                       |      |
|              | 470      | 10*13         | 20                         | 3200                                      | 3290                       |      |

# PZ series

■ STANDARD RATINGS

| VDC (SV)  | Cap (μF) | Size ΦDxL(mm) | ESR (mΩ,20°C,100kHz)(max.) | Rated ripple current (mArms/105°C,100kHz) | Leakage Current (μA)(max.) |
|-----------|----------|---------------|----------------------------|---|----------------------------|
| 35 (41)   | 560      | 10*14         | 20                         | 3300                                      | 3920                       |
|           | 680      | 10*16         | 20                         | 3400                                      | 4760                       |
|           | 820      | 10*18         | 20                         | 3500                                      | 5000                       |
|           | 1000     | 10*18         | 20                         | 3700                                      | 5000                       |
| 50 (58)   | 4.7      | 5*8           | 60                         | 1600                                      | 500                        |
|           | 10       | 6.3*7         | 35                         | 1850                                      | 500                        |
|           | 15       | 5*8           | 70                         | 1630                                      | 500                        |
|           | 22       | 5*8           | 70                         | 1660                                      | 500                        |
|           | 33       | 6.3*7         | 40                         | 1900                                      | 500                        |
|           | 47       | 6.3*7         | 40                         | 2000                                      | 500                        |
|           | 56       | 6.3*8         | 35                         | 2100                                      | 500                        |
|           | 68       | 6.3*8         | 35                         | 2120                                      | 560                        |
|           | 100      | 6.3*10        | 30                         | 2150                                      | 680                        |
|           | 120      | 8*11          | 30                         | 2300                                      | 1000                       |
|           | 150      | 8*9           | 40                         | 2100                                      | 1000                       |
|           | 180      | 8*11          | 30                         | 2400                                      | 1200                       |
|           | 220      | 10*12         | 30                         | 2500                                      | 1500                       |
|           | 270      | 10*12         | 30                         | 2600                                      | 1800                       |
|           | 330      | 10*12         | 30                         | 2700                                      | 2200                       |
|           | 440      | 10*13         | 20                         | 2900                                      | 2700                       |
| 470       | 10*15    | 20            | 3000                       | 3300                                      |                            |
| 680       | 10*18    | 20            | 3100                       | 4400                                      |                            |
| 1000      | 10*18    | 20            | 3150                       | 4700                                      |                            |
| 1000      | 13*18    | 20            | 3300                       | 5000                                      |                            |
| 63 (73)   | 4.7      | 6.3*8         | 60                         | 1600                                      | 500                        |
|           | 6.8      | 6.3*8         | 60                         | 1650                                      | 500                        |
|           | 10       | 6.3*5         | 60                         | 1600                                      | 500                        |
|           | 33       | 6.3*8         | 30                         | 1700                                      | 500                        |
|           | 39       | 6.3*8         | 30                         | 1750                                      | 500                        |
|           | 47       | 6.3*8         | 30                         | 1900                                      | 592                        |
|           | 56       | 6.3*9         | 30                         | 1900                                      | 592                        |
|           | 68       | 8*9           | 30                         | 1800                                      | 706                        |
|           | 82       | 8*11          | 30                         | 2000                                      | 857                        |
|           | 100      | 8*11          | 30                         | 2100                                      | 1033                       |
|           | 150      | 10*12         | 30                         | 2200                                      | 1260                       |
|           | 180      | 10*12         | 30                         | 2500                                      | 1890                       |
|           | 220      | 10*13         | 20                         | 2600                                      | 2268                       |
|           | 270      | 10*15         | 20                         | 2650                                      | 2772                       |
|           | 330      | 10*17         | 20                         | 2850                                      | 3402                       |
|           | 470      | 10*18         | 20                         | 2950                                      | 4158                       |
| 1000      | 13*18    | 20            | 3100                       | 5000                                      |                            |
| 1000      | 16*20    | 20            | 3500                       | 5000                                      |                            |
| 1000      | 18*20    | 20            | 3700                       | 5000                                      |                            |
| 80 (92)   | 4.7      | 6.3*8         | 60                         | 1500                                      | 500                        |
|           | 6.8      | 6.3*8         | 60                         | 1550                                      | 500                        |
|           | 22       | 6.3*10        | 60                         | 1650                                      | 500                        |
|           | 33       | 8*11          | 35                         | 1700                                      | 528                        |
|           | 47       | 10*12         | 35                         | 1850                                      | 752                        |
|           | 68       | 10*12         | 35                         | 1900                                      | 1088                       |
|           | 100      | 10*14         | 35                         | 2100                                      | 1600                       |
|           | 220      | 13*18         | 35                         | 2700                                      | 4400                       |
| 100 (115) | 4.7      | 6.3*8         | 60                         | 1400                                      | 500                        |
|           | 6.8      | 6.3*8         | 60                         | 1450                                      | 500                        |
|           | 10       | 6.3*10        | 50                         | 1500                                      | 500                        |
|           | 15       | 8*11          | 50                         | 1550                                      | 500                        |
|           | 22       | 8*11          | 50                         | 1550                                      | 500                        |
|           | 33       | 10*12         | 35                         | 1600                                      | 500                        |
|           | 47       | 10*14         | 35                         | 1650                                      | 660                        |
| 47        | 10*16    | 35            | 1800                       | 940                                       |                            |

Conductive Polymer Radial Type

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