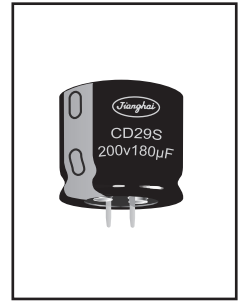
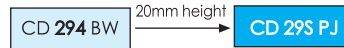


2000h at 105°C

- 20mm height
- For laminated electrical devices



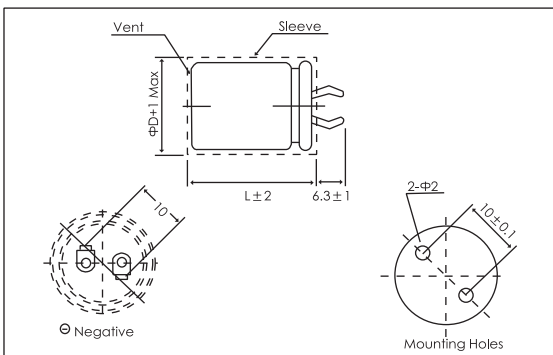
SNAP-IN/LUG

| Items | Characteristics | | | | | | | | |
|---|---|--|-------------------------|---|---|---|-------------------------|----|---|
| Operating Temperature Range (°C) | -40 ~ +105 | -25 ~ +105 | | | | | | | |
| Voltage Range (V) | 10 ~ 100 | 160 ~ 450 | | | | | | | |
| Capacitance Range (μF) | 33 ~ 10000 | | | | | | | | |
| Capacitance Tolerance (20°C, 120Hz) | ± 20% | | | | | | | | |
| Leakage Current (μA) | After 5 minutes at 20°C application of rated voltage, leakage current is not more than 0.01CV or 1.5mA, whichever is smaller. C: Nominal Capacitance (μF) V: Rated Voltage (V) | | | | | | | | |
| Dissipation Factor (20°C, 120Hz) | WV (V) | 10 16 25 35 50 60 80 100 160~250 350~450 | | | | | | | |
| | Tan δ (max) | 0.55 0.50 0.45 0.40 0.35 0.30 0.25 0.20 0.15 0.25 | | | | | | | |
| Stability at Low Temperature (Impedance Ratio at 120Hz) | Rated Voltage (V) | 10~100 160~250 350~450 | | | | | | | |
| | Impedance Ratio | <table border="1"> <tr> <td>$Z_{-25°C} / Z_{+20°C}$</td> <td>3</td> <td>3</td> <td>8</td> </tr> <tr> <td>$Z_{-40°C} / Z_{+20°C}$</td> <td>12</td> <td>-</td> <td>-</td> </tr> </table> | $Z_{-25°C} / Z_{+20°C}$ | 3 | 3 | 8 | $Z_{-40°C} / Z_{+20°C}$ | 12 | - |
| $Z_{-25°C} / Z_{+20°C}$ | 3 | 3 | 8 | | | | | | |
| $Z_{-40°C} / Z_{+20°C}$ | 12 | - | - | | | | | | |

| | Useful Life | | Load Life | Endurance Test | Shelf Life |
|---|---------------------------------------|-----------------------------------|---------------------------------------|---------------------------------------|---|
| Lifetime | 4000h | >180000h | 2000h | 3000h | 1000h |
| Leakage Current | Not more than specified value | | Not more than specified value | Not more than specified value | Not more than specified value |
| Capacitance Change | Within ± 30% of initial value | | Within ± 20% of initial value | Within ± 20% of initial value | Within ± 20% of initial value |
| Dissipation Factor | Not more than 300% of specified value | | Not more than 200% of specified value | Not more than 200% of specified value | Not more than 200% of specified value |
| Condition: Applied Voltage Applied Current Applied Temperature | U_R I_R 105°C | U_R $1.4 \times I_R$ 40°C | U_R I_R 105°C | U_R $I_R = 0$ 105°C | $U_R = 0$ $I_R = 0$ 105°C After test: U_R to be applied for 30min >24h before measurement |

Dimensions

mm



Frequency Coefficient

| Rated Voltage (V) | Frequency | | | | | |
|-------------------|-----------|-------|-------|------|-------|--------|
| | 50/60Hz | 120Hz | 500Hz | 1kHz | 10kHz | ≥50kHz |
| 10 ~ 100 | 0.90 | 1.00 | 1.10 | 1.15 | 1.15 | 1.15 |
| 160 ~ 250 | 0.90 | 1.00 | 1.20 | 1.30 | 1.45 | 1.50 |
| 350 ~ 450 | 0.85 | 1.00 | 1.20 | 1.30 | 1.42 | 1.45 |

Temperature Coefficient

| Temperature(°C) | +40 | +55 | +70 | +80 | +105 |
|-----------------|-----|-----|-----|-----|------|
| Coefficient | 2.7 | 2.5 | 2.1 | 1.7 | 1.0 |

CD 29S PJ SERIES



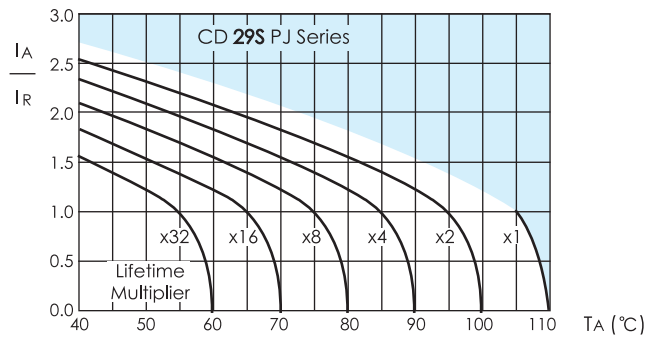
Ratings for CD 29S PJ Series

| U_R (Surge Voltage) Code | Rated Capa- cittance | Max ESR 20°C, 120Hz | Typ ESR 20°C, 120Hz | Rated Ripple Current 105°C, 120Hz | Size $\Phi D \times L$ | P/N |
|-------------------------------------|----------------------------|---------------------------|---------------------------|---|---------------------------|---------------------|
| (V) | (μF) | (m Ω) | (m Ω) | (Arms) | (mm) | - |
| 10 (13) 1A | 4700 | 155 | 109 | 0.98 | 22×20 | ECS1APJ472M□□220020 |
| | 5600 | 130 | 91 | 1.16 | 25×20 | ECS1APJ562M□□250020 |
| | 6800 | 107 | 75 | 1.31 | 25×20 | ECS1APJ682M□□250020 |
| | 8200 | 89 | 62 | 1.59 | 30×20 | ECS1APJ822M□□300020 |
| | 10000 | 73 | 51 | 1.77 | 30×20 | ECS1APJ103M□□300020 |
| 16 (20) 1C | 3300 | 201 | 141 | 1.06 | 22×20 | ECS1CPJ332M□□220020 |
| | 3900 | 170 | 119 | 1.25 | 25×20 | ECS1CPJ392M□□250020 |
| | 4700 | 141 | 99 | 1.38 | 25×20 | ECS1CPJ472M□□250020 |
| | 5600 | 119 | 83 | 1.68 | 30×20 | ECS1CPJ562M□□300020 |
| 25 (32) 1E | 6800 | 98 | 68 | 1.80 | 30×20 | ECS1CPJ682M□□300020 |
| | 2200 | 271 | 190 | 0.98 | 22×20 | ECS1EPJ222M□□220020 |
| | 2700 | 221 | 155 | 1.08 | 25×20 | ECS1EPJ272M□□250020 |
| | 3300 | 181 | 127 | 1.29 | 25×20 | ECS1EPJ332M□□250020 |
| 35 (44) 1V | 3900 | 153 | 107 | 1.58 | 30×20 | ECS1EPJ392M□□300020 |
| | 4700 | 127 | 89 | 1.61 | 30×20 | ECS1EPJ472M□□300020 |
| | 1500 | 354 | 248 | 0.80 | 22×20 | ECS1VPJ152M□□220020 |
| | 1800 | 295 | 206 | 0.94 | 25×20 | ECS1VPJ182M□□250020 |
| 50 (63) 1H | 2200 | 241 | 169 | 1.04 | 25×20 | ECS1VPJ222M□□250020 |
| | 2700 | 197 | 138 | 1.29 | 30×20 | ECS1VPJ272M□□300020 |
| | 3300 | 161 | 113 | 1.45 | 30×20 | ECS1VPJ332M□□300020 |
| | 1000 | 464 | 325 | 0.87 | 22×20 | ECS1HPJ102M□□220020 |
| 63 (79) 1J | 1200 | 387 | 271 | 1.02 | 25×20 | ECS1HPJ122M□□250020 |
| | 1500 | 310 | 217 | 1.15 | 25×20 | ECS1HPJ152M□□250020 |
| | 1800 | 258 | 181 | 1.34 | 30×20 | ECS1HPJ182M□□300020 |
| | 2200 | 211 | 148 | 1.60 | 30×20 | ECS1HPJ222M□□300020 |
| | 680 | 585 | 410 | 0.83 | 22×20 | ECS1JPJ681M□□220020 |
| 80 (100) 1K | 820 | 486 | 340 | 0.99 | 25×20 | ECS1JPJ821M□□250020 |
| | 1000 | 398 | 279 | 1.10 | 25×20 | ECS1JPJ102M□□250020 |
| | 1200 | 332 | 232 | 1.20 | 30×20 | ECS1JPJ122M□□300020 |
| | 1500 | 265 | 186 | 1.47 | 30×20 | ECS1JPJ152M□□300020 |
| | 1800 | 221 | 155 | 1.52 | 30×20 | ECS1JPJ182M□□300020 |
| 100 (125) 2A | 470 | 706 | 494 | 0.65 | 22×20 | ECS1KPJ471M□□220020 |
| | 560 | 592 | 415 | 0.70 | 22×20 | ECS1KPJ561M□□220020 |
| | 680 | 488 | 342 | 0.84 | 25×20 | ECS1KPJ681M□□250020 |
| | 820 | 405 | 283 | 1.04 | 30×20 | ECS1KPJ821M□□300020 |
| | 1000 | 332 | 232 | 1.19 | 30×20 | ECS1KPJ102M□□300020 |
| | 1200 | 277 | 194 | 1.44 | 30×20 | ECS1KPJ122M□□300020 |
| 160 (200) 2C | 330 | 804 | 563 | 0.60 | 22×20 | ECS2APJ331M□□220020 |
| | 390 | 681 | 476 | 0.71 | 25×20 | ECS2APJ391M□□250020 |
| | 470 | 565 | 395 | 0.78 | 25×20 | ECS2APJ471M□□250020 |
| | 560 | 474 | 332 | 0.95 | 30×20 | ECS2APJ561M□□300020 |
| | 680 | 390 | 273 | 1.09 | 30×20 | ECS2APJ681M□□300020 |
| 180 (225) 2K | 820 | 324 | 227 | 1.32 | 30×20 | ECS2APJ821M□□300020 |
| | 100 | 1990 | 1393 | 0.51 | 22×20 | ECS2DPJ101M□□220020 |
| | 120 | 1659 | 1161 | 0.56 | 22×20 | ECS2DPJ121M□□220020 |
| | 150 | 1327 | 929 | 0.65 | 25×20 | ECS2DPJ151M□□250020 |
| | 180 | 1106 | 774 | 0.78 | 30×20 | ECS2DPJ181M□□300020 |
| | 220 | 905 | 633 | 0.85 | 30×20 | ECS2DPJ221M□□300020 |
| | 270 | 737 | 516 | 0.95 | 30×20 | ECS2DPJ271M□□300020 |
| | 200 (250) 2D | 100 | 1990 | 1393 | 0.51 | 22×20 |
| 250 (300) 2E | 120 | 1659 | 1161 | 0.56 | 22×20 | ECS2DPJ121M□□220020 |
| | 150 | 1327 | 929 | 0.65 | 25×20 | ECS2DPJ151M□□250020 |
| | 180 | 1106 | 774 | 0.78 | 30×20 | ECS2DPJ181M□□300020 |
| | 220 | 905 | 633 | 0.85 | 30×20 | ECS2DPJ221M□□300020 |
| | 68 | 2927 | 2049 | 0.39 | 22×20 | ECS2EPJ680M□□220020 |
| | 82 | 2427 | 1699 | 0.45 | 22×20 | ECS2EPJ820M□□220020 |
| 350 (400) 2V | 100 | 1990 | 1393 | 0.51 | 22×20 | ECS2EPJ101M□□250020 |
| | 120 | 1659 | 1161 | 0.62 | 25×20 | ECS2EPJ121M□□250020 |
| | 150 | 1327 | 929 | 0.76 | 30×20 | ECS2EPJ151M□□300020 |
| | 180 | 1106 | 774 | 0.79 | 30×20 | ECS2EPJ181M□□300020 |
| | 47 | 7058 | 4941 | 0.28 | 22×20 | ECS2VPJ470M□□220020 |
| | 56 | 5924 | 4147 | 0.34 | 25×20 | ECS2VPJ560M□□250020 |
| 400 (450) 2G | 68 | 4879 | 3415 | 0.39 | 25×20 | ECS2VPJ680M□□250020 |
| | 82 | 4046 | 2832 | 0.45 | 30×20 | ECS2VPJ820M□□300020 |
| | 100 | 3317 | 2322 | 0.49 | 30×20 | ECS2VPJ101M□□300020 |
| | 39 | 8506 | 5954 | 0.27 | 22×20 | ECS2GPJ390M□□220020 |
| | 47 | 7058 | 4941 | 0.31 | 25×20 | ECS2GPJ470M□□250020 |
| | 56 | 5924 | 4147 | 0.34 | 25×20 | ECS2GPJ560M□□250020 |
| 450 (500) 2W | 68 | 4879 | 3415 | 0.40 | 30×20 | ECS2GPJ680M□□300020 |
| | 82 | 4046 | 2832 | 0.45 | 30×20 | ECS2GPJ820M□□300020 |
| | 33 | 10053 | 7037 | 0.25 | 22×20 | ECS2WPJ330M□□220020 |
| | 39 | 8506 | 5954 | 0.28 | 25×20 | ECS2WPJ390M□□250020 |
| | 47 | 7058 | 4941 | 0.31 | 25×20 | ECS2WPJ470M□□250020 |
| | 56 | 5924 | 4147 | 0.36 | 30×20 | ECS2WPJ560M□□300020 |
| 68 | 4879 | 3415 | 0.40 | 30×20 | ECS2WPJ680M□□300020 | |

| U_R (Surge Voltage) Code | Rated Capa- cittance | Max ESR 20°C, 120Hz | Typ ESR 20°C, 120Hz | Rated Ripple Current 105°C, 120Hz | Size $\Phi D \times L$ | P/N |
|-------------------------------------|----------------------------|---------------------------|---------------------------|---|---------------------------|---------------------|
| (V) | (μF) | (m Ω) | (m Ω) | (Arms) | (mm) | - |
| 180 (225) 2K | 100 | 1990 | 1393 | 0.50 | 22×20 | ECS2KPJ101M□□220020 |
| | 120 | 1659 | 1161 | 0.54 | 22×20 | ECS2KPJ121M□□220020 |
| | 150 | 1327 | 929 | 0.63 | 25×20 | ECS2KPJ151M□□250020 |
| | 180 | 1106 | 774 | 0.70 | 25×20 | ECS2KPJ181M□□250020 |
| | 220 | 905 | 633 | 0.85 | 30×20 | ECS2KPJ221M□□300020 |
| | 270 | 737 | 516 | 0.95 | 30×20 | ECS2KPJ271M□□300020 |
| 200 (250) 2D | 100 | 1990 | 1393 | 0.51 | 22×20 | ECS2DPJ101M□□220020 |
| | 120 | 1659 | 1161 | 0.56 | 22×20 | ECS2DPJ121M□□220020 |
| | 150 | 1327 | 929 | 0.65 | 25×20 | ECS2DPJ151M□□250020 |
| | 180 | 1106 | 774 | 0.78 | 30×20 | ECS2DPJ181M□□300020 |
| 250 (300) 2E | 220 | 905 | 633 | 0.85 | 30×20 | ECS2DPJ221M□□300020 |
| | 68 | 2927 | 2049 | 0.39 | 22×20 | ECS2EPJ680M□□220020 |
| | 82 | 2427 | 1699 | 0.45 | 22×20 | ECS2EPJ820M□□220020 |
| | 100 | 1990 | 1393 | 0.59 | 25×20 | ECS2EPJ101M□□250020 |
| | 120 | 1659 | 1161 | 0.62 | 25×20 | ECS2EPJ121M□□250020 |
| | 150 | 1327 | 929 | 0.76 | 30×20 | ECS2EPJ151M□□300020 |
| 350 (400) 2V | 180 | 1106 | 774 | 0.79 | 30×20 | ECS2EPJ181M□□300020 |
| | 47 | 7058 | 4941 | 0.28 | 22×20 | ECS2VPJ470M□□220020 |
| | 56 | 5924 | 4147 | 0.34 | 25×20 | ECS2VPJ560M□□250020 |
| | 68 | 4879 | 3415 | 0.39 | 25×20 | ECS2VPJ680M□□250020 |
| | 82 | 4046 | 2832 | 0.45 | 30×20 | ECS2VPJ820M□□300020 |
| | 100 | 3317 | 2322 | 0.49 | 30×20 | ECS2VPJ101M□□300020 |
| 400 (450) 2G | 39 | 8506 | 5954 | 0.27 | 22×20 | ECS2GPJ390M□□220020 |
| | 47 | 7058 | 4941 | 0.31 | 25×20 | ECS2GPJ470M□□250020 |
| | 56 | 5924 | 4147 | 0.34 | 25×20 | ECS2GPJ560M□□250020 |
| | 68 | 4879 | 3415 | 0.40 | 30×20 | ECS2GPJ680M□□300020 |
| | 82 | 4046 | 2832 | 0.45 | 30×20 | ECS2GPJ820M□□300020 |
| | 33 | 10053 | 7037 | 0.25 | 22×20 | ECS2WPJ330M□□220020 |
| 450 (500) 2W | 39 | 8506 | 5954 | 0.28 | 25×20 | ECS2WPJ390M□□250020 |
| | 47 | 7058 | 4941 | 0.31 | 25×20 | ECS2WPJ470M□□250020 |
| | 56 | 5924 | 4147 | 0.36 | 30×20 | ECS2WPJ560M□□300020 |
| | 68 | 4879 | 3415 | 0.40 | 30×20 | ECS2WPJ680M□□300020 |

Customer products are available on request.

Lifetime Diagram



I_A = actual ripple current at 120Hz, I_R = rated ripple current at 120Hz, 105°C
Multiplier of Useful Life as a function of ambient temperature and ripple current load

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