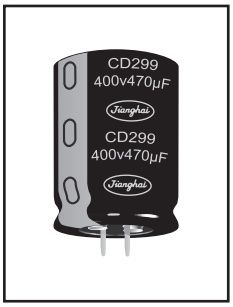
# CD 299 PG SERIES

## 7000h at 105℃

- Extended Lifetime at 105℃
- High Ripple Current
- High Professional Industrial Power Supplies

CD 299 PG
↑ Longer Life higher current
CD 297 BB




SNAP-IN/LUG

| Items | Characteristics | |
|---|---|---|
| Operating Temperature Range (℃) | -40 ~ +105 | -25 ~ +105 |
| Voltage Range (V) | 160 ~ 250 | 315 ~ 500 |
| Capacitance Range (μF) | 39 ~ 2200 | |
| Capacitance Tolerance (20℃, 120Hz) | ± 20% | |
| Leakage Current (μA) | After 5 minutes at 20℃ 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℃, 120Hz)**

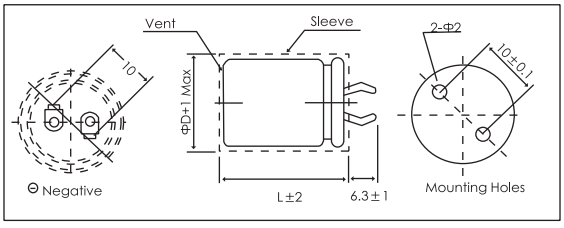
| Rated Voltage (V) | 160 | 180 | 200 | 250 | 315 | 350 | 400 | 450~500 |
|---|---|---|---|---|---|---|---|---|
| Tan δ (max) | 0.15 | | | | | | | 0.20 |

**Stability at Low Temperature (Impedance Ratio at 120Hz)**

| Rated Voltage (V) | ⩽ 250 | 315 ~ 500 |
|---|---|---|
| $Z_{-25℃} / Z_{+20℃}$ | 3 | 8 |
| $Z_{-40℃} / Z_{+20℃}$ | 12 | - |

| | Useful Life | | Load Life | Endurance Test | Shelf Life |
|---|---|---|---|---|---|
| Lifetime | 9000h | >200000h | 7000h | 7000h | 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℃ | $U_R$ 1.4 x $I_R$ 50℃ | $U_R$ $I_R$ 105℃ | $U_R$ $I_R$ = 0 105℃ | $U_R$ = 0 $I_R$ = 0 105℃ After test: $U_R$ to be applied for 30min >24h before measurement |

## Dimensions mm



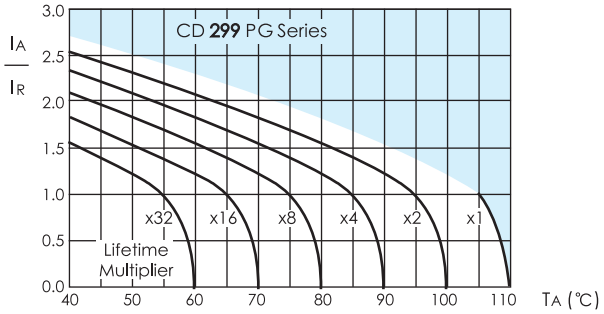

## Frequency Coefficient

| Frequency / Rated Voltage (V) | 50/60Hz | 120Hz | 300Hz | 1kHz | 10kHz | ⩾40kHz |
|---|---|---|---|---|---|---|
| 160 ~ 250 | 0.80 | 1.00 | 1.17 | 1.30 | 1.45 | 1.50 |
| ⩾315 | 0.80 | 1.00 | 1.16 | 1.30 | 1.43 | 1.45 |

## Temperature Coefficient

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

## Lifetime Diagram




IA = actual ripple current at 120Hz, IR = rated ripple current at 120Hz, 105℃
Multiplier of Useful Life as a function of ambient temperature and ripple current load

SNAP-IN/LUG

## Ratings for CD **299** PG Series

| $U_R$ (Surge Voltage) Code | Rated Capa-citance | Max ESR 20℃, 120Hz | Typ ESR 20℃, 120Hz | Rated Ripple Current 105℃, 120Hz | Size ΦD x L | P/N |
|---|---|---|---|---|---|---|
| (V) | (μF) | (mΩ) | (mΩ) | (Arms) | (mm) | - |
| 160 (200) 2C | 270 | 737 | 516 | 1.1 | 22×25 | ECS2CPG271M□□220025 |
| | 330 | 603 | 422 | 1.2 | 22×30 | ECS2CPG331M□□220030 |
| | 390 | 510 | 357 | 1.3 | 25×25 | ECS2CPG391M□□250025 |
| | 470 | 424 | 296 | 1.4 | 22×35 | ECS2CPG471M□□220035 |
| | | 424 | 296 | 1.4 | 25×30 | ECS2CPG471M□□250030 |
| | 560 | 355 | 249 | 1.5 | 22×40 | ECS2CPG561M□□220040 |
| | | 355 | 249 | 1.5 | 30×25 | ECS2CPG561M□□300025 |
| | 680 | 293 | 205 | 1.7 | 22×45 | ECS2CPG681M□□220045 |
| | | 293 | 205 | 1.7 | 25×35 | ECS2CPG681M□□250035 |
| | | 293 | 205 | 1.7 | 30×30 | ECS2CPG681M□□300030 |
| | 820 | 243 | 170 | 2 | 25×40 | ECS2CPG821M□□250040 |
| | 1000 | 199 | 139 | 2.2 | 25×45 | ECS2CPG102M□□250045 |
| | | 199 | 139 | 2.2 | 30×35 | ECS2CPG102M□□300035 |
| | 1200 | 166 | 116 | 2.3 | 25×50 | ECS2CPG122M□□250050 |
| | | 166 | 116 | 2.3 | 30×40 | ECS2CPG122M□□300040 |
| | | 166 | 116 | 2.3 | 35×35 | ECS2CPG122M□□350035 |
| | 1500 | 133 | 93 | 2.5 | 30×45 | ECS2CPG152M□□300045 |
| | | 133 | 93 | 2.5 | 35×40 | ECS2CPG152M□□350040 |
| | 1800 | 111 | 77 | 2.7 | 30×50 | ECS2CPG182M□□300050 |
| | | 111 | 77 | 2.7 | 35×45 | ECS2CPG182M□□350045 |
| | 2200 | 91 | 63 | 2.9 | 35×50 | ECS2CPG222M□□350050 |
| 180 (225) 2K | 220 | 905 | 633 | 1 | 22×25 | ECS2KPG221M□□220025 |
| | 330 | 603 | 422 | 1.2 | 22×30 | ECS2KPG331M□□220030 |
| | | 603 | 422 | 1.2 | 25×25 | ECS2KPG331M□□250025 |
| | 470 | 424 | 296 | 1.4 | 22×35 | ECS2KPG471M□□220035 |
| | | 424 | 296 | 1.4 | 25×30 | ECS2KPG471M□□250030 |
| | | 424 | 296 | 1.4 | 30×25 | ECS2KPG471M□□300025 |
| | 560 | 355 | 249 | 1.5 | 22×40 | ECS2KPG561M□□220040 |
| | | 355 | 249 | 1.5 | 25×35 | ECS2KPG561M□□250035 |
| | 680 | 293 | 205 | 1.7 | 22×50 | ECS2KPG681M□□220050 |
| | | 293 | 205 | 1.7 | 25×40 | ECS2KPG681M□□250040 |
| | | 293 | 205 | 1.7 | 30×30 | ECS2KPG681M□□300030 |
| | 820 | 243 | 170 | 2 | 25×45 | ECS2KPG821M□□250045 |
| | | 243 | 170 | 2 | 30×35 | ECS2KPG821M□□300035 |
| | | 243 | 170 | 2 | 35×30 | ECS2KPG821M□□350030 |
| | 1000 | 199 | 139 | 2.2 | 30×40 | ECS2KPG102M□□300040 |
| | 1200 | 166 | 116 | 2.3 | 30×45 | ECS2KPG122M□□300045 |
| | | 166 | 116 | 2.2 | 35×35 | ECS2KPG122M□□350035 |
| | 1500 | 133 | 93 | 2.5 | 30×50 | ECS2KPG152M□□300050 |
| | | 133 | 93 | 2.5 | 35×40 | ECS2KPG152M□□350040 |
| | 1800 | 111 | 77 | 2.7 | 35×45 | ECS2KPG182M□□350045 |
| | 2200 | 91 | 63 | 2.9 | 35×50 | ECS2KPG222M□□350050 |
| 200 (250) 2D | 220 | 905 | 633 | 1 | 22×25 | ECS2DPG221M□□220025 |
| | 270 | 737 | 516 | 1.1 | 22×30 | ECS2DPG271M□□220030 |
| | | 737 | 516 | 1.1 | 25×25 | ECS2DPG271M□□250025 |
| | 390 | 510 | 357 | 1.3 | 22×35 | ECS2DPG391M□□220035 |
| | | 510 | 357 | 1.3 | 25×30 | ECS2DPG391M□□250030 |
| | | 510 | 357 | 1.3 | 30×25 | ECS2DPG391M□□300025 |
| | 470 | 424 | 296 | 1.4 | 22×40 | ECS2DPG471M□□220040 |
| | | 424 | 296 | 1.4 | 25×35 | ECS2DPG471M□□250035 |
| | | 424 | 296 | 1.4 | 30×30 | ECS2DPG471M□□300030 |
| | 560 | 355 | 249 | 1.5 | 22×45 | ECS2DPG561M□□220045 |
| | 680 | 293 | 205 | 1.7 | 25×40 | ECS2DPG681M□□250040 |
| | | 293 | 205 | 1.7 | 30×35 | ECS2DPG681M□□300035 |
| | 820 | 243 | 170 | 2 | 25×50 | ECS2DPG821M□□250050 |
| | | 243 | 170 | 2 | 30×40 | ECS2DPG821M□□300040 |
| | | 243 | 170 | 2 | 35×30 | ECS2DPG821M□□350030 |
| | 1000 | 199 | 139 | 2.2 | 30×45 | ECS2DPG102M□□300045 |
| | | 199 | 139 | 2.2 | 35×35 | ECS2DPG102M□□350035 |
| | 1200 | 166 | 116 | 2.3 | 30×50 | ECS2DPG122M□□300050 |
| | | 166 | 116 | 2.3 | 35×40 | ECS2DPG122M□□350040 |
| | 1500 | 133 | 93 | 2.5 | 35×50 | ECS2DPG152M□□350050 |
| 250 (300) 2E | 180 | 1106 | 774 | 0.9 | 22×30 | ECS2EPG181M□□220030 |
| | 220 | 905 | 633 | 1 | 25×25 | ECS2EPG221M□□250025 |
| | 270 | 737 | 516 | 1.1 | 22×35 | ECS2EPG271M□□220035 |
| | | 737 | 516 | 1.1 | 25×30 | ECS2EPG271M□□250030 |
| | | 737 | 516 | 1.1 | 30×25 | ECS2EPG271M□□300025 |
| | 330 | 603 | 422 | 1.2 | 22×40 | ECS2EPG331M□□220040 |
| | | 603 | 422 | 1.2 | 25×35 | ECS2EPG331M□□250035 |
| | 390 | 510 | 357 | 1.3 | 22×45 | ECS2EPG391M□□220045 |
| | | 510 | 357 | 1.3 | 25×40 | ECS2EPG391M□□250040 |
| | | 510 | 357 | 1.3 | 30×30 | ECS2EPG391M□□300030 |
| | 470 | 424 | 296 | 1.4 | 25×45 | ECS2EPG471M□□250045 |
| | | 424 | 296 | 1.4 | 30×35 | ECS2EPG471M□□300035 |
| | | 424 | 296 | 1.4 | 35×30 | ECS2EPG471M□□350030 |
| | 560 | 355 | 249 | 1.5 | 25×50 | ECS2EPG561M□□250050 |
| | 680 | 293 | 205 | 1.7 | 30×45 | ECS2EPG681M□□300045 |
| | | 293 | 205 | 1.7 | 35×35 | ECS2EPG681M□□350035 |
| | 820 | 243 | 170 | 2 | 30×50 | ECS2EPG821M□□300050 |
| | | 243 | 170 | 2 | 35×40 | ECS2EPG821M□□350040 |
| | 1000 | 199 | 139 | 2.2 | 35×45 | ECS2EPG102M□□350045 |
| | 1200 | 166 | 116 | 2.3 | 35×50 | ECS2EPG122M□□350050 |
| 315 (365) 2F | 82 | 2427 | 1335 | 0.64 | 22×25 | ECS2FPG820M□□220025 |
| | 100 | 1990 | 1095 | 0.69 | 22×30 | ECS2FPG101M□□220030 |
| | 120 | 1659 | 912 | 0.75 | 25×25 | ECS2FPG121M□□250025 |

| $U_R$ (Surge Voltage) Code | Rated Capa-citance | Max ESR 20℃, 120Hz | Typ ESR 20℃, 120Hz | Rated Ripple Current 105℃, 120Hz | Size ΦD x L | P/N |
|---|---|---|---|---|---|---|
| (V) | (μF) | (mΩ) | (mΩ) | (Arms) | (mm) | - |
| 315 (365) 2F | 150 | 1327 | 730 | 0.82 | 22×35 | ECS2FPG151M□□220035 |
| | | 1327 | 730 | 0.82 | 25×30 | ECS2FPG151M□□250030 |
| | | 1327 | 730 | 0.82 | 30×25 | ECS2FPG151M□□300025 |
| | 180 | 1106 | 608 | 0.9 | 22×40 | ECS2FPG181M□□220040 |
| | | 1106 | 608 | 0.9 | 25×35 | ECS2FPG181M□□250035 |
| | 220 | 905 | 498 | 1 | 22×45 | ECS2FPG221M□□220045 |
| | | 905 | 498 | 1 | 25×40 | ECS2FPG221M□□250040 |
| | | 905 | 498 | 1 | 30×30 | ECS2FPG221M□□300030 |
| | 270 | 737 | 406 | 1.1 | 25×45 | ECS2FPG271M□□250045 |
| | | 737 | 406 | 1.1 | 30×35 | ECS2FPG271M□□300035 |
| | | 737 | 406 | 1.1 | 35×30 | ECS2FPG271M□□350030 |
| | 330 | 603 | 332 | 1.2 | 25×50 | ECS2FPG331M□□250050 |
| | | 603 | 332 | 1.2 | 30×40 | ECS2FPG331M□□300040 |
| | 390 | 510 | 281 | 1.3 | 30×45 | ECS2FPG391M□□300045 |
| | | 510 | 281 | 1.3 | 35×35 | ECS2FPG391M□□350035 |
| | 470 | 424 | 233 | 1.4 | 30×50 | ECS2FPG471M□□300050 |
| | | 424 | 233 | 1.4 | 35×40 | ECS2FPG471M□□350040 |
| | 560 | 355 | 196 | 1.5 | 35×45 | ECS2FPG561M□□350045 |
| | 680 | 293 | 161 | 1.7 | 35×50 | ECS2FPG681M□□350050 |
| 350 (400) 2V | 82 | 2427 | 1335 | 0.64 | 22×25 | ECS2VPG820M□□220025 |
| | 100 | 1990 | 1095 | 0.69 | 22×30 | ECS2VPG101M□□220030 |
| | | 1990 | 1095 | 0.69 | 25×25 | ECS2VPG101M□□250025 |
| | 120 | 1659 | 912 | 0.75 | 22×35 | ECS2VPG121M□□220035 |
| | | 1659 | 912 | 0.75 | 25×30 | ECS2VPG121M□□250030 |
| | 150 | 1327 | 730 | 0.82 | 22×40 | ECS2VPG151M□□220040 |
| | | 1327 | 730 | 0.82 | 30×25 | ECS2VPG151M□□300025 |
| | 180 | 1106 | 608 | 0.9 | 22×45 | ECS2VPG181M□□220045 |
| | | 1106 | 608 | 0.9 | 25×35 | ECS2VPG181M□□250035 |
| | | 1106 | 608 | 0.9 | 30×30 | ECS2VPG181M□□300030 |
| | 220 | 905 | 498 | 1 | 22×50 | ECS2VPG221M□□220050 |
| | | 905 | 498 | 1 | 25×40 | ECS2VPG221M□□250040 |
| | 270 | 737 | 406 | 1.1 | 25×50 | ECS2VPG271M□□250050 |
| | | 737 | 406 | 1.1 | 30×35 | ECS2VPG271M□□300035 |
| | | 737 | 406 | 1.1 | 35×30 | ECS2VPG271M□□350030 |
| | 330 | 603 | 332 | 1.2 | 30×45 | ECS2VPG331M□□300045 |
| | | 603 | 332 | 1.2 | 35×35 | ECS2VPG331M□□350035 |
| | 390 | 510 | 281 | 1.3 | 30×50 | ECS2VPG391M□□300050 |
| | | 510 | 281 | 1.3 | 35×40 | ECS2VPG391M□□350040 |
| | 560 | 355 | 196 | 1.5 | 35×50 | ECS2VPG561M□□350050 |
| 400 (450) 2G | 56 | 3554 | 1955 | 0.51 | 22×25 | ECS2GPG560M□□220025 |
| | 68 | 2927 | 1610 | 0.56 | 22×30 | ECS2GPG680M□□220030 |
| | | 2927 | 1610 | 0.56 | 25×25 | ECS2GPG680M□□250025 |
| | 82 | 2427 | 1335 | 0.64 | 22×35 | ECS2GPG820M□□220035 |
| | 100 | 1990 | 1095 | 0.69 | 25×30 | ECS2GPG101M□□250030 |
| | 120 | 1659 | 912 | 0.75 | 22×40 | ECS2GPG121M□□220040 |
| | | 1659 | 912 | 0.75 | 25×35 | ECS2GPG121M□□250035 |
| | | 1659 | 912 | 0.75 | 30×25 | ECS2GPG121M□□300025 |
| | 150 | 1327 | 730 | 0.82 | 22×50 | ECS2GPG151M□□220050 |
| | | 1327 | 730 | 0.82 | 25×40 | ECS2GPG151M□□250040 |
| | | 1327 | 730 | 0.82 | 30×30 | ECS2GPG151M□□300030 |
| | 180 | 1106 | 608 | 0.9 | 25×45 | ECS2GPG181M□□250045 |
| | | 1106 | 608 | 0.9 | 30×35 | ECS2GPG181M□□300035 |
| | | 1106 | 608 | 0.9 | 35×25 | ECS2GPG181M□□350025 |
| | 220 | 905 | 498 | 1 | 25×50 | ECS2GPG221M□□250050 |
| | | 905 | 498 | 1 | 30×40 | ECS2GPG221M□□300040 |
| | | 905 | 498 | 1 | 35×30 | ECS2GPG221M□□350030 |
| | 270 | 737 | 406 | 1.1 | 30×45 | ECS2GPG271M□□300045 |
| | | 737 | 406 | 1.1 | 35×35 | ECS2GPG271M□□350035 |
| | 330 | 603 | 332 | 1.2 | 30×50 | ECS2GPG331M□□300050 |
| | | 603 | 332 | 1.2 | 35×40 | ECS2GPG331M□□350040 |
| | 390 | 510 | 281 | 1.3 | 35×45 | ECS2GPG391M□□350045 |
| | 470 | 424 | 233 | 1.4 | 35×50 | ECS2GPG471M□□350050 |
| 450 (500) 2W | 39 | 6805 | 3062 | 0.37 | 22×25 | ECS2WPG390M□□220025 |
| | 47 | 5647 | 2541 | 0.4 | 22×30 | ECS2WPG470M□□220030 |
| | 56 | 4739 | 2133 | 0.47 | 22×35 | ECS2WPG560M□□220035 |
| | | 4739 | 2133 | 0.47 | 25×25 | ECS2WPG560M□□250025 |
| | 68 | 3903 | 1756 | 0.53 | 22×40 | ECS2WPG680M□□220040 |
| | | 3903 | 1756 | 0.53 | 25×30 | ECS2WPG680M□□250030 |
| | 82 | 3237 | 1456 | 0.56 | 22×45 | ECS2WPG820M□□220045 |
| | | 3237 | 1456 | 0.56 | 25×35 | ECS2WPG820M□□250035 |
| | | 3237 | 1456 | 0.56 | 30×25 | ECS2WPG820M□□300025 |
| | 100 | 2654 | 1194 | 0.64 | 22×50 | ECS2WPG101M□□220050 |
| | | 2654 | 1194 | 0.64 | 25×40 | ECS2WPG101M□□250040 |
| | | 2654 | 1194 | 0.64 | 30×30 | ECS2WPG101M□□300030 |
| | 120 | 2212 | 995 | 0.72 | 25×45 | ECS2WPG121M□□250045 |
| | 150 | 1769 | 796 | 0.79 | 25×50 | ECS2WPG151M□□250050 |
| | | 1769 | 796 | 0.79 | 30×40 | ECS2WPG151M□□300040 |
| | | 1769 | 796 | 0.79 | 35×30 | ECS2WPG151M□□350030 |
| | 180 | 1474 | 664 | 0.87 | 30×45 | ECS2WPG181M□□300045 |
| | | 1474 | 664 | 0.87 | 35×35 | ECS2WPG181M□□350035 |
| | 220 | 1206 | 543 | 1 | 30×50 | ECS2WPG221M□□300050 |
| | | 1206 | 543 | 1 | 35×40 | ECS2WPG221M□□350040 |
| | 270 | 983 | 442 | 1.19 | 35×45 | ECS2WPG271M□□350045 |
| | 330 | 804 | 362 | 1.38 | 35×50 | ECS2WPG331M□□350050 |

## Ratings for CD **299** PG Series

| $U_R$ (Surge Voltage) Code | Rated Capa-citance | Max ESR 20℃, 120Hz | Typ ESR 20℃, 120Hz | Rated Ripple Current 105℃, 120Hz | Size ΦD x L | P/N |
|---|---|---|---|---|---|---|
| (V) | (μF) | (mΩ) | (mΩ) | (Arms) | (mm) | - |
| 500 (550) 2H | 47 | 5647 | 2823 | 0.41 | 22×30 | ECS2HPG470M□□220030 |
| | 56 | 4739 | 2370 | 0.47 | 22×30 | ECS2HBB560M□□220030 |
| | 68 | 3903 | 1951 | 0.54 | 22×35 | ECS2HBB680M□□220035 |
| | | 3903 | 1951 | 0.54 | 25×30 | ECS2HBB680M□□250030 |
| | 82 | 3237 | 1618 | 0.62 | 22×40 | ECS2HBB820M□□220040 |
| | | 3237 | 1618 | 0.62 | 25×35 | ECS2HBB820M□□250035 |
| | 100 | 2654 | 1327 | 0.67 | 22×45 | ECS2HBB101M□□220045 |
| | | 2654 | 1327 | 0.67 | 25×40 | ECS2HBB101M□□250040 |
| | | 2654 | 1327 | 0.67 | 30×30 | ECS2HBB101M□□300030 |
| | 120 | 2212 | 1106 | 0.77 | 22×50 | ECS2HBB121M□□220050 |
| | | 2212 | 1106 | 0.74 | 25×40 | ECS2HBB121M□□250040 |
| | | 2212 | 1106 | 0.77 | 30×35 | ECS2HBB121M□□300035 |
| | | 2212 | 1106 | 0.80 | 35×30 | ECS2HBB121M□□350030 |
| | 150 | 1769 | 885 | 0.82 | 25×45 | ECS2HBB151M□□250045 |
| | | 1769 | 885 | 0.85 | 30×40 | ECS2HBB151M□□300040 |
| | | 1769 | 885 | 0.85 | 35×35 | ECS2HBB151M□□350035 |
| | 180 | 1474 | 737 | 0.98 | 25×50 | ECS2HBB181M□□250050 |
| | | 1474 | 737 | 1.01 | 30×45 | ECS2HBB181M□□300045 |
| | 220 | 1206 | 603 | 1.12 | 30×50 | ECS2HBB221M□□300050 |
| | | 1206 | 603 | 1.12 | 35×40 | ECS2HBB221M□□350040 |
| | 270 | 983 | 492 | 1.25 | 30×50 | ECS2HBB271M□□300050 |
| | | 983 | 492 | 1.25 | 35×45 | ECS2HBB271M□□350045 |
| | 330 | 804 | 402 | 1.36 | 35×50 | ECS2HBB331M□□350050 |

Customer products are available on request.