

HL series

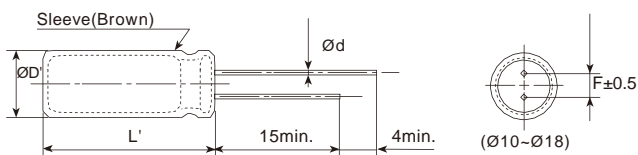
- Long life, downsized, high ripple current; For power supply applications
- Endurance: +105°C 8,000~12,000 hours
- RoHS Compliant



SPECIFICATIONS

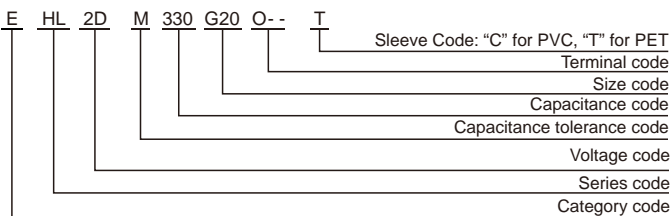
| Items | Characteristics | | | | | | | | | | |
|--|--|--|-----------------|----------------|-----------------|--|------------|-------------|---------|--------------|-------------|
| Category Temperature Range | -40~+105°C(160~400V _{dc}) | -25~+105°C(450~500V _{dc}) | | | | | | | | | |
| Rated Voltage Range | 160~500 V _{dc} | | | | | | | | | | |
| Capacitance Tolerance | ±20%(M) (at 20°C, 120Hz) | | | | | | | | | | |
| Leakage Current | <table border="1"> <tr> <td></td> <td>After 1 minute</td> <td>After 5 minutes</td> </tr> <tr> <td>CV 1000</td> <td> 0.1CV+40μA</td> <td> 0.03CV+15μA</td> </tr> <tr> <td>CV>1000</td> <td> 0.04CV+100μA</td> <td> 0.02CV+25μA</td> </tr> </table> | | | After 1 minute | After 5 minutes | CV 1000 | 0.1CV+40μA | 0.03CV+15μA | CV>1000 | 0.04CV+100μA | 0.02CV+25μA |
| | | After 1 minute | After 5 minutes | | | | | | | | |
| CV 1000 | 0.1CV+40μA | 0.03CV+15μA | | | | | | | | | |
| CV>1000 | 0.04CV+100μA | 0.02CV+25μA | | | | | | | | | |
| | | Where, I: Max. leakage current (μA), C: Nominal capacitance (μF), V: Rated voltage (V) (at 20°C) | | | | | | | | | |
| Dissipation Factor (tan δ) | Rated Voltage(V _{dc}) | 160 200 250 350 400 450 500 | | | | | | | | | |
| | tan (max.) | 0.18 0.18 0.18 0.24 0.24 0.24 0.24 (at 20°C, 120Hz) | | | | | | | | | |
| Low Temperature Characteristics (Max. Impedance Ratio) | Rated Voltage(V _{dc}) | 160 200 250 350 400 450 500 | | | | | | | | | |
| | Z(-25°C)/Z(+20°C) | 3 3 3 6 6 6 6 (at 120Hz) | | | | | | | | | |
| | Z(-40°C)/Z(+20°C) | 8 8 8 10 10 - - | | | | | | | | | |
| Endurance | The following specifications shall be satisfied when the capacitors are restored to 20°C after DC voltage plus the rated ripple current is applied for a specified period of time at 105°C. | | | | | | | | | | |
| | Capacitance Change | ±20% of the initial value | | | Rated Voltage | 160 to 450V _{dc} 500V _{dc} | | | | | |
| | D.F. (tan δ) | 200% of the initial specified value | | | Life time | L 20: 10,000 hours 10: 8,000 hours | | | | | |
| | Leakage Current | The initial specified value | | | | L>20: 12,000 hours 12.5: 10,000 hours | | | | | |
| Shelf Life | The following specifications shall be satisfied when the capacitors are restored to 20°C after exposing them for 1,000 hours at 105°C without voltage applied. | | | | | | | | | | |
| | Capacitance Change | ±20% of the initial value | | | | | | | | | |
| | D.F. (tan δ) | 200% of the initial specified value | | | | | | | | | |
| | Leakage Current | 200% of the initial specified value | | | | | | | | | |

DIMENSIONS[mm]



| | | | | |
|-----|------------|------|-----|-----|
| ØD | 10 | 12.5 | 16 | 18 |
| Ød | 0.6 | 0.6 | 0.8 | 0.8 |
| F | 5.0 | 5.0 | 7.5 | 7.5 |
| ØD' | ØD+0.5max. | | | |
| L' | L+2max. | | | |

PART NUMBERING SYSTEM



RATED RIPPLE CURRENT MULTIPLIERS

Frequency correction factor for ripple current

| | Freq.(Hz) | | | |
|----------|-----------|------|------|------|
| Cap.(μF) | 120 | 1k | 10k | 100k |
| <100 | 1.0 | 1.75 | 2.25 | 2.50 |
| 100 | 1.0 | 1.67 | 2.05 | 2.25 |

The endurance of capacitors is shortened with internal heating produced by ripple current at the rate of halving the lifetime with every 5°C rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

HL series

■ STANDARD RATINGS

| WV (Vdc) | Cap (µF) | Size DxL(mm) | tan | Rated ripple current (mA _{rms} /105°C, 120Hz) | Part Number |
|----------|----------|--------------|-------|--|----------------|
| 160(2C) | 33 | 10x16 | 0.18 | 210 | EHL2CM330G16OT |
| | 47 | 10x20 | 0.18 | 300 | EHL2CM470G20OT |
| | 56 | 10x20 | 0.18 | 318 | EHL2CM560G20OT |
| | 68 | 10x25 | 0.18 | 345 | EHL2CM680G25OT |
| | 82 | 10x25 | 0.18 | 416 | EHL2CM820G25OT |
| | | 10x30 | 0.18 | 448 | EHL2CM820G30OT |
| | 100 | 12.5x20 | 0.18 | 575 | EHL2CM101W20OT |
| | 120 | 10x35 | 0.18 | 572 | EHL2CM121G35OT |
| | | 10x40 | 0.18 | 668 | EHL2CM151G40OT |
| | 150 | 10x45 | 0.18 | 696 | EHL2CM151G45OT |
| | | 12.5x25 | 0.18 | 767 | EHL2CM151W25OT |
| | 180 | 10x50 | 0.18 | 788 | EHL2CM181G50OT |
| | | 12.5x30 | 0.18 | 885 | EHL2CM181W30OT |
| | | 16x20 | 0.18 | 858 | EHL2CM181L20OT |
| | 220 | 12.5x35 | 0.18 | 1044 | EHL2CM221W35OT |
| | | 16x25 | 0.18 | 1022 | EHL2CM221L25OT |
| | | 18x20 | 0.18 | 992 | EHL2CM221M20OT |
| | 270 | 12.5x40 | 0.18 | 1196 | EHL2CM271W40OT |
| | | 12.5x45 | 0.18 | 1230 | EHL2CM271W45OT |
| | 330 | 12.5x50 | 0.18 | 1404 | EHL2CM331W50OT |
| | | 16x30 | 0.18 | 1355 | EHL2CM331L30OT |
| | | 18x25 | 0.18 | 1292 | EHL2CM331M25OT |
| | 390 | 16x35 | 0.18 | 1505 | EHL2CM391L35OT |
| | | 16x40 | 0.18 | 1708 | EHL2CM471L40OT |
| | 470 | 16x45 | 0.18 | 1730 | EHL2CM471L45OT |
| | | 18x30 | 0.18 | 1665 | EHL2CM471M30OT |
| | | 18x35 | 0.18 | 1722 | EHL2CM471M35OT |
| | 560 | 16x50 | 0.18 | 1924 | EHL2CM561L50OT |
| | | 18x40 | 0.18 | 1910 | EHL2CM561M40OT |
| | 680 | 18x45 | 0.18 | 2135 | EHL2CM681M45OT |
| | | 18x50 | 0.18 | 2148 | EHL2CM681M50OT |
| | 200(2D) | 33 | 10x20 | 0.18 | 255 |
| 39 | | 10x20 | 0.18 | 268 | EHL2DM390G20OT |
| 47 | | 10x20 | 0.18 | 302 | EHL2DM470G20OT |
| 56 | | 10x25 | 0.18 | 346 | EHL2DM560G25OT |
| 68 | | 10x30 | 0.18 | 406 | EHL2DM680G30OT |
| 82 | | 12.5x20 | 0.18 | 522 | EHL2DM820W20OT |
| 100 | | 10x35 | 0.18 | 520 | EHL2DM101G35OT |
| | | 12.5x25 | 0.18 | 628 | EHL2DM101W25OT |
| 120 | | 10x40 | 0.18 | 595 | EHL2DM121G40OT |
| | | 10x45 | 0.18 | 624 | EHL2DM121G45OT |
| | | 12.5x30 | 0.18 | 728 | EHL2DM121W30OT |
| 150 | | 16x20 | 0.18 | 698 | EHL2DM121L20OT |
| | | 10x50 | 0.18 | 720 | EHL2DM151G50OT |
| 180 | | 12.5x35 | 0.18 | 862 | EHL2DM151W35OT |
| | | 16x25 | 0.18 | 928 | EHL2DM181L25OT |
| | | 18x20 | 0.18 | 895 | EHL2DM181M20OT |
| 220 | | 12.5x40 | 0.18 | 1078 | EHL2DM221W40OT |
| | | 12.5x45 | 0.18 | 1116 | EHL2DM221W45OT |
| | | 18x25 | 0.18 | 1050 | EHL2DM221M25OT |
| 270 | | 12.5x50 | 0.18 | 1268 | EHL2DM271W50OT |
| | | 16x30 | 0.18 | 1225 | EHL2DM271L30OT |
| | | 16x35 | 0.18 | 1252 | EHL2DM271L35OT |
| 330 | | 16x40 | 0.18 | 1428 | EHL2DM331L40OT |
| | | 18x30 | 0.18 | 1402 | EHL2DM331M30OT |
| 390 | | 16x45 | 0.18 | 1575 | EHL2DM391L45OT |
| | | 18x35 | 0.18 | 1570 | EHL2DM391M35OT |
| 470 | | 16x50 | 0.18 | 1762 | EHL2DM471L50OT |
| | | 18x40 | 0.18 | 1748 | EHL2DM471M40OT |
| | | 18x45 | 0.18 | 1775 | EHL2DM471M45OT |
| 560 | | 18x50 | 0.18 | 1952 | EHL2DM561M50OT |

| WV (Vdc) | Cap (µF) | Size DxL(mm) | tan | Rated ripple current (mA _{rms} /105°C, 120Hz) | Part Number | |
|----------|----------|--------------|-------|--|----------------|----------------|
| 250(2E) | 27 | 10x20 | 0.18 | 205 | EHL2EM270G20OT | |
| | 33 | 10x20 | 0.18 | 242 | EHL2EM330G20OT | |
| | 47 | 10x25 | 0.18 | 316 | EHL2EM470G25OT | |
| | | 10x30 | 0.18 | 342 | EHL2EM470G30OT | |
| | 56 | 12.5x20 | 0.18 | 430 | EHL2EM560W20OT | |
| | 68 | 10x35 | 0.18 | 432 | EHL2EM680G35OT | |
| | | 10x40 | 0.18 | 495 | EHL2EM820G40OT | |
| | | 10x45 | 0.18 | 518 | EHL2EM820G45OT | |
| | 82 | 12.5x25 | 0.18 | 565 | EHL2EM820W25OT | |
| | | 12.5x30 | 0.18 | 575 | EHL2EM820W30OT | |
| | | 10x50 | 0.18 | 586 | EHL2EM101G50OT | |
| | 100 | 12.5x30 | 0.18 | 662 | EHL2EM101W30OT | |
| | | 16x20 | 0.18 | 638 | EHL2EM101L20OT | |
| | 120 | 12.5x35 | 0.18 | 770 | EHL2EM121W35OT | |
| | | 16x25 | 0.18 | 758 | EHL2EM121L25OT | |
| | | 18x20 | 0.18 | 732 | EHL2EM121M20OT | |
| | 150 | 12.5x40 | 0.18 | 892 | EHL2EM151W40OT | |
| | | 12.5x45 | 0.18 | 922 | EHL2EM151W45OT | |
| | 180 | 12.5x50 | 0.18 | 1040 | EHL2EM181W50OT | |
| | | 16x30 | 0.18 | 995 | EHL2EM181L30OT | |
| | | 18x25 | 0.18 | 955 | EHL2EM181M25OT | |
| | 220 | 16x35 | 0.18 | 1130 | EHL2EM221L35OT | |
| | | 18x30 | 0.18 | 1138 | EHL2EM221M30OT | |
| | 270 | 16x40 | 0.18 | 1290 | EHL2EM271L40OT | |
| | | 16x45 | 0.18 | 1315 | EHL2EM271L45OT | |
| | 330 | 18x35 | 0.18 | 1300 | EHL2EM271M35OT | |
| | | 16x50 | 0.18 | 1480 | EHL2EM331L50OT | |
| | | 18x40 | 0.18 | 1466 | EHL2EM331M40OT | |
| | 390 | 18x45 | 0.18 | 1488 | EHL2EM331M45OT | |
| | | 18x50 | 0.18 | 1630 | EHL2EM391M50OT | |
| | 350(2V) | 15 | 10x16 | 0.24 | 150 | EHL2VM150G16OT |
| | | 18 | 10x20 | 0.24 | 165 | EHL2VM180G20OT |
| 22 | | 10x20 | 0.24 | 200 | EHL2VM220G20OT | |
| 27 | | 10x25 | 0.24 | 242 | EHL2VM270G25OT | |
| | | 10x30 | 0.24 | 256 | EHL2VM270G30OT | |
| 33 | | 12.5x20 | 0.24 | 332 | EHL2VM330W20OT | |
| 39 | | 10x35 | 0.24 | 326 | EHL2VM390G35OT | |
| 47 | | 10x40 | 0.24 | 376 | EHL2VM470G40OT | |
| | | 12.5x25 | 0.24 | 425 | EHL2VM470W25OT | |
| 56 | | 10x45 | 0.24 | 426 | EHL2VM560G45OT | |
| | | 12.5x30 | 0.24 | 498 | EHL2VM560W30OT | |
| | | 16x20 | 0.24 | 476 | EHL2VM560L20OT | |
| 68 | | 10x50 | 0.24 | 486 | EHL2VM680G50OT | |
| | | 12.5x35 | 0.24 | 583 | EHL2VM680W35OT | |
| 82 | | 18x20 | 0.24 | 550 | EHL2VM680M20OT | |
| | | 12.5x40 | 0.24 | 658 | EHL2VM820W40OT | |
| | | 16x25 | 0.24 | 628 | EHL2VM820L25OT | |
| 100 | | 12.5x45 | 0.24 | 752 | EHL2VM101W45OT | |
| | | 12.5x50 | 0.24 | 772 | EHL2VM101W50OT | |
| | | 16x30 | 0.24 | 744 | EHL2VM101L30OT | |
| 120 | | 18x25 | 0.24 | 710 | EHL2VM101M25OT | |
| | | 16x35 | 0.24 | 832 | EHL2VM121L35OT | |
| | | 16x40 | 0.24 | 964 | EHL2VM151L40OT | |
| 150 | | 16x45 | 0.24 | 978 | EHL2VM151L45OT | |
| | | 18x30 | 0.24 | 944 | EHL2VM151M30OT | |
| 180 | | 16x50 | 0.24 | 1095 | EHL2VM181L50OT | |
| | | 18x35 | 0.24 | 1065 | EHL2VM181M35OT | |
| | | 18x40 | 0.24 | 1086 | EHL2VM181M40OT | |
| 220 | | 18x45 | 0.24 | 1215 | EHL2VM221M45OT | |
| | | 18x50 | 0.24 | 1222 | EHL2VM221M50OT | |

Radial Type

HL series

■ STANDARD RATINGS

| WV (Vdc) | Cap (μF) | Size DxL(mm) | tan | Rated ripple current (mA _{rms} /105°C, 120Hz) | Part Number |
|----------|----------|--------------|------|--|----------------|
| 400(2G) | 12 | 10x16 | 0.24 | 135 | EHL2GM120G16OT |
| | 15 | 10x20 | 0.24 | 155 | EHL2GM150G20OT |
| | 18 | 10x20 | 0.24 | 180 | EHL2GM180G20OT |
| | 22 | 10x25 | 0.24 | 216 | EHL2GM220G25OT |
| | 27 | 10x30 | 0.24 | 256 | EHL2GM270G30OT |
| | | 12.5x20 | 0.24 | 300 | EHL2GM270W20OT |
| | 33 | 10x35 | 0.24 | 300 | EHL2GM330G35OT |
| | 39 | 10x40 | 0.24 | 342 | EHL2GM390G40OT |
| | | 10x45 | 0.24 | 358 | EHL2GM390G45OT |
| | | 12.5x25 | 0.24 | 390 | EHL2GM390W25OT |
| | 47 | 12.5x30 | 0.24 | 456 | EHL2GM470W30OT |
| | | 16x20 | 0.24 | 438 | EHL2GM470L20OT |
| | 56 | 10x50 | 0.24 | 440 | EHL2GM560G50OT |
| | | 12.5x35 | 0.24 | 528 | EHL2GM560W35OT |
| | | 18x20 | 0.24 | 502 | EHL2GM560M20OT |
| | 68 | 12.5x40 | 0.24 | 600 | EHL2GM680W40OT |
| | | 16x25 | 0.24 | 572 | EHL2GM680L25OT |
| | 82 | 12.5x45 | 0.24 | 684 | EHL2GM820W45OT |
| | | 12.5x50 | 0.24 | 700 | EHL2GM820W50OT |
| | | 16x30 | 0.24 | 672 | EHL2GM820L30OT |
| | | 18x25 | 0.24 | 644 | EHL2GM820M25OT |
| | 100 | 16x35 | 0.24 | 760 | EHL2GM101L35OT |
| | 120 | 16x40 | 0.24 | 864 | EHL2GM101L40OT |
| | | 16x45 | 0.24 | 880 | EHL2GM121L45OT |
| | | 18x30 | 0.24 | 842 | EHL2GM121M30OT |
| | | 18x35 | 0.24 | 875 | EHL2GM121M35OT |
| | 150 | 16x50 | 0.24 | 1000 | EHL2GM151L50OT |
| | | 18x40 | 0.24 | 985 | EHL2GM151M40OT |
| | 180 | 18x45 | 0.24 | 1098 | EHL2GM181M45OT |
| | 220 | 18x50 | 0.24 | 1225 | EHL2GM221M50OT |

| WV (Vdc) | Cap (μF) | Size DxL(mm) | tan | Rated ripple current (mA _{rms} /105°C, 120Hz) | Part Number | |
|----------|----------|--------------|---------|--|----------------|----------------|
| 450(2W) | 10 | 10x16 | 0.24 | 120 | EHL2WM100G16OT | |
| | 12 | 10x20 | 0.24 | 150 | EHL2WM120G20OT | |
| | 15 | 10x25 | 0.24 | 186 | EHL2WM150G25OT | |
| | 18 | 10x30 | 0.24 | 216 | EHL2WM180G30OT | |
| | | 12.5x20 | 0.24 | 256 | EHL2WM180W20OT | |
| | 22 | 10x35 | 0.24 | 252 | EHL2WM220G35OT | |
| | 27 | 10x40 | 0.24 | 292 | EHL2WM270G40OT | |
| | | 10x45 | 0.24 | 306 | EHL2WM270G45OT | |
| | | 12.5x25 | 0.24 | 342 | EHL2WM270W25OT | |
| | 33 | 12.5x30 | 0.24 | 400 | EHL2WM330W30OT | |
| | | 16x20 | 0.24 | 386 | EHL2WM330L20OT | |
| | 39 | 10x50 | 0.24 | 378 | EHL2WM390G50OT | |
| | | 12.5x35 | 0.24 | 462 | EHL2WM390W35OT | |
| | | 18x20 | 0.24 | 440 | EHL2WM390M20OT | |
| | 47 | 12.5x40 | 0.24 | 528 | EHL2WM470W40OT | |
| | | 16x25 | 0.24 | 500 | EHL2WM470L25OT | |
| | 56 | 12.5x45 | 0.24 | 592 | EHL2WM560W45OT | |
| | | 16x30 | 0.24 | 588 | EHL2WM560L30OT | |
| | | 18x25 | 0.24 | 562 | EHL2WM560M25OT | |
| | 68 | 12.5x50 | 0.24 | 672 | EHL2WM680W50OT | |
| | | 16x35 | 0.24 | 664 | EHL2WM680L35OT | |
| | 82 | 16x40 | 0.24 | 750 | EHL2WM820L40OT | |
| | | 16x45 | 0.24 | 762 | EHL2WM820L45OT | |
| | | 18x30 | 0.24 | 734 | EHL2WM820M30OT | |
| | 100 | 16x50 | 0.24 | 858 | EHL2WM101L50OT | |
| | | 18x35 | 0.24 | 836 | EHL2WM101M35OT | |
| | 120 | 18x40 | 0.24 | 935 | EHL2WM121M40OT | |
| | | 18x45 | 0.24 | 948 | EHL2WM121M45OT | |
| | 150 | 18x50 | 0.24 | 1065 | EHL2WM151M50OT | |
| | 500(2H) | 6.8 | 10x20 | 0.24 | 90 | EHL2HM6R8G20OT |
| | | 10 | 10x30 | 0.24 | 130 | EHL2HM100G30OT |
| | | | 12.5x20 | 0.24 | 125 | EHL2HM100W20OT |
| 12 | | 12.5x20 | 0.24 | 135 | EHL2HM120W20OT | |
| 15 | | 10x35 | 0.24 | 170 | EHL2HM150G35OT | |
| | | 12.5x25 | 0.24 | 170 | EHL2HM150W25OT | |
| | | 16x20 | 0.24 | 165 | EHL2HM150L20OT | |
| 18 | | 10x45 | 0.24 | 190 | EHL2HM180G45OT | |
| | | 12.5x30 | 0.24 | 190 | EHL2HM180W30OT | |
| 22 | | 10x50 | 0.24 | 230 | EHL2HM220G50OT | |
| | | 12.5x35 | 0.24 | 225 | EHL2HM220W35OT | |
| | | 16x20 | 0.24 | 220 | EHL2HM220L20OT | |
| 33 | | 18x25 | 0.24 | 285 | EHL2HM330M25OT | |
| 47 | | 18x30 | 0.24 | 400 | EHL2HM470M30OT | |