

# Type LPW 85 °C Snap-In Aluminum Electrolytic Capacitors

## Low Voltage, High Value Capacitors



Type LPW radial leaded snap-in aluminum electrolytic capacitors are a compact design for high density packaging and is ideal for low voltage, general purpose input filtering applications.

### High-

- Low voltage
- High Capacitance
- 85 °C
- Good for input filtering in consumer applications
- 22 to 35 mm diameter with 10 mm lead spacing

## Specifications



Complies with the EU Directive 2002/95/EC requirement restricting the use of Lead (Pb), Mercury (Hg), Cadmium (Cd), Hexavalent chromium (Cr(VI)), PolyBrominated Biphenyls (PBB) and PolyBrominated Diphenyl Ethers (PBDE).

|                                     |                  |
|-------------------------------------|------------------|
| <b>Capacitance Range:</b>           | 820 to 22,000 µF |
| <b>Voltage Range:</b>               | 10 to 100 Vdc    |
| <b>Capacitance tolerance:</b>       | ±20%             |
| <b>Operating Temperature Range:</b> | –40 °C to +85 °C |
| <b>Dissipation Factor</b>           |                  |

| DF at 120 Hz, +25 °C |         |         |         |     |
|----------------------|---------|---------|---------|-----|
| Vdc                  | 10 - 16 | 25 - 35 | 50 - 63 | 100 |
| DF %                 | 30      | 25      | 20      | 15  |

For values that are >1000 µF, the DF (%) increases 2% for every additional 1000 µF

### DC Leakage Test:

$I \leq .03CV$  or 3 mA  
C = capacitance in µF  
V = rated voltage  
I = leakage current in µA

### Frequency Ripple Multipliers:

| Rated Vdc | Ripple Multipliers |        |       |        |         |
|-----------|--------------------|--------|-------|--------|---------|
|           | 60 Hz              | 120 Hz | 1 kHz | 10 kHz | 100 kHz |
| 10 to 35  | 0.90               | 1.00   | 1.05  | 1.10   | 1.10    |
| 50 to 100 | 0.90               | 1.00   | 1.15  | 1.20   | 1.20    |

### Temperature Ripple Multipliers:

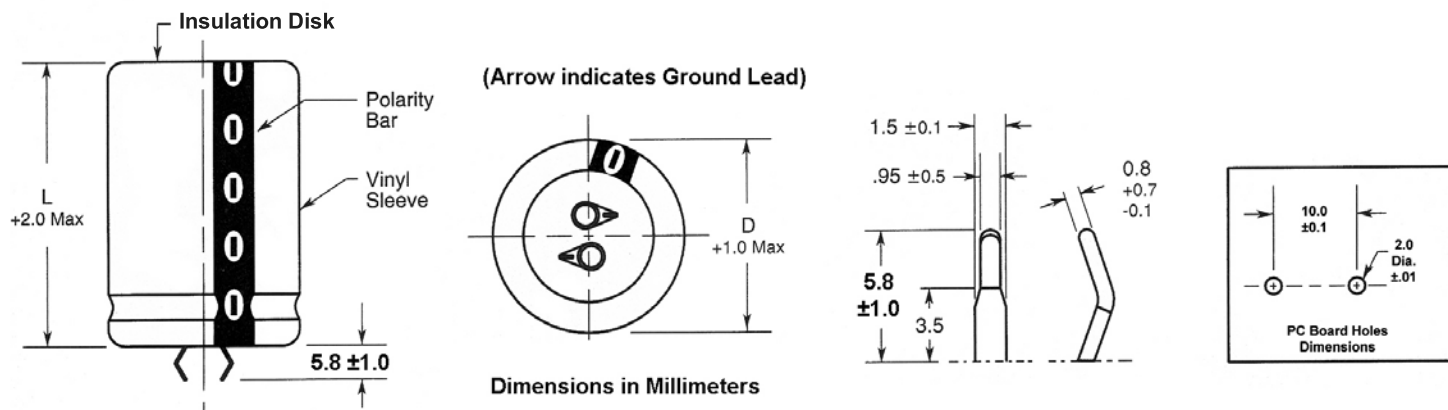
| Temperature | Ripple Multiplier |
|-------------|-------------------|
| +70 °C      | 1.20              |
| +60 °C      | 1.30              |
| +45 °C      | 1.55              |

## Part Numbering System

| LPW  | 332                                              | M         | 1J                                                                                                     | Q                                                | 25          | V-W                                        |
|------|--------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------|--------------------------------------------|
| Type | Cap                                              | Tolerance | Voltage                                                                                                | Case Diameter Code                               | Case Length | Case Type & Terminals                      |
| LPW  | 821 = 820 µF<br>332 = 3300 µF<br>103 = 10,000 µF | ±20%      | 1A = 10 Vdc<br>1C = 16 Vdc<br>1E = 25 Vdc<br>1V = 35 Vdc<br>1H = 50 Vdc<br>1J = 63 Vdc<br>2A = 100 Vdc | N = 22 mm<br>O = 25 mm<br>P = 30 mm<br>Q = 35 mm | 25 = 25 mm  | V = Vented Case<br>— = Dash<br>W = Snap-In |

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## Outline Drawing



## Ratings

| Cap<br>(μF)          | Catalog<br>Part Number | Max ESR<br>@ 120 Hz<br>+25 °C<br>(Ω) | Max Ripple<br>@ 120 Hz<br>+85 °C<br>(A) | Size<br>(Inches) |       | Size<br>(mm) |    |
|----------------------|------------------------|--------------------------------------|-----------------------------------------|------------------|-------|--------------|----|
|                      |                        |                                      |                                         | D                | L     | D            | L  |
| 10 Vdc; 13 Vdc Surge |                        |                                      |                                         |                  |       |              |    |
| 8,200                | LPW822M1AN25V-W        | 0.101                                | 2.39                                    | 0.866            | 0.984 | 22           | 25 |
| 8,200                | LPW822M1AO25V-W        | 0.101                                | 2.46                                    | 0.984            | 0.984 | 25           | 25 |
| 10,000               | LPW103M1AN30V-W        | 0.083                                | 2.69                                    | 0.866            | 1.181 | 22           | 30 |
| 10,000               | LPW103M1AO25V-W        | 0.083                                | 2.57                                    | 0.984            | 0.984 | 25           | 25 |
| 12,000               | LPW123M1AN30V-W        | 0.083                                | 2.81                                    | 0.866            | 1.181 | 22           | 30 |
| 12,000               | LPW123M1AP25V-W        | 0.083                                | 2.84                                    | 1.181            | 0.984 | 30           | 25 |
| 15,000               | LPW153M1AN35V-W        | 0.066                                | 3.14                                    | 0.866            | 1.378 | 22           | 35 |
| 15,000               | LPW153M1AP25V-W        | 0.066                                | 2.97                                    | 1.181            | 0.984 | 30           | 25 |
| 22,000               | LPW223M1AN45V-W        | 0.045                                | 3.79                                    | 0.866            | 1.772 | 22           | 45 |
| 22,000               | LPW223M1AP30V-W        | 0.045                                | 3.45                                    | 1.181            | 1.181 | 30           | 30 |
| 16 Vdc; 20 Vdc Surge |                        |                                      |                                         |                  |       |              |    |
| 4,700                | LPW472M1CN25V-W        | 0.141                                | 1.81                                    | 0.866            | 0.984 | 22           | 25 |
| 4,700                | LPW472M1CO25V-W        | 0.141                                | 2.21                                    | 0.984            | 0.984 | 25           | 25 |
| 6,800                | LPW682M1CN25V-W        | 0.122                                | 2.40                                    | 0.866            | 0.984 | 22           | 25 |
| 6,800                | LPW682M1CO25V-W        | 0.122                                | 2.47                                    | 0.984            | 0.984 | 25           | 25 |
| 8,200                | LPW822M1CN30V-W        | 0.101                                | 2.70                                    | 0.866            | 1.181 | 22           | 30 |
| 8,200                | LPW822M1CP25V-W        | 0.101                                | 2.73                                    | 1.181            | 0.984 | 30           | 25 |
| 10,000               | LPW103M1CN35V-W        | 0.083                                | 3.00                                    | 0.866            | 1.378 | 22           | 35 |
| 10,000               | LPW103M1CP25V-W        | 0.083                                | 2.84                                    | 1.181            | 0.984 | 30           | 25 |
| 12,000               | LPW123M1CN40V-W        | 0.069                                | 3.30                                    | 0.866            | 1.575 | 22           | 40 |
| 12,000               | LPW123M1CP30V-W        | 0.069                                | 3.16                                    | 1.181            | 1.181 | 30           | 30 |
| 15,000               | LPW153M1CN45V-W        | 0.055                                | 3.62                                    | 0.866            | 1.772 | 22           | 45 |
| 15,000               | LPW153M1CQ25V-W        | 0.055                                | 3.55                                    | 1.378            | 0.984 | 35           | 25 |
| 22,000               | LPW223M1CO45V-W        | 0.038                                | 4.25                                    | 0.984            | 1.772 | 25           | 45 |
| 22,000               | LPW223M1CQ30V-W        | 0.038                                | 4.37                                    | 1.378            | 1.181 | 35           | 30 |
| 25 Vdc; 32 Vdc Surge |                        |                                      |                                         |                  |       |              |    |
| 3,300                | LPW332M1EN25V-W        | 0.176                                | 2.03                                    | 0.866            | 0.984 | 22           | 25 |
| 3,300                | LPW332M1EO25V-W        | 0.176                                | 2.09                                    | 0.984            | 0.984 | 25           | 25 |
| 4,700                | LPW472M1EN30V-W        | 0.159                                | 2.49                                    | 0.866            | 1.181 | 22           | 30 |
| 4,700                | LPW472M1EO25V-W        | 0.159                                | 2.31                                    | 0.984            | 0.984 | 25           | 25 |
| 6,800                | LPW682M1EN35V-W        | 0.110                                | 2.87                                    | 0.866            | 1.378 | 22           | 35 |

| Cap<br>(μF)          | Catalog<br>Part Number | Max ESR       | Max Ripple    | Size     |       | Size |    |
|----------------------|------------------------|---------------|---------------|----------|-------|------|----|
|                      |                        | @ 120 Hz      | @ 120 Hz      | (Inches) |       | (mm) |    |
|                      |                        | +25 °C<br>(Ω) | +85 °C<br>(A) | D        | L     | D    | L  |
| 25 Vdc; 32 Vdc Surge |                        |               |               |          |       |      |    |
| 6,800                | LPW682M1EP25V-W        | 0.110         | 2.72          | 1.181    | 0.984 | 30   | 25 |
| 8,200                | LPW822M1EN40V-W        | 0.091         | 3.16          | 0.866    | 1.575 | 22   | 40 |
| 8,200                | LPW822M1EP30V-W        | 0.091         | 3.03          | 1.181    | 1.181 | 30   | 30 |
| 10,000               | LPW103M1EN45V-W        | 0.075         | 3.45          | 0.866    | 1.772 | 22   | 45 |
| 10,000               | LPW103M1EP30V-W        | 0.075         | 3.14          | 1.181    | 1.181 | 30   | 30 |
| 12,000               | LPW123M1EN50V-W        | 0.062         | 3.74          | 0.866    | 1.969 | 22   | 50 |
| 12,000               | LPW123M1EQ30V-W        | 0.062         | 3.75          | 1.378    | 1.181 | 35   | 30 |
| 15,000               | LPW153M1EO45V-W        | 0.050         | 3.78          | 0.984    | 1.772 | 25   | 45 |
| 15,000               | LPW153M1EQ30V-W        | 0.050         | 3.89          | 1.378    | 1.181 | 35   | 30 |
| 22,000               | LPW223M1EP50V-W        | 0.034         | 4.94          | 1.181    | 1.969 | 30   | 50 |
| 35 Vdc; 44 Vdc Surge |                        |               |               |          |       |      |    |
| 3,300                | LPW332M1VN25V-W        | 0.176         | 2.04          | 0.866    | 0.984 | 22   | 25 |
| 3,300                | LPW332M1VO25V-W        | 0.176         | 2.10          | 0.984    | 0.984 | 25   | 25 |
| 4,700                | LPW472M1VN30V-W        | 0.123         | 2.41          | 0.866    | 1.181 | 22   | 30 |
| 4,700                | LPW472M1VP25V-W        | 0.123         | 2.44          | 1.181    | 0.984 | 30   | 25 |
| 6,800                | LPW682M1VN40V-W        | 0.085         | 2.98          | 0.866    | 1.575 | 22   | 40 |
| 6,800                | LPW682M1VP30V-W        | 0.085         | 2.86          | 1.181    | 1.181 | 30   | 30 |
| 8,200                | LPW822M1VN45V-W        | 0.071         | 3.25          | 0.866    | 1.772 | 22   | 45 |
| 8,200                | LPW822M1VQ30V-W        | 0.071         | 3.42          | 1.378    | 1.181 | 35   | 30 |
| 10,000               | LPW103M1VO45V-W        | 0.058         | 3.41          | 0.984    | 1.772 | 25   | 45 |
| 10,000               | LPW103M1VQ30V-W        | 0.058         | 3.51          | 1.378    | 1.181 | 35   | 30 |
| 12,000               | LPW123M1VO50V-W        | 0.048         | 3.68          | 0.984    | 1.969 | 25   | 50 |
| 12,000               | LPW123M1VQ35V-W        | 0.048         | 3.84          | 1.378    | 1.378 | 35   | 35 |
| 15,000               | LPW153M1VP45V-W        | 0.039         | 4.08          | 1.181    | 1.772 | 30   | 45 |
| 50 Vdc; 63 Vdc Surge |                        |               |               |          |       |      |    |
| 2,200                | LPW222M1HN25V-W        | 0.226         | 1.92          | 0.866    | 0.984 | 22   | 25 |
| 2,200                | LPW222M1HO25V-W        | 0.226         | 1.98          | 0.984    | 0.984 | 25   | 25 |
| 3,300                | LPW332M1HN35V-W        | 0.151         | 2.51          | 0.866    | 1.378 | 22   | 35 |
| 3,300                | LPW332M1HP25V-W        | 0.151         | 2.38          | 1.181    | 0.984 | 30   | 25 |
| 4,700                | LPW472M1HN40V-W        | 0.106         | 2.89          | 0.866    | 1.575 | 22   | 40 |
| 4,700                | LPW472M1HQ25V-W        | 0.106         | 2.99          | 1.378    | 0.984 | 35   | 25 |

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| Cap<br>(μF)          | Catalog<br>Part Number | Max ESR<br>@ 120 Hz<br>+25 °C | Max Ripple<br>@ 120 Hz<br>+85 °C | Size<br>(Inches) |       | Size<br>(mm) |    |
|----------------------|------------------------|-------------------------------|----------------------------------|------------------|-------|--------------|----|
|                      |                        | (Ω)                           | (A)                              | D                | L     | D            | L  |
| 50 Vdc; 63 Vdc Surge |                        |                               |                                  |                  |       |              |    |
| 6,800                | LPW682M1HO45V-W        | .073                          | 3.37                             | 0.984            | 1.772 | 25           | 45 |
| 6,800                | LPW682M1HQ30V-W        | 0.073                         | 3.46                             | 1.378            | 1.181 | 35           | 30 |
| 8,200                | LPW822M1HO50V-W        | 0.061                         | 3.62                             | 0.984            | 1.969 | 25           | 50 |
| 8,200                | LPW822M1HQ35V-W        | 0.061                         | 3.79                             | 1.378            | 1.378 | 35           | 35 |
| 10,000               | LPW103M1HP45V-W        | 0.050                         | 3.72                             | 1.181            | 1.772 | 30           | 45 |
| 63 Vdc; 79 Vdc Surge |                        |                               |                                  |                  |       |              |    |
| 1,000                | LPW102M1JN25V-W        | 0.414                         | 1.42                             | 0.866            | 0.984 | 22           | 25 |
| 1,000                | LPW102M1JO25V-W        | 0.414                         | 1.46                             | 0.984            | 0.984 | 25           | 25 |
| 1,500                | LPW152M1JN25V-W        | 0.276                         | 1.74                             | 0.866            | 0.984 | 22           | 25 |
| 1,500                | LPW152M1JP25V-W        | 0.276                         | 1.81                             | 1.181            | 0.984 | 30           | 25 |
| 2,200                | LPW222M1JN30V-W        | 0.226                         | 2.08                             | 0.866            | 1.181 | 22           | 30 |
| 2,200                | LPW222M1JP25V-W        | 0.226                         | 2.10                             | 1.181            | 0.984 | 30           | 25 |
| 3,300                | LPW332M1JN45V-W        | 0.151                         | 2.81                             | 0.866            | 1.772 | 22           | 45 |
| 3,300                | LPW332M1JQ25V-W        | 0.151                         | 2.76                             | 1.378            | 0.984 | 35           | 25 |
| 4,700                | LPW472M1JO45V-W        | 0.106                         | 3.11                             | 0.984            | 1.772 | 25           | 45 |
| 4,700                | LPW472M1JQ30V-W        | 0.106                         | 3.20                             | 1.378            | 1.181 | 35           | 30 |
| 6,800                | LPW682M1JP45V-W        | 0.073                         | 3.54                             | 1.181            | 1.772 | 30           | 45 |

| Cap<br><br>(μF)        | Catalog<br><br>Part Number | Max ESR  | Max Ripple | Size     |       | Size |    |     |  |  |  |  |  |
|------------------------|----------------------------|----------|------------|----------|-------|------|----|-----|--|--|--|--|--|
|                        |                            | @ 120 Hz | @ 120 Hz   | (Inches) |       | (mm) |    |     |  |  |  |  |  |
|                        |                            | +25 °C   | +85 °C     | D        | L     | D    | L  |     |  |  |  |  |  |
| (Ω)                    |                            |          |            |          |       |      |    | (A) |  |  |  |  |  |
| 100 Vdc; 125 Vdc Surge |                            |          |            |          |       |      |    |     |  |  |  |  |  |
| 820                    | LPW821M2AN30V-W            | 0.404    | 1.55       | 0.866    | 1.181 | 22   | 30 |     |  |  |  |  |  |
| 820                    | LPW821M2AO25V-W            | 0.404    | 1.54       | 0.984    | 0.984 | 25   | 25 |     |  |  |  |  |  |
| 1,000                  | LPW102M2AN30V-W            | 0.332    | 1.71       | 0.866    | 1.181 | 22   | 30 |     |  |  |  |  |  |
| 1,000                  | LPW102M2AP25V-W            | 0.332    | 2.20       | 1.181    | 0.984 | 30   | 25 |     |  |  |  |  |  |
| 1,500                  | LPW152M2AN40V-W            | 0.276    | 2.38       | 0.866    | 1.575 | 22   | 40 |     |  |  |  |  |  |
| 1,500                  | LPW152M2AQ30V-W            | 0.276    | 2.54       | 1.378    | 1.181 | 35   | 30 |     |  |  |  |  |  |
| 2,200                  | LPW222M2AO45V-W            | 0.188    | 2.77       | 0.984    | 1.772 | 25   | 45 |     |  |  |  |  |  |
| 2,200                  | LPW222M2AQ30V-W            | 0.188    | 3.07       | 1.378    | 1.181 | 35   | 30 |     |  |  |  |  |  |
| 3,300                  | LPW332M2AP45V-W            | 0.126    | 3.27       | 1.181    | 1.772 | 30   | 45 |     |  |  |  |  |  |

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