

# PHE850

**RoHS**  
Compliant

- EMI suppressor, class Y2, metallized polypropylene
- 0.001 – 1.0  $\mu\text{F}$ , 300 VAC, +110 °C
- New, small dimensions including low profile capacitors

## TYPICAL APPLICATIONS

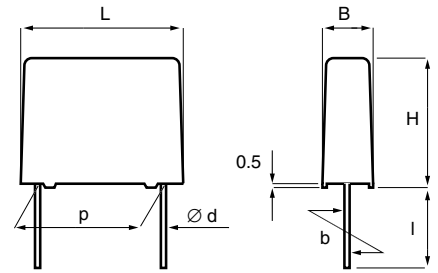
The capacitors are intended for use as interference suppressors in Y2 (line-to-earth) applications.

Not for use in series with the mains.

See [www.kemet.com](http://www.kemet.com) for more information.

## CONSTRUCTION

Winding of metallized polypropylene. Encapsulated in self-extinguishing material meeting the requirements of UL 94V-0.



## TECHNICAL DATA

|   |   |  |
|---|---|--|
| <b>Rated voltage</b>                              | 300 VAC, 50/60 Hz (ENEC,UL,cUL)   |  |
| <b>Capacitance range <math>\mu\text{F}</math></b> | 0.001–1.0   |  |
| <b>Temperature range °C</b>                       | –55/+110  |  |
| <b>Climatic category IEC</b>                      | 55/110/56/B   |  |
| <b>Capacitance tolerance</b>                      | $\pm 20\%$ standard, other tolerances on request  |  |
| <b>Approvals</b>                                  | ENEC, UL, cUL   |  |
| <b>Dissipation factor <math>\tan\delta</math></b> | Maximum values at +23 °C  |  |
|   | $C \leq 0.1 \mu\text{F}$  | $0.1 \mu\text{F} < C \leq 1 \mu\text{F}$ |
| 1 kHz   | 0.2%  | 0.15%                                    |
| 10 kHz  | 0.3%  | 0.4%                                     |
| 100 kHz   | 0.6%  | –  |
| <b>Insulation resistance</b>                      | $C \leq 0.33 \mu\text{F}$ : $\geq 30\,000 \text{ M}\Omega$<br>$C > 0.33 \mu\text{F}$ : $\geq 10\,000 \text{ s}$   |  |
| <b>Resonance frequency</b>                        | Tabulated self-resonance frequencies $f_0$ refer to 5 mm lead lengths.  |  |
| <b>Test voltage between terminals</b>             | The 100% screening factory test is carried out at 5000 VDC and 2500 VAC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test. |  |
| <b>In DC applications</b>                         | Recommended voltage: $\leq 1250 \text{ VDC}$  |  |

| p              | d        | std l | max l | b         |
|----------------|----------|-------|-------|-----------|
| $10.0 \pm 0.4$ | 0.6      | 17    | 30    | $\pm 0.4$ |
| $15.0 \pm 0.4$ | 0.6/0.8* | 17    | 30    | $\pm 0.4$ |
| $22.5 \pm 0.4$ | 0.8      | 6     | 30    | $\pm 0.4$ |
| $27.5 \pm 0.4$ | 0.8      | 6     | 30    | $\pm 0.4$ |
| $37.5 \pm 0.5$ | 1.0      | 6     | 30    | $\pm 0.7$ |

\* Size 7.5 x 14.5 x 18.0 and bigger,  $d = 0.8 \text{ mm}$ .

Tolerance in lead length  
< 30 mm  $\begin{matrix} +0 \\ -1 \end{matrix} \text{ mm}$

30 mm  $\begin{matrix} +5 \\ -0 \end{matrix} \text{ mm}$

## ENVIRONMENTAL TEST DATA

|                              |                         |   |   |
|------------------------------|-------------------------|---|---|
| <b>Endurance</b>             | EN/IEC 60384-14:2005    | 1.7 x $U_R$ VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature |   |
| <b>Vibration</b>             | IEC 60068-2-6, Test Fc  | 3 directions at 2 hour each, 10 – 55 Hz at 0.75 mm or 98 m/s <sup>2</sup>                                 | No visible damage, No open or short circuit |
| <b>Bump</b>                  | IEC 60068-2-29, Test Eb | 1000 bumps at 390 m/s <sup>2</sup>  | No visible damage, No open or short circuit |
| <b>Change of temperature</b> | IEC 60068–2–14 Test Na  | Upper and lower rated temperature 5 cycles  | No visible damage                           |
| <b>Active flammability</b>   | EN/IEC 60384-14:2005    |   |   |
| <b>Passive flammability</b>  | EN/IEC 60384-14:2005    |   |   |
| <b>Humidity</b>              | IEC 60068-2-3, Test Ca  | +40°C and 90 – 95% R.H.   | 56 days                                     |

ARTICLE TABLE

Capaci- Box Max dimensions Max  
tance code in mm f<sub>o</sub> dU/dt Article code  
µF B H L MHz V/µs

Capaci- Box Max dimensions Max  
tance code in mm f<sub>o</sub> dU/dt Article code  
µF B H L MHz V/µs

LEAD SPACING 10 MM

|        |     |     |      |      |    |     |                     |
|--------|-----|-----|------|------|----|-----|---------------------|
| 0.0010 | A06 | 4.0 | 8.0  | 13.0 | 50 | 100 | PHE850EA4100MA06R17 |
| 0.0012 | A06 | 4.0 | 8.0  | 13.0 | 45 | 100 | PHE850EA4120MA06R17 |
| 0.0015 | A01 | 4.0 | 9.0  | 13.0 | 43 | 100 | PHE850EA4150MA01R17 |
| 0.0018 | A01 | 4.0 | 9.0  | 13.0 | 40 | 100 | PHE850EA4180MA01R17 |
| 0.0022 | A01 | 4.0 | 9.0  | 13.0 | 36 | 100 | PHE850EA4220MA01R17 |
| 0.0027 | A02 | 4.5 | 10.5 | 13.0 | 34 | 100 | PHE850EA4270MA02R17 |
| 0.0033 | A02 | 4.5 | 10.5 | 13.0 | 31 | 100 | PHE850EA4330MA02R17 |
| 0.0039 | A03 | 5.0 | 11.0 | 13.0 | 29 | 100 | PHE850EA4390MA03R17 |
| 0.0047 | A03 | 5.0 | 11.0 | 13.0 | 26 | 100 | PHE850EA4470MA03R17 |
| 0.0056 | A04 | 6.0 | 12.0 | 13.0 | 23 | 100 | PHE850EA4560MA04R17 |
| 0.0068 | A04 | 6.0 | 12.0 | 13.0 | 20 | 100 | PHE850EA4680MA04R17 |
| 0.0068 | A05 | 9.5 | 7.5  | 13.0 | 21 | 100 | PHE850EP4680MA05R17 |

LEAD SPACING 15 MM

|        |     |      |      |      |     |     |                     |
|--------|-----|------|------|------|-----|-----|---------------------|
| 0.0068 | B04 | 5.5  | 10.5 | 18.0 | 14  | 100 | PHE850EB4680MB04R17 |
| 0.0082 | B04 | 5.5  | 10.5 | 18.0 | 14  | 100 | PHE850EB4820MB04R17 |
| 0.010  | B04 | 5.5  | 10.5 | 18.0 | 13  | 100 | PHE850EB5100MB04R17 |
| 0.012  | B05 | 5.5  | 12.5 | 18.0 | 12  | 100 | PHE850EB5120MB05R17 |
| 0.015  | B15 | 6.0  | 12.0 | 18.0 | 11  | 100 | PHE850EB5150MB15R17 |
| 0.018  | B10 | 6.5  | 12.5 | 18.0 | 10  | 100 | PHE850EB5180MB10R17 |
| 0.022  | B06 | 7.5  | 14.5 | 18.0 | 9.5 | 100 | PHE850EB5220MB06R17 |
| 0.027  | B06 | 7.5  | 14.5 | 18.0 | 8.6 | 100 | PHE850EB5270MB06R17 |
| 0.033  | B12 | 8.0  | 15.0 | 18.0 | 7.8 | 100 | PHE850EB5330MB12R17 |
| 0.039  | B11 | 8.5  | 16.0 | 18.0 | 7.0 | 100 | PHE850EB5390MB11R17 |
| 0.047  | B14 | 9.5  | 17.5 | 18.0 | 6.3 | 100 | PHE850EB5470MB14R17 |
| 0.047  | B17 | 13.0 | 12.5 | 18.0 | 6.3 | 100 | PHE850EH5470MB17R17 |
| 0.056  | B16 | 11.0 | 19.0 | 18.0 | 5.5 | 100 | PHE850EB5560MB16R17 |
| 0.068  | B16 | 11.0 | 19.0 | 18.0 | 4.7 | 100 | PHE850EB5680MB16R17 |

LEAD SPACING 22.5 MM

|       |     |      |      |      |     |     |                       |
|-------|-----|------|------|------|-----|-----|-----------------------|
| 0.033 | D13 | 6.5  | 14.5 | 26.0 | 5.7 | 100 | PHE850ED5330MD13R06L2 |
| 0.039 | D13 | 6.5  | 14.5 | 26.0 | 5.4 | 100 | PHE850ED5390MD13R06L2 |
| 0.047 | D13 | 6.5  | 14.5 | 26.0 | 5.0 | 100 | PHE850ED5470MD13R06L2 |
| 0.056 | D17 | 7.0  | 16.5 | 26.0 | 4.7 | 100 | PHE850ED5560MD17R06L2 |
| 0.068 | D17 | 7.0  | 16.5 | 26.0 | 4.3 | 100 | PHE850ED5680MD17R06L2 |
| 0.082 | D15 | 9.0  | 18.5 | 26.0 | 4.0 | 100 | PHE850ED5820MD15R06L2 |
| 0.10  | D18 | 10.5 | 19.0 | 26.0 | 3.6 | 100 | PHE850ED6100MD18R06L2 |
| 0.12  | D18 | 10.5 | 19.0 | 26.0 | 3.3 | 100 | PHE850ED6120MD18R06L2 |
| 0.15  | D16 | 11.0 | 21.5 | 26.0 | 2.8 | 100 | PHE850ED6150MD16R06L2 |
| 0.18  | D20 | 13.5 | 23.0 | 26.0 | 2.5 | 100 | PHE850ED6180MD20R06L2 |
| 0.22  | D20 | 13.5 | 23.0 | 26.0 | 2.3 | 100 | PHE850ED6220MD20R06L2 |

LEAD SPACING 27.5 MM

|      |     |      |      |      |     |     |                        |
|------|-----|------|------|------|-----|-----|------------------------|
| 0.15 | F11 | 10.5 | 20.5 | 31.5 | 2.4 | 100 | PHE850EF6150MF11R06L2  |
| 0.15 | F17 | 21.0 | 12.5 | 31.5 | 2.4 | 100 | PHE850ET6150MF17R06L2  |
| 0.18 | F11 | 10.5 | 20.5 | 31.5 | 2.2 | 100 | PHE850EF6180MF11R06L2  |
| 0.22 | F12 | 11.5 | 22.5 | 31.5 | 2.1 | 100 | PHE850EF6220MF12R06L2  |
| 0.27 | F03 | 13.5 | 23.0 | 31.5 | 1.9 | 100 | PHE850EF6270MF03R06L2  |
| 0.33 | F13 | 14.5 | 24.5 | 31.5 | 1.7 | 100 | PHE850EF6330MF13R06L2  |
| 0.39 | F14 | 17.5 | 28.0 | 31.5 | 1.6 | 100 | PHE850EF6390MF14R06L2  |
| 0.47 | F14 | 17.5 | 28.0 | 31.5 | 1.4 | 100 | PHE850EF6470MF14R06L2  |
| 0.47 | F19 | 27.5 | 16.0 | 31.5 | 1.5 | 100 | PHE850ET6470MF19R06L2  |
| 0.56 | F16 | 21.0 | 30.0 | 31.5 | 1.3 | 100 | PHE850EF6560MF16R06L2  |
| 0.68 | F16 | 21.0 | 30.0 | 31.5 | 1.2 | 100 | PHE850EZ6680MF16R06L2* |

LEAD SPACING 37.5 MM

|      |     |      |      |      |      |     |                       |
|------|-----|------|------|------|------|-----|-----------------------|
| 0.33 | R05 | 13.0 | 24.0 | 41.0 | 1.2  | 100 | PHE850ER6330MR05R06L2 |
| 0.39 | R05 | 13.0 | 24.0 | 41.0 | 1.1  | 100 | PHE850ER6390MR05R06L2 |
| 0.47 | R05 | 13.0 | 24.0 | 41.0 | 1.1  | 100 | PHE850ER6470MR05R06L2 |
| 0.56 | R04 | 15.0 | 26.0 | 41.0 | 1.0  | 100 | PHE850ER6560MR04R06L2 |
| 0.68 | R02 | 16.5 | 32.0 | 41.0 | 0.94 | 100 | PHE850ER6680MR02R06L2 |
| 0.82 | R02 | 16.5 | 32.0 | 41.0 | 0.88 | 100 | PHE850ER6820MR02R06L2 |
| 1.0  | R03 | 19.0 | 36.0 | 41.0 | 0.81 | 100 | PHE850ER7100MR03R06L2 |

\* Only ± 20% tolerance

APPROVALS

Certification Body Specification

|      |                      |
|------|----------------------|
| ENEC | EN/IEC 60384-14:2013 |
| UL   | UL 60384-14          |
|      | CAN/CSA-E60384-14:09 |

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- Y2
- Approval marks
- IEC Climatic category
- Passive flammability class
- Manufacturing date code

ORDERING INFORMATION

The article code for the standard part is given in the article table.

Statements of suitability for certain applications are based on our knowledge of typical operating conditions for such applications, but are not intended to constitute – and we specifically disclaim – any warranty concerning suitability for a specific customer application or use. This Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by us with reference to the use of our products is given gratis, and we assume no obligation or liability for the advice given or results obtained.

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