

PHE840E

RoHS
Compliant

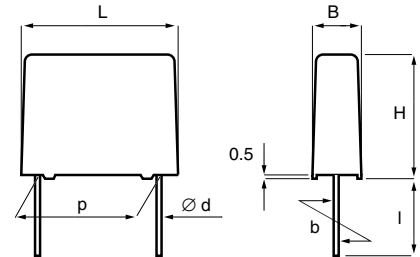
- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 10 μF , 300 VAC, +105°C
- New improved design: small dimensions including low profile capacitors

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X2 and across-the-line applications.
Not for use in series with the mains.
See www.kemet.com for more information.

CONSTRUCTION

Metallized polypropylene winding, encapsulated in self-extinguishing material meeting the requirements of UL 94 V-0.



TECHNICAL DATA

| | | | |
|---|--|--|---------------------|
| Rated voltage | 300 VAC 50/60 Hz | | |
| Capacitance range | 0.01 – 10 μF | | |
| Capacitance tolerance | $\pm 20\%$ standard, $\pm 10\%$ option | | |
| Temperature range | -55 to +105°C | | |
| Climatic category | 55/105/56/B | | |
| Approvals | ENEC, UL, cUL related to rated voltage and climatic category | | |
| Dissipation factor $\tan\delta$ | Maximum values at +23°C | | |
| | $C \leq 0.1 \mu\text{F}$ | $0.1 \mu\text{F} < C \leq 1 \mu\text{F}$ | $C > 1 \mu\text{F}$ |
| 1 kHz | 0.1% | 0.1% | 0.1% |
| 10 kHz | 0.2% | 0.4% | 0.8% |
| 100 kHz | 0.6% | - | - |
| Test voltage between terminals | The 100% screening factory test is carried out at 2200 VDC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test. | | |
| Resonance frequency | Tabulated self-resonance frequencies f_0 refer to 5 mm lead length. | | |
| Insulation resistance | $C \leq 0.33 \mu\text{F}$: $\geq 30\,000 \text{ M}\Omega$ $C > 0.33 \mu\text{F}$: $\geq 10\,000 \Omega\text{F}$ | | |
| In DC applications | Recommended voltage $\leq 760 \text{ VDC}$ | | |

| P | d | std l | max l | b |
|----------------|-----|-------|-------|-----------|
| 10.0 ± 0.4 | 0.6 | 17 | 30 | ± 0.4 |
| 15.0 ± 0.4 | 0.8 | 17 | 30 | ± 0.4 |
| 22.5 ± 0.4 | 0.8 | 6 | 30 | ± 0.4 |
| 27.5 ± 0.4 | 0.8 | 6 | 30 | ± 0.4 |
| 37.5 ± 0.5 | 1.0 | 6 | 30 | ± 0.7 |

Tolerance in lead length
< 30 mm $^{+0}_{-1}$ mm

30 mm $^{+5}_{-0}$ mm

ENVIRONMENTAL TEST DATA

| | | | |
|------------------------------|--------------------------------|--|---|
| Endurance | EN/IEC 60384-14:2005 | 1.25 x U_R VAC 50 Hz, once every hour increased to 1000 VAC for 0.1 s, 1000 h at upper rated temperature | |
| Vibration | IEC 60068-2-6 Test Fc | 3 directions at 2 hours each, 10-55 Hz at 0.75 mm or 98 m/s ² | No visible damage No open or short circuit |
| Bump | IEC 60068-2-29 Test Eb | 1000 bumps at 390 m/s ² | No visible damage No open or short circuit |
| Change of temperature | IEC 60068-2-14 Test Na | Upper and lower rated temperature 5 cycles | No visible damage |
| Active flammability | EN/IEC 60384-14:2005 | | |
| Passive flammability | EN/IEC 60384-14:2005 UL1414 | Enclosure material of UL94V-0 flammability class | |
| Humidity | IEC 60068-2-3 Test Ca | +40°C and 90 – 95% R.H. | 56 days |

ARTICLE TABLE

| Capacitance μF | Box code | Max dimensions in mm | | | f_o MHz | Max dU/dt V/ μs | Article code | Capacitance μF | Box code | Max dimensions in mm | | | f_o MHz | Max dU/dt V/ μs | Article code |
|------------------------------|----------|-------------------------|------|------|--------------|----------------------------------|------------------------|------------------------------|----------|-------------------------|------|------|--------------|----------------------------------|------------------------|
| | | B | H | L | | | | | | B | H | L | | | |
| LEAD SPACING 10 MM | | | | | | | | | | | | | | | |
| 0.010 | A01 | 4.0 | 9.0 | 13.0 | 11 | 100 | PHE840EA5100MA01R17 | 0.56 | D15 | 9.0 | 18.5 | 26.0 | 1.4 | 100 | PHE840ED6560MD15R06L2 |
| 0.012 | A01 | 4.0 | 9.0 | 13.0 | 10 | 100 | PHE840EA5120MA01R17 | 0.68 | D15 | 9.0 | 18.5 | 26.0 | 1.3 | 100 | PHE840EY6680MD15R06L2* |
| 0.015 | A01 | 4.0 | 9.0 | 13.0 | 9.4 | 100 | PHE840EA5150MA01R17 | 0.68 | D18 | 10.5 | 19.0 | 26.0 | 1.2 | 100 | PHE840ED6680MD18R06L2 |
| 0.018 | A01 | 4.0 | 9.0 | 13.0 | 8.9 | 100 | PHE840EA5180MA01R17 | 0.82 | D16 | 11.0 | 21.5 | 26.0 | 1.1 | 100 | PHE840ED6820MD16R06L2 |
| 0.022 | A01 | 4.0 | 9.0 | 13.0 | 8.6 | 100 | PHE840EA5220MA01R17 | 1.0 | D16 | 11.0 | 21.5 | 26.0 | 1.1 | 100 | PHE840EY7100MD16R06L2* |
| 0.027 | A02 | 4.5 | 10.5 | 13.0 | 8.1 | 100 | PHE840EA5270MA02R17 | 1.0 | D20 | 13.5 | 23.0 | 26.0 | 1.0 | 100 | PHE840ED7100MD20R06L2 |
| 0.033 | A02 | 4.5 | 10.5 | 13.0 | 7.6 | 100 | PHE840EA5330MA02R17 | 1.2 | D19 | 15.5 | 24.5 | 26.0 | 0.90 | 100 | PHE840ED7120MD19R06L2 |
| 0.039 | A03 | 5.0 | 11.0 | 13.0 | 6.6 | 100 | PHE840EA5390MA03R17 | 1.5 | D19 | 15.5 | 24.5 | 26.0 | 0.85 | 100 | PHE840ED7150MD19R06L2 |
| 0.047 | A03 | 5.0 | 11.0 | 13.0 | 6.1 | 100 | PHE840EA5470MA03R17 | | | | | | | | |
| 0.056 | A04 | 6.0 | 12.0 | 13.0 | 5.6 | 100 | PHE840EA5560MA04R17 | | | | | | | | |
| 0.068 | A04 | 6.0 | 12.0 | 13.0 | 5.0 | 100 | PHE840EA5680MA04R17 | | | | | | | | |
| LEAD SPACING 15 MM | | | | | | | | | | | | | | | |
| 0.033 | B04 | 5.5 | 10.5 | 18.0 | 5.9 | 100 | PHE840EB5330MB04R17 | 0.82 | F11 | 10.5 | 20.5 | 31.5 | 1.0 | 100 | PHE840EF6820MF11R06L2 |
| 0.039 | B04 | 5.5 | 10.5 | 18.0 | 5.4 | 100 | PHE840EB5390MB04R17 | 1.0 | F11 | 10.5 | 20.5 | 31.5 | 1.0 | 100 | PHE840EZ7100MF11R06L2* |
| 0.047 | B04 | 5.5 | 10.5 | 18.0 | 5.0 | 100 | PHE840EB5470MB04R17 | 1.0 | F12 | 11.5 | 22.5 | 31.5 | 0.95 | 100 | PHE840EF7100MF12R06L2 |
| 0.056 | B04 | 5.5 | 10.5 | 18.0 | 4.6 | 100 | PHE840EB5560MB04R17 | 1.0 | F17 | 21.0 | 12.5 | 31.5 | 0.95 | 100 | PHE840ET7100MF17R06L2 |
| 0.068 | B04 | 5.5 | 10.5 | 18.0 | 4.2 | 100 | PHE840EB5680MB04R17 | 1.2 | F03 | 13.5 | 23.0 | 31.5 | 0.82 | 100 | PHE840EF7120MF03R06L2 |
| 0.082 | B05 | 5.5 | 12.5 | 18.0 | 3.9 | 100 | PHE840EB5820MB05R17 | 1.5 | F13 | 14.5 | 24.5 | 31.5 | 0.73 | 100 | PHE840EF7150MF13R06L2 |
| 0.10 | B05 | 5.5 | 12.5 | 18.0 | 3.7 | 100 | PHE840EB6100MB05R17 | 1.8 | F14 | 17.5 | 28.0 | 31.5 | 0.65 | 100 | PHE840EF7180MF14R06L2 |
| 0.12 | B10 | 6.5 | 12.5 | 18.0 | 3.3 | 100 | PHE840EB6120MB10R17 | 2.2 | F14 | 17.5 | 28.0 | 31.5 | 0.64 | 100 | PHE840EZ7220MF14R06L2* |
| 0.15 | B10 | 6.5 | 12.5 | 18.0 | 2.8 | 100 | PHE840EB6150MB10R17 | 2.2 | F15 | 19.0 | 29.0 | 31.5 | 0.62 | 100 | PHE840EF7220MF15R06L2 |
| 0.18 | B06 | 7.5 | 14.5 | 18.0 | 2.7 | 100 | PHE840EB6180MB06R17 | 2.2 | F19 | 27.5 | 16.0 | 31.5 | 0.62 | 100 | PHE840ET7220MF19R06L2 |
| 0.22 | B06 | 7.5 | 14.5 | 18.0 | 2.6 | 100 | PHE840EX6220MB06R17 * | 2.7 | F15 | 19.0 | 29.0 | 31.5 | 0.58 | 100 | PHE840EF7270MF15R06L2 |
| 0.22 | B17 | 13.0 | 12.5 | 18.0 | 2.5 | 100 | PHE840EQ6220MB17R17 | 3.3 | F15 | 19.0 | 29.0 | 31.5 | 0.54 | 100 | PHE840EZ7330MF15R06L2* |
| 0.22 | B12 | 8.0 | 15.0 | 18.0 | 2.5 | 100 | PHE840EB6220MB12R17 | 3.3 | F16 | 21.0 | 30.0 | 31.5 | 0.50 | 100 | PHE840EF7330MF16R06L2 |
| 0.27 | B11 | 8.5 | 16.5 | 18.0 | 2.3 | 100 | PHE840EB6270MB11R17 | 3.3 | F18 | 31.0 | 19.0 | 31.5 | 0.50 | 100 | PHE840ET7330MF18R06L2 |
| 0.33 | B11 | 8.5 | 16.5 | 18.0 | 2.2 | 100 | PHE840EX6330MB11R17* | | | | | | | | |
| 0.33 | B17 | 13.0 | 12.5 | 18.0 | 2.2 | 100 | PHE840EH6330MB17R17 | | | | | | | | |
| 0.33 | B14 | 9.5 | 17.5 | 18.0 | 2.0 | 100 | PHE840EB6330MB14R17 | | | | | | | | |
| 0.39 | B16 | 11.0 | 19.0 | 18.0 | 1.9 | 100 | PHE840EB6390MB16R17 | | | | | | | | |
| 0.47 | B16 | 11.0 | 19.0 | 18.0 | 1.8 | 100 | PHE840EB6470MB16R17 | | | | | | | | |
| LEAD SPACING 22.5 MM | | | | | | | | | | | | | | | |
| 0.22 | D13 | 6.5 | 14.5 | 26.0 | 2.1 | 100 | PHE840ED6220MD13R06L2 | 1.8 | R05 | 13.0 | 24.0 | 41.0 | 0.60 | 100 | PHE840ER7180MR05R06L2 |
| 0.27 | D17 | 7.0 | 16.5 | 26.0 | 1.9 | 100 | PHE840ED6270MD17R06L2 | 2.2 | R05 | 13.0 | 24.0 | 41.0 | 0.58 | 100 | PHE840ER7220MR05R06L2 |
| 0.33 | D17 | 7.0 | 16.5 | 26.0 | 1.8 | 100 | PHE840ED6330MD17R06L2 | 2.7 | R04 | 15.0 | 26.0 | 41.0 | 0.53 | 100 | PHE840ER7270MR04R06L2 |
| 0.39 | D14 | 8.0 | 16.0 | 26.0 | 1.7 | 100 | PHE840ED6390MD14R06L2 | 3.3 | R04 | 15.0 | 26.0 | 41.0 | 0.49 | 100 | PHE840ER7330MR04R06L2 |
| 0.47 | D14 | 8.0 | 16.0 | 26.0 | 1.6 | 100 | PHE840EY6470MD14R06L2* | 3.9 | R02 | 16.5 | 32.0 | 41.0 | 0.46 | 100 | PHE840ER7390MR02R06L2 |
| 0.47 | D15 | 9.0 | 18.5 | 26.0 | 1.5 | 100 | PHE840ED6470MD15R06L2 | 4.7 | R03 | 19.0 | 36.0 | 41.0 | 0.44 | 100 | PHE840ER7470MR03R06L2 |
| | | | | | | | | 5.6 | R06 | 21.0 | 38.0 | 41.0 | 0.41 | 100 | PHE840ER7560MR06R06L2 |
| | | | | | | | | 6.8 | R06 | 21.0 | 38.0 | 41.0 | 0.39 | 100 | PHE840ER7680MR06R06L2 |
| | | | | | | | | 8.2 | R08 | 28.0 | 43.0 | 41.0 | 0.30 | 100 | PHE840ER7820MR08R06L2 |
| | | | | | | | | 10 | R08 | 28.0 | 43.0 | 41.0 | 0.26 | 100 | PHE840ER8100MR08R06L2 |

* Only $\pm 20\%$ tolerance

APPROVALS

| Certification Body | Specification |
|--------------------|---|
| ENEC | EN/IEC 60384-14:2005 |
| UL | UL 1283 UL 1414 (U _R = 250 VAC) |
| cUL recognition | C 22.2 No. 8 C 22.2 No. 1 |

MARKING

- RIFA
- RIFA article code
- Rated capacitance
- Capacitance tolerance code
- Rated voltage
- X2
- Approval marks
- Manufacturing date code
- IEC climatic category
- Passive flammability class

ORDERING INFORMATION

The article code for the standard part is given in the article table.
For other options, see page 11.