

PHE840M

RoHS
Compliant

- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 10.0 μF , 275/280 VAC, +105°C
- 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.

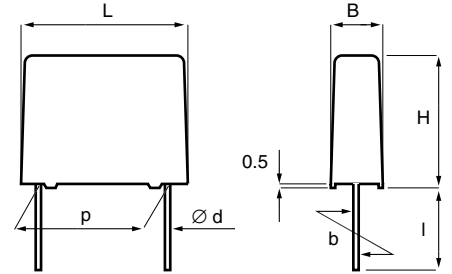
See www.kemet.com for more information.

CONSTRUCTION

Metallized polypropylene film encapsulated with selfextinguishing epoxy resin in a box of material recognized to UL 94 V-0.

TECHNICAL DATA

| | | | |
|---------------------------------------|--|--|---------------------|
| Rated voltage | 275 VAC 50/60 Hz (ENEC) 280 VAC 50/60 Hz (UL, CSA) | | |
| Capacitance range | 0.01 – 10.0 μF | | |
| Capacitance tolerance | $\pm 20\%$ standard, $\pm 10\%$ option, $\pm 5\%$ on request | | |
| Temperature range | -55 to +105°C | | |
| Climatic category | 55/105/56/B | | |
| Approvals | ENEC, UL, cUL | | |
| Dissipation factor | 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. | | |
| Insulation resistance | $C \leq 0.33 \mu\text{F}$: $\geq 30\,000 \text{ M}\Omega$ $C > 0.33 \mu\text{F}$: $\geq 10\,000 \text{ s}$ | | |
| In DC applications | Recommended voltage $\leq 760 \text{ VDC}$ | | |



| p | d | std l | max l | b |
|----------------|-----|-------|-------|-----------|
| 7.5 ± 0.4 | 0.6 | 17 | 20 | ± 0.4 |
| 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

Capaci- Box Max dimensions Max
tance code in mm f_o dU/dt Article code
 μF B H L MHz V/ μs

LEAD SPACING 7.5 MM

| | | | | | | | |
|-------|-----|-----|------|------|-----|-----|---------------------|
| 0.010 | K01 | 4.0 | 8.0 | 10.0 | 14 | 100 | PHE840MK5100MK01R17 |
| 0.012 | K01 | 4.0 | 8.0 | 10.0 | 13 | 100 | PHE840MK5120MK01R17 |
| 0.015 | K01 | 4.0 | 8.0 | 10.0 | 12 | 100 | PHE840MK5150MK01R17 |
| 0.018 | K03 | 5.0 | 11.0 | 10.0 | 11 | 100 | PHE840MK5180MK03R17 |
| 0.022 | K03 | 5.0 | 11.0 | 10.0 | 10 | 100 | PHE840MK5220MK03R17 |
| 0.027 | K03 | 5.0 | 11.0 | 10.0 | 9.5 | 100 | PHE840MK5270MK03R17 |
| 0.033 | K03 | 5.0 | 11.0 | 10.0 | 8.8 | 100 | PHE840MK5330MK03R17 |
| 0.039 | K03 | 5.0 | 11.0 | 10.0 | 8.3 | 100 | PHE840MK5390MK03R17 |
| 0.047 | K04 | 6.0 | 12.0 | 10.0 | 7.5 | 100 | PHE840MK5470MK04R17 |

LEAD SPACING 10 MM

| | | | | | | | |
|-------|-----|-----|------|------|-----|-----|---------------------|
| 0.022 | A01 | 4.0 | 9.0 | 13.0 | 8.5 | 100 | PHE840MA5220MA01R17 |
| 0.027 | A01 | 4.0 | 9.0 | 13.0 | 8.0 | 100 | PHE840MA5270MA01R17 |
| 0.033 | A01 | 4.0 | 9.0 | 13.0 | 7.6 | 100 | PHE840MA5330MA01R17 |
| 0.039 | A02 | 4.5 | 10.5 | 13.0 | 6.7 | 100 | PHE840MA5390MA02R17 |
| 0.047 | A02 | 4.5 | 10.5 | 13.0 | 5.9 | 100 | PHE840MA5470MA02R17 |
| 0.056 | A03 | 5.0 | 11.0 | 13.0 | 5.5 | 100 | PHE840MA5560MA03R17 |
| 0.068 | A03 | 5.0 | 11.0 | 13.0 | 4.9 | 100 | PHE840MA5680MA03R17 |
| 0.082 | A04 | 6.0 | 12.0 | 13.0 | 4.4 | 100 | PHE840MA5820MA04R17 |
| 0.10 | A05 | 9.5 | 7.5 | 13.0 | 4.0 | 100 | PHE840MP6100MA05R17 |
| 0.10 | A04 | 6.0 | 12.0 | 13.0 | 4.0 | 100 | PHE840MA6100MA04R17 |

LEAD SPACING 15 MM

| | | | | | | | |
|-------|-----|------|------|------|-----|-----|----------------------|
| 0.047 | B04 | 5.5 | 10.5 | 18.0 | 5.0 | 100 | PHE840MB5470MB04R17 |
| 0.056 | B04 | 5.5 | 10.5 | 18.0 | 4.6 | 100 | PHE840MB5560MB04R17 |
| 0.068 | B04 | 5.5 | 10.5 | 18.0 | 4.2 | 100 | PHE840MB5680MB04R17 |
| 0.082 | B05 | 5.5 | 12.5 | 18.0 | 3.9 | 100 | PHE840MB5820MB05R17 |
| 0.10 | B05 | 5.5 | 12.5 | 18.0 | 3.7 | 100 | PHE840MB6100MB05R17 |
| 0.12 | B10 | 6.5 | 12.5 | 18.0 | 3.3 | 100 | PHE840MB6120MB10R17 |
| 0.15 | B10 | 6.5 | 12.5 | 18.0 | 2.8 | 100 | PHE840MB6150MB10R17 |
| 0.18 | B06 | 7.5 | 14.5 | 18.0 | 2.7 | 100 | PHE840MB6180MB06R17 |
| 0.22 | B06 | 7.5 | 14.5 | 18.0 | 2.6 | 100 | PHE840MX6220MB06R17* |
| 0.22 | B17 | 13.0 | 12.5 | 18.0 | 2.5 | 100 | PHE840MQ6220MB17R17 |
| 0.22 | B12 | 8.0 | 15.0 | 18.0 | 2.5 | 100 | PHE840MB6220MB12R17 |
| 0.27 | B11 | 8.5 | 16.0 | 18.0 | 2.3 | 100 | PHE840MB6270MB11R17 |
| 0.33 | B11 | 8.5 | 16.0 | 18.0 | 2.2 | 100 | PHE840MX6330MB11R17* |
| 0.33 | B17 | 13.0 | 12.5 | 18.0 | 2.2 | 100 | PHE840MH6330MB17R17* |
| 0.33 | B14 | 9.5 | 17.5 | 18.0 | 2.0 | 100 | PHE840MB6330MB14R17 |
| 0.39 | B16 | 11.0 | 19.0 | 18.0 | 1.9 | 100 | PHE840MB6390MB16R17 |
| 0.47 | B16 | 11.0 | 19.0 | 18.0 | 1.8 | 100 | PHE840MB6470MB16R17 |

Capaci- Box Max dimensions Max
tance code in mm f_o dU/dt Article code
 μF B H L MHz V/ μs

LEAD SPACING 22.5 MM

| | | | | | | | |
|------|-----|------|------|------|------|-----|------------------------|
| 0.22 | D13 | 6.5 | 14.5 | 26.0 | 2.1 | 100 | PHE840MD6220MD13R06L2 |
| 0.27 | D17 | 7.0 | 16.5 | 26.0 | 1.9 | 100 | PHE840MD6270MD17R06L2 |
| 0.33 | D17 | 7.0 | 16.5 | 26.0 | 1.8 | 100 | PHE840MD6330MD17R06L2 |
| 0.39 | D14 | 8.0 | 16.0 | 26.0 | 1.7 | 100 | PHE840MD6390MD14R06L2 |
| 0.47 | D14 | 8.0 | 16.0 | 26.0 | 1.6 | 100 | PHE840MY6470MD14R06L2* |
| 0.47 | D15 | 9.0 | 18.5 | 26.0 | 1.5 | 100 | PHE840MD6470MD15R06L2 |
| 0.56 | D15 | 9.0 | 18.5 | 26.0 | 1.4 | 100 | PHE840MD6560MD15R06L2 |
| 0.68 | D15 | 9.0 | 18.5 | 26.0 | 1.3 | 100 | PHE840MY6680MD15R06L2* |
| 0.68 | D18 | 10.5 | 19.0 | 26.0 | 1.2 | 100 | PHE840MD6680MD18R06L2 |
| 0.82 | D16 | 11.0 | 21.5 | 26.0 | 1.1 | 100 | PHE840MD6820MD16R06L2 |
| 1.0 | D16 | 11.0 | 21.5 | 26.0 | 1.1 | 100 | PHE840MY7100MD16R06L2* |
| 1.0 | D20 | 13.5 | 23.0 | 26.0 | 1.0 | 100 | PHE840MD7100MD20R06L2 |
| 1.2 | D19 | 15.5 | 24.5 | 26.0 | 0.90 | 100 | PHE840MD7120MD19R06L2 |
| 1.5 | D19 | 15.5 | 24.5 | 26.0 | 0.85 | 100 | PHE840MD7150MD19R06L2 |

LEAD SPACING 27.5 MM

| | | | | | | | |
|------|-----|------|------|------|------|-----|------------------------|
| 0.82 | F11 | 10.5 | 20.5 | 31.5 | 1.0 | 100 | PHE840MF6820MF11R06L2 |
| 1.0 | F11 | 10.5 | 20.5 | 31.5 | 1.0 | 100 | PHE840MZ7100MF11R06L2* |
| 1.0 | F12 | 11.5 | 22.5 | 31.5 | 0.95 | 100 | PHE840MF7100MF12R06L2 |
| 1.2 | F03 | 13.5 | 23.0 | 31.5 | 0.82 | 100 | PHE840MF7120MF03R06L2 |
| 1.5 | F13 | 14.5 | 24.5 | 31.5 | 0.73 | 100 | PHE840MF7150MF13R06L2 |
| 1.8 | F14 | 17.5 | 28.0 | 31.5 | 0.65 | 100 | PHE840MF7180MF14R06L2 |
| 2.2 | F14 | 17.5 | 28.0 | 31.5 | 0.64 | 100 | PHE840MZ7220MF14R06L2* |
| 2.2 | F15 | 19.0 | 29.0 | 31.5 | 0.62 | 100 | PHE840MF7220MF15R06L2 |
| 2.7 | F15 | 19.0 | 29.0 | 31.5 | 0.58 | 100 | PHE840MF7270MF15R06L2 |
| 3.3 | F15 | 19.0 | 29.0 | 31.5 | 0.54 | 100 | PHE840MZ7330MF15R06L2* |
| 3.3 | F16 | 21.0 | 30.0 | 31.5 | 0.50 | 100 | PHE840MF7330MF16R06L2 |
| 3.3 | F18 | 31.0 | 19.0 | 31.5 | 0.50 | 100 | PHE840MT7330MF18R06L2 |

LEAD SPACING 37.5 MM

| | | | | | | | |
|------|-----|------|------|------|------|-----|-----------------------|
| 1.8 | R05 | 13.0 | 24.0 | 41.0 | 0.60 | 100 | PHE840MR7180MR05R06L2 |
| 2.2 | R05 | 13.0 | 24.0 | 41.0 | 0.58 | 100 | PHE840MR7220MR05R06L2 |
| 2.7 | R04 | 15.0 | 26.0 | 41.0 | 0.53 | 100 | PHE840MR7270MR04R06L2 |
| 3.3 | R04 | 15.0 | 26.0 | 41.0 | 0.49 | 100 | PHE840MR7330MR04R06L2 |
| 3.9 | R02 | 16.5 | 32.0 | 41.0 | 0.46 | 100 | PHE840MR7390MR02R06L2 |
| 4.7 | R03 | 19.0 | 36.0 | 41.0 | 0.44 | 100 | PHE840MR7470MR03R06L2 |
| 5.6 | R06 | 21.0 | 38.0 | 41.0 | 0.41 | 100 | PHE840MR7560MR06R06L2 |
| 6.8 | R06 | 21.0 | 38.0 | 41.0 | 0.39 | 100 | PHE840MR7680MR06R06L2 |
| 8.2 | R08 | 28.0 | 43.0 | 41.0 | 0.30 | 100 | PHE840MR7820MR08R06L2 |
| 10.0 | R08 | 28.0 | 43.0 | 41.0 | 0.26 | 100 | PHE840MR8100MR08R06L2 |

* Only $\pm 20\%$ tolerance

APPROVALS

| Certification Body | Specification |
|--------------------|--|
| ENEC | EN/IEC 60384-14:2005 |
| UL | UL 1283 ($U_R = 280$ VAC) UL 1414 ($U_R = 250$ VAC) |
| cUL recognition | C 22.2 No. 8 ($U_R = 280$ VAC) C 22.2 No. 1 ($U_R = 250$ VAC) |

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.