

# PHE840E

- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 10  $\mu\text{F}$ , 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.

## 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 $\mu\text{F}$
Capacitance tolerance	$\pm 20\%$ standard, $\pm 10\%$ option
Temperature range	-55 to +105°C
Climatic category	55/105/56/B

Approvals ENEC, UL, CSA

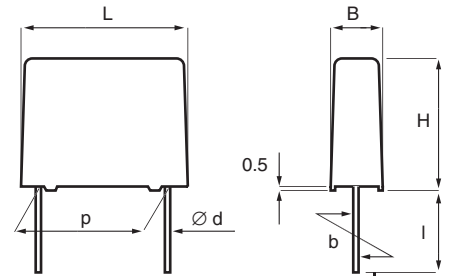
Dissipation factor $\tan\delta$	Maximum values at +23°C			
		$C \leq 0.1 \mu\text{F}$	$0.1 \mu\text{F} < C \leq 1 \mu\text{F}$	$C > 1 \mu\text{F}$
	1 kHz	0.1%	0.1%	0.1%
	10 kHz	0.2%	0.4%	0.8%
	100 kHz	0.6%	-	-

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
$10.0 \pm 0.4$	0.6	17	30	$\pm 0.4$
$15.0 \pm 0.4$	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	$\pm 0.7$

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

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

## ENVIRONMENTAL TEST DATA

Endurance	IEC 60384-14	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 <sup>2</sup>	No visible damage No open or short circuit
Bump	IEC 60068-2-29 Test Eb	1000 bumps at 390 m/s <sup>2</sup>	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 132400		
Passive flammability	IEC 60384-14 (1993) EN 132400 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<sub>o</sub> dU/dt Article code  
μF B H L MHz V/μs

## LEAD SPACING 10 MM

0.010	A01	4.0	9.0	13.0	11	100	PHE840EA5100MA01R17
0.012	A01	4.0	9.0	13.0	10	100	PHE840EA5120MA01R17
0.015	A01	4.0	9.0	13.0	9.4	100	PHE840EA5150MA01R17
0.018	A01	4.0	9.0	13.0	8.9	100	PHE840EA5180MA01R17
0.022	A01	4.0	9.0	13.0	8.6	100	PHE840EA5220MA01R17
0.027	A02	4.5	10.5	13.0	8.1	100	PHE840EA5270MA02R17
0.033	A02	4.5	10.5	13.0	7.6	100	PHE840EA5330MA02R17
0.039	A03	5.0	11.0	13.0	6.6	100	PHE840EA5390MA03R17
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
0.039	B04	5.5	10.5	18.0	5.4	100	PHE840EB5390MB04R17
0.047	B04	5.5	10.5	18.0	5.0	100	PHE840EB5470MB04R17
0.056	B04	5.5	10.5	18.0	4.6	100	PHE840EB5560MB04R17
0.068	B04	5.5	10.5	18.0	4.2	100	PHE840EB5680MB04R17
0.082	B05	5.5	12.5	18.0	3.9	100	PHE840EB5820MB05R17
0.10	B05	5.5	12.5	18.0	3.7	100	PHE840EB6100MB05R17
0.12	B10	6.5	12.5	18.0	3.3	100	PHE840EB6120MB10R17
0.15	B10	6.5	12.5	18.0	2.8	100	PHE840EB6150MB10R17
0.18	B06	7.5	14.5	18.0	2.7	100	PHE840EB6180MB06R17
0.22	B06	7.5	14.5	18.0	2.6	100	PHE840EX6220MB06R17*
0.22	B17	13.0	12.5	18.0	2.5	100	PHE840EQ6220MB17R17
0.22	B12	8.0	15.0	18.0	2.5	100	PHE840EB6220MB12R17
0.27	B11	8.5	16.5	18.0	2.3	100	PHE840EB6270MB11R17
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
0.27	D17	7.0	16.5	26.0	1.9	100	PHE840ED6270MD17R06L2
0.33	D17	7.0	16.5	26.0	1.8	100	PHE840ED6330MD17R06L2
0.39	D14	8.0	16.0	26.0	1.7	100	PHE840ED6390MD14R06L2
0.47	D14	8.0	16.0	26.0	1.6	100	PHE840EY6470MD14R06L2*
0.47	D15	9.0	18.5	26.0	1.5	100	PHE840ED6470MD15R06L2

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 22.5 MM

0.56	D15	9.0	18.5	26.0	1.4	100	PHE840ED6560MD15R06L2
0.68	D15	9.0	18.5	26.0	1.3	100	PHE840EY6680MD15R06L2*
0.68	D18	10.5	19.0	26.0	1.2	100	PHE840ED6680MD18R06L2
0.82	D16	11.0	21.5	26.0	1.1	100	PHE840ED6820MD16R06L2
1.0	D16	11.0	21.5	26.0	1.1	100	PHE840EY7100MD16R06L2*
1.0	D20	13.5	23.0	26.0	1.0	100	PHE840ED7100MD20R06L2
1.2	D19	15.5	24.5	26.0	0.90	100	PHE840ED7120MD19R06L2
1.5	D19	15.5	24.5	26.0	0.85	100	PHE840ED7150MD19R06L2

## LEAD SPACING 27.5 MM

0.82	F11	10.5	20.5	31.5	1.0	100	PHE840EF6820MF11R06L2
1.0	F11	10.5	20.5	31.5	1.0	100	PHE840EZ7100MF11R06L2*
1.0	F12	11.5	22.5	31.5	0.95	100	PHE840EF7100MF12R06L2
1.0	F17	21.0	12.5	31.5	0.95	100	PHE840ET7100MF17R06L2
1.2	F03	13.5	23.0	31.5	0.82	100	PHE840EF7120MF03R06L2
1.5	F13	14.5	24.5	31.5	0.73	100	PHE840EF7150MF13R06L2
1.8	F14	17.5	28.0	31.5	0.65	100	PHE840EF7180MF14R06L2
2.2	F14	17.5	28.0	31.5	0.64	100	PHE840EZ7220MF14R06L2*
2.2	F15	19.0	29.0	31.5	0.62	100	PHE840EF7220MF15R06L2
2.2	F19	27.5	16.0	31.5	0.62	100	PHE840ET7220MF19R06L2
2.7	F15	19.0	29.0	31.5	0.58	100	PHE840EF7270MF15R06L2
3.3	F15	19.0	29.0	31.5	0.54	100	PHE840EZ7330MF15R06L2*
3.3	F16	21.0	30.0	31.5	0.50	100	PHE840EF7330MF16R06L2
3.3	F18	31.0	18.5	31.5	0.50	100	PHE840ET7330MF18R06L2

## LEAD SPACING 37.5 MM

1.8	R05	13.0	24.0	41.0	0.60	100	PHE840ER7180MR05R06L2
2.2	R05	13.0	24.0	41.0	0.58	100	PHE840ER7220MR05R06L2
2.7	R04	15.0	26.0	41.0	0.53	100	PHE840ER7270MR04R06L2
3.3	R04	15.0	26.0	41.0	0.49	100	PHE840ER7330MR04R06L2
3.9	R02	16.5	32.0	41.0	0.46	100	PHE840ER7390MR02R06L2
4.7	R03	19.0	36.0	41.0	0.44	100	PHE840ER7470MR03R06L2
6.8	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 ± 20% tolerance

## APPROVALS/REFERENCE DOCUMENTS

Certification Body	Specification	Approval reference
ENEC	EN 132400	SE/0140-5
UL	UL 1283 UL 1414	E100117 E73869 (U <sub>R</sub> = 250 VAC)
cUL recognition	C 22.2 No. 8 C 22.2 No. 1	E100117 E73869

## 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 12.