

PHE840E

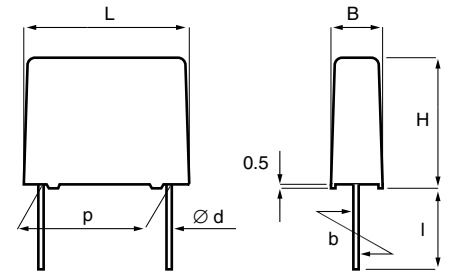
- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 4.7 μF , 300 VAC, +100°C

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 – 4.7 μF
Capacitance tolerance	$\pm 20\%$ standard, $\pm 10\%$ option
Temperature range	-40 to +100°C
Climatic category	40/100/56/C
Approvals	S, VDE, 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%
	10 kHz	0.2%	0.4%
	100 kHz	0.6%	—

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

Tolerance in lead length
 $< 30 \text{ mm}$ $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix} \text{ mm}$
 $\geq 30 \text{ mm}$ $\begin{smallmatrix} +5 \\ -0 \end{smallmatrix} \text{ mm}$

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 $C \leq 0.33 \mu\text{F}$: $\geq 30\,000 \text{ M}\Omega$
 $C > 0.33 \mu\text{F}$: $\geq 10\,000 \text{ s}$

In DC applications Recommended voltage $\leq 760 \text{ VDC}$

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 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 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- tance μF	Max dimensions in mm			p	Quantity per package			Weight g	f ₀ MHz	Max dU/dt V/μs	Approvals				Article code
	B	H	L		Bulk pcs	Tray pcs	reel taped pcs				S	VDE	UL	CSA	
LEAD SPACING 10 MM															
0.010	4.0	9.0	13.0	10.0	1000		900	0.7	11	100	✓	✓	✓	✓	PHE840EA5100MR17
0.012	4.0	9.0	13.0	10.0	1000		900	0.7	10	100	✓	✓	✓	✓	PHE840EA5120MR17
0.015	4.0	9.0	13.0	10.0	1000		900	0.7	9.4	100	✓	✓	✓	✓	PHE840EA5150MR17
0.018	4.5	10.5	13.0	10.0	1000		800	0.9	8.7	100	✓	✓	✓	✓	PHE840EA5180MR17
0.022	4.5	10.5	13.0	10.0	1000		800	0.9	8.1	100	✓	✓	✓	✓	PHE840EA5220MR17
0.027	5.0	11.0	13.0	10.0	800		700	1.0	7.5	100	✓	✓	✓	✓	PHE840EA5270MR17
0.033	5.0	11.0	13.0	10.0	800		700	1.0	6.9	100	✓	✓	✓	✓	PHE840EA5330MR17
0.039	6.0	12.0	13.0	10.0	600		500	1.2	6.5	100	✓	✓	✓	✓	PHE840EA5390MR17
0.047	6.0	12.0	13.0	10.0	600		500	1.2	6.0	100	✓	✓	✓	✓	PHE840EA5470MR17
LEAD SPACING 15 MM															
0.010	5.5	10.5	18.0	15.0	800		600	1.4	10	100	✓	✓	✓	✓	PHE840EB5100MR17
0.012	5.5	10.5	18.0	15.0	800		600	1.4	9.7	100	✓	✓	✓	✓	PHE840EB5120MR17
0.015	5.5	10.5	18.0	15.0	800		600	1.4	8.7	100	✓	✓	✓	✓	PHE840EB5150MR17
0.018	5.5	10.5	18.0	15.0	800		600	1.4	7.9	100	✓	✓	✓	✓	PHE840EB5180MR17
0.022	5.5	10.5	18.0	15.0	800		600	1.4	7.2	100	✓	✓	✓	✓	PHE840EB5220MR17
0.027	5.5	10.5	18.0	15.0	800		600	1.4	6.5	100	✓	✓	✓	✓	PHE840EB5270MR17
0.033	5.5	10.5	18.0	15.0	800		600	1.4	5.9	100	✓	✓	✓	✓	PHE840EB5330MR17
0.039	5.5	10.5	18.0	15.0	800		600	1.4	5.4	100	✓	✓	✓	✓	PHE840EB5390MR17
0.047	5.5	10.5	18.0	15.0	800		600	1.4	5.0	100	✓	✓	✓	✓	PHE840EB5470MR17
0.056	5.5	12.5	18.0	15.0	800		600	1.6	4.6	100	✓	✓	✓	✓	PHE840EB5560MR17
0.068	5.5	12.5	18.0	15.0	800		600	1.6	4.2	100	✓	✓	✓	✓	PHE840EB5680MR17
0.082	6.5	12.5	18.0	15.0	600		500	1.9	3.8	100	✓	✓	✓	✓	PHE840EB5820MR17
0.10	6.5	12.5	18.0	15.0	600		500	1.9	3.7	100	✓	✓	✓	✓	PHE840EX6100MR17 *
0.10	7.5	14.5	18.0	15.0	400		400	2.2	3.5	100	✓	✓	✓	✓	PHE840EB6100MR17
0.12	7.5	14.5	18.0	15.0	400		400	2.2	3.2	100	✓	✓	✓	✓	PHE840EB6120MR17
0.15	8.0	15.0	18.0	15.0	400		400	2.5	2.8	100	✓	✓	✓	✓	PHE840EB6150MR17
0.18	8.5	16.0	18.0	15.0	400		400	2.9	2.6	100	✓	✓	✓	✓	PHE840EB6180MR17
0.22	8.5	16.0	18.0	15.0	400		400	2.9	2.5	100	✓	✓	✓	✓	PHE840EX6220MR17 *
0.22	9.5	17.5	18.0	15.0	300		350	3.5	2.4	100	✓	✓	✓	✓	PHE840EB6220MR17
LEAD SPACING 22.5 MM															
0.10	6.5	14.5	26.0	22.5		234		2.7	2.7	100	✓	✓	✓	✓	PHE840ED6100MR06L2
0.12	6.5	14.5	26.0	22.5		234		2.7	2.6	100	✓	✓	✓	✓	PHE840ED6120MR06L2
0.15	6.5	14.5	26.0	22.5		234		2.7	2.5	100	✓	✓	✓	✓	PHE840ED6150MR06L2
0.18	6.5	14.5	26.0	22.5		234		2.7	2.3	100	✓	✓	✓	✓	PHE840ED6180MR06L2
0.22	7.0	16.5	26.0	22.5		216		3.2	2.2	100	✓	✓	✓	✓	PHE840ED6220MR06L2
0.27	8.0	16.0	26.0	22.5		186		3.8	2.0	100	✓	✓	✓	✓	PHE840ED6270MR06L2
0.33	8.0	16.0	26.0	22.5		186		3.8	1.9	100	✓	✓	✓	✓	PHE840EY6330MR06L2
0.33	9.0	18.5	26.0	22.5		168		5.0	1.7	100	✓	✓	✓	✓	PHE840ED6330MR06L2
0.39	9.0	18.5	26.0	22.5		168		5.0	1.6	100	✓	✓	✓	✓	PHE840ED6390MR06L2
0.47	9.0	18.5	26.0	22.5		168		5.0	1.5	100	✓	✓	✓	✓	PHE840EY6470MR06L2
0.47	10.5	19.0	26.0	22.5		264		5.8	1.4	100	✓	✓	✓	✓	PHE840ED6470MR06L2
0.56	11.0	21.5	26.0	22.5		253		6.6	1.3	100	✓	✓	✓	✓	PHE840ED6560MR06L2
0.68	11.0	21.5	26.0	22.5		253		6.6	1.2	100	✓	✓	✓	✓	PHE840EY6680MR06L2
0.82	15.5	24.5	26.0	22.5		176		10.6	1.1	100	✓	✓	✓	✓	PHE840ED6820MR06L2
1.0	15.5	24.5	26.0	22.5		176		10.0	1.0	100	✓	✓	✓	✓	PHE840ED7100MR06L2
LEAD SPACING 27.5 MM															
0.47	10.5	20.5	31.5	27.5		216		8.0	1.3	100	✓	✓	✓	✓	PHE840EF6470MR06L2
0.56	10.5	20.5	31.5	27.5		216		8.0	1.2	100	✓	✓	✓	✓	PHE840EF6560MR06L2
0.68	10.5	20.5	31.5	27.5		216		8.0	1.1	100	✓	✓	✓	✓	PHE840EF6680MR06L2
0.82	11.5	22.5	31.5	27.5		198		9.1	1.0	100	✓	✓	✓	✓	PHE840EF6820MR06L2
1.0	11.5	22.5	31.5	27.5		198		9.1	1.0	100	✓	✓	✓	✓	PHE840EZ7100MR06L2
1.0	13.5	23.0	31.5	27.5		171		10.8	0.94	100	✓	✓	✓	✓	PHE840EF7100MR06L2
1.2	14.5	24.5	31.5	27.5		153		14.5	0.87	100	✓	✓	✓	✓	PHE840EF7120MR06L2

* Only $\pm 20\%$

ARTICLE TABLE

Capaci- tance μF	Max dimensions in mm				Quantity per package				Max dU/dt V/μs	Approvals				Article code	
					Bulk pcs	Tray pcs	reel taped pcs	Weight g		f ₀ MHz	S	VDE	UL		CSA
	B	H	L	p											
LEAD SPACING 27.5 MM															
1.5	17.5	28.0	31.5	27.5		126		17.0	0.78	100	✓	✓	✓	✓	PHE840EF7150MR06L2
1.8	19.0	29.0	31.5	27.5		117		19.5	0.72	100	✓	✓	✓	✓	PHE840EF7180MR06L2
2.2	19.0	29.0	31.5	27.5		117		19.5	0.70	100	✓	✓	✓	✓	PHE840EZ7220MR06L2 *
2.2	21.0	30.0	31.5	27.5		108		22.6	0.66	100	✓	✓	✓	✓	PHE840EF7220MR06L2

LEAD SPACING 37.5 MM

1.0	13.0	24.0	41.0	37.5		140		14.0	0.93	100	✓	✓	✓	✓	PHE840ER7100MR06L2
1.2	13.0	24.0	41.0	37.5		140		14.0	0.84	100	✓	✓	✓	✓	PHE840ER7120MR06L2
1.5	13.0	24.0	41.0	37.5		140		14.0	0.74	100	✓	✓	✓	✓	PHE840ER7150MR06L2
1.8	15.0	26.0	41.0	37.5		119		17.0	0.67	100	✓	✓	✓	✓	PHE840ER7180MR06L2
2.2	15.0	26.0	41.0	37.5		119		17.0	0.60	100	✓	✓	✓	✓	PHE840ER7220MR06L2
2.7	16.5	32.0	41.0	37.5		105		23.0	0.54	100	✓	✓	✓	✓	PHE840ER7270MR06L2
3.3	19.0	36.0	41.0	37.5		91		28.5	0.48	100	✓	✓	✓	✓	PHE840ER7330MR06L2
3.9	19.0	36.0	41.0	37.5		91		28.5	0.44	100	✓	✓	✓	✓	PHE840ER7390MR06L2
4.7	21.0	38.0	41.0	37.5		84		34.4	0.39	100	✓	✓	✓	✓	PHE840ER7470MR06L2

* Only $\pm 20\%$

APPROVALS/REFERENCE DOCUMENTS

Certification Body	Specification	Approval reference
S	EN 132400	9934306/01
VDE	EN 132400	124109 123570
UL	UL 1283	E100117 ($U_R = 300\text{ VAC}$)
	UL 1414	E73869 ($U_R = 250\text{ VAC}$)
cUL recognition (CSA)	C 22.2 No. 8	E100117 ($U_R = 300\text{ VAC}$)
	C 22.2 No. 1	E73869 ($U_R = 250\text{ VAC}$)

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 21.

PACKING

The box dimensions for bulk packaging are 245 x 145 x 80 mm. Quantity/package as per article table.

Reels with taped capacitors are packed 10 in a box with dimension 370 x 370 x 560 mm. Quantity/reel according to article table. The standard quantity/reel is for 360 mm reel. If 500 mm reel is required, it must be specified when ordering and the quantity is 2 x the given quantity.