

PHE840

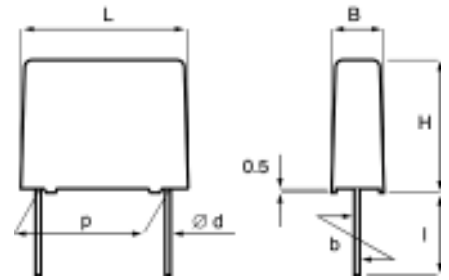
- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 4.7 μF , 275/280 VAC and 300 VAC, +100°C
- For smaller dimensions and larger capacitance values see PHE843

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

	PHE840M	PHE840E	
Rated voltage	275 VAC 50/60 Hz (280 VAC North America)	300 VAC 50/60 Hz	
Capacitance range	0.01 – 4.7 μF	0.01 – 4.7 μF	
Capacitance tolerance	± 20% standard, ± 10% option		
Temperature range	–40 to +100°C		
Climatic category	40/100/56/C		
Approvals	S, VDE, UL, CSA		
Dissipation factor tanδ	Maximum values at +23°C		
	C ≤ 0.1 μF	0.1 μF < C ≤ 0.47 μF	C > 0.47 μF
1 kHz	0.1%	0.1%	0.1%
10 kHz	0.1%	0.2%	0.5%
100 kHz	0.6%	0.9%	–
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 ≤ 0.33 μF: ≥ 30 000 MΩ C > 0.33 μF: ≥ 10 000 s		
In DC applications	Recommended voltage: PHE840M ≤ 630 VDC PHE840E ≤ 760 VDC		

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

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				Quantity per package				f ₀ MHz	Max dU/dt V/μs	Approvals				Article code 1 st block
	B	H	L	p	Bulk pcs	Tray pcs	reel taped pcs	Weight g			s	VDE	UL	CSA	
275/280 VAC, PHE840 M															
LEAD SPACING 10 MM															
0.010	4.0	9.0	13.0	10.0	1000		900	0.7	11	100	✓	✓	✓	✓	PHE840MA5100M
0.012	4.0	9.0	13.0	10.0	1000		900	0.7	10	100	✓	✓	✓	✓	PHE840MA5120M
0.015	4.0	9.0	13.0	10.0	1000		900	0.7	9.4	100	✓	✓	✓	✓	PHE840MA5150M
0.018	4.5	10.5	13.0	10.0	1000		800	0.9	8.7	100	✓	✓	✓	✓	PHE840MA5180M
0.022	4.5	10.5	13.0	10.0	1000		800	0.9	8.1	100	✓	✓	✓	✓	PHE840MA5220M
0.027	5.0	11.0	13.0	10.0	800		700	1.0	7.5	100	✓	✓	✓	✓	PHE840MA5270M
0.033	5.0	11.0	13.0	10.0	800		700	1.0	6.9	100	✓	✓	✓	✓	PHE840MA5330M
0.039	6.0	12.0	13.0	10.0	600		500	1.2	6.5	100	✓	✓	✓	✓	PHE840MA5390M
0.047	6.0	12.0	13.0	10.0	600		500	1.2	6.0	100	✓	✓	✓	✓	PHE840MA5470M
LEAD SPACING 15 MM															
0.010	5.5	10.5	18.0	15.0	800		600	1.4	10	100	✓	✓	✓	✓	PHE840MB5100M
0.012	5.5	10.5	18.0	15.0	800		600	1.4	9.7	100	✓	✓	✓	✓	PHE840MB5120M
0.015	5.5	10.5	18.0	15.0	800		600	1.4	8.7	100	✓	✓	✓	✓	PHE840MB5150M
0.018	5.5	10.5	18.0	15.0	800		600	1.4	7.9	100	✓	✓	✓	✓	PHE840MB5180M
0.022	5.5	10.5	18.0	15.0	800		600	1.4	7.2	100	✓	✓	✓	✓	PHE840MB5220M
0.027	5.5	10.5	18.0	15.0	800		600	1.4	6.5	100	✓	✓	✓	✓	PHE840MB5270M
0.033	5.5	10.5	18.0	15.0	800		600	1.4	5.9	100	✓	✓	✓	✓	PHE840MB5330M
0.039	5.5	10.5	18.0	15.0	800		600	1.4	5.4	100	✓	✓	✓	✓	PHE840MB5390M
0.047	5.5	10.5	18.0	15.0	800		600	1.4	5.0	100	✓	✓	✓	✓	PHE840MB5470M
0.056	5.5	12.5	18.0	15.0	800		600	1.6	4.6	100	✓	✓	✓	✓	PHE840MB5560M
0.068	5.5	12.5	18.0	15.0	800		600	1.6	4.2	100	✓	✓	✓	✓	PHE840MB5680M
0.082	6.5	12.5	18.0	15.0	600		500	1.9	3.8	100	✓	✓	✓	✓	PHE840MB5820M
0.10	5.5	12.5	18.0	15.0	800		600	1.6	3.7	100	✓	✓	✓	✓	PHE840MX6100M *
0.10	6.0	12.0	18.0	15.0	800		500	1.7	3.5	100	✓	✓	✓	✓	PHE840MB6100M
0.12	7.5	14.5	18.0	15.0	400		400	2.2	3.2	100	✓	✓	✓	✓	PHE840MB6120M
0.15	8.0	15.0	18.0	15.0	400		400	2.5	2.8	100	✓	✓	✓	✓	PHE840MB6150M
0.18	8.5	16.0	18.0	15.0	400		400	2.9	2.6	100	✓	✓	✓	✓	PHE840MB6180M
0.22	8.5	16.0	18.0	15.0	400		400	2.9	2.5	100	✓	✓	✓	✓	PHE840MX6220M *
0.22	9.5	17.5	18.0	15.0	300		350	3.5	2.4	100	✓	✓	✓	✓	PHE840MB6220M
0.27	9.5	17.5	18.0	15.0	300		350	3.5	2.1	100	✓	✓	✓	✓	PHE840MB6270M
0.33	9.5	17.5	18.0	15.0	300		350	3.5	2.0	100	✓	✓	✓	✓	PHE840MX6330M *
LEAD SPACING 22.5 MM															
0.10	6.5	14.5	26.0	22.5		234		2.7	2.7	100	✓	✓	✓	✓	PHE840MD6100M
0.12	6.5	14.5	26.0	22.5		234		2.7	2.6	100	✓	✓	✓	✓	PHE840MD6120M
0.15	6.5	14.5	26.0	22.5		234		2.7	2.5	100	✓	✓	✓	✓	PHE840MD6150M
0.18	6.5	14.5	26.0	22.5		234		2.7	2.3	100	✓	✓	✓	✓	PHE840MD6180M
0.22	7.0	16.5	26.0	22.5		216		3.2	2.2	100	✓	✓	✓	✓	PHE840MD6220M
0.27	8.0	16.0	26.0	22.5		186		3.8	2.0	100	✓	✓	✓	✓	PHE840MD6270M
0.33	8.0	16.0	26.0	22.5		186		3.8	1.9	100	✓	✓	✓	✓	PHE840MY6330M *
0.33	9.0	18.5	26.0	22.5		168		5.0	1.7	100	✓	✓	✓	✓	PHE840MD6330M
0.39	9.0	18.5	26.0	22.5		168		5.0	1.6	100	✓	✓	✓	✓	PHE840MD6390M
0.47	9.0	18.5	26.0	22.5		168		5.0	1.5	100	✓	✓	✓	✓	PHE840MY6470M *
0.47	10.5	19.0	26.0	22.5		264		5.8	1.4	100	✓	✓	✓	✓	PHE840MD6470M
0.56	11.0	21.5	26.0	22.5		253		6.6	1.3	100	✓	✓	✓	✓	PHE840MD6560M
0.68	11.0	21.5	26.0	22.5		253		6.6	1.2	100	✓	✓	✓	✓	PHE840MY6680M *
0.82	15.5	24.5	26.0	22.5		176		10.6	1.1	100	✓	✓	✓	✓	PHE840MD6820M
1.0	15.5	24.5	26.0	22.5		176		10.0	1.0	100	✓	✓	✓	✓	PHE840MD7100M
LEAD SPACING 27.5 MM															
0.47	10.5	20.5	31.5	27.5		216		8.0	1.3	100	✓	✓	✓	✓	PHE840MF6470M
0.56	10.5	20.5	31.5	27.5		216		8.0	1.2	100	✓	✓	✓	✓	PHE840MF6560M
0.68	10.5	20.5	31.5	27.5		216		8.0	1.1	100	✓	✓	✓	✓	PHE840MF6680M
0.82	11.5	22.5	31.5	27.5		198		9.1	1.0	100	✓	✓	✓	✓	PHE840MF6820M
1.0	11.5	22.5	31.5	27.5		198		9.1	1.0	100	✓	✓	✓	✓	PHE840MZ7100M *
1.0	13.5	23.0	31.5	27.5		171		10.8	0.94	100	✓	✓	✓	✓	PHE840MF7100M
1.2	14.5	24.5	31.5	27.5		153		14.5	0.87	100	✓	✓	✓	✓	PHE840MF7120M

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 1 st block
	B	H	L		Bulk pcs	Tray pcs	reel taped pcs				s	VDE	UL	CSA	
275/280 VAC, PHE840 M															
LEAD SPACING 27.5 MM															
1.5	17.5	28.0	31.5	27.5		126		17.0	0.78	100	✓	✓	✓	✓	PHE840MF7150M
1.8	19.0	29.0	31.5	27.5		117		19.5	0.72	100	✓	✓	✓	✓	PHE840MF7180M
2.2	19.0	29.0	31.5	27.5		117		19.5	0.70	100	✓	✓	✓	✓	PHE840MZ7220M *
2.2	21.0	30.0	31.5	27.5		108		22.6	0.66	100	✓	✓	✓	✓	PHE840MF7220M
LEAD SPACING 37.5 MM															
1.0	13.0	24.0	41.0	37.5		140		14.0	0.93	100	✓	✓	✓	✓	PHE840MR7100M
1.2	13.0	24.0	41.0	37.5		140		14.0	0.84	100	✓	✓	✓	✓	PHE840MR7120M
1.5	13.0	24.0	41.0	37.5		140		14.0	0.74	100	✓	✓	✓	✓	PHE840MR7150M
1.8	15.0	26.0	41.0	37.5		119		17.0	0.67	100	✓	✓	✓	✓	PHE840MR7180M
2.2	15.0	26.0	41.0	37.5		119		17.0	0.60	100	✓	✓	✓	✓	PHE840MR7220M
2.7	16.5	32.0	41.0	37.5		105		23.0	0.54	100	✓	✓	✓	✓	PHE840MR7270M
3.3	19.0	36.0	41.0	37.5		91		28.5	0.48	100	✓	✓	✓	✓	PHE840MR7330M
3.9	19.0	36.0	41.0	37.5		91		28.5	0.44	100	✓	✓	✓	✓	PHE840MR7390M
4.7	21.0	38.0	41.0	37.5		84		34.4	0.39	100	✓	✓	✓	✓	PHE840MR7470M
300 VAC, PHE840 E															
LEAD SPACING 10 MM															
0.010	4.0	9.0	13.0	10.0	1000		900	0.7	11	100	✓	✓	✓	✓	PHE840EA5100M
0.012	4.0	9.0	13.0	10.0	1000		900	0.7	10	100	✓	✓	✓	✓	PHE840EA5120M
0.015	4.0	9.0	13.0	10.0	1000		900	0.7	9.4	100	✓	✓	✓	✓	PHE840EA5150M
0.018	4.5	10.5	13.0	10.0	1000		800	0.9	8.7	100	✓	✓	✓	✓	PHE840EA5180M
0.022	4.5	10.5	13.0	10.0	1000		800	0.9	8.1	100	✓	✓	✓	✓	PHE840EA5220M
0.027	5.0	11.0	13.0	10.0	800		700	1.0	7.5	100	✓	✓	✓	✓	PHE840EA5270M
0.033	5.0	11.0	13.0	10.0	800		700	1.0	6.9	100	✓	✓	✓	✓	PHE840EA5330M
0.039	6.0	12.0	13.0	10.0	600		500	1.2	6.5	100	✓	✓	✓	✓	PHE840EA5390M
0.047	6.0	12.0	13.0	10.0	600		500	1.2	6.0	100	✓	✓	✓	✓	PHE840EA5470M
LEAD SPACING 15 MM															
0.010	5.5	10.5	18.0	15.0	800		600	1.4	10	100	✓	✓	✓	✓	PHE840EB5100M
0.012	5.5	10.5	18.0	15.0	800		600	1.4	9.7	100	✓	✓	✓	✓	PHE840EB5120M
0.015	5.5	10.5	18.0	15.0	800		600	1.4	8.7	100	✓	✓	✓	✓	PHE840EB5150M
0.018	5.5	10.5	18.0	15.0	800		600	1.4	7.9	100	✓	✓	✓	✓	PHE840EB5180M
0.022	5.5	10.5	18.0	15.0	800		600	1.4	7.2	100	✓	✓	✓	✓	PHE840EB5220M
0.027	5.5	10.5	18.0	15.0	800		600	1.4	6.5	100	✓	✓	✓	✓	PHE840EB5270M
0.033	5.5	10.5	18.0	15.0	800		600	1.4	5.9	100	✓	✓	✓	✓	PHE840EB5330M
0.039	5.5	10.5	18.0	15.0	800		600	1.4	5.4	100	✓	✓	✓	✓	PHE840EB5390M
0.047	5.5	10.5	18.0	15.0	800		600	1.4	5.0	100	✓	✓	✓	✓	PHE840EB5470M
0.056	5.5	12.5	18.0	15.0	800		600	1.6	4.6	100	✓	✓	✓	✓	PHE840EB5560M
0.068	5.5	12.5	18.0	15.0	800		600	1.6	4.2	100	✓	✓	✓	✓	PHE840EB5680M
0.082	6.5	12.5	18.0	15.0	600		500	1.9	3.8	100	✓	✓	✓	✓	PHE840EB5820M
0.10	6.5	12.5	18.0	15.0	600		500	1.9	3.7	100	✓	✓	✓	✓	PHE840EX6100M *
0.10	7.5	14.5	18.0	15.0	400		400	2.2	3.5	100	✓	✓	✓	✓	PHE840EB6100M
0.12	7.5	14.5	18.0	15.0	400		400	2.2	3.2	100	✓	✓	✓	✓	PHE840EB6120M
0.15	8.0	15.0	18.0	15.0	400		400	2.5	2.8	100	✓	✓	✓	✓	PHE840EB6150M
0.18	8.5	16.0	18.0	15.0	400		400	2.9	2.6	100	✓	✓	✓	✓	PHE840EB6180M
0.22	8.5	16.0	18.0	15.0	400		400	2.9	2.5	100	✓	✓	✓	✓	PHE840EX6220M *
0.22	9.5	17.5	18.0	15.0	300		350	3.5	2.4	100	✓	✓	✓	✓	PHE840EB6220M
LEAD SPACING 22.5 MM															
0.10	6.5	14.5	26.0	22.5		234		2.7	2.7	100	✓	✓	✓	✓	PHE840ED6100M
0.12	6.5	14.5	26.0	22.5		234		2.7	2.6	100	✓	✓	✓	✓	PHE840ED6120M
0.15	6.5	14.5	26.0	22.5		234		2.7	2.5	100	✓	✓	✓	✓	PHE840ED6150M
0.18	6.5	14.5	26.0	22.5		234		2.7	2.3	100	✓	✓	✓	✓	PHE840ED6180M
0.22	7.0	16.5	26.0	22.5		216		3.2	2.2	100	✓	✓	✓	✓	PHE840ED6220M
0.27	8.0	16.0	26.0	22.5		186		3.8	2.0	100	✓	✓	✓	✓	PHE840ED6270M

ARTICLE TABLE

Capacitance μF	Max dimensions in mm				p	Quantity per package reel			Weight g	f ₀ MHz	Max dU/dt V/μs	Approvals				Article code 1 st block
	B	H	L	Bulk pcs		Tray pcs	taped pcs	ISO 9001				VDE	UL	CSA		
300 VAC, PHE840 E																
LEAD SPACING 22.5 MM																
0.33	8.0	16.0	26.0	22.5		186		3.8	1.9	100	✓	✓	✓	✓	PHE840EY6330M *	
0.33	9.0	18.5	26.0	22.5		168		5.0	1.7	100	✓	✓	✓	✓	PHE840ED6330M	
0.39	9.0	18.5	26.0	22.5		168		5.0	1.6	100	✓	✓	✓	✓	PHE840ED6390M	
0.47	9.0	18.5	26.0	22.5		168		5.0	1.5	100	✓	✓	✓	✓	PHE840EY6470M *	
0.47	10.5	19.0	26.0	22.5		264		5.8	1.4	100	✓	✓	✓	✓	PHE840ED6470M	
0.56	11.0	21.5	26.0	22.5		253		6.6	1.3	100	✓	✓	✓	✓	PHE840ED6560M	
0.68	11.0	21.5	26.0	22.5		253		6.6	1.2	100	✓	✓	✓	✓	PHE840EY6680M *	
0.82	15.5	24.5	26.0	22.5		176		10.6	1.1	100	✓	✓	✓	✓	PHE840ED6820M	
1.0	15.5	24.5	26.0	22.5		176		10.0	1.0	100	✓	✓	✓	✓	PHE840ED7100M	
LEAD SPACING 27.5 MM																
0.47	10.5	20.5	31.5	27.5		216		8.0	1.3	100	✓	✓	✓	✓	PHE840EF6470M	
0.56	10.5	20.5	31.5	27.5		216		8.0	1.2	100	✓	✓	✓	✓	PHE840EF6560M	
0.68	10.5	20.5	31.5	27.5		216		8.0	1.1	100	✓	✓	✓	✓	PHE840EF6680M	
0.82	11.5	22.5	31.5	27.5		198		9.1	1.0	100	✓	✓	✓	✓	PHE840EF6820M	
1.0	11.5	22.5	31.5	27.5		198		9.1	1.0	100	✓	✓	✓	✓	PHE840EZ7100M *	
1.0	13.5	23.0	31.5	27.5		171		10.8	0.94	100	✓	✓	✓	✓	PHE840EF7100M	
1.2	14.5	24.5	31.5	27.5		153		14.5	0.87	100	✓	✓	✓	✓	PHE840EF7120M	
1.5	17.5	28.0	31.5	27.5		126		17.0	0.78	100	✓	✓	✓	✓	PHE840EF7150M	
1.8	19.0	29.0	31.5	27.5		117		19.5	0.72	100	✓	✓	✓	✓	PHE840EF7180M	
2.2	19.0	29.0	31.5	27.5		117		19.5	0.70	100	✓	✓	✓	✓	PHE840EZ7220M *	
2.2	21.0	30.0	31.5	27.5		108		22.6	0.66	100	✓	✓	✓	✓	PHE840EF7220M	
LEAD SPACING 37.5 MM																
1.0	13.0	24.0	41.0	37.5		140		14.0	0.93	100	✓	✓	✓	✓	PHE840ER7100M	
1.2	13.0	24.0	41.0	37.5		140		14.0	0.84	100	✓	✓	✓	✓	PHE840ER7120M	
1.5	13.0	24.0	41.0	37.5		140		14.0	0.74	100	✓	✓	✓	✓	PHE840ER7150M	
1.8	15.0	26.0	41.0	37.5		119		17.0	0.67	100	✓	✓	✓	✓	PHE840ER7180M	
2.2	15.0	26.0	41.0	37.5		119		17.0	0.60	100	✓	✓	✓	✓	PHE840ER7220M	
2.7	16.5	32.0	41.0	37.5		105		23.0	0.54	100	✓	✓	✓	✓	PHE840ER7270M	
3.3	19.0	36.0	41.0	37.5		91		28.5	0.48	100	✓	✓	✓	✓	PHE840ER7330M	
3.9	19.0	36.0	41.0	37.5		91		28.5	0.44	100	✓	✓	✓	✓	PHE840ER7390M	
4.7	21.0	38.0	41.0	37.5		84		34.4	0.39	100	✓	✓	✓	✓	PHE840ER7470M	

* Only $\pm 20\%$

APPROVALS/REFERENCE DOCUMENTS

Country	Specification	Approval reference	
		PHE840M	PHE840E
S = Sweden	EN 132400	9837223-01	9934306/01
VDE = Germany	EN 132400	122222	124109
		115119	123570
UL = USA	UL 1283	E100117	E100117
		(U _R = 280 VAC)	(U _R = 300 VAC)
	UL 1414	E73869	E73869
		(U _R = 250 VAC)	
CSA = Canada	C 22.2 No. 8	E100117	E100117
		(U _R = 280 VAC)	(U _R = 300 VAC)
(cUL recognition)	C 22.2 No. 1	E73869	E73869
		(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

Article code

1st block

See article table
 Pos. 13 Capacitance tolerance code:
 M = ± 20% standard
 K = ± 10% option

2nd block

If not standard lead length,
 add R06 – R30 in pos. 14–16.
 For reel taped, add 17T0 or 17T1
 in pos. 14–15.
 For packing on trays (6 mm lead length),
 add L2 in pos. 17–18.

P H E 8 4 0 E B 5 3 3 0 M**R 0 6**

1 2 3 4 5 6 7 8 9 10 11 12 13

14 15 16 17 18 19 20

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.