

PHE840M

- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 10.0 μF , 275/280 VAC, +105°C
- New, small dimensions including low profile capacitors
- Replaces PHE843

TYPICAL APPLICATIONS

For worldwide use as electromagnetic interference suppressor in all X2 and across-the-line applications.

CONSTRUCTION

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

TECHNICAL DATA

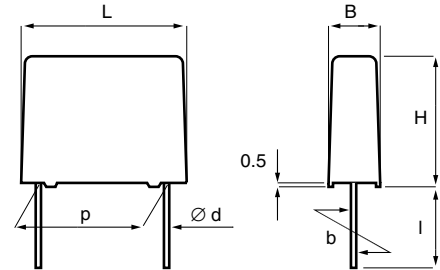
Rated voltage	275 VAC 50/60 Hz (ENEC) 280 VAC 50/60 Hz (UL, CSA)
Capacitance range	0.01 – 10.0 μF
Capacitance tolerance	$\pm 20\%$ standard, $\pm 10\%$ option, $\pm 5\%$ on request
Temperature range	-55 to +105°C
Climatic category	55/105/56/B
Approvals	ENEC, UL, CSA
Dissipation factor	Maximum values 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.
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Insulation resistance	$C \leq 0.33 \mu\text{F}$: $\geq 30\,000 \text{ M}\Omega$ $C > 0.33 \mu\text{F}$: $\geq 10\,000 \text{ s}$
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In DC applications	Maximum voltage 630 VDC
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p	d	std l	max l	b
7.5 $\pm$ 0.4	0.6	17	20	± 0.4
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 mm	$+0$ -1 mm
≥ 30 mm	$+5$ -0 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
	B	H	L	p	Bulk pcs	Tray pcs	reel taped pcs	Weight g			ENEC	UL	CSA	
LEAD SPACING 7.5 MM														
0.010	4.0	8.0	10.5	7.5	1000		1700	0.5	14	100	✓	✓	✓	PHE840MK5100MK01R17
0.012	4.0	8.0	10.5	7.5	1000		1700	0.5	13	100	✓	✓	✓	PHE840MK5120MK01R17
0.015	4.0	8.0	10.5	7.5	1000		1700	0.5	12	100	✓	✓	✓	PHE840MK5150MK01R17
0.018	5.0	11.0	10.5	7.5	1000		1300	0.8	11	100	✓	✓	✓	PHE840MK5180MK03R17
0.022	5.0	11.0	10.5	7.5	1000		1300	0.8	10	100	✓	✓	✓	PHE840MK5220MK03R17
0.027	5.0	11.0	10.5	7.5	1000		1300	0.8	9.5	100	✓	✓	✓	PHE840MK5270MK03R17
0.033	5.0	11.0	10.5	7.5	1000		1300	0.8	8.8	100	✓	✓	✓	PHE840MK5330MK03R17
0.039	5.0	11.0	10.5	7.5	1000		1300	0.8	8.3	100	✓	✓	✓	PHE840MK5390MK03R17
0.047	6.0	12.0	10.5	7.5	1000		1000	1.0	7.5	100	✓	✓	✓	PHE840MK5470MK04R17
LEAD SPACING 10 MM														
0.022	4.0	9.0	13.0	10.0	1000		900	0.7	8.5	100	✓	✓	✓	PHE840MA5220MA01R17
0.027	4.0	9.0	13.0	10.0	1000		900	0.7	8.0	100	✓	✓	✓	PHE840MA5270MA01R17
0.033	4.0	9.0	13.0	10.0	1000		900	0.7	7.6	100	✓	✓	✓	PHE840MA5330MA01R17
0.039	4.5	10.5	13.0	10.0	1000		800	0.9	6.7	100	✓	✓	✓	PHE840MA5390MA02R17
0.047	4.5	10.5	13.0	10.0	1000		800	0.9	5.9	100	✓	✓	✓	PHE840MA5470MA02R17
0.056	5.0	11.0	13.0	10.0	800		700	1.0	5.5	100	✓	✓	✓	PHE840MA5560MA03R17
0.068	5.0	11.0	13.0	10.0	800		700	1.0	4.9	100	✓	✓	✓	PHE840MA5680MA03R17
0.082	6.0	12.0	13.0	10.0	600		500	1.2	4.4	100	✓	✓	✓	PHE840MA5820MA04R17
0.10	9.5	7.5	13.0	10.0	600		350	1.2	4.0	100	✓	✓	✓	PHE840MP6100MA05R17
0.10	6.0	12.0	13.0	10.0	600		500	1.2	4.0	100	✓	✓	✓	PHE840MA6100MA04R17
LEAD SPACING 15 MM														
0.047	5.5	10.5	18.0	15.0	800		600	1.4	5.0	100	✓	✓	✓	PHE840MB5470MB04R17
0.056	5.5	10.5	18.0	15.0	800		600	1.4	4.6	100	✓	✓	✓	PHE840MB5560MB04R17
0.068	5.5	10.5	18.0	15.0	800		600	1.4	4.2	100	✓	✓	✓	PHE840MB5680MB04R17
0.082	5.5	12.5	18.0	15.0	800		600	1.6	3.9	100	✓	✓	✓	PHE840MB5820MB05R17
0.10	5.5	12.5	18.0	15.0	800		600	1.6	3.7	100	✓	✓	✓	PHE840MB6100MB05R17
0.12	6.5	12.5	18.0	15.0	600		500	1.9	3.3	100	✓	✓	✓	PHE840MB6120MB10R17
0.15	6.5	12.5	18.0	15.0	600		500	1.9	2.8	100	✓	✓	✓	PHE840MB6150MB10R17
0.18	7.5	14.5	18.0	15.0	400		400	2.2	2.7	100	✓	✓	✓	PHE840MB6180MB06R17
0.22	7.5	14.5	18.0	15.0	400		400	2.2	2.6	100	✓	✓	✓	PHE840MX6220MB06R17 *
0.22	13.0	12.5	18.0	15.0	300		250	3.4	2.5	100	✓	✓	✓	PHE840MQ6220MB17R17
0.22	8.0	15.0	18.0	15.0	400		400	2.5	2.5	100	✓	✓	✓	PHE840MB6220MB12R17
0.27	8.5	16.0	18.0	15.0	400		400	2.9	2.3	100	✓	✓	✓	PHE840MB6270MB11R17
0.33	8.5	16.0	18.0	15.0	400		400	2.9	2.2	100	✓	✓	✓	PHE840MX6330MB11R17 *
0.33	13.0	12.5	18.0	15.0	300		250	3.4	2.2	100	✓	✓	✓	PHE840MH6330MB17R17 *
0.33	9.5	17.5	18.0	15.0	300		350	3.5	2.0	100	✓	✓	✓	PHE840MB6330MB14R17
0.39	11.0	19.0	18.0	15.0	250		300	4.4	1.9	100	✓	✓	✓	PHE840MB6390MB16R17
0.47	11.0	19.0	18.0	15.0	250		300	4.4	1.8	100	✓	✓	✓	PHE840MB6470MB16R17
LEAD SPACING 22.5 MM														
0.22	6.5	14.5	26.0	22.5		234		2.7	2.1	100	✓	✓	✓	PHE840MD6220MD13R06L2
0.27	7.0	16.5	26.0	22.5		216		3.2	1.9	100	✓	✓	✓	PHE840MD6270MD17R06L2
0.33	7.0	16.5	26.0	22.5		216		3.2	1.8	100	✓	✓	✓	PHE840MD6330MD17R06L2
0.39	8.0	16.0	26.0	22.5		186		3.8	1.7	100	✓	✓	✓	PHE840MD6390MD14R06L2
0.47	8.0	16.0	26.0	22.5		186		3.8	1.6	100	✓	✓	✓	PHE840MY6470MD14R06L2
0.47	9.0	18.5	26.0	22.5		168		5.0	1.5	100	✓	✓	✓	PHE840MD6470MD15R06L2
0.56	9.0	18.5	26.0	22.5		168		5.0	1.4	100	✓	✓	✓	PHE840MD6560MD15R06L2
0.68	9.0	18.5	26.0	22.5		168		5.0	1.3	100	✓	✓	✓	PHE840MY6680MD15R06L2
0.68	10.5	19.0	26.0	22.5		264		5.8	1.2	100	✓	✓	✓	PHE840MD6680MD18R06L2
0.82	11.0	21.5	26.0	22.5		253		6.6	1.1	100	✓	✓	✓	PHE840MD6820MD16R06L2
1.0	11.0	21.5	26.0	22.5		253		6.6	1.1	100	✓	✓	✓	PHE840MY7100MD16R06L2
1.0	13.5	23.0	26.0	22.5		209		8.2	1.0	100	✓	✓	✓	PHE840MD7100MD20R06L2
1.2	15.5	24.5	26.0	22.5		176		10.0	0.90	100	✓	✓	✓	PHE840MD7120MD19R06L2
1.5	15.5	24.5	26.0	22.5		176		10.0	0.85	100	✓	✓	✓	PHE840MD7150MD19R06L2

* Only $\pm 20\%$ tolerance

ARTICLE TABLE

Capacitance 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	ENEC				UL	CSA		
LEAD SPACING 27.5 MM															
0.82	10.5	20.5	31.5	27.5		216			8.0	1.0	100	✓	✓	✓	PHE840MF6820MF11R06L2
1.0	10.5	20.5	31.5	27.5		216			8.0	1.0	100	✓	✓	✓	PHE840MZ7100MF11R06L2 *
1.0	11.5	22.5	31.5	27.5		198			9.1	0.95	100	✓	✓	✓	PHE840MF7100MF12R06L2
1.2	13.5	23.0	31.5	27.5		171			10.8	0.82	100	✓	✓	✓	PHE840MF7120MF03R06L2
1.5	14.5	24.5	31.5	27.5		153			14.5	0.73	100	✓	✓	✓	PHE840MF7150MF13R06L2
1.8	17.5	28.0	31.5	27.5		126			17.0	0.65	100	✓	✓	✓	PHE840MF7180MF14R06L2
2.2	17.5	28.0	31.5	27.5		126			17.0	0.64	100	✓	✓	✓	PHE840MZ7220MF14R06L2 *
2.2	19.0	29.0	31.5	27.5		117			19.5	0.62	100	✓	✓	✓	PHE840MF7220MF15R06L2
2.7	19.0	29.0	31.5	27.5		117			19.5	0.58	100	✓	✓	✓	PHE840MF7270MF15R06L2
3.3	19.0	29.0	31.5	27.5		117			19.5	0.54	100	✓	✓	✓	PHE840MZ7330MF15R06L2 *
3.3	21.0	30.0	31.5	27.5		108			22.6	0.50	100	✓	✓	✓	PHE840MF7330MF16R06L2
3.3	31.0	18.5	31.5	27.5		72			20.0	0.50	100	✓	✓	✓	PHE840MT7330MF18R06L2
LEAD SPACING 37.5 MM															
1.8	13.0	24.0	41.0	37.5		140			14.0	0.60	100	✓	✓	✓	PHE840MR7180MR05R06L2
2.2	13.0	24.0	41.0	37.5		140			14.0	0.58	100	✓	✓	✓	PHE840MR7220MR05R06L2
2.7	15.0	26.0	41.0	37.5		119			17.0	0.53	100	✓	✓	✓	PHE840MR7270MR04R06L2
3.3	15.0	26.0	41.0	37.5		119			17.0	0.49	100	✓	✓	✓	PHE840MR7330MR04R06L2
3.9	16.5	32.0	41.0	37.5		105			23.0	0.46	100	✓	✓	✓	PHE840MR7390MR02R06L2
4.7	19.0	36.0	41.0	37.5		91			28.5	0.44	100	✓	✓	✓	PHE840MR7470MR03R06L2
5.6	21.0	38.0	41.0	37.5		84			34.4	0.41	100	✓	✓	✓	PHE840MR7560MR06R06L2
6.8	21.0	38.0	41.0	37.5		84			34.4	0.39	100	✓	✓	✓	PHE840MR7680MR06R06L2
8.2	28.0	43.0	41.0	37.5		63			53.0	0.30	100	✓	✓	✓	PHE840MR7820MR08R06L2
10.0	28.0	43.0	41.0	37.5		63			53.0	0.26	100	✓	✓	✓	PHE840MR8100MR08R06L2

* Only $\pm 20\%$ tolerance

APPROVALS/REFERENCE DOCUMENTS

Certification Body	Specification	Approval reference
ENEC UL	EN 132400	SE/0140-4A
	UL 1283 ($U_R = 280 \text{ VAC}$)	E100117
cUL recognition (CSA)	UL 1414 ($U_R = 250 \text{ VAC}$)	E73869
	C 22.2 No. 8 ($U_R = 280 \text{ VAC}$)	E100117
	C 22.2 No. 1 ($U_R = 280 \text{ VAC}$)	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.