

PHE840M

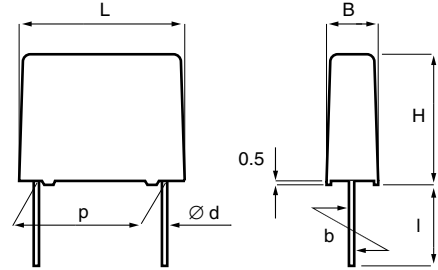
- EMI suppressor, class X2, metallized polypropylene
- 0.01 – 10.0 μF , 275/280 VAC, +105°C
- New, small dimensions including low profile capacitors
- Replaces PHE843

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%	-	-

Tolerance in lead length

< 30 mm $\begin{matrix} +0 \\ -1 \end{matrix}$ mm

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

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

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

Maximum voltage 630 VDC

ENVIRONMENTAL TEST DATA

Endurance

IEC 60384-14

$1.25 \times U_R$ 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/s²

No visible damage
No open or short circuit

Bump

IEC 60068-2-29
Test Eb

1000 bumps at
390 m/s²

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

Capacitance μF	Max dimensions in mm			ρ	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 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	EN 132400	SE/0140-4A
UL	UL 1283 ($U_R = 280 \text{ VAC}$)	E100117
	UL 1414 ($U_R = 250 \text{ VAC}$)	E73869
cUL recognition (CSA)	C 22.2 No. 8 ($U_R = 280 \text{ VAC}$)	E100117
	C 22.2 No. 1 ($U_R = 250 \text{ VAC}$)	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 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.