

PHE 404

- MUAHAG-approval pending
- Self-extinguishing encapsulation
- Very precise positioning of the leads in relation to the case giving efficient utilisation of PC-board space.

Applications

This capacitor is intended for pulse applications where higher frequencies are used i.e. SMPS and electronic ballasts.

Application Guide

To simplify the self-heating calculation, order the "Application Guide" concerning pulse capacitors.

Specification

Rated voltage, (U _R) VDC	160	250	400
VAC, 50 Hz	100	160	220
Capacitance range, µF	0.047-0.56	0.022-0.47	0.001-0.15
Standard tolerance	±10%, ±20% for K-size		
Climatic category	55/085/56		
Based on	IEC 384-16 grade 1		

Technical data

Rated capacitance, C_R

According to article table. Other capacitance values within the range on request.

Capacitance tolerance

Standard ±10%, ±20% for K-size. Other tolerances on request.

Rated voltage, U_R

According to article table. Maximum voltage vs frequency see graphs.

Dissipation factor

According to table below.

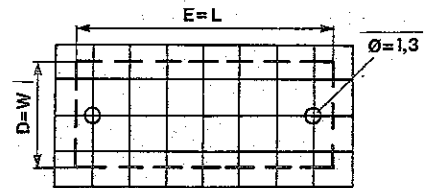
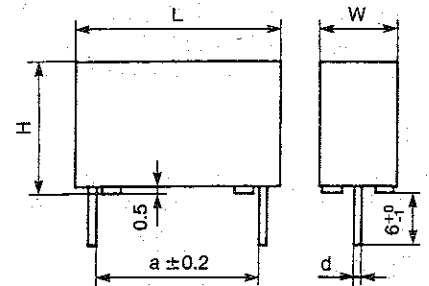
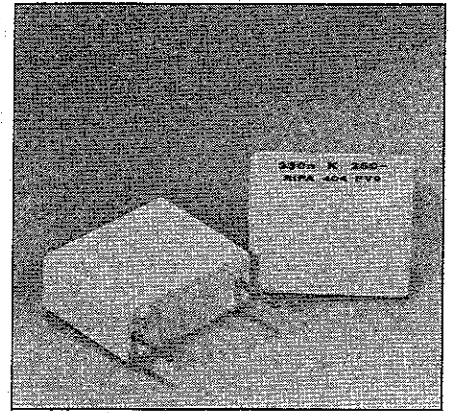
Pulse rise time, dU/dt

The capacitor withstands an unlimited number of pulses with a pulse steepness according to table below.

Basic design

The PHE 404 uses polypropylene (PP) as dielectric, metallized with aluminium. The winding is encased in epoxy. Both case and epoxy are flame-retardant (UL 94/V-0).

The capacitors withstand all common solvents and rinsing liquids without damage. The mechanical design assures narrow tolerances (suitable for automatic insertion).



d=0.6 for a=7.6 and 10.2 mm
d=0.8 for a=15.0 mm

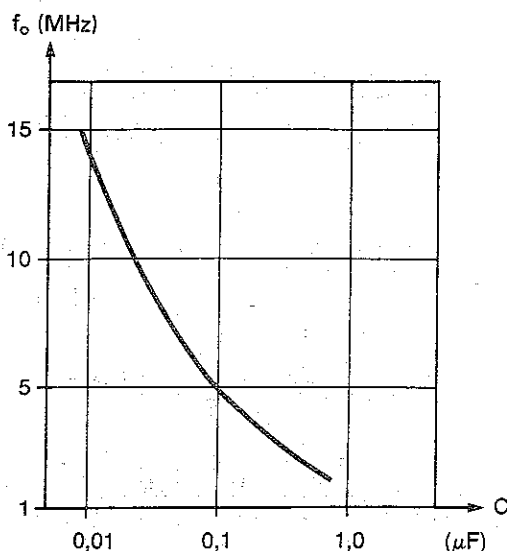
Article code	Dissipation factor			Pulse rise time dU/dt V/µs
	f = 1 kHz	f = 10 kHz	f = 100 kHz	
PHE 404 FA	≅ 3 × 10 ⁻⁴	≅ 8 × 10 ⁻⁴	≅ 25 × 10 ⁻⁴	85
PHE 404 HA	≅ 3 × 10 ⁻⁴	≅ 5 × 10 ⁻⁴	≅ 15 × 10 ⁻⁴	120
PHE 404 KA	≅ 3 × 10 ⁻⁴	≅ 5 × 10 ⁻⁴	≅ 12 × 10 ⁻⁴	180
PHE 404 FB	≅ 3 × 10 ⁻⁴	≅ 10 × 10 ⁻⁴	≅ 60 × 10 ⁻⁴	85
PHE 404 HB	≅ 3 × 10 ⁻⁴	≅ 8 × 10 ⁻⁴	≅ 30 × 10 ⁻⁴	120
PHE 404 KB	≅ 3 × 10 ⁻⁴	≅ 8 × 10 ⁻⁴	≅ 25 × 10 ⁻⁴	180
PHE 404 KK	≅ 3 × 10 ⁻⁴	≅ 5 × 10 ⁻⁴	≅ 12 × 10 ⁻⁴	180

Article table

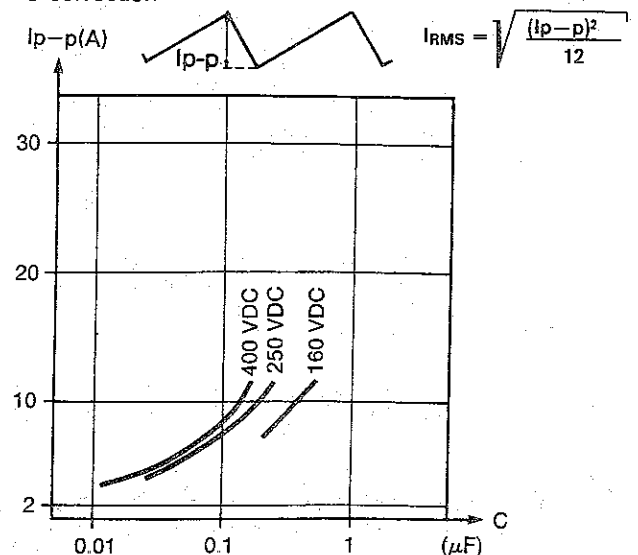
Rated voltage U_R	C_R 1) μF	Max dimensions in mm				Max space requirements in mm		Weight g	R_{th} $^{\circ}C/W$	Quantity per package reel		Article code 1st block
		L	W	H	a	D	E			pcs	pcs	
160 VDC 100 VAC	0.047	13.0	4.5	8.0	10.2	4.9	14.0	0.7	31	2000	800	PHE 404FA5470K
	0.068	13.0	4.5	8.0	10.2	4.9	14.0	0.7	31	2000	800	PHE 404FA5680K
	0.10	13.0	4.5	10.5	10.2	4.9	14.0	0.8	31	2000	800	PHE 404FA6100K
	0.15	18.0	5.5	10.5	15	5.9	19.0	1.1	28	1000	600	PHE 404FB6150K
	0.22	18.0	5.5	10.5	15	5.9	19.0	1.1	28	1000	600	PHE 404FB6220K
	0.33	18.0	7.5	12.5	15	7.9	19.0	1.9	27	500	400	PHE 404FB6330K
	0.47	18.0	7.5	12.5	15	7.9	19.0	1.9	27	500	400	PHE 404FB6470K
0.56	18.0	7.5	14.5	15	7.9	19.0	2.3	27	500	400	PHE 404FB6560K	
250 VDC 160 VAC	0.022	13.0	4.5	8.0	10.2	4.9	14.0	0.7	31	2000	800	PHE 404HA5220K
	0.033	13.0	4.5	8.0	10.2	4.9	14.0	0.7	31	2000	800	PHE 404HA5330K
	0.047	13.0	4.5	10.5	10.2	4.9	14.0	0.8	31	2000	800	PHE 404HA5470K
	0.068	18.0	5.5	10.5	15	5.9	19.0	1.1	28	1000	600	PHE 404HB5680K
	0.10	18.0	5.5	10.5	15	5.9	19.0	1.1	28	1000	600	PHE 404HB6100K
	0.15	18.0	7.5	12.5	15	7.9	19.0	1.9	27	500	400	PHE 404HB6150K
	0.22	18.0	7.5	12.5	15	7.9	19.0	1.9	27	500	400	PHE 404HB6220K
0.33	18.0	7.5	14.5	15	7.9	19.0	2.3	27	500	400	PHE 404HB6330K	
0.47	18.0	7.5	14.5	15	7.9	19.0	2.3	27	500	400	PHE 404HB6470K	
400 VDC 220 VAC	0.001	10.5	4.0	8.0	7.6	4.4	11.5	0.5	33	2000	1700	PHE 404KK4100M
	0.0015	10.5	4.0	8.0	7.6	4.4	11.5	0.5	33	2000	1700	PHE 404KK4150M
	0.0022	10.5	4.0	8.0	7.6	4.4	11.5	0.5	33	2000	1700	PHE 404KK4220M
	0.0033	10.5	4.0	8.0	7.6	4.4	11.5	0.5	33	2000	1700	PHE 404KK4330M
	0.0047	10.5	4.0	8.0	7.6	4.4	11.5	0.5	33	2000	1700	PHE 404KK4470M
	0.010	13.0	4.5	8.0	10.2	4.9	14.0	0.7	31	2000	800	PHE 404KA5100K
	0.015	13.0	4.5	8.0	10.2	4.9	14.0	0.7	31	2000	800	PHE 404KA5150K
	0.022	13.0	4.5	10.5	10.2	4.9	14.0	0.8	31	2000	800	PHE 404KA5220K
	0.033	13.0	4.5	10.5	10.2	4.9	14.0	0.8	31	2000	800	PHE 404KA5330K
	0.047	18.0	5.5	10.5	15	5.9	19.0	1.1	28	1000	600	PHE 404KB5470K
	0.068	18.0	5.5	12.5	15	5.9	19.0	1.1	28	1000	600	PHE 404KB5680K
	0.10	18.0	7.5	12.5	15	7.9	19.0	1.9	27	500	400	PHE 404KB6100K
	0.15	18.0	7.5	14.5	15	7.9	19.0	2.3	27	500	400	PHE 404KB6150K

1) Other values within the range on request. R_{th} = Thermal resistance

Graph 1.
Resonance frequency (f_o) versus rated capacitance (self-inductance = 15 nH)

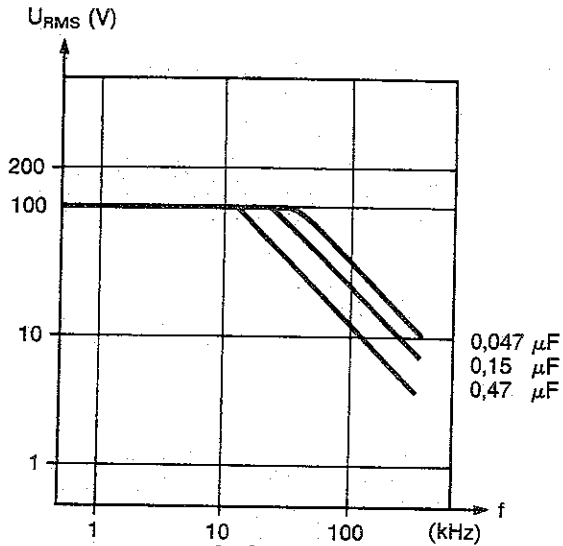


Graph 2.
Maximum peak-to-peak current for saw-tooth formed current typical of S-correction



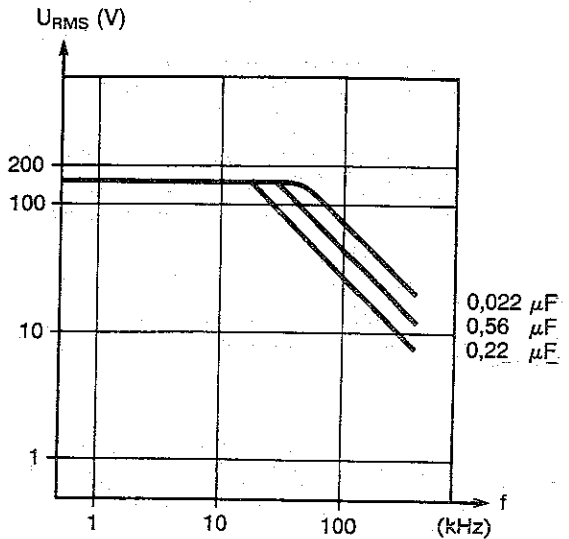
Max RMS-voltage (sinusoidal) vs frequency

Graph 3
 $U_R = 160 \text{ VDC}/100 \text{ VAC}$



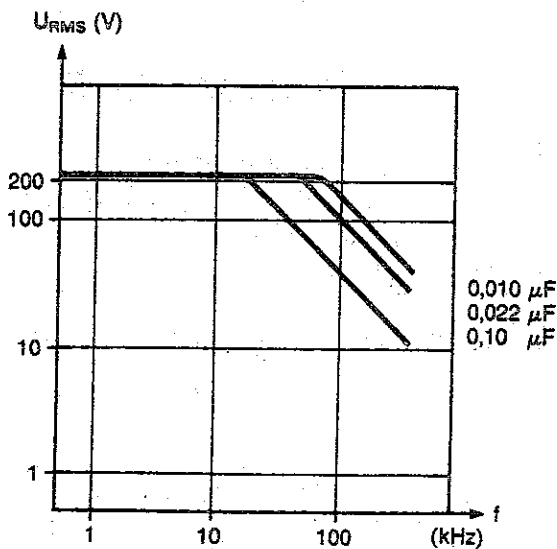
Max RMS-voltage (sinusoidal) vs frequency

Graph 4
 $U_R = 250 \text{ VDC}/160 \text{ VAC}$



Max RMS-voltage (sinusoidal) vs frequency

Graph 5
 $U_R = 400 \text{ VDC}/220 \text{ VAC}$



Marking

The capacitors are marked with:

- RIFA
- Rated capacitance
- Tolerance on rated capacitance in code acc. to IEC 62
- Rated voltage
- Code for manufacturing date (month and year)
- Rifa article code

Packing

Capacitors are packed bulk in a box with dimensions 230×155×72 mm. Quantity/package as per the article table.

Reels with taped capacitors are packed 10 or 12 in a box with dimensions 570×380×380 mm.

Ordering information

Article code Ex. PHE 404, 0.047μF, 250 VDC/160 VAC
17 mm lead length, taped

1st block

See "Article table"
K = Capacitance tol. ±10% = K
±20% = M

2nd block

The capacitor is also available with
10 ±⁰₁ or 17 ±⁰₁ mm lead length
(add R10 or R17 pos 14-16)
For taped add T0 in pos. 14-15
(=lead length 17 mm)

P H E 4 0 4 H A 5 4 7 0 K T 0

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20