F43 Series Metallized Polypropylene Film, 160 VAC/250 VDC, 200 VAC/400 VDC, 220 VAC/630 VDC & Class X2, 275 VAC

Overview

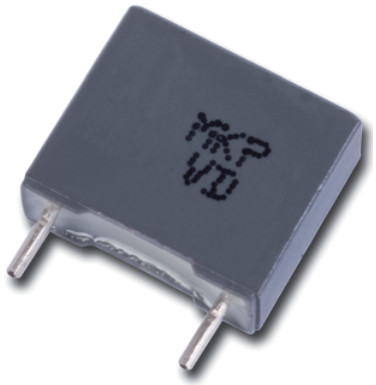
Metallized polypropylene film encapsulated with self-extinguishing resin in a box of material meeting the requirements of UL 94 V–0.

Applications

For worldwide use in contact protection, contact interference suppression and transient suppression.

Benefits

- Approvals (for 275 VAC only): ENEC, UL
- Rated voltage: 160 VAC/250 VDC, 200 VAC/400 VDC, 220 VAC/630 VDC, & Class X2, 275 VAC
- Capacitance range: 0.01 – 1.0 µF
- Lead spacing: 15.0 – 27.5 mm
- Capacitance tolerance: ±20%, ±10%
- Climatic category: 55/100/56, IEC 60068–1 and 40/100/56 (275 VAC), IEC 60068–1
- Tape and reel packaging in accordance with IEC 60286–2
- RoHS Compliant and lead-free terminations
- Operating temperature range: -55˚C to +100˚C and -40˚C to +100˚C (275 VAC)



Part Number System

F	43	K	N	3100	XX	01	M
Capacitor Class	Series	Rated Voltage (VAC)	Lead Spacing (mm)	Capacitance Code (EIA pF)	Lead and Packaging Code	Internal Use	Capacitance Tolerance
Legacy PN: F New KEMET PN: Omit this character	RC Snubber, Metallized Polypropylene	I = 160 M = 200 P = 220 K = 275 (X2)	I = 15.0 N = 22.5 R = 27.5	Digits 2-4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	Contact KEMET for packaging availability and details	00, 01, 04 (Standard)	K = ±10% M = ±20%

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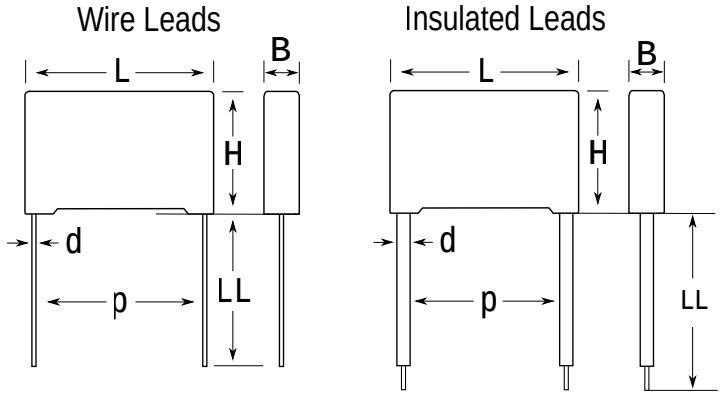
Ordering Options Table

Lead Type	Lead Length (mm)	Lead and Packaging Code
Wire leads	up to 30	Contact KEMET for availability and details
Insulated wire leads	up to 30	
Flexible cable leads	up to 270	

Dimensions – Millimeters



p		B		H		L		d	
Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
15.0	+/-0.4	7.5	Max	14.5	Max	18.0	Max	0.6	+/-0.05
15.0	+/-0.4	8.5	Max	14.5	Max	18.0	Max	0.8	+/-0.05
15.0	+/-0.4	10.0	Max	16.0	Max	18.0	Max	0.6	+/-0.05
22.5	+/-0.4	6.0	Max	15.0	Max	26.5	Max	0.8	+/-0.05
22.5	+/-0.4	7.0	Max	16.0	Max	26.5	Max	0.6(1)	+/-0.05
22.5	+/-0.4	8.5	Max	17.0	Max	26.5	Max	0.6(1)	+/-0.05
22.5	+/-0.4	10.0	Max	18.5	Max	26.5	Max	0.8	+/-0.05
22.5	+/-0.4	10.0	Max	20.0	Max	26.5	Max	0.6	+/-0.05
22.5	+/-0.4	11.0	Max	20.0	Max	26.5	Max	0.6(1)	+/-0.05
27.5	+/-0.4	11.0	Max	20.0	Max	32.0	Max	0.8	+/-0.05
27.5	+/-0.4	13.0	Max	22.0	Max	32.0	Max	0.8	+/-0.05
27.5	+/-0.4	18.0	Max	33.0	Max	32.0	Max	0.8	+/-0.05
Note: See Ordering Options Table for lead length (LL) options.									

(1) d = 0.8 when capacitance ≥ 0.25 µF.

Performance Characteristics

Rated Voltage	160 VAC/250 VDC, 200 VAC/400 VDC, 220 VAC/630 VDC, & Class X2, 275 VAC	
Capacitance Range	0.01 – 1.0 µF	
Capacitance Tolerance	±20%, ±10%	
Temperature Range	-55°C to +100°C, -40°C to +100°C (275 VAC)	
Climatic Category	55/100/56, 40/100/56 (275 VAC)	
Approvals	ENEC, UL	
Dissipation Factor	Maximum Values at +23°C	
	Frequency	tanδ
	1 kHz	0.1%
Test Voltage Between Terminals	The 100% screening factory test is carried out at 1.6 V_R, 4.3 V_R for 275 VAC. The voltage level is selected to meet the requirements in applicable equipment standards. All electrical characteristics are checked after the test. This test may not be repeated due to potential capacitor damage. KEMET is not liable in such case for any failures.	
Insulation Resistance	Between Terminals:	
	C ≤ 0.33 µF	≥ 10,000 MΩ
	C > 0.33 µF	≥ 3,000 MΩ • µF
In DC Applications	Recommended voltage ≤ 800 VDC	

Environmental Test Data

Test	IEC Publication	Procedure
Vibration	IEC 60068–2–6 Test Fc	3 directions at 2 hours each 10 – 500 Hz at 0.75 mm or 98 m/s^2
Bump	IEC 60068–2–29 Test Eb	4,000 bumps at 390 m/s^2
Solderability	IEC 60068–2–20 Test Ta	Wetting time for d > 0.8 < 1.5 seconds
Active Flammability	IEC 60384–14	V_R + 20 surge pulses at 2.5 kV (pulse every 5 seconds)
Passive Flammability	IEC 60384–14	IEC 60384–1, IEC 60695–11–5 Needle-flame test
Damp Heat Steady State	IEC 60068–2–78 Test Cab	+40°C and 93% RH, 56 days

Approvals

Certification Body	Specification	File Number
	EN/IEC 60384–14	
	UL 1414 (250 VAC)	

Environmental Compliance

All KEMET EMI capacitors are RoHS Compliant.

RoHS Compliant

Table 1 – Ratings & Part Number Reference

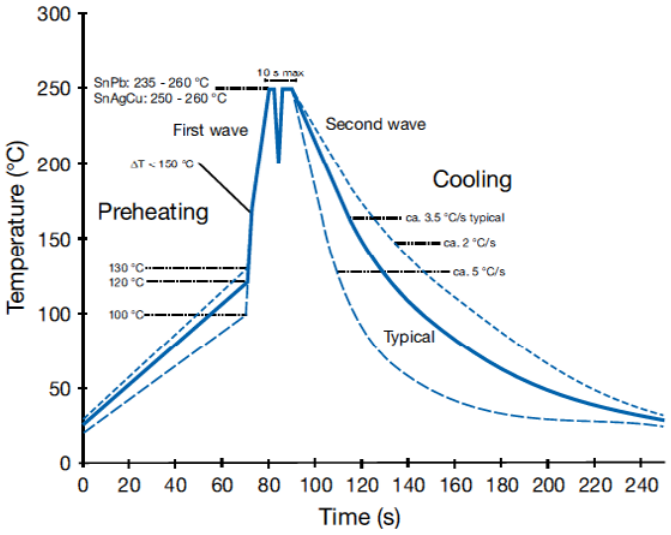
VAC	VDC	Cap Value (µF)	Max Dimensions in mm			Lead Spacing (p)	Available E12[3] Resistor Values (Ω)	New KEMET Part Number	Legacy Part Number
			B	H	L				
160	250	0.25	8.5	14.5	18.0	15.0	10–100	43II3250(1)01(2)	F43II3250(1)01(2)
160	250	0.33	6.0	15.0	26.5	22.5	10–100	43IN3330(1)01(2)	F43IN3330(1)01(2)
160	250	0.47	8.5	17.0	26.5	22.5	10–100	43IN3470(1)01(2)	F43IN3470(1)01(2)
160	250	0.5	8.5	17.0	26.5	22.5	10–100	43IN3500(1)01(2)	F43IN3500(1)01(2)
160	250	1	10.0	18.5	26.5	22.5	10–22	43IN4100(1)01(2)	F43IN4100(1)01(2)
200	400	0.25	7.0	16.0	26.5	22.5	10–100	43MN3250(1)01(2)	F43MN3250(1)01(2)
200	400	0.5	10.0	18.5	26.5	22.5	10–100	43MN3500(1)01(2)	F43MN3500(1)01(2)
200	400	1	13.0	22.0	32.0	27.5	10–22	43MR4100(1)01(2)	F43MR4100(1)01(2)
220	630	0.022	7.5	14.5	18.0	15.0	10–1000	43PI2220(1)01(2)	F43PI2220(1)01(2)
220	630	0.1	7.0	16.0	26.5	22.5	10–1000	43PN3100(1)01(2)	F43PN3100(1)01(2)
220	630	0.25	11.0	20.0	26.5	22.5	10–100	43PN3250(1)01(2)	F43PN3250(1)01(2)
220	630	0.5	13.0	22.0	32.0	27.5	10–100	43PR3500(1)01(2)	F43PR3500(1)01(2)
275 (X2)		0.01	7.5	14.5	18.0	15.0	10–1000	43KI2100(1)01(2)	F43KI2100(1)01(2)
275 (X2)		0.015	7.5	14.5	18.0	15.0	10–1000	43KI2150(1)01(2)	F43KI2150(1)01(2)
275 (X2)		0.022	7.5	14.5	18.0	15.0	10–1000	43KI2220(1)01(2)	F43KI2220(1)01(2)
275 (X2)		0.033	7.5	14.5	18.0	15.0	10–1000	43KI2330(1)01(2)	F43KI2330(1)01(2)
275 (X2)		0.047	7.5	14.5	18.0	15.0	10–1000	43KI2470(1)01(2)	F43KI2470(1)01(2)
275 (X2)		0.068	10.0	16.0	18.0	15.0	10–1000	43KI2680(1)01(2)	F43KI2680(1)01(2)
275 (X2)		0.1	8.5	17.0	26.5	22.5	10–1000	43KN3100(1)01(2)	F43KN3100(1)01(2)
275 (X2)		0.15	10.0	20.0	26.5	22.5	10–470	43KN3150(1)01(2)	F43KN3150(1)01(2)
275 (X2)		0.22	11.0	20.0	26.5	22.5	10–470	43KN3220(1)01(2)	F43KN3220(1)01(2)
275 (X2)		0.25	11.0	20.0	32.0	27.5	10–100	43KR3250(1)01(2)	F43KR3250(1)01(2)
275 (X2)		0.33	11.0	20.0	32.0	27.5	10–100	43KR3330(1)01(2)	F43KR3330(1)01(2)
275 (X2)		0.47	13.0	22.0	32.0	27.5	10–100	43KR3470(1)01(2)	F43KR3470(1)01(2)
275 (X2)		0.5	13.0	22.0	32.0	27.5	10–100	43KR3500(1)01(2)	F43KR3500(1)01(2)
275 (X2)		0.68	18.0	33.0	32.0	27.5	10–100	43KR3680(1)01(2)	F43KR3680(1)01(2)
275 (X2)		1	18.0	33.0	32.0	27.5	10–22	43KR4100(1)01(2)	F43KR4100(1)01(2)
VAC	**VDC**	**Cap Value (µF)**	**B (mm)**	**H (mm)**	**L (mm)**	**Lead Spacing (p)**	**Available E12[3] Resistor Values (Ω)**	**New KEMET Part Number**	**Legacy Part Number**

(1) Lead and packaging code. Contact KEMET for availability and details.
(2) M = ±20%, K = ±10%.
(3) E12 values are multiples of 10 in the following range: 10, 12, 15, 18, 22, 27, 33, 39, 47, 56, 68, 82. The standard resistance tolerance is 10%.

Roll Over for Order Info.

Soldering Process

The implementation of the RoHS Directive has required the use of SnAuCu (SAC) or SnCu alloys as primary solder. These alloys require a higher liquidus temperature (217ºC – 221ºC) as compared to SnPb eutectic alloy (183ºC). Due to the higher pre-heat and wave temperatures, the heat stress to components has increased considerably. Polypropylene capacitors are especially sensitive to soldering temperature due to the relatively low melting point of polypropylene material (160ºC – 170ºC). As a result, wave soldering can be destructive, especially to mechanically small polypropylene capacitors with lead spacings of 5 –10 mm. For more information, please refer to KEMET's Recommended Soldering Profiles or contact a KEMET representative. IEC Publication 61760–1 Edition 2 may also be consulted for general guidelines.



Marking

- KEMET's logo
- Series
- Capacitance
- Rated resistance
- Rated voltage
- Capacitor class
- Approval marks
- IEC climatic category
- Passive flammability class
- Manufacturing date code

Mounting

RC units are mounted in parallel with the contacts to be protected or in parallel with the inductive load (Fig. 1 and Fig. 2). RC units are generally mounted in parallel with the contacts to suppress radio interferences (Fig. 1).

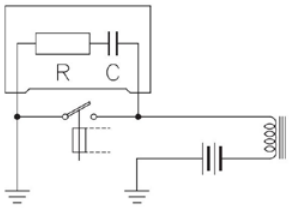


Fig. 1

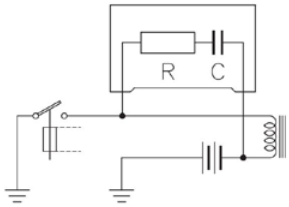
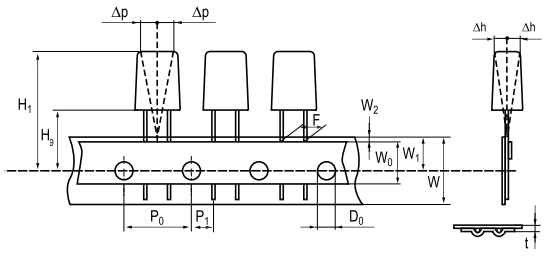


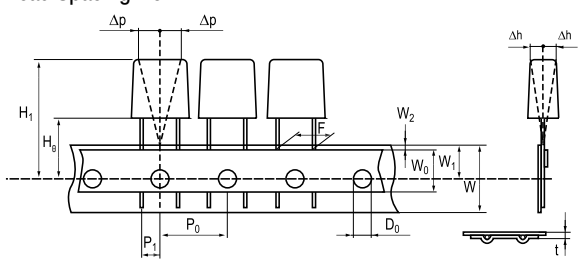
Fig. 2

Lead Taping & Packaging (IEC 60286–2)

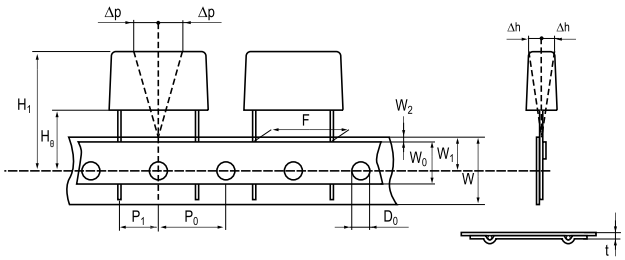
Lead Spacing 5 mm



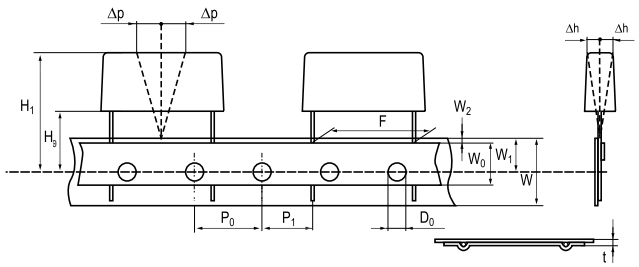
Lead Spacing 7.5 mm



Lead Spacing 10 – 15 mm



Lead Spacing 22.5 – 27.5 mm



Taping Specification

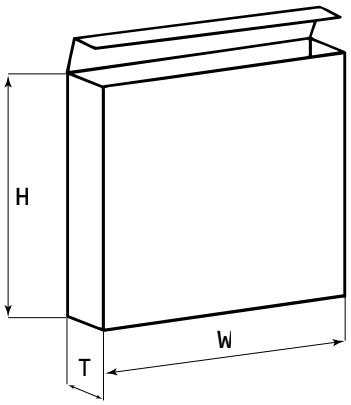
Dimensions in mm									Standard IEC 60286–2
Lead spacing	+6/-0.1	F	5	7.5	10	15	22.5	27.5	F
Carrier tape width	+1/-0.5	W	18	18	18	18	18	18	$18^{+1/-0.5}$
Hold-down tape width	MIN	W_0	6	6	9	10	10	10	
Position of sprocket hole	+/-0.5	W_1	9	9	9	9	9	9	$9^{+0.75/-0.5}$
Distance between tapes	MAX	W_2	3	3	3	3	3	3	3
Sprocket hole diameter	+/-0.2	D_0	4	4	4	4	4	4	4
Feed hole lead spacing	+/-0.2(1)	P_0(3)	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Distance lead - feed hole	+/-0.7	P_1	3.85	3.75	7.7	5.2	7.8	5.3	P1
Deviation tape - plane	MAX	Δp	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Lateral deviation	+/-2	Δh	2	2	2	2	2	2	2
Total thickness	+/-0.2	t	0.7	0.7	0.7	0.7	0.9^{MAX}	0.9^{MAX}	0.9^{MAX}
Sprocket hole/cap body	+/-0.5	H_0(2)	$18.5^{+/-0.5}$	$18.5^{+/-0.5}$	$18.5^{+/-0.5}$	$18.5^{+/-0.5}$	$18.5^{+/-0.5}$	$18.5^{+/-0.5}$	$18^{+2/-0}$

(1) Maximum cumulative feed hole error, 1 mm per 20 parts.
(2) 16.5 mm available on request.
(3) 15 mm available on request (F ≥ 10 mm).

Lead Taping & Packaging (IEC 60286–2) cont'd

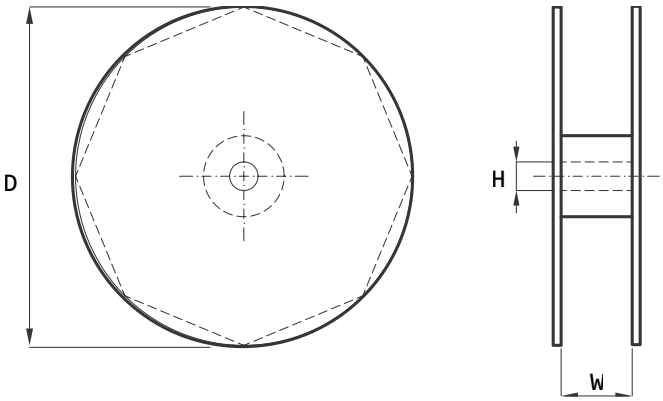
Ammo Specifications

Series	Dimensions (mm)		
	H	W	T
R4x, R4x+R, R7x, RSB	360	340	59
F5A, F5B, F5D			
F6xx, F8xx			
PHExxx, PMExxx, PMRxxx	330	330	50



Reel Specifications

Series	Dimensions (mm)		
	D	H	W
R4x, R4x+R, R7x, RSB	355	30	55 (Max)
F5A, F5B, F5D	500	25	
F6xx, F8xx			
PHExxx, PMExxx, PMRxxx	360 500	30	46 (Max)



Manufacturing Date Code (IEC–60062)

Y = Year, Z = Month			
Year	Code	Month	Code
2000	M	January	1
2001	N	February	2
2002	P	March	3
2003	R	April	4
2004	S	May	5
2005	T	June	6
2006	U	July	7
2007	V	August	8
2008	W	September	9
2009	X	October	O
2010	A	November	N
2011	B	December	D
2012	C		
2013	D		
2014	E		
2015	F		
2016	H		
2017	J		
2018	K		
2019	L		
2020	M		

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Zapopan, Jalisco
Tel: 52-33-3123-2141

Europe

Southern Europe
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Tel: 41-22-715-0100

Paris, France
Tel: 33-1-4646-1009

Sasso Marconi, Italy
Tel: 39-051-939111

Milan, Italy
Tel: 39-02-57518176

Rome, Italy
Tel: 39-06-23231718

Madrid, Spain
Tel: 34-91-804-4303

Central Europe
Landsberg, Germany
Tel: 49-8191-3350800

Dortmund, Germany
Tel: 49-2307-3619672

Kwidzyn, Poland
Tel: 48-55-279-7025

Northern Europe
Bishop's Stortford, United Kingdom
Tel: 44-1279-757201

Weymouth, United Kingdom
Tel: 44-1305-830747

Coatbridge, Scotland
Tel: 44-1236-434455

Färjestaden, Sweden
Tel: 46-485-563934

Espoo, Finland
Tel: 358-9-5406-5000

Asia

Northeast Asia
Hong Kong
Tel: 852-2305-1168

Shenzhen, China
Tel: 86-755-2518-1306

Beijing, China
Tel: 86-10-5829-1711

Shanghai, China
Tel: 86-21-6447-0707

Taipei, Taiwan
Tel: 886-2-27528585

Southeast Asia
Singapore
Tel: 65-6586-1900

Penang, Malaysia
Tel: 60-4-6430200

Bangalore, India
Tel: 91-806-53-76817

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Other KEMET Resources

Tools	
Resource	Location
Configure A Part: CapEdge	http://capacitoredge.kemet.com
SPICE & FIT Software	http://www.kemet.com/spice
Search Our FAQs: KnowledgeEdge	http://www.kemet.com/keask

Product Information	
Resource	Location
Products	http://www.kemet.com/products
Technical Resources (Including Soldering Techniques)	http://www.kemet.com/technicalpapers
RoHS Statement	http://www.kemet.com/rohs
Quality Documents	http://www.kemet.com/qualitydocuments

Product Request	
Resource	Location
Sample Request	http://www.kemet.com/sample
Engineering Kit Request	http://www.kemet.com/kits

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Although we design and manufacture our products to the most stringent quality and safety standards, given the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage.

Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated or that other measures may not be required.

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