

# F5A Series Metallized Polyester Film with Integrated Ceramic Varistor, 18 – 63 VDC

## Overview

The F5A Series is a metallized polyester (MKT) film capacitor with integrated ceramic varistor encapsulated in a thermosetting resin-filled plastic box with tinned wire leads. Box material is solvent resistant and flame retardant meeting the requirements of UL 94 V-0.

## Applications

Typical applications include worldwide use as EMI/RFI and transient voltage suppressors for automotive motors and other suppression applications. These include engine blower fans, central locking systems, heating/air-conditioning blowers, electric sun roofs, electric window regulators, fuel/oil pumps, electric windshield wipers and electrically operated seats. This through-hole EMI/RFI suppression element is mainly used for automotive applications without a printed circuit board, e.g., motor suppression or mixed through-hole and surface mount printed circuit boards.

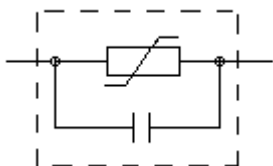
## Benefits

- Low inductive MKT capacitors in parallel construction with a ceramic varistor in a single case provide superior suppression results
- Approvals: AEC-Q200, ISO 7637
- Rated voltage: 18 – 63 VDC
- Capacitance range: 0.1  $\mu$ F to 2.2  $\mu$ F
- Lead spacing: 5 – 10 mm
- Capacitance tolerance:  $\pm 10\%$ ,  $\pm 20\%$
- Climatic category: 55/125/56 IEC 60068-1
- Tape and reel packaging in accordance with IEC 60286-2
- RoHS Compliant and lead-free terminations
- Operating temperature range:  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

## Part Number System

F5A	H	C	4100	DQ	A	6	K
Series	Rated Voltage (VDC)	Lead Spacing (mm)	Capacitance Code (pF)	Lead and Packaging Code	Varistor Voltage $V_v$ @ 1 mA	Size Code	Capacitance Tolerance
Film Capacitor/ Ceramic Varistor Unit	B = 18 H = 25 J = 30 N = 45 C = 50 D = 63	C = 5 F = 10	Digits 2 – 4 indicate the first three digits of the capacitance value. First digit indicates the number of zeros to be added.	See Ordering Options Table	See Varistor Voltage Table	See Dimension Table	K = $\pm 10\%$ M = $\pm 20\%$

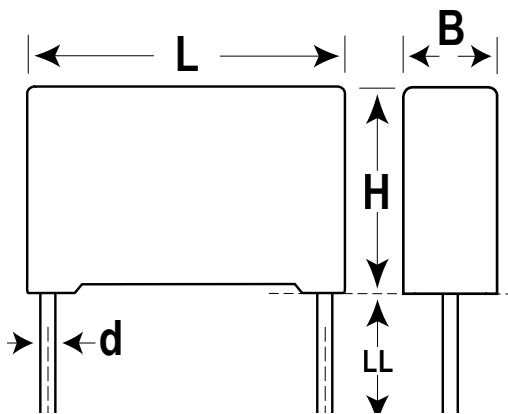
## Circuit Diagram



## Ordering Options Table

Lead Spacing Nominal (mm)	Type of Leads and Packaging	Lead Length (mm)	Lead and Packaging Code
5	<b>Standard Lead and Packaging Options</b>		
	Bulk (Bag) – Short Leads	4 +2/-0	AA
	Ammo Pack	H <sub>0</sub> = 18.5 +/-0.5	DQ
	<b>Other Lead and Packaging Options</b>		
	Bulk (Bag) – Long Leads	17 +1/-2	Z3
	Tape & Reel (Standard Reel)	H <sub>0</sub> = 18.5 +/-0.5	CK
10	<b>Standard Lead and Packaging Options</b>		
	Bulk (Bag) – Short Leads	4 +2/-0	AA
	Ammo Pack	H <sub>0</sub> = 18.5 +/-0.5	DQ
	<b>Other Lead and Packaging Options</b>		
	Bulk (Bag) – Long Leads	17 +1/-2	Z3
	Tape & Reel (Large Reel)	H <sub>0</sub> = 18.5 +/-0.5	CK

## Dimensions – Millimeters



Rated Capacitance $\mu\text{F}$	Size Code	p		B		H		L		d	
		Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance	Nominal	Tolerance
0.1 – 0.47	5	5.0	+/-0.4	4.6	Maximum	9.6	Maximum	7.4	Maximum	0.6	+/-0.05
0.56 – 1.5	6	5.0	+/-0.4	5.1	Maximum	10.1	Maximum	7.5	Maximum	0.6	+/-0.05
1.8 – 2.2	7	5.0	+/-0.4	6.1	Maximum	11.1	Maximum	7.5	Maximum	0.6	+/-0.05
0.1 – 1.0	2	10.0	+/-0.4	5.2	Maximum	11.1	Maximum	13.4	Maximum	0.7	+/-0.05
1.2 – 1.5	3	10.0	+/-0.4	6.2	Maximum	12.1	Maximum	13.4	Maximum	0.7	+/-0.05

Note: See Ordering Options Table for lead length (LL) options.

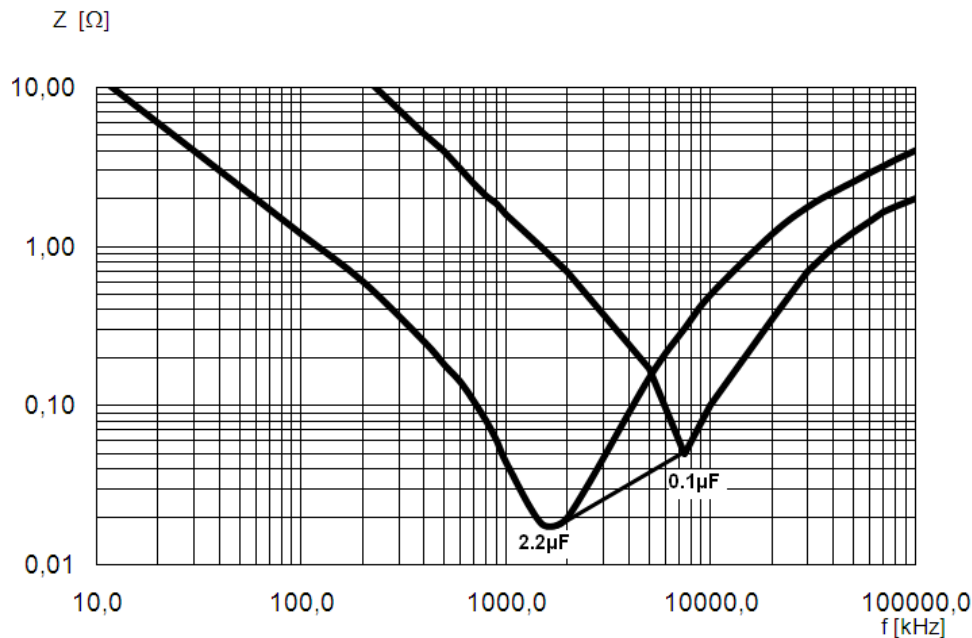
## Varistor Voltage Table

Part Number Digit 4		Part Number Digit 12		Clamping Voltage (1A, Pulse 8/20 $\mu$ s)
Letter	$V_r$ (VDC)	Letter	$V_v$ (VDC)	$V_c$ (V)
B	18	B	22	38
B	18	E	27	44
H	25	A	33	54
J	30	D	39	65
J	30	I	47	77
N	45	B	56	90
C	50	C	68	110
D	63	C	82	135

## Performance Characteristics

Rated Voltage	18 – 63 VDC (For temperature over 100°C a decreasing factor of 2% per degree has to be applied on the rated voltage $V_R$ )
Capacitance Range	0.1 – 2.2 $\mu$ F
Capacitance Tolerance	$\pm 10\%$ , $\pm 20\%$
Temperature Range	-55°C to +125°C
Climatic Category	55/125/56, IEC 60068-1
Leakage Current	$\leq 50 \mu$ A at $V_R$
Approvals	AEC-Q200, ISO 7637
Dissipation Factor	0.01 (1 kHz at 25°C $\pm 5^\circ$ C)
Test Voltage Between Terminals	100 VDC
Insulation Resistance	$V_R < 24$ V 1M $\Omega$ @ 12 V, $V_R \geq 24$ V 1M $\Omega$ @ 24 V
Varistor	Multilayer ceramic, EIA case size 1206
Peak Current Pulse	8/20 $\mu$ s
Peak Current for $V_V < 50$ V	200 A
Peak Current for $V_V > 50$ V	100 A

## Impedance Graph



## Environmental Test Data

Test	Conditions	Performance	
Damp Heat Steady State	+40°C ±2°C and 93% ±2% RH, 56 days	Δ C/C	≤ 5%
		V <sub>v</sub> change	≤ 10%
		DF change	≤ 50 x 10 <sup>-4</sup> @ 1 kHz
		Leakage current at V <sub>R</sub>	≤ 100 μA
Endurance	+125°C ±2°C/100°C ±2°C, 0.5 x V <sub>R</sub> /1.0 x V <sub>R</sub> , 1,000 hours	Δ C/C	≤ 10%
		V <sub>v</sub> change	≤ 10%
		DF change	≤ 50 x 10 <sup>-4</sup> @ 1 kHz
		Leakage current at V <sub>R</sub>	≤ 100 μA
Resistance to Soldering Heat	+260°C ±5°C, 10 ±1 second	Δ C/C	≤ 3%
		V <sub>v</sub> change	≤ 5%
		DF change	≤ 30 x 10 <sup>-4</sup> @ 1 kHz
		Leakage current at V <sub>R</sub>	≤ 50 μA
Peak Current Derating	Reference CECC 42,000/Test C 2.1, 100 times (2 ms), 120 seconds between each current peak	Δ C/C	≤ 10%
		V <sub>v</sub> change	≤ 10%
		DF change	≤ 30 x 10 <sup>-4</sup> @ 1 kHz
		Leakage current at V <sub>R</sub>	≤ 100 μA
Long Term Stability (After 2 Years)	-40°C to +80°C, ≤ 70% Humidity	Δ C/C	≤ 3%
		V <sub>v</sub> change	≤ 5%
		DF change	≤ 20 x 10 <sup>-4</sup> @ 1 kHz
		Leakage current at V <sub>R</sub>	≤ 50 μA
Reliability Failure Criteria	Reference MIL HDB 217 +40°C ±2°C, 0.5 x V <sub>R</sub> , ≤ 5 FIT	Δ C/C	> 10%
		V <sub>v</sub> change	≤ 10%
		DF change	≤ 20 x 10 <sup>-4</sup> @ 1 kHz
		Leakage current at V <sub>R</sub>	≤ 200 μA

## Environmental Compliance

All KEMET EMI capacitors are RoHS Compliant.



RoHS Compliant

**Table 1 – Ratings & Part Number Reference**

Capacitance Value (µF)	VDC	Max Dimensions in mm			Lead Spacing (p)	Varistor Voltage (VDC)	New KEMET Part Number	Legacy Part Number
		B	H	L				
0.10	18	4.6	9.6	7.4	5.0	22	5ABC3100(1)B5(2)	F5ABC3100(1)B5(2)
0.10	18	4.6	9.6	7.4	5.0	27	5ABC3100(1)E5(2)	F5ABC3100(1)E5(2)
0.22	18	4.6	9.6	7.4	5.0	22	5ABC3220(1)B5(2)	F5ABC3220(1)B5(2)
0.22	18	4.6	9.6	7.4	5.0	27	5ABC3220(1)E5(2)	F5ABC3220(1)E5(2)
0.33	18	4.6	9.6	7.4	5.0	22	5ABC3330(1)B5(2)	F5ABC3330(1)B5(2)
0.33	18	4.6	9.6	7.4	5.0	27	5ABC3330(1)E5(2)	F5ABC3330(1)E5(2)
0.47	18	4.6	9.6	7.4	5.0	22	5ABC3470(1)B5(2)	F5ABC3470(1)B5(2)
0.47	18	4.6	9.6	7.4	5.0	27	5ABC3470(1)E5(2)	F5ABC3470(1)E5(2)
0.56	18	5.1	10.1	7.5	5.0	22	5ABC3560(1)B6(2)	F5ABC3560(1)B6(2)
0.56	18	5.1	10.1	7.5	5.0	27	5ABC3560(1)E6(2)	F5ABC3560(1)E6(2)
0.68	18	5.1	10.1	7.5	5.0	22	5ABC3680(1)B6(2)	F5ABC3680(1)B6(2)
0.68	18	5.1	10.1	7.5	5.0	27	5ABC3680(1)E6(2)	F5ABC3680(1)E6(2)
0.82	18	5.1	10.1	7.5	5.0	22	5ABC3820(1)B6(2)	F5ABC3820(1)B6(2)
0.82	18	5.1	10.1	7.5	5.0	27	5ABC3820(1)E6(2)	F5ABC3820(1)E6(2)
1.00	18	5.1	10.1	7.5	5.0	22	5ABC4100(1)B6(2)	F5ABC4100(1)B6(2)
1.00	18	5.1	10.1	7.5	5.0	27	5ABC4100(1)E6(2)	F5ABC4100(1)E6(2)
1.20	18	5.1	10.1	7.5	5.0	22	5ABC4120(1)B6(2)	F5ABC4120(1)B6(2)
1.20	18	5.1	10.1	7.5	5.0	27	5ABC4120(1)E6(2)	F5ABC4120(1)E6(2)
1.50	18	5.1	10.1	7.5	5.0	22	5ABC4150(1)B6(2)	F5ABC4150(1)B6(2)
1.50	18	5.1	10.1	7.5	5.0	27	5ABC4150(1)E6(2)	F5ABC4150(1)E6(2)
1.80	18	6.1	11.1	7.5	5.0	22	5ABC4180(1)B7(2)	F5ABC4180(1)B7(2)
1.80	18	6.1	11.1	7.5	5.0	27	5ABC4180(1)E7(2)	F5ABC4180(1)E7(2)
2.20	18	6.1	11.1	7.5	5.0	22	5ABC4220(1)B7(2)	F5ABC4220(1)B7(2)
2.20	18	6.1	11.1	7.5	5.0	27	5ABC4220(1)E7(2)	F5ABC4220(1)E7(2)
0.10	25	4.6	9.6	7.4	5.0	33	5AHC3100(1)A5(2)	F5AHC3100(1)A5(2)
0.22	25	4.6	9.6	7.4	5.0	33	5AHC3220(1)A5(2)	F5AHC3220(1)A5(2)
0.33	25	4.6	9.6	7.4	5.0	33	5AHC3330(1)A5(2)	F5AHC3330(1)A5(2)
0.47	25	4.6	9.6	7.4	5.0	33	5AHC3470(1)A5(2)	F5AHC3470(1)A5(2)
0.56	25	5.1	10.1	7.5	5.0	33	5AHC3560(1)A6(2)	F5AHC3560(1)A6(2)
0.68	25	5.1	10.1	7.5	5.0	33	5AHC3680(1)A6(2)	F5AHC3680(1)A6(2)
0.82	25	5.1	10.1	7.5	5.0	33	5AHC3820(1)A6(2)	F5AHC3820(1)A6(2)
1.00	25	5.1	10.1	7.5	5.0	33	5AHC4100(1)A6(2)	F5AHC4100(1)A6(2)
1.20	25	5.1	10.1	7.5	5.0	33	5AHC4120(1)A6(2)	F5AHC4120(1)A6(2)
1.50	25	5.1	10.1	7.5	5.0	33	5AHC4150(1)A6(2)	F5AHC4150(1)A6(2)
1.80	25	6.1	11.1	7.5	5.0	33	5AHC4180(1)A7(2)	F5AHC4180(1)A7(2)
2.20	25	6.1	11.1	7.5	5.0	33	5AHC4220(1)A7(2)	F5AHC4220(1)A7(2)
0.10	30	4.6	9.6	7.4	5.0	39	5AJC3100(1)D5(2)	F5AJC3100(1)D5(2)
0.10	30	4.6	9.6	7.4	5.0	47	5AJC3100(1)I5(2)	F5AJC3100(1)I5(2)
0.22	30	4.6	9.6	7.4	5.0	39	5AJC3220(1)D5(2)	F5AJC3220(1)D5(2)
0.22	30	4.6	9.6	7.4	5.0	47	5AJC3220(1)I5(2)	F5AJC3220(1)I5(2)
0.33	30	4.6	9.6	7.4	5.0	39	5AJC3330(1)D5(2)	F5AJC3330(1)D5(2)
0.33	30	4.6	9.6	7.4	5.0	47	5AJC3330(1)I5(2)	F5AJC3330(1)I5(2)
0.47	30	4.6	9.6	7.4	5.0	39	5AJC3470(1)D5(2)	F5AJC3470(1)D5(2)
0.47	30	4.6	9.6	7.4	5.0	47	5AJC3470(1)I5(2)	F5AJC3470(1)I5(2)
0.56	30	5.1	10.1	7.5	5.0	39	5AJC3560(1)D6(2)	F5AJC3560(1)D6(2)
0.56	30	5.1	10.1	7.5	5.0	47	5AJC3560(1)I6(2)	F5AJC3560(1)I6(2)
0.68	30	5.1	10.1	7.5	5.0	39	5AJC3680(1)D6(2)	F5AJC3680(1)D6(2)
0.68	30	5.1	10.1	7.5	5.0	47	5AJC3680(1)I6(2)	F5AJC3680(1)I6(2)
0.82	30	5.1	10.1	7.5	5.0	39	5AJC3820(1)D6(2)	F5AJC3820(1)D6(2)
0.82	30	5.1	10.1	7.5	5.0	47	5AJC3820(1)I6(2)	F5AJC3820(1)I6(2)
1.00	30	5.1	10.1	7.5	5.0	39	5AJC4100(1)D6(2)	F5AJC4100(1)D6(2)
1.00	30	5.1	10.1	7.5	5.0	47	5AJC4100(1)I6(2)	F5AJC4100(1)I6(2)
1.20	30	5.1	10.1	7.5	5.0	39	5AJC4120(1)D6(2)	F5AJC4120(1)D6(2)
1.20	30	5.1	10.1	7.5	5.0	47	5AJC4120(1)I6(2)	F5AJC4120(1)I6(2)
1.50	30	5.1	10.1	7.5	5.0	39	5AJC4150(1)D6(2)	F5AJC4150(1)D6(2)
1.50	30	5.1	10.1	7.5	5.0	47	5AJC4150(1)I6(2)	F5AJC4150(1)I6(2)
1.80	30	6.1	11.1	7.5	5.0	39	5AJC4180(1)D7(2)	F5AJC4180(1)D7(2)
1.80	30	6.1	11.1	7.5	5.0	47	5AJC4180(1)I7(2)	F5AJC4180(1)I7(2)
2.20	30	6.1	11.1	7.5	5.0	39	5AJC4220(1)D7(2)	F5AJC4220(1)D7(2)
Capacitance Value (µF)	VDC	B (mm)	H (mm)	L (mm)	Lead Spacing (p)	Varistor Voltage (VDC)	New KEMET Part Number	Legacy Part Number

(1) Insert lead and packaging code. See Ordering Options Table for available options.

(2) K = 10%, M = 20%.

**Table 1 – Ratings & Part Number Reference cont'd**

Capacitance Value (µF)	VDC	Max Dimensions in mm			Lead Spacing (p)	Varistor Voltage (VDC)	New KEMET Part Number	Legacy Part Number
		B	H	L				
2.20	30	6.1	11.1	7.5	5.0	47	5AJC4220(1)I7(2)	F5AJC4220(1)I7(2)
0.10	45	4.6	9.6	7.4	5.0	56	5ANC3100(1)B5(2)	F5ANC3100(1)B5(2)
0.22	45	4.6	9.6	7.4	5.0	56	5ANC3220(1)B5(2)	F5ANC3220(1)B5(2)
0.33	45	4.6	9.6	7.4	5.0	56	5ANC3330(1)B5(2)	F5ANC3330(1)B5(2)
0.47	45	4.6	9.6	7.4	5.0	56	5ANC3470(1)B5(2)	F5ANC3470(1)B5(2)
0.56	45	5.1	10.1	7.5	5.0	56	5ANC3560(1)B6(2)	F5ANC3560(1)B6(2)
0.68	45	5.1	10.1	7.5	5.0	56	5ANC3680(1)B6(2)	F5ANC3680(1)B6(2)
0.82	45	5.1	10.1	7.5	5.0	56	5ANC3820(1)B6(2)	F5ANC3820(1)B6(2)
1.00	45	5.1	10.1	7.5	5.0	56	5ANC4100(1)B6(2)	F5ANC4100(1)B6(2)
1.20	45	5.1	10.1	7.5	5.0	56	5ANC4120(1)B6(2)	F5ANC4120(1)B6(2)
1.50	45	5.1	10.1	7.5	5.0	56	5ANC4150(1)B6(2)	F5ANC4150(1)B6(2)
1.80	45	6.1	11.1	7.5	5.0	56	5ANC4180(1)B7(2)	F5ANC4180(1)B7(2)
2.20	45	6.1	11.1	7.5	5.0	56	5ANC4220(1)B7(2)	F5ANC4220(1)B7(2)
0.10	50	4.6	9.6	7.4	5.0	68	5ACC3100(1)C5(2)	F5ACC3100(1)C5(2)
0.22	50	4.6	9.6	7.4	5.0	68	5ACC3220(1)C5(2)	F5ACC3220(1)C5(2)
0.33	50	4.6	9.6	7.4	5.0	68	5ACC3330(1)C5(2)	F5ACC3330(1)C5(2)
0.47	50	4.6	9.6	7.4	5.0	68	5ACC3470(1)C5(2)	F5ACC3470(1)C5(2)
0.56	50	5.1	10.1	7.5	5.0	68	5ACC3560(1)C6(2)	F5ACC3560(1)C6(2)
0.68	50	5.1	10.1	7.5	5.0	68	5ACC3680(1)C6(2)	F5ACC3680(1)C6(2)
0.82	50	5.1	10.1	7.5	5.0	68	5ACC3820(1)C6(2)	F5ACC3820(1)C6(2)
1.00	50	5.1	10.1	7.5	5.0	68	5ACC4100(1)C6(2)	F5ACC4100(1)C6(2)
1.20	50	5.1	10.1	7.5	5.0	68	5ACC4120(1)C6(2)	F5ACC4120(1)C6(2)
1.50	50	5.1	10.1	7.5	5.0	68	5ACC4150(1)C6(2)	F5ACC4150(1)C6(2)
1.80	50	6.1	11.1	7.5	5.0	68	5ACC4180(1)C7(2)	F5ACC4180(1)C7(2)
2.20	50	6.1	11.1	7.5	5.0	68	5ACC4220(1)C7(2)	F5ACC4220(1)C7(2)
0.10	63	4.6	9.6	7.4	5.0	68	5ADC3100(1)C5(2)	F5ADC3100(1)C5(2)
0.22	63	4.6	9.6	7.4	5.0	68	5ADC3220(1)C5(2)	F5ADC3220(1)C5(2)
0.33	63	4.6	9.6	7.4	5.0	68	5ADC3330(1)C5(2)	F5ADC3330(1)C5(2)
0.47	63	4.6	9.6	7.4	5.0	68	5ADC3470(1)C5(2)	F5ADC3470(1)C5(2)
0.56	63	5.1	10.1	7.5	5.0	68	5ADC3560(1)C6(2)	F5ADC3560(1)C6(2)
0.68	63	5.1	10.1	7.5	5.0	68	5ADC3680(1)C6(2)	F5ADC3680(1)C6(2)
0.82	63	5.1	10.1	7.5	5.0	68	5ADC3820(1)C6(2)	F5ADC3820(1)C6(2)
1.00	63	5.1	10.1	7.5	5.0	68	5ADC4100(1)C6(2)	F5ADC4100(1)C6(2)
1.20	63	5.1	10.1	7.5	5.0	68	5ADC4120(1)C6(2)	F5ADC4120(1)C6(2)
1.50	63	5.1	10.1	7.5	5.0	68	5ADC4150(1)C6(2)	F5ADC4150(1)C6(2)
1.80	63	6.1	11.1	7.5	5.0	68	5ADC4180(1)C7(2)	F5ADC4180(1)C7(2)
2.20	63	6.1	11.1	7.5	5.0	68	5ADC4220(1)C7(2)	F5ADC4220(1)C7(2)
0.10	18	5.2	11.1	13.4	10.0	22	5ABF3100(1)B2(2)	F5ABF3100(1)B2(2)
0.10	18	5.2	11.1	13.4	10.0	27	5ABF3100(1)E2(2)	F5ABF3100(1)E2(2)
0.22	18	5.2	11.1	13.4	10.0	22	5ABF3220(1)B2(2)	F5ABF3220(1)B2(2)
0.22	18	5.2	11.1	13.4	10.0	27	5ABF3220(1)E2(2)	F5ABF3220(1)E2(2)
0.33	18	5.2	11.1	13.4	10.0	22	5ABF3330(1)B2(2)	F5ABF3330(1)B2(2)
0.33	18	5.2	11.1	13.4	10.0	27	5ABF3330(1)E2(2)	F5ABF3330(1)E2(2)
0.47	18	5.2	11.1	13.4	10.0	22	5ABF3470(1)B2(2)	F5ABF3470(1)B2(2)
0.47	18	5.2	11.1	13.4	10.0	27	5ABF3470(1)E2(2)	F5ABF3470(1)E2(2)
0.56	18	5.2	11.1	13.4	10.0	22	5ABF3560(1)B2(2)	F5ABF3560(1)B2(2)
0.56	18	5.2	11.1	13.4	10.0	27	5ABF3560(1)E2(2)	F5ABF3560(1)E2(2)
0.68	18	5.2	11.1	13.4	10.0	22	5ABF3680(1)B2(2)	F5ABF3680(1)B2(2)
0.68	18	5.2	11.1	13.4	10.0	27	5ABF3680(1)E2(2)	F5ABF3680(1)E2(2)
0.82	18	5.2	11.1	13.4	10.0	22	5ABF3820(1)B2(2)	F5ABF3820(1)B2(2)
0.82	18	5.2	11.1	13.4	10.0	27	5ABF3820(1)E2(2)	F5ABF3820(1)E2(2)
1.00	18	5.2	11.1	13.4	10.0	22	5ABF4100(1)B2(2)	F5ABF4100(1)B2(2)
1.00	18	5.2	11.1	13.4	10.0	27	5ABF4100(1)E2(2)	F5ABF4100(1)E2(2)
1.20	18	6.2	12.1	13.4	10.0	22	5ABF4120(1)B3(2)	F5ABF4120(1)B3(2)
1.20	18	6.2	12.1	13.4	10.0	27	5ABF4120(1)E3(2)	F5ABF4120(1)E3(2)
1.50	18	6.2	12.1	13.4	10.0	22	5ABF4150(1)B3(2)	F5ABF4150(1)B3(2)
1.50	18	6.2	12.1	13.4	10.0	27	5ABF4150(1)E3(2)	F5ABF4150(1)E3(2)
0.10	25	5.2	11.1	13.4	10.0	33	5AHF3100(1)A2(2)	F5AHF3100(1)A2(2)
0.22	25	5.2	11.1	13.4	10.0	33	5AHF3220(1)A2(2)	F5AHF3220(1)A2(2)

(1) Insert lead and packaging code. See Ordering Options Table for available options.

(2) K = 10%, M = 20%.

**Table 1 – Ratings & Part Number Reference cont'd**

Capacitance Value (µF)	VDC	Max Dimensions in mm			Lead Spacing (p)	Varistor Voltage (VDC)	New KEMET Part Number	Legacy Part Number
		B	H	L				
0.33	25	5.2	11.1	13.4	10.0	33	5AHF3330(1)A2(2)	F5AHF3330(1)A2(2)
0.47	25	5.2	11.1	13.4	10.0	33	5AHF3470(1)A2(2)	F5AHF3470(1)A2(2)
0.56	25	5.2	11.1	13.4	10.0	33	5AHF3560(1)A2(2)	F5AHF3560(1)A2(2)
0.68	25	5.2	11.1	13.4	10.0	33	5AHF3680(1)A2(2)	F5AHF3680(1)A2(2)
0.82	25	5.2	11.1	13.4	10.0	33	5AHF3820(1)A2(2)	F5AHF3820(1)A2(2)
1.00	25	5.2	11.1	13.4	10.0	33	5AHF4100(1)A2(2)	F5AHF4100(1)A2(2)
1.20	25	6.2	12.1	13.4	10.0	33	5AHF4120(1)A3(2)	F5AHF4120(1)A3(2)
1.50	25	6.2	12.1	13.4	10.0	33	5AHF4150(1)A3(2)	F5AHF4150(1)A3(2)
0.10	30	5.2	11.1	13.4	10.0	39	5AJF3100(1)D2(2)	F5AJF3100(1)D2(2)
0.10	30	5.2	11.1	13.4	10.0	47	5AJF3100(1)I2(2)	F5AJF3100(1)I2(2)
0.22	30	5.2	11.1	13.4	10.0	39	5AJF3220(1)D2(2)	F5AJF3220(1)D2(2)
0.22	30	5.2	11.1	13.4	10.0	47	5AJF3220(1)I2(2)	F5AJF3220(1)I2(2)
0.33	30	5.2	11.1	13.4	10.0	39	5AJF3330(1)D2(2)	F5AJF3330(1)D2(2)
0.33	30	5.2	11.1	13.4	10.0	47	5AJF3330(1)I2(2)	F5AJF3330(1)I2(2)
0.47	30	5.2	11.1	13.4	10.0	39	5AJF3470(1)D2(2)	F5AJF3470(1)D2(2)
0.47	30	5.2	11.1	13.4	10.0	47	5AJF3470(1)I2(2)	F5AJF3470(1)I2(2)
0.56	30	5.2	11.1	13.4	10.0	39	5AJF3560(1)D2(2)	F5AJF3560(1)D2(2)
0.56	30	5.2	11.1	13.4	10.0	47	5AJF3560(1)I2(2)	F5AJF3560(1)I2(2)
0.68	30	5.2	11.1	13.4	10.0	39	5AJF3680(1)D2(2)	F5AJF3680(1)D2(2)
0.68	30	5.2	11.1	13.4	10.0	47	5AJF3680(1)I2(2)	F5AJF3680(1)I2(2)
0.82	30	5.2	11.1	13.4	10.0	39	5AJF3820(1)D2(2)	F5AJF3820(1)D2(2)
0.82	30	5.2	11.1	13.4	10.0	47	5AJF3820(1)I2(2)	F5AJF3820(1)I2(2)
1.00	30	5.2	11.1	13.4	10.0	39	5AJF4100(1)D2(2)	F5AJF4100(1)D2(2)
1.00	30	5.2	11.1	13.4	10.0	47	5AJF4100(1)I2(2)	F5AJF4100(1)I2(2)
1.20	30	6.2	12.1	13.4	10.0	39	5AJF4120(1)D3(2)	F5AJF4120(1)D3(2)
1.20	30	6.2	12.1	13.4	10.0	47	5AJF4120(1)I3(2)	F5AJF4120(1)I3(2)
1.50	30	6.2	12.1	13.4	10.0	39	5AJF4150(1)D3(2)	F5AJF4150(1)D3(2)
1.50	30	6.2	12.1	13.4	10.0	47	5AJF4150(1)I3(2)	F5AJF4150(1)I3(2)
0.10	45	5.2	11.1	13.4	10.0	56	5ANF3100(1)B2(2)	F5ANF3100(1)B2(2)
0.22	45	5.2	11.1	13.4	10.0	56	5ANF3220(1)B2(2)	F5ANF3220(1)B2(2)
0.33	45	5.2	11.1	13.4	10.0	56	5ANF3330(1)B2(2)	F5ANF3330(1)B2(2)
0.47	45	5.2	11.1	13.4	10.0	56	5ANF3470(1)B2(2)	F5ANF3470(1)B2(2)
0.56	45	5.2	11.1	13.4	10.0	56	5ANF3560(1)B2(2)	F5ANF3560(1)B2(2)
0.68	45	5.2	11.1	13.4	10.0	56	5ANF3680(1)B2(2)	F5ANF3680(1)B2(2)
0.82	45	5.2	11.1	13.4	10.0	56	5ANF3820(1)B2(2)	F5ANF3820(1)B2(2)
1.00	45	5.2	11.1	13.4	10.0	56	5ANF4100(1)B2(2)	F5ANF4100(1)B2(2)
1.20	45	6.2	12.1	13.4	10.0	56	5ANF4120(1)B3(2)	F5ANF4120(1)B3(2)
1.50	45	6.2	12.1	13.4	10.0	56	5ANF4150(1)B3(2)	F5ANF4150(1)B3(2)
0.10	50	5.2	11.1	13.4	10.0	68	5ACF3100(1)C2(2)	F5ACF3100(1)C2(2)
0.22	50	5.2	11.1	13.4	10.0	68	5ACF3220(1)C2(2)	F5ACF3220(1)C2(2)
0.33	50	5.2	11.1	13.4	10.0	68	5ACF3330(1)C2(2)	F5ACF3330(1)C2(2)
0.47	50	5.2	11.1	13.4	10.0	68	5ACF3470(1)C2(2)	F5ACF3470(1)C2(2)
0.56	50	5.2	11.1	13.4	10.0	68	5ACF3560(1)C2(2)	F5ACF3560(1)C2(2)
0.68	50	5.2	11.1	13.4	10.0	68	5ACF3680(1)C2(2)	F5ACF3680(1)C2(2)
0.82	50	5.2	11.1	13.4	10.0	68	5ACF3820(1)C2(2)	F5ACF3820(1)C2(2)
1.00	50	5.2	11.1	13.4	10.0	68	5ACF4100(1)C2(2)	F5ACF4100(1)C2(2)
1.20	50	6.2	12.1	13.4	10.0	68	5ACF4120(1)C3(2)	F5ACF4120(1)C3(2)
1.50	50	6.2	12.1	13.4	10.0	68	5ACF4150(1)C3(2)	F5ACF4150(1)C3(2)
0.10	63	5.2	11.1	13.4	10.0	68	5ADF3100(1)C2(2)	F5ADF3100(1)C2(2)
0.22	63	5.2	11.1	13.4	10.0	68	5ADF3220(1)C2(2)	F5ADF3220(1)C2(2)
0.33	63	5.2	11.1	13.4	10.0	68	5ADF3330(1)C2(2)	F5ADF3330(1)C2(2)
0.47	63	5.2	11.1	13.4	10.0	68	5ADF3470(1)C2(2)	F5ADF3470(1)C2(2)
0.56	63	5.2	11.1	13.4	10.0	68	5ADF3560(1)C2(2)	F5ADF3560(1)C2(2)
0.68	63	5.2	11.1	13.4	10.0	68	5ADF3680(1)C2(2)	F5ADF3680(1)C2(2)
0.82	63	5.2	11.1	13.4	10.0	68	5ADF3820(1)C2(2)	F5ADF3820(1)C2(2)
1.00	63	5.2	11.1	13.4	10.0	68	5ADF4100(1)C2(2)	F5ADF4100(1)C2(2)
1.20	63	6.2	12.1	13.4	10.0	68	5ADF4120(1)C3(2)	F5ADF4120(1)C3(2)
1.50	63	6.2	12.1	13.4	10.0	68	5ADF4150(1)C3(2)	F5ADF4150(1)C3(2)
Capacitance Value (µF)	VDC	B (mm)	H (mm)	L (mm)	Lead Spacing (p)	Varistor Voltage (VDC)	New KEMET Part Number	Legacy Part Number

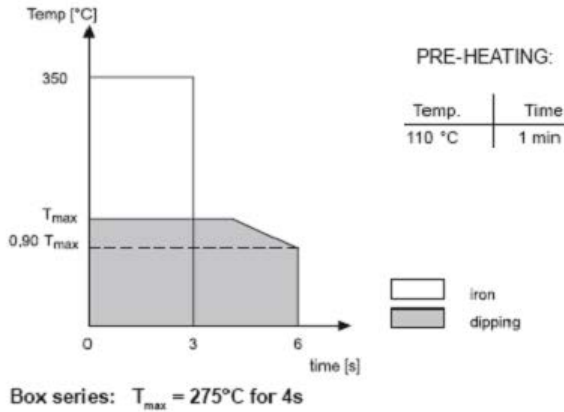
(1) Insert lead and packaging code. See Ordering Options Table for available options.

(2) K = 10%, M = 20%.



## Maximum Soldering Temperature

- Set the temperature so that inside the element the maximum temperature is below 160°C
- Solder within the following temperature profiles, especially for iron soldering:



## General Conditions

- If two solderings are needed, please apply a recovery time until the temperature on the capacitor surface is below 50°C.
- Avoid any passing through adhesive curing oven when fixing surface mount parts in combination with through-hole parts. Insert through-hole parts only after the curing of surface mount parts.
- Avoid reflow soldering by combining the lead type with surface mount parts

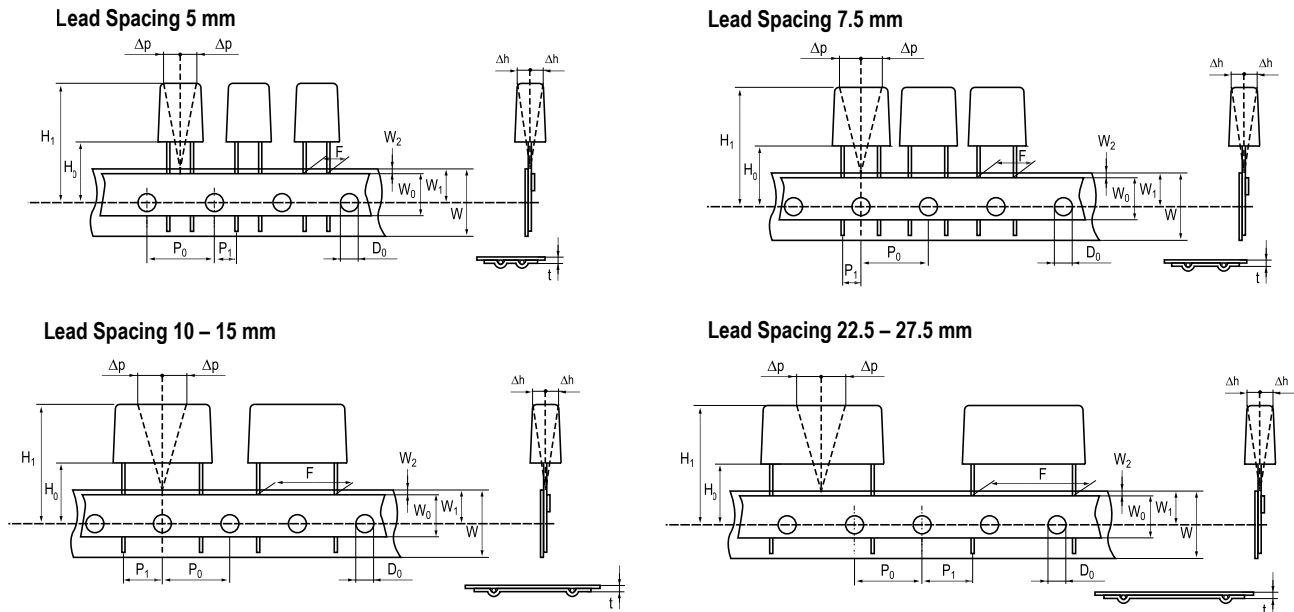
## Marking

- Capacitance
- Tolerance
- DC rated voltage
- Series (F5A)
- Manufacturing date code

## Packaging Quantities

Lead Spacing	Thickness (mm)	Height (mm)	Length (mm)	Bulk Short Leads	Bulk Long Leads	Standard Reel ø 355 mm	Large Reel ø 500 mm	Ammo
5	4.6	9.6	7.4	1500	2000	1400		1900
	5.1	10.1	7.5	1000	1500	1200		1700
	6.1	11.1	7.5	2000	1000	1000		1400
	7.3	13.1	7.5	1500	750	800		1150
10	5.2	11.1	13.4	1300	2000	600	1250	800
	6.2	12.1	13.4	1000	1800	500	1000	680

## Lead Taping & Packaging (IEC 60286–2)



## 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 <sup>+1/-0.5</sup>
Hold-down tape width	Minimum	W <sub>0</sub>	6	6	9	10	10	10	
Position of sprocket hole	+/-0.5	W <sub>1</sub>	9	9	9	9	9	9	9 <sup>+0.75/-0.5</sup>
Distance between tapes	Maximum	W <sub>2</sub>	3	3	3	3	3	3	3
Sprocket hole diameter	+/-0.2	D <sub>0</sub>	4	4	4	4	4	4	4
Feed hole lead spacing	+/-0.2 <sup>(1)</sup>	P <sub>0</sub> <sup>(3)</sup>	12.7	12.7	12.7	12.7	12.7	12.7	12.7
Distance lead – feed hole	+/-0.7	P <sub>1</sub>	3.85	3.75	7.7	5.2	7.8	5.3	P <sup>1</sup>
Deviation tape – plane	Maximum	$\Delta p$	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Lateral deviation	+/-2	$\Delta h$	2	2	2	2	2	2	2
Total thickness	+/-0.2	t	0.7	0.7	0.7	0.7	0.9 <sup>MAX</sup>	0.9 <sup>MAX</sup>	0.9 <sup>MAX</sup>
Sprocket hole/cap body	+/-0.5	H <sub>0</sub> <sup>(2)</sup>	18.5 <sup>+/-0.5</sup>	18.5 <sup>+/-0.5</sup>	18.5 <sup>+/-0.5</sup>	18.5 <sup>+/-0.5</sup>	18.5 <sup>+/-0.5</sup>	18.5 <sup>+/-0.5</sup>	18 <sup>+2/-0</sup>

(1) Maximum cumulative feed hole error, 1 mm per 20 parts.

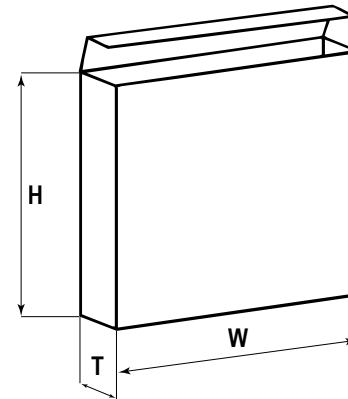
(2) 16.5 mm available on request.

(3) 15 mm available on request ( $F \geq 10$  mm).

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

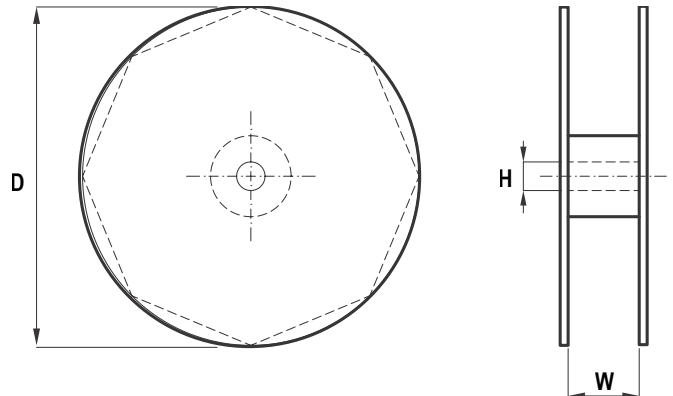
### Ammo Specifications

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	355 500	30	55 (Max)
F5A, F5B, F5D		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	0
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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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.

**Warning:** The component F5A is a combined passive suppression component. Overloading with high voltage or voltage transients can strongly damage the component with the risk of fire.

**Remark:** For technical reasons, the varistor may not be covered fully by resin. This does not constitute grounds for complaint. The varistors are specified for the same range of temperature and climate as the combined elements. They do not require protection by the resin.



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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