

# F5A, Metallized Polyester Film with Integrated Ceramic Varistor, 18 – 45 VDC

## Overview

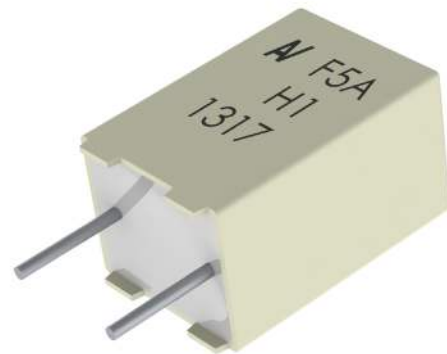
The F5A series is a metallized polyester (MKT) film capacitor with an integrated ceramic varistor, encapsulated in a thermosetting, resin-filled, plastic box with tinned wire leads. Box material is solvent-resistant and flame-retardant, meeting the requirements of UL 94 V-0.

## Applications

For 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 for superior suppression results
- Approvals: AEC-Q200, ISO 7637
- Rated Voltage: 18 – 45 VDC
- Capacitance Range: 0.1 – 2.2  $\mu$ F
- Lead Spacing: 5 – 10 mm
- Capacitance Tolerance:  $\pm$ 10%,  $\pm$ 20%
- Climatic Category: 55/125/56 IEC 60068-1
- Tape & Reel packaging in accordance with IEC 60286-2
- RoHS compliance and lead-free terminations
- Operating temperature range: -55°C to +125°C



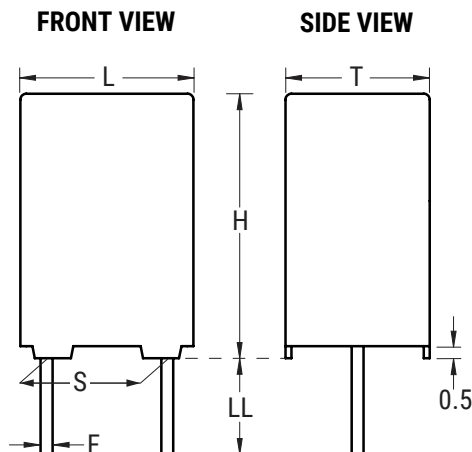
## Part Number System

F5A	H	C	4100	DQ	A	6	K
Series	Rated Voltage (VDC)	Lead Spacing (mm)	Capacitance Code (pF)	Lead and Packaging Code	Varistor Voltage $V_V$ at 1 mA	Size Code	Capacitance Tolerance
Film Capacitor/ Ceramic Varistor Unit	B = 18 H = 25 J = 30 N = 45	C = 5 F = 10	Digits 2 - 4 indicate the first three digits of the capacitance value. The 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%

## 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

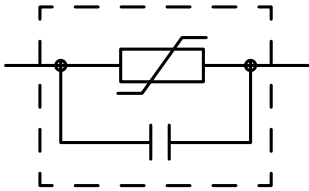
## Dimensions – Millimeters



Rated Capacitance $\mu\text{F}$	Size Code	S		T		H		L		F	
		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	0.75	±0.05
1.2 – 1.5	3	10.0	±0.4	6.2	Maximum	12.1	Maximum	13.4	Maximum	0.75	±0.05

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

## Circuit Diagram



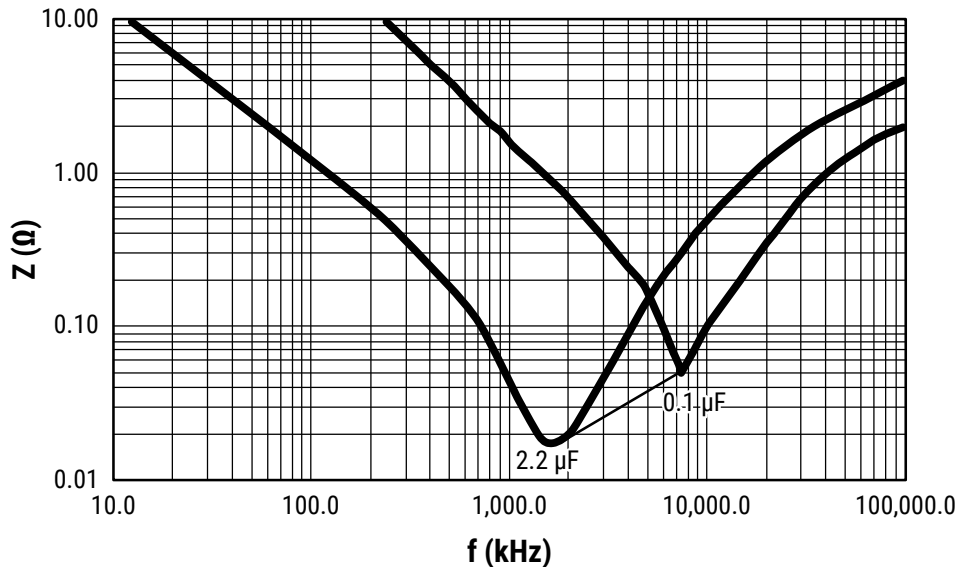
## Varistor Voltage Table

Part Number Digit 4		Part Number Digit 12		Clamping Voltage (1 A, Pulse 8/20 $\mu$ s)
Letter	$V_{R_{low}}$ (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

## Performance Characteristics

Rated Voltage	18 – 45 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)
Insulation Resistance	$V_R < 24$ V 1 M $\Omega$ at 12 V $V_R \geq 24$ V 1 M $\Omega$ at 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% R.H., 56 days	Δ C/C	≤ 5%
		V <sub>v</sub> change	≤ 10%
		DF change	≤ 50 x 10 <sup>-4</sup> at 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> at 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> at 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> at 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> at 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> at 1 kHz
		Leakage current at V <sub>R</sub>	≤ 200 μA

## Environmental Compliance

All KEMET pulse capacitors are RoHS compliant.



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

Capacitance Value (µF)	VDC	Max Dimensions in mm			Lead Spacing (S)	Varistor Voltage (VDC)	KEMET Part Number	Legacy Part Number
		T	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)
Capacitance Value (µF)	VDC	T (mm)	H (mm)	L (mm)	Lead Spacing (S)	Varistor Voltage (VDC)	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.**

Capacitance Value (µF)	VDC	Max Dimensions in mm			Lead Spacing (S)	Varistor Voltage (VDC)	KEMET Part Number	Legacy Part Number
		T	H	L				
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)
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	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)
0.33	25	5.2	11.1	13.4	10.0	33	5AHF3330(1)A2(2)	F5AHF3330(1)A2(2)
Capacitance Value (µF)	VDC	T (mm)	H (mm)	L (mm)	Lead Spacing (S)	Varistor Voltage (VDC)	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.**

Capacitance Value (µF)	VDC	Max Dimensions in mm			Lead Spacing (S)	Varistor Voltage (VDC)	KEMET Part Number	Legacy Part Number
		T	H	L				
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)
Capacitance Value (µF)	VDC	T (mm)	H (mm)	L (mm)	Lead Spacing (S)	Varistor Voltage (VDC)	KEMET Part Number	Legacy Part Number

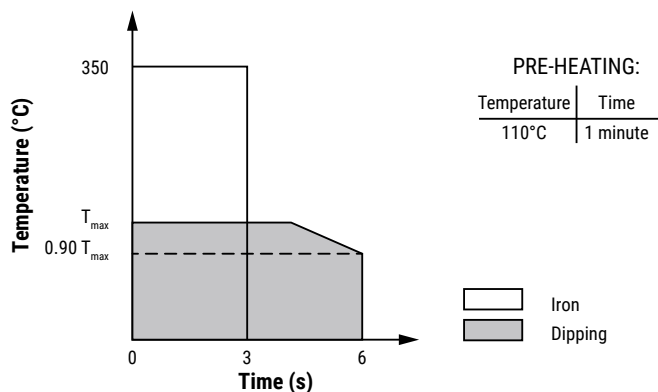
(1) Insert lead and packaging code. See Ordering Options Table for available options.

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

## Maximum Soldering Temperature

In order to achieve optimal solderability, we suggest the following:

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

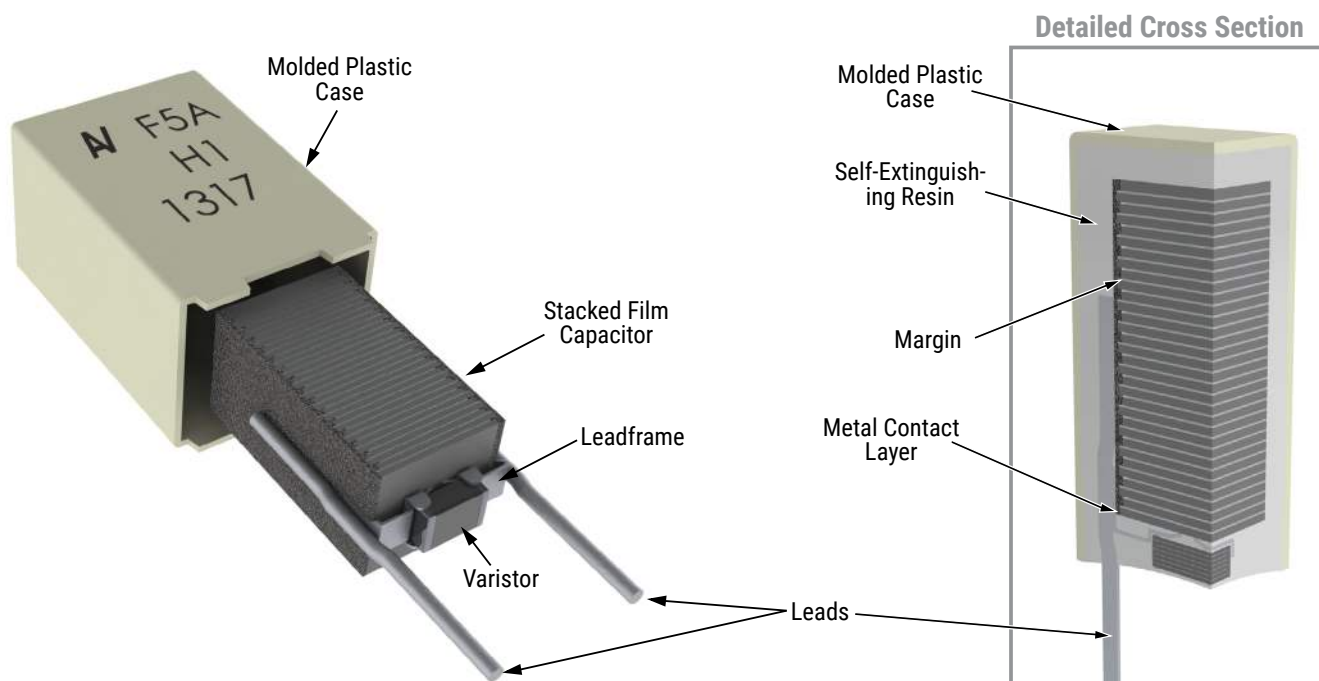


Box series:  $T_{max} = 275^{\circ}\text{C}$  for 4 seconds

## General Conditions

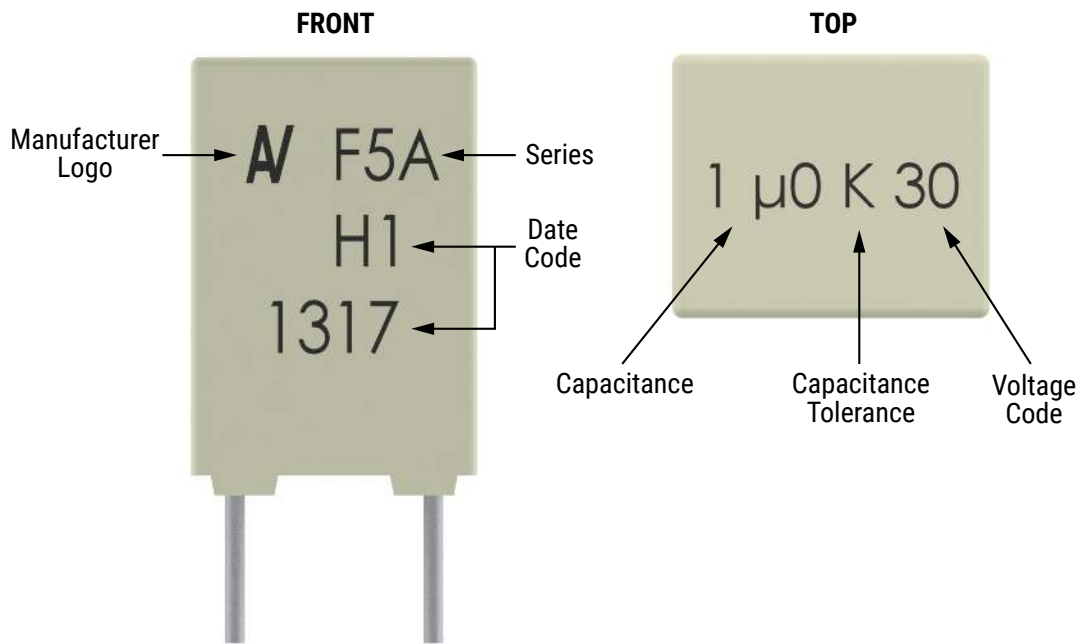
- If two solderings are required, allow for recovery time until the temperature on the capacitor surface is below 50°C.
- Avoid passing through the adhesive curing oven when fixing surface-mount parts in combination with through-hole parts. Insert through-hole parts only after curing the surface-mount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

## Construction





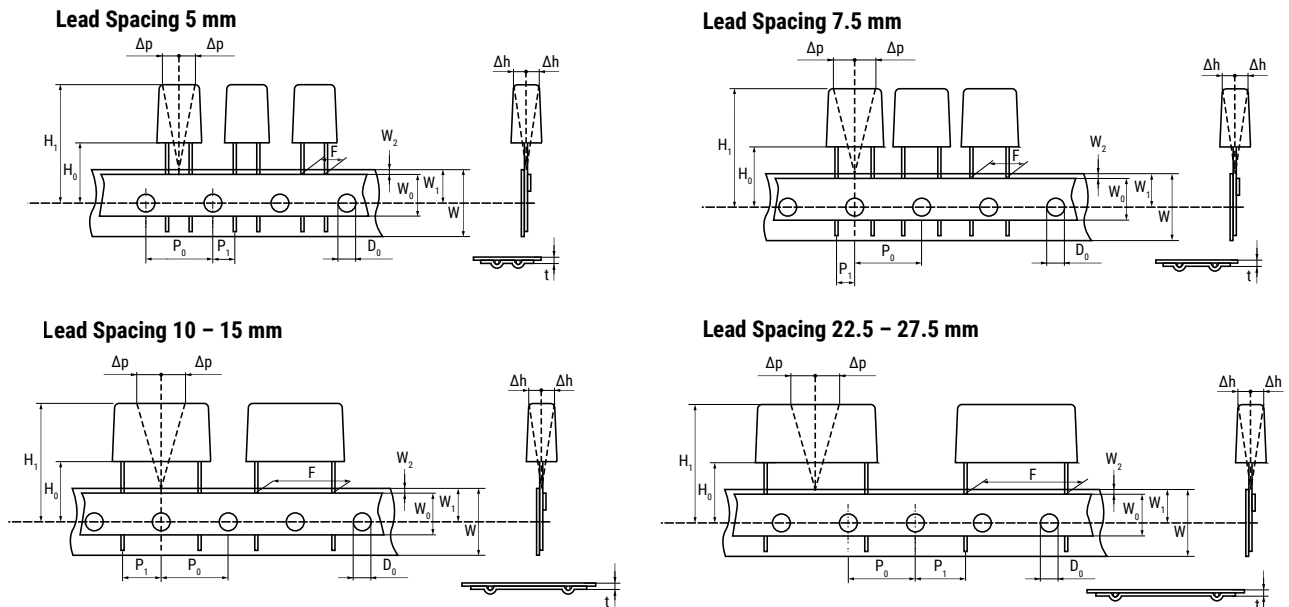
## Marking



## Packaging Quantities

Lead Spacing	Thickness (mm)	Height (mm)	Length (mm)	Bulk Short Leads	Bulk Long Leads	Standard Reel 355 mm	Large Reel 500 mm	Ammo
5	4.6	9.6	7.4	1,500	2,000	1,400		1,900
	5.1	10.1	7.5	1,000	1,500	1,200		1,700
	6.1	11.1	7.5	2,000	1,000	1,000		1,400
	7.3	13.1	7.5	1,500	750	800		1,150
10	5.2	11.1	13.4	1,300	2,000	600	1,250	800
	6.2	12.1	13.4	1,000	1,800	500	1,000	680

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



## Taping Specification

Dimensions in mm									Standard IEC 60286-2
Lead Spacing	+0.6/-0.1	F	5.0	7.5	10.0	15.0	22.5	27.5	F
Carrier Tape Width	+1/-0.5	W	18.0	18.0	18.0	18.0	18.0	18.0	18 <sup>+1/-0.5</sup>
Hold-Down Tape Width	Minimum	$W_0$	6.0	6.0	9.0	10.0	10.0	10.0	
Position of Sprocket Hole	±0.5	$W_1$	9.0	9.0	9.0	9.0	9.0	9.0	9 <sup>+0.75/-0.5</sup>
Distance Between Tapes	Maximum	$W_2$	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sprocket Hole Diameter	±0.2	$D_0$	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Feed Hole Lead Spacing	±0.2 <sup>(1)</sup>	$P_0$ <sup>(3)</sup>	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	$P^1$
Deviation Tape – Plane	Maximum	$\Delta p$	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Lateral Deviation	±2	$\Delta h$	2.0	2.0	2.0	2.0	2.0	2.0	2.0
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	$H_0$ <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.

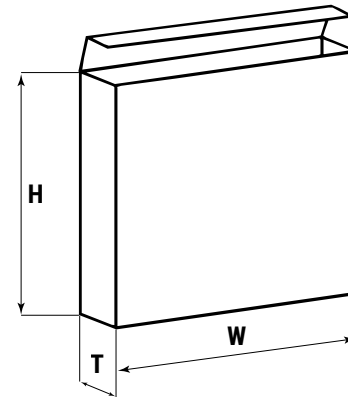
(2) 16.5 mm available on request.

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

## Lead Taping & Packaging (IEC 60286-2) cont.

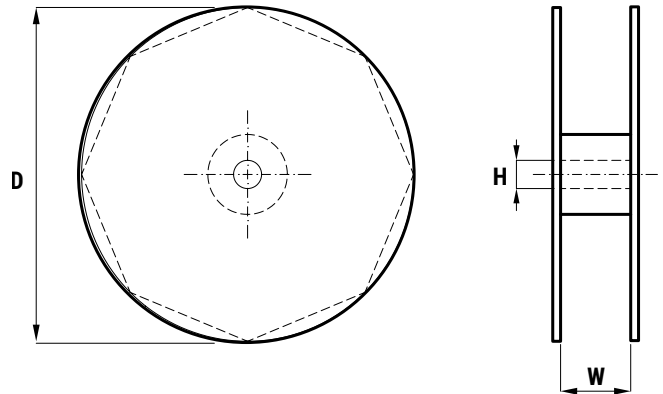
### Ammo Specifications

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



### Reel Specifications

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



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Although KEMET designs and manufactures its 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.

**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. 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.

Note: 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.