

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

Overview

The F5A Series is a metallized polypropylene (MKT) film capacitor with integrated ceramic capacitor 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.

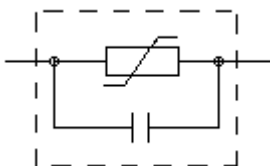
Benefits

- 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 μ F to 2.2 μ 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°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 @ 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 = $\pm 20\%$

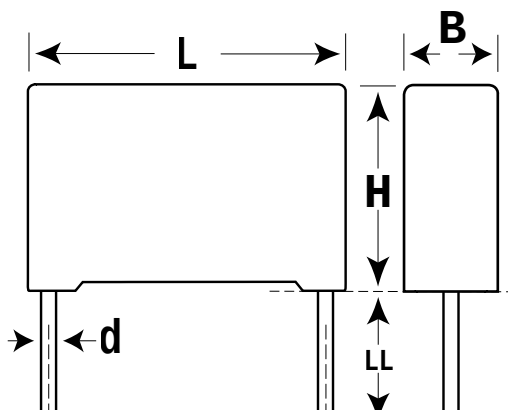
Circuit Diagram



Ordering Options Table

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

Dimensions – Millimeters



Rated Capacitance μF	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.											

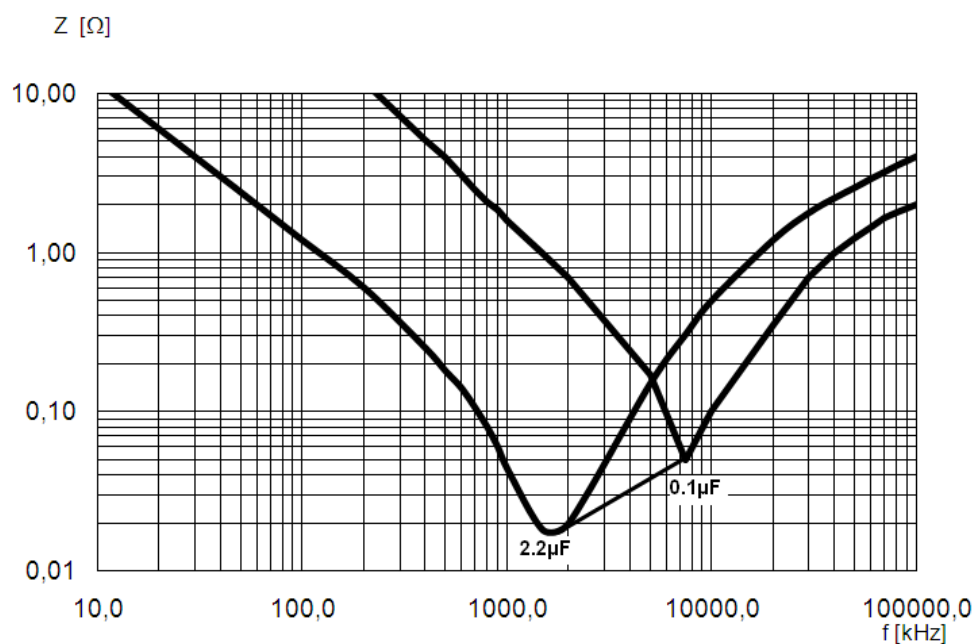
Varistor Voltage Table

Part Number Digit 4		Part Number Digit 12		Clamping Voltage (1A, Pulse 8/20 μ 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 μF
Capacitance Tolerance	$\pm 10\%$, $\pm 20\%$
Temperature Range	-55°C to +125°C
Climatic Category	55/125/56, IEC 60068-1
Leakage Current	$\leq 50 \mu\text{A}$ at V_R
Approvals	AEC-Q200, ISO 7637
Dissipation Factor	0.01 (1 kHz at 25°C $\pm 5^\circ\text{C}$)
Test Voltage Between Terminals	100 VDC
Insulation Resistance	100 M Ω @ 50 V
Varistor	Multilayer ceramic, EIA case size 1206
Peak Current Pulse	8/20 μs
Peak Current for $V_v < 50 \text{ V}$	200 A
Peak Current for $V_v > 50 \text{ V}$	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 _v change	≤ 10%
		DF change	≤ 50 x 10 ⁻⁴ @ 1 kHz
		Leakage current at V _R	≤ 100 μA
Endurance	+125°C ±2°C/100°C ±2°C, 0.5 x V _R /1.0 x V _R , 1,000 hours	Δ C/C	≤ 10%
		V _v change	≤ 10%
		DF change	≤ 50 x 10 ⁻⁴ @ 1 kHz
		Leakage current at V _R	≤ 100 μA
Resistance to Soldering Heat	+260°C ±5°C, 10 ±1 second	Δ C/C	≤ 3%
		V _v change	≤ 5%
		DF change	≤ 30 x 10 ⁻⁴ @ 1 kHz
		Leakage current at V _R	≤ 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 _v change	≤ 10%
		DF change	≤ 30 x 10 ⁻⁴ @ 1 kHz
		Leakage current at V _R	≤ 100 μA
Long Term Stability (After 2 Years)	-40°C to +80°C, ≤ 70% Humidity	Δ C/C	≤ 3%
		V _v change	≤ 5%
		DF change	≤ 20 x 10 ⁻⁴ @ 1 kHz
		Leakage current at V _R	≤ 50 μA
Reliability Failure Criteria	Reference MIL HDB 217 +40°C ±2°C, 0.5 x V _R , ≤ 5 FIT	Δ C/C	> 10%
		V _v change	≤ 10%
		DF change	≤ 20 x 10 ⁻⁴ @ 1 kHz
		Leakage current at V _R	≤ 200 μA

Environmental Compliance

All KEMET EMI capacitors are RoHS Compliant.



RoHS Compliant

Table 1 – Ratings & Part Number Reference

Cap Value (μ F)	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)
Cap Value (μ F)	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

Cap Value (μ F)	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)J7(2)	F5AJC4220(1)J7(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)
Cap Value (μ F)	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

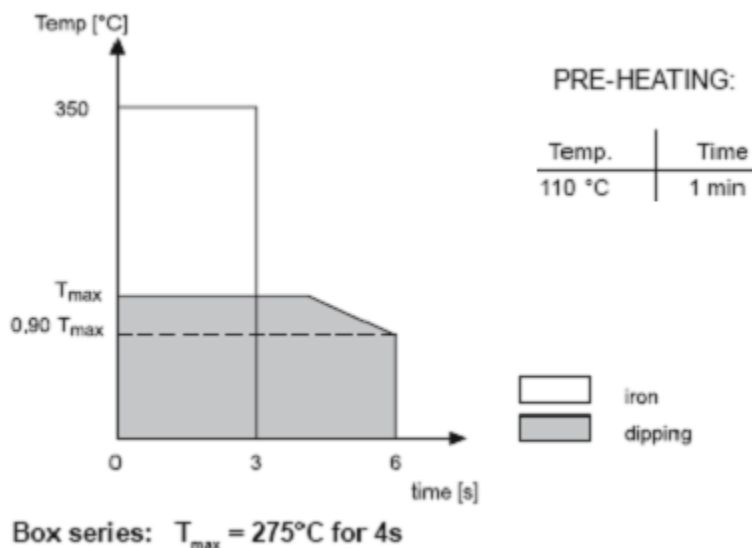
Cap Value (μ F)	VDC	Max Dimensions in mm			Lead Spacing (p)	Varistor Voltage (VDC)	New KEMET Part Number	Legacy Part Number
		B	H	L				
0.33	25	5.2	11.1	13.4	10.0	33	5AHF3330(1)A2(2)	F5AHF3330(1)A2(2)
0.47	25	5.2	11.1	13.4	10.0	33	5AHF3470(1)A2(2)	F5AHF3470(1)A2(2)
0.56	25	5.2	11.1	13.4	10.0	33	5AHF3560(1)A2(2)	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)
Cap Value (μ F)	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

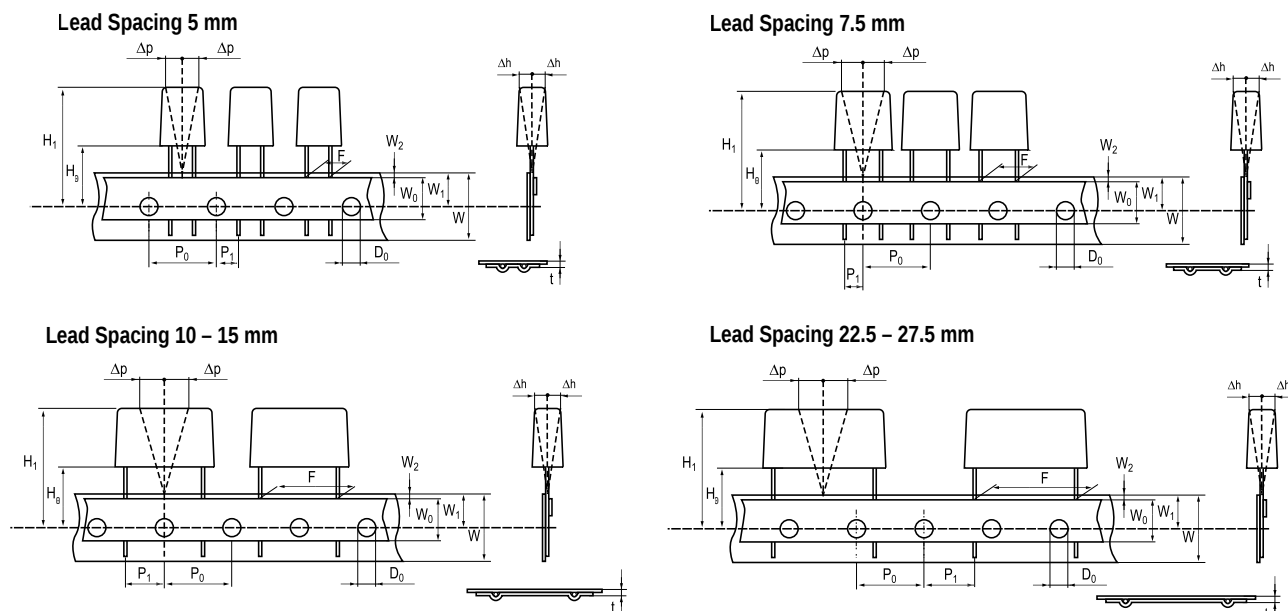
Marking

- 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 ^{+1/-0.5}
Hold-down tape width	Minimum	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	Maximum	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	P ¹
Deviation tape – plane	Maximum	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.

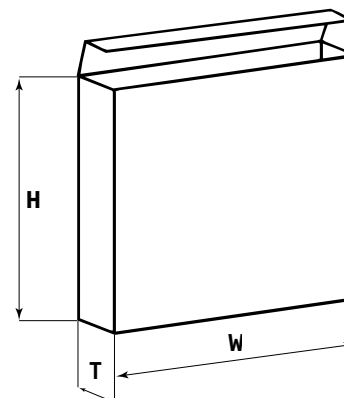
(2) 16.5 mm available on request.

(3) 15 mm available on request (F ≥ 10 mm).

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

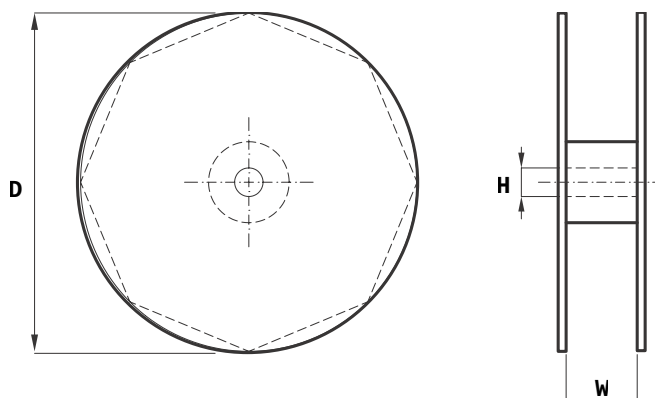
Ammo Specifications

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	355 500	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	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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West Chester, PA
Tel: 610-692-4642

Central

Novi, MI
Tel: 248-994-1030

Carmel, IN
Tel: 317-706-6742

West

Milpitas, CA
Tel: 408-433-9950

Mexico

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

Europe

Southern Europe

Geneva, Switzerland
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

Note: KEMET reserves the right to modify minor details of internal and external construction at any time in the interest of product improvement. KEMET does not assume any responsibility for infringement that might result from the use of KEMET Capacitors in potential circuit designs. KEMET is a registered trademark of KEMET Electronics Corporation.

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

Contact	
Resource	Location
Website	www.kemet.com
Contact Us	http://www.kemet.com/contact
Investor Relations	http://www.kemet.com/ir
Call Us	1-877-MyKEMET
Twitter	http://twitter.com/kemetcapacitors

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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.

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.

