

F5B Series Metallized Polyester Film with Integrated Suppression Diode 18 – 63 VDC

Overview

The F5B Series is a metallized polyester (MKT) film capacitor with an integrated suppression diode 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 advanced transient voltage suppressors for automotive motors and other suppression applications such as 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.

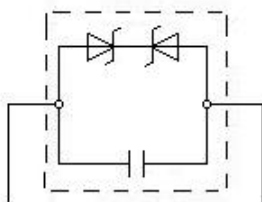
Benefits

- Low inductive MKT capacitors in parallel construction with a high power bidirectional transient voltage suppressor diode in a single case provide superior suppression results
- Approvals: AEC-Q200 (in progress), ISO7637
- Rated voltage: 18 – 63 VDC
- Capacitance range: 0.1 μ F to 2.2 μ F
- Lead spacing: 5 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 $+125^{\circ}\text{C}$

Part Number System

| F5B | H | C | 4100 | DQ | A | 7 | K |
|-------------------------------|--|-------------------|---|----------------------------|---|---------------------|----------------------------------|
| Series | Rated Voltage (VDC) | Lead Spacing (mm) | Capacitance Code (μ F) | Lead and Packaging Code | Diode Breakdown Voltage V_{BR} @ 1 mA | Size Code | Capacitance Tolerance |
| Film Capacitor/ Diode Unit | B = 18 H = 25 J = 30 N = 45 C = 50 D = 63 | C = 5 | 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 Diode Breakdown Voltage Table | See Dimension Table | K = $\pm 10\%$ M = $\pm 20\%$ |

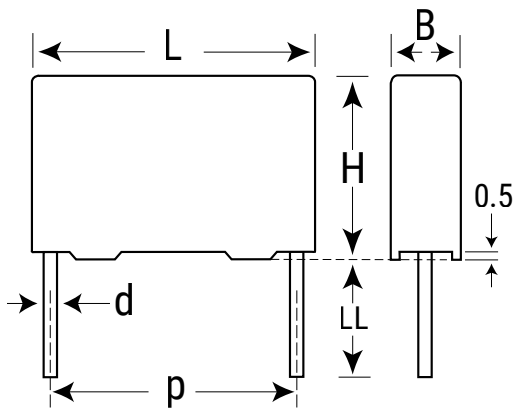
Circuit Diagram



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 |

Dimensions – Millimeters



| Rated Capacitance μ F | Size Code | p | | B | | H | | L | | d | |
|---------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| | | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance |
| 0.1 – 1.2 | 7 | 5 | +/-0.4 | 6.1 | Maximum | 11.1 | Maximum | 7.5 | Maximum | 0.6 | +/-0.05 |
| 1.5 – 2.2 | 8 | 5 | +/-0.4 | 7.3 | Maximum | 13.1 | Maximum | 7.5 | Maximum | 0.6 | +/-0.05 |

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

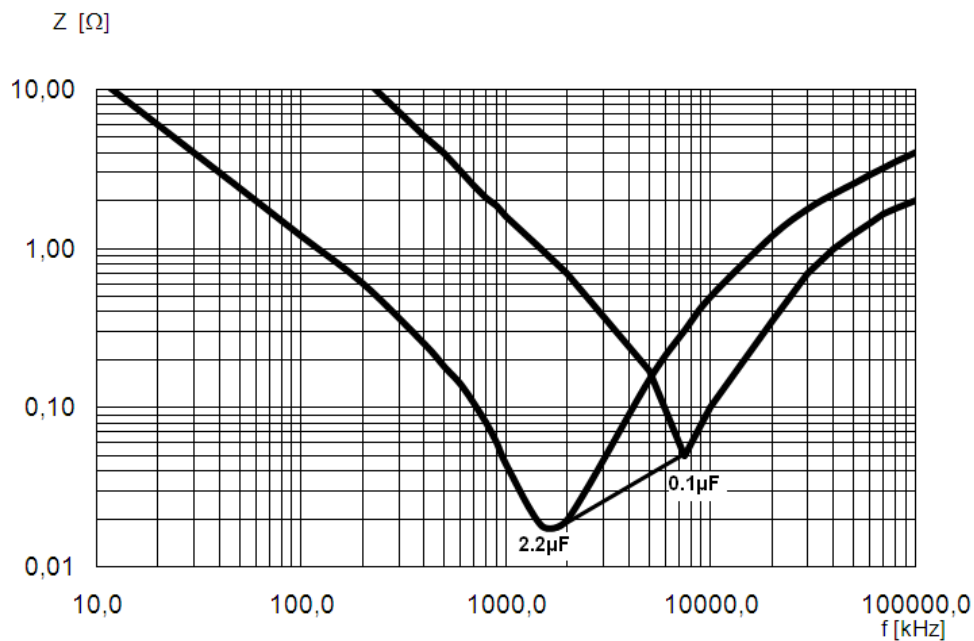
Diode Breakdown Voltage & Clamping Voltage Table

| Part Number Digit 4 | | Part Number Digit 12 | | Clamping Voltage (Pulse 10/700 μ s) | |
|------------------------|----------------------|-------------------------|-----------------------|--|--------------------|
| Letter | V _r (VDC) | Letter | V _{BR} (VDC) | V _c (V) | I _p (A) |
| B | 18 | B | 22 | 28 | 24 |
| B | 18 | E | 27 | 33 | 31 |
| H | 25 | A | 30 | 36 | 20 |
| H | 25 | C | 33 | 40 | 19 |
| J | 30 | D | 36 | 43 | 18 |
| J | 30 | I | 39 | 46 | 17 |
| J | 30 | N | 44 | 52 | 16 |
| N | 45 | B | 53 | 62 | 14 |
| C | 50 | C | 68 | 78 | 12 |
| D | 63 | C | 78 | 89 | 11 |

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 μ 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 μ A at V_R |
| Approvals | AEC-Q200 (in progress), ISO 7637-2 |
| Dissipation Factor | 0.01 (1 kHz at 25°C \pm 5°C) |
| Test Voltage Between Terminals | 100 VDC |
| Insulation Resistance | $V_R < 24$ V 1M Ω @ 12 V, $V_R \geq 24$ V 1M Ω @ 24 V |
| Diode | 600 W TVS diode, bidirectional |
| Peak Current Pulse | 10/700 μ s |
| Peak Current | See Diode Breakdown Voltage & Clamping Voltage Table |

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 _{BR} 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 _{BR} 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 _{BR} change | ≤ 5% |
| | | DF change | ≤ 30 x 10 ⁻⁴ @ 1 kHz |
| | | Leakage current at V _R | ≤ 50 μA |
| Peak Current Derating | Pulse 10/700 μs, 300 V _p , 100 cycles with alternating polarity, 120 seconds between each current peak | Δ C/C | ≤ 10% |
| | | V _{BR} 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 _{BR} 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 _{BR} 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.

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 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3100(1)B7(2) | F5BBC3100(1)B7(2) |
| 0.10 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3100(1)E7(2) | F5BBC3100(1)E7(2) |
| 0.22 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3220(1)B7(2) | F5BBC3220(1)B7(2) |
| 0.22 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3220(1)E7(2) | F5BBC3220(1)E7(2) |
| 0.33 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3330(1)B7(2) | F5BBC3330(1)B7(2) |
| 0.33 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3330(1)E7(2) | F5BBC3330(1)E7(2) |
| 0.47 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3470(1)B7(2) | F5BBC3470(1)B7(2) |
| 0.47 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3470(1)E7(2) | F5BBC3470(1)E7(2) |
| 0.56 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3560(1)B7(2) | F5BBC3560(1)B7(2) |
| 0.56 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3560(1)E7(2) | F5BBC3560(1)E7(2) |
| 0.68 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3680(1)B7(2) | F5BBC3680(1)B7(2) |
| 0.68 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3680(1)E7(2) | F5BBC3680(1)E7(2) |
| 0.82 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC3820(1)B7(2) | F5BBC3820(1)B7(2) |
| 0.82 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC3820(1)E7(2) | F5BBC3820(1)E7(2) |
| 1.00 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC4100(1)B7(2) | F5BBC4100(1)B7(2) |
| 1.00 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC4100(1)E7(2) | F5BBC4100(1)E7(2) |
| 1.20 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 22 | 5BBC4120(1)B7(2) | F5BBC4120(1)B7(2) |
| 1.20 | 18 | 6.1 | 11.1 | 7.5 | 5.0 | 27 | 5BBC4120(1)E7(2) | F5BBC4120(1)E7(2) |
| 1.50 | 18 | 7.3 | 13.1 | 7.5 | 5.0 | 22 | 5BBC4150(1)B8(2) | F5BBC4150(1)B8(2) |
| 1.50 | 18 | 7.3 | 13.1 | 7.5 | 5.0 | 27 | 5BBC4150(1)E8(2) | F5BBC4150(1)E8(2) |
| 1.80 | 18 | 7.3 | 13.1 | 7.5 | 5.0 | 22 | 5BBC4180(1)B8(2) | F5BBC4180(1)B8(2) |
| 1.80 | 18 | 7.3 | 13.1 | 7.5 | 5.0 | 27 | 5BBC4180(1)E8(2) | F5BBC4180(1)E8(2) |
| 2.20 | 18 | 7.3 | 13.1 | 7.5 | 5.0 | 22 | 5BBC4220(1)B8(2) | F5BBC4220(1)B8(2) |
| 2.20 | 18 | 7.3 | 13.1 | 7.5 | 5.0 | 27 | 5BBC4220(1)E8(2) | F5BBC4220(1)E8(2) |
| 0.10 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3100(1)A7(2) | F5BHC3100(1)A7(2) |
| 0.10 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3100(1)C7(2) | F5BHC3100(1)C7(2) |
| 0.22 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3220(1)A7(2) | F5BHC3220(1)A7(2) |
| 0.22 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3220(1)C7(2) | F5BHC3220(1)C7(2) |
| 0.33 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3330(1)A7(2) | F5BHC3330(1)A7(2) |
| 0.33 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3330(1)C7(2) | F5BHC3330(1)C7(2) |
| 0.47 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3470(1)A7(2) | F5BHC3470(1)A7(2) |
| 0.47 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3470(1)C7(2) | F5BHC3470(1)C7(2) |
| 0.56 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3560(1)A7(2) | F5BHC3560(1)A7(2) |
| 0.56 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3560(1)C7(2) | F5BHC3560(1)C7(2) |
| 0.68 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3680(1)A7(2) | F5BHC3680(1)A7(2) |
| 0.68 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3680(1)C7(2) | F5BHC3680(1)C7(2) |
| 0.82 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC3820(1)A7(2) | F5BHC3820(1)A7(2) |
| 0.82 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC3820(1)C7(2) | F5BHC3820(1)C7(2) |
| 1.00 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC4100(1)A7(2) | F5BHC4100(1)A7(2) |
| 1.00 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC4100(1)C7(2) | F5BHC4100(1)C7(2) |
| 1.20 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 30 | 5BHC4120(1)A7(2) | F5BHC4120(1)A7(2) |
| 1.20 | 25 | 6.1 | 11.1 | 7.5 | 5.0 | 33 | 5BHC4120(1)C7(2) | F5BHC4120(1)C7(2) |
| 1.50 | 25 | 7.3 | 13.1 | 7.5 | 5.0 | 30 | 5BHC4150(1)A8(2) | F5BHC4150(1)A8(2) |
| 1.50 | 25 | 7.3 | 13.1 | 7.5 | 5.0 | 33 | 5BHC4150(1)C8(2) | F5BHC4150(1)C8(2) |
| 1.80 | 25 | 7.3 | 13.1 | 7.5 | 5.0 | 30 | 5BHC4180(1)A8(2) | F5BHC4180(1)A8(2) |
| 1.80 | 25 | 7.3 | 13.1 | 7.5 | 5.0 | 33 | 5BHC4180(1)C8(2) | F5BHC4180(1)C8(2) |
| 2.20 | 25 | 7.3 | 13.1 | 7.5 | 5.0 | 30 | 5BHC4220(1)A8(2) | F5BHC4220(1)A8(2) |
| 2.20 | 25 | 7.3 | 13.1 | 7.5 | 5.0 | 33 | 5BHC4220(1)C8(2) | F5BHC4220(1)C8(2) |
| 0.10 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3100(1)D7(2) | F5BJC3100(1)D7(2) |
| 0.10 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3100(1)I7(2) | F5BJC3100(1)I7(2) |
| 0.10 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3100(1)N7(2) | F5BJC3100(1)N7(2) |
| 0.22 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3220(1)D7(2) | F5BJC3220(1)D7(2) |
| 0.22 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3220(1)I7(2) | F5BJC3220(1)I7(2) |
| 0.22 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3220(1)N7(2) | F5BJC3220(1)N7(2) |
| 0.33 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3330(1)D7(2) | F5BJC3330(1)D7(2) |
| 0.33 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3330(1)I7(2) | F5BJC3330(1)I7(2) |
| 0.33 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3330(1)N7(2) | F5BJC3330(1)N7(2) |
| 0.47 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3470(1)D7(2) | F5BJC3470(1)D7(2) |
| 0.47 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3470(1)I7(2) | F5BJC3470(1)I7(2) |
| 0.47 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3470(1)N7(2) | F5BJC3470(1)N7(2) |

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

(2) Capacitance tolerance: K= +/-10%, M = +/-20%.

Table 1 – Ratings & Part Number Reference cont'd

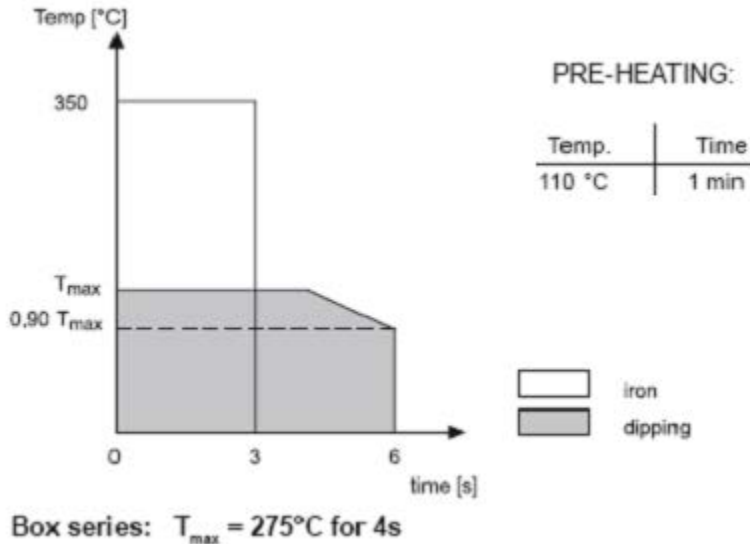
| Capacitance Value (µF) | VDC | Max Dimensions in mm | | | Lead Spacing (p) | Varistor Voltage (VDC) | New KEMET Part Number | Legacy Part Number |
|------------------------|-----|----------------------|--------|--------|------------------|------------------------|-----------------------|--------------------|
| | | B | H | L | | | | |
| 0.56 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3560(1)D7(2) | F5BJC3560(1)D7(2) |
| 0.56 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3560(1)I7(2) | F5BJC3560(1)I7(2) |
| 0.56 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3560(1)N7(2) | F5BJC3560(1)N7(2) |
| 0.68 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3680(1)D7(2) | F5BJC3680(1)D7(2) |
| 0.68 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3680(1)I7(2) | F5BJC3680(1)I7(2) |
| 0.68 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3680(1)N7(2) | F5BJC3680(1)N7(2) |
| 0.82 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC3820(1)D7(2) | F5BJC3820(1)D7(2) |
| 0.82 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC3820(1)I7(2) | F5BJC3820(1)I7(2) |
| 0.82 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC3820(1)N7(2) | F5BJC3820(1)N7(2) |
| 1.00 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC4100(1)D7(2) | F5BJC4100(1)D7(2) |
| 1.00 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC4100(1)I7(2) | F5BJC4100(1)I7(2) |
| 1.00 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC4100(1)N7(2) | F5BJC4100(1)N7(2) |
| 1.20 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 36 | 5BJC4120(1)D7(2) | F5BJC4120(1)D7(2) |
| 1.20 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 39 | 5BJC4120(1)I7(2) | F5BJC4120(1)I7(2) |
| 1.20 | 30 | 6.1 | 11.1 | 7.5 | 5.0 | 44 | 5BJC4120(1)N7(2) | F5BJC4120(1)N7(2) |
| 1.50 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 36 | 5BJC4150(1)D8(2) | F5BJC4150(1)D8(2) |
| 1.50 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 39 | 5BJC4150(1)I8(2) | F5BJC4150(1)I8(2) |
| 1.50 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 44 | 5BJC4150(1)N8(2) | F5BJC4150(1)N8(2) |
| 1.80 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 36 | 5BJC4180(1)D8(2) | F5BJC4180(1)D8(2) |
| 1.80 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 39 | 5BJC4180(1)I8(2) | F5BJC4180(1)I8(2) |
| 1.80 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 44 | 5BJC4180(1)N8(2) | F5BJC4180(1)N8(2) |
| 2.20 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 36 | 5BJC4220(1)D8(2) | F5BJC4220(1)D8(2) |
| 2.20 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 39 | 5BJC4220(1)I8(2) | F5BJC4220(1)I8(2) |
| 2.20 | 30 | 7.3 | 13.1 | 7.5 | 5.0 | 44 | 5BJC4220(1)N8(2) | F5BJC4220(1)N8(2) |
| 0.10 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3100(1)B7(2) | F5BNC3100(1)B7(2) |
| 0.22 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3220(1)B7(2) | F5BNC3220(1)B7(2) |
| 0.33 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3330(1)B7(2) | F5BNC3330(1)B7(2) |
| 0.47 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3470(1)B7(2) | F5BNC3470(1)B7(2) |
| 0.56 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3560(1)B7(2) | F5BNC3560(1)B7(2) |
| 0.68 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3680(1)B7(2) | F5BNC3680(1)B7(2) |
| 0.82 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC3820(1)B7(2) | F5BNC3820(1)B7(2) |
| 1.00 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC4100(1)B7(2) | F5BNC4100(1)B7(2) |
| 1.20 | 45 | 6.1 | 11.1 | 7.5 | 5.0 | 53 | 5BNC4120(1)B7(2) | F5BNC4120(1)B7(2) |
| 1.50 | 45 | 7.3 | 13.1 | 7.5 | 5.0 | 53 | 5BNC4150(1)B8(2) | F5BNC4150(1)B8(2) |
| 1.80 | 45 | 7.3 | 13.1 | 7.5 | 5.0 | 53 | 5BNC4180(1)B8(2) | F5BNC4180(1)B8(2) |
| 2.20 | 45 | 7.3 | 13.1 | 7.5 | 5.0 | 53 | 5BNC4220(1)B8(2) | F5BNC4220(1)B8(2) |
| 0.10 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3100(1)C7(2) | F5BCC3100(1)C7(2) |
| 0.22 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3220(1)C7(2) | F5BCC3220(1)C7(2) |
| 0.33 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3330(1)C7(2) | F5BCC3330(1)C7(2) |
| 0.47 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3470(1)C7(2) | F5BCC3470(1)C7(2) |
| 0.56 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3560(1)C7(2) | F5BCC3560(1)C7(2) |
| 0.68 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3680(1)C7(2) | F5BCC3680(1)C7(2) |
| 0.82 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC3820(1)C7(2) | F5BCC3820(1)C7(2) |
| 1.00 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC4100(1)C7(2) | F5BCC4100(1)C7(2) |
| 1.20 | 50 | 6.1 | 11.1 | 7.5 | 5.0 | 68 | 5BCC4120(1)C7(2) | F5BCC4120(1)C7(2) |
| 1.50 | 50 | 7.3 | 13.1 | 7.5 | 5.0 | 68 | 5BCC4150(1)C8(2) | F5BCC4150(1)C8(2) |
| 1.80 | 50 | 7.3 | 13.1 | 7.5 | 5.0 | 68 | 5BCC4180(1)C8(2) | F5BCC4180(1)C8(2) |
| 2.20 | 50 | 7.3 | 13.1 | 7.5 | 5.0 | 68 | 5BCC4220(1)C8(2) | F5BCC4220(1)C8(2) |
| 0.10 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3100(1)C7(2) | F5BDC3100(1)C7(2) |
| 0.22 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3220(1)C7(2) | F5BDC3220(1)C7(2) |
| 0.33 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3330(1)C7(2) | F5BDC3330(1)C7(2) |
| 0.47 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3470(1)C7(2) | F5BDC3470(1)C7(2) |
| 0.56 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3560(1)C7(2) | F5BDC3560(1)C7(2) |
| 0.68 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3680(1)C7(2) | F5BDC3680(1)C7(2) |
| 0.82 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC3820(1)C7(2) | F5BDC3820(1)C7(2) |
| 1.00 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC4100(1)C7(2) | F5BDC4100(1)C7(2) |
| 1.20 | 63 | 6.1 | 11.1 | 7.5 | 5.0 | 82 | 5BDC4120(1)C7(2) | F5BDC4120(1)C7(2) |
| 1.50 | 63 | 7.3 | 13.1 | 7.5 | 5.0 | 82 | 5BDC4150(1)C8(2) | F5BDC4150(1)C8(2) |
| 1.80 | 63 | 7.3 | 13.1 | 7.5 | 5.0 | 82 | 5BDC4180(1)C8(2) | F5BDC4180(1)C8(2) |
| 2.20 | 63 | 7.3 | 13.1 | 7.5 | 5.0 | 82 | 5BDC4220(1)C8(2) | F5BDC4220(1)C8(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) Capacitance tolerance: 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

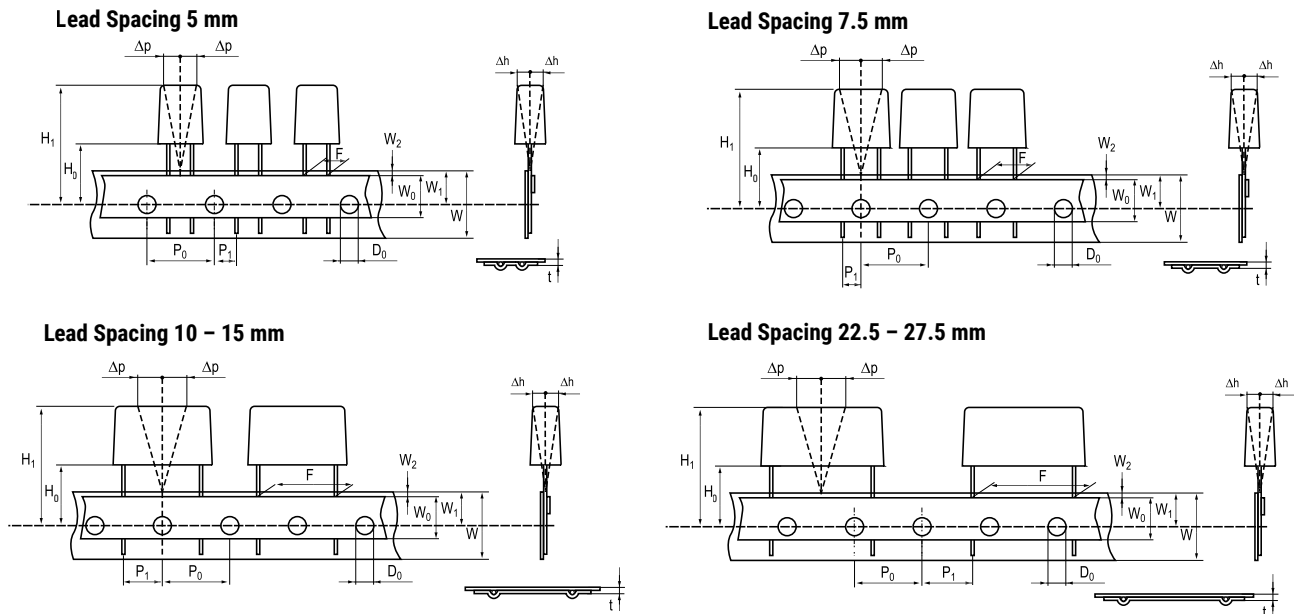
Marking

- Capacitance
- Tolerance
- DC rated voltage
- Series (F5B)
- Manufacturing date code

Packaging Quantities

| Lead Spacing | Thickness (mm) | Height (mm) | Length (mm) | Bulk Short Leads | Bulk Long Leads | Standard Reel ϕ 355 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 |

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.

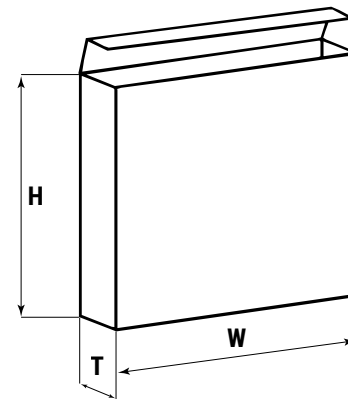
(2) 16.5 mm available on request.

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

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

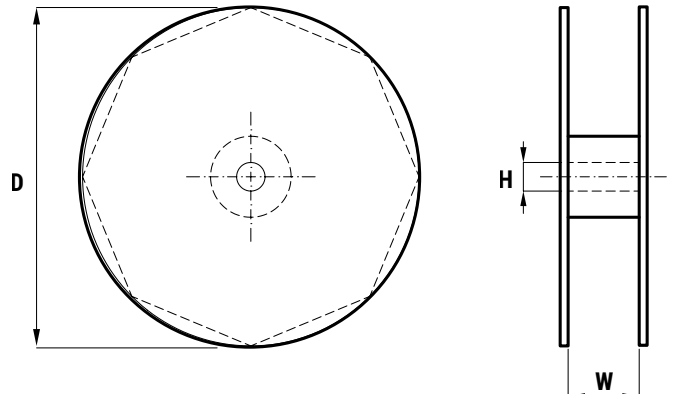
Ammo Specifications

| 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 | 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 F5B is a combined passive suppression component. Overloading with high voltage or voltage transients can strongly damage the component with the risk of fire.