Polypropylene Pulse/High Frequency Capacitors

# R79, Single Metallized Polypropylene Film, Radial, 5 mm Lead Spacing, Multipurpose Applications

## Overview

The R79 Series is constructed of metallized polypropylene film with radial leads of tinned wire. The radial leads are electrically welded to the metal layer on the ends of the capacitor winding. The capacitor is encapsulated with a self-extinguishing thermosetting resin in a box material meeting the UL 94 V–0 requirements.

## Applications

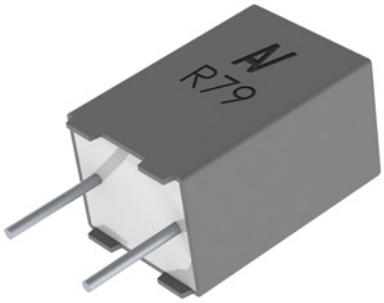
Typical applications include timing, oscillator circuits, high frequency coupling and decoupling applications.

Not suitable for across-the-line application (see Suppressor Capacitors).

*ATTENTION -- This series was replaced by the R75 series. Please click on the link to the R75 series datasheet HERE.*

## Benefits

- Voltage range: 160 – 630 VDC
- Capacitance range: 0.001 – 0.22 µF
- Lead Spacing: 5 mm
- Capacitance tolerance: ±5%, ±10%, ±20%
- Climatic category: 55/105/56 IEC 60068–1
- Operating temperature range of −55˚C to +105˚C
- RoHS compliance and lead-free terminations
- Tape & Reel packaging in accordance with IEC 60286–2
- Self-healing




## Part Number System

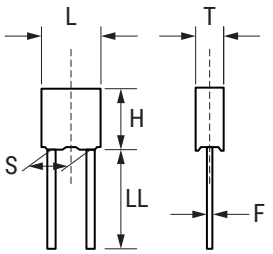
| R79 | G | C | 2390 | AA | 40 | K |
|---|---|---|---|---|---|---|
| Series | Rated Voltage (VDC) | Lead Spacing (mm) | Capacitance Code (pF) | Packaging | Internal Use | Capacitance Tolerance |
| Metallized Polypropylene | G = 160<br>I = 250<br>M = 400<br>P = 630 | C = 5 | The last three digits represent significant figures. The first digit specifies the total number of zeros to be added. | See Ordering Options Table | 40<br>45 | H = 2.5%<br>J = ±5%<br>K = ±10% |

## Ordering Options Table

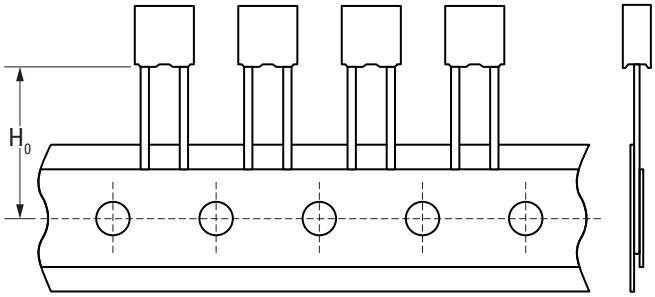
| Lead Spacing Nominal (mm) | Type of Leads and Packaging | Lead Length (mm) | Lead and Packaging Code |
|---|---|---|---|
| 5 | **Standard Lead and Packaging Options** | | |
| | Bulk (Bag) – Short Leads | 4 +1.5/−0 | AA |
| | Ammo Pack | $H_0$ = 18.5 ±0.5 | DQ |
| | **Other Lead and Packaging Options** | | |
| | Tape & Reel (Standard Reel Ø 355 mm) | $H_0$ = 18.5 ±0.5 | CK |
| | Bulk (Bag) – Short Leads | 10±1 | JC |
| | Bulk (Bag) – Short Leads | 4.0 +0.5/−0 | JE |
| | Bulk (Bag) – Short Leads | 3.2 +0.3/−0.2 | JH |
| | Bulk (Bag) – Long Leads | 17 +1/−2 | Z3 |

## Dimensions – Millimeters

**Loose**




**Taped**




| S | | T | | H | | L | | F | |
|---|---|---|---|---|---|---|---|---|---|
| Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance |
| 5.0 | ±0.4 | 3.5 | +0.1/−0.5 | 7.5 | +0.1/−0.5 | 7.2 | +0.2/−0.5 | 0.5 | ±0.05 |
| 5.0 | ±0.4 | 4.5 | +0.1/−0.5 | 9.5 | +0.1/−0.5 | 7.2 | +0.3/−0.5 | 0.5 | ±0.05 |
| 5.0 | ±0.4 | 5.0 | +0.1/−0.5 | 10.0 | +0.1/−0.5 | 7.2 | +0.3/−0.5 | 0.5 | ±0.05 |
| 5.0 | ±0.4 | 6.0 | +0.1/−0.5 | 11.0 | +0.1/−0.5 | 7.2 | +0.3/−0.5 | 0.5 | ±0.05 |
| 5.0 | ±0.4 | 7.2 | +0.1/−0.5 | 13.0 | +0.1/−0.5 | 7.2 | +0.3/−0.5 | 0.5 | ±0.05 |

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

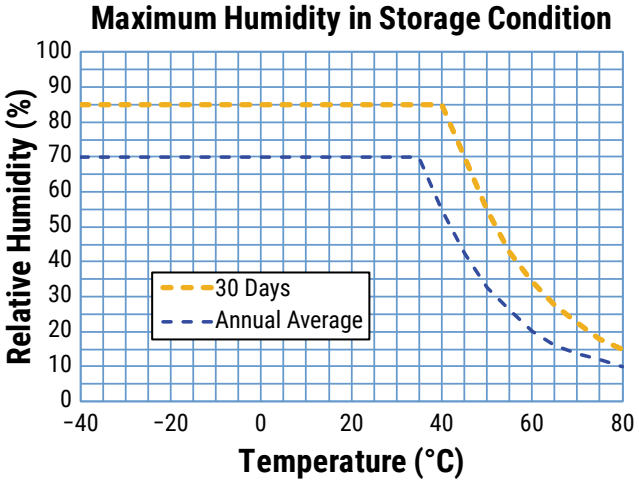
## Performance Characteristics

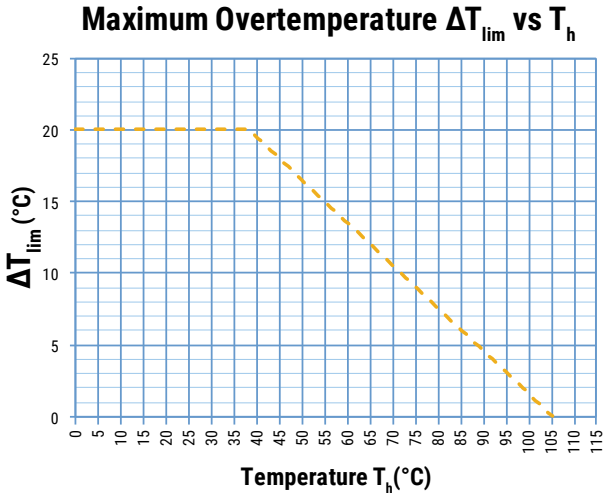
| | | | | | |
|---|---|---|---|---|---|
| Dielectric | Polypropylene film | | | | |
| Plates | Metal layer deposited by evaporation under vacuum | | | | |
| Winding | Non-inductive type | | | | |
| Leads | Tinned wire | | | | |
| Protection | Plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94. | | | | |
| Related Documents | IEC 60384–16 | | | | |
| Rated Voltage $V_R$ (VDC) | 160 | 250 | 400 | 630 | |
| Rated Voltage $V_R$ (VAC) | 70 | 160 | 200 | 220 | |
| Capacitance Range (µF) | 0.039 – 0.22 | 0.012 – 0.15 | 0.0039 – 0.047 | 0.001 – 0.018 | |
| Capacitance Values | E12 series (IEC 60063) measured at 1 kHz and +20 ±1°C | | | | |
| Capacitance Tolerance | ±2.5%, ±5%, ±10% | | | | |
| Operating Temperature Range | –55°C to +105°C | | | | |
| Rated Temperature $T_R$ | +85°C | | | | |
| Voltage Derating | Above +85°C DC and AC voltage derating is 1.25%/°C | | | | |
| Climatic Category | 55/105/56 IEC 60068–1 | | | | |
| Storage Conditions | Storage time: ≤ 24 months from the date marked on the label package | | | | |
| | Average relative humidity per year ≤ 70% | | | | |
| | RH ≤ 85% for 30 days randomly distributed throughout the year | | | | |
| | Dew is absent | | | | |
| | Temperature: –40 to 80°C (see "Maximum Humidity in Storage Conditions" graph below) | | | | |
| Test Voltage | 1.6 x $V_R$ VDC for 2 seconds (between terminations) at +25°C ±5°C | | | | |
| Capacitance Drift | Maximum 0.5% after a 2 year storage period at a temperature of +10°C to +40°C and a relative humidity of 40% to 60% | | | | |
| Maximum Pulse Steepness | dV/dt according to Table 1. For working voltages lower than rated voltage (V < VR), the specified dV/dt can be multiplied by the factor VR/V. | | | | |
| Temperature Coefficient | –(200 ±100) ppm/°C at 1 kHz | | | | |
| Self Inductance | Approximately 6 nH. Maximum 1 nH per 1 mm lead and capacitor length. | | | | |
| Dissipation Factor tanδ | Maximum Values at 25°C ±5°C | | | | |
| | Frequency | C ≤ 0.1 µF | C > 0.1 µF | | |
| | 1 kHz | 0.06% | 0.06% | | |
| | 10 kHz | 0.10% | 0.10% | | |
| | 100 kHz | 0.30% | - | | |

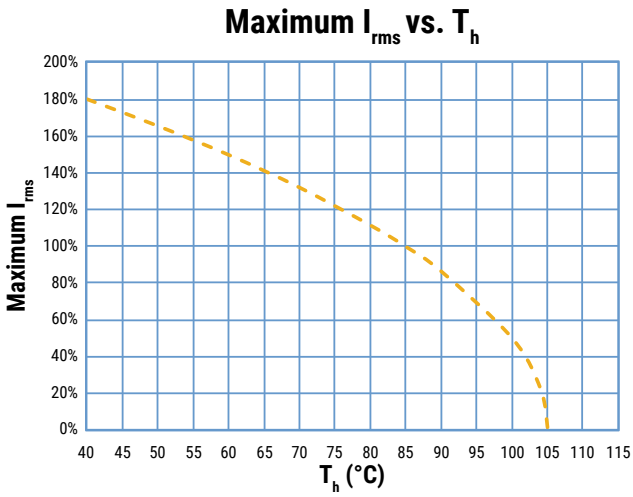
## Performance Characteristics cont.

| | |
|---|---|
| Insulation Resistance | Measured at +25°C ±5°C, 100 VDC 60 seconds |
| | Minimum Values Between Terminals |
| | All Capacitance Values |
| | ≥ 100,000 MΩ<br>( ≥ 500,000 MΩ )* |

** Typical value*

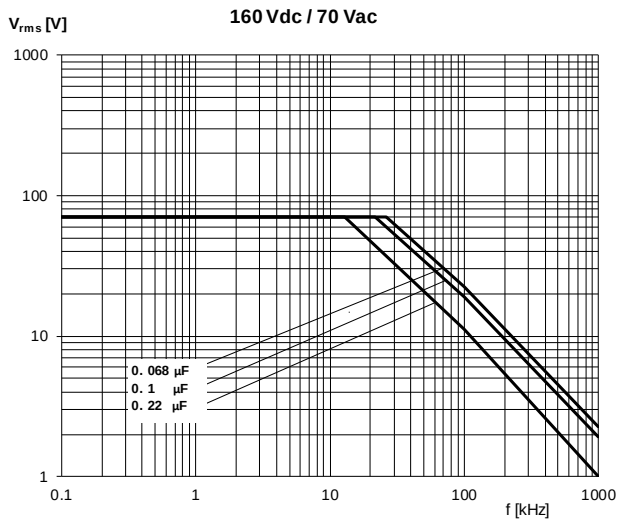


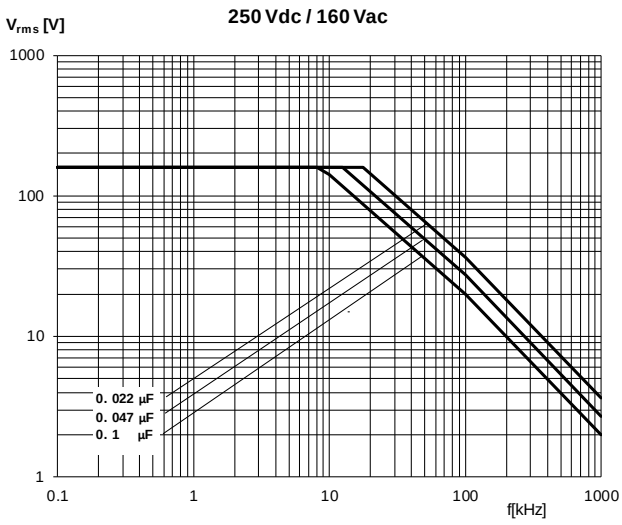



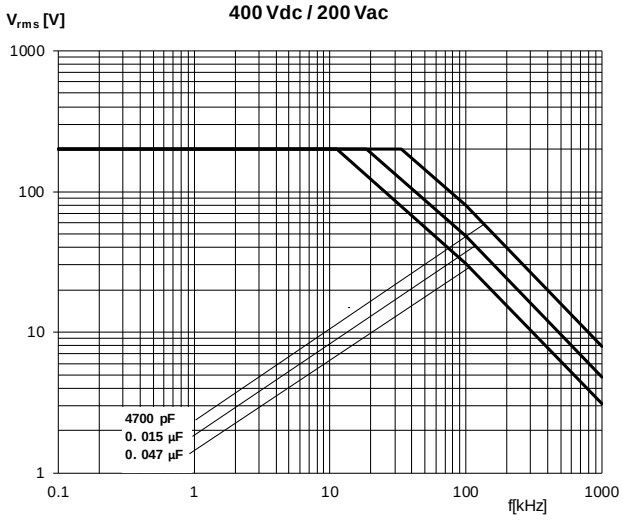



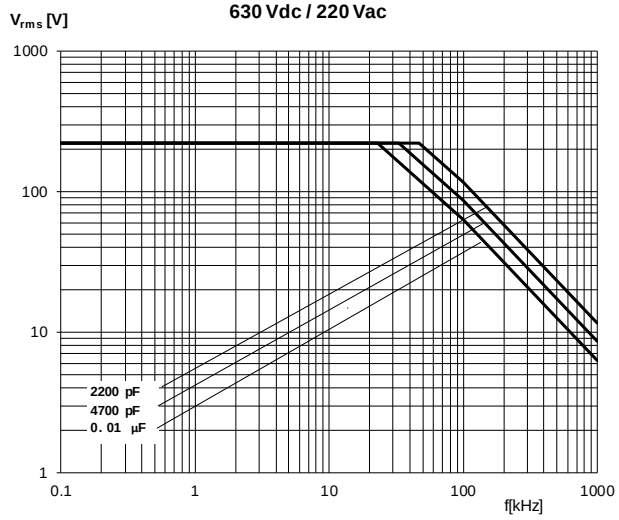

*$T_h$ is the maximum ambient temperature surrounding the capacitor or hottest contact point (e.g. tracks), whichever is higher, in the worst operation conditions in °C.*

# Maximum Voltage ($V_{rms}$) vs. Frequency (Sinusoidal Waveform/Th ≤ 85°C)

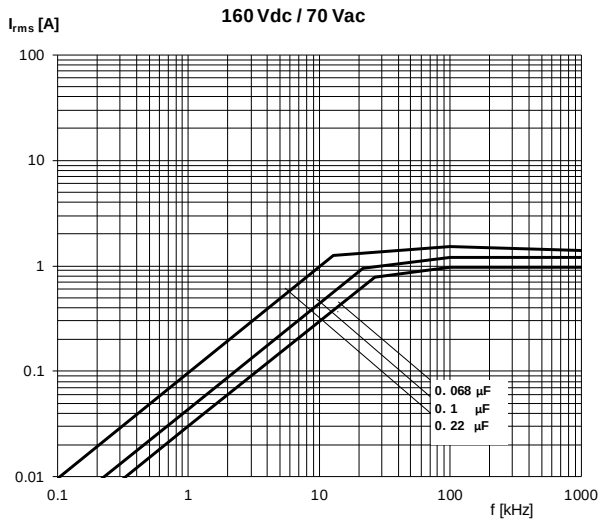


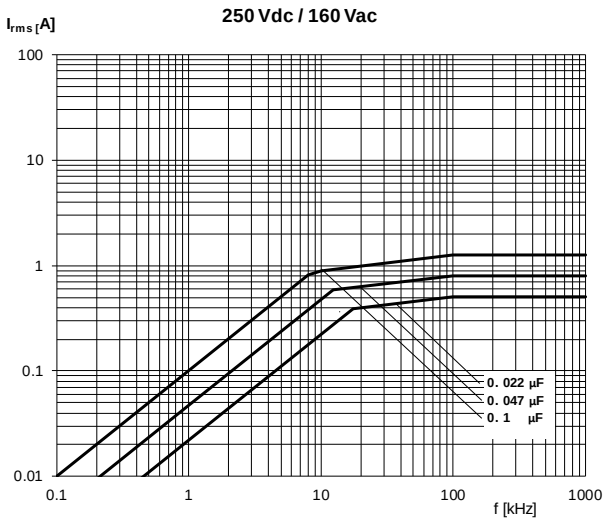



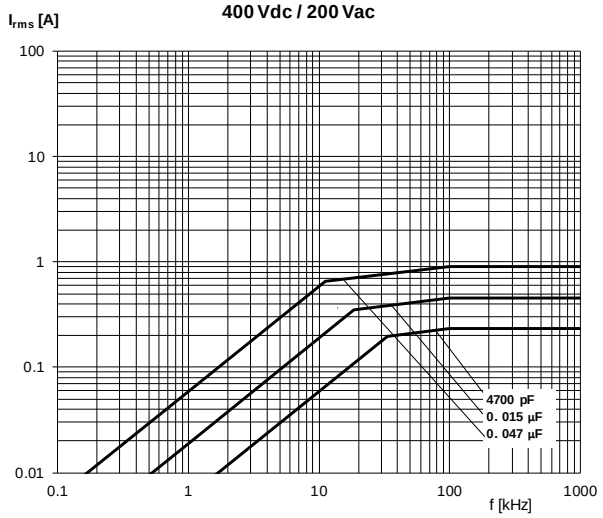



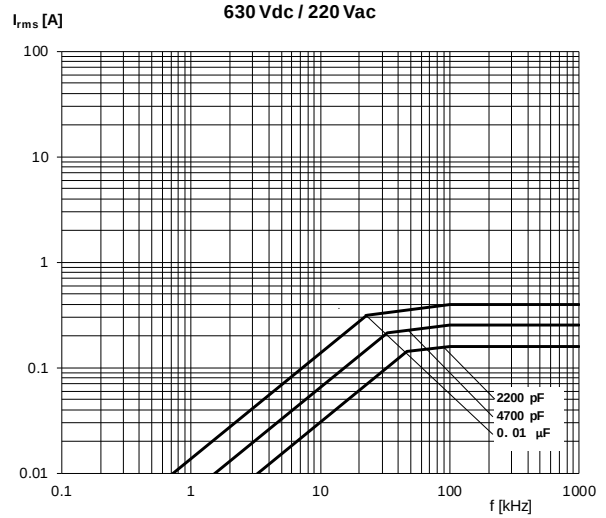



# Maximum Current ($I_{rms}$) vs. Frequency (Sinusoidal Waveform/Th ≤ 85°C)



## Environmental Test Data

| Damp Heat, Steady State Test | Test Conditions: | | Performances |
|---|---|---|---|
| | Temperature:<br>Relative humidity (RH):<br>Test duration: | +40°C ±2°C<br>93% ±2%<br>56 days | \|Δ C/C\| ≤ 3%,<br>Δ tanδ ≤ 0.001 at 1 kHz<br>IR after test ≥ 50% of initial limit |
| **Endurance Test** | **Test Conditions** | | **Performances** |
| | Temperature:<br>Voltage applied:<br>Test duration: | +85°C ±2°C<br>1.25 x $V_R$ (DC)<br>2,000 hours | \|Δ C/C\| ≤ 3%,<br>Δ tanδ ≤ 0.001 at 10 kHz<br>IR after test ≥ 50% of initial limit |
| **Resistance to Soldering Heat Test** | **Test Conditions** | | **Performances** |
| | Solder bath temperature:<br>Dipping time (with heat screen): | 260°C ±5°C<br>10 seconds ±1 second | \|Δ C/C\| ≤ 2%,<br>Δ tanδ ≤ 0.001 at 10 kHz for C ≤ 1 µF<br>IR after test ≥ initial limit |

## Environmental Compliance

All KEMET pulse capacitors are RoHS Compliant.

## Table 1 – Ratings & Part Number Reference

| VDC | VAC | Capacitance Value (µF) | Dimensions in mm | | | Lead Spacing (S) | dV/dt (V/µs) | Max $K_0$ ($V^2$/µs) | KEMET Internal Part Number | Customer Part Number |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | T | H | L | | | | | |
| 160 | 70 | 0.039 | 3.5 | 7.5 | 7.2 | 5.0 | 100 | 32,000 | 79GC2390(1)40(2) | R79GC2390(1)40(2) |
| 160 | 70 | 0.047 | 4.5 | 9.5 | 7.2 | 5.0 | 100 | 32,000 | 79GC2470(1)40(2) | R79GC2470(1)40(2) |
| 160 | 70 | 0.056 | 4.5 | 9.5 | 7.2 | 5.0 | 100 | 32,000 | 79GC2560(1)40(2) | R79GC2560(1)40(2) |
| 160 | 70 | 0.068 | 4.5 | 9.5 | 7.2 | 5.0 | 100 | 32,000 | 79GC2680(1)40(2) | R79GC2680(1)40(2) |
| 160 | 70 | 0.082 | 5.0 | 10.0 | 7.2 | 5.0 | 100 | 32,000 | 79GC2820(1)40(2) | R79GC2820(1)40(2) |
| 160 | 70 | 0.10 | 5.0 | 10.0 | 7.2 | 5.0 | 100 | 32,000 | 79GC3100(1)40(2) | R79GC3100(1)40(2) |
| 160 | 70 | 0.12 | 6.0 | 11.0 | 7.2 | 5.0 | 100 | 32,000 | 79GC3120(1)40(2) | R79GC3120(1)40(2) |
| 160 | 70 | 0.15 | 6.0 | 11.0 | 7.2 | 5.0 | 100 | 32,000 | 79GC3150(1)40(2) | R79GC3150(1)40(2) |
| 160 | 70 | 0.18 | 7.2 | 13.0 | 7.2 | 5.0 | 100 | 32,000 | 79GC3180(1)40(2) | R79GC3180(1)40(2) |
| 160 | 70 | 0.22 | 7.2 | 13.0 | 7.2 | 5.0 | 100 | 32,000 | 79GC3220(1)40(2) | R79GC3220(1)40(2) |
| 250 | 160 | 0.012 | 3.5 | 7.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2120(1)45(2) | R79IC2120(1)45(2) |
| 250 | 160 | 0.015 | 3.5 | 7.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2150(1)45(2) | R79IC2150(1)45(2) |
| 250 | 160 | 0.018 | 3.5 | 7.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2180(1)45(2) | R79IC2180(1)45(2) |
| 250 | 160 | 0.022 | 3.5 | 7.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2220(1)45(2) | R79IC2220(1)45(2) |
| 250 | 160 | 0.027 | 3.5 | 7.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2270(1)45(2) | R79IC2270(1)45(2) |
| 250 | 160 | 0.033 | 3.5 | 7.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2330(1)45(2) | R79IC2330(1)45(2) |
| 250 | 160 | 0.039 | 4.5 | 9.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2390(1)40(2) | R79IC2390(1)40(2) |
| 250 | 160 | 0.047 | 4.5 | 9.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2470(1)40(2) | R79IC2470(1)40(2) |
| 250 | 160 | 0.056 | 4.5 | 9.5 | 7.2 | 5.0 | 250 | 125,000 | 79IC2560(1)40(2) | R79IC2560(1)40(2) |
| 250 | 160 | 0.068 | 5.0 | 10.0 | 7.2 | 5.0 | 250 | 125,000 | 79IC2680(1)40(2) | R79IC2680(1)40(2) |
| 250 | 160 | 0.082 | 6.0 | 11.0 | 7.2 | 5.0 | 250 | 125,000 | 79IC2820(1)40(2) | R79IC2820(1)40(2) |
| 250 | 160 | 0.10 | 6.0 | 11.0 | 7.2 | 5.0 | 250 | 125,000 | 79IC3100(1)40(2) | R79IC3100(1)40(2) |
| 250 | 160 | 0.12 | 7.2 | 13.0 | 7.2 | 5.0 | 250 | 125,000 | 79IC3120(1)40(2) | R79IC3120(1)40(2) |
| 250 | 160 | 0.15 | 7.2 | 13.0 | 7.2 | 5.0 | 250 | 125,000 | 79IC3150(1)40(2) | R79IC3150(1)40(2) |
| 400 | 200 | 0.0039 | 3.5 | 7.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC1390(1)40(2) | R79MC1390(1)40(2) |
| 400 | 200 | 0.0047 | 3.5 | 7.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC1470(1)40(2) | R79MC1470(1)40(2) |
| 400 | 200 | 0.0056 | 3.5 | 7.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC1560(1)40(2) | R79MC1560(1)40(2) |
| 400 | 200 | 0.0068 | 3.5 | 7.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC1680(1)40(2) | R79MC1680(1)40(2) |
| 400 | 200 | 0.0082 | 3.5 | 7.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC1820(1)40(2) | R79MC1820(1)40(2) |
| 400 | 200 | 0.010 | 3.5 | 7.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC2100(1)40(2) | R79MC2100(1)40(2) |
| 400 | 200 | 0.012 | 4.5 | 9.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC2120(1)40(2) | R79MC2120(1)40(2) |
| 400 | 200 | 0.015 | 4.5 | 9.5 | 7.2 | 5.0 | 400 | 320,000 | 79MC2150(1)40(2) | R79MC2150(1)40(2) |
| 400 | 200 | 0.018 | 5.0 | 10.0 | 7.2 | 5.0 | 400 | 320,000 | 79MC2180(1)40(2) | R79MC2180(1)40(2) |
| 400 | 200 | 0.022 | 5.0 | 10.0 | 7.2 | 5.0 | 400 | 320,000 | 79MC2220(1)40(2) | R79MC2220(1)40(2) |
| 400 | 200 | 0.027 | 6.0 | 11.0 | 7.2 | 5.0 | 400 | 320,000 | 79MC2270(1)40(2) | R79MC2270(1)40(2) |
| 400 | 200 | 0.033 | 6.0 | 11.0 | 7.2 | 5.0 | 400 | 320,000 | 79MC2330(1)40(2) | R79MC2330(1)40(2) |
| 400 | 200 | 0.039 | 7.2 | 13.0 | 7.2 | 5.0 | 400 | 320,000 | 79MC2390(1)40(2) | R79MC2390(1)40(2) |
| 400 | 200 | 0.047 | 7.2 | 13.0 | 7.2 | 5.0 | 400 | 320,000 | 79MC2470(1)40(2) | R79MC2470(1)40(2) |
| 630 | 220 | 0.0010 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1100(1)40(2) | R79PC1100(1)40(2) |
| 630 | 220 | 0.0012 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1120(1)40(2) | R79PC1120(1)40(2) |
| 630 | 220 | 0.0015 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1150(1)40(2) | R79PC1150(1)40(2) |
| 630 | 220 | 0.0018 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1180(1)40(2) | R79PC1180(1)40(2) |
| 630 | 220 | 0.0022 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1220(1)40(2) | R79PC1220(1)40(2) |
| 630 | 220 | 0.0027 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1270(1)40(2) | R79PC1270(1)40(2) |
| 630 | 220 | 0.0033 | 3.5 | 7.5 | 7.2 | 5.0 | 500 | 630,000 | 79PC1330(1)40(2) | R79PC1330(1)40(2) |
| 630 | 220 | 0.0039 | 4.5 | 9.5 | 7.2 | 5.0 | 600 | 756,000 | 79PC1390(1)40(2) | R79PC1390(1)40(2) |
| 630 | 220 | 0.0047 | 4.5 | 9.5 | 7.2 | 5.0 | 600 | 756,000 | 79PC1470(1)40(2) | R79PC1470(1)40(2) |
| 630 | 220 | 0.0056 | 4.5 | 9.5 | 7.2 | 5.0 | 600 | 756,000 | 79PC1560(1)40(2) | R79PC1560(1)40(2) |
| 630 | 220 | 0.0068 | 5.0 | 10.0 | 7.2 | 5.0 | 600 | 756,000 | 79PC1680(1)40(2) | R79PC1680(1)40(2) |
| 630 | 220 | 0.0082 | 5.0 | 10.0 | 7.2 | 5.0 | 600 | 756,000 | 79PC1820(1)40(2) | R79PC1820(1)40(2) |
| 630 | 220 | 0.010 | 6.0 | 11.0 | 7.2 | 5.0 | 600 | 756,000 | 79PC2100(1)40(2) | R79PC2100(1)40(2) |
| 630 | 220 | 0.012 | 6.0 | 11.0 | 7.2 | 5.0 | 600 | 756,000 | 79PC2120(1)40(2) | R79PC2120(1)40(2) |
| 630 | 220 | 0.015 | 7.2 | 13.0 | 7.2 | 5.0 | 600 | 756,000 | 79PC2150(1)40(2) | R79PC2150(1)40(2) |
| 630 | 220 | 0.018 | 7.2 | 13.0 | 7.2 | 5.0 | 600 | 756,000 | 79PC2180(1)40(2) | R79PC2180(1)40(2) |
| **VDC** | **VAC** | **Capacitance Value (µF)** | **T (mm)** | **H (mm)** | **L (mm)** | **Lead Spacing (S)** | **dV/dt (V/µs)** | **Max $K_0$ ($V^2$/µs)** | **KEMET Internal Part Number** | **Customer Part Number** |

*(1) Insert lead and packaging code. See Ordering Options Table for available options.*
*(2) J = 5%, K = 10%, M = 20%*

## Soldering Process

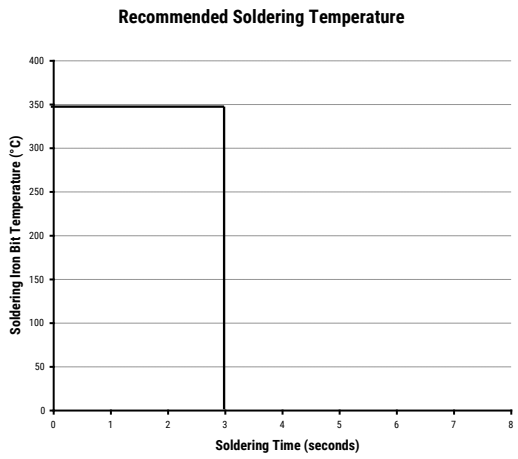
The implementation of the RoHS directive has resulted in the selection of SnAgCu (SAC) alloys or SnCu alloys as a primary solder. This has increased the liquidus temperature from that of 183°C for SnPb eutectic alloy to 217 – 221°C for the new alloys. As a result, the heat stress to the components, even in wave soldering, has increased considerably due to higher pre-heat and wave temperatures. Polypropylene capacitors are especially sensitive to heat (the melting point of polypropylene is 160 – 170°C). Wave soldering can be destructive, especially for mechanically small polypropylene capacitors (with lead spacing of 5 mm to 15 mm), and great care has to be taken during soldering. The recommended solder profiles from KEMET should be used. Please consult KEMET with any questions. In general, the wave soldering curve from IEC Publication 61760–1 Edition 2 serves as a solid guideline for successful soldering. Please see Figure 1.

Reflow soldering is not recommended for through-hole film capacitors. Exposing capacitors to a soldering profile in excess of the above recommended limits may result in degradation or permanent damage to the capacitors.

Do not place the polypropylene capacitor through an adhesive curing oven to cure resin for surface mount components. Insert through-hole parts after the curing of surface mount parts. Consult KEMET to discuss the actual temperature profile in the oven, if through-hole components must pass through the adhesive curing process. A maximum two soldering cycles is recommended. Please allow time for the capacitor surface temperature to return to a normal temperature before the second soldering cycle.

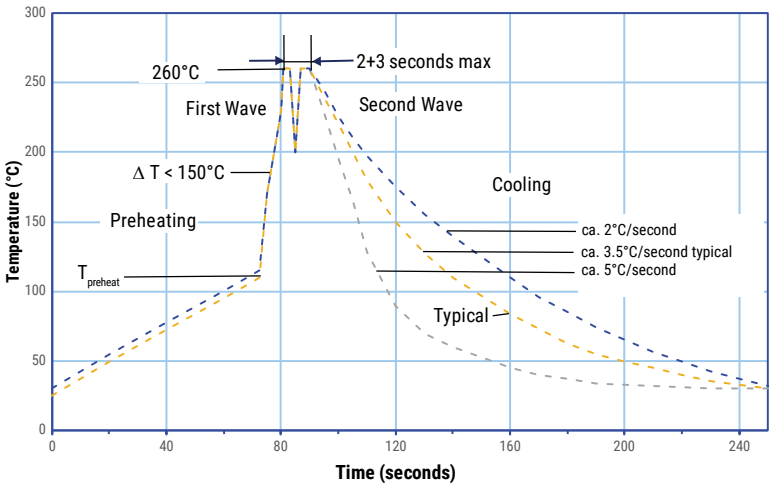
### Manual Soldering Recommendations

The following is recommended for manual soldering with a soldering iron.




The soldering iron tip temperature should be set at 350°C (+10°C maximum) with the soldering duration not to exceed more than 3 seconds.

### Wave Soldering Recommendations



## Soldering Process cont.

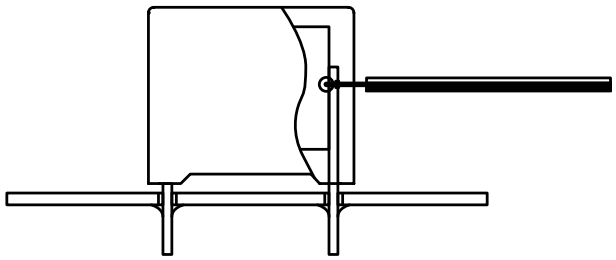
**Wave Soldering Recommendations cont.**

1. The table indicates the maximum set-up temperature of the soldering process Figure 1.

| Dielectric Film Material | Maximum Preheat Temperature | | Maximum Peak Soldering Temperature | |
|---|---|---|---|---|
| | Capacitor Pitch ≤ 15 mm | Capacitor Pitch > 15 mm | Capacitor Pitch ≤ 15 mm | Capacitor Pitch > 15 mm |
| Polyester | 130°C | 130°C | 270°C | 270°C |
| Polypropylene | 110°C | 130°C | 260°C | 270°C |
| Paper | 130°C | 140°C | 270°C | 270°C |
| Polyphenylene Sulphide | 150°C | 160°C | 270°C | 270°C |

2. The maximum temperature measured inside the capacitor:
   Set the temperature so that inside the element the maximum temperature is below the limit:

| Dielectric Film Material | Maximum temperature measured inside the element |
|---|---|
| Polyester | 160°C |
| Polypropylene | 110°C |
| Paper | 160°C |
| Polyphenylene Sulphide | 160°C |



*Temperature monitored inside the capacitor.*

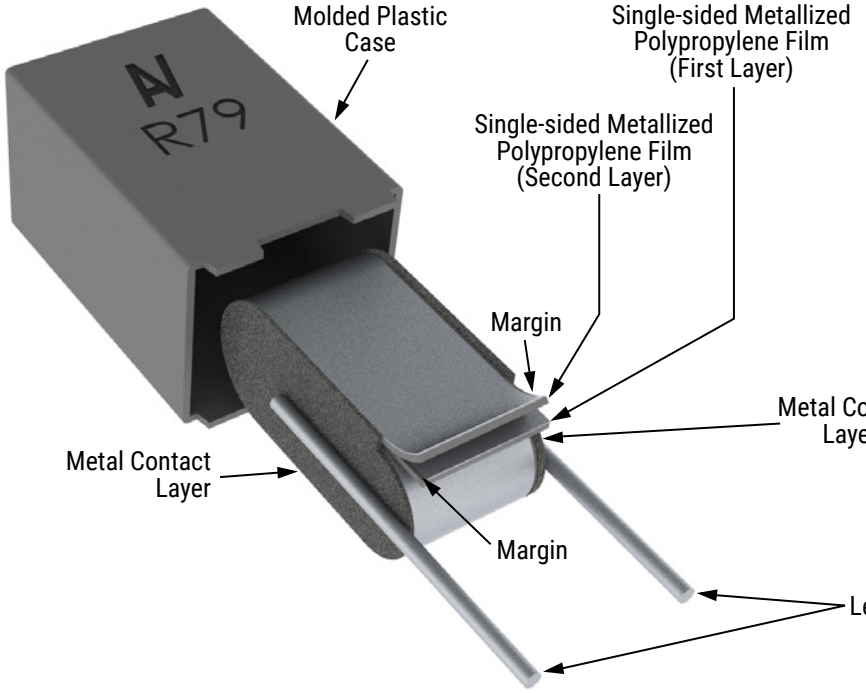
**Selective Soldering Recommendations**

Selective dip soldering is a variation of reflow soldering. In this method, the printed circuit board with through-hole components to be soldered is preheated and transported over the solder bath as in normal flow soldering without touching the solder. When the board is over the bath, it is stopped and pre-designed solder pots are lifted from the bath with molten solder only at the places of the selected components, and pressed against the lower surface of the board to solder the components.

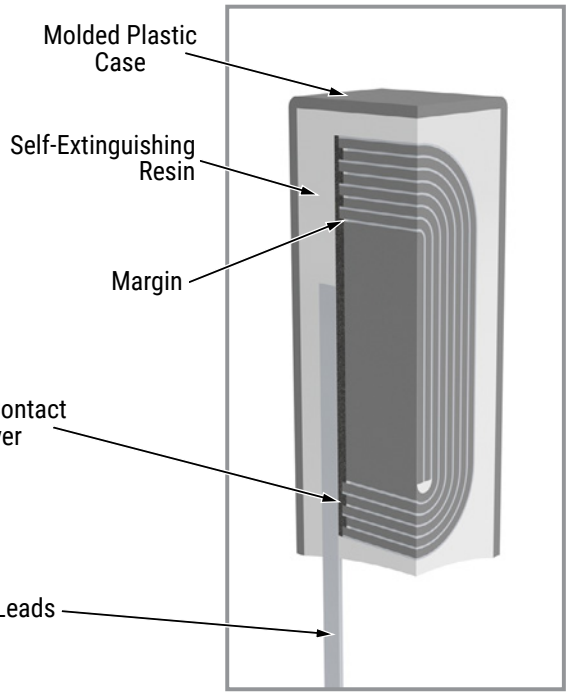
The temperature profile for selective soldering is similar to the double wave flow soldering outlined in this document, **however, instead of two baths, there is only one bath with a time from 3 to 10 seconds.** In selective soldering, the risk of overheating is greater than in double wave flow soldering. Great care must be taken so that the parts are not overheated.

## Construction

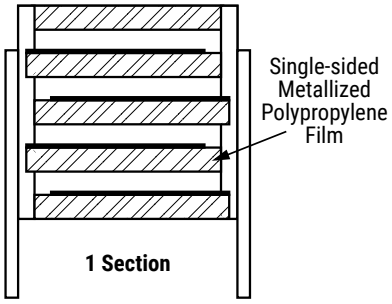
### Wound



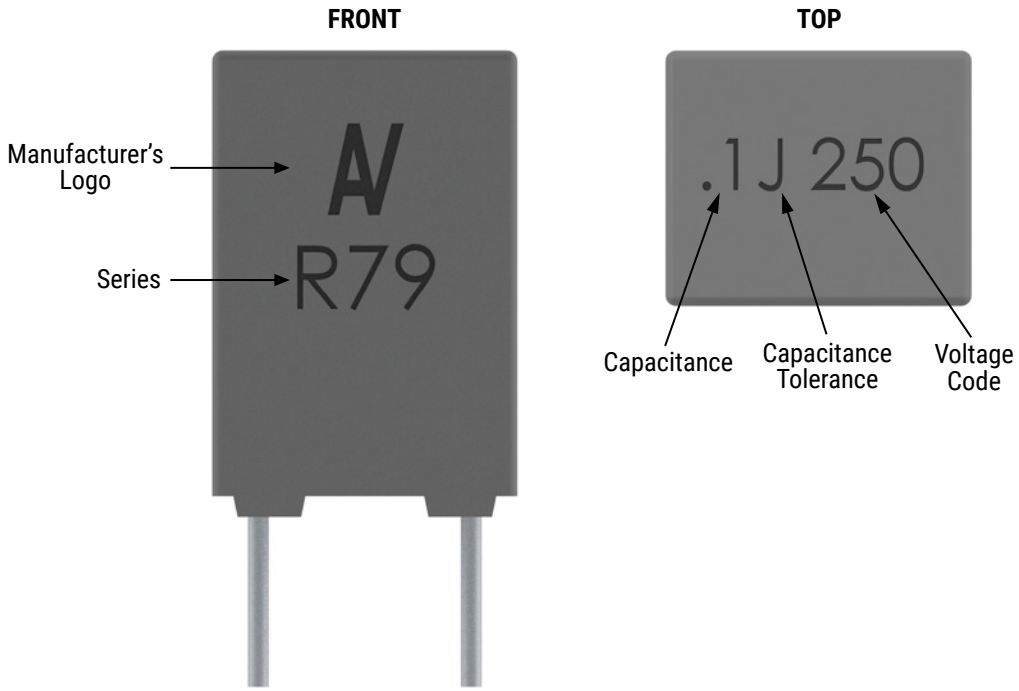

### Detailed Cross Section




### Winding Scheme



## Marking


FRONT
TOP
Manufacturer's Logo
Series
R79
.1 J 250
Capacitance
Capacitance Tolerance
Voltage Code

## Marking cont.

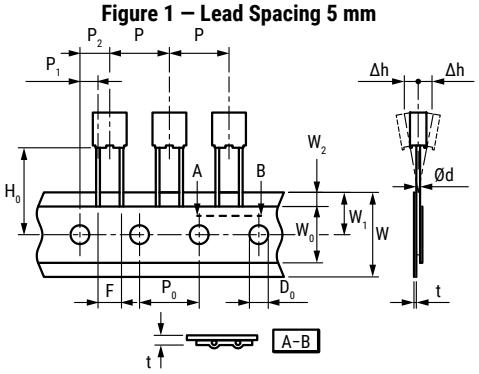
| Manufacturing Date Code (IEC–60062) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Year | Code | Year | Code | Month | Code | Month | Code |
| 2020 | M | 2030 | A | January | 1 | July | 7 |
| 2021 | N | 2031 | B | February | 2 | August | 8 |
| 2022 | P | 2032 | C | March | 3 | September | 9 |
| 2023 | R | 2033 | D | April | 4 | October | O |
| 2024 | S | 2034 | E | May | 5 | November | N |
| 2025 | T | 2035 | F | June | 6 | December | D |
| 2026 | U | 2036 | H | | | | |
| 2027 | V | 2037 | J | | | | |
| 2028 | W | 2038 | K | | | | |
| 2029 | X | 2039 | L | | | | |
| 2030 | A | 2040 | M | | | | |

## Packaging Quantities

| Lead Spacing | Thickness (mm) | Height (mm) | Length (mm) | Bulk Short Leads | Bulk Long Leads | Standard Reel ø 355 mm | Ammo Taped |
|---|---|---|---|---|---|---|---|
| | Lead and Packaging Code | | | AA - JC<br>JE - JH | Z3 | CK | DQ |
| 5.0 | 3.5 | 7.5 | 7.2 | 2,000 | 3,000 | 1,800 | 2,500 |
| | 4.5 | 9.5 | 7.2 | 1,500 | 2,000 | 1,400 | 1,900 |
| | 5.0 | 10 | 7.2 | 1,000 | 1,500 | 1,200 | 1,700 |
| | 6.0 | 11 | 7.2 | 2,000 | 1,000 | 1,000 | 1,400 |
| | 7.2 | 13 | 7.2 | 1,500 | 750 | 800 | 1,150 |

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

**Figure 1 — Lead Spacing 5 mm**




## Taping Specification

| Description | Symbol | Dimensions (mm) | |
|---|---|---|---|
| | | Lead Spacing | Tolerance |
| | | 5 | |
| | | Figure 1 | |
| Lead wire diameter | d | 0.5 | ±0.05 |
| Taping lead space | P | 12.7 | ±1 |
| Feed hole lead space | $P_0$ | 12.7 | ±0.2** |
| Centering of the lead wire | $P_1$ | 3.85 | ±0.7 |
| Centering of the body | $P_2$ | 6.35 | ±1.3 |
| Lead spacing | F | 5 | +0.6/−0.1 |
| Component alignment | Dh | 0 | ±2 |
| Height of component from tape center | $H_0$* | 18.5 | ±0.5 |
| Carrier tape width | W | 18 | +1/−0.5 |
| Hold down tape width | $W_0$ | 6 | Minimum |
| Hole position | $W_1$ | 9 | ±0.5 |
| Hold down tape position | $W_2$ | 3 | Maximum |
| Feed hole diameter | $D_0$ | 4 | ±0.2 |
| Total Tape thickness | t | 0.7 | ±0.2 |

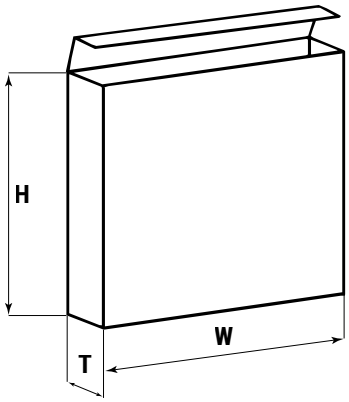
*$H_0$ = 16.5 mm is available upon request.*
***Maximum 1 mm on 20 lead spacing.*

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

## Ammo Specifications

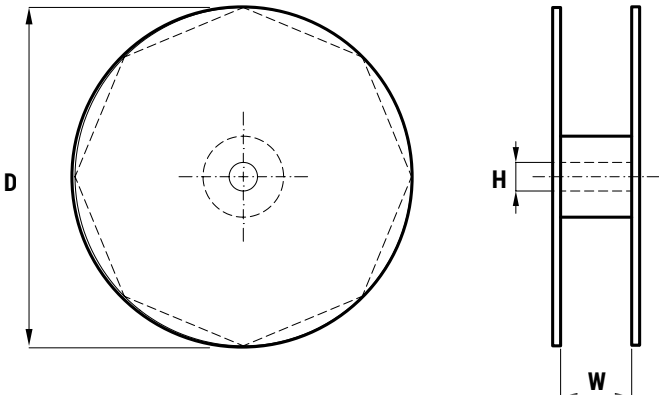
| Dimensions (mm) | | |
|---|---|---|
| H | W | T |
| 360* | 340 | 59 |

** Lower dimension available upon request (Maximum 295 mm)*




## Reel Specifications

| Dimensions (mm) | | |
|---|---|---|
| D | H | W |
| 355 | 30 | 55 Maximum |



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