

# R71, Single Metallized Polypropylene Film, Radial, SMPS PFC Applications

## Overview

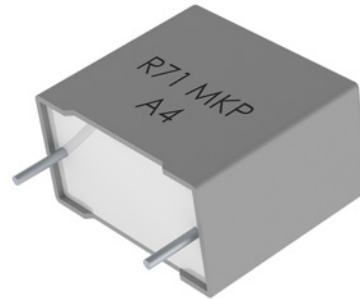
The R71 is constructed of metallized polypropylene film with radial leads of tinned wire. The radial leads are electrically welded to the metal layer on the ends of the capacitor winding. The capacitor is encapsulated in a self-extinguishing solvent resistant plastic case with thermosetting resin material meeting UL 94 V-0 requirements.

## Applications

Typical applications include power factor correction and pulse applications. Not suitable for across-the-line application (see Suppressor Capacitors).

## Benefits

- Voltage range: 420 – 1,000 VDC
- Capacitance range: 0.01 – 22  $\mu$ F
- Lead Spacing: 10 – 37.5 mm
- Capacitance tolerance:  $\pm$ 10%,  $\pm$ 20%,  $\pm$ 5% (on request)
- Climatic category: 40/110/56 IEC 60068-1
- Operating temperature range of  $-55^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$
- RoHS compliance and lead-free terminations
- Tape & Reel packaging in accordance with IEC 60286-2
- Self-healing



## Part Number System

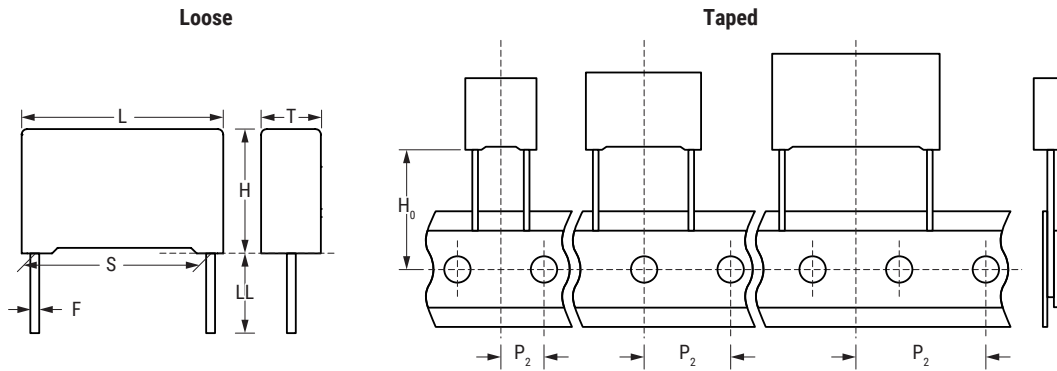
| R71                      | M  | F  | 2100   | AA                         | 00                         | J  |
|--------------------------|--|--|--|----------------------------|----------------------------|--|
| Series                   | Rated Voltage (VDC)                        | Lead Spacing (mm)  | Capacitance Code (pF)  | Packaging                  | Internal Use               | Capacitance Tolerance                          |
| Metallized Polypropylene | M = 420<br>V = 520<br>P = 630<br>Q = 1,000 | F = 10.0<br>I = 15.0<br>N = 22.5<br>R = 27.5<br>W = 37.5 | The last three digits represent significant figures.<br>The first digit specifies the total number of zeros to be added. | See Ordering Options Table | 00<br>10<br>20<br>30<br>40 | J = $\pm$ 5%<br>K = $\pm$ 10%<br>M = $\pm$ 20% |

## Ordering Options Table

| Lead Spacing Nominal (mm) | Type of Leads and Packaging                | Lead Length (mm)          | Lead and Packaging Code |
|---------------------------|--|---------------------------|-------------------------|
| 10<br><br>15<br><br>22.5  | <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>    |                           |                         |
|                           | Tape & Reel (Standard Reel Ø 355 mm)       | H <sub>0</sub> = 18.5±0.5 | GY                      |
|                           | Tape & Reel (Large Reel Ø 500 mm)          | H <sub>0</sub> = 18.5±0.5 | CK                      |
|                           | Bulk (Bag) – Short Leads                   | 3.5 +0.5/-0               | JB                      |
|                           | 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                    | 18±1                      | JM                      |
| Bulk (Bag) – Long Leads   | 30 +5/-0                                   | 40                        |                         |
| Bulk (Bag) – Long Leads   | 25 +2/-1                                   | 50                        |                         |
| 27.5                      | <b>Standard Lead and Packaging Options</b> |                           |                         |
|                           | Bulk (Tray) – Short Leads                  | 4 +2/-0                   | AA                      |
|                           | <b>Other Lead and Packaging Options</b>    |                           |                         |
|                           | Tape & Reel (Standard Reel Ø 355 mm)       | H <sub>0</sub> = 18.5±0.5 | GY                      |
|                           | Tape & Reel (Large Reel Ø 500 mm)          | H <sub>0</sub> = 18.5±0.5 | CK <sup>1</sup>         |
|                           | Bulk (Tray) – Short Leads                  | 3.5 +0.5/-0               | JB                      |
|                           | Bulk (Tray) – Short Leads                  | 4.0 +0.5/-0               | JE                      |
|                           | Bulk (Tray) – Short Leads                  | 3.2 +0.3/-0.2             | JH                      |
|                           | Bulk (Tray) – Long Leads                   | 18±1                      | JM                      |
|                           | Bulk (Tray) – Long Leads                   | 30 +5/-0                  | 40                      |
| Bulk (Tray) – Long Leads  | 25 +2/-1                                   | 50                        |                         |
| 37.5                      | <b>Standard Lead and Packaging Options</b> |                           |                         |
|                           | Bulk (Tray) – Short Leads                  | 4 +2/-0                   | AA                      |
|                           | <b>Other Lead and Packaging Options</b>    |                           |                         |
|                           | Bulk (Tray) – Short Leads                  | 3.5 +0.5/-0               | JB                      |
|                           | Bulk (Tray) – Short Leads                  | 4.0 +0.5/-0               | JE                      |
|                           | Bulk (Tray) – Short Leads                  | 3.2 +0.3/-0.2             | JH                      |
|                           | Bulk (Tray) – Long Leads                   | 18±1                      | JM                      |
|                           | Bulk (Tray) – Long Leads                   | 30 +5/-0                  | 40                      |
| Bulk (Tray) – Long Leads  | 25 +2/-1                                   | 50                        |                         |

<sup>1</sup> = Not for all sizes, see "Packaging Quantities" table.

## Dimensions – Millimeters



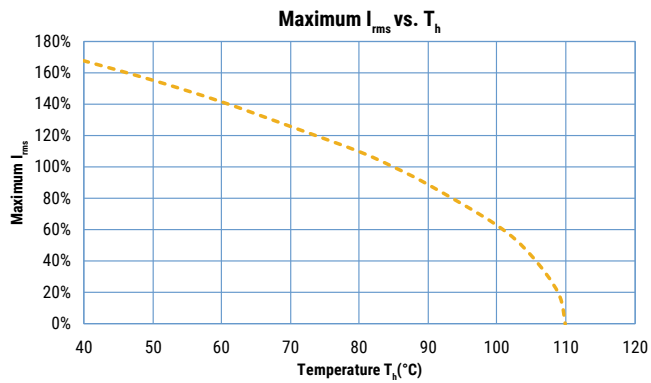
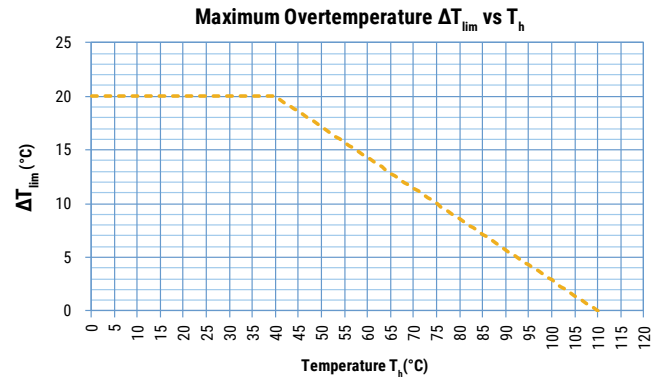
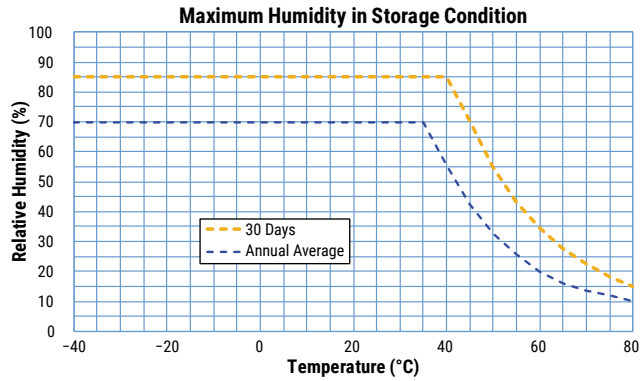
| S       |           | T       |           | H       |           | L       |           | F       |           |
|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|
| Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance | Nominal | Tolerance |
| 10.0    | ±0.4      | 4.0     | +0.2/-0.5 | 9.0     | +0.1/-0.5 | 13.0    | +0.2/-0.5 | 0.6     | ±0.05     |
| 10.0    | ±0.4      | 5.0     | +0.2/-0.5 | 11.0    | +0.1/-0.5 | 13.0    | +0.2/-0.5 | 0.6     | ±0.05     |
| 10.0    | ±0.4      | 6.0     | +0.2/-0.5 | 12.0    | +0.1/-0.5 | 13.0    | +0.2/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 5.0     | +0.2/-0.5 | 11.0    | +0.1/-0.5 | 18.0    | +0.3/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 6.0     | +0.2/-0.5 | 12.0    | +0.1/-0.5 | 18.0    | +0.3/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 6.0     | +0.2/-0.5 | 17.5    | +0.1/-0.5 | 18.0    | +0.3/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 7.5     | +0.2/-0.5 | 13.5    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 7.5     | +0.2/-0.5 | 18.5    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.8     | ±0.05     |
| 15.0    | ±0.4      | 8.5     | +0.2/-0.5 | 14.5    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 9.0     | +0.2/-0.5 | 12.5    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.6     | ±0.05     |
| 15.0    | ±0.4      | 10.0    | +0.2/-0.5 | 16.0    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.8     | ±0.05     |
| 15.0    | ±0.4      | 11.0    | +0.2/-0.5 | 19.0    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.8     | ±0.05     |
| 15.0    | ±0.4      | 13.0    | +0.2/-0.5 | 12.0    | +0.1/-0.5 | 18.0    | +0.5/-0.5 | 0.8     | ±0.05     |
| 22.5    | ±0.4      | 6.0     | +0.2/-0.5 | 15.0    | +0.1/-0.5 | 26.5    | +0.3/-0.5 | 0.8     | ±0.05     |
| 22.5    | ±0.4      | 7.0     | +0.2/-0.5 | 16.0    | +0.1/-0.5 | 26.5    | +0.3/-0.5 | 0.8     | ±0.05     |
| 22.5    | ±0.4      | 8.5     | +0.2/-0.5 | 17.0    | +0.1/-0.5 | 26.5    | +0.3/-0.5 | 0.8     | ±0.05     |
| 22.5    | ±0.4      | 10.0    | +0.2/-0.5 | 18.5    | +0.1/-0.5 | 26.5    | +0.3/-0.5 | 0.8     | ±0.05     |
| 22.5    | ±0.4      | 11.0    | +0.2/-0.5 | 20.0    | +0.1/-0.5 | 26.5    | +0.3/-0.5 | 0.8     | ±0.05     |
| 22.5    | ±0.4      | 13.0    | +0.2/-0.5 | 22.0    | +0.1/-0.5 | 26.5    | +0.3/-0.5 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 9.0     | +0.2/-0.7 | 17.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 11.0    | +0.2/-0.7 | 20.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 13.0    | +0.2/-0.7 | 22.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 13.0    | +0.2/-0.7 | 25.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 14.0    | +0.2/-0.7 | 28.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 18.0    | +0.2/-0.7 | 33.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 27.5    | ±0.4      | 22.0    | +0.2/-0.7 | 37.0    | +0.1/-0.7 | 32.0    | +0.3/-0.7 | 0.8     | ±0.05     |
| 37.5    | ±0.4      | 11.0    | +0.3/-0.7 | 22.0    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |
| 37.5    | ±0.4      | 13.0    | +0.3/-0.7 | 24.0    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |
| 37.5    | ±0.4      | 16.0    | +0.3/-0.7 | 28.5    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |
| 37.5    | ±0.4      | 19.0    | +0.3/-0.7 | 32.0    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |
| 37.5    | ±0.4      | 20.0    | +0.3/-0.7 | 40.0    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |
| 37.5    | ±0.4      | 24.0    | +0.3/-0.7 | 44.0    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |
| 37.5    | ±0.4      | 30.0    | +0.3/-0.7 | 45.0    | +0.1/-0.7 | 41.5    | +0.3/-0.7 | 1.0     | ±0.05     |

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

## Performance Characteristics

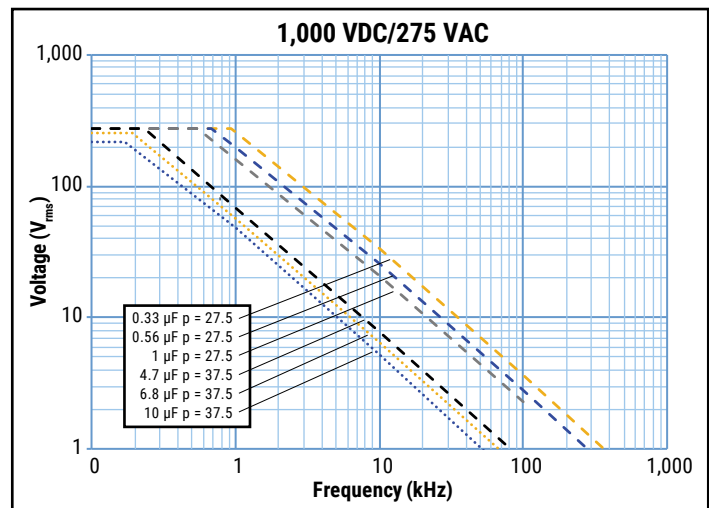
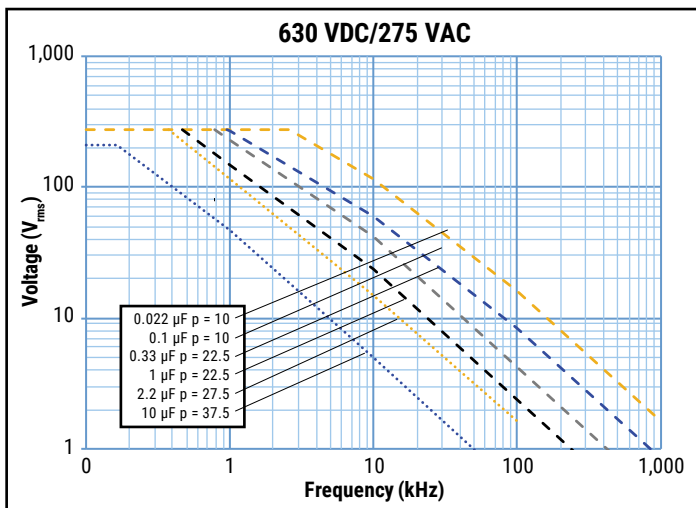
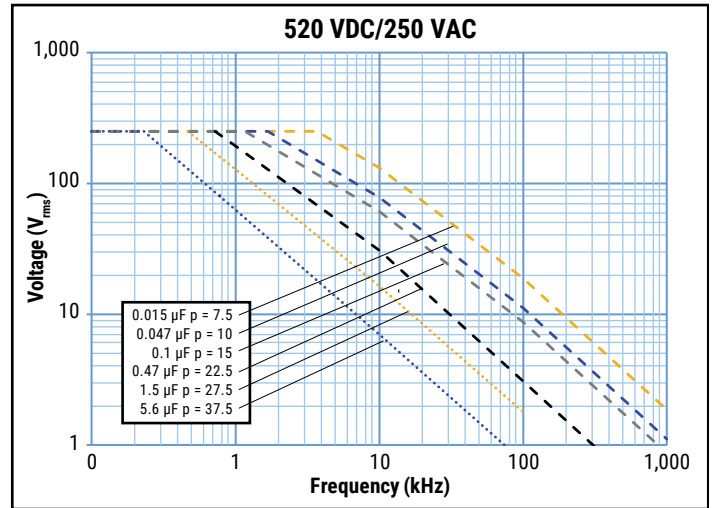
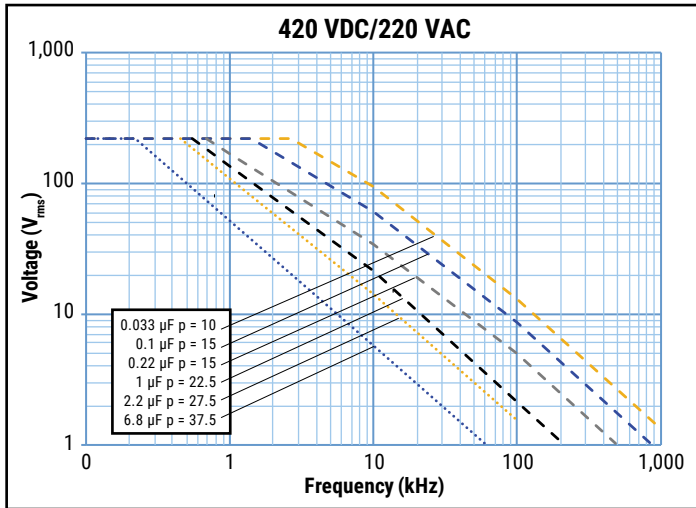
|  |  |           |           |  |      |      |
|--|--|-----------|-----------|--|------|------|
| Dielectric   | Polypropylene film   |           |           |  |      |      |
| Plates   | Metal layer deposited by evaporation under vacuum  |           |           |  |      |      |
| Winding  | Non-inductive type   |           |           |  |      |      |
| Leads  | Tinned wire  |           |           |  |      |      |
| Protection   | Plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94.                                     |           |           |  |      |      |
| Rated Voltage $V_R$ (VDC)                                      | 420  | 520       | 630       | 1,000  |      |      |
| Rated Voltage $V_R$ (VAC)                                      | 220  | 250       | 275       | 275  |      |      |
| Capacitance Range ( $\mu\text{F}$ )                            | 0.01 – 22  | 0.01 – 22 | 0.01 – 15 | 0.22 – 10  |      |      |
| Capacitance Values   | E12 series (IEC 60063) measured at 1 kHz and +20 $\pm$ 1°C   |           |           |  |      |      |
| Capacitance Tolerance  | $\pm$ 10%, $\pm$ 20%, $\pm$ 5% on request  |           |           |  |      |      |
| Operating Temperature Range                                    | -40°C to +110°C  |           |           |  |      |      |
| Rated Temperature $T_R$  | +105°C   |           |           |  |      |      |
| Voltage Derating   | Above +105°C DC and AC voltage derating is 4%/°C   |           |           |  |      |      |
| Climatic Category  | 40/110/56 IEC 60068-1  |           |           |  |      |      |
| Storage Conditions   | Storage time: $\leq$ 24 months from the date marked on the package label   |           |           |  |      |      |
|  | Average relative humidity per year $\leq$ 70%  |           |           |  |      |      |
|  | RH $\leq$ 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 $\pm$ 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 ( $V < V_R$ ), the specified dV/dt can be multiplied by the factor $V_R/V$ . |           |           |  |      |      |
| Temperature Coefficient  | -(200 $\pm$ 100) ppm/°C at 1 kHz   |           |           |  |      |      |
| Self Inductance<br>(Lead Length ~ 2 mm)                        | Lead Spacing (mm)  | 10        | 15        | 22.5   | 27.5 | 37.5 |
|  | L (nH) $\approx$   | 9         | 10        | 16   | 18   | 20   |
|  | Maximum 1 nH per 1 mm lead and capacitor length.   |           |           |  |      |      |
| Dissipation Factor ( $\tan\delta$ ) at 1 kHz at 25°C $\pm$ 5°C | $\leq$ 0.1% (0.06%)* at 25°C $\pm$ 5°C (* typical value)   |           |           |  |      |      |
| Insulation Resistance  | Measured at +25°C $\pm$ 5°C, 100 VDC 60 seconds  |           |           |  |      |      |
|  | Minimum Values Between Terminals   |           |           |  |      |      |
|  | C $\leq$ 0.33 $\mu\text{F}$  |           |           | C > 0.33 $\mu\text{F}$   |      |      |
|  | $\geq$ 100,000 M $\Omega$<br>( $\geq$ 500,000 M $\Omega$ )*  |           |           | $\geq$ 30,000 M $\Omega$ $\cdot$ $\mu\text{F}$<br>( $\geq$ 150,000 M $\Omega$ $\cdot$ $\mu\text{F}$ )* |      |      |

## Performance Characteristics cont.

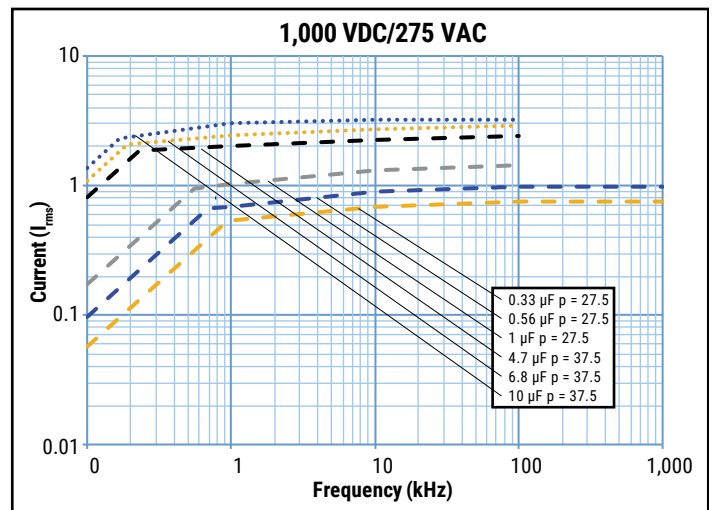
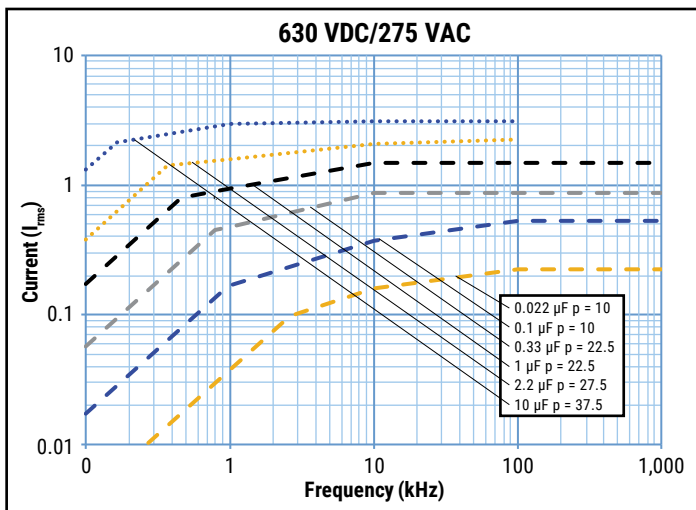
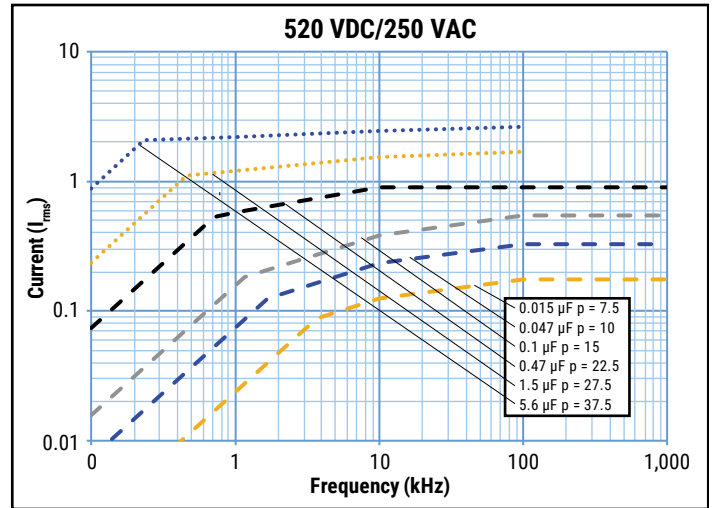
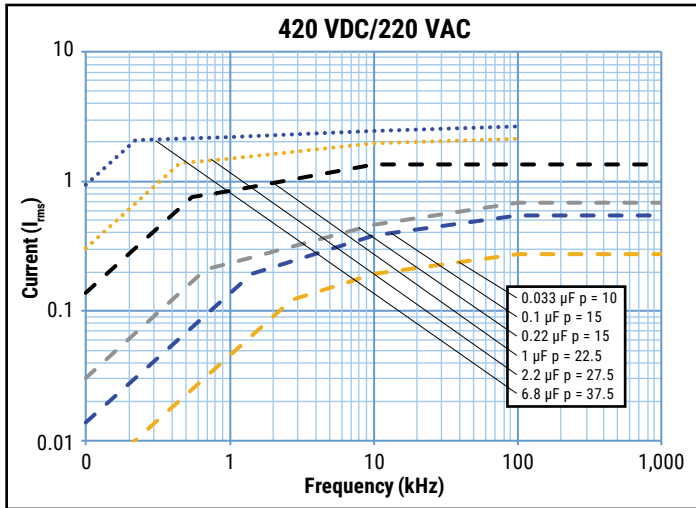


$T_h$  is the maximum ambient temperature surrounding the capacitor or hottest contact point (e.g. tracks), whichever is higher, in the worst operation conditions in °C.

## Maximum Voltage ( $V_{rms}$ ) vs. Frequency (Sinusoidal Waveform/ $Th \leq 85^\circ C$ )



## Maximum Current ( $I_{rms}$ ) vs. Frequency (Sinusoidal Waveform/ $T_h \leq 85^\circ\text{C}$ )



## Environmental Test Data

| Damp Heat, Steady State Test      | Test Conditions:   |  | Performances   |
|-----------------------------------|--|--|--|
| Test 1st                          | Temperature:<br>Relative humidity (RH):<br>Test duration:    | +40°C ±2°C<br>93% ±2%<br>56 days                         | Δ C/C  ≤ 5%,<br>IR after test ≥ 50% of initial limit |
| Test 2nd                          | Temperature:<br>Relative humidity (RH):<br>Test duration:    | +60°C ±2°C<br>95% ±2%<br>500 hours                       |  |
| Endurance Test                    | Test Conditions  |  | Performances   |
|                                   | Temperature:<br>Voltage applied:<br>Test duration:           | +105°C ±2°C<br>1.25 x V <sub>R</sub> (DC)<br>2,000 hours | Δ C/C  ≤ 5%,<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%  |

## Environmental Compliance

All KEMET pulse capacitors are RoHS Compliant.





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

| VDC | VAC | Cap Value (µF) | Dimensions in mm    |            |                  | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs) | I <sub>pk</sub> | ESL             | ESR max | I <sub>rms</sub> max (*) | R <sub>th</sub> | KEMET Internal Part Number | Customer Part Number |                  |        |
|-----|-----|----------------|---------------------|------------|------------------|------------------|---------|--------------|---|-----------------|-----------------|---------|--------------------------|-----------------|----------------------------|----------------------|------------------|--------|
|     |     |                | Lead Length 2x 4 mm | at 100 kHz | at 100 kHz, 85°C |                  |         |              |   |                 | A <sub>pk</sub> | nH      | mΩ                       |                 |                            |                      | A <sub>rms</sub> | (°C/W) |
|     |     |                |                     |            |                  |                  |         |              |   |                 |                 |         |                          |                 |                            |                      |                  |        |
| 420 | 220 | 0.010          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 2.5             | 9               | 3,979   | 0.2                      | 61              | 71MF2100(1)00(2)           | R71MF2100(1)00(2)    |                  |        |
| 420 | 220 | 0.015          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 3.8             | 9               | 2,653   | 0.2                      | 61              | 71MF2150(1)00(2)           | R71MF2150(1)00(2)    |                  |        |
| 420 | 220 | 0.022          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 5.5             | 9               | 1,809   | 0.3                      | 61              | 71MF2220(1)00(2)           | R71MF2220(1)00(2)    |                  |        |
| 420 | 220 | 0.033          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 8.3             | 9               | 1,206   | 0.3                      | 61              | 71MF2330(1)00(2)           | R71MF2330(1)00(2)    |                  |        |
| 420 | 220 | 0.047          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 11.8            | 9               | 847     | 0.4                      | 61              | 71MF2470(1)00(2)           | R71MF2470(1)00(2)    |                  |        |
| 420 | 220 | 0.068          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 17.0            | 9               | 585     | 0.4                      | 61              | 71MF2680(1)30(2)           | R71MF2680(1)30(2)    |                  |        |
| 420 | 220 | 0.10           | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 25.0            | 9               | 398     | 0.5                      | 61              | 71MF3100(1)30(2)           | R71MF3100(1)30(2)    |                  |        |
| 420 | 220 | 0.15           | 5.0                 | 11.0       | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 37.5            | 9               | 265     | 0.7                      | 57              | 71MF3150(1)30(2)           | R71MF3150(1)30(2)    |                  |        |
| 420 | 220 | 0.22           | 6.0                 | 12.0       | 13.0             | 10.0             | 0.6     | 250          | 210,000                                 | 55.0            | 9               | 181     | 0.8                      | 55              | 71MF3220(1)30(2)           | R71MF3220(1)30(2)    |                  |        |
| 420 | 220 | 0.10           | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 16.0            | 10              | 398     | 0.6                      | 44              | 71MI3100(1)00(2)           | R71MI3100(1)00(2)    |                  |        |
| 420 | 220 | 0.15           | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 24.0            | 10              | 371     | 0.7                      | 44              | 71MI3150(1)00(2)           | R71MI3150(1)00(2)    |                  |        |
| 420 | 220 | 0.22           | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 35.2            | 10              | 253     | 0.8                      | 44              | 71MI3220(1)00(2)           | R71MI3220(1)00(2)    |                  |        |
| 420 | 220 | 0.33           | 6.0                 | 12.0       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 52.8            | 10              | 169     | 1.0                      | 43              | 71MI3330(1)00(2)           | R71MI3330(1)00(2)    |                  |        |
| 420 | 220 | 0.47           | 7.5                 | 13.5       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 75.2            | 10              | 119     | 1.2                      | 41              | 71MI3470(1)00(2)           | R71MI3470(1)00(2)    |                  |        |
| 420 | 220 | 0.47           | 6.0                 | 17.5       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 75.2            | 10              | 119     | 1.3                      | 38              | 71MI3470(1)10(2)           | R71MI3470(1)10(2)    |                  |        |
| 420 | 220 | 0.47           | 9.0                 | 12.5       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 75.2            | 10              | 119     | 1.2                      | 42              | 71MI3470(1)20(2)           | R71MI3470(1)20(2)    |                  |        |
| 420 | 220 | 0.68           | 6.0                 | 17.5       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 108.8           | 10              | 105     | 1.3                      | 38              | 71MI3680(1)40(2)           | R71MI3680(1)40(2)    |                  |        |
| 420 | 220 | 0.68           | 8.5                 | 14.5       | 18.0             | 15.0             | 0.6     | 160          | 134,400                                 | 108.8           | 10              | 105     | 1.3                      | 40              | 71MI3680(1)30(2)           | R71MI3680(1)30(2)    |                  |        |
| 420 | 220 | 0.68           | 13.0                | 12.0       | 18.0             | 15.0             | 0.8     | 160          | 134,400                                 | 108.8           | 10              | 105     | 1.3                      | 43              | 71MI3680(1)20(2)           | R71MI3680(1)20(2)    |                  |        |
| 420 | 220 | 1.0            | 7.5                 | 18.5       | 18.0             | 15.0             | 0.8     | 160          | 134,400                                 | 160.0           | 10              | 72      | 1.6                      | 37              | 71MI4100(1)40(3)           | R71MI4100(1)40(3)    |                  |        |
| 420 | 220 | 1.0            | 10.0                | 16.0       | 18.0             | 15.0             | 0.8     | 160          | 134,400                                 | 160.0           | 10              | 72      | 1.6                      | 39              | 71MI4100(1)30(2)           | R71MI4100(1)30(2)    |                  |        |
| 420 | 220 | 1.5            | 11.0                | 19.0       | 18.0             | 15.0             | 0.8     | 160          | 134,400                                 | 240.0           | 10              | 53      | 1.9                      | 37              | 71MI4150(1)30(2)           | R71MI4150(1)30(2)    |                  |        |
| 420 | 220 | 0.22           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 22.0            | 16              | 326     | 0.9                      | 30              | 71MN3220(1)00(2)           | R71MN3220(1)00(2)    |                  |        |
| 420 | 220 | 0.33           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 33.0            | 16              | 217     | 1.0                      | 30              | 71MN3330(1)00(2)           | R71MN3330(1)00(2)    |                  |        |
| 420 | 220 | 0.47           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 47.0            | 16              | 203     | 1.1                      | 30              | 71MN3470(1)00(2)           | R71MN3470(1)00(2)    |                  |        |
| 420 | 220 | 0.68           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 68.0            | 16              | 140     | 1.3                      | 30              | 71MN3680(1)00(2)           | R71MN3680(1)00(2)    |                  |        |
| 420 | 220 | 1.0            | 7.0                 | 16.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 100.0           | 16              | 95      | 1.6                      | 29              | 71MN4100(1)30(2)           | R71MN4100(1)30(2)    |                  |        |
| 420 | 220 | 1.5            | 8.5                 | 17.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 150.0           | 16              | 64      | 2.0                      | 29              | 71MN4150(1)30(3)           | R71MN4150(1)30(3)    |                  |        |
| 420 | 220 | 1.5            | 10.0                | 18.5       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 150.0           | 16              | 64      | 2.0                      | 28              | 71MN4150(1)00(2)           | R71MN4150(1)00(2)    |                  |        |
| 420 | 220 | 2.2            | 10.0                | 18.5       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 220.0           | 16              | 43      | 2.4                      | 28              | 71MN4220(1)40(3)           | R71MN4220(1)40(3)    |                  |        |
| 420 | 220 | 2.2            | 11.0                | 20.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 220.0           | 16              | 43      | 2.4                      | 27              | 71MN4220(1)30(2)           | R71MN4220(1)30(2)    |                  |        |
| 420 | 220 | 3.3            | 13.0                | 22.0       | 26.5             | 22.5             | 0.8     | 100          | 84,000                                  | 330.0           | 16              | 29      | 3.0                      | 27              | 71MN4330(1)30(2)           | R71MN4330(1)30(2)    |                  |        |
| 420 | 220 | 0.68           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 54.4            | 18              | 176     | 1.3                      | 25              | 71MR3680(1)00(2)           | R71MR3680(1)00(2)    |                  |        |
| 420 | 220 | 1.0            | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 80.0            | 18              | 119     | 1.5                      | 25              | 71MR4100(1)00(2)           | R71MR4100(1)00(2)    |                  |        |
| 420 | 220 | 1.5            | 11.0                | 20.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 120.0           | 18              | 80      | 1.9                      | 24              | 71MR4150(1)00(2)           | R71MR4150(1)00(2)    |                  |        |
| 420 | 220 | 2.2            | 13.0                | 22.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 176.0           | 18              | 54      | 2.4                      | 23              | 71MR4220(1)00(2)           | R71MR4220(1)00(2)    |                  |        |
| 420 | 220 | 3.3            | 13.0                | 25.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 264.0           | 18              | 36      | 3.0                      | 22              | 71MR4330(1)40(2)           | R71MR4330(1)40(2)    |                  |        |
| 420 | 220 | 4.7            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 376.0           | 18              | 25      | 3.7                      | 20              | 71MR4470(1)00(2)           | R71MR4470(1)00(2)    |                  |        |
| 420 | 220 | 6.8            | 22.0                | 37.0       | 32.0             | 27.5             | 0.8     | 80           | 67,200                                  | 544.0           | 18              | 18      | 4.6                      | 19              | 71MR4680(1)00(2)           | R71MR4680(1)00(2)    |                  |        |
| 420 | 220 | 3.3            | 13.0                | 24.0       | 41.5             | 37.5             | 1.0     | 60           | 50,400                                  | 198.0           | 20              | 36      | 3.3                      | 18              | 71MW4330(1)20(2)           | R71MW4330(1)20(2)    |                  |        |
| 420 | 220 | 4.7            | 16.0                | 28.5       | 41.5             | 37.5             | 1.0     | 60           | 50,400                                  | 282.0           | 20              | 71      | 2.4                      | 17              | 71MW4470(1)00(2)           | R71MW4470(1)00(2)    |                  |        |
| 420 | 220 | 6.8            | 19.0                | 32.0       | 41.5             | 37.5             | 1.0     | 60           | 50,400                                  | 408.0           | 20              | 49      | 2.9                      | 17              | 71MW4680(1)00(2)           | R71MW4680(1)00(2)    |                  |        |
| 420 | 220 | 10             | 20.0                | 40.0       | 41.5             | 37.5             | 1.0     | 60           | 50,400                                  | 600.0           | 20              | 43      | 3.3                      | 16              | 71MW5100(1)00(2)           | R71MW5100(1)00(2)    |                  |        |
| 420 | 220 | 15             | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 60           | 50,400                                  | 900.0           | 20              | 29      | 4.1                      | 15              | 71MW5150(1)00(2)           | R71MW5150(1)00(2)    |                  |        |
| 420 | 220 | 22             | 30.0                | 45.0       | 41.5             | 37.5             | 1.0     | 60           | 50,400                                  | 1,320.0         | 20              | 24      | 4.5                      | 15              | 71MW5220(1)00(2)           | R71MW5220(1)00(2)    |                  |        |
| 520 | 250 | 0.010          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 300          | 312,000                                 | 3.0             | 9               | 3,979   | 0.2                      | 61              | 71VF2100(1)00(2)           | R71VF2100(1)00(2)    |                  |        |
| 520 | 250 | 0.015          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 300          | 312,000                                 | 4.5             | 9               | 2,653   | 0.2                      | 61              | 71VF2150(1)00(2)           | R71VF2150(1)00(2)    |                  |        |
| 520 | 250 | 0.022          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 300          | 312,000                                 | 6.6             | 9               | 1,809   | 0.3                      | 61              | 71VF2220(1)00(2)           | R71VF2220(1)00(2)    |                  |        |
| 520 | 250 | 0.033          | 4.0                 | 9.0        | 13.0             | 10.0             | 0.6     | 300          | 312,000                                 | 9.9             | 9               | 1,206   | 0.3                      | 61              | 71VF2330(1)00(2)           | R71VF2330(1)00(2)    |                  |        |
| VDC | VAC | Cap Value      | T                   | H          | L                | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs) | A <sub>pk</sub> | nH              | mΩ      | A <sub>rms</sub>         | (°C/W)          | KEMET Internal Part Number | Customer Part Number |                  |        |
|     |     |                |                     |            |                  |                  |         |              |   | I <sub>pk</sub> | ESL             | ESR max | I <sub>rms</sub> max (*) | R <sub>th</sub> |                            |                      |                  |        |

(1) Insert lead and packaging code. See Ordering Options Table for available options.  
(2) J = 5%, K = 10%, M = 20%.  
(3) M = ±20% (only available tolerance).  
(\*) I<sub>rms</sub> value that leads to a ΔT of ≈ 20°C in the hot spot > T<sub>HS</sub> = T<sub>AMB</sub> + ΔT = 85°C + 20°C = 105°C

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

| VDC | VAC | Cap Value (µF) | Dimensions in mm |      |      | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs) | I <sub>pk</sub> | ESL                 | ESR max    | I <sub>rms</sub> max (*) | R <sub>th</sub> | KEMET Internal Part Number | Customer Part Number |
|-----|-----|----------------|------------------|------|------|------------------|---------|--------------|---|-----------------|---------------------|------------|--------------------------|-----------------|----------------------------|----------------------|
|     |     |                |                  |      |      |                  |         |              |   |                 | Lead Length 2x 4 mm | at 100 kHz | at 100 kHz, 85°C         |                 |                            |                      |
|     |     |                | A <sub>pk</sub>  | nH   | mΩ   |                  |         |              |   |                 | A <sub>rms</sub>    | (°C/W)     |                          |                 |                            |                      |
| 520 | 250 | 0.047          | 4.0              | 9.0  | 13.0 | 10.0             | 0.6     | 300          | 312,000                                 | 14.1            | 9                   | 847        | 0.4                      | 61              | 71VF2470(1)30(2)           | R71VF2470(1)30(2)    |
| 520 | 250 | 0.068          | 4.0              | 9.0  | 13.0 | 10.0             | 0.6     | 300          | 312,000                                 | 20.4            | 9                   | 585        | 0.4                      | 61              | 71VF2680(1)30(2)           | R71VF2680(1)30(2)    |
| 520 | 250 | 0.10           | 5.0              | 11.0 | 13.0 | 10.0             | 0.6     | 300          | 312,000                                 | 30.0            | 9                   | 398        | 0.6                      | 57              | 71VF3100(1)30(2)           | R71VF3100(1)30(2)    |
| 520 | 250 | 0.15           | 6.0              | 12.0 | 13.0 | 10.0             | 0.6     | 300          | 312,000                                 | 45.0            | 9                   | 265        | 0.7                      | 55              | 71VF3150(1)30(2)           | R71VF3150(1)30(2)    |
| 520 | 250 | 0.10           | 5.0              | 11.0 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 20.0            | 10                  | 398        | 0.6                      | 44              | 71VI3100(1)00(2)           | R71VI3100(1)00(2)    |
| 520 | 250 | 0.15           | 5.0              | 11.0 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 30.0            | 10                  | 371        | 0.7                      | 44              | 71VI3150(1)30(2)           | R71VI3150(1)30(2)    |
| 520 | 250 | 0.22           | 6.0              | 12.0 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 44.0            | 10                  | 253        | 0.8                      | 43              | 71VI3220(1)30(2)           | R71VI3220(1)30(2)    |
| 520 | 250 | 0.22           | 6.0              | 17.5 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 44.0            | 10                  | 253        | 0.9                      | 38              | 71VI3220(1)10(2)           | R71VI3220(1)10(2)    |
| 520 | 250 | 0.33           | 6.0              | 17.5 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 66.0            | 10                  | 169        | 1.1                      | 38              | 71VI3330(1)40(2)           | R71VI3330(1)40(2)    |
| 520 | 250 | 0.33           | 7.5              | 13.5 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 66.0            | 10                  | 169        | 1.0                      | 41              | 71VI3330(1)30(2)           | R71VI3330(1)30(2)    |
| 520 | 250 | 0.33           | 9.0              | 12.5 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 66.0            | 10                  | 169        | 1.0                      | 42              | 71VI3330(1)20(2)           | R71VI3330(1)20(2)    |
| 520 | 250 | 0.47           | 8.5              | 14.5 | 18.0 | 15.0             | 0.6     | 200          | 208,000                                 | 94.0            | 10                  | 119        | 1.2                      | 40              | 71VI3470(1)30(2)           | R71VI3470(1)30(2)    |
| 520 | 250 | 0.47           | 7.5              | 18.5 | 18.0 | 15.0             | 0.8     | 200          | 208,000                                 | 94.0            | 10                  | 119        | 1.3                      | 37              | 71VI3470(1)10(2)           | R71VI3470(1)10(2)    |
| 520 | 250 | 0.47           | 13.0             | 12.0 | 18.0 | 15.0             | 0.8     | 200          | 208,000                                 | 94.0            | 10                  | 119        | 1.2                      | 43              | 71VI3470(1)20(2)           | R71VI3470(1)20(2)    |
| 520 | 250 | 0.68           | 10.0             | 16.0 | 18.0 | 15.0             | 0.8     | 200          | 208,000                                 | 136.0           | 10                  | 105        | 1.3                      | 39              | 71VI3680(1)30(2)           | R71VI3680(1)30(2)    |
| 520 | 250 | 1.0            | 11.0             | 19.0 | 18.0 | 15.0             | 0.8     | 200          | 208,000                                 | 200.0           | 10                  | 72         | 1.6                      | 37              | 71VI4100(1)30(3)           | R71VI4100(1)30(3)    |
| 520 | 250 | 0.22           | 6.0              | 15.0 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 26.4            | 16                  | 326        | 0.9                      | 30              | 71VN3220(1)00(2)           | R71VN3220(1)00(2)    |
| 520 | 250 | 0.33           | 6.0              | 15.0 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 39.6            | 16                  | 217        | 1.0                      | 30              | 71VN3330(1)00(2)           | R71VN3330(1)00(2)    |
| 520 | 250 | 0.47           | 6.0              | 15.0 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 56.4            | 16                  | 203        | 1.1                      | 30              | 71VN3470(1)30(2)           | R71VN3470(1)30(2)    |
| 520 | 250 | 0.68           | 7.0              | 16.0 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 81.6            | 16                  | 140        | 1.3                      | 29              | 71VN3680(1)30(2)           | R71VN3680(1)30(2)    |
| 520 | 250 | 1.0            | 10.0             | 18.5 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 120.0           | 16                  | 95         | 1.6                      | 28              | 71VN4100(1)30(2)           | R71VN4100(1)30(2)    |
| 520 | 250 | 1.5            | 11.0             | 20.0 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 180.0           | 16                  | 64         | 2.0                      | 27              | 71VN4150(1)30(2)           | R71VN4150(1)30(2)    |
| 520 | 250 | 2.2            | 13.0             | 22.0 | 26.5 | 22.5             | 0.8     | 120          | 124,800                                 | 264.0           | 16                  | 43         | 2.5                      | 27              | 71VN4220(1)30(2)           | R71VN4220(1)30(2)    |
| 520 | 250 | 0.68           | 9.0              | 17.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 68.0            | 18                  | 176        | 1.3                      | 25              | 71VR3680(1)00(2)           | R71VR3680(1)00(2)    |
| 520 | 250 | 1.0            | 9.0              | 17.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 100.0           | 18                  | 119        | 1.5                      | 25              | 71VR4100(1)30(2)           | R71VR4100(1)30(2)    |
| 520 | 250 | 1.0            | 11.0             | 20.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 100.0           | 18                  | 119        | 1.6                      | 24              | 71VR4100(1)00(2)           | R71VR4100(1)00(2)    |
| 520 | 250 | 1.5            | 11.0             | 20.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 150.0           | 18                  | 80         | 1.9                      | 24              | 71VR4150(1)00(2)           | R71VR4150(1)00(2)    |
| 520 | 250 | 2.2            | 13.0             | 25.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 220.0           | 18                  | 54         | 2.4                      | 22              | 71VR4220(1)30(2)           | R71VR4220(1)30(2)    |
| 520 | 250 | 2.2            | 14.0             | 28.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 220.0           | 18                  | 54         | 2.5                      | 21              | 71VR4220(1)00(2)           | R71VR4220(1)00(2)    |
| 520 | 250 | 3.3            | 14.0             | 28.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 330.0           | 18                  | 36         | 3.0                      | 21              | 71VR4330(1)30(2)           | R71VR4330(1)30(2)    |
| 520 | 250 | 3.3            | 18.0             | 33.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 330.0           | 18                  | 36         | 3.1                      | 20              | 71VR4330(1)00(2)           | R71VR4330(1)00(2)    |
| 520 | 250 | 4.7            | 18.0             | 33.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 470.0           | 18                  | 25         | 3.7                      | 20              | 71VR4470(1)30(2)           | R71VR4470(1)30(2)    |
| 520 | 250 | 4.7            | 22.0             | 37.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 470.0           | 18                  | 25         | 3.8                      | 19              | 71VR4470(1)00(2)           | R71VR4470(1)00(2)    |
| 520 | 250 | 6.8            | 22.0             | 37.0 | 32.0 | 27.5             | 0.8     | 100          | 104,000                                 | 680.0           | 18                  | 18         | 4.6                      | 19              | 71VR4680(1)30(2)           | R71VR4680(1)30(2)    |
| 520 | 250 | 2.2            | 11.0             | 22.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 154.0           | 20                  | 54         | 2.6                      | 19              | 71VW4220(1)00(2)           | R71VW4220(1)00(2)    |
| 520 | 250 | 3.3            | 13.0             | 24.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 231.0           | 20                  | 36         | 3.3                      | 18              | 71VW4330(1)30(2)           | R71VW4330(1)30(2)    |
| 520 | 250 | 3.3            | 16.0             | 28.5 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 231.0           | 20                  | 36         | 3.4                      | 17              | 71VW4330(1)00(2)           | R71VW4330(1)00(2)    |
| 520 | 250 | 4.7            | 16.0             | 28.5 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 329.0           | 20                  | 71         | 2.4                      | 17              | 71VW4470(1)00(2)           | R71VW4470(1)00(2)    |
| 520 | 250 | 6.8            | 19.0             | 32.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 476.0           | 20                  | 49         | 2.9                      | 17              | 71VW4680(1)30(2)           | R71VW4680(1)30(2)    |
| 520 | 250 | 6.8            | 20.0             | 40.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 476.0           | 20                  | 49         | 3.1                      | 16              | 71VW4680(1)00(2)           | R71VW4680(1)00(2)    |
| 520 | 250 | 10             | 20.0             | 40.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 700.0           | 20                  | 43         | 3.3                      | 16              | 71VW5100(1)30(2)           | R71VW5100(1)30(2)    |
| 520 | 250 | 10             | 24.0             | 44.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 700.0           | 20                  | 43         | 3.3                      | 15              | 71VW5100(1)00(2)           | R71VW5100(1)00(2)    |
| 520 | 250 | 15             | 24.0             | 44.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 1,050.0         | 20                  | 29         | 4.1                      | 15              | 71VW5150(1)30(2)           | R71VW5150(1)30(2)    |
| 520 | 250 | 15             | 30.0             | 45.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 1,050.0         | 20                  | 29         | 4.1                      | 15              | 71VW5150(1)00(2)           | R71VW5150(1)00(2)    |
| 520 | 250 | 22             | 30.0             | 45.0 | 41.5 | 37.5             | 1.0     | 70           | 72,800                                  | 1,540.0         | 20                  | 24         | 4.5                      | 15              | 71VW5220(1)00(2)           | R71VW5220(1)00(2)    |
| 630 | 275 | 0.010          | 4.0              | 9.0  | 13.0 | 10.0             | 0.6     | 400          | 504,000                                 | 4.0             | 9                   | 3,979      | 0.2                      | 61              | 71PF2100(1)30(2)           | R71PF2100(1)30(2)    |
| 630 | 275 | 0.015          | 4.0              | 9.0  | 13.0 | 10.0             | 0.6     | 400          | 504,000                                 | 6.0             | 9                   | 2,653      | 0.2                      | 61              | 71PF2150(1)30(2)           | R71PF2150(1)30(2)    |
| 630 | 275 | 0.022          | 4.0              | 9.0  | 13.0 | 10.0             | 0.6     | 400          | 504,000                                 | 8.8             | 9                   | 1,809      | 0.3                      | 61              | 71PF2220(1)30(2)           | R71PF2220(1)30(2)    |
| 630 | 275 | 0.033          | 5.0              | 11.0 | 13.0 | 10.0             | 0.6     | 400          | 504,000                                 | 13.2            | 9                   | 1,206      | 0.3                      | 57              | 71PF2330(1)00(2)           | R71PF2330(1)00(2)    |
| VDC | VAC | Cap Value      | T                | H    | L    | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs) | A <sub>pk</sub> | nH                  | mΩ         | A <sub>rms</sub>         | (°C/W)          | KEMET Internal Part Number | Customer Part Number |
|     |     |                |                  |      |      |                  |         |              |   | I <sub>pk</sub> | ESL                 | ESR max    | I <sub>rms</sub> max (*) | R <sub>th</sub> |                            |                      |

(1) Insert lead and packaging code. See Ordering Options Table for available options.  
(2) J = 5%, K = 10%, M = 20%.  
(3) M = ±20% (only available tolerance).  
(\*) I<sub>rms</sub> value that leads to a ΔT of ≈ 20°C in the hot spot > T<sub>HS</sub> = T<sub>AMB</sub> + ΔT = 85°C + 20°C = 105°C

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

| VDC   | VAC | Cap Value (µF) | Dimensions in mm    |            |                  | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs) | I <sub>pk</sub> | ESL             | ESR max         | I <sub>rms</sub> max (*) | R <sub>th</sub> | KEMET Internal Part Number | Customer Part Number |
|-------|-----|----------------|---------------------|------------|------------------|------------------|---------|--------------|---|-----------------|-----------------|-----------------|--------------------------|-----------------|----------------------------|----------------------|
|       |     |                | Lead Length 2x 4 mm | at 100 kHz | at 100 kHz, 85°C |                  |         |              |   |                 | R <sub>th</sub> |                 |                          |                 |                            |                      |
|       |     |                |                     |            |                  |                  |         |              |   |                 |                 | A <sub>pk</sub> | nH                       |                 |                            |                      |
| T     | H   | L              | A <sub>pk</sub>     | nH         | mΩ               | A <sub>rms</sub> | (°C/W)  |              |   |                 |                 |                 |                          |                 |                            |                      |
| 630   | 275 | 0.047          | 5.0                 | 11.0       | 13.0             | 10.0             | 0.6     | 400          | 504,000                                 | 18.8            | 9               | 847             | 0.4                      | 57              | 71PF2470(1)30(2)           | R71PF2470(1)30(2)    |
| 630   | 275 | 0.068          | 6.0                 | 12.0       | 13.0             | 10.0             | 0.6     | 400          | 504,000                                 | 27.2            | 9               | 585             | 0.5                      | 55              | 71PF2680(1)30(2)           | R71PF2680(1)30(2)    |
| 630   | 275 | 0.10           | 6.0                 | 12.0       | 13.0             | 10.0             | 0.6     | 400          | 504,000                                 | 40.0            | 9               | 398             | 0.6                      | 55              | 71PF3100(1)30(3)           | R71PF3100(1)30(3)    |
| 630   | 275 | 0.010          | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 2.5             | 10              | 3,979           | 0.2                      | 44              | 71PI2100(1)00(2)           | R71PI2100(1)00(2)    |
| 630   | 275 | 0.015          | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 3.8             | 10              | 2,653           | 0.2                      | 44              | 71PI2150(1)00(2)           | R71PI2150(1)00(2)    |
| 630   | 275 | 0.022          | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 5.5             | 10              | 1,809           | 0.3                      | 44              | 71PI2220(1)00(2)           | R71PI2220(1)00(2)    |
| 630   | 275 | 0.033          | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 8.3             | 10              | 1,206           | 0.4                      | 44              | 71PI2330(1)00(2)           | R71PI2330(1)00(2)    |
| 630   | 275 | 0.047          | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 11.8            | 10              | 847             | 0.4                      | 44              | 71PI2470(1)00(2)           | R71PI2470(1)00(2)    |
| 630   | 275 | 0.068          | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 17.0            | 10              | 585             | 0.5                      | 44              | 71PI2680(1)00(2)           | R71PI2680(1)00(2)    |
| 630   | 275 | 0.10           | 5.0                 | 11.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 25.0            | 10              | 398             | 0.6                      | 44              | 71PI3100(1)30(2)           | R71PI3100(1)30(2)    |
| 630   | 275 | 0.15           | 6.0                 | 12.0       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 37.5            | 10              | 371             | 0.7                      | 43              | 71PI3150(1)30(2)           | R71PI3150(1)30(2)    |
| 630   | 275 | 0.15           | 6.0                 | 17.5       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 37.5            | 10              | 371             | 0.7                      | 38              | 71PI3150(1)40(2)           | R71PI3150(1)40(2)    |
| 630   | 275 | 0.22           | 7.5                 | 13.5       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 55.0            | 10              | 253             | 0.8                      | 41              | 71PI3220(1)30(2)           | R71PI3220(1)30(2)    |
| 630   | 275 | 0.22           | 6.0                 | 17.5       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 55.0            | 10              | 253             | 0.9                      | 38              | 71PI3220(1)10(2)           | R71PI3220(1)10(2)    |
| 630   | 275 | 0.22           | 9.0                 | 12.5       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 55.0            | 10              | 253             | 0.8                      | 42              | 71PI3220(1)20(2)           | R71PI3220(1)20(2)    |
| 630   | 275 | 0.33           | 8.5                 | 14.5       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 82.5            | 10              | 169             | 1.0                      | 40              | 71PI3330(1)30(2)           | R71PI3330(1)30(2)    |
| 630   | 275 | 0.33           | 7.5                 | 18.5       | 18.0             | 15.0             | 0.8     | 250          | 315,000                                 | 82.5            | 10              | 169             | 1.1                      | 37              | 71PI3330(1)10(2)           | R71PI3330(1)10(2)    |
| 630   | 275 | 0.33           | 9.0                 | 12.5       | 18.0             | 15.0             | 0.6     | 250          | 315,000                                 | 82.5            | 10              | 169             | 1.0                      | 42              | 71PI3330(1)40(3)           | R71PI3330(1)40(3)    |
| 630   | 275 | 0.33           | 13.0                | 12.0       | 18.0             | 15.0             | 0.8     | 250          | 315,000                                 | 82.5            | 10              | 169             | 1.0                      | 43              | 71PI3330(1)20(2)           | R71PI3330(1)20(2)    |
| 630   | 275 | 0.47           | 7.5                 | 18.5       | 18.0             | 15.0             | 0.8     | 250          | 315,000                                 | 117.5           | 10              | 119             | 1.3                      | 37              | 71PI3470(1)40(3)           | R71PI3470(1)40(3)    |
| 630   | 275 | 0.47           | 10.0                | 16.0       | 18.0             | 15.0             | 0.8     | 250          | 315,000                                 | 117.5           | 10              | 119             | 1.2                      | 39              | 71PI3470(1)30(3)           | R71PI3470(1)30(3)    |
| 630   | 275 | 0.68           | 11.0                | 19.0       | 18.0             | 15.0             | 0.8     | 250          | 315,000                                 | 170.0           | 10              | 105             | 1.4                      | 37              | 71PI3680(1)30(3)           | R71PI3680(1)30(3)    |
| 630   | 275 | 0.15           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 24.0            | 16              | 477             | 0.7                      | 30              | 71PN3150(1)00(2)           | R71PN3150(1)00(2)    |
| 630   | 275 | 0.22           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 35.2            | 16              | 326             | 0.9                      | 30              | 71PN3220(1)00(2)           | R71PN3220(1)00(2)    |
| 630   | 275 | 0.33           | 6.0                 | 15.0       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 52.8            | 16              | 217             | 1.0                      | 30              | 71PN3330(1)30(2)           | R71PN3330(1)30(2)    |
| 630   | 275 | 0.47           | 7.0                 | 16.0       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 75.2            | 16              | 203             | 1.1                      | 29              | 71PN3470(1)30(2)           | R71PN3470(1)30(2)    |
| 630   | 275 | 0.68           | 10.0                | 18.5       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 108.8           | 16              | 140             | 1.3                      | 28              | 71PN3680(1)30(2)           | R71PN3680(1)30(2)    |
| 630   | 275 | 1.0            | 10.0                | 18.5       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 160.0           | 16              | 95              | 1.6                      | 28              | 71PN4100(1)40(3)           | R71PN4100(1)40(3)    |
| 630   | 275 | 1.0            | 11.0                | 20.0       | 26.5             | 22.5             | 0.8     | 160          | 201,600                                 | 160.0           | 16              | 95              | 1.7                      | 27              | 71PN4100(1)30(2)           | R71PN4100(1)30(2)    |
| 630   | 275 | 0.68           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 115          | 144,900                                 | 78.2            | 18              | 176             | 1.3                      | 25              | 71PR3680(1)00(2)           | R71PR3680(1)00(2)    |
| 630   | 275 | 1.0            | 11.0                | 20.0       | 32.0             | 27.5             | 0.8     | 115          | 144,900                                 | 115.0           | 18              | 119             | 1.6                      | 24              | 71PR4100(1)00(2)           | R71PR4100(1)00(2)    |
| 630   | 275 | 1.5            | 13.0                | 22.0       | 32.0             | 27.5             | 0.8     | 115          | 144,900                                 | 172.5           | 18              | 80              | 2.0                      | 23              | 71PR4150(1)00(2)           | R71PR4150(1)00(2)    |
| 630   | 275 | 2.2            | 14.0                | 28.0       | 32.0             | 27.5             | 0.8     | 115          | 144,900                                 | 253.0           | 18              | 54              | 2.5                      | 21              | 71PR4220(1)00(2)           | R71PR4220(1)00(2)    |
| 630   | 275 | 3.3            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 115          | 144,900                                 | 379.5           | 18              | 36              | 3.1                      | 20              | 71PR4330(1)00(2)           | R71PR4330(1)00(2)    |
| 630   | 275 | 4.7            | 22.0                | 37.0       | 32.0             | 27.5             | 0.8     | 115          | 144,900                                 | 540.5           | 18              | 25              | 3.8                      | 19              | 71PR4470(1)00(2)           | R71PR4470(1)00(2)    |
| 630   | 275 | 1.5            | 11.0                | 22.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 120.0           | 20              | 80              | 2.2                      | 19              | 71PW4150(1)00(2)           | R71PW4150(1)00(2)    |
| 630   | 275 | 2.2            | 13.0                | 24.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 176.0           | 20              | 54              | 2.7                      | 18              | 71PW4220(1)00(2)           | R71PW4220(1)00(2)    |
| 630   | 275 | 3.3            | 16.0                | 28.5       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 264.0           | 20              | 36              | 3.4                      | 17              | 71PW4330(1)00(2)           | R71PW4330(1)00(2)    |
| 630   | 275 | 4.7            | 19.0                | 32.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 376.0           | 20              | 71              | 2.4                      | 17              | 71PW4470(1)00(2)           | R71PW4470(1)00(2)    |
| 630   | 275 | 6.8            | 20.0                | 40.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 544.0           | 20              | 49              | 3.0                      | 16              | 71PW4680(1)00(2)           | R71PW4680(1)00(2)    |
| 630   | 275 | 8.2            | 20.0                | 40.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 656.0           | 20              | 49              | 3.0                      | 16              | 71PW4820(1)00(2)           | R71PW4820(1)00(2)    |
| 630   | 275 | 10             | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 800.0           | 20              | 43              | 3.1                      | 16              | 71PW5100(1)00(2)           | R71PW5100(1)00(2)    |
| 630   | 275 | 15             | 30.0                | 45.0       | 41.5             | 37.5             | 1.0     | 80           | 100,800                                 | 1,200.0         | 20              | 29              | 3.3                      | 15              | 71PW5150(1)00(2)           | R71PW5150(1)00(2)    |
| 1,000 | 275 | 0.22           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 39.6            | 18              | 543             | 4.1                      | 15              | 71QR3220(1)00(2)           | R71QR3220(1)00(2)    |
| 1,000 | 275 | 0.27           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 48.6            | 18              | 442             | 0.7                      | 25              | 71QR3270(1)00(2)           | R71QR3270(1)00(2)    |
| 1,000 | 275 | 0.33           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 59.4            | 18              | 362             | 0.8                      | 25              | 71QR3330(1)10(2)           | R71QR3330(1)10(2)    |
| 1,000 | 275 | 0.33           | 11.0                | 20.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 59.4            | 18              | 362             | 0.9                      | 25              | 71QR3330(1)00(2)           | R71QR3330(1)00(2)    |
| 1,000 | 275 | 0.39           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 70.2            | 18              | 306             | 0.9                      | 24              | 71QR3390(1)10(2)           | R71QR3390(1)10(2)    |
| 1,000 | 275 | 0.39           | 11.0                | 20.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 70.2            | 18              | 306             | 1.0                      | 25              | 71QR3390(1)00(2)           | R71QR3390(1)00(2)    |

| VDC | VAC | Cap Value | T | H | L | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs) | A <sub>pk</sub> | nH  | mΩ      | A <sub>rms</sub>         | (°C/W)          | KEMET Internal Part Number | Customer Part Number |
|-----|-----|-----------|---|---|---|------------------|---------|--------------|---|-----------------|-----|---------|--------------------------|-----------------|----------------------------|----------------------|
|     |     |           |   |   |   |                  |         |              |   | I <sub>pk</sub> | ESL | ESR max | I <sub>rms</sub> max (*) | R <sub>th</sub> |                            |                      |

(1) Insert lead and packaging code. See Ordering Options Table for available options.  
(2) J = 5%, K = 10%, M = 20%.  
(3) M = ±20% (only available tolerance).  
(\*) I<sub>rms</sub> value that leads to a ΔT of ≈ 20°C in the hot spot > T<sub>HS</sub> = T<sub>AMB</sub> + ΔT = 85°C + 20°C = 105°C

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

| VDC   | VAC | Cap Value (µF) | Dimensions in mm    |            |                  | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>v</sub> (V <sup>2</sup> /µs) | I <sub>pk</sub> | ESL             | ESR max         | I <sub>rms</sub> max (*) | R <sub>th</sub> | KEMET Internal Part Number | Customer Part Number |
|-------|-----|----------------|---------------------|------------|------------------|------------------|---------|--------------|---|-----------------|-----------------|-----------------|--------------------------|-----------------|----------------------------|----------------------|
|       |     |                | Lead Length 2x 4 mm | at 100 kHz | at 100 kHz, 85°C |                  |         |              |   |                 | R <sub>th</sub> |                 |                          |                 |                            |                      |
|       |     |                |                     |            |                  |                  |         |              |   |                 |                 | A <sub>pk</sub> | nH                       |                 |                            |                      |
| T     | H   | L              | A <sub>pk</sub>     | nH         | mΩ               | A <sub>rms</sub> | (°C/W)  |              |   |                 |                 |                 |                          |                 |                            |                      |
| 1,000 | 275 | 0.47           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 84.6            | 18              | 254             | 1.0                      | 24              | 71QR3470(1)10(2)           | R71QR3470(1)10(2)    |
| 1,000 | 275 | 0.47           | 13.0                | 22.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 84.6            | 18              | 254             | 1.1                      | 25              | 71QR3470(1)00(2)           | R71QR3470(1)00(2)    |
| 1,000 | 275 | 0.56           | 9.0                 | 17.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 100.8           | 18              | 213             | 1.1                      | 23              | 71QR3560(1)10(2)           | R71QR3560(1)10(2)    |
| 1,000 | 275 | 0.56           | 13.0                | 22.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 100.8           | 18              | 213             | 1.2                      | 25              | 71QR3560(1)00(2)           | R71QR3560(1)00(2)    |
| 1,000 | 275 | 0.68           | 11.0                | 20.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 122.4           | 18              | 176             | 1.2                      | 23              | 71QR3680(1)10(2)           | R71QR3680(1)10(2)    |
| 1,000 | 275 | 0.68           | 14.0                | 28.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 122.4           | 18              | 176             | 1.3                      | 24              | 71QR3680(1)00(2)           | R71QR3680(1)00(2)    |
| 1,000 | 275 | 0.82           | 11.0                | 20.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 147.6           | 18              | 146             | 1.4                      | 21              | 71QR3820(1)10(2)           | R71QR3820(1)10(2)    |
| 1,000 | 275 | 0.82           | 14.0                | 28.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 147.6           | 18              | 146             | 1.4                      | 24              | 71QR3820(1)00(2)           | R71QR3820(1)00(2)    |
| 1,000 | 275 | 1.0            | 13.0                | 22.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 180.0           | 18              | 119             | 1.5                      | 21              | 71QR4100(1)10(2)           | R71QR4100(1)10(2)    |
| 1,000 | 275 | 1.0            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 180.0           | 18              | 119             | 1.6                      | 23              | 71QR4100(1)00(2)           | R71QR4100(1)00(2)    |
| 1,000 | 275 | 1.2            | 13.0                | 25.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 216.0           | 18              | 99              | 1.7                      | 20              | 71QR4120(1)10(2)           | R71QR4120(1)10(2)    |
| 1,000 | 275 | 1.2            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 216.0           | 18              | 99              | 1.8                      | 22              | 71QR4120(1)00(2)           | R71QR4120(1)00(2)    |
| 1,000 | 275 | 1.5            | 14.0                | 28.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 270.0           | 18              | 80              | 1.9                      | 20              | 71QR4150(1)10(2)           | R71QR4150(1)10(2)    |
| 1,000 | 275 | 1.5            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 270.0           | 18              | 80              | 2.0                      | 21              | 71QR4150(1)00(2)           | R71QR4150(1)00(2)    |
| 1,000 | 275 | 1.8            | 14.0                | 28.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 324.0           | 18              | 66              | 2.1                      | 20              | 71QR4180(1)10(2)           | R71QR4180(1)10(2)    |
| 1,000 | 275 | 1.8            | 22.0                | 37.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 324.0           | 18              | 66              | 2.2                      | 21              | 71QR4180(1)00(2)           | R71QR4180(1)00(2)    |
| 1,000 | 275 | 2.2            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 396.0           | 18              | 54              | 2.4                      | 19              | 71QR4220(1)10(2)           | R71QR4220(1)10(2)    |
| 1,000 | 275 | 2.2            | 22.0                | 37.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 396.0           | 18              | 54              | 2.6                      | 20              | 71QR4220(1)00(2)           | R71QR4220(1)00(2)    |
| 1,000 | 275 | 2.7            | 18.0                | 33.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 486.0           | 18              | 44              | 2.6                      | 19              | 71QR4270(1)10(2)           | R71QR4270(1)10(2)    |
| 1,000 | 275 | 3.3            | 22.0                | 37.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 594.0           | 18              | 36              | 2.8                      | 20              | 71QR4330(1)10(2)           | R71QR4330(1)10(2)    |
| 1,000 | 275 | 3.9            | 22.0                | 37.0       | 32.0             | 27.5             | 0.8     | 180          | 360,000                                 | 702.0           | 18              | 31              | 3.2                      | 19              | 71QR4390(1)10(2)           | R71QR4390(1)10(2)    |
| 1,000 | 275 | 0.68           | 11.0                | 22.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 102.0           | 20              | 176             | 3.5                      | 19              | 71QW3680(1)00(2)           | R71QW3680(1)00(2)    |
| 1,000 | 275 | 0.82           | 13.0                | 24.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 123.0           | 20              | 146             | 1.5                      | 19              | 71QW3820(1)00(2)           | R71QW3820(1)00(2)    |
| 1,000 | 275 | 1.0            | 11.0                | 22.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 150.0           | 20              | 119             | 1.6                      | 18              | 71QW4100(1)10(2)           | R71QW4100(1)10(2)    |
| 1,000 | 275 | 1.0            | 13.0                | 24.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 150.0           | 20              | 119             | 1.8                      | 19              | 71QW4100(1)00(2)           | R71QW4100(1)00(2)    |
| 1,000 | 275 | 1.2            | 11.0                | 22.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 180.0           | 20              | 99              | 1.8                      | 18              | 71QW4120(1)10(2)           | R71QW4120(1)10(2)    |
| 1,000 | 275 | 1.2            | 16.0                | 28.5       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 180.0           | 20              | 99              | 2.0                      | 19              | 71QW4120(1)00(2)           | R71QW4120(1)00(2)    |
| 1,000 | 275 | 1.5            | 11.0                | 22.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 225.0           | 20              | 80              | 2.0                      | 17              | 71QW4150(1)10(2)           | R71QW4150(1)10(2)    |
| 1,000 | 275 | 1.5            | 16.0                | 28.5       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 225.0           | 20              | 80              | 2.2                      | 19              | 71QW4150(1)00(2)           | R71QW4150(1)00(2)    |
| 1,000 | 275 | 1.8            | 13.0                | 24.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 270.0           | 20              | 66              | 2.3                      | 17              | 71QW4180(1)10(2)           | R71QW4180(1)10(2)    |
| 1,000 | 275 | 1.8            | 19.0                | 32.0       | 41.5             | 37.5             | 1.0     | 150          | 300,000                                 | 270.0           | 20              | 66              | 2.4                      | 18              | 71QW4180(1)00(2)           | R71QW4180(1)00(2)    |
| 1,000 | 275 | 2.2            | 16.0                | 28.5       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 264.0           | 20              | 54              | 2.5                      | 17              | 71QW4220(1)10(2)           | R71QW4220(1)10(2)    |
| 1,000 | 275 | 2.2            | 20.0                | 40.0       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 264.0           | 20              | 54              | 2.8                      | 17              | 71QW4220(1)20(2)           | R71QW4220(1)20(2)    |
| 1,000 | 275 | 2.7            | 16.0                | 28.5       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 324.0           | 20              | 44              | 2.9                      | 16              | 71QW4270(1)10(2)           | R71QW4270(1)10(2)    |
| 1,000 | 275 | 2.7            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 324.0           | 20              | 44              | 3.0                      | 17              | 71QW4270(1)20(2)           | R71QW4270(1)20(2)    |
| 1,000 | 275 | 3.3            | 19.0                | 32.0       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 396.0           | 20              | 36              | 3.3                      | 15              | 71QW4330(1)10(2)           | R71QW4330(1)10(2)    |
| 1,000 | 275 | 3.3            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 396.0           | 20              | 36              | 3.4                      | 17              | 71QW4330(1)00(2)           | R71QW4330(1)00(2)    |
| 1,000 | 275 | 3.9            | 19.0                | 32.0       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 468.0           | 20              | 86              | 3.6                      | 15              | 71QW4390(1)10(2)           | R71QW4390(1)10(2)    |
| 1,000 | 275 | 3.9            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 120          | 240,000                                 | 468.0           | 20              | 86              | 2.2                      | 17              | 71QW4390(1)00(2)           | R71QW4390(1)00(2)    |
| 1,000 | 275 | 4.7            | 20.0                | 40.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 376.0           | 20              | 71              | 2.4                      | 15              | 71QW4470(1)10(2)           | R71QW4470(1)10(2)    |
| 1,000 | 275 | 4.7            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 376.0           | 20              | 71              | 2.5                      | 16              | 71QW4470(1)00(2)           | R71QW4470(1)00(2)    |
| 1,000 | 275 | 5.6            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 448.0           | 20              | 60              | 2.6                      | 15              | 71QW4560(1)20(2)           | R71QW4560(1)20(2)    |
| 1,000 | 275 | 5.6            | 30.0                | 45.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 448.0           | 20              | 60              | 2.8                      | 15              | 71QW4560(1)00(2)           | R71QW4560(1)00(2)    |
| 1,000 | 275 | 6.8            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 544.0           | 20              | 49              | 2.8                      | 15              | 71QW4680(1)10(2)           | R71QW4680(1)10(2)    |
| 1,000 | 275 | 8.2            | 24.0                | 44.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 656.0           | 20              | 52              | 3.1                      | 15              | 71QW4820(1)10(2)           | R71QW4820(1)10(2)    |
| 1,000 | 275 | 10.0           | 30.0                | 45.0       | 41.5             | 37.5             | 1.0     | 80           | 160,000                                 | 800.0           | 20              | 43              | 3.0                      | 15              | 71QW5100(1)10(2)           | R71QW5100(1)10(2)    |
| VDC   | VAC | Cap Value      | T                   | H          | L                | Lead Spacing (S) | Φd (mm) | dV/dt (V/µs) | Max K <sub>v</sub> (V <sup>2</sup> /µs) | A <sub>pk</sub> | nH              | mΩ              | A <sub>rms</sub>         | (°C/W)          | KEMET Internal Part Number | Customer Part Number |
|       |     |                |                     |            |                  |                  |         |              |   | I <sub>pk</sub> | ESL             | ESR max         | I <sub>rms</sub> max (*) | R <sub>th</sub> |                            |                      |

(1) Insert lead and packaging code. See Ordering Options Table for available options.  
(2) J = 5%, K = 10%, M = 20%.  
(3) M = ±20% (only available tolerance).  
(\*) I<sub>rms</sub> value that leads to a ΔT of ≈ 20°C in the hot spot > T<sub>HS</sub> = T<sub>AMB</sub> + ΔT = 85°C + 20°C = 105°C

## 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.

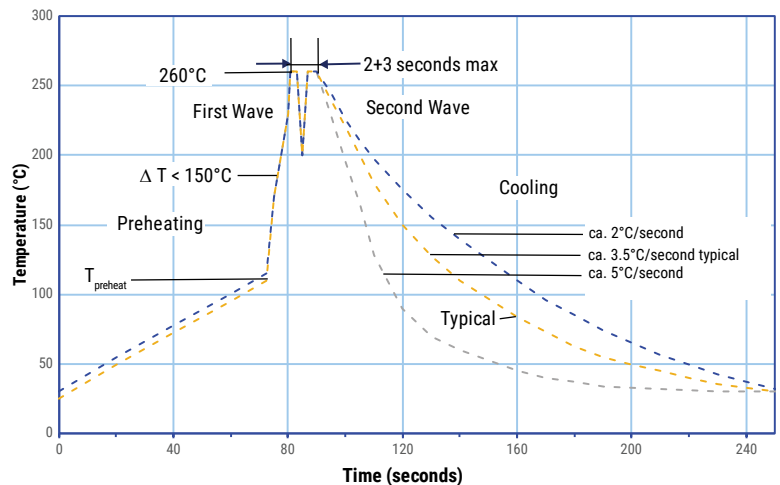
### Manual Soldering Recommendations

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.

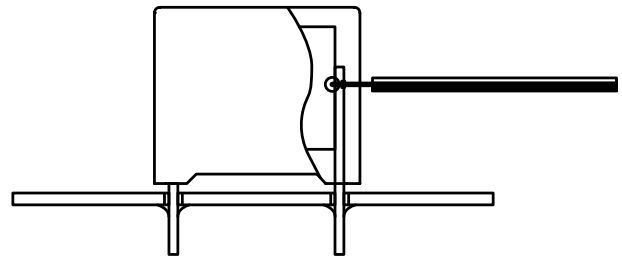
1. The table indicates the maximum set-up temperature of the soldering process  
Figure 1.

| 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   |



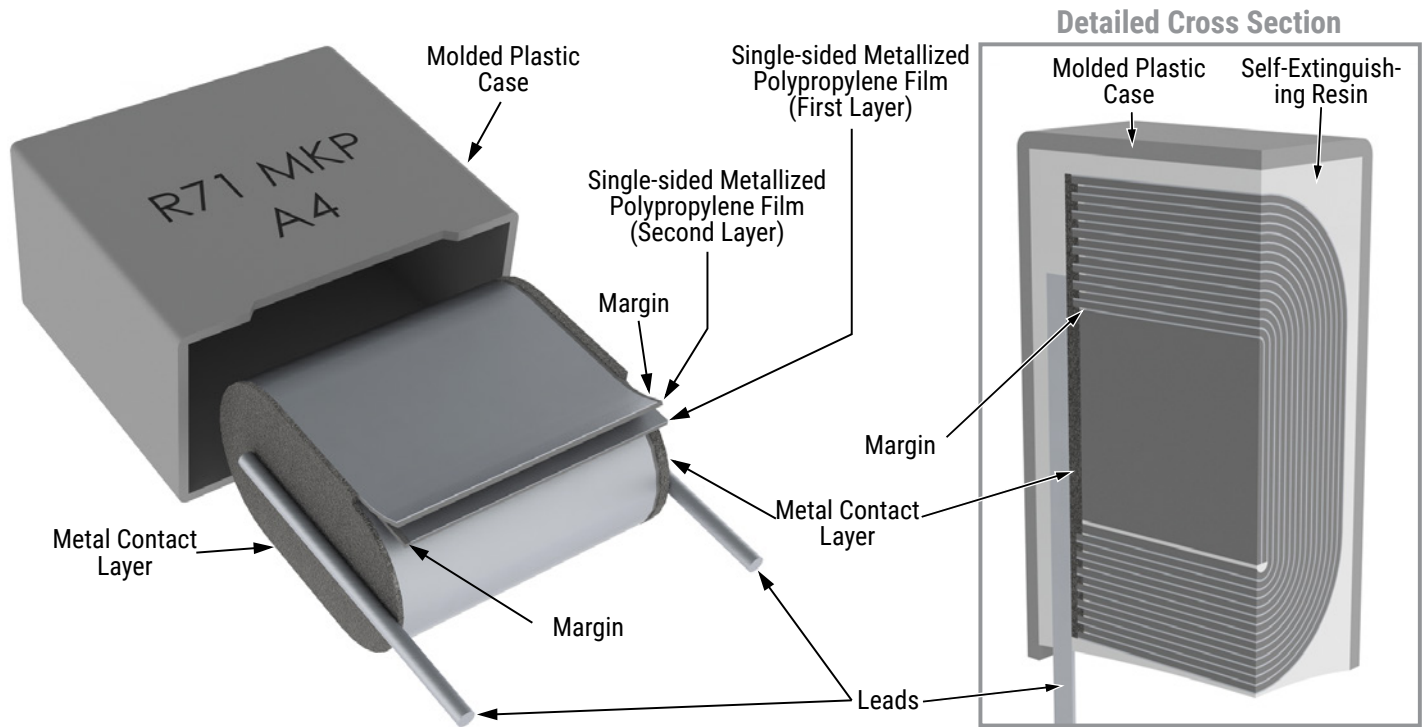
*Temperature monitored inside the capacitor.*

### Selective Soldering Recommendations

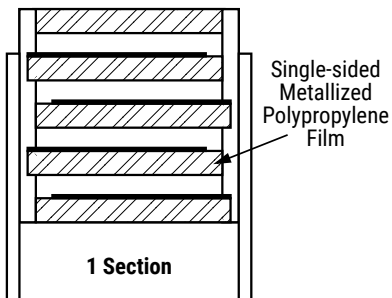
Selective dip soldering is a variation of reflow soldering. In this method, the printed circuit board with through-hole components to be soldered is preheated and transported over the solder bath as in normal flow soldering without touching the solder. When the board is over the bath, it is stopped and 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



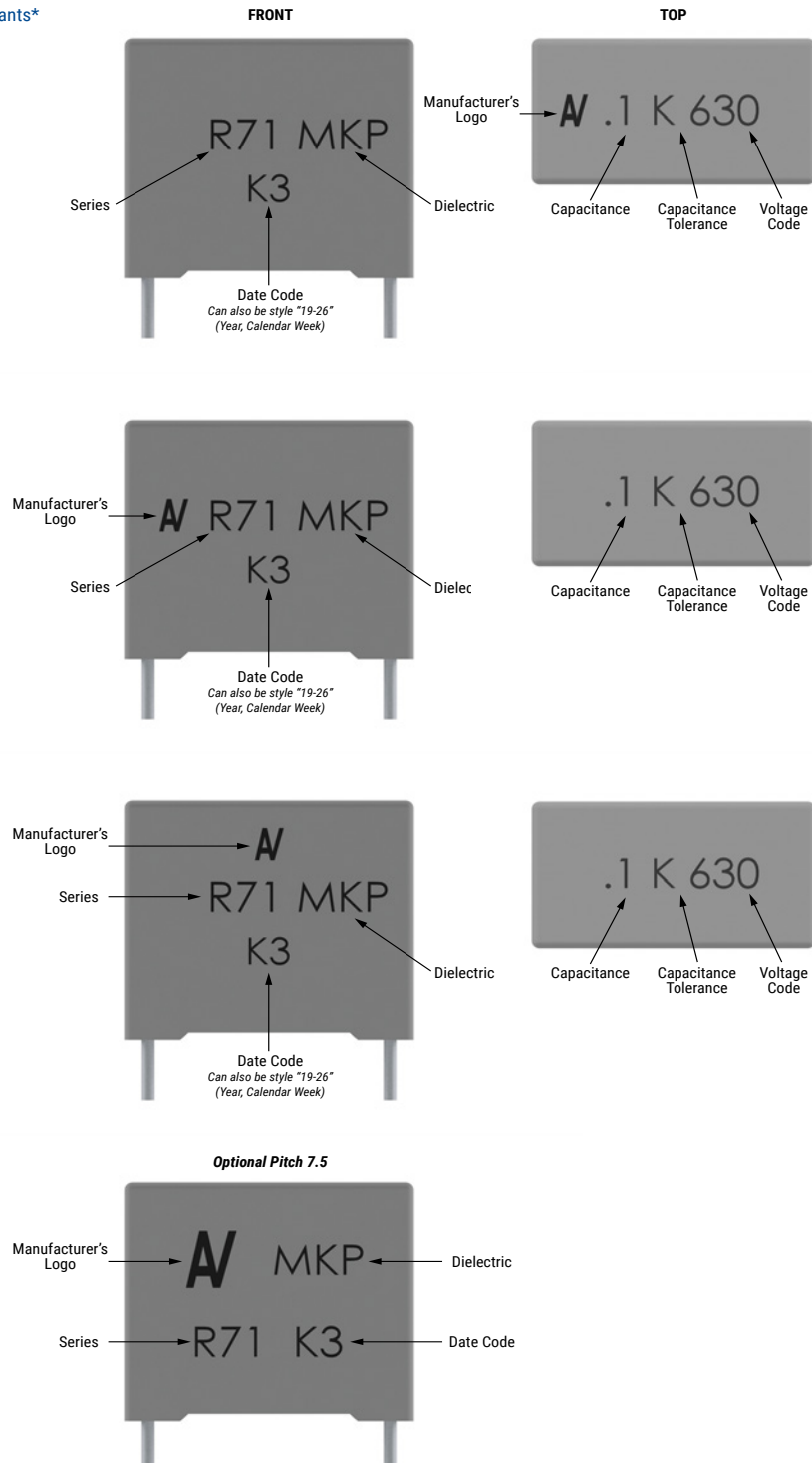
## Winding Scheme



## Marking

Pitch – 7.5, 10, 15 & 22.5

Marking Variants\*



\* Differences are caused by technology (clichee, laser or ink jet) and technic (production line).

Slight change in the layout can be possible but this does not affect the content of the information of the current marking.

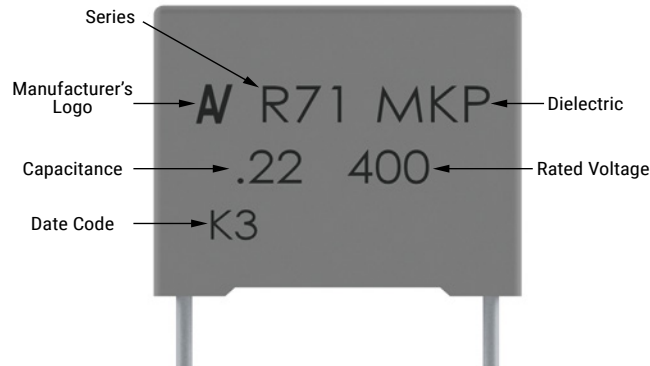
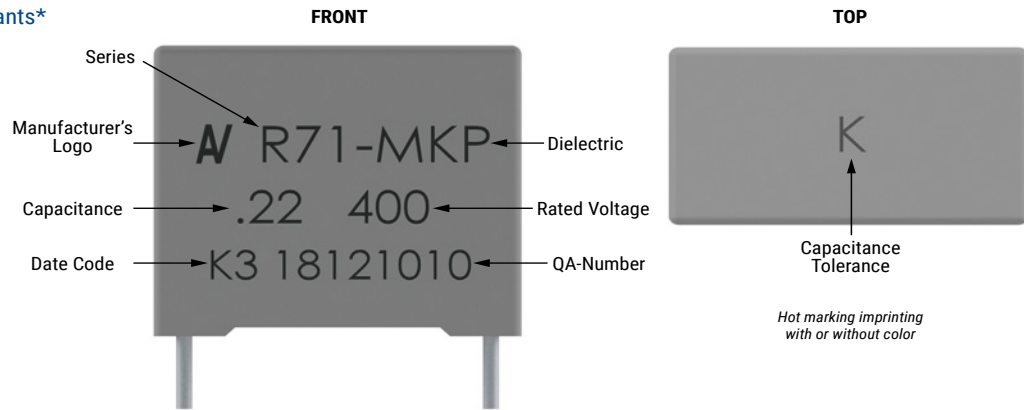
This change will be achieved without impact to product form, fit or function, as the products are equivalent with respect to physical, mechanical, quality and reliability characteristics.



## Marking cont.

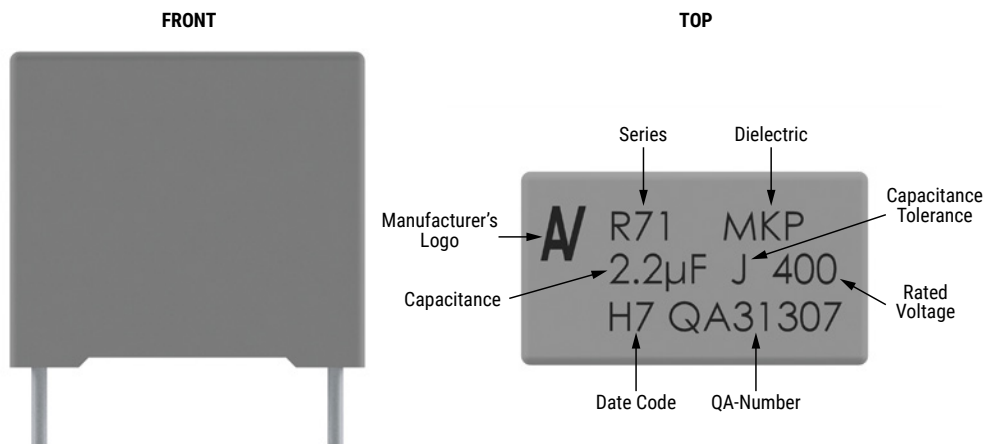
Pitch – 7.5, 10, 15, 22.5, 27.5 & 37.5

Marking Variants\*



Pitch – 22.5, 27.5 & 37.5

Marking Variants\*



\* Differences are caused by technology (clichee, laser or ink jet) and technic (production line)

*Slight change in the layout can be possible but this does not affect the content of the information of the current marking.*

*This change will be achieved without impact to product form, fit or function, as the products are equivalent with respect to physical, mechanical, quality and reliability characteristics.*

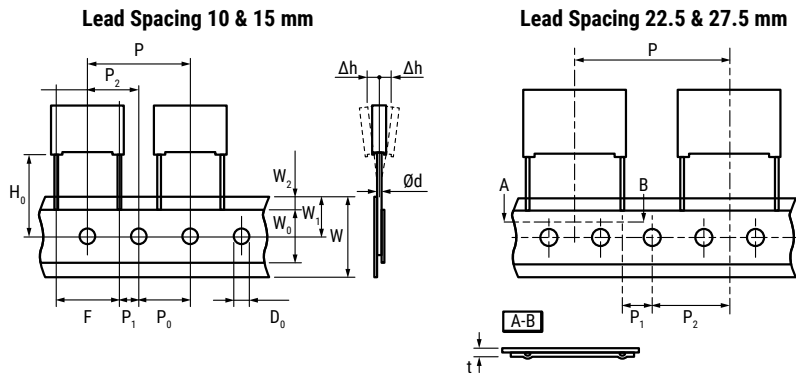
**Marking cont.**

| Manufacturing Date Code (IEC-60062) |      |           |      |
|-------------------------------------|------|-----------|------|
| Year                                | Code | Month     | Code |
| 2020                                | M    | January   | 1    |
| 2021                                | N    | February  | 2    |
| 2022                                | P    | March     | 3    |
| 2023                                | R    | April     | 4    |
| 2024                                | S    | May       | 5    |
| 2025                                | T    | June      | 6    |
| 2026                                | U    | July      | 7    |
| 2027                                | V    | August    | 8    |
| 2028                                | W    | September | 9    |
| 2029                                | X    | October   | 0    |
| 2030                                | A    | November  | N    |
| 2031                                | B    | December  | D    |
| 2032                                | C    |           |      |
| 2033                                | D    |           |      |
| 2034                                | E    |           |      |
| 2035                                | F    |           |      |
| 2036                                | H    |           |      |
| 2037                                | J    |           |      |
| 2038                                | K    |           |      |
| 2039                                | L    |           |      |
| 2040                                | M    |           |      |

## Packaging Quantities

| Lead Spacing | Thickness (mm)          | Height (mm) | Length (mm) | Bulk Short Leads   | Bulk Long Leads |         | Standard Reel<br>ø 355 mm | Large Reel<br>ø 500 mm | Ammo Taped |
|--------------|-------------------------|-------------|-------------|--------------------|-----------------|---------|---------------------------|------------------------|------------|
|              | Lead and Packaging Code |             |             | AA - JB<br>JE - JH | JM              | 40 - 50 | GY                        | CK                     | DQ         |
| 10           | 4.0                     | 9.0         | 13.0        | 2,000              | 2,200           | 1,800   | 750                       | 1,500                  | 1,000      |
|              | 5.0                     | 11.0        | 13.0        | 1,300              | 2,000           | 1,500   | 600                       | 1,250                  | 800        |
|              | 6.0                     | 12.0        | 13.0        | 1,000              | 1,800           | 1,200   | 500                       | 1,000                  | 680        |
| 15           | 5.0                     | 11.0        | 18.0        | 2,000              | 1,250           | 1,000   | 600                       | 1,250                  | 800        |
|              | 6.0                     | 12.0        | 18.0        | 1,750              | 1,000           | 900     | 500                       | 1,000                  | 680        |
|              | 6.0                     | 17.5        | 18.0        | 1,000              | 800             | 700     | 500                       | 1,000                  | 680        |
|              | 7.5                     | 13.5        | 18.0        | 1,000              | 800             | 700     | 350                       | 800                    | 500        |
|              | 7.5                     | 18.5        | 18.0        | 900                | 650             | 500     | 350                       | 800                    | 500        |
|              | 8.5                     | 14.5        | 18.0        | 1,000              | 650             | 500     | 300                       | 700                    | 440        |
|              | 9.0                     | 12.5        | 18.0        | 1,000              | 700             | 520     | 270                       | 650                    | 410        |
|              | 10.0                    | 16.0        | 18.0        | 750                | 550             | 500     | 270                       | 600                    | 380        |
|              | 11.0                    | 19.0        | 18.0        | 450                | 400             | 350     | 270                       | 500                    | 340        |
|              | 13.0                    | 12.0        | 18.0        | 750                | 520             | 490     | 200                       | 480                    | 280        |
| 22.5         | 6.0                     | 15.0        | 26.5        | 805                | 450             | 500     | 300                       | 700                    | 464        |
|              | 7.0                     | 16.0        | 26.5        | 700                | 450             | 500     | 250                       | 550                    | 380        |
|              | 8.5                     | 17.0        | 26.5        | 468                | 350             | 300     | 250                       | 450                    | 280        |
|              | 10.0                    | 18.5        | 26.5        | 396                | 350             | 300     | 160                       | 350                    | 235        |
|              | 11.0                    | 20.0        | 26.5        | 360                | 200             | 250     | 160                       | 350                    | 217        |
|              | 13.0                    | 22.0        | 26.5        | 300                | 150             | 200     | 130                       | 300                    | -          |
| 27.5         | 9.0                     | 17.0        | 32.0        | 816                | -               | 408     | 230                       | 450                    | -          |
|              | 11.0                    | 20.0        | 32.0        | 560                | -               | 336     | 190                       | 350                    | -          |
|              | 13.0                    | 12.0        | 32.0        | 672                | -               | 288     | -                         | -                      | -          |
|              | 13.0                    | 22.0        | 32.0        | 480                | -               | 288     | 150                       | 300                    | -          |
|              | 13.0                    | 25.0        | 32.0        | 480                | -               | 288     | -                         | -                      | -          |
|              | 14.0                    | 28.0        | 32.0        | 352                | -               | 176     | -                         | -                      | -          |
|              | 18.0                    | 33.0        | 32.0        | 256                | -               | 128     | -                         | -                      | -          |
|              | 22.0                    | 37.0        | 32.0        | 168                | -               | 112     | -                         | -                      | -          |
|              | 24.0                    | 15.0        | 32.0        | 336                | -               | 144     | -                         | -                      | -          |
| 37.5         | 11.0                    | 22.0        | 41.5        | 420                | -               | 252     | -                         | -                      | -          |
|              | 13.0                    | 24.0        | 41.5        | 360                | -               | 216     | -                         | -                      | -          |
|              | 16.0                    | 28.5        | 41.5        | 216                | -               | 108     | -                         | -                      | -          |
|              | 19.0                    | 32.0        | 41.5        | 192                | -               | 96      | -                         | -                      | -          |
|              | 20.0                    | 40.0        | 41.5        | 126                | -               | 84      | -                         | -                      | -          |
|              | 24.0                    | 15.0        | 41.5        | 252                | -               | 108     | -                         | -                      | -          |
|              | 24.0                    | 19.0        | 41.5        | 216                | -               | 108     | -                         | -                      | -          |
|              | 24.0                    | 44.0        | 41.5        | 108                | -               | 72      | -                         | -                      | -          |
|              | 30.0                    | 45.0        | 41.5        | 90                 | -               | 60      | -                         | -                      | -          |

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



## Taping Specification

| Description                          | Symbol              | Dimensions (mm) |           |       |       |           | Tolerance |
|--------------------------------------|---------------------|-----------------|-----------|-------|-------|-----------|-----------|
|                                      |                     | Lead Spacing    |           |       |       |           |           |
|                                      |                     | 10.0            | 15.0      | 22.5  | 27.5  |           |           |
| Lead wire diameter                   | d                   | 0.6             | 0.6 – 0.8 | 0.8   | 0.8   | ±0.05     |           |
| Taping lead space                    | P                   | 25.4            | 25.4      | 38.1  | 38.1  | ±1        |           |
| Feed hole lead space *               | P <sub>0</sub>      | 12.7            | 12.7      | 12.7  | 12.7  | ±0.2 **   |           |
| Centering of the lead wire           | P <sub>1</sub>      | 7.7             | 5.2       | 7.8   | 5.3   | ±0.7      |           |
| Centering of the body                | P <sub>2</sub>      | 12.7            | 12.7      | 19.05 | 19.05 | ±1.3      |           |
| Lead spacing ***                     | F                   | 10.0            | 15.0      | 22.5  | 27.5  | +0.6/-0.1 |           |
| Component alignment                  | Δh                  | 0               | 0         | 0     | 0     | ±2        |           |
| Component deviation                  | Δp                  | 0               | 0         | 0     | 0     | ±1        |           |
| Height of component from tape center | H <sub>0</sub> **** | 18.5            | 18.5      | 18.5  | 18.5  | ±0.5      |           |
| Carrier tape width                   | W                   | 18              | 18        | 18    | 18    | +1/-0.5   |           |
| Hold down tape width                 | W <sub>0</sub>      | 9               | 10        | 10    | 10    | Minimum   |           |
| Hole position                        | W <sub>1</sub>      | 9               | 9         | 9     | 9     | ±0.5      |           |
| Hold down tape position              | W <sub>2</sub>      | 3               | 3         | 3     | 3     | Maximum   |           |
| Feed hole diameter                   | D <sub>0</sub>      | 4               | 4         | 4     | 4     | ±0.2      |           |
| Total tape thickness                 | t                   | 0.7             | 0.7       | 0.7   | 0.7   | ±0.2      |           |

\* Available also 15 mm.

\*\* Maximum 1 mm on 20 lead spacing.

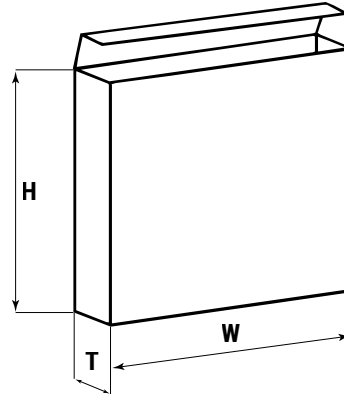
\*\*\* 15 mm and 10 mm taped to 7.5 mm (crimped leads) available upon request.

\*\*\*\* H<sub>0</sub> = 16.5 mm is available upon request.

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

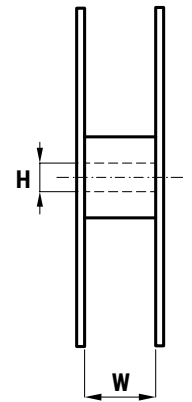
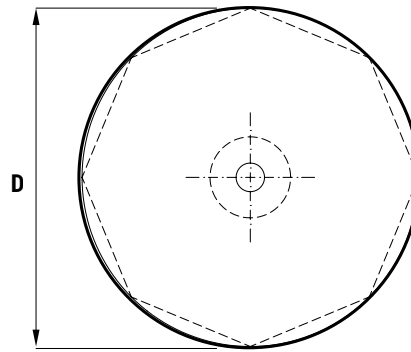
### Ammo Specifications

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



### Reel Specifications

| Dimensions (mm) |    |            |
|-----------------|----|------------|
| D               | H  | W          |
| 355             | 30 | 55 Maximum |
| 500             | 25 |            |



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