

## R60 Series, Radial, 10 – 37.5 mm Lead Spacing, 50 – 1,000 VDC (Automotive Grade)

### Overview

The R60 Series is constructed of metallized polyester film (wound or stacked technology) with radial leads of tinned wire. Radial leads are electrically welded to the contact 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 the UL 94V-0 requirements.

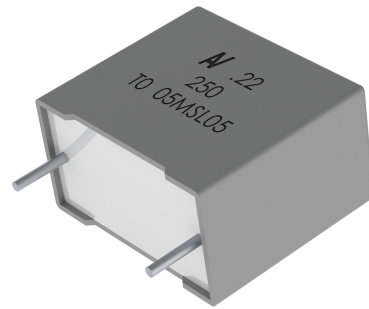
Automotive Grade devices are available (up to lead spacing 22.5 mm) and meet the demanding Automotive Electronics Council's AEC-Q200 qualification requirements.

### Applications

Typical applications include blocking, coupling, decoupling, bypassing and interference suppression in low voltage applications such as automotive. Not suitable for across-the-line application (see Suppressor Capacitors).

### Benefits

- Voltage range: 50 – 1000 VDC
- Capacitance range: 0.001  $\mu$ F – 150.0  $\mu$ F
- Lead spacing: 10.0 – 37.5 mm
- Capacitance tolerance:  $\pm 5\%$ ,  $\pm 10\%$ ,  $\pm 20\%$
- Climatic category: 55/105/56
- Operating temperature range of -55°C to +105°C
- RoHS compliance and lead-free terminations
- Tape and reel packaging in accordance with IEC 60286-2
- Self-healing
- Automotive (AEC-Q200) grades available up to pitch 22.5 mm



### Part Number System

| R60                  | M                                                                                   | F                                                    | 2470                                                                                                        | AA                         | 60                                           | K                                                 |
|----------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------|---------------------------------------------------|
| Series               | Rated Voltage (VDC)                                                                 | Length (mm)                                          | Capacitance Code (pF)                                                                                       | Packaging                  | Internal Use                                 | Capacitance Tolerance                             |
| Metallized Polyester | C = 50<br>D = 63<br>E = 100<br>G = 160<br>I = 250<br>M = 400<br>P = 630<br>Q = 1000 | F = 10<br>I = 15<br>N = 22.5<br>R = 27.5<br>W = 37.5 | The last three digits represent significant figures. First digit specifies the number of zeros to be added. | See Ordering Options Table | 00<br>01<br>30<br>40<br>50<br>6A<br>L0<br>L1 | J = $\pm 5\%$<br>K = $\pm 10\%$<br>M = $\pm 20\%$ |

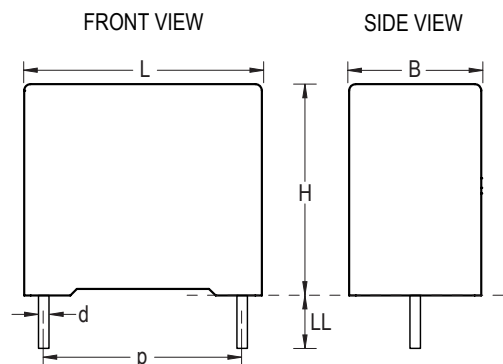
## Ordering Options Table

| Lead Spacing<br>Nominal (mm) | Type of Leads and Packaging                | LL Lead Length<br>(mm)        | Lead and<br>Packaging<br>Code |
|------------------------------|--------------------------------------------|-------------------------------|-------------------------------|
| 10<br>15<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)                | H <sub>0</sub> = 18.5 +/- 0.5 | GY                            |
|                              | Tape & Reel (Large Reel)                   | H <sub>0</sub> =18.5 +/- 0.5  | CK                            |
|                              | Bulk (Bag) – Short Leads                   | 2.7 +0.5/-0                   | JA                            |
|                              | Bulk (Bag) – Short Leads                   | 3.5 +0.5/-0                   | JB                            |
|                              | Bulk (Bag) – Short Leads                   | 10 +/- 1                      | JC                            |
|                              | Bulk (Bag) – Short Leads                   | 4.0 +0.5/-0                   | JE                            |
|                              | Bulk (Bag) – Short Leads                   | 3.2 +0.3/-0.2                 | JH                            |
|                              | Bulk (Bag) – Long Leads                    | 18 +1/-1                      | JM*                           |
|                              | Bulk (Bag) – Long Leads                    | 17 +1/-2                      | Z3**                          |
|                              | 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 (Bag) – Short Leads                   | 4 +2/-0                       | AA                            |
|                              | <b>Other Lead and Packaging Options</b>    |                               |                               |
|                              | T&R (Large Reel)                           | H <sub>0</sub> =18.5 +/-0.5   | CK                            |
|                              | Bulk (Bag) – Short Leads                   | 2.7 +0.5/-0                   | JA                            |
|                              | 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/-1                      | JM                            |
|                              | Bulk (Bag) – Long Leads                    | 30 +5/-0                      | 40                            |
|                              | Bulk (Bag) – Long Leads                    | 25 +2/-1                      | 50                            |
| 37.5                         | <b>Standard Lead and Packaging Options</b> |                               |                               |
|                              | Bulk (Bag) – Short Leads                   | 4 +2/-0                       | AA                            |
|                              | <b>Other Lead and Packaging Options</b>    |                               |                               |
|                              | Bulk (Bag) – Short Leads                   | 2.7 +0.5/-0                   | JA                            |
|                              | 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/-1                      | JM                            |
|                              | Bulk (Bag) – Long Leads                    | 30 +5/-0                      | 40                            |
|                              | Bulk (Bag) – Long Leads                    | 25 +2/-1                      | 50                            |

\* Only available for Lead Spacing ≥15 mm.

\*\* Only available for 10 mm Lead Spacing.

## Dimensions – Millimeters



| <b>p</b>                                                                       |           | <b>B</b> |           | <b>H</b> |           | <b>L</b> |           | <b>d</b> |           |
|--------------------------------------------------------------------------------|-----------|----------|-----------|----------|-----------|----------|-----------|----------|-----------|
| Nominal                                                                        | Tolerance | Nominal  | Tolerance | Nominal  | Tolerance | Nominal  | Tolerance | Nominal  | Tolerance |
| 10.0                                                                           | +/- 0.4   | 4.0      | +0.2      | 9.0      | +0.1      | 13.0     | +0.2      | 0.6      | +/- 0.05  |
| 10.0                                                                           | +/- 0.4   | 5.0      | +0.2      | 11.0     | +0.1      | 13.0     | +0.2      | 0.6      | +/- 0.05  |
| 10.0                                                                           | +/- 0.4   | 6.0      | +0.2      | 12.0     | +0.1      | 13.0     | +0.2      | 0.6      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 5.0      | +0.2      | 11.0     | +0.1      | 18.0     | +0.3      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 6.0      | +0.2      | 12.0     | +0.1      | 18.0     | +0.3      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 7.5      | +0.2      | 13.5     | +0.1      | 18.0     | +0.5      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 8.5      | +0.2      | 14.5     | +0.1      | 18.0     | +0.5      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 9.0      | +0.2      | 12.5     | +0.1      | 18.0     | +0.5      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 10.0     | +0.2      | 16.0     | +0.1      | 18.0     | +0.5      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 11.0     | +0.2      | 19.0     | +0.1      | 18.0     | +0.5      | 0.8      | +/- 0.05  |
| 15.0                                                                           | +/- 0.4   | 13.0     | +0.2      | 12.0     | +0.1      | 18.0     | +0.5      | 0.8      | +/- 0.05  |
| 22.5                                                                           | +/- 0.4   | 6.0      | +0.2      | 15.0     | +0.1      | 26.5     | +0.3      | 0.8      | +/- 0.05  |
| 22.5                                                                           | +/- 0.4   | 7.0      | +0.2      | 16.0     | +0.1      | 26.5     | +0.3      | 0.8      | +/- 0.05  |
| 22.5                                                                           | +/- 0.4   | 8.5      | +0.2      | 17.0     | +0.1      | 26.5     | +0.3      | 0.8      | +/- 0.05  |
| 22.5                                                                           | +/- 0.4   | 10.0     | +0.2      | 18.5     | +0.1      | 26.5     | +0.3      | 0.8      | +/- 0.05  |
| 22.5                                                                           | +/- 0.4   | 11.0     | +0.2      | 20.0     | +0.1      | 26.5     | +0.3      | 0.8      | +/- 0.05  |
| 22.5                                                                           | +/- 0.4   | 13.0     | +0.2      | 22.0     | +0.1      | 26.5     | +0.3      | 0.8      | +/- 0.05  |
| 27.5                                                                           | +/- 0.4   | 9.0      | +0.2      | 17.0     | +0.1      | 32.0     | +0.3      | 0.8      | +/- 0.05  |
| 27.5                                                                           | +/- 0.4   | 11.0     | +0.2      | 20.0     | +0.1      | 32.0     | +0.3      | 0.8      | +/- 0.05  |
| 27.5                                                                           | +/- 0.4   | 13.0     | +0.2      | 22.0     | +0.1      | 32.0     | +0.3      | 0.8      | +/- 0.05  |
| 27.5                                                                           | +/- 0.4   | 14.0     | +0.2      | 28.0     | +0.1      | 32.0     | +0.3      | 0.8      | +/- 0.05  |
| 27.5                                                                           | +/- 0.4   | 18.0     | +0.2      | 33.0     | +0.1      | 32.0     | +0.3      | 0.8      | +/- 0.05  |
| 27.5                                                                           | +/- 0.4   | 22.0     | +0.2      | 37.0     | +0.1      | 32.0     | +0.3      | 0.8      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 11.0     | +0.3      | 22.0     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 13.0     | +0.3      | 24.0     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 16.0     | +0.3      | 28.5     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 19.0     | +0.3      | 32.0     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 20.0     | +0.3      | 40.0     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 24.0     | +0.3      | 44.0     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| 37.5                                                                           | +/- 0.4   | 30.0     | +0.3      | 45.0     | +0.1      | 41.5     | +0.3      | 1.0      | +/- 0.05  |
| Note: See Ordering Options Table for lead length (LL/H <sub>0</sub> ) options. |           |          |           |          |           |          |           |          |           |

## Performance Characteristics

|                                         |                                                                                                                                                                                                        |            |            |            |          |            |             |             |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|----------|------------|-------------|-------------|
| Dielectric                              | Polyester film (polyethylene terephthalate).                                                                                                                                                           |            |            |            |          |            |             |             |
| Plates                                  | Metal layer deposited by evaporation under vacuum.                                                                                                                                                     |            |            |            |          |            |             |             |
| Winding                                 | Non-inductive type.                                                                                                                                                                                    |            |            |            |          |            |             |             |
| Leads                                   | Tinned wire.                                                                                                                                                                                           |            |            |            |          |            |             |             |
| Protection                              | Plastic case, thermosetting resin filled. Box material is solvent resistant and flame retardant according to UL94.                                                                                     |            |            |            |          |            |             |             |
| Related Documents                       | IEC 60384-2                                                                                                                                                                                            |            |            |            |          |            |             |             |
| Rated Voltage V <sub>R</sub> (VDC)      | 50                                                                                                                                                                                                     | 63         | 100        | 160        | 250      | 400        | 630         | 1000        |
| Rated Voltage V <sub>R</sub> (VAC)      | 30                                                                                                                                                                                                     | 40         | 63         | 90         | 160      | 200        | 220         | 250         |
| Capacitance Range (μF)                  | 1.5 – 5.6                                                                                                                                                                                              | 0.68 – 100 | 0.33 – 150 | 0.22 – 150 | 0.1 – 68 | 0.015 – 33 | 0.0047 – 10 | 0.001 – 4.7 |
| Capacitance Values                      | E6 series (IEC 60063) measured @ 1 kHz and +20 ±1°C                                                                                                                                                    |            |            |            |          |            |             |             |
| Capacitance Tolerance                   | ±5%, ±10%, ±20%                                                                                                                                                                                        |            |            |            |          |            |             |             |
| Operating Temperature Range             | -55°C to +105°C<br>Upper operating temperature of +125°C is allowed for a maximum operating time of 1,000 hours.                                                                                       |            |            |            |          |            |             |             |
| Rated Temperature T <sub>R</sub>        | +85°C                                                                                                                                                                                                  |            |            |            |          |            |             |             |
| Voltage Derating                        | Above +85°C DC and AC voltage derating is 1.25%/°C                                                                                                                                                     |            |            |            |          |            |             |             |
| Climatic Category                       | 55/105/56 IEC 60068-1                                                                                                                                                                                  |            |            |            |          |            |             |             |
|                                         | Average relative humidity ≤75%                                                                                                                                                                         |            |            |            |          |            |             |             |
|                                         | RH = 95% for 30 days per year                                                                                                                                                                          |            |            |            |          |            |             |             |
|                                         | RH = 85% for further days limited by average value per year                                                                                                                                            |            |            |            |          |            |             |             |
| Test Voltage                            | 1.6 x V <sub>R</sub> VDC for 2 seconds (between terminations) @ +25°C ±5°C                                                                                                                             |            |            |            |          |            |             |             |
| Capacitance Drift                       | Maximum 3% after a 2 year storage period at a temperature of +10°C to +40°C and a relative humidity of 40% to 60%                                                                                      |            |            |            |          |            |             |             |
| Reliability<br>(Reference MIL-HDBK-217) | Operational life >200,000 hours                                                                                                                                                                        |            |            |            |          |            |             |             |
|                                         | Failure rate ≤ 5 FIT, T = +40°C, V = 0.5 x V <sub>R</sub>                                                                                                                                              |            |            |            |          |            |             |             |
|                                         | Failure criteria: open or short circuit, cap. change > 10%, DF 2 times the catalog limits, IR < 0.005 x initial limit                                                                                  |            |            |            |          |            |             |             |
| Maximum Pulse Steepness                 | dV/dt according to Table 1. For peak to peak voltages lower than rated voltage (V <sub>pp</sub> <V <sub>R</sub> ), the specified dv/dt can be multiplied by the factor V <sub>R</sub> /V <sub>pp</sub> |            |            |            |          |            |             |             |
| Temperature Coefficient                 | +400 (±200)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)                                                                                                                                                                                                 | 9          | 10         | 18         | 18       | 22         |             |             |
|                                         | Maximum 1 nH per 1 mm lead and capacitor length.                                                                                                                                                       |            |            |            |          |            |             |             |

## Performance Characteristics cont'd

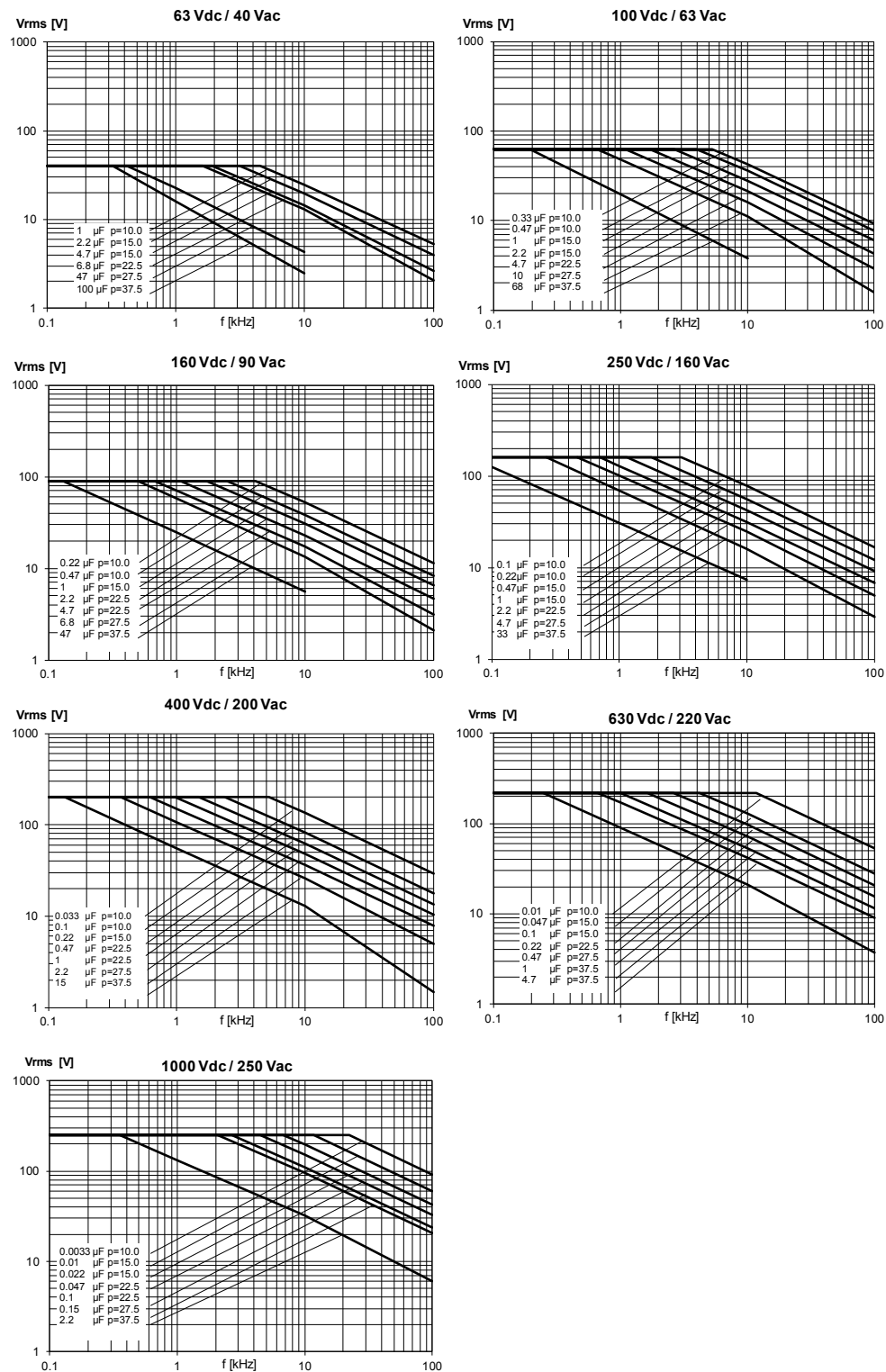
| Dissipation Factor $\tan\delta$ | Maximum Values @ 25°C ±5°C                      |                                                                      |                                                                                                          |
|---------------------------------|-------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                                 | Frequency                                       | $C \leq 1 \mu\text{F}$                                               | $C > 1 \mu\text{F}$                                                                                      |
|                                 | 1 kHz                                           | 1.00%                                                                | 1.00%                                                                                                    |
|                                 | 10 kHz                                          | 1.50%                                                                | –                                                                                                        |
| Insulation Resistance           | Measured @ +25°C ±5°C, according to IEC 60384–2 |                                                                      |                                                                                                          |
|                                 | Minimum Values Between Terminals                |                                                                      |                                                                                                          |
|                                 | Voltage Charge/Time                             | $C \leq 0.33 \mu\text{F}$                                            | $C > 0.33 \mu\text{F}$                                                                                   |
|                                 | 50 VDC for $V_R \leq 100$ VDC<br>1 minute       | $\geq 3,750 \text{ M}\Omega$<br>( $\geq 50,000 \text{ M}\Omega$ ) *  | $\geq 1,250 \text{ M}\Omega \cdot \mu\text{F}$<br>( $\geq 5,000 \text{ M}\Omega \cdot \mu\text{F}$ ) *   |
|                                 | 100 VDC for $V_R > 100$ VDC<br>1 minute         | $\geq 30,000 \text{ M}\Omega$<br>( $\geq 50,000 \text{ M}\Omega$ ) * | $\geq 10,000 \text{ M}\Omega \cdot \mu\text{F}$<br>( $\geq 17,000 \text{ M}\Omega \cdot \mu\text{F}$ ) * |

\* typical value

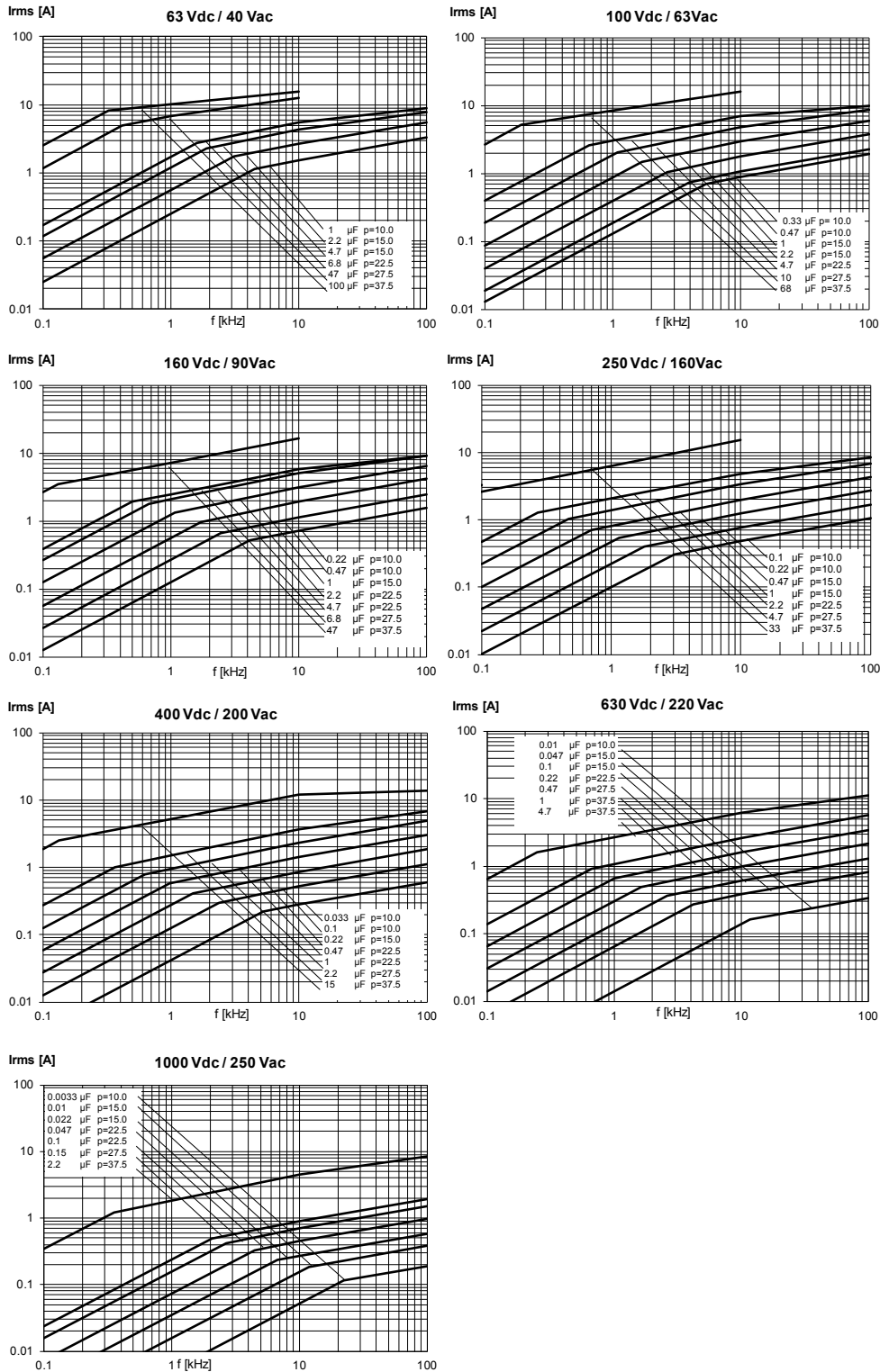
## Qualification

Automotive Grade products meet or exceed the requirements outlined by the Automotive Electronics Council. Details regarding test methods and conditions are referenced in document AEC–Q200, Stress Test Qualification for Passive Components. For additional information regarding the Automotive Electronics Council and AEC–Q200, please visit their website at [www.aecouncil.com](http://www.aecouncil.com).

## Maximum Voltage ( $V_{rms}$ ) vs. Frequency (Sinusoidal Waveform/ $T_h \leq 40^\circ\text{C}$ )



## Maximum Current ( $I_{rms}$ ) vs. Frequency (Sinusoidal Waveform/ $T_h \leq 40^\circ\text{C}$ )



## Environmental Test Data

| Damp Heat, Steady State Test      | Test Conditions:                                             |                                                     | Performances                                                                                                                                                                                                    |
|-----------------------------------|--------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   | Temperature:<br>Relative humidity (RH):<br>Test duration:    | +40°C ±2°C<br>93% ±2%<br>56 days                    | $ \Delta C/C  \leq 5\%$ ,<br>$\Delta \tan \delta \leq 0.005$ @ 1 kHz<br>IR after test $\geq 50\%$ of initial limit                                                                                              |
| Endurance Test                    | Test Conditions                                              |                                                     | Performances                                                                                                                                                                                                    |
|                                   | Temperature:<br>Voltage applied:<br>Test duration:           | +105°C ±2°C<br>1.25 x V <sub>C</sub><br>2,000 hours | $ \Delta C/C  \leq 5\%$ ,<br>$\Delta \tan \delta \leq 0.005$ @10 kHz for C $\leq 1\mu\text{F}$<br>$\Delta \tan \delta \leq 0.003$ @ 1 kHz for C > 1 $\mu\text{F}$<br>IR after test $\geq 50\%$ 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                  | $ \Delta C/C  \leq 2\%$ ,<br>$\Delta \tan \delta \leq 0.005$ @10 kHz for C $\leq 1\mu\text{F}$<br>$\Delta \tan \delta \leq 0.003$ @ 1 kHz for C > 1 $\mu\text{F}$<br>IR after test $\geq$ initial limit         |

## Environmental Compliance

All KEMET MKT capacitors are RoHS Compliant.

**Table 1A – Ratings & Part Number Reference (Stacked Capacitor Technology)**

| VDC | VAC | Capacitance Value (μF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/μs) | Maximum K <sub>0</sub> (V <sup>2</sup> /μs) | New KEMET Part Number | Legacy Part Number |
|-----|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|     |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 50  | 30  | 1.5                    | 4.0              | 9.0    | 13.0   | 10.0         | 30           | 3000                                        | 60CF4150(1)6A(2)      | R60CF4150(1)6A(2)  |
| 50  | 30  | 2.2                    | 4.0              | 9.0    | 13.0   | 10.0         | 30           | 3000                                        | 60CF4220(1)6A(2)      | R60CF4220(1)6A(2)  |
| 50  | 30  | 3.3                    | 5.0              | 11.0   | 13.0   | 10.0         | 30           | 3000                                        | 60CF4330(1)6A(2)      | R60CF4330(1)6A(2)  |
| 50  | 30  | 4.7                    | 6.0              | 12.0   | 13.0   | 10.0         | 30           | 3000                                        | 60CF4470(1)6A(2)      | R60CF4470(1)6A(2)  |
| 50  | 30  | 5.6                    | 6.0              | 12.0   | 13.0   | 10.0         | 30           | 3000                                        | 60CF4560(1)6A(2)      | R60CF4560(1)6A(2)  |
| 63  | 40  | 1.0                    | 4.0              | 9.0    | 13.0   | 10.0         | 50           | 6300                                        | 60DF4100(1)6A(2)      | R60DF4100(1)6A(2)  |
| 63  | 40  | 1.5                    | 5.0              | 11.0   | 13.0   | 10.0         | 50           | 6300                                        | 60DF4150(1)6A(2)      | R60DF4150(1)6A(2)  |
| 63  | 40  | 2.2                    | 5.0              | 11.0   | 13.0   | 10.0         | 50           | 6300                                        | 60DF4220(1)6A(2)      | R60DF4220(1)6A(2)  |
| 63  | 40  | 3.3                    | 6.0              | 12.0   | 13.0   | 10.0         | 50           | 6300                                        | 60DF4330(1)6A(2)      | R60DF4330(1)6A(2)  |
| 100 | 63  | 0.33                   | 4.0              | 9.0    | 13.0   | 10.0         | 75           | 15000                                       | 60EF3330(1)6A(2)      | R60EF3330(1)6A(2)  |
| 100 | 63  | 0.47                   | 4.0              | 9.0    | 13.0   | 10.0         | 75           | 15000                                       | 60EF3470(1)6A(2)      | R60EF3470(1)6A(2)  |
| 100 | 63  | 0.68                   | 4.0              | 9.0    | 13.0   | 10.0         | 75           | 15000                                       | 60EF3680(1)6A(2)      | R60EF3680(1)6A(2)  |
| 100 | 63  | 1.0                    | 5.0              | 11.0   | 13.0   | 10.0         | 75           | 15000                                       | 60EF4100(1)6A(2)      | R60EF4100(1)6A(2)  |
| 100 | 63  | 1.5                    | 5.0              | 11.0   | 13.0   | 10.0         | 75           | 15000                                       | 60EF4150(1)6A(2)      | R60EF4150(1)6A(2)  |
| 160 | 90  | 0.22                   | 4.0              | 9.0    | 13.0   | 10.0         | 100          | 32000                                       | 60GF3220(1)6A(2)      | R60GF3220(1)6A(2)  |
| 160 | 90  | 0.33                   | 4.0              | 9.0    | 13.0   | 10.0         | 100          | 32000                                       | 60GF3330(1)6A(2)      | R60GF3330(1)6A(2)  |
| 160 | 90  | 0.47                   | 5.0              | 11.0   | 13.0   | 10.0         | 100          | 32000                                       | 60GF3470(1)6A(2)      | R60GF3470(1)6A(2)  |
| 160 | 90  | 0.68                   | 6.0              | 12.0   | 13.0   | 10.0         | 100          | 32000                                       | 60GF3680(1)6A(2)      | R60GF3680(1)6A(2)  |
| 250 | 160 | 0.10                   | 4.0              | 9.0    | 13.0   | 10.0         | 150          | 75000                                       | 60IF3100(1)6A(2)      | R60IF3100(1)6A(2)  |
| 250 | 160 | 0.15                   | 4.0              | 9.0    | 13.0   | 10.0         | 150          | 75000                                       | 60IF3150(1)6A(2)      | R60IF3150(1)6A(2)  |
| 250 | 160 | 0.22                   | 5.0              | 11.0   | 13.0   | 10.0         | 150          | 75000                                       | 60IF3220(1)6A(2)      | R60IF3220(1)6A(2)  |
| 250 | 160 | 0.33                   | 5.0              | 11.0   | 13.0   | 10.0         | 150          | 75000                                       | 60IF3330(1)6A(2)      | R60IF3330(1)6A(2)  |
| 250 | 160 | 0.47                   | 6.0              | 12.0   | 13.0   | 10.0         | 150          | 75000                                       | 60IF3470(1)6A(2)      | R60IF3470(1)6A(2)  |
| 400 | 200 | 0.033                  | 4.0              | 9.0    | 13.0   | 10.0         | 175          | 140000                                      | 60MF2330(1)6A(2)      | R60MF2330(1)6A(2)  |
| VDC | VAC | Capacitance Value (μF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/μs) | Max K <sub>0</sub> (V <sup>2</sup> /μs)     | New KEMET Part Number | Legacy Part Number |

Table 1A – Ratings &amp; Part Number Reference (Stacked Capacitor Technology) cont'd

| VDC | VAC | Capacitance Value (μF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/μs) | Maximum K <sub>0</sub> (V <sup>2</sup> /μs) | New KEMET Part Number | Legacy Part Number |
|-----|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|     |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 400 | 200 | 0.047                  | 4.0              | 9.0    | 13.0   | 10.0         | 175          | 140000                                      | 60MF2470(1)6A(2)      | R60MF2470(1)6A(2)  |
| 400 | 200 | 0.068                  | 4.0              | 9.0    | 13.0   | 10.0         | 175          | 140000                                      | 60MF2680(1)6A(2)      | R60MF2680(1)6A(2)  |
| 400 | 200 | 0.10                   | 5.0              | 11.0   | 13.0   | 10.0         | 175          | 140000                                      | 60MF3100(1)6A(2)      | R60MF3100(1)6A(2)  |
| 400 | 200 | 0.15                   | 6.0              | 12.0   | 13.0   | 10.0         | 175          | 140000                                      | 60MF3150(1)6A(2)      | R60MF3150(1)6A(2)  |
| 630 | 220 | 0.010                  | 4.0              | 9.0    | 13.0   | 10.0         | 200          | 252000                                      | 60PF2100(1)6A(2)      | R60PF2100(1)6A(2)  |
| 630 | 220 | 0.015                  | 4.0              | 9.0    | 13.0   | 10.0         | 200          | 252000                                      | 60PF2150(1)6A(2)      | R60PF2150(1)6A(2)  |
| 630 | 220 | 0.022                  | 4.0              | 9.0    | 13.0   | 10.0         | 200          | 252000                                      | 60PF2220(1)6A(2)      | R60PF2220(1)6A(2)  |
| 630 | 220 | 0.033                  | 5.0              | 11.0   | 13.0   | 10.0         | 200          | 252000                                      | 60PF2330(1)6A(2)      | R60PF2330(1)6A(2)  |
| 630 | 220 | 0.047                  | 5.0              | 11.0   | 13.0   | 10.0         | 200          | 252000                                      | 60PF2470(1)6A(2)      | R60PF2470(1)6A(2)  |
| VDC | VAC | Capacitance Value (μF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/μs) | Max K <sub>0</sub> (V <sup>2</sup> /μs)     | New KEMET Part Number | Legacy Part Number |

Table 1B – Ratings &amp; Part Number Reference (Wound Capacitor Technology)

| VDC | VAC | Capacitance Value (μF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/μs) | Maximum K <sub>0</sub> (V <sup>2</sup> /μs) | New KEMET Part Number | Legacy Part Number |
|-----|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|     |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 63  | 40  | 0.68                   | 5.0              | 11.0   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI3680(1)30(2)      | R60DI3680(1)30(2)  |
| 63  | 40  | 1.0                    | 5.0              | 11.0   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4100(1)30(2)      | R60DI4100(1)30(2)  |
| 63  | 40  | 1.5                    | 5.0              | 11.0   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4150(1)30(2)      | R60DI4150(1)30(2)  |
| 63  | 40  | 2.2                    | 6.0              | 12.0   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4220(1)30(2)      | R60DI4220(1)30(2)  |
| 63  | 40  | 3.3                    | 7.5              | 13.5   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4330(1)30(2)      | R60DI4330(1)30(2)  |
| 63  | 40  | 3.3                    | 9.0              | 12.5   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4330(1)L0(2)      | R60DI4330(1)L0(2)  |
| 63  | 40  | 4.7                    | 8.5              | 14.5   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4470(1)30(2)      | R60DI4470(1)30(2)  |
| 63  | 40  | 4.7                    | 13.0             | 12.0   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4470(1)L0(2)      | R60DI4470(1)L0(2)  |
| 63  | 40  | 6.8                    | 10.0             | 16.0   | 18.0   | 15.0         | 2.5          | 315                                         | 60DI4680(1)30(2)      | R60DI4680(1)30(2)  |
| 63  | 40  | 3.3                    | 6.0              | 15.0   | 26.5   | 22.5         | 1.5          | 189                                         | 60DN4330(1)30(2)      | R60DN4330(1)30(2)  |
| 63  | 40  | 4.7                    | 7.0              | 16.0   | 26.5   | 22.5         | 1.5          | 189                                         | 60DN4470(1)30(2)      | R60DN4470(1)30(2)  |
| 63  | 40  | 6.8                    | 7.0              | 16.0   | 26.5   | 22.5         | 1.5          | 189                                         | 60DN4680(1)30(2)      | R60DN4680(1)30(2)  |
| 63  | 40  | 10.0                   | 8.5              | 17.0   | 26.5   | 22.5         | 1.5          | 189                                         | 60DN5100(1)30(2)      | R60DN5100(1)30(2)  |
| 63  | 40  | 15.0                   | 11.0             | 20.0   | 26.5   | 22.5         | 1.5          | 189                                         | 60DN5150(1)30(2)      | R60DN5150(1)30(2)  |
| 63  | 40  | 10.0                   | 9.0              | 17.0   | 32.0   | 27.5         | 1.0          | 126                                         | 60DR5100(1)30(2)      | R60DR5100(1)30(2)  |
| 63  | 40  | 15.0                   | 11.0             | 20.0   | 32.0   | 27.5         | 1.0          | 126                                         | 60DR5150(1)30(2)      | R60DR5150(1)30(2)  |
| 63  | 40  | 22.0                   | 13.0             | 22.0   | 32.0   | 27.5         | 1.0          | 126                                         | 60DR5220(1)30(2)      | R60DR5220(1)30(2)  |
| 63  | 40  | 33.0                   | 18.0             | 33.0   | 32.0   | 27.5         | 1.0          | 126                                         | 60DR5330(1)50(2)      | R60DR5330(1)50(2)  |
| 63  | 40  | 47.0                   | 22.0             | 37.0   | 32.0   | 27.5         | 1.0          | 126                                         | 60DR5470(1)50(2)      | R60DR5470(1)50(2)  |
| 63  | 40  | 68.0                   | 22.0             | 37.0   | 32.0   | 27.5         | 1.0          | 126                                         | 60DR5680(1)30(2)      | R60DR5680(1)30(2)  |
| 63  | 40  | 22.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 0.8          | 101                                         | 60DW5220(1)30(2)      | R60DW5220(1)30(2)  |
| 63  | 40  | 33.0                   | 13.0             | 24.0   | 41.5   | 37.5         | 0.8          | 101                                         | 60DW5330(1)50(2)      | R60DW5330(1)50(2)  |
| 63  | 40  | 47.0                   | 16.0             | 28.5   | 41.5   | 37.5         | 0.8          | 101                                         | 60DW5470(1)50(2)      | R60DW5470(1)50(2)  |
| 63  | 40  | 68.0                   | 19.0             | 32.0   | 41.5   | 37.5         | 0.8          | 101                                         | 60DW5680(1)30(2)      | R60DW5680(1)30(2)  |
| 63  | 40  | 100.0                  | 20.0             | 40.0   | 41.5   | 37.5         | 0.8          | 101                                         | 60DW6100(1)50(2)      | R60DW6100(1)50(2)  |
| 100 | 63  | 0.33                   | 5.0              | 11.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI3330(1)30(2)      | R60EI3330(1)30(2)  |
| 100 | 63  | 0.47                   | 5.0              | 11.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI3470(1)30(2)      | R60EI3470(1)30(2)  |
| 100 | 63  | 0.68                   | 5.0              | 11.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI3680(1)30(2)      | R60EI3680(1)30(2)  |
| 100 | 63  | 1.0                    | 5.0              | 11.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4100(1)30(2)      | R60EI4100(1)30(2)  |
| 100 | 63  | 1.5                    | 7.5              | 13.5   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4150(1)30(2)      | R60EI4150(1)30(2)  |
| 100 | 63  | 2.2                    | 8.5              | 14.5   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4220(1)30(2)      | R60EI4220(1)30(2)  |
| 100 | 63  | 2.2                    | 9.0              | 12.5   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4220(1)L0(2)      | R60EI4220(1)L0(2)  |
| 100 | 63  | 3.3                    | 10.0             | 16.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4330(1)30(2)      | R60EI4330(1)30(2)  |
| 100 | 63  | 3.3                    | 13.0             | 12.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4330(1)L0(2)      | R60EI4330(1)L0(2)  |
| 100 | 63  | 4.7                    | 11.0             | 19.0   | 18.0   | 15.0         | 3.0          | 600                                         | 60EI4470(1)30(2)      | R60EI4470(1)30(2)  |
| 100 | 63  | 1.5                    | 6.0              | 15.0   | 26.5   | 22.5         | 2.0          | 400                                         | 60EN4150(1)30(2)      | R60EN4150(1)30(2)  |
| 100 | 63  | 2.2                    | 6.0              | 15.0   | 26.5   | 22.5         | 2.0          | 400                                         | 60EN4220(1)30(2)      | R60EN4220(1)30(2)  |
| 100 | 63  | 3.3                    | 7.0              | 16.0   | 26.5   | 22.5         | 2.0          | 400                                         | 60EN4330(1)30(2)      | R60EN4330(1)30(2)  |
| 100 | 63  | 4.7                    | 8.5              | 17.0   | 26.5   | 22.5         | 2.0          | 400                                         | 60EN4470(1)30(2)      | R60EN4470(1)30(2)  |
| VDC | VAC | Capacitance Value (μF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/μs) | Max K <sub>0</sub> (V <sup>2</sup> /μs)     | New KEMET Part Number | Legacy Part Number |

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

(2) J = 5%, K = 10%, M = 20%

Table 1B – Ratings &amp; Part Number Reference (Wound Capacitor Technology) cont'd

| VDC | VAC | Capacitance Value (μF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/μs) | Maximum K <sub>0</sub> (V <sup>2</sup> /μs) | New KEMET Part Number | Legacy Part Number |
|-----|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|     |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 100 | 63  | 6.8                    | 10.0             | 18.5   | 26.5   | 22.5         | 2.0          | 400                                         | 60EN4680(1)30(2)      | R60EN4680(1)30(2)  |
| 100 | 63  | 10.0                   | 13.0             | 22.0   | 26.5   | 22.5         | 2.0          | 400                                         | 60EN5100(1)30(2)      | R60EN5100(1)30(2)  |
| 100 | 63  | 4.7                    | 9.0              | 17.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER4470(1)30(2)      | R60ER4470(1)30(2)  |
| 100 | 63  | 6.8                    | 9.0              | 17.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER4680(1)30(2)      | R60ER4680(1)30(2)  |
| 100 | 63  | 10.0                   | 9.0              | 17.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER5100(1)40(2)      | R60ER5100(1)40(2)  |
| 100 | 63  | 15.0                   | 11.0             | 20.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER5150(1)40(2)      | R60ER5150(1)40(2)  |
| 100 | 63  | 22.0                   | 13.0             | 22.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER5220(1)40(2)      | R60ER5220(1)40(2)  |
| 100 | 63  | 33.0                   | 14.0             | 28.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER5330(1)40(2)      | R60ER5330(1)40(2)  |
| 100 | 63  | 47.0                   | 18.0             | 33.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER5470(1)40(2)      | R60ER5470(1)40(2)  |
| 100 | 63  | 68.0                   | 22.0             | 37.0   | 32.0   | 27.5         | 1.5          | 300                                         | 60ER5680(1)00(2)      | R60ER5680(1)00(2)  |
| 100 | 63  | 15.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW5150(1)40(2)      | R60EW5150(1)40(2)  |
| 100 | 63  | 22.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW5220(1)40(2)      | R60EW5220(1)40(2)  |
| 100 | 63  | 33.0                   | 13.0             | 24.0   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW5330(1)40(2)      | R60EW5330(1)40(2)  |
| 100 | 63  | 47.0                   | 16.0             | 28.5   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW5470(1)40(2)      | R60EW5470(1)40(2)  |
| 100 | 63  | 68.0                   | 19.0             | 32.0   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW5680(1)50(2)      | R60EW5680(1)50(2)  |
| 100 | 63  | 100.0                  | 20.0             | 40.0   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW6100(1)00(2)      | R60EW6100(1)00(2)  |
| 100 | 63  | 150.0                  | 24.0             | 44.0   | 41.5   | 37.5         | 1.0          | 200                                         | 60EW6150(1)00(2)      | R60EW6150(1)00(2)  |
| 160 | 90  | 0.33                   | 5.0              | 11.0   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI3330(1)30(2)      | R60GI3330(1)30(2)  |
| 160 | 90  | 0.47                   | 5.0              | 11.0   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI3470(1)30(2)      | R60GI3470(1)30(2)  |
| 160 | 90  | 0.68                   | 5.0              | 11.0   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI3680(1)30(2)      | R60GI3680(1)30(2)  |
| 160 | 90  | 1.0                    | 7.5              | 13.5   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI4100(1)30(2)      | R60GI4100(1)30(2)  |
| 160 | 90  | 1.5                    | 8.5              | 14.5   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI4150(1)30(2)      | R60GI4150(1)30(2)  |
| 160 | 90  | 1.5                    | 9.0              | 12.5   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI4150(1)L0(2)      | R60GI4150(1)L0(2)  |
| 160 | 90  | 2.2                    | 10.0             | 16.0   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI4220(1)30(2)      | R60GI4220(1)30(2)  |
| 160 | 90  | 2.2                    | 13.0             | 12.0   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI4220(1)L0(2)      | R60GI4220(1)L0(2)  |
| 160 | 90  | 3.3                    | 11.0             | 19.0   | 18.0   | 15.0         | 9.0          | 2880                                        | 60GI4330(1)30(2)      | R60GI4330(1)30(2)  |
| 160 | 90  | 1.5                    | 6.0              | 15.0   | 26.5   | 22.5         | 5.5          | 1760                                        | 60GN4150(1)30(2)      | R60GN4150(1)30(2)  |
| 160 | 90  | 2.2                    | 7.0              | 16.0   | 26.5   | 22.5         | 5.5          | 1760                                        | 60GN4220(1)30(2)      | R60GN4220(1)30(2)  |
| 160 | 90  | 3.3                    | 8.5              | 17.0   | 26.5   | 22.5         | 5.5          | 1760                                        | 60GN4330(1)30(2)      | R60GN4330(1)30(2)  |
| 160 | 90  | 4.7                    | 11.0             | 20.0   | 26.5   | 22.5         | 5.5          | 1760                                        | 60GN4470(1)30(2)      | R60GN4470(1)30(2)  |
| 160 | 90  | 6.8                    | 13.0             | 22.0   | 26.5   | 22.5         | 5.5          | 1760                                        | 60GN4680(1)30(2)      | R60GN4680(1)30(2)  |
| 160 | 90  | 3.3                    | 9.0              | 17.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR4330(1)30(2)      | R60GR4330(1)30(2)  |
| 160 | 90  | 4.7                    | 9.0              | 17.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR4470(1)30(2)      | R60GR4470(1)30(2)  |
| 160 | 90  | 6.8                    | 9.0              | 17.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR4680(1)40(2)      | R60GR4680(1)40(2)  |
| 160 | 90  | 10.0                   | 9.0              | 17.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR5100(1)40(2)      | R60GR5100(1)40(2)  |
| 160 | 90  | 15.0                   | 11.0             | 20.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR5150(1)40(2)      | R60GR5150(1)40(2)  |
| 160 | 90  | 22.0                   | 13.0             | 22.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR5220(1)40(2)      | R60GR5220(1)40(2)  |
| 160 | 90  | 33.0                   | 14.0             | 28.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR5330(1)00(2)      | R60GR5330(1)00(2)  |
| 160 | 90  | 47.0                   | 18.0             | 33.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR5470(1)00(2)      | R60GR5470(1)00(2)  |
| 160 | 90  | 68.0                   | 22.0             | 37.0   | 32.0   | 27.5         | 3.0          | 960                                         | 60GR5680(1)00(2)      | R60GR5680(1)00(2)  |
| 160 | 90  | 10.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW5100(1)30(2)      | R60GW5100(1)30(2)  |
| 160 | 90  | 15.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW5150(1)40(2)      | R60GW5150(1)40(2)  |
| 160 | 90  | 22.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW5220(1)40(2)      | R60GW5220(1)40(2)  |
| 160 | 90  | 33.0                   | 13.0             | 24.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW5330(1)40(2)      | R60GW5330(1)40(2)  |
| 160 | 90  | 47.0                   | 16.0             | 28.5   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW5470(1)40(2)      | R60GW5470(1)40(2)  |
| 160 | 90  | 68.0                   | 19.0             | 32.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW5680(1)00(2)      | R60GW5680(1)00(2)  |
| 160 | 90  | 100.0                  | 20.0             | 40.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW6100(1)00(2)      | R60GW6100(1)00(2)  |
| 160 | 90  | 150.0                  | 30.0             | 45.0   | 41.5   | 37.5         | 2.0          | 640                                         | 60GW6150(1)00(2)      | R60GW6150(1)00(2)  |
| 250 | 160 | 0.10                   | 5.0              | 11.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3100(1)30(2)      | R60II3100(1)30(2)  |
| 250 | 160 | 0.15                   | 5.0              | 11.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3150(1)30(2)      | R60II3150(1)30(2)  |
| 250 | 160 | 0.22                   | 5.0              | 11.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3220(1)30(2)      | R60II3220(1)30(2)  |
| 250 | 160 | 0.33                   | 5.0              | 11.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3330(1)30(2)      | R60II3330(1)30(2)  |
| 250 | 160 | 0.47                   | 6.0              | 12.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3470(1)30(2)      | R60II3470(1)30(2)  |
| 250 | 160 | 0.68                   | 7.5              | 13.5   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3680(1)30(2)      | R60II3680(1)30(2)  |
| 250 | 160 | 0.68                   | 9.0              | 12.5   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II3680(1)L0(2)      | R60II3680(1)L0(2)  |
| 250 | 160 | 1.0                    | 8.5              | 14.5   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II4100(1)30(2)      | R60II4100(1)30(2)  |
| 250 | 160 | 1.0                    | 13.0             | 12.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II4100(1)L0(2)      | R60II4100(1)L0(2)  |
| 250 | 160 | 1.5                    | 10.0             | 16.0   | 18.0   | 15.0         | 12.0         | 6000                                        | 60II4150(1)30(2)      | R60II4150(1)30(2)  |
| 250 | 160 | 0.47                   | 6.0              | 15.0   | 26.5   | 22.5         | 8.0          | 4000                                        | 60IN3470(1)30(2)      | R60IN3470(1)30(2)  |
| VDC | VAC | Capacitance Value (μF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/μs) | Max K <sub>0</sub> (V <sup>2</sup> /μs)     | New KEMET Part Number | Legacy Part Number |

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

(2) J = 5%, K = 10%, M = 20%

Table 1B – Ratings &amp; Part Number Reference (Wound Capacitor Technology) cont'd

| VDC | VAC | Capacitance Value (μF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/μs) | Maximum K <sub>0</sub> (V <sup>2</sup> /μs) | New KEMET Part Number | Legacy Part Number |
|-----|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|     |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 250 | 160 | 0.68                   | 6.0              | 15.0   | 26.5   | 22.5         | 8.0          | 4000                                        | 60IN3680(1)30(2)      | R60IN3680(1)30(2)  |
| 250 | 160 | 1.0                    | 6.0              | 15.0   | 26.5   | 22.5         | 8.0          | 4000                                        | 60IN4100(1)30(2)      | R60IN4100(1)30(2)  |
| 250 | 160 | 1.5                    | 7.0              | 16.0   | 26.5   | 22.5         | 8.0          | 4000                                        | 60IN4150(1)30(2)      | R60IN4150(1)30(2)  |
| 250 | 160 | 2.2                    | 10.0             | 18.5   | 26.5   | 22.5         | 8.0          | 4000                                        | 60IN4220(1)30(2)      | R60IN4220(1)30(2)  |
| 250 | 160 | 3.3                    | 11.0             | 20.0   | 26.5   | 22.5         | 8.0          | 4000                                        | 60IN4330(1)30(2)      | R60IN4330(1)30(2)  |
| 250 | 160 | 1.5                    | 9.0              | 17.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR4150(1)30(2)      | R60IR4150(1)30(2)  |
| 250 | 160 | 2.2                    | 9.0              | 17.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR4220(1)30(2)      | R60IR4220(1)30(2)  |
| 250 | 160 | 3.3                    | 9.0              | 17.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR4330(1)40(2)      | R60IR4330(1)40(2)  |
| 250 | 160 | 4.7                    | 9.0              | 17.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR4470(1)40(2)      | R60IR4470(1)40(2)  |
| 250 | 160 | 6.8                    | 11.0             | 20.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR4680(1)40(2)      | R60IR4680(1)40(2)  |
| 250 | 160 | 10.0                   | 13.0             | 22.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR5100(1)40(2)      | R60IR5100(1)40(2)  |
| 250 | 160 | 15.0                   | 14.0             | 28.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR5150(1)40(2)      | R60IR5150(1)40(2)  |
| 250 | 160 | 22.0                   | 18.0             | 33.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR5220(1)00(2)      | R60IR5220(1)00(2)  |
| 250 | 160 | 33.0                   | 22.0             | 37.0   | 32.0   | 27.5         | 5.0          | 2500                                        | 60IR5330(1)00(2)      | R60IR5330(1)00(2)  |
| 250 | 160 | 4.7                    | 11.0             | 22.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW4470(1)30(2)      | R60IW4470(1)30(2)  |
| 250 | 160 | 6.8                    | 11.0             | 22.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW4680(1)40(2)      | R60IW4680(1)40(2)  |
| 250 | 160 | 10.0                   | 11.0             | 22.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW5100(1)40(2)      | R60IW5100(1)40(2)  |
| 250 | 160 | 15.0                   | 13.0             | 24.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW5150(1)40(2)      | R60IW5150(1)40(2)  |
| 250 | 160 | 22.0                   | 16.0             | 28.5   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW5220(1)40(2)      | R60IW5220(1)40(2)  |
| 250 | 160 | 33.0                   | 19.0             | 32.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW5330(1)40(2)      | R60IW5330(1)40(2)  |
| 250 | 160 | 47.0                   | 20.0             | 40.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW5470(1)00(2)      | R60IW5470(1)00(2)  |
| 250 | 160 | 68.0                   | 24.0             | 44.0   | 41.5   | 37.5         | 4.0          | 2000                                        | 60IW5680(1)00(2)      | R60IW5680(1)00(2)  |
| 400 | 200 | 0.015                  | 4.0              | 9.0    | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF2150(1)30(2)      | R60MF2150(1)30(2)  |
| 400 | 200 | 0.022                  | 4.0              | 9.0    | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF2220(1)30(2)      | R60MF2220(1)30(2)  |
| 400 | 200 | 0.033                  | 4.0              | 9.0    | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF2330(1)30(2)      | R60MF2330(1)30(2)  |
| 400 | 200 | 0.047                  | 4.0              | 9.0    | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF2470(1)30(2)      | R60MF2470(1)30(2)  |
| 400 | 200 | 0.068                  | 4.0              | 9.0    | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF2680(1)40(2)      | R60MF2680(1)40(2)  |
| 400 | 200 | 0.068                  | 5.0              | 11.0   | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF2680(1)30(2)      | R60MF2680(1)30(2)  |
| 400 | 200 | 0.10                   | 5.0              | 11.0   | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF3100(1)40(2)      | R60MF3100(1)40(2)  |
| 400 | 200 | 0.10                   | 6.0              | 12.0   | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF3100(1)30(2)      | R60MF3100(1)30(2)  |
| 400 | 200 | 0.15                   | 6.0              | 12.0   | 13.0   | 10.0         | 30.0         | 24000                                       | 60MF3150(1)30(2)      | R60MF3150(1)30(2)  |
| 400 | 200 | 0.022                  | 5.0              | 11.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI2220(1)30(2)      | R60MI2220(1)30(2)  |
| 400 | 200 | 0.047                  | 5.0              | 11.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI2470(1)30(2)      | R60MI2470(1)30(2)  |
| 400 | 200 | 0.068                  | 5.0              | 11.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI2680(1)30(2)      | R60MI2680(1)30(2)  |
| 400 | 200 | 0.10                   | 5.0              | 11.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3100(1)30(2)      | R60MI3100(1)30(2)  |
| 400 | 200 | 0.15                   | 5.0              | 11.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3150(1)30(2)      | R60MI3150(1)30(2)  |
| 400 | 200 | 0.22                   | 5.0              | 11.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3220(1)40(2)      | R60MI3220(1)40(2)  |
| 400 | 200 | 0.22                   | 6.0              | 12.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3220(1)30(2)      | R60MI3220(1)30(2)  |
| 400 | 200 | 0.33                   | 7.5              | 13.5   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3330(1)30(2)      | R60MI3330(1)30(2)  |
| 400 | 200 | 0.33                   | 9.0              | 12.5   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3330(1)L0(2)      | R60MI3330(1)L0(2)  |
| 400 | 200 | 0.47                   | 7.5              | 13.5   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3470(1)40(2)      | R60MI3470(1)40(2)  |
| 400 | 200 | 0.47                   | 8.5              | 14.5   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3470(1)30(2)      | R60MI3470(1)30(2)  |
| 400 | 200 | 0.47                   | 9.0              | 12.5   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3470(1)L1(2)      | R60MI3470(1)L1(2)  |
| 400 | 200 | 0.47                   | 13.0             | 12.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3470(1)L0(2)      | R60MI3470(1)L0(2)  |
| 400 | 200 | 0.68                   | 10.0             | 16.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3680(1)40(2)      | R60MI3680(1)40(2)  |
| 400 | 200 | 0.68                   | 11.0             | 19.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3680(1)30(2)      | R60MI3680(1)30(2)  |
| 400 | 200 | 0.68                   | 13.0             | 12.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI3680(1)L0(2)      | R60MI3680(1)L0(2)  |
| 400 | 200 | 1.0                    | 11.0             | 19.0   | 18.0   | 15.0         | 20.0         | 16000                                       | 60MI4100(1)30(2)      | R60MI4100(1)30(2)  |
| 400 | 200 | 0.22                   | 6.0              | 15.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN3220(1)30(2)      | R60MN3220(1)30(2)  |
| 400 | 200 | 0.33                   | 6.0              | 15.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN3330(1)30(2)      | R60MN3330(1)30(2)  |
| 400 | 200 | 0.47                   | 6.0              | 15.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN3470(1)30(2)      | R60MN3470(1)30(2)  |
| 400 | 200 | 0.68                   | 6.0              | 15.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN3680(1)40(2)      | R60MN3680(1)40(2)  |
| 400 | 200 | 0.68                   | 7.0              | 16.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN3680(1)30(2)      | R60MN3680(1)30(2)  |
| 400 | 200 | 1.0                    | 8.5              | 17.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN4100(1)40(2)      | R60MN4100(1)40(2)  |
| 400 | 200 | 1.0                    | 10.0             | 18.5   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN4100(1)30(2)      | R60MN4100(1)30(2)  |
| 400 | 200 | 1.5                    | 10.0             | 18.5   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN4150(1)40(2)      | R60MN4150(1)40(2)  |
| 400 | 200 | 1.5                    | 11.0             | 20.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN4150(1)30(2)      | R60MN4150(1)30(2)  |
| 400 | 200 | 2.2                    | 13.0             | 22.0   | 26.5   | 22.5         | 10.0         | 8000                                        | 60MN4220(1)30(2)      | R60MN4220(1)30(2)  |
| 400 | 200 | 0.68                   | 9.0              | 17.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR3680(1)30(2)      | R60MR3680(1)30(2)  |
| VDC | VAC | Capacitance Value (μF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/μs) | Max K <sub>0</sub> (V <sup>2</sup> /μs)     | New KEMET Part Number | Legacy Part Number |

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

(2) J = 5%, K = 10%, M = 20%

Table 1B – Ratings &amp; Part Number Reference (Wound Capacitor Technology) cont'd

| VDC | VAC | Capacitance Value (µF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/µs) | Maximum K <sub>0</sub> (V <sup>2</sup> /µs) | New KEMET Part Number | Legacy Part Number |
|-----|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|     |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 400 | 200 | 1.0                    | 9.0              | 17.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR4100(1)30(2)      | R60MR4100(1)30(2)  |
| 400 | 200 | 1.5                    | 9.0              | 17.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR4150(1)40(2)      | R60MR4150(1)40(2)  |
| 400 | 200 | 2.2                    | 11.0             | 20.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR4220(1)40(2)      | R60MR4220(1)40(2)  |
| 400 | 200 | 3.3                    | 13.0             | 22.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR4330(1)40(2)      | R60MR4330(1)40(2)  |
| 400 | 200 | 4.7                    | 14.0             | 28.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR4470(1)40(2)      | R60MR4470(1)40(2)  |
| 400 | 200 | 6.8                    | 18.0             | 33.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR4680(1)40(2)      | R60MR4680(1)40(2)  |
| 400 | 200 | 10.0                   | 22.0             | 37.0   | 32.0   | 27.5         | 8.5          | 6800                                        | 60MR5100(1)40(2)      | R60MR5100(1)40(2)  |
| 400 | 200 | 3.3                    | 11.0             | 22.0   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW4330(1)30(2)      | R60MW4330(1)30(2)  |
| 400 | 200 | 4.7                    | 11.0             | 22.0   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW4470(1)40(2)      | R60MW4470(1)40(2)  |
| 400 | 200 | 6.8                    | 13.0             | 24.0   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW4680(1)40(2)      | R60MW4680(1)40(2)  |
| 400 | 200 | 10.0                   | 16.0             | 28.5   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW5100(1)40(2)      | R60MW5100(1)40(2)  |
| 400 | 200 | 15.0                   | 24.0             | 44.0   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW5150(1)30(2)      | R60MW5150(1)30(2)  |
| 400 | 200 | 22.0                   | 24.0             | 44.0   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW5220(1)40(2)      | R60MW5220(1)40(2)  |
| 400 | 200 | 33.0                   | 30.0             | 45.0   | 41.5   | 37.5         | 6.0          | 4800                                        | 60MW5330(1)40(2)      | R60MW5330(1)40(2)  |
| 630 | 220 | 0.0047                 | 4.0              | 9.0    | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF1470(1)30(2)      | R60PF1470(1)30(2)  |
| 630 | 220 | 0.0068                 | 4.0              | 9.0    | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF1680(1)30(2)      | R60PF1680(1)30(2)  |
| 630 | 220 | 0.010                  | 4.0              | 9.0    | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2100(1)30(2)      | R60PF2100(1)30(2)  |
| 630 | 220 | 0.015                  | 4.0              | 9.0    | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2150(1)30(2)      | R60PF2150(1)30(2)  |
| 630 | 220 | 0.022                  | 4.0              | 9.0    | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2220(1)40(2)      | R60PF2220(1)40(2)  |
| 630 | 220 | 0.022                  | 5.0              | 11.0   | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2220(1)30(2)      | R60PF2220(1)30(2)  |
| 630 | 220 | 0.033                  | 5.0              | 11.0   | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2330(1)40(2)      | R60PF2330(1)40(2)  |
| 630 | 220 | 0.033                  | 6.0              | 12.0   | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2330(1)30(2)      | R60PF2330(1)30(2)  |
| 630 | 220 | 0.047                  | 6.0              | 12.0   | 13.0   | 10.0         | 40.0         | 50400                                       | 60PF2470(1)30(2)      | R60PF2470(1)30(2)  |
| 630 | 220 | 0.033                  | 5.0              | 11.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI2330(1)30(2)      | R60PI2330(1)30(2)  |
| 630 | 220 | 0.047                  | 5.0              | 11.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI2470(1)30(2)      | R60PI2470(1)30(2)  |
| 630 | 220 | 0.068                  | 5.0              | 11.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI2680(1)40(2)      | R60PI2680(1)40(2)  |
| 630 | 220 | 0.068                  | 6.0              | 12.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI2680(1)30(2)      | R60PI2680(1)30(2)  |
| 630 | 220 | 0.10                   | 6.0              | 12.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3100(1)40(2)      | R60PI3100(1)40(2)  |
| 630 | 220 | 0.10                   | 7.5              | 13.5   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3100(1)30(2)      | R60PI3100(1)30(2)  |
| 630 | 220 | 0.10                   | 9.0              | 12.5   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3100(1)L0(2)      | R60PI3100(1)L0(2)  |
| 630 | 220 | 0.15                   | 7.5              | 13.5   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3150(1)40(2)      | R60PI3150(1)40(2)  |
| 630 | 220 | 0.15                   | 8.5              | 14.5   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3150(1)30(2)      | R60PI3150(1)30(2)  |
| 630 | 220 | 0.22                   | 8.5              | 14.5   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3220(1)40(2)      | R60PI3220(1)40(2)  |
| 630 | 220 | 0.22                   | 10.0             | 16.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3220(1)30(2)      | R60PI3220(1)30(2)  |
| 630 | 220 | 0.33                   | 10.0             | 16.0   | 18.0   | 15.0         | 25.0         | 31500                                       | 60PI3330(1)30(2)      | R60PI3330(1)30(2)  |
| 630 | 220 | 0.10                   | 6.0              | 15.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3100(1)30(2)      | R60PN3100(1)30(2)  |
| 630 | 220 | 0.15                   | 6.0              | 15.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3150(1)30(2)      | R60PN3150(1)30(2)  |
| 630 | 220 | 0.22                   | 6.0              | 15.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3220(1)40(2)      | R60PN3220(1)40(2)  |
| 630 | 220 | 0.22                   | 7.0              | 16.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3220(1)30(2)      | R60PN3220(1)30(2)  |
| 630 | 220 | 0.33                   | 7.0              | 16.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3330(1)50(2)      | R60PN3330(1)50(2)  |
| 630 | 220 | 0.33                   | 8.5              | 17.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3330(1)40(2)      | R60PN3330(1)40(2)  |
| 630 | 220 | 0.33                   | 10.0             | 18.5   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3330(1)30(2)      | R60PN3330(1)30(2)  |
| 630 | 220 | 0.47                   | 10.0             | 18.5   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3470(1)40(2)      | R60PN3470(1)40(2)  |
| 630 | 220 | 0.47                   | 11.0             | 20.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3470(1)30(2)      | R60PN3470(1)30(2)  |
| 630 | 220 | 0.68                   | 11.0             | 20.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3680(1)40(2)      | R60PN3680(1)40(2)  |
| 630 | 220 | 0.68                   | 13.0             | 22.0   | 26.5   | 22.5         | 12.0         | 15120                                       | 60PN3680(1)30(2)      | R60PN3680(1)30(2)  |
| 630 | 220 | 0.33                   | 9.0              | 17.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR3330(1)30(2)      | R60PR3330(1)30(2)  |
| 630 | 220 | 0.47                   | 9.0              | 17.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR3470(1)40(2)      | R60PR3470(1)40(2)  |
| 630 | 220 | 0.68                   | 11.0             | 20.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR3680(1)40(2)      | R60PR3680(1)40(2)  |
| 630 | 220 | 1.0                    | 11.0             | 20.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR4100(1)50(2)      | R60PR4100(1)50(2)  |
| 630 | 220 | 1.5                    | 18.0             | 33.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR4150(1)30(2)      | R60PR4150(1)30(2)  |
| 630 | 220 | 2.2                    | 18.0             | 33.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR4220(1)40(2)      | R60PR4220(1)40(2)  |
| 630 | 220 | 3.3                    | 22.0             | 37.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR4330(1)40(2)      | R60PR4330(1)40(2)  |
| 630 | 220 | 4.7                    | 22.0             | 37.0   | 32.0   | 27.5         | 10.0         | 12600                                       | 60PR4470(1)40(2)      | R60PR4470(1)40(2)  |
| 630 | 220 | 1.0                    | 11.0             | 22.0   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW4100(1)30(2)      | R60PW4100(1)30(2)  |
| 630 | 220 | 1.5                    | 11.0             | 22.0   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW4150(1)40(2)      | R60PW4150(1)40(2)  |
| 630 | 220 | 2.2                    | 13.0             | 24.0   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW4220(1)40(2)      | R60PW4220(1)40(2)  |
| 630 | 220 | 3.3                    | 16.0             | 28.5   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW4330(1)40(2)      | R60PW4330(1)40(2)  |
| 630 | 220 | 4.7                    | 19.0             | 32.0   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW4470(1)40(2)      | R60PW4470(1)40(2)  |
| VDC | VAC | Capacitance Value (µF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/µs) | Max K <sub>0</sub> (V <sup>2</sup> /µs)     | New KEMET Part Number | Legacy Part Number |

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

(2) J = 5%, K = 10%, M = 20%

**Table 1B – Ratings & Part Number Reference (Wound Capacitor Technology) cont'd**

| VDC  | VAC | Capacitance Value (μF) | Dimensions in mm |        |        | Lead Spacing | dV/dt (V/μs) | Maximum K <sub>0</sub> (V <sup>2</sup> /μs) | New KEMET Part Number | Legacy Part Number |
|------|-----|------------------------|------------------|--------|--------|--------------|--------------|---------------------------------------------|-----------------------|--------------------|
|      |     |                        | B                | H      | L      |              |              |                                             |                       |                    |
| 630  | 220 | 6.8                    | 20.0             | 40.0   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW4680(1)00(2)      | R60PW4680(1)00(2)  |
| 630  | 220 | 10.0                   | 24.0             | 44.0   | 41.5   | 37.5         | 8.0          | 10080                                       | 60PW5100(1)40(2)      | R60PW5100(1)40(2)  |
| 1000 | 250 | 0.0010                 | 4.0              | 9.0    | 13.0   | 10.0         | 60.0         | 120000                                      | 60QF1100(1)01(2)      | R60QF1100(1)01(2)  |
| 1000 | 250 | 0.0015                 | 4.0              | 9.0    | 13.0   | 10.0         | 60.0         | 120000                                      | 60QF1150(1)01(2)      | R60QF1150(1)01(2)  |
| 1000 | 250 | 0.0022                 | 4.0              | 9.0    | 13.0   | 10.0         | 60.0         | 120000                                      | 60QF1220(1)01(2)      | R60QF1220(1)01(2)  |
| 1000 | 250 | 0.0033                 | 4.0              | 9.0    | 13.0   | 10.0         | 60.0         | 120000                                      | 60QF1330(1)01(2)      | R60QF1330(1)01(2)  |
| 1000 | 250 | 0.0047                 | 5.0              | 11.0   | 13.0   | 10.0         | 60.0         | 120000                                      | 60QF1470(1)01(2)      | R60QF1470(1)01(2)  |
| 1000 | 250 | 0.0068                 | 6.0              | 12.0   | 13.0   | 10.0         | 60.0         | 120000                                      | 60QF1680(1)01(2)      | R60QF1680(1)01(2)  |
| 1000 | 250 | 0.010                  | 5.0              | 11.0   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2100(1)00(2)      | R60QI2100(1)00(2)  |
| 1000 | 250 | 0.015                  | 5.0              | 11.0   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2150(1)30(2)      | R60QI2150(1)30(2)  |
| 1000 | 250 | 0.022                  | 6.0              | 12.0   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2220(1)30(2)      | R60QI2220(1)30(2)  |
| 1000 | 250 | 0.033                  | 7.5              | 13.5   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2330(1)30(2)      | R60QI2330(1)30(2)  |
| 1000 | 250 | 0.033                  | 9.0              | 12.5   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2330(1)L0(2)      | R60QI2330(1)L0(2)  |
| 1000 | 250 | 0.047                  | 10.0             | 16.0   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2470(1)00(2)      | R60QI2470(1)00(2)  |
| 1000 | 250 | 0.047                  | 13.0             | 12.0   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2470(1)L0(2)      | R60QI2470(1)L0(2)  |
| 1000 | 250 | 0.068                  | 11.0             | 19.0   | 18.0   | 15.0         | 30.0         | 60000                                       | 60QI2680(1)00(2)      | R60QI2680(1)00(2)  |
| 1000 | 250 | 0.033                  | 6.0              | 15.0   | 26.5   | 22.5         | 15.0         | 30000                                       | 60QN2330(1)00(2)      | R60QN2330(1)00(2)  |
| 1000 | 250 | 0.047                  | 6.0              | 15.0   | 26.5   | 22.5         | 15.0         | 30000                                       | 60QN2470(1)00(2)      | R60QN2470(1)00(2)  |
| 1000 | 250 | 0.068                  | 7.0              | 16.0   | 26.5   | 22.5         | 15.0         | 30000                                       | 60QN2680(1)30(2)      | R60QN2680(1)30(2)  |
| 1000 | 250 | 0.10                   | 8.5              | 17.0   | 26.5   | 22.5         | 15.0         | 30000                                       | 60QN3100(1)30(2)      | R60QN3100(1)30(2)  |
| 1000 | 250 | 0.15                   | 13.0             | 22.0   | 26.5   | 22.5         | 15.0         | 30000                                       | 60QN3150(1)00(2)      | R60QN3150(1)00(2)  |
| 1000 | 250 | 0.15                   | 9.0              | 17.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR3150(1)30(2)      | R60QR3150(1)30(2)  |
| 1000 | 250 | 0.22                   | 9.0              | 17.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR3220(1)40(2)      | R60QR3220(1)40(2)  |
| 1000 | 250 | 0.33                   | 11.0             | 20.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR3330(1)40(2)      | R60QR3330(1)40(2)  |
| 1000 | 250 | 0.47                   | 13.0             | 22.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR3470(1)40(2)      | R60QR3470(1)40(2)  |
| 1000 | 250 | 0.68                   | 14.0             | 28.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR3680(1)40(2)      | R60QR3680(1)40(2)  |
| 1000 | 250 | 1.0                    | 18.0             | 33.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR4100(1)40(2)      | R60QR4100(1)40(2)  |
| 1000 | 250 | 1.5                    | 22.0             | 37.0   | 32.0   | 27.5         | 12.0         | 24000                                       | 60QR4150(1)40(2)      | R60QR4150(1)40(2)  |
| 1000 | 250 | 0.5                    | 11.0             | 22.0   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW3470(1)30(2)      | R60QW3470(1)30(2)  |
| 1000 | 250 | 0.7                    | 11.0             | 22.0   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW3680(1)40(2)      | R60QW3680(1)40(2)  |
| 1000 | 250 | 1.0                    | 13.0             | 24.0   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW4100(1)40(2)      | R60QW4100(1)40(2)  |
| 1000 | 250 | 1.5                    | 16.0             | 28.5   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW4150(1)40(2)      | R60QW4150(1)40(2)  |
| 1000 | 250 | 2.2                    | 19.0             | 32.0   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW4220(1)30(2)      | R60QW4220(1)30(2)  |
| 1000 | 250 | 3.3                    | 24.0             | 44.0   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW4330(1)00(2)      | R60QW4330(1)00(2)  |
| 1000 | 250 | 4.7                    | 30.0             | 45.0   | 41.5   | 37.5         | 10.0         | 20000                                       | 60QW4470(1)40(2)      | R60QW4470(1)40(2)  |
| VDC  | VAC | Capacitance Value (μF) | B (mm)           | H (mm) | L (mm) | Lead Spacing | dV/dt (V/μs) | Max K <sub>0</sub> (V <sup>2</sup> /μs)     | New KEMET Part Number | Legacy Part Number |

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

(2) J = 5%, K = 10%, M = 20%

## Soldering Process

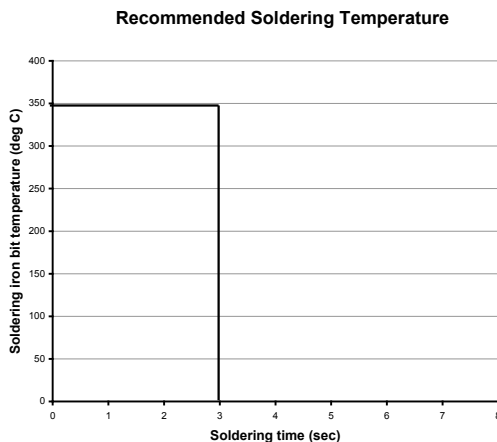
The implementation of the RoHS directive has resulted in the selection of SnAgCu (SAC) alloys or SnCu alloys as primary solder. This has increased the liquidus temperature from that of 183°C for SnPb eutectic alloy to 217 – 221°C for the new alloys. As a result, the heat stress to the components, even 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 the recommended limits may result to 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.

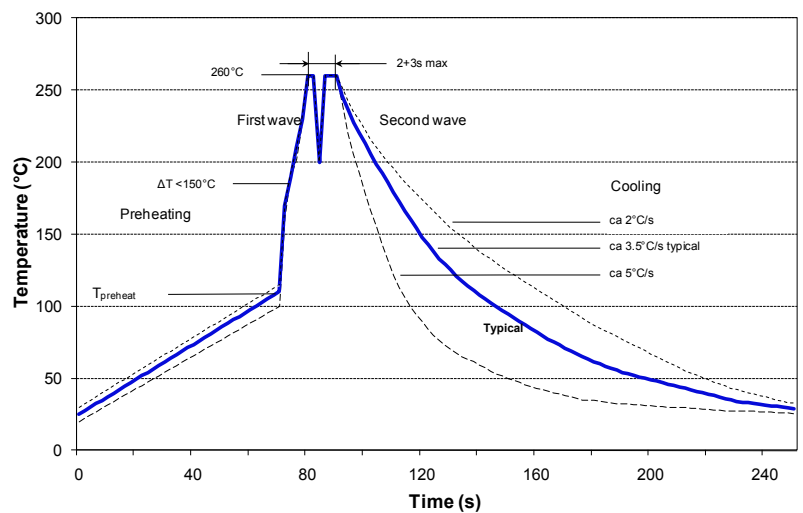
### Manual Soldering Recommendations

Following is the recommendation 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'd

### Wave Soldering Recommendations cont'd

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

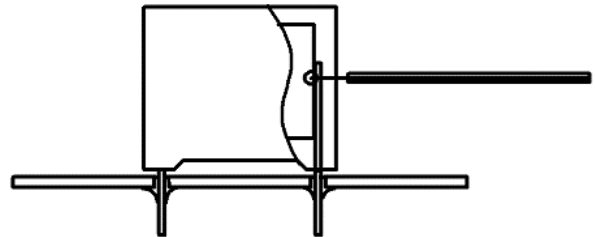
Figure 1

| Dielectric Film Material | Maximum Preheat Temperature |                         |                         | Maximum Peak Soldering Temperature |                         |
|--------------------------|-----------------------------|-------------------------|-------------------------|------------------------------------|-------------------------|
|                          | Capacitor Pitch ≤ 10 mm     | Capacitor Pitch = 15 mm | Capacitor Pitch > 15 mm | Capacitor Pitch ≤ 15 mm            | Capacitor Pitch > 15 mm |
| Polyester                | 130°C                       | 130°C                   | 130°C                   | 270°C                              | 270°C                   |
| Polypropylene            | 100°C                       | 110°C                   | 130°C                   | 260°C                              | 270°C                   |
| Paper                    | 130°C                       | 130°C                   | 140°C                   | 270°C                              | 270°C                   |
| Polyphenylene Sulphide   | 150°C                       | 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.*

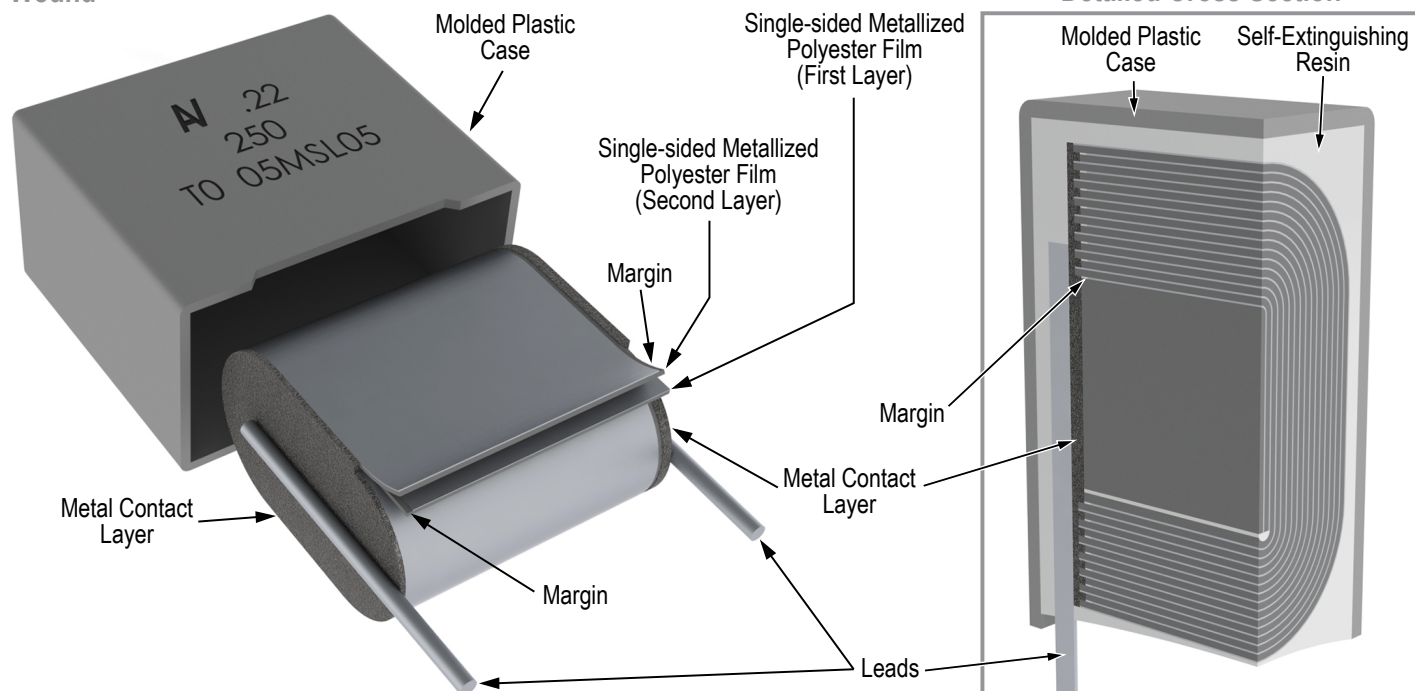
### Selective Soldering Recommendations

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.

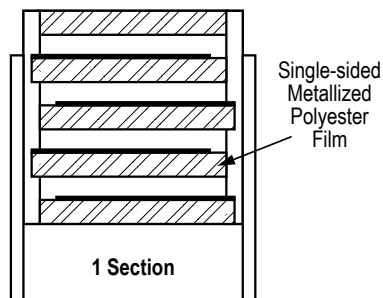
The temperature profile for selective soldering is similar to the double wave flow soldering outlined in this document, **however, instead of two baths, there is only one bath with a time from 3 to 10 seconds.** In selective soldering, the risk of overheating is greater than in double wave flow soldering,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

## Construction

### Wound

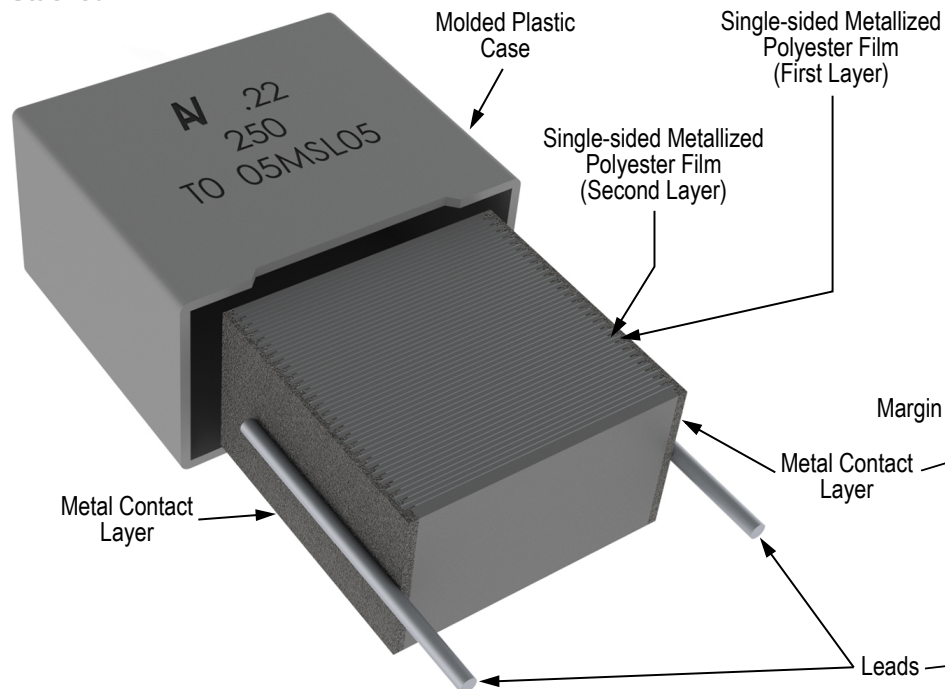


### Winding Scheme

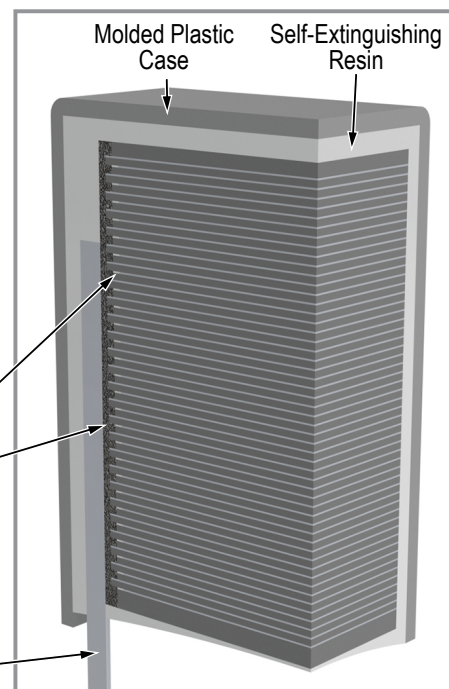


## Construction cont'd

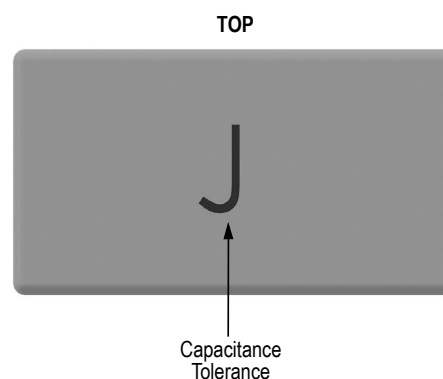
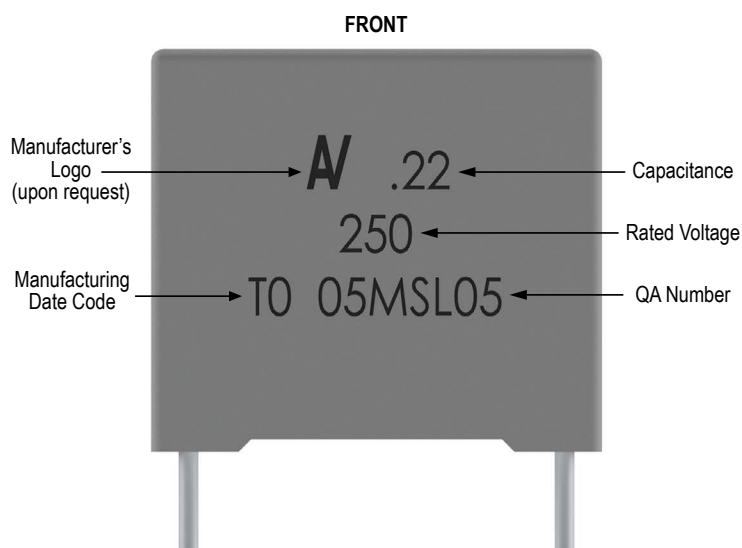
Stacked



Detailed Cross Section



## Marking



## 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  |
|--------------|----------------|-------------|-------------|------------------|-----------------|---------------------------|------------------------|-------|
| 10           | 4.0            | 9.0         | 13.0        | 2,000            | 1,800           | 750                       | 1,500                  | 1,000 |
|              | 5.0            | 11.0        | 13.0        | 1,300            | 1,500           | 600                       | 1,250                  | 800   |
|              | 6.0            | 12.0        | 13.0        | 1,000            | 1,200           | 500                       | 1,000                  | 680   |
| 15           | 5.0            | 11.0        | 18.0        | 2,000            | 1,000           | 600                       | 1,250                  | 800   |
|              | 6.0            | 12.0        | 18.0        | 1,750            | 900             | 500                       | 1,000                  | 680   |
|              | 7.5            | 13.5        | 18.0        | 1,000            | 700             | 350                       | 800                    | 500   |
|              | 8.5            | 14.5        | 18.0        | 1,000            | 500             | 300                       | 700                    | 440   |
|              | 9.0            | 12.5        | 18.0        | 1,000            | 520             | 270                       | 650                    | 410   |
|              | 10.0           | 16.0        | 18.0        | 750              | 500             | 300                       | 600                    | 380   |
|              | 11.0           | 19.0        | 18.0        | 450              | 350             | -                         | 500                    | 340   |
|              | 13.0           | 12.0        | 18.0        | 750              | 490             | 200                       | 480                    | 280   |
| 22.5         | 6.0            | 15.0        | 26.5        | 805              | 500             |                           | 700                    | 464   |
|              | 7.0            | 16.0        | 26.5        | 700              | 500             |                           | 550                    | 380   |
|              | 8.5            | 17.0        | 26.5        | 468              | 300             |                           | 450                    | 280   |
|              | 10.0           | 18.5        | 26.5        | 396              | 300             |                           | 350                    | 235   |
|              | 11.0           | 20.0        | 26.5        | 360              | 250             |                           | 350                    | 217   |
|              | 13.0           | 22.0        | 26.5        | 300              | 200             |                           | 300                    | -     |
| 27.5         | 9.0            | 17.0        | 32.0        | 816              | 408             |                           | 450                    |       |
|              | 11.0           | 20.0        | 32.0        | 560              | 336             |                           | 350                    |       |
|              | 13.0           | 22.0        | 32.0        | 480              | 288             |                           | 300                    |       |
|              | 14.0           | 28.0        | 32.0        | 352              | 176             |                           |                        |       |
|              | 18.0           | 33.0        | 32.0        | 256              | 128             |                           |                        |       |
|              | 22.0           | 37.0        | 32.0        | 168              | 112             |                           |                        |       |
| 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           | 44.0        | 41.5        | 108              | 72              |                           |                        |       |
|              | 30.0           | 45.0        | 41.5        | 90               | 60              |                           |                        |       |

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

Figure 1 – Lead Space 10 mm

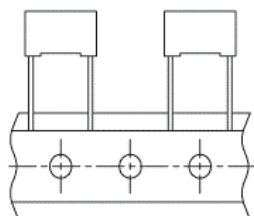


Figure 2 – Lead Spacing 15 mm

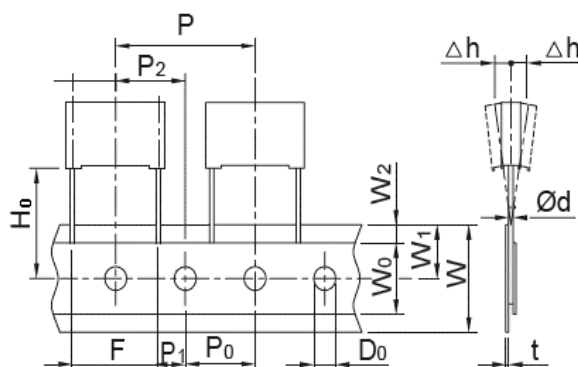
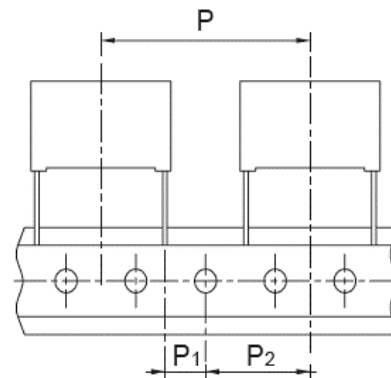


Figure 3 – Lead Spacing 22.5 & 27.5 mm



| Description                          | Symbol              | Dimensions (mm)  |                  |                  |                  |             |  |
|--------------------------------------|---------------------|------------------|------------------|------------------|------------------|-------------|--|
|                                      |                     | Lead Space       |                  |                  |                  | Tolerance   |  |
|                                      |                     | 10.0<br>Figure 1 | 15.0<br>Figure 2 | 22.5<br>Figure 3 | 27.5<br>Figure 3 |             |  |
| 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         |  |
| 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               | min.        |  |
| Hole position                        | W <sub>1</sub>      | 9                | 9                | 9                | 9                | ± 0.5       |  |
| Hold down tape position              | W <sub>2</sub>      | 3                | 3                | 3                | 3                | max.        |  |
| Feed hole diameter                   | D <sub>0</sub>      | 4                | 4                | 4                | 4                | ± 0.2       |  |
| Tape thickness                       | t                   | 0.7              | 0.7              | 0.7              | 0.7              | ± 0.2       |  |

\* Available also 15 mm.

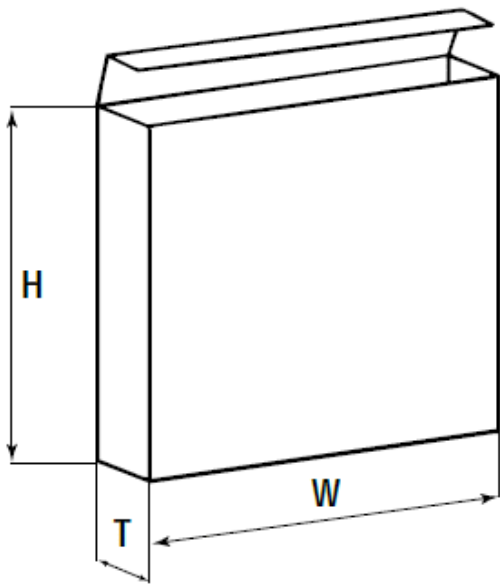
\*\* Maximum 1 mm on 20 lead spaces.

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

\*\*\*\* H = 16.5 mm is available upon request.

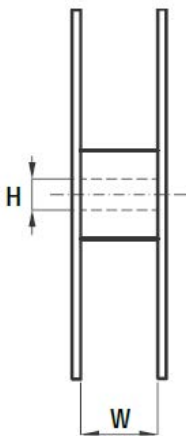
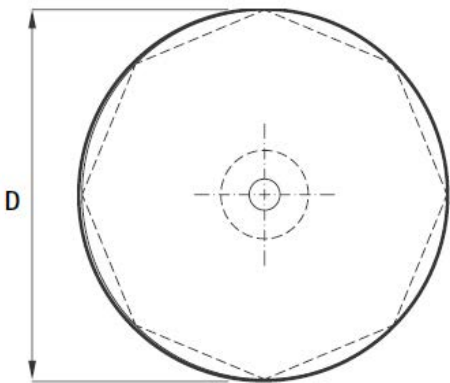
**Ammo Specifications**

| Dimensions in mm |     |    |
|------------------|-----|----|
| H                | W   | T  |
| 360              | 340 | 59 |



**Reel Specifications**

| Dimensions in mm |    |            |
|------------------|----|------------|
| D                | H  | W          |
| 355              | 30 | 55 maximum |
| 500              | 25 |            |



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