# Type MK Precision Power Film Radial-Lead Resistors



## Non-Inductive with Expanded Resistance Range — 1 ohm to 100 Megohms

Here are the precision radial lead resistors that provide high density packaging in circuit board applications. Available in three miniature rectangular package configurations with standard lead spacings, Type MK Precision Power Radial-Lead Film Resistors now cover the entire resistance range from 1 ohm to 100 Megohms.

Constructed with Caddock's Micronox® resistance films fired onto a solid ceramic substrate, Type MK Precision Film Resistors combine all of these outstanding advantages:

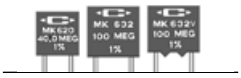
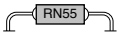
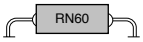
- **±1% Resistance Tolerance is Standard** - tolerances to ±0.1% are available on special order.
- **Operating Temperature** - from -55°C to +175°C.
- **Full Power Rating at +125°C.**
- **Temperature Coefficient is ≤ 50 ppm/°C from 5 ohms to 5 Megohms and ≤ 80 ppm/°C up to 100 Megohms** - referenced to +25°C with the ΔR taken at -15°C and +105°C.
- **Extended Life Stability is Typically Better Than 0.1% per 1,000 Hours.**
- **Caddock's Non-Inductive Performance** - provides faster settling times and minimum distortion in all types of high frequency circuits.

This combination of performance advantages in a small, standardized case can simplify many engineering and production problems:

**One size of Type MK resistor can replace many sizes of axial-lead resistors.**

This table of "RN" style axial-lead resistors shows the many sizes and power ratings that can be replaced with one of the three models of Type MK Precision Film Resistors, within the maximum allowable voltage ratings.

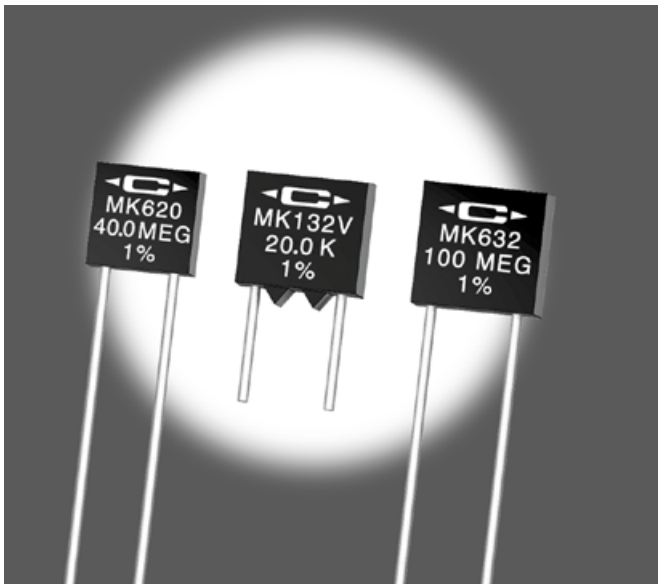
**Comparison of Type MK and "RN" Ratings and Dimensions**

| Resistor Type | Power Rating | Maximum Resistance | Mounting Hole Spacing | Even the smallest Type MK resistor can replace all of these RN type resistors |
|---|---|---|---|---|
| **MK120 or MK620** | **0.50 W** | **40 Megohms** | **.150 (3.81)** |  |
| **MK132, MK132V, MK632, or MK632V** | **0.75 W** | **100 Megohms** | **.200 (5.08)** | |
| RN50 | 0.05 W | 1 Megohm | .400 (10.15) | |
| RN55 | 0.10 W | 5 Megohms | .500 (12.70) |  |
| RN60 | 0.125 W | 10 Megohms | .625 (15.90) |  |
| RN65 | 0.25 W | 20 Megohms | .875 (22.20) | |
| RN70 | 0.50 W | 40 Megohms | 1.000 (25.40) | |

All outline drawings full size - dimensions in inches and (millimeters).

The largest Type MK - rated at .75 watt - requires less board space than even the .05 watt RN50.

The smallest Type MK - rated at .50 watt - provides power dissipation **equal** to the RN70 resistor. The RN70 resistor requires a mounting hole spacing of 1 inch and a side-to-side spacing of .25 inch, resulting in a total mounting area of .25 square inch - **10 times the area required for a .50 Watt Type MK resistor!**




**One standard resistor configuration can simplify board layouts.**

With the exceptionally wide range of resistance values that are available in each model of Type MK Precision Film Resistors, circuits can now be designed for maximum packaging densities without the need for leaving extra space where resistor value changes can require larger resistors or non-uniform lead spacings.

**Standardization of resistor size can speed assembly procedures and reduce procurement costs.**

The standardization of resistor size can pay additional dividends by simplifying assembly procedures. The radial leads do not require additional bending prior to insertion, and the standard lead spacing can reduce the time required for assembly.

The combination of higher power ratings and smaller size can also lower procurement costs. By reducing the wide variety of sizes and types of axial-lead resistors to a single, standardized resistor type, unit prices can be lowered and inventory problems simplified. For specific price and delivery information, contact our Sales Office.

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# Type MK Precision Power Film Radial-Lead Resistors



## Type MK Precision Film Resistors - Low and Standard Resistance Ranges

| Model No. | Watt-age | Max. Voltage | Oper. Temp. Max. | Dielect. Strength | Resistance | | | Dimensions | Encapsulation | Leadwire | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Low Min. | Standard Min. | Standard Max. | | | | |
| MK120 | 0.50 | 200 | 175°C | 300 | 1 Ω | 5 Ω | 2 Meg | Ref. Case "A" Dwg. | Transfer Molded | Tinned Copper | ——— |
| MK132 | 0.75 | 400 | 175°C | 400 | 1 Ω | 5 Ω | 5 Meg | Ref. Case "B" Dwg. | Transfer Molded | Tinned Copper | ——— |
| MK132V | 0.75 | 400 | 175°C | 400 | 1 Ω | 5 Ω | 5 Meg | Ref. Case "C" Dwg. | Transfer Molded | Tinned Copper | With Standoff |

**Resistance Tolerance:** ±1% (tolerances to ±0.1% available on values of 30 ohms or higher).

**Overload/Overvoltage:** 5 times rated power with applied voltage not to exceed 1.5 times maximum continuous operating voltage for 5 seconds, ΔR ±(0.15 percent + 0.01 ohm) max.

**Operating Temperature:** -55°C to +175°C.

**Temperature Coefficient:**

| Resistance Range | Temp. Coef. |
|---|---|
| Standard : 5 Ω and above | 50 ppm/°C |
| Low : 1 Ω to 4.99 Ω | 200 ppm/°C |

Temperature Coefficient referenced to +25°C, ΔR taken at -15°C and +105°C.

**Insulation Resistance:** 10,000 Megohms, minimum.

**Load Life:** 1,000 hours at +125°C at rated power, ΔR ±(0.4 percent +0.01 ohm) max.

**Thermal Shock:** Mil-Std-202, Method 107, Cond. B, ΔR ±(0.2 percent +0.01 ohm) max.

**Moisture Resistance:** Mil-Std-202, Method 106, ΔR ±(0.5 percent + 0.01 ohm) max.

**Measurement Note:** Resistance measurement on low resistance values shall be made at a point within 0.2 inch (5.08 mm) of the body.

## Type MK Precision Film Resistors - Extended Resistance Range

| Model No. | Watt-age | Max. Voltage | Oper. Temp. Max. | Dielect. Strength | TC ppm/°C | Resistance | | Dimensions | Encapsulation | Leadwire | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Min. | Max. | | | | |
| MK620 | 0.50 | 200 | 175°C | 300 | 80 | 2.01 Meg | 40 Meg | Ref. Case "A" Dwg. | Transfer Molded | Tinned Copper | ——— |
| MK632 | 0.75 | 400 | 175°C | 400 | 80 | 5.01 Meg | 100 Meg | Ref. Case "B" Dwg. | Transfer Molded | Tinned Copper | ——— |
| MK632V | 0.75 | 400 | 175°C | 400 | 80 | 5.01 Meg | 100 Meg | Ref. Case "C" Dwg. | Transfer Molded | Tinned Copper | With Standoff |

**Resistance Tolerance:** ±1% (consult factory for tighter tolerances).

**Overload/Overvoltage:** 1.5 times max. voltage for 5 seconds, ΔR 0.5% max.

**Operating Temperature:** -55°C to +175°C.

**Temperature Coefficient:** See Table for TC value. TC referenced to +25°C, ΔR taken at -15°C and +105°C.

**Insulation Resistance:** 10,000 Megohms, minimum.

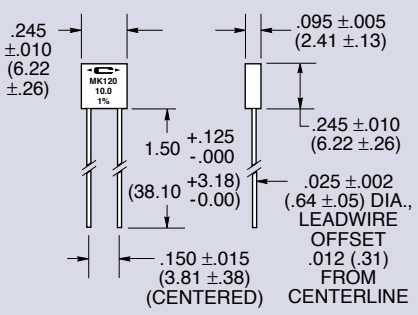
**Load Life:** 1,000 hours at +125°C at rated power, ΔR 0.5% max.

**Thermal Shock:** Mil-Std-202, Method 107, Cond. B, ΔR 0.5% max.

**Moisture Resistance:** Mil-Std-202, Method 106, ΔR 0.5% max.

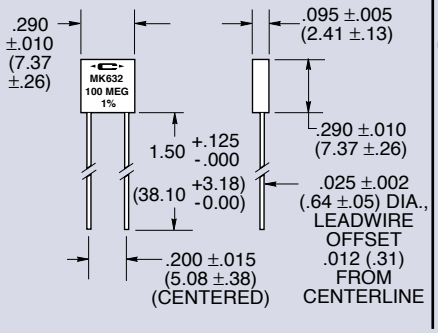
### Case "A"

**Model MK120 and MK620**



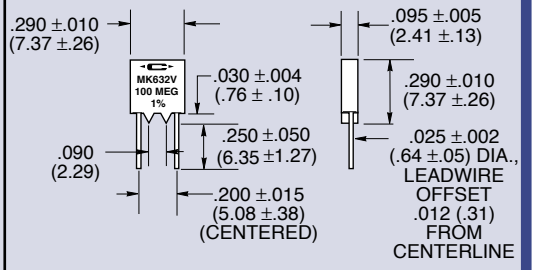

### Case "B"

**Model MK132 and MK632**




### Case "C"

**Model MK132V and MK632V**

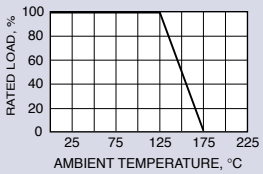



### Ordering Information:

**MK132 - 500K - 1%**

- **Model Number:** MK132
- **Resistor Value:** 500K
- **Tolerance:** 1%

**Derating Curve:**

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