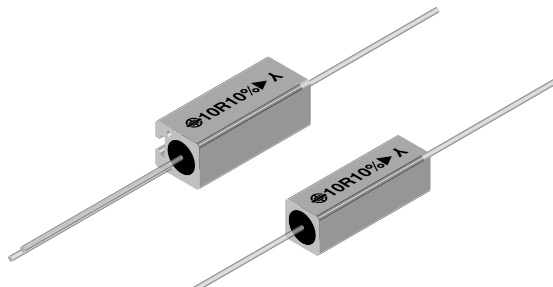


## Wirewound and Fusible Leaded Wirewound Resistors in Ceramic Case



### FEATURES

- Fiberglass core, ceramic case
- Fireproof inorganic construction
- Axial or radial leaded
- Fusing styles available as style KKE.. Si
- Pure tin plating provides compatibility with lead (Pb)-free and lead containing soldering processes
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

| GLOBAL MODEL            | POWER RATING<br>W<br>$P_{70^{\circ}\text{C}}$ | LIMITING VOLTAGE<br>V | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$<br>TCR +400 $\pm$ 50 ppm/K | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$<br>TCR +0 $\pm$ 40 ppm/K | RESISTANCE RANGE <sup>(1)</sup><br>$\Omega$<br>TCR +0 $\pm$ 10 ppm/K | TOLERANCE<br>$\pm$ % |
|-------------------------|---|-----------------------|--|--|--|----------------------|
| KKA4                    | 4   | 125                   | 0.056 to 0.20  | 0.22 to 300  | 330 to 9.1K  | 10                   |
|                         | 4   |                       | 0.10 to 0.20   | 0.22 to 300  | 330 to 9.1K  | 5                    |
| KKA5                    | 5   | 185                   | 0.075 to 0.30  | 0.33 to 470  | 510 to 15K   | 10                   |
|                         | 5   |                       | 0.15 to 0.30   | 0.33 to 470  | 510 to 15K   | 5                    |
| KKA7                    | 7   | 250                   | 0.11 to 0.68   | 0.75 to 910  | 1 to 33K   | 10                   |
|                         | 7   |                       | 0.33 to 0.68   | 0.75 to 910  | 1 to 33K   | 5                    |
| KKA9                    | 9   | 250                   | 0.11 to 0.68   | 0.75 to 910  | 1K to 33K  | 10                   |
|                         | 9   |                       | 0.33 to 0.68   | 0.75 to 910  | 1K to 33K  | 5                    |
| KKA11                   | 11  | 350                   | 0.15 to 1.0  | 1.1 to 1.3 K   | 1.5K to 47K  | 10                   |
|                         | 11  |                       | 0.51 to 1.0  | 1.1 to 1.3 K   | 1.5K to 47K  | 5                    |
| KKA17                   | 17  | 500                   | 0.27 to 1.6  | 1.8 to 2.4K  | 2.7K to 82K  | 10                   |
|                         | 17  |                       | 0.91 to 1.6  | 1.8 to 2.4K  | 2.7K to 82K  | 5                    |
| KKE4                    | 4   | 125                   | 0.056 to 0.20  | 0.22 to 300  | 330 to 9.1K  | 10                   |
|                         | 4   |                       | 0.10 to 0.20   | 0.22 to 300  | 330 to 9.1K  | 5                    |
| KKE7                    | 7   | 250                   | 0.075 to 0.30  | 0.33 to 470  | 510 to 15K   | 10                   |
|                         | 7   |                       | 0.15 to 0.30   | 0.33 to 470  | 510 to 15K   | 5                    |
| KKE9                    | 9   | 250                   | 0.11 to 0.68   | 0.75 to 910  | 1K to 33K  | 10                   |
|                         | 9   |                       | 0.33 to 0.68   | 0.75 to 910  | 1K to 33K  | 5                    |
| KKE11                   | 11  | 350                   | 0.15 to 1.0  | 1.1 to 1.3 K   | 1.5K to 47K  | 10                   |
|                         | 11  |                       | 0.51 to 1.0  | 1.1 to 1.3 K   | 1.5K to 47K  | 5                    |
| KKE17                   | 17  | 500                   | 0.27 to 1.6  | 1.8 to 2.4K  | 2.7K to 82K  | 10                   |
|                         | 17  |                       | 0.91 to 1.6  | 1.8 to 2.4K  | 2.7K to 82K  | 5                    |
| KKE7 Si <sup>(2)</sup>  | 4   | 165                   | 0.075 to 0.13  | -  | -  | 10                   |
|                         | 4   |                       | -  | 0.15 to 12K  | -  | 5                    |
| KKE9 Si <sup>(2)</sup>  | 5.5   | 250                   | 0.11 to 0.30   | -  | -  | 10                   |
|                         | 5.5   |                       | -  | 0.33 to 33K  | -  | 5                    |
| KKE11 Si <sup>(2)</sup> | 7   | 350                   | 0.28 to 0.47   | -  | -  | 10                   |
|                         | 7   |                       | -  | 0.51 to 47K  | -  | 5                    |

#### Notes

<sup>(1)</sup> Resistance value to be selected for  $\pm 10$  % tolerance from E12 and for  $\pm 5$  % from E24

<sup>(2)</sup> Power rating at  $P_{40^{\circ}\text{C}}$

**PART NUMBER AND PRODUCT DESCRIPTION**

Part Number: KKA040B1009KG1000

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K | K | A | 0 | 4 | 0 | B | 1 | 0 | 0 | 9 | K | G | 1 | 0 | 0 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| MODEL   | VARIANT                             | TCR/MATERIAL   | VALUE  | TOLERANCE CODE                                    | PACKAGING CODE        | SPECIAL  |
|---|-------------------------------------|--|--|---|-----------------------|--|
| <b>KKA04</b> = KKA4<br><b>KKA05</b> = KKA5<br><b>KKA07</b> = KKA7<br><b>KKA09</b> = KKA9<br><b>KKA11</b> = KKA11<br><b>KKA17</b> = KKA17<br><b>KKE04</b> = KKE4<br><b>KKE07</b> = KKE7<br><b>KKE09</b> = KKE9<br><b>KKE11</b> = KKE11<br><b>KKE17</b> = KKE17 | <b>0</b> = neutral<br><b>L</b> = Si | <b>0</b> = SWI per BV<br><b>A</b> = $400 \pm 50$ ppm/K<br><b>B</b> = $0 \pm 40$ ppm/K<br><b>C</b> = $0 \pm 10$ ppm/K<br><b>D</b> = $+200... +1200$ ppm/K | <b>3 digit value</b><br><b>1 digit multiplier</b><br><b>MULTIPLIER</b><br><b>F</b> = $\times 10^{-4}$<br><b>7</b> = $\times 10^{-3}$<br><b>8</b> = $\times 10^{-2}$<br><b>9</b> = $\times 10^{-1}$<br><b>0</b> = $\times 10^0$<br><b>1</b> = $\times 10^1$<br><b>2</b> = $\times 10^2$ | <b>J</b> = $\pm 5.0$ %<br><b>K</b> = $\pm 10.0$ % | (see Packaging table) | The 5 digit BV number will be encoded using a 36 character code. This code contains numbers 0 to 9 and letters A to Z (36 characters total) and allows to encode at least 46 655 five digit BV numbers.<br><b>000</b> = standard |

Product Description: KKA4 10R 10 % 0 +40 -80 R1

|                      |                      |                               |                             |                                      |
|----------------------|----------------------|-------------------------------|-----------------------------|--------------------------------------|
| <b>KKA4</b>          | <b>10R</b>           | <b>10 %</b>                   | <b>0 ± 40</b>               | <b>R1</b>                            |
| MODEL <sup>(1)</sup> | VALUE <sup>(1)</sup> | TOLERANCE CODE <sup>(1)</sup> | TCR/MATERIAL <sup>(1)</sup> | PACKAGING DESCRIPTION <sup>(2)</sup> |

**Notes**

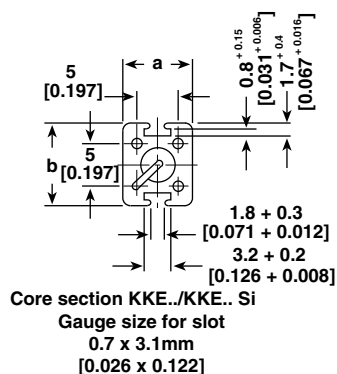
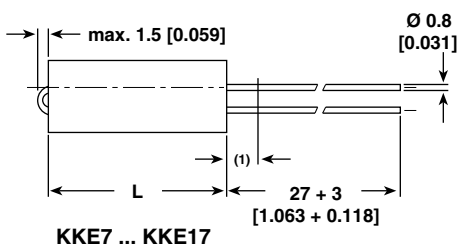
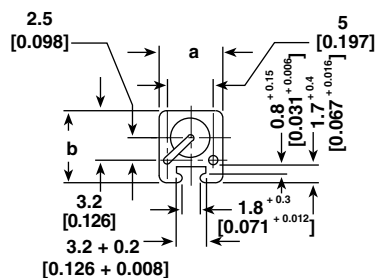
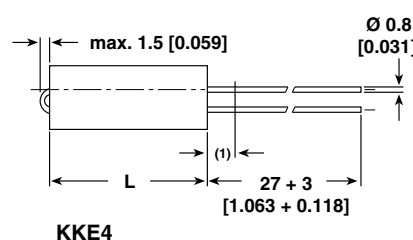
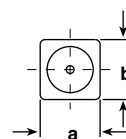
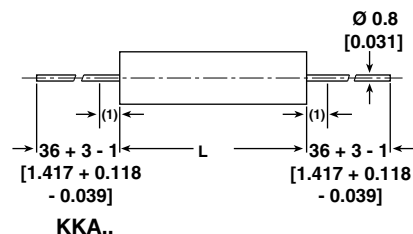
- (1) See "Part Number" above  
(2) See "Packaging Table"

**PACKAGING TABLE**

| MODEL    | REEL <sup>(1)</sup> |                |                       | LOOSE  |                |                       |
|----------|---------------------|----------------|-----------------------|--------|----------------|-----------------------|
|          | PIECES              | PACKAGING CODE | PACKAGING DESCRIPTION | PIECES | PACKAGING CODE | PACKAGING DESCRIPTION |
| KKA4     | 1000                | G1             | R1                    | 200    | LJ             | LJ                    |
| KKA5     | 1000                | G1             | R1                    | 200    | LJ             | LJ                    |
| KKA7     |                     |                |                       | 200    | LJ             | LJ                    |
| KKA9     |                     |                |                       | 100    | LA             | LA                    |
| KKA11    |                     |                |                       | 100    | LA             | LA                    |
| KKA17    |                     |                |                       | 100    | LA             | LA                    |
| KKE4     |                     |                |                       | 200    | LJ             | LJ                    |
| KKE7     |                     |                |                       | 200    | LJ             | LJ                    |
| KKE9     |                     |                |                       | 200    | LJ             | LJ                    |
| KKE11    |                     |                |                       | 200    | LJ             | LJ                    |
| KKE17    |                     |                |                       | 100    | LA             | LA                    |
| KKE7 Si  |                     |                |                       | 200    | LJ             | LJ                    |
| KKE9 Si  |                     |                |                       | 200    | LJ             | LJ                    |
| KKE11 Si |                     |                |                       | 200    | LJ             | LJ                    |

**Note**

- (1) Tape length for KKA4 and KKA5 = 80 mm

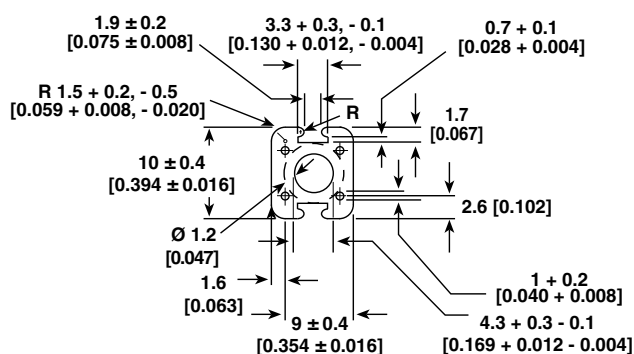
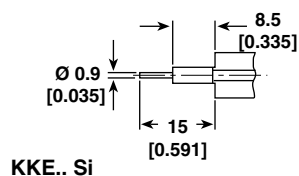
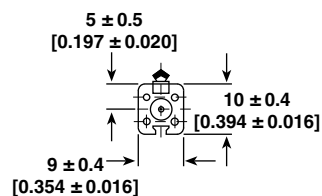
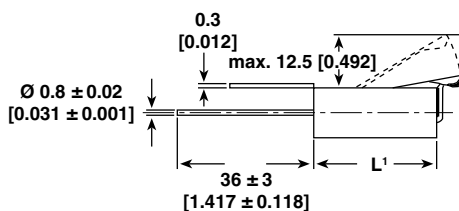
**DIMENSIONS** in millimeters [inches]


| MODEL | a           | b            | L            | MASS (g) |
|-------|-------------|--------------|--------------|----------|
| KKA4  | 6.4 [0.256] | 6.4 [0.256]  | 20 [0.787]   | 1.8      |
| KKA5  | 6.4 [0.256] | 6.4 [0.256]  | 25 [0.984]   | 2.6      |
| KKA7  | 6.4 [0.256] | 6.4 [0.256]  | 38 [1.496]   | 3.2      |
| KKA9  | 9 [0.354]   | 9 [0.354]    | 38 [1.496]   | 7        |
| KKA11 | 9 [0.354]   | 9 [0.354]    | 50 [1.969]   | 9        |
| KKA17 | 9 [0.354]   | 9 [0.354]    | 75 [2.953]   | 13       |
| KKE4  | 7 [0.276]   | 7.8 [0.307]  | 19.5 [0.768] | 2        |
| KKE7  | 9 [0.354]   | 10.5 [0.413] | 25 [0.984]   | 4        |
| KKE9  | 9 [0.354]   | 10.5 [0.413] | 38 [1.496]   | 7.5      |
| KKE11 | 9 [0.354]   | 10.5 [0.413] | 50 [1.969]   | 9.5      |
| KKE17 | 9 [0.354]   | 10.5 [0.413] | 75 [2.953]   | 13.5     |

**Note**

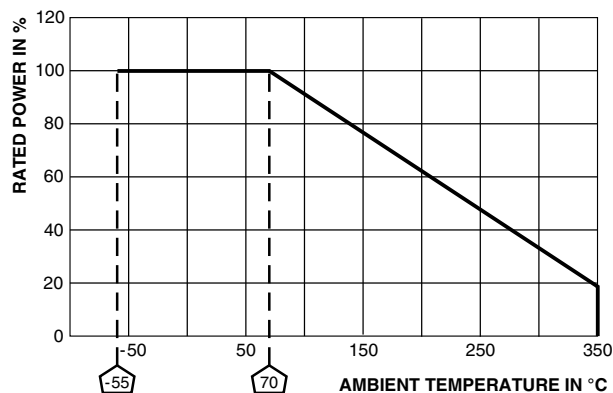
(1) In this section confined solderability 6 mm [0.157]

**DIMENSIONS** in millimeters [inches] (continued)

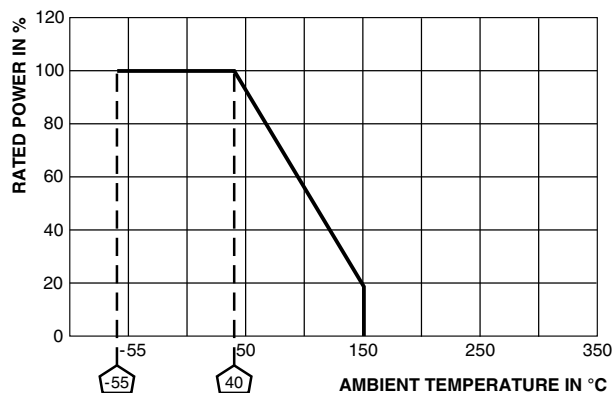


### Profile dimensions

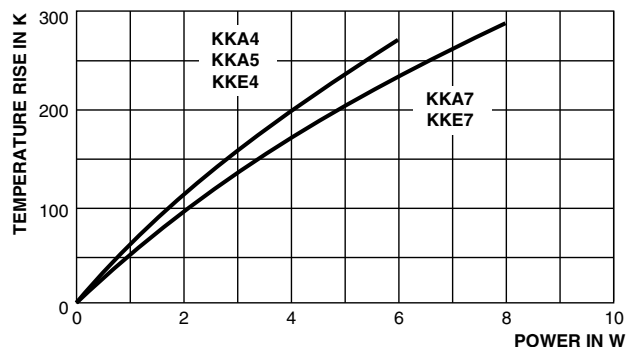
| MODEL    | a         | b            | L          | MASS (g) |
|----------|-----------|--------------|------------|----------|
| KKE7 Si  | 9 [0.354] | 10.5 [0.413] | 25 [0.984] | 5.5      |
| KKE9 Si  | 9 [0.354] | 10.5 [0.413] | 38 [1.496] | 8        |
| KKE11 Si | 9 [0.354] | 10.5 [0.413] | 50 [1.969] | 9.8      |



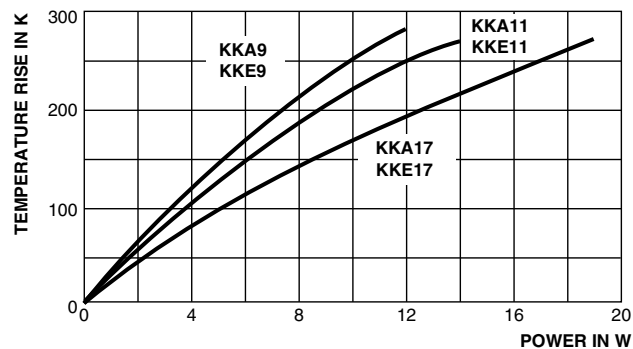
Derating KKA, KKE



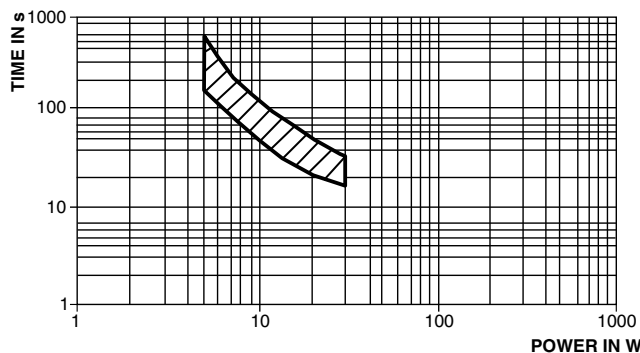
Derating KKE.. Si



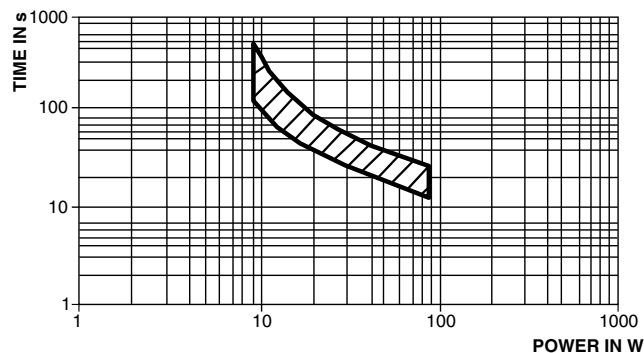
Temperature Rise



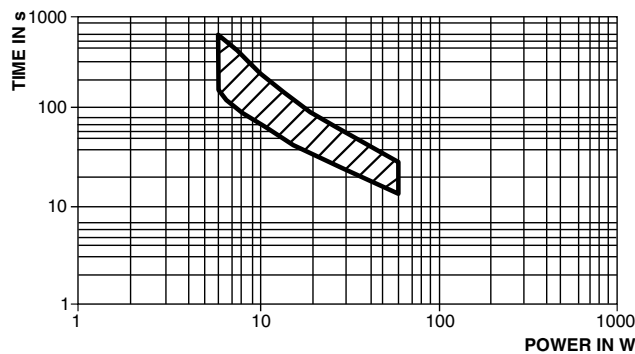
Temperature Rise



Fusing Characteristics KKE7 Si



Fusing Characteristics KKE11 Si



Fusing Characteristics KKE9 Si



| PERFORMANCE  |                                    |
|--|------------------------------------|
| TEST   | TEST RESULTS                       |
| Load Life<br>$P_{70}$ , 70 °C, 1000 h                          | $\leq \pm 3.0 \% \Delta R$ average |
| Climatic Sequence<br>IEC 60115-1 4.23                          | $\leq \pm 2.0 \% \Delta R$         |
| Damp Heat, Steady State<br>(40 ± 2) °C, 56 days, (93 ± 3) % RH | $\leq \pm 2.0 \% \Delta R$         |
| Resistance to Solder Heat<br>(260 ± 5) °C, (10 ± 1) s          | $\leq \pm 0.2 \% \Delta R$ typical |



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