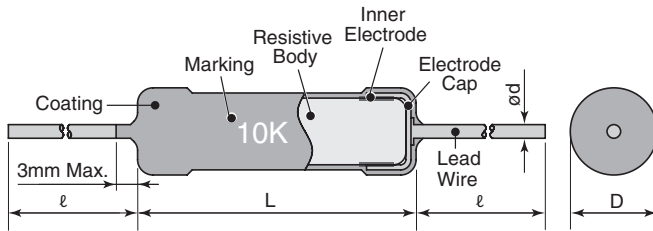


features

- KOA original bulk ceramic resistors
- Excellent in anti-pulse characteristics
- Higher reliability against disconnection compared to wirewound resistors and film resistors
- Products with lead-free terminations meet EU RoHS requirements. RoHS regulation is not intended for Pb-glass contained in the electrode.
- Non-inductive resistors
- AEC-Q200 Qualified

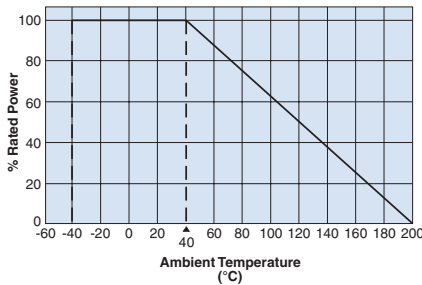
dimensions and construction



| Type | Dimensions inches (mm) | | | |
|--------|--------------------------|------------------------|---------------|-------------------------|
| | L | D | d (nom.) | I* |
| HPC1/2 | .433±.039 (11.0±2.0) | .138±.039 (3.5±1.0) | .031 (0.8) | 1.50±.118 (38.0±3.0) |
| HPC1 | 0.630±.039 (16.0±2.0) | .177±.039 (4.5±1.0) | | |
| HPC2 | .827±.039 (21.0±2.0) | .197±.039 (5.0±1.0) | | |
| HPC3 | 1.02±.039 (26.0±2.0) | .236±.039 (6.0±1.0) | .039 (1.0) | |
| HPC4 | 1.50±.039 (38.0±2.0) | .276±.039 (7.0±1.0) | | |
| HPC5 | 1.73±.039 (44.0±2.0) | .295±.039 (7.5±1.0) | | |

* Lead length changes depending on taping type

Derating Curve



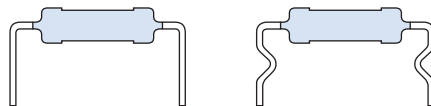
For resistors operated at an ambient temperature of 40°C or above, a power rating shall be derated in accordance with the derating curve.

ordering information

| | | | | | | |
|------------|--|----------------------|---------------------|--------------------|--------------------------------------|--------------------|
| HPC | 1/2 | C | T631 | R | 103 | K |
| Type | Power Rating | Termination Material | Taping | Packaging | Nominal Resistance | Tolerance |
| HPC | 1/2: 0.5W 1: 1W 2: 2W 3: 3W 4: 4W 5: 5W | C: SnCu | 1/2: T52 1: T631 | A: Ammo R: Reel | 2 significant figures + 1 multiplier | K: ±10% M: ±20% |

taping

| Type | Axial Taping | |
|--------|--------------|------|
| | T52 | T631 |
| HPC1/2 | ○ | — |
| HPC1 | — | ○ |



Contact us for lead forming details.

For further information on packaging, please refer to Appendix C.

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

10/29/18

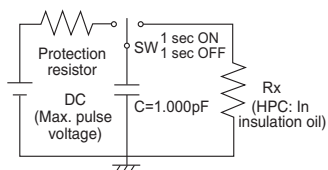
applications and ratings

| Part Designation | Power Rating @ 40°C | Resistance Range (Ω) | | T.C.R. (x10 ⁻⁶ /K) | Maximum Working Voltage | Maximum Overload Voltage | Rated Ambient Temp. | Operating Temp. Range |
|------------------|---------------------|----------------------|-------------|-------------------------------|-------------------------|--------------------------|---------------------|-----------------------|
| | | K: ±10% E-12 | M: ±20% E-6 | | | | | |
| HPC1/2 | 0.5W | 10 - 390K | 3.3 - 330K | -500 ~ -1300: 3.3Ω≤R<10Ω | 200V | 400V | +40°C | -40°C to +200°C |
| HPC1 | 1.0W | | | -600 ~ -1500: 10Ω≤R<100Ω | 300V | 600V | | |
| HPC2 | 2.0W | | | -700 ~ -1800: 100Ω≤R<1kΩ | 400V | 800V | | |
| HPC3 | 3.0W | | | -900 ~ -1900: 1kΩ≤R<100kΩ | 450V | 900V | | |
| HPC4 | 4.0W | | | -900 ~ -2000: 100kΩ≤R<200kΩ | 500V | 1000V | | |
| HPC5 | 5.0W | | | -900 ~ -2200: 200kΩ≤R<390kΩ | 550V | 1100V | | |

Rated voltage = $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$ or Max. working voltage, whichever is lower

environmental applications

Performance Characteristics

| Parameter | Requirement $\Delta R \pm(\% + 0.05\Omega)$ | | Test Method | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--|---|------|--------------|--|--------|-----------------|---|------------------|----|------------------|---|------|------------------|---|-------------------|----|------------------|---|------|------------------|---|-------------------|----|-------------------|---|----------------------|------|---|
| | Limit | Typical | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance | Within regulated to tolerance | — | Resistance 3.3Ω≤R<10Ω 10Ω≤R<100Ω 100Ω≤R<390kΩ | Measurement voltage 0.3V 1.0V 3.0V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T.C.R | -500~-1300:3.3Ω≤R<10Ω -600~-1500:10Ω≤R<100Ω -700~-1800:100Ω≤R<1kΩ -900~-1900:1kΩ≤R<100kΩ -900~-2000:100kΩ≤R<200kΩ -900~-2200:200kΩ≤R<390kΩ | — | +25°C/-40°C and +25°C/+125°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Voltage Coefficient (Apply for over 1kΩ) | 0~-0.2%/V (HPC1/2) 0~-0.1%/V (HPC1) 0~-0.05%/V (HPC2,3,4,5) | — | Rated voltage and rated voltage x 10% | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Overload | 2% | 0.4% | Rated voltage x 2.5 or maximum overload voltage for 5s, whichever less | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to pulse | Refer to the table on the right | — | <p>The resistor mounted to the test circuit as below is applied with high voltage impulse 10,000 cycles.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Test Voltage</th> <th>Performance Requirements $\Delta R \pm(\% + 0.05\Omega)$</th> </tr> </thead> <tbody> <tr> <td rowspan="3">HPC1/2</td> <td>8kV:3.3Ω≤R<30kΩ</td> <td>5</td> </tr> <tr> <td>8kV:30kΩ≤R<390kΩ</td> <td>10</td> </tr> <tr> <td>5kV:30kΩ≤R<390kΩ</td> <td>5</td> </tr> <tr> <td rowspan="3">HPC1</td> <td>15kV:3.3Ω≤R<30kΩ</td> <td>5</td> </tr> <tr> <td>15kV:30kΩ≤R<390kΩ</td> <td>10</td> </tr> <tr> <td>7kV:30kΩ≤R<390kΩ</td> <td>5</td> </tr> <tr> <td rowspan="3">HPC2</td> <td>25kV:3.3Ω≤R<30kΩ</td> <td>5</td> </tr> <tr> <td>25kV:30kΩ≤R<390kΩ</td> <td>10</td> </tr> <tr> <td>15kV:30kΩ≤R<390kΩ</td> <td>5</td> </tr> <tr> <td>HPC3 HPC4 HPC5</td> <td>25kV</td> <td>5</td> </tr> </tbody> </table>  | | Type | Test Voltage | Performance Requirements $\Delta R \pm(\% + 0.05\Omega)$ | HPC1/2 | 8kV:3.3Ω≤R<30kΩ | 5 | 8kV:30kΩ≤R<390kΩ | 10 | 5kV:30kΩ≤R<390kΩ | 5 | HPC1 | 15kV:3.3Ω≤R<30kΩ | 5 | 15kV:30kΩ≤R<390kΩ | 10 | 7kV:30kΩ≤R<390kΩ | 5 | HPC2 | 25kV:3.3Ω≤R<30kΩ | 5 | 25kV:30kΩ≤R<390kΩ | 10 | 15kV:30kΩ≤R<390kΩ | 5 | HPC3 HPC4 HPC5 | 25kV | 5 |
| Type | Test Voltage | Performance Requirements $\Delta R \pm(\% + 0.05\Omega)$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HPC1/2 | 8kV:3.3Ω≤R<30kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 8kV:30kΩ≤R<390kΩ | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5kV:30kΩ≤R<390kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HPC1 | 15kV:3.3Ω≤R<30kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15kV:30kΩ≤R<390kΩ | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 7kV:30kΩ≤R<390kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HPC2 | 25kV:3.3Ω≤R<30kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25kV:30kΩ≤R<390kΩ | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 15kV:30kΩ≤R<390kΩ | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HPC3 HPC4 HPC5 | 25kV | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to soldering heat | 2% | 0.8% | 350°C±10°C, 3.5s±0.5s | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rapid change of temperature | 2% | 0.4% | -40°C(30min.)/+85°C(30min.), 5 cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture resistance | 5% | 0.6% | 40°C±2°C, 90%~95%RH, 1000 hours, 1.5h ON/0, 5h OFF cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Load life | 5% | 0.4% | 40°C±2°C, 1000h, 1.5h ON/0, 5h OFF cycles | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Resistance to Solvent | No abnormality in appearance. Marking shall be easily legible. | — | Dipping in IPA or Xylene for 3 minutes and leaving for 10 minutes after removing drops, then brushing 10 times. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| High Temperature Exposure | 5% | 1.7% | +200°C, 1000 hours | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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