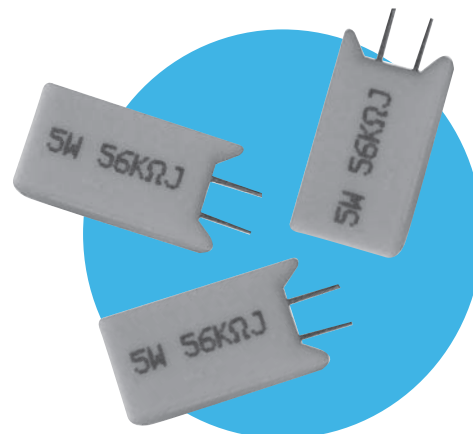


# Radial Ceramic Case Resistors

## Wirewound / Metal Oxide

### SQM / CVF / CVW Series

- 2 to 10 watts
- Resistance 0R1 to 200K
- High overload capability
- Flameproof case
- Small PCB footprint
- RoHS compliant



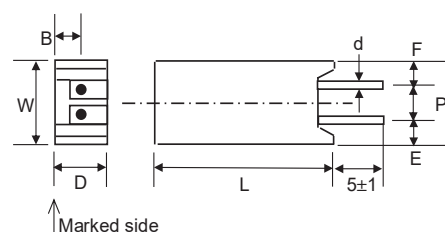
All parts are Pb-free and comply with EU Directive 2011/65/EU amended by (EU) 2015/863 (RoHS3)

## Electrical Data

|                                    |                    | SQM2 / CV-2              | SQM3 / CV-3 | SQM5 / CV-5 | SQM7 / CV-7 | SQM10 / CV-10 | SQM10A     |
|------------------------------------|--------------------|--------------------------|-------------|-------------|-------------|---------------|------------|
| Power rating at 70°C               | watts              | 2                        | 3           | 5           | 7           | 10            | 10         |
| Resistance range – wirewound (CVW) | ohms               | 0R1 - 27R                | 0R1 - 39R   | 0R1 - 47R   | 0R1 - 680R  | 0R1 - 910R    | 0R1 - 560R |
| Resistance range – oxide (CVF)     | ohms               | 30R - 33K                | 43R - 56K   | 51R - 100K  | 750R - 200K | 1K0 - 200K    |            |
| Limiting element voltage           | volts dc or ac rms | 150                      | 300         | 350         | 500         | 750           | 750        |
| Thermal impedance                  | °C/watt            | 50                       | 45          | 30          | 28          | 23            | 23         |
| Isolation voltage                  | volts              | 1000                     |             |             |             |               |            |
| TCR                                | ppm/°C             | <20R: ± 400, ≥20R: ± 350 |             |             |             |               |            |
| Resistance Tolerance               | %                  | ± 5 ± 10                 |             |             |             |               |            |
| Standard Values                    |                    | E24                      |             |             |             |               |            |
| Ambient temperature range          | °C                 | -55 to +155°C            |             |             |             |               |            |

## Physical Data (all dimensions in mm, weights in g)

| Type          | L<br>± 1.0 | W<br>± 1.0 | D<br>± 1.0 | B<br>± 1.0 | E<br>± 1.0 | F<br>± 1.0 | P<br>± 1.0 | d<br>± 0.05 | Weight<br>Nom. |
|---------------|------------|------------|------------|------------|------------|------------|------------|-------------|----------------|
| SQM2 / CV-2   | 20         | 11.5       | 7.5        | 4.5        | 3.0        | 3.0        | 5          | 0.7         | 4.3            |
| SQM3 / CV-3   | 25         | 12.5       | 8.5        | 4.5        | 4.0        | 4.0        | 5          | 0.7         | 5.6            |
| SQM5 / CV-5   | 25         | 12.5       | 9          | 5.0        | 3.5        | 3.5        | 5          | 0.8         | 6.3            |
| SQM7 / CV-7   | 38         | 12.5       | 9          | 5.0        | 2.75       | 5.0        | 5          | 0.8         | 10.7           |
| SQM10 / CV-10 | 50         | 12.5       | 9          | 4.25       | 2.75       | 5.0        | 5          | 0.8         | 13.4           |
| SQM10A        | 35         | 16.0       | 12         | 6.0        | 4.25       | 4.25       | 7.5        | 0.8         | 13.8           |



## Construction

A high purity ceramic rod, with force fit end caps onto which is wound a wire element: or a desposited metal oxide film (depending on value). The element is fitted into a ceramic case with fireproof insulation cement.

### General Note

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**Termination Details:**

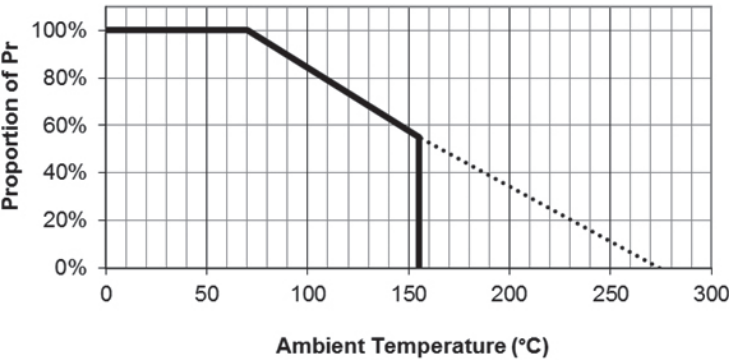
|                      |                                                                                                |
|----------------------|------------------------------------------------------------------------------------------------|
| <b>Material</b>      | The 100% Sn finish copper lead wires are internally welded to the resistance element end caps. |
| <b>Solderability</b> | The terminations meet the requirements of IEC 115-1 Clause 4.17.3.2                            |
| <b>Strength</b>      | The terminations meet the requirements of IEC 86.2.21                                          |

**Marking:** Type reference, resistance value and tolerance are legend marked onto the upper surface.  
**Flammability:** The resistor will not burn under any condition of applied temperature or overload.  
**Solvent resistance:** The body protection and marking are resistant to all normal industrial solvents suitable for printed circuits.

**Performance Data**

|                                                               |            | Maximum                                                                     |
|---------------------------------------------------------------|------------|-----------------------------------------------------------------------------|
| Load at rated power (1000hrs at 70°C)                         | $\Delta R$ | <100K: 5% $\geq$ 100K: 10%                                                  |
| Derating from rated power at 70°C                             |            | See Graph                                                                   |
| short term overload (lesser of 6.25 x Pr or 2.5 x LEV for 5s) | $\Delta R$ | 5% +0.05 $\Omega$                                                           |
| Damp heat steady state (56 days, 40°C, $\geq$ 90% RH)         | $\Delta R$ | 5% +0.05 $\Omega$                                                           |
| Temperature rapid change (5 cycles -55°C to +155°C)           | $\Delta R$ | 2% +0.05 $\Omega$                                                           |
| Resistance to solder heat                                     | $\Delta R$ | 1% +0.05 $\Omega$                                                           |
| Voltage Proof (1kV for 60s)                                   |            | No evidence of flashover, mechanical damage, arcing or insulation breakdown |
| Solderability                                                 |            | Min. 95% coverage                                                           |

**Temperature Derating**



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## Ordering Procedure

This product has two valid part numbers:

**European (Welwyn) Part Number: SQM3-1K2JB3** (SQM3, 1.2 kilohms  $\pm 5\%$ , Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
| S | Q | M | 3 | - | 1 | K | 2 | J | B | 3 |
| 1 |   | 2 |   | 3 | 4 |   |   |   |   |   |

| 1<br>Type                                     | 2<br>Value                                      | 3<br>Tolerance | 4<br>Packing & Termination Finish |             |          |
|-----------------------------------------------|-------------------------------------------------|----------------|-----------------------------------|-------------|----------|
| SQM2, SQM3,<br>SQM5, SQM7<br>SQM10,<br>SQM10A | E24 = 3/4 characters<br>R = ohms<br>K = kilohms | J = $\pm 5\%$  | Pb-free only                      |             |          |
|                                               |                                                 | K = $\pm 10\%$ | B3                                | SQM2, SQM3  | 3000/box |
|                                               |                                                 |                | B2                                | SQM5        | 2000/box |
|                                               |                                                 |                | B1                                | SQM7, SQM10 | 1000/box |
|                                               |                                                 |                | B09                               | SQM10A      | 900/box  |

**USA (IRC) Part Number: CVF31201JLF** (CVF3, 1.2 kilohms  $\pm 5\%$ , Pb-free)

|   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|
| C | V | F | 3 | 1 | 2 | 0 | 1 | J | L | F |
| 1 | 2 | 3 |   | 4 | 5 |   |   |   |   |   |

| 1        | 2    | 3                     | 4         | 5                  |         |          |
|----------|------|-----------------------|-----------|--------------------|---------|----------|
| Type     | Size | Value                 | Tolerance | Termination Finish | Packing |          |
| CVF, CVW | 2    | 3 digits + multiplier | J = ±5%   | LF = Pb-free       | 2, 3    | 3000/box |
|          | 3    | R = ohms for values   | K = ±10%  |                    | 5       | 2000/box |
|          | 5    | <100 ohms             |           |                    | 7, 10   | 1000/box |
|          | 7    |                       |           |                    |         |          |
|          | 10   |                       |           |                    |         |          |

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