


# MATERIAL DECLARATION SHEET



|                 |   |     |     |   |
|-----------------|---|-----|-----|---|
| Material Number | CHV 0603-A  |     |     |  |
| Product Line    | Safety Certified Thick-Film Type High-Voltage Automotive Chip Resistors |     |     |   |
| Compliance Date | 04/22/2019  |     |     |   |
| RoHS Compliant  | Yes (Lead Exemption)  | MSL | N/A |   |

| No. | Construction Element(subpart) | Homogeneous Material | Material weight [mg] | Homogeneous Material\ Substances | CASRN if applicable | Materials Mass % | Material Mass % of total unit wt. | Subpart mass of total wt. (%) |
|-----|-------------------------------|----------------------|----------------------|----------------------------------|---------------------|------------------|-----------------------------------|-------------------------------|
| 1   | Ceramic                       | Substrate            | 1.811                | Aluminum oxide                   | 1344-28-1           | 96               | 77.313                            | 80.535                        |
|     |                               |                      |                      | Silicon dioxide                  | 14808-60-7          | 4                | 3.222                             |                               |
|     |                               |                      |                      | Magnesium oxide                  | 1309-48-4           |                  |                                   |                               |
| 2   | Top conductor                 | Silver               | 0.0464               | Sliver                           | 7440-22-4           | 100              | 2.063                             | 2.063                         |
| 3   | Bottom conductor              | Silver               | 0.0201               | Silver                           | 7440-22-4           | 100              | 0.894                             | 0.894                         |
| 4   | Resistor                      | Ruthenium Oxide      | 0.0264               | Glass                            | 65997-18-4          | 55.7             | 0.653                             | 1.174                         |
|     |                               |                      |                      | Lead-containing glass            | 7439-92-1           | 19.3             | 0.227                             |                               |
|     |                               |                      |                      | Ruthenium oxide                  | 12036-10-1          | 25               | 0.294                             |                               |

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|              |                     |        |        |                    |            |     |       |       |
|--------------|---------------------|--------|--------|--------------------|------------|-----|-------|-------|
| 5            | First encapsulating | Glass  | 0.0252 | Silica             | 14808-60-7 | 74  | 0.83  | 1.121 |
|              |                     |        |        | Glass              | 65997-18-4 | 12  | 0.134 |       |
|              |                     |        |        | Aluminum oxide     | 1344-28-1  | 6   | 0.067 |       |
|              |                     |        |        | Chromium III oxide | 1308-38-9  | 8   | 0.09  |       |
| 6            | Overcoat            | Resin  | 0.0517 | Resin              | 25036-25-3 | 100 | 2.299 | 2.299 |
| 7            | Side conductor      | Silver | 0.1309 | Silver             | 7440-22-4  | 85  | 4.948 | 5.821 |
|              |                     |        |        | Resin              | 9003-36-5  | 15  | 0.873 |       |
| 8            | Plating (Middle)    | Nickel | 0.0525 | Nickel             | 7440-02-0  | 100 | 2.335 | 2.335 |
| 9            | Plating (Outer)     | Tin    | 0.0782 | Tin                | 7440-31-5  | 100 | 3.478 | 3.478 |
| 10           | Marking             | Resin  | 0.0063 | Resin              | 29690-82-2 | 70  | 0.196 | 0.280 |
|              |                     |        |        | Titanium oxide     | 1317-80-2  | 30  | 0.084 |       |
| Total weight |                     |        | 2.2487 |                    |            |     |       |       |

**This Document was updated on: 04/22/2019**

**Important remarks:**

1. It is the responsibility of the user to verify they are accessing the latest version.
2. RoHS exemption: 7( c )-1 Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound.