

# MATERIAL DECLARATION SHEET

|                 |                        |     |     |  |
|-----------------|------------------------|-----|-----|--|
| Material Number | FW 10W                 |     |     |  |
| Product Line    | Fusible Power Resistor |     |     |  |
| Compliance Date | 2012.02.07             |     |     |  |
| RoHS Compliant  | Yes                    | 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                   | FW 10W                        | Substrate (Ceramic)            | 187.27               | Aluminum oxide                   | 1344-28-1           | 69.21            | 129.61                            | 22.09                         |
|                     |                               |                                |                      | Silicon dioxide                  | 14808-60-7          | 23.89            | 44.73                             | 7.62                          |
|                     |                               |                                |                      | Magnesium oxide                  | 1309-48-4           | 1.23             | 2.30                              | 0.39                          |
|                     |                               |                                |                      | Barium oxide                     | 1304-28-5           | 2.92             | 5.47                              | 0.93                          |
|                     |                               |                                |                      | Calcium oxide                    | 1305-78-8           | 2.37             | 4.44                              | 0.76                          |
|                     |                               |                                |                      | Potassium oxide                  | 12136-45-7          | 0.38             | 0.71                              | 0.12                          |
| 2                   |                               | Resistive layer (Ni-Cr Alloy ) | 4.72                 | Nickel                           | 7440-02-0           | 80.00            | 3.78                              | 0.64                          |
|                     |                               |                                |                      | Chromium                         | 7440-47-3           | 20.00            | 0.94                              | 0.16                          |
| 3                   |                               | End cap                        | 163.11               | Copper                           | 7440-50-8           | 92.70            | 151.20                            | 25.76                         |
|                     |                               |                                |                      | Tin                              | 7440-31-5           | 2.92             | 4.76                              | 0.81                          |
|                     |                               |                                |                      | Iron                             | 7439-89-6           | 4.38             | 7.14                              | 1.22                          |
| 4                   |                               | Lead wire                      | 82.87                | Copper                           | 7440-50-8           | 99.96            | 82.834                            | 14.11                         |
|                     | Tin                           |                                |                      | 7440-31-5                        | 0.04                | 0.033            | 0.01                              |                               |
| 5                   | Coating                       | 148.90                         | Epoxy Resin          | 25085-99-8                       | 100.00              | 148.90           | 25.37                             |                               |
| <b>Total weight</b> |                               |                                | <b>586.86</b>        |                                  |                     |                  |                                   |                               |


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# MATERIAL DECLARATION SHEET



|                 |                               |     |            |   |
|-----------------|-------------------------------|-----|------------|---|
| Material Number | <b>FW 20W</b>                 |     |            |  |
| Product Line    | <b>Fusible Power Resistor</b> |     |            |   |
| Compliance Date | <b>2012.02.07</b>             |     |            |   |
| RoHS Compliant  | <b>Yes</b>                    | MSL | <b>N/A</b> |   |


| 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   | <b>FW 20W</b>                 | <b>Substrate (Ceramic)</b>            | 239.55               | Aluminum oxide                   | 1344-28-1           | 67.81            | 162.44                            | 23.83                         |
|     |                               |                                       |                      | Silicon dioxide                  | 14808-60-7          | 26.53            | 63.55                             | 9.32                          |
|     |                               |                                       |                      | Magnesium oxide                  | 1309-48-4           | 1.37             | 3.28                              | 0.48                          |
|     |                               |                                       |                      | Barium oxide                     | 1304-28-5           | 3.25             | 7.78                              | 1.14                          |
|     |                               |                                       |                      | Calcium oxide                    | 1305-78-8           | 0.62             | 1.50                              | 0.22                          |
|     |                               |                                       |                      | Potassium oxide                  | 12136-45-7          | 0.42             | 1.01                              | 0.15                          |
| 2   |                               | <b>Resistive layer (Ni-Cr Alloy )</b> | 4.72                 | Nickel                           | 7440-02-0           | 80.00            | 3.78                              | 0.55                          |
|     |                               |                                       |                      | Chromium                         | 7440-47-3           | 20.00            | 0.94                              | 0.14                          |
| 3   |                               | <b>End cap</b>                        | 163.11               | Copper                           | 7440-50-8           | 92.70            | 151.20                            | 22.18                         |
|     |                               |                                       |                      | Tin                              | 7440-31-5           | 2.92             | 4.76                              | 0.70                          |
|     |                               |                                       |                      | Iron                             | 7439-89-6           | 4.38             | 7.14                              | 1.05                          |
| 4   |                               | <b>Lead wire</b>                      | 80.00                | Copper                           | 7440-50-8           | 99.96            | 79.968                            | 11.73                         |
|     | Tin                           |                                       |                      | 7440-31-5                        | 0.04                | 0.033            | 0.005                             |                               |
| 5   | <b>Coating</b>                | 194.40                                | Epoxy Resin          | 25085-99-8                       | 100.00              | 194.40           | 28.51                             |                               |
|     |                               | <b>Total weight</b>                   | <b>681.78</b>        |                                  |                     |                  |                                   |                               |

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# MATERIAL DECLARATION SHEET

|                 |                               |     |            |   |
|-----------------|-------------------------------|-----|------------|---|
| Material Number | <b>FW 30W</b>                 |     |            |  |
| Product Line    | <b>Fusible Power Resistor</b> |     |            |   |
| Compliance Date | <b>2012.02.07</b>             |     |            |   |
| RoHS Compliant  | <b>Yes</b>                    | MSL | <b>N/A</b> |   |

| 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   | <b>FW 30W</b>                 | <b>Substrate (Ceramic)</b>            | 530.90               | Aluminum oxide                   | 1344-28-1           | 69.21            | 367.44                            | 29.22                         |
|     |                               |                                       |                      | Silicon dioxide                  | 14808-60-7          | 23.89            | 126.83                            | 10.09                         |
|     |                               |                                       |                      | Magnesium oxide                  | 1309-48-4           | 1.23             | 6.53                              | 0.52                          |
|     |                               |                                       |                      | Barium oxide                     | 1304-28-5           | 2.92             | 15.50                             | 1.23                          |
|     |                               |                                       |                      | Calcium oxide                    | 1305-78-8           | 2.37             | 12.58                             | 1                             |
|     |                               |                                       |                      | Potassium oxide                  | 12136-45-7          | 0.38             | 2.02                              | 0.16                          |
| 2   |                               | <b>Resistive layer (Ni-Cr Alloy )</b> | 48.70                | Nickel                           | 7440-02-0           | 80.00            | 38.96                             | 3.10                          |
|     |                               |                                       |                      | Chromium                         | 7440-47-3           | 20.00            | 9.74                              | 0.77                          |
| 3   |                               | <b>End cap</b>                        | 157.00               | Copper                           | 7440-50-8           | 92.70            | 145.54                            | 11.57                         |
|     |                               |                                       |                      | Tin                              | 7440-31-5           | 2.92             | 4.58                              | 0.36                          |
|     |                               |                                       |                      | Iron                             | 7439-89-6           | 4.38             | 6.88                              | 0.55                          |
| 4   |                               | <b>Lead wire</b>                      | 200.00               | Copper                           | 7440-50-8           | 99.96            | 199.92                            | 15.90                         |
|     | Tin                           |                                       |                      | 7440-31-5                        | 0.04                | 0.13             | 0.01                              |                               |
| 5   | <b>Coating</b>                | 321.00                                | Epoxy Resin          | 25085-99-8                       | 100.00              | 321.00           | 25.52                             |                               |
|     |                               | <b>Total weight</b>                   | 1257.60              |                                  |                     |                  |                                   |                               |

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# MATERIAL DECLARATION SHEET

|                 |                               |     |            |  |
|-----------------|-------------------------------|-----|------------|--|
| Material Number | <b>FW 50W</b>                 |     |            |  |
| Product Line    | <b>Fusible Power Resistor</b> |     |            |  |
| Compliance Date | <b>2012.02.07</b>             |     |            |  |
| RoHS Compliant  | <b>Yes</b>                    | MSL | <b>N/A</b> |  |

| 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   | <b>FW 50W</b>                 | <b>Substrate (Ceramic)</b>            | 982.50               | Aluminum oxide                   | 1344-28-1           | 69.21            | 679.99                            | 37.42                         |
|     |                               |                                       |                      | Silicon dioxide                  | 14808-60-7          | 23.89            | 234.72                            | 12.92                         |
|     |                               |                                       |                      | Magnesium oxide                  | 1309-48-4           | 1.23             | 12.08                             | 0.67                          |
|     |                               |                                       |                      | Barium oxide                     | 1304-28-5           | 2.92             | 28.69                             | 1.58                          |
|     |                               |                                       |                      | Calcium oxide                    | 1305-78-8           | 2.37             | 23.29                             | 1.28                          |
|     |                               |                                       |                      | Potassium oxide                  | 12136-45-7          | 0.38             | 3.73                              | 0.21                          |
| 2   |                               | <b>Resistive layer (Ni-Cr Alloy )</b> | 57.20                | Nickel                           | 7440-02-0           | 80.00            | 45.76                             | 2.52                          |
|     |                               |                                       |                      | Chromium                         | 7440-47-3           | 20.00            | 11.44                             | 0.63                          |
| 3   |                               | <b>End cap</b>                        | 243.40               | Copper                           | 7440-50-8           | 92.70            | 225.63                            | 12.42                         |
|     |                               |                                       |                      | Tin                              | 7440-31-5           | 2.92             | 7.11                              | 0.39                          |
|     |                               |                                       |                      | Iron                             | 7439-89-6           | 4.38             | 10.66                             | 0.59                          |
| 4   |                               | <b>Lead wire</b>                      | 200.00               | Copper                           | 7440-50-8           | 99.96            | 199.92                            | 11.00                         |
|     | Tin                           |                                       |                      | 7440-31-5                        | 0.04                | 0.13             | 0.01                              |                               |
| 5   | <b>Coating</b>                | 334.00                                | Epoxy Resin          | 25085-99-8                       | 100.00              | 334.00           | 18.38                             |                               |
|     |                               | <b>Total weight</b>                   | 1817.10              |                                  |                     |                  |                                   |                               |

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# MATERIAL DECLARATION SHEET

|                 |                        |     |     |  |
|-----------------|------------------------|-----|-----|--|
| Material Number | FW 70W                 |     |     |  |
| Product Line    | Fusible Power Resistor |     |     |  |
| Compliance Date | 2012.02.07             |     |     |  |
| RoHS Compliant  | Yes                    | 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   | FW 70W                        | Substrate (Ceramic)            | 2791.20              | Aluminum oxide                   | 1344-28-1           | 69.21            | 1931.79                           | 46.80                         |
|     |                               |                                |                      | Silicon dioxide                  | 14808-60-7          | 23.89            | 666.82                            | 16.15                         |
|     |                               |                                |                      | Magnesium oxide                  | 1309-48-4           | 1.23             | 34.33                             | 0.83                          |
|     |                               |                                |                      | Barium oxide                     | 1304-28-5           | 2.92             | 81.50                             | 1.97                          |
|     |                               |                                |                      | Calcium oxide                    | 1305-78-8           | 2.37             | 66.15                             | 1.60                          |
|     |                               |                                |                      | Potassium oxide                  | 12136-45-7          | 0.38             | 10.61                             | 0.26                          |
| 2   |                               | Resistive layer (Ni-Cr Alloy ) | 133.40               | Nickel                           | 7440-02-0           | 80.00            | 106.72                            | 2.59                          |
|     |                               |                                |                      | Chromium                         | 7440-47-3           | 20.00            | 26.68                             | 0.65                          |
| 3   |                               | End cap                        | 443.20               | Copper                           | 7440-50-8           | 92.70            | 410.85                            | 9.95                          |
|     |                               |                                |                      | Tin                              | 7440-31-5           | 2.92             | 12.94                             | 0.31                          |
|     |                               |                                |                      | Iron                             | 7439-89-6           | 4.38             | 19.41                             | 0.47                          |
| 4   |                               | Lead wire                      | 280.00               | Copper                           | 7440-50-8           | 99.96            | 279.89                            | 6.78                          |
|     | Tin                           |                                |                      | 7440-31-5                        | 0.04                | 0.19             | 0.005                             |                               |
| 5   | Coating                       | 480.00                         | Epoxy Resin          | 25085-99-8                       | 100.00              | 480.00           | 11.63                             |                               |
|     |                               | <b>Total weight</b>            | 4127.80              |                                  |                     |                  |                                   |                               |

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