



# ALLIANCE MEMORY MDS REPORT

| Part Number:     |              |                | AS4C512M16D4C-62BCN     |                   |                                                                                                    |              |                |                      |                       |        |
|------------------|--------------|----------------|-------------------------|-------------------|----------------------------------------------------------------------------------------------------|--------------|----------------|----------------------|-----------------------|--------|
| Part Weight(mg): |              |                | 194.884                 |                   |                                                                                                    |              |                |                      |                       |        |
| No.              | Part Name    | Material Name  | Material Part no.       | Component wt (mg) | Substance in Materials                                                                             | CAS Number   | Element wt (%) | wt% of Total unit wt | Substance Weight (mg) | PPM    |
| 1                | Substrate    | Substrate_CCL  | NPG-180INBK             | 29.2500           | E-Glass Fabric                                                                                     | 65997-17-3   | 20.601%        | 6.004%               | 11.7000               | 60036  |
|                  |              |                |                         |                   | Epoxy Resin                                                                                        | 29690-82-2   | 14.164%        | 4.127%               | 8.0438                | 41275  |
|                  |              |                |                         |                   | Fillers                                                                                            | 60676-86-0   | 14.164%        | 4.127%               | 8.0438                | 41275  |
|                  |              |                |                         |                   | Phosphorous Flame Retardant                                                                        | 35948-25-5   | 2.575%         | 0.750%               | 1.4625                | 7504   |
|                  |              |                |                         |                   |                                                                                                    |              |                |                      |                       |        |
|                  |              | Copper Foil    | Copper foil             | 14.1170           | Copper                                                                                             | 7440-50-8    | 24.857%        | 7.244%               | 14.1170               | 72438  |
|                  |              |                |                         |                   | Barium Sulfate                                                                                     | 7727-43-7    | 0.975%         | 0.284%               | 0.5536                | 2840   |
|                  |              |                |                         |                   | 3-Methoxy-3-methylbutylacetate                                                                     | Trade Secret | 0.672%         | 0.196%               | 0.3818                | 1959   |
|                  |              |                |                         |                   | Dipropylene Glycol Monomethyl Ether                                                                | 34590-94-8   | 0.336%         | 0.098%               | 0.1909                | 979    |
|                  |              |                |                         |                   | Talc containing no asbestiform fibers                                                              | 14807-96-6   | 0.084%         | 0.024%               | 0.0477                | 245    |
|                  |              | Solder mask    | AUS308 (PSR-4000/CA-40) | 4.7720            | Morpholine derivative                                                                              | Trade Secret | 0.084%         | 0.024%               | 0.0477                | 245    |
|                  |              |                |                         |                   | Solvent naphtha(petroleum), Heavy arom                                                             | Trade Secret | 0.084%         | 0.024%               | 0.0477                | 245    |
|                  |              |                |                         |                   | 2,4,6-Triamino-1,3,5-Triazine                                                                      | Trade Secret | 0.084%         | 0.024%               | 0.0477                | 245    |
|                  |              |                |                         |                   | Silicon dioxide                                                                                    | Trade Secret | 0.008%         | 0.002%               | 0.0048                | 24     |
|                  |              |                |                         |                   | Diethylene Glycol Monoethyl Ether Acetate                                                          | Trade Secret | 0.008%         | 0.002%               | 0.0048                | 24     |
|                  |              |                |                         |                   | Naphthalene                                                                                        | 91-20-3      | 0.008%         | 0.002%               | 0.0048                | 24     |
|                  |              |                |                         |                   | Trimethylbenzene                                                                                   | Trade Secret | 0.008%         | 0.002%               | 0.0048                | 24     |
|                  |              |                |                         |                   | Epoxy Resin (MW≤700)                                                                               | Trade Secret | 2.521%         | 0.735%               | 1.4316                | 7346   |
|                  |              |                |                         |                   | Barium Sulfate                                                                                     | 7727-43-7    | 1.512%         | 0.441%               | 0.8590                | 4408   |
|                  |              |                |                         |                   | Dipropylene Glycol Monomethyl Ether                                                                | 34590-94-8   | 1.008%         | 0.294%               | 0.5726                | 2938   |
|                  |              |                |                         |                   | Dipentaerythritol hexaacrylate                                                                     | Trade Secret | 0.504%         | 0.147%               | 0.2863                | 1469   |
|                  |              |                |                         |                   | Dipentaerythritol pentaacrylate                                                                    | Trade Secret | 0.252%         | 0.073%               | 0.1432                | 735    |
|                  |              |                |                         |                   | 3-Methoxy-3-methylbutylacetate                                                                     | Trade Secret | 0.252%         | 0.073%               | 0.1432                | 735    |
|                  |              |                |                         |                   |                                                                                                    |              |                |                      |                       |        |
|                  |              | Nickel plating | Nickel Plate            | 7.0590            | Nickel                                                                                             | 7440-02-0    | 12.430%        | 3.622%               | 7.0590                | 36222  |
|                  |              | Gold Plating   | Gold Plate              | 1.4240            | Gold                                                                                               | 7440-57-5    | 2.507%         | 0.731%               | 1.4240                | 7307   |
|                  |              | Copper Plating | Copper Plate            | 0.1700            | Copper                                                                                             | 7440-50-8    | 0.299%         | 0.087%               | 0.1700                | 872    |
| 2                | Compound     | Resin          | CEL-9120HF              | 65.3140           | Epoxy resin                                                                                        | Trade Secret | 5.000%         | 1.676%               | 3.2657                | 16757  |
|                  |              |                |                         |                   | 2,2'-((2,2',5,5'-tetramethy-(1,1'-biphenyl)-4,4'-diyl)-bis(oxymethylene))-bis-oxirane              | Trade Secret | 5.000%         | 1.676%               | 3.2657                | 16757  |
|                  |              |                |                         |                   | Hardener                                                                                           | Trade Secret | 5.000%         | 1.676%               | 3.2657                | 16757  |
|                  |              |                |                         |                   | Carbon Black                                                                                       | 1333-86-4    | 0.200%         | 0.067%               | 0.1306                | 670    |
|                  |              |                |                         |                   | Amorphous Silica 1                                                                                 | 60676-86-0   | 80.800%        | 27.080%              | 52.7737               | 270796 |
|                  |              |                |                         |                   | Amorphous Silica 2                                                                                 | 7631-86-9    | 4.000%         | 1.341%               | 2.6126                | 13406  |
| 3                | Die Adhesive | Epoxy          | 6202C                   | 3.0400            | 2-(2-Ethoxyethoxy)ethyl acetate                                                                    | 112-15-2     | 36.500%        | 0.569%               | 1.1096                | 5694   |
|                  |              |                |                         |                   | Butadiene, acrylonitrile polymer, carboxy-terminated, polymer with bisphenol A and epichlorohydrin | 68610-41-3   | 28.000%        | 0.437%               | 0.8512                | 4368   |
|                  |              |                |                         |                   | Isodecyl alcohol, ethoxylated                                                                      | 61827-42-7   | 10.000%        | 0.156%               | 0.3040                | 1560   |
|                  |              |                |                         |                   | Silica Filler                                                                                      | 112926-00-8  | 25.000%        | 0.390%               | 0.7600                | 3900   |
|                  |              |                |                         |                   | Tert-butyl peroxyneodecanoate                                                                      | 26748-41-4   | 0.500%         | 0.008%               | 0.0152                | 78     |
| 4                | Solder Ball  | Metal          | M705GE                  | 33.8780           | Tin                                                                                                | 7440-31-5    | 96.492%        | 16.774%              | 32.6896               | 167739 |
|                  |              |                |                         |                   | Silver                                                                                             | 7440-22-4    | 3.000%         | 0.522%               | 1.0163                | 5215   |
|                  |              |                |                         |                   | Copper                                                                                             | 7440-50-8    | 0.500%         | 0.087%               | 0.1694                | 869    |
|                  |              |                |                         |                   | Germanium                                                                                          | 7440-56-4    | 0.008%         | 0.001%               | 0.0027                | 14     |
| 5                | Gold Wire    | Metal          | 4N                      | 0.2860            | Gold                                                                                               | 7440-57-5    | 99.996%        | 0.147%               | 0.2860                | 1467   |
|                  |              |                |                         |                   | Calcium                                                                                            | 7440-70-2    | 0.004%         | 0.000%               | 0.0000                | 0      |
| 6                | Chip         | Silicon        | 20nm                    | 35.5740           | Silicon                                                                                            | 7440-21-3    | 99.682%        | 18.196%              | 35.4609               | 181959 |
|                  |              |                |                         |                   | Aluminum                                                                                           | 7429-90-5    | 0.149%         | 0.027%               | 0.0530                | 272    |
|                  |              |                |                         |                   | Tungston                                                                                           | 7440-33-7    | 0.106%         | 0.019%               | 0.0377                | 193    |
|                  |              |                |                         |                   | Titanium                                                                                           | 7440-32-6    | 0.042%         | 0.008%               | 0.0149                | 77     |
|                  |              |                |                         |                   | Boron                                                                                              | 7440-42-8    | 0.006%         | 0.001%               | 0.0021                | 11     |
|                  |              |                |                         |                   | Arsenic                                                                                            | 7440-38-2    | 0.003%         | 0.001%               | 0.0011                | 5      |
|                  |              |                |                         |                   | Phosphorous                                                                                        | 7723-14-0    | 0.004%         | 0.001%               | 0.0014                | 7      |
|                  |              |                |                         |                   | Copper                                                                                             | 7440-50-8    | 0.005%         | 0.001%               | 0.0018                | 9      |
|                  |              |                |                         |                   | Fluorine                                                                                           | 7782-41-4    | 0.003%         | 0.001%               | 0.0011                | 5      |
|                  |              |                |                         |                   |                                                                                                    |              |                | 100.0000%            | 194.8840              |        |