



| Semiconductor Device Type: DGB 120 TFBGA 8x8x1.2mm SAC105 | | | Termination Base Alloy: Copper Alloy (Cu) | | | Package Homogeneous Materials: 8.1 Electronics (e.g. pc boards, displays) | | | J-STD-609A Product Marking and/or Pkg. Labeling e8 |
|---|--------------|--|--|----------------|------------------|--|------------------|-------------------|--|
| Basic Substance | CAS Number | Contained In Sub-Component | % Total Weight | mg/part | ppm | 105.55 (mg) Total | Mold Compound | % of Total Weight | 56.90 |
| Silica, vitreous | 60676-86-0 | Mold Compound | 50.783 | 94.203 | 507,833 | | Silica, vitreous | 60676-86-0 | 89.25 |
| Epoxy Resin | Trade Secret | Mold Compound | 3.283 | 6.090 | 32,831 | | Epoxy Resin | Trade Secret | 5.77 |
| Phenolic Resin | Trade Secret | Mold Compound | 2.686 | 4.982 | 26,857 | | Phenolic Resin | Trade Secret | 4.72 |
| Carbon Black | 1333-86-4 | Mold Compound | 0.148 | 0.274 | 1,479 | | Carbon Black | 1333-86-4 | 0.26 |
| Copper | 7440-50-8 | Lead Frame | 0.950 | 1.763 | 9,504 | | | | |
| Phthalocyanine Blue, Organic Pigment | 65997-17-3 | Lead Frame | 0.006 | 0.012 | 65 | | | | |
| Formaldehyde, polymer with 2-(chloromethyl)oxirane and phenol | 9003-36-5 | Lead Frame | 0.486 | 0.902 | 4,860 | | | | |
| Silica | 7631-86-9 | Lead Frame | 0.242 | 0.449 | 2,419 | | | | |
| Nickel | 7440-02-0 | Lead Frame | 0.242 | 0.449 | 2,419 | | | | |
| Aromatic Carbonyl Compound | 7727-43-7 | Lead Frame | 0.093 | 0.172 | 929 | | | | |
| Amine Compound | 14807-96-6 | Lead Frame | 0.015 | 0.028 | 151 | | | | |
| Levelling Agents & Others | 25068-38-6 | Lead Frame | 0.060 | 0.112 | 605 | | | | |
| Dipropylene Glycol Monomethyl Ether | 34590-94-8 | Lead Frame | 0.341 | 0.633 | 3,413 | | | | |
| 3-Methoxy-3-Methyl Butyl-Acetate | system | Lead Frame | 0.531 | 0.986 | 5,314 | | | | |
| High Boiling Point Petroleum Solvent | 9003-36-5 | Lead Frame | 0.091 | 0.168 | 907 | | | | |
| Acrylic Monomer | 7631-86-9 | Lead Frame | 0.147 | 0.272 | 1,469 | | | | |
| Epoxy Resin | 7440-02-0 | Lead Frame | 0.499 | 0.926 | 4,990 | | | | |
| Organic Filler | 7727-43-7 | Lead Frame | 0.050 | 0.092 | 497 | | | | |
| Continuous Filament Fiber Glass | 14807-96-6 | Lead Frame | 3.810 | 7.068 | 38,102 | | | | |
| Bismaleimide | 25068-38-6 | Lead Frame | 1.616 | 2.997 | 16,157 | | | | |
| Triazine | 34590-94-8 | Lead Frame | 1.616 | 2.997 | 16,157 | | | | |
| Epoxy Resin | system | Lead Frame | 3.002 | 5.569 | 30,024 | | | | |
| Inorganic filler | 24623-77-6 | Lead Frame | 1.501 | 2.785 | 15,012 | | | | |
| Copper | 7440-57-5 | Lead Frame | 6.134 | 11.379 | 61,344 | | | | |
| Nickel | 7440-02-0 | Lead Frame | 0.136 | 0.252 | 1,361 | | | | |
| Gold | 7440-57-5 | Lead Frame | 0.030 | 0.056 | 302 | | | | |
| Silver | 7440-22-4 | Die Attach | 0.350 | 0.649 | 3,500 | | | | |
| Silicon | 7440-21-3 | Die Attach | 0.120 | 0.223 | 1,200 | | | | |
| Epoxy Resin | Trade secret | Die Attach | 0.030 | 0.056 | 300 | | | | |
| Silicon | 7440-21-3 | Chip (Die) | 4.750 | 8.811 | 47,500 | | | | |
| Copper | 7440-50-8 | Wire Bond Copper palladium coated (CuPdAu) | 0.343 | 0.636 | 3,427 | | | | |
| Palladium | 7440-05-3 | Wire Bond Copper palladium coated (CuPdAu) | 0.007 | 0.013 | 70 | | | | |
| Gold | 7440-57-5 | Wire Bond Copper palladium coated (CuPdAu) | 0.000 | 0.001 | 4 | | | | |
| Tin | 7440-31-5 | Plating on external leads (pins) (SAC105) | 15.662 | 29.052 | 156,615 | | | | |
| Silver | 7440-22-4 | Plating on external leads (pins) (SAC105) | 0.159 | 0.295 | 1,590 | | | | |
| Copper | 7440-50-8 | Plating on external leads (pins) (SAC105) | 0.080 | 0.147 | 795 | | | | |
| TOTALS: | | | 100.000 | 185.500 | 1,000,000 | | | | |
| 0.1855 g Total Mass | | | | | | | | | |

This semiconductor device and its homogenous materials comply with EU Directives: 2002/95/EC (27 January 2003) & Directive 2011/65/EU (08 June 2011) and 2015/863/EU (31 March 2015) and 2000/53/EC and 2016/774/EU (End-of-Life Vehicles (ELV) without exemption (zero)

Compliance with the above EU Directives has been verified via internal design controls, supplier declarations, and /or analytical test data.

If a chemical substance is absent from the list above, the chemical substance is NOT an intentional ingredient in the semiconductor device and, to the best of Microchip Technology Incorporated's knowledge and belief as of the date of this document, there is no credible reason to believe that the unavoidable impurity concentration of the chemical substance, if any, is not below the threshold of regulatory concern for any regulatory scheme world-wide.

Molding compounds used by Microchip meet the UL94 V0 flammability standard for plastics. You can access the UL iQTM family of databases to obtain a test report at <http://iq.ul.com/plastics/>

The protective "tubes" in which the specific product is shipped are made from polyvinyl chloride (PVC) plastic. "Window envelopes" used to hold the packing slip on the outer box and certain "reels" may be made from PVC plastic.

Microchip Technology Incorporated believes the information in this form concerning substances restricted by RoHS in Microchip Technology Incorporated's semiconductor devices in their original packing materials is true and correct to the best of its knowledge and belief, as of the date listed in this form. Microchip Technology Incorporated cannot guarantee the completeness and accuracy of data in this form because it has been compiled based on the ranges provided in Material Safety Data Sheets provided by raw material suppliers. Supplier information is often protected from disclosure as trade secrets and some information may not have been provided by subcontract assemblers and raw material suppliers. Information is provided only as estimates of the average weight of these parts and the average weight of anticipated significant toxic metals components. These estimates do not include trace levels of dopants, metals, and non-metal materials contained within silicon devices (silicon IC) in the finished parts.

Microchip Technology Incorporated does not provide any warranty, express or implied, with respect to the information provided in this declaration. The exclusive, limited product warranties provided by Microchip Technology Incorporated and its subsidiaries are contained in Microchip's standard terms and conditions of sale. These are provided in Microchip's quotations, sales order acknowledgement, and invoices.

Microchip disclaims any duty to notify users of updates or changes to Material Content Declarations and shall not be liable for any damages, direct or indirect, consequential or otherwise, suffered by users or third parties as a result of the users' reliance on the information in Material Content Declarations (MCD) or independent third party test reports (SGS) or of this Certificate of Compliance for semiconductor products.

Assembled package referenced above is EU REACH compliant based on the latest SVHC candidate list of ECHA which can be found at <http://echa.europa.eu/web/guest/candidate-list-table>

| Termination Base Alloy: Copper Alloy (Cu) | | | Package Homogeneous Materials: 8.1 Electronics (e.g. pc boards, displays) | | | J-STD-609A Product Marking and/or Pkg. Labeling e8 |
|--|--|-------------------|--|--|--|--|
| 105.55 (mg) Total | Mold Compound | % of Total Weight | | | | 56.90 |
| | Silica, vitreous | 60676-86-0 | 89.25 | | | |
| | Epoxy Resin | Trade Secret | 5.77 | | | |
| | Phenolic Resin | Trade Secret | 4.72 | | | |
| | Carbon Black | 1333-86-4 | 0.26 | | | |
| | | | Total | | | 100.00 |
| 40.07 (mg) Total | Lead Frame | % of Total Weight | | | | 21.60 |
| | Copper | 7440-50-8 | 4.40 | | | |
| | Phthalocyanine Blue, Organic Pigment | 65997-17-3 | 0.03 | | | |
| | Formaldehyde, polymer with 2- | 9003-36-5 | 2.25 | | | |
| | Silica | 7631-86-9 | 1.12 | | | |
| | Nickel | 7440-02-0 | 1.12 | | | |
| | Aromatic Carbonyl Compound | 7727-43-7 | 0.43 | | | |
| | Amine Compound | 14807-96-6 | 0.07 | | | |
| | Levelling Agents & Others | 25068-38-6 | 0.28 | | | |
| | Dipropylene Glycol Monomethyl Ether | 34590-94-8 | 1.58 | | | |
| | 3-Methoxy-3-Methyl Butyl-Acetate | system | 2.46 | | | |
| | High Boiling Point Petroleum Solvent | 9003-36-5 | 0.42 | | | |
| | Acrylic Monomer | 7631-86-9 | 0.68 | | | |
| | Epoxy Resin | 7440-02-0 | 2.31 | | | |
| | Organic Filler | 7727-43-7 | 0.23 | | | |
| | Filament Fiber Glass | 14807-96-6 | 17.64 | | | |
| | Bismaleimide | 25068-38-6 | 7.48 | | | |
| | Triazine | 34590-94-8 | 7.48 | | | |
| | Epoxy Resin | system | 13.90 | | | |
| | Inorganic filler | 24623-77-6 | 6.95 | | | |
| | Copper | 7440-57-5 | 28.40 | | | |
| | Nickel | 7440-02-0 | 0.63 | | | |
| | Gold | 7440-57-5 | 0.14 | | | |
| | | | Total | | | 100.00 |
| 0.93 (mg) Total | Die Attach | % of Total Weight | | | | 0.50 |
| | Silver | 7440-22-4 | 70.00 | | | |
| | Silicon | 7440-21-3 | 24.00 | | | |
| | Epoxy Resin | Trade secret | 6.00 | | | |
| | | | Total | | | 100.00 |
| 8.81 (mg) Total | Chip (Die) | % of Total Weight | | | | 4.75 |
| | Doped Silicon | 7440-21-3 | 100.00 | | | |
| | | | Total | | | 100.00 |
| 0.65 (mg) Total | Wire Bond Copper palladium coated (CuPdAu) | % of Total Weight | | | | 0.35 |
| | Copper | 7440-50-8 | 97.90 | | | |
| | Palladium | 7440-05-3 | 2.00 | | | |
| | Gold | 7440-57-5 | 0.10 | | | |
| | | | Total | | | 100.00 |
| 29.49 (mg) Total | Plating on external leads (pins) (SAC105) | % of Total Weight | | | | 15.90 |
| | Tin | 7440-31-5 | 98.50 | | | |
| | Silver | 7440-22-4 | 1.00 | | | |
| | Copper | 7440-50-8 | 0.50 | | | |
| | | | Total | | | 100.00 |
| | | | 185.50 | | | 100.00 |