PK726 (v1.0) June 12, 2015

# 100% Material Declaration Data Sheet for UltraScale FLGA2577

## Average Weight: 40.4124g

| Component | Substance Description | CAS Number or Description | Percentage of Component | Use in Product | Component Weight/ Substance Weight (grams) | Component Percent of Total |
|---|---|---|---|---|---|---|
| **Silicon Die** | | | | | **0.761099** | **1.883%** |
| | Silicon (Si) | 7440-21-3 | 100.00 | Basis | 0.761099 | |
| **Interposer die** | | | | | **0.178526** | **0.442%** |
| | Silicon (Si) | 7440-21-3 | 100.00 | basis | 0.178526 | |
| **Micro-bump** | | | | | **0.042292** | **0.105%** |
| | Copper (Cu) | 7440-50-8 | 54.80 | metal | 0.023176 | |
| | Nickel (Ni) | 7440-02-0 | 22.69 | metal | 0.009594 | |
| | Tin (Sn) | 7440-31-5 | 21.87 | metal | 0.009250 | |
| | Silver (Ag) | 7440-22-4 | 0.64 | metal | 0.000272 | |
| **Micro-bump underfill** | | | | | **0.038875** | **0.096%** |
| | Amorphous silica | trade secret | 46.87 | Filler | 0.018220 | |
| | Amine compound | trade secret | 20.84 | Glue | 0.008100 | |
| | Epoxy resin compound-A | trade secret | 15.63 | Glue | 0.006075 | |
| | Epoxy resin compound-B | trade secret | 15.63 | Glue | 0.006075 | |
| | Epoxy resin compound-C | trade secret | 1.04 | Glue | 0.000405 | |
| **C4 Bump** | | | | | **0.005346** | **0.013%** |
| | Copper (Cu) | 7440-50-8 | 5.41 | metal | 0.000289 | |
| | Nickel (Ni) | 7440-02-0 | 3.22 | metal | 0.000172 | |
| | Tin (Sn) | 7440-31-5 | 57.53 | metal | 0.003075 | |
| | Lead (Pb) | 7439-92-1 | 33.84 | metal | 0.001809 | |
| **C4 Bump Underfill** | | | | | **0.148000** | **0.366%** |
| | Bisphenol F/ epichlorohydrin copolymer | 9003-36-5 | 24.00 | basis | 0.035520 | |
| | Phenolic resin | trade secret | 19.00 | basis | 0.028120 | |
| | Bisphenol A type liquid epoxy resin | 25068-38-6 | 4.00 | basis | 0.005920 | |
| | Amine type accelerator | trade secret | 5.00 | basis | 0.007400 | |
| | Silicon dioxide | 60676-86-0 | 44.10 | basis | 0.065268 | |
| | Carbon black | 1333-86-4 | 0.90 | basis | 0.001332 | |
| | Additives | trade secret | 3.00 | Additive | 0.004440 | |

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|---|---|---|---|---|---|---|
| **Molding compound** | | | | | **0.096193** | **0.238%** |
| | Silica filler (SiO2) | trade secret | 86.02 | Filler | 0.082746 | |
| | Epoxy resin | trade secret | 8.60 | Glue | 0.008275 | |
| | Hardener resin | trade secret | 5.38 | Glue | 0.005172 | |
| **Solder Paste** | | | | | **0.026250** | **0.065%** |
| | Tin (Sn) | 7440-31-5 | 96.50 | metal | 0.025331 | |
| | Silver (Ag) | 7440-22-4 | 3.00 | metal | 0.000788 | |
| | Copper (Cu) | 7440-50-8 | 0.50 | metal | 0.000131 | |
| **Capacitor 1** | | | | | **0.054400** | **0.135%** |
| | Titanium Dioxide | 13463-67-7 | 15.11 | | 0.00822 | |
| | Misc | N/A | 5.04 | | 0.002742 | |
| | Ni | 7440-02-0 | 33.44 | Inner electrode | 0.018191 | |
| | Cu | 7440-50-8 | 11.87 | Out electrode | 0.006457 | |
| | Silicon Dioxide | 7631-86-9 | 1.06 | | 0.000577 | |
| | Diboron trioxide | 1303-86-2 | 0.26 | | 0.000141 | |
| | Ni | 7440-02-0 | 0.81 | Plating1 | 0.000441 | |
| | Sn | 7440-31-5 | 2.19 | Plating2 | 0.001191 | |
| | Other | trade secret | 30.22 | | 0.01644 | |
| **Capacitor 2** | | | | | **0.016253** | **0.040%** |
| | BaTiO3 type | 12047-27-7 | 51.10 | Ceramic | 0.008305 | |
| | Copper (Cu) | 7440-50-8 | 27.00 | Inner electrode | 0.004388 | |
| | Nickel (Ni) | 7440-02-0 | 16.90 | Out electrode | 0.002747 | |
| | Nickel (Ni) | 7440-02-0 | 2.00 | Plating1 | 0.000325 | |
| | Tin (Sn) | 7440-31-5 | 3.00 | Plating2 | 0.000488 | |
| **Lid** | | | | | **21.337377** | **52.799%** |
| | Copper (Cu) | 7440-50-8 | 99.64 | Main material | 21.260600 | |
| | Nickel (Ni) | 8049-31-8 | 0.36 | Main material | 0.076777 | |
| **Lid Adhesive** | | | | | **0.050000** | **0.124%** |
| | Silica,Vitreous | 60676-86-0 | 60.00 | Main material | 0.030000 | |
| | Unsaturated Cyclic Siloxane Polymer | trade secret | 30.00 | Main material | 0.015000 | |
| | Hydrocarbon Synthetic Rubber | trade secret | 8.00 | Main material | 0.004000 | |
| | Boron Nitride | trade secret | 1.00 | Main material | 0.000500 | |
| | Carbon Black | 1333-86-4 | 0.50 | Main material | 0.000250 | |
| | Toluene | 108-88-3 | 0.50 | Main material | 0.000250 | |

| Component | Substance Description | CAS Number or Description | Percentage of Component | Use in Product | Component Weight/ Substance Weight (grams) | Component Percent of Total |
|---|---|---|---|---|---|---|
| **Lid TIM** | | | | | **0.260000** | **0.643%** |
| | Aluminum oxide | 1344-28-1 | 85.00 | Main material | 0.221000 | |
| | Zinc oxide | 1314-13-2 | 5.00 | Main material | 0.013000 | |
| | Silicone | Confidential | 9.00 | Main material | 0.023400 | |
| | Others | Confidential | 1.00 | Main material | 0.002600 | |
| **Solder Ball** | | | | | **1.911631** | **4.730%** |
| | Tin (Sn) | 7440-31-5 | 96.50 | Main material | 1.844724 | |
| | Silver (Ag) | 7440-22-4 | 3.00 | Main material | 0.057349 | |
| | Copper (Cu) | 7440-50-8 | 0.50 | Main material | 0.009558 | |
| **Substrate** | | | | | **15.486170** | **38.320%** |
| | Copper (Cu) | 7440-50-8 | 36.39 | | 5.635642 | |
| | Tin (Sn) | 7440-31-5 | 0.62 | | 0.096596 | |
| | Lead (Pb) | 7439-92-1 | 0.17 | | 0.026501 | |
| | Silver (Ag) | 7440-22-4 | 0.01 | | 0.001601 | |
| | BT Core | N/A | 45.92 | | 7.110485 | |
| | ABF | N/A | 15.85 | | 2.454138 | |
| | Solder Mask | N/A | 1.04 | | 0.161207 | |

## Revision History

The following table shows the revision history for this document.

| Date | Version | Description of Revisions |
|---|---|---|
| 6/12/2015 | 1.0 | Initial Xilinx release |

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